START

Volume: 1188

Issues: 1 - 2
PATENT: 5,530,966-5,535,445

Date: JULY 2 - 9, 1996

UMI Number: 10426.00

Note:

REEL: 9

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

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THE PAPER AND INK USED IN THE ORIGINAL
PUBLICATION MAY AFFECT THE QUALITY OF
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VOL
1188

ISS
1

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1996

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U.S.
DEPARTMENT
OF COMMERCE

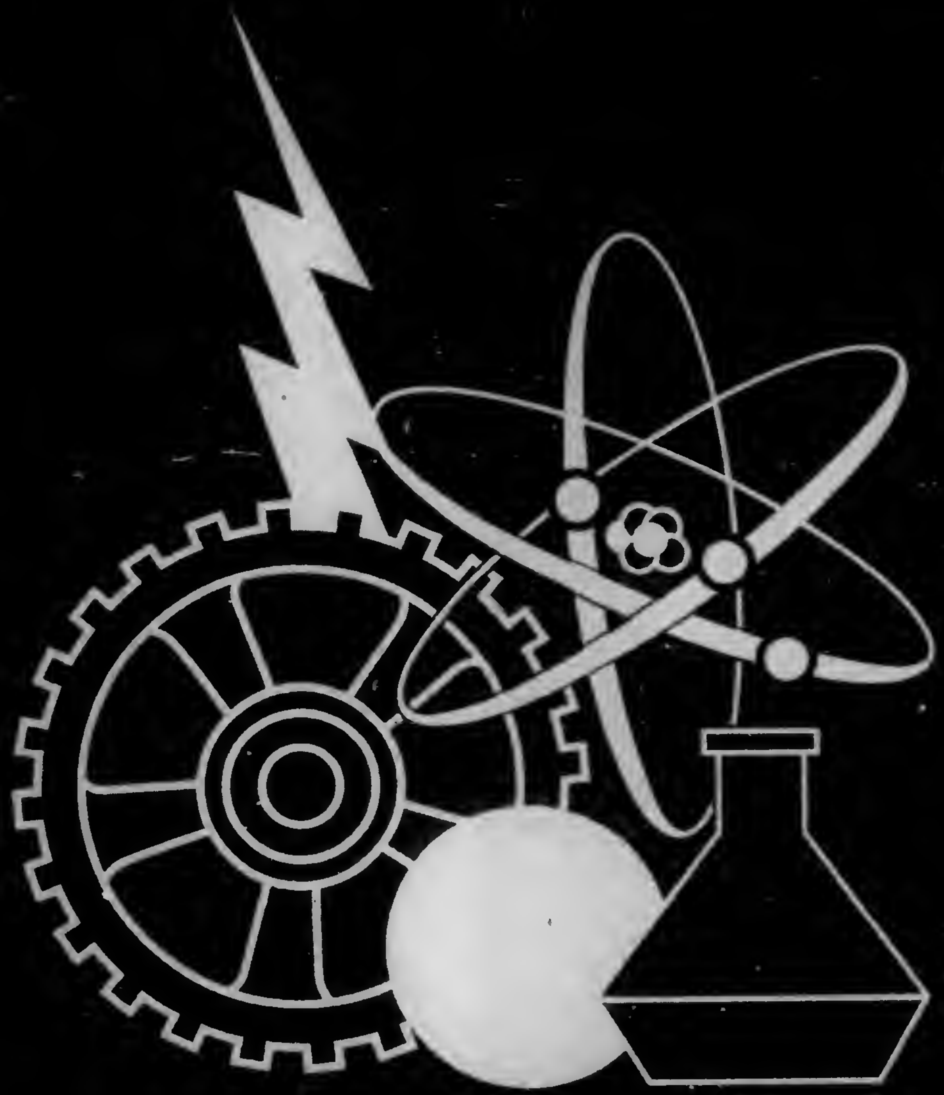
Patent
and
Trademark
Office

Vol. 1188 Number 1

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS
July 2, 1996



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
July 2, 1996 Volume 1188 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	125.00	250.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 29, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,222,256 through 5,224,218
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 27, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,841,576 through 4,843,640
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 25, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,524,463 through 4,525,784
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

Attention is drawn to the patents which were issued on

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED April 24, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,194	06/691,267	06/24/86
(4,445,143)	(06/260,589)	(04/24/84)
Re. 32,367	06/755,370	03/10/87
(4,443,938)	(06/359,341)	(04/24/84)
Re. 32,548	07/013,951	11/24/87
(4,444,174)	(06/339,868)	(04/24/84)
Re. 32,654	06/855,515	04/26/88
(4,445,061)	(06/401,134)	(04/24/84)
Re. 33,466	07/509,939	12/04/90
(4,738,015)	(07/008,245)	(04/19/88)
Re. 33,776	07/510,975	12/24/91
(4,738,206)	(06/907,961)	(04/19/88)
4,443,891	06/341,995	04/24/84
4,443,892	06/363,620	04/24/84
4,443,902	06/280,211	04/24/84
4,443,906	06/409,845	04/24/84
4,443,910	06/393,275	04/24/84
4,443,911	06/444,175	04/24/84
4,443,912	06/320,611	04/24/84
4,443,913	06/285,466	04/24/84
4,443,914	06/360,384	04/24/84
4,443,916	06/325,856	04/24/84
4,443,918	06/283,990	04/24/84
4,443,920	06/300,216	04/24/84
4,443,923	06/391,163	04/24/84
4,443,926	06/346,476	04/24/84
4,443,927	06/323,966	04/24/84
4,443,933	06/367,506	04/24/84
4,443,935	06/353,479	04/24/84
4,443,941	06/312,182	04/24/84
4,443,947	06/268,632	04/24/84
4,443,959	06/357,764	04/24/84
4,443,973	06/283,541	04/24/84
4,443,984	06/277,226	04/24/84
4,443,985	06/297,983	04/24/84
4,443,986	06/358,277	04/24/84
4,443,993	06/321,012	04/24/84
4,444,013	06/301,638	04/24/84
4,444,014	06/340,342	04/24/84
4,444,017	06/362,785	04/24/84
4,444,019	06/293,126	04/24/84
4,444,026	06/352,324	04/24/84
4,444,027	06/313,352	04/24/84
4,444,028	06/321,617	04/24/84
4,444,032	06/380,501	04/24/84
4,444,033	06/260,835	04/24/84
4,444,035	06/398,813	04/24/84
4,444,038	06/314,580	04/24/84
4,444,040	06/400,020	04/24/84
4,444,044	06/399,943	04/24/84
4,444,050	06/322,487	04/24/84
4,444,056	06/374,972	04/24/84
4,444,063	06/296,043	04/24/84
4,444,066	06/278,771	04/24/84
4,444,067	06/253,585	04/24/84
4,444,070	06/297,932	04/24/84
4,444,078	06/345,707	04/24/84
4,444,079	06/388,052	04/24/84
4,444,080	06/331,929	04/24/84
4,444,083	06/344,640	04/24/84
4,444,087	06/343,540	04/24/84
4,444,089	06/352,869	04/24/84
4,444,093	06/313,983	04/24/84
4,444,094	06/422,893	04/24/84
4,444,097	06/376,580	04/24/84
4,444,098	06/382,885	04/24/84
4,444,109	06/443,343	04/24/84
4,444,113	06/251,633	04/24/84
4,444,118	06/237,907	04/24/84
4,444,122	06/296,796	04/24/84
4,444,128	06/385,051	04/24/84
4,444,129	06/439,629	04/24/84
4,444,133	06/490,353	04/24/84
4,444,137	06/481,546	04/24/84
4,444,141	06/377,232	04/24/84
4,444,143	06/284,455	04/24/84
4,444,152	06/379,660	04/24/84
4,444,154	06/365,551	04/24/84
4,444,157	06/448,838	04/24/84
4,444,158	06/414,744	04/24/84
4,444,162	06/367,555	04/24/84
4,444,164	06/368,391	04/24/84
4,444,165	06/368,393	04/24/84
4,444,166	06/472,317	04/24/84
4,444,171	06/440,547	04/24/84
4,444,172	06/389,586	04/24/84
4,444,191	06/285,771	04/24/84
4,444,200	06/299,578	04/24/84
4,444,208	06/394,989	04/24/84
4,444,209	06/357,183	04/24/84
4,444,222	06/377,610	04/24/84
4,444,229	06/264,917	04/24/84
4,444,231	06/334,475	04/24/84
4,444,244	06/374,780	04/24/84
4,444,257	06/215,995	04/24/84
4,444,263	06/487,790	04/24/84
4,444,280	06/332,616	04/24/84
4,444,284	06/290,342	04/24/84
4,444,285	06/288,538	04/24/84
4,444,290	06/315,955	04/24/84
4,444,294	06/306,759	04/24/84
4,444,296	06/343,658	04/24/84
4,444,297	06/319,325	04/24/84
4,444,298	06/282,296	04/24/84
4,444,301	06/222,020	04/24/84
4,444,304	06/276,718	04/24/84
4,444,319	06/271,704	04/24/84
4,444,322	06/309,770	04/24/84
4,444,332	06/292,939	04/24/84
4,444,340	06/382,485	04/24/84
4,444,344	06/422,075	04/24/84
4,444,373	06/363,150	04/24/84
4,444,376	06/529,668	04/24/84
4,444,377	06/398,406	04/24/84
4,444,380	06/292,555	04/24/84
4,444,388	06/303,298	04/24/84
4,444,395	06/435,756	04/24/84
4,444,402	06/400,909	04/24/84
4,444,406	06/333,463	04/24/84
4,444,411	06/373,310	04/24/84
4,444,413	06/298,154	04/24/84
4,444,414	06/372,403	04/24/84
4,444,422	06/366,065	04/24/84
4,444,427	06/376,516	04/24/84
4,444,428	06/273,922	04/24/84
4,444,431	06/396,321	04/24/84
4,444,442	06/361,985	04/24/84
4,444,446	06/303,955	04/24/84
4,444,459	06/278,015	04/24/84
4,444,462	06/297,177	04/24/84
4,444,467	06/291,851	04/24/84
4,444,468	06/292,123	04/24/84
4,444,470	06/311,328	04/24/84
4,444,479	06/343,160	04/24/84
4,444,481	06/328,001	04/24/84
4,444,484	06/411,226	04/24/84
4,444,486	06/387,061	04/24/84
4,444,488	06/337,321	04/24/84
4,444,492	06/403,277	04/24/84
4,444,493	06/364,333	04/24/84
4,444,495	06/258,340	04/24/84
4,444,506	06/295,263	04/24/84
4,444,512	06/313,516	04/24/84
4,444,522	06/391,036	04/24/84
4,444,529	06/370,275	04/24/84
4,444,530	06/400,441	04/24/84
4,444,531	06/326,399	04/24/84
4,444,533	06/314,995	04/24/84
4,444,537	06/373,484	04/24/84
4,444,539	06/365,907	04/24/84
4,444,540	06/287,765	04/24/84
4,444,547	06/252,393	04/24/84
4,444,550	06/435,473	04/24/84
4,444,554	06/377,874	04/24/84
4,444,557	06/332,240	04/24/84
4,444,558	06/426,502	04/24/84
4,444,567	06/480,962	04/24/84
4,444,570	06/413,187	04/24/84
4,444,571	06/472,713	04/24/84
4,444,572	06/402,335	04/24/84
4,444,573	06/390,294	04/24/84
4,444,581	06/449,049	04/24/84
4,444,589	06/370,197	04/24/84
4,444,593	06/463,259	04/24/84
4,444,598	06/434,872	04/24/84
4,444,600	06/486,959	04/24/84
4,444,602	06/350,578	04/24/84
4,444,612	06/244,400	04/24/84
4,444,613	06/378,564	04/24/84
4,444,616	06/384,111	04/24/84
4,444,620	06/531,353	04/24/84
4,444,627	06/352,101	04/24/84
4,444,633	06/451,241	04/24/84
4,444,636	06/270,129	04/24/84
4,444,641	06/279,754	04/24/84
4,444,647	06/340,501	04/24/84
4,444,652	06/311,465	04/24/84
4,444,663	06/302,214	04/24/84
4,444,665	06/468,093	04/24/84
4,444,666	06/419,193	04/24/84
4,444,668	06/538,836	04/24/84
4,444,684	06/345,989	04/24/84
4,444,687	06/484,350	04/24/84
4,444,691	06/351,884	04/24/84
4,444,692	06/264,886	04/24/84
4,444,694	06/487,478	04/24/84
4,444,702	06/366,970	04/24/84
4,444,703	06/355,939	04/24/84
4,444,708	06/389,311	04/24/84
4,444,714	06/391,488	04/24/84
4,444,719	06/466,902	04/24/84
4,444,729	06/393,695	04/24/84
4,444,730	06/385,639	04/24/84
4,444,737	06/251,765	04/24/84
4,444,743	06/302,563	04/24/84
4,444,746	06/444,099	04/24/84
4,444,747	06/479,528	04/24/84
4,444,752	06/417,493	04/24/84
4,444,756	06/374,342	04/24/84
4,444,759	06/402,117	04/24/84
4,444,764	06/246,500	04/24/84
4,444,767	06/436,524	04/24/84
4,444,774	06/403,185	04/24/84
4,444,781	06/447,055	04/24/84
4,444,788	06/387,140	04/24/84
4,444,797	06/234,377	04/24/84
4,444,799	06/293,924	04/24/84
4,444,802	06/374,465	04/24/84
4,444,803	06/374,466	04/24/84
4,444,807	06/518,207	04/24/84
4,444,808	06/415,296	04/24/84
4,444,813	06/404,204	04/24/84
4,444,814	06/387,375	04/24/84
4,444,815	06/502,045	04/24/84
4,444,818	06/462,178	04/24/84

Patent Number	Serial Number	Issue Date			
			4,445,146	06/347,486	04/24/84
			4,445,150	06/322,367	04/24/84
4,444,821	06/438,210	04/24/84	4,445,160	06/363,758	04/24/84
4,444,827	06/391,525	04/24/84	4,445,167	06/421,346	04/24/84
4,444,833	06/356,542	04/24/84	4,445,175	06/301,695	04/24/84
4,444,835	06/422,139	04/24/84	4,445,181	06/269,471	04/24/84
4,444,848	06/337,054	04/24/84	4,445,211	06/316,252	04/24/84
4,444,854	06/302,309	04/24/84	4,445,212	06/316,255	04/24/84
4,444,872	06/406,945	04/24/84	4,445,216	06/242,293	04/24/84
4,444,875	06/478,902	04/24/84	4,445,221	06/336,975	04/24/84
4,444,879	06/229,448	04/24/84	4,445,223	06/222,422	04/24/84
4,444,882	06/324,550	04/24/84	4,445,229	06/237,053	04/24/84
4,444,883	06/406,747	04/24/84	4,737,994	06/947,610	04/19/88
4,444,884	06/420,982	04/24/84	4,738,005	07/004,163	04/19/88
4,444,887	06/243,021	04/24/84	4,738,008	06/854,150	04/19/88
4,444,889	06/366,542	04/24/84	4,738,010	07/017,211	04/19/88
4,444,896	06/374,977	04/24/84	4,738,016	07/020,879	04/19/88
4,444,897	06/374,978	04/24/84	4,738,017	06/923,434	04/19/88
4,444,901	06/457,331	04/24/84	4,738,019	07/025,750	04/19/88
4,444,902	06/333,370	04/24/84	4,738,024	07/088,644	04/19/88
4,444,912	06/395,706	04/24/84	4,738,029	06/825,680	04/19/88
4,444,915	06/519,274	04/24/84	4,738,031	07/005,030	04/19/88
4,444,916	06/519,276	04/24/84	4,738,033	06/883,958	04/19/88
4,444,917	06/519,275	04/24/84	4,738,036	07/004,411	04/19/88
4,444,921	06/423,384	04/24/84	4,738,039	06/896,178	04/19/88
4,444,925	06/450,332	04/24/84	4,738,043	06/908,694	04/19/88
4,444,929	06/444,281	04/24/84	4,738,044	06/876,030	04/19/88
4,444,934	06/446,027	04/24/84	4,738,046	07/025,993	04/19/88
4,444,936	06/461,432	04/24/84	4,738,053	06/924,396	04/19/88
4,444,938	06/385,958	04/24/84	4,738,054	06/799,140	04/19/88
4,444,940	06/507,264	04/24/84	4,738,060	06/939,353	04/19/88
4,444,946	06/344,083	04/24/84	4,738,065	07/000,345	04/19/88
4,444,948	06/357,608	04/24/84	4,738,070	06/934,183	04/19/88
4,444,952	06/410,743	04/24/84	4,738,078	06/905,973	04/19/88
4,444,953	06/485,768	04/24/84	4,738,082	06/774,948	04/19/88
4,444,954	06/431,980	04/24/84	4,738,083	06/937,004	04/19/88
4,444,955	06/431,995	04/24/84	4,738,086	06/870,760	04/19/88
4,444,956	06/439,863	04/24/84	4,738,095	06/914,113	04/19/88
4,444,958	06/368,230	04/24/84	4,738,102	06/914,334	04/19/88
4,444,966	06/481,955	04/24/84	4,738,107	06/691,529	04/19/88
4,444,968	06/424,803	04/24/84	4,738,111	06/804,400	04/19/88
4,444,969	06/410,742	04/24/84	4,738,112	06/904,984	04/19/88
4,444,972	06/491,125	04/24/84	4,738,120	07/098,783	04/19/88
4,444,973	06/411,751	04/24/84	4,738,126	06/864,145	04/19/88
4,444,975	06/520,079	04/24/84	4,738,129	06/905,557	04/19/88
4,444,977	06/472,695	04/24/84	4,738,137	06/874,319	04/19/88
4,444,980	06/475,579	04/24/84	4,738,138	06/916,491	04/19/88
4,444,983	06/368,759	04/24/84	4,738,140	06/890,125	04/19/88
4,444,984	06/522,944	04/24/84	4,738,141	06/942,652	04/19/88
4,444,985	06/402,489	04/24/84	4,738,149	06/843,663	04/19/88
4,444,986	06/307,048	04/24/84	4,738,153	06/944,898	04/19/88
4,444,988	06/400,828	04/24/84	4,738,158	07/054,214	04/19/88
4,445,009	06/313,082	04/24/84	4,738,159	07/011,237	04/19/88
4,445,020	06/479,920	04/24/84	4,738,161	06/893,569	04/19/88
4,445,022	06/356,152	04/24/84	4,738,162	06/913,985	04/19/88
4,445,025	06/438,053	04/24/84	4,738,163	06/771,381	04/19/88
4,445,031	06/232,273	04/24/84	4,738,167	06/900,830	04/19/88
4,445,034	06/331,469	04/24/84	4,738,168	06/895,799	04/19/88
4,445,046	06/394,010	04/24/84	4,738,170	06/946,100	04/19/88
4,445,049	06/334,844	04/24/84	4,738,171	07/031,107	04/19/88
4,445,057	06/468,553	04/24/84	4,738,175	06/813,121	04/19/88
4,445,070	06/320,838	04/24/84	4,738,185	06/886,264	04/19/88
4,445,073	06/360,278	04/24/84	4,738,200	06/829,418	04/19/88
4,445,080	06/324,769	04/24/84	4,738,202	06/932,969	04/19/88
4,445,081	06/331,108	04/24/84	4,738,204	06/898,747	04/19/88
4,445,085	06/449,705	04/24/84	4,738,210	06/933,884	04/19/88
4,445,086	06/350,426	04/24/84	4,738,214	07/017,743	04/19/88
4,445,094	06/268,412	04/24/84	4,738,217	07/041,856	04/19/88
4,445,095	06/348,283	04/24/84	4,738,218	06/911,493	04/19/88
4,445,097	06/302,123	04/24/84	4,738,222	06/889,426	04/19/88
4,445,105	06/392,527	04/24/84	4,738,225	07/056,968	04/19/88
4,445,115	06/301,256	04/24/84	4,738,227	06/907,809	04/19/88
4,445,118	06/266,253	04/24/84	4,738,229	06/805,740	04/19/88
4,445,121	06/332,132	04/24/84	4,738,233	06/832,409	04/19/88
4,445,123	06/354,849	04/24/84	4,738,234	07/090,777	04/19/88
4,445,128	06/364,834	04/24/84	4,738,235	06/795,659	04/19/88
4,445,130	06/319,401	04/24/84	4,738,236	07/035,404	04/19/88
4,445,132	06/270,030	04/24/84	4,738,250	06/782,427	04/19/88
4,445,135	06/317,421	04/24/84	4,738,260	06/724,584	04/19/88

Patent Number	Serial Number	Issue Date			
			4,738,522	06/883,112	04/19/88
			4,738,523	07/089,056	04/19/88
4,738,270	06/931,185	04/19/88	4,738,529	06/761,203	04/19/88
4,738,271	06/918,222	04/19/88	4,738,531	06/821,718	04/19/88
4,738,276	06/871,560	04/19/88	4,738,538	07/006,517	04/19/88
4,738,277	06/872,498	04/19/88	4,738,540	06/904,935	04/19/88
4,738,279	06/937,706	04/19/88	4,738,541	06/920,144	04/19/88
4,738,281	06/943,772	04/19/88	4,738,544	06/803,163	04/19/88
4,738,286	07/031,041	04/19/88	4,738,547	06/383,153	04/19/88
4,738,287	07/021,337	04/19/88	4,738,549	06/847,476	04/19/88
4,738,290	06/935,573	04/19/88	4,738,553	07/009,032	04/19/88
4,738,294	06/919,500	04/19/88	4,738,555	06/762,834	04/19/88
4,738,300	07/038,989	04/19/88	4,738,566	06/840,909	04/19/88
4,738,310	06/769,602	04/19/88	4,738,568	06/743,574	04/19/88
4,738,311	06/919,790	04/19/88	4,738,571	06/426,744	04/19/88
4,738,314	06/927,142	04/19/88	4,738,572	06/828,991	04/19/88
4,738,319	07/009,154	04/19/88	4,738,574	06/890,713	04/19/88
4,738,323	06/930,420	04/19/88	4,738,576	06/848,336	04/19/88
4,738,325	06/945,525	04/19/88	4,738,577	06/865,342	04/19/88
4,738,332	06/926,315	04/19/88	4,738,580	06/852,429	04/19/88
4,738,337	07/079,201	04/19/88	4,738,581	07/011,786	04/19/88
4,738,339	07/004,260	04/19/88	4,738,583	06/913,432	04/19/88
4,738,342	07/003,251	04/19/88	4,738,584	06/889,694	04/19/88
4,738,345	06/917,099	04/19/88	4,738,586	07/049,043	04/19/88
4,738,351	06/824,964	04/19/88	4,738,590	06/905,213	04/19/88
4,738,352	06/847,224	04/19/88	4,738,591	06/905,207	04/19/88
4,738,353	06/923,145	04/19/88	4,738,592	06/656,063	04/19/88
4,738,354	06/846,056	04/19/88	4,738,594	06/826,328	04/19/88
4,738,355	06/946,000	04/19/88	4,738,595	07/054,171	04/19/88
4,738,362	07/099,161	04/19/88	4,738,597	07/012,378	04/19/88
4,738,363	06/937,712	04/19/88	4,738,598	06/871,695	04/19/88
4,738,365	07/042,680	04/19/88	4,738,600	07/022,038	04/19/88
4,738,367	06/901,294	04/19/88	4,738,602	06/938,080	04/19/88
4,738,369	06/873,259	04/19/88	4,738,606	06/934,427	04/19/88
4,738,370	07/002,349	04/19/88	4,738,608	07/014,437	04/19/88
4,738,371	06/926,651	04/19/88	4,738,609	06/930,359	04/19/88
4,738,374	06/897,140	04/19/88	4,738,610	06/938,204	04/19/88
4,738,375	06/898,049	04/19/88	4,738,611	07/021,662	04/19/88
4,738,376	06/820,971	04/19/88	4,738,628	06/912,710	04/19/88
4,738,379	06/864,741	04/19/88	4,738,630	06/851,772	04/19/88
4,738,382	07/017,039	04/19/88	4,738,633	06/862,066	04/19/88
4,738,387	06/900,148	04/19/88	4,738,638	07/065,647	04/19/88
4,738,389	06/845,728	04/19/88	4,738,644	07/019,937	04/19/88
4,738,390	06/826,146	04/19/88	4,738,646	06/832,455	04/19/88
4,738,395	07/015,284	04/19/88	4,738,651	06/933,706	04/19/88
4,738,396	07/058,039	04/19/88	4,738,654	06/442,387	04/19/88
4,738,403	07/013,086	04/19/88	4,738,657	06/781,965	04/19/88
4,738,411	06/490,747	04/19/88	4,738,661	06/908,640	04/19/88
4,738,412	07/089,099	04/19/88	4,738,667	06/927,044	04/19/88
4,738,415	06/920,564	04/19/88	4,738,669	07/009,841	04/19/88
4,738,416	06/911,881	04/19/88	4,738,672	06/904,411	04/19/88
4,738,419	07/017,706	04/19/88	4,738,684	07/007,323	04/19/88
4,738,421	06/929,718	04/19/88	4,738,688	06/886,360	04/19/88
4,738,424	07/042,066	04/19/88	4,738,699	06/732,558	04/19/88
4,738,426	07/097,503	04/19/88	4,738,707	06/877,629	04/19/88
4,738,430	06/915,459	04/19/88	4,738,708	06/635,226	04/19/88
4,738,432	07/047,471	04/19/88	4,738,710	06/780,716	04/19/88
4,738,437	07/027,749	04/19/88	4,738,729	07/006,869	04/19/88
4,738,438	06/944,853	04/19/88	4,738,730	06/830,536	04/19/88
4,738,440	07/057,779	04/19/88	4,738,739	06/832,056	04/19/88
4,738,442	06/791,358	04/19/88	4,738,741	06/944,279	04/19/88
4,738,448	07/012,879	04/19/88	4,738,742	06/882,886	04/19/88
4,738,452	06/776,843	04/19/88	4,738,744	07/097,493	04/19/88
4,738,454	07/005,068	04/19/88	4,738,753	06/778,644	04/19/88
4,738,457	07/020,968	04/19/88	4,738,756	07/078,349	04/19/88
4,738,458	07/008,624	04/19/88	4,738,757	07/017,239	04/19/88
4,738,460	07/017,907	04/19/88	4,738,760	07/091,716	04/19/88
4,738,463	07/018,262	04/19/88	4,738,769	06/478,428	04/19/88
4,738,469	06/943,717	04/19/88	4,738,774	06/917,668	04/19/88
4,738,470	06/883,649	04/19/88	4,738,775	06/907,376	04/19/88
4,738,478	06/904,620	04/19/88	4,738,781	06/538,154	04/19/88
4,738,479	06/928,889	04/19/88	4,738,782	06/727,476	04/19/88
4,738,481	07/018,691	04/19/88	4,738,783	06/881,593	04/19/88
4,738,496	06/839,282	04/19/88	4,738,784	06/881,595	04/19/88
4,738,500	06/924,267	04/19/88	4,738,787	07/054,028	04/19/88
4,738,510	06/717,004	04/19/88	4,738,790	06/762,420	04/19/88
4,738,512	06/903,471	04/19/88	4,738,791	06/876,849	04/19/88
4,738,518	07/067,599	04/19/88	4,738,792	06/876,850	04/19/88
4,738,520	06/869,583	04/19/88	4,738,795	06/781,014	04/19/88

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4,738,800	07/026,084	04/19/88
4,738,805	07/016,749	04/19/88
4,738,807	06/945,443	04/19/88
4,738,810	06/756,905	04/19/88
4,738,814	06/917,697	04/19/88
4,738,818	06/912,854	04/19/88
4,738,819	06/886,843	04/19/88
4,738,825	06/706,073	04/19/88
4,738,826	06/823,939	04/19/88
4,738,827	06/860,055	04/19/88
4,738,830	06/879,681	04/19/88
4,738,832	06/719,362	04/19/88
4,738,846	06/645,998	04/19/88
4,738,848	06/870,464	04/19/88
4,738,852	06/757,773	04/19/88
4,738,858	06/768,810	04/19/88
4,738,860	06/908,630	04/19/88
4,738,861	06/847,314	04/19/88
4,738,864	07/059,208	04/19/88
4,738,866	07/028,561	04/19/88
4,738,869	06/934,304	04/19/88
4,738,872	07/004,751	04/19/88
4,738,874	06/813,615	04/19/88
4,738,876	06/941,139	04/19/88
4,738,877	07/027,178	04/19/88
4,738,882	06/905,285	04/19/88
4,738,884	07/049,373	04/19/88
4,738,887	06/817,394	04/19/88
4,738,892	06/781,025	04/19/88
4,738,893	06/910,720	04/19/88
4,738,896	06/912,964	04/19/88
4,738,899	06/883,341	04/19/88
4,738,901	07/030,530	04/19/88
4,738,903	06/938,488	04/19/88
4,738,905	06/938,483	04/19/88
4,738,909	06/901,400	04/19/88
4,738,911	06/924,354	04/19/88
4,738,923	06/865,059	04/19/88
4,738,924	07/029,684	04/19/88
4,738,925	06/728,243	04/19/88
4,738,930	07/001,640	04/19/88
4,738,939	07/067,541	04/19/88
4,738,948	06/881,347	04/19/88
4,738,952	06/811,675	04/19/88
4,738,958	06/846,945	04/19/88
4,738,963	06/867,810	04/19/88
4,738,968	06/829,097	04/19/88
4,738,969	06/876,135	04/19/88
4,738,970	07/062,429	04/19/88
4,738,977	06/925,175	04/19/88
4,738,981	06/929,039	04/19/88
4,738,982	06/856,251	04/19/88
4,738,983	06/558,984	04/19/88
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4,738,986	07/024,045	04/19/88
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4,738,990	07/091,141	04/19/88
4,738,995	06/662,120	04/19/88
4,738,997	06/807,674	04/19/88
4,738,998	07/053,161	04/19/88
4,738,999	06/846,443	04/19/88
4,739,010	06/941,340	04/19/88
4,739,011	07/049,337	04/19/88
4,739,021	06/861,878	04/19/88
4,739,022	06/940,080	04/19/88
4,739,028	07/020,948	04/19/88
4,739,031	07/048,711	04/19/88
4,739,035	06/900,970	04/19/88
4,739,042	06/893,114	04/19/88
4,739,043	06/860,195	04/19/88
4,739,049	06/897,456	04/19/88
4,739,053	06/837,880	04/19/88
4,739,058	06/876,160	04/19/88
4,739,059	07/030,490	04/19/88
4,739,062	06/879,474	04/19/88
4,739,063	06/804,576	04/19/88
4,739,064	06/804,579	04/19/88
4,739,066	06/900,816	04/19/88
4,739,067	06/925,760	04/19/88
4,739,069	06/679,183	04/19/88
4,739,070	06/855,226	04/19/88
4,739,076	06/712,140	04/19/88
4,739,078	06/581,471	04/19/88
4,739,079	06/845,150	04/19/88
4,739,082	06/717,383	04/19/88
4,739,083	06/815,919	04/19/88
4,739,087	06/690,436	04/19/88
4,739,089	07/017,417	04/19/88
4,739,090	06/845,903	04/19/88
4,739,097	06/896,110	04/19/88
4,739,099	06/781,634	04/19/88
4,739,108	06/623,946	04/19/88
4,739,113	06/868,472	04/19/88
4,739,116	06/820,875	04/19/88
4,739,118	06/907,209	04/19/88
4,739,119	07/002,095	04/19/88
4,739,124	06/837,919	04/19/88
4,739,129	07/033,408	04/19/88
4,739,132	06/921,348	04/19/88
4,739,135	07/045,979	04/19/88
4,739,137	07/011,488	04/19/88
4,739,138	06/923,880	04/19/88
4,739,139	06/915,584	04/19/88
4,739,144	06/909,354	04/19/88
4,739,145	06/848,506	04/19/88
4,739,148	07/042,903	04/19/88
4,739,149	07/021,115	04/19/88
4,739,151	06/937,540	04/19/88
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Patent Number	Serial Number	Issue Date
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Patent Number	Serial Number	Issue Date
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5,106,995	07/347,647	04/21/92
5,106,996	07/558,265	04/21/92
5,106,999	07/543,943	04/21/92
5,107,016	07/460,236	04/21/92
5,107,021	07/685,305	04/21/92
5,107,022	07/573,086	04/21/92
5,107,028	07/671,031	04/21/92
5,107,030	07/661,722	04/21/92
5,107,031	07/452,873	04/21/92
5,107,034	07/502,146	04/21/92
5,107,040	07/701,400	04/21/92
5,107,043	07/606,700	04/21/92
5,107,044	07/586,388	04/21/92
5,107,045	07/660,435	04/21/92
5,107,056	07/622,442	04/21/92
5,107,058	07/622,688	04/21/92
5,107,059	07/622,689	04/21/92
5,107,060	07/599,200	04/21/92
5,107,066	07/746,096	04/21/92
5,107,074	07/516,506	04/21/92

5,107,075	07/393,541	04/21/92
5,107,096	07/582,666	04/21/92
5,107,098	07/532,451	04/21/92
5,107,105	07/610,088	04/21/92
5,107,107	07/506,636	04/21/92
5,107,123	07/519,129	04/21/92
5,107,126	07/630,739	04/21/92
5,107,132	07/557,998	04/21/92
5,107,133	07/576,604	04/21/92
5,107,144	07/487,721	04/21/92
5,107,145	07/492,639	04/21/92
5,107,156	07/611,681	04/21/92
5,107,159	07/402,225	04/21/92
5,107,169	07/530,664	04/21/92
5,107,174	07/477,119	04/21/92
5,107,176	07/459,291	04/21/92
5,107,181	07/518,994	04/21/92
5,107,183	07/586,950	04/21/92
5,107,191	06/537,970	04/21/92
5,107,192	07/633,760	04/21/92
5,107,196	07/570,730	04/21/92
5,107,211	07/507,759	04/21/92
5,107,212	07/625,218	04/21/92
5,107,232	07/546,822	04/21/92
5,107,236	07/649,404	04/21/92
5,107,237	07/614,901	04/21/92
5,107,247	07/504,669	04/21/92
5,107,258	07/251,577	04/21/92
5,107,265	07/283,446	04/21/92
5,107,269	07/616,792	04/21/92
5,107,270	07/541,991	04/21/92
5,107,271	07/129,431	04/21/92
5,107,280	07/578,220	04/21/92
5,107,297	07/661,911	04/21/92
5,107,307	07/742,523	04/21/92
5,107,319	07/528,551	04/21/92
5,107,326	07/643,128	04/21/92
5,107,333	07/555,648	04/21/92
5,107,336	07/625,856	04/21/92
5,107,340	07/628,988	04/21/92
5,107,346	07/509,602	04/21/92
5,107,357	07/643,396	04/21/92
5,107,358	07/603,708	04/21/92
5,107,359	07/440,275	04/21/92
5,107,365	07/477,838	04/21/92
5,107,374	07/454,762	04/21/92
5,107,375	07/606,709	04/21/92
5,107,379	07/541,582	04/21/92
5,107,385	07/438,263	04/21/92
5,107,391	07/503,681	04/21/92
5,107,404	07/406,998	04/21/92
5,107,409	07/480,016	04/21/92
5,107,412	07/672,712	04/21/92
5,107,426	07/362,824	04/21/92
5,107,430	07/633,854	04/21/92
5,107,431	07/506,612	04/21/92
5,107,440	07/578,838	04/21/92
5,107,441	07/606,872	04/21/92
5,107,461	07/549,763	04/21/92
5,107,467	07/688,305	04/21/92
5,107,468	07/536,847	04/21/92
5,107,474	07/310,750	04/21/92
5,107,477	07/757,717	04/21/92
5,107,481	07/322,428	04/21/92
5,107,508	07/614,989	04/21/92
5,107,509	07/684,091	04/21/92
5,107,510	07/414,472	04/21/92
5,107,513	07/451,422	04/21/92
5,107,517	07/435,367	04/21/92
5,107,532	07/572,238	04/21/92
5,107,541	07/548,192	04/21/92

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining

Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

D. 354,584, Re. S.N. 29/051,334, Feb. 20, 1996, Cl. D27/162, WATER PIPE, Mark R. Newman, Owner of Record: *Inventor,* Attorney or Agent: Victor Flores, Ex. Gp.: 2901

4,928,536, Re. S.N. 08/538,040, Oct. 2, 1995, Cl. 73/863.830, FLUID SAMPLE APPARATUS FEATURING INTEGRAL CONSTRUCTION WITH A MOTOR DRIVEN SAMPLING SYSTEM, Brian H. Welker, Owner of Record: *First National Bank of Missouri City, Missouri City, Tex.,* Attorney or Agent: Robert A. Felsman, Ex. Gp.: 2212

5,171,144, Re. S.N. 08/641,867, May 2, 1996, Cl. 431/159, PRESSURIZED AIR SEAL FOR COMBUSTION CHAMBER, Joseph Gerstmann, et. al., Owner of Record: *ADS Holding Co., Wilmington, Del.,* Attorney or Agent: James Earl Lowe, Jr., Ex. Gp.: 3406

5,250,055, Re. S.N. 08/547,645, Oct. 5, 1995, Cl. 606/148, METHOD AND APPARATUS FOR TYING SUTURE TO BONE, Robert R. Moore, et. al., Owner of Record: *Orthopedic Systems Inc.,* Attorney or Agent: Kathleen A. Frost, Ex. Gp.: 3309

5,263,136, Re. S.N. 08/559,027, Nov. 16, 1995, Cl. 395/164, SYSTEM FOR MANAGING TILED IMAGES USING MULTIPLE RESOLUTIONS, John R. DeAquiar, et. al., Owner of Record: *Optigraphics Corp., San Diego, Calif.,* Attorney or Agent: John M. Carson, Ex. Gp.: 2415

5,306,294, Re. S.N. 08/630,696, Apr. 12, 1996, Cl. 623/001, STENT CONSTRUCTION OF ROLLED CONFIGURATION, Thomas R. Winston, et. al., Owner of Record: *Ultrasonic Sensing and Monitoring Systems, Inc., Leawood, Kans.,* Attorney or Agent: Daniel E. Altman, Ex. Gp.: 3308

5,326,675, Re. S.N. 08/639,973, Apr. 29, 1996, Cl. 430/326, PATTERN FORMING METHOD INCLUDING THE FORMATION OF AN ACIDIC COATING LAYER ON THE RADIATION-SENSITIVE LAYER, Hirokazu Niki, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawaskai-Shi, Japan,* Attorney or Agent: Richard D. Kelly, Ex. Gp.: 1507

5,394,528, Re. S.N. 08/617,467, Mar. 18, 1996, Cl. 395/307, DATA PROCESSOR WITH BUS-SIZING FUNCTION, Souichi Kobayashi, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Robert C. Laurenson, Ex. Gp.: 2305

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,396,806, Reexam. No. 90/004,246, May 21, 1996, Cl. 381/103, HEARING AID AMPLIFYER, Jared A. Anderson, Owner of Record: *A & L Ventures I, Orinda, Calif.,* Attorney or Agent: Cooley Godward Castro Huddleson & Tatum, Palo Alto, Calif., Ex. Gp.: 2608, Requester: Topholm & Westermann, c/o David J. Cushing, Shugrue Mion Zinn MacPeak & Seas, Washington, D.C.

5,037,753, Reexam. No. 90/004,247, May 21, 1996, Cl. 435/235.1, FELINE T-LYMPHO TROPIC LENTIVIRUS, Neils C. Pedersen, et. al., Owner of Record: *The Regents of the Univ. of California, Alameda, Calif.,* Attorney or Agent: James M. Heslin, Townsend and Townsend and Crew, Palo Alto, Calif., Ex. Gp.: 1802, Requester: Edward S. Irons, Washington, D.C.

5,254,002, Reexam. No. 90/004,245, May 17, 1996, Cl. 433/008, ORTHODONTIC PLASTIC BRACKET, James F. Reher, et. al., Owner of Record: *Ormco Corp., Glendora, Calif.,* Attorney or Agent: Gregory F. Ahrens, Wood Herron & Evans, Cincinnati, Ohio, Ex. Gp.: 3303, Requester: Kenyon & Kenyon, New York, N.Y.

5,405,922, Reexam. No. 90/004,248, May 21, 1996, Cl. 526/068, PROCESS FOR POLYMERIZING MONOMERS IN FLUIDIZED DEDS, Marc L. DeChellis, et. al., Owner of Record: *Exxon Chemical Patents, Inc., Wilmington, Del.,* Attorney or Agent: Jaimes Sher, Exxon Chemical Co., Baytown, Tex., Ex. Gp.: 1505, Requester: BP Chemicals Ltd., London, England, c/o Finnegan Henderson Farabow Garrett & Dunner, Washington, D.C.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED FEBRUARY 12, 1996 DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
104,206	71/076,071	05/11/1915
104,221	71/084,087	05/11/1915
104,251	71/083,752	05/11/1915
323,851	71/359,239	05/07/1935
323,854	71/359,213	05/07/1935
323,869	71/357,817	05/07/1935
323,876	71/357,259	05/07/1935
323,895	71/360,560	05/07/1935
323,896	71/360,557	05/07/1935
323,914	71/358,853	05/07/1935
323,932	71/360,261	05/07/1935
323,971	71/359,781	05/07/1935
323,987	71/359,627	05/07/1935
324,043	71/352,331	05/07/1935
604,640	71/664,447	04/12/1955
605,642	71/667,974	05/10/1955
605,645	71/665,631	05/10/1955
605,648	71/668,763	05/10/1955
605,653	71/659,589	05/10/1955
605,663	71/657,050	05/10/1955
605,666	71/665,191	05/10/1955
605,669	71/669,390	05/10/1955
605,670	71/669,542	05/10/1955
605,671	71/669,679	05/10/1955
605,674	71/631,547	05/10/1955
605,681	71/647,409	05/10/1955
605,698	71/630,211	05/10/1955
605,707	71/653,912	05/10/1955
605,711	71/657,607	05/10/1955
605,713	71/658,504	05/10/1955
605,714	71/661,731	05/10/1955
605,716	71/664,863	05/10/1955
605,717	71/665,222	05/10/1955
605,721	71/666,569	05/10/1955
605,726	71/668,129	05/10/1955
605,727	71/668,589	05/10/1955
605,736	71/655,462	05/10/1955
605,749	71/667,432	05/10/1955
605,767	71/668,296	05/10/1955

Reg. No.	Serial Number	Reg. Date
605,772	71/620,595	05/10/1955
605,774	71/635,175	05/10/1955
605,778	71/643,738	05/10/1955
605,779	71/644,254	05/10/1955
605,780	71/644,538	05/10/1955
605,782	71/648,238	05/10/1955
605,783	71/651,141	05/10/1955
605,786	71/654,621	05/10/1955
605,797	71/661,924	05/10/1955
605,798	71/662,080	05/10/1955
605,804	71/669,473	05/10/1955
605,805	71/669,490	05/10/1955
605,811	71/656,037	05/10/1955
605,816	71/656,234	05/10/1955
605,821	71/670,065	05/10/1955
605,829	71/669,232	05/10/1955
605,830	71/658,866	05/10/1955
605,849	71/657,671	05/10/1955
605,855	71/664,629	05/10/1955
605,859	71/668,591	05/10/1955
605,861	71/668,836	05/10/1955
605,868	71/630,391	05/10/1955
605,870	71/638,402	05/10/1955
605,871	71/639,827	05/10/1955
605,877	71/645,633	05/10/1955
605,878	71/646,491	05/10/1955
605,883	71/651,202	05/10/1955
605,886	71/653,528	05/10/1955
605,890	71/656,807	05/10/1955
605,893	71/659,932	05/10/1955
605,897	71/662,429	05/10/1955
605,902	71/664,006	05/10/1955
605,903	71/664,618	05/10/1955
605,912	71/668,383	05/10/1955
605,920	71/669,706	05/10/1955
605,921	71/669,804	05/10/1955
605,922	71/670,136	05/10/1955
605,925	71/627,186	05/10/1955
605,935	71/668,626	05/10/1955
605,938	71/616,264	05/10/1955
605,942	71/664,895	05/10/1955
605,948	71/668,556	05/10/1955
612,369	71/679,695	09/13/1955
1,002,552	73/006,893	01/28/1975
1,006,613	72/457,887	03/11/1975
1,007,681	72/444,536	03/25/1975
1,009,779	73/000,642	05/06/1975
1,009,780	73/002,827	05/06/1975
1,009,783	73/015,683	05/06/1975
1,009,787	73/023,422	05/06/1975
1,009,791	73/028,421	05/06/1975
1,009,794	73/028,975	05/06/1975
1,009,796	73/029,684	05/06/1975
1,009,798	73/030,0[illegible]7	05/06/1975
1,009,800	73/034,376	05/06/1975
1,009,805	73/012,505	05/06/1975
1,009,806	73/012,506	05/06/1975
1,009,808	73/017,838	05/06/1975
1,009,809	73/018,783	05/06/1975
1,009,811	73/022,531	05/06/1975
1,009,812	73/023,344	05/06/1975
1,009,815	73/024,225	05/06/1975
1,009,820	73/026,666	05/06/1975
1,009,821	73/026,667	05/06/1975
1,009,825	73/002,373	05/06/1975
1,009,829	73/014,792	05/06/1975
1,009,843	73/005,668	05/06/1975
1,009,845	73/018,510	05/06/1975
1,009,849	73/022,511	05/06/1975
1,009,856	73/004,228	05/06/1975
1,009,857	73/004,725	05/06/1975
1,009,862	73/006,875	05/06/1975
1,009,863	73/007,951	05/06/1975
1,009,864	73/008,949	05/06/1975
1,009,865	73/010,569	05/06/1975
1,009,866	73/012,190	05/06/1975
1,009,867	73/013,523	05/06/1975
1,009,873	73/018,203	05/06/1975
1,009,874	73/018,402	05/06/1975
1,009,875	73/018,585	05/06/1975
1,009,880	73/021,533	05/06/1975
1,009,881	73/021,613	05/06/1975
1,009,884	73/033,965	05/06/1975
1,009,897	73/019,124	05/06/1975
1,009,901	73/008,415	05/06/1975
1,009,907	73/024,992	05/06/1975
1,009,908	73/025,590	05/06/1975
1,009,913	73/006,511	05/06/1975
1,009,914	73/006,864	05/06/1975
1,009,915	73/008,452	05/06/1975
1,009,916	73/008,962	05/06/1975
1,009,919	73/014,856	05/06/1975
1,009,924	73/025,502	05/06/1975
1,009,927	73/026,694	05/06/1975
1,009,929	73/027,158	05/06/1975
1,009,930	73/027,180	05/06/1975
1,009,938	73/024,867	05/06/1975
1,009,944	73/023,895	05/06/1975
1,009,947	73/026,823	05/06/1975
1,009,950	73/020,121	05/06/1975
1,009,953	73/022,970	05/06/1975
1,009,957	73/023,571	05/06/1975
1,009,964	73/004,066	05/06/1975
1,009,965	73/004,524	05/06/1975
1,009,968	73/009,108	05/06/1975
1,009,969	73/009,113	05/06/1975
1,009,970	73/016,368	05/06/1975
1,009,973	73/018,249	05/06/1975
1,009,974	73/021,031	05/06/1975
1,009,986	73/023,415	05/06/1975
1,009,988	73/005,948	05/06/1975
1,009,989	73/009,136	05/06/1975
1,009,990	73/014,683	05/06/1975
1,009,992	73/016,077	05/06/1975
1,010,000	73/024,186	05/06/1975
1,010,003	73/001,596	05/06/1975
1,010,004	73/004,830	05/06/1975
1,010,006	73/012,104	05/06/1975
1,010,007	73/015,803	05/06/1975
1,010,009	73/022,807	05/06/1975
1,010,010	73/022,813	05/06/1975
1,010,017	73/020,211	05/06/1975
1,010,020	73/022,394	05/06/1975
1,010,021	73/022,785	05/06/1975
1,010,023	73/027,323	05/06/1975
1,010,028	73/011,915	05/06/1975
1,010,029	73/016,954	05/06/1975
1,010,034	73/026,368	05/06/1975
1,010,035	73/026,369	05/06/1975
1,010,039	73/013,578	05/06/1975
1,010,040	73/014,174	05/06/1975
1,010,041	73/016,045	05/06/1975
1,010,045	73/002,134	05/06/1975
1,010,051	73/000,860	05/06/1975
1,010,060	73/011,882	05/06/1975
1,010,061	73/022,615	05/06/1975
1,010,062	73/029,817	05/06/1975
1,010,063	73/034,700	05/06/1975
1,010,067	73/009,411	05/06/1975
1,010,075	73/016,169	05/06/1975
1,010,076	73/016,626	05/06/1975
1,010,079	73/026,173	05/06/1975
1,010,080	73/029,203	05/06/1975
1,010,081	72/444,729	05/06/1975
1,010,085	72/464,131	05/06/1975
1,010,086	72/463,400	05/06/1975
1,010,089	72/435,659	05/06/1975
1,010,091	72/464,799	05/06/1975
1,010,093	72/444,665	05/06/1975
1,010,097	72/461,551	05/06/1975
1,010,100	72/440,590	05/06/1975
1,010,101	72/463,616	05/06/1975
1,010,109	72/410,426	05/06/1975
1,010,110	72/411,278	05/06/1975
1,010,111	72/462,724	05/06/1975
1,010,115	72/466,129	05/06/1975

Reg. No.	Serial Number	Reg. Date
1,010,117	72/406,060	05/06/1975
1,010,122	72/456,735	05/06/1975
1,010,128	72/459,990	05/06/1975
1,010,129	72/460,628	05/06/1975
1,010,135	72/448,253	05/06/1975
1,010,136	72/451,521	05/06/1975
1,010,139	72/461,100	05/06/1975
1,010,143	72/419,927	05/06/1975
1,010,148	72/419,520	05/06/1975
1,010,153	72/458,478	05/06/1975
1,010,156	72/463,271	05/06/1975
1,010,159	72/442,423	05/06/1975
1,010,162	72/456,472	05/06/1975
1,010,163	72/456,473	05/06/1975
1,010,164	72/456,991	05/06/1975
1,010,167	72/466,822	05/06/1975
1,010,169	72/457,670	05/06/1975
1,010,171	72/395,449	05/06/1975
1,010,172	72/398,354	05/06/1975
1,010,175	72/442,050	05/06/1975
1,010,176	72/444,044	05/06/1975
1,010,180	72/465,194	05/06/1975
1,010,183	72/466,807	05/06/1975
1,010,185	72/444,129	05/06/1975
1,010,187	72/466,001	05/06/1975
1,010,192	72/462,481	05/06/1975
1,010,203	72/455,306	05/06/1975
1,010,206	73/028,325	05/06/1975
1,010,207	73/004,001	05/06/1975
1,010,210	73/027,410	05/06/1975
1,010,211	73/011,627	05/06/1975
1,010,212	73/007,107	05/06/1975
1,010,214	73/015,595	05/06/1975
1,010,215	73/017,918	05/06/1975
1,010,217	73/001,301	05/06/1975
1,010,218	73/001,309	05/06/1975
1,010,221	72/442,177	05/06/1975
1,010,224	72/456,256	05/06/1975
1,010,230	72/463,640	05/06/1975
1,010,231	72/464,610	05/06/1975
1,010,233	73/012,835	05/06/1975

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Karlan Industries, Inc., Wilton, Conn., Reg. No. 730,782 for the mark "I-Do", Canc. No. 24,926.

Beecham Inc., Bristol, Tenn., Reg. No. 811,476 for the mark "CURRIER & IVES", Canc. No. 24,897.

Valley Independent Pharmacies, Inc., Sacto, Calif., Reg. No. 1,621,984, for the mark "LEADER PHARMACIES AND DESIGN", Canc. No. 24,559.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Registration To Practice

The following person successfully passed the registration examination that was held October 13, 1993, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 16, 1996.

Lee, Wendy M., 905 Sunnybrae Blvd., San Mateo, Calif. 94402

June 5, 1996

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held November 2, 1994, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 16, 1996.

Stokey, Richard, 1420 W. Abingdon Dr., #204, Alexandria, Va. 22314

June 5, 1996

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held April 8, 1992, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 16, 1996.

Fleck, Linda Joan, 4487 Bascule Bridge Dr., #424, Beaver Creek, Ohio 45440

June 5, 1996

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held May 5, 1995 and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing

to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 16, 1996.

Baze, Mark Edward, 593 Saratoga Ave., #7, Santa Clara, Calif. 95050

Dottavio, James John, 674 Brookmill Ct., Canton, Mich. 48188

Evans, Charles Lewis, 5432 Sharpe Dr., Raleigh, N.C. 27612

Lindenbaum, Keith D., 5012 N. Larkin, Milwaukee, Wis. 53217

Nelson, David Britton, 419 Larkbunting Dr., Ft. Collins, Colo. 80526

Papalas, Michael Anthony, 9128 Wood Pointe Way, Fairfax Station, Va. 22039

Pierson, Bernadette A., 90 Lombard Ln., South Hero, Vt. 05486

Wesolowski, Carl Rieffanaugh, 1613 Princess St., Alexandria, Va. 22314

Yoon, Tae-Sik, 2301 N. St., N.W., Washington, D.C. 20037

June 5, 1996

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

United States Postal Service Emergency in the State of California Terminated

The service interruption in United States Postal Service (USPS) in the State of California that occurred on June 29, 1995, due to the action of the UNABOM bomber, caused the USPS to maintain heightened security procedures for mail originating in the State of California. Currently there are no extraordinary restrictions being placed on Express Mail originating in the State of California. Therefore, the Patent and Trademark Office (PTO) is terminating the postal service interruption and emergency declared in the Official Gazette Notice entitled "United States Postal Service Interruption and Emergency in the State of California", 1176 *Off. Gaz. Pat. Office* 74 (July 18, 1995). Any questions regarding this Notice should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Disclaimers and Dedications

D 290,204—Bernard C. Bruget, Tempe, Ariz. DISPLAY CASE. Patent dated June 9, 1987. Disclaimer and Dedication filed November 24, 1995, by the assignee, Laverne L. Bruget.

Hereby disclaims and dedicates to the public the entire term of said patent.

D 357,220—Gustav J. Steinke; Starla D. Elsass-Huffer, both of Lima, Ohio. DISC BRAKE SHIM. Patent dated April 11, 1995. Disclaimer and dedication filed August 22, 1995, by the assignee, International Brake Industries, Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

Disclaimers

4,969,670—Eldon G. Bonnema, Prinsburg, Minn.; James L. Fouss, Baton Rouge, La. LARGE DIAMETER CORRUGATED PLASTIC PIPE. Patent dated November 13, 1990. Disclaimer filed January 11, 1996, by the assignee, Prinsco, Inc.

The term of this patent subsequent to April 3, 2007, has been disclaimed.

5,108,503—Suraj L. Hindagolla, Corvallis; John M. Skene, Lake Oswego; Charles L. Thierheimer, Jr., Corvallis, all of Oreg. SMEAR RESISTANT INKS FOR INK-JET PRINTERS. Patent dated April 28, 1992. Disclaimer filed April 15, 1996, by the assignee, Hewlett-Packard Company.

Hereby enters this disclaimer to claims 1, 5 and 14 of said patent.

5,368,551—Raymond S. Zuckerman, Scottsdale, Ariz. ANKLE BRACE WALKER. Patent dated November 29, 1994. Disclaimer filed November 3, 1995, by the assignee, Royce Medical Company.

Hereby enters this disclaimer to the remaining term of said patent.

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37 CFR 1.47 Notice by Publication

A petition to accept the application without the signature of all inventors having been filed, and the notice of the filing of such application having been sent to the inventor whose signature is missing, and such notice having been returned undeliv-ered, notice is hereby given of the filing of the application. The inventor whose signature is missing (Michel Poivet) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/EP92/02225 and was filed on 29 September 1992 in the names of Albert Dorner, David Naccache, Etienne Cochon, and David Poivet for the invention entitled Method and Apparatus for Secure Transmission of Video Signals. The national stage application number is 08/211,280 and has a 35 U.S.C. 371 date of 16 November 1994.

Certificate of Correction For Week of July 2,1996

P. 09,089
Re. 34,652
D. 363,113
D. 366,858
D. 368,890
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Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

April 15-19, 1996

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
4-15	EX (R)	74/290,689	Schober GmbH	whether the matter asserted for registration has been used as a trademark for applicant's goods (or, rather, has been used only in advertising), as evidenced by specimens of use	Request for Reconsideration Denied (Refusal Affirmed)		"BANDFLEX" [crimp units installed in rotary machines for binding paper]		No
4-16	EX (R)	74/432,141	Teledyne Industries, Inc.	2(d)	Request for Reconsideration Denied (Refusal Affirmed)		"ORARELIEF" (in stylized lettering) [medicine in gel form dispensed from tubes for teething pain, denture and gum irritations, cold and canker sores, sun and fever blisters and brace and orthodontia pain]	"ORALIEF" [medicated mouth rinse]	No
4-17	EX	74/452,911	Collegeville/ Imagineering	2(e)(1)	Refusal Affirmed		"HAT-N-TEE" [costumes, namely, decorated t-shirts and coordinated hats]		No
4-18	EX	74/436,517	Klein Bicycle Corp.	2(d)	Refusal Affirmed		"AEROS" [bicycle forks]	"AERO SADDLE" (and design) [bicycle seats]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
4-18	EX	74/412,474	Altro Ltd.	2(d)	Refusal Reversed		"ALTRO WHITEROCK" (and design) [non-metallic materials for use in construction, namely, cladding for buildings, walls and ceilings; etc.]	"WHITE ROC" [pigmented and clear coatings and finishes in the nature of paints]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Concord: New Hampshire State Library	Not Yet Operational
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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	New York Public Library (The Research Libraries)	(212) 592-7000
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North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	09/15/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/13/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/12/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	12/08/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	06/24/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	07/05/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	11/15/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	09/16/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	04/15/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	11/11/94
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	10/04/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	11/16/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/27/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	07/28/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	03/13/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	02/09/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/13/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of June 1, 1996

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/03/95	04/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	12/22/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/20/95	05/03/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	02/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/18/95	03/28/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	02/05/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/02/95	03/22/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/16/96	02/29/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/16/96	04/08/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	09/28/95	—0—
Renewals (All Classes)	03/13/96	—0—
Section 12(c) Publications (All Classes)	01/01/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JULY 2, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,569,280 (2933rd)

PRODUCE WEDGER

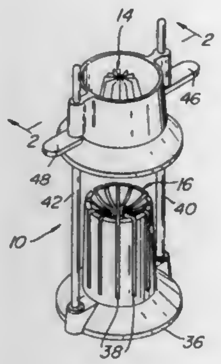
Dominic D'Ambro, and Clayton E. Giangiulio, both of Malvern, Pa., assignors to Le-Jo Enterprises, Inc., Malvern, Pa.

Reexamination Request No. 90/003,950, Aug. 21, 1995.

Reexamination Certificate for Patent 4,569,280, issued Feb. 11, 1986, Ser. No. 654,802, Sep. 26, 1984.

Int. Cl.^{6} A47J *17/00*

U.S. Cl. 99—538



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. In a device for sectioning produce, said device having a plurality of blades, the improvement comprising:

a) means for holding the produce;

b) movable means for engaging said produce to force it against said holding means and slice it into sections; said plurality of blades being arranged in said movable means to engage when in operation the outer surface of said produce at a plurality of suface locations and slice the produce toward its center;

c) means for joining said blades to minimize the mass of the juncture of the blades; said blades joined in a configuration such that in their passage during operation through said produce the juncture of said blades will not substantially compress, displace and destroy the composition of said produce; and

d) said movable means, said holding means and said blades having a configuration and juxtaposition with one another such that during operation thereof said produce retains its overall shape during sectioning and the sections are not substantially separated by the action of the movable means and the blades, with the juncture of the blades engaging the produce only after slicing occurs at a plurality of surface locations.

B1 4,640,933 (2934th)

Patent Not Issued For This Number

B1 4,726,193 (2935th)

TEMPERATURE CONTROLLED PICNIC BOX

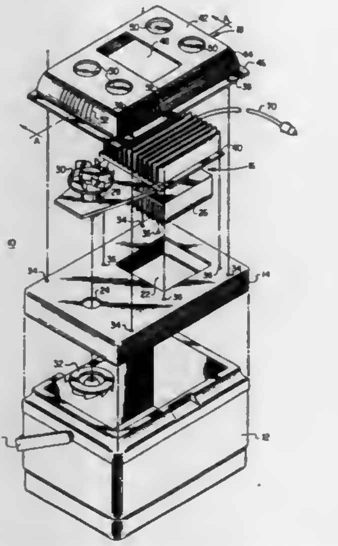
Edward J. Burke, Plano, and Gregory J. Nancarrow, Wylie, both of Tex., assignors to Marlow Industries Incorporated, Richardson, Tex.

Reexamination Request Nos. 90/003,691, Jan. 17, 1995 and 90/003,833, May 17, 1995.

Reexamination Certificate for Patent 4,726,193, issued Feb. 23, 1988, Ser. No. 14,360, Feb. 13, 1987.

Int. Cl.^{6} F25B *21/02*

U.S. Cl. 62—457.7



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

1. A refrigerator/food warmer picnic box apparatus or the like comprising:

(a) a housing means for forming a food compartment, the housing means having walls forming a top access aperture; and

(b) a lid means for closing the housing means aperture, said lid means including walls forming first and second adjacent apertures, a thermal electric unit, and a motor means mounted, respectively, in said first and second lid apertures in sealing engagement with the aperture forming walls, the thermal electric unit having first and second *finned plate* heat sinks mounted on opposing sides of the thermal electric unit with the first heat sink on the food compartment side of the lid and the second heat sink on the exterior side of the lid, and said motor means having a common drive shaft having first and second opposing ends disposed interiorly and exteriorly of the food compartment lid, respectively, and first and second air impellers mounted on the first and second opposing ends of the common drive shaft in [operative association] *a planar or parallel planar relationship* with the first and second heat sinks, whereby said first and second air impellers *coact with said finned plate heat sinks to* draw air, respectively, through [the] *spaces formed by the fins of said* first and second heat sinks for selectively heating and cooling and circulating the air in the food compartment picnic box, and keeping the second heat sink substantially at ambient temperature.

B1 4,757,689 (2936th)

CRYOPUMP, AND A METHOD FOR THE OPERATION THEREOF

Werner Bächler, Rösrath; Hans-Joachim Forth, Cologne; Hans-Hermann Klein, Rösrath, and Wilhelm Strasser, Bergisch Gladbach, all of, Germany, assignors to Leybold Aktiengesellschaft, Cologne, Germany

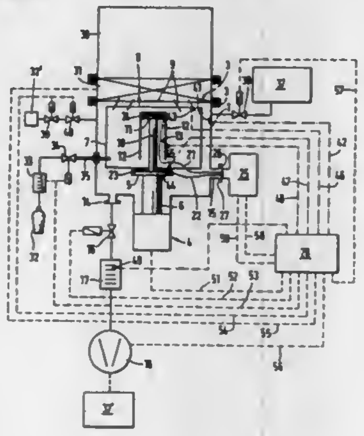
Reexamination Request No. 90/003,962, Sep. 21, 1995.

Reexamination Certificate for Patent 4,757,689, issued Jul. 19, 1988, Ser. No. 922,034, Oct. 22, 1986.

Claims priority, application European Pat. Off., Jun. 23, 1986, 86108529.8

Int. Cl.^{6} B01D *8/00*

U.S. Cl. 62—55.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4**, **5**, **9–29** is confirmed.

Claims **1–3** are cancelled.

Claims **6** and **7** are determined to be patentable as amended.

Claim **8**, dependent on an amended claim, is determined to be patentable.

New claims **30–34** are added and determined to be patentable.

30. A cryopump comprising

(a) a casing;

(b) a gas inlet to which a vacuum chamber can be connected;

(c) a first valve for connecting the gas inlet to the vacuum chamber;

(d) a vacuum pump;

(e) a second valve connecting said vacuum pump with said casing;

(f) a refrigerator situated in said casing and including first and second refrigeration stages having pumping surfaces thereon;

(g) electric heating means associated with said pumping surfaces;

(h) pressure sensor means located in said casing for producing a pressure signal responsive to the pressure within said casing;

(i) first control means connected to said pressure sensor means for controlling the operation of the cryopump in response to said pressure signal; and

(j) second control means for controlling said electric heating means.

B1 4,880,635 (2937th)

DEHYDRATED LIPOSOMES

Andrew S. Janoff, Yardley, Pa.; Pieter R. Cullis; Marcel B. Bally, both of Vancouver, Canada; Michael W. Fountain, Griggstown; Richard S. Ginsberg, Monroe, both of N.J.; Michael J. Hope; Thomas D. Madden, both of Vancouver, Canada; Hugh P. Schieren, Yardley, Pa., and Regina L. Jablonski, Trenton, N.J., assignors to Liposome Company, Inc., Princeton, N.J.

Reexamination Request No. 90/003,125, Jul. 13, 1993.

Reexamination Certificate for Patent 4,880,635, issued Nov. 14, 1989, Ser. No. 759,419, Jul. 26, 1985.

Continuation-in-part of Ser. No. 638,809, Aug. 8, 1984, abandoned, and Ser. No. 749,161, Jun. 26, 1985, abandoned.

Int. Cl.^{6} A61K *9/127;9/133*

U.S. Cl. 424—450

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **6–8** are cancelled.

Claims **1–5** and **9** are determined to be patentable as amended.

New claims **10–28** and **29** are added and determined to be patentable.

1. A dehydrated liposome preparation comprising *unilamellar* liposomes having a bilayer membrane and one or more protective sugars, wherein *protective concentrations of* the protective sugars are present at both the inside and outside surfaces of the liposome membrane so that the liposomes have retained [a substantial portion] *at least about 66%* of their internal contents during dehydration and [retain a substantial portion of their contents upon] subsequent rehydration *and wherein the liposomes upon rehydration are about 112 nm.*

B1 4,918,608 (2938th)

METHOD FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING

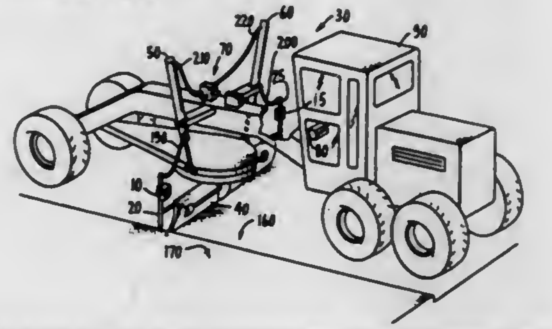
Christopher O. Middleton, 1925 46th Ave., #141, Capitola, Calif. 95010, and Colin L. Robson, 6124 Corte De La Reina, San Jose, Calif. 95120

Reexamination Request No. 90/002,234, Dec. 18, 1990.

Reexamination Certificate for Patent 4,918,608, issued Apr. 17, 1990, Ser. No. 204,508, Jun. 9, 1988.

Int. Cl.^{6} A01B *63/114*

U.S. Cl. 364—424.07



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **6** and **7** is confirmed.

Claims **1**, **2**, **4** and **8–12** are determined to be patentable as amended.

Claims **3** and **5**, dependent on an amended claim, are determined to be patentable.

1. A method of controlling a hydraulic system for grading a first surface at a chosen depth relative to a reference surface by means of an earth grader carrying a vertically adjustable blade at the chosen depth relative to the reference surface by action of the hydraulic system on the blade, including the steps of:

implementing a calibration procedure, including [determining a reference time interval relating to a travel time of an acoustic pulse from a transducer to the reference surface and back to the transducer,] *sending an acoustic reference pulse from a transducer to the reference surface for reflection thereby, detecting the reference pulse at the transducer after reflection by the reference surface, and determining a reference time interval between the sending of the reference pulse and the detecting of the reflected reference pulse* so that the reference time interval corresponds to the chosen depth of the blade as determined by an operator of the earth grader;

emitting a ranging pulse from the transducer toward the reference surface and starting a counter at a first time, the transducer being mounted in a fixed position relative to the blade, such that the ranging pulse reflects from the reference surface back toward the transducer;

stopping the counter when the reflected ranging pulse reaches the transducer, thereby generating a count corresponding to the length of time taken by the ranging pulse to reflect from the reference surface back to the transducer and further corresponding to an actual blade depth;

vertically adjusting the blade by a distance relating to the count such that the actual blade depth corresponds to the chosen blade depth;

repeating the steps of emitting the ranging pulse, starting and stopping the counter, and vertically adjusting the blade, whereby variations in the height of the reference surface are automatically compensated by the adjustments of the blade as the grader moves along the reference surface; and

compensating the adjustments of the blade for temperature variations after the reference time interval has been determined, and before each time the ranging pulse is emitted.

B1 4,993,171 (2939th)

COVERING FOR A HYDRAULIC RAM OF A FREEZE DRYER

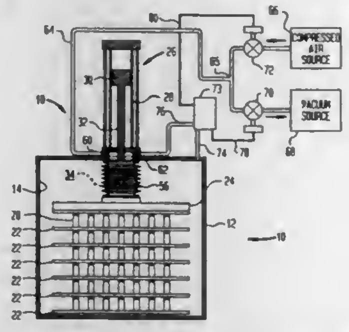
Ernesto Renzi, Youngstown, N.Y., assignor to BOC Group, Inc., Murray Hill, N.J.

Reexamination Request No. 90/003,871, Jun. 23, 1995.

Reexamination Certificate for Patent 4,993,171, issued Feb. 19, 1991, Ser. No. 440,919, Nov. 22, 1989.

Int. Cl.^{6} F26B *13/30*

U.S. Cl. 34—92



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **3** is confirmed.

Claims **1–2** are cancelled.

3. The improvement of claim 1 wherein..

the freeze dryer also includes vacuum means for producing a subatmospheric pressure in the freeze drying chamber during the freeze drying of the sterile material; and

the elongated covering means comprises:

an elastomeric bellows sealably connected, at one end, to the pressure vessel and, at the other end, to the pressure plate;

sensing means in communication with the inside of the elastomeric bellows and the freeze drying chamber for sensing the pressure difference between the inside of the elastomeric bellows and the freeze drying chamber; and

pressure equalization means in communication with the inside of the bellows and responsive to the sensing means for setting the inside pressure of the bellows equal to the freeze drying chamber to prevent failure of the elastomeric bellows and to permit expansion and contraction thereof with extension and retraction of the actuating arm.

B1 5,003,061 (2940th)

METHOD FOR PREPARING HIGH-PURITY CRYSTALLINE LACTULOSE

Renato Carobbi, Pistoia, and Franco Innocenti, Bagno a Ripoli, both of, Italy, assignors to Inalco SpA, Milan, Italy

Reexamination Request No. 90/003,836, May 10, 1995.

Reexamination Certificate for Patent 5,003,061, issued Mar. 26, 1991, Ser. No. 141,786, Jan. 11, 1988.

Claims priority, application Italy, Dec. 1, 1987, 22848/87

Int. Cl.^{6} C07H *1/06;* **C13F** *1/02*

U.S. Cl. 536—127

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2**, **3** and **4**, dependent on an amended claim, are determined to be patentable.

1. A method for preparing crystalline lactulose having less than 2% of carbohydrate other than lactulose and a purity exceeding 98% comprising:

(a) adding a crystalline lactulose seed to an aqueous solution of lactulose having a lactulose concentration of from 50% to 80% w/w, a lactose concentration of less than 5% of the lactulose concentration by wt., a galactose concentration of less than 5% of the lactulose concentration by wt. and concentration of other carbohydrates of less than 4% of the lactulose concentration by wt., *said aqueous solution containing water as the only solvent*;

(b) crystallizing said lactulose solution at a temperature between 5° and 40° C. and in a time between 10 and 60 hours; and

(c) drying the obtained crystalline lactulose.

B1 5,037,522 (2941st)

ELECTRIC ARC VAPOR DEPOSITION DEVICE

Gary E. Vergason, Spencer, N.Y., assignor to Vergason Technology, Incorporated, Van Etten, N.Y.

Reexamination Request No. 90/004,125, Feb. 5, 1996.

Reexamination Certificate for Patent 5,037,522, issued Aug. 6, 1991, Ser. No. 556,429, Jul. 24, 1990.

Int. Cl.^{6} C23C *14/22*

U.S. Cl. 204—298.41

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. An electric arc vapor deposition device comprising:

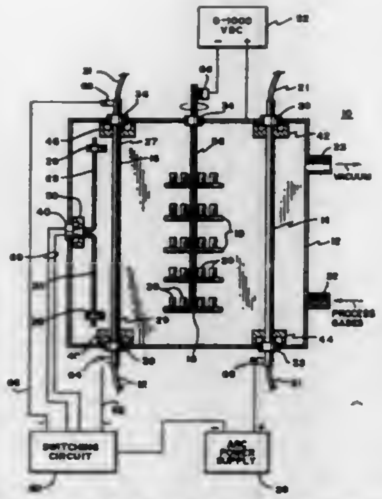
a) a chamber for receiving articles to be coated;

b) a first electrode disposed in said chamber;

c) a second electrode disposed in said chamber and spaced from said first electrode; said second electrode having a first end and a second end;

d) power supply means for generating and sustaining an electric arc between said first and second electrodes which causes surface material on the second electrode to vaporize and be deposited on said articles;

e) means to sense when an electric arc between said first and second electrodes approaches said first or second end of said second electrode;



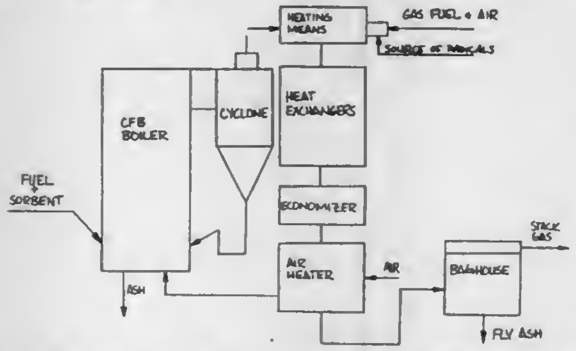
f) means to connect a first side of said power supply means to said first electrode; and,

g) means to connect selectively a second side of said power supply means to either said first end or said second end of said second electrode, said means to connect selectively being responsive to said means to sense so that when an arc approaches said first end of said second electrode, said means to connect selectively connects the second side of said said power supply means to said second end of said second electrode, and when an arc approaches said second end of said second electrode, said means to connect selectively connects the second side of said power supply means to said first end of said second electrode,

whereby, an electric arc formed between said first and second electrodes is caused to travel back and forth between said first and second ends of said second electrode.

B1 5,048,432 (2942nd)
PROCESS AND APPARATUS FOR THE THERMAL DECOMPOSITION OF NITROUS OXIDE

John E. Hofmann, Naperville, and William H. Sun, Aurora, both of Ill., assignors to Nalco Fuel Tech, Naperville, Ill.
Reexamination Request No. 90/002,629, Feb. 18, 1992.
Reexamination Certificate for Patent 5,048,432, issued Sep. 17, 1991, Ser. No. 634,402, Dec. 27, 1990.
Int. Cl.^{6} F23J *11/00;15/00*
U.S. Cl. 110—345



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 3, 4, 11 and 16 are cancelled.

Claims 1, 10, 12, 15 and 17 are determined to be patentable as amended.

Claims 2, 5–9, 13 and 14, dependent on an amended claim, are determined to be patentable.

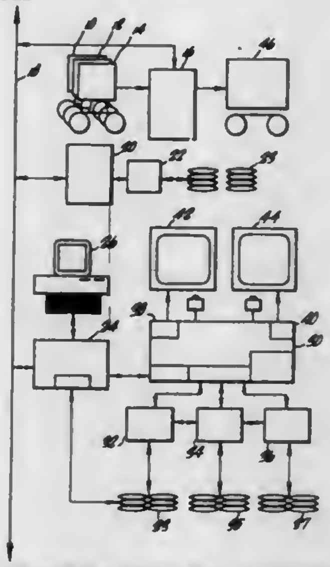
1. A process for the reduction of nitrous oxide in the effluent from the combustion of a carbonaceous fuel, the process comprising:

a) forming an effluent in a circulating fluidized bed boiler *by combustion of a carbonaceous fuel*; and

b) raising the temperature of said effluent to a temperature of at least about 1700° F. *by burning a fuel by means of a burner*, when said effluent is at a temperature below about 1700° F.

B1 5,051,835 (2943rd)
METHOD OF PROCESSING THEATRICAL FILM

Thomas L. Bruehl, Burbank; Daniel R. Brewer, La Canada; Clifford C. Hay, Burbank, and William H. Childers, Los Angeles, all of Calif., assignors to Paramount Pictures Corporation, Hollywood, Calif.
Reexamination Request No. 90/003,313, Jan. 18, 1994.
Reexamination Certificate for Patent 5,051,835, issued Sep. 24, 1991, Ser. No. 430,557, Nov. 1, 1989.
Int. Cl.^{6} H04N *9/79*
U.S. Cl. 358—311



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–5 are cancelled.

B1 5,060,485 (2944th)
EXPANSION VALVE

Masaru Watanabe, Kawasaki, and Osamu Yamamoto, Tokyo, both of, Japan, assignors to Fujikoki America, Inc., Dallas, Tex.
Reexamination Request No. 90/003,614, Oct. 25, 1994.
Reexamination Certificate for Patent 5,060,485, issued Oct. 29, 1991, Ser. No. 299,427, Jan. 23, 1989.
Continuation of Ser. No. 67,865, Jun. 30, 1987, Pat. No. 4,819,443.
Int. Cl.^{6} F25B *41/04*
U.S. Cl. 62—225

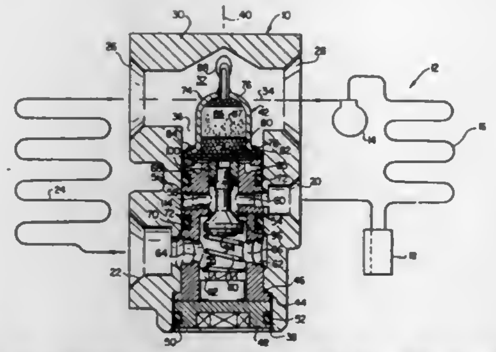
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–5 are cancelled.

[1. An expansion valve for an air conditioner having an evaporator and a compressor, the expansion valve comprising:

a body assembly defining a first flow path for high pressure refrigerant flow from the compressor to the evaporator and a second flow path for low pressure refrigerant flow from the evaporator to the compressor;

a cartridge, including:



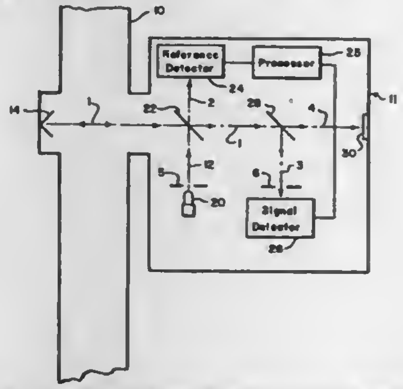
(a) a valve member positioned in the first flow path for varying the flow cross section through the first flow path for modulating refrigerant flow;

(b) means positioned within the second flow path for sensing the superheat of the low pressure refrigerant flow and for moving the valve member in response to the sensed superheat to modulate the refrigerant flow;

the cartridge being self-contained and pre-calibrated to modulate the refrigerant flow in response to the superheat sensed independent of the body assembly, permitting use in a variety of body assembly configurations.]

B1 5,077,480 (2945th)
TRANSMISSOMETER HAVING SOLID STATE LIGHT SOURCE

John E. Traina, Glenshaw, Pa., assignor to United Sciences, Inc., Gibsonia, Pa.
Reexamination Request No. 90/003,864, Jun. 16, 1995.
Reexamination Certificate for Patent 5,077,480, issued Dec. 31, 1991, Ser. No. 524,845, May 18, 1990.
Int. Cl.^{6} G01N *15/06;21/49;21/85*
U.S. Cl. 250—575



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 3–11 and 15–23 is confirmed.

Claim 1 is determined to be patentable as amended.

Claims 2 and 12–14, dependent on an amended claim, are determined to be patentable.

New claims 24, 25 and 26 are added and determined to be patentable.

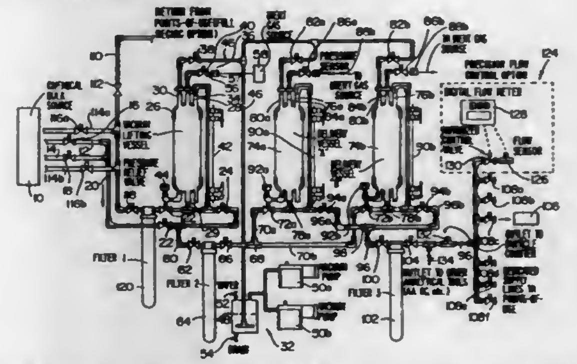
1. An improved transmissometer of the type which measures light energy having a light source which produces a visible beam and a detection means which light source emits a light beam that passes through a sample to the detection means, the detection means produces an electrical signal responsive to the light beam and the transmissometer has peak and mean spectral responses between 500 nm and 600 nm wherein the improvement comprises a solid state light source of known intensity and amplification means connected to the detection mean for amplifying the electrical signal produced [by] *in response to the light beam from* the light source said amplification means providing high gain, low noise amplification *to produce an amplified signal having adequate signal to noise ratio sufficient to indicate opacity of a fluid passing through a stack or duct in excess of 3 feet in diameter but not greater than 42 feet in diameter.*

B1 5,116,353 (2946th)

Patent Not Issued For This Number

B1 5,148,945 (2947th)
APPARATUS AND METHOD FOR THE TRANSFER AND DELIVERY OF HIGH PURITY CHEMICALS

Tobin Geatz, Durham, N.C., assignor to Applied Chemical Solutions, Durham, N.C.
Reexamination Request No. 90/003,602, Oct. 14, 1994.
Reexamination Certificate for Patent 5,148,945, issued Sep. 22, 1992, Ser. No. 583,826, Sep. 17, 1990.
Int. Cl.^{6} B67D *5/08*
U.S. Cl. 222—1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 35–37 is confirmed.

Claims 19–21 are cancelled.

Claims 1, 10, 30 and 34 are determined to be patentable as amended.

Claims 2–9, 11–18, 22–29, 31–33 dependent on an amended claim, are determined to be patentable.

New claims 38–44 are added and determined to be patentable.

1. A process for providing chemical transfer and delivery of chemical from a bulk source to an end-use station which comprises

providing a lifting vessel;

providing a source conduit between the bulk source and the lifting vessel, [includign] *including* a valve to control fluid flow through the source conduit;

providing a vacuum system in communication with the lifting vessel and including means to evacuate gas selectively from the lifting vessel;

providing a pressure system, operated [independelty] *independently* of said vacuum system, in communication with the lifting vessel and including means to pressurize selectively the lifting vessel;

providing a delivery vessel in communication with the lifting vessel;

providing a delivery conduit from the delivery vessel to the end-use station, including a valve to control [fulid] *fluid* flow through the delivery conduit;

providing connecting conduits among the lifting vessel, the delivery vessel, and the end use station, including valving to regulate flow through such conduits, so as to allow any vessel to be bypassed in the system without affecting the operation of the system;

wherein chemical is transferred from the bulk source to the end-use station by the process comprising

employing the vacuum system to evacuate the lifting vessel of gas so to create a negative pressure therein;

opening the valve on the source conduit between the bulk source and the lifting vessel so to cause the chemical to be drawn from the bulk source to the lifting vessel;

closing the valve on the source conduit and pressurizing the lifting vessel;

causing the chemical under pressure in the lifting vessel to transfer to the delivery vessel;

dispensing chemical under presure from the delivery vessel to the end-use station as needed by controlling a valve on the delivery conduit; and

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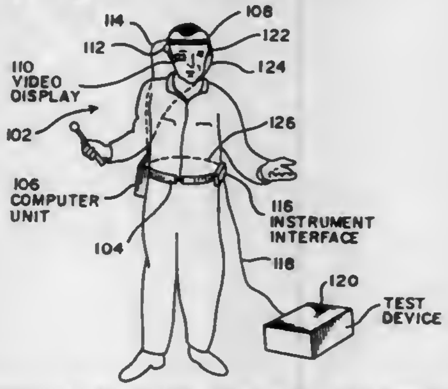
B1 5,242,059 (2948th)

Patent Not Issued For This Number

B1 5,305,244 (2949th)
HANDS-FREE, USER-SUPPORTED PORTABLE COMPUTER

Edward G. Newman, Fairfax; Gil S. Christian, Stephens City, and Michael D. Jenkins, Manassas, all of Va., assignors to Computer Products & Services, Inc., Fairfax, Va.
Reexamination Request No. 90/003,751, Mar. 15, 1995.
Reexamination Certificate for Patent 5,305,244, issued Apr. 19, 1994, Ser. No. 863,619, Apr. 6, 1992.
Int. Cl.^{6} G06F *1/16;3/00*
U.S. Cl. 364—708.1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **9** are determined to be patentable as amended.

Claims **2–8** and **10–13**, dependent on an amended claim, are determined to be patentable.

1. A compact, self-contained portable computing apparatus for being completely supported by a user for hand-free retrieval and display of information for the user comprising:

a general-purpose computer contained in a housing, *the general-purpose computer having storage means and processor means, the housing* having securing means for removably mounting the housing on a user for being carried without hands by the user[;],

the storage means [mounted in the housing for] storing previously entered information including an electronic technical manual and a preprogrammed [vocabularly] *vocabulary* model of a plurality of words and phrases[;],

the processor means [mounted in the housing and] communicating with the storage means for receiving, retrieving and processing information and user commands in accordance with a stored program[;],

audio tranducer and converter means in communication with the processor means for receiving audio commands from the user, for converting the received audio commands into electrical signals, and for sending the converted electrical signals to the processor means, the audio transducer and converter means being supported hands-free by the user[;],

said processor means including means for recognizing [a] *an audio* command in the *form of* converted electrical signals and responding to the recognized *audio* command by retrieving and outputting corresponding information from the electronic technical manual stored in the storage means[;],

said recognizing means including means for defining a subset of the plurality of words and phrases in the preprogrammed vocabulary model according to a current context of the stored program and for matching the converted electrical signals against the defined subset to recognize the command;

audio transducer and converter means in communication with the processor means for receiving the audio commands from the user, for converting the received audio commands into the electrical signals, and for sending the converted electrical signals to the processor means, the audio transducer and converter means being supported hands-free by the user;

computer display means in communication with the processor means for receiving the outputted information from the processor means and for displaying the received information for the user; and

means for mounting the computer display means on the user such that the computer display means is carried hands-free in a portion of the view of the user whereby the computing apparatus is capable of being operated to display the received information in a hands-free manner utilizing only the audio commands.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED JULY 2, 1996

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1553
CLEAN DIESEL FUEL AND METHODS OF PRODUCING CLEAN DIESEL FUEL

Michael J. Pedersen, 33 Colonial, Irvine, Calif. 92720
Division of Ser. No. 169,914, Dec. 20, 1993. This application Sep. 26, 1994, Ser. No. 312,022
Int. Cl.^{6} C10L *7/00*
U.S. Cl. 44—268 **4 Claims**

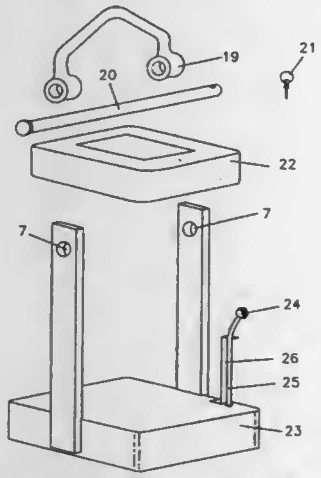
1. A diesel fuel, having reduced, or at least substantially equivalent, emissions of oxides of nitrogen as compared to a reference fuel containing 10% by volume aromatics prepared in accordance with Title 13, California Code of Regulations effective at Oct. 1, 1993, characterized by:

a. a cetane number (per ASTM D-613-84) not less than 55.2; and,

b. total aromatics (per ASTM D-1319-84), not less than 21 percent by weight nor greater than 21.7 percent by weight.

H1554
MAGNELL HARDNESS TESTER

Donald W. Horton, Havre de Grace, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 22, 1992, Ser. No. 949,200
Int. Cl.^{6} G01N *3/40*
U.S. Cl. 73—82 **2 Claims**



2. A method for determining the resistance of armor materials to projectile penetration, wherein said method is performed while said armor is physically affixed to a structure which it is intended to protect, wherein said method comprises

removing scale and decarburization from the surface of the physically affixed armor by grinding said surface using a coarse grinder;

polishing said surface to provide a reflective surface on said armor material;

employing an apparatus comprising two electromagnets and a test head assembly, wherein said test head assembly is sandwiched between said two electromagnets and is mechanically attached to said electromagnets, and wherein said test head assembly comprises a ball indenter means, a means for applying a load to said armor material and a pop-off release valve, in the following manner:

positioning said ball indenter means above said armor to be tested;

activating said two electromagnets;

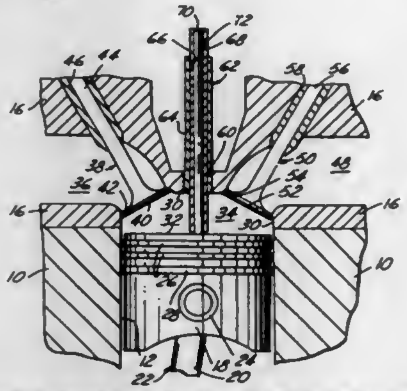
forcing a predetermined load onto said armor by activating said means for applying a load to said armor, wherein said load is applied through said ball indenter;

optically measuring the diameter of the hardness impression left by said load; and

converting said diameter to a hardness measurement.

H1555
PISTON TOP DEAD CENTER LOCATING TOOL

John S. Kargilis, Birmingham, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.
Filed Nov. 8, 1993, Ser. No. 148,947
Int. Cl.^{6} G01M *17/007*
U.S. Cl. 73—116 **3 Claims**

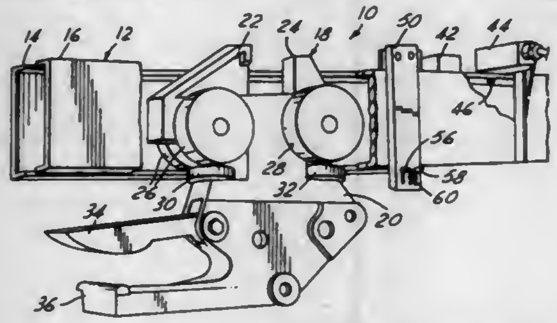


2. A piston position indicating tool for revealing the top dead center position of a piston in a combustion chamber of an internal combustion engine of the type having a cylinder bore and a cylinder head with a threaded spark plug opening, the spark plug opening and the cylinder being generally axially aligned with direction of travel taken by a piston in the cylinder, comprising: a base member having an end portion with external thread means configured and sized to attach into the spark plug opening for temporarily attachment to the engine, said base member having a bore therethrough with its axis extending generally parallel to the movement of the piston in the cylinder; a tubular outer member extending through said bore in said base member and defining an interior end portion adapted to project into the combustion chamber of the associated engine and having an opposite exterior end portion; an inner member supported by and extending through said tubular outer member, said inner member having an interior end portion within the combustion chamber of the associated engine and having an opposite exterior end portion; said outer member being sized and configured relative to said bore in said base member to permit axial movement of said outer member relative to said base member only in response to a significant axially applied force upon said outer member such as by upward movement of the piston toward said base member; said inner member being sized and configured relative to said supporting tubular outer member to freely allow axial movement relative to said outer member and said base member without significant axially applied forces other than gravitational force; said tubular outer member and said inner member having equal lengths so that when the interior ends of both members are engaged by a piston moving upward toward said base member, said opposite external ends of both members are arranged to form a common unbroken plane but when the piston moves past its top dead center position and withdraws from said base member, said outer member retains its uppermost position relative to the base member while the inner member follows the piston's downward movement thereby producing an axial dislocation of said external end surfaces to visually present the outer and inner ends in two different planes.

H1556
INVENTED POWER & FREE CONVEYOR CARRIER TROLLEY WHEEL DETECTION DEVICE

Phares A. Noel, Detroit, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jun. 1, 1995, Ser. No. 457,419
Int. Cl.^{6} B61B *3/00*
U.S. Cl. 104—172.4 **1 Claim**



1. In a power and free conveyor system that includes a trolley frame having spaced pairs of load wheels supporting the trolley frame for movement in a longitudinal direction along a track and a spaced pair of guide wheels for maintaining orientation of the trolley frame with respect to the track, a system for monitoring the trolley frame load and guide wheels comprising:

a pair of first sensors respectively disposed on opposed sides of the track and responsive to passage of a corresponding pair of load wheels for generating first electrical signal patterns as a function thereof,

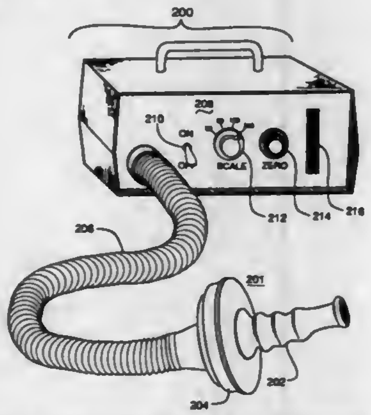
a plurality of second sensors mounted adjacent to the track and responsive to passage of the pair of guide wheels for generating second electrical signal patterns as a function thereof, and

a fundamental mode asynchronous machine coupled to said first and second sensors for performing pattern recognition analysis on said first and second signal patterns to determine operative condition of the load and guide wheels in real time.

H1557
SWALLOWING REHABILITATION

Carl A. Joubert, 8538 Bristlecone, San Antonio, Tex. 78240; Kall K. Fessenden, WHMC/SGHAE, Lackland AFB, Tex. 78236-5300, and Karen V. Myers, 835 Firefly Dr., San Antonio, Tex. 78216

Division of Ser. No. 907,910, Jul. 2, 1992. This application Jan. 27, 1994, Ser. No. 187,374
Int. Cl.^{6} A61B *5/103*
U.S. Cl. 128—782 **23 Claims**



15. Dysphagia rehabilitation apparatus comprising the combination of:

transducer means including a negative pressure to electrical signal transducer element disposable in pressurized constant volume communication with the mouth cavity of a dysphagia treatment patient for generating an electrical signal representative of oral sucking act related negative pressures generated in said dysphagia patient mouth cavity;

said oral sucking act related negative pressures exceeding human lung capacity negative pressures and extending up to a pressure of two hundred forty millimeters of mercury;

electrical circuit means connected with said transducer element electrical signal for generating a processed electrical signal also representative of said oral sucking act related negative pressures generated in said dysphagia patient mouth cavity; and

electrical display means connected with said processed electrical signal for communicating a sucking act negative pressure determined graphic display image feedback incentive to said dysphagia patient.

H1558
METHOD FOR MANUFACTURING AND AN ABSORBENT ARTICLE HAVING ELASTICALLY EXTENSIBLE PORTIONS

David J. K. Goulait, 6100 Center Hill Rd., Cincinnati, Ohio 45224, and Jerry E. Carstens, 1001 Tillman Ave., Memphis, Tenn. 38112

Division of Ser. No. 821,654, Jan. 16, 1992, which is a continuation-in-part of Ser. No. 382,516, Jul. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 64,896, Jun. 19, 1987, Pat. No. 4,854,984. This application Aug. 18, 1993, Ser. No. 109,014
Int. Cl.^{6} B31F *1/20*
U.S. Cl. 156—210 **15 Claims**

1. A method for manufacturing a disposable absorbent article having portions which are elastically extensible in at least a first direction, said method comprising the steps of:

providing a chassis, said chassis comprising:

a liquid pervious topsheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet;

providing a first lamina joined to said chassis, said first lamina having pleats, said pleats being oriented in a second direction;

providing at least one elastomeric lamina in face to face relation with at least a portion of said pleats of said first lamina;

providing two circumferentially grooved rolls, a first roll and a second roll, having mutually parallel axes and defining a nip therebetween, at least said first roll having a plurality of circumferential grooves and lands intermediate said grooves, said grooves being oriented in said second direction;

passing said first lamina and said elastomeric lamina in face to face relation through said nip, such that said pleats of said first lamina face said grooves of said first roll;

transversely registering the pleats of said first lamina with said grooves of said first roll;

pressing said rolls together about a the plane generally perpendicular to and connecting the axes of said rolls so that said first lamina contacts said elastomeric lamina at a position corresponding to said lands; and

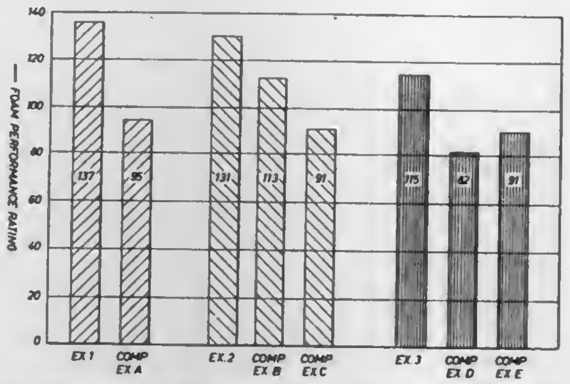
bonding said first lamina to said elastomeric lamina at said positions of contact.

H1559
SECONDARY ALKYL SULFATE-CONTAINING LIGHT DUTY LIQUID DETERGENT COMPOSITIONS

Nelson E. Prieto, Richmond; JanElsa E. Carty, Sugarland; Ruth J. Blanco, and William W. Schmidt, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 25, 1993, Ser. No. 111,794
Int. Cl.^{6} C11D *1/14*
U.S. Cl. 510—235 **15 Claims**

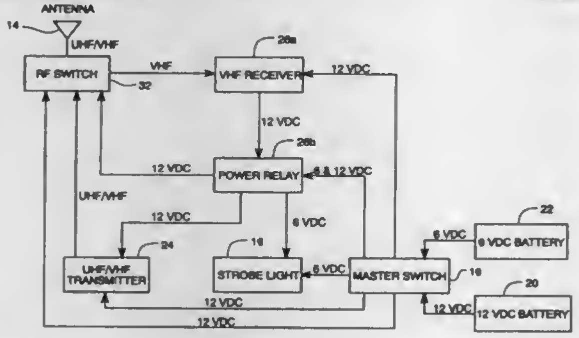
1. A liquid detergent composition comprising from about 1 percent by weight to about 35 percent by weight, basis the total weight of the composition, of one or more secondary alkyl sulfate compounds, from about 0.1 percent by weight to about 20 percent by weight, basis the total weight of the composition, of one or more suds stabilizers and from about 50 percent by weight to about 97 percent by weight, basis the total weight of the composition, of water.



H1560
CRASH SITE LOCATOR BEACON

Robert A. Gill, and Robert J. Feldmann, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 6, 1994, Ser. No. 301,084
Int. Cl.^{6} G01S *1/04;* B64D *47/06*
U.S. Cl. 342—385 **2 Claims**



1. A radio beacon unit comprising: radio electronics contained in a housing and an external antenna designed to be air dropped via parachute;

wherein the housing comprises: a top portion having a flat upper surface, and a bottom portion having a hemispherical lower surface, with said antenna mounted on said upper surface perpendicular thereto, means for providing a relatively low center of gravity, so that when the beacon unit is in any position on the hemispherical lower surface the beacon unit will upright itself so that the antenna is oriented for maximum efficiency;

wherein said radio beacon unit is a locator beacon which has mounted inside said housing a first subunit comprising a receiver and a power relay, a second subunit comprising a transmitter for sending radio signals on given frequencies so that the radio beacon unit can be tracked with directional locating equipment, a third subunit comprising an RF antenna switch which normally connects the antenna to the receiver, and a fourth subunit comprising a main battery pack;

a mode switch mounted on said upper surface, said mode switch having an OFF position in which the main battery pack is disconnected, and an ACTIVE position in which the main battery pack is connected to the receiver and to a first terminal of the power relay in the first subunit;

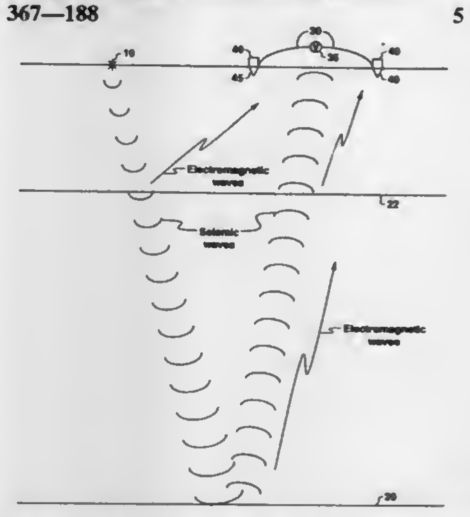
wherein the first subunit includes means for detecting a given number of RF pulses received via said antenna and in response thereto activating the power relay to extend the connection of the main battery pack from said first terminal to the second and third subunits, so the transmitter and the RF antenna switch are activated to transmit a beacon signal and to disconnect the receiver from the antenna;

wherein the first subunit further includes timing means to deactivate the power relay after a given period of time, to thereby disconnect the transmitter and RF antenna switch from the main battery pack, and to reconnect the receiver via the RF antenna switch to the antenna so that further RF pulses can be detected.

H1561
METHOD AND APPARATUS FOR DETECTION OF SEISMIC AND ELECTROMAGNETIC WAVES

Artur H. Thompson, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 22, 1994, Ser. No. 310,692
Int. Cl.^{6} G01V *3/00;11/00;* G01S *13/00*
U.S. Cl. 367—188 **5 Claims**



1. A method of making geophysical measurements comprising:

(a) generating a seismic wave at a first location; and

(b) concurrently detecting with an apparatus both the seismic wave and electromagnetic waves generated by said seismic wave at a spaced-apart second location.

H1562
HEAT SENSITIVE LIQUID CHEMICAL AGENT AND PESTICIDE DETECTOR AND METHOD OF USING

Thomas M. Albrechcinski, Cheektowaga, and Charles K. Akers, Williamsville, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 866,774, Apr. 3, 1992, abandoned. This application Jan. 29, 1993, Ser. No. 10,719
Int. Cl.^{6} G01N *27/00*
U.S. Cl. 422—98 **4 Claims**

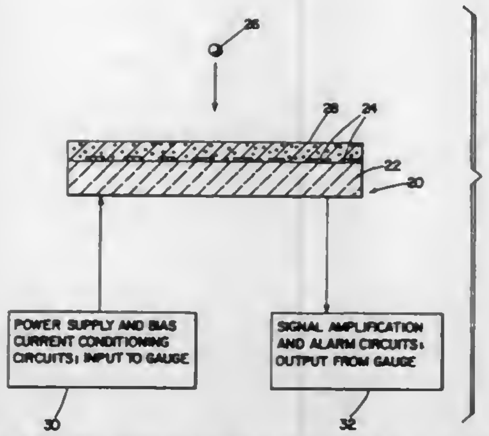
1. A device for detecting presence of chemical agents, said agents comprising of organic phosphate materials contacting said device, the device comprising:

a base means made of an electrically and thermally insulative material, said base means having an electrode having a defined dimension of height and an upper surface;

an electrode made of a layer of platinum material deposited on the upper surface of said base means; the thickness of said layer being relatively small compared to the height of said base means;

a porous material, embedded with an oxidizing agent, said material vapor deposited over the upper surface of said base means, covering over said electrode;

means for causing a constant current of approximately 4 milliamps direct current to flow through said electrode when the device is in use;


26
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POWER SUPPLY AND BIAS CURRENT CONDITIONING CIRCUITS; INPUT TO GAUGE
SIGNAL AMPLIFICATION AND ALARM CIRCUITS; OUTPUT FROM GAUGE
30
32

means for constantly measuring the voltage that appears across said electrode, such voltage occurring because of said current flowing in said electrode;

whereby when liquid droplets of organic phosphate chemical agents are deposited onto said porous material, they react with said oxidizing agent causing heat release, whereupon a heating of said electrode occurs within one second which heating leads to a current fluctuation in said electrode, such current fluctuation causes a change in the voltage being measured across the electrode whereupon such voltage change is indicative that such deposited droplets had been chemical agents comprising organic phosphate materials.

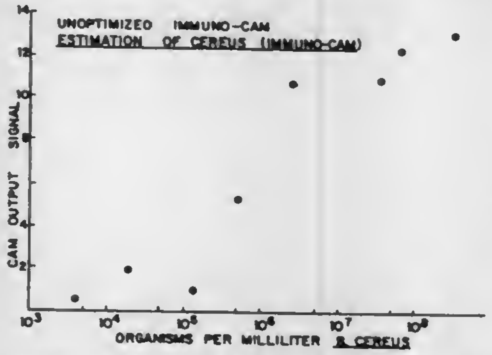
H1563
CHEMICAL AGENT MONITOR FOR IMMUNOASSAY DETECTION

A. Peter Snyder; Maryalice Miller, both of Bel Air, Md., and David A., Blyth, Salisbury Wilts, United Kingdom, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 23, 1994, Ser. No. 312,728

Int. Cl.^{6} G01N *33/554;33/569*

U.S. Cl. 435—7.32 **11 Claims**



1. A method of detecting bacteria, comprising the steps of:

forming an immunoassay ladder including a biological substance (Ag) adsorbed onto a surface, adding an immunological biochemical ladder (Ab) and beta-galactosidase enzyme (gal) to form a Ag-Ab-gal system;

adding said system to an aqueous solution of an enzyme selected from ortho-nitrophenylgalactopyranoside and ortho-nitrophenylgalactosidase enzyme; and

detecting the amount of ortho-nitrophenol (ONP) produced by measuring the vapor pressure generated by said ONP using an ion mobility spectrometer monitor, said pressure being in proportion to the amount of biological substance present in said system.

H1564
FUNCTIONALIZED BLOCK COPOLYMERS CURED WITH ISOCYANATES

David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 9, 1991, Ser. No. 727,174

Int. Cl.^{6} C08F *8/00*

U.S. Cl. 525—98 **22 Claims**

1. An isocyanate-cured hydroxy-functionalized selectively hydrogenated block copolymer of a vinyl aromatic hydrocarbon and a conjugated diene wherein the hydroxy functionality is randomly dispersed throughout the polymer on the conjugated diene blocks.

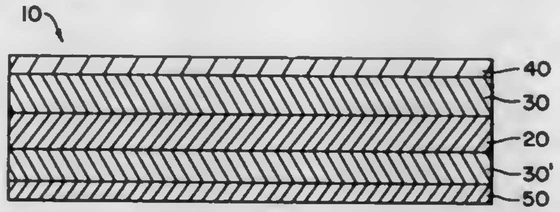
H1565
SUPERABSORBENT, CONTINUOUS FILAMENT WEB

Terry A. Brodof, 7714 Quail Hill Rd., Charlotte, N.C. 28210; Ronald O. Bryant, 1100 Ardsley Rd., Charlotte, N.C. 28207, and Harold W. Davis, 1551 Ovenbrook Dr., Gaffney, S.C. 29340

Filed Aug. 15, 1994, Ser. No. 290,260

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—368 **17 Claims**



1. A process for making a superabsorbent fiber web comprising the steps of:

providing opened, continuous filament, cellulose ester tow having crimped filaments; and

applying superabsorbent polymer particulate and an effective amount of a tackifying agent to said opened tow, said tackifying agent being selected from the group consisting of: acetone, methyl ethyl ketone, methyl acetate, ethyl acetate, propyl acetate, methyl formate, ethyl formate, propyl formate, glacial acetic acid, methylene chloride, tetrahydrofuran, formic acid and mixtures thereof including combinations with a minor amount of other volatile liquids having a boiling point of about 100° C. or less at atmospheric pressures; and cyclohexanone, benyl alcohol, and glycerol derivatives, said glycerol derivatives including glycerol triacetate, triethylglycerol diacetate, and glycol monoethyl ether acetate, whereby there is produced a superabsorbent fiber web comprising said superabsorbent polymer particulate adhered to a surface of said filaments of said tow.

10. An absorbent article comprising a continuous filament, cellulose ester web having crimped filaments and loaded with superabsorbent polymer particulate adhered to the surface of said filaments.

REISSUES

JULY 2, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

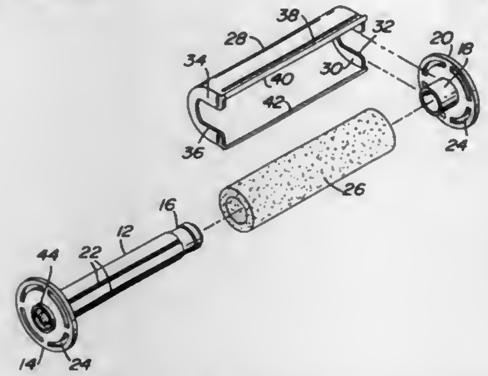
Re. 35,287
HAIR CURLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Original No. 4,453,554, dated Jun. 12, 1984, Ser. No. 464,538, Feb. 7, 1983. Continuation of Ser. No. 374,934, Jun. 29, 1989, abandoned. Application for reissue Sep. 2, 1993, Ser. No. 116,213

Int. Cl.^{6} A45D *6/14*

U.S. Cl. 132—251 **21 Claims**



1. A hair curler for use with steam comprising a hollow perforated core, said core having an opening only at one end, a [purous] *porous* sleeve around said core, a rim at each end of the core, the diameter of the rim being greater than the diameter of the core, at least one rim being releasably connected to the core, [and] a finger contact surface on the exterior surface of each rim, at least one of said finger contact surfaces being annular and coaxial with said opening, *and a shield which is generally semi-circular, said shield having end walls, each end wall having a notch, said end walls being juxtaposed to an associated rim and being between the rims while the core is received in said notches, an outer peripheral surface of the core engaging the surfaces of a notch in the end wall of the shield.*

Re. 35,288
CARRIER STRAP FOR BOTTLES OR JUGS

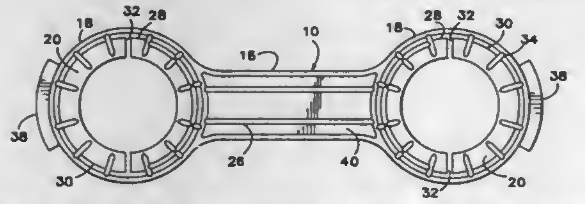
James C. Borg, Eugene, Oreg., assignor to Oregon Precision Industries, Inc., Eugene, Oreg.

Original No. 5,306,060, dated Apr. 26, 1994, Ser. No. 125,352, Sep. 22, 1993. Continuation of Ser. No. 919,213, Jul. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 914,691, Jul. 6, 1992, Pat. No. Des. 349,459. Application for reissue Dec. 15, 1994, Ser. No. 356,862

Int. Cl.^{6} B65D *71/00*

U.S. Cl. 294—87.2 **13 Claims**

1. A one-piece carrier strap for carrying a pair of containers, such as jugs, narrow-necked bottles or the like, that are of a type having an enlarged neck portion, said strap comprising:



(a) an elongate grip having a pair of opposite ends;

(b) a pair of rings, each ring being fixedly attached to a respective one of said ends of said grip, each ring having a pair of scores formed therein; and

(c) a respective neck-retaining collar within each ring, each collar having at least a pair of resiliently yieldable portions that progressively approach each other toward an upper side of said strap for yieldably receiving and springably retaining the enlarged neck portion of a respective container of said type that is inserted through said collar toward said upper side, said yieldable portions of each collar being, apart from the corresponding ring, completely separated from each other by at least a pair of gaps such that if either ring is stressed and thereby broken along said scores, then at least a pair of the corresponding yieldable portions are fully disconnected from each other.

Re. 35,289
PROCESS FOR PRODUCTION OF STYRENE POLYMERS

Nobuhide Ishihara; Masahiko Kuramoto, both of Chiba, and Michitake Uoi, Ichihara, all of, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Original No. 4,680,353, dated Jul. 14, 1987, Ser. No. 923,395, Oct. 23, 1986. Continuation of Ser. No. 737,825, Jul. 26, 1991, abandoned, which is a continuation of Ser. No. 378,846, Jul. 12, 1989, abandoned. Application for reissue Jun. 1, 1993, Ser. No. 70,057

Claims priority, application Japan, Nov. 11, 1985, 60-252531; May 6, 1986, 61-101927

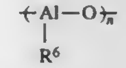
Int. Cl.^{6} C08F *4/642;12/08*

U.S. Cl. 526—129 **37 Claims**

1. A process for producing *syndiotactic* styrene polymers which comprises polmerizing styrene or styrene derivatives *at a polymerization temperature of from 0° C. to 90° C.* by the use of a catalyst comprising:

(A) a titanium compound, and

(B) a [contact product of an organoaluminum compound and a condensation agent] *an alkyl aluminoxane compound represented by the formula:*



$$\left(\underset{\displaystyle R^6}{\underset{|}{\mathrm{Al}}}-\mathrm{O}\right)_n$$

wherein n is 2 to 50 and R^6 is an alkyl group having 1 to 8 carbon atoms, wherein said titanium compound is at least one compound selected from titanium compounds and titanium chelate compounds represented by the general formulae:

$$TiR^1_aR^2_bR^3_cX^1_{4-(a+b+c)} \text{ and}$$

$$TiR^1_dR^2_eX^1_{3-(d+e)}$$

wherein R^1, R^2 and R^3 each represent a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an alkylaryl group, an arylalkyl group, an acyloxy group having 1 to 20 carbon atoms, a cyclopentadienyl group, a substituted cyclopentadienyl group or an indenyl group, X^1 represents a halogen atom, a, b and c each represent an integer of 0 to 4, and d and e each represent an integer of 0 to 3; provided that said titanium compound is not absorbed or deposited on a magnesium compound. [The process as claimed in claim 1, wherein the titanium compound is at least one compound selected from titanium compounds and titanium chelate compounds represented by the general formulae:

$TiR^1_aR^2_bR^3_cX^1_{4-(a+b+c)}$ and

$TiR^1_dR^2_eX^1_{3-(d+e)}$

(wherein R^1, R^2 and R^3 each represent a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an alkylaryl group, an arylalkyl group, an acyloxy group having 1 to 20 carbon atoms, a cyclopentadienyl group, a substituted cyclopentadienyl group or an indenyl group, X^1 represents a halogen atom, a, b and c each represent an integer of 0 to 4, and d and e each represent an integer of 0 to 3).]

Re. 35,290

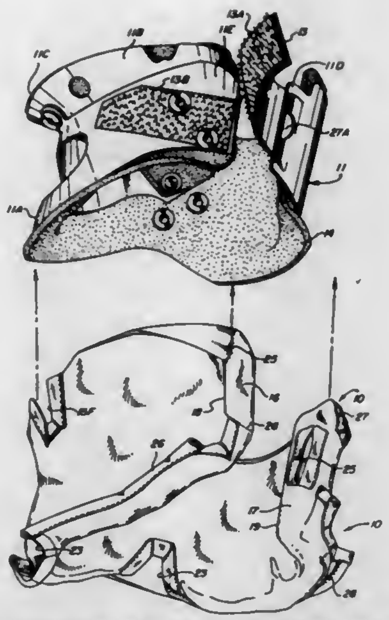
SURGICAL COLLAR AND LINER THEREFOR

Sue Druskoczi, 10609 Dixon Dr., Riverview, Fla. 33569

Original No. 5,010,877, dated Apr. 30, 1991, Ser. No. 440,716, Nov. 24, 1989. Application for reissue Apr. 29, 1993, Ser. No. 54,946

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—18 **16 Claims**



1. A surgical collar and liner therefor, said collar [and further including aperture means formed in said blank adapted to receive a portion of said collar] having an upper longitudinal edge forming a chin rest, and opposed ends, and

said liner comprising a flat blank of soft pliable absorbent material capable of being washed, adapted to cover the interior surface of said collar,

said blank having opposed longitudinal extending marginal portions and opposed end portions,

said opposed end portions of said blank being reversely folded to form [an] end [pocket] *pockets* thereat between said opposed marginal portions,

said end pockets being adapted to receive the opposed ends of said collar *and further including aperture means formed in said blank adapted to receive a portion of said collar,*

said longitudinally extending marginal portions extending beyond the upper longitudinal edge and *a* lower longitudinal circumscribing edge of said collar,

said marginal portions being adapted to [e] *be* outwardly and reversely folded over the longitudinal [edge] *edges* of said collar whereby said liner covers the interior surface of said collar and is releaseably secured to said collar solely by said marginal portions, said end pockets, and said aperture means.

PLANT PATENTS

GRANTED JULY 2, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,597

NEOREGELIA PLANT NAMED 'ULTIMA'

Chester Skotak, Jr., Alajuela, Costa Rica, assignor to Dura Flor S.A., Alajuela, Costa Rica

Filed Apr. 14, 1995, Ser. No. 422,531

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Neoregelia plant named 'Ultima,' as illustrated and described.

9,598

NEOREGELIA PLANT NAMED 'SHEBA'

Chester Skotak, Jr., Alajuela, Costa Rica, assignor to Dura Flor S.A., Alajuela, Costa Rica

Filed Apr. 14, 1995, Ser. No. 422,532

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Neoregelia plant named 'Sheba,' as illustrated and described.

9,599

NEOREGELIA PLANT NAMED 'MORADO'

Chester Skotak, Jr., Alajuela, Costa Rica, assignor to Dura Flor S.A., Alajuela, Costa Rica

Filed Apr. 14, 1995, Ser. No. 422,583

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar of Neoregelia plant named 'Morado,' as illustrated and described.

PATENTS

GRANTED JUL. 2, 1996

ERRATA

For CLASS	See PATENT NO.
30–134	5,531,007
70–279	5,531,086
108–102	5,531,159
280–775	5,531,317
222–001	5,531,344
256–022	5,531,427
473–331	5,531,439
463–012	5,531,440
463–012	5,531,441
463–037	5,531,443
473–349	5,531,444
473–341	5,531,445
473–227	5,531,446
301–110	5,531,510
301–110	5,531,511
205–751	5,531,865
502–202	5,531,869
205–044	5,531,868
205–778	5,531,870
205–688	5,531,871
205–602	5,531,882
205–626	5,531,883
510–102	5,531,909
510–102	5,531,910

ERRATA–CONTINUED

For CLASS	See PATENT NO.
508–408	5,531,911
508–507	5,531,912
510–294	5,531,915
510–412	5,531,916
510–114	5,531,917
510–320	5,531,918
510–200	5,531,919
510–281	5,531,927
510–429	5,531,933
510–417	5,531,938
510–182	5,531,939
252–79	5,532,094
435–240	5,532,108
525–54	5,532,305
525–54	5,532,311
525–232	5,532,312
530–399	5,532,343
514–234	5,532,366
546–196	5,532,383
585–671	5,532,421
257–201	5,532,486
375–356	5,532,556
326–98	5,532,625
327–545	5,532,676
340–825	5,532,692
361–813	5,532,910

PATENTS

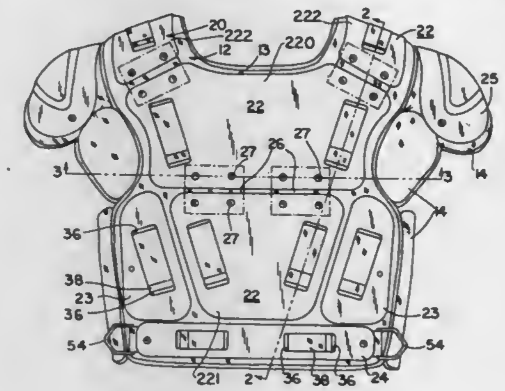
GRANTED JULY 2, 1996

GENERAL AND MECHANICAL

5,530,966

PROTECTIVE GARMENT FOR BASEBALL UMPIRES HAVING AN INNER CUSHIONED LAYER AND AN OUTER LAYER OF INTERCONNECTED PLATES

Joseph H. West, 437 Lakeview Dr., Fort Lauderdale, Fla. 33326
Continuation of Ser. No. 994,497, Dec. 21, 1992, abandoned.
This application Apr. 10, 1995, Ser. No. 416,688
Int. Cl.^{6} A41D *13/00*
U.S. Cl. 2—2 **24 Claims**



1. A protective garment for the torso of a body for use by baseball umpires comprising in combination

an inner layer in the form of a flexible pad adapted to conform to the contour of the entire frontal area of the upper torso and having an inner surface adapted to confront the torso, an outer surface facing outwardly from the torso, and a perimeter defining the outlines of said inner and outer surfaces, said layer including an intermediate thickness of cushioning material between said inner and outer surfaces,

an outer shell layer covering substantially the entire frontal area of the upper torso and adapted to overlie said inner layer within its perimeter and comprising a plurality of interconnected plate elements, each plate element being positioned and arranged to overlie a selected area of the torso, and means interconnecting said plate elements to form a torso-fitting shell overlying said inner layer,

said cushioning material adapted to distribute impacts against a given area of the outer layer over an area of the inner layer which is at least as great as said given area,

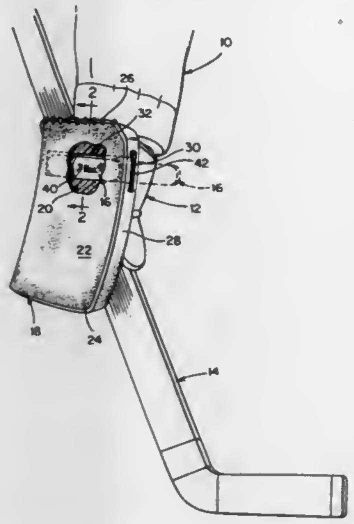
said interconnecting means comprising at least one flexible strap spanning between adjacent plate elements of said plurality, said strap having one end connected to one element and the other end connected to the adjacent element and being of a length to provide a clearance space between the adjacent elements to afford hinge-like displacement of said adjacent plate elements about a hinge axis within said clearance space, said clearance space being limited to less than the diameter of a baseball whereby said inner layer, in the entire frontal area of the upper torso is protected against direct impact by a baseball,

each of said plate elements being a stiff, shock-resistant, lightweight material, having releasable fastening means interconnecting said shell on said inner layer.

5,530,967

HOCKEY TRAINING GLOVES WITH ATTACHABLE AND REMOVABLE WEIGHTS

Robert Clelo, 190 Oak Ave., Island Heights, N.J. 08732
Filed Sep. 13, 1994, Ser. No. 305,444
Int. Cl.^{6} A41D *3/10;13/10*
U.S. Cl. 2—16 **3 Claims**



1. In combination with a hockey players glove having a pad provided with an outer surface facing a hockey puck shooter, an inner surface spaced from said outer surface, a peripheral side edge interconnecting said outer and inner surfaces, an elongated rigid training weight, said pad filling the space between the outer and inner surfaces, said pad including a transversely extending pocket spaced inwardly from the outer surface and outwardly from the inner surface, said spacing of the weight from the outer surface maintaining rebound characteristics of a hockey puck engaging said pad, said peripheral side edge having a longitudinal opening aligned with the pocket whereby the pocket in the pad is accessible from a portion of a periphery of said pad spaced from said surfaces for removably receiving said weight, said opening including a closure removably retaining said weight in the pocket, said pocket and weight extending substantially the entire distance between opposed side edges of the pad, said weight increasing resistance to movement of the glove during normal glove movements when practicing or warming up for playing hockey to enable a hockey player to increase hand and glove speed, increase agility of a hand having a glove mounted thereon and strengthen and increase stamina of the muscles controlling movement of a hand on which the glove is mounted.

5,530,968

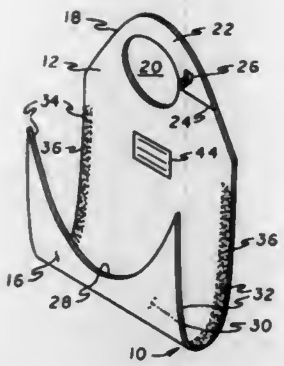
COMMUTER'S APRON

Wendy P. Crockett, 20 Upper Cir., Carmel Valley, Calif. 93924
Filed Apr. 11, 1995, Ser. No. 419,950
Int. Cl.^{6} A41B *3/10*
U.S. Cl. 2—46 **7 Claims**

1. A method of manufacturing and dispensing a commuter's apron, comprising the following steps:

(a) providing a thin, flexible sheet of liquid impervious material in an unbroken, elongate strip;

(b) forming a plurality of commuter's aprons by forming a plurality of regularly spaced apart separation lines across the strip, with each of the separation lines forming an arc and defining a common convex upper edge and a concave lower edge between adjacent aprons;



(c) separating adjacent aprons along their common separation line to form individual aprons each having a convex upper edge and concave lower edge, said convex upper edge having a curvature identical to said concave lower edge;

(d) folding said concave lower edge of each apron forwardly and upwardly to form a lower front pocket at the bottom of each apron;

(e) forming neck openings near the upper edge of each apron, with the material between each neck opening and the respective upper edge of each apron defining a collar for that apron, and;

(f) providing a lateral slit extending generally radially from said neck opening and defining a collar opening across the collar of each apron.

5,530,969

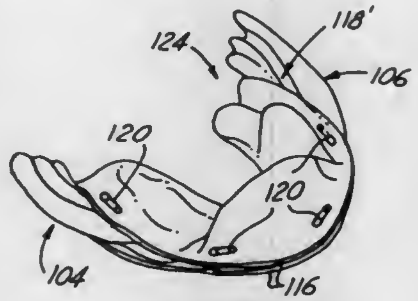
METHOD FOR PROVIDING A T-SHIRT HAVING A CONFIGURATION RESEMBLING THAT OF A FORTUNE COOKIE

Brian C. Lewandowski, 39310 Lembke, Sterling Heights, Mich. 48313

Filed Jun. 9, 1995, Ser. No. 489,110

Int. Cl.^{6} A41B *1/00*

U.S. Cl. 2—115 **20 Claims**



1. A method for configuring a T-shirt to resemble a fortune cookie, the T-shirt having a body, the body having a trunk portion, a waist portion and a waist end, the T-shirt further having a first sleeve, a second sleeve and a neck, said method comprising the steps of:

placing a selected T-shirt flatly upon a surface with the first and second sleeves thereof opposingly outstretched on the surface;

gathering inwardly the trunk portion of the body of the T-shirt, while the waist portion of the T-shirt is left ungathered;

vertically folding the T-shirt wherein the first sleeve is superposed the second sleeve;

folding the first and second sleeves over onto the body;

rolling the T-shirt starting from the neck toward the waist portion;

opening and wrapping the waist portion around the body to thereby form a clam-shell appearance to the T-shirt; and closing together the waist end of the T-shirt.

5,530,970

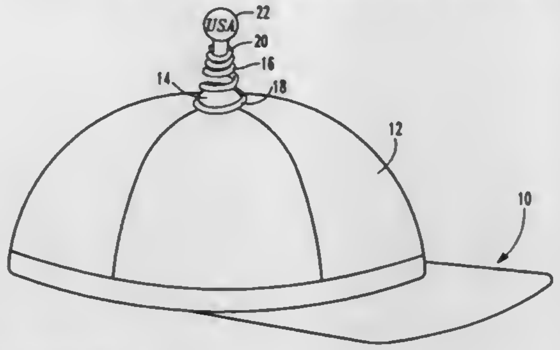
COIL SPRING DISPLAY DEVICE

Kirby J. Knutson, 1915 Windsor Rd., Rockford, Ill. 61111

Continuation of Ser. No. 99,613, Jul. 30, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,655

Int. Cl.^{6} A42B *1/24*

U.S. Cl. 2—209.13 **1 Claim**



1. A display device removably attachable to an article of clothing, comprising:

a coil spring having a lower end and an upper end, said lower end of said coil spring comprising a pair of generally circular, resilient sections disposed in proximity to one another and adapted to releasably secure a portion of said article of clothing therebetween, said upper end of said coil spring comprising a generally circular section having an opening therethrough; and

a display having a visible display surface and a generally tapered, lower end, said lower end of said display adapted to be insertable into said opening of said upper end of said coil spring for maintaining said display therein;

wherein said coil spring is tapered such that the diameter of said lower end of said coil spring is larger that the diameter of said upper end of said coil spring.

5,530,971

ODOR CONTROL SYSTEM FOR TOILETS

Donald C. Anderson, P.O. Box 1057, Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 207,752, Aug. 3, 1994, abandoned. This application May 12, 1995, Ser. No. 439,701

Int. Cl.^{6} E03D *9/05*

U.S. Cl. 4—215 **1 Claim**

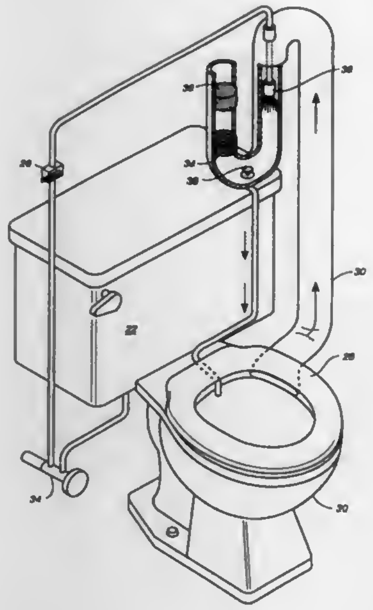
1. An odor control system for use with a conventional water tank and bowl combination located in a room, said system comprising:

an exhaust duct leading from said toilet bowl to a location above said water tank and forming a U-shaped configuration having an outlet opening at the top of one leg of said configuration;

said exhaust duct having a fine water spray nozzle located within said duct at the other end of said configuration, said nozzle being capable of producing intense intermingling of air from said bowl with water from said nozzle;

a valved conduit connectable at one end to a toilet water source, said valved conduit connected at another end to said fine water spray nozzle, an entrainment separator located in said exhaust duct in said one leg downstream from said fine water spray nozzle,

a return conduit connected to said exhaust duct via a check valve between said fine water spray nozzle and said entrainment separator in the base of said configuration for permitting water sprayed from said nozzle and water entrained by said separator to drain by gravity into said toilet bowl; characterized in that said fine water spray nozzle imparts enough kinetic energy to the air in said exhaust duct to exhaust odors from said bowl, preventing their escape into the room, and simultaneously, by absorbing action, the fine water spray from said fine water spray nozzle removes sufficient odor bodies from the ducted air, to permit its return to the room as clean and odor-free air through said outlet opening.



5,530,972

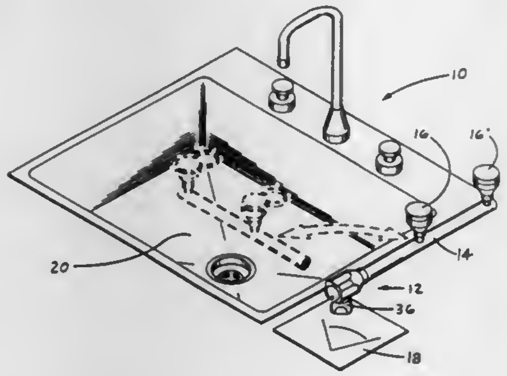
EMERGENCY EYEWASH FOUNTAIN

Stephen F. Tanner, Hockley, Tex., assignor to Encon Safety Products, Houston, Tex.

Filed Jan. 31, 1995, Ser. No. 381,312

Int. Cl.^{6} A61H *33/00*

U.S. Cl. 4—620 **9 Claims**



1. An eyewash fountain, comprising:

a valve having a base in fluid communication with a source of pressurized fluid, a body member in fluid communication with a distribution conduit, and a retainer member, said base having a longitudinal axis and an exterior wall surface generally radially spaced from said longitudinal axis, a pair of spaced apart parallel walls extending inwardly from the exterior wall surface, and a pair of abutment surfaces normal to said parallel walls, said parallel walls and abutment surfaces cooperating to define a recess in said base, and a retainer member removably attached to said body member in a selectively reversible position, said retainer member extending into the recess in said base and having a two predefined edge surfaces that are respectively abutable with a preselected one of said abutment surfaces of the recess in said base in response to rotating said body member about the longitudinal axis of said base; and

a pair of spray heads in fluid communication with said distribution conduit.

5,530,973

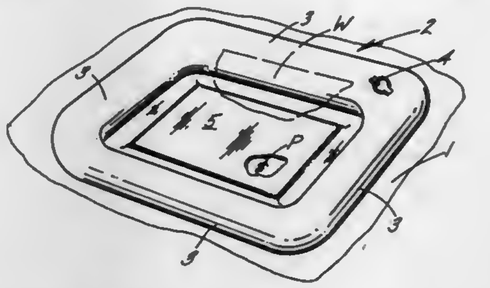
CAMP SINK WITH HEAT SOURCE

James L. Dodge, 375 "A" Owosso Dr., Eugene, Oreg. 97404

Filed Jan. 9, 1995, Ser. No. 370,524

Int. Cl.^{6} A47K *1/05*

U.S. Cl. 4—643 **6 Claims**



1. An open container for placement on a surface to receive a quantity of water and including,

side walls,

a bottom wall of pliant material secured to said side walls for support by said surface, and

a holder in place subjacent the bottom wall and defining with said bottom wall an open space into which a heat source may be inserted in a removable manner for heating the water, said holder being of closed cell synethetic sheet material for insulative purposes.

5,530,974

PATIENT REPOSITIONING AND POSITION MAINTENANCE DEVICE

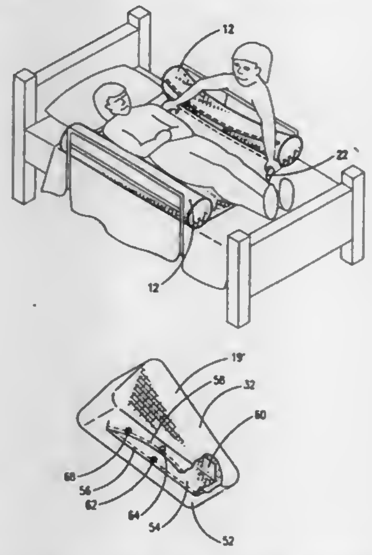
Thersa J. Rains, Wagoner, Okla., and Mark Pempsell, Ft. Worth, Tex., assignors to DeMar Technologies, Inc., Wagner, Okla.

Continuation-in-part of Ser. No. 113,076, Aug. 30, 1993, Pat. No. 5,359,739. This application Oct. 31, 1994, Ser. No. 332,368

The portion of the term of this patent subsequent to Oct. 31, 2014, has been disclaimed.

Int. Cl.^{6} A61G *12/00;* A47G *9/00;* A47C *21/08*

U.S. Cl. 5—81.1 T **9 Claims**



1. A patient repositioning and position maintenance device adapted to be positioned on the supporting surface of a bed of conventional width, comprising:

a rectangular sheet of fabric material, and

a pair of resilient cylindrical cushions,

the rectangular sheet of fabric material being folded and stitched such that a rectangular patient resting area is disposed between a pair of cylindrical pockets, the cylindrical pockets being situated on opposite sides of the rectangular patient resting area, each cylindrical pocket having a cylindrical cushion received therein, the distance between the cylindrical pockets being approximately equal to the width of the bed upon which the device is used, such that one of the cylindrical pockets with cylindrical cushion therein can hang over the side of the bed when preparing to load a patient onto the bed,

whereby one of the cylindrical pockets with cushion therein can be used to maintain the position of a bedfast patient by rolling the cylindrical pocket with cushion therein snugly against the bedfast patient's shoulder, back and buttocks.

5,530,975

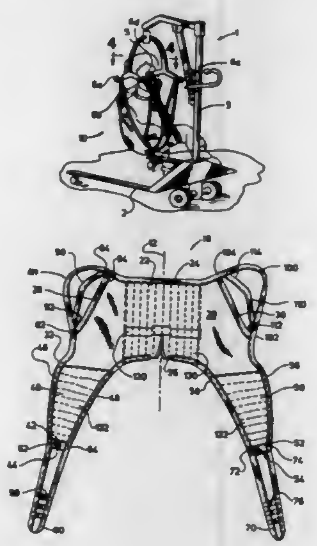
METHOD OF LIFTING A PATIENT WITH A SLING

Ronald L. Firebaugh, Oshkosk, Wis., and Jim R. Schultz, Thousand Oaks, Calif., assignors to Guardian Products, Inc., Simi Valley, Calif.

Continuation of Ser. No. 134,283, Oct. 8, 1993, Pat. No. 5,396,670. This application Feb. 7, 1995, Ser. No. 384,840

Int. Cl.^{6} A61G *7/10;7/14*

U.S. Cl. 5—81.1 T **12 Claims**



1. A method for lifting a patient comprising:
a. providing a patient lifter having a four point cradle;
b. providing a sling that comprises
  i. a reversed U-shaped body,
  ii. a first and a second leg strap with each strap located at the distal end of the U,
  iii. at least two left side straps, with each left side strap having a first and second end both attached to the body to form a loop, each of the first ends of each left side strap being aligned and each of the second ends of each left side strap being aligned wherein each left side strap defines a loop having a perimeter length different than the perimeter length of each of the other loops, and,
  iv. at least two right side straps with each right side strap having a first and second end both attached to the body to form a loop, each of the first ends of each right side strap being aligned and each of the second ends of each right side strap being aligned wherein each right side strap defines a loop having a perimeter length different than the perimeter length of each of the other loops,
c. placing the sling underneath a patient; and,
d. attaching at least one loop of the sling to a point on the cradle.

5,530,976

LIFTING DEVICE WITH FLUID FILLED TRACTION ELEMENT FOR HANDICAPPED PERSONS

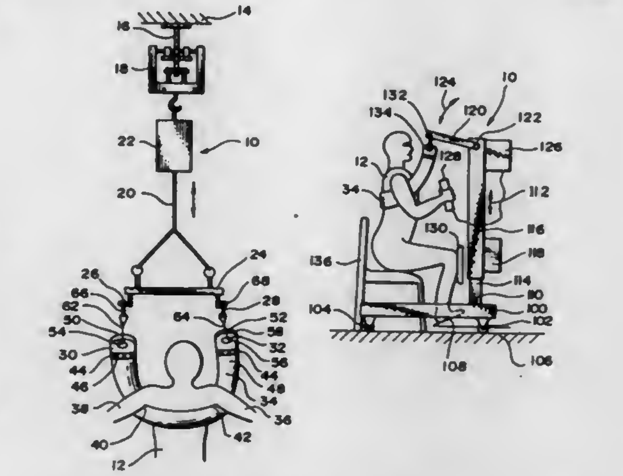
Stefan Horcher, Nidderau, Germany, assignor to Horcher GmbH, Nidderan, Germany

Filed May 6, 1994, Ser. No. 238,943

Claims priority, application Germany, May 7, 1993, 93 06 922.7 U

Int. Cl.^{6} A61G *7/12*

U.S. Cl. 5—89.1 **11 Claims**



1. A lifting device (**10**) for a handicapped person (**12**), comprising a traction element (**34**) for placement under the armpits (**40**, **42**) of the person to be lifted and transported, a beight-adjustable lifting arm (**24**) including attachment points (**26**, **28**) for the ends (**30**, **32**) of the traction element,

wherein said traction element is an elastic hose made of a fiber material, such as polyamide, which is sealingly coated with an elastomer and the hose is filled with a fluid.

5,530,977

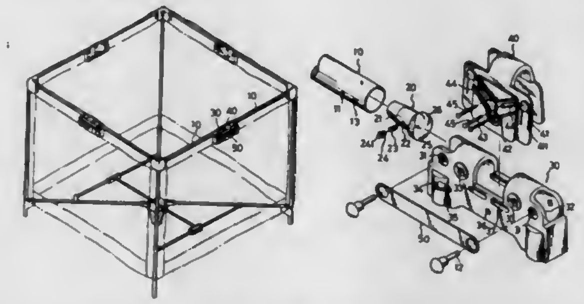
CONTROL DEVICE FOR FOLDING AND EXPANDING ARMRAIL OF A PLAYPEN

Kun Wang, No. 51, Lane 31, Sec. 2, Changping Rd., Taichung, Taiwan

Filed Aug. 25, 1994, Ser. No. 296,030

Int. Cl.^{6} A47D *13/06*

U.S. Cl. 5—99.1 **3 Claims**



1. A control device for folding and expanding armrails of a playpen which comprises four pairs of armrails respectively arranged on four upper sides thereof, said control device cooperating with each pair of armrails and comprising:

socket means having two distal ends each pivotally engaged with a corresponding one of said pair of armrails, said socket means having a substantiality U-shaped configuration with two parallel side plates each having two distal ends, a longitudinal passage defined in said socket means between the two side plates thereof, a first hole defined in each of the two distal ends of one side plate of said socket means, a second hole defined in each of said pair of armrails and in alignment

with an associated first hole, two horizontal slots defined in each of the two side plates of said socket means and located adjacent to each other, an orifice defined in each of the two side plates of said socket means and located under said two horizontal slots;

coupling means received in each of said pair of armrails and comprising a biasing member detachably engaged with a corresponding one of the two distal ends of said socket means, a shoulder formed on said coupling means and received in said passage and located above a corresponding one of said two horizontal slots, a tapered surface formed on said shoulder, a compartment defined in said coupling means and in alignment with said second hole of an associated armrail, said biasing member including a spring mounted in said compartment and a stub biased against said spring and having a projection extending through said second hole of said armrail and projecting outward of said first hole of said socket means, thereby fixing said armrail to an associated distal end of said socket means, wherein, when said projection of said stub is detached from said first hole of said socket means, said armrail together with said coupling means is released from an associated distal end of said socket means and is pivoted relative to said socket means; and

bracket means having a substantially U-shaped configuration with two parallel side plates for covering said socket means, a vertical slot defined in each of said two side plates of said bracket means and communicating with an associated orifice, a first positioning rod extending through said two orifices and slidably received in said two vertical slots, two oblique slots arranged in a V-shaped fashion defined in each of the two side plates of said bracket means and arranged symmetrically relative to an associated vertical slot and communicating with said two horizontal slots, two second positioning rods each slidably extending through a corresponding one of said two oblique slots and a corresponding one of said two horizontal slots, wherein, said bracket means is vertically slidable between a first position where said first positioning rod abuts against a top face of said vertical slot while each of said two second positioning rods abuts against a top face of each of said two oblique slots and against an outermost face of each of said two horizontal slots so as to bias against an underside of said shoulder of said coupling means, such that each of said armrails together with an associated coupling means is fixed to an associated distal end of said socket means, and a second position where said first positioning rod abuts against a bottom face of said vertical slot while each of said to second positioning rods abuts against a bottom face of each of said two oblique slots and against an inner most face of each of said two horizontal slots, such that each of said armrails together with an associated coupling means is able to rotate freely.

5,530,978

SOFTSIDED WATERBED WITH INTERCHANGEABLE COVER

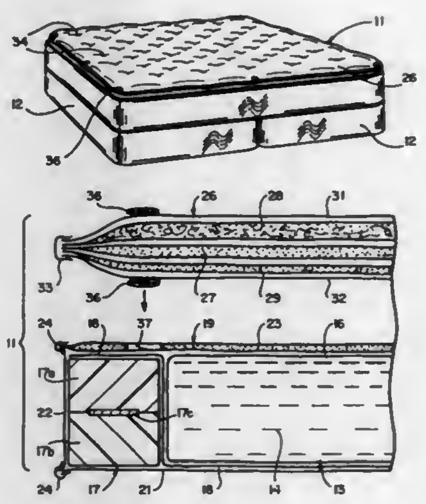
John B. Johenning, Beverly Hills, Calif., assignor to Strata Flotation, Inc., Torrance, Calif.

Filed Mar. 8, 1994, Ser. No. 207,731

Int. Cl.^{6} A47C *27/08*

U.S. Cl. 5—451 **15 Claims**

1. In a waterbed: a water-filled bladder of flexible material having a horizontally extending upper surface, a cushion of resilient material extending peripherally of the bladder, an enveloping cover of flexible material enclosing the bladder and the cushion and having an upper panel which overlies the upper surface of the bladder and the peripheral cushion, a removable cover overlying the upper panel of the enveloping cover and having layers of heavier and lighter filler materials toward opposite sides thereof, and means releasably securing the removable cover to the upper panel of the enveloping cover and permitting the removable cover to be selectively oriented with either the heavier filler material or the lighter filler material on top.



5,530,979

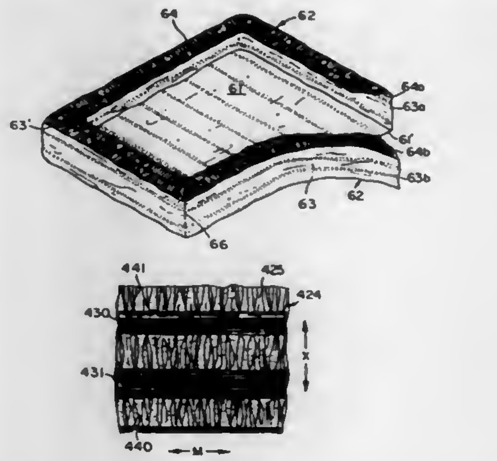
MATTRESS COVERINGS

John W. Whitley, Monroe, N.C., assignor to Perfect Fit Industries, Inc., Monroe, N.C.

Continuation-in-part of Ser. No. 45,643, Apr. 9, 1993, Pat. No. 5,325,555. This application Jul. 1, 1994, Ser. No. 269,487

Int. Cl.^{6} A47G *9/04;9/02*

U.S. Cl. 5—500 **20 Claims**



1. A mattress covering adapted for fitted disposition over the top, sides, ends and corners of mattresses of predetermined standard top surface sizes comprising:

a substantially inelastic, generally rectangular top portion having an outer periphery dimensioned to at least substantially cover the top surface of mattresses of at least one predetermined standard top surface size;

a substantially inelastic side skirt extending transversely from the outer periphery of the generally rectangular top portion around the outer periphery of the top portion;

an elastic underskirt extending away from a periphery of the side skirt remote from the top portion; and

at least one elastic strand secured to the elastic underskirt at a periphery of the elastic underskirt remote from the side skirt, the at least one strand extending at least partially around the elastic underskirt periphery.

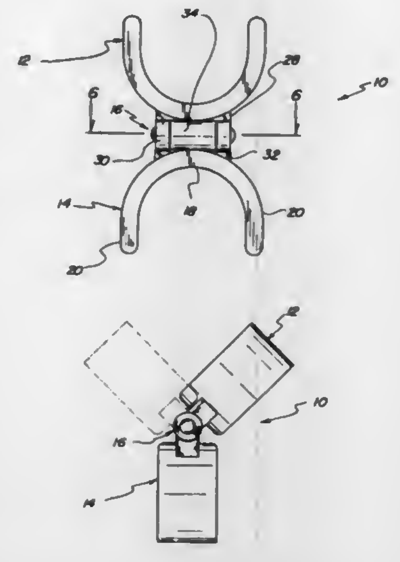
5,530,980
LEG STABILIZATION SLEEPING DEVICE

Louis Sommerhalter, Jr., 77 E. Missouri Ave. #67, Phoenix, Ariz. 85012

Filed Nov. 16, 1994, Ser. No. 340,534

Int. Cl.^{6} A47C *20/02*

U.S. Cl. 5—648 **1 Claim**



1. A leg stabilization sleeping device comprising:

a first engaging means adapted to receive a portion of a first leg of an individual;

a second engaging means adapted to receive a portion of a second leg of an individual;

each of the engaging means being substantially similar in shape and configuration and comprising a U-shaped interior frame including a substantially semi-cylindrical center section having opposed lateral ends with a pair of lateral sections projecting from the lateral ends and into a substantially spaced and parallel orientation relative to one another to define a substantially U-shape of the engaging means, each of the engaging means further comprising a resilient foam material coupled along an interior surface of the U-shaped interior frame and extending coextensively therewith; and an exterior skin encapsulating both the interior frame and the resilient foam material to enclose together the interior frame and the resilient foam material, the U-shaped interior frame comprising a substantially resilient plastic material, the plastic material being resiliently deformable to permit resilient and frictional engagement of the leg of an individual positioned between the lateral sections and into contact with the semi-cylindrical center section; and,

a coupling means adapted to pivotally couple the first engaging means relative to the second engaging means, the coupling means comprising a first mounting block coupled to an exterior surface of the semi-cylindrical center section of the first engaging means; a pair of pivot plates coupled to the first mounting block and positioned in a substantially spaced and parallel orientation relative to one another; a second mounting block coupled to an exterior surface of the semi-cylindrical center section of the second engaging means; a cylindrical pivot tube mounted to the second mounting block and positioned between the pivot plates; and a pivot pin extending through both of the pivot plates and the pivot tube to pivotally couple the first mounting block relative the second mounting block, whereby the first one of in individual's legs can be received within the first engaging means, the second one of an individual's legs can be received within the second engaging means so as to position and maintain the legs in a spaced and parallel orientation during sleep.

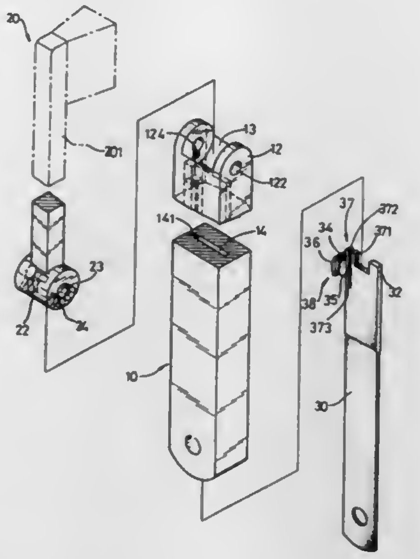
5,530,981
TOOTHBRUSH HAVING A TONGUE SCRAPER DISPOSED THEREIN

Wen-sqn Chen, No. 54, Nanmel St., Taichung, Taiwan

Filed Apr. 24, 1995, Ser. No. 427,204

Int. Cl.^{6} A47L *13/12*

U.S. Cl. 15—111 **2 Claims**



1. A toothbrush having a scraper disposed therein, said toothbrush comprising a bristle portion and a handle;

said handle having a first end and a second end, said first end thereof having two ears extending longitudinally from two opposite sides thereof, each ear extending from one of said two opposite sides of said handle and having a hole defined therein, a first recess defined in an inner surface of each of said two ears, a second recess defined in said first end of said handle between said two ears, a longitudinal groove defined in one in one of said two opposite sides of said handle and said longitudinal groove longitudinally extending through said handle to an opening at said second end of said handle;

said bristle portion comprising an elongated barrel having bristles attached at one end and a transversely oriented cylinder attached at the other end of said barrel, said cylinder defining a longitudinal axis, said cylinder being inserted into said second recess, said cylinder having two ends and a stud extending centrally from each of two ends thereof for engagement with said corresponding hole of said ear and a plurality of short grooves defined in each of said two ends of said cylinder, each of said short grooves having a central axis passing through said longitudinal axis of said cylinder and extending through a periphery of said cylinder, and

said scraper being a flexible and elongated plate and having a first end and a second end, said first end thereof having a first part and a second part both extending longitudinally from two opposite sides thereof, said first pate divided into a first portion and a second portion by a slit longitudinally defined therebetween, said second portion having a hook portion and a T-shaped plate extending laterally therefrom, said scraper inserted in said longitudinal groove with said first end thereof entering said second end of said handle, and first part and said second part each respectively inserted into one of said short grooves defined in said two ends of said cylinder and said hook portion being engaged with one of said first recesses.

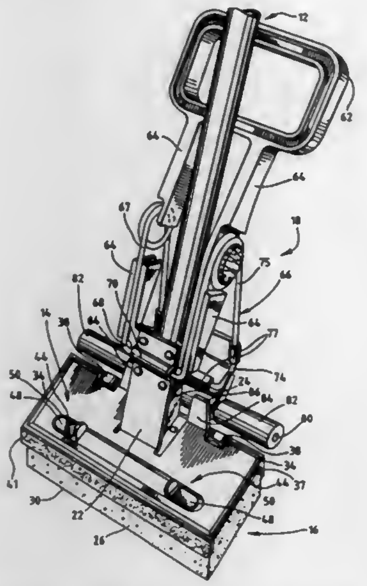
5,530,982
WRINGABLE FLAT-SURFACE SPONGE MOP

Paul B. Specht, Wilmette, Ill., assignor to M. B. Walton, Inc., Del.

Continuation of Ser. No. 179,095, Jan. 10, 1994, Pat. No. 5,438,727. This application May 30, 1995, Ser. No. 453,653

Int. Cl.^{6} A47L *13/26*

U.S. Cl. 15—119.2 **11 Claims**



1. A self-wringable mop for mopping substantially-flat surfaces comprising:

- (a) an elongated handle having a longitudinal axis;
- (b) a support assembly for a cleaning element secured adjacent one extremity of said elongated handle, and having a generally-planar surface disposed at an angle to said longitudinal axis for supporting a cleaning element;
- (c) a compressible absorbent cleaning element having
  - (i) a first surface substantially registering with and detachably secured to said generally-planar surface of said support assembly, and
  - (ii) a substantially-flat second surface spaced from said first surface and exposed and oriented with respect to the handle so that substantially the full area of said substantially-flat second surface is contactable with substantially-flat surfaces to be mopped, peripheral portions of said second surface extending beyond corresponding peripheral portions of said support assembly whereby said peripheral portions of said second surface facilitate mopping-action on surfaces immediately adjacent upstanding articles while inhibiting potentially-damaging contact of said support assembly therewith and cushioning such contact should it occur; and
- (d) a hand actuated wringing assembly comprising
  - (i) a lever mechanism pivotally secured to said elongated handle adjacent said one extremity of said elongated handle and having a hand grip disposed relative to said longitudinal axis for limited pivotal rotation of the lever mechanism in relation to said elongated handle, and
  - (ii) a single roller unit operably and resiliently secured by biasing means to said lever mechanism and disposed so that upon pivotal actuation of said lever mechanism by limited pivotal rotation of said hand grip the roller unit resiliently rolls over said substantially-flat second surface and resiliently and progressively compresses said cleaning element against said generally-planar surface of the support assembly, thereby progressively wringing absorbed fluids from said cleaning element,

  said wringing assembly being disposed relative to said elongated handle so that when in an at-rest position it does not interfere either functionally or visually with normal mopping operation;

said support assembly being metallic and said first surface of said compressible absorbent cleaning element including a plastic mounting plate secured thereto and having integrally-molded edge portions overlying edge portions of the metallic support assembly for shielding the edge portions of said support assembly from direct contact with upstanding articles when mopping surfaces immediately adjacent thereto.

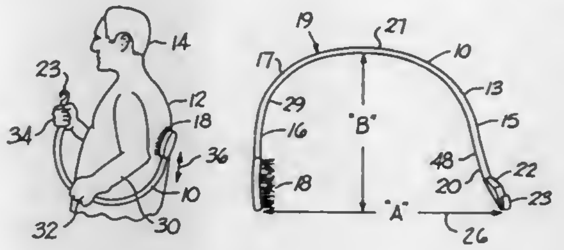
5,530,983
APPLIANCE FOR WASHING, MASSAGING, OR HEAT-TREATING THE BACK

Roy D. Maltese, 22131 Cleveland - Apt. 103, Dearborn, Mich. 48124

Filed Jul. 5, 1994, Ser. No. 270,264

Int. Cl.^{6} A47K *7/02;* **A61H** *15/00;15/02*

U.S. Cl. 15—160 **5 Claims**



1. A back appliance comprising:

an elongated rigid support body (19) having a generally U-shaped configuration, said U-shaped body comprising a bight portion, a first arm, and a second arm extending in a common plane (24);

said first arm extending approximately normal to said bight portion whereby said first arm can extend across the back of the person using the appliance; said first arm having a first curved connector portion (17) joining said first arm to said bight portion, so that said connector portion conforms generally to the side surface contour of the person using the appliance;

said first arm having a first terminal end remote from said bight portion, and a working element (18) on said terminal end having a working surface engageable against the person's back;

said second arm angling from said bight portion in a spaced relationship to said first arm, whereby said second arm extends in front of the person using the appliance, said second arm having a second curved connector portion (13) joining said second arm to said bight portion whereby the elongated U-shaped support body has a relatively smooth continuous surface adapted to partially encircle the body of the person using the appliance;

said second arm having a second terminal end remote from said bight portion, and a handle (22) on said second terminal end adapted for gripping by one hand of the person using the appliance, said handle extending angularly away from said working element at an obtuse angle to said bight portion, and non-parallel to the working surface of the working element whereby the person can grip the handle, with his arm extending forwardly from his body;

said working element being spaced from said handle along an imaginary line (A) that is larger than the maximum distance (B) from said imaginary line to said bight portion;

the handle and the working element each being spaced generally the same distance from the bight;

said bight portion forming a hand grip for the other hand of the person using the appliance, whereby the person can use various combinations of hand motions to shift said working element horizontally across his back or up and down on his back.

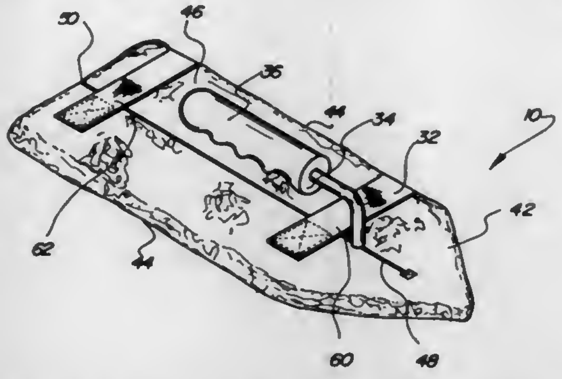
5,530,984
QUICK WIPE ERASER FOR CHALKBOARDS

William E. Walker, 364 Oriole Trail, Crystal Lake, Ill. 60014

Filed Aug. 31, 1995, Ser. No. 521,876

Int. Cl.⁶ A47L *13/10*

U.S. Cl. 15—209.1 **1 Claim**



1. A new and improved quick wipe eraser for chalkboards comprising, in combination:

a frame formed of tubular components coupled together and including a first peripheral member having long parallel side edges, a short rear edge and a front angled edge that connects to the two side edges integrally as well as the rear edge, the side edges being about twice the length of the rear edge and the triangle having three essentially equal 60 degree angles;

three cross-brace members including a front cross-brace member constituting the base of the triangle and having two additional cross-brace members at equally spaced locations on the interior faces of the side edges;

a handle formed of a rod extending upwardly from the central extent of the forward cross brace and extending rearwardly at a right angle to and over the central cross brace member with a plastic grip member of an enlarged diameter with finger receiving recesses on its lower extent secured to the end of the handle remote from the frame;

a flexible cover secured over the lower surface of the frame and essentially co-extensive therewith with side edges and with an upper surface secured with respect to the upper surface of the frame, the upper surface being formed with a longitudinal slit from adjacent the triangle to the opposite end thereof, the opposite end of the cover being open to facilitate coupling to the frame, the fabric being formed of a felt with a knap extending downwardly away from the frame for erasing chalk from a chalkboard; and

a connector strap at a side edge of the cover adjacent to the rear end of the cover and a connector strap at a side edge of the cover adjacent to the triangle with patches of pile-type fastener secured to the ends of the straps and with mutually coupleable pile-type fasteners on the rear surface of the cover to removably join with the pile-type fasteners of the straps for maintaining the cover in position on the frame.

5,530,985
WIRE BRUSH

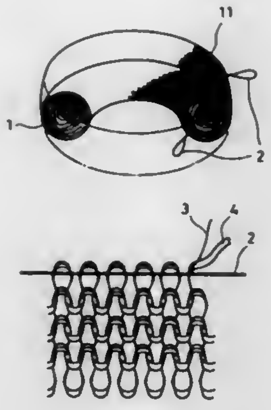
Chin-Tien Tsai, No. 40, Tou-Chang Lane, Tou-Nan Li, Lu-Kang Town, Changhua County, Taiwan, and Shu-yen Tsai, No. 20, Alley 39, Lane 206, Sec. 2, Tai-Ho Rd., Ah-Yi Li, Changhua County, Taiwan

Filed Nov. 13, 1995, Ser. No. 556,656

Int. Cl.⁶ A47L *17/08*

U.S. Cl. 15—229.11 **1 Claim**

1. A wire brush comprising a cylindrical body made from a nylon wire and an elastic plastic strip, which are put together and then woven on loop-like pull ropes, which are arranged in said cylindrical body in a parallel relation, said cylindrical body being turned inside out into an annular configuration, and then fixed in shape by tying up said loop-like pull ropes pair by pair.



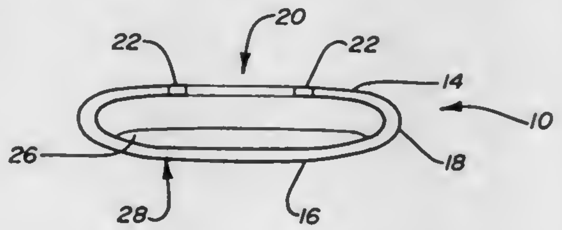
5,530,986
BUFFER COVERING

Ronald L. Rackley, Sr., P.O. Box 15582, Tallahassee, Fla. 32317

Filed Apr. 7, 1994, Ser. No. 224,040

Int. Cl.⁶ B65D *65/02;85/00*

U.S. Cl. 15—247 **7 Claims**



1. A buffer cover to be used in combination with a floor machine comprising:

an outer shell;

said outer shell is adapted to be removably secured to said floor machine quickly and efficiently after use of said floor machine;

said outer shell has a top surface, an encompassing side surface, and a bottom surface;

said bottom surface has an outside portion and an inside portion;

said outside portion faces a floor or work surface;

said top surface has an outside area and an inside area;

said inside area of said top surface faces said inside portion of said bottom surface;

an opening;

said opening is centrally located in said top surface;

said opening has an edge;

an elastic band;

said elastic band is attached to said edge of said opening;

an absorbent layer;

said absorbent layer is attached to said inside portion of said bottom surface; and

said absorbent layer absorbs excess chemicals, solutions or like from said floor machine and said outer shell maintains said absorbent layer and said outer shell possesses properties for enabling said excess chemicals, said solutions or like to remain within said inside portion, for enabling said floor machine to be transported without leakage.

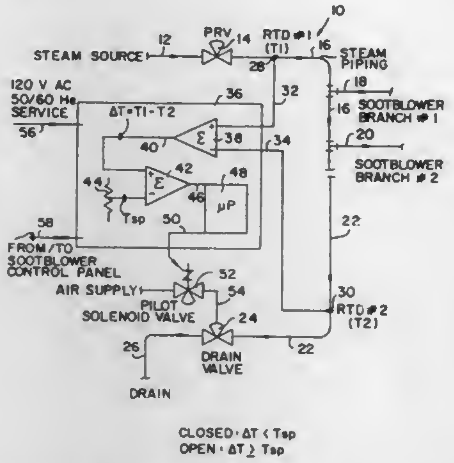
5,530,987
CONDENSATE DRAIN CONTROLLER

David P. Piccirillo, Carroll, and John T. Huston, Lancaster, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 24, 1992, Ser. No. 919,471

Int. Cl.⁶ A47L *25/00*

U.S. Cl. 15—319 **2 Claims**



1. A system for automatically controlling a modulating type drain valve connected to a steam piping system used to supply steam from a source to at least one sootblower, comprising:

means for producing a first signal representative of the steam temperature at the source;

means for producing a second signal representative of the steam temperature at the modulating type drain valve;

means, connected to said first and second signal producing means, for producing a third signal, based on said first and second signals, representative of the difference in steam temperature between the steam temperature at the source and the steam temperature at the modulating type drain valve;

means for providing a temperature setpoint signal;

a microprocessor based control unit connected to said means for producing said first and second signals, and having means connected to said third signal producing means and to said temperature setpoint signal providing means for producing a drain valve control signal as a function of said third signal for proportionally controlling drain valve position to control a rate of flow through said modulating type drain valve based upon a comparison of said third signal to said temperature setpoint signal, said setpoint signal being representative of the minimum allowable difference in steam temperature between the steam temperature at the source and the steam temperature at the modulating type drain valve; and

means for providing said drain valve control signal to means for controlling said modulating type drain valve in response to said drain valve control signal, said control means proportionally closing said drain valve when the value of said third signal is less than the value of said setpoint signal and proportionally opening said drain valve when the value of said third signal is greater than or equal to the value of said setpoint signal.

5,530,988
DEVICE FOR CLEARING PIPES OR OTHER LINES WITH PRESSURIZED GAS

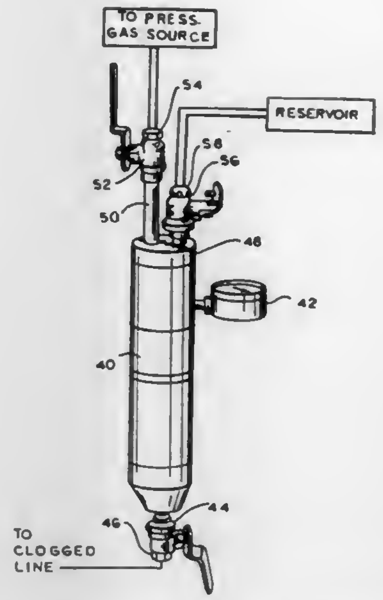
Raymond McQuillan, 140 Cedar Ave., Rockville Centre, N.Y. 11570

Continuation-in-part of Ser. No. 902,294, Jun. 19, 1992, Pat. No. Des. 361,371. This application Jul. 26, 1994, Ser. No. 280,789

Int. Cl.⁶ A47L *9/00*

U.S. Cl. 15—406 **4 Claims**

1. A device for unclogging a pipe or other line comprising:



a canister, the canister adapted to receive a pressurized gas, the canister having a first valve adapted to be coupled to the pipe or line that is to be unclogged;

the canister having a second valve attached thereto, the second valve being adapted to connect to a source of pressurized gas;

the canister having a pressure gauge coupled thereto for indicating the pressure in the canister;

whereby pressurized gas may be fed into said canister through said second valve, and pressurized gas in said canister can be fed to the pipe or line to be unclogged through said first valve; and further comprising a third valve coupled to said canister, said third valve being adapted to relieve pressure in said canister if the pipe or line fails to become unclogged by said pressure in the canister; and

a collection reservoir coupled to the third valve for collecting the contents of the canister.

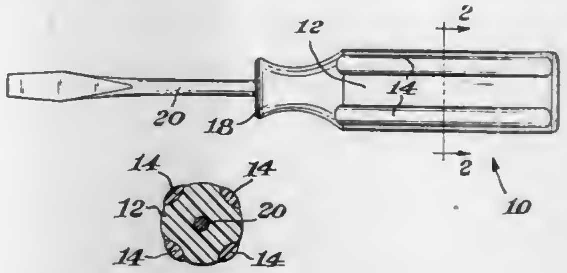
5,530,989
DUAL DUROMETER HANDLES

Mark A. Remmert, Saginaw; Richard W. Oertel, and Paul J. Moses, Jr., both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1994, Ser. No. 359,668

Int. Cl.⁶ A47B *95/02*

U.S. Cl. 16—110 R **8 Claims**

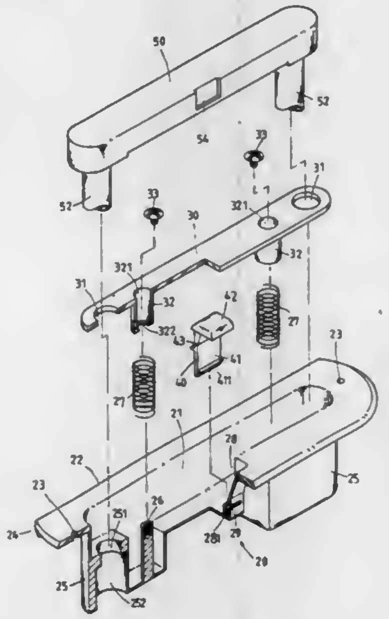


1. A dual durometer thermoplastic polyurethane handle suitable for grip by a human hand, comprising:

a) a rigid thermoplastic polyurethane core having a glass transition temperature above about 50° C., or a thermoplastic polyurethane-containing core having a flex modulus of at least 100,000 psi; and

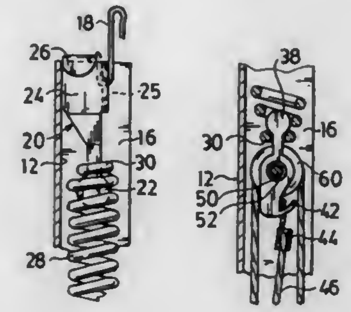
b) a soft thermoplastic polyurethane material having a glass transition temperature below about 25° C., or a thermoplastic polyurethane blend having a shore A hardness not greater than about 95, the soft polyurethane material or thermoplastic polyurethane blend superposing at least a portion of the rigid thermoplastic polyurethane or the thermoplastic polyurethane-containing material of (a) so that a hand, upon gripping the handle, contacts the soft thermoplastic polyurethane material.

5,530,990
HANDLE ASSEMBLY FOR SUITCASE
Shou-Mao Chen, 58 Ma Yuan West St., Taichung, Taiwan
Filed Mar. 27, 1995, Ser. No. 412,902
Int. Cl.⁶ A45C *13/22*
U.S. Cl. 16—115 **1 Claim**



1. A handle assembly for suitcase comprising:
a housing including a cavity formed therein and including two bases each having an aperture formed therein and each having a post extended therein, said housing including a middle portion having a recess formed therein and communicating with said cavity,
stop means secured to said posts,
a plate slidably engaged in said cavity of said housing and including two end portions each having an orifice formed therein, said plate including a pair of studs extended downward therefrom for slidably engaging with said posts, said studs each including a ring formed therein for engaging with said stop means so as to limit sliding movement of said studs relative to said posts,
means for biasing said plate outwards of said cavity,
a hand grip including a pair of rods extended downward therefrom and extending through said orifices of said plate and extending inwards of said apertures of said housing, said hand grip including a notch formed therein, and
a catch engaged in said recess of said housing and including a bottom portion secured in said housing, said earth including an upper portion having a knob provided thereon and including a middle portion having a projection extended therefrom for engaging with said notch of said hand grip,
said projection of said catch being engaged with said notch of said hand grip so as to retain said hand grip in said cavity of said housing when both said hand grip and said plate are depressed inwards of said cavity of said housing, and said biasing means biasing said hand grip and said plate outward of said cavity of said housing when said projection is disengaged from said notch of said hand grip and when said knob of said catch is depressed.

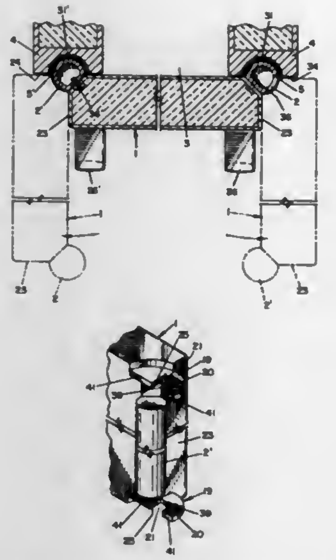
5,530,991
BLOCK AND TACKLE WINDOW BALANCE
Richard S. deNormand, Rochester; James A. Martini, Honeoye Falls, and Norman R. Westfall, Rochester, all of N.Y., assignors to Caldwell Manufacturing Company, Rochester, N.Y.
Filed Jan. 21, 1994, Ser. No. 184,663
Int. Cl.⁶ E05F *5/08*
U.S. Cl. 16—198 **5 Claims**



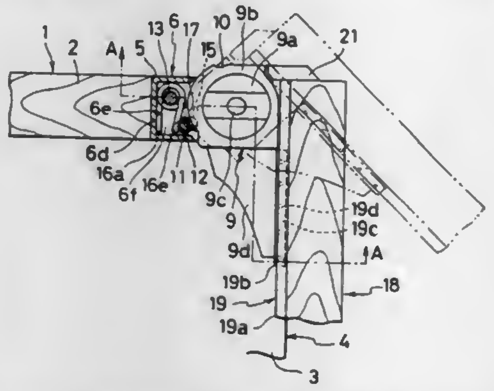
1. A block and tackle window balance system comprising:
a rigid channel having a bottom, two sides separated at a predetermined spacing, and two ends;
an extension spring having first and second ends;
said first end of the extension spring being attached to one of said two ends of the channel;
first and second blocks of pulleys rotatable about respective first and second axles;
a cord reeved through said first and second blocks of pulleys for attaching the balance system to one of a window sash and a window frame;
a spring coupler for attaching said second end of the extension spring to said first axle;
said first axle including two axle halves extending from opposite sides of said spring coupler;
said pulleys of said first block being mounted on said axle halves;
a plate-shaped head portion of said spring coupler being in engagement with said second end of the extension spring and said head portion being rounded in a plane parallel to said sides of the rigid channel to permit angular movement between said spring coupler and said extension spring toward and away from said bottom of the channel;
said second end of the extension spring being loosely crimped about said head portion of said spring coupler to permit the angular movement between the spring coupler and the extension spring toward and away from said bottom of the channel;
said pulleys of said first block together with said spring coupler being sized in width equal to said predetermined spacing between said two sides of the rigid channel for centering said extension spring within said rigid channel; and
said second end of the extension spring being tapered to engage the rounded head portion of the spring coupler as a ball-and-socket joint.

5,530,992
DOUBLE-SIDED HINGES
Eckhard Baermann, Am Branderhof 9, 51429 Bergisch Gladbach, Germany
Filed Jun. 14, 1994, Ser. No. 260,800
Claims priority, application Germany, Aug. 27, 1993, 43 28 821.9
Int. Cl.⁶ E05D *15/50*
U.S. Cl. 16—231 **9 Claims**

1. A hinge unit for use along one side of a double-hinged door and the frame of a cabinet, said hinge unit comprising:
a) an elongated pivot means, a receiver, and means to magnetically couple said pivot means to said receiver; said pivot means engaging said receiver to form a pivot axis for the hinge unit, the pivot means being rotatable about said pivot axis within said receiver; and
b) at least two spaced apart interlocks in axial alignment with said elongated pivot means, each interlock comprising a planar semicircular hinge element adapted to be mounted along one edge of the door, and a pickup engageable by the hinge element, each hinge element having a curved semicircular edge, a straight diametric edge and a semicircular recess communicating with said straight edge, said recess extending into the hinge element on one side of the diametric axis of the hinge element, said pickup comprising a circular disc, a semicircular disc, and a semicylindrical post joining the two discs, while maintaining a space between the discs to receive the hinge element therebetween, the planar hinge element being rotatable into interlocking engagement with said pickup when the hinge element is mounted on the door, said pickup is mounted in the cabinet frame, and said hinged door is rotated about said pivot axis, said hinge element being removable from said pickup upon rotation of said door about a pivot axis through a second hinge unit mounted on a second side of the cabinet frame and said door.

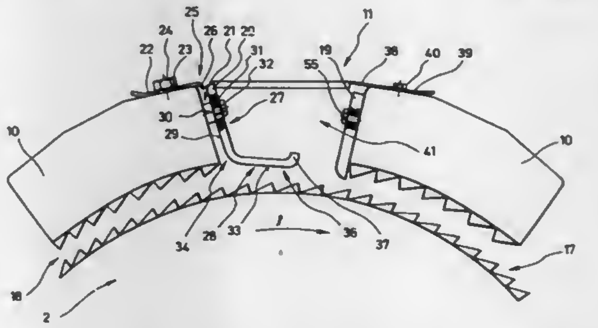


5,530,993
DEVICE FOR HOLDING A FLAP DOOR TO A HORIZONTAL POSITION
Tatsuya Hayakawa, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan
Filed May 9, 1994, Ser. No. 239,970
Claims priority, application Japan, Jul. 13, 1993, 5-043455 U
Int. Cl.⁶ E05D *11/10;15/06*
U.S. Cl. 16—332 **5 Claims**



3. A damper for holding a pivotally mounted door at the edge of a wall in which the door is pivoted from an open horizontal position to a closed vertical position extending downwardly from said wall, said damper holding the door in open horizontal position against the force of gravity pivoting the door downwardly to closed vertical position, said damper comprising an outer sleeve mounted on said door and an inner cylinder mounted on said wall, a bracket attached to said wall supporting said damper for pivotal movement of the outer sleeve about a generally horizontal axis to enable pivotal movement of the door between open and closed positions, said sleeve including a horizontally disposed notch, a latch member mounted on the bracket and spring biased towards said sleeve for entry into the notch on the outer sleeve when the door is in a horizontal position thereby retaining the door in horizontal position until the spring biased latch is moved out of the notch by downward pressure being exerted on the door in spaced relation to the pivotal connection between the bracket and outer sleeve.

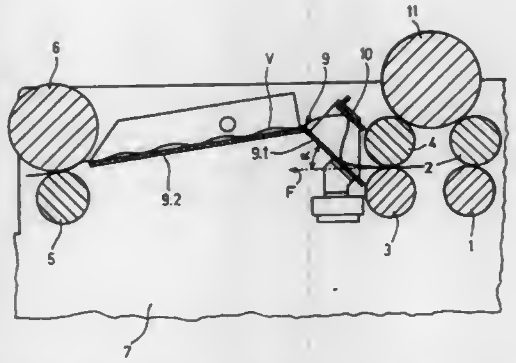
5,530,994
DUST AND TRASH REMOVAL SYSTEM FOR CARDING MACHINES
Walter Loeffler, Neubulach, Germany, assignor to Hollingsworth GmbH, Neubulach, Germany
Filed Sep. 19, 1994, Ser. No. 309,326
Claims priority, application Germany, Jun. 28, 1994, 44 22 655.1
Int. Cl.⁶ D01G *15/34*
U.S. Cl. 19—109 **36 Claims**



1. Dust and trash removal system for carding machines or cards comprising: a cylinder (**2**) and cooperating carding segments (**10**) cooperating therewith, the cylinder (**2**) having a surface (**17**), a mote knife (**19**) having a blade section (**45**) whose blade (**46**) is arranged in a direction opposite to a running direction (**1**) of said cylinder (**2**) at a small distance from the surface (**17**) of said cylinder (**2**), said blade (**46**) having a front side (**48**) arranged in a direction opposite to the running direction of said cylinder (**2**), and a back side (**49**) arranged in the running direction of said cylinder (**2**), and a hold-down means (**20**) arranged in the running direction of said cylinder (**2**) upstream of said mote knife (**19**) with a base section (**33**) that extends substantially in parallel with the surface (**17**) of said cylinder (**2**), characterized in that, when being viewed in cross-section, said blade (**46**) has at least one rounded section (**47**), whose radius is greater than 1 mm, interconnecting said front and back sides.

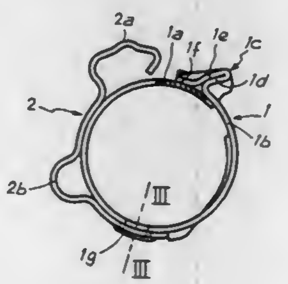
5,530,995
COMBING MACHINE HAVING A WEB GUIDE DEVICE
Hans-Ulrich Eichenberger; Flavio Cavadini, and Paul Jager, all of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Nov. 23, 1994, Ser. No. 344,472
Claims priority, application Switzerland, Dec. 23, 1993, 3848/93
Int. Cl.⁶ D01G *19/18*
U.S. Cl. 19—231 **14 Claims**

1. A combing machine comprising



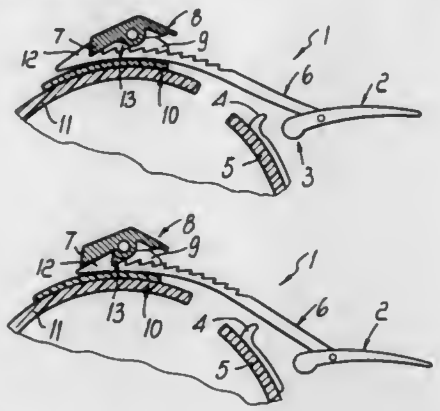
a pair of detaching rollers disposed in vertical overlying relation to each other to deliver a fiber web therefrom;
a guide plate having a first upwardly inclined surface facing said detaching rollers to deflect a web delivered therefrom in an upward direction;
a deflection plate having a surface facing said inclined surface of said guide plate to deflect a web passing from said guide plate in a forward direction away from said detaching rollers; and
a pair of delivery rollers for receiving the web deflected from said deflection plate.

5,530,996
BAND CLAMP FITTING STRUCTURE
Lionel Calmettes, Romorantin Lanthenay; Pascal Detable, Glevres, and Michel Andre, Romorantin Lanthenay, all of, France, assignors to Etablissements Caillau, Issy Les Moulineaux, France
Filed May 11, 1994, Ser. No. 241,606
Claims priority, application France, May 19, 1993, 93 06046
Int. Cl.⁶ F16L *33/02*
U.S. Cl. 4—20 R **1 Claim**



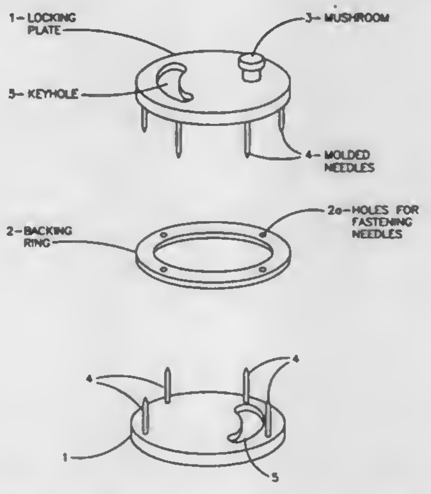
1. A clamp fitting comprising:
an internal segment of metal band wound on itself defining an inner end and an outer end, the outer end overlapping the inner end of said internal segment to form a continuous inner surface and an outer surface;
an external segment of metal band formed about a portion of the outer surface of said internal segment, said external segment having a fixed end secured to the outer surface of said internal segment and a free end positioned adjacent the outer end of said internal segment;
a complementary fastening means on the outer end of said internal segment and on the free end of said external segment, said fastening means including an ear integrally formed in the outer end of said internal segment and projecting radially outward therefrom, and a hook integrally formed at the free end on said external segment, the hook and the ear of said fastening means adapted to be coupled to each other and to maintain the continuous inner surface after the clamp is tightened; and
an undulation formed in said external segment of metal band, said undulation spaced apart from the hook at the free end of said external segment for providing a reserve of elasticity.

5,530,997
LEVER PARTICULARLY FOR SPORTS SHOES
Pino Tessari, Riese Pio X, Italy, assignor to Nordica S.p.A., Trevignano, Italy
Filed Jul. 6, 1995, Ser. No. 498,815
Claims priority, application Italy, Jul. 13, 1994, TV94U037 U
Int. Cl.⁶ A43C *11/00*
U.S. Cl. 24—68 SK **6 Claims**



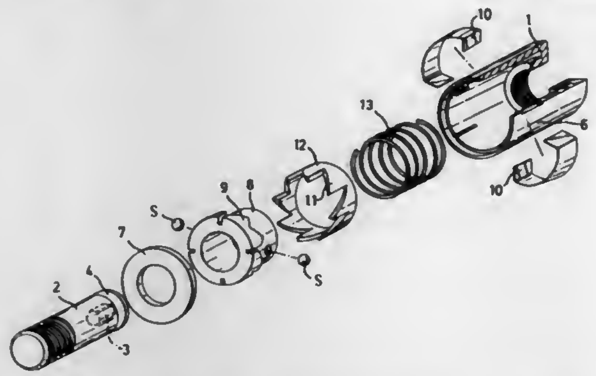
1. Lever, particularly for sports shoes, comprising a free lever arm, one end whereof engages an abutment associated with a first flap to be fastened, a toothed strap being freely pivoted to said lever arm, said strap selectively interacting, in a ratchet-like manner, with a first tooth of a pawl rigidly coupled to a second flap to be joined, said strap having a larger last tooth adapted to interfere with said first tooth, said pawl having a second safety tooth for locking said last tooth of said strap, preventing its extraction once said first tooth has disengaged.

5,530,998
TWIST AND SNAP FASTENER MADE OF IDENTICAL MATING PARTS
Carl P. Hurst, 1419 Tangier Way, Sarasota, Fla. 34239, and Monica Hujazi, 1016 San Raymundo Rd., Hillsborough, Calif. 94010
Filed Oct. 12, 1994, Ser. No. 292,325
Int. Cl.⁶ A44B *21/00*
U.S. Cl. 24—575 **3 Claims**



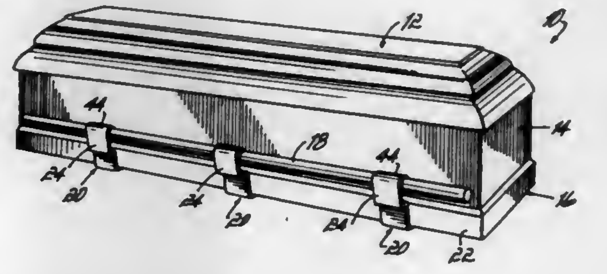
1. A quarter turn fastener for articles of clothing and other materials, consisting of two identical parts designed to be attached to the facing surfaces of said materials to be mutually fastened and unfastened, each part comprising an integral combination: a disk of injection molded hard plastic, nylon, resin or other synthetic material, having a face and back, the face having a keyhole shaped slot curving near and parallel to the circumference of the disk and a headed projection at a point 180 degrees and equidistant from the center of the disk as the circular hole end of the keyhole slot, such slot and projection matching an identical slot and keyhole in the other half for fastening, each hole at the end of the slot designed to capture and hold firmly the mating headed projection when the two halves are brought together face to face, mated and manually rotated in opposite directions until positive engagement at the end of rotation occurs, with each disk half having a plurality of needles protruding outward from said back of said disk to be fastened to the fiat surface of said material.

5,530,999
AXIAL LOCKING DEVICE
Austen H. Barnes, 3407 Rolborn Road, RR #2 Queensville, Ontario, Canada
PCT No. PCT/GB93/00674, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO93/20357, PCT Pub. Date Oct. 14, 1993
PCT Filed Apr. 2, 1993, Ser. No. 307,811
Claims priority, application United Kingdom, Apr. 2, 1992, 9207258
Int. Cl.⁶ A44B *21/00;* **F16L** *37/00*
U.S. Cl. 24—590 **25 Claims**



1. An axial locking device comprising first and second separable members which are relatively moveable with respect to each other along an axis, the separable members being lockable together by a first movement of the separable members relative to each other in one axial sense, followed by a relative return movement, and unlockable by a further relative movement in the first axial sense, wherein:
the second separable member comprises a locking projection; and
the first separable member comprises a locking mechanism comprising:
a locking element for engaging the locking projection of the second separable member, the locking element being moveable between a locking position in which it engages the locking projection of the second separable member and a release position in which it does not engage the locking projection of the second separable member;
a slider moveable in an axial sense with respect to the first separable member and engagable by the second separable member when said first movement occurs, whereby actuation of the locking mechanism is initiated;
a rotor coacting with the locking element and relatively rotable always in the same rotary sense about said axis from a first, release angular position in which the rotor does not retain the locking element in its locking position to at least a second, locking angular position in which the rotor retains the locking element in its locking position, and subsequently to said first, release angular position;
first teeth substantially fixed with respect to the slider in a rotary sense;
second teeth substantially fixed with respect to the rotor in a rotary sense and co-acting with the first teeth, at least the second teeth having inclined flanks whereby when the first and second teeth move towards each other axially and engage, the first teeth apply rotary thrust to the second teeth and thereby rotate the rotor;
a spring means for applying biasing opposing said first movement and for applying axial biasing tending to engage the first and second teeth in the axial direction; and
retaining members substantially fixed in a rotary sense with respect to the first teeth and relative to which the first teeth slide axially during actuation;
whereby during said first movement, a respective second tooth slides axially relative to a respective retaining member until the second tooth reaches the end of the retaining member whilst under the influence of rotary thrust applied by a respective first tooth which thereby biases the second tooth in a rotary sense against the retaining member, and when the second tooth reaches the end of the retaining member the second tooth is rotated by said rotary thrust, and engages the next first tooth with a click, and during said return movement, the respective second tooth is able to cam over the end of the respective retaining member whereby the second tooth rotates in the same rotary sense and is able to engage an end surface of the next first tooth, riding up the next first tooth until the second tooth reaches the crest of the first tooth and moving against the retaining member with a click, thereby rotating the rotor from said release angular position into said locking angular position, and during said further movement and a relative return movement therefrom, the rotor is rotated in a similar manner from said locking angular position into said release angular position.

5,531,000
SLIDE LOCKING EXTERNALLY REMOVABLE CASKET HARDWARE
John P. Blondo, Batesville, Ind., assignor to Bateville Casket Company, Inc., Batesville, Ind.
Filed Dec. 29, 1994, Ser. No. 365,775
Int. Cl.⁶ A61G *17/00*
U.S. Cl. 27—27 **33 Claims**



1. Externally removable casket hardware for mounting to a casket comprising a mounting plate having a first leg and a second leg connected by a connecting portion, said first leg having at least one slide locking element for engaging and disengaging a mating element of a casket with a sliding movement, said second leg including a casket handle mount and wherein said slide locking element is disengageable in a sliding motion without accessing an interior of said casket.

5,531,001
DEVICE FOR YARN DIVISION ON A SECTIONAL WARPING MACHINE

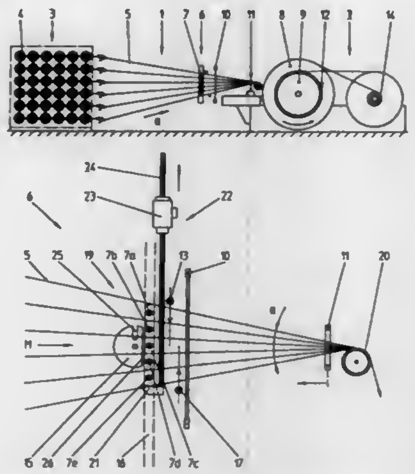
Markus Beerli, Gossau, Switzerland, assignor to Benninger AG, Uzwil, Switzerland

Filed May 10, 1995, Ser. No. 435,419

Claims priority, application Switzerland, Jun. 20, 1994, 1940/94

Int. Cl.^{6} D02H *9/00*

U.S. Cl. 28—198 **7 Claims**



1. In a device for dividing yarns on a sectional warping machine having a lease rod holder comprising a plurality of horizontal lease rods forming a grid in which the distance between adjacent lease rods can be increased in order to form a shed on a yarn warp passing through the grid, the improvement, in combination therewith, comprising

means for moving the entire grid in a vertical plane between an upper operating position, a neutral middle position, and a lower operating position,

a mechanical stop for supporting the rod grid in its lower operating position,

a lifting device for raising the rod grid to its raised operating position, and

a locking device for holding the lease rods in their upper operating position, said locking device comprising means for releasing the lease rods sequentially, allowing each to fall to its lower operating position.

5,531,002
METHOD OF MANUFACTURING PHYSICAL QUANTITY DETECTOR

Kazuhiro Okada, 73, Sugaya 4-chome, Ageo-shi, Saitama 362, Japan

Division of Ser. No. 292,496, Aug. 18, 1994, Pat. No. 5,406,848, which is a division of Ser. No. 764,159, Sep. 20, 1991, Pat. No. 5,421,213. This application Feb. 24, 1995, Ser. No. 394,310

Claims priority, application Japan, Oct. 12, 1990, 2-274299; Dec. 31, 1990, 2-416188

Int. Cl.^{6} H01G *7/00;* **G01L** *1/18;9/12;* **G01P** *15/09*

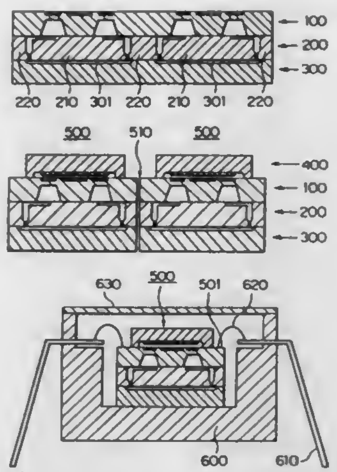
U.S. Cl. 29—25.41 **9 Claims**

1. A method of manufacturing substrates for a physical quantity detector utilizing changes in an electrostatic capacitance, said method comprising the steps of:

defining a working region area, a flexible region area and a fixed region area successively on a first surface of a first substrate;

forming first electrode layers on said first surface of said first substrate at predetermined portions of said working and flexible region areas;

partially removing an opposite, second surface of said first substrate opposite said flexible region area for forming a flexible region having flexibility relative to said first substrate at said working and fixed region areas;



cutting away portions of a second substrate and connecting uncut portions of a first surface of said second substrate to said second surface of said first substrate opposite said working and fixed region areas for forming a working body at a working region of said first substrate comprised of portions of said first and second substrates and a pedestal at a fixed region of said first substrate comprised of portions of said first and second substrates; and

forming a groove on a first surface of a third substrate, forming a second electrode layer on a bottom surface of said groove and connecting said first surface of said third substrate to said first surface of said first substrate at said fixed region so that said second electrode layer faces said first electrode layers with a predetermined spacing therebetween.

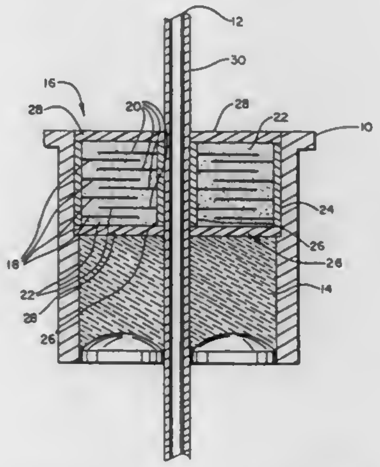
5,531,003
FABRICATING A COMBINATION FEEDTHROUGH/ CAPACITOR INCLUDING A METALLIZED TANTALUM OR NIOBIUM PIN

Lynn M. Seifried, and Susan A. Tettemer, both of Minneapolis, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 38,273, Mar. 29, 1993, Pat. No. 5,312,377. This application Dec. 13, 1994, Ser. No. 355,377

Int. Cl.^{6} H01G *7/00*

U.S. Cl. 29—25.42 **8 Claims**



1. A method of fabricating a combination feedthrough/capacitor comprising the steps:

metallizing a tantalum or niobium pin with a vacuum deposited thin film coating selected from the group consisting of gold, platinum, palladium and titanium;

inserting the pin through a metal ferrule and supporting it therein with a brazed ceramic body, and

contacting the pin with a capacitive structure within the ferrule.

5,531,004
MACHINING CENTER HAVING A ROTARY DOOR OPENABLE BY AN AUTOMATIC PALLET CHANGER

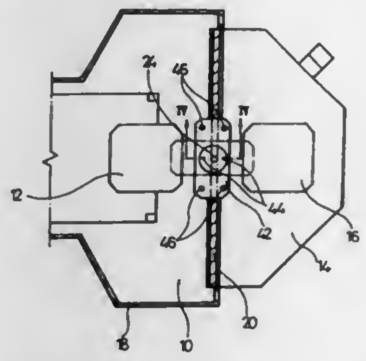
Jae B. Ahn, Changwon, Rep. of Korea, assignor to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea

Filed Dec. 28, 1994, Ser. No. 365,625

Claims priority, application Rep. of Korea, Dec. 28, 1993, 93-30395

Int. Cl.^{6} B23Q *7/00*

U.S. Cl. 29—33 P **7 Claims**



1. A machining center adapted for use in cutting a workpiece into a desired shape, comprising:

a bed having a table for changeably holding a first pallet;

a support die disposed in front of the bed to support a second pallet to be changed with the first pallet;

a machine housing extending upwardly from the bed to define a cutting compartment enclosing the first pallet, the machine housing having a frontal access opening;

a rotary door mounted on the machine housing to openably close the access opening;

means for pivotally supporting the rotary door at central top and bottom edges of the door;

a pallet changer disposed beneath the rotary door for exchanging the first and second pallets with each other, the pallet changer including a rotary arm, means for causing the arm to vertically move from a lower position to an upper position and means for causing the arm to rotate between a first angular position where the arm remains parallel to the door and a second angular position where the arm becomes perpendicular to the door; and

means for allowing the rotary arm to engage with the rotary door as the rotary arm moves into the upper position at the second angular position.

5,531,005
DEVICE FOR FIXED POSITIONING OF A PALLET ON A WORK TABLE

George Morshäuser, Nesselwang, and Alfred Geissler, Pfronten, both of, Germany, assignors to Deckel Maho GmbH, Germany

Filed Sep. 21, 1994, Ser. No. 310,272

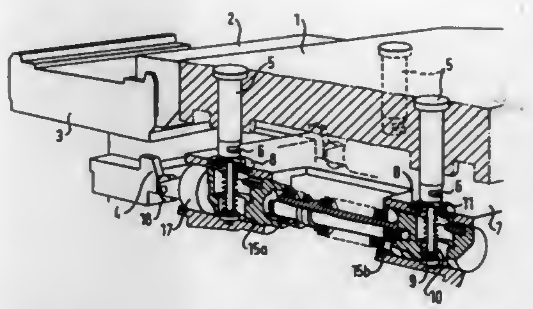
Claims priority, application Germany, Sep. 24, 1993, 9314483 U

Int. Cl.^{6} B23Q *7/00*

U.S. Cl. 29—33 P **5 Claims**

1. A device for fixed positioning of a pallet on a work table, and said device comprising:

a vertically movable pallet carrier for transport and for raising and lowering the pallet, said pallet being equipped with clamping elements on its lower side;



at least one clamping device mounted in the work table, said clamping device being actuatable by vertical movements of said pallet carrier, said clamping device having at least one wedge-type valve for clamping one of said clamping elements of said pallet after said pallet has been deposited; and

at least one control element that is actuatable by said pallet carrier for releasing said clamping elements against a spring force;

wherein said control element is mounted directly on one of said wedge-type valves.

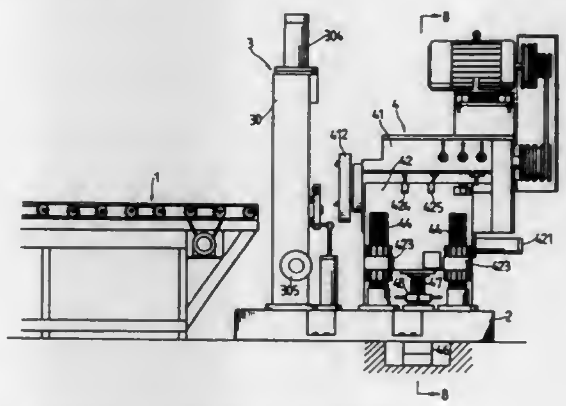
5,531,006
MACHINE FOR TAPERING PIPE ENDS WITH DIFFERENT DIAMETERS

Lee T. Shing, P.O. Box 82-144, Taipei, Taiwan

Filed Dec. 20, 1994, Ser. No. 359,409

Int. Cl.^{6} B23P *19/00;* **B23B** *5/16;* **B23Q** *3/06*

U.S. Cl. 29—33 T **3 Claims**



1. A machine for tapering pipe ends comprising:

a feeding conveyor;

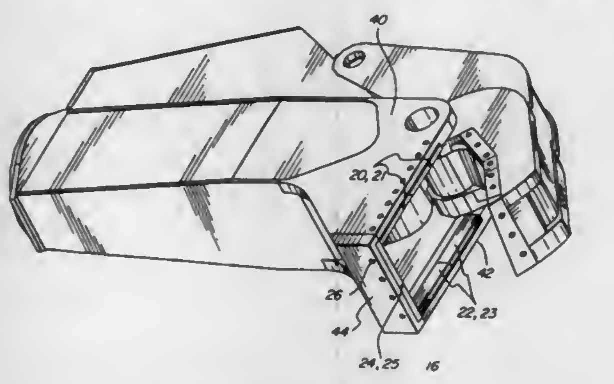
a platform;

a gripping mechanism mounted at one side of said feeding conveyor and mounted on said platform, said gripping mechanism including a frame provided with two vertical racks, a horizontal rack between lower ends of the vertical racks, an upper clamp slidably mounted on an upper portion of the two vertical racks, a lower clamp slidably mounted on a lower portion of the two vertical racks, a first hydraulic cylinder installed on a top of the frame and drivingly connected with the upper clamp, a second hydraulic cylinder mounted on one vertical side of the frame and drivingly connected with a lower sliding wedge, an upper sliding wedge arranged on the lower sliding wedge, an axle mounted on a rear side of the frame and connected with an arm, a third hydraulic cylinder mounted on said platform and connected with an end of the arm, another end of the arm being connected with a triggering rod and a sensor; and

a head stock mounted on said platform and having a head installed on a U-shaped seat controlled by a fourth hydraulic cylinder and a fifth hydraulic cylinder drivingly connected with the U-shaped seat.

5,531,007
SHEAR PROCESSOR FOR STEEL STRUCTURES

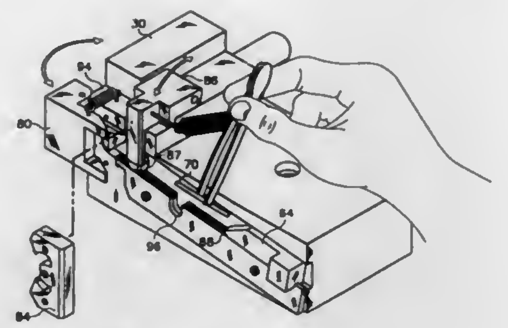
Roy E. Labounty, Two Harbors, Minn., assignor to LaBounty Manufacturing, Inc., Two Harbors, Minn.
Filed May 23, 1995, Ser. No. 448,228
Int. Cl.^{6} B23P *19/00*
U.S. Cl. 30—134 **17 Claims**

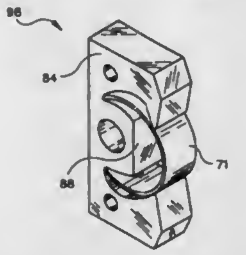


1. A heavy duty cutting shear comprising
(a) first and second elongated jaws pivotably connected adjacent their inner ends for movement relative to each other between open and closed positions, said jaws having opposed working faces with said working face of said second jaw providing a recess therein and said working face of said first jaw being dimensioned and configured cooperatively with said recess of said second jaw to enable said working face of said first jaw to move into said recess when said jaws are moved into said closed position, said working faces having sides and an outer end;
(b) a pair of transversely spaced longitudinally extending side cutting members extending along said sides of said working faces on each of said jaws, said side cutting members of said first jaw having inner and outer portions intersecting at an obtuse angle, said side cutting members on one side of said first jaw being at a different elevation than the side cutting members on the other side of said jaw; and
(c) an end cutting member extending transversely of said side cutting members adjacent said outer end of each of said jaws, said end cutting member of said first jaw extending at an angle between said side cutting members on the opposite sides of said jaw, said side and end cutting members of each of said jaws providing a generally U-shaped configuration and cooperating to provide a shearing action as said jaws are moved into said closed position, said end cutting members cooperating to retain a workpiece between said jaws during the closing movement and the shearing action proceeding incrementally along the several cutting members during such movement.

5,531,008
METHOD AND APPARATUS FOR MAKING A BUBBLE SPRING ASSEMBLY

Michael J. Chapman, Churchville; Thomas C. Merle, and David L. Rowden, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 7, 1995, Ser. No. 483,403
Int. Cl.^{6} B23P *19/04*; B21F *35/00*; B25B *27/14*
U.S. Cl. 29—230 **24 Claims**

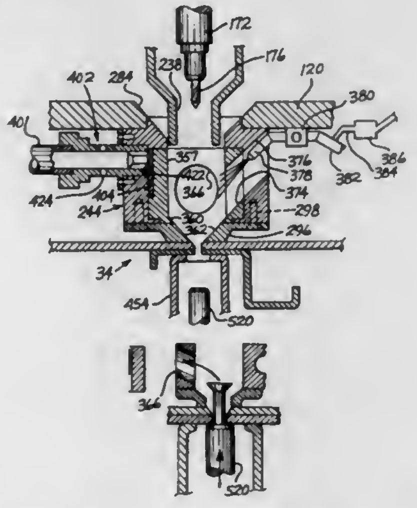




1. An apparatus for making a bubble spring assembly including a cavity block and a bubble spring, said apparatus comprising:
a base member having a side surface and a head assembly positioned adjacent thereto;
track means extending along said side surface toward said head assembly, said track means for guiding a spring blank into said head assembly;
means for moving the spring blank along said track means and into said head assembly;
shaping means positioned within said head assembly for receiving the spring blank from said track means and for shaping the spring blank into a predetermined form;
retaining means located proximate said shaping means for positioning a respective cavity block adjacent said shaping means; and
transfer means for moving a shaped bubble spring blank from said shaping means into the cavity block without further deformation to said shaped bubble spring blank whereby when said transfer means moves said shaped bubble spring blank into the cavity block, said bubble spring assembly is thereby formed and removable from said retaining means.

5,531,009
APPARATUS FOR REMOVING AN UNDEFORMED RIVET FROM A HOLE

Gregory C. Givler, 2902-200th Ave. SE., Issaquah, Wash. 98027
Division of Ser. No. 819,201, Jan. 10, 1992, Pat. No. 5,259,104, which is a division of Ser. No. 632,445, Dec. 21, 1990, Pat. No. 5,231,747. This application May 5, 1993, Ser. No. 57,135
Int. Cl.^{6} B23P *19/04*
U.S. Cl. 29—243.53 **5 Claims**

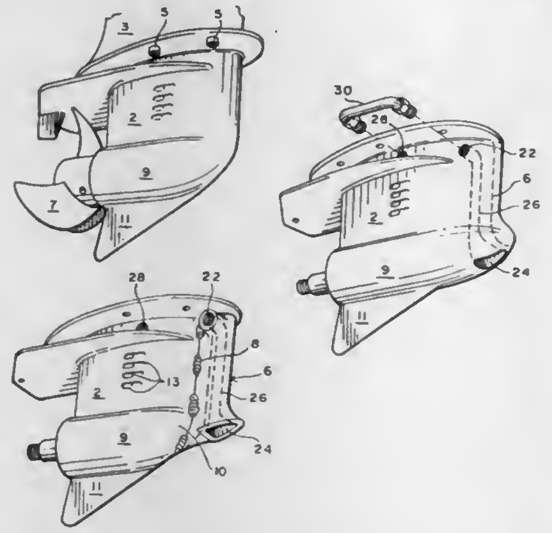


1. An apparatus, in a riveting machine, for removing an undeformed rivet from a rivet hole in a workpiece, before said rivet is upset by said riveting machine, said apparatus comprising:
a rivet dimension sensor for sensing at least one rivet dimension on said rivet;

a comparator for comparing said at least one sensed rivet dimension with a predetermined set of dimension tolerance limits;
a movable suction cavity disposed adjacent to a plane on which one side of said workpiece will be supported;
a mechanism for moving said suction cavity over said rivet hole in said workpiece when said rivet is to be removed;
a pusher for pushing said undeformed rivet in said rivet hole into said suction cavity;
a connector for coupling a suction hose from a source of suction to a suction port in said suction cavity;
whereby a rivet sensed by said rivet dimension sensor to be our of dimensional tolerance is removed prior to being upset by said riveting machine by moving said suction cavity over said rivet, and pushing said rivet into said suction cavity while applying suction to said cavity to draw said rivet into said cavity and out said suction port in said cavity.

5,531,010
MARINE LOWER UNIT ALTERING PROCESS

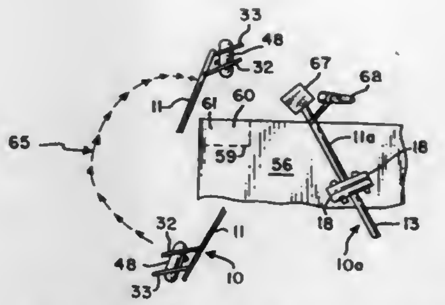
Robert O. Icenogle, 1501 33rd St. SE., Ruskin, Fla. 33670
Filed Mar. 30, 1995, Ser. No. 413,839
Int. Cl.^{6} B21K *21/16*
U.S. Cl. 29—401.1 **20 Claims**



1. A process for altering a surface-prepared free-standing marine lower unit which has been removed from a marine engine comprising the steps of;
a. welding a preformed casting to said marine lower unit,
b. placing the marine lower unit with the casting welded thereon in a preformed mold,
c. pouring a hardenable liquid polymeric material into said mold, around the casting and that portion of the marine lower unit disposed in the mold,
d. allowing the liquid polymeric material to harden,
e. removing the marine lower unit from the mold.

5,531,011
LONGSHOREMAN'S STACKING PIN TOOL AND PROCESS

William H. Gray, Rte. 3, Box 268, Smithfield, Va. 23430
Division of Ser. No. 125,231, Sep. 23, 1993, Pat. No. 5,390,970. This application Nov. 23, 1994, Ser. No. 344,106
Int. Cl.^{6} B23P *19/00*
U.S. Cl. 29—428 **4 Claims**

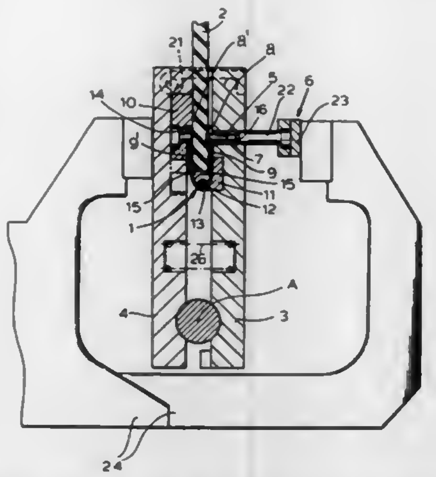


1. A method of inserting a stacking pin in a top reinforced corner receptacle of a cargo container while standing on a lower level comprising the steps of:
(a) providing cargo containers having reinforced corner receptacles and adapted for crane loading onto a ship or dock;
(b) providing a plurality of stacking pins adjacent one or more cargo containers on a deck of a ship or a dock where it is desired to stack one or two additional cargo containers onto each other, each of said stacking pins being provided with an elongated vertical central body portion having an integral protruding horizontal ear extending laterally outwardly from opposite sides thereof, each of said pins further including an opening therein;
(c) providing a stacking pin engaging and retention tool structure on an elongated handle member, said structure including a forked member having a pair of separated tines and a central tine disposed approximately intermediate said separated tines, with said forked member and said central tine being attached to said handle but being spaced along said handle from one another, the separated tines of said forked member serving to engage one side of the integral horizontal ear on opposite sides Of the vertical central body portion, and the central tine serving to engage in the opening of said pin;
(d) contacting and engaging one vertically disposed stacking pin with the stacking pin engaging and retention tool while said stacking pin is on said deck, with said forked member engaging one side of the horizontal ear thereof on said opposite sides of the central body portion and the central tine engaging in the opening of said stacking pin;
(e) employing the elongated handle member, thereby lifting from the deck, and rotating, the engaged stacking pin approximately 180° overhead;
(f) positioning the engaged stacking pin over one of the top reinforced corner receptacles of a cargo container;
(g) inserting the stacking pin in a reinforced corner receptacle; and, then
(h) removing the stacking pin engaging and retention tool structure from engagement with the stacking pin.

5,531,012
SYSTEM AND METHOD FOR RIVETING CLIPS TO CONVEYOR-BELT ENDS

Jean-François Schick, Saint Privat des Vieux, France, assignor to Goro S.A., Saint Privat Des Vieux, France
Filed Dec. 12, 1994, Ser. No. 354,932
Claims priority, application Germany, Dec. 18, 1993, 43 43 384.7
Int. Cl.^{6} B23P *11/00*; B25C *9/00*
U.S. Cl. 29—432.1 **9 Claims**

9. A method of securing a clip to a belt end having opposite front and back faces with a fastening machine having a front jaw formed with a guide passage and a back jaw spacedly confronting the front jaw and carrying a centering point, the clip having
front and back legs each formed with at least one throughgoing hole and shaped and dimensioned to embrace the belt end with each leg engaging the respective belt face, and
a U-shaped bight interconnecting the legs; the method comprising the steps of:
fitting the front leg of the clip to the front jaw;
fitting the belt end between the legs of the clip;
providing in the guide passage in the front jaw a rivet having one end formed as a head and an opposite free end formed centrally with a generally conical recess;



thereafter closing the front and back jaws pivotally together to clamp the belt between the legs of the clip with the leg holes aligned with the passage; and

thereafter driving the rivet from the passage first through the front-leg hole, then through the belt end by cutting a hole through the belt end with the free end of the rivet, then through the back-leg hole, and finally against the centering point to engage the centering point in the conical recess and to upset the free end at the back leg with the centering point.

5,531,013

METHOD OF AND APPARATUS FOR ASSEMBLING WORK UNIT

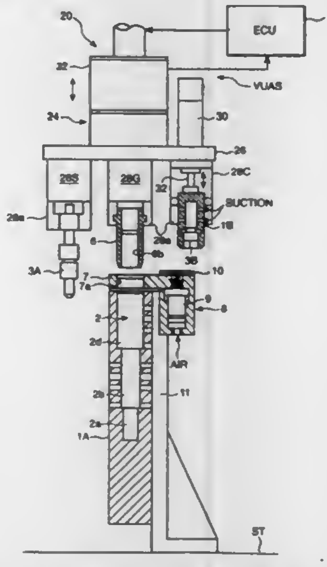
Jun Nakamura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Jun. 28, 1994, Ser. No. 266,772

Claims priority, application Japan, Jun. 28, 1993, 5-157691; Jun. 15, 1994, 6-132887

Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—436 **9 Claims**



1. A method of assembling a mechanical unit including a body, formed with an axial bore having a plurality of cylindrical bore sections with different inner diameters and arranged coaxially in order of diameter, and a plunger-like rod, installed for sliding movement in said body, which has a plurality of cylindrical rod sections having different outer diameters, a largest diameter of said different outer diameters being approximately equal to a second largest diameter of said different inner diameters, said method comprising the steps of:

inserting a cylindrical guide bush, having an outer diameter approximately equal to a largest inner diameter of said different inner diameters and an inner diameter approximately equal to the second largest diameter of said different inner diameters, into said largest inner diameter of said different inner diameters;

coaxially aligning said largest diameter of said different outer diameters of said cylindrical rod sections of said plunger-like rod with said cylindrical guide bush;

forcing said plunger-like rod into said cylindrical guide bush and then into said body;

removing said cylindrical guide bush from said body; and closing said axial bore.

5,531,014

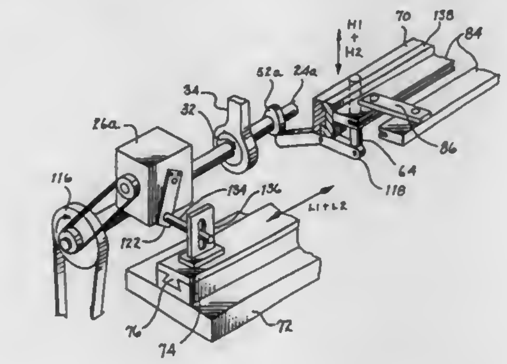
ELECTROMECHANICAL PRESS AND METHOD OF OPERATING

Richard H. J. Fierkens, Keurbeek 15, 6914 AE Herwen, Netherlands

Continuation-in-part of Ser. No. 162,716, Dec. 6, 1993. This application Sep. 30, 1994, Ser. No. 316,131

Int. Cl.^{6} B23P *23/00*

U.S. Cl. 29—566.3 **20 Claims**



1. An electromechanical press apparatus for trimming excess portions from a leadframe strip package having a semiconductor chip thereon and for forming leads of said leadframe strip package extending from said semiconductor chip comprising, in combination:

means coupled to said leadframe strip package and having a portion thereof moving along a rectangular path of motion for linearly shifting a leadframe strip having at least one leadframe strip package thereon along a plane orthogonally oriented to said rectangular path of motion; and

means coupled to means for linearly shifting said leadframe strip and having a portion thereof moving along a line of motion orthogonally oriented to said plane for performing at least one of said trimming of said excess portions from said leadframe strip package and said forming of said leads of said leadframe strip package extending from said semiconductor chip,

said means for performing said trimming and said forming including a tool for executing at least one of said trimming and said forming operations, a drive member for said tool, and a lever connecting said drive member and said tool with one another and having two end portions, said lever being pivotally supported at one of said end portions and said drive member engaging said lever at a location intermediate said portions.

5,531,015

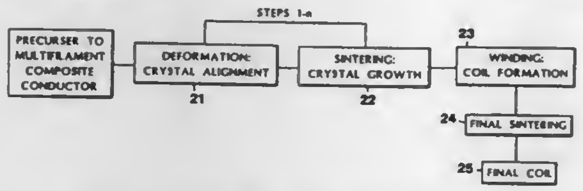
METHOD OF MAKING SUPERCONDUCTING WIND-AND-REACT COILS

Michael D. Manlief, Westborough; Gilbert N. Riley, Jr., Marlborough; John Voccio, Somerville, and Anthony J. Rodenbush, Marlborough, all of Mass., assignors to American Superconductor Corporation, Westborough, Mass.

Filed Jan. 28, 1994, Ser. No. 188,220

Int. Cl.^{6} H01L *39/24*

U.S. Cl. 29—599 **21 Claims**


STEPS 1-n
PRECURSER TO MULTIFILAMENT COMPOSITE CONDUCTOR
DEFORMATION: CRYSTAL ALIGNMENT
21
SINTERING: CRYSTAL GROWTH
22
23
WINDING: COIL FORMATION
24
FINAL SINTERING
25
FINAL COIL

1. A method for producing a superconducting magenetic coil comprising the steps of:

fabricating a precursor to a multi-filament composite conductor comprising multiple superconductor precursor filaments enclosed in a matrix-forming material,

surrounding said precursor to said multi-filament composite conductor with one of an insulating layer and a precursor to an insulating layer,

forming said precursor to said multi-filament composite conductor as a coil, and

heat treating said coil after said forming step by exposing said coil to high temperatures and an environment comprising oxygen, said superconductor precursor filaments being oxidized and said matrix-forming material reversibly weakening during said heat treating step,

a composition and thickness of one of said insulating layer and said precursor to said insulating layer chosen to encase said weakened matrix-forming material and said superconductor precursor filaments and to permit exposure of said superconductor precursor filaments to oxygen during said heat treating step,

said heat treating step resulting in formation of a superconducting magnetic coil.

5,531,016

METHOD OF MANUFACTURING A THIN-FILM MAGNETIC HEAD

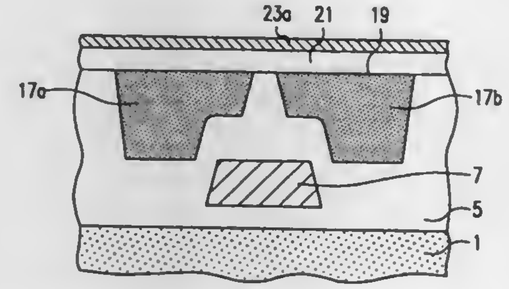
Lambertus Postma; Henricus G. R. Maas; Jan Haisma; Jacobus J. M. Ruigrok, and Gerardus H. J. Somers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1994, Ser. No. 216,575

Claims priority, application Belgium, Mar. 22, 1993, 09300274; European Pat. Off., Apr. 6, 1993, 93200995

Int. Cl.^{6} G11B *5/42*

U.S. Cl. 29—603.16 **28 Claims**



1. A method of manufacturing a thin-film magnetic head comprising a magnetoresistive element and at least one flux guide on a support, the method characterized by forming a main layer of a nonmagnetic material on the support, providing a recess in the layer by removing material from a side of the layer remote from the support, subsequently filling up the recess with a soft-magnetic material to form the flux guide, thereafter mechanochemically polishing the main layer provided with the filled recess to form a main surface, and providing a layer of a magnetoresistive material on the main surface to form the magnetoresistive element.

5,531,017

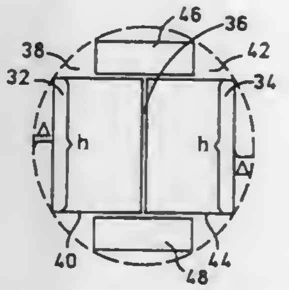
THIN FILM MAGNETIC HEAD FABRICATION METHOD

Mark A. Church; Annayya P. Deshpande, both of San Jose, and Alain M. Desouches, Santa Cruz, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 195,411, Feb. 14, 1994, abandoned. This application Dec. 27, 1995, Ser. No. 579,466

Int. Cl.^{6} G11B *5/127*

U.S. Cl. 29—603.12 **30 Claims**



1. A method for fabricating a plurality of thin film magnetic head elements, comprising the steps of:

selecting a wafer substrate of suitable size and quality;

determining a width dimension which is not substantially less than a maximum permissible row length that is attainable without exceeding an acceptable level of row bow in rows of magnetic transducer elements to be formed on said wafer substrate;

designating at least two primary sub-areas of said wafer substrate as work areas for the deposition of magnetic recording transducer elements, said work areas having said width dimension and a length dimension extending between first and second end portions thereof, and said work areas further being in mutually adjacent relation along a shared boundary zone extending in a first direction through said wafer substrate between said first and second end portions;

populating said wafer substrate with plural rows of magnetic recording transducer elements in said designated work areas, said plural rows extending in a second direction that is substantially perpendicular to said first direction; and

separating said work areas from said wafer substrate and fabricating magnetic transducer slider elements from said plural rows of magnetic recording transducer elements.

5,531,018

METHOD OF MICROMACHINING ELECTROMAGNETICALLY ACTUATED CURRENT SWITCHES WITH POLYIMIDE REINFORCEMENT SEALS, AND SWITCHES PRODUCED THEREBY

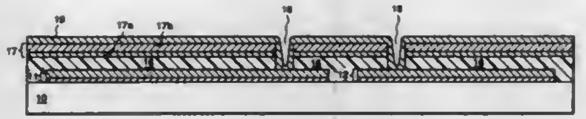
Richard J. Saia, Schenectady; Mario Ghezzo, Ballston Lake; Bharat S. K. Bagepalli, Schenectady, and Kevin M. Durocher, Waterford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1993, Ser. No. 169,272

Int. Cl.^{6} H01H *11/00*

U.S. Cl. 29—622 **11 Claims**

1. A method of fabricating a switch, comprising the steps of:



providing an insulating layer over a metal plate, said insulating layer having at least one via extending to said metal plate;
providing a sacrificial layer over a portion of said insulating layer so that said sacrificial layer extends conformally into said at least one via;
providing a metal bridge over a portion of said sacrificial layer and a portion of said insulating layer so that said metal bridge extends over said at least one via, said metal bridge having at least one opening therein situated adjacent said portion of said sacrificial layer for providing access for the removal of said sacrificial layer;
providing a reinforcing seal layer over said metal bridge, said seal layer having a well situated adjacent to at least a portion of said at least one opening; and
removing said sacrificial layer.

5,531,019
SOLID OXIDE FUEL CELL AND MANUFACTURING METHOD THEREOF

Hiroaki Taira; Michiaki Iha, and Hiroshi Takagi, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 209,109, Mar. 9, 1994, abandoned. This application Apr. 28, 1995, Ser. No. 430,403

Claims priority, application Japan, Mar. 10, 1993, 5-48841; Jun. 28, 1993, 5-157147; Mar. 1, 1994, 6-30740

Int. Cl.^{6} H01M *6/00*

U.S. Cl. 29—623.5 **4 Claims**

1. A method for producing a solid oxide fuel cell, the method comprising the steps of:
spreading out a grainy electrolyte on a first surface and a second surface of a green sheet of solid electrolyte;
putting a green sheet of fuel electrode on the first surface of the solid electrolyte with the grainy electrolyte in-between and putting a green sheet of air electrode on the second surface of the solid electrolyte with the grainy electrolyte in-between to form a laminate of green sheets of solid electrolyte, of fuel electrode and of air electrode;
pressing the laminate of green sheets so that the green sheets are fixed together; and
sintering the laminate of green sheets to obtain a solid electrolyte with a fuel electrode and an air electrode thereon.

5,531,020
METHOD OF MAKING SUBSURFACE ELECTRONIC CIRCUITS

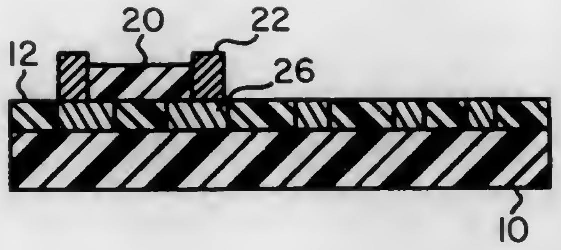
David Durand, Providence, and Roger A. Iannetta, Jr., Warwick, both of R.I., assignors to Poly Flex Circuits, Inc., Cranston, R.I.

Continuation-in-part of Ser. No. 974,370, Nov. 10, 1992, which is a continuation-in-part of Ser. No. 934,826, Aug. 24, 1992, abandoned, which is a continuation of Ser. No. 607,554, Nov. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 533,628, Jun. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 436,199, Nov. 14, 1989, Pat. No. 5,180,523. This application Aug. 27, 1993, Ser. No. 112,225

Int. Cl.^{6} H05K *3/34*

U.S. Cl. 29—840 **11 Claims**

1. A method of making electronic circuits in a rigid dielectric substrate comprising steps of:
(a) forming a channel within a dielectric substrate;



(b) screening a curable conductive material into the channel to form an uncured circuit trace;
(c) placing circuit components in engagement with the uncured circuit trace; and
(d) curing the curable conductive material after placing the circuit components, thereby creating a circuit trace which electrically connects the circuit components;
wherein the channel forming step includes steps of:
  i) applying a layer of photoimagable material on to the substrate,
  ii) exposing the photoimagable material with an image corresponding to the circuit trace, and
  iii) developing the photoimagable material, thereby leaving a channel in the layer of photoimagable material.

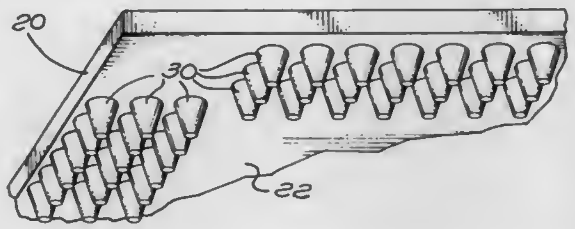
5,531,021
METHOD OF MAKING SOLDER SHAPE ARRAY PACKAGE

Frank Kolman, Phoenix, Ariz., and Kevin Haley, San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1994, Ser. No. 366,801

Int. Cl.^{6} H01K *3/10*

U.S. Cl. 29—843 **18 Claims**



1. A method of fabricating an interconnection apparatus for an electronic device having a plurality of bonding leads arranged in a pattern, said method comprising the steps of:
(a) providing a substrate having first and second opposing surfaces;
(b) defining a first array of contact sites on the substrate;
(c) providing a mold having an array of shaped cavities congruent with said first array of contact sites;
(d) clamping said mold against the second surface of the substrate with said array of cavities aligned with said first array of contact sites;
(e) filling said cavities with a molten conductive material;
(f) removing said mold from the substrate after the molten conductive material solidifies, thereby leaving an array of conductive shapes extending from the second surface of the substrate;
(g) forming a conductive path between each of the conductive shapes and a corresponding one of a second array of contact sites on the first surface of the substrate, said secondary array congruent with the pattern of bonding leads of the electronic device.

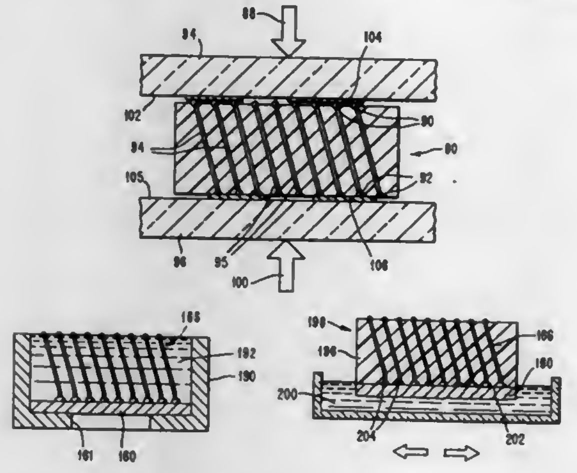
5,531,022
METHOD OF FORMING A THREE DIMENSIONAL HIGH PERFORMANCE INTERCONNECTION PACKAGE

Brain S. Beaman, Hyde Park; Fuad E. Doany, Katonah; Keith E. Fogel, Bardonia, all of N.Y.; James L. Hedrick, Jr., Oakland, Calif.; Paul A. Lauro, Nannet, N.Y.; Maurice H. Norcott, Valley Cottage, N.Y.; John J. Ritsko, Mt. Kisco, N.Y.; Leathen Shi, Yorktown Heights, N.Y.; Da-Yuan Shih, Poughkeepsie, N.Y., and George F. Walker, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 963,346, Oct. 19, 1992, Pat. No. 5,371,654. This application Sep. 2, 1994, Ser. No. 300,620

Int. Cl.^{6} H05K *3/40;* **H01R** *9/09*

U.S. Cl. 29—850 **15 Claims**



1. A method comprising the steps of:
providing a substrate;
providing a plurality of elongated conductors each having a first end and a second end;
bonding said first end of each of said plurality of conductors to said substrate;
said second ends of said plurality of elongated conductors projects away from said substrate;
placing said substrate in a mold;
adding to said mold a liquid material;
curing said liquid to a solid body having said plurality of elongated conductors disposed therein and said substrate attached thereto;
removing said solid body from said mold;
removing said substrate from said solid body and from said first end of each of said plurality of said conductors, thereby leaving said solid body with said elongated conductors extending there through;
said first and said second ends of said elongated conductors being exposed at the surface of said solid body and
said substrate has projections disposed there on to form cavities on said solid body during said curing step, said cavities being disposed to permit said elongated conductors to move relative to each other when said elongated conductors are pressed against a surface.

5,531,023
METHOD OF MANUFACTURING MAMMOTH IVORY JEWELRY

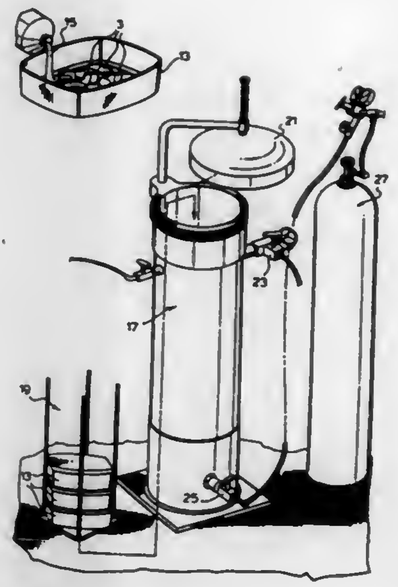
John C. Armstrong, Calgary, Canada, assignor to Korite Minerals Limited, Alberta, Canada

Division of Ser. No. 157,027, Dec. 1, 1993, Pat. No. 5,488,838. This application Jun. 2, 1995, Ser. No. 459,785

Int. Cl.^{6} B21F *43/00*

U.S. Cl. 29—896.41 **11 Claims**

1. A process for manufacturing mammoth ivory jewelry, comprising the steps of:



(a) slow curing a supply of rough mammoth ivory for partially drying said rough mammoth ivory;
(b) cutting said rough mammoth ivory into pieces;
(c) further curing said pieces of rough mammoth ivory by heating said pieces in a vacuum oven for removing moisture therefrom;
(d) immediately pressure impregnating said pieces with suitable material for preventing moisture entry into said pieces;
(e) inlaying gemstones between predetermined ones of said pieces to form composite pieces;
(f) further pressure impregnating said composite pieces with said material for bonding said gemstones and mammoth ivory pieces;
(g) removing a portion of the material from between the gemstones and mammoth ivory pieces so as to form a shallow bed in the composite pieces as such for eliminating cracking and separation of the gemstones and mammoth ivory pieces;
(h) inlaying the shallow bed with gold alloy dust for aesthetic appearance in said pieces; and
(i) processing said composite pieces to acquire a final shape and polished appearance.

5,531,024
METHOD OF MAKING A FULL FACE WHEEL

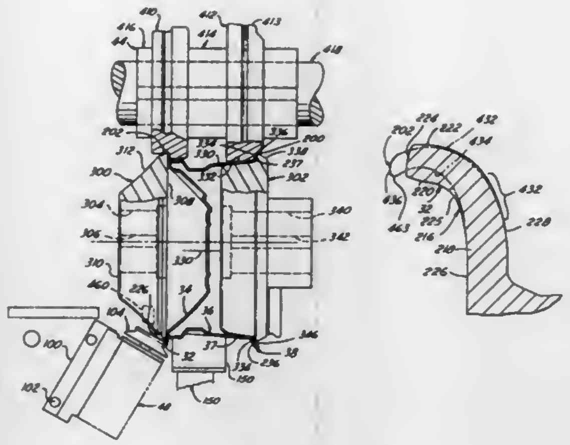
Danny E. Lowe, and Kevin D. Jurus, both of 4000 Collins Rd., Lansing, Mich. 48910

Filed Mar. 31, 1994, Ser. No. 221,063

Int. Cl.^{6} B21K *1/28*

U.S. Cl. 29—894.323 **26 Claims**

1. A method of making a full face metal fabricated wheel of the type having a disc fabricated from sheet metal and including a disc central bolt circle mounting portion, a disc intermediate portion extending generally radially outwardly from the bolt circle mounting portion and including an array of window-vent openings, and a disc outer peripheral portion surrounding the intermediate portion and providing an outboard tire bead retaining flange for the wheel, and the wheel further having a rim part including an inboard tire bead retaining flange, an inboard tire bead seat portion, a drop-center well portion, an outboard bead seat portion, and a rim edge portion extending circumferentially continuously around the rim edge adjacent the rim outboard bead seat, the rim and disc parts being permanently joined at a circumferentially continuous junction of the rim edge portion and the disc outer peripheral portion, said method comprising the steps of:
(1) progressive die forming the disc so as to have the outer peripheral flange portion partially formed to define a radially extending tire-bead retaining and sealing surface portion in substantially finished form and a unfinished curl-pre-cursor



portion extending axially and radially outwardly generally in the form of an outboard divergent conical section;

(2) forming the rim to generally finished form;

(3) then permanently assembling the disc and rim in operative relationship to provide a full face wheel workpiece;

(4) providing in a roll forming machine outboard and inboard inner back-up rolls spaced axially apart from and bodily movable axially relative to one another, said outboard inner roll having a peripheral roll forming contour complemental to the desired finished contour of the radially inwardly facing surface of the finished wheel outboard flange curl;

(5) clamping the workpiece for roll forming by moving the axially spaced apart and opposed inner outboard and inboard back-up rolls axially relative to one another into opposed clamping engagement with the inboard and outboard flange faces of the workpiece such that the outboard inner roll is juxtaposed by such clamping with the forming contour thereof radially inwardly at and against the outboard flange curl pre-cursor portion in a roll forming zone of the machine and workpiece;

(6) providing outer inboard and outboard rolls rotatable on an axis generally parallel to the rotational axes of said inner rolls, and bodily movable transverse to the workpiece axis between travel end limits defining a working stroke and a retraction stroke respectively toward and away from the outer periphery of the clamped workpiece, the outer outboard roll being constructed and arranged to have a roll forming profile groove cooperable with the roll forming contour of the outboard inner roll operable to roll form to a desired finished contour profile the finished wheel outboard flange curl, the inboard outer roll being constructed and arranged to have a profile operable to roll engage the outer periphery of the rim of the workpiece adjacent the inboard flange thereof generally at the end limit of the working stroke of the outboard outer roll;

(7) roll forming the desired finished contour of the finished wheel outboard flange curl while the workpiece is clamped as set forth in step (5) by power rotating all of said rolls to rotate the workpiece in an axially stationary position and then causing said outer rolls to move in a direction radially thereof to the working stroke end limit to thereby first bend over said flange pre-cursor portion and then roll form and iron the same by causing cold flow of metal between the outboard inner and outer rolls as they close during the working stroke to thereby finish form the wheel outboard flange curl.

5,531,025

NAIL CLIPPER WITH INDEX FINGER HOLDER

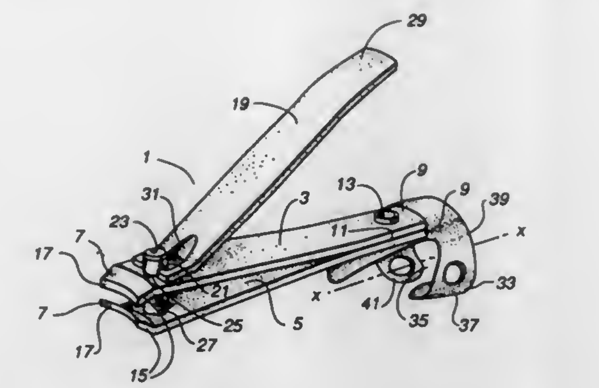
Norman W. Albone, 15525 Meknes St., San Diego, Calif. 92129

Filed May 9, 1994, Ser. No. 240,180

Int. Cl.^{6} A45D ***29/02***

U.S. Cl. 30—28 **16 Claims**

1. A nail clipper comprising:



a) a pair of upper and lower co-extensive, yieldingly-resilient and cooperatively-opposed members having correspondingly-mated inward and outward end portions;

b) said outward end portions of said members superimposed upon each other and fixedly joined together;

c) said inward ends spring biased and spaced-apart in divergent relationship and including transverse confronting jaws with mating primary cutting blades of requisite curvature and clipping ability;

d) a lever extending angularly upward from a pivotal mounting at a divergent portion of said members and including a cam-like surface for angular movement with said lever thereabout to squeeze said blades together in a clipping action when said lever is rotated toward said joined ends of said members; and,

e) a capsular index finger end piece attached to said members at said fixed junction for insertion and housing of the distal phalange of the user's index finger in fixed receipt therein to operatively support said clipper between the thumb and the end of the forefinger in a pincer-like position.

5,531,026

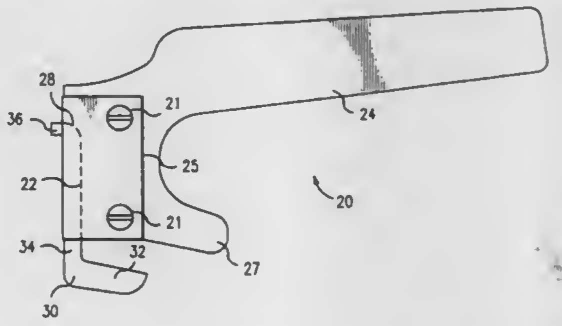
STRIPPING TOOL FOR ARMORED FIBER OPTIC CABLES

Douglas E. Avery, Stone Mountain, Ga., assignor to AT&T Corp., Murray Hill, N.J.

Filed Mar. 28, 1995, Ser. No. 412,406

Int. Cl.^{6} B26B ***3/00***

U.S. Cl. 30—90.4 **15 Claims**



1. A stripping tool for separating armor from a signal transmission cable, comprising:

a shoe including a curved portion having a curved surface with first and second ends, said curved surface having a radius of curvature which increases from said first end of said curved surface to said second end of said curved surface;

a handle; and

a bracket for removably attaching said shoe to said handle;

whereby when said handle is pulled and an inner surface of said curved portion slides along a core tube of said cable, said curved surface lifts and separates said armor, thereby exposing said core tube.

5,531,027

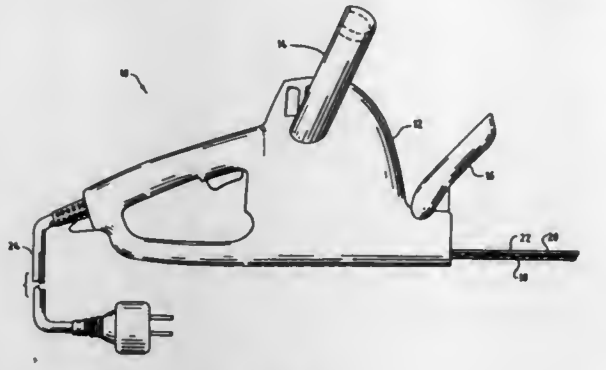
HEDGE TRIMMER DRIVE ASSEMBLY

David M. Martinez, Williamsport, Pa., and Erich Edlinger, Tucson, Ariz., assignors to McCulloch Corporation, Tucson, Ariz.

Filed Jul. 21, 1994, Ser. No. 278,654

Int. Cl.^{6} B26B ***15/00***

U.S. Cl. 30—216 **11 Claims**



1. A hedge trimmer, comprising:

a hedge trimmer housing;

a motor disposed in said hedge trimmer housing, said motor having a rotatable drive shaft;

a drive assembly associated with said motor, said drive assembly comprising:

- a first housing;
- a first gear associated with said first housing, said first gear being connected to said rotatable drive shaft;
- a second housing;
- a second gear associated with said second housing, said second gear being in contact with said first gear so that said second gear rotates when said first gear rotates; and
- a support connector disposed in contact with said first and second housings, said support connector causing said first and second housings to maintain a fixed positional relationship to ensure that said first and second gears remain in contact;

a first cutting blade operatively coupled to said second gear so that said first cutting blade reciprocates when said second gear rotates;

a second cutting blade movable relative to said first cutting blade.

5,531,028

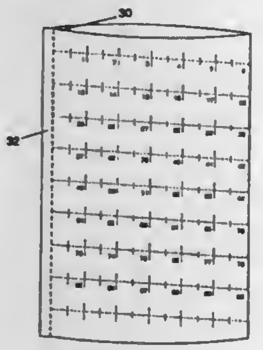
PRINTED SHEET MEASURING DEVICE

James Flippen, 55 Sand Harbor, Alameda, Calif. 94502

Filed Nov. 16, 1994, Ser. No. 341,351

Int. Cl.^{6} G01B ***3/10***

U.S. Cl. 33—1 B **9 Claims**



1. A printed sheet measuring device which can be manufactured inexpensively and, optionally, inserted into printed publications for distributing an elongated tape measure, the printed publications each being bound the printed sheet measuring device comprising:

a printed sheet of material, said printed sheet of material forming essentially a continuous loop of material having an outer surface and in inner surface;

a plurality of folds in said printed sheet of material, said folds creating at least a first opposing portion of said printed sheet of material and a second opposing portion of said printed sheet of material, said folds also creating an attachment flap, said attachment flap being contiguous with said first opposing portion of said printed sheet of material and attached to said second opposing portion of said printed sheet of material;

lines of separation indicated on said printed sheet of material, said lines of separation being essentially parallel to each other upon said outer surface of said continuous loop of material such that said lines of separation align themselves along a continuous spiraling path upon said outer surface of said continuous loop of material;

an attachment means, said attachment means attaching said attachment flap to said second opposing portion of said printed sheet of material thereby forming said essentially continuous loop of material: and

a set of sequential dimension markings printed upon said outer surface of said printed sheet of material, the sequential dimension markings essentially parallel to and delineated by the lines of separation, whereby upon separation of said printed sheet of material along said lines of separation, a contiguous, elongated tape measure is produced.

5,531,029

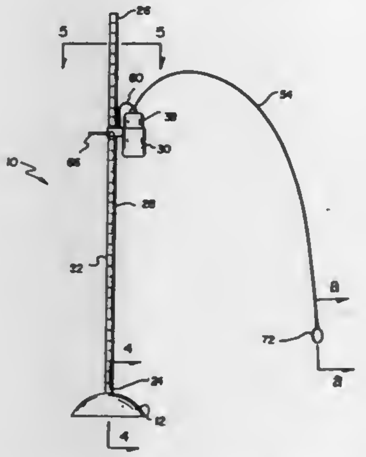
DO IT YOURSELF HEM LINE MARKER WITH CHALK

Alcye Y. Hawes, P.O. Box 715 Peachtree St., Lincolnton, Ga. 30817

Filed Jul. 18, 1994, Ser. No. 276,832

Int. Cl.^{6} A41H ***23/00***

U.S. Cl. 33—9 A **1 Claim**



1. A new and improved do it yourself hem line marker with chalk providing a way for a user to mark hems evenly on a garment without the help of another person comprising, in combination:

a base having a flat bottom surface, a rounded top surface, and a hollow interior, a recess formed in the rounded top surface, the recess being internally threaded, a sand mixture positioned within the hollow interior, the sand mixture functioning to weigh the base down;

a three foot long ruler having an externally threaded first end, a second end, and an intermediate extent therebetween, the externally threaded first end removably coupled with the internally threaded recess formed in the rounded top surface of the base;

a container holder having an open top receiving surface and a flat bottom surface, the container bolder adjustably coupled with the intermediate extent of the three foot long ruler by a fastening means for removable securement thereto;

a plastic container having a top surface, a bottom surface, a hollow inner surface, and an outer surface, the plastic container received in the open top receiving surface of the container holder, a hollow extension integral with the top surface, an extension lid removably secured to the hollow extension, an aperture formed in the extension lid, a chalk powder positioned within the hollow inner surface;

a long piece of tubing having a first end and a second end, the first end received through the aperture formed in the extension lid of the plastic container, the long piece of tubing having a length of about four feet;

a short piece of tubing having a first end and a second end, the first end received through the aperture formed in the extension lid of the plastic container and into the chalk powder positioned therein; the second end secured to the intermediate extent of the three foot long ruler by the fastening means;

a metal extension having a first open end and a second open end, the first open end secured to the second end of the short piece of tubing, the second open end being tapered;

a rubber squeeze ball having an open extension, the open extension coupled with the second end of the long piece of tubing, the rubber squeeze ball functioning to cause the chalk powder to exit the plastic container through the short piece of tubing.

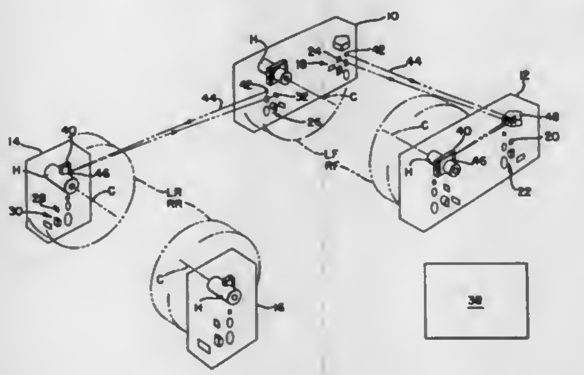
5,531,030
SELF-CALIBRATING WHEEL ALIGNMENT APPARATUS AND METHOD

James L. Dale, Jr., Conway, Ark., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 17, 1993, Ser. No. 122,854

Int. Cl.^{6} G01C *25/00;* G01B *11/275*

U.S. Cl. 33—203 **13 Claims**



1. In combination with a vehicle wheel aligner having at least one primary sensor mountable to a wheel of a vehicle for measuring the angular orientation of the wheel with respect to a reference, the improvement comprising:

first sensor means mountable to the wheel for generating a signal when the wheel is oriented at a first known angle with respect to the reference; and

means responsive to the signal generated by the first sensor means for determining a difference between the angle measured by the primary sensor when the wheel is oriented at the first known angle and the first known angle and determining whether the difference is greater than a certain predetermined amount.

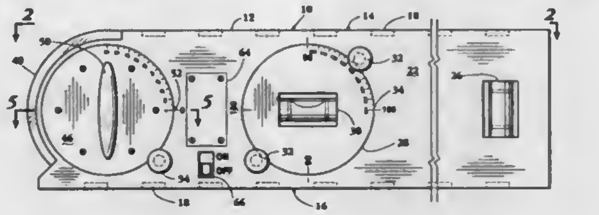
5,531,031
LASER LEVEL AND SQUARE

Kevin D. Green, 7627 E. 21st No. 106, Tulsa, Okla. 74129

Filed Jan. 20, 1995, Ser. No. 376,002

Int. Cl.^{6} G01C *1/00;15/00*

U.S. Cl. 33—365 **18 Claims**



1. A device for leveling and squaring, comprising:

a level body;

a means for leveling coupled with said level body;

a means contained within said level body for emitting a visible laser beam therefrom;

a means for variably directing the laser beam, wherein the laser beam is variably redirected through a range of about 0° to about 90° from a longitudinal axis of said level body;

a window coupled with said level body, said window having means for allowing the laser beam to exit said level body throughout said range of about 0° to about 90° from the longitudinal axis of said level body; and

wherein said means for allowing the laser beam to exit said level body includes said window being curvedly extended through said range of about 0° to about 90° from the longitudinal axis of said level body.

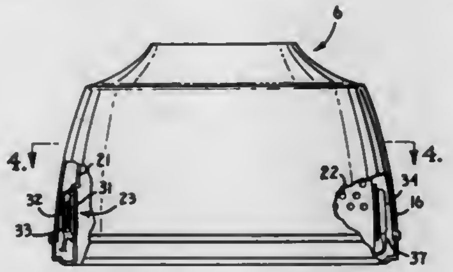
5,531,032
HAIR DRYER WITH INTEGRAL STEREO AUDIO SYSTEM

Blaise M. Wooderson, and Lewis A. Mendelson, both of Industrial Airport, Kans., assignors to Dazey Corporation, New Century, Kans.

Filed Dec. 22, 1994, Ser. No. 361,734

Int. Cl.^{6} F26B *19/00*

U.S. Cl. 34—90 **10 Claims**



9. A hair dryer bonnet sized and positioned to accommodate the head of a user, and comprising:

a. an outer shell which is relatively impervious to air;

b. an inner liner which is perforated to allow the passage of air passing from between said inner and outer liner to the user's head therethrough;

c. a first audio speaker integrally mounted within said bonnet and attached to said inner liner;

d. a second audio speaker integrally mounted within said bonnet and attached to said inner liner;

e. each of said first and second speakers being positioned between said outer shell and said inner liner and each including a seal which seals off the respective speaker from air circulating between said outer shell and said inner liner, said first speaker being positioned such that it directs sound through said inner liner to one ear of said user and said second speaker being positioned such that it directs sound through said inner liner to the other ear of said user such that audio information can be conveniently conveyed to the user while his or her hair is being dried;

f. an audio input jack positioned within said outer shell with an opening extending through said outer shell; and

g. a two conductor audio cable connecting respective stereo terminals in said audio jack to said first and second audio speakers, said audio cable being positioned between said outer shell and said inner liner.

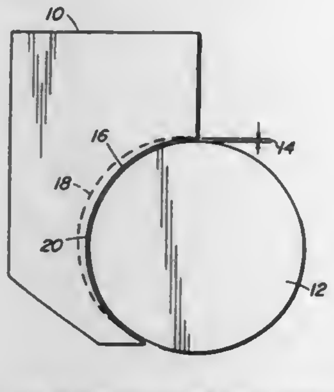
5,531,033
CONTROLLED PROFILE DRYING HOOD

Rodney M. Smith, Pointe Claire, and Daniel J. J. Poirier, Pincourt, both of, Canada, assignors to Asea Brown Boveri, Inc., LaSalle, Canada

Filed Oct. 18, 1994, Ser. No. 325,041

Int. Cl.^{6} F26B *11/02*

U.S. Cl. 34—117 **4 Claims**



1. A Yankee type drying hood structure adapted for mounting adjacent the surface of a cylinder, said hood including an internal mechanism with an air distribution and drying system therein and being decoupled from the outside walls of said hood, said internal mechanism having a deformed, cold profile; a guidance system for supporting said internal mechanism at or adjacent the extremities of the hood wrap to prevent interference between said hood and said cylinder; said guidance system comprising at least upper guides located at or adjacent the upper end of said hood wrap, said hood wrap ends being closest to the surface of said cylinder, the arrangement being such that the internal mechanism of said hood is adjusted to said deformed profile when cold so that, when the operative temperature of said hood is reached, a hot profile is assumed by said internal mechanism to provide a stable hood with controlled impingement distances at operating temperatures.

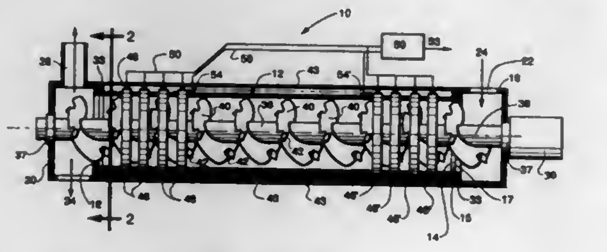
5,531,034
HORIZONTAL DRYER HAVING A SCREW CONVEYOR AND RING ELECTRICAL HEATING ELEMENTS

James W. Mentz, 306 Hawthorne Dr., Wilmington, Del. 19802

Filed Apr. 28, 1995, Ser. No. 431,486

Int. Cl.^{6} F26B *11/12*

U.S. Cl. 34—179 **5 Claims**



1. A dryer for wet solids comprising:

a substantially horizontal elongated hollow cylindrical drying chamber having an axis, a first end and a second end;

an inlet chamber located at the first end of the drying chamber the inlet chamber having an inlet port;

an outlet chamber located at the second end of the drying chamber the outlet chamber comprising a vent port and a discharge port;

a single screw conveyor within said drying chamber, said screw conveyor also having an axis said axis being coaxial with the chamber axis, said screw conveyor comprising a shaft with flights extending from said shaft, the flights having cut and folded flight portions, said flights extending to within less than one quarter inch from an inner wall of said drying chamber;

a motor drive for driving said single screw;

a plurality of mineral insulated electric ring heating elements located in intimate contact with an outer surface of said drying chamber each substantially surrounding said drying chamber, the heating elements being distributed at substantially equal distances axially along substantially the entire drying chamber;

a power distributor comprising an external power source connector and at least one electrical conductor connected to said heating elements and said power distributor for applying electrical energy to said heating elements; and

a temperature sensor in contact with the outer surface of the drying chamber and connected to said power distributor.

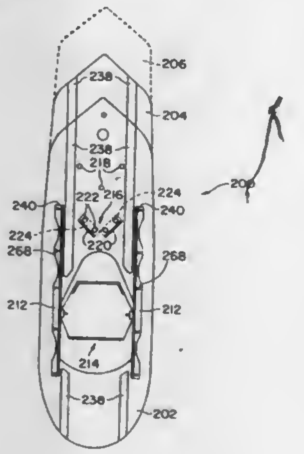
5,531,035
SNOWSHOE BINDING ASSEMBLY

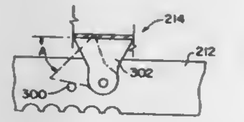
Bill Forrest, Denver, Colo., assignor to Mountain Safety Research, Seattle, Wash.

Continuation-in-part of Ser. No. 141,853, Oct. 22, 1993, Pat. No. 5,469,643, and Ser. No. 194,983, Feb. 10, 1994. This application Mar. 10, 1994, Ser. No. 209,383

Int. Cl.^{6} A43B *5/04*

U.S. Cl. 36—125.000 **5 Claims**





1. A snowshoe apparatus comprising:

flotation means for providing a snow contact surface area, said flotation means including an upper surface;

support means including a platform for supportably underlying a foot of a snowshoe wearer; and

interconnection means for pivotally interconnecting said flotation means and said support means, wherein said support means is pivotable relative to said flotation means between a first position wherein said platform of said support means is substantially parallel to said support surface of said flotation means and a second position wherein said platform is disposed at an angle relative to said upper surface; and

motion limiting means interconnected to one of said flotation means and support means including a rigid member extending from said one of said flotation means and said support means into a travel path of the other of said flotation means and said support means, wherein said rigid member contacts said other of said flotation means and support means when said support means is in said second position so as to limit motion of said support means relative to said flotation means.

5,531,036

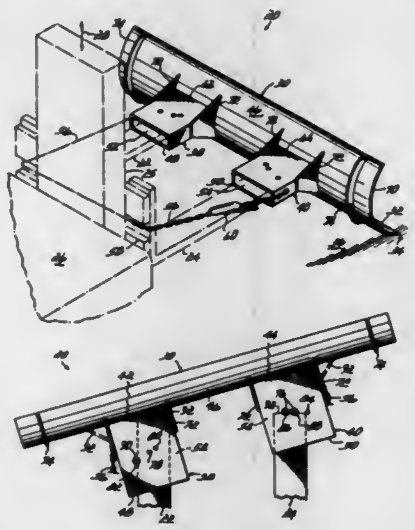
FORKLIFT VEHICLE PLOW ATTACHMENT

Carl W. Shinkle, Louisville, Ky., assignor to FOR S Inc., Louisville, Ky.

Filed Feb. 16, 1995, Ser. No. 391,425

Int. Cl.^{6} E02F ***3/96***

U.S. Cl. 37—405 **14 Claims**



1. A plow attachment for a forklift vehicle with two lift arms, each of the two lift arms having a first generally rectangular cross-section with a first longitudinal dimension, the plow attachment comprising:

a plow body having

a front side being curved about an axis forward of the front side of the plow body, and

a rear side generally opposite the front side;

a pair of hollow support members having

first ends connected to the rear side of the plow body,

second ends opposite the first ends and extending from the rear side of the plow body, and

cavities intersecting the second ends of the support members, each of the cavities having a second generally rectangular cross-section with a second longitudinal dimension substantially greater than the first longitudinal dimension, the cavities receiving and sliding over the, lift arms of the forklift vehicle to support the plow attachment on the two lift arms

a blocking member extending through a hole in one of the pair of hollow members intermediate its respective first and second ends to limit penetration of a lift arm into a respective cavity; and

a connecting element mechanically linking the plow body to the forklift vehicle for holding the plow body on the two lift arms.

5,531,037

WATER PROPORTIONING DEVICE FOR STEAM IRONS

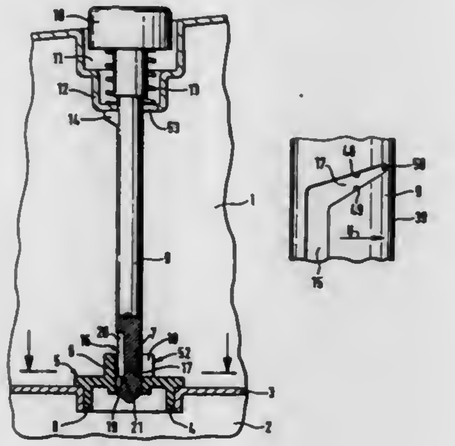
Francesc Pons, Sant Just Desvern; Pedro Perez, Cornella, and Augustin Auria, Esplugues de Llobregat, all of, Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany

Filed Jan. 23, 1995, Ser. No. 376,872

Claims priority, application Germany, Jan. 29, 1994, 44 02 683.8

Int. Cl.^{6} D06F ***75/18;*** **F16K** ***5/10***

U.S. Cl. 38—77.8 **17 Claims**



1. A water proportioning device for steam irons comprising water reservoir structure, steam-generating chamber structure, a first valve arranged between said water reservoir structure and said steam-generating chamber structure, said first valve including a valve member having skirt structure and a valve opening and valve pin structure in sealing engagement within said valve opening, said skirt structure encompassing said valve pin structure, said valve pin structure having a longitudinal groove that has two ends and a transverse groove at one end of said longitudinal groove, said valve pin structure being movable between a first position closing said valve opening and a second position in which said two ends of said longitudinal groove are open on either side of said valve opening, said valve pin structure being movable by rotary motion within said valve opening between a closed position and an open position and vice versa, said transverse groove extending circumferentially in an area of said valve pin structure lying in said valve opening such as to extend within the height of said skirt structure, and said transverse groove being in communication with said opening in said skirt structure to a greater or lesser extent, depending on the open position of said first valve.

5,531,038

CORNER MOUNTABLE DISPLAY DEVICE FOR GREETING CARDS

Kevin C. Keith, 12008 W. 87th St., #183, Lenexa, Kans. 66215

Filed Feb. 28, 1995, Ser. No. 395,908

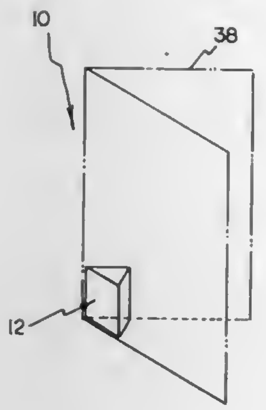
Int. Cl.^{6} G09F ***1/00***

U.S. Cl. 40—124.1 **2 Claims**

2. A corner mountable display device for greeting cards comprising:

a shell being formed as an essentially solid object with a cylindrical bore and a cylindrical magnet within the bore, the shell having at least two generally linear side faces which meet to form a corner, at least one corner including coupling devices affixed thereto, one positioned within a corner of a greeting card, the shell capable of supporting a greeting card in a generally vertical orientation;

a plurality of greeting cards having an inner surface and an outer surface, each card being folded over into a generally V-shaped configuration, the inner surface of one of the greeting cards having a V receiving the coupling devices of the shell, the greeting cards being secured in an open end upright position when having a shell coupled therein.



5,531,039

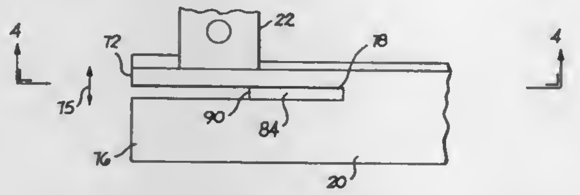
BASE FOR MOUNTING A TELESCOPIC SIGHT ON A GUN

Thomas D. Gore, 227 Coronation Ct., Canton, Mich. 48188

Filed Mar. 9, 1995, Ser. No. 401,240

Int. Cl.^{6} F41G ***1/387***

U.S. Cl. 42—101 **13 Claims**



1. A base for mounting a telescopic sight on a device having a barrel which discharges a projectile along an axis of motion accompanied by an abrupt reactionary motion, comprising:

an elongated body and means for mounting the body on the device;

an elongated resilient leaf element having a first end connected in a cantilever manner to the body, and a second end which is moveable toward or away from the axis of motion of the projectile, the leaf element being supported parallel to the axis of motion of the projectile, the connection between the first end of the leaf element and the body comprising structure between the first end of the leaf element and the body having a decreasing cross sectional area from said first end partially toward the send end; and

means for mounting a telescopic sight mount on the leaf element,

whereby when the base and a telescopic sight mount are mounted on a device having a barrel which discharges a projectile along an axis of motion accompanied by an abrupt reactionary motion, the sight mount and the leaf element are moveable as a unit with respect to the body in a transverse direction with respect to axis of motion of the projectile in response to said reactionary motion caused by the; discharge of the projectile.

5,531,040

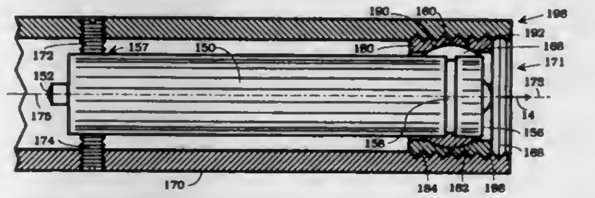
LASER MODULE MOUNTING MEANS FOR WEAPONS AND OTHER APPLICATIONS

Larry Moore, Cottonwood, Ariz., assignor to Tac Star Industries, Inc., Cottonwood, Ariz.

Continuation-in-part of Ser. No. 8,679, Jan. 25, 1993, Pat. No. 5,419,072, which is a continuation-in-part of Ser. No. 4,451, Jan. 14, 1993, Pat. No. 5,392,550. This application Nov. 23, 1994, Ser. No. 344,174

Int. Cl.^{6} F41G ***1/36***

U.S. Cl. 42—103 **19 Claims**



1. An assembly for projecting an angularly adjustable light beam, comprising a hollow enclosure having therein a partly spherical interior surface of predetermined radius, a light beam generation module within the enclosure and coupled to the enclosure proximate a first end of the module by a collar having a partly spherical outer surface for rotatably engaging the partly spherical interior surface, wherein the collar has therein a through-cut so that the collar may be temporarily expanded to allow the collar to engage the module; and said assembly further includes an adjustment mechanism operative upon the distal end of the module for varying the alignment of the module relative to said enclosure.

5,531,041

GUIDING DEVICE FOR FISHING-ROD LINES

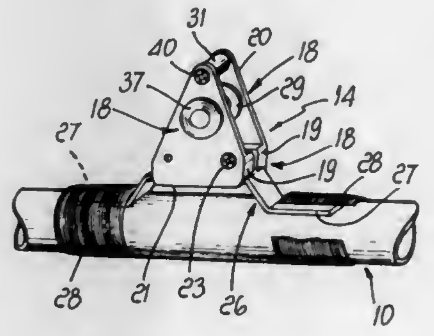
Massimo Betto, Pernumia, Italy, assignor to Alutecnos S.r.l., Monselice, Italy

Filed Sep. 22, 1994, Ser. No. 310,293

Claims priority, application Italy, Sep. 29, 1993, PD93A0194

Int. Cl.^{6} A01K ***87/04***

U.S. Cl. 43—24 **5 Claims**



1. A guiding device for fishing-rod lines, comprising:

a body which is formed by two facing symmetrical elements, each element forming a block; two parallel wings extending upwards from said block; clamping screw means being provided throughout said blocks for imparting to said blocks a clamping movement;

at least one guiding roller rigidly coupled between the said two symmetrical elements;

at least one pin also rigidly coupled between the said two symmetrical elements, forming together with said roller a passage for a line of a fishing rod;

at least two disk-like domes, acting as bearings for said guiding roller;

at least one pivot to allow said guiding roller to rotate about;

- a one piece plate-like support having a central flat shaped portion being adapted to be fixed to the fishing rod and detachably secured to said body;
- said blocks defining each a channel to form a seat in which said central flat portion is accommodated and clamped.

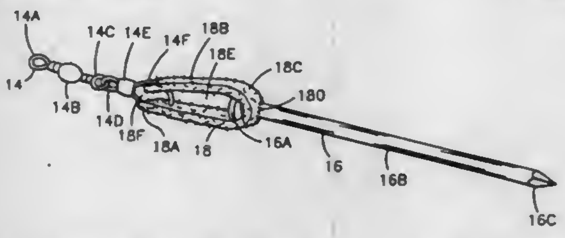
5,531,042
FISHING SINKER HAVING INTERCHANGEABLE WEIGHTS

David E. Rinker, P.O. Box 1129, Cottonwood, Calif. 96022, and Terry Vietz, E. 410 Main St., Pullman, Wash. 99163

Filed Oct. 20, 1994, Ser. No. 326,225

Int. Cl.^{6} A01K ***85/00***

U.S. Cl. 43—42.06 **5 Claims**



1. A fishing sinker for use with interchangeable weight, for fishing sinker comprising:
- a fishing line connector member;
- a flexible, ring-shaped, sinker sleeve having an aperture for mounting a sinker weight;
- a means of attaching said fishing line connector member to the sinker sleeve; and
- an elongated sinker weight having an elongated shaft mounted in the aperture of the sinker sleeve and frictionally held therewithin, and an integral head at one end of the elongated shaft, the head larger than the aperture, thereby, unable to pass therethrough;
- the sinker sleeve having a scenting agent permeated therein as a fish attractant, and being of such flexibility as to flatten into an elongated linear shape under the weight of the sinker weight.

5,531,043
POISONOUS BAIT CONTAINER FOR CRAWLING INSECTS

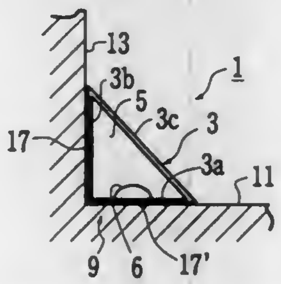
Yukio Shiboh, Tokyo, Japan, assignor to Hohto Shoji Co., Ltd., Japan

Filed Dec. 30, 1993, Ser. No. 175,935

Claims priority, application Japan, Apr. 8, 1993, 5-017670 U

Int. Cl.^{6} A01M ***1/20***

U.S. Cl. 43—131 **12 Claims**



1. A poisonous bait container for crawling insects comprising:
- a body consisting of first, second and third walls connected together to form a tubular body having a triangular cross-sectional shape, the first and second walls being in substantially perpendicular relation one to the other, and each having a width not greater than 2 centimeters;
- adhesive means on an exterior surface of said first wall; and
- insect control means disposed within said body.

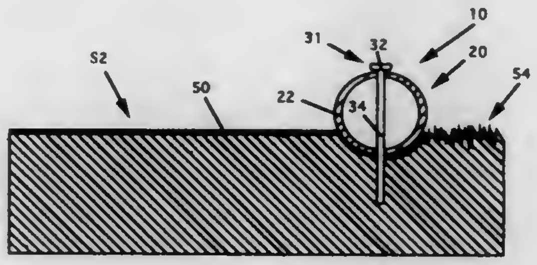
5,531,044
LANDSCAPE EDGING DEVICE AND METHOD

Ronald Wallenius, 6344 Cleveland, Merrillville, Ind. 46410

Filed Nov. 4, 1994, Ser. No. 334,150

Int. Cl.^{6} A01G ***1/08***

U.S. Cl. 47—33 **9 Claims**



1. In combination with a first earth surface and an adjacent earth surface, forming a border between said first earth surface and said adjacent earth surface, a landscape edging device comprising, in combination:
- a substantially cylindrical elongated member resting substantially horizontally on the ground intermediate said first earth surface and said adjacent earth surface, said substantially cylindrical elongated member having one or more longitudinally spaced bores extending substantially vertically therethrough;
- and anchor means for anchoring said substantially cylindrical elongated member to the ground, said anchor means comprising one or more corresponding spikes disposed to extend substantially vertically through said bores, said spikes having head portions and shank portions, said head portions adapted to cooperatively engage said substantially cylindrical elongated member.

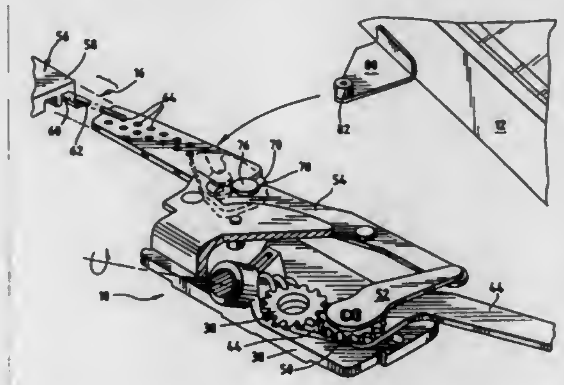
5,531,045
AUTOMATIC WINDOW SASH AND LOCK OPERATOR

Stephen M. Piltingsrud, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Mar. 31, 1995, Ser. No. 414,917

Int. Cl.^{6} E05F ***11/02***

U.S. Cl. 49—279 **26 Claims**



1. In a window operator and lock structure for controlling a window sash relative to a window frame including a drive input securable to a frame and engaging both an operator linkage securable to a window sash to effectuate motion of a secured sash relative to a frame and a lock linkage securable to a lock structure for locking a secured sash to a frame, the improvement comprising:
- a generally longitudinal link in said lock linkage and movable in a generally longitudinal direction when operating a lock structure, said longitudinal link including a substantially transverse slot;
- a cam pivotable about a cam axis fixable relative to a frame and including a member receivable in said link slot to block operation of said lock linkage;
- means associated with a secured sash for engaging said cam when a secured sash is closed against a secured frame to pivot said cam in a first direction to move said cam member clear of said link slot; and
- means for blocking said engaging means from moving toward opening of an associated secured sash when said cam member is clear of said link slot.

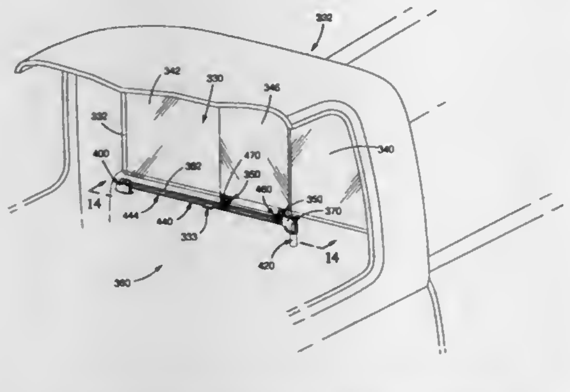
5,531,046
POWER SLIDING WINDOW ASSEMBLY

Craig A. Kollar, Rochester Hills; Donald Szerlag, Canton; William C. Lajack, Warren, and Kevin Koneval, Rochester all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 2, 1995, Ser. No. 456,042

Int. Cl.^{6} E05F ***11/48;11/53***

U.S. Cl. 49—360 **19 Claims**



1. A power window assembly in a vehicle comprising:
- a slidable window pane mounted to the vehicle for movement in a first lateral direction to an open position and in a second lateral direction to a closed position;
- first and second mounting brackets securely attached to the window pane and each having a pocket therein; and
- a power drive mechanism for selectively moving the window pane between the closed position and the open position, the power drive mechanism including first and second connector arms each laterally coupled to the first and second mounting brackets, respectively, the first and second connector arms each having; an upper portion seated in the respective pockets of the first and second mounting brackets by slip-fitted insertion therein and being vertically slidable relative the pockets to adjustably connect the window pane to the power drive mechanism;
- whereby the connector arms of the power drive mechanism vertically float relative the window pane during movement of the window pane between the open position and the closed position.

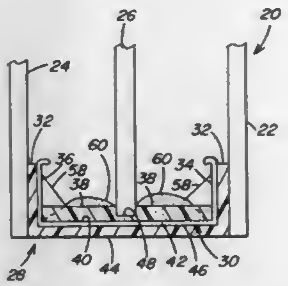
5,531,047
GLAZING UNIT HAVING THREE OR MORE GLASS SHEETS AND HAVING A LOW THERMAL EDGE, AND METHOD OF MAKING SAME

Edmund A. Leopold, Hudson, Ohio, and Paul J. Kovacik, Manor Township, Armstrong County, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 5, 1993, Ser. No. 102,596

Int. Cl.^{6} E06B ***3/66***

U.S. Cl. 52—172 **10 Claims**



1. A glazing unit having at least three sheets, comprising:
- a pair of sheets defined as a first sheet and a second sheet;
- a spacer between the first and second sheets to provide a space between the first and second sheets, the spacer having a first upright leg and a second upright leg, each upright leg joined to a base and spaced from one another such that the base and upright legs have a U-shaped cross section, each of the upright legs has an outer major surface and an inner major surface opposite to the outer major surface with the inner major surfaces facing one another, the base having a receiving surface with the receiving surface of the base facing the space between the first and second sheets and the inner major surfaces of the upright legs, wherein selected portions of the upright legs are bent toward and spaced from one another;
- a moisture and gas impervious sealant securing the first sheet to the outer surface of the first upright leg and securing the second sheet to the outer surface of the second upright leg;
- a sheet defined as an intermediate sheet in the space between the selected portions of the upright legs bent toward and spaced from one another, and
- a pliable, flowable material on the receiving surface of the base between the inner surface of the first upright leg and the intermediate sheet, defined as a first bead, and on the receiving surface of the base between the inner surface of the second upright leg and the intermediate sheet defined as a second bead, the first and second beads and selected portions of the upright legs maintaining the intermediate sheet in position between and spaced from the first and second sheets.

5,531,048
STEP FOR A STAIRWAY AND METHOD FOR MAKING SAME

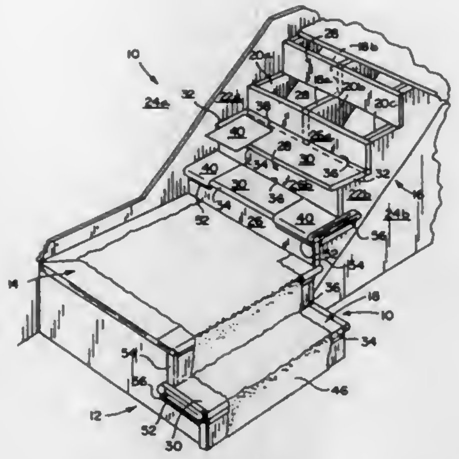
Gary L. Darling, Grandville, Mich., assignor to Primary Millwork, Grand Rapids, Mich.

Filed Oct. 31, 1994, Ser. No. 331,963

Int. Cl.^{6} E04F ***11/16***

U.S. Cl. 52—188 **26 Claims**

22. A kit for making a stair step, comprising:
- a base stair tread made from a wood composite and having predetermined dimensions, said base stair tread having opposing upper and lower surfaces, a back edge, a front edge, and first and second ends;
- a riser made from a wood composite and precut to predetermined dimensions with a length generally equal to a length of said base stair tread;
- at least one sheet of wood veneer precut to cover at least a portion of said upper surface, at least a portion of said front edge, and at least a portion of said lower surface of said base stair tread proximate at least one of said first and second ends



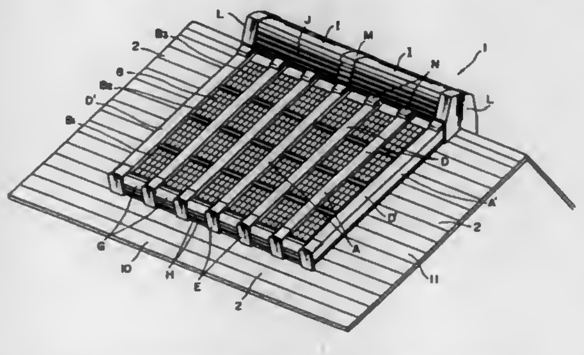
and leaving a central portion of said base stair tread exposed to be covered by a suitable floor covering; and

an adhesive deposited on one surface of said at least one sheet of wood veneer for attaching said wood veneer to said base stair tread.

5,531,049

ROOF MOUNTED LIGHT TRANSMITTING FRAME

Takashi Hirai, and Yoshio Kaneko, both of Tokyo, Japan, assignors to Hirai Engineering Corporation, Tokyo, Japan
Division of Ser. No. 598,633, Oct. 19, 1990, Pat. No. 5,406,936. This application Mar. 9, 1994, Ser. No. 208,249
Claims priority, application Japan, Mar. 30, 1989, 1-76703
Int. Cl.^{6} E04B *7/18*
U.S. Cl. 52—200 **20 Claims**



1. A roof mounted light transmitting frame comprising:

a pair of longitudinal sash members;

a pair of light-transmitting sheet support sash members each mounted along an inner surface of a respective one of said longitudinal sash members;

a lower horizontal sash member having a vertically disposed support member mounted between front ends of said light-transmitting sheet support sash members;

an upper horizontal sash member mounted between rear ends of said light-transmitting sheet support sash members; and

a light-transmitting sheet mounted inside a space defined by said light-transmitting sheet support sash members, said upper horizontal sash member and said lower horizontal sash member;

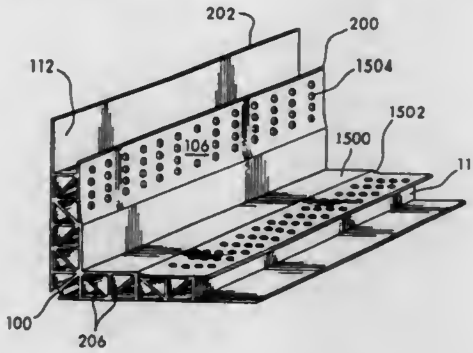
each said light-transmitting sheet support sash member being mounted obliquely to said longitudinal sash member such that a distance between the front end of said support sash member and a lower edge of said longitudinal sash member to which said support sash member is mounted is larger than a distance between the rear end of said support sash member and the lower edge of said longitudinal sash member; and

a recess being longitudinally formed on said lower horizontal sash member adapted to receive said upper horizontal sash member.

5,531,050

DRYWALL CORNER FINISHING DEVICE

Paul E. Stibolt, 9801 E. Iliff Ave., Denver, Colo. 80231, and Russell E. Judy, 14290 Foothills Cir., Golden, Colo. 80401
Continuation-in-part of Ser. No. 234,423, Apr. 28, 1994, Pat. No. 5,459,969. This application Aug. 11, 1995, Ser. No. 513,716
Int. Cl.^{6} E04F *19/04;13/06*
U.S. Cl. 52—254 **12 Claims**



1. A finishing device primarily for use in forming a corner between two panels of drywall having edges of a predetermined thickness, said finishing device comprising:

a flexible joint extending along a predetermined axis;

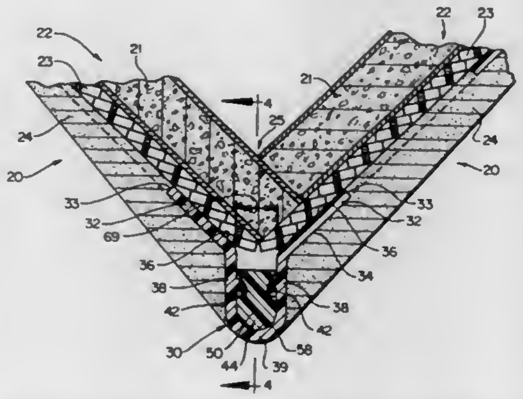
two wings connected to and extending outwardly in a diverging relation from said joint to form a corner having an adjustable angle, each wing having a front surface and an edge distal from said joint to abut one of said drywall panels, wherein said distal edge has a thickness approximately equal to said drywall panel edge thickness; and

a corner surface extending between said front surfaces of said wings and covering said flexible joint.

5,531,051

CONNECTOR CLIP FOR CORNER BEAD

Gary J. Chenier, Jr., W. Palm Beach, Fla., and Gary J. Maylon, Trussville, Ala., assignors to Alabama Metal Industries Corporation, Birmingham, Ala.
Filed Oct. 7, 1994, Ser. No. 320,433
Int. Cl.^{6} E04B *1/00*
U.S. Cl. 52—255 **16 Claims**



1. An extruded strip joining system for aligning abutting ends of axially elongated extruded strips and retaining the abutting ends in end-to-end engagement, said extruded strips having an interior surface and an exterior surface, said joining system comprising:

means defining an axially elongated channel on an interior surface of each of said extruded strips;

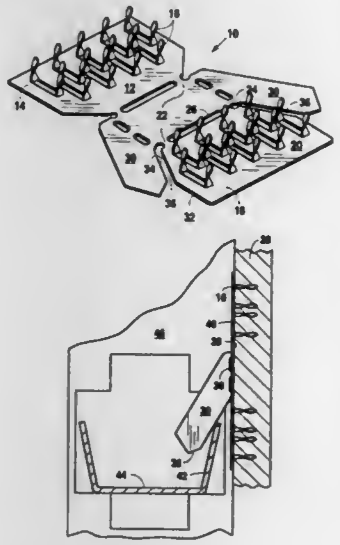
a pair of axially elongated tabs integrally fabricated on said interior surface at generally symmetric positions in said channel; and

clip means engageable with said tabs in said channel for retaining said abutting ends in engagement.

5,531,052

UNITARY SUSPENSION CLIP FOR SUPPORTING PARTITION WALLS

Robert S. Agar, 150 Ferrier St., Unit 14, Markham, Ontario, Canada
Filed Dec. 28, 1993, Ser. No. 174,243
Int. Cl.^{6} E04B *2/30*
U.S. Cl. 52—489.2 **9 Claims**



1. A unitary suspension clip for supporting a gypsum board panel on a horizontal channel member comprising a vertical support structure comprising:

a plate comprised of upper and lower portions having a plurality of panel piercing members for affixing said plate to a gypsum board panel extending from one face thereof;

a transverse line of weakness extending substantially across said plate between the upper and lower portions thereof;

a channel formed in said plate at an acute angle relative to the edge of said plate and terminating at a point spaced inwardly from the edge of said plate;

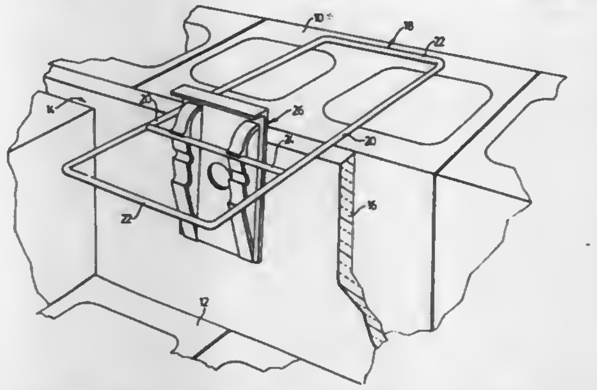
a second line of weakness formed in said plate and extending from a point near the termination of said channel in a direction substantially co-linear with the edge of said plate; and

a wing formed integrally with said plate and extending outwardly from the edge thereof pivotable about said second line weakness from a first position substantially co-planar with said plate to a second position forming an angle relative to said plate whereby the edge of said wing formed by said channel comprises a surface angled at an acute angle relative to the edge of said plate for cooperating with the horizontal channel member of the vertical support structure to translate the downward movement of the clip resulting from the weight of the panel to which the clip is engaged into movement which draws the panel into engagement with the vertical support structure and prevents movement of the panel away from the vertical support structure.

5,531,053

SPRING FASTENER FOR HOLDING INSULATION AGAINST AN INNER SURFACE OF CAVITY WALLING

Hans Hamm, 1 Paisley Ct., Shanty Bay, Ontario, Canada
Filed Jun. 14, 1994, Ser. No. 260,220
Int. Cl.^{6} E04B *1/38;1/74*
U.S. Cl. 52—713 **12 Claims**



1. A spring clip fastener for insertion between a restraining bar and a wall to hold sheet material firmly against the wall, the fastener comprising

a front flat generally rigid plate;

a generally rigid top surface extending rearwardly from said plate to accept driving force directing the plate into a space between a restraint and sheet material to be biased against a wall;

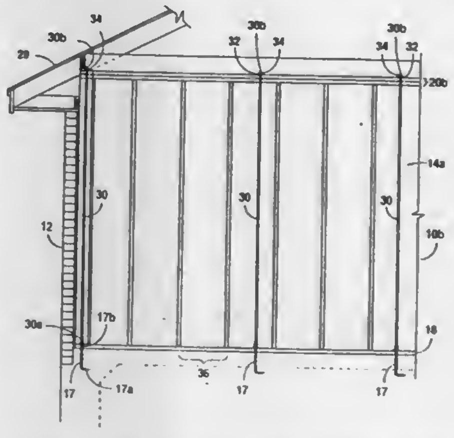
biasing means comprising a number of resilient strips, each of which forms a resilient bow directed rearwardly from the plane of said plate, the bow being located to extend from an upper portion of said plate to a lower portion of said plate at least a lower portion of said bow merging with the lower portion of said plate through an acute angle; and

at least one horizontal groove being provided in the bow to engage said restraint.

5,531,054

REINFORCED WOODEN WALL

Jose G. Ramirez, 2-½ Moorefield Rd., Mission, Tex. 78572
Continuation of Ser. No. 979,137, Nov. 20, 1992, abandoned. This application Jun. 9, 1994, Ser. No. 257,371
Int. Cl.^{6} E04H *9/14;* **E02D** *27/50*
U.S. Cl. 52—741.1 **6 Claims**



1. An improved wall for a wood frame building structure, the building structure having a foundation with a multiplicity of threaded anchor bolts projecting vertically upwards from a top surface thereof, a multiplicity of vertical, channel-free wood studs and a multiplicity of horizontal wood beams laying atop at least some of said multiplicity of channel-free, vertical wood studs, the

multiplicity of horizontal wood beams having a multiplicity of channels therethrough, the improvement comprising:

- a multiplicity of rigid metal tie rods, each of said rods having a first end and a second end, and a body between the first end and the second end, the first end having walls defining threaded sockets dimensioned to accept the threaded anchor bolts of the foundation of the wood frame building structure and the second end having threads thereon, said multiplicity of rigid metal tie rods spaced apart from and not enclosed by the vertical wood studs;
- a multiplicity of tie rod end washers and fasteners, dimensioned for receipt over the second ends of said rigid metal tie rods, the washer exceeding the diameter of the channels wherein said tie rod end washers and fasteners are engaged to the rigid metal tie rod second ends such that they meet the top of the walls defining the channel of said horizontal beams in flush relation; and
- wherein at least a portion of the bodies of each of said multiplicity of rigid metal tie rods is not enclosed by channels.

5,531,055

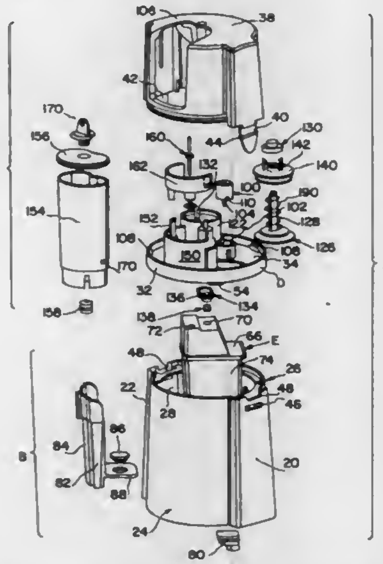
REFILL ASSEMBLY AND SYSTEM FOR INK-JET PRINTER CARTRIDGES

Ryan M. Sell, Frankfort; Christopher L. Allgeier, Sr., Louisville; Martin A. Carpenter, Bardstown; Mordechal Lev, Lexington; William T. Kearney, III, Lexington; William G. Goff, III, Lexington; Joseph E. Domhoff, Shelbyville, and Jonathan K. Voet, Lexington, all of Ky., assignors to Nu-Kote International, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 223,768, Apr. 4, 1994. This application Sep. 30, 1994, Ser. No. 315,968

Int. Cl.^{6} B65B *31/00*

U.S. Cl. 53—86 **16 Claims**



1. An assembly for refilling a printer cartridge, the printer cartridge having an equalize opening that provides selective air communication with an interior of the printer cartridge and a refill opening that allows the printer cartridge to receive a new supply of ink therein, the assembly comprising:

- a base for receiving a printer cartridge to be refilled;
- a lid received on the base and having separate stations for performing distinct operations in refilling a printer cartridge, the lid also including a seal member for sealing the equalize opening of a printer cartridge when the lid is received on the base;
- a first station on said lid having a pusher member that is positioned adjacent the refill opening, the pusher member adapted to open the refill opening upon actuation of the pusher member;
- a second station on said lid that includes a plunger for providing a predetermined amount of air to the equalize opening upon actuation of the plunger;
- a third station on said lid adapted to receive an ink container therein and dispense ink through the refill opening into the printer cartridge;
- a fourth station on said lid including a recess for receiving a closure member and a member for advancing the closure member into the refill member and sealing the refill opening;
- means for allowing movement of at least a portion of said lid relative to said cartridge to align each of said stations with said cartridge.

5,531,056

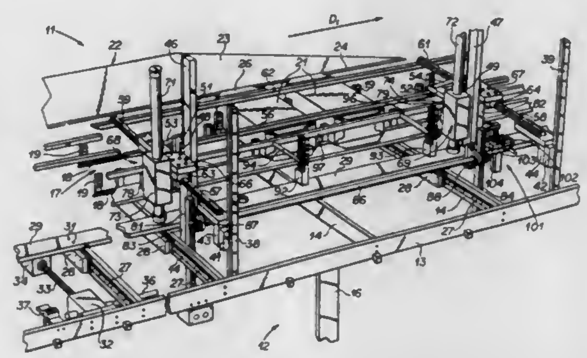
METHOD AND APPARATUS FOR STABILIZING CARTONS IN A PACKAGING MACHINE

Kun Liang, Marietta, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed May 6, 1994, Ser. No. 239,001

Int. Cl.^{6} B65B *7/00*

U.S. Cl. 53—251 **10 Claims**



1. In a continuous motion article packaging machine wherein grouped articles and cartons having open ends and back ends are conveyed along aligned synchronized paths and the grouped articles are inserted into the open ends of the moving cartons, the improvement comprising a carton hold-down and stabilization apparatus having hold-down means for engaging the cartons from above to hold the cartons down as the grouped articles are inserted into the cartons and barrier means for engaging the back ends of the cartons to stabilize the cartons against lateral displacement as the grouped articles are inserted into the cartons, said apparatus further including vertical adjustment means for selectively adjusting the vertical position of said hold-down means and lateral adjustment means for selectively adjusting the lateral position of said barrier means, said hold-down means comprising a forward hold-down rail for engaging the cartons a predetermined distance from the open ends thereof and a rear hold-down rail disposed in spaced substantially parallel relationship with said forward hold-down rail for engaging the cartons a predetermined distance from the back ends thereof, said lateral adjustment means including means for adjusting the lateral position of said rear hold-down rail along with the barrier means to reset the spacing between the forward and rear hold-down rails as the barrier means is adjusted, said lateral adjustment means including an accessory rail movably mounted to said apparatus for selective lateral movement toward and away from the rear ends of moving cartons on said packaging machine, said barrier means being mounted to said accessory rail, and a pair of spaced forward guide rails fixed to and extending upwardly from said accessory rail, each of said forward guide rails bearing a bracket assembly having an arm that extends forwardly to a distal end that overlies the path of moving cartons on the packaging machine, said rear hold-down rail extending between and being secured to the distal ends of said arms of said bracket assemblies whereby lateral displacement of said accessory rail causes corresponding lateral adjustment of said barrier means and said rear hold-down rail.

5,531,057

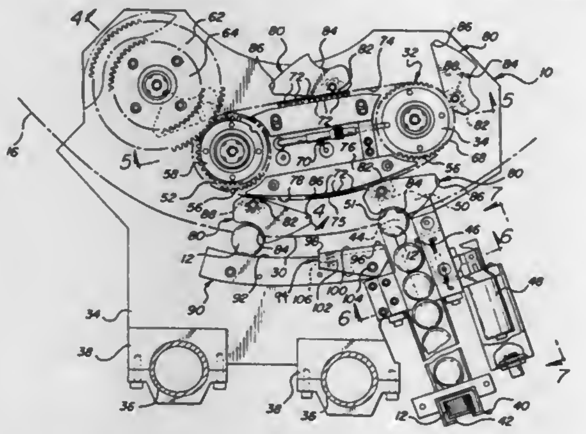
BOTTLE CAP DELIVERY SYSTEM

Matthew R. Coleman, Pottstown; Gerald M. Futej, West Chester, and James D. Ash, Pottstown, all of Pa., assignors to Crown Cork and Seal Company, Inc., Philadelphia, Pa.

Filed Sep. 8, 1995, Ser. No. 525,224

Int. Cl.^{6} B67B *3/06;3/064;* **B65B** *7/28*

U.S. Cl. 53—308 **45 Claims**



1. A bottle-capping apparatus (**18**) for applying screw-type cap closures to the threaded neck portion of a bottle, said apparatus comprising:

- a base (**20**);
- a turret (**22**) rotatably supported above said base (**20**) about a central vertical axis (A);
- a plurality of capping-heads (**14**) independently rotatably and reciprocally supported from said turret (**22**) about respective vertical axes, said respective vertical axes equally spaced along a common pitch circle (**16**) concentric with said central axis (A);
- cap conveyor means (**32**) for sequentially delivering bottle-caps (**12**) to each of said capping-heads (**14**);
- characterized by said cap conveyor means (**32**) including a driven endless belt (**68**) disposed entirely within the circumscribed boundaries of said pitch circle (**16**) to reduce space requirements and worker exposure to said endless belt (**68**).

5,531,058

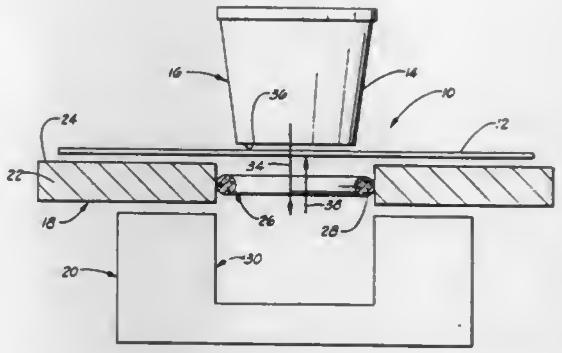
MEANS FOR SECURING A DECORATIVE COVER ABOUT A FLOWER POT

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc. as trustee of The Family Trust U/T/A, Oklahoma City, Okla.

Continuation of Ser. No. 124,843, Sep. 21, 1993, Pat. No. 5,417,033, which is a continuation of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned. This application Feb. 27, 1995, Ser. No. 395,030

Int. Cl.^{6} B65B *11/58;27/00*

U.S. Cl. 53—399 **17 Claims**



1. A method for securing a sheet of material generally about a flower pot to form a decorative cover for the flower pot and securing the decorative cover about the flower pot utilizing a band applicator having an object opening adapted to receive at least a portion of the flower pot having the decorative cover disposed thereabout and substantially automatically apply a band to secure the decorative cover about the flower pot when the flower pot having the decorative cover disposed thereabout is positioned in the object opening of the band applicator, the flower pot being characterized as having a bottom, an upwardly extending outer peripheral surface and an open upper end, the method comprising:

- forming a sheet of material generally about the bottom and upwardly extending outer peripheral surface of the flower pot to provide a decorative cover which extends about the bottom and upwardly extending outer peripheral surface of the flower pot and extends upwardly from the open upper end of the flower pot such that the open upper end of the flower pot remains substantially uncovered by the decorative cover;
- moving the flower pot with the decorative cover formed generally about the bottom and upwardly extending outer peripheral surface thereof into the object opening in the band applicator and utilizing the band applicator to automatically apply the band about the decorative cover disposed generally about the bottom and the upwardly extending outer peripheral surface of the flower pot, the band cooperating to secure the decorative cover in position disposed generally about the bottom and upwardly extending outer peripheral surface of the flower pot such that the open upper end of the flower pot remains substantially uncovered by the portion of the decorative cover extending upwardly from the open upper end of the flower pot; and
- removing the flower pot with the decorative cover secured thereto by the band from the object opening in the band applicator.

5,531,059

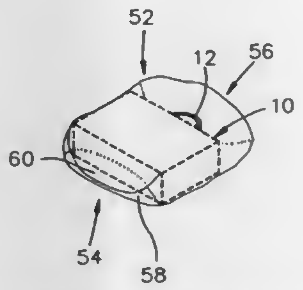
METHOD FOR SHRINK WRAPPING LUGGAGE

Donald L. Dickinson, #9 Bishop's Crest Ct., St. Peters, Mo. 63376

Filed Sep. 30, 1994, Ser. No. 315,964

Int. Cl.^{6} B65B *61/14*

U.S. Cl. 53—413 **6 Claims**



1. A method for encapsulating luggage having a handle grip with a heat shrinkable plastic wrap to provide protection for the surface of the luggage and to provide visual detection of entry into the luggage, said method comprising: providing a plurality of heat shrinkable plastic bags in the form of preformed flattened tubes open at both ends, selecting an appropriate sized tube and cutting said tube to an appropriate sized length, as necessary to fit the luggage being wrapped, loosely enclosing the luggage in said cut tube so that the tube fits around the luggage with an open bottom end and opposite top end of tube extending beyond the top of the luggage and the grip, sealing the bottom end of the tube by tucking a first bottom side inside a second opposite side and wrapping the second opposite side over said first side to form a bag having an

open top, and sealing the top portions of the open top over the grip and top of the luggage by heat applied by a hot air gun.

5,531,060
METHOD OF PRODUCING INTERIORLY STERILE PACKAGES POSSESSING SUPERIOR BARRIER PROPERTIES

Pierre Fayet, Lausanne, and Bertrand Jaccoud, Slviriez, both of, Switzerland, assignors to Tetra Laval Holdings & Finance SA, Pully, Switzerland

Filed Feb. 3, 1995, Ser. No. 383,319

Claims priority, application Switzerland, Feb. 4, 1994, 00327/94

Int. Cl.^{6} B65B *55/04*

U.S. Cl. 53—426 **20 Claims**

18. A method of producing an interiorly sterile package possessing superior barrier properties, comprising:

(a) applying a gaseous medium under pressure to a plastic blank, thereby blow-molding the plastic into a package preform;

(b) sealing the package preform while it contains the gaseous medium; and

(c) forming an opening in the sealed package preform while simultaneously subjecting the package preform to chemical plasma vapor deposition conditions, such that reaction gas molecules in the gaseous medium contained in the package react to deposit a coating of SiO_x, wherein x lies in a range of about 1.8–2.2, on inner walls of the package, in a thickness of about 2000 Å or less.

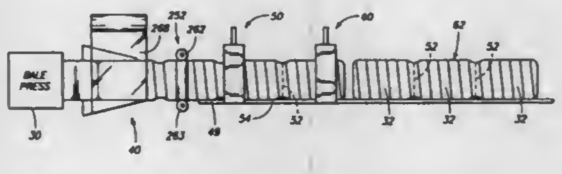
5,531,061
SYSTEM AND METHOD FOR PACKAGING BALES OF HAY AND AN IMPROVED WRAPPING APPARATUS

Robert W. Peterson, 9545 Road "0" SW., Royal City, Wash. 99357

Continuation-in-part of Ser. No. 52,333, Apr. 22, 1993, Pat. No. 5,433,058. This application Jan. 6, 1994, Ser. No. 179,031

Int. Cl.^{6} B65B *53/00;27/12;61/06;63/00*

U.S. Cl. 53—526 **14 Claims**



1. A system for packaging bales of hay comprising:

a wrapping machine having a conduit through which hay bales are extruded along a feed axis, the wrapping machine having means for wrapping multiple layers of material around the hay bales as the hay bales are extruded through and out of the conduit, the wrapping machine applying the layers of material to successive hay bales such that the material extends between adjacent wrapped hay bales; and

a pressing machine provided downstream of the wrapping machine to receive the wrapped hay bales, the pressing machine physically engaging and mechanically pressing against the layers of material and hay bales, squeezing the layered material together and against the hay bales to remove air pockets formed between adjacent layers of material.

5,531,062
TENSIONING MECHANISM FOR UPPER MOWER CONDITIONER ROLL

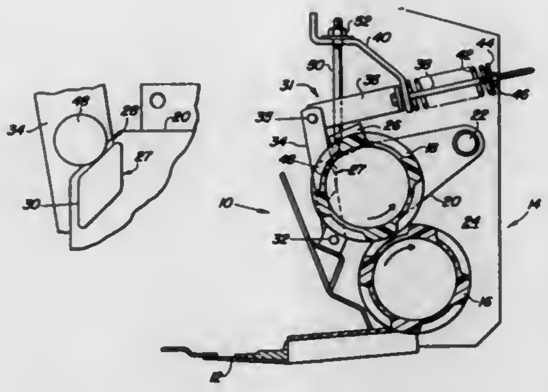
Ernest Pfrimmer, Paris, France, assignor to Deere & Company, Moline, Ill.

Filed Mar. 13, 1995, Ser. No. 402,672

Claims priority, application Germany, May 28, 1994, 44 18 696.7

Int. Cl.^{6} A01D *82/00*

U.S. Cl. 56—16.4 B **14 Claims**



1. In a mower conditioner including upper and lower, parallel transverse conditioner rolls with the lower roll having opposite ends respectively rotatably mounted in opposite walls of a header frame and with the upper roll having opposite ends respectively rotatably mounted in a pair of pivot arms which are in turn vertically pivotably mounted in said opposite walls, whereby the upper roll and arms move up and down from and to an initial position, and a tensioner mechanism being associated with at least one of the arms for yieldably resisting upward movement of the upper roll, the improvement comprising: said tensioning mechanism comprising a lever mounted for pivoting in a region located adjacent said at least one of said arms for movement from and toward a starting position corresponding to said initial position of said at least one arm, and a yieldable biasing means attached to said lever and resisting pivotal movement of the lever away from said starting position; one of said lever and said at least one of said arms having a cam mounted thereon and the other having a follower mounted thereon; and said cam having a first surface engaged by said cam follower, during a normal operating range of movement of said one arm and said upper roll between said initial position and a maximum working position, and having a second surface engaged by said cam follower when said arm and said upper roll are moved upwardly from said initial position beyond said normal range of movement; and said first and second surfaces being configured such that increasing upward movement of said one arm and said upper roll in said normal range of movement results in said lever undergoing increasing movement from its starting position and in an increase in the resistant force exerted by said yieldable biasing means, and such that increasing upward movement of said one arm and said upper roll beyond said normal range of movement results in substantially no additional movement of said lever nor in any substantial increase in the resistant force exerted by said yieldable biasing means.

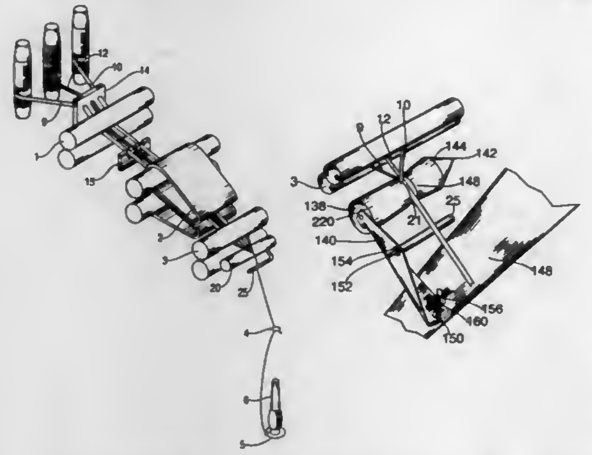
5,531,063
DEVICE FOR FORMING CORE/WRAP YARN

A. Paul S. Sawhney, Metairie, and Craig L. Folk, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of the Department of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 22,207, Feb. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 603,504, Oct. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 366,702, Jun. 15, 1989, Pat. No. 4,976,096. This application Feb. 14, 1994, Ser. No. 195,429

Int. Cl.^{6} D02G *3/36;* **D01H** *1/00;1/42*

U.S. Cl. 57—12 **11 Claims**



1. A ring spinning device for forming core/wrap yarn comprising:

a frame;

a pair of draft rollers coupled to the frame so that a nip is formed between the draft rollers;

a strand feeding apparatus for feeding a core strand, a first wrap strand and a second wrap strand to the nip, wherein the first wrap strand enters the nip on one side of the core strand and the second wrap strand enters the nip on the side of the core strand opposite the first wrap strand;

a curved support surface including an open channel extending substantially perpendicularly to the nip, wherein the support surface is coupled to the frame so that the open channel may be moved from a first operative position immediately downstream of the nip to a second non-operative position not immediately downstream of the nip, spaced from the first operative position, wherein the first and second wrap strands are wrapped around the core strand while supported within the channel;

a wind-up spindle;

a yarn guide coupled to the frame downstream of the support surface for guiding the wrapped yarn to the wind-up spindle.

5,531,064
OPTICAL FIBER CABLE CONTAINING RIBBON FIBERS

Hiroyuki Sawano; Masayoshi Yamanaka; Yutaka Kurosawa, and Matsuhiro Miyamoto, all of Chiba-ken, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 400,091

Claims priority, application Japan, Jun. 3, 1994, 6-144058

Int. Cl.^{6} D01H *13/26;* **G02B** *6/44*

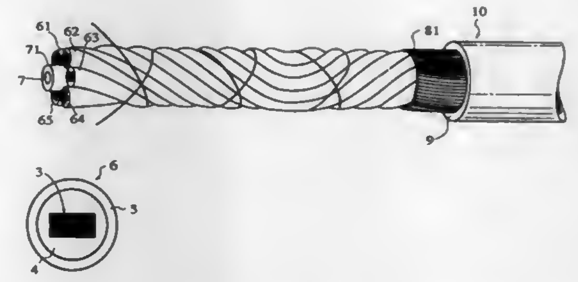
U.S. Cl. 57—204 **2 Claims**

1. An optical fiber cable comprising:

a central member;

a plurality of tube units wound around said central member in an alternating hand helix, said tube units having a plurality of superimposed ribbon units comprising a plurality of optical fibers held together in side-by-side relation, respectively, said ribbon units being loosely received in said tube units;

a sheath of plastic material encircling said tube units; and



a water blocking material in any otherwise empty spaces in said tube units and between said sheath and said tube units,

wherein said plurality of superimposed ribbon units in said tube units form a group of ribbon units having a common axis in cross section and said group of ribbon units is twisted around said axis in an alternating hand helix with a same twisting pitch and twisting direction of said tube units wound around said central member,

said tube units reversing said twisting direction with a predetermined reverse stranding angle ϕ, and

wherein a clearance C between said superimposed ribbon units and said tube units is larger than 1.2 mm with a relation:

$$C=2\sqrt{di^2-W^{2+}}-T>1.2$$

where 2 di is a width of said ribbon unit, 2 W is a thickness of said superimposed ribbon units, and T is an inner diameter of said tube unit.

5,531,065
FINE JEWELRY DIAMOND CUT ROPE CHAIN AND METHOD OF MANUFACTURE THEREOF

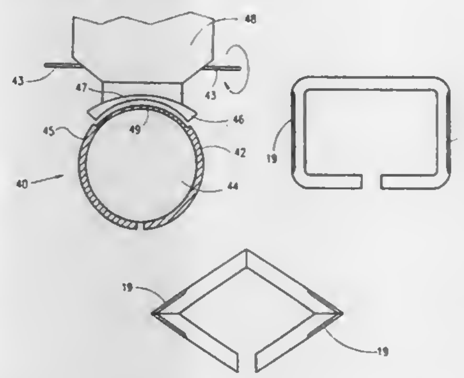
David Rozenwasser, Savion, Israel, assignor to Avraham M. Rozenwasser, Savion, Israel

Filed May 6, 1994, Ser. No. 238,828

Claims priority, application Israel, Oct. 1, 1992, 103324; Jul. 1, 1993, 106201

Int. Cl.^{6} B21L *5/02*

U.S. Cl. 59—80 **22 Claims**

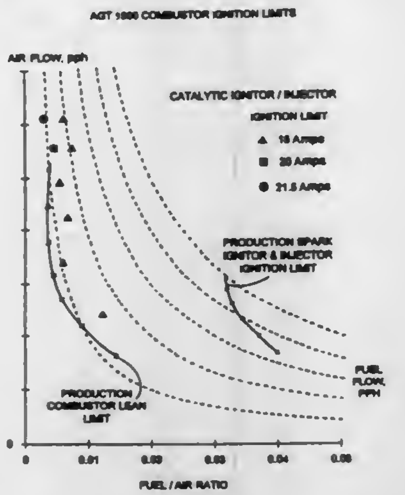


1. A fine diamond cut rope chain comprising a double helix rope chain made from tightly interfitting links of precious metal link wire, each link having a small gap formed therein so as to enable one of said links to pass through the gap of another link, said links being intertwined to fit tightly one against another, at least some of the links of the chain having a shallow high luster diamond-cut surface band formed in at least part of a peripheral outer wall surface of said link, the cross-section of the link wire being substantially of the same shape throughout.

5,531,066
FUEL INJECTOR AND IGNITER ASSEMBLY

William C. Pfefferle, Middletown, N.J., and E. Jack Sweet, Trumbell, Conn., assignors to Precision Combustion, Inc., New Haven, Conn.

Continuation of Ser. No. 227,596, Apr. 14, 1994, abandoned.
This application Aug. 18, 1995, Ser. No. 516,964
Int. Cl.⁶ F02C *7/264*
U.S. Cl. 60—39.822 **9 Claims**



9. In a gas turbine engine, which comprises; a fuel combustion chamber; a catalytic fuel igniter mounted in communication with the combustion chamber; a reservoir of fuel; and means for injecting the fuel into the combustion chamber; the improvement, which comprises;

a fuel injector and ignition catalyst assembly for the catalytic ignition of droplets of atomized liquid fuel for combustion within the combustion chamber, positioned in open communication with the combustion chamber, said assembly comprising;

means for atomizing liquid fuel and forming droplets of the atomized fuel within the assembly;

a catalytic fuel igniter for igniting the fuel droplets;

means for electrically heating said igniter to a temperature for ignition of the fuel droplets; and

means for passing atomized fuel droplets into said chamber such that at least a portion of said atomized fuel droplets contacts said igniter and are ignited as they enter said combustion chamber;

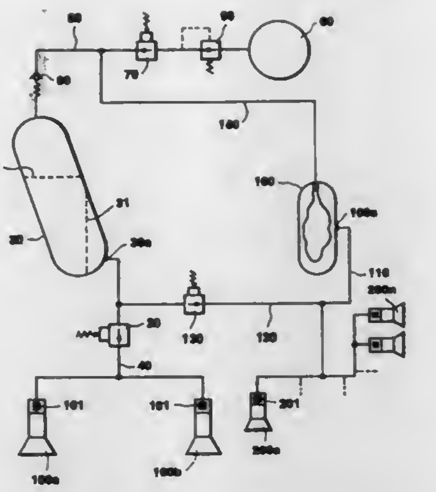
whereby ignited fuel droplets enter the combustion chamber.

5,531,067
OPTIMIZED SYSTEM FOR FEEDING A REIGNITABLE ROCKET ENGINE

Christophe Koppel, St. Denis, France, assignor to Societe Europeenne De Propulsion, Suresnes, France

Continuation of Ser. No. 146,798, Nov. 1, 1993, abandoned.
This application Nov. 13, 1995, Ser. No. 556,631
Claims priority, application France, Nov. 4, 1992, 92 13203
Int. Cl.⁶ F02K *9/44*
U.S. Cl. 60—259 **8 Claims**

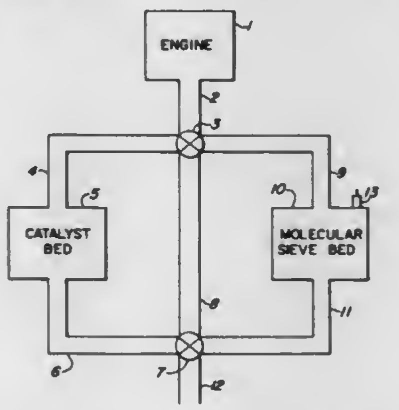
1. A system for feeding the engines of a space vehicle operating in weightlessness or in microgravity with at least one liquid propellant, the system comprising, for the purpose of storing said liquid propellant under a determined pressure of a gas that is greater than the engine feed pressure, a main tank having an outlet and that does not include any device that keeps the main tank outlet covered with liquid whenever outflow is demanded, said main tank oriented in a predetermined attitude such that propellant covers said main tank outlet when said space vehicle accelerates in response to thrust from a load member, and an auxiliary tank of smaller size than the main tank and provided with liquid propellant under pressure of a gas that is greater than the engine feed pressure said auxiliary tank having an outlet and including a device operative to keep the auxiliary tank outlet covered with liquid whenever outflow is demanded, switching means enabling the auxiliary tank to be selectively refilled with propellant from the main tank when the flight conditions of the vehicle due to the thrust orientation are such that the outlet of the main tank is covered by propellant; such that it is always possible to feed a set of load members of liquid propellant that is free from pressurization gas bubbles regardless of the flight conditions of the vehicle, and in particular when it is not possible to take said liquid propellant in bubble-free condition from the main tank.



5,531,068
COMBINATION CATALYST/ADSORBER SYSTEM FOR TREATING AN ENGINE EXHAUST GAS STREAM

Lawrence T. Kass, White Plains, N.Y.; Timothy M. Cowan, Lincoln Park; Dennis Reinertsen, Mt. Olive, both of N.J., and Stephen R. Dunne, Bethel, Conn., assignors to UOP, Des Plaines, Ill.

Filed Jun. 19, 1995, Ser. No. 492,379
Int. Cl.⁶ F01N *3/20*
U.S. Cl. 60—274 **10 Claims**



1. A process for treating an engine exhaust gas stream containing pollutants including hydrocarbons comprising:

a) adjusting a first diverter valve upstream of a catalyst bed containing at least one catalyst such that a cold start engine exhaust stream is directed through the catalyst bed to provide a first treated exhaust stream which is flowed through a second diverter valve which directs said first treated exhaust stream through a connecting pipe, through the first diverter valve and then through a molecular sieve bed containing at least one molecular sieve which preferentially adsorbs hydrocarbons in said first treated exhaust stream versus water to provide a final treated exhaust stream which is flowed through the second diverter valve and then discharged to the atmosphere;

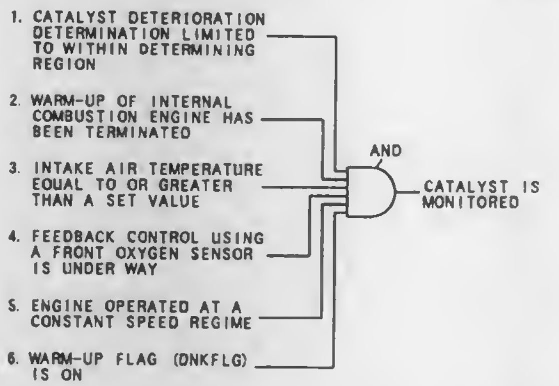
b) continuing to flow an increasingly warmer engine exhaust stream per step (a) until the molecular sieve bed reaches a temperature of about 150° C. to about 200° C., at which time the first diverter valve is adjusted such that the engine exhaust stream is flowed through the molecular sieve bed, thereby desorbing the adsorbed hydrocarbons and providing a second treated exhaust stream containing the desorbed hydrocarbons which is flowed through the second diverter valve which is adjusted to direct said second stream through the connecting pipe, through the first diverter valve and then through the catalyst bed to convert the pollutants to innocuous compounds to provide a final treated exhaust stream which is flowed through the second diverter valve and then discharged to the atmosphere;

c) continuing to flow the engine exhaust stream as in step (b) for a time sufficient to desorb substantially all the hydrocarbons on the molecular sieve, at which time the first diverter valve is adjusted such that the engine exhaust stream is flowed through the catalyst bed, thereby producing a final treated exhaust and flowing said final treated exhaust through the second diverter valve which is adjusted such that the final treated exhaust stream is discharged to the atmosphere.

5,531,069
CATALYST DETERIORATION-DETERMINING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Toyoda Katsuhiko, Shizuoka-ken, Japan, assignor to Suzuki Motor Corporation, Shizuoka-ken, Japan

Filed Dec. 21, 1994, Ser. No. 361,433
Claims priority, application Japan, Jan. 31, 1994, 6-027297
Int. Cl.⁶ F01N *3/20*
U.S. Cl. 60—276 **2 Claims**

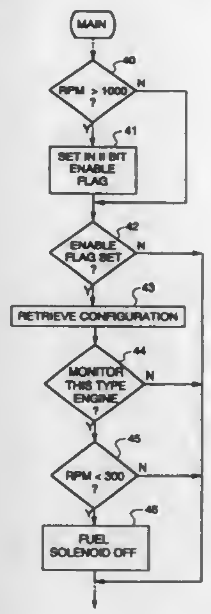

1. CATALYST DETERIORATION DETERMINATION LIMITED TO WITHIN DETERMINING REGION
2. WARM-UP OF INTERNAL COMBUSTION ENGINE HAS BEEN TERMINATED
3. INTAKE AIR TEMPERATURE EQUAL TO OR GREATER THAN A SET VALUE
4. FEEDBACK CONTROL USING A FRONT OXYGEN SENSOR IS UNDER WAY
5. ENGINE OPERATED AT A CONSTANT SPEED REGIME
6. WARM-UP FLAG (DNKFLG) IS ON
AND
CATALYST IS MONITORED

1. In a catalyst deterioration-determining device for an internal combustion engine, having first and second exhaust sensors disposed in an exhaust passage of said internal combustion engine respectively on upstream and downstream sides of a catalyst body, said catalyst body being placed generally midway along said exhaust passage, said catalyst deterioration-determining device effecting feedback control of an air-fuel ratio in response to respective detection signals from said first and second exhaust sensors, and simultaneously determining deterioration of said catalyst body when predetermined catalyst deterioration-determining conditions are fulfilled, the improvement comprising: a control means for judging, on the basis of a warm-up counter used for said catalyst body, whether or not said catalyst body is in a predetermined warm-up state, said warm-up counter counting in relation to any engine load of said internal combustion engine, wherein when said catalyst body is found to be in said predetermined warm-up state according to the above judgment, said control means determines whether or not deterioration-determining conditions for said catalyst body have been fulfilled.

5,531,070
DIESEL ENGINE REVERSE START INHIBIT

John G. Berger, Landisville, Pa.; Edward H. Priepke, Lancaster, and Peter J. Torland, Mt. Joy, all of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed Nov. 25, 1994, Ser. No. 348,898
Int. Cl.⁶ F16D *31/00;* **F02B** *77/00*
U.S. Cl. 60—327.000 **6 Claims**



1. A method for preventing a diesel engine from restarting in reverse when an engine stall, under conditions which might place a backload on the engine, is imminent, said method comprising:

providing a fuel control means for controlling the flow of fuel to the engine;

comparing the sensed engine speed with a first reference speed value having a fixed magnitude representing a speed in approximately the range of the idle speed of the engine;

comparing the sensed engine speed with a second reference speed value having a fixed magnitude representing a second speed less than the idle speed of the engine only after a comparison of the sensed engine speed with said first reference value indicates that the engine speed has exceeded said first reference speed value; and,

controlling said fuel control means to stop the flow of fuel to said engine when the sensed engine speed is less than said second reference speed value.

2. Apparatus for preventing a diesel engine from restarting in reverse when an engine stall, under conditions which might place a backload on the engine, is imminent, said engine having fuel control means for controlling the flow of fuel to said engine, said apparatus comprising:

a speed sensor for sensing the speed of the engine;

a memory for storing a first reference speed value and a second reference speed value, said first reference speed value having a first fixed magnitude representing a speed in approximately the range of the idle speed of said engine and said second reference speed value having a second fixed magnitude representing a second speed less than the idle speed of said engine; and,

a controller responsive to said speed sensor and including,

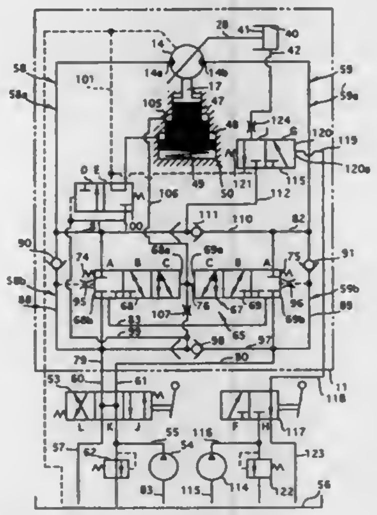
  first comparing means for comparing the sensed engine speed with said first reference speed value;

  second comparing means for comparing the sensed engine speed with said second reference speed value; and,

  means responsive to said first comparing means for enabling said second comparing means only after said first comparing means determines that said sensed engine speed is greater than said first reference speed value; and,

means responsive to said second comparing means for controlling said fuel control means to stop the flow of fuel to said engine when the sensed engine speed is less than said second reference speed value.

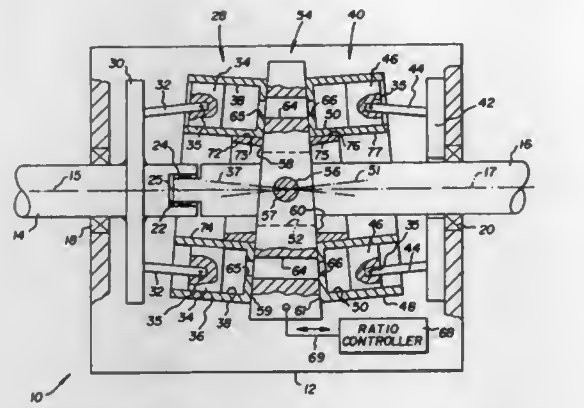
5,531,071
HYDRAULIC SYSTEM
Youji Asano, Gifu-ken, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan
Filed Aug. 15, 1995, Ser. No. 515,528
Claims priority, application Japan, Aug. 22, 1994, 6-219460
Int. Cl.^{6} F16D *31/02;* **F15B** *15/26*
U.S. Cl. 60—441 **14 Claims**



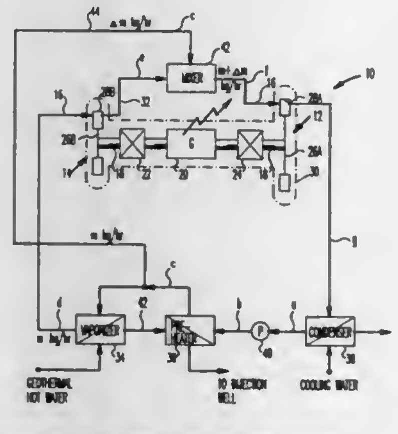
1. A hydraulic system comprising:
a reservoir tank reserving working fluid;
a hydraulic pump sucking in the working fluid from said reservoir tank to increase in pressure and deliver the working fluid;
a hydraulic motor having first and second inlet/outlet ports and having an output rotation shaft, the working fluid being supplied from said hydraulic pump to one of said first and second inlet/outlet ports through one of first and second fluid supply/discharge passageways and discharged from the other of said first and second inlet/outlet ports to said reservoir tank through the other of said first and second fluid supply/discharge passageways, said output rotation shaft being rotated in a direction when the working fluid from said hydraulic pump is received by said first inlet/outlet port, and said output rotation shaft being rotated in the opposite direction when the working fluid from said hydraulic pump is received by said second inlet/outlet port;
a mechanical brake assembly having a brake piston engageable with said output rotation shaft of said hydraulic motor, a cylindrical casing having said brake piston slidably received therein and a brake spring resiliently urging said brake piston to engage with said output rotation shaft of said hydraulic motor, said brake piston and said cylindrical casing collectively defining a main hydraulic chamber to which the working fluid is supplied through a release fluid passageway and from which the working fluid is discharged through said release fluid passageway, said brake piston having a first piston area portion on which pressure of the working fluid in said main hydraulic chamber is exerted so as to disengage said brake piston from said output rotation shaft of said hydraulic motor against resilient force of said brake spring, said output rotation shaft of said hydraulic motor being mechanically braked by the resilient force of said brake spring through said brake piston when the working fluid is discharged from said main hydraulic chamber of said mechanical brake assembly, and said output rotation shaft of said hydraulic motor being released from said brake piston by fluid pressure of the working fluid in said main hydraulic chamber when the working fluid is supplied to said main hydraulic chamber of said mechanical brake assembly;
a shuttle valve provided on said first and second fluid supply/discharge passageways for having said release fluid passageway held in fluid communication selectively with said first and second fluid supply/discharge passageways, the working fluid in one of said first and second fluid supply/discharge passageways held in fluid communication with said release fluid passageway being higher in pressure than that in the other of said first and second fluid supply/discharge passageways;
a directional control valve provided on said first and second fluid supply/discharge passageways, and operative to assume three different directional control valve positions consisting of a first direction control valve position in which the working fluid is permitted to be supplied from said hydraulic pump to said first fluid supply/discharge passageway and to be discharged from said second fluid supply/discharge passageway to said reservoir tank, a second directional control valve position in which the working fluid is permitted to be discharged from said first and second fluid supply/discharge passageways to said reservoir tank, and a third directional control valve position in which the working fluid is permitted to be supplied from said hydraulic pump to said second fluid supply/discharge passageway and to be discharged from said first fluid supply/discharge passageway; and
a counterbalance valve provided on said first and second fluid supply/discharge passageways between said hydraulic pump and said directional control valve, said counterbalance valve being operative to prevent the working fluid from being forced by said hydraulic motor into one of said first and second fluid supply/discharge passageways when said hydraulic motor is still at work under condition that said directional control valve is shifted to assume said second directional control valve position,
said brake piston and said cylindrical casing further defining a secondary hydraulic chamber held in fluid communication with said release fluid passageway through a fluid feed/return passageway, said brake piston having a second piston area portion on which pressure of the working fluid in said secondary hydraulic chamber is exerted so as to resist the resilient force of said brake spring, and
said hydraulic system further comprising a brake resistance restrictor provided on said fluid feed/return passageway for restricting flow of the working fluid in said fluid feed/return passageway.

5,531,072
CONTINUOUSLY VARIABLE HYDROSTATIC TRANSMISSION HAVING SWASHPLATE-MOUNTED CYLINDER BLOCKS
Robert F. Larkin, Pittsfield, Mass., assignor to Martin Marietta Corporation, King of Prussia, Pa.
Filed Mar. 31, 1995, Ser. No. 414,813
Int. Cl.^{6} F16D *39/00*
U.S. Cl. 60—492 **16 Claims**

1. A continuously variable hydrostatic transmission comprising:
an input shaft for receiving input torque from a prime mover and having a first axis;
an output shaft for imparting output torque to a load and having a second axis;
a housing journaling the input shaft for rotation about the first axis and the output shaft for rotation about the second axis;
a hydraulic pump unit coupled for rotation by the input shaft about the first axis, the hydraulic pump unit including a plurality of pump pistons respectively in a plurality of pump cylinders in respective fluid communication with openings in a face of a first member;
a hydraulic motor unit fixed against rotation by the housing, the hydraulic motor unit including a plurality of motor pistons respectively operating in a plurality of motor cylinders in respective fluid communication with openings in a face of a second member;
an annular swashplate drivingly connected to the output shaft on a pivot axis intersecting the second axis in orthogonal relation, the swashplate including:
  an input face in sliding interfacial engagement with the first member face,
  an output face in axially opposed relation to the input face and arranged at an acute angle to the input face, the output face in sliding, interfacial engagement with the second member face, and
  a plurality of ports extending between the input and output faces to accommodate pumped exchanges of hydraulic fluid between the hydraulic pump and motor unit cylinders;
bearing means supporting the first and second members for nutating motions centered on the pivot axis at all transmission ratios; and
a ratio controller linked to the swashplate for producing transmission ratio-changing pivotal motion of the swashplate about the pivot axis.

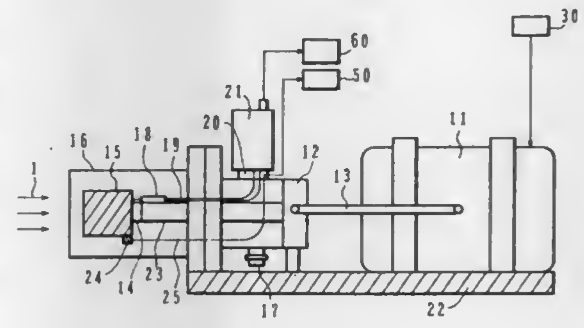


5,531,073
RANKINE CYCLE POWER PLANT UTILIZING ORGANIC WORKING FLUID
Lucien Y. Bronicki, Yavne, and Asher Elovic, Macabeem, both of, Israel, assignors to Ormat Turbines (1965) Ltd, Yavne, Israel
Continuation of Ser. No. 295,036, Aug. 25, 1994, abandoned, which is a continuation of Ser. No. 918,001, Jul. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 730,526, Jul. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 658,303, Feb. 20, 1991, abandoned, which is a continuation of Ser. No. 444,565, Dec. 1, 1989, abandoned.
This application Jun. 2, 1995, Ser. No. 460,728
Int. Cl.^{6} F03G *7/00;* **F01K** *7/34*
U.S. Cl. 60—641.2 **80 Claims**



1. Apparatus for producing power comprising:
a) a pair of multi-staged turbine modules each of which has an input for receiving vaporized working fluid and an output shaft, and each of which is responsive to vaporized working fluid applied to its input for expending the working fluid and producing work at the output shaft and heat depleted working fluid that is superheated;
b) an electric generator located between said modules and directly coupled to their output shafts; and
c) means for supplying superheated, heat depleted working fluid from one of the modules to the input of the other of the modules.

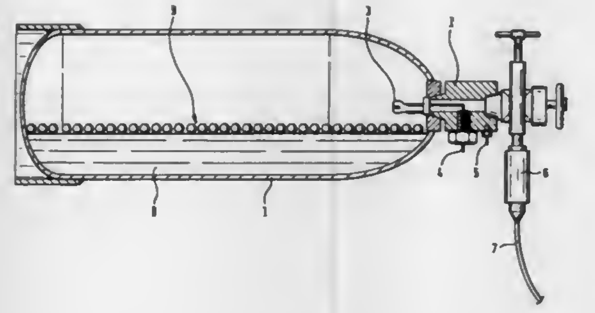
5,531,074
ELECTRONIC DEVICE FREEZED BY INTERMITTENTLY DRIVEN REFRIGERATOR
Masaki Katagiri, Hitachinaka; Yoshito Taguchi, Tokorozawa, and Toshio Uchida, Tanashi, all of, Japan, assignors to Japan Atomic Energy Research Institute, and Sumitomo Heavy Industries, Ltd., both of Tokyo, Japan
Filed Mar. 2, 1995, Ser. No. 397,843
Int. Cl.^{6} F25B *9/00;* **G01J** *5/02*
U.S. Cl. 62—6 **19 Claims**



17. A detecting method wherein a detector is mounted on a cooling part of a refrigerator having a movable part to be forcibly driven, the detector outputting a detection signal corresponding to an externally inputted object to be measured, the detector is cooled, and the detection signal outputted from the detector is analyzed, the method comprising the steps of:
driving said refrigerator and cooling said detector;
stopping driving of said refrigerator and analyzing the detection signal outputted from said detector; and
repeating said cooling step and said analyzing step at a certain periodical cycle.

5,531,075
PROCESS TO TRANSPORT ACETYLENE
Hartmut Behringer, Erstadt; Siegfried Pottkämper; Hans-Werner Stephan, both of Hurth, and Gerrit Marcks, Berlin, all of, Germany, assignors to Messer Griesheim GmbH, Germany
Filed Dec. 19, 1994, Ser. No. 358,247
Claims priority, application Germany, Dec. 21, 1993, 43 43 659.5
Int. Cl.^{6} F17C *11/00*
U.S. Cl. 62—46.1 **19 Claims**

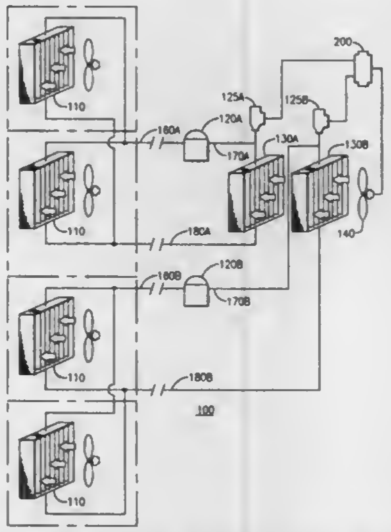
1. In a process to transport acetylene in a pressurized, insulated tank whereby the acetylene is dissolved in a solvent, the improvement being in dissolving the acetylene in the solvent to obtain a solution having a maximum mass ratio of 0.30 acetylene-to-solvent at a temperature of up to −55° C., and covering the surface of the solution in the tank by a multilayer configuration consisting of pieces of floating material.



5,531,076
MULTI-SPLIT FAN CONTROL

Peter J. Pellenz, Syracuse, and Richard D. Dennis, Bridgeport, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 26, 1995, Ser. No. 427,860
Int. Cl.^{6} F25B *39/04;* F25D *17/06*
U.S. Cl. 62—184 **8 Claims**



1. A compressor discharge pressure control apparatus for a unitary fan, multi-split air conditioning system of a type having a plurality of compressors, a plurality of indoor evaporator coils, and a plurality of outdoor condenser coils cooled by a single outdoor fan, comprising:

discharge pressure comparison means for comparing a plurality of compressor discharge pressure measurements with a plurality of predetermined pressure levels and generating a plurality of pressure state signals;

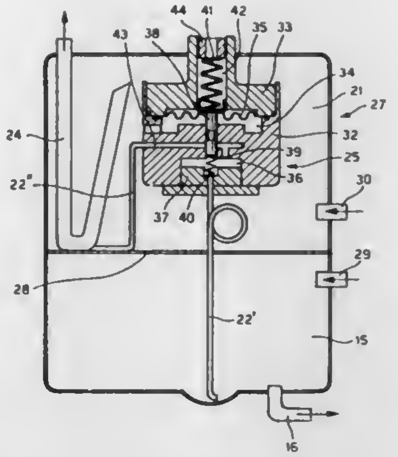
means for generating a plurality of compressor state signals indicative of the running state of said compressors; and

control means for turning said fan on and off in accordance with said pressure control signals and said compressor state signals.

5,531,077
REFRIGERATING SYSTEM WITH AUXILIARY COMPRESSOR-COOLING DEVICE

Franco Formenti, Verano Brianza, Italy, assignor to Veco S.R.L., Giussano, Italy

Filed Nov. 7, 1994, Ser. No. 337,419
Claims priority, application Italy, Nov. 5, 1993, MI93A2361
Int. Cl.^{6} F25B *41/04*
U.S. Cl. 62—197 **3 Claims**



1. A refrigeration system for air conditioners, in which a liquefied refrigerant is circulated at an operative pressure in a closed refrigeration circuit comprising a compressor, a condenser, a receiver for collecting the liquefied refrigerant from the condenser, and an evaporator serially connected to each other; and an auxiliary cooling device for the compressor, said auxiliary cooling device comprising a branched-off path for circulation of liquefied refrigerant from the receiver to an intake of the compressor; flow control and pressure-actuated valve means being provided in said branched-off path, and first pressure sensing means at the intake side of the compressor to operate said flow control valve means and to allow circulation of liquefied refrigerant from said receiver to said compressor intake, said valve means and said first pressure sensing means comprise in combination:

a valve body having a valve chamber and a yielding membrane sealingly provided in said valve chamber between an upper and a bottom side; the upper side of said valve chamber being connected to the atmosphere while the bottom side of the valve chamber being connected to the compressor intake to provide said first pressure sensing means;

and a closed cavity in the valve body (32), said closed cavity being connected to the bottom of the receiver by a capillary pipe, respectively being connected to the intake side of the compressor by a flow path provided with said pressure-actuated flow-control valve means; a bore in the valve body axially extending between the bottom side of the valve chamber and said closed cavity, and a valve member slidingly movable in said axial bore between a retracted and an advanced position respectively to close and to open said flow path;

counteracting spring means being provided at opposite ends of the valve member, said spring means and said membrane conjointly acting on said valve member to open said flow path for circulating a metered flow of liquefied refrigerant from the receiver to the compressor intake when the sensed suction force in the bottom side of the valve chamber, drops below a preset pressure value lower than the operative pressure for the compressor.

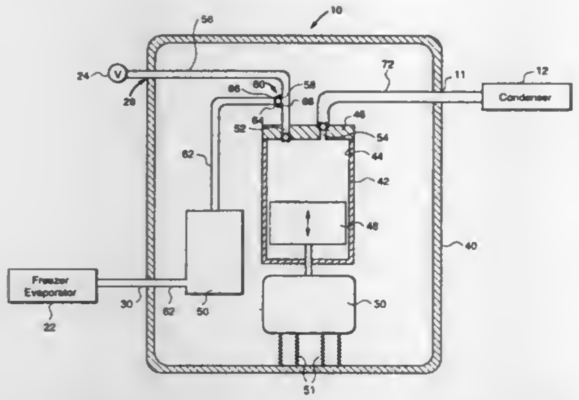
5,531,078
LOW VOLUME INLET RECIPROCATING COMPRESSOR FOR DUAL EVAPORATOR REFRIGERATION SYSTEM

James Day, Scotia, N.Y., and Stephen Searl, Rockford, Mich., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,863
Int. Cl.^{6} F25B *5/02*
U.S. Cl. 62—199 **19 Claims**

7. In a refrigeration system having a first evaporator, a second evaporator and an active valve connected to receive a portion of the refrigerant discharged from said first evaporator, a reciprocating compressor comprising:

a housing having a first inlet connected to said active valve and a second inlet connected to said second evaporator;



a cylinder block disposed in said housing and having a cylinder formed therein, said cylinder having an inlet port and an outlet port;

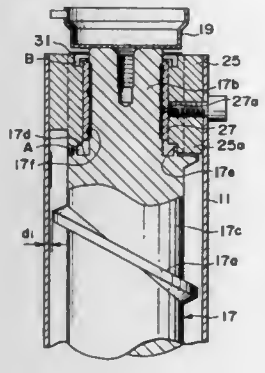
a conduit extending between said inlet port and said first inlet and having an inlet passage formed therein; and

a check valve connected to said inlet passage so as to prevent flow out of said conduit.

5,531,079
BEARING STRUCTURE FOR AUGER-TYPE ICE MAKING MACHINES

Susumu Tatematsu, 5-12-1, Josai, Nishi-ku, Nagoya-shi, Aichi-ken; Hiroyuki Sugie, 15-9, Higashiyamadai, Miyoshi-cho, Nishikamo-gun, Aichi-ken; Naoya Uchida, Sakyoyama Kopo B201, 2108 Sakyoyama, Midori-ku, Nagoya-shi, Aichi-ken; Yasumitsu Tsukiyama, 2-68, Dengakugakubo, Kutsukake-cho, Toyoake-shi, Aichi-ken, and Hideyuki Ikari, 6-35, Hoochida, Imagawa-cho, Kariya-shi, Aichi-ken, all of, Japan

Filed Oct. 6, 1994, Ser. No. 319,010
Int. Cl.^{6} F25C *5/12*
U.S. Cl. 62—354 **13 Claims**



1. A bearing structure for auger-type ice making machines, comprising:

a vertical and cylindrical refrigeration casing having an upper end portion and an inner surface;

an auger rotatably mounted within said refrigeration casing having a helical blade for scraping off ice generated on the inner surface of said refrigeration casing and pushing the ice up and out of said refrigeration casing and an upper shaft section;

a slide bearing supporting said upper shaft section of said auger, said slide bearing having a bearing surface with a helical groove therein and lower and upper ends;

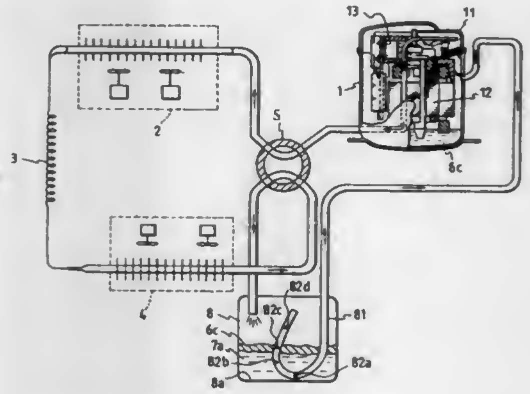
a press head provided inside said upper end portion of said refrigeration casing, said press head supporting said slide bearing; and

substantially closed first and second foreign matter trap spaces formed adjacent to said lower and upper ends of said slide bearing.

5,531,080
REFRIGERANT CIRCULATING SYSTEM

Takubo Hirahara; Susumu Kawaguchi; Tatsuaki Shimizu; Katsuyuki Kawasaki; Noboru Masuda; Shinobu Ogasawara; Hiroshige Konishi; Hitoshi Maruyama, all of Shizuoka; Yoshihiro Sumida, Hyogo; Akemi Ueyama, Hyogo; Satoru Toyama, Hyogo; Sou Suzuki, and Yasushi Akahori, both of Shizuoka, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 206,846, Mar. 7, 1994. This application Jul. 12, 1994, Ser. No. 273,848
Claims priority, application Japan, Apr. 27, 1993, 5-101264; Nov. 30, 1993, 5-300220; Apr. 26, 1994, 6-088957
Int. Cl.^{6} F25B *43/02*
U.S. Cl. 62—470 **28 Claims**



1. A refrigerant circulating system comprising:

a compressor that uses a hydrofluorocarbon based single or mixed refrigerant and which draws in a gaseous refrigerant containing a liquid refrigerant while discharging it as a high-pressure gaseous refrigerant;

a condenser positioned downstream of said compressor for condensing the high-pressure gaseous refrigerant discharged from said compressor;

a throttle mechanism positioned downstream of said condenser for reducing a pressure of a liquid refrigerant leaving said condenser; and

an evaporator positioned downstream of said throttle mechanism for vaporizing the liquid refrigerant or a gas-liquid phase refrigerant leaving said throttle mechanism, and in which system a refrigerating oil is contained within one of said compressor provided in said system or in a separate tank at least part of said refrigerating oil being exposed to said refrigerant for performing the function of at least one of lubrication or sealing, wherein said refrigerating oil has such a solubility that a weight factor of dissolution thereof in the liquid refrigerant is 0.5 to 7% under condensing pressure and temperature conditions, and the refrigerant is a mixture of refrigerants at least one of which is an inflammable refrigerant.

5,531,081
TWO PIECE LAUNDRY ADDITIVE DISPENSER CUP

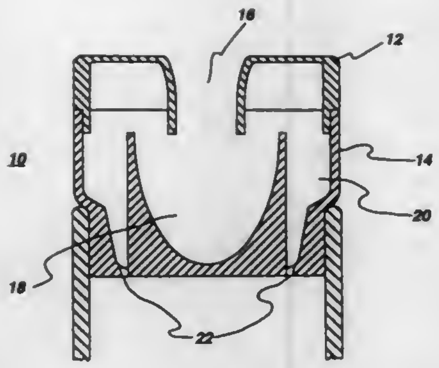
Sudhir D. Savkar, Schenectady, N.Y.; Brain D. Lisek, Louisville, Ky., and Robert E. Sundell, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 27, 1995, Ser. No. 379,041
Int. Cl.^{6} D06F *39/02*
U.S. Cl. 68—17 A **6 Claims**

1. A dispenser cup for use within a washing machine having a design angular speed, a spin speed, a peak agitation speed and a peak angular speed of agitation, comprising:

a top cap having an inlet;

said top cap fixedly positioned above a bottom cup, wherein said inlet fluidly connects said top cap to said bottom cup;



said bottom cup comprising an inner chamber capable of holding an additive and an outer chamber having a bottom;
said outer chamber having a larger diameter than said inner chamber, and said outer chamber coaxially positioned to said inner chamber;
said outer chamber having one or more apertures therein, wherein said apertures are located at the bottom of said outer chamber, to dispense said additive;
said inner chamber having a parabolic shape defined by the following equations:

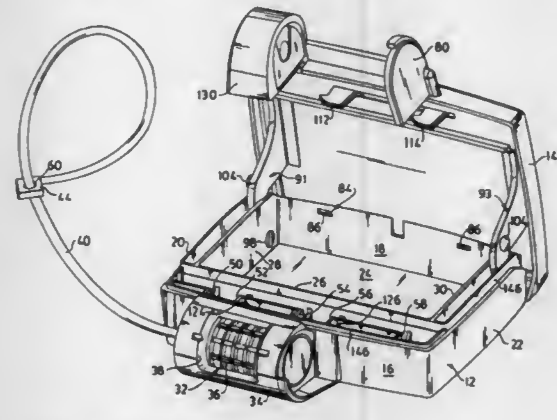
shape—$Z=(\Omega^2 r^2)/2g$;

fill Level—$c=\Omega[v_c/(\pi g)]^{1/2}$;

height—$H^2=c^2[1-(w^2/\Omega^2)]^{-1}$;

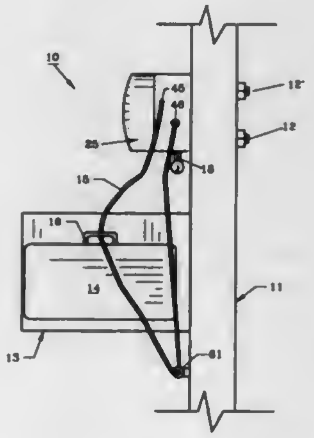
wherein, Ω is equal to the design angular speed (radians/second) set less than or equal to the spin speed and greater than or equal to the peak agitation speed; v_c is the inner chamber's volumetric capacity; g is the gravitational force; r is the radius of the inner chamber at a given height Z; c is the height of the fill level; and w is the peak angular speed (radians/second) of agitation.

5,531,082
PORTABLE SECURITY CASE
Douglas J. Wolk, Hamlin; William C. Carapezza, and Richard J. Sylvester, both of Rochester, all of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.
Filed Oct. 18, 1994, Ser. No. 324,874
Int. Cl.^{6} B65B *55/14;* **F05B** *65/48*
U.S. Cl. 70—63 **7 Claims**



1. A portable security case comprising:
a base;
a lid that can be opened and closed with respect to said base;
a primary lock that locks both said lid to said base and said base to another object;
a secondary lock that locks said lid to said base;
said primary and secondary locks being interconnected so that said secondary lock cannot be unlocked unless said primary lock is also unlocked;
said primary and secondary locks being interconnected by a latch that is movable between positions of engagement and disengagement with said secondary lock;
said primary lock being a cable lock that includes a bore for capturing one end of a cable; and
said latch being moved into engagement with said secondary lock by inserting said one end of the cable into said bore.

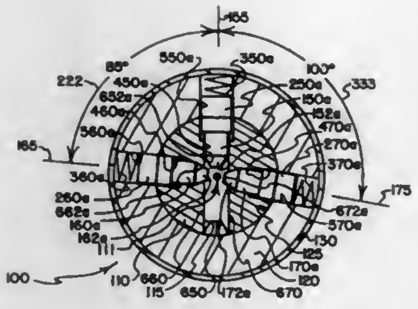
5,531,083
CABLE LOCK DEVICE
William F. Franck, III, Greensboro, N.C., and James R. Jamerson, Martinsville, Va., assignors to Windsor Products, Inc., Greensboro, N.C.
Filed Jul. 25, 1994, Ser. No. 280,073
Int. Cl.^{6} E05B *73/00;67/06*
U.S. Cl. 70—58 **17 Claims**



1. A cable lock device comprising: a cylindrical base, a grooved protraction, said protraction attached to said base, an end cap, an end cap extension, said end cap extension attached to said end cap, said end cap extension for insertion into said cylindrical base, a cap stud, said cap stud joined to said cap, said cap stud for selective engagement with said grooved protraction for rotation therein, a locking ring, said locking ring contained within said cylindrical base, for engagement and a cable reel, said cable reel mounted within said cylindrical base for cable storage thereon and release therefrom upon selected rotation of said end cap.

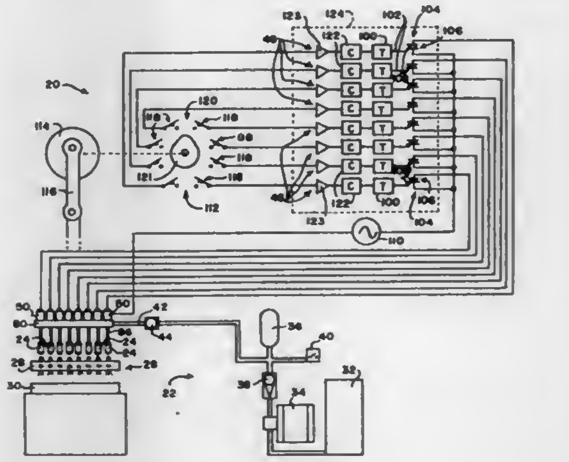
5,531,084
KEY FOR ROTARY PLUG AND CYLINDER LOCK, AND METHOD OF FORMING THE KEY
Timothy P. Laabs, Palatine; Michael O. Misner, Lake Villa; Richard H. Schulz, Wheeling, and Elbert M. Spencer, Wildwood, all of Ill., assignors to The Eastern Company, Wheeling, Ill.
Continuation-in-part of Ser. No. 163,149, Dec. 6, 1993, Pat. No. 5,485,735. This application Mar. 1, 1995, Ser. No. 397,421
Int. Cl.^{6} E05B *19/06*
U.S. Cl. 70—409 **36 Claims**

1. A difficult-to-duplicate key for operating a lock, wherein the key comprises:
a) an elongate key member that has a pair of opposed, relatively narrow edge surfaces, and a pair of opposed, relatively wide side surfaces that cooperate to provide the key member with a rectangular cross section that is substantially uniform along the length of the key member, and that has an imaginary center axis extending along the length of the key member at a location between the edge surfaces and centered between the side surfaces;



b) first, second and third rows of concave recesses formed in the key member, with the rows each extending lengthwise along the key member;
c) with the recesses of the first row each being symmetrical about and extending along a separate one of a set of first axes that extend parallel to each other and that reside within a common first plane, with the first plane being oriented such that it includes the imaginary center axis and extends from the imaginary center axis to substantially perpendicularly intersect one of the edge surfaces, at which intersection the recesses of the first row are formed in said one edge surface of the key member, with each of the recesses of the first row being substantially circular in shape;
d) with the recesses of the second row each being symmetrical about and extending along a separate one of a set of second axes that extend parallel to each other and that reside within a common second plane, with the second plane being oriented such that it includes the imaginary center axis and extends from the imaginary center axis to intersect one of the side surfaces, at which intersection the recesses of the second row are formed in said one side surface of the key member;
e) with the recesses of the third row each being symmetrical about and extending along a separate one of a set of third axes that extend parallel to each other and that reside within a common third plane, with the third plane being oriented such that it includes the imaginary center axis and extends from the imaginary center axis to intersect the other of the side surfaces, at which intersection the recesses of the third row are formed in said other side surface of the key member;
f) with the second and third planes comprising distinctly separate, non-coplanar planes that intersect with the first plane along the imaginary center axis, and with the second and third planes being inclined relative to the first plane at unequal first and second angles of inclination, respectively, with the first angle being chosen from a first set of angles that reside within a range of about 75 to about 105 degrees, with the second angle being chosen from a second set of angles that reside within a range of about 75 to about 105 degrees, with the angles that comprise the first set differing from each other by no less than about 5 degrees, with the angles that comprise the second set differing from each other by no less than about 5 degrees, and with at least one of the chosen first and second angles of inclination not being equal to either of 90 and 105 degrees; and,
g) whereby the recesses of at least one of the second and third rows of recesses are caused to be of non-circular shapes that are difficult to "read" to ascertain the orientation of their associated set of axes, thereby rendering the key difficult to duplicate.

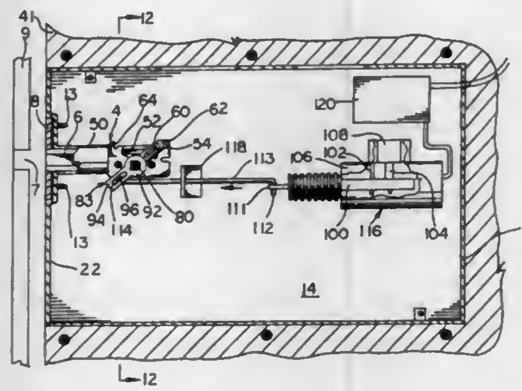
5,531,085
DIE LUBRICANT APPLICATOR
John W. Hayes, 1660 Highway 51 South, Hernando, Miss. 38632
Filed May 5, 1994, Ser. No. 238,302
Int. Cl.^{6} B21B *45/02;37/08*
U.S. Cl. 72—43 **18 Claims**



1. A die lubricant applicator for spraying lubricant from a pressurized source of said lubricant through a plurality of injector nozzles onto a die press, said die press having a movable die, said applicator comprising, respectively associated with each said injector nozzle:
(a) metering means, interposed between its respective said injector nozzle and said pressurized source, for selectively passing said lubricant in a flow from said pressurized source to its respective said injector nozzle, said metering means including solenoid-operated valve means for selectively gating the flow of said lubricant to its respective said injector nozzle; said solenoid-operated valve means having an orifice through which said lubricant is allowed to selectively flow from said pressurized source to said respective said injector nozzle and said solenoid-operated valve means including a movable plunger, said plunger being movable between a first open position in which said orifice is not sealed by said plunger and a second closed position in which said orifice is directly sealed by said plunger; and
(b) control means, responsive to the movement of said movable die, for causing said metering means to pass said lubricant from said pressurized source to its respective said injector nozzle during a predetermined and programmable dwell time, thereby causing a predetermined volume of said lubricant to pass from said pressurized source to its respective said injector nozzle; said control means including:
  i. programmable timer means, triggerable by the movement of said movable die, for generating a control signal active for said dwell time; and
  ii. switching means, responsive to said control signal, for selectively applying current from an electrical power source to said solenoid-operated valve means and causing said metering means to pass said lubricant for said dwell time,
at least one said programmable timer means, associated with one said injector nozzle, being independently programmable for its respective said dwell time relative to another said programmable timer means associated with another said injector nozzle.

5,531,086
KEYLESS ENTRY DEADBOLT LOCK

Randy K. Bryant, 20430 C.R. 8, Bristol, Ind. 46507
Filed Aug. 15, 1994, Ser. No. 290,068
Int. Cl.^{6} E05B *47/00*
U.S. Cl. 70—279 **20 Claims**



1. A locking system for a door comprising:

a bolt movable between a retracted and extended position;

a manual operator means operatively connected to said bolt for moving said bolt between said extended and retracted positions upon manual actuation;

an engaging member telescoping a part of said manual operator means, said part having an axis of rotation extending transversely to a line along which said bolt moves;

said engaging member having a slot extending substantially radially from an axis of rotation of the engaging member; and

an actuator having gear means and an elongated moving member, said elongated moving member having a plurality of teeth, said gear means having a gear segment that engages said teeth of said elongated moving member to longitudinally move said elongated moving member between extended and retracted positions upon rotation of said gear means, said moving member operatively connected to said engaging member slot to rotate said engaging member to rotate said part that moves said bolt longitudinally between its extended and retracted positions upon energization of said actuator to operate said gear means to rotate said gear segment that longitudinally moves said moving member between extended and retracted positions.

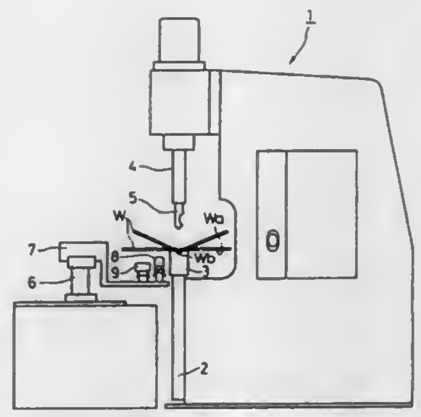
5,531,087
METAL SHEET BENDING MACHINE

Hiroyuki Kitabayashi, Hirakata; Yoshiaki Kuroda; Ikuo Kamada, both of Komatsu, and Toshiyuki Ooenoki, Hirakata, all of, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Continuation-in-part of Ser. No. 30,467, Apr. 5, 1993, Pat. No. 5,367,902. This application Aug. 18, 1994, Ser. No. 292,940
Int. Cl.^{6} B21C *51/00;* **B21B** *37/14;* **B30B** *15/26*
U.S. Cl. 72—37 **14 Claims**

1. A metal sheet bending machine for being a metal sheet, said machine having an upper bender and lower bender between which the metal sheet is positioned for bending the metal sheet to a desired angle along a bending line, said machine comprising:

(a) a measuring light source for projecting a linear image onto an outer face of the metal sheet while the metal sheet is being bent to the desired angle, said light source positioned relative to the metal sheet so that the linear image of projected measuring light rotates as the bending angle of the metal sheet changes as a result of bending of the metal sheet by changing the relative position of the upper and lower benders;

(b) photographing means for sequentially photographing the outer face of the bent metal sheet on which the linear image of projected measuring light is formed by the measuring light source, while the metal sheet is being bent to the desired angle, said photographing means forming sequential images representative of the position of the linear image on the outer face as the metal sheet is bent;



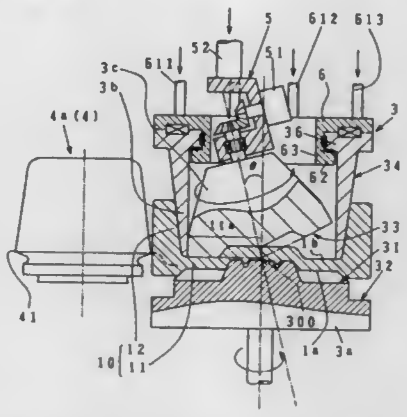
(c) memory means for storing the sequential images which have been photographed by the photographing means, each sequential image including the linear image of projected measuring light;

(d) calculating means for calculating, based on changes in the rotated angular position of the linear image of successive sequential image stored in the memory means and based on a preset photographing angle for the photographing means and a preset light projecting angle for the measuring light source, a bending angle of the metal sheet while the metal sheet is being bent and the resulting sequential images are being photographed; and

(e) control means for controlling the positions of the upper bender and/or lower bender according to a calculation result obtained from the calculating means.

5,531,088
ROTARY FORGING APPARATUS

Shujiro Inatani, Osaka, Japan, assignor to Rays Engineering Co., Ltd., Osaka, Japan
Filed Nov. 9, 1994, Ser. No. 338,092
Claims priority, application Japan, Nov. 10, 1993, 5-281510
Int. Cl.^{6} B21D *5/00;22/00;22/14*
U.S. Cl. 72—84 **12 Claims**



1. A rotary forging apparatus for making a product from a workpiece of plastic metal material, the product having a disc part and a rim part, the disc part having a first disc surface and a second disc surface, the rim part having an outer surface, a first inner surface that communicates with the first disc surface and a second inner surface that communicates with the second disc surface, the apparatus comprising:

a first rotary ram rotatable around a common axis and having a first disc pressing surface and a first rim shaping surface, the first disc pressing surface conforming to the first disc surface of the product, the first rim shaping part conforming to the first inner surface of the rim part,

a hollow second rotary ram facing the first ram, the second ram being rotatable around the common axis and having a second rim shaping surface conforming to the second inner surface of the rim part,

a generally conical third rotary ram having a curved bottom which serves as a second disc pressing surface, the third ram being provided in the second ram and being rotatable around an oblique axis slanting with respect to the common axis, the second disc pressing surface being configured to form the second disc surface,

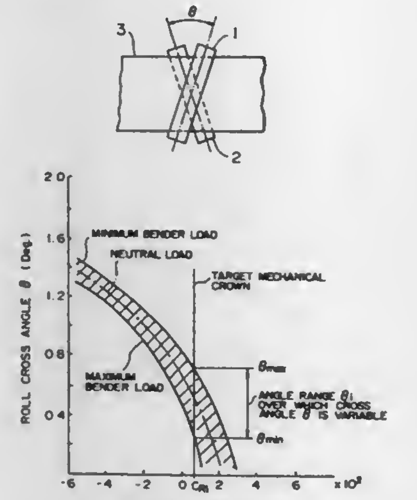
a shaping roller device comprising at least a shaping roller at a side of the rams, the shaping roller having a section configured to form at least a portion of the outer surface of the rim part and being rotatable around a roller axis parallel with the common axis for shaping the rim part, and

a roller supporting device for sustaining the shaping roller adjacent the rams,

wherein the workpiece is sandwiched between the first ram and the second ram, wherein the third ram presses the workpiece against the first ram and shapes the disc part, and wherein a portion of the workpiece is extruded from the rams and is pressed from the side by the shaping roller device for shaping the rim part.

5,531,089
SHEET CROWN CONTROL METHOD AND ROLLING EQUIPMENT LINE FOR ENDLESS ROLLING

Hideyuki Nikaido; Nobuaki Nomura; Toshisada Takechi; Yoshimitsu Fukui; Masanori Kitahama; Kunio Isobe, and Norio Takashima, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan
Filed May 3, 1994, Ser. No. 237,050
Claims priority, application Japan, May 7, 1993, 5-106741; Jan. 26, 1994, 6-007003
Int. Cl.^{6} B21B *1/24*
U.S. Cl. 72—241.8 **11 Claims**



1. A sheet crown control method for use in endless rolling in which consecutively fed sheets are joined to each other and continuously rolled through a rolling equipment line having a plurality of stands, the method comprising the steps of:

determining a roll cross angle range for each sheet based on a target sheet crown corresponding to the sheet, at least two of the sheets having different roll cross angle ranges;

comparing the roll cross angle ranges for the sheets to be rolled;

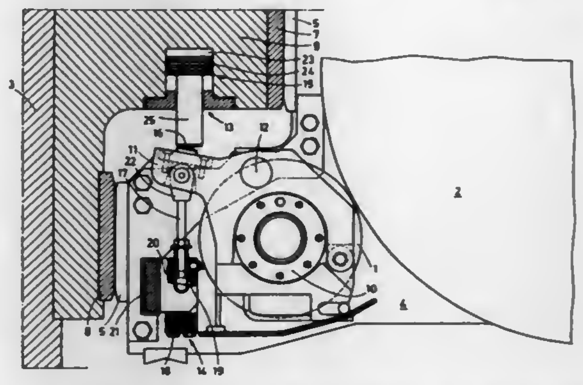
determining a common roll cross angle which is within the roll cross angle range for each sheet;

setting a roll cross angle of rolls incorporated in each of said stands to the common roll cross angle; and

adjusting a roll bender load of each of said stands for each of said sheets to achieve the target sheet crown for each of said sheets.

5,531,090
ADJUSTING DEVICE FOR THE BRUSH ROLL IN A ROLL STAND

Achim Klein, Kreuztal, and Hans-Jürgen Bender, Olpe, both of, Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany
Filed Dec. 23, 1993, Ser. No. 173,580
Claims priority, application Germany, Dec. 30, 1992, 42 44 524.8
Int. Cl.^{6} B21B *28/00*
U.S. Cl. 72—236 **20 Claims**



1. A device for adjusting a brush roll relative to a work roll in a roll stand for hot-rolling of aluminum, wherein the brush roll is rotatable in a direction opposite the direction of rotation of the work roll, and wherein the roll stand comprises means for displacing in a translatory movement the brush roll parallel to the work roll, the roll stand including a chock and a balancing block for the work roll, the adjusting device comprising support means for the roll brush mounted on the chock, each support means comprising a pivot bearing and a pivoting lever for pivoting the roll brush about the pivot bearing relative to the work roll, a controllable actuating element mounted in the balancing block and a restoring support element mounted on the chock, wherein the pivoting lever is mounted between the controllable actuating element and the restoring support element.

5,531,091
SENSOR WITH QUARTZ TUNING FORK

Lothar Gademann, Rottenburg; Klaus Miekley, Ludwigsburg; Botho Ziegenbein, Reutlingen, and Andreas Reppich, Leonberg, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Sep. 23, 1994, Ser. No. 311,076
Claims priority, application Germany, Sep. 28, 1993, 43 32 944.6
Int. Cl.^{6} G01D *3/036;11/24*
U.S. Cl. 73—1 DV **10 Claims**

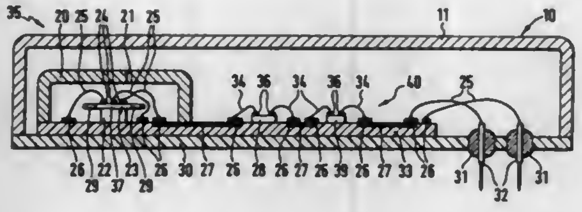
1. A sensor comprising:

a) a gas-tight housing having gas-tight passthroughs to guide electrical signals into and out of said gas-tight housing;

b) a board, said board arranged within said gas-tight housing;

c) a quartz tuning fork

  i) being arranged on said board within said gas-tight housing, and



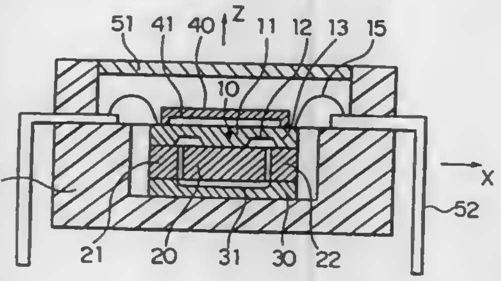
ii) having electrical contact surfaces at which the electrical signals are delivered and derived via connector wires; and

d) an analysis circuit for processing the electrical signals, said analysis circuit being arranged on said board within said gas-tight housing.

5,531,092

DEVICE FOR MOVING A SUSPENDED WEIGHT BODY

Kazuhiro Okada, 73, Sugaya 4-Chome, Ageo, Saitama 362, Japan
Division of Ser. No. 168,024, Dec. 15, 1993, which is a division of Ser. No. 761,771, Aug. 14, 1991, Pat. No. 5,295,386. This application Feb. 24, 1995, Ser. No. 393,801
Claims priority, application Japan, Dec. 28, 1989, 1-343354; Mar. 27, 1990, 2-77397; Jul. 27, 1990, 2-200449
Int. Cl.^{6} G01P *15/04*
U.S. Cl. 73—1 D **16 Claims**



1. A device for moving a suspended weight body in a direction along an X-axis in an XYZ three-dimensional coordinate system, the device comprising:

a first substrate having a first plane surface which is parallel with an XY-plane of said coordinate system, said first substrate including a working portion to which a weight body to be moved is attached, a fixed portion fixed to a device body, and a flexible portion having flexibility formed between said working portion and said fixed portion, said weight body being suspended by the first substrate;

a second substrate having a second plane surface which is opposite to said first plane surface with a predetermined distance and is fixed to said fixed portion;

a first set of two electrode layers formed on said first plane surface, wherein a first layer is located in a positive field of the X-axis and substantially has a symmetrical shape with respect to the X-axis, and a second layer is located in a negative field of the X-axis and substantially has a symmetrical shape with respect to the X-axis;

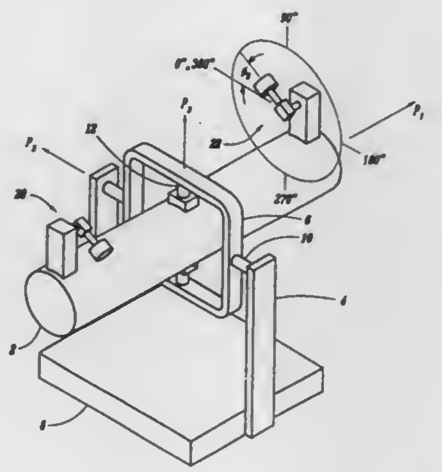
a second set of two electrode layers formed on said second plane surface, wherein first and second layers of the second set are opposite to said first and second layers of the first set, respectively; and

means for applying predetermined voltages to said first set of electrodes and said second set of electrodes to exert a coulomb force therebetween, thereby permitting said first substrate to produce a mechanical deformation to move said weight body in the X-axis direction.

5,531,093

MEANS FOR POSITIONING AND REPOSITIONING SCANNING INSTRUMENTS

Michael E. Polites, and Dean C. Alhorn, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 17, 1995, Ser. No. 422,967
Int. Cl.^{6} G01C *25/00*
U.S. Cl. 73—1 E **6 Claims**



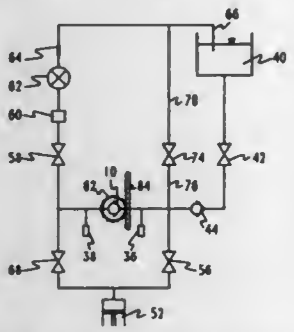
1. A method for positioning and repositioning, that is pointing, a scanning instrument when the instrument is offset from a center-of-scan thereof and must be pointed to that center, wherein the instrument is a type whose scanning is accomplished by rotating unbalanced-masses (RUMS) rotating in fixed axes rotation relative to and associated with the instrument, and wherein the rotating unbalanced-mass instrument has first and second rotatable unbalanced-masses supported on respective drive shafts spaced from the center-of-mass of the instrument, and adapted to rotate 180 degrees out-of-phase with each other, with planes-of-rotation thereof parallel to each other, and at a constant nominal angular velocity so that centrifugal forces caused by rotation of the RUMs create a time-varying relatively large-amplitude/high-frequency reaction forces and torques which act on the instrument to move its line-of-sight in a predetermined, repetitive, scan pattern, the pointing method including the steps of: measuring elevation and cross-elevation angles and the rate-of-change of these angles to determine any offset and offset time rate-of-change, calibrating magnitude and direction components of the offset about elevation and cross-elevation axes, converting these components to a RUM cyclic angular velocity component on top of the nominal velocity, and to a locus of the RUM 360 degree orbit where a peak of this cyclic component is to occur, accelerating the speed of the RUMS and decelerating the RUMs each cycle to produce the required angular velocity, thereby modulating the angular velocity to generate a torque which when combined with the high-frequency torque produces a resultant torque vector each cycle whose direction is dependent upon the location of the locus in the RUM orbit where a peak of the cyclic component of the RUM angular velocity occurs, and which acts to compensate for the offset from the center-of-scan.

5,531,094

APPARATUS FOR TESTING PROSTHETIC HEART VALVE HINGE MECHANISM

Robert B. More; Peter Strzepa, both of Austin; Michael J. Mewhort, Pflugerville, and Thomas S. Reventas, Austin, all of Tex., assignors to Carbomedics, Inc., Austin, Tex.
Filed Nov. 14, 1994, Ser. No. 339,476
Int. Cl.^{6} G01M *19/00*
U.S. Cl. 73—4 R **22 Claims**

1. An apparatus for proof testing at least part of a mechanical prosthetic heart valve, said part including at least one leaflet and a valve body holding said leaflet, said apparatus comprising



means for holding said part of said mechanical prosthetic heart valve in a selected position for proof testing,

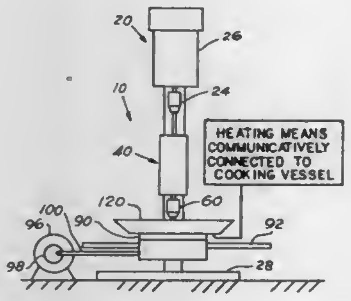
means for directing a working fluid against said at least one leaflet and for forcing said leaflet into a closed position impeding flow of said working fluid, and

means for maintaining an elevated back pressure against said leaflet for a selected period of time, said back pressure exceeding 22 psi and being sufficient to provide a selected energy of fracture.

5,531,095

METHOD AND APPARATUS FOR DETERMINING THE MECHANICAL DURABILITY OF THE SURFACE FINISH OF A COOKING VESSEL

Charles J. Hupf, Cascade, Wis., assignor to Regal Ware, Inc., Kewaskum, Wis.
Filed Jan. 14, 1994, Ser. No. 182,921
Int. Cl.^{6} G01N *3/56*
U.S. Cl. 73—7 **8 Claims**



1. An apparatus for determining the mechanical durability of a surface finish of a cooking vessel, the apparatus comprising:

a web of material having an abrasive surface;

a stationary base;

a rotary motor connected to the base, the rotary motor having a first connector;

a force transferring mechanism having an input and an output, the input connected to the first connector;

a predetermined point of the web of material connected to the output;

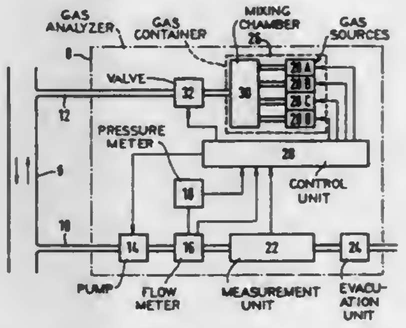
a linear table connected to the base, the linear table having at least one clamp for clamping the cooking vessel to the table;

a reciprocating motor connected to the linear table.

5,531,096

GAS ANALYZER AND METHOD FOR ANALYZING A GAS

Rolf Castor, Haegerstein, Sweden, assignor to Siemens Elema AB, Solna, Sweden
Filed Nov. 17, 1994, Ser. No. 342,058
Claims priority, application Sweden, Dec. 3, 1993, 9304028
Int. Cl.^{6} G01N *30/00;31/00;* A61B *5/08*
U.S. Cl. 73—23.2 **17 Claims**



1. A method for analyzing a gas in a confined system with fluid flow having a plurality of gas components, with regard to at least one of said components, said method comprising the steps of:

extracting a quantity of gas from gas to be analyzed as a gas sample;

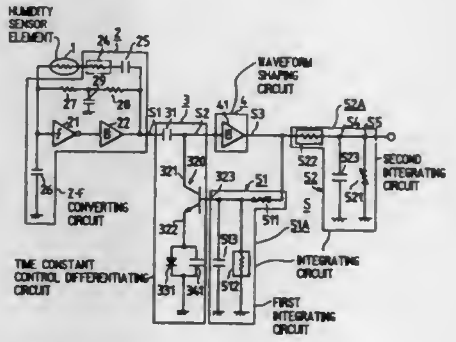
measuring the flow of said extracted gas sample; and

supplying a replacement gas that compensates for said extracted quantity of gas back to said gas to be analyzed with substantially no delay following extraction of said gas sample and with said replacement gas having the same quantity as the extracted gas sample.

5,531,097

ABSOLUTE HUMIDITY METER

Atsuko Tsuchida, and Shiro Nakagawa, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Feb. 9, 1995, Ser. No. 385,877
Claims priority, application Japan, Feb. 9, 1994, 6-015589; Dec. 14, 1994, 6-310797
Int. Cl.^{6} G01W *1/00;* G01N *27/12*
U.S. Cl. 73—29.02 **16 Claims**



1. An absolute humidity meter comprising:

a humidity sensor having an electrical impedance changing exponentially with respect to a relative humidity;

an impedance-frequency converting circuit for generating a pulse signal whose frequency corresponds to the impedance of said humidity sensor;

a time constant control differentiating circuit including a capacitor and a voltage control variable impedance element connected in series with each other, said voltage control variable impedance element including a three-terminal element having main electrodes and a control electrode, an impedance of said voltage control variable impedance element changing exponentially in accordance with a voltage applied to the control electrode, a differentiated signal being obtained by differentiating the pulse signal being outputted across both terminals of the main electrodes;

a waveform shaping circuit coupled with output of said time constant controlled differentiating circuit, for generating a pulse signal when the differentiated signal exceeds a predetermined threshold level; and

an integrator including a first integrating circuit and a second integrating circuit, said first integrating circuit coupled with output of said waveform shaping circuit for integrating the inputted pulse signal train and supplying a voltage obtained by the integration to the control electrode of the voltage control variable impedance element, and said second integrating circuit coupled with the output of said waveform shaping circuit for integrating the pulse signal train and outputting a voltage obtained by the integration which represents a relative humidity signal,

wherein at least one of the first integrating circuit and the second integrating circuit includes a thermal sensing element placed in close association to the humidity sensor so as to monitor temperature and change in temperature at a location of said humidity sensor to control one of the control voltage and the output voltage of the relative humidity signal in accordance with changes in the temperature of the humidity sensor to obtain an absolute humidity signal.

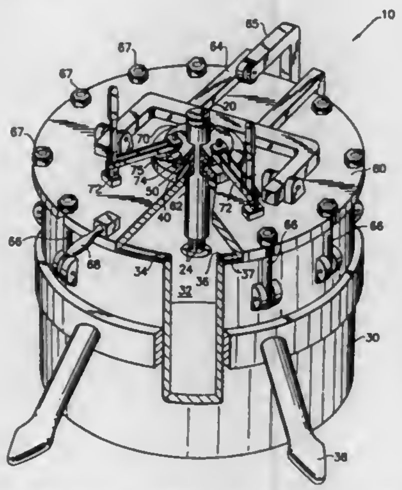
5,531,098
HYBRID INFLATOR TESTING TANK

Steven D. Bybee, Roy, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed May 31, 1995, Ser. No. 456,034

Int. Cl.^{6} G01N *33/22*

U.S. Cl. 73—35.17 **20 Claims**



1. A hybrid inflator assembly for use with a testing tank defining a testing chamber and an opening communicating with the testing chamber, the assembly comprising:

a hybrid inflator having a cylindrical sidewall terminating at one end in a plurality of gas discharge ports;

an adaptor housing having a cylindrical sleeve-like body sealingly fitable within the opening of the testing tank and a peripheral flange extending radially outward from the cylindrical sleeve-like body securable to the testing tank surrounding the opening, the sleeve-like body of the adaptor housing sealingly positioned around the cylindrical sidewall of the hybrid inflator so that a portion of the sidewall of the hybrid inflator would extend through the opening in the testing tank and into the test chamber with the plurality of gas discharge ports located within the test chamber of the testing tank.

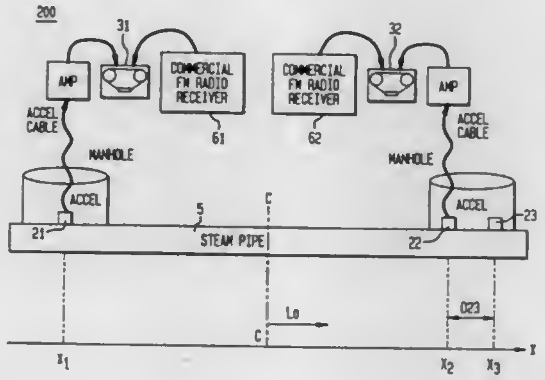
5,531,099
UNDERGROUND CONDUIT DEFECT LOCALIZATION

Anthony P. Russo, Bloomfield, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Nov. 9, 1994, Ser. No. 336,452

Int. Cl.^{6} G01M *3/080*

U.S. Cl. 73—40.50 A **27 Claims**



15. An acoustic method of locating a leak in a buried steam conduit having a fluid with multiple velocities of acoustic energy contained therein, comprising the steps of:

attaching sensors to the conduit at a first, second, and third location, respectively, where each location is separated by a known distance from the others;

sensing steam leak noise propagating in the conduit from waves propagating normal to an outside surface of said conduit with said sensors to thereby generate an electrical signal at each location proportional to said steam leak noise;

providing synchronization to a recording operation for signal processing;

recording each signal in digital form for preserving it;

filtering each signal to pass a frequency band from 4000 to 8500 Hz for discriminating against turbulent flow noise in the steam, noise transmitted by the conduit;

filtering each signal to exclude single frequency tones; computing a cross-correlation function from leak noise data obtained from a first pair of sensors located along the conduit for obtaining a raw plot of a first time differential;

computing a cross-correlation function from leak noise data obtained from a second pair of sensors located along the conduit for obtaining a raw plot of a second time differential;

smoothing each raw plot of time differential for obtaining a peak time differential in each plot;

determining the velocity of propagation for leak noise in the conduit using the first peak time differential and the known spacing between the first pair of sensors;

determining an uncorrected location of the leak using the velocity of propagation, the second peak time differential, and the known spacing between the second pair of sensors; and

adjusting the uncorrected location calculation by including the rate and direction of flow of a medium within the conduit for determining the final leak location.

5,531,100
METHOD OF DETECTING A LEAKY EXHAUST VALVE

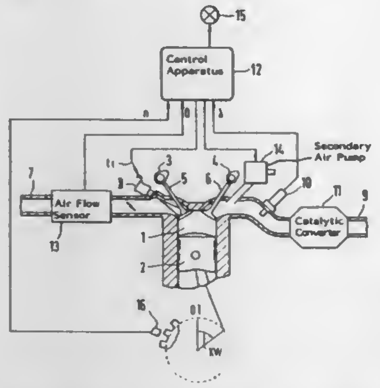
Manfred Mezger, Markgröningen, and Klaus Ries-Müller, Bad Rappenau, both of; Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 15, 1995, Ser. No. 404,564

Claims priority, application Germany, Jun. 10, 1994, 44 20 290.3

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—47 **5 Claims**



1. A method of checking for leakage of exhaust valves of an internal combustion engine having an exhaust system, the method comprising the steps of:

providing means for forming a measure for uneven running of the engine and means for metering air to a region of the exhaust system downstream of said exhaust valves;

running said engine under its own power;

forming a first quantity (LU1) for uneven running without metering air into said region downstream of said exhaust valves;

forming a second quantity (LU2) for uneven running while metering air to said region downstream of said exhaust valves; and,

forming a difference (dLU) between said first quantity (LU1) and said second quantity (LU2);

determining one of said exhaust valves to leak when said difference exceeds a predetermined threshold value (SW).

5,531,101
PACKAGE TESTING

Christopher Fenlon, Whitchurch, England, assignor to Ishida-Nonpareil Limited, Bristol, England

PCT No. PCT/GB93/00480, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO93/18385, PCT Pub. Date Sep. 16, 1993

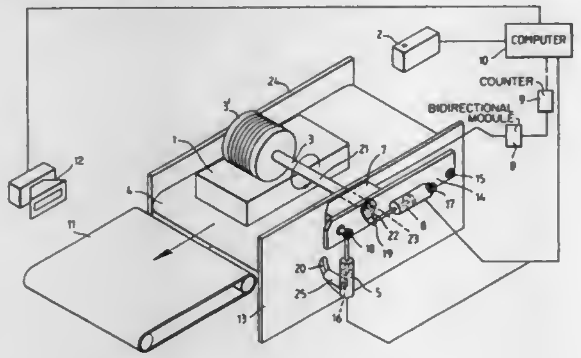
PCT Filed Mar. 8, 1993, Ser. No. 295,864

Claims priority, application United Kingdom, Mar. 7, 1992, 9205011

Int. Cl.^{6} G01M *3/34*

U.S. Cl. 73—49.3 **11 Claims**

1. Apparatus for testing packages comprising:



a test station having support means for supporting a package;

a test probe arranged to be relatively reciprocable towards and away from the support means;

said probe having a surface portion which is transversely displaceable

first urging means for urging relative movement of the probe towards the support means to cause said transversely displaceable surface portion to contact a package supported at said test station;

second urging means to urge said transverse displacement of said probe surface portion; and

means for detecting transverse displacement of the probe surface portion and providing a corresponding output signal; said probe being urgeable by said first urging means to contact a package at the test station with said transversely displaceable surface portion, whereupon the ability of the second urging means to displace said transversely displaceable surface portion is dependent on the nature of the contacted package, so that the output signal of the detecting means is indicative of package quality.

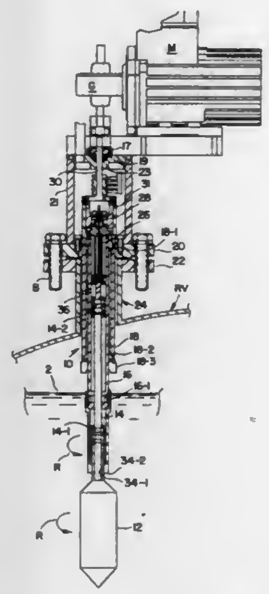
5,531,102
VISCOMETER USABLE IN SITU IN LARGE REACTOR VESSELS

David A. Brookfield, Sharon, and Robert P. Bishop, Pembroke, both of Mass., assignors to Brookfield Engineering Laboratories, Inc., Stoughton, Mass.

Filed Dec. 14, 1994, Ser. No. 355,702

Int. Cl.^{6} G01N *11/14*

U.S. Cl. 73—54.32 **23 Claims**



1. A viscometer for insertion into a reactor vessel or the like comprising:

(a) means defining a first elongated shaft extending from the proximal position outside the vessel to a distal position with a measuring surface at the distal end and means for rotating the shaft with the distal end within contents of the vessel, .

(b) means defining a second shaft which is tubular and surrounds the first shaft over a common axial length portion thereof, the first and second shafts being essentially concentric and having means to respond correctively to radial deviation of either or both of the shafts from concentricity without imposing substantial rotational drag therebetween,

(c) means for interconnecting the shafts for rotation in common, said means including a torque responsive interconnect allowing angular deflection between the connected shafts responsive to shearing force sensed at said measuring surface element,

(d) means responsive to such angular deflection to yield an output,

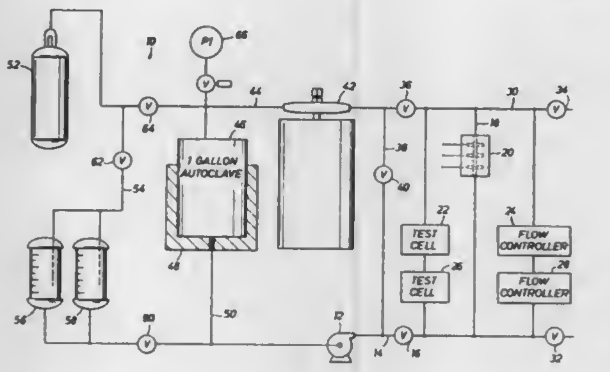
(e) means for stabilizing the first and second shafts to remain aligned with a selected concentric axis thereof,

(f) means for mounting a majority length portion of the first and second shaft within the said reactor vessel or the like and for mounting a drive system for the first and second shafts outside the vessel.

5,531,103
METHOD AND APPARATUS FOR DETERMINING VELOCITY DEPENDENT CORROSION RATE

Paul Eaton, Houston, Tex., assignor to Champion Technologies, Inc., Fresno, Tex.

Filed Jan. 23, 1995, Ser. No. 376,768
Int. Cl.^{6} G01N *33/18*
U.S. Cl. 73—61.62 **17 Claims**



1. An apparatus for testing corrosion of a flowing fluid, the apparatus comprising:

a) a pump connected with a source of fluid having a specified formulation to simulate a flow situation wherein said pump delivers the flowing fluid at a specified pressure;

b) a test cell serially connected with said pump so that the fluid delivered thereby is directed through the test cell and wherein the test cell includes at least one exposed test coupon in contact with the flowing fluid;

c) a measuring circuit connected to said coupon for obtaining measurements relating to corrosion at said coupon;

d) a flow controller to adjust the fluid flow velocity through the test cell; and

e) a heat controller for controlling the temperature of the flowing fluid prior to flowing through the test cell.

5,531,104
DEVICE AND METHOD FOR AUTOMATIC DETECTION OF THE HEIGHT OF SEDIMENTATION IN A SEDIMENTOMETER

Manfred Futterer, Frauenfeld, and Gerhard Bolli, Berg, both of, Switzerland, assignors to SIA Schweizer Schmirgel, Frauenfeld, Switzerland

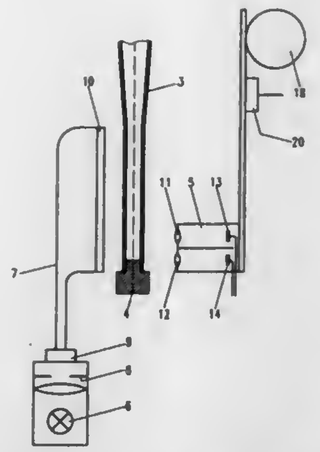
Filed Feb. 27, 1995, Ser. No. 395,096

Claims priority, application Switzerland, Mar. 21, 1994, 837/94

Int. Cl.^{6} G01N *15/05;33/49;21/00*
U.S. Cl. 73—61.69 **9 Claims**

1. Device for automatically ascertaining sediment level in a sedimentometer having a sedimentation tube and a sediment collection tube, said device comprising

a light source (6,7) on one side of the collecting tube (3), and a light sensor (5) on an opposite side of the collecting tube (3), and means including a motor (18) for moving the light sensor (5) vertically,

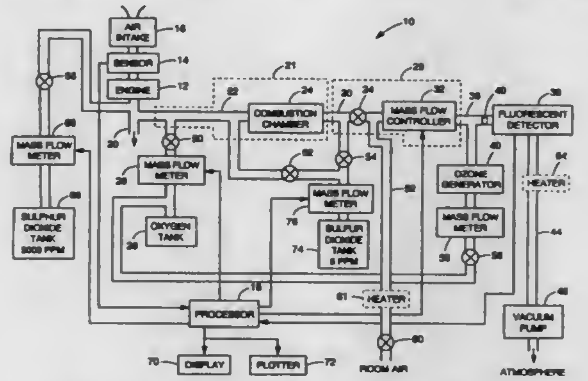


said light sensor (**5**) comprising two light receivers (**11,13**; **12,14**) arranged one above the other, and a controller (**16,17**) responsive to outputs from the receivers (**11,13**; **12,14**) and adapted to operate the motor (**18**) in such a way that the first light receiver (**12,14**) remains partially obstructed by the sediment, and the quantities of light striking the respective light receivers (**11,13**; **12,14**) are maintained at a constant ratio.

5,531,105
METHOD AND SYSTEM FOR DETERMINING ENGINE OIL CONSUMPTION

Dick Y. Leong, Bloomfield Hills; Alex D. Colvin, Oak Park, and Keith R. Carduner, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 14, 1995, Ser. No. 422,400
Int. Cl.^{6} G01M *15/00*
U.S. Cl. 73—116 **20 Claims**



1. For use with an automotive engine having an exhaust manifold and containing oil and fuel with a known sulphur content, a method for determining oil consumption of the engine, the method comprising:

extracting an exhaust gas sample from the engine independent of air flow through the engine;

converting the exhaust gas sample into a combustion product at an elevated temperature;

transferring said combustion product to a fluorescent detector at a temperature and pressure sufficient to prevent the formation of water condensation and at a flow rate sufficient to overcome changes in back pressure of the engine, the pressure being less than atmospheric pressure;

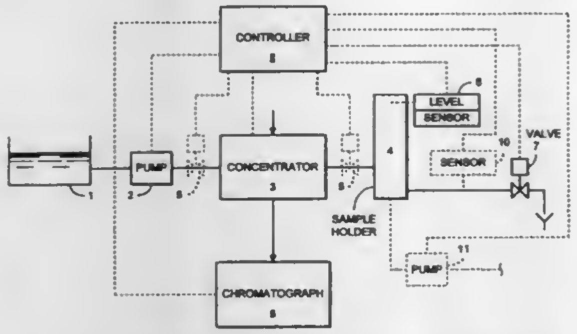
determining a sulphur dioxide content of the combustion product using the fluorescent detector; and

automatically determining the oil consumption of the engine in real time based on the sulphur dioxide content of the combustion product and the known sulphur content of the oil and the fuel.

5,531,106
VOLUME CONTROL SYSTEM FOR A CHROMATOGRAPH

Dan Lyon, 173 Plattekill-Ardonia Rd., Wallkill, N.Y. 12589; Terrance Perrone, 653 Bridge St., Hopewell Junction, N.Y. 12533, and Joseph Rutz, 79 Rombout Ave., Beacon, N.Y. 12508

Filed Jan. 18, 1995, Ser. No. 375,420
Int. Cl.^{6} G01N *30/00*
U.S. Cl. 73—61.560 **11 Claims**



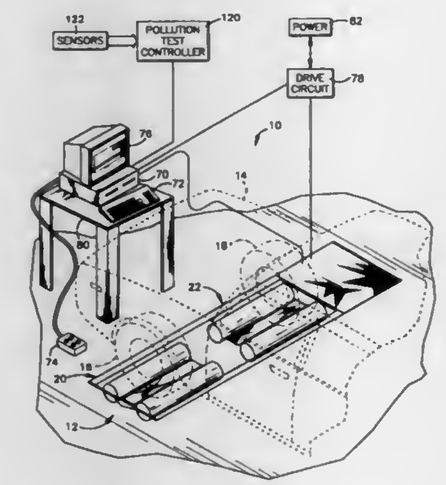
1. An ion chromatograph for determining the amount of a selected ion in a sample, the ion chromatograph having a concentrator for capturing the ions therein, the improvement comprising:

calibrated sample holding means, located adjacent to the concentrator for collecting a sample therefrom, liquid level sensing means located at a selected height on the sample holding means, transport means for providing liquid from the concentrator to the sample means, switch means connected to the liquid level sensing means and to the transport means such that when the selected liquid level is reached, the sensing means sends a signal to the switch means to halt the flow of liquid through the concentrator to the sample holding means.

5,531,107
METHOD AND APPARATUS FOR ESTABLISHING VIRTUAL INERTIA IN A CHASSIS DYNAMOMETER

Donald W. Ganzhorn, Jr., Solon, Ohio, assignor to Ganzcorp Investments, Inc., Twinsburg, Ohio

Filed Feb. 15, 1995, Ser. No. 388,803
Int. Cl.^{6} G01L *3/22*
U.S. Cl. 73—117 **17 Claims**



1. An apparatus for establishing virtual inertia in a dynamometer, said apparatus comprising:

actuatable force producing means for, when actuated, applying a controllable amount of force to a device under test;

display means for displaying predetermined velocity values versus time graph;

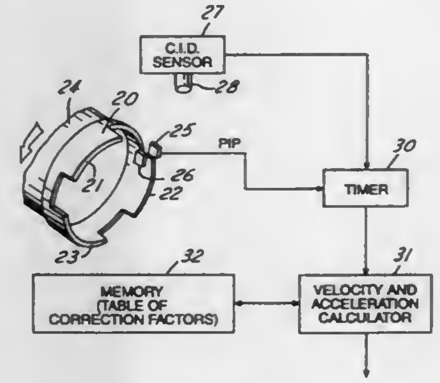
means for monitoring velocity of said device under test; and

control means for comparatively displaying on said display means said monitored velocity value of said device under test against the predetermined velocity value and for controlling said actuatable force producing means to simulate inertia loads in accordance with said displayed predetermined velocity values.

5,531,108
ADAPTIVE CORRECTION OF TORSIONAL AND WHEEL PROFILE POSITION IRREGULARITIES FOR MISFIRE DETECTION

Lee A. Feldkamp, Plymouth; Gintaras V. Puskorius, Redford; John V. James, Walled Lake, and Kenneth A. Marko, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1995, Ser. No. 417,357
Int. Cl.^{6} G01M *15/00*
U.S. Cl. 73—117.3 **11 Claims**



27
C.I.D. SENSOR
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PIP
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26
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TIMER
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31
MEMORY (TABLE OF CORRECTION FACTORS)
VELOCITY AND ACCELERATION CALCULATOR

1. A method of obtaining adaptive correction factors to detect malfunctions in an internal combustion engine, said method comprising the steps of:

measuring an engine variable at a plurality of different times to produce raw values of said engine variable;

correcting said raw values by applying a respective adaptive correction factor to each raw value to produce corrected values;

selecting one of said adaptive correction factors for updating;

selecting a block of consecutive corrected values including a particular corrected value that has been corrected using said one selected adaptive correction factor;

comparing said particular corrected value with other said corrected values of said block; and

if said particular corrected value is more closely indicative of said malfunction than each of said other corrected values of said block, then updating said particular adaptive correction factor in a first manner without regard to the raw value corresponding to said particular corrected value, otherwise, if said particular corrected value is not more closely indicative of said malfunction than each of said other corrected values of said block, then updating said particular adaptive correction factor in a second manner responsive to said raw value corresponding to said particular corrected value.

5,531,109

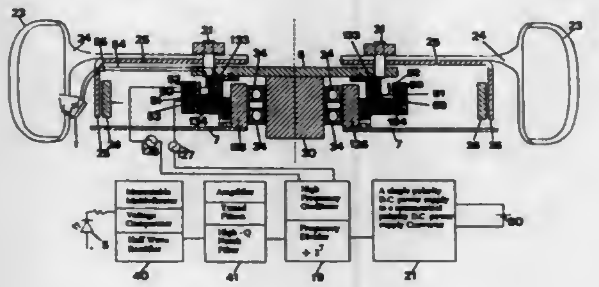
INDICATOR OF THE AIR PRESSURE IN THE PNEUMATIC TIRES OF A VEHICLE BASED ON A CAPACITIVE COUPLING

Nicolaos Tsagas, Terma Nees Ergatikes Katikies, Xanthi 67100, Greece

Continuation-in-part of Ser. No. 941,048, Oct. 7, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 282,061

Int. Cl.⁶ B60C *23/04;* G01L *7/06*

U.S. Cl. 73—146.5 **13 Claims**



1. An indicator of the air pressure in the pneumatic tires of a vehicle, comprising for each one of the wheels of the vehicle a first metallic annular strip, a second metallic annular strip, a third metallic annular strip and a fourth metallic annular scrip, first pair comprised of said first and second metallic annular strips being concentrically mounted onto an insulating layer fixed onto the inner surface of a brake drum and a second pair comprised of said third and fourth metallic annular strips being concentrically mounted onto a nonrotating insulated base fixed on a nonrotating part of said vehicle, a pair of air capacitors being formed between said first pair, and said second pair of metallic annular strips said indicator further comprising an integrated electronic circuit which includes a high frequency oscillator and a frequency divider unit to produce a square train pulse, an amplifier and a set of tuned filters unit including a high-Q notch filter permitting the fundamental frequency of said square train pulse pass in order to convert said square train pulse to a sinusoidal signal, a system of LEDs, one LED for each one of the wheels of the vehicle, a unit including a half wave rectifier converting said sinusoidal signal to a D.C. level, a voltage comparator giving an output of a square train pulse whenever an input signal to said voltage comparator falls below a certain level and a monostable multivibrator increasing the amplitude of the square train pulse of said voltage comparator output, a single polarity D.C. power supply to a symmetrical polarity D.C. power supply converter and a tire pressure gauge to connect electrically as an ON- OFF switch said first pair of first and second metallic annular strips said pair of air capacitors being adapted to operate as a timing capacitor in said oscillator, wherein a first frequency range is produced to correspond to the ON position of said tire pressure gauge and a second frequency range is produced to correspond to the OFF position of said tire pressure gauge, wherein said first frequency range falls within a gap of notch filter of said amplifier and set of tuned filters unit and passes with an attenuation of the order of one hundred, while said second frequency range falls outside the gap of said notch filter and wherein said half wave rectifier converts the sinusoidal signal to the D.C. level, said voltage comparator providing said square train pulse output whenever the input signal to said voltage comparator falls below a certain level determined by a trimmer and said monostable multivibrator increasing the amplitude of the square train pulse of said voltage comparator output by using a timing circuit, an output of said monostable multivibrator driving one of said LEDs, corresponding to a tire with abnormal air pressure.

5,531,110

METHOD AND APPARATUS FOR ESTIMATING DISTURBANCE ACTING ON VEHICLE TIRED WHEEL BASED ON WHEEL ANGULAR VELOCITY AND EQUATION OF STATE

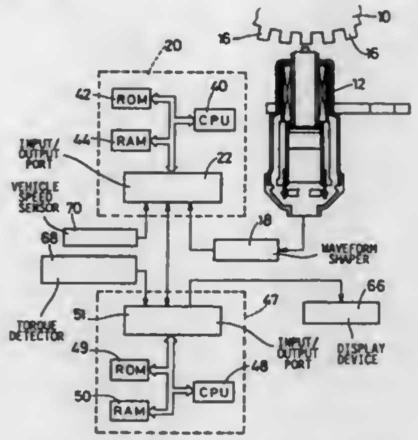
Hideki Ohashi; Hiroyuki Kawai, both of Susono; Hiroyoshi Kojima, Nishio; Nobuo Hiraiwa, Toyota; Katsuhiro Asano, Toyoake; Takaji Umeno, Aichi-ken, and Toshimichi Takahashi, Nagoya, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi-ken, Japan

Filed Jul. 25, 1994, Ser. No. 280,214

Claims priority, application Japan, Jul. 30, 1993, 5-190204; May 24, 1994, 6-109397

Int. Cl.⁶ G01M *17/013;17/02*

U.S. Cl. 73—146 **26 Claims**



1. A disturbance detecting apparatus for detecting a disturbance acting on a tired wheel of a motor vehicle, comprising:

an angular velocity detecting device for detecting an angular velocity of the tired wheel; and

a disturbance observer for estimating said disturbance acting on the tired wheel on the basis of at least said angular velocity of the tired wheel detected by said angular velocity detecting device, said disturbance observer estimating said disturbance as one of a plurality of variables in an equation of state indicative of a rotary motion of said tired wheel.

5,531,111

STRUCTURE OF A VOLUMETRIC MEASURING APPARATUS

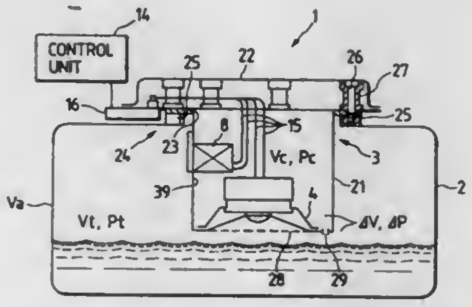
Yoshiyuki Okamoto, Nagoya; Yasuhiro Horiuchi, Toyota; Kouichi Yamada, Aichi; Kazuhiko Yamaguchi, Gifu, and Hidekuni Sugi, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Aichi-Pref., Japan

Filed Apr. 28, 1995, Ser. No. 431,043

Claims priority, application Japan, Apr. 28, 1994, 6-092687; Feb. 10, 1995, 7-023237

Int. Cl.⁶ G01F *17/00*

U.S. Cl. 73—149 **24 Claims**



1. A volumetric measuring apparatus for measuring the volume of a given material stored within a container comprising:

a reference enclosure, disposed within the container, defining therein a reference cavity having a preselected volume;

pressure balancing means for balancing static pressures in the container and said reference enclosure with each other;

pressure difference producing means for producing a pressure difference between pressures in the container and said enclosure;

a pressure sensor having a pressure sensitive element exposed inside both the container and said reference enclosure, said pressure sensitive element being sensitive to a pressure acting thereon to provide a sensor signal indicative thereof;

sensor mode switching means for switching an operation of said pressure sensor between a first operation mode and a second operation mode, the first operation mode being such that the pressure sensitive element of said pressure sensor is sensitive to said pressure difference between the container and said reference enclosure, the second operation mode being such that the pressure sensitive element of said pressure sensor is sensitive to a pressure only in one of the container and said reference enclosure;

control means for controlling operations of said pressure difference, producing means and said sensor mode switching means in first and second control modes, the first control mode being such that said pressure difference producing means produces said pressure difference between the container and said reference enclosure and said sensor mode switching means activates said pressure sensor in the first operation mode to provide a first sensor signal indicative of said pressure difference, the second control means being such that said pressure difference producing means produces said pressure difference and said sensor mode switching means activates said pressure sensor in the second operation mode to provide a second sensor signal indicative of the pressure in the one of the container and said reference enclosure; and

volume determining means for determining the volume of the given material stored within the container based on the first sensor signal and the second sensor signal provided by said pressure sensor.

5,531,112

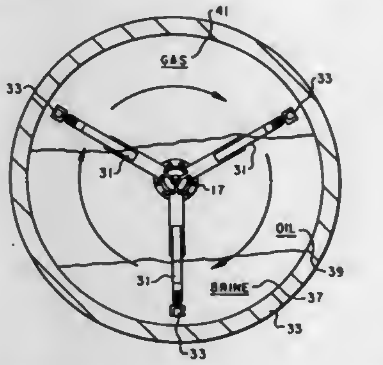
FLUID HOLDUP TOOL FOR DEVIATED WELLS

Allen R. Young, Arlington; Jerry L. Davidson, Burleson, and Edward Baltazar, Keene, all of Tex., assignors to Computalog U.S.A., Inc., Fort Worth, Tex.

Filed May 20, 1994, Ser. No. 246,842

Int. Cl.⁶ F21B *47/00;* G01R *27/22;* G01N *11/00;* G01V *1/40*

U.S. Cl. 73—152 **17 Claims**



1. A production logging tool for use in a tool string to determine fluid holdup of a multiphase fluid flow within a well, said production logging tool comprising:

a tool housing having a power supply and an electronics section disposed therein;

a plurality of arms rotatably mounted to said tool housing, each of said plurality of arms extending from said tool housing to points distal from a longitudinal axis of said tool housing, wherein said distal points are spaced apart along a satellite path which circumscribes said tool housing;

a motor for rotating said plurality of arms about said tool housing to pass said plurality of sensors through said satellite path which circumscribes said tool housing for detecting said variations in said fluid property;

an angular position detector for indicating an angular position of said plurality of arms about said tool housing, which determines said angular position for said points at which said plurality of sensors detect said variations in said fluid property;

a mechanical power source for selectively controlling said distal spacing between said plurality of arms and said tool housing;

a spacing detection means for indicating said distal spacing of each of said points from said tool housing; and

a plurality of sensors for detecting variations in a fluid property attributable to different flow constituents of said multiphase fluid flow, wherein each of said plurality of sensors is secured to one of said plurality of arms at one of said points and exposed to said multi-phase fluid flow within said well for determining proportions of said different flow constituents at each of said points.

5,531,113

BALLISTICS MEASURING SYSTEM

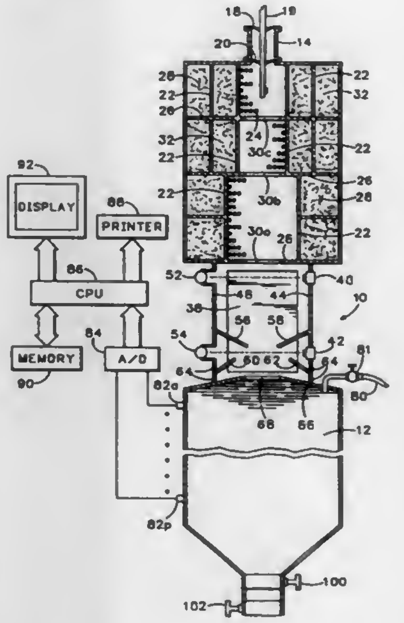
John R. Jamison, 84780 Christensen Rd., Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 131,200, Oct. 1, 1993, Pat. No. 5,357,796. This application Sep. 22, 1994, Ser. No. 310,963

The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.

Int. Cl.⁶ G01L *5/14*

U.S. Cl. 73—167 **4 Claims**



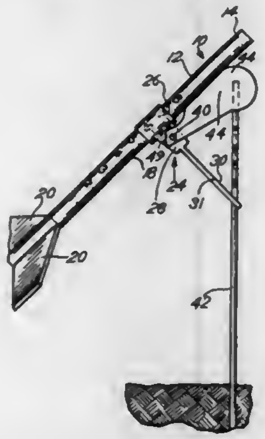
1. A method of measuring the ballistics of a projectile, comprising the steps of:

(a) providing a mass of fluid;

(b) creating a disturbance in said fluid by launching said projectile out from a firearm into said fluid;

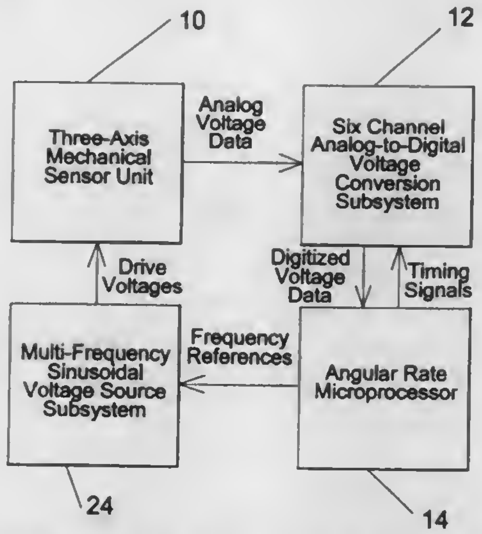
(c) sensing at different times during the passage of said projectile through said fluid the pressure exerted by said disturbance within said fluid.

5,531,114
RAIN GAUGE
James R. Frager, 702 N. C St., Fairfield, Nebr. 68938
Filed Mar. 22, 1995, Ser. No. 408,733
Int. Cl.^{6} G01W *1/00*
U.S. Cl. 73—170.17 **14 Claims**



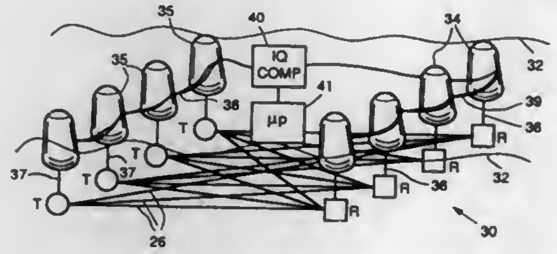
1. A rain gauge comprising
a graduated plastic collection tube having an open end to receive rainfall and a closed end opposite said open end,
a plurality of spaced fins mounted on the tube adjacent said closed end,
a tube support fixed to said tube between said open end and said fins and extending radially from said tube,
a pin mounted in said tube support at a right angle to the axis of said tube about which said tube tilts,
a swivel arm having an inner and an outer end, supporting said pin at said inner end, said arm having a low friction bearing bore in said outer end, and
a support rod for insertion in the ground having an upper end disposed within said bearing bore, said upper end having a smooth surface to permit free rotation of said tube about said rod.

5,531,115
SELF-CALIBRATING THREE AXIS ANGULAR RATE SENSOR
Harold F. Erdley, 1210 El Medio Ave., Pacific Palisades, Calif. 90272-2423
Filed Jun. 29, 1995, Ser. No. 496,816
Int. Cl.^{6} G01P *3/48;21/00*
U.S. Cl. 73—504.02 **10 Claims**


10
12
Three-Axis Mechanical Sensor Unit
Analog Voltage Data
Six Channel Analog-to-Digital Voltage Conversion Subsystem
Drive Voltages
Digitized Voltage Data
Timing Signals
Multi-Frequency Sinusoidal Voltage Source Subsystem
Frequency References
Angular Rate Microprocessor
24
14

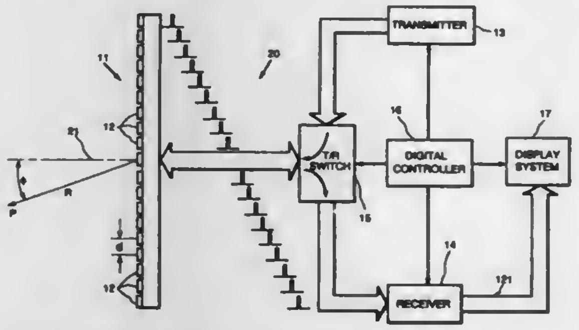
1. A three axis angular rate sensor comprising:
a proof mass,
an outer case,
a set of mechanical spring elements connecting said proof mass to said outer case and having substantially equal mechanical translational spring rates along all directions,
electromechanical coupling means for relating externally connected electrical voltages and electrical currents to forces upon said set of mechanical spring elements and to translational velocities of said proof mass with respect to a three axis coordinate system fixed in said outer case,
electrical excitation means for applying said electrical voltages and said electrical currents as a multiplicity of additive separate frequency sinusoidal signals with respect to time to generate translational velocities of said proof mass along each axis of said coordinate system, and to generate consequent coriolis forces upon said proof mass in response to input angular rates,
frequency setting means for fixing each of said frequency sinusoidal signals within a frequency band generally near a translational mode natural mechanical resonant frequency as determined by a combination of said proof mass and said equal mechanical translational spring rates of said set of mechanical spring elements,
measurement means for obtaining time periodic data samples of said electrical voltages and said electrical currents of said electromechanical coupling means,
electrical parameter computational means for determination from said measurement means electrical parameters of said electromechanical coupling means,
mechanical spring rate computational means for determination from said measurement means direct axis and cross axis mechanical spring rate parameters of said set of mechanical spring elements,
mechanical damping computational means for determination from said measurement means direct axis and cross axis mechanical damping parameters of said set of mechanical spring elements,
electromechanical coupling computational means for determination from said measurement means direct axis and cross axis electromechanical coupling coefficients of said electromechanical coupling means,
angular rate computational means of said outer case with respect to said three axis coordinate system from said measurement means so that said angular rate computational means are self-calibrating and self-aligning to mutually orthogonal axes, are substantially independent of variations of said electrical parameters, are substantially independent of variations of said direct axis and cross axis mechanical spring rate parameters, are substantially independent of variations of said direct axis and cross axis mechanical damping parameters, and are substantially independent of variations of said direct axis and cross axis electromechanical coupling coefficients,
data validity computational means for determining validity of computed said angular rate computational means based upon computed said electrical parameters, computed said direct axis and cross axis mechanical spring rate parameters, computed said direct axis and cross axis mechanical damping parameters, and computed said direct axis and cross axis electromechanical coupling coefficients all remaining within established limits.

5,531,116
APPARATUS AND METHOD FOR PHASE TOMOGRAPHIC DETERMINATION OF FLUID CURRENTS
David B. Chang, Tustin; Victor Vali, Laguna Hills, and Donald H. Webb, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jan. 12, 1994, Ser. No. 180,266
Int. Cl.^{6} G01F *1/66*
U.S. Cl. 73—597 **14 Claims**



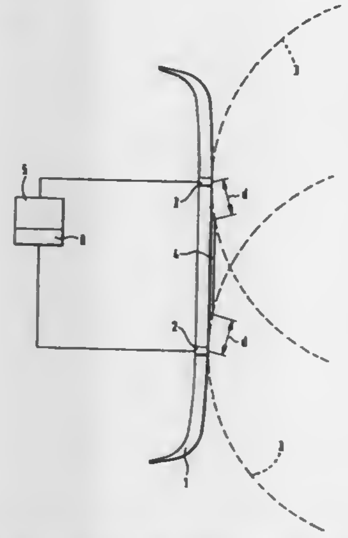
1. A system for determining fluid currents, comprising:
at least one transmitter for transmitting acoustic signals through a fluid, said fluid having a surface;
at least one acoustic receiver for receiving said transmitted acoustic signals;
means for determining the phases of said transmitted acoustic signals as received by said receiver relative to said transmitted acoustic signals phases wherein said means for determining said phases of said transmitted acoustic signals employs an eikonal approximation; and
means for calculating a current flow distribution within said fluid between said transmitter and receiver based upon said acoustic signal phases, wherein said calculating means calculates said current flow distribution from said acoustic signal phases by a tomographic calculation.

5,531,117
CLOSED LOOP MAXIMUM LIKELIHOOD PHASE ABERRATION CORRECTION IN PHASED-ARRAY IMAGING SYSTEMS
Jose-Mauro P. Fortes, Gavea, Brazil, assignor to General Electric Company, Schenectady, N.Y.
Filed Sep. 26, 1994, Ser. No. 312,370
Int. Cl.^{6} G01N *29/18*
U.S. Cl. 73—602 **27 Claims**



1. A sampled aperture imaging system comprising:
a plurality of transducers arranged in a sequence to form an array;
means for selectively operating said transducers in a transmission mode to produce propagating energy pulses from electrical driving signals;
means for selectively operating said transducers in a reception mode to produce analog electrical detection signals in respective ones of a plurality of receive channels in response to detection of reflected energy pulses, each receive channel being coupled to a corresponding one of said transducers and comprising means for sampling and demodulating said analog electrical detection signals into digital complex signal samples; and
a plurality of phase locked loops for estimating maximum likelihood of phase aberration angles associated with digital complex signal samples of said receive channels.

5,531,118
METHOD AND DEVICE FOR OPERATING AN ULTRASONIC SENSOR
Peter Knoll, Ettlingen, and Martin Noll, Muggensturm, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 20, 1994, Ser. No. 326,453
Claims priority, application Germany, Nov. 12, 1993, 43 38 743.8
Int. Cl.^{6} G01N *29/04*
U.S. Cl. 73—628 **12 Claims**

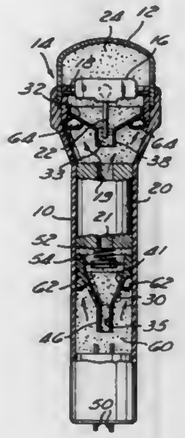


1. A method for operating an ultrasonic sensor arranged on a vehicle for measuring distance to an obstacle in a vicinity of the vehicle, comprising the steps of:
controlling the ultrasonic sensor to transmit at least one ultrasonic signal and at least one ultrasonic control signal;
evaluating an echoed ultrasonic signal received by the ultrasonic sensor, the echoed ultrasonic signal being generated as a function of the at least one ultrasonic signal and the obstacle;
determining an ambient temperature;
determining the measured distance to the obstacle as a function of the evaluated echoed ultrasound signal and the ambient temperature; and
controlling a sensitivity of the ultrasonic sensor as a function of predetermined reference values and at least one of
- (a) an amplitude of an echoed ultrasound control signal, the echoed ultrasound control signal being generated as a function of the ultrasonic control signal and a reference object located a predetermined distance from the ultrasonic sensor, the reference object being in a detecting range of the ultrasonic sensor, and
- (b) a relationship of an amplitude of the ultrasonic control signal and the amplitude of the echoed ultrasonic control signal.

5,531,119

ULTRASOUND PROBE WITH BUBBLE TRAP

Paul F. Meyers, San Juan Capistrano, Calif., assignor to Capistrano Labs, Inc., San Clement, Calif.
Filed Apr. 19, 1994, Ser. No. 230,160
Int. Cl.^{6} A61B *8/00;* G01H *17/00*
U.S. Cl. 73—661 **5 Claims**

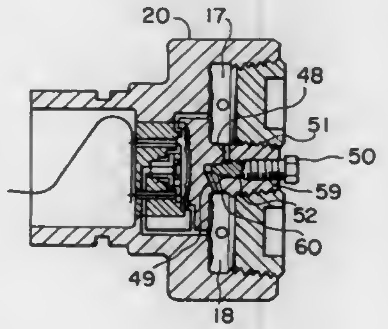


1. An ultrasound probe comprising:
a) a housing;
b) an ultrasound transmissive window formed to said housing;
c) a motor disposed within said housing;
d) a first air bubble trap disposed proximate said window;
e) a second air bubble trap disposed proximate said motor such that said motor is disposed intermediate said first and second air bubble traps;
f) wherein said first air bubble trap isolates said window from air bubbles and said second air bubble trap isolates said motor from air bubbles; and
g) an accumulation area to which said air bubble traps moves the air bubbles, said accumulation area being an area where air bubbles do not have an undesirable effect upon operation of the ultrasound probe.

5,531,120

COMPACT DIFFERENTIAL PRESSURE TRANSMITTER HAVING FIRST AND SECOND DAMPER CHAMBERS

Akira Nagasu; Yoshimi Yamamoto, both of Ibaraki-ken; Tomoyuki Tobita, and Toshihiro Onose, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 19, 1993, Ser. No. 49,218
Claims priority, application Japan, Apr. 23, 1992, 4-104262
Int. Cl.^{6} G01L *7/08*
U.S. Cl. 73—706 **18 Claims**

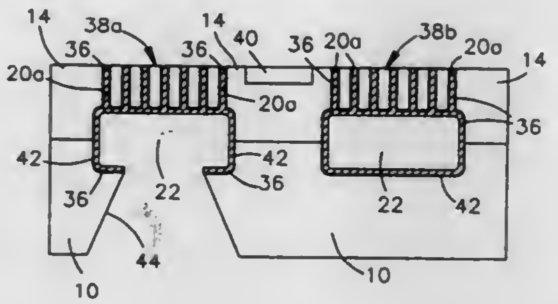


1. A differential pressure transmitter comprising:
a first pressure receiving chamber transmitting a pressure of a first measurement fluid to a first detection fluid contained in a member through a first diaphragm connected to said member;
a second pressure receiving chamber transmitting a pressure of a second measurement fluid to a second detection fluid contained in said member through a second diaphragm connected to said member;
said first and second diaphragms are substantially coplanar:
a semiconductor sensor detecting a difference between a pressure of said first detection fluid and a pressure of said second detection fluid; and
a third diaphragm connected to said member to form a first damper chamber and a second damper chamber;
wherein the pressure of said first detection fluid and the pressure of said second detection fluid are applied to said semiconductor sensor via said first damper chamber and said second damper chamber, respectively, said first diaphragm and said second diaphragm are formed on one end surface of said member, said third diaphragm is provided between said one end surface of said member and said semiconductor sensor and substantially parallel to said first and second diaphragms, and a member for forming said first damper chamber or said second damper chamber and a member for forming said first pressure receiving chamber and a member for forming said second pressure receiving chamber are constituted by a single member.

5,531,121

MICROMACHINED INTEGRATED PRESSURE SENSOR WITH OXIDE POLYSILICON CAVITY SEALING

Douglas R. Sparks; Ronald E. Brown; Robert L. Healton, and John C. Christenson, all of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Division of Ser. No. 59,222, May 10, 1993, Pat. No. 5,427,975. This application Jan. 19, 1995, Ser. No. 375,040
Int. Cl.^{6} G01L *13/02;13/06*
U.S. Cl. 73—716 **3 Claims**

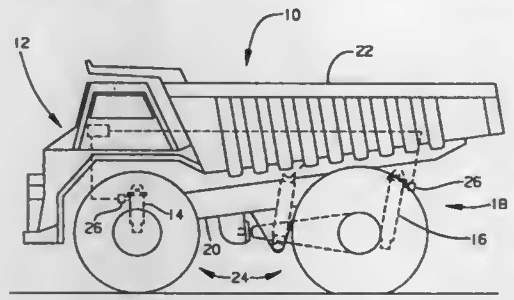


1. A pressure sensing device formed in a substrate having at least one semiconductor device formed thereon for monitoring the pressure sensing device, the pressure sensing device comprising:
a first cavity formed beneath a first surface of the substrate;
first pressure sensing means formed between the first cavity and the first surface of the substrate so as to be responsive to a pressure at the first surface of the substrate;
a second cavity formed beneath the first surface of the substrate so as to be adjacent the first cavity, the second cavity being vented to a second surface of the substrate;
second pressure sensing means formed between the second cavity and the first surface of the substrate so as to be responsive to a pressure at the second surface of the substrate;
an oxide layer formed on an interior surface of each of the first and second cavities; and
a polysilicon layer formed over the oxide layer so as to seal the first and second cavities from the first surface.

5,531,122

FATIGUE ANALYSIS AND WARNING SYSTEM

Michael D. Chatham, Bloomington; Paul D. Fotsch, Dunlap; Doyle G. Heyveld, Peoria; Edward P. Kelley, Chillicothe; Walter E. Lohmann, Jr., Decatur; David R. Roley, Morton; Charles F. Sieck, Dunlap, and David G. Young, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Feb. 28, 1994, Ser. No. 203,240
Int. Cl.^{6} G01B *5/300*
U.S. Cl. 73—760 **48 Claims**

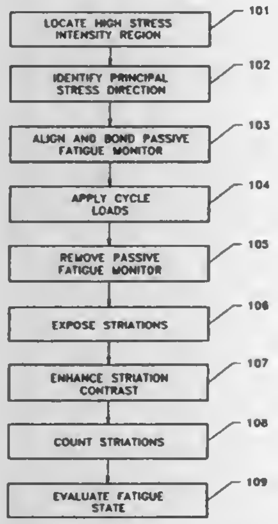


1. An apparatus for a machine having a ground engaging portion, a frame connected to the ground engaging portion, a plurality of pressure sensing devices connected to and between the frame and the ground engaging portion, each of the plurality of pressure sensing devices being adapted to produce pressure signals indicative of load characteristics, comprising:
a processor means for receiving said pressure signals and responsively calculating one or more estimates of strains occurring on the frame; and
means for quantifying frame stress in response to the pressure signals and said estimates of strains occurring on the frame.

5,531,123

REMOTE AND POWERLESS MINIATURE FATIGUE MONITOR AND METHOD

Daniel P. Henkel, 3 Curson Ct., Poquoson, Va. 23662
Filed Nov. 4, 1994, Ser. No. 334,680
Int. Cl.^{6} G01N *3/00*
U.S. Cl. 73—795 **18 Claims**

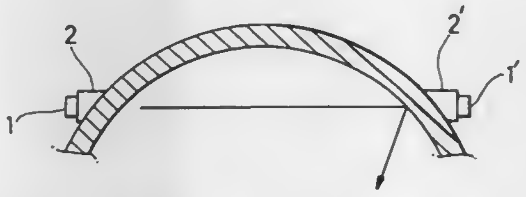

LOCATE HIGH STRESS INTENSITY REGION
101
IDENTIFY PRINCIPAL STRESS DIRECTION
102
ALIGN AND BOND PASSIVE FATIGUE MONITOR
103
APPLY CYCLE LOADS
104
REMOVE PASSIVE FATIGUE MONITOR
105
EXPOSE STRIATIONS
106
ENHANCE STRIATION CONTRAST
107
COUNT STRIATIONS
108
EVALUATE FATIGUE STATE
109

1. A method for monitoring fatigue in a structure comprising the steps of:
providing passive fatigue monitors;
locating a region of high stress intensity on a structure;
identifying the principal direction of stresses on said structure;
aligning and bonding said passive fatigue monitors to said structure along the axes of principal stresses;
applying a cycle lead to generate stresses in said structure;
removing said passive fatigue monitor from said structure after the development of striation patterns independent of any crack formation or lack of formation;
determining the number of fatigue-induced striations; and
evaluating the state of fatigue from the number of striations produced during the load application cycle.

5,531,124

ULTRASONIC FLOW MEASURING METHOD AND APPARATUS THEREOF

Soo D. Kim; Hak S. Chang, both of Seoul, and Jong S. Paik, Dajon, all of, Rep. of Korea, assignors to Changmin Technology Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 24, 1994, Ser. No. 295,287
Claims priority, application Rep. of Korea, Aug. 25, 1993, 93-16627
Int. Cl.^{6} G01F *1/66*
U.S. Cl. 73—861.27 **5 Claims**



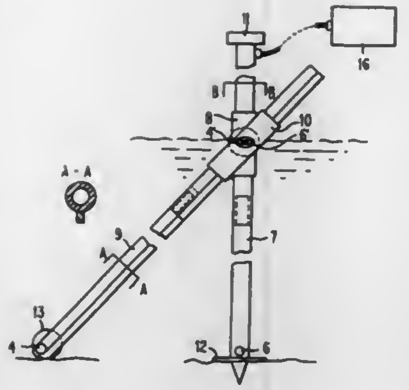
1. A method for measuring the flow rate of a large caliber pipe comprising steps of:
mounting a plurality of ultrasonic vibrators on both the left and the right side radius of the circle circumference in a plurality of channels arranged by reference to the diameter line of the pipe, in which one channel is disposed along the diameter line, a part of the channels are arranged on one side radius to meet the formula $l=2R/(N+1)$, and other channels are arranged on the opposite side radius to meet $l'=\frac{1}{2}=R/(N+1)$;
measuring the propagation time t_1 of the ultrasonic pulse every channel;
measuring the propagation time Δt of the ultrasonic pulse when any one of the ultrasonic vibrators is inserted into the pipe at a distance ΔL on one of the channels;
calculating the propagation distance of the ultrasonic pulse in the liquid at the other channels; and,
calculating the average flow velocity V_s of the pipe cross-sectional area using all parameters obtained by performing the above steps.

5,531,125

METHOD AND DEVICE FOR SIMULTANEOUSLY MEASURING THE FLOW SPEED AND THE DEPTH OF A RIVER

Kyu-Hong Ahn, and Hak-Su Chang, both of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea
Filed Dec. 21, 1994, Ser. No. 360,301
Claims priority, application Rep. of Korea, Dec. 24, 1993, 93-29487
Int. Cl.^{6} G01F *1/00*
U.S. Cl. 73—861.27 **2 Claims**

2. A device for simultaneously measuring the flow speed and the depth of a river using ultrasonic waves to measure average flow speeds at a plurality of points in the water flow of a river to measure the flow rate of the river, comprising,
a flow speed measuring device and a calculating means,
said flow speed measuring device includes a vertical rod (**7**), an inclined rod (**9**), a vertical rod cylinder (**8**) movable up and down along the vertical rod, an inclined rod cylinder (**10**), through which the inclined rod can move, installed at an axis



fixed perpendicular to the vertical rod cylinder (8), an angle sensor (15) measuring the angle between the vertical rod (7) and the inclined rod (9), support rods (14) installed at said axis and the ends of the vertical rod and the inclined rod (9) opposite to said axis, ultrasonic vibrators (4, 4',6, 6') installed at the ends of said support rods (14) spaced form the vertical rod and the inclined rod, and a level (11) attached to the top of the vertical rod (7), and

said calculating means (16) includes an ultrasonic pulse oscillation circuit, ultrasonic pulse generation, receiving, and amplification circuit, an analog-digital signal conversion circuit, a microprocessor including a memory circuit, a digital signal processing circuit, an arithmetic unit circuit, and a display displaying the measured result, and high frequency wave cables connected to the flow speed measuring device.

5,531,126
CORIOLIS-TYPE MASS FLOW SENSOR WITH FLOW CONDITION COMPENSATING

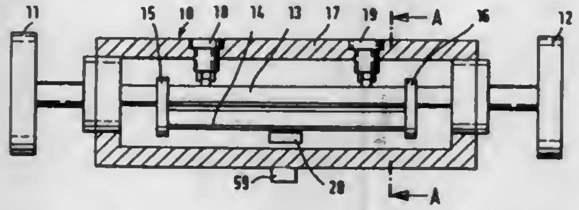
Wolfgang Drahm, Zwingen, Switzerland, assignor to Endress + Hauser Flowtec AG, Switzerland

Filed Jul. 19, 1994, Ser. No. 277,245

Claims priority, application European Pat. Off., Jul. 21, 1993, 93810523

Int. Cl.^{6} G01F *1/84*

U.S. Cl. 73—861.357 **8 Claims**



1. A mass flow sensor working on the Coriolis principle

having flanges for installing said flow sensor in a conduit of a given diameter so as to be axially aligned with said conduit, through which flows a fluid to be measured,

with a straight measuring tube having an inlet-side and an outlet-side end portions and extending between the flanges and traversed by the fluid,

with a straight dummy tube extending parallel to the measuring tube, defined by end portions and not traversed by the fluid,

with a nodal plate on the inlet side of said measuring tube and a nodal plate on the outlet side of said measuring tube,

one of which fixes the inlet-side end portion of the measuring tube to the corresponding end portion of the dummy tube, and

the other of which fixes the outlet-side end portion of the measuring tube to the corresponding end portion of the dummy tube, so that the measuring tube and the dummy tube are arranged side by side,

with a support tube having its ends fixed in the respective flanges, and

with means which act only on the dummy tube to excite resonance vibrations of the measuring tube so that the phase relationship between the vibration of the dummy tube and that of the measuring tube is 180 or as close as possible to this value.

5,531,127
OPTICAL TORQUE SENSOR

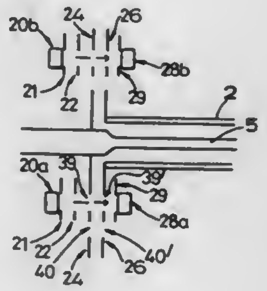
Roger J. Hazelden, Worcestershire, England, assignor to Lucas Industries public limited company, West Midlands, England

Filed Aug. 11, 1994, Ser. No. 289,195

Claims priority, application United Kingdom, Aug. 13, 1993, 9316842

Int. Cl.^{6} G01F *1/00*

U.S. Cl. 73—862.336 **11 Claims**



1. A torque sensor comprising:

an input member;

an output member;

electromagnetic wave emitter means;

first electromagnetic wave receiver means for receiving a first signal, the first receiver means comprising means to output at least one output signal dependent upon the first signal;

second electromagnetic wave receiver means for receiving a second signal;

the second receiver means comprising means to output at least one output signal dependent upon the second signal;

signal processing means for processing the output signals from the first and second receiver means to produce a modified output signal indicative of the angular displacement between, or torque applied between, the input and output members, and

input and output masks, the input and output masks being associated with the input and output members respectively and being interposed between the emitter means and the first and second receiver means, the input and output masks each comprising an outer track containing an angularly spaced set of apertures and a radially spaced inner track containing an angularly spaced set of apertures, and the masks having equal aperture pitch, the aperture pitch of each mask being defined as the total angle subtended at a central axis of the respective mask by one opaque and one transparent region of the mask, wherein:

the first receiver means comprises a pair of first and second effective receivers disposed so as to receive signals from the inner tracks of apertures;

the second receiver means comprises a pair of third and fourth effective receivers disposed so as to receive signals from the outer tracks of apertures;

each of the effective receivers comprises means to output a signal dependent upon the respective signal received, and

the pair of first and second effective receivers of the first receiver means is diametrically opposed to the pair of third and fourth effective receivers of the second receiver means, in relation to the tracks of apertures of at least one of the masks.

5,531,128
CAPACITIVE TRANSDUCER FEEDBACK-CONTROLLED BY MEANS OF ELECTROSTATIC FORCE AND METHOD FOR CONTROLLING THE PROFILE OF THE TRANSDUCING ELEMENT IN THE TRANSDUCER

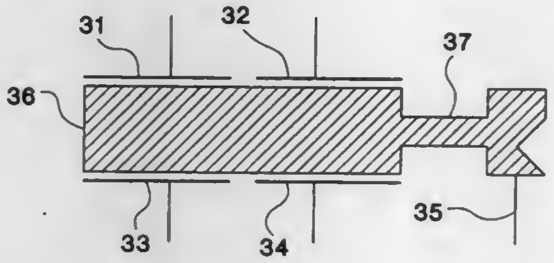
Tapani Ryhänen, 00270 Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Aug. 19, 1994, Ser. No. 293,463

Claims priority, application Finland, Aug. 20, 1993, 933670

Int. Cl.^{6} G01C *1/00*

U.S. Cl. 73—862.623 **20 Claims**



1. A capacitive transducer, feedback-controlled by electrostatic force, comprising:

a transducing element sensitive to a variable being measured and being at least on its surface electrically conductive to form a first electrode of the transducer, and

at least two second electrodes having substantially equal effective areas which are aligned essentially parallel to a longitudinal axis of said transducing element and placed on the same side with respect to said first electrode wherein said second electrodes measure a profile of the transducing element, and

a controller controlling said second electrodes to maintain the profile of said transducing element.

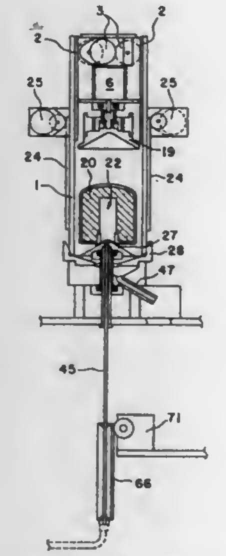
5,531,129
APPARATUS FOR EXTRACTING WEAR PARTICLES FROM USED OIL FILTERS

Janine M. Thornton, and Michael G. Thornton, both of Littleton, Colo., assignors to Synectic Technology, Inc., Littleton, Colo.

Continuation-in-part of Ser. No. 309,910, Sep. 21, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,766

Int. Cl.^{6} B01D *21/30*

U.S. Cl. 73—863.24 **17 Claims**



1. An apparatus for extracting standardized samples of wear particles from a series of used filters, each filter having an opening extending from one end along an axis, said apparatus comprising:

a housing having an interior chamber for receiving said filter;

means for rotating said filter about said axis within said chamber;

means for spraying a predetermined quantity of fluid within said opening during said rotation of said filter to produce a standardized sample of said wear particles from each filter; and

means for rinsing said interior of said chamber of said housing between consecutive filters to prevent cross-contamination of samples.

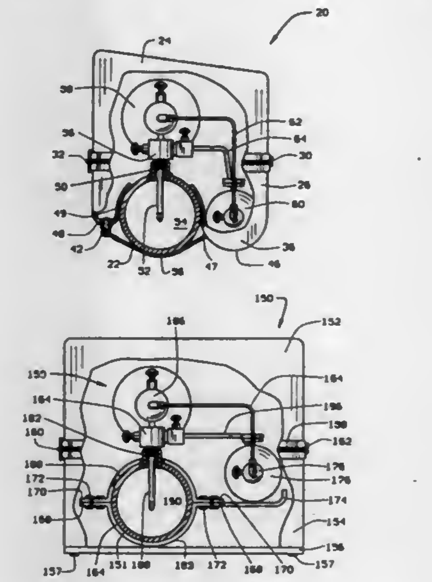
5,531,130
PIPELINE SAMPLING ENCLOSURE

Brian H. Welker, 13818 Florence, Sugar Land, Tex. 77478

Filed Apr. 26, 1995, Ser. No. 429,350

Int. Cl.^{6} G01N *1/00*

U.S. Cl. 73—863.81 **8 Claims**



1. A housing mounted on a pipeline to enclose a sampler and a sample cylinder, the pipeline containing a flowing fluid which has a temperature that is generally different from the ambient surrounding atmosphere, said housing comprising:

(a) a top element;

(b) a bottom element dimensioned to engage said top element, said top element and said bottom element together defining a housing which partially encircles the pipeline, said housing sized to enclose and isolate the sampler and the sample cylinder from the ambient surrounding atmosphere when mounted on said pipeline;

(c) opposed rims extending from and forming a part of said bottom element, said rims contacting said pipeline to support said housing, said rims exposing the interior atmosphere of said housing to a portion of the pipeline, so that the interior atmosphere and the sample cylinder are maintained at approximately the same temperature as the fluid flowing through said pipeline; and

(d) a plurality of straps mounted on said bottom element to securely position and hold said bottom element on the pipeline.

5. A housing mounted on a pipeline to enclose a sampler and a sample cylinder, the pipeline containing a flowing fluid which has a temperature that is generally different from the ambient surrounding atmosphere, said housing comprising:

(a) a top element;

(b) a bottom element dimensioned to engage said top element, said top element and said bottom element together defining a housing which completely encircles the pipeline, said housing sized to enclose and isolate the sampler and the sample cylinder from the ambient surrounding atmosphere when

mounted on said pipeline, said top element and said bottom element completely encircling the pipeline;
(c) at least one clamp extending from and connected to said bottom element, said clamp gripping said pipeline to support said housing;
(d) support brackets that cradle the sample cylinder inside said housing; and
(e) said top element and said bottom element exposing the interior atmosphere of said housing to at least a portion of the pipeline so that the interior atmosphere and the sample cylinder are maintained at approximately the same temperature as the fluid flowing through said pipeline.

5,531,131
DEVICE FOR ADJUSTING CORRECTION FACTOR OF A PLUNGER LIFT PIPET

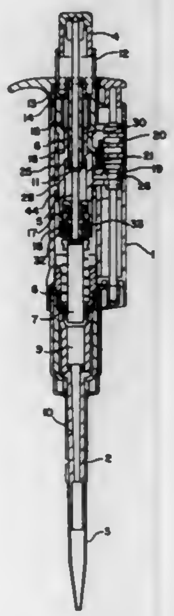
Horst Sabloewski, Hamburg, Germany, assignor to Eppendorf-Netheler-Hinz GmbH, Hamburg, Germany

Filed Oct. 21, 1994, Ser. No. 326,999

Claims priority, application Germany, Oct. 21, 1993, 43 35 863.2

Int. Cl.⁶ G01N *1/14*

U.S. Cl. 73—864.18 **12 Claims**



1. A device for adjusting a correction factor of a plunger lift pipet, comprising:
adjusting means for changing a travel path of a pipet plunger;
display means for displaying a liquid volume pipetted with each stroke of the pipet plunger;
releasable coupling means for positively connecting said adjusting means and said display means, said releasable coupling means having two gears supported on a common axis and connected to each other for joint rotation with each other, and spring means for biasing said two gears into engagement with respective gear means of said adjusting means and said display means; and
switching means for displacing said two gears against a biasing force of said spring means for disengaging at least one of said two gears from a respective one of said respective gear means of said adjusting means and said display means to enable adjustment of the correction factor by manipulating said adjusting means.

5,531,132
CAM APPARATUS USING AN ELECTROMAGNET AND GEARS FOR DECELERATING A MOTOR

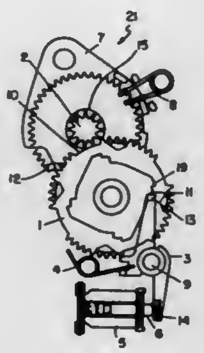
Katsuhiko Koshino, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 12, 1994, Ser. No. 180,226

Claims priority, application Japan, Jan. 14, 1993, 5-004644

Int. Cl.⁶ F16H *55/17*

U.S. Cl. 74—435 **6 Claims**



1. A cam apparatus, comprising:
a cam gear having a toothless area and teeth at a circumferential surface thereof and also having a first locking projection and a second locking projection on a surface thereof;
a driving gear for engaging the teeth of the cam gear to rotate the cam gear by a driving force transmitted from a motor through a deceleration mechanism;
a lever for engaging another surface of the cam gear thus to pivot in accordance with rotation of the cam gear;
a lock lever having an end for sequentially engaging the first and the second locking projections of the cam gear while the driving gear is opposed to the toothless area of the cam gear;
a spring for biasing the lock lever to engage the first locking projection; and
an electromagnet for engaging another end of the lock lever, wherein
the lock lever is positioned to be released from the first locking projection when the electromagnet is turned ON and to engage the second locking projection before the driving gear engages the teeth of the cam gear, whereby the second locking projection locks the end released from the first locking projection and prevents the cam pear from rotating before the driving gear engages the teeth of the cam gear.

5,531,133
SHIFT LEVER ASSEMBLY FOR TRANSMISSION HAVING TURNING INHIBITING MEMBERS

Tadashi Takemura; Toshihiko Morita; Kenichi Aimi, all of Kyoto, and Katsuhiro Komori, Uji, all of, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, and Mitsubishi Jidosha Engineering Kabushiki Kaisha, both of Tokyo, Japan

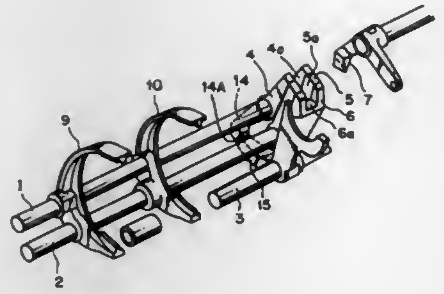
Filed Jul. 12, 1994, Ser. No. 274,199

Claims priority, application Japan, Jul. 16, 1993, 5-176580

Int. Cl.⁶ B60K *20/02*

U.S. Cl. 74—473 R **11 Claims**

1. A shift lever assembly for a transmission, said assembly comprising a plurality of fork shafts arranged in parallel with each other shift lugs fixed in a mutually adjacent relationship on said fork shafts, respectively; a control finger associated with a shift lever and releasably engageable with said shift lugs to cause a corresponding one of said fork shafts to slide to perform a shifting operation; and turning inhibiting members arranged on outermost shift lugs located on outermost sides of said mutually-adjacent shift lugs.



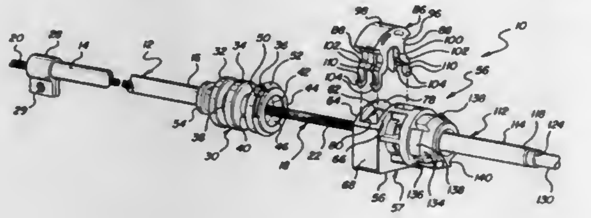
5,531,134
REMOTE CONTROL ASSEMBLY HAVING ROTATABLE END FITTING

John P. Petruccello, Detroit, Mich., assignor to Teleflex, Inc., Plymouth Meeting, Pa.

Filed May 24, 1995, Ser. No. 449,304

Int. Cl.⁶ F16C *1/14*

U.S. Cl. 74—502.4 **11 Claims**



1. A motion transmitting remote control assembly, comprising:
a conduit (12) having opposite ends (14, 16);
a core element (18) supported slideably within said conduit (12) having extended end portions (20, 22) extending beyond said ends (14, 16) of said conduit (12);
an end fitting (30) fixed to one of said ends (16) of said conduit (12);
a connector (56) disposed about said end fitting (30) having mounting means (134) for mounting said end fitting (30) to a support structure;
said connector (56) including a receptacle (60) having an access opening (62) therein to receive and support said end fitting (30) rotatably within said receptacle (60) and retaining means (86) acting between said end fitting (30) and said connector (56) to retain said end fitting (30) against subsequent removal from said receptacle (60) while allowing relative rotation between said connector (56) and said end fitting (30) and resilient seal means (52) acting between said end fitting (30) and said connector (56) upon insertion of said end fitting (30) into said receptacle (60) for providing and maintaining a fluid-tight seal between said end fitting (30) and said connector (56) during said relative rotation of said end fitting (30) and said connector (56);
said end fitting (30) including a plurality of annular projections (32,34,36) spaced axially from one another defining at least one annular locking groove (38,40) therebetween;
said retaining means (86) comprising a locking member (86) having portions engageable with said end fitting (30), said locking member (86) being movable with respect to said connector (56) and said end fitting (30) from a disengaged position to permit insertion of said end fitting (30) into said receptacle (60) to an engaged position in which said portions of said locking member (86) engage said end fitting (30) to prevent subsequent removal of said end fitting (30) from said receptacle (60);
said locking member (86) including at least one locking channel (100) engageable with said locking groove (38, 40) when said locking member (86) is moved to said engaged position to retain said end fitting (30) against removal from said receptacle (60) through said access opening (62);
said locking member (86) and said connector (56) including mutually engageable portions that coact to lock said locking member (86) in said engaged position;
said connector (56) having a passage (78) with an opening (80) spaced from said access opening (62) and extending transversely into said receptacle (60) supporting and guiding said locking member (86) during movement toward said engaged position;
said mutually engageable portion of said locking member (86) comprising at least a pair of deflectable spring fingers (102) extending from said locking channel (100) and terminating at laterally outwardly extending locking projections (104) spaced at a lateral distance relatively greater than the lateral dimension of said passage (78).

5,531,135
PEDAL ARRANGEMENT FOR A MOTOR VEHICLE

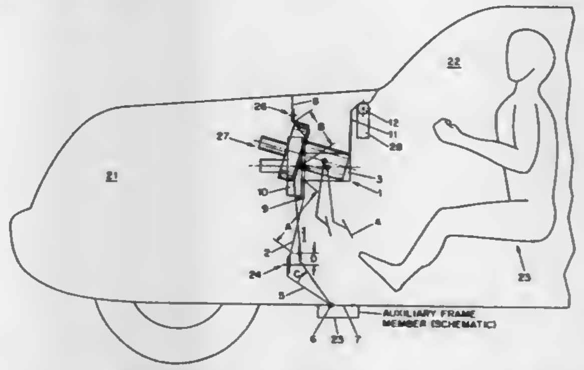
Franz Dolla, Isenbüttel, Germany, assignor to Volkswagon AG, Wolfsburg, Germany

Filed May 2, 1994, Ser. No. 236,996

Claims priority, application Germany, Jun. 11, 1993, 43 19 358.7

Int. Cl.⁶ G05G *1/14*

U.S. Cl. 74—512 **7 Claims**



1. A pedal arrangement for a motor vehicle having an engine compartment and an operator compartment comprising a bulkhead between the engine compartment and the operator compartment, a bearing mount fastened to the bulkhead, at least one pedal lever supported by the bearing mount, a flexurally rigid transverse member to which the bearing mount is attached, and a buckling zone in the bulkhead located in a region where the bearing mount is fastened to the bulkhead and arranged so that, in response to application of a force to the bulkhead resulting from a frontal impact, the bearing mount is displaced in a direction to move the pedal lever supported thereby away from an operator of the vehicle in the operator compartment.

5,531,136
BRAKE OPERATING MECHANISM

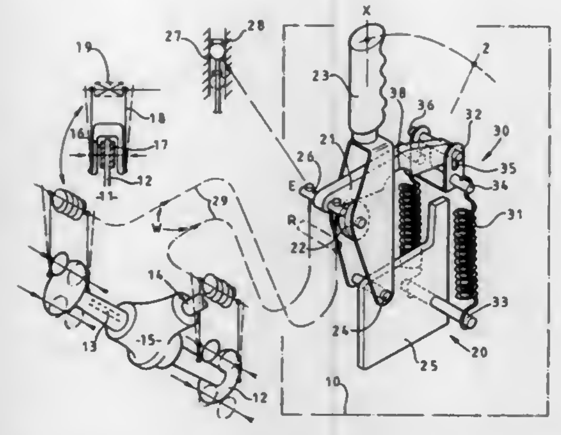
Stanley R. Tyler, Knapp Corner House, Painswick, Gloucestershire, England

Filed Oct. 3, 1994, Ser. No. 321,811

Int. Cl.⁶ G05G *1/04*

U.S. Cl. 74—523 **10 Claims**

1. A brake operating mechanism comprising a frame, an articulatable beam movable relative to the frame, a force reacting fulcrum movable relative to both the frame and the beam and pivotably supporting the beam, and resilient means acting on one end of the beam, the other end of the beam being for connection to a brake operating element, the fulcrum being movable in use between a first position in which the beam is in a maximum loading condition with the brakes, which the mechanism operates, applied and in which the beam is force balanced resiliently about the fulcrum and a second position nearer said one end of the beam



than when in its first position and in which position the beam is unloaded as a result of the resilient means becoming grounded-out by the frame so as to render the force balance ineffective and allow the brakes to become released.

5,531,137

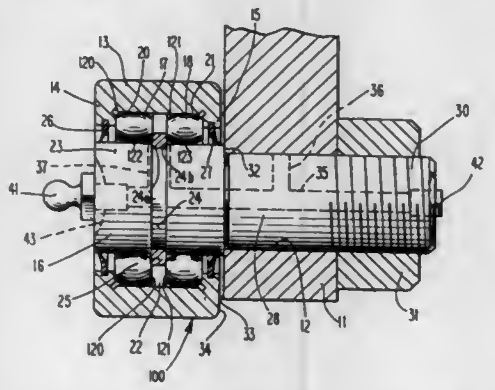
CAM FOLLOWER ASSEMBLY

Werner B. Guilford, Hulmeville, Pa., assignor to Roller Bearing Company of America, Trenton, N.J.

Continuation-in-part of Ser. No. 972,231, Nov. 5, 1992, abandoned, which is a continuation of Ser. No. 707,427, May 28, 1991, abandoned, which is a continuation of Ser. No. 217,874, Jul. 12, 1988, abandoned. This application Nov. 14, 1994, Ser. No. 337,774

Int. Cl.^{6} F16H *53/06*

U.S. Cl. 74—569 **20 Claims**



1. A cam follower assembly comprising a bearing outer ring and an inner bearing member; with the bearing outer ring having a cylindrical inner surface disposed between inwardly directed flanges at axially spaced apart ends thereof and defining a cylindrical race for cylindrical bearing rollers therein, said inwardly directed flanges each having an inner surface disposed in perpendicular relation to said cylindrical inner surface;

with said inner bearing member comprising a cylindrical member having a cylindrical outer periphery and mounting shaft extending axially from an end thereof;

a pair of generally parallel rows of bearing rollers mounted in axially spaced-apart relation defining a space there between and between the cylindrical outer periphery of said inner bearing member and the cylindrical inner periphery of the bearing outer ring;

a generally annular groove on the outer periphery of said inner bearing member;

with thrust means disposed in said groove and carried thereby and extending radially outwardly thereof into the space between the rows of bearing rollers, for contact with and thrust engagement with adjacent ends of said bearing rollers, with said thrust means, said pair of rows of bearing rollers and said annular groove between said rows of bearing rollers cooperating to define means for accommodating axial thrust through row of bearing rollers in either axial direction;

wherein said inner bearing member is provided with lubricating means comprising a generally longitudinally directed lubrication channel, and a transverse roller lubrication channel communicating therewith, said transverse roller lubrication channel being longitudinally wider than the thickness of said annular groove of the shaft inner bearing member and being provided in communicating relation on opposite sides of said annular groove with said cylindrical race, for lubrication of said bearing outer ring, said inner bearing member, and said pair of rows of bearing rollers from the transverse channel;

said bearing rollers each having crowned end portions provided at each axial end thereof, wherein each said crowned end portion comprises a crown radial portion and a corner radial portion, said crown radial portion and said corner radial portion together defining a crown width, and wherein said crown width comprises a unit dimension at least as great as the width of said transverse lubrication channel extends past each side of said annular groove and is suitable for maintaining said cylindrical peripheral roller surface a predetermined distance from said transverse roller lubrication channel to facilitate the operation of said bearing assembly by preventing said bearing rollers from contacting said transverse lubrication channel;

with said mounting shaft having fastening means thereon for facilitating the fastening of said shaft to a carrier member for movement therewith;

wherein said thrust means accommodates a first thrust load transmitted from the shaft in one direction through one of the parallel rows of bearing rollers, and accommodates a second thrust load transmitted from the shaft in the opposite direction through the other parallel row of bearing rollers; and wherein said bearing outer ring ultimately transmits a thrust load to the mounting shaft of said inner bearing member through said thrust means by engagement of said flange inner surface with one of the parallel rows of bearing rollers.

5,531,138

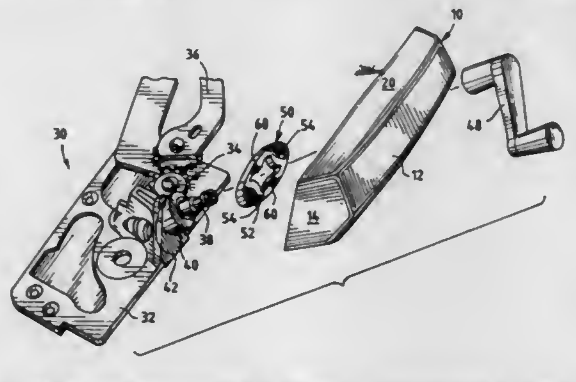
WINDOW OPERATOR HOUSING

Gregory J. Vetter, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Jul. 8, 1994, Ser. No. 272,126

Int. Cl.^{6} F16H *57/02*

U.S. Cl. 74—606 R **12 Claims**



1. A housing assembly for housing a portion of a window operating assembly which includes a drive shaft and a drive shaft boss having recesses on opposite sides thereof, said housing assembly comprising:

a cover having a top side with an annular opening therethrough and sides depending from the top side to define an interior and an exterior, said cover being open on the interior for receiving a portion of a window operating assembly including a drive shaft boss with a portion of a window operating assembly drive shaft extending through the top side opening to the exterior, said depending sides having outer edges mateable with a window operating assembly to maintain alignment of the cover with a substantial portion of a window operating assembly housed by the cover;

a discrete connecting member having an oblong opening therethrough, said oblong opening having a narrow portion with a radial dimension less than that of a drive shaft boss for securely fitting with recesses on opposite sides of a drive shaft boss; and

means for securing said connecting member to the interior of the cover with the oblong opening and annular opening substantially axially aligned and the narrow portion substantially radially aligned with recesses on opposite sides of a drive shaft boss.

5,531,139

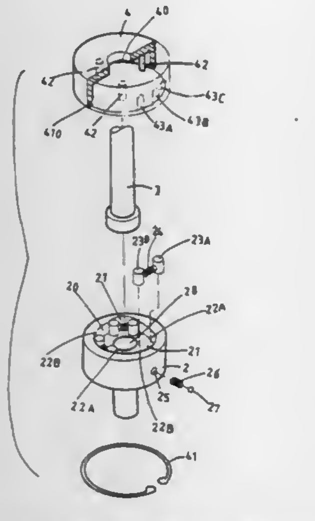
UNIDIRECTIONAL DRIVE TOOL MECHANISM

Wei-Chuan Fanchang, No. 58, Alley 122, Liuh Shan Lane, Nan Yang Road, Feng Yuan, Taichung County, and Shih-Yueh Chen, No. 111, Lane 41, Section 1, Hsin Jen Road, Da-Li, Taichung County, both of, Taiwan

Filed Aug. 14, 1995, Ser. No. 514,801

Int. Cl.^{6} B25B *13/46*

U.S. Cl. 81—59.1 **2 Claims**



1. A unidirectional drive tool mechanism comprising:

a housing including a hole formed therein and including an inner peripheral surface having at least three recesses formed therein, said recesses each including a first end and a second end, said housing including an outer peripheral surface having a projection means provided thereon,

a shaft rotatably engaged in said hole of said housing,

at least three pairs of rods engaged in said recesses respectively, said pairs of rods each including a first rod and a second rod for engaging with said first end and said second end of said recesses respectively,

at least three biasing means engaged between said pairs of rods respectively so as to bias said first rods and said second rods to engage with said first ends and said second ends of said recesses respectively, and

a cap engaged on said housing and including at least three poles extended inward of said housing for engaging with said rods and including an inner peripheral surface having at least two depressions formed therein for engaging with said projection means,

said poles being engaged with said first rods so as to bias said second rods to engage with said second ends of said recesses when said projection means is engaged with a first of said two depressions, in order to allow said shaft to be driven in a first direction by said housing and to allow said shaft to rotate freely in a second direction; and said poles being engaged with said second rods so as to bias said first rods to engage with said first ends of said recesses when said projection means is engaged with a second of said two depressions, in order to allow said shaft to be driven in said second direction by said housing and to allow said shaft to rotate freely in said first direction.

5,531,140

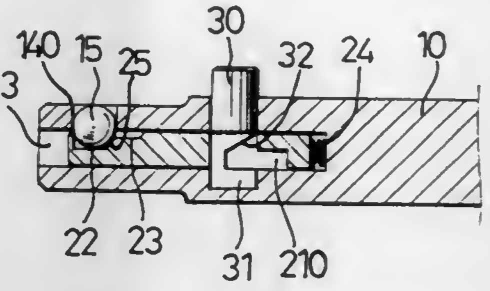
COUPLING MECHANISM OF SOCKET WRENCH EXTENSION

Jessie Chow, No. 18, Hou Juan Road, Taichung, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,924

Int. Cl.^{6} B25B *13/00*

U.S. Cl. 81—177.85 **2 Claims**



1. A socket wrench extension comprising:

a body including an axial bore formed therein, and including an opening and an orifice formed therein and intersecting with said axial bore, said axial bore including an open end,

a ball engaged in said opening,

an actuator engaged in said orifice and including a lower portion having a lateral projection and a first tapered surface formed therein,

a rod slidably engaged in said axial bore of said body and including an aperture formed therein for engaging with said lower portion of said actuator and including a recess in communication with said aperture for receiving said lateral projection of said actuator, said rod including a cavity for receiving said ball and including a second tapered surface for engaging with said ball and for moving said ball partially outward of said opening, and

means for biasing said rod to engage with said first tapered surface of said actuator and for engaging said projection of said actuator in said recess of said rod, and said biasing means biasing said second tapered surface of said rod to engage with said ball so as to move said ball partially outward of said opening,

said rod being moved inward of said axial bore of said body against said biasing means by said first tapered surface of said actuator when said actuator is depressed inwards of said orifice, such that said ball is received in said cavity of said rod.

5,531,141

DRAIN NUT PLIERS

David S. Gilbert, Jr., 110 Rock Run Rd., Elizabeth, Pa. 15037

Filed May 30, 1995, Ser. No. 453,989

Int. Cl.^{6} B25B *7/02*

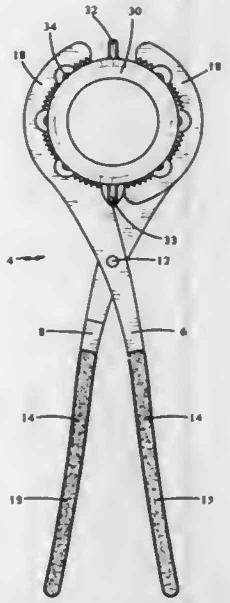
U.S. Cl. 81—426.5 **14 Claims**

1. A hand tool for handling a workpiece, comprising:

a first elongated member having an arcuate jaw at a first end and a handle portion at a second end;

a second elongated member having an arcuate jaw at a first end and a handle portion at a second end; and

a pivot pin for pivotally coupling said first elongated member to said second elongated member;

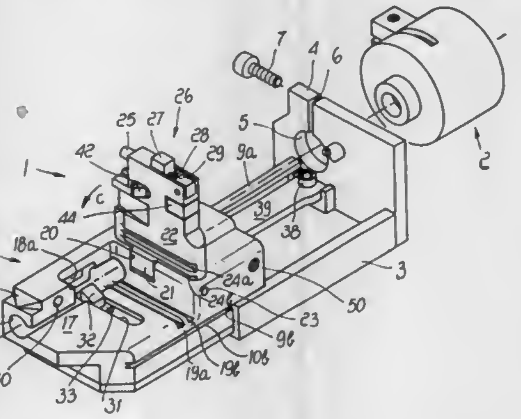


wherein an inner surface of each said arcuate jaw includes a plurality of teeth thereon which are adapted to engage the workpiece at a plurality of positions around the circumference of the workpiece, and each said arcuate jaw further including a plurality of grooves positioned on said jaw extending away from said inner surface into said jaw, said plurality of grooves separating said plurality of teeth into spaced teeth arrays, each said teeth array including a plurality of said teeth, wherein tips of said teeth of each said array lie on a concave, arcuate curve, wherein adjacent teeth arrays on one arcuate jaw are separated by one said groove, and wherein said tips of said teeth of a first set of said teeth arrays defines a first circular profile and said tips of said teeth of a second set of said teeth arrays defines a second circular profile.

5,531,142
DEVICE WITH AUTOMATIC FEEDER FOR DRIVING RIBBON-MOUNTED SCREWS

Giuseppe Adamo, Bologna, Italy, assignor to Nikema S.r.l., Sala Bolognese, Italy

Filed Mar. 10, 1995, Ser. No. 402,215
Claims priority, application Italy, Mar. 22, 1994, BO94A0122
Int. Cl.^{6} B25B *23/06*
U.S. Cl. 81—434 **6 Claims**



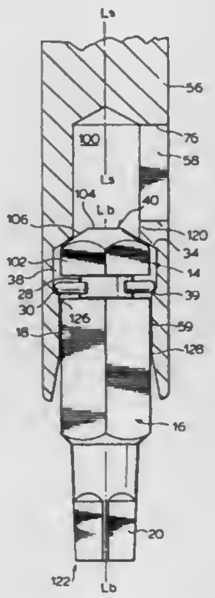
1. Device with automatic feeder for driving ribbon-mounted screws, comprising:

a guide being mountable in front of a screwing tool;
elastic means provided on said guide;
a box-like body being mounted on said guide, said body being slideable on said guide in contrast with said elastic means;
a shallow seat provided at said body for allowing a sliding of a ribbon on which screws are mounted;
a longitudinal hole for positioning a first screw, said hole further allowing a longitudinal sliding of a shank of the screwing tool, and said longitudinal hole being connected to said shallow seat along a side thereof;
a lid being pivoted to said body, said lid being lockable for covering said seat;
a sliding bolt for locking in a covering position said lid over said seat;
a transverse slot which crosses said seat;
a tooth element passing through said slot for retaining with a lower tooth thereof a first screw;
a lever system for moving said tooth element below a second screw during a relative retraction of the body during screwing and for moving the second screw into said hole during a relative advancement of the body;
a spring latch mounted in said lid, said latch being actuatable for retaining the second screw while said lower tooth of said tooth element passes below said second screw, and respectively for allowing a translatory motion of the second screw in said hole, said latch keeping aligned said second screw during the translatory motion.

5,531,143
SCREWDRIVER WITH REPLACEABLE BIT ASSEMBLY

G. Lyle Habermehl, 7528 Hickory Hill Ct., Whites Creek, Tenn. 37189, and Paul T. Scherer, Lexington, Ky., assignors to G. Lyle Habermehl, Whites Creek, Tenn.

Continuation-in-part of Ser. No. 44,956, Apr. 8, 1993, Pat. No. 5,351,586. This application Apr. 8, 1994, Ser. No. 225,949
Int. Cl.^{6} B25B *23/00*
U.S. Cl. 81—438 **13 Claims**



1. An apparatus for automatically power driving fasteners which are joined together in a strip comprising:

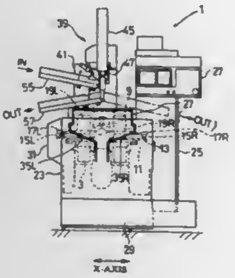
housing means;
power drive means secured to the housing means;
drive shaft means operatively connected to the power drive means for rotation and defining a longitudinal axis;
slide body means coupled to the housing for reciprocal displacement parallel to the axis of the drive shaft means;
spring means biasing said body means forwardly relative to the housing means parallel the axis to the extended position;
guide channel means for said fastener strip extending through said slide body means;

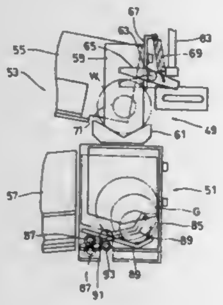
the body means including guideway means to receive screws when advanced therein via the guide channel means and to locate the screws in alignment with said drive shaft means for engagement thereby in driving of the screws from the guide tube means by the drive shaft means on reciprocal displacement of the slide body means relative the housing means;
the improvement wherein the drive shaft means comprises elongate mandrel means having at a forward end axially engaging socket means;
bit means disposed in the socket means for rotation with the socket means with a forward screw engaging end of the bit means extending from the socket means;
the bit means received in the socket means whereby the bit means may move in a substantially ball-and-socket manner relative the socket means from an orientation in which a longitudinal axis of the bit means is coaxial with the axis of the drive shaft means to orientations in which the axis of the bit means is inclined at an angle of at least 2° relative the axis of the shaft means with the screw engaging end of the bit means displaced away from the axis of the drive shaft means to assist the screw engaging end of the bit means in driving engagement of a screw which is not coaxially aligned with the axis of the drive shaft means;
the bit means having an annular groove therein about a reduced diameter portion, the socket means having rearwardly directed shoulder means;
resilient ring means about the bit means in the annular groove engaging the annular groove and the shoulder means to retain the bit means in the socket means against removal under axially directed forces less than a required force.

5,531,144
NC LOADER FOR NC MACHINE TOOL

Hideo Niidoi, Anjo, Japan, assignor to Tecno Wasino Co., Ltd., Aichi, Japan

Filed Dec. 20, 1994, Ser. No. 360,023
Claims priority, application Japan, Dec. 24, 1993, 5-325527
Int. Cl.^{6} B23B *15/00;* **B23Q** *7/04*
U.S. Cl. 82—127 **5 Claims**





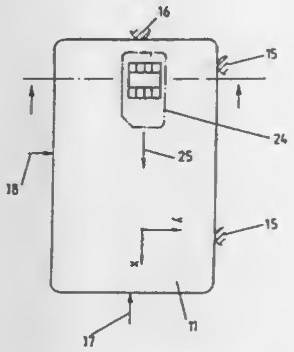
1. An NC loader for a machine tool having a main spindle mounted on a main spindle base, said NC loader comprising:

a support frame mounted on the main spindle base;
a loader body mounted on said support frame and provided with a horizontal shaft and a vertical shaft to allow said loading body to be movable in both horizontal and vertical directions, respectively;
a loading and unloading hand provided with a workpiece hand section and a product hand section both integrally attached to an end of the vertical shaft;
at least one workpiece shooter attached to said support frame, for loading work onto the workpiece hand section of said loading and unloading hand; and
at least one product shooter attached to said support frame, for unloading products from the product hand section of said loading and unloading hand;
said workpiece hand section including a hand body attached to a lower end of the vertical shaft, a lower clamp jaw fixed to said hand body, for receiving a workpiece discharged from said workpiece shooter, a pivotal upper clamp jaw pivotally attached to said hand body, for clamping the discharged workpiece in cooperation with said lower clamp jaw, and a piston rod for pivoting said upper clamp jaw after the discharged workpiece has been mounted on said lower clamp jaw, and said product hand section including a bucket mounted at a lower end of said loading and unloading hand, and a pivotal bar disposed within said bucket for receiving a product.

5,531,145
METHOD FOR MAKING IC CARD HAVING SEVERABLE MINI CHIP CARD

Yahya Haghiri-Tehrani, Munich, Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Germany

Division of Ser. No. 200,584, Feb. 22, 1994, Pat. No. 5,362,955, which is a continuation of Ser. No. 665,023, Mar. 5, 1991, abandoned. This application Aug. 11, 1994, Ser. No. 289,191
Claims priority, application Germany, Mar. 7, 1990, 40 07 221.5
Int. Cl.^{6} B26D *5/32*
U.S. Cl. 83—27 **4 Claims**

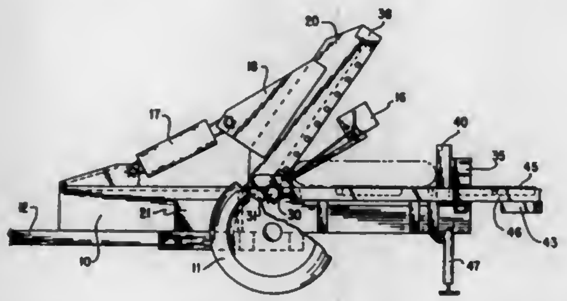


1. A method for producing a mini chip card from a standard card, said standard card having outer edges and having an embedded semiconductor chip with contact surfaces, said contact surfaces being located in agreement with a tolerance window defined by a standard and within a certain tolerance from the outer edges of the standard card, said method employing a punching die with cutting edges defining an outer contour of the mini chip card when produced from the standard card, said method comprising the steps of:

adjusting a position of the punching die relative to the standard card by positioning the die with respect to the contact surfaces so that the cutting edges of the punching die are at a predefined position with respect to the contact surfaces; and
performing a punching operation with the punching die in the adjusted position to form the outer contour of the mini chip card, the contact surfaces being in a desired position with respect to the outer contour of the mini chip card formed by the punching operation so that the mini chip card is produced from the standard card with a desired positional relationship with respect to the contact surfaces.

5,531,146
TIRE SHEAR

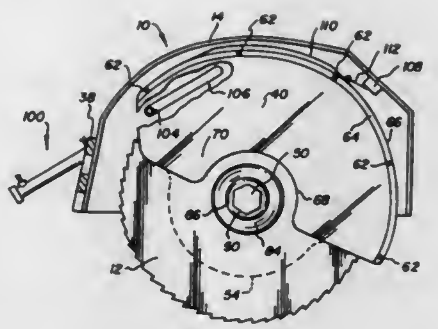
Les H. Pederson, 2612 W. Sixth St., Sioux City, Iowa 51103
Continuation-in-part of Ser. No. 856,247, Mar. 25, 1992, abandoned, and a continuation-in-part of Ser. No. 91,958, Jul. 15, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 310,964
Int. Cl.^{6} B26D *7/01;* B23D *15/04*
U.S. Cl. 83—467.1 **2 Claims**



1. A shearing device for cutting tires comprising a frame, lower shear blade means fixedly mounted on said frame, upper shear blade means including an upper blade support pivoted to a pivotal mounting on said frame, said upper shear blade means being in shearing relationship with said lower shear blade means thus forming a V-shaped opening between said upper and said lower shear blade means, said pivotal mounting defining a pivot axis substantially at the vertex of said V-shaped opening, said upper shear blade means also including an upper blade removably fixed to said upper blade support, power means including an expanding piston and cylinder assembly fastened at one end to said upper shear blade means and at the other end to said frame, said fastening of said other end to said frame being on said frame at a location remote from said pivot axis in a direction opposite to said V-shaped opening whereby said V-shaped opening is not obstructed by said piston and cylinder assembly, and outer guide means including upper guide means on said upper shear blade means remote from said pivot axis at an outer end of said upper blade, said upper guide means being positioned to be engaged with corresponding lower guide means on said lower shear blade means so that interaction between said upper guide means and said lower guide means prevents movement of said upper shear blade means laterally of said lower shear blade means, rollers mounted on said frame adjacent said lower shear blade means, said rollers being positioned to support said tire in position above said lower shear blade means, extendible supports mounted on said frame, at least a plurality of said rollers mounted on said extendible supports whereby said rollers may be extended and retracted for differing sizes of tires.

5,531,147
SAW GUARD

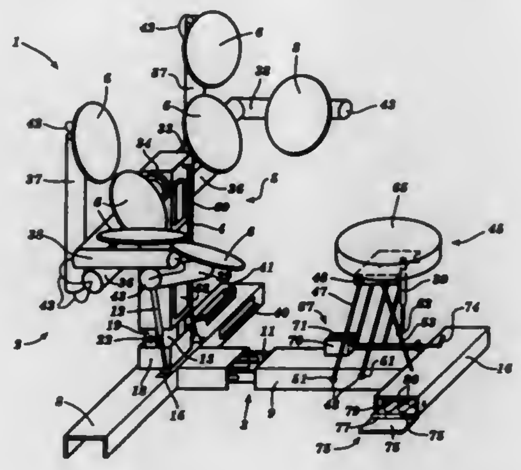
George Serban, Ft. Lauderdale, Fla., assignor to Alpine Engineered Products, Inc., Pompano Beach, Fla.
Continuation-in-part of Ser. No. 155,726, Nov. 23, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 323,833
Int. Cl.^{6} B27G *19/02*
U.S. Cl. 83—478 **5 Claims**



1. A guard apparatus for covering the cutting edge of a circular blade of a radial power saw, comprising:
a pivoting guard member extending over at least a portion of said cutting edge of said blade, and mounting means for mounting said pivoting guard member to rotate essentially coaxially with said blade,
guard rotation means for rotating said pivoting guard member to an open position to expose said cutting edge of said blade to a work piece to make a cut and to a closed position to cover the exposed cutting edge, and,
activating means for activating said guard rotation means to cause said guard rotation means to rotate said pivoting guard member to a closed position, wherein said activating means includes,
a cam portion protruding from said pivoting guard member, said cam portion having a cam surface, and
switch means cooperating with said can surface for activating said guard rotation means, said switch means comprising a switch actuator member biased to ride against said cam surface, such that movement of said switch actuator member resulting from riding over said cam surface operates said switch means.

5,531,148
AUTOMATIC SET-UP, COLLAPSIBLE ELECTRONIC DRUM SET

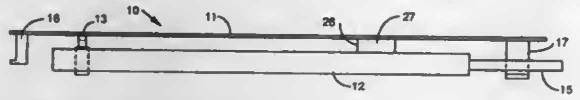
Robert Wilson, P.O. Box 97, Hoopeston, Ill. 60942
Filed Jun. 19, 1995, Ser. No. 492,269
Int. Cl.^{6} G10D *13/02*
U.S. Cl. 84—412 **11 Claims**



1. A method for operation of a collapsible drum set comprising:
providing a drum set including a base, at least one support, and a plurality of drums attached to said support, wherein said support is hingedly attached with respect to said base;
providing a seat support, hingedly attached to said base;
adjusting the positioning of said base, support, and drums;
adjusting the positioning of said seat support;
collapsing said seat support toward said base for storage and/or transportation;
collapsing said support toward said base for storage and/or transportation; and
automatically reassembling said drum set and said seat support to said previously adjusted position.

5,531,149
ANTI-CAR JACKING DEVICE

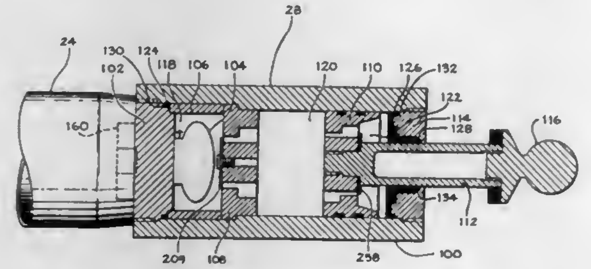
David P. Schubert, 447 Riverside Ave., Lyndhurst, N.J. 07071, and Patrick J. O'Neil, 62 Patton Ave., Princeton, N.J. 08540
Filed Feb. 15, 1994, Ser. No. 155,711
Int. Cl.^{6} F41B *15/00;* B60R *27/00;* G08B *15/00*
U.S. Cl. 89—1.14 **9 Claims**



1. An anti-car jacking device comprising:
(a) a base plate;
(b) a hollow outer cylinder pivotably mounted on said base plate;
(c) a solid rod telescopically disposed in said hollow outer cylinder;
(d) stop means disposed on said base plate for stopping the pivoting of said hollow outer cylinder;
(e) restraining means mounted on said base plate and operatively associated with said solid rod for restraining rotation of said solid rod and said hollow outer cylinder; and
(f) propulsion means operatively associated with said restraining means for releasing said solid rod and initating rotation of said hollow outer cylinder and said solid rod about a pivot bolt, whereby when said propulsion means is activated said solid rod is released from said restraining means, said outer cylinder and said solid rod rotate, said solid rod telescopes by centrifugal force out of said hollow outer cylinder until said solid rod engages a car jacker or said stop means.

5,531,150
LIGHTWEIGHT GUN SYSTEMS

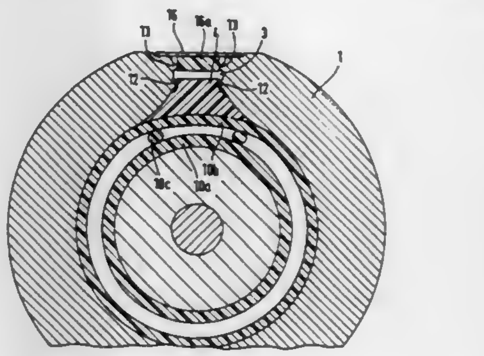
Albert A. Gegaregian, Portola Valley; Vincenzo F. Costa, Milpitas; William L. Hendricks, San Jose; Milan G. Maximovich, Santa Cruz; Jacob Savitt, Belvedere; Hsiang-Sheng Shen, Saratoga, and Michael R. Webber, Sunnyvale, all of Calif., assignors to Lockheed Missiles & Space Company, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 213,298, Mar. 14, 1994. This application May 9, 1994, Ser. No. 240,052
Int. Cl.^{6} F41A *25/20;21/04;* F41F *1/06*
U.S. Cl. 89—15 **43 Claims**



1. A gun system comprising: a barrel having a cylindrical liner enclosed within an outer sleeve, and damper means for substantially reducing recoil force and absorbing recoil energy of said barrel and being axially aligned with said barrel, said outer sleeve comprising layers of wound carbon fiber impregnated with thermally stable organic polymer, wherein the damper means includes a housing filled with a liquid medium; a metering block that divides the housing into a first space and a second space; and a piston supported in the second space, the metering block defining at least one first passageway extending between the first and second spaces for flow of the liquid medium at least in a direction from the second space to the first space, and including first resilient spring means, at least partially covering the at least one first passageway for regulating flow of the liquid medium from the second space to the first space.

5,531,151
RODLESS CYLINDER

Akio Matsui, Gifu, Japan, assignor to Festo KG, Esslingen, Germany
Continuation of Ser. No. 769,184, Sep. 30, 1991, abandoned. This application Dec. 27, 1994, Ser. No. 364,391
Claims priority, application Japan, Feb. 19, 1991, 3-023639
Int. Cl.^{6} F01B *29/00*
U.S. Cl. 92—88 **3 Claims**

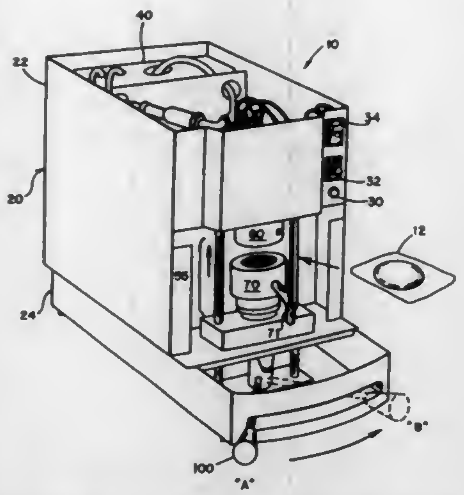


1. A rodless cylinder capable of minimizing the leakage of pressure fluid therefrom comprising:
a cylinder tube having a substantially trapezoidal-shaped slit formed along its longitudinal length, said slit including convexly-curved side walls;
a piston slidably positioned in said cylinder tube;
a substantially trapezoidal-shaped belt positioned to sealingly engage said slit, said belt having a pair of opposing concavely-curved surfaces adjoining said convexly-curved side walls of said slit;
annular sealing means fitted onto the outer periphery of said piston for providing a seal between said piston and said cylinder tube; and
wherein said side walls of said slit and the inner periphery of said cylinder tube adjoin one another in such a manner as to form a smooth curve; and
wherein said sealing means includes at least one rib positioned radially inward from and proximal said smooth curve for forcing said sealing means into sealing contact with said belt and for forcing said belt into sealing contact with said smooth curve of said cylinder tube when said cylinder tube is pressurized.

5,531,152
PLATEN ASSEMBLY FOR COFFEE MAKER USING PRE-DOSAGED COFFEE FILTER PACKETS

Giancarlo Gardosi, Zolas Predosa, Italy, assignor to Grimac Royal Falcon Corp., Old Field, N.Y.
Filed Jan. 5, 1995, Ser. No. 369,129
Int. Cl.^{6} A47J *31/44*
U.S. Cl. 99—289 R **8 Claims**

1. A coffee machine that utilizes a coffee pad containing a predetermined amount of ground coffee from which espresso or cappuccino coffee is prepared, said coffee machine comprising:
means for supplying at least one of steam and hot water;
a first upper chamber member having a first surface connected via a first passage to said supply means;
a second lower chamber member having a second surface connected via a second passage to a spout;
said first member and said second member being movable between an open position for receiving a coffee pad and a closed position for forming, between said first surface and said second surface, a closed sealed chamber to contain the coffee pad so that in said closed position the at least one of a supply of steam and hot water passes through said chamber containing a coffee pad and discharges as espresso coffee from said spout; and



movable means for moving said first member and said second member between said open position and said closed position thereof, said movable means including a platen attached to said second member, two spaced apart vertical posts on which said platen is vertically and reciprocally movable, a horizontally-pivotal elongate handle, a stationery first cam member attached to said platen and a rotatable second cam member attached to said handle and disposed beneath and cammingly engaged with said stationary first cam member, said first and second cam members being configured and dimensioned such that when said handle is pivoted horizontally from one side to another said second cam member pivotally rotates and cammingly lifts said first cam member upward to, in turn, move said platen and said lower chamber member into said closed position and, conversely, when said handle is pivoted in the opposite direction, said second cam member pivotally rotates and cammingly lowers said first cam member and, in turn, said platen and said second lower chamber member to said open position.

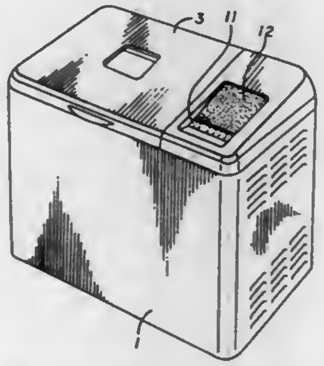
5,531,153
BREAD BAKING APPARATUS

Eiki Maruyama; Makoto Nasu; Yoshisada Misawa, all of Magano, and Soichi Takeda, Togura-Machi, all of, Japan, assignors to MK Seiko, Co., Ltd., Nagano-Pref., Japan

Filed Aug. 19, 1994, Ser. No. 293,067

Int. Cl.^{6} A47J *27/00*

U.S. Cl. 99—327 **1 Claim**



1. In a bread baking apparatus having a bread container, a mixer for mixing ingredients in said container to form a dough, and an oven for baking the dough, the improvement comprising in combination:

storage means for storing bread baking information, including a plurality of bread types, bread recipes and bread processing operating times;

display means including a single screen for displaying said information;

selection means for selecting one of said displayed bread types;

set means for setting said selected bread type;

control means for controlling the time of operation of said apparatus;

power means for connecting electric power to said apparatus; and

start means for starting said mixing and baking;

said display means further including:

means for displaying a bread type selection instruction on actuation of said power means;

means for displaying a plurality of bread types;

means for displaying the recipe for the selected bread type after actuation of said selection means and said set means; and

means for displaying the status of the baking process as it proceeds after actuation of said start means.

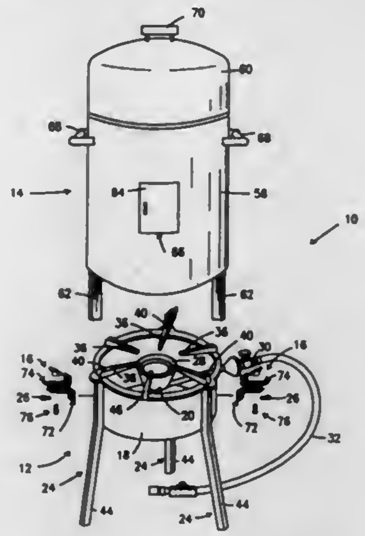
5,531,154
COMBINATION OUTDOOR COOKER AND SMOKER

Manuel Perez, III, 11204 Hidden Valley Dr., Tampa, Fla.

Continuation of Ser. No. 390,229, Feb. 17, 1995, Pat. No. 5,467,692. This application Nov. 20, 1995, Ser. No. 560,665

Int. Cl.^{6} A47J *37/04;37/07*

U.S. Cl. 99—340 **5 Claims**



1. A retention assembly to convert an outdoor cooker to a combination outdoor cooker and smoker having a cooker configuration for use as an outdoor cooker and a smoker configuration for use as a smoker comprising a cooker assembly including a hollow housing having a heat source therein and a support grate supported thereon disposed in heat exchange relationship relative to the heat source and a plurality of support legs attached to the hollow housing and a smoker enclosure detachably mountable on said cooker assembly when said combination outdoor cooker and smoker is in said smoker configuration said retention assembly comprising a plurality of retention brackets attached to said cooker assembly each having a cooker retention configuration to retain a cooking utensil in operative relationship relative to said support grate when said combination cooker and smoker is in said cooker configuration and a smoker retention configuration to retain said smoke enclosure in operative relationship relative to said support grate when said combination cooker and smoker is in said smoker configuration.

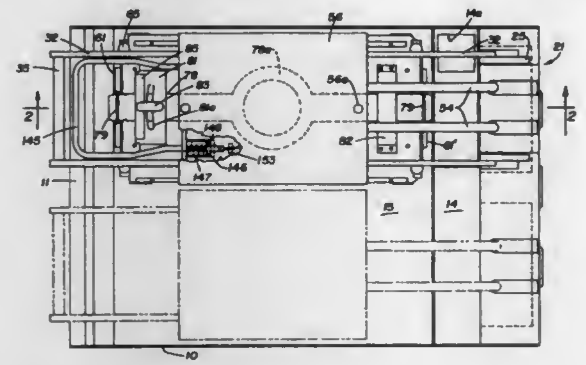
5,531,155
COOKING APPARATUS FOR TWO-SIDED COOKING

Jack E. Pellicane, Rockton, Ill.; Jon P. Russett, Beloit, Wis., and Jeffery L. Sands, Freeport, Ill., assignors to Specialty Equipment Companies, Inc., Rockton, Ill.

Filed Oct. 30, 1995, Ser. No. 550,211

Int. Cl.^{6} A47J *37/06*

U.S. Cl. 99—349 **32 Claims**



1. A cooking apparatus comprising:

a support structure having spaced sides; a front and a rear;

a lower cooking platen mounted on the support structure;

a support arm having a rear end mounted on the support structure for movement about an arm pivot axis adjacent the rear of the structure between a lower position extending above the lower cooking platen and a raised position inclined upwardly from the lower cooking platen;

an upper cooking platen mounted on the support arm for movement therewith and having a lower cooking surface;

first and second ramp means mounted on the upper cooking platen at relatively opposite sides thereof, the first and second ramp means each including a stationary ramp member fixed to the upper platen and having a downwardly facing guide face inclined at an acute angle to the cooking surface of the upper platen, and a movable ramp member mounted on the stationary ramp member for sliding movement relative thereto along a path paralleling the guide face on the stationary ramp member, the movable ramp members each having means at a lower side thereof for engaging the lower platen at spaced locations; and

upper platen adjusting means for slidably moving the movable ramp members relative to the associated stationary ramp members to adjust the minimum spacing between the upper and lower platens when the support arm is in a lower position.

5,531,156
AUTOMATIC TACO MACHINE

Barry J. Brummett, Santa Ana, Calif., assignor to Taco Bell Corp., Irvine, Calif.

Continuation of Ser. No. 156,435, Nov. 23, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,364

Int. Cl.^{6} A47J *37/00*

U.S. Cl. 99—450.1 **14 Claims**

1. An apparatus for storing, dispensing, and filling soft tortillas and taco shells comprising:

a frame;

a generally V-shaped conveyor on the frame defining a path for advancing tortillas and taco shells;

a tortilla storage compartment on the frame;

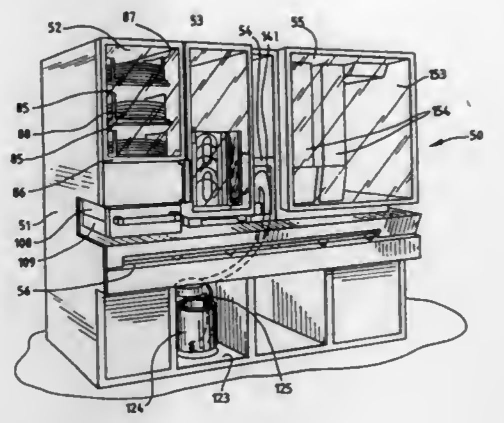
tortilla dispensing means for moving a tortilla from the tortilla storage compartment to the V-shaped conveyor;

a taco shell storage compartment on the frame;

taco shell dispensing means for moving a taco shell from the taco shell storage compartment to the V-shaped conveyor;

means on the frame for storing hot food;

hot food dispensing means adjacent the conveyor for dispensing hot food onto a tortilla or taco shell on the conveyor;



means on the frame for storing cold food; and

cold food dispensing means adjacent the conveyor for dispensing cold food onto a tortilla or taco shell on the conveyor.

5,531,157
STERILIZATION AND HOMOGENIZATION OF FLUID SUBSTANCES BY HIGH FREQUECY VIBRATION

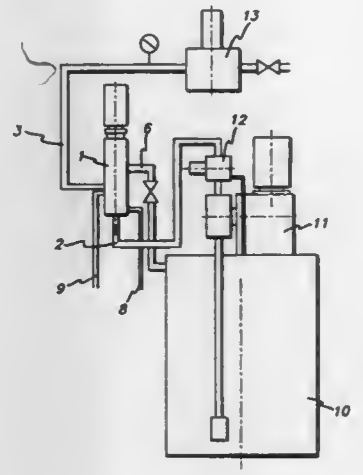
Gastone Probst, Viganello, Switzerland, assignor to Ixtlan Aktiengesellschaft, Triesen, Liechtenstein

Filed Jul. 20, 1994, Ser. No. 277,635

Claims priority, application Switzerland, Jun. 30, 1994, 02078/94

Int. Cl.^{6} A23C *9/00;* **A23L** *3/32;* **B01F** *11/00*

U.S. Cl. 99—451 **10 Claims**



1. Device for sterilization and homogenization of a liquid or a fluid of low or medium viscosity, comprising:

a tank (**10**);

a pump means (**11**) for taking in the liquid or fluid from the tank (**10**) and sending it out;

an inlet pipe (**2**) connected to the pump means (**11**);

a chamber means (**1**), connected to the inlet pipe (**2**), for receiving the liquid or fluid;

a means (**5**), installed inside of the chamber means (**1**), for transferring high-frequency vibrations to the liquid or fluid;

an outlet pipe (**3**) for the liquid or fluid circulating inside of the chamber means (**1**);

a high-frequency vibration converter-generator (**14**) arranged coaxially with said transferring means (**5**); and

a collection container (**13**) into which the liquid or fluid continues from the outlet pipe (**3**).

5,531,158

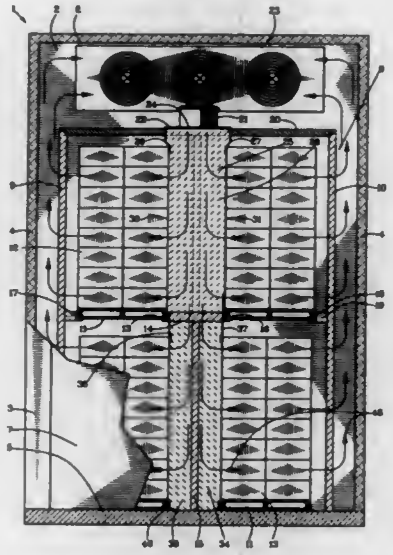
PRODUCE RIPENING APPARATUS AND METHOD

Owen J. Perryman, Jr., P.O. Box 11137, Daytona Beach, Fla. 32120-1137

Filed May 16, 1994, Ser. No. 243,330

Int. Cl.^{6} A23B *7/00*

U.S. Cl. 99—467 **28 Claims**



1. A produce-ripening apparatus comprising:

a ripening chamber with front, rear and side walls, a floor and a ceiling;

the ripening chamber having design dimensions for containment of a pallet rack of a desired size and for providing design circulation of controlled atmosphere exterior to the pallet rack;

a door in a desired wall of the ripening chamber;

design airtightness of the ripening chamber with the door closed;

design thermal insulation of the walls, ceiling and floor of the ripening chamber;

an atmosphere conditioner in atmosphere-conditioning relationship to space inside of the ripening chamber;

at least two rack pillars of the pallet rack spaced apart a distance to receive two pallets juxtaposed on opposite sides of a central circulation section and to allow design side clearance intermediate outside lateral edges of the two pallets and inside lateral edges of the rack pillars;

the pallet rack being extended in length to receive a design plurality of juxtaposed pallets end-to-end;

the rack pillars being extended a vertical distance to receive at least one tier of produce crates stacked on the two pallets;

horizontal rack structure extended intermediate the rack pillars at a position vertically above the produce crates;

at least one top horizontal baffle positioned centrally on the horizontal rack structure;

at least one pressurizer positioned centrally on the top horizontal baffle and having fluid communication with conditioned atmosphere provided by the atmosphere conditioner;

at least one pressurization conveyance in fluid communication intermediate the pressurizer and the central circulation section; and

circulation seal means in sealing relationship between the top horizontal baffle and a high-pressure plenum in a return conveyance to the pressurizer respectively for each of the design plurality of juxtaposed pallets from-end-to-end of the pallet rack.

5,531,159

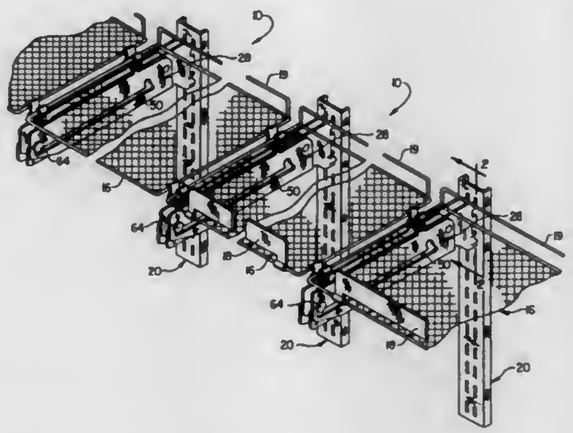
PULL-OUT DROP DOWN SHELF STRUCTURE

Reggie W. Stubblefield, Garland, Tex., assignor to Universal Display & Fixtures Company, Garland, Tex.

Filed Aug. 19, 1994, Ser. No. 293,880

Int. Cl.^{6} A47B *11/00*

U.S. Cl. 108—102 **16 Claims**



1. A universal support bracket suitable to support each lateral side of a grocery shelf which can be pulled out, pivoted down at an angle and held in a downwardly angled position in order to load fresh material behind the already shelved material without unloading the shelf, comprising:

an elongated stationary bracket having a front, a back and generally flat sides defining top and bottom edges, the back having formations for engaging supports at the rear of the stationary bracket capable of holding the stationary bracket in a horizontal orientation with the sides vertical;

an elongated slot in the stationary bracket extending longitudinally from front to back along its length and having outer and inner ends;

an elongated sliding bracket having a front, a back and generally flat sides defining top and bottom edges, said sliding bracket arranged as a companion to the stationary bracket in side by side relation;

an elongated slot in the sliding bracket extending longitudinally from front to back along its length and having outer and inner ends;

a first headed connector fixed near the back of the sliding bracket which slides in the elongated slot in the stationary bracket and a second headed connector fixed near the front of the stationary bracket which slides in the elongated slot in the sliding bracket, said first and second connectors holding said brackets in close sliding side by side relation whereby said sliding bracket can be moved longitudinally with respect to the stationary bracket between a retracted and an extended position;

one of said elongated slots of one of said brackets having a short arcuate slot at its end extending toward the top edge wherein one of said first or second headed connectors serves as a stop and pivot for the sliding bracket in the extended position while the other of said first or second headed connectors follows the arcuate slot when the sliding bracket is pulled out to the extended position, pivoted downwardly and supported in a downwardly angled position by said other of said first or second headed connectors; and

said universal support bracket will support either side edge of a grocery shelf by attaching each lateral side of said grocery shelf to an elongated sliding bracket of a universal support bracket whereby said shelf can be pulled out to the extended position, pivoted downwardly and supported in a downwardly angled position.

5,531,160

SINGLE-SHAFT FOUR-POINT PUNCH PRESS

Oskar Elgenmann, Arbon, Switzerland, assignor to Bruderer AG, Frasnacht, Switzerland

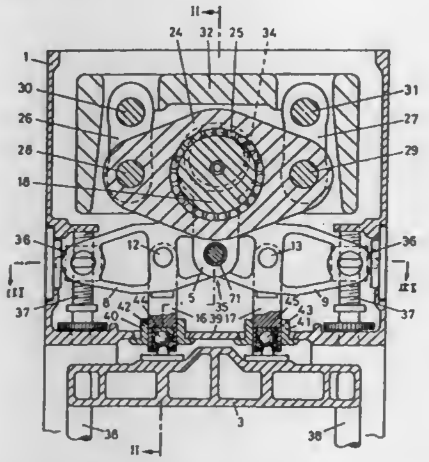
PCT No. PCT/CH94/00106, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/29100, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 3, 1994, Ser. No. 374,618

Claims priority, application Switzerland, Jun. 4, 1993, 93108969.2

Int. Cl.^{6} B30B *1/14*

U.S. Cl. 100—258 R **6 Claims**



1. A single-shaft four-point punch press having

a machine frame, said machine frame having a bottom close-off plate;

an eccentric shaft supported for rotation in said machine frame;

a ram guided for a rectilinear reciprocating movement in said machine frame;

an arrangement of rod members, which rod members are drivingly connected to said eccentric shaft;

an arrangement of levers having four lever units arranged separate from each other, whereby every lever unit is pivotally mounted individually and independent from the other lever units at a first point to rod members and pivotally supported at the machine frame at a second point, and includes a further pivot point located remote from said first and second points;

four push rods extending parallel to each other, of which each push rod is pivotally mounted at one of its ends to one of said further pivot points and at its other end to said ram;

said punch press comprising ball-and-socket joints arranged in such a manner that each push rod is pivotally mounted via one ball-and-socket joint to said ram, in which:

said ram is movable between an upper dead center position and a lower dead center position, wherein the fulcrum point of each ball-and-socket joint is located inside of the respective push rod and each push rod extends through a movable seal mounted to said bottom close-off plate of the machine frame, by means of which seal the inner space of the machine frame is sealed against the area of the ram in the punch press; and

at the upper dead center position of the ram, each respective fulcrum point of the ball-and-socket joints is located in the area enclosed by the respective seal.

5,531,161

GRAVURE COATING FEEDER APPARATUS

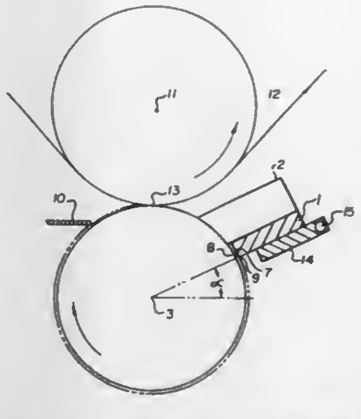
Dennis J. Coyle, Clifton Park, and Barry A. Fitzgerald, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1994, Ser. No. 350,921

Int. Cl.^{6} B41F *9/10;31/07*

U.S. Cl. 101—157 **4 Claims**

1. A coating feeder for supplying liquid coating composition to a gravure cylinder comprising:



a supply box having a fully opened top portion, opposite end walls adjoining a back wall, said opened top portion extending from said back wall to a circumferential portion of said gravure cylinder, said opposite ends surrounding said fully opened top portion, a feed bar forming the base of said box, a baffle mounted on said base and extending upwardly into the box, and a delivery means for supplying coating composition to the supply box;

said feed bar being disposed longitudinally adjacent the gravure cylinder, said baffle being fixed at one end to said feed bar,

wherein a metering slot is formed between a surface of the coating roll and a front surface of the feed bar, the feed bar having an upper surface forming a bottom wall of the supply box;

at least one overflow slot positioned on at least one of said end walls, said overflow slot and said baffle cooperating to control the liquid coating composition level in said supply box;

a doctor blade to trim the coating composition, which is delivered from the supply box to the surface of the gravure cylinder through the metering slot.

5,531,162

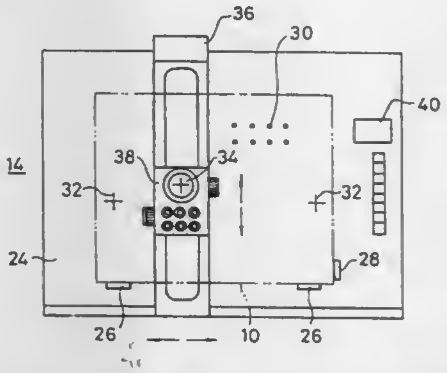
PRESS PLATE REGISTERING METHOD

Masayuki Iwamoto, Shizuoka, Japan, assignor to Shinohara Machinery Co., Ltd., Shizuoka, Japan

Continuation of Ser. No. 976,171, Jan. 13, 1992, abandoned. This application Mar. 1, 1994, Ser. No. 205,134

Int. Cl.^{6} B41F *27/00;13/12*

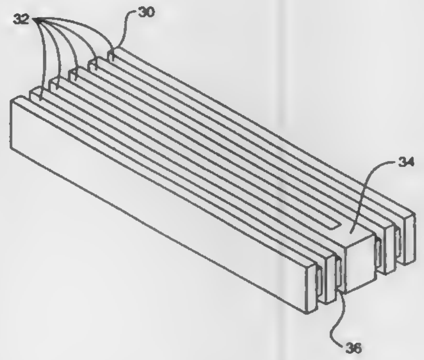
U.S. Cl. 101—171 **21 Claims**



1. In a method wherein register information about a plurality of press plates (**10**) is utilized in a sheet-fed press, which has a plurality of plate cylinders (**12**) for multicolor printing, from a press plate register measuring device (**14**), for thereby registering said press plates (**10**) which are to be attached to said plate cylinders (**12**), respectively, each plate cylinder (**12**) having a pair of clamps (**16**) and (**18**) for gripping front and rear ends of a press plate by which the press plate (**10**) is stretched around said plate cylinder (**12**), an improvement comprising:

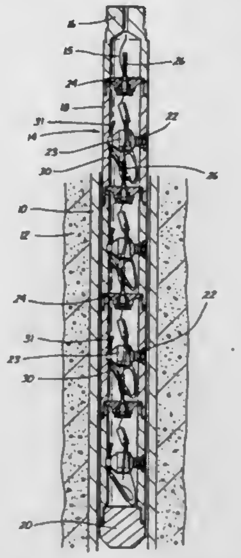
providing said clamp (**16**) for the front end with gripping references (**20**) and (**22**) in the circumferential and axial directions of said plate cylinder (**12**), which references cooperate with edges of said press plate (**10**);
providing said press plate register measuring device (**14**) with measuring references (**26**) and (**28**) corresponding to the circumferential and axial directions of said plate cylinder (**12**), which similarly cooperate with the edges of said press plate (**10**) with the same positional relationship as that of said gripping references (**20**) and (**22**);
sequentially placing a plurality of press plates (**10**), produced by a plate-making process, on said press plate register measuring device (**14**) with edges of each press plate (**10**) brought into contact with said measuring references (**26**) and (**28**), and measuring distances between reference marks (**32**) of each press plate (**10**) and the corresponding measuring references (**26**) and (**28**);
obtaining register information by determining differences between the measured values of one of said press plates (**10**) that is defined as a reference press plate and the measured values of the other press plates; and
registering a series of plate cylinders (**12**) on the basis of said register information.

5,531,163
FLARE PALLET AND PROCESS FOR MAKING SAME
David R. Dillehay, and David W. Turner, both of Marshall, Tex., assignors to Thiokol Corporation, Ogden, Utah
Continuation of Ser. No. 189,903, Feb. 1, 1994, Pat. No. 5,456,455. This application Jun. 6, 1995, Ser. No. 471,376
Int. Cl.^{6} C06D *5/06*
U.S. Cl. 102—288 **11 Claims**



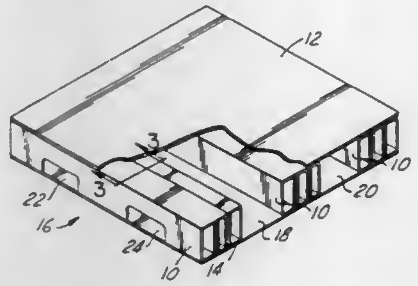
1. A flare pellet containing a flare composition, comprising:
a first side having a first groove for increasing the surface area of said flare pellet;
a second side opposite said first side and having a second groove for increasing the surface area of said flare pellet;
two substantially groove free sides separating said first side and said second side; and
an outer layer substantially covering said first side and said second side, said outer layer comprising an ignition composition.

5,531,164
SELECT FIRE GUN ASSEMBLY AND ELECTRONIC MODULE FOR UNDERGROUND JET PERFORATING USING RESISTIVE BLASTING CAPS
Demmie L. Mosley, Pampa, Tex., assignor to Titan Specialties, Inc., Pampa, Tex.
Filed May 10, 1995, Ser. No. 438,403
Int. Cl.^{6} F42B *3/00*
U.S. Cl. 102—312 **20 Claims**



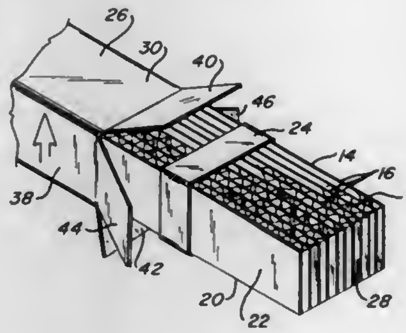
1. A select fire gun assembly for jet perforating of underground well casings, having a plurality of explosive charges and capable of sequentially detonating each one of the charges by applying d. c. voltage of alternating polarity from the surface, the gun assembly comprising:
a closed tubular carrier having a plurality of internal compartments, the compartments being separated from one another by baffles, and each of said compartments containing an explosive charge to be detonated and a blasting cap attached to each explosive charge, the blasting cap capable of being activated by passage of current therethrough, and having a first and second electrical terminus, each of the baffles containing a dart mounted into the baffle without being in electrical contact therewith and capable of sealing the baffle and electrically grounding the dart only after the explosive charge in the compartment immediately below has detonated, the last blasting cap on the bottom of the gun assembly being electrically grounded at its first terminus, the remaining blasting caps being electrically connected at their respective first terminus to the dart of the respective baffle of the compartment wherein the blasting cap is located;
a d. c. voltage source on the surface;
a switch controlling said voltage source;
a logging cable that comprises a conductor connected to the switch whereby negative or positive voltage may be applied to the conductor at the option of an operator, and
in operative connection with each blasting cap a first diode interposed between the second terminus of the blasting cap and the conductor, an electronic switch in series with the conductor, the electronic switch being responsive to the voltage on the first terminus of the blasting cap, and a second diode in series with the conductor and parallel with the electronic switch, the first and second diodes being disposed with opposite polarity, and the electronic switch capable of passing current through when the voltage applied to the conductor is passed through the first diode and there is voltage at the first terminus of the blasting cap, said first and second diodes and electronic switch being arranged with alternating polarity for the blasting caps, whereby sequentially applying d. c. voltage of alternating polarity to the logging cable activates the blasting caps and detonates the explosive charges in sequential order starting with the explosive charge on the bottom of the gun assembly.

5,531,165
STRUCTURAL MEMBER FOR USE IN A PALLET OR A SHIPPING CONTAINER
Philip Taravella, Grosse Pointe Shores; Edward J. Blair, New Baltimore; Ronald S. Domanski, St. Clair Shores, and Joseph C. Shippell, New Baltimore, all of Mich., assignors to Anchor Bay Packaging Corporation, St. Chair Shores, Mich.
Filed Sep. 27, 1994, Ser. No. 312,824
Int. Cl.^{6} B65D *19/00*
U.S. Cl. 108—51.3 **8 Claims**



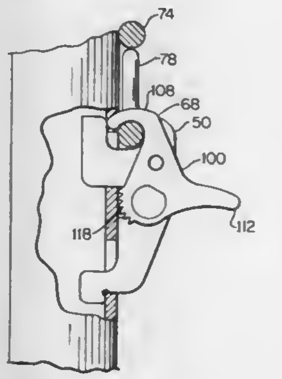
1. A structural member made from corrugated board and having a longitudinal axis comprising:
a housing having a top wail, a bottom wall and a pair of side walls;
a pair of laterally spaced apart internal dividers located within the interior of said housing on opposite sides of the axis and extending from one end of said housing to the other end;
a plurality of laterally extending reinforcing elements located within said housing and being supported by said internal dividers, said reinforcing elements having peripheral edges which contact the walls of said housing to provide support for said walls; and
each of said internal dividers having a three ply thickness.

5,531,166
CORRUGATED FIBERBOARD RISER
James L. Woods, and Robert F. Thomasino, both of 4120 Brighton Blvd., Unit A-23, Denver, Colo. 80216
Filed Sep. 27, 1994, Ser. No. 313,453
Int. Cl.^{6} B65D *19/00*
U.S. Cl. 108—51.3 **15 Claims**



1. An improved lightweight load carrying riser for supporting a load spaced above a supporting surface, said riser comprising:
(a) a plurality of elongated flat strips having width and length dimensions and formed from a corrugated material, the corrugations of said material being arranged parallel to the width dimension of said strip;
(b) said strips being arranged side by side to each other and permanently fastened together with a suitable adhesive to form an elongated, laminated core member, a sufficient number of strips being used to form a laminated core member having a predetermined core width to form top and bottom supporting surfaces;
(c) an outer cover to encapsulate said core member, said outer cover being formed from a sheet-like material which is formed to correspond to the outside dimensions of the core member and completely enclose said core member in order to protect and distribute the forces across the core member; and
(d) said core member is reinforced with one or more lateral bands wrapped around the core member so as to prevent the separation of the strips causing delamination and loss of compressive strength in the core member.

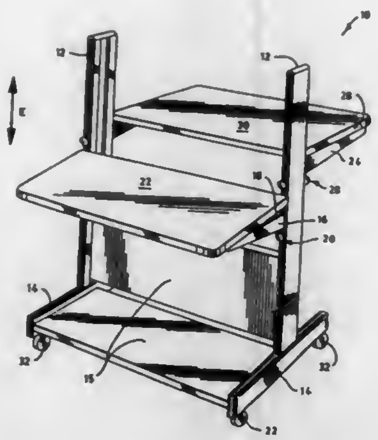
5,531,167
LOCKING HANGER BRACKET FOR USE IN A QUICK-CHANGE MODULAR SHELVING SYSTEM AND SHELVING SYSTEM EMPLOYING SUCH HANGER BRACKET
Kenneth A. Stevens, Harleysville, and Bradley J. Carlson, Wilkes-Barre, both of Pa., assignors to Metro Industries, Inc., Reno, Nev.
Filed Aug. 30, 1994, Ser. No. 297,831
Int. Cl.^{6} A47B *9/00*
U.S. Cl. 108—106 **21 Claims**



1. A shelving system, comprising:
a first shelf assembly;
a second shelf assembly;
a plurality of support posts disposed between and removably secured to said first shelf assembly and said second shelf assembly;
a plurality of hanger brackets removably secured to said support posts, said hanger brackets disposed in at least one group;
at least one intermediate shelf assembly removably supported by said one group of hanger brackets; and
locking means, rotatably mounted to and cooperating with said hanger brackets, for locking said intermediate shelf assembly to said one group of hanger brackets.

5,531,168
ADJUSTABLE TABLE AND SHELF UNIT
Keivan Towfigh, Millis, Mass., assignor to Sobo, Inc., Boston, Mass.
Filed Jul. 21, 1994, Ser. No. 278,604
Int. Cl.^{6} A47B *9/00*
U.S. Cl. 108—108 **9 Claims**

1. An adjustable shelf unit comprising:



a pair of stanchions arranged parallel to one another, each of the stanchions defining a front vertical channel;
supports coupled to the stanchions for supporting the stanchions vertically;
a first pair of braces slidably retained in the front channels and defining horizontal surfaces, each of the braces having a proximal end configured for retention in one of the front channels while permitting displacement along said one front channel;
locking means coupled to the proximal end of the braces for releasably securing the braces at a freely selectable elevation in the front channels; and
a first planar element slidably coupled to the stanchions above the braces such that the horizontal surfaces support the first planar element for load bearing, the horizontal surfaces being capable of remaining substantially horizontally disposed as the braces are moved to a freely selectable elevation in the front channels.

5,531,169
TREATMENT OF LIQUID WASTE MATERIAL

James Mole, Chesire, United Kingdom; Philippe Queille, Jouy-en-Josas, France, and Guillermo Garrido, Sao Paulo, Brazil, assignors to Imperial Chemical Industries PLC, London, United Kingdom, and L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

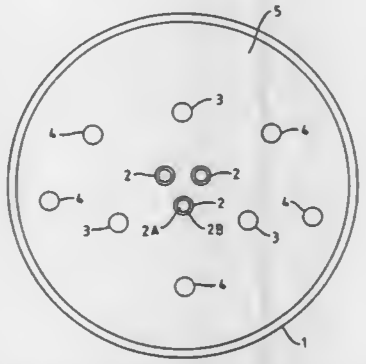
PCT No. PCT/GB92/02330, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO93/13362, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 16, 1992, Ser. No. 256,048

Claims priority, application United Kingdom, Dec. 20, 1991, 9127096

Int. Cl.^{6} F23G *7/00*

U.S. Cl. 110—346 **30 Claims**



1. A process for treating liquid waste material by combustion in a furnace whereby said liquid waste material is vaporized and decomposed to produce a flow of combustion gas which is substantially free of liquid waste material at an exit from the furnace, which process comprises: (a) supplying to the furnace through at least one burner located in an end wall thereof a flow of a primary oxidant which issues from the at least one burner in a first flow direction and which contains at least 22% by volume of oxygen, together with a flow of fuel which issues from the at least one burner in a second flow direction which is substantially the same as the first flow direction;

(b) combusting the fuel so as to produce a source of heat;
(c) controlling the primary oxidant to fuel ratio such that the flow of primary oxidant provides insufficient oxygen to effect complete combustion of the fuel;
(d) supplying a flow of liquid waste material to the furnace through a plurality of atomizing lances such that the liquid waste material issues from the atomizing lances in a third flow direction in the form of atomized jets, the atomizing lances being arranged in the end wall around the at least one burner such that the third flow direction is substantially the same as that of the first and second flow directions; and
(e) supplying a flow of secondary oxidant, which contains at least 22% by volume of oxygen, to the furnace through a plurality of oxidant lances spaced from the at least one burner so as to supplement the flow of primary oxidant and thereby providing sufficient oxygen to effect complete combustion of the fuel, and wherein the flows are supplied to the furnace at such rates and positions that a plug flow of material through the furnace from the end wall to the exit is created, whereby said liquid waste material is vaporized and decomposed.

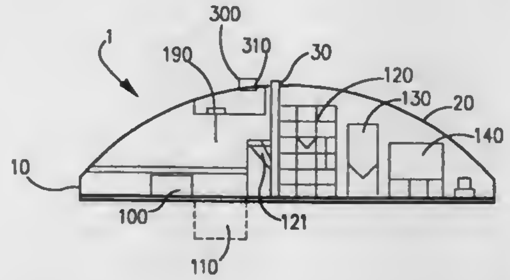
5,531,170
COMPOUND CURVATURE, DOMICAL STRUCTURE FOR WASTE-TO-ENERGY FACILITIES

Richard A. Ubaldi, Wayne, N.J.; Paul L. Hauck, Tampa, Fla., and Kevin J. Walls, Blairstown, N.J., assignors to Ogden Projects, Inc., Fairfield, N.J.

Filed Nov. 23, 1993, Ser. No. 155,842

Int. Cl.^{6} F23B *7/00*

U.S. Cl. 110—349 **6 Claims**



1. A structure that encloses a facility which employs a combustion process that exhausts waste gases, the structure comprising:
a domical structure enclosing the facility, wherein said domical structure has a top portion including an apex; and
a chimney integrated with said domical structure for venting the waste gases, wherein said chimney is located in the top portion of said domical structure;
wherein the integration of said domical structure and said chimney aerodynamically disperses the waste gas and reduces downwash.

5,531,171
LIQUID PRODUCT DEVICE

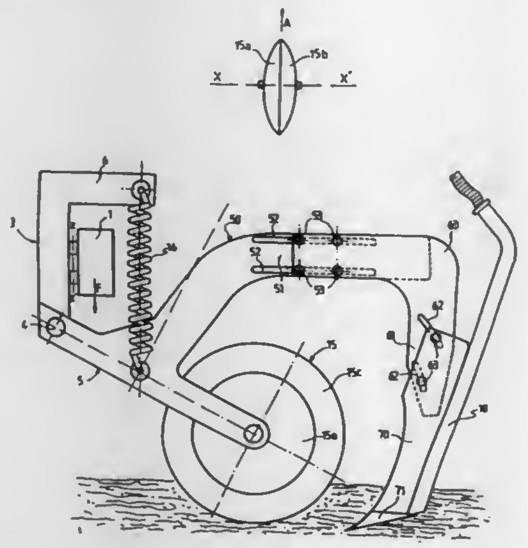
J. Warren Whitesel, Entrammes, and Gabriel Desbois, Malestroit, both of, France, assignors to Etablissements Mauguin SA, France

Continuation of Ser. No. 962,392, Oct. 16, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,477

Claims priority, application France, Dec. 9, 1991, 91 15403

Int. Cl.^{6} A01C *23/02;* **A01B** *15/16;49/02*

U.S. Cl. 111—121 **6 Claims**



1. An apparatus for injecting fertilizer products into a vegetated surface of the earth without appreciably disturbing said vegetation, said apparatus comprising a beam clamped to a vehicle or tank containing a fertilizer to be buried, means for mounting a plurality of digging devices (2) side by side on said beam, said means for mounting having an L-shaped member pivotally connecting said digging device to said beam at a vertical leg of said L-shaped member, each of said devices (2) comprising a disk (15) having at least one convex face, said disk (15) being oriented to rotate in substantially a vertical plane, an axis of said disk rotation being substantially horizontal and perpendicular to the direction of a forward movement of said device, means for applying an almost vertical downward force on the disk (15) of each of the said devices, each of said devices (2) also comprising only one almost vertical foot (70) in a plane which is substantially the same plane which contains the disk (15), said foot 70 having a delta wing plowshare (71), mounted at its lower end, said foot (70) being within the ground when the device is operating, a tube (18) attached behind said foot (70), for injecting said fertilizer via said tube (18) behind said foot (70), said tube (18) having an outlet at approximately an upper level of the delta wing plowshare (71), said disk (15) opening a furrow on the vegetated surface and the foot (70) widening said furrow for injecting said fertilizer and said furrow closes after said injection by gravity, and means for mounting the foot (70) and plowshare (71) combination to slide from front to back in relation to the disk (15).

5,531,172
AUXILIARY BED DEVICE FOR OVERLOCK MACHINE

Shinji Kojima, and Koichi Nakayama, both of Utsunomiya, Japan, assignors to The Singer Company N.V., Curaco, Netherlands

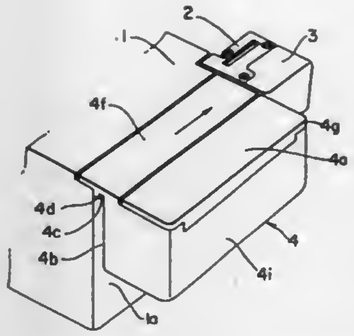
Filed Dec. 15, 1994, Ser. No. 356,755

Claims priority, application Japan, Dec. 20, 1993, 5-072830

Int. Cl.^{6} D05B *73/10*

U.S. Cl. 112—260 **3 Claims**

1. An overlock machine including a main bed, a free arm horizontally extending from a side wall of the main bed, and a throat plate secured to the free arm, comprising:



a guide plate secured to the side wall of the main bed, said guide plate having at least one flanged projecting portion extending outwardly away from said main bed; and
an auxiliary bed comprising a horizontal upper surface, at least one side wall that vertically extends downward from said upper surface, and a fitting part horizontally extending from said side wall, said side wall of said auxiliary bed having at least one longitudinally disposed elongated slot adapted to receive said flanged projecting portion for detachably and slidably connecting said auxiliary bed to said guide plate, said fitting part slidably engaging the guide plate for longitudinally guiding the movement of the auxiliary bed parallel to the side wall of the main bed between a first position and a second position; said auxiliary bed being contiguous to said free arm at said first position to provide a workpiece holding area defined by upper surfaces of the main bed, the free arm, the throat plate and said auxiliary bed; said auxiliary bed being spaced from said free arm at said second position.

5,531,173
APPARATUS FOR POSITIONING THE FOOT PORTION OF TUBULAR KNITTED ARTICLES

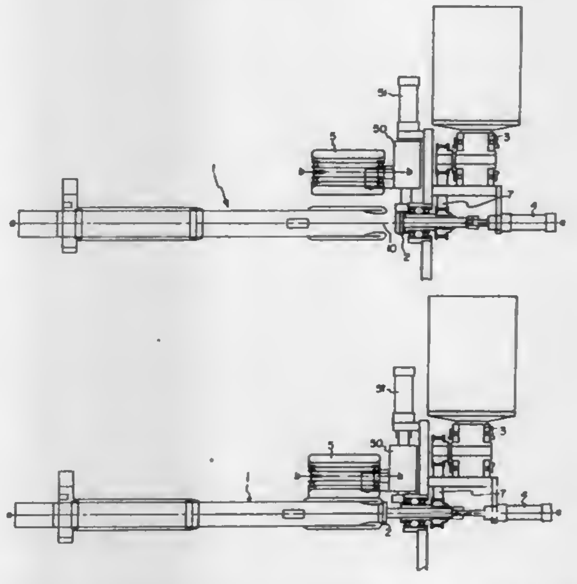
Pier L. Migliorini, Terranuova Bracciolini, Italy, assignor to Solis S.R.L., Tavarnuzze, Italy

Filed Sep. 12, 1994, Ser. No. 304,560

Claims priority, application Italy, Oct. 18, 1993, FI93A0207

Int. Cl.^{6} D05B *39/00*

U.S. Cl. 112—470.15 **10 Claims**



1. An apparatus for positioning a tubular article, the apparatus comprising:
a hosiery support having a longitudinal support axis, said hosiery support having means for holding the tubular article

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on said hosiery support and said hosiery support being rotatable with the tubular article about said support axis;

a coupling means positioned substantially coaxial with said support axis for rotating said hosiery support with the tubular article positioned on said hosiery support;

detection means positioned adjacent said hosiery support for detecting when the tubular knitted article has been rotated to a predetermined position by said coupling means;

actuator means connected to said coupling means for engaging and disengaging said coupling means with said hosiery support.

5,531,174

SEWING MACHINE FOR SEWING SEAMS ON A TUBULAR WORKPIECE

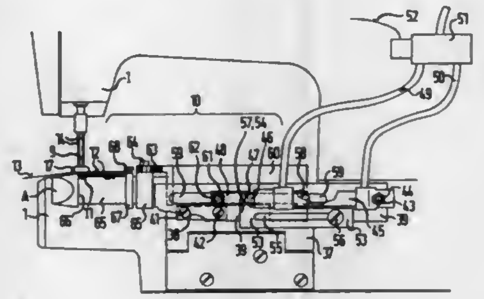
Wolfgang Norz, Schwelberdingen, and Günter Rohr, Hemmingen, both of, Germany, assignors to Union Special GmbH, Germany

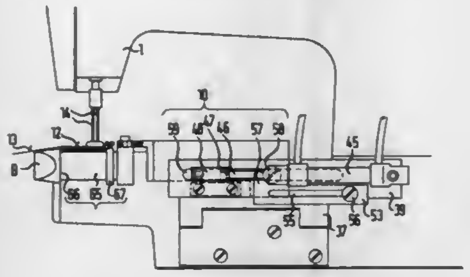
Filed Aug. 12, 1994, Ser. No. 289,924

Claims priority, application Germany, Aug. 13, 1993, 9312091 U

Int. Cl.⁶ D05B *21/00;35/06*

U.S. Cl. 112—470.29 **14 Claims**





1. A sewing machine for the automatic sewing of an endless edge of an elastic portion of a workpiece, comprising a guide device for guiding the edge towards a sewing location of the sewing machine and an adjustable tensioning member for applying a specific tension to the workpiece, said specific tension to be maintained for the sewing operation of said edge of the workpiece, wherein a binding including a separate seam is produced along said edge of the workpiece, said guide device being constrained for movement between first and second extreme positions and movable transversely to the feed direction of the workpiece by a power operated mechanism that includes a fully extended position that establishes said first position of said guide device, an adjustable stop supported by the sewing machine that establishes said second position of the guide device, a sensor that senses the beginning of said separate seam as it approaches said sewing location and creates a signal indicating the location of the beginning of said separate seam relative to said sewing location wherein the completion of said separate seam is derivable from said signal.

5,531,175

ALIGNMENT, EJECTION AND DRAGGING APPARATUS FOR SEWING BUCKLES AND BELT CARRIERS ON BELTS

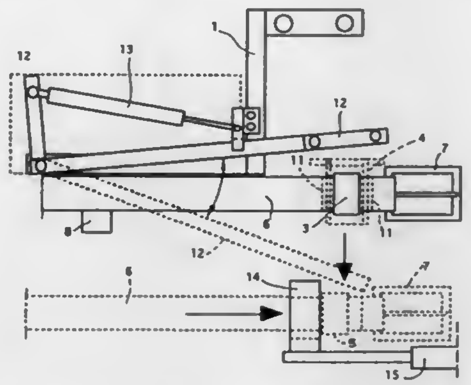
Osvaldo Vezzoli, via dei Videtti, 8-24064, Grumello del Monte, Italy

Filed Oct. 4, 1994, Ser. No. 317,463

Claims priority, application Italy, Oct. 14, 1993, BG93A0045

Int. Cl.⁶ D05B *3/12;33/00;35/06;41/00*

U.S. Cl. 112—470.33 **8 Claims**



1. Alignment, ejection and dragging apparatus for sewing buckles and belt carriers on belts, the apparatus comprising a) an interchangeable guide (4) for aligning the belt carriers (5) of belts (6) prearranged for the sewing of buckles (7), b) a transversal ejecting lever (12), said guide being coupled to said lever, c) a traction hooking fork (14), said guide being coupled to said fork, d) dragging devices (15), said fork being engaged with said dragging devices (15), e) devices (19), said dragging devices aligning with said devices (19) for removing the protruding sewing end, and for aligning and unloading sewn belts (6) in collection containers (20).

5,531,176

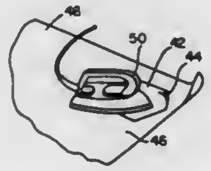
METHOD OF MAKING AN APPLIQUE

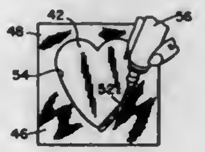
Adrienne M. Johnson, 201 Country Club Rd., Laconia, N.H. 03246

Filed Jun. 16, 1994, Ser. No. 258,615

Int. Cl.⁶ D05B *1/24;* **B32B** *7/08;7/14*

U.S. Cl. 112—475.24 **8 Claims**





1. A method for preparing an appliqué element having a desired shape for attachment to a fabric base material to provide a decorative effect to the fabric base material, said method comprising:

a. providing a sheet of flexible fabric material from which an appliqué element is formed, the fabric material having a fabric grain and having a desired color and a desired decorative design, the sheet having a front face to face outwardly when the appliqué element has been prepared, and a back face to face against the fabric base material when the appliqué element is attached to the base material;

b. providing a paper sheet having printed thereon in a non-transferable ink an outline of a shape element of which a fabric pattern element is to be made, wherein the paper sheet includes on one face thereof a heat softenable coating having a softening temperature greater than normal room temperature;

c. cutting the paper sheet along the printed outline to separate the shape element from the paper sheet and provide a paper template having a coated face and an uncoated face;

d. placing the paper template on the flexible fabric sheet with the coated face of the template against the back face of the fabric sheet and with the uncoated paper face of the paper template facing outwardly;

e. applying heat and pressure substantially uniformly over the uncoated face of the template to soften the heat softenable coating without transfer of ink from the paper template to the fabric sheet to releasably adhere the coated face of the template to the fabric sheet;

f. applying a layer of releasable adhesive along the outer peripheral edge portion of the uncoated face of the paper template and along an adjacent portion of the fabric sheet adjacent the peripheral edge of the paper template to provide a substantially continuous strip of adhesive coated surface on the paper template adjacent to the peripheral edge of the uncoated face of the paper template and on the fabric sheet outwardly of and adjacent to the peripheral edge of the paper template;

g. cutting the fabric sheet around the peripheral edge of the paper template at a substantially uniform, predetermined spacing therefrom to provide a fabric seam allowance around and outwardly of the periphery of the paper template;

h. folding the fabric seam allowance over the peripheral edge of the paper template and against the paper template on the uncoated face thereof to adhere the adhesive coated surface portion of the fabric sheet to the adhesive coated surface portion of the peripheral edge of the paper template to provide an appliqué element; and

i. attaching the appliqué element to the fabric base material.

5,531,177

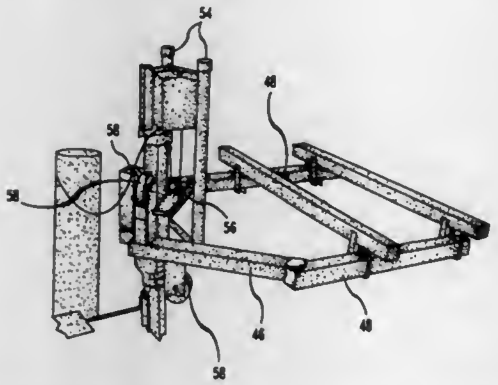
ROLLER CONSTRUCTION FOR THE LAUNCHING AND RECOVERY OF PERSONAL WATERCRAFT

Vincent Urbank, 609 Elizabeth Ter., Toms River, N.J. 08753

Filed Apr. 3, 1995, Ser. No. 415,563

Int. Cl.⁶ B63C *1/02*

U.S. Cl. 114—48 **4 Claims**



1. A launching and recovery device for personal watercraft to be installed adjacent a dock or seawall of the type including an elongated vertical post having separable upper and lower portions of polygonal cross-sectional shape, with the lower portion having a lower end for support on the bottom beneath the water adjacent the dock or seawall and an upper end to be disposed at the upper edge of the dock or seawall, a rigid connection between the upper end of the lower post portion to the dock or seawall, a support for the upper post portion on the lower post portion for rotatable movement therebetween about their common axis, with the upper post portion having an upper end and a winch fixedly mounted on such upper end and rotatable therewith; a watercraft supporting cradle cantilevered on the post and extending laterally therefrom for vertically sliding movement therealong and between the upper and lower post portions and arranged to be disposed beneath a watercraft to lift the same and a hoist extending between the winch and cradle for raising and lowering the cradle upon operation of the winch, the improvement comprising roller means disposed between the post and cradle for supporting the cradle on the post for vertical movement and for horizontal rotation, said roller means comprising:

a plurality of rollers equal in number to the number of sides of said polygonal cross-sectional shape post, some individual ones of which are positioned to bear against adjacent sides of said polygonal cross-sectional post above said cradle and other individual ones of which are positioned to bear against other adjacent sides of said polygonal cross-sectional post below said cradle, and wherein the positioning of said plurality of rollers automatically centers said cradle about said post while supporting the weight of said cradle.

5,531,178

SUPPORT STRUCTURE FOR SELF-STANDING STORAGE TANK IN LIQUIFIED GAS CARRIER SHIP

Akinori Abe, Yokohama, and Akitoshi Ando, Kamifukuoka, both of, Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

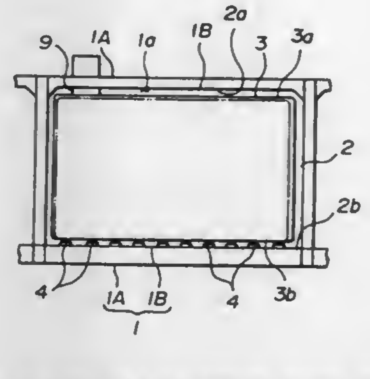
Continuation of Ser. No. 182,779, Jan. 18, 1994, abandoned.

This application Oct. 25, 1994, Ser. No. 328,606

Claims priority, application Japan, May 27, 1993, 5-126373; May 27, 1993, 5-126374

Int. Cl.⁶ B63B *25/08*

U.S. Cl. 114—74 A **13 Claims**



1. A support structure for a self-standing storage tank used in a liquid-transport carrier ship, said self-standing storage tank having a roof section, a bottom section, and a tank dome disposed at the upper part of said tank for passing lines into said tank, said support structure comprising:

a hold for housing said self-standing storage tank in a self-standing state, said hold having a roof surface facing said roof section of said tank and a bottom surface facing said bottom section of said tank;

lateral movement restraining devices for restraining movements of said tank in the widthwise direction of said ship, said lateral movement restraining devices being disposed between said bottom section of said tank and said bottom surface of said hold, and between said roof section of said tank and said roof surface of said hold, said lateral movement restraining devices being aligned along a widthwise center line of said tank; and

fore-aft movement restraining devices for restraining movements of said tank in the fore-aft direction of said ship, said fore-aft movement restraining devices being disposed only between said bottom section of said tank and said bottom surface of said hold, said fore-aft movement restraining devices being aligned in the widthwise direction of said tank;

wherein said fore-aft movement restraining devices and said lateral movement restraining devices which are disposed at the lower part of said tank, and said lateral movement restraining devices which are disposed at the upper part of said tank, are arranged such that any line drawn through said fore-aft movement restraining devices and said lateral movement restraining devices intersects said tank dome in plan view, and thereby said support structures are defined such that a position corresponding to said tank dome is anchored as a restraining base point of movement of said tank.

5,531,179
WHEEL-RETRACTION APPARATUS AND METHOD FOR AMPHIBIOUS VEHICLE

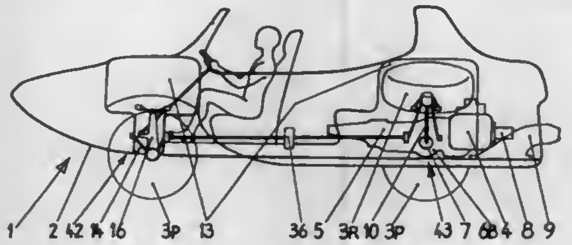
Terence J. Roycroft, and Marie A. Roycroft, both of Manukau Heads Road, Waiuku R.D. 4, New Zealand

Filed Feb. 8, 1995, Ser. No. 385,644

Claims priority, application New Zealand, Feb. 25, 1994, 250979

Int. Cl.^{6} B63B *35/00*

U.S. Cl. 114—270 **12 Claims**



1. An apparatus for retracting an axle-driven wheel onboard an amphibious vehicle, said apparatus comprising:

(a) drive means for driveably and pivotally connecting a drive-output to said wheel while allowing said wheel to follow a retracting process, from a protracted position wherein said wheel has an axis of rotation substantially horizontal and said wheel is able to provide land-support to said vehicle, to a retracted position wherein said wheel has said axis at an angle greater than 45 degrees to said horizontal and said wheel is elevated substantially above the waterline of said vehicle when afloat; and

(b) location means for locating said wheel to the body of said vehicle, said location means providing a geometric arrangement whereby said wheel may follow said retracting process while remaining connected to said drive-means.

5,531,180
DEVICE SERVING AS INDICATOR OF THERMAL HISTORY ESPECIALLY FOR FROZEN PRODUCTS AND THE LIKE

Marco Bianchini, Rome, Italy, assignor to Consiglio Nazionale delle Ricerche, Rome, Italy

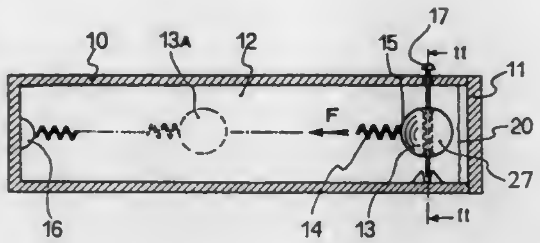
PCT No. PCT/IT93/00046, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO93/22638, PCT Pub. Date Nov. 11, 1993

PCT Filed May 7, 1993, Ser. No. 331,551

Claims priority, application Italy, May 7, 1992, RM92A0343

Int. Cl.^{6} G01K *1/02;3/00*

U.S. Cl. 116—216 **15 Claims**



1. A device for indicating a time-temperature thermal history of a refrigerated product, the thermal history being integrated over a contemplated temperature range of refrigeration of the product, the contemplated temperature range including a lowest contemplated temperature; the device comprising:

a container of non-opaque material;

a high-viscosity fluid disposed within the container, the fluid being in one of a liquid and a gaseous state at temperatures equal to and greater than the lowest contemplated temperature the viscosity of the fluid being dependent upon temperature;

a mobile portion having a controlled geometry and able to move about in the fluid as a result of a return force of an elastic component; and

releasable holding means for retaining the mobile portion in a initial position at room temperature and at the lowest contemplated temperature; wherein

within the contemplated temperature range the mobile portion, when released by the releasable holding means, moves slowly through the fluid under the force of the elastic component such that a displacement of the mobile portion from the initial position is a function of the viscosity of the fluid and a time interval elapsed since a time of release by the releasable holding means.

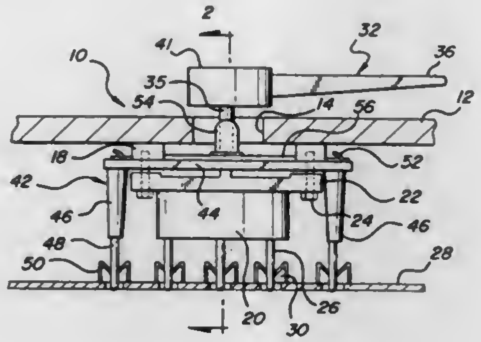
5,531,181
APPARATUS FOR ILLUMINATING INSTRUMENT CLUSTER POINTERS

Gerald T. Cookingham, Flushing, Mich., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 28, 1994, Ser. No. 218,406

Int. Cl.^{6} G01D *13/22*

U.S. Cl. 116—288 **10 Claims**



1. In an instrument cluster having a circuit board, a gauge electrically connected to the circuit board and having a spindle carrying a translucent illuminated pointer for rotation about a pointer axis, and means for mounting the gauge between the circuit board and the pointer; apparatus for illuminating the pointer comprising:

a bridge adjacent the spindle and supported on the gauge between the gauge and the pointer;

a light source supported on the bridge adjacent the spindle and offset from the pointer axis for illuminating the pointer; and

electrical leads on the bridge extending from the light source and around the gauge to the circuit board.

5,531,182
METHOD OF MAKING A SEMICONDUCTOR THIN-FILM

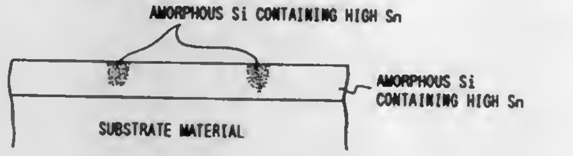
Takao Yonehara, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,447, May 24, 1993, abandoned, which is a continuation of Ser. No. 819,641, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 501,667, Mar. 30, 1990, abandoned. This application May 12, 1994, Ser. No. 241,678

Claims priority, application Japan, Mar. 31, 1989, 1-081101; Mar. 31, 1989, 1-081697; Jun. 26, 1989, 1-163429

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 117—7 **5 Claims**


AMORPHOUS Si CONTAINING HIGH Sn
AMORPHOUS Si CONTAINING HIGH Sn
SUBSTRATE MATERIAL

1. A method for forming a semiconductor thin film, comprising:

(i) preparing an amorphous silicon thin film containing tin;

(ii) forming a region in said amorphous silicon thin film by incorporating tin in an amount of 1×10^{15} atom/cm^3 to 1×10^{22} at a desired position of said amorphous silicon thin film, said region having a sufficiently minute area so as to form only one single nucleus from which a single crystal is grown and having a higher tin-atom density than other portions in said amorphous silicon thin film containing tin said other portions having a tin-atom density not more than 10^{-2} times the density of the area of higher tin-atom density;

(iii) heat-treating said amorphous silicon thin film at a temperature such that said single crystal grows only from said single nucleus in said minute area and crystal nucleus is inhibited from forming in said portions of said amorphous thin silicon thin film having said lower tin-atom density; and

(iv) growing said single crystal in a solid state in said amorphous silicon thin film on the base of said crystal nucleus.

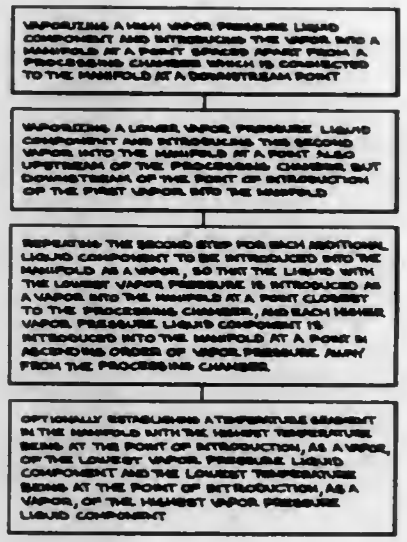
5,531,183
VAPORIZATION SEQUENCE FOR MULTIPLE LIQUID PRECURSORS USED IN SEMICONDUCTOR THIN FILM APPLICATIONS

Visweswaren Sivaramakrishnam, Cupertino, Calif.; Hiroshi Nishizato, Kumamoto, Japan; Jun Zhao, Milpitas, Calif., and Ichiro Yokoyama, Sakura, Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 13, 1994, Ser. No. 274,672

Int. Cl.^{6} C30G *25/14*

U.S. Cl. 117—93 **24 Claims**


VAPORIZING A HIGH VAPOR PRESSURE LIQUID COMPONENT AND INTRODUCING THE VAPOR INTO A MANIFOLD AT A POINT SPACED APART FROM A PROCESSING CHAMBER WHICH IS CONNECTED TO THE MANIFOLD AT A DOWNSTREAM POINT
VAPORIZING A LOWER VAPOR PRESSURE LIQUID COMPONENT AND INTRODUCING THIS SECOND VAPOR INTO THE MANIFOLD AT A POINT ALSO UPSTREAM OF THE PROCESSING CHAMBER BUT DOWNSTREAM OF THE POINT OF INTRODUCTION OF THE FIRST VAPOR INTO THE MANIFOLD
REPEATING THE SECOND STEP FOR EACH ADDITIONAL LIQUID COMPONENT TO BE INTRODUCED INTO THE MANIFOLD AS A VAPOR, SO THAT THE LIQUID WITH THE LOWEST VAPOR PRESSURE IS INTRODUCED AS A VAPOR INTO THE MANIFOLD AT A POINT CLOSEST TO THE PROCESSING CHAMBER, AND EACH HIGHER VAPOR PRESSURE LIQUID COMPONENT IS INTRODUCED INTO THE MANIFOLD AT A POINT IN ASCENDING ORDER OF VAPOR PRESSURE AWAY FROM THE PROCESSING CHAMBER
OPTIONALLY ESTABLISHING A TEMPERATURE GRADIENT IN THE MANIFOLD WITH THE HIGHEST TEMPERATURE BEING AT THE POINT OF INTRODUCTION, AS A VAPOR, OF THE LOWEST VAPOR PRESSURE LIQUID COMPONENT AND THE LOWEST TEMPERATURE BEING AT THE POINT OF INTRODUCTION, AS A VAPOR, OF THE HIGHEST VAPOR PRESSURE LIQUID COMPONENT

1. A process for the processing of thin films on semiconductor substrates using two or more liquid precursor sources which comprises:

a) determining the relative vapor pressures of each of said liquid precursors at a common temperature;

b) vaporizing a first liquid precursor source with the highest vapor pressure and then introducing the resulting vapor into a manifold also connected to a processing chamber, with the point of introduction of said vaporized first liquid precursor source into said manifold being spaced away from said processing chamber; and

c) vaporizing a second liquid precursor source, having a vapor pressure lower than said first liquid precursor source, and then introducing the resulting vapor into said manifold at a point of introduction of said vaporized second liquid precursor source closer to said processing chamber than said point of introduction of said vaporized first liquid precursor source;

whereby, each subsequent downstream liquid precursor source has a lower vapor pressure than all preceding liquid precursor sources.

5,531,184
METHOD FOR PRODUCING SYNTHETIC DIAMOND THIN FILM, THE THIN FILM AND DEVICE USING IT

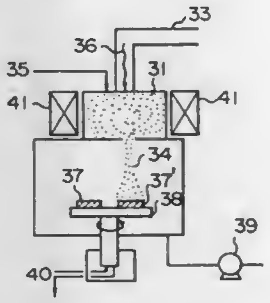
Yasushi Muranaka, Katsuta; Hisao Yamashita, and Hiroshi Miyadera, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 691,852, Apr. 26, 1991, abandoned. This application Dec. 13, 1993, Ser. No. 165,525

Claims priority, application Japan, Apr. 26, 1990, 2-108797; Mar. 19, 1991, 3-054775

Int. Cl.^{6} C30B *29/04*

U.S. Cl. 117—108 **11 Claims**



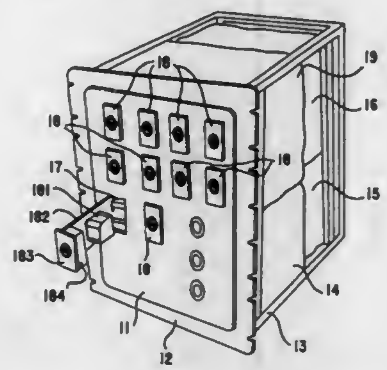
1. A method of producing a synthetic, highly crystallized, diamond thin film, which comprises decomposing with microwave a raw material gas mixture selected from the group consisting of $CO/O_2/H_2$, $CO/CO_2/O_2/H_2$, and $CO/CH_4/O_2/H_2$ at low temperature of 750° C. or lower to produce a non-equilibrium plasma, and contacting the plasma with the surface of the plasma being held outside the area irradiated with the microwave to form the highly crystallized diamond thin film on the substrate; the substrate comprising a glass and surface temperature of the substrate being controlled to be lower than the softening point of the material of the substrate by 100° C. or more and higher than the atmospheric temperature.

5,531,185

MANUFACTURING APPARATUS FOR USE IN A MICRO-GRAVITY ENVIRONMENT

Koji Asano; Atsushi Shiraishi, and Hidefumi Ueda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 30, 1994, Ser. No. 317,652
Claims priority, application Japan, Dec. 28, 1993, 5-336689
Int. Cl.⁶ C30B *7/14*
U.S. Cl. 117—206 9 Claims



1. A manufacturing apparatus to be used in a micro-gravity environment, when installed in a room of a manned artificial satellite, the apparatus having a top and a bottom, facing each other, and having a front panel disposed between the top and bottom, and secured to the satellite in such a manner that a vertical axis extends through the top and bottom, said apparatus comprising:

(a) a manufacturing unit including a plate or frame-like member having a plane supporting at least a device manipulatable by one hand of an operator, wherein the operator faces the front panel with his head generally opposite the top; and

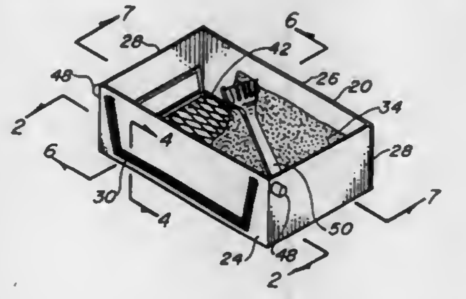
(b) a housing section for housing therein the manufacturing unit, the housing section having means for slidably supporting the manufacturing unit in such a manner that the plane of the plate or frame-like member of the manufacturing unit is generally parallel to the vertical axis and generally perpendicular with the front panel at least when the manufacturing unit is drawn out from the housing section through an opening provided in the front panel.

5,531,186

LITTER BOX WITH EXCREMENT REMOVING SCREEN

Eric Flood, 18313 Index St., and Richard Jarvis, 18200 Index St., both of Northridge, Calif. 91326

Filed Apr. 24, 1995, Ser. No. 427,350
Int. Cl.⁶ A01K *1/035;29/00*
U.S. Cl. 119—166 18 Claims



1. An animal litter box with excrement removing screen comprising:

a) an open topped box having a bottom, a first side, a second side and a pair of ends,

b) said first side having a U-shaped slot therethrough substantially adjacent to the bottom and corresponding ends,

c) seal means within the box covering the slot, retaining granular litter material within the box and,

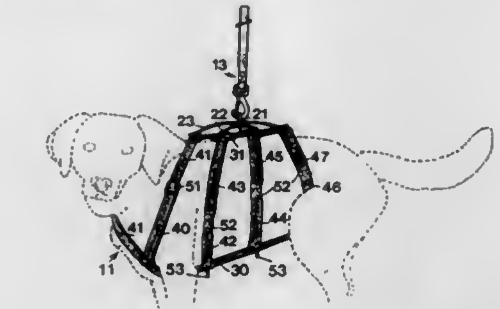
d) a screen grid tray, having integral handles, configured to correspond in shape with the slot and insertable into the tray through the slot with capabilities of removal by lifting the handles upwardly sifting the granular litter material through the tray screen captivating excrement thereon for subsequent disposal.

5,531,187

MULTI-PURPOSE PET HARNESS

James F. Ward, 25 Pine Valley Rd., Rome, Ga. 30161

Continuation-in-part of Ser. No. 992,110, Dec. 17, 1992, Pat. No. 5,305,710. This application Apr. 25, 1994, Ser. No. 232,493
The portion of the term of this patent subsequent to Sep. 25, 2013, has been disclaimed.
Int. Cl.⁶ A01K *29/00*
U.S. Cl. 119—856 4 Claims



1. An apparatus adapted for restraining a pet, which comprises:

(a) a harness, the harness having an upper strap member adapted to extend longitudinally along the pet's backbone and four sets of straps interconnected with said upper strap member but extending generally perpendicularly thereto;

(b) first and second strips of unequal length, distal ends of the first and second strips being attached to the upper strap member proximate with one of the interconnections between the upper strap member and the sets of straps extending generally perpendicularly thereto; the distal ends of both the first and second strips being spaced apart from each other; each end of the first strip being spaced apart from both ends of the second strip; and

(c) means including a connector which is slidably received by both the first and second strips for flexibly coupling them together, portions of the upper strap member and the strips so coupled defining a flexible truss through which, during normal use, forces applied to the connector tend to be distributed evenly to each of the straps.

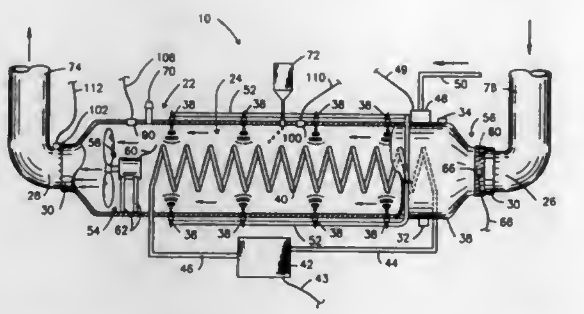
5,531,188

CLEANING SYSTEM FOR REMOVAL OF SOLUBLE HYDROCARBON RESIDUE FROM SURFACES

James Tomasulo, 9570 Southern Bell Dr., Brooksville, Fla. 34613

Filed Aug. 2, 1993, Ser. No. 100,133
Int. Cl.⁶ F22B *7/18*
U.S. Cl. 122—379 30 Claims

1. A cleaning system to remove soluble hydrocarbon residue from the surfaces in land storage tanks through the generation and circulation of vaporized solvent, said cleaning system comprising a vapor generating chamber having a vapor generating means and a gas flow control disposed therein to generate a solvent vapor to clean the surfaces and control the flow of gas through the vapor generating chamber respectively, a gas recovery device comprising a filter and vacuum pump coupled to said vapor generating chamber and the interior of the land storage tank to exhaust air and vapor therefrom, and a system control to control the vapor concentration of the solvent vapor circulated throughout said cleaning system and land storage tank.

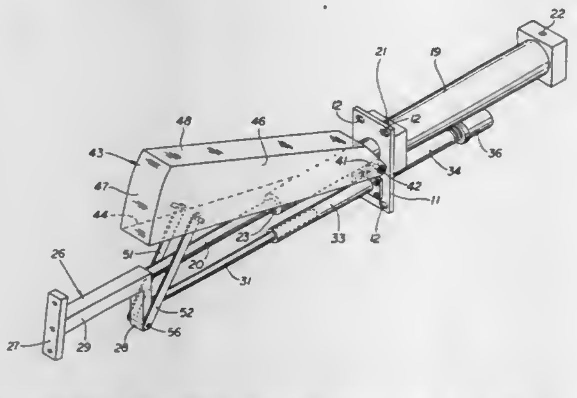


5,531,189

AUTOMATED DAMPING PORT RODDER

Jeff L. Shelton; Kevin J. Stallings, both of Jacksonville, and Thomas H. Hogan, Anniston, all of Ala., assignors to Drayton Corporation, Jacksonville, Ala.

Filed Sep. 12, 1994, Ser. No. 304,402
Int. Cl.⁶ F22B *37/18*
U.S. Cl. 122—379 19 Claims



1. Apparatus for cleaning and damping a port in a boiler comprising:

(a) means for iteratively urging a reciprocating plunger through at least one boiler port;

(b) means for damping said port; and

(c) means connecting said damping means and said plunger for automatically displacing said damping means relative to said port responsive to reciprocating motion of said plunger.

5,531,190

ELECTROHYDRAULIC FAN CONTROL

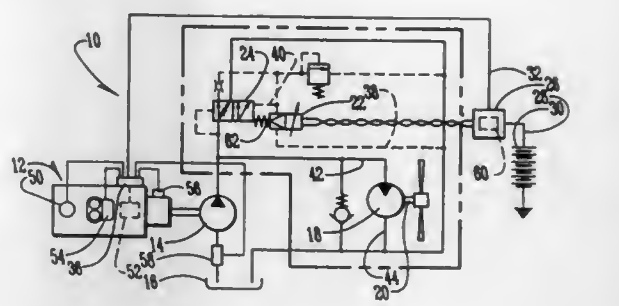
David A. Mork, Ames, Iowa, assignor to Sauer Inc., Ames, Iowa

Filed Dec. 9, 1994, Ser. No. 348,319
Int. Cl.⁶ F01P *7/02*
U.S. Cl. 123—41.12 15 Claims

1. The method of controlling the speed of a hydraulic motor for driving a cooling fan for cooling an internal combustion engine wherein said engine has an engine control processor electronically connected to a plurality of engine components, comprising:

sensing a first temperature from at least one temperature source in said engine;

generating an electronic signal in the engine control processor based on said first temperature;



providing a valve control circuit electrically connected to the engine control processor for receiving the electronic signal, said valve control circuit being remotely located from said engine control processor;

evaluating said electronic signal and converting the electronic signal to a valve control signal;

emitting the valve control signal to a solenoid controlled hydraulic valve, wherein said valve will be actuated to change fluid flow of a determined magnitude; and

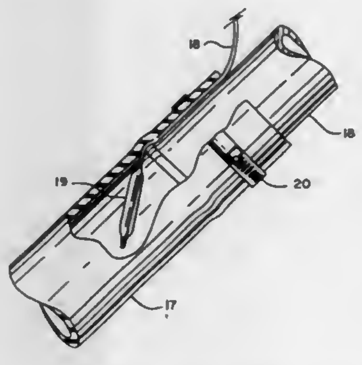
hydraulically connecting said valve to a hydraulic motor operatively coupled to a fan so that the speed of said hydraulic motor and the speed of said fan will be coordinated to provide cooling air to said engine appropriate to deal with the temperature conditions of said engine.

5,531,191

FLUID TEMPERATURE MONITOR

William J. Davis, Columbus, Ohio, assignor to Thermo-Tech, Inc., Hilliard, Ohio

Filed Sep. 8, 1995, Ser. No. 525,483
Int. Cl.⁶ F02B *77/00*
U.S. Cl. 123—41.15 2 Claims



1. A monitor for monitoring the temperature of the coolant fluid of an internal combustion engine provided with a radiator and a pump connected between said internal combustion engine and said radiator for circulating said coolant fluid between said internal combustion engine and said radiator and comprising:

thermosensing means having output means, and adapted to function within a radiator hose and adapted to extend between said hose and a pipe fitting it attaches to with a fluid tight joint,

audible warning means,

first relay means which is responsive to said output means to close and complete an electrical circuit to actuate said audible warning means for a preset period of time when the temperature of said fluid reaches a predetermined level,

internal combustion engine cutoff means,

visible display means,

second relay means which is responsive to said output means to close and complete an electrical circuit to activate said visible display means and said internal combustion engine cutoff means after said preset period of time.

5,531,192
HYDRAULICALLY ACTUATED VALVE SYSTEM

Dennis D. Feucht, Morton; Steven J. Funke, Peoria, and Steven F. Meister, Chillicothe, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 4, 1994, Ser. No. 286,068

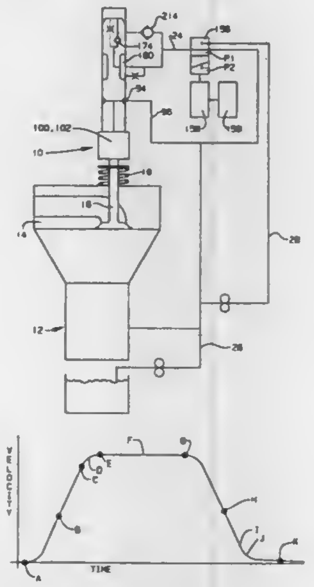
Int. Cl.^{6} F01L *9/02*

U.S. Cl. 123—90.12

34 Claims

1. A valve actuation system adapted for use with an internal combustion engine having a cylinder head and a valve disposed within the cylinder head, the valve having an open and a closed position, comprising:

- an actuator head with a bore therein connected to the cylinder head;
- a cylindrical body adapted for connection within the bore in the actuator head, the body having an axially extending bore therethrough;
- a plunger operatively associated with the valve and having a plunger surface, the plunger operatively associated with the cylinder head to define a plunger cavity and being slidably disposed partially within the bore in the body and being movable between a first position and a second position to define a plunger cavity;
- a source of relatively high pressure fluid;
- a source of relatively low pressure fluid;
- means for biasing the plunger towards the first position;
- first means for selectively communicating fluid from the high pressure source into the plunger cavity for urging the plunger toward the second position so that the valve is moved to the open position;
- second means for selectively communicating fluid exhausted from the plunger cavity to the low pressure source in response to the biasing means urging the plunger toward the first position so that the valve is moved to the closed position; and
- hydraulic means for reducing the plunger velocity as the valve approaches the open and closed positions.



5,531,193
INTAKE AND EXHAUST VALVE CONTROL OF INTERNAL COMBUSTION ENGINE

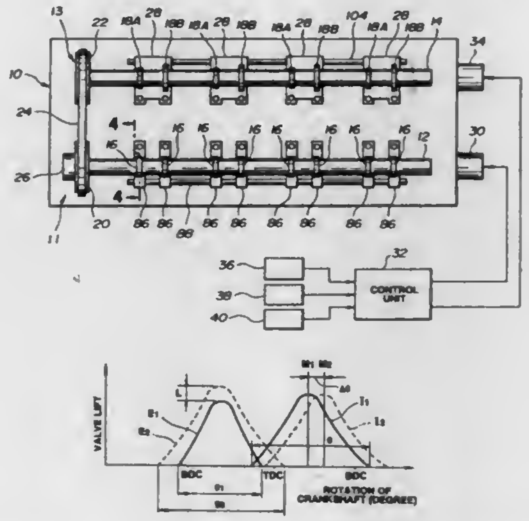
Makoto Nakamura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 319,528, Oct. 7, 1994, Pat. No. 5,497,737. This application May 5, 1995, Ser. No. 435,168

Claims priority, application Japan, Oct. 14, 1993, 5-256580

Int. Cl.^{6} F01L *13/00;1/34;* **F02D** *13/02*

U.S. Cl. 123—90.15 **2 Claims**



1. An apparatus for operating an intake valve and an exhaust valve of an internal combustion engine, the apparatus comprising:

- sensing means for generating an output distinguishing an engine operation under a cold condition from other engine operations;
- an intake valve gear for the intake valve, said intake valve gear incorporating an intake variable valve timing mechanism;
- an exhaust valve gear for the exhaust valve, said exhaust valve gear incorporating an exhaust variable valve timing mechanism; and
- means operatively responsive to said output of said sensing means to condition said exhaust variable valve timing mechanism for decreasing an opening duration of the exhaust valve to provide a retarded opening timing thereof and an advanced closing timing thereof, said advanced closing timing of the exhaust valve being disposed before a top dead center of an engine piston stroke, and at the same time condition said intake variable valve timing mechanism for providing an advanced opening timing of the intake valve before the top dead center of the engine piston stroke and an advanced closing timing of the intake valve to provide a predetermined valve overlap timing between the exhaust and intake valves and reduce hydrocarbons emitting through the exhaust valve without deteriorating stable operation of the engine.

5,531,194
CYLINDER HEAD FOR ENGINE

Kenji Komatsu, and Tomotaka Takano, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

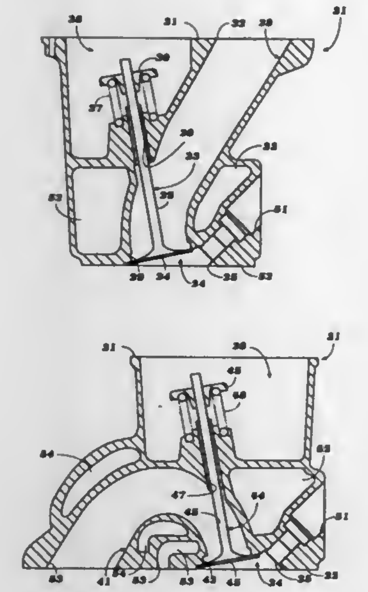
Filed May 10, 1995, Ser. No. 438,502

Claims priority, application Japan, May 10, 1994, 6-096771

Int. Cl.^{6} F01L *1/02*

U.S. Cl. 123—193.5 **24 Claims**

1. A cylinder head for an internal combustion engine, having a lower surface for sealing engagement with a cylinder block having a cylinder bore closed by said cylinder head lower surface to form a combustion chamber, said cylinder head having an upper surface surrounding a valve chamber adapted to be closed by a valve cover sealingly engaged with said upper surface, an intake passage extending through said cylinder head from an intake port in said combustion chamber to an inlet opening surrounded by a sealing surface co-planar with one of said upper and lower surfaces, and an exhaust passage formed extending through said cylinder head from an exhaust port in said combustion chamber to an exhaust outlet opening surrounded by a sealing surface co-planar with the other of said upper and lower surfaces.



5,531,195
PISTON RING

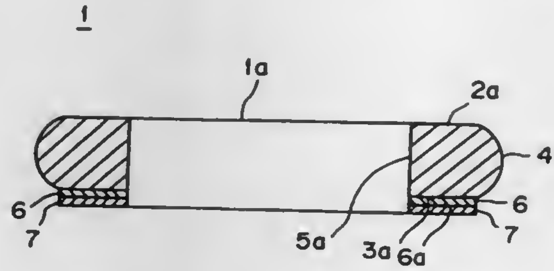
Motonobu Onoda; Takeshi Tsuchiya; Etsuo Tamegai; Katsuaki Ogawa, all of Yono, and Makoto Murata, Tsurugashima, all of, Japan, assignors to Nippon Piston Ring Co., Ltd., Japan

Filed Aug. 16, 1994, Ser. No. 291,436

Claims priority, application Japan, Aug. 25, 1993, 5-210757

Int. Cl.^{6} F16J *9/26;* **F02F** *5/00*

U.S. Cl. 123—193.6 **9 Claims**



1. A piston ring comprising:

- a ring-shaped piston ring main body having upper, lower and outer circumferential surfaces;
- an anti-abrasion surface treatment layer formed on the lower surface of said piston ring main body; and
- a polybenzimidazole resin coating film including a solid lubricant, formed on a surface of said anti-abrasion surface treatment layer.

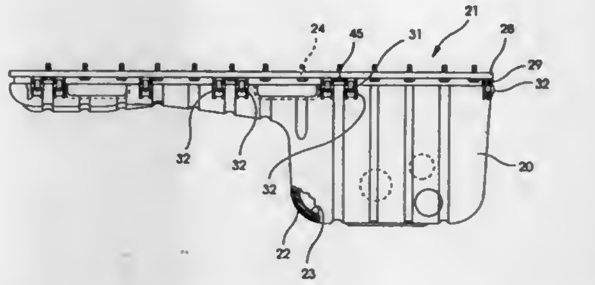
5,531,196
OIL PAN NOISE ENCLOSURE AND ATTACHMENT SYSTEM FOR SAME

Kent H. Clark, Panama, N.Y., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 352,527, Dec. 9, 1994, Pat. No. 5,452,693. This application Sep. 1, 1995, Ser. No. 522,606

Int. Cl.^{6} F02F *7/00;* **F16N** *31/00*

U.S. Cl. 123—195 C **3 Claims**



1. A vehicle oil pan assembly which is acoustically insulated for noise reduction comprises:

- an oil pan having an enclosing sidewall and a peripheral flange disposed adjacent an upper edge of said sidewall;
- a plurality of support brackets securely affixed to said oil pan flange, each bracket of said plurality including a plurality of support tabs;
- a noise-reducing enclosure including an outer skin and an isolation layer, said isolation layer being positioned between the enclosing sidewall of said oil pan and said outer skin, said outer skin including a plurality of latching portions; and
- a plurality of snap-on clips for connecting together each of said plurality of support tabs with a corresponding one of said plurality of latching portions.

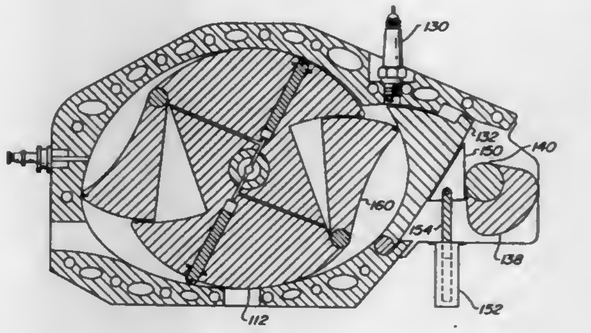
5,531,197
VARIABLE DISPLACEMENT ROTARY INTERNAL COMBUSTION ENGINE

David R. Lobb, 1 Chestnut St., Pomeroy, Pa. 19367

Continuation-in-part of Ser. No. 327,752, Oct. 24, 1994, Pat. No. 5,494,014. This application Oct. 17, 1995, Ser. No. 544,053

Int. Cl.^{6} F02B *53/00*

U.S. Cl. 123—243 **9 Claims**



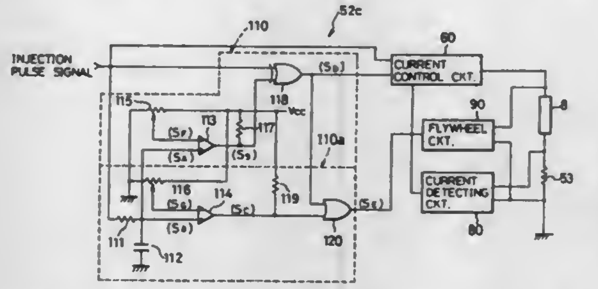
1. A rotary internal combustion engine comprising:

- a rotor provided with at least one outwardly moveable rotor segment;
- a block having a bore within which said rotor rotates;
- said block being provided with an outer segment pivotally mounted on said block, a combustion space being formed or enlarged by the outward movement of said outer segment; and
- means for controlling the outward movement of said outer segment, said means controlling the movement of said outer segment for each combustion cycle and being adjustable to

control the range of movement to vary the maximum size of the combustion chamber to create a variable displacement engine.

5,531,198
FUEL INJECTION CONTROL SYSTEM FOR AUTOMOBILE ENGINE

Takashi Matsuura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 20, 1995, Ser. No. 425,508
Claims priority, application Japan, May 19, 1994, 6-105759
Int. Cl.^{6} F02D *41/20*
U.S. Cl. 123—294 **7 Claims**

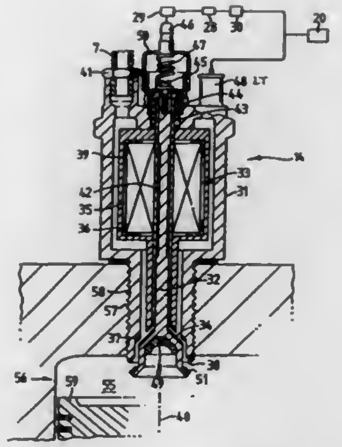


1. A fuel injector drive circuit having a flywheel circuit for controlling a drive current of a fuel injector, comprising:
- means for raising said drive current from a zero level to a high level so as to open said fuel injector;
- means for holding said drive current at said high level for a predetermined time;
- means for reducing said drive current from said high level while said flywheel circuit is inoperative;
- flywheel circuit control means for generating an operating signal and for operating said flywheel circuit responsive to said signal while said drive current is being reduced; and
- closed loop control means for holding said drive current at a low level by a closed loop control so as to keep said fuel injector open while said flywheel circuit is operative.

5,531,199
INTERNAL COMBUSTION ENGINES

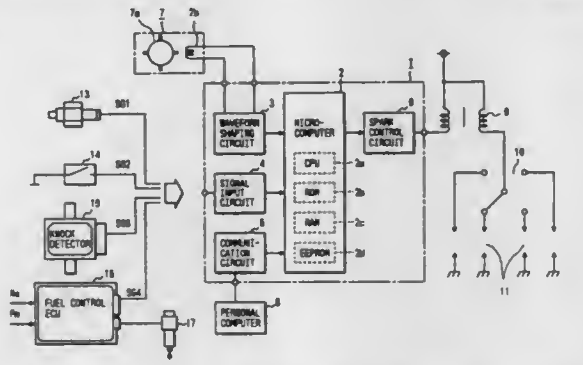
Peter J. Bryant, Oldham, and Jacob Epstein, London, both of, England, assignors to United Fuels Limited, London, United Kingdom
PCT No. PCT/GB93/00955, § 371 Date Nov. 10, 1994, § 102(e) Date Nov. 10, 1994, PCT Pub. No. WO93/23662, PCT Pub. Date Nov. 25, 1993
PCT Filed May 10, 1993, Ser. No. 335,721
Claims priority, application United Kingdom, May 11, 1992, 92 10 115
Int. Cl.^{6} F02M *57/06*
U.S. Cl. 123—297 **13 Claims**

1. An internal combustion engine including at least one piston-and-cylinder combination, in which said cylinder is connected in use both to a source of air and to a source of fuel held as a gas under pressure, in which the engine operates a combustion cycle including a compression stroke in which the cylinder compresses a full charge of air, and in which the compression stroke is then substantially completed before gaseous fuel is admitted to the cylinder from the fuel source, and an air/fuel mixture is subsequently ignited to initiate a power stroke, characterized in that the cylinder is disconnected from the fuel source before the air/fuel mixture is ignited, and in that substantially all the gaseous fuel is admitted to the cylinder through a unit which carries electrodes of an igniter, said unit including an admission valve having a member which carries at least one of said electrodes, in which said unit comprises two parts which are capable of a predetermined range of relative movement, in which at least one pair of said electrodes for generating an ignition spark are mounted with the two electrodes of the pair carried one on each of the two parts, in which when the two parts are at one end of their range of relative movement the admission valve is shut and the two electrodes are at the correct relative spacing for ignition, and in which as the two parts move towards the other end of the range of movement the spacing between the two electrodes changes.



5,531,200
CONTROL APPARATUS FOR ENGINE

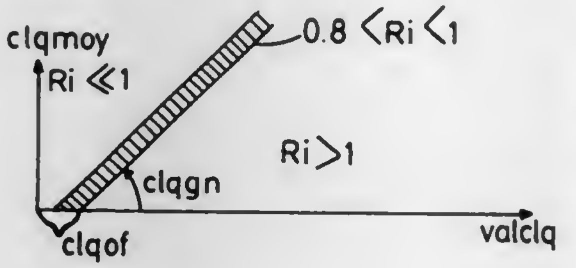
Katsuharu Hosoe, Okazaki, and Toshihisa Yamamoto, Kariya, both of, Japan, assignors to Nippondenso Co., Ltd., Japan
Filed Dec. 1, 1994, Ser. No. 352,794
Claims priority, application Japan, Dec. 1, 1993, 5-302088
Int. Cl.^{6} F02P *5/152*
U.S. Cl. 123—417 **14 Claims**



7. An engine control apparatus including a microcomputer which receives a signal from a signal source, the apparatus comprising:
- a signal input circuit selectively connectable with signal sources of plural types;
- memory means for storing control programs corresponding to the signal sources of the plural types respectively;
- signal source identifying means for identifying a signal source connected with the signal input circuit, said signal source identifying means comprising
  - an electrically rewritable nonvolatile memory loaded with a control specification constant indicating the connected signal source, and
  - a signal characteristic discriminating means for discriminating a characteristic of the signal from the connected signal source; and
  - control program executing means for selectively executing a control program in the microcomputer corresponding to the signal source identified by the signal source identifying means, said control program executing means selectively executing a control program corresponding to a result of the discrimination by the signal characteristic discriminating means only when the electrically rewritable nonvolatile memory is loaded with a given control specification constant.

5,531,201
METHOD OF SUPPRESSING A PINGING PHENOMENON AFFECTING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Serge Boverie, Plaisance du Touch; Bernhard Demaya, Valence d'Agen, and André Titli, Balma, all of, France, assignors to Siemens Automotive S.A., Toulouse Cedex, France
PCT No. PCT/EP93/00627, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/19293, PCT Pub. Date Sep. 30, 1993
PCT Filed Mar. 17, 1993, Ser. No. 302,900
Claims priority, application France, Mar. 26, 1992, 92 03645
Int. Cl.^{6} F02P *5/152;* **G01L** *23/22*
U.S. Cl. 123—425 **5 Claims**



1. A method for suppressing a pinging phenomenon affecting operation of an internal combustion engine, by correcting at least one of ignition advance angle of an air/fuel mixture introduced into the engine, composition of this mixture and energy of an ignition spark, comprising the steps of: measuring an instantaneous energy of the pinging phenomenon and calculating a quantity dependent on the instantaneous value of this measurement the quantity being calculated from the expressions:

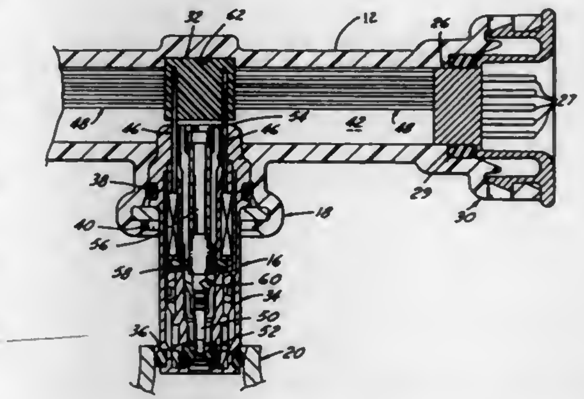
$$R_i=\frac{valclq-K_1}{clqmoy}\times K_2$$

where R_i is the quantity, valclq is the instantaneous value of the measurement of the energy of the pinging phenomenon, and clqmoy is a sliding average value of this measurement, and K_1 and K_2 are constants; calculating a sliding average value of the quantity, weighted by a forget factor; and calculating a correction to be applied from predetermined relations derived from a set of such relations and selected as a function of the instantaneous values of the quantity and of the weighted sliding average,

3. A method for suppressing a pinging phenomenon affecting operation of an internal combustion engine, by correcting at least one of ignition advance angle of an air/fuel mixture introduced into the engine, composition of this mixture and energy of an ignition spark, comprising the steps of: measuring an instantaneous energy of the pinging phenomenon and calculating a quantity dependent on the instantaneous value of this measurement; calculating a sliding average value of the quantity, weighted by a forget factor; and calculating a correction to be applied from predetermined relations derived from a set of such relations and selected as a function of the instantaneous values of the quantity and of the weighted sliding average, the quantity and the average value being converted into "fuzzy" variables and the correction is derived from an inference engine supplied with the quantity and the average value.

5,531,202
FUEL RAIL ASSEMBLY HAVING INTERNAL ELECTRICAL CONNECTORS

Jack R. Lorraine, Newport News, Va., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.
Filed Jul. 18, 1995, Ser. No. 503,783
Int. Cl.^{6} F02M *55/02*
U.S. Cl. 123—456 **8 Claims**

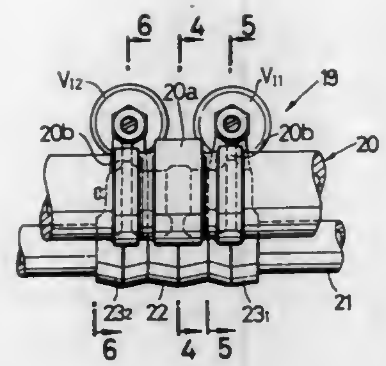


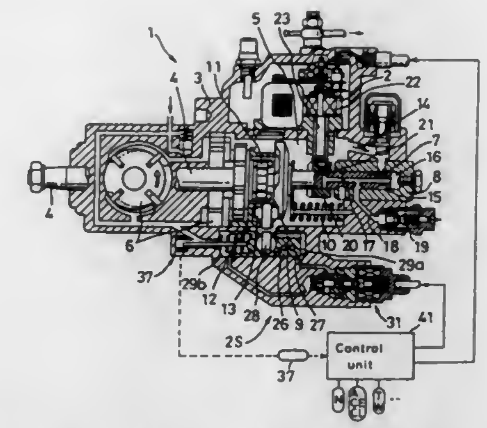
1. A fuel rail assembly including an elongated generally tubular fuel rail having an internal fuel passage adapted to receive fuel under pressure, and a series of generally cylindrical fuel injectors installed in said fuel rail distributed along the length thereof;
- said fuel rail formed with a series of injector seats each injector seat having a seat opening communicating into the interior of said fuel rail, each injector seat having one end of a respective fuel injector sealingly received therein and retaining means holding said one end of each fuel injector in said injector seat opening;
- each of said fuel injectors having an internal passage communicating with said fuel rail internal fuel passage;
- said fuel rail having a series of connector seat recesses formed in an interior wall of said internal fuel passage opposite said seat openings, each of said connector seat recesses located opposite a respective seat opening;
- an internal electrical connector disposed in each connector seat;
- each of said fuel injectors having an electrical solenoid operator and a pair of contacts electrically connected to said solenoid, said contacts mating with corresponding contacts in a respective one of said internal connectors, said fuel injectors each including a valve operated by said electrical solenoid operator to controllably allow outflow of fuel from said injector internal passage;
- electrical leads extending from each internal electrical connector to a single external electrical connector installed in said fuel rail to enable connection to an electronic controller for said fuel injectors.

5,531,203
CATALYST ACTIVATING SYSTEM IN MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Takashi Komatsuda; Hiroaki Kato; Yuichi Shimasaki; Akihisa Saito; Toshikazu Oketani, and Takuya Aoki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 25, 1995, Ser. No. 377,736
Claims priority, application Japan, Jan. 25, 1994, 6547/94
Int. Cl.^{6} F02D *7/00*
U.S. Cl. 123—481 **20 Claims**

1. A catalyst activating system in a multi-cylinder combustion engine for activating a catalyst by increasing an amount of oxygen supplied to said catalyst, said engine including a plurality of cylinders, each cylinder having a fuel injection valve operatively associated therewith, at least one intake valve operatively associated therewith, and at least one exhaust valve operatively associ-





ated therewith; and a catalytic converter having said catalyst therein, operatively coupled to said cylinders; said catalyst activating system comprising:

- (a) detecting means for detecting operational conditions of said engine including engine temperature, engine intake pressure and engine speed;
- (b) valve operating means for opening and closing said intake valves and said exhaust valves;
- (c) valve opening and closing operation changing means operatively coupled to said valve operating means for changing the opening and closing operation of at least one of said intake valves and at least one of said exhaust valves in at least one of said cylinders between at least two operating modes dependent on at least one of said engine intake pressure and said engine speed detected by said detecting means, wherein in one of said operating modes, said intake valves and exhaust valves are closed and in another of said operating modes, at least one of said intake valves and one of said exhaust valves are opened for at least a predetermined period; and
- (d) control means for controlling the operation of said fuel injection valves to stop the supply of fuel into at least one of said cylinders and for controlling the operation of said valve opening and closing operation changing means to operate in said one operating mode and said another operating mode, when said engine is at a temperature which is below a predetermined temperature, thereby permitting only air to be fed through said at least one cylinder to said catalyst, whereby the amount of oxygen provided to said catalyst is controlled thereby controlling the activity of said catalyst.

5,531,204
INJECTION TIMING DEVICE FOR FUEL INJECTION SYSTEM

Akira Sekiguchi, and Yoshinori Uchida, both of Higashimatsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Aug. 2, 1995, Ser. No. 510,536
Claims priority, application Japan, Aug. 10, 1994, 6-209131
Int. Cl.⁶ F02M *59/20*
U.S. Cl. 123—502 **20 Claims**

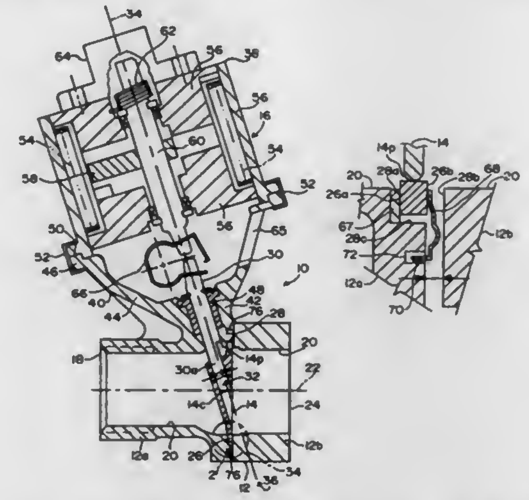
1. An injection timing device for a fuel injection system comprising;

- a timing device that adjusts the fuel injection start timing by causing the pressure of fuel in a pump chamber to work on a timer piston and adjusting said pressure working on said timer piston,
- a means for timer position detection for detecting the actual position of said timer piston,
- a means for timer target position setting for setting a target position for said timer piston,
- a means for feedback control for performing feedback control of said timing device in such a manner that said actual position of said timer piston approaches said target position,
- a means for engine rotation rate decision making for deciding that the engine rotation rate is equal to or less than a specific rotation rate,
- a means for open loop control for performing open loop control of said timing device when said means for engine rotation rate decision making has determined that said engine rotation rate is equal to or less than a specific rotation rate,
- a means for startup decision making for determining that the operation is at startup time, and
- a means for control that cancels the decision making by said means for engine rotation rate decision making and maintains said feedback control, when it is determined by said means for startup time decision making that the operation in at startup time.

5,531,205
ROTARY DIESEL ELECTRIC EGR VALVE

John E. Cook, and Scott E. W. Hussey, both of Chatham, Canada, assignors to Siemens Electric Limited, Ontario, Canada

Filed Mar. 31, 1995, Ser. No. 414,454
Int. Cl.⁶ F02M *25/07*
U.S. Cl. 123—568 **17 Claims**

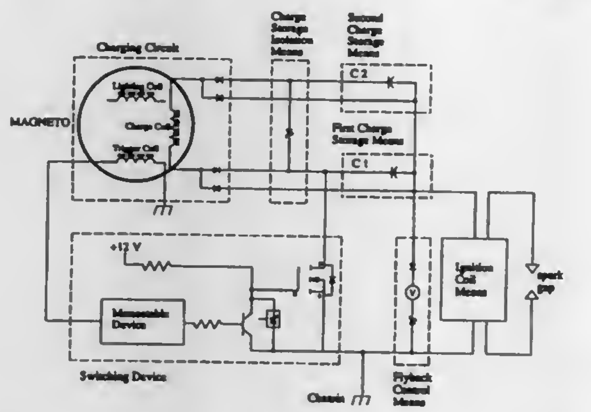


1. An exhaust gas recirculation (EGR) valve for an internal combustion engine comprising a body, an inlet at which engine exhaust gas to be recirculated enters said body, a walled passage that has its own axis and that extends through said body for conveying engine exhaust gas that has entered said inlet, an outlet at which engine exhaust gas that has passed through said walled passage exits said body, a valve blade that is disposed within said walled passage and is selectively positionable within said walled passage for selectively restricting flow through said walled passage, actuating means disposed exterior of said walled passage, an actuating shaft operatively coupling said actuating means with said valve blade for selectively positioning said valve blade between a closed position wherein said valve blade is sealed relative to said walled passage and a number of increasingly open positions, and a sealing ring mounted on, and extending peripherally around, said walled passage, said sealing ring having its own axis and comprising opposite end surfaces facing in opposite axial directions relative to said sealing ring's axis and a radially inward surface extending between said opposite end surfaces, said valve body comprising respective body segments disposed end-to-end axially along said walled passage's axis and cooperatively defining a groove that is radially inwardly open relative to said walled passage's axis and within which said sealing ring is disposed, and means providing for said sealing ring to position itself within said groove during the process of assembling the EGR valve such that said radially inward surface of said sealing ring concentrically seals to an outer perimeter of said valve blade when said valve blade is in closed position, said groove comprising confronting wall surfaces that are axially spaced apart along said walled passage's axis, and said means providing for said sealing ring to position itself within said groove during the process of assembling the EGR valve including separate individual elements in association with said groove, each separate individual element being disposed between a respective one of said confronting wall surfaces of said groove and a respective end surface of said sealing ring, one of said separate individual elements comprising a resilient portion for resiliently urging said sealing ring against the other of said separate individual elements, and including a sealing means disposed radially outwardly of said groove relative to said walled passage's axis for sealing between said body segments so that engine exhaust gas does not leak out of said walled passage between said body segments.

5,531,206
CAPACITATIVE DISCHARGE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Mark R. Kitson, 2 Barnet Place, Kingsley, Western Australia 6026, and Peter J. Ayre, 40 Riga Crescent, Willeton, Western Australia 6155, both of, Australia

Continuation of Ser. No. 282,025, Jul. 29, 1994, abandoned, which is a continuation of Ser. No. 39,303, Apr. 22, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,205
Claims priority, application Australia, Nov. 15, 1990, PK3373
Int. Cl.⁶ F02P *3/06*
U.S. Cl. 123—596 **19 Claims**



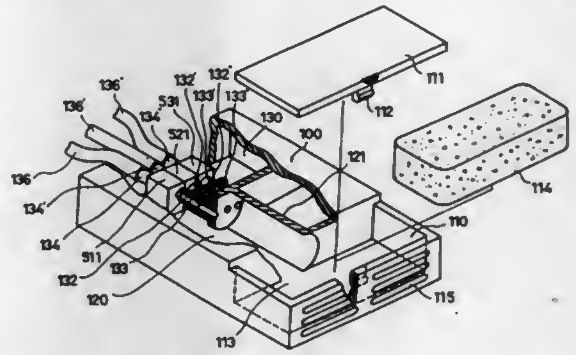
1. A method for producing spark in a capacitive discharge ignition system of an internal combustion engine, comprising the steps of:

- isolating a first charge storage device from a second charge storage device by a charge storage isolation device;
- charging said first charge storage device with a charging circuit;
- charging said second charge storage device with said charging circuit;
- operating a switching means to discharge said first charge storage device to cause an ignition coil spark means to generate a first spark;
- upon a potential of said charge storage means falling below a potential of said second charge storage means, discharging said second charge storage device for prolonging the first spark;
- operating said switching means at approximately a time said first and second charge storage devices are substantially fully discharged for inducing a flyback potential in a primary coil of said ignition coil spark means operatively connected to said first charge storage device and said second charge storage device;
- thereby inducing a current to flow at said ignition coil spark means thereby generating a second spark.

5,531,207
MULTI-STEP ENGINE AIR INTAKE VOLUME CONTROL DEVICE

Jung-Chih Lin, No. 48, Sec. 2, Kan-Yuan St., Shulin Town, Taipei County, Taiwan

Filed Jul. 5, 1995, Ser. No. 498,114
Int. Cl.⁶ F02B *25/06*
U.S. Cl. 123—572 **5 Claims**



1. A multi-step engine intake air volume control device installed in the positive crankcase ventilating system of a motor vehicle and controlled to regulate the volume of supply air to the engine of the motor vehicle, the device comprising:

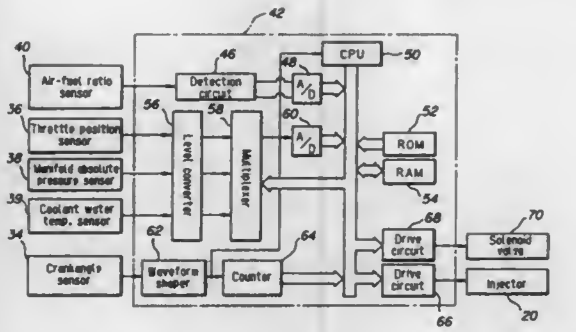
- a casing covered with a hinged cover, said casing having an air input port and an air output port;
- an air filter element mounted inside said casing to filter air passing from said air input port to said air output port;
- a control chamber connected to said air output port, said control chamber comprising a plurality of guide tubes respectively connected to said air output port, a plurality of electromagnetic valves controlled to open and close said guide tubes respectively, a plurality of connecting tubes connected between said guide tubes and respective branch tubes of a manifold pipe being installed in said positive crankcase ventilating system; and,
- a control circuit connected to the speedometer of the motor vehicle and controlled to alternatively close and open said electromagnetic valves subject to the revolving speed of the engine.

5,531,208
AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yusuke Hasegawa; Isao Komoriya; Shusuke Akazaki, and Eisuke Kimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 305,162
Claims priority, application Japan, Sep. 13, 1993, 5-251138
Int. Cl.⁶ F02D *41/00*
U.S. Cl. 123—673 **52 Claims**

1. A system for controlling an air-fuel ratio of an air-fuel mixture supplied to each cylinder of a multicylinder internal combustion engine, comprising:



an air-fuel ratio sensor installed at a location at or downstream of a confluence point of an exhaust system of said engine;

a circuit means for detecting a first air-fuel ratio at the confluence point of the exhaust system of the engine based on an output of the air-fuel ratio sensor:

individual cylinder air-fuel ratio estimating means for estimating a second air-fuel ratio at each cylinder of the engine based on the output of the air-fuel ratio sensor and a model describing a behavior of the exhaust system;

engine operating parameter detecting means for detecting parameters indicative of operating conditions of the engine at least including engine speed and engine load;

fuel injection quantity determining means for determining a fuel injection quantity at least based on the detected parameters of the engine;

first feedback control loop for determining a first feedback correction coefficient based on a first error between the first air-fuel ratio and a first desired air-fuel ratio to correct the fuel injection quantity by the first feedback correction coefficient;

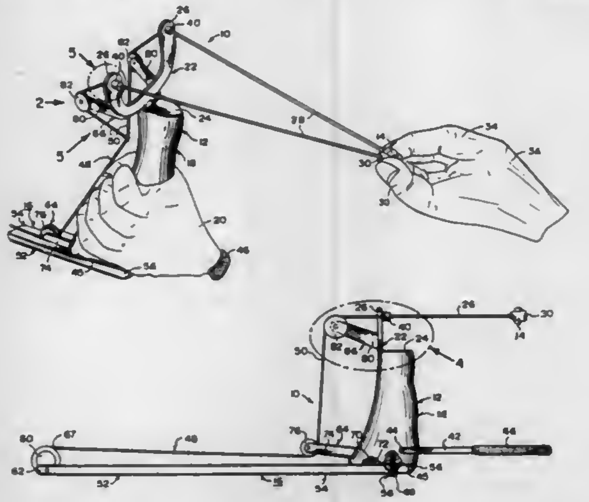
a second feedback control loop for determining a second feedback correction coefficient based on a second error between a second air-fuel ratio and a second desired air-fuel ratio to correct the fuel injection quantity by the second feedback correction coefficient;

fuel injection quantity correcting means for correcting the determined fuel injection quantity by the first and second feedback correction coefficients; and

a fuel injector for injecting fuel in a cylinder of said engine based on the corrected fuel injection quantity.

5,531,209
COMPOUND SLINGSHOT

David J. Liedtke, 244 N. First St., Rogers City, Mich. 49779
Filed May 9, 1994, Ser. No. 239,900
Int. Cl.^{6} F41B *3/02*
U.S. Cl. 124—20.1 **9 Claims**

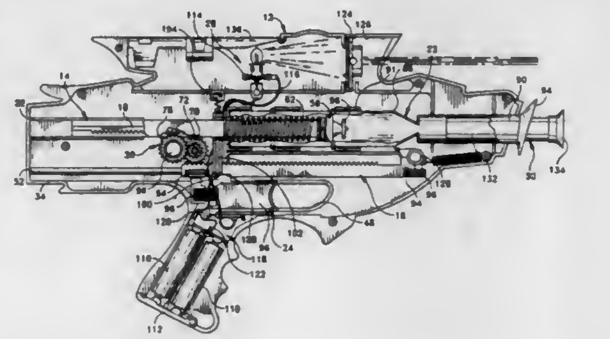


1. A compound slingshot which comprises:

a weapon operated by manual energy to propel a small missile towards a target, said weapon including a handle to be gripped by a first hand of a person, a fork on a top end of said handle and having two spaced apart upstanding prongs, an elastic band extending through said prongs and having two ends extending rearwardly from said prongs and connected to a speed increasing means, and a pouch centered on said elastic band opposite from said prongs for holding the small missile to be propelled therefrom, with a thumb and an index finger of a second hand of the person engageable with said pouch and the small missile, so as to pull back said elastic band and then release said pouch to propel the small missile towards the target, each said prong having an aperture and a pair of sleeves, each extending rearwardly from one said aperture in one said prong, to allow said elastic band to slide therethrough when pulled back by said thumb and said index finger.

5,531,210
TOY GUN

Daniel G. Meiser, Butler, Ky., and Randolph C. Stewart, Cincinnati, Ohio, assignors to Hasbro, Inc., Pawtucket, R.I.
Filed Nov. 16, 1994, Ser. No. 340,504
Int. Cl.^{6} F41B *11/14;11/18*
U.S. Cl. 124—66 **5 Claims**



1. A toy gun comprising:

a housing having front and rear ends and having a pair of longitudinally extending slots in transversely opposite sides thereof;

plunger means in said housing movable between cocked and uncocked positions and operable for launching a projectile from said housing upon movement of said plunger means from the cocked position thereof to the uncocked position thereof;

first rack gear means connected to said plunger means for movement therewith and operable for moving said plunger means from the uncocked position thereof to the cocked position thereof;

releasable retaining means releasably retaining said plunger means in the cocked position thereof;

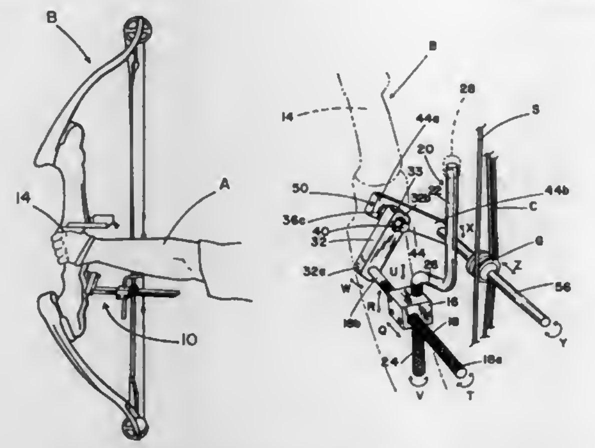
second rack gear means in said housing manually movable between first and second positions thereof;

transmission gear means communicating manual movement of said second rack gear means to said first rack gear means such that movement of said second rack gear means from the first position thereof to the second position thereof causes movement of said plunger means from the uncocked position thereof to the cocked position thereof; and

a pair of handles traveling in said slots on opposite sides of said housing and communicating with said second rack gear means for moving said second rack gear means from the first position thereof to the second position thereof.

5,531,211
ARCHERY ARM GUARD

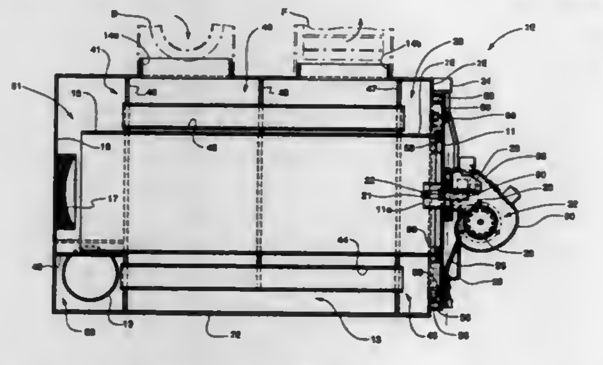
Gary R. Wilfong, Jr., HCR 62, Box 122-B, Sedgewickville, Mo. 63781-9509
Filed Nov. 2, 1994, Ser. No. 333,506
Int. Cl.^{6} F41B *5/00*
U.S. Cl. 124—86 **17 Claims**



1. A device for attachment to an archery bow, the device comprising a plurality of pieces adapted for attachment to the bow and movably interconnected to one another in such manner that at least one of the plurality of pieces is adjustable in at least three different directions, to an individual archer's preferred position on the bow, wherein the plurality of pieces includes a first rod and second rod, the first rod connected to the bow and extending rearwardly therefrom so as to be substantially horizontal when the bow is held in a normal shooting position, and a mounting block rotatably, slidably mounted on the first rod, the mounting block having a first through-bore for receiving and rotatably and slidably retaining the first rod, and a second through-bore for receiving and rotatably and slidably retaining the second rod perpendicularly to the first rod and substantially vertically when the bow is held in a normal, upright use position, whereby the archer can optimally position the archer's bow-supporting arm relative to the second rod of the device to enhance shooting performance and to prevent contact of the bowstring with the archer's bow-supporting arm.

5,531,212
MULTI OIL FURNACE

Benjamin K. Smoker; David J. Yoder; Benuel F. Smoker; Frederick W. Phillips, all of Leola, and Emanuel S. Beiler, Gordonville, all of Pa., assignors to Clean Burn, Inc., Leola, Pa.
Filed Apr. 14, 1994, Ser. No. 227,345
Int. Cl.^{6} F24H *3/00*
U.S. Cl. 126—104 R **20 Claims**



1. A multi oil furnace comprising:

an external cabinet shell having a floor, a front wall and a rear wall, said front wall having a door pivotally mounted thereon for internal access to said cabinet shell, said door defining a burner opening therethrough;

an elongated cylindrical burner chamber supported within said cabinet shell in alignment with said burner opening and being oriented longitudinally between said front and rear walls for the burning of a flame therewithin to generate heat;

a burner assembly mounted on said front door and being operably coupled to means for providing a flow of air and a flow of oil, said burner assembly being operable to ignite a combined flow of air and oil to fire a flame through said burner opening into said burner chamber;

an upper bank of conduits, each individual conduit of which is positioned above said burner chamber and being oriented generally parallel to said burner chamber, said upper bank of conduits being in flow communication with said burner chamber such that exhaust gases resulting from the burning of air and oil within said burner chamber by said burner assembly will flow from said burner chamber into said upper bank of conduits;

a lower bank of conduits, each individual conduit of which is positioned below said burner chamber and being oriented generally parallel to said burner chamber, said lower bank of conduits being in flow communication with said upper bank of conduits such that said exhaust gases can flow from said upper bank of conduits into said lower bank of conduits;

a generally vertical support wall positioned centrally within said cabinet shell to support said upper and lower banks of conduits and said burner chamber, said support wall terminating above said floor to provide a barrier dividing said cabinet shell into first and second chambers in flow communication through a passageway beneath said lower bank of conduits between said support wall and the floor of said cabinet shell, said first chamber having an intake opening and said second chamber having a discharge opening;

an exhaust opening formed in said cabinet shell in flow communication with said lower bank of conduits to allow exhaust gases to exit said cabinet shell; and

means for passing ambient ventilation air into said first chamber and through said first and second chambers in said cabinet shell to absorb heat from said exhaust gases flowing through said upper and lower banks of conduits, said means for passing ventilation air keeping said ventilation air isolated from said exhaust gases while allowing said ventilation air to pass between said conduits and around said burner chamber in each of said first and second chambers to absorb heat therefrom before being discharged from said second chamber.

5,531,213
SOLID OR LIQUID FUEL STOVE

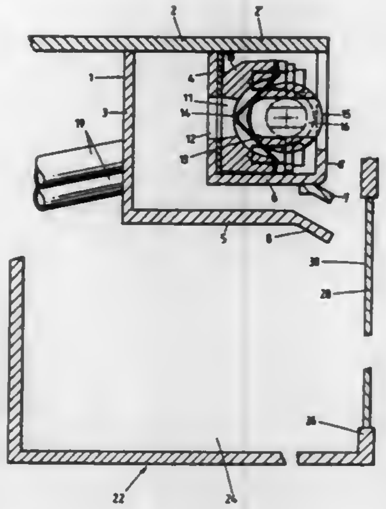
Claude Berlaimont, Falisolle, Belgium, assignor to Fonderies Du Lion S.A., Frasnes-lez-Couvin, and Nestor Martin S.A., Brussels, both of, Belgium
Filed Feb. 27, 1995, Ser. No. 394,581
Claims priority, application Belgium, Feb. 25, 1994, 09400220
Int. Cl.^{6} F23M *7/00;* **F24C** *15/04*
U.S. Cl. 126—193 **7 Claims**

1. A stove comprising:

a combustion chamber having a front wall;

a window made from transparent material disposed at the front wall of the combustion chamber for allowing observation of flames inside the combustion chamber, the window having an inner side and a width; and

means disposed at the front wall of the combustion chamber for directing air from a region outside of the combustion chamber into the combustion chamber across the inner side of the window and in a downward direction, the means for directing being effective for forming, across the inner side of the window, a screen of air which has a width approximately equal to the width of the window, the means for directing further having a first region adjacent the front wall of the combustion chamber, and a second region separated from the



front wall of the combustion chamber by the first region, the means for directing including:

(a) a plurality of walls defining a longitudinal chamber therebetween, the longitudinal chamber being disposed at the second region and having a length;

(b) a back wall and two mutually parallel wings defining at least one longitudinal slot therebetween, the longitudinal slot being disposed at the first region and being in flow communication with the longitudinal chamber, the parallel wings further having free edges configured to extend substantially into a plane defined by the front wall of the combustion chamber;

(c) a cylindrical register disposed within the longitudinal slot, the register including a longitudinal axis, and being adapted to rotate about its longitudinal axis for controlling a flow amount of the screen of air across the window by adjustably obturating air flow across the longitudinal slot, the register further being configured such that the screen of air across the window has a homogeneous thickness;

(d) a profiled piece disposed in the longitudinal slot and having air passage openings therein, the profiled piece further being one of folded and arcuate; and

(e) a flexible sealing leaf engaging, on one side thereof, the cylindrical register, and on another side thereof, the profiled piece, the sealing leaf further having air passage openings therein, the air passage openings of the profiled piece being situated between the air passage openings of the sealing leaf and the back wall of the longitudinal slot, such that air being aspirated from the outside of the combustion chamber flows through the longitudinal slot by flowing, respectively, through the register, through the air passage openings of the sealing leaf, and through the air passage openings of the profiled piece to the longitudinal chamber, and from the longitudinal chamber across the window.

5,531,214
GAS VENT AND BURNER MONITORING SYSTEM

Ricky L. Cheek, 1944 Bernhurst Dr., Knoxville, Tenn. 37918

Filed Apr. 24, 1995, Ser. No. 449,010

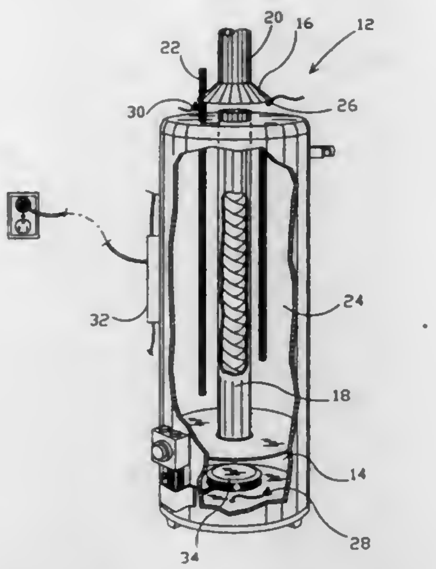
Int. Cl.^{6} F24N *1/00*

U.S. Cl. 126—361 **14 Claims**

1. A gas vent and burner monitoring system for monitoring a gas burner vent appliance which includes a combustion chamber including a burner, a draft hood with an outlet pipe, a flue extending between the combustion chamber and the draft hood and an interior pressurized chamber, said gas vent and burner monitoring system comprising:

an alarm;

a first sensor located proximate the burner and in electrical communication with said alarm, said first sensor for detecting the occurrence of an event proximate the burner, said first sensor activating said alarm when said event occurs proximate the burner;



a second sensor located proximate the draft hood and in electrical communication with said alarm, said second sensor for detecting the occurrence of an event proximate the draft hood, said second sensor activating said alarm when said event occurs proximate the draft hood; and,

a pressure sensor located proximate an inlet to the pressurized chamber and in electrical communication with said alarm, said pressure sensor for detecting an increase in pressure above a predetermined value, said pressure sensor activating said alarm when the pressure exceeds said predetermined value.

5,531,215
DEVICE FOR ABSORBING RADIANT HEAT ENERGY

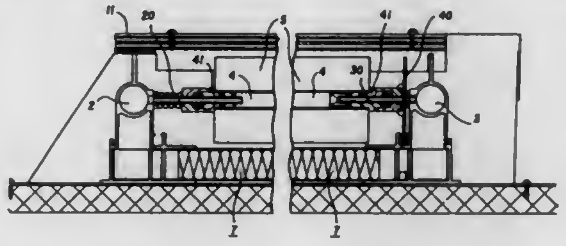
Alois Schwarz, Schwendter Strasse 28, A-6382 Kirchdorf in Tirol, Austria

Filed Mar. 4, 1994, Ser. No. 206,435

Claims priority, application Austria, Mar. 4, 1993, 415/93

Int. Cl.^{6} F24J *2/38*

U.S. Cl. 126—578 **11 Claims**



1. A device for absorbing radiant heat energy, comprising:

a frame-like rack having a top;

a heat radiation-permeable cover disposed on said top of said rack;

a distributor tube for feeding a heat carrier into said rack, a plurality of collector tubes each communicating with said distributor tube, and a gathering tube communicating with each of said collector tubes, each of said tubes being disposed below said heat radiation-permeable cover;

a plurality of collector elements disposed on said collector tubes, each of said collector elements having an upper surface and a lower surface as seen in a direction of heat radiation entering said rack through said cover, a heat-absorbing coating disposed on said upper and said lower surfaces;

reflector means disposed substantially entirely below said collector elements as seen in the direction of the heat radiation entering said rack for reflecting heat radiation which has not been absorbed by said upper surface onto said lower surface; and

said collector tubes being rotatably mounted in said rack in a mutually spaced-apart relationship for allowing said collector elements to be pivoted such that said upper surface faces towards the heat radiation entering said rack;

said collector elements being mutually spaced apart with a given spacing therebetween, said spacing being defined relative to a width of said collector elements such that adjacent collector elements do not shade one another from the heat radiation entering said rack; and

sealing means for sealing said rotatable collector tubes relative to said gathering tube and to said distributor tube, said sealing means including an axially movable retainer ring and a sealing disk adjacent thereto, said retainer ring and said sealing disk forming a space therebetween for receiving silicone grease.

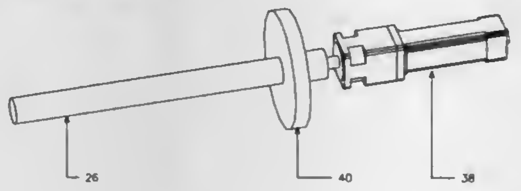
5,531,216
SOLAR ENERGY CONCENTRATING SYSTEM HAVING AN AUTOMATIC SAFETY MEANS

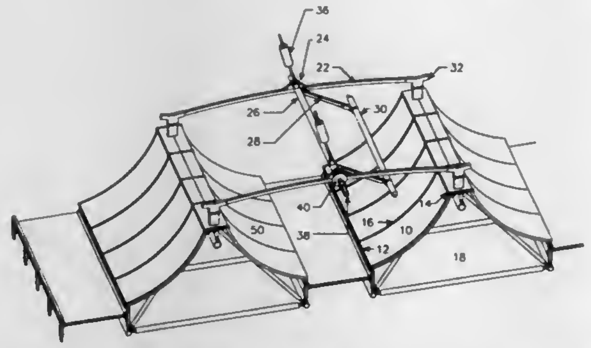
Michael H. Nicklas, 1237 Gatehouse Dr., Cary, N.C. 27511, and Louis J. Gerics, 804 Sasser St., Raleigh, N.C. 27604

Filed Jan. 26, 1995, Ser. No. 379,845

Int. Cl.^{6} F24J *2/40*

U.S. Cl. 126—599 **16 Claims**





1. An improved solar energy concentrating system having an arcuate, solar energy concentrating reflector; a structural support means connected to the reflector which holds the reflector in a predetermined stationary position; a reflected solar energy collector being located and disposed above the reflector so as to move within a predetermined focal zone for collecting reflected solar energy from the reflector, said collector being dimensioned and configured to receive the reflected solar energy from the reflector into a conduit through which an energy transfer fluid can flow, said fluid being heated by the reflected solar energy; a collector support means extending lengthwise across and above the reflector which is connected to and supports the collector; a means for automatically positioning the collector in an optimal position within the focal collection zone throughout a defined solar cycle, said positioning means being connected to the collector support means; and a fluid transport means which connects the conduit of the collector to a thermal energy means, wherein the fluid transport means circulates the fluid through the conduit; wherein the improvement comprises:

a) a disengaging means for disconnecting control over a rotating means, said disengaging means being disposed between the rotating means and the positioning means so as to be able to stop control of the rotating means by the positioning means;

b) a temperature sensor means disposed in the fluid transport system, said temperature sensor means being able to detect and signal to the positioning means when the temperature of the fluid in the collector exceeds a predetermined limit such that if the temperature of the fluid should exceed the predetermined limit, then the disengaging means stops control over the rotating means by the positioning means; and

c) the collector support means having:
    i) a transverse collector support member that spans across and above the length of the reflector;
    ii) a rotating means which is connected to the positioning means and to the transverse collector support member;
    iii) a rotating collector support member having a lower end and an upper end, which at the lower end is attached to the collector, and at the upper end is attached to the rotating means such that the rotating collector support member allows the collector to move within the focal collection zone; and
    iv) a counterweight attached to the rotating collector support member or the rotating means, said counterweight extending outward at an angle and a distance with respect to the collector and the rotating means and having a sufficient weight such that if the disengaging means stops control of the rotating means by the positioning means, then the counterweight forces the collector to rotate away from the optimal position in the focal collection zone.

5,531,217
HEATING DEVICE

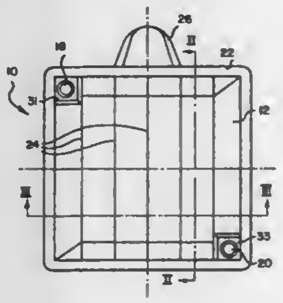
Hendrik H. Louw, 34 Cornwall Street, Gordon's Bay 7150, South Africa

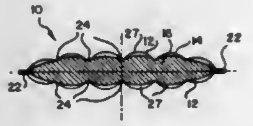
Filed Nov. 7, 1994, Ser. No. 335,048

Claims priority, application South Africa, Nov. 8, 1993, 93/8291; Sep. 23, 1994, 94/7423; Oct. 6, 1994, 94/7801

Int. Cl.^{6} F24J *2/36*

U.S. Cl. 126—624 **6 Claims**





1. A portable-solar heating device for heating water, the device including a self supporting outer housing of transparent synthetic plastic material bounding a heating cavity, the outer housing being of rigid material whereby the volume of said heating cavity remains substantially constant irrespective of changes in pressure and temperature, a heat absorbing bladder within said heating cavity and secured to said housing, the bladder being of resiliently flexible material and being capable of expansion when filled with water to be heated, at least one port in the bladder which is accessible from outside said housing and which provides a flow path through which water can flow into and out of the bladder, a plurality of spaced apart ribs on the inner face of said housing and housing parts which are between the ribs, the ribs protecting into said cavity towards said bladder and being contacted by said

bladder when the bladder expands while it is being filled, the ribs holding the bladder away from said parts of the housing thereby to embodiment air gaps bounded by the ribs, the parts of the housing between the ribs and the bladder.

5,531,218

APPARATUS FOR THE MONITORED METERING OF NO INTO PATIENTS' RESPIRATORY AIR

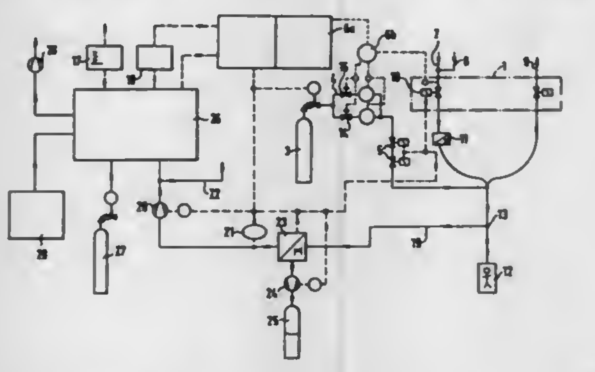
Christian Krebs, Vienna, Austria, assignor to Messer Griesheim GmbH, Germany

Filed Apr. 12, 1994, Ser. No. 226,550

Claims priority, application Germany, Apr. 17, 1993, 43 12 431.3; Jul. 29, 1993, 43 25 319.9

Int. Cl.⁶ A61M *15/00*

U.S. Cl. 128—203.12 **26 Claims**



1. An apparatus for the monitored metering of NO (nitric oxide) into patients' respiratory air, comprising

a) a respirator communicating with passageway means for leading to a patient,

b) an NO metering container which is connected to said passageway means for supplying NO to the respiratory air supplied to a patient,

c) a-metering unit arranged between the respirator and the NO metering container,

d) an analyzer connected to said passageway means leading from the respirator to a patient for determining the concentration of NO in a patient's respiratory air,

e) a control unit which is connected to the analyzer and acts on the metering unit to control the amount of flow of NO from the NO container to a patient,

f) a debumidifier located in a connecting line between the respirator and the analyzer, and

g) a measurement gas pump located in the connecting line between the analyzer and the debumidifier.

5,531,219

USE OF LIQUID FLUOROCARBONS TO FACILITATE PULMONARY DRUG DELIVERY

Gwen H. Rosenberg, Rancho Santa Fe, Calif., assignor to Alliance Pharmaceutical Corp., San Diego, Calif.

Filed Nov. 4, 1994, Ser. No. 334,688

Int. Cl.⁶ A61M *15/00*

U.S. Cl. 128—203.12 **29 Claims**

1. A method for pulmonary drug delivery, comprising the steps of:

introducing into pulmonary air passages of a mammalian host a volume of perfluorocarbon liquid substantially equivalent to or less than the pulmonary functional residual capacity of the host;

dispersing a microparticulate medicament in a breathable gas to form a gas/medicament dispersion; and

introducing said dispersion into the pulmonary air passages containing the introduced perfluorocarbon liquid, such that said perfluorocarbon liquid and said microparticulate medicament are simultaneously present in the same pulmonary air passages of the host.

5,531,220

GAS SUPPLY SYSTEMS

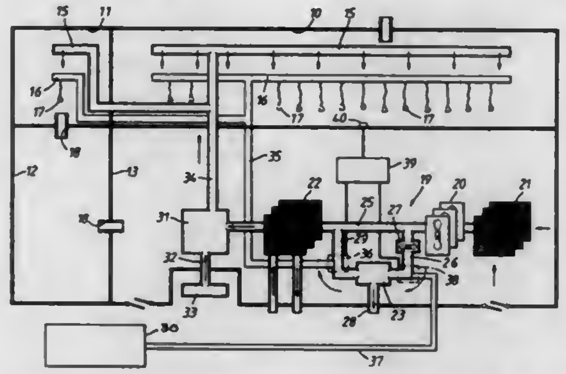
Ronald F. Cassidy, Waterlooville, United Kingdom, assignor to Pall Corporation, East Hills, N.Y.

Filed Mar. 9, 1994, Ser. No. 207,686

Claims priority, application United Kingdom, Mar. 10, 1993, 9304858

Int. Cl.⁶ A61M *16/00;* **B01D** *53/00*

U.S. Cl. 128—204.29 **15 Claims**



1. A method of changing the composition of a gas in an enclosed space

(a) comprising supplying a first gas having a first composition from said enclosed space to a pressure swing adsorption system,

(b) modifying the composition of said first gas with said system,

(c) supplying said modified gas to said enclosed space,

(d) then halting said supply of first gas to the pressure swing adsorption system,

(e) supplying a second gas having a second composition to said pressure swing adsorption system from outside said enclosed space,

(f) modifying the composition of said second gas and

(g) supplying said modified second gas to the enclosed space.

5,531,221

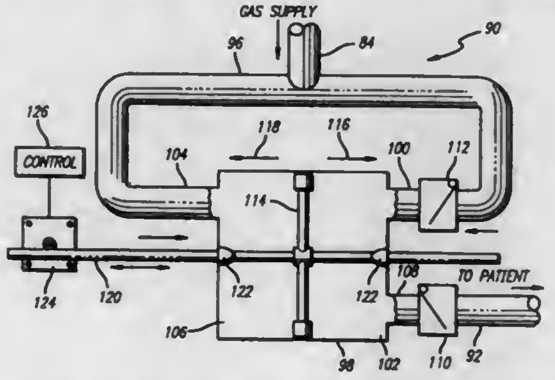
DOUBLE AND SINGLE ACTING PISTON VENTILATORS

John S. Power; John J. O'Mahony, both of Galway, Ireland, and Edwin B. Merrick, Stow, Mass., assignors to Puritan Bennett Corporation, Carlsbad, Calif.

Filed Sep. 12, 1994, Ser. No. 304,046

Int. Cl.⁶ A61M *16/00*

U.S. Cl. 128—205.18 **12 Claims**



1. A single acting piston ventilator system for providing breathing gas to a patient airway, comprising:

a source of said breathing gas for providing a supply flow of said breathing gas;

a fixed volume piston cylinder having a first end and a second end, a first inlet connecting said first end of said piston cylinder in fluid communication with said source of breathing gas for receiving said supply flow of breathing gas, a second inlet connecting said second end of said piston cylinder in fluid communication with said source of breathing gas for receiving said supply flow of breathing gas, said first and second inlets being connected in fluid communication, and an outlet connected to said first end of said piston cylinder for delivering mixed gas to the patient airway;

a single inlet valve, said inlet valve located in said first inlet for allowing flow of said mixed gas into said piston cylinder;

outlet valve means in said outlet for allowing a flow of said mixed gas to the patient airway;

a reciprocating piston disposed within said piston cylinder and moveable between said first and second ends of said piston cylinder; and

means for moving said piston between said first and second ends.

5,531,222

Patent Not Issued For This Number

5,531,223

METHOD AND APPARATUS OF NUCLEAR MAGNETIC RESONANCE IMAGING WITH NONLINEARLY PROCESSED IMAGE DISPLAY

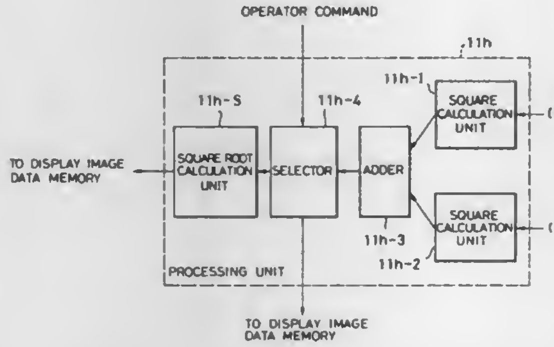
Masahiko Hatanaka, Tochigi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 654,258, Feb. 12, 1991, abandoned. This application Jun. 23, 1994, Ser. No. 265,686

Claims priority, application Japan, Feb. 15, 1990, 2-32375; Jan. 11, 1991, 3-002150

Int. Cl.⁶ A61B *5/055*

U.S. Cl. 128—653.2 **22 Claims**



1. A method of generating a contrast enhanced nuclear magnetic resonance image, comprising

carrying out a predetermined imaging pulse sequence by an MRI apparatus means to obtain nuclear magnetic resonance image signals of a parameter of a nuclear magnetic resonance image;

operating non-linearly on the nuclear magnetic resonance image signals by a processor means for processing the nuclear magnetic resonance image signals obtained by the MRI apparatus means, to obtain contrast enhanced image signals having an enhanced contrast of said parameter; and

forming and displaying the contrast enhanced nuclear magnetic resonance image according to said contrast enhanced image signals obtained by the processor means.

5,531,224

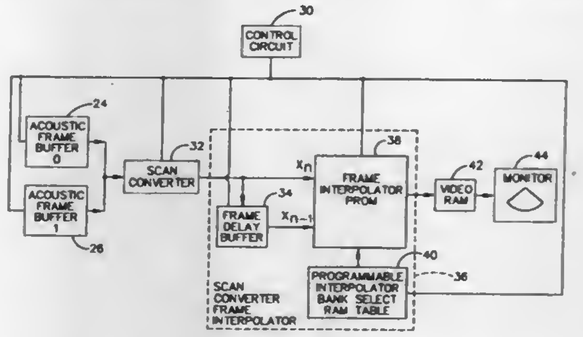
FRAMEM INTERPOLATOR FOR INCREASING APPARENT ACOUSTIC FRAME RATE IN ULTRASOUND IMAGING

Matthew Ellis, Waukesha; Rowland F. Saunders, Hartland; James A. Smith, Pewaukee, all of Wis., and Patrick Noret, Montigny, France, assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1994, Ser. No. 344,046

Int. Cl.⁶ A61B *8/00*

U.S. Cl. 128—660.07 **20 Claims**



1. A circuit for processing frames of acoustic image data for display on a video monitor, comprising:

first and second acoustic frame buffers each having a storage capacity sufficient to store a complete acoustic frame of acoustic image data;

means for scan converting acoustic image data received from either of said first and second acoustic frame buffers; and

control means for controlling the input and output of acoustic image data into and out of said first and second acoustic frame buffers and the output of scan-converted acoustic image data from said scan converting means,

wherein said control means control the input of a first acoustic frame into said first acoustic frame buffer during a first cycle, the input of a second acoustic frame into said second acoustic frame buffer during a second cycle after said first cycle and the output of said first acoustic frame from said first acoustic frame buffer to said scan converting means during said second cycle.

5,531,225

MEASURING APPARATUS FOR A COMPONENT CONTAINED IN EXHALATION

Katsumi Nawata, Susono; Fumihiro Ushijima, Gotenba; Toshiyuki Taguchi, Okazaki, and Hazime Inagaki, Nagoya, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-gun, both of, Japan

Filed Oct. 13, 1994, Ser. No. 322,426

Claims priority, application Japan, Oct. 15, 1993, 5-258712; Oct. 18, 1993, 5-260048

Int. Cl.⁶ A61B *5/08*

U.S. Cl. 128—719 **5 Claims**

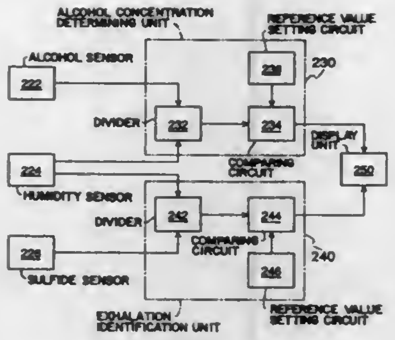
1. An alcohol measuring apparatus for measuring a concentration of alcohol contained in an exhalation, the alcohol measuring apparatus comprising:

a suction unit having an air passage for introducing a mixture of air and exhalation, and suction means connected to said air passage for suctioning the mixture;

a sulfide sensor, provided in said air passage upstream of said suction means, for sensing a sulfide contained in the mixture;

a humidity sensor, provided in said air passage upstream of said suction means, for sensing water vapor contained in the mixture;

an alcohol sensor, provided in said air passage upstream of said suction means, for sensing alcohol contained in the mixture;

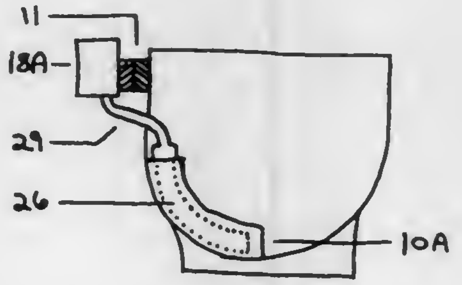


an exhalation identification unit for determining a presence of the exhalation in the mixture in accordance with a ratio of an output from said sulfide sensor to an output from said humidity sensor; and

an alcohol concentration determining unit for determining the concentration of alcohol contained in the exhalation in accordance with a ratio of an output from said alcohol sensor to the output from said humidity sensor.

5,531,226
UROGENITAL MUSCLE EXERCISE SENSOR SYSTEM

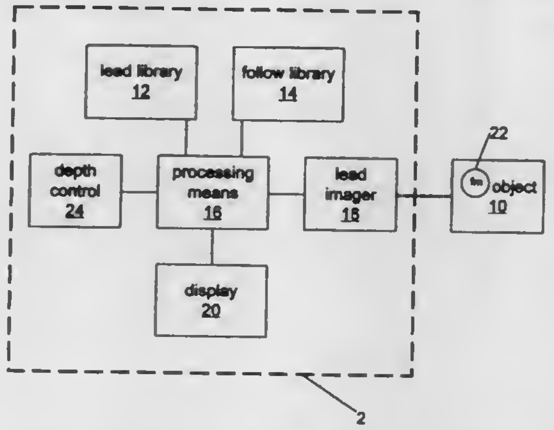
Howard T. Harris, 2235 Whiteback, Houston, Tex. 77084
Continuation-in-part of Ser. No. 917,786, Jul. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 683,558, Apr. 10, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,665
Int. Cl.⁶ A61B *5/103*
U.S. Cl. 128—774 **26 Claims**



1. A urogenital muscle exercise sensor system externally located on a human body to provide muscular feedback to the user comprising:
a self-resilient hollow bag means which resiliently expands to its initial shape after compression,
a feedback means for providing a feedback to the user,
a connection means for connecting said self-resilient hollow bag means to said feedback means,
a fluid means within said self-resilient hollow bag means and connection means for transmitting pressure from said self-resilient hollow bag means to said feedback means,
and attachment means with pocket means for the insertion of said self-resilient hollow bag means therein for attaching said urogenital muscle execise sensor system to the body,
whereby said pocket means with said self-resilient hollow bag means is located against the external genital part of the body and muscles exercised in this body area will place pressure on said self-resilient hollow bag means which will be shown to the user by said feedback means.

5,531,227
IMAGING DEVICE AND METHOD

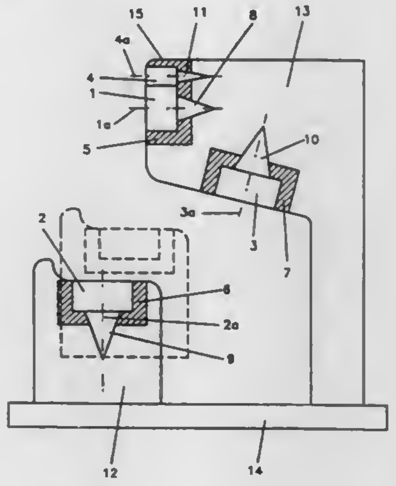
M. Bret Schneider, Palo Alto, Calif., assignor to Schneider Medical Technologies, Inc., Palo Alto, Calif.
Filed Jan. 28, 1994, Ser. No. 188,189
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 128—653.1 **32 Claims**



1. A method for obtaining and displaying an image of an object comprising the following steps:
(1) obtaining a follow image library of the object via a first imaging modality;
(2) obtaining a real time lead image of the object via a second imaging modality along a lead view;
(3) referencing the real time lead image to the follow image library via digital image analysis to identify a follow image line of view corresponding to the lead view;
(4) transforming a follow image to correspond to the scale, rotation and position of the real time lead image; and
(5) displaying the transformed follow image without displaying the real time lead image, the referencing, transforming and displaying steps being performed substantially in real time after the step of obtaining the real time lead image.

5,531,228
DETECTOR SYSTEM FOR DIRECT INTERNAL DOSIMETRY IN HUMAN BEINGS

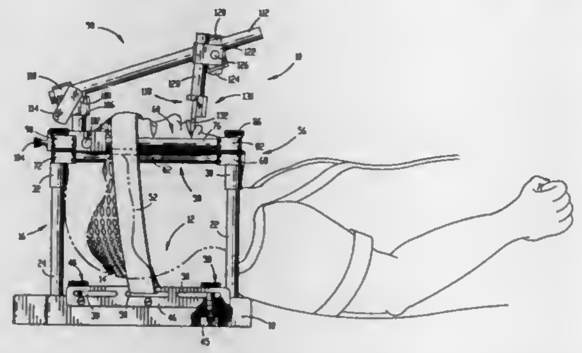
Hans Doerfel, Karlsruhe, Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Germany
Filed Dec. 12, 1994, Ser. No. 354,203
Claims priority, application Germany, Jul. 10, 1992, 42 22 661.9
Int. Cl.⁶ A61B *6/00*
U.S. Cl. 128—653.1 **5 Claims**



1. A detector system for direct internal dosimetry of a person, said system comprising a support structure with a bottom plate and with at least three lead-shielded detectors each having an unshielded face area with a central axis for detecting gamma radiation entering said detectors through said face area along said central axis, said support structure including a seat portion mounted on said bottom plate for supporting said person thereon in a seated position, a first one of said detectors being supported by said support structure such that its central axis is directed toward the mass center of the lungs of such person, a second detector mounted into said seat portion such that its unshielded face area is facing upwardly toward the center of the digestive tract of such person seated on said seat portion, and a third detector supported on said support structure such that its central axis is directed toward the legs of such person seated on said seat portion.

5,531,229
BODY PART IMMOBILIZATION DEVICE

Richard D. Dean, 21617 W. 71st Ter., Shawnee, Kans. 66218, and Dick A. Jones, 8112 Lichtenauer Dr., Shawnee, Kans. 66219
Filed Jan. 20, 1995, Ser. No. 375,655
Int. Cl.⁶ A61F *5/00;11/00;* **H05G** *1/02*
U.S. Cl. 128—866 **12 Claims**

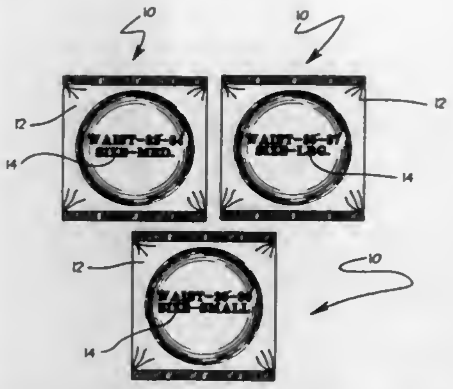


12. A head immobilization device, comprising:
a section of preformed, shape-retaining material presenting a concavity substantially conforming with a head to be immobilized and configured for receiving and holding the head;
a frame assembly including a generally U-shaped base adapted to rest upon a support surface, said assembly being operably coupled with said section for holding said concavity in an elevated position above said support surface, said frame assembly permitting placement of the head within said concavity; and
stabilization means supported on said frame assembly and having structure adapted to be taken into the mouth of a patient and to be grasped by the patient's teeth, said stabilizing means comprising an arm operably coupled with said frame assembly and extending to a point above said concavity, said structure being secured to said arm.

5,531,230
STRAP SECURED CONDOM

Ray W. Bell, 4601 W. Bellarose St., Tallahassee, Fla. 32310
Filed Jul. 14, 1995, Ser. No. 502,377
Int. Cl.⁶ A61F *6/02;6/04*
U.S. Cl. 128—842 **1 Claim**

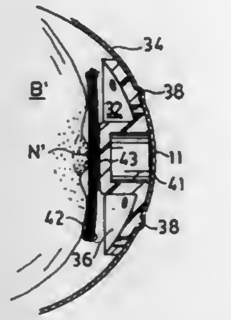
1. A strap secured condom comprising:
a condom comprising a cylindrical sheath of elongated flexible construction, the condom being closed at a distal end thereof;
an annular collar otherwise secured to the cylindrical sheath at the proximal end thereof, the annular collar being rotatably positioned over the exterior of the cylindrical sheath to position the condom in a rolled orientation,



a first strap comprising a first length of flexible resilient material which is integrally secured to an exterior surface of the cylindrical sheath, the first strap extending from a proximal end of the condom;
a second strap comprising a second length of flexible resilient material which is integrally secured to an exterior surface of the cylindrical sheath and extending from the proximal end of the condom in a diametrically opposed orientation relative to the first length of flexible resilient material, the straps being of a combined longitudinal length sufficient to extend about a waist of an individual, the straps being tied in order to secure the condom over a male sexual organ of the body, the first and second straps being folded in half so as to define medial fold lines, the folded straps being positioned so as to extend along a longitudinal exterior of the cylindrical sheath, the medial fold lines projecting beyond the closed distal end of the first and second straps, in an operative orientation, the condom being positioned at the tip of a male sexual organ and the straps being pulled to unroll the condom onto the male sexual organ; and
a frangible package including indicia printed thereon, the condom being positioned in a rolled orientation within the package, the indicia identifying the waist sizes and S, M and L, the indicia enabling a user to select the proper size of the strap secured condom for a secure fit.

5,531,231
APPARATUS AND METHOD FOR CONTROLLING HUMAN LACTATION

Gerald Morrissey, and Suzanne Morrissey, both of 3 Lake View Cir., Skaneateles, N.Y. 13152
Continuation-in-part of Ser. No. 954,012, Sep. 30, 1992, Pat. No. 5,394,889. This application Mar. 1, 1995, Ser. No. 396,921
Int. Cl.⁶ A61F *5/37;* **A61J** *13/00*
U.S. Cl. 128—846 **19 Claims**

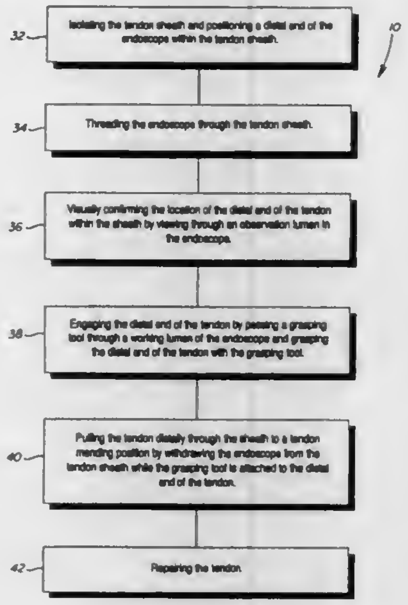


1. An apparatus for the control of human lactation comprising a support having an outer surface and an inner surface that is shaped to conform substantially to a human female breast, said inner surface having a substantially rigid protrusion with a substantially flat, nipple-contacting surface extending away from said support

and positioned to align substantially with and contact a nipple of said human female breast when said apparatus is placed over said human female breast, whereby said protrusion substantially prevents said human female breast from lactating.

5,531,232
METHOD OF TENDON REPAIR

Bradley B. Hill, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.
Filed Sep. 23, 1994, Ser. No. 311,693
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 128—898 **7 Claims**


10
32
Isolating the tendon sheath and positioning a distal end of the endoscope within the tendon sheath.
34
Threading the endoscope through the tendon sheath.
36
Visually confirming the location of the distal end of the tendon within the sheath by viewing through an observation lumen in the endoscope.
38
Engaging the distal end of the tendon by passing a grasping tool through a working lumen of the endoscope and grasping the distal end of the tendon with the grasping tool.
40
Pulling the tendon distally through the sheath to a tendon mending position by withdrawing the endoscope from the tendon sheath while the grasping tool is attached to the distal end of the tendon.
42
Repairing the tendon.

1. A method of repairing a transected or torn flexor or extensor tendon of a digit that has retracted proximally within an associated tendon sheath, comprising the steps of:

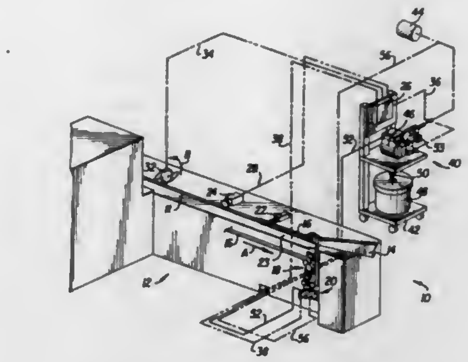
visually locating a distal end of the tendon within the sheath;
engaging the distal end of the tendon;
pulling the tendon distally through the sheath to a tendon mending position; and
repairing the tendon.

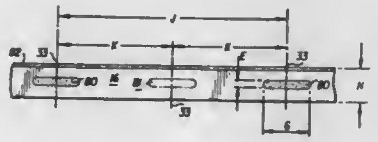
5,531,233
METHOD OF AND APPARATUS FOR APPLYING ADHESIVE TO CIGARETTE PAPER AND THE PAPER AND CIGARETTE PRODUCED THEREBY

Robert L. Oglesby, Kernersville; Leigh A. B. Smith, Pfafftown; Larry S. Jordan, Lexington; Carl C. Greene, Jr., Winston-Salem, and Wayne E. Leonard, Sr., Pinnacle, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jun. 22, 1994, Ser. No. 263,576
Int. Cl.^{6} A24C *5/24*
U.S. Cl. 131—69 **29 Claims**

1. In a cigarette maker having a garniture for forming a continuous rod of tobacco and means for cutting said rod of tobacco into rods of a predetermined length, an apparatus for applying an adhesive to a strip of cigarette wrapping paper on the cigarette maker, said apparatus comprising:

a source of adhesive;
a spray nozzle having a needle valve, said nozzle being located upstream of said garniture in opposing relation to said strip of cigarette wrapping paper, said strip of wrapping paper having a longitudinal axis;

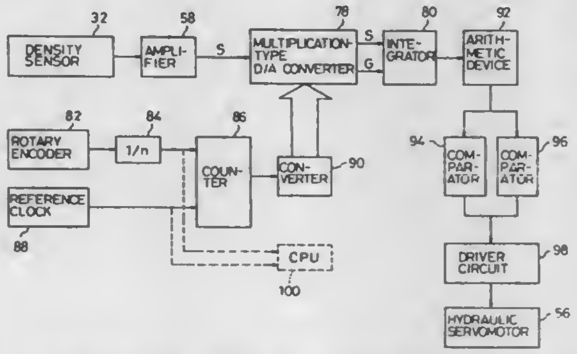




means for moving said spray nozzle toward and away from said strip of wrapping paper;
means for moving said spray nozzle transversely relative to the longitudinal axis of said strip of wrapping paper;
a valve actuator for intermittently actuating the needle valve of said nozzle to spray adhesive on said strip of paper;
means connected between said adhesive source and said spray nozzle for supplying adhesive to said spray nozzle; and
a controller connected between said cutting means and said valve actuator for operating said actuator in response to the cutting of said continuous rod of tobacco.

5,531,234
APPARATUS FOR CONTROLLING THE FILLING AMOUNT OF SHREDDED TOBACCO IN CIGARETTES

Shigemitsu Inomata, and Mikio Komori, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan
Continuation of Ser. No. 259,129, Jun. 13, 1994, abandoned, which is a continuation of Ser. No. 19,284, Feb. 18, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 355,215
Claims priority, application Japan, Feb. 18, 1992, 4-030689; Feb. 18, 1992, 4-030690
Int. Cl.^{6} A24C *5/14;5/18;5/28*
U.S. Cl. 131—84.1 **18 Claims**

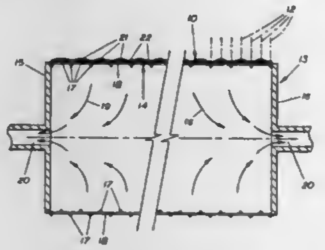


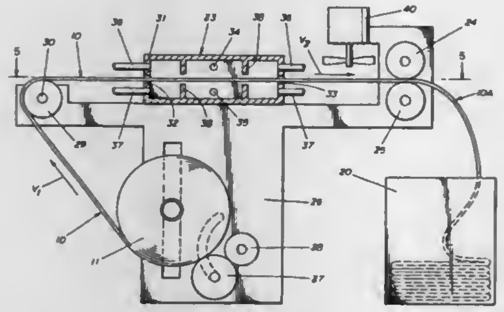
1. An apparatus for controlling the filling amount of shredded tobacco in tobacco rod continuously produced by wrapping the shredded tobacco in a cigarette paper, the tobacco rod having a rod speed, said apparatus comprising:

a feeder for feeding the shredded tobacco onto the cigarette paper;
detecting means for detecting a filling density of the shredded tobacco in the tobacco rod and successively outputting detection signals;
measuring means for calculating a unit filling of the shredded tobacco corresponding to a predetermined length of the tobacco rod in accordance with the output of said detecting means and outputting the result of the calculation, said measuring means including integrating means for integrating the output of said detecting means for a predetermined period of time and outputting an integral value, varying means for varying the internal value output from the integrating means in proportion to the rod speed, wherein the rod speed is defined by the traveling speed of cigarette paper and a length of a cigarette to be manufactured, and outputting a result, and arithmetic means for calculating the unit filling on the basis of the result from the varying means; and
adjusting means for adjusting the feed of said feeder in accordance with the unit filling from the arithmetic means.

5,531,235
CIGARETTE FILTER MICROPLEATED WEB AND METHOD OF MANUFACTURE

Charles B. Hassenboehler, Jr., 1806 Mansfield, Knoxville, Tenn. 37918
Filed Sep. 28, 1992, Ser. No. 952,059
Int. Cl.^{6} A24D *3/16*
U.S. Cl. 131—332 **18 Claims**





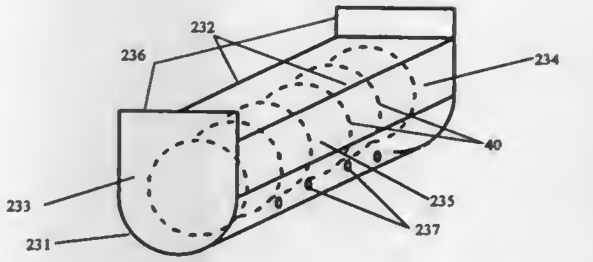
1. A process for manufacturing a pleated web suitable for the manufacture of cigarette filters which comprises:

(a) selecting a nonwoven web having from 10 to 50 bend lines per inch extending generally in the MD and spaced transversely across the web,
(b) heating the web to a temperature equal to or greater than the softening temperature of the polymer while drawing the web in the MD by at least 10% to cause micropleats to form at the bend lines, thereby reducing the width of the web by at least 15% and condensing the micropleats thereby forming a pleated web; and
(c) cooling the tow pleated web.

5,531,236
DIRECTED FLOW FLUID RINSE TROUGH

Steven N. Kempka, 9504 Lona La., Albuquerque, N.M. 87111, and Robert N. Walters, 11872 LaGrange St., Boise, Id. 83709
Continuation of Ser. No. 251,984, Jun. 1, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,175
Int. Cl.^{6} B08B *3/04*
U.S. Cl. 134—182 **15 Claims**

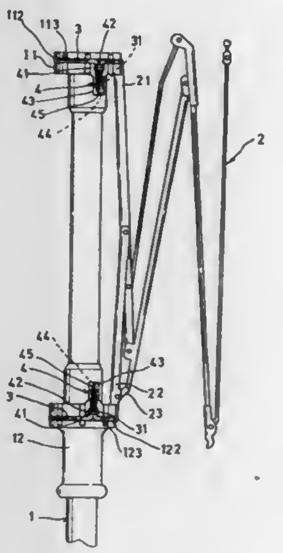
1. A trough for rinsing one or more planar items having substantially the same shape and size comprising:



a) side and bottom walls of the trough adjacent the lower portions of the items conforming to the lower perimeter shape of the items at an approximately constant distance normal thereto;
b) parallel end walls of the trough that extend beyond the side walls so that rinsing fluid will preferentially flow out over the side walls;
c) means for holding the items in the trough parallel to the end walls; and
d) means for allowing the rinsing fluid into the trough.

5,531,237
SHELTER MEANS ON UMBRELLA FERRULES FOR CONCEALING WIRE ENDS OF RIB-FASTENING WIRE

Chi-Kuo Yang, P.O. Box 55-1670, Taipei, Taiwan
Filed Oct. 31, 1995, Ser. No. 550,757
Int. Cl.^{6} A45B *25/06*
U.S. Cl. 135—28 **4 Claims**



1. In an umbrella including an upper ferrule and a lower ferrule held on a central shaft of the umbrella for pivotally securing at least two ribs of a rib means between the upper and the lower ferrules for securing an umbrella cloth on the rib means, each said ferrule having a shelter means formed thereon and having a fastening wire fastened in a wire groove recessed in a ring portion of said ferrule for pivotally securing each said rib of said rib means on said fastening wire having two opposite free wire ends of said wire tied to form a twisted knot to be concealed in said shelter means formed on each said ferrule, said shelter means including: a base portion formed on each said ferrule having a wire recess recessed inwardly in said base portion for securing the fastening wire therein, a guiding port formed in a central front portion of the base portion and communicating with the wire recess of said base portion, a sheath portion longitudinally protruding from the base portion to be contiguous to an outer surface of said ferrule, a tubular hole longitudinally formed in a central hollow portion in

said sheath portion for storing said twisted knot of the two wire ends of the fastening wire in said tubular hole, and a slit longitudinally formed in a front wall of said sheath portion to communicate with the tubular hole in said sheath portion, whereby upon an inward insertion of the twisted knot of the two wire ends of the fastening wire in said sheath portion through said guiding port and said slit, said twisted knot of the two wire ends of the fastening wire will be safely stored in said tubular hole without pricking a person.

5,531,238

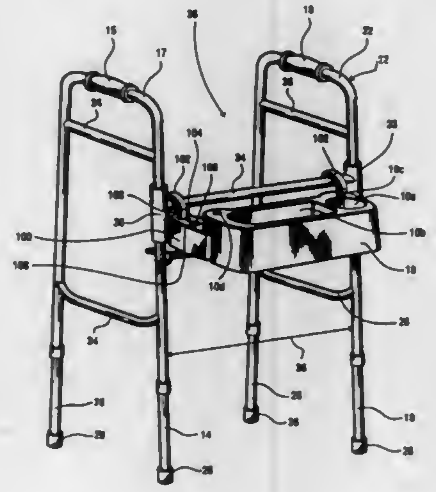
ATTACHMENT APPARATUS FOR A WALKER CADDY CONTAINER

Paul T. Azzarelli, and Carol Azzarelli, both of 645 Magnus La., Coraopolis, Pa. 15108

Filed Jan. 31, 1995, Ser. No. 382,249

Int. Cl.⁶ A45B *3/00*

U.S. Cl. 135—66 **6 Claims**



1. In a walker having a first pair of legs having upper end portions and a first hand grip means connecting the upper end portions, a second pair of legs having upper end portions and a second hand grip means connecting the upper end portions of the second pair of legs, the first pair of legs spaced a predetermined distance from the second pair of legs, and a structural member connecting the upper end portion of one of the first pair of legs with the upper end portion of one of the second pair of legs to define a space within the walker bounded by the first and second pairs of legs, and a walker caddy container, the improvement comprising:

- hanger means for hanging said walker caddy container from said structural member;
- mounting means affixed to said hanger means for mounting said hanger means to said container;
- a disc with an outer radius, wherein said disc is rotatably affixed to a bottom portion of said container; and
- a support arm having a first end, a central portion, and a second end, wherein said first end is rotatably affixed to said disc proximal to said outer radius, and wherein said central portion is slidably mounted to said bottom portion of said container, thereby to extend said second end outwardly from said container when said disc is rotated in a first direction, and to retract said second end inwardly toward said container when said disc is rotated in a second direction which is opposite said first direction.

5,531,239

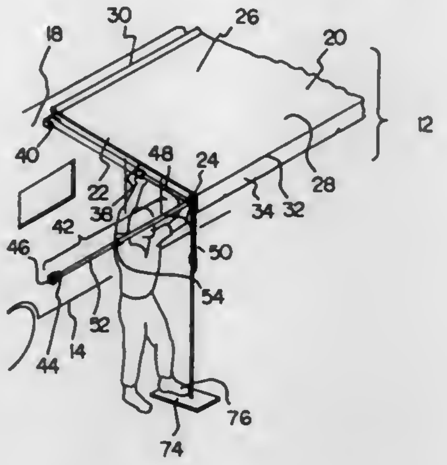
RECREATIONAL VEHICLE AWNING TIGHTENER

Delbert R. Hannah, Jr., 56 McKinley Pl. North, St. Cloud, Minn. 56303

Filed May 15, 1995, Ser. No. 446,952

Int. Cl.⁶ E04F *10/00;* **B25B** *25/00*

U.S. Cl. 135—88.1 **1 Claim**



1. An awning system comprising, in combination:

a recreational vehicle positioned upon a recipient surface and with the recreational vehicle having an upstanding supporting surface thereon;

an awning further comprising:

- a generally rectangular cover having an inboard extent and an outboard extent bounded by an inboard portion, an outboard portion, and a pair of opposed side edges extended therebetween and with the inboard portion thereof coupled to the supporting surface of the recreational vehicle at an upper extent thereof; and
- a telescopically adjustable elongated truss having an inboard end removably coupled to the supporting surface of the recreational vehicle at a lower extent thereof, an outboard end removably coupled to an outboard portion of the cover, and an adjustment knob therebetween;
- a rectangular planar rigid plate having an upper surface, a lower surface, and a periphery interconnecting the surfaces formed of a short front edge, a short back edge, and a pair of opposed long side edges extended therebetween, the plate further having a central axis formed therethrough and extended perpendicularly between the front edge and the back edge, a characteristic thickness, a width that is at least ten times greater than the thickness, a length that is at least 36 times greater than the thickness, and a through hole formed thereon at a location aligned with the central axis and with the through hole offset toward the front edge to thereby define a stepping area upon the upper surface between it and the rear edge, the rear edge of the plate positioned upon the recipient surface and the front edge of the plate extended upwards to thereby create an acute angle of about thirty degrees between the lower surface and the recipient surface;
- a rigid hook having a curved upper extent and a lower extent with an eyelet formed thereon and with the upper extent removably coupled to an outer portion of the cover of the awning; and
- a piece of flexible non-extendable rope disposed within the through hole of the plate, the rope having a knot at one end positioned in contact with the lower surface of the plate, a loop formed at the other end coupled with the eyelet of the hook, and an intermediate taut portion therebetween, whereby when a user's foot is placed upon the stepping area and then applies a downward force, the hook pulls the outboard portion of the cover of the awning downwards for allowing telescopic adjustment of the truss.

5,531,240

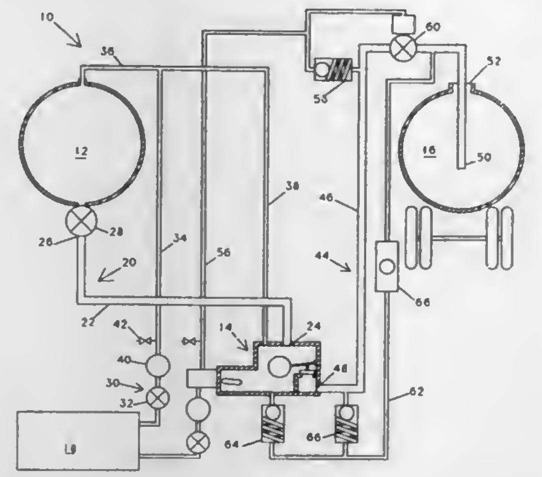
METHOD AND APPARATUS FOR SPILL FREE LIQUID TRANSFER

Maher I. Kelada, 3711 Heather La., Pearland, Tex. 77581

Filed Mar. 13, 1995, Ser. No. 403,602

Int. Cl.⁶ F04F *1/00*

U.S. Cl. 137—15 **12 Claims**



1. In a liquid transfer mechanism having a liquid source, a liquid receiver, a source of pressurized gas, and a transfer mechanism, the improvement characterized by:

- an unloading arm assembly having primary and secondary flow lines with one end of said arm assembly connected to said source container and the other end connected to said transfer assembly;
- a loading arm assembly having primary and secondary flow lines with one end of said arm assembly connected to said receiving container and the other end connected to said transfer assembly;
- said transfer assembly comprising housing means defining therein a chamber having an inlet and an outlet, both of which are connected to the unloading and loading primary lines, respectively; first and second float valve means in said chamber one of which controls flow of liquid through the chamber and the other of which controls flow of pressurized gas into the secondary lines, whereby when the liquid level drops sufficiently the first float valve closes off liquid flow to the loading primary line and the second float valve initiates pressurized gas flow to pressurize in the secondary line and purge liquid in the primary line into the secondary line and into the liquid receiver.

5,531,241

CONDENSATE TRAP AND DRAIN FOR SYSTEMS UNDER PRESSURE

John Rasmussen, 8433 South Ave., Youngstown, Ohio 44514

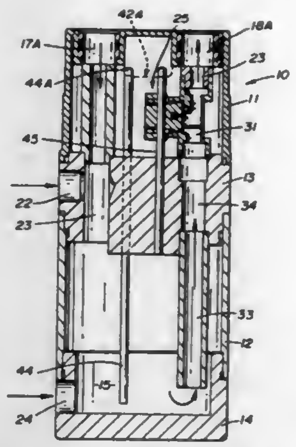
Continuation-in-part of Ser. No. 247,879, May 23, 1994, Pat. No. 5,469,879. This application May 18, 1995, Ser. No. 445,223

Int. Cl.⁶ G05D *9/12*

U.S. Cl. 137—188 **4 Claims**

1. A condensate trap and drain apparatus for systems under pressure, wherein said apparatus comprises:

- a. a condensate collection reservoir, the collection reservoir being formed within a housing, the housing being connected to an inlet port;
- b. a purge outlet port extending from said reservoir, a passageway connects the reservoir with the purge outlet port, the purge outlet port having a diaphragm normally closing the passageway, the diaphragm being controlled by a purge valve;
- c. a first sensing probe projecting within said collection reservoir, the sensing probe detecting the pressure within said reservoir;



- d. a second sensing probe detecting the pressure within said reservoir, the first sensing probe being in vertical spaced relation with the second sensing probe; and
- e. a solenoid being connected to the purge valve, the solenoid responding to a solenoid drive.

5,531,242

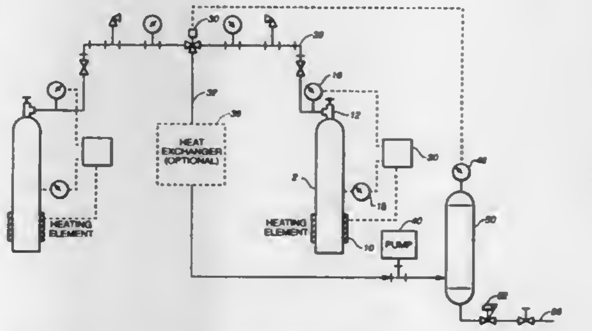
CYLINDER SOLVENT PUMPING SYSTEM

Joseph E. Paganessi, Burr Ridge, Ill., assignor to American Air Liquide, Walnut Creek, Calif.

Filed Dec. 28, 1993, Ser. No. 176,756

Int. Cl.⁶ F17D *1/00;* **F17C** *13/00*

U.S. Cl. 137—255 **12 Claims**



1. A system for delivery of fluid from cylinders comprising:

- a) a plurality of supply cylinders containing fluid, each cylinder comprising a fluid outlet;
- b) sensing means for sensing at least one fluid property in at least one cylinder of said plurality of supply cylinders;
- c) heating means adapted to said plurality of supply cylinders and coupled to said sensing means to adjust the pressure of said fluid in said supply cylinders in response to said at least one sensed fluid property to maintain said fluid under supercritical conditions;
- d) pump means to deliver fluid from said cylinder outlet to an application.

5,531,243

IRRIGATION STANDPIPE FLOW DIVERTER AND METHOD FOR MAKING SAME

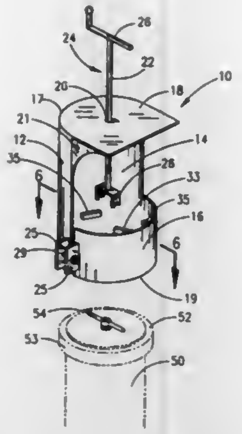
Golden R. Broussard, HCR 63-Box 174, Lake Arthur, La. 70549

Filed Mar. 30, 1994, Ser. No. 220,155

Int. Cl.⁶ F16K *31/50;51/00*

U.S. Cl. 137—315 **8 Claims**

1. A flow diverter for mounting on the end of an irrigation standpipe, said standpipe end having a valve mounted thereto, said



valve having a protruding external circular flange, an internal circular valve seat, a central hub, a circular disc-shaped valve element, said valve element being mounted to a threaded stem having a head at one end for rotating said stem, said stem being threadably engaged to said hub for moving said stem through said hub and thereby moving said valve element to open and close said valve, comprising:

a) a hollow cylindrical body, said body having a top end and a bottom end, a side opening at said top end of said body, and a longitudinal gap along one side of said body, adjacent to said side opening;
b) an anchor strap, said anchor strap being formed integrally with said body below said side opening, said anchor strap beginning at a point on said body opposite said gap and extending around said body to said gap;
c) a cap mounted to the upper end of said body above said side opening;
d) a pair of opposing connector flanges having a plurality of bolt holes, the first of said flanges mounted to said body and the second of said flanges mounted to said anchor strap, said flanges being mounted on either said of said longitudinal gap;
e) a plurality of anchor stops mounted in top and bottom rows along the inside periphery of said body and along the inside periphery of said anchor strap, said top and bottom rows of said anchor stops being spaced apart a distance sufficient to receive and retain said protruding flange of said standpipe valve between said top and bottom anchor stops; and
f) means for holding said connector flanges together.

5,531,244
HEMISPHERICAL BALL VALVE

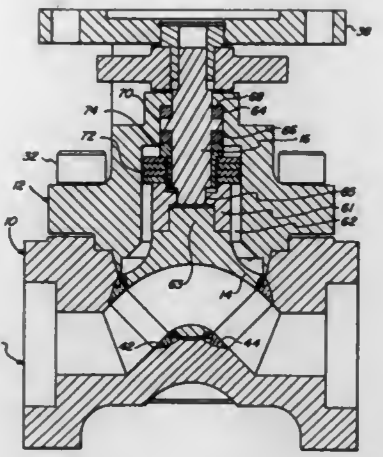
Chester A. Slver, Belleair, Fla., assignor to Conval, Inc., Somers, Conn.

Filed Jul. 25, 1995, Ser. No. 506,571
Int. Cl.^{6} F16K *5/06;41/04;43/00*

U.S. Cl. 137—315 **17 Claims**

1. A valve for controlling fluid flow and having open and closed positions comprising:

(a) a housing providing a chamber therewithin and a fluid flow passage therethrough with inlet and outlet portions to and from said chamber adjacent the lower end of said housing, said housing also having an opening in its upper end communicating with said chamber;
(b) a removable bonnet on said housing sealing said opening in said upper end and having a passage extending therethrough from said chamber;
(c) means fastening said bonnet to said housing;
(d) a generally hemispherical plug member rotatably seated in said chamber and having an axis of rotation aligned with the center of said opening in said housing, said opening in said housing and said plug member being cooperatively dimensioned to permit removal of said plug member therethrough, said plug member having



  (i) a spheroidal lower portion having an anticlinal shaped fluid flow passage therethrough with inlet and outlet ends, said inlet and said outlet ends of said plug member being aligned with said inlet and outlet portions of said flow passage into and from said chamber in the open position of said valve and being displaced from said inlet and outlet portions of said flow passage in the closed of said valve, said flow passage extending through said axis of rotation; and
  (ii) an upper portion;
(e) valve seats removably seated in said housing within said chamber and extending about said inlet and outlet portions of said flow passage, the wall of said chamber of said housing having annular concave recesses about said inlet and outlet portions with transverse axes extending perpendicularly to the flow axes of the adjacent inlet and outlet end portions of said anticlinal flow passage through said plug and of said inlet and outlet portions of said flow passage into and from chamber, said valve seats being seated in said annular concave recesses and extending outwardly of said recesses into said chamber, said valve seats including a concave surface in sealing engagement with the surface of said lower portion of said plug member, said valve seats being dimensioned and configured for facile insertion into and removal from said annular arcuate recesses in said chamber through said opening in said housing; and
(f) means for rotating said plug member about its axis of rotation between said open and closed positions of said valve, said means for rotating having a portion disposed outwardly of said housing and bonnet and operatively connected to said upper portion of said ball member trough said passage in said bonnet.

5,531,245
HIGH TEMPERATURE HEATED VALVE

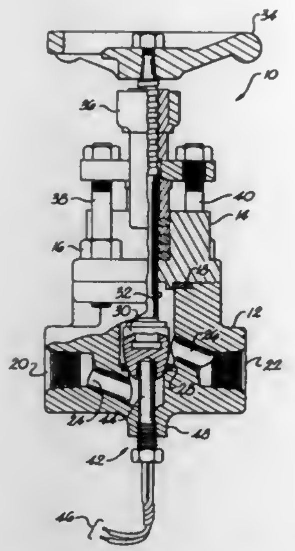
Anthony L. Sparks, Columbus, Ind., assignor to Reliance Electric Industrial Company, Greenville, S.C.

Filed May 17, 1994, Ser. No. 243,987
Int. Cl.^{6} F16K *49/00*

U.S. Cl. 137—341 **19 Claims**

1. A valve for regulating flow of a fluid having enhanced flow properties above a predetermined temperature, said valve comprising:

a valve housing defining a fluid inlet and a fluid outlet and further defining a fluid flow path therebetween;
a valve seat fixedly mounted inside of said valve housing along the fluid flow path;
a stopper member located inside of said valve housing, said stopper member being movable into engagement with said valve seat to close said valve and out of engagement with said valve seat to open said valve;



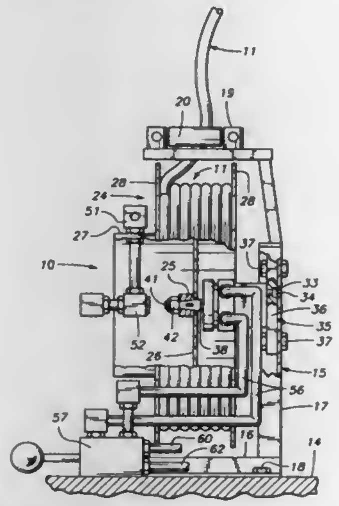
means operatively connected to said stopper member for selectively moving said stopper member to vary a flow rate of the fluid; and
an elongate heater fixedly secured to said valve housing and extending from a first location distal from said stopper member across said fluid flow path to a second location proximate to said stopper member when said valve is closed, said heater being operative to heat the fluid in the fluid flow path to a temperature exceeding the predetermined temperature.

5,531,246
HOSE REEL FOR MOBILE SERVICE VEHICLES

Alex F. Ritter, E. 7265 Highview, Coeur d'Alene, Id. 83814

Filed Oct. 26, 1994, Ser. No. 329,245
Int. Cl.^{6} B65H *75/34*

U.S. Cl. 137—355.21 **21 Claims**



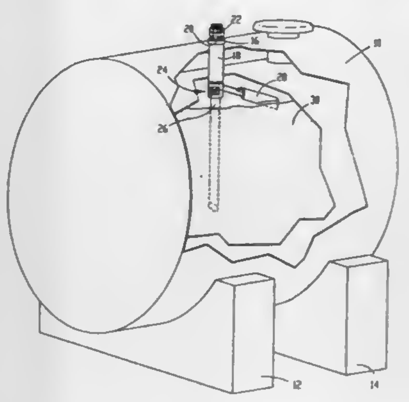
1. A powered hose reel, comprising:
a mounting base;
a motor releasably secured to the base in a cantilevered manner, with one axial end thereof secured to the mounting base and including a driven rotatable live axle projecting from a remaining opposite axial end;
a spool including a drum for receiving a hose, a central spacer disk mounted to the drum, and a center hub; and
  wherein the center hub is fitted to the live axle such that the spool is cantilevered on the live axle and motor for coaxial rotation with the live axle in direct response to rotation of the motor live axle.

5,531,247
TEMPERATURE AND PRESSURE RESISTANT SHUTOFF VALVE

Ronald W. Borst, Kansas Clty, and Donald R. David, Raytown, both of Mo., assignors to Clay and Bailey Manufacturing Company, Kansas City, Mo.

Filed Jun. 28, 1994, Ser. No. 267,572
Int. Cl.^{6} F16K *31/32;33/00*

U.S. Cl. 137—447 **15 Claims**



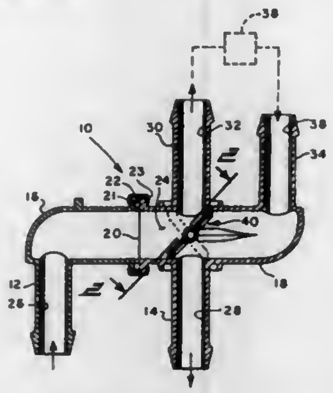
1. In a float-controlled shutoff valve for a generally upright supply tube disposed within the interior of a liquid storage tank, the improvement comprising:

a tubular valve body adapted to be mounted on the tube and having an elongated, internal passage therethrough disposed for liquid flow communication with the tube and the tank when the body is mounted on the tube,
said passage having a valve chamber provided with an upstream end and a downstream end;
a valve spool located within said chamber, extending across said passage and supported by the body for rotation about a transverse axis between open and closed positions,
said spool having a cross-flow cavity extending through one side thereof and a single, solid sidewall on the opposite side thereof,
said sidewall having an interior surface defining the boundaries of the cavity, and said cavity extending transverse to said axis of rotation,
said cavity being disposed in liquid flow alignment with the passage and said sidewall being disposed generally along-side the passage when the spool is in said open position,
said cavity being disposed out of liquid flow alignment with the passage and said sidewall being disposed across the passage at the upstream end of the chamber generally above the cavity to block liquid flow past the valve spool when the spool is rotated to said closed position,
said spool being open and unobstructed on said one side thereof in the area of said cavity regardless of the position of said spool; and
a float operably coupled with said spool for progressively rotating the spool into said closed position as the liquid being supplied through the supply tube rises to a predetermined level in the tank,
the direction of rotation of the valve spool during movement from the open position to the closed position being such that the cavity becomes progressively less exposed as said sidewall of the spool moves across the passage generally in the same direction as liquid passing through the unobstructed cavity to thereby eliminate counteracting forces acting on said spool and within said cavity.

5,531,248
BUTTERFLY VALVE

James E. Pearson, Downers Grove, and Dennis R. Carls, Geneva, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 19, 1995, Ser. No. 375,011
Int. Cl.^{6} F16K *1/22*
U.S. Cl. 137—625.46 **10 Claims**

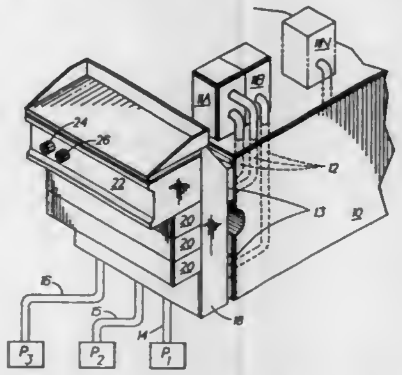


1. A valve assembly comprising:
- (a) a valve body having an inlet adapted for connection to a fluid source, an outlet, and a valving passage communicating with said inlet and outlet;
- (b) a resilient butterfly disposed in said passage and pivotally moveable therein between a first position and a second position seating on said body for controlling flow between said inlet and outlet, said butterfly formed integrally and having:
  - (i) a hub portion having certain inner surfaces formed therein adapted for torque transmitting engagement,
  - (ii) a pair of relatively thin blade portions extending outwardly from said bub in opposite direction therefrom,
  - (iii) a rim portion extending about the periphery of said blade portion, said rim having a thickness significantly greater than said blade portion and defining certain surfaces thereon for effecting said seating; and,
- (c) a shaft received through said hub portion, said shaft having surface portions thereof engaging said certain inner surfaces of said hub portion, said shaft journalled for rotation on said body.

5,531,249
VALVE BLOCK ASSEMBLY FOR I.S. MACHINE

Joseph A. Borbone, Paxton, Mass., assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Continuation of Ser. No. 48,141, Apr. 15, 1993, Pat. No. 5,435,349. This application Mar. 16, 1995, Ser. No. 405,479
Int. Cl.^{6} F16K *11/00*
U.S. Cl. 137—884 **4 Claims**

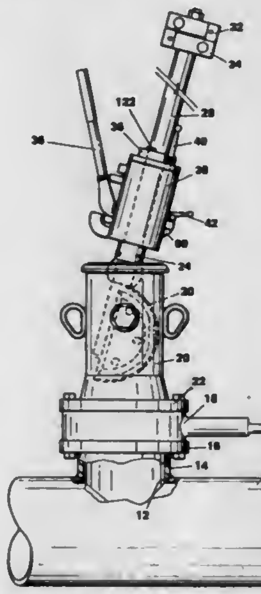


1. A valve assembly for controlling the flow of air at either of two pressures to an air operated mechanism of a section of an I.S. machine comprising
- a valve having a cylindrical sleeve and a valve element axially displaceable within said cylindrical sleeve between first and second control positions,
- a valve body including a bore for receiving said valve,
- said valve sleeve being closed at one end and having an opening extending through said closed end through which air under pressure can be delivered to said valve, said opening being selectively configured so that the sleeve can have two orientations selected to define separated opening locations,
- first conduit means communicating with said opening when said sleeve has one of said orientations for delivering air at one pressure to said valve and
- second conduit means communicating with said opening when said sleeve has said second orientation for delivering air at a different pressure to said valve.

5,531,250
DEVICE FOR PLUGGING THE INTERIOR OF A PIPE

Eric N. Freeman, Sapulpa; David L. Blevins, Tulsa; Gene R. Ralls, Tulsa; Bill D. Andrew, Tulsa; Buddy A. Wilson, Sapulpa, and Coy D. Osburn, Tulsa, all of Okla., assignors to TDW Delaware, Inc., Tulsa, Okla.

Filed May 5, 1994, Ser. No. 238,430
Int. Cl.^{6} F16L *55/10*
U.S. Cl. 138—94 **20 Claims**

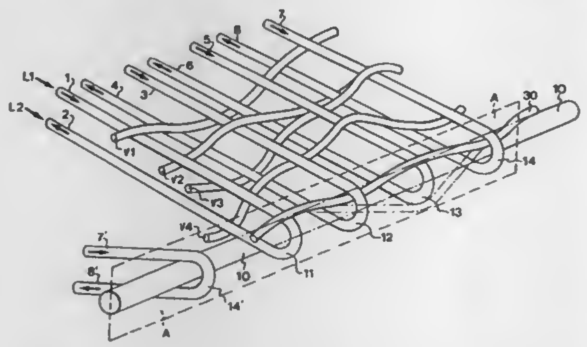


1. A device for plugging the interior of a pipe having an internal cylindrical surface, the pipe being penetrated by an access opening of a diameter substantially equal to the diameter of the pipe internal cylindrical surface, the plugging device comprising:
- a vertically oriented body;
- a backing plate, said body and said backing plate forming mating parts, one of said body and said backing plate having spaced apart integral fork portions with a space therebetween, the fork portions each having a pair of aligned slots therein, said body having a longitudinal axis and the slots extending in paralleled planes that are at an acute angle relative to a plane of the body longitudinal axis and the other of said body and said backing plate having opposed paralleled side surfaces positioned between said fork portions;
- a pair of spaced-apart axles extending from each said side surface, the axles being received in said slots so that said backing plate is retained by said body in a manner to permit vertical and lateral motion of said backing plate relative to said body as said axles move in said slots, the backing plate having a forward surface with a frustoconical circumferential edge;
- an elastomeric cup supported in variably spaced sliding relationship to said backing plate, the cup having a circumferential outer sealing surface of diameter slightly greater than the internal diameter of the pipe to be plugged, the cup having a rearward surface facing said backing plate forward surface, the cup rearward surface being partially defined by an internal circumferential frustoconical surface that mates with said backing plate frustoconical edge;
- means to engage the interior surface of a pipe to be plugged to cause said backing plate to be slidably displaced forwardly of said body as said body is forced downwardly into a pipe to be plugged, said backing plate frustoconical circumferential edge engaging said cup internal circumferential frustoconical surface whereby said cup is outwardly expanded as said backing plate is forced against said cup rearward surface to provide improved sealing relationship between said cup sealing surface and a pipe internal cylindrical surface; and
- means to secure said plugger body to the lower end of an elongated control bar by which the device is inserted into a pipe to be plugged.

5,531,251
METHOD OF MAKING LOOP SEAM FOR DOUBLE LAYERED PAPERMAKING FABRIC

Björn Rydin, Halmstad, Sweden, assignor to Albany Nordiskafilt AB, Halmstad, Sweden

Continuation of Ser. No. 75,447, Jun. 18, 1993, Pat. No. 5,476,123. This application May 25, 1995, Ser. No. 452,562
Claims priority, application Sweden, Dec. 21, 1990, 9004162
Int. Cl.^{6} D03D *13/00*
U.S. Cl. 139—383 AA **3 Claims**

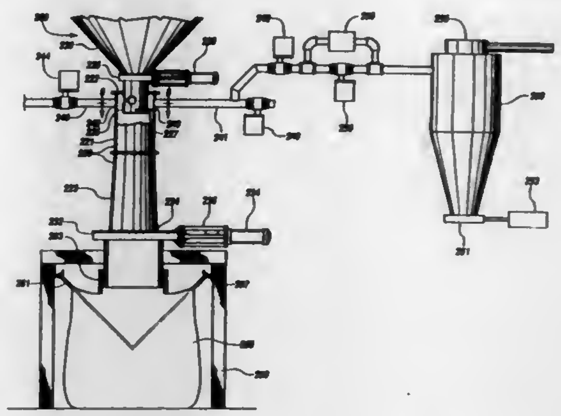


1. In a method of manufacturing a double-layered fabric designed for use in a papermaking, cellulose or board manufacturing machine by a round-weaving technique, wherein an endless weft thread is interwoven with a plurality of warp threads, wherein said double-layered fabric has two end edges, and wherein seam loops at said two end edges of the fabric are formed by weaving said endless weft thread around a seam thread during the weaving of the fabric, said plurality of warp threads being on one side of said seam thread, said fabric having a first side for supporting fibrous web material to be dewatered and an underside, said endless weft thread being alternatively disposed on said first side and on said underside with each pass around said seam thread, the improvement comprising:
- weaving said endless weft thread with at least one extra warp thread adjacent to said seam thread when said endless weft thread is on said first side, said at least one extra warp thread being on the other side of said seam thread from said plurality of warp threads, whereby there is formed in the seam zone a type of extension of the regular thread system of the fabric to conform the loop seam to the rest of the fabric and thereby avoid markings in a paper web at the loop seam.

5,531,252
VACUUM FILL SYSTEM

Norwin C. Derby, Dallas, and Norman C. Derby, Bonham, both of Tex., assignors to B.A.G. Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 302,377, Sep. 8, 1994, which is a continuation of Ser. No. 105,341, Aug. 9, 1993, abandoned, which is a continuation of Ser. No. 875,636, Apr. 28, 1992, Pat. No. 5,234,037, which is a continuation of Ser. No. 558,678, Jul. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 407,901, Sep. 15, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 485,710
Int. Cl.^{6} B65B *1/26*
U.S. Cl. 141—67 **15 Claims**



1. A vacuum fill system for deaerating flowable materials for storage in a receiving container disposed beneath the vacuum fill system comprising:
- a hollow, upwardly extending container defining a predetermined cross-sectional area for receiving and holding the flowable materials;
- the hollow, upwardly extending container having:
  - a top end and a bottom end,
  - a top portion with a substantially vertical air impervious side wall extending continuously from the top end of the hollow container to a deflection point and comprising the sole connection therebetween,
  - a bottom portion with an upwardly tapered air impervious side wall extending continuously from the deflection point to the bottom end of the hollow container;
  - a discharge outlet attached to the bottom end of the hollow container and defining an opening having a cross-sectional area at least as large as the largest cross-sectional area defined by the hollow container;
- means for controlling the movement of the flowable material into the hollow container;
- means for creating a vacuum in the hollow container to temporarily suspend the flowable materials to occupy a slightly greater volume than before creation of the vacuum with the suspended materials having a uniform cross-sectional area substantially the same as the cross-sectional area defined by the hollow container;
- means connected to the air impervious side wall in proximity to the top end of the hollow container for returning the pressure in the hollow container to atmospheric pressure substantially instantaneously for compacting the deaerated material into a substantially solid slug of material occupying a cross-sectional area substantially identical to, but slightly smaller than, the cross-sectional area defined by the hollow container; and
- means for controlling the movement of the substantially solid slug of deaerated, compacted materials as a unitary form from the bottom end of the hollow container.

5,531,253

POWDER FILLING APPARATUS AND A METHOD FOR FILLING A CONTAINER WITH POWDER

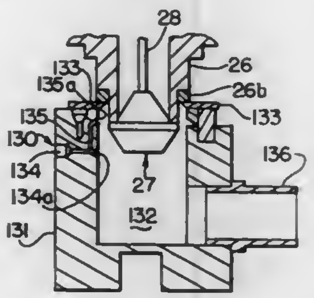
Shigeru Nishiyama; Yasuhiro Hayashi, and Naoki Yamane, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 20,329, Feb. 18, 1993, Pat. No. 5,337,794. This application May 11, 1994, Ser. No. 241,283

Claims priority, application Japan, Feb. 20, 1992, 4-033718; Feb. 20, 1992, 4-033719; Feb. 20, 1992, 4-033720; Feb. 20, 1992, 4-033721; Feb. 20, 1992, 4-033723

Int. Cl.^{6} B65B *1/00*

U.S. Cl. 141—90 **7 Claims**



1. A cleaner for cleaning a nozzle portion, wherein the cleaner is adapted to be attachable to the nozzle portion, disposed in a powder filling apparatus for filling a container with powder by equally evacuating the inside and the outside of said container, and dropping powder through said nozzle portion into said container simultaneously with raising the pressure outside the container, said cleaner comprising:

a cleaner head having a cleaning chamber therein for enclosing the nozzle portion airtightly when the cleaning head is fitted to said nozzle portion;

a gas passage disposed in said cleaner head for allowing compressed air to flow therethrough so as to spurt the compressed air to said nozzle portion; and

an exhaust passage for allowing powder flowing down in said cleaning chamber together with the compressed air spurted to said nozzle portion to be discharged together with the compressed air, wherein said nozzle portion includes a bottom opening for allowing said powder to drop therethrough and a packing disposed above said bottom opening so as to airtightly press an inlet of said container, and wherein said cleaner head is pressed to said packing airtightly when fitted to said nozzle portion.

5,531,254

PORTABLE HAND ACTIVATED CARBONATOR

Arnie Rosenbach, 28 Mapel Ave., Erving, Mass. 01344

Filed Feb. 22, 1994, Ser. No. 199,589

Int. Cl.^{6} A23L *2/00*

U.S. Cl. 141—113 **4 Claims**

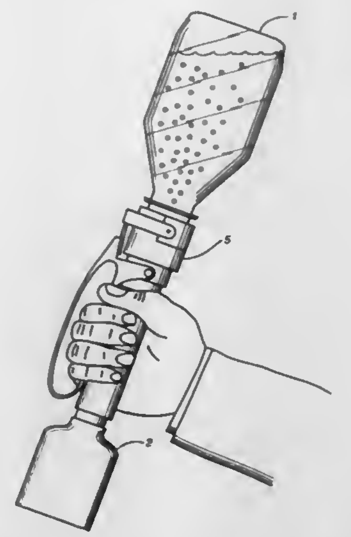
1. An improved portable device for carbonating beverages comprising

a refillable pin valved canister with a threaded connector for providing pressurized carbon dioxide gas,

a tubular control section means connectable via mating threads to said threaded connector of said canister for regulating the flow of carbon dioxide passing through the section,

a plastic drink bottle holding a liquid beverage to be carbonated, and

internal control features of said tubular control section means comprising a pusher for opening said pin valved canister allowing gas to flow into chambers and passageways within said tubular control section means, a gas pressure regulator means for controlling the flow and pressure of gas before exiting, a reverse flow stop valve for keeping said liquid beverage from fouling any internal control features, and an exit orifice for allowing regulated gas to flow into the drink bottle, with improvements comprising



a handle movably connected to said tubular control section means and juxtaposed to said tubular control section means making a grip combination such that said handle may be operated concurrently with gripping said tubular control section means,

said handle having a member positioned to actuate intentional operation of said gas pressure regulator means to allow gas flow there through,

a bottle clamp with a moveable jaw mechanically linked to said handle, and

said bottle clamp positioned about said exit orifice to firmly hold said drink bottle in a position to receive gas from said exit orifice when forced closed by action of said handle, whereby pressurization with carbon dioxide will be maintained while being shaken to dissolve carbon dioxide into said liquid beverage.

5,531,255

APPARATUS USED IN PRODUCING PREFILLED STERILE DELIVERY DEVICES

Rita D. Vacca, Glendale, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 988,265, Dec. 14, 1992, Pat. No. 5,373,684. This application Sep. 23, 1994, Ser. No. 310,984

Int. Cl.^{6} B65B *1/04;3/04;* **B67C** *3/00*

U.S. Cl. 141—285 **2 Claims**

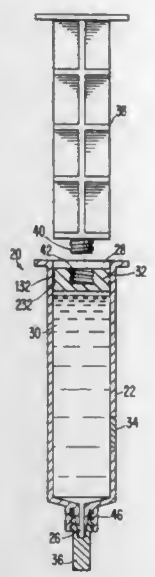
1. An apparatus for use in producing a prefilled, sterile delivery device, the apparatus comprising:

a container portion with an inner wall, the container portion having a sealed tip end and an opposite open end, said open end adapted to receive a piston positioned within the container portion for sealing engagement with said inner wall of the container portion to define an interior chamber thereof and retain a fluid therein;

a port through said inner wall of said container portion, said port disposed between the tip end and the open opposite end through which the container portion is filled with a desired quantity of fluid material when the tip end is sealed and the piston is positioned within and sealing the container portion; and

means for venting air from the interior chamber of the container portion while the container portion is being filled with said fluid material;

whereby said container portion is sealed at the tip end and the piston is placed in a sealing position at the open end so that said container portion is open only at said port, and said container portion is filled with said fluid material through the port as air is vented from the interior chamber through the venting means while said piston remains at said sealing position and after which said port is sealed with the fluid material sealingly contained within the container portion and the apparatus sterilized to provide a prefilled, sterile delivery device having sterile contents.



5,531,256

FLAME-RETARDANT RUBBER TIRES

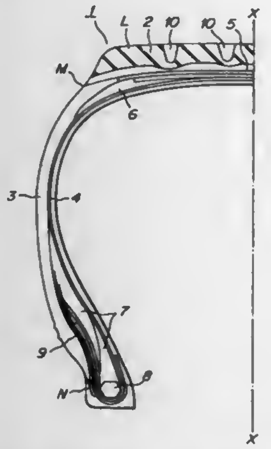
Takatsugu Hashimoto; Keizo Akutagawa; Kazuo Yagawa, all of Kodaira; Makoto Tanaka, Higashimurayama; Junichi Yamagishi, and Kazuo Hachiya, borh of Kodaira, all of, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 974,519, Nov. 12, 1992, Pat. No. 5,341,862. This application Apr. 21, 1994, Ser. No. 230,774

Claims priority, application Japan, Nov. 14, 1991, 3-299017; Nov. 15, 1991, 3-300390

Int. Cl.^{6} B60C *1/00*

U.S. Cl. 152—209 R **3 Claims**



1. A flame-retardant rubber tire comprising: an outer rubber body portion consisting essentially of a tread rubber layer, a sidewall rubber layer extending inward from each side edge of the tread rubber layer toward the vicinity of a bead portion in radial direction and a rubber chafer layer arranged in the vicinity of the bead portion; and a reinforcing body located inside the outer rubber body portion, wherein a flame-retardant rubber composition having an oxygen index of not less than 19.8 but not more than 27.5 is disposed in the outer rubber body portion to amount at least 20% by weight of the tread rubber layer; said oxygen index determined in accordance with JIS K7201.

5,531,257

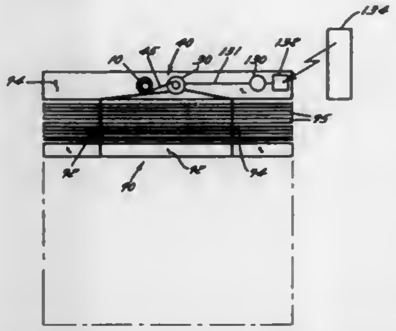
CORDLESS, BALANCED WINDOW COVERING

Otto Kuhar, Garfield, N.J., assignor to Newell Operating Company, Freeport, Ill.

Continuation-in-part of Ser. No. 223,989, Apr. 6, 1994, Pat. No. 5,482,100. This application Sep. 9, 1994, Ser. No. 303,773

Int. Cl.^{6} F06B *9/30*

U.S. Cl. 160—168.1 **20 Claims**



1. A window covering of the type including a headrail, a bottom rail and window covering material located therebetween, the bottom rail being moveable between a fully raised and a fully lowered position with respect to the headrail and intermediate positions, the improvement comprising:

a spring motor located near the headrail and including a cord spool;

at least two cords coupling the bottom rail to the cord spool;

the spring of the spring motor coupled to the cord spool to exert spring forces upon the spool as cord is wound therefrom and wound thereon, the spring being an elongate spring which moves from a first to a second spring storage drum and which is selected to have sufficient spring force to essentially balance the bottom rail against movement when the bottom rail is in any position; and

an electric motor coupled to the spring motor and adapted for selectively rotating the cord spool thereof to raise or lower the window covering.

5,531,258

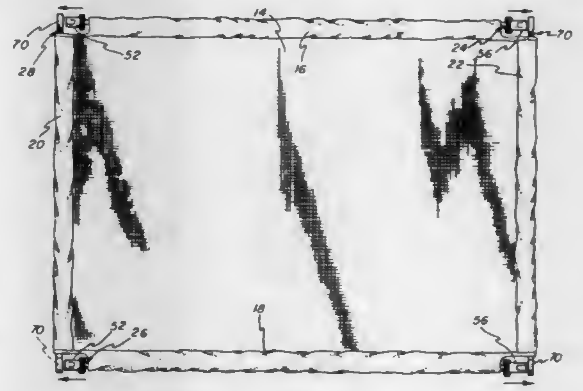
FOLDING SOFT GATE

Keith L. Poulson, Westminster; Paul Fair, Denver, and Robert M. Parker, Aurora, all of Colo., assignors to Gerry Baby Products Company, Thornton, Colo.

Filed Jul. 19, 1994, Ser. No. 276,948

Int. Cl.^{6} A47G *5/00;* **E06B** *3/30;* **F16B** *7/10*

U.S. Cl. 160—376 **10 Claims**



1. A releasable closure adaptable for disposition between spaced, confronting sides of an area way, said releasable closure comprising:

an upper horizontal member having opposing first and second ends for engaging the sides of said area way;

- a lower horizontal member having opposing first and second ends for engaging the sides of said area way;
- a first vertical member extending between said first end of said upper horizontal member and said first end of said lower horizontal member, said first vertical member including upper and lower ends;
- a second vertical member extending between said second end of said upper horizontal member and said second end of said lower horizontal member, said second vertical member including upper and lower ends;
- a ring portion located at each of said upper and lower ends of said first and second vertical members wherein said ring portions are located extending around said upper and lower members with said ends of said upper and lower horizontal members extending through said ring portions for engaging the sides of said area way; and
- a flexible panel fastened to said horizontal and vertical members.

5,531,259

METHOD FOR INTERMEDIATE CAST TYPE WELDING OF FINELY PEARLITIZED RAILS

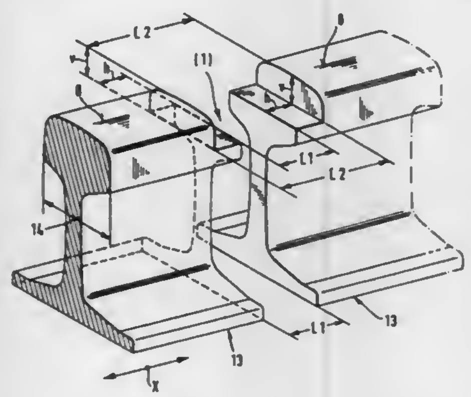
Frank Kuster, Ratingen, Germany, assignor to Elektro-Thermit GmbH, Essen, Germany

Filed Jun. 8, 1994, Ser. No. 255,686

Claims priority, application Germany, Jun. 9, 1993, 43 19 165.7

Int. Cl.⁶ B23K *23/00*

U.S. Cl. 164—54 **2 Claims**



1. A method of intermediate cast welding of finely pearlitized rails by pouring aluminothermically produced steel in a casting mold which surrounds ends of a pair of rails, said method comprising the step of:

providing in a rail head of each rail along an entire rail head width, at an end face of an rail end facing an end face of another rail end, a recess having a width and a height each substantially equal from 1/10 to 10/10 of a gap separating webs and feet of the ends of the pair of rails, when the ends of the pair of rails are received in the casting mold whereby, upon the ends of the pair of rails being received in the casting mold, an increased gap is provided at rolling surfaces of the ends of the pair of rails; and pouring aluminothermically produced steel into the casting mold.

5,531,260

METHOD OF FORMING METAL MATRIX COMPOSITES BY USE OF AN IMMERSION CASTING TECHNIQUE AND PRODUCTS PRODUCED THEREBY

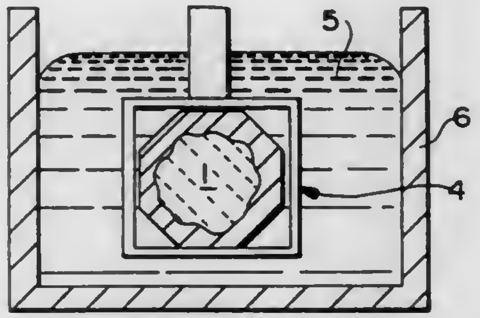
John T. Burke, Hockessin, Del., assignor to Lanxide Technology Company, Newark, Del.

Continuation of Ser. No. 136,482, Oct. 13, 1993, Pat. No. 5,377,741, which is a continuation of Ser. No. 951,72, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 671,049, Mar. 18, 1991, Pat. No. 5,150,747, which is a continuation of Ser. No. 269,371, Nov. 10, 1988, Pat. No. 5,000,249. This application Dec. 29, 1994, Ser. No. 366,345

The portion of the term of this patent subsequent to Mar. 19, 2007, has been disclaimed.

Int. Cl.⁶ B22D *19/14*

U.S. Cl. 164—97 **19 Claims**



1. A method for forming a metal matrix composite body comprising:

- forming a pool of molten matrix metal;
- forming at least one preform comprising a permeable mass of a substantially non-reactive filler material;
- providing an infiltration enhancer to at least one of said pool of molten matrix metal and said preform;
- communicating an inert atmosphere with at least said pool of molten matrix metal;
- completely submerging said at least one preform into said pool, said pool lacking a quantity of said matrix metal sufficient to completely infiltrate said at least one preform;
- spontaneously infiltrating at least a portion of said at least one preform with said molten matrix metal, thereby forming at least one partially infiltrated preform;
- adding an additional quantity of said molten matrix metal to said pool of molten matrix metal, thereby replenishing at least a portion of said molten matrix metal which has infiltrated said preform; and
- continuing said infiltrating of said at least one preform to a desired extent.

5,531,261

PROCESS FOR DIECASTING GRAPHITE CAST IRON AT SOLID-LIQUID COEXISTING STATE

Chisato Yoshida; Yuichi Ando; Kunio Kitamura, and Seiro Yahata, all of Chiba, Japan, assignors to Rheo-Technology, Ltd., Japan

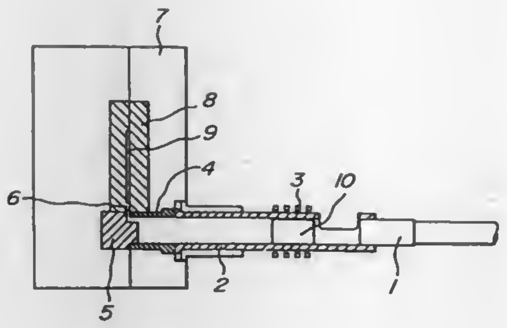
Filed Dec. 30, 1994, Ser. No. 366,672

Claims priority, application Japan, Jan. 13, 1994, 6-014082; Sep. 26, 1994, 6-229598

Int. Cl.⁶ B22D *27/09;23/06;* **B22C** *9/00*

U.S. Cl. 164—113 **4 Claims**

1. A process for diecasting graphite cast iron at a solid-liquid coexisting state, which comprises heating an ingot of graphite cast iron to a temperature of a solid-liquid coexisting state and then injecting the graphite cast iron with a plunger into a mold having a gate opened at an area of not more than 1/10 of a pressurized area of a tip of the plunger.



5,531,262

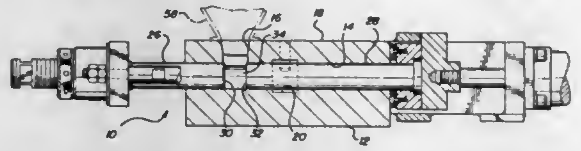
BULK LUBRICANT DELIVERY UNIT FOR A DIE CASTER

Lewis G. Freeman, 1509 Pontiac Dr., Kokomo, Ind. 46902

Filed Sep. 26, 1995, Ser. No. 534,073

Int. Cl.⁶ B22D *17/10;17/14;17/20*

U.S. Cl. 164—149 **16 Claims**



1. A bulk lubricant delivery unit for delivery of bulk lubricant to a die casting die apparatus, said unit characterized by:

- a body having an inlet for receiving a charge of bulk lubricant from a supply source;
- a transfer member within said body and movable between loading and delivery positions;
- a delivery chamber defined between said body and said transfer member in said delivery position;
- said transfer member having a transfer space communicating with said inlet in one of said loading and delivery positions and with at least part of said delivery chamber in one of said loading and delivery positions; and
- charge control means for varying the volume of lubricant charge transferred from said transfer space in said loading position to said delivery chamber in said delivery position.

5,531,263

OSCILLATING TROUGH FOR SHOT BLAST

Masatoshi Yamamoto, Hoi; Mitsuo Matsuba; Hideaki Kaga, both of Toyokawa, and Masaki Shibata, Toyohashi, all of, Japan, assignors to Sintokogio, Ltd., Aichi, Japan

Filed Oct. 6, 1994, Ser. No. 319,430

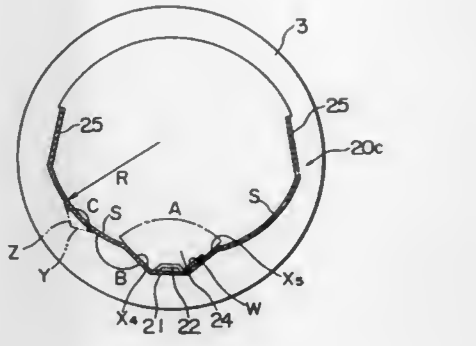
Claims priority, application Japan, Oct. 8, 1993, 5-277501; Feb. 4, 1994, 6-032879; Mar. 4, 1994, 6-059868

Int. Cl.⁶ B24C *3/26*

U.S. Cl. 164—404 **8 Claims**

1. An oscillating trough for shotblasting, having a workpiece transfer portion, where workpieces are turned over and transferred downstream to a workpiece discharging portion, wherein the transfer portion includes:

- a depression defined by two surfaces X_4 X_5 extending from the bottom of the transfer portion upwardly and outwardly thereby making an inner angle of 80°–100°; and
- an arcuate surface S connected to the top of each surface X_4 and X_5 of the depression, each of the surfaces S corresponding to a curved plane with a radius in cross section of 70–100% of the radius of the largest cylinder inscribable in imaginary planes Y and Z each of a predetermined length, the plane Y at one end intersecting an upper end of the respective surface X_4 and X_5 with an external angle of 140°–160°, and the plane Z at one end intersecting the plane Y with an inner angle of 120°–140°.



5,531,264

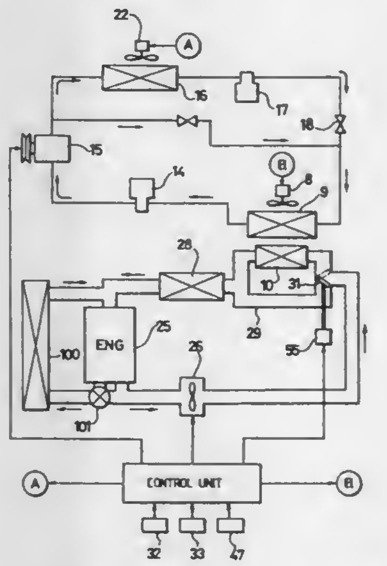
CONTROL APPARATUS FOR A COOLING UNIT WITH A HEATING FUNCTION AND A MULTI-COMPARTMENT TEMPERATURE MANAGEMENT APPARATUS FOR A VEHICLE USING THIS COOLING UNIT

Masatoyo Eike, and Kunio Miyazaki, both of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 325,068

Int. Cl.⁶ B60H *01/00*

U.S. Cl. 165—43 **9 Claims**



1. A control apparatus for a cooling unit having a heating function, said apparatus comprising:

- a cooling unit casing;
- a plurality of unit fans located within said cooling unit casing;
- a cooling circuit including an evaporator and a heater core each located within said cooling unit casing;
- a valve for controlling a flow rate of a heating medium into said heater core;
- an intake temperature sensor for detecting an air intake temperature of air taken into said cooling unit casing;
- an outlet temperature sensor for detecting an air outlet temperature of air discharged from said cooling unit casing into a space to be temperature regulated;
- a temperature setting device for setting a regulated temperature for the space to be temperature regulated;
- a target outlet temperature calculation means for calculating a target air outlet temperature for the air that is discharged into said space to be temperature regulated based upon said air intake temperature detected by said intake temperature sensor and said regulated temperature set by said temperature setting device; and
- a valve openness control means for maintaining said valve in one of a fully open state and a fully closed state until said air intake temperature enters a predetermined temperature range,

and for then adjusting a degree of openness of said valve to cause said air outlet temperature detected by said outlet temperature sensor to be adjusted toward said target air outlet temperature calculated by said target outlet temperature calculation means.

5,531,265

METHOD OF OPERATING HEAT EXCHANGERS

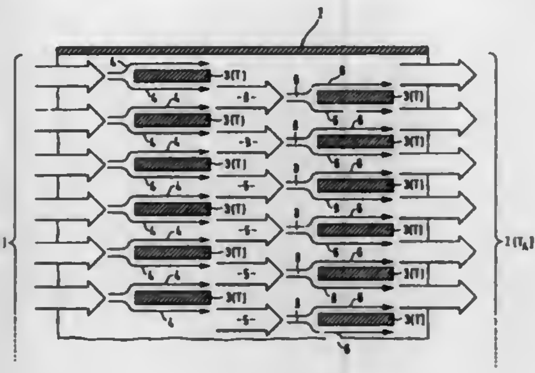
Rudolf Ganz, Lauf; Ottmar Rosenfelder, and Barbara Schwandner, both of Selb, all of, Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Germany

Filed Nov. 1, 1994, Ser. No. 332,725

Claims priority, application Germany, Nov. 3, 1993, 43 37 471.9

Int. Cl.⁶ F28B *1/00*

U.S. Cl. 165—110 **15 Claims**



1. A method of operating a heat exchanger by means of a hot gas stream having an entry temperature T_I when entering the heat exchanger and containing condensable components, which method comprises

dividing the hot gas stream into substreams,

cooling the substreams by means of obstacles having a temperature T which is lower than the entry temperature T_I of the hot gas stream,

combining the substreams with one another after leaving the obstacles to give combined new substreams, and

dividing and cooling said combined new substreams in their cores by means of further obstacles at a temperature T to give other substreams,

wherein this procedure is repeated until the hot gas stream leaving the heat exchanger has reached an exit temperature T_O of from 200° C. to 60° C., and wherein T_O is above the dew point temperature T_D of the hot gas stream, and wherein at least a portion of the condensable components of the hot gas stream are condensed in the heat exchanger.

5,531,266

METHOD OF INDIRECT HEAT EXCHANGE FOR TWO PHASE FLOW DISTRIBUTION

Elias G. Ragi, Williamsville, and Thomas J. Godry, Tonawanda, both of N.Y., assignors to UOP, Des Plaines, Ill.

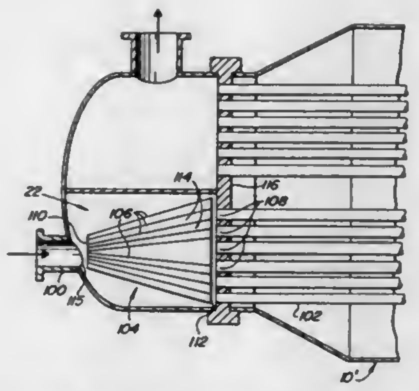
Filed Dec. 28, 1993, Ser. No. 174,510

Int. Cl.⁶ F28F *9/00*

U.S. Cl. 165—115 **7 Claims**

1. A method for indirectly exchanging heat in a shell and tube heat exchange zone by cooling a first fluid stream on a shell side of a heat exchanger and boiling a second fluid stream on the tube side of said heat exchanger, said method comprising:

passing a first stream comprising a first fluid to the shell side of a shell and tube heat exchange zone and cooling said first fluid by contact with the outside surface of a plurality of heat exchange tubes;



passing a second stream comprising a mixed phase second fluid to a tube inlet chamber of said heat exchanger;

dividing said second fluid in said chamber into a plurality of mixed phase inlet streams in a manner to equalize the distribution of liquid and the weight ratio of liquid to vapor of each of said streams; and,

directing each of said inlet streams into an inlet of more than one of said heat exchange tubes and contacting said second fluid with a boiling surface on the inside of said heat exchange tubes and boiling at least a portion of the liquid in said second fluid.

5,531,267

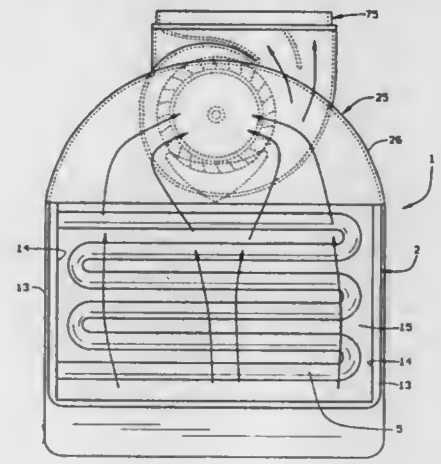
REFRIGERATION CENTRIFUGAL BLOWER SYSTEM

Sohail Ahmed, and Kevin M. May, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 24, 1994, Ser. No. 295,209

Int. Cl.⁶ F28F *13/06*

U.S. Cl. 165—124 **6 Claims**



1. In a refrigeration system in which coils are mounted in a coil passage defined by front and back walls, said walls being spaced from one another a short distance relative to their width, a blower system by which air is caused to pass over said coils comprising a housing communicating with said coil passage, said housing having an intake and an outlet, each with an axially elongated mouth the mouths of said intake and outlet being oriented substantially 180° from one another, said inlet mouth communicating with an intake passage defined in part by an intake front wall, said outlet mouth communicating with an outlet passage in a blower casing, said blower casing being defined in part by a front blower casing wall spaced inboard from said intake front wall and having an air inlet therethrough for admitting air from said intake passage to said blower casing, a centrifugal scroll caged blower mounted in said blower casing between said intake mouth and said outlet mouth, said centrifugal blower having a blower wheel axially thin with respect to its diameter, mounted on a blower wheel shaft with an

axis of rotation substantially perpendicular to a long dimension of said outlet mouth, and electric motor means connected to said shaft for rotating said centrifugal blower wheel, baffle means in said inlet passage, outside said blower casing, for directing air in separate paths through said intake to said air inlet of said front blower casing wall and outlet divider and guide wing means in said blower casing between said blower wheel and said outlet mouth and extending transversely of said outlet mouth for dividing the flow of and spreading air discharged from said blower along the long dimension of said outlet mouth.

5,531,268

HEAT EXCHANGER

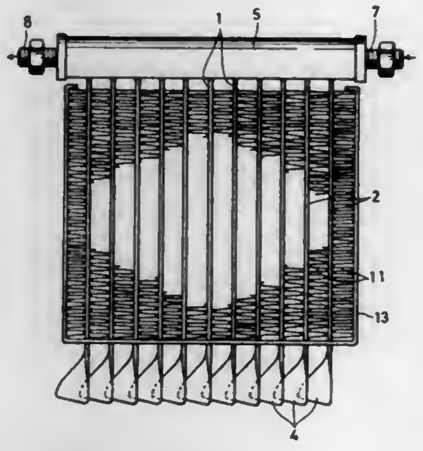
Ryoichi Hoshino, and Hiroki Shibata, both of Oyamashi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Nov. 22, 1994, Ser. No. 345,712

Claims priority, application Japan, Nov. 24, 1993, 5-293439

Int. Cl.⁶ F28D *1/047;7/06*

U.S. Cl. 165—153 **21 Claims**



1. A heat exchanger comprising:

a plurality of tubes with each tube having an oblong longitudinal cross-section of a predetermined thickness, a first end connected to a first straight section, a second end connected to a second straight section, and a middle section located between said first and second straight sections and including a bent and twisted portion which has been bent and twisted to a predetermined angle relative to each of said first and second straight sections, wherein each of said tubes is arranged in said heat exchanger at regular, spaced apart intervals from and in parallel with an adjacent tube at a predetermined distance in a direction parallel to said thickness of said tubes and said bent and twisted portion of each tube is located adjacent said bent and twisted portion of said adjacent tube so that said bent and twisted portion contacts and overlaps said bent and twisted portion of said adjacent tube in order to reinforce said middle section of said tubes;

a pair of hollow headers wherein a first header is disposed at said first ends of said tubes, a second header is disposed at said second ends of said tubes and wherein each header is connected to said tubes so as to be in fluid communication therewith;

a plurality of fins with each fin interposed between said straight sections of said adjacent tubes.

5,531,269

PLATE HEAT EXCHANGER FOR LIQUIDS WITH DIFFERENT FLOWS

Arthur Dahlgren, Klockartorpsvägen 2, S-582 75 Linköping, Sweden

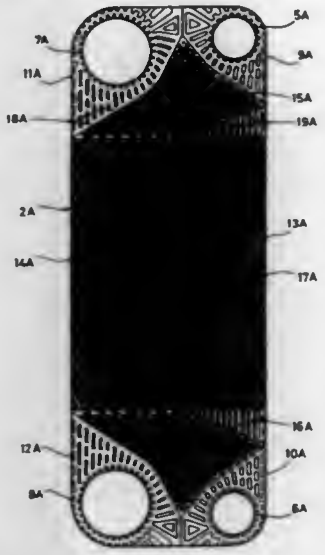
PCT No. PCT/SE93/00505, § 371 Date Nov. 10, 1994, § 102(e) Date Nov. 10, 1994, PCT Pub. No. WO93/25860, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 8, 1993, Ser. No. 335,774

Claims priority, application Sweden, Jun. 12, 1992, 9201825; Jul. 3, 1992, 9202057

Int. Cl.⁶ F28F *3/08*

U.S. Cl. 165—167 **9 Claims**



1. A plate heat exchanger for heat transfer between two fluids having different flow volumes, comprising several principally rectangular heat transfer plates (**2***a*, **20**), each having inlet and outlet openings (**5***a*, **6***a* and **7***a*, **8***a*; **25**, **26** and **27**, **28**) for respective fluids through its corner portions (**9***a*, **10***a*, **11***a*, **12***a*), a heat transfer portion (**17***a*), located centrally between respective inlet and outlet openings, and two distribution portions (**15***a*, **16***a*), located between the heat transfer portion (**17***a*) and respective inlet and outlet openings and being formed for distribution of the respective two fluids flowing from their inlet openings towards the heat transfer portions, characterized in that the size of the inlet and outlet openings (**5***a*, **6***a*; **25**, **26**) of the heat transfer plates for the first of said two fluids is smaller than the size of the inlet and outlet openings (**7***a*, **8***a*; **27**, **28**) for the other fluid and that the heat transfer plates in their distribution portions are so formed that the flow resistance for the first fluid, flowing between the inlet and outlet openings (**5***a*, **6***a*; **25**, **26**) of the first fluid and the heat transfer portions (**17***a*), is larger than the flow resistance for the other fluid, flowing between the inlet and outlet openings (**7***a*, **8***a*; **27**, **28**) of the other fluid and the heat transfer portions (**17**).

5,531,270

DOWNHOLE FLOW CONTROL IN MULTIPLE WELLS

Paul A. Fletcher, Richardson, Tex., and Gregory S. Walz, Anchorage, Ak., assignors to Atlantic Richfield Company, Los Angeles, Calif.

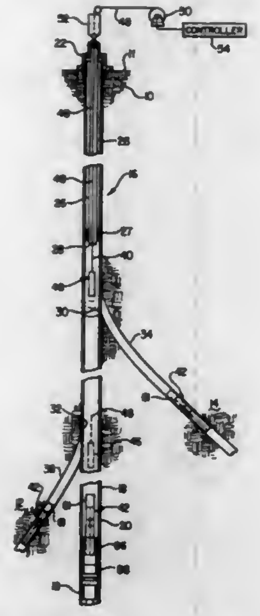
Filed May 4, 1995, Ser. No. 435,784

Int. Cl.⁶ E21B *34/06*

U.S. Cl. 166—53 **18 Claims**

1. A system for controlling fluid flow in a well including at least one wellbore, said system comprising:

a fluid flow control valve interposed in said wellbore for controlling flow of fluid between a predetermined portion of said wellbore and the surface, said flow control valve including a valve closure member, an actuator, a controller and a signal receiver for receiving wireless signals for selectively position-



ing said closure member to control the flow of fluid through said flow control valve; and

a signal transmitter disposed in said wellbore in a preselected position spaced from said flow control valve and operable to transmit signals to said receiver for operating said flow control valve, at will.

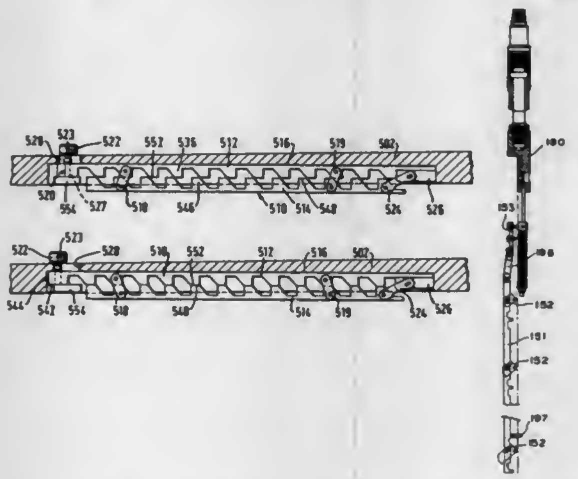
5,531,271
WHIPSTOCK SIDE SUPPORT

Thurman B. Carter, Pearland, Tex., assignor to Weatherford US, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 300,917, Sep. 6, 1994, Pat. No. 5,425,417, which is a continuation-in-part of Ser. No. 225,384, Apr. 4, 1994, Pat. No. 5,409,060, which is a continuation-in-part of Ser. No. 119,813, Sep. 10, 1993, Pat. No. 5,452,759, and a continuation-in-part of Ser. No. 210,697, Mar. 18, 1994, Pat. No. 5,429,187. This application Mar. 31, 1995, Ser. No. 414,201

Int. Cl.^{6} E21B *7/08;23/00;47/00*

U.S. Cl. 166—117.6 **5 Claims**



3. A wellbore tool side support for providing lateral support for a wellbore tool against an interior wall of a tubular or of a wellbore to prevent flexing of the wellbore tool, the wellbore tool side support comprising

at least one support movably secured to the wellbore tool,

the at least one support interconnected with a setting means for selectively moving the at least one support out from the wellbore tool, the setting means movably secured to the wellbore tool and movable to move the at least one support so that a portion of the at least one support projects from the wellbore tool to contact the interior wall to support the wellbore tool against the interior wall,

locking means for holding the setting means in place after the setting means has moved to effect movement of the at least one support, and

the locking means comprising at least one spring loaded pin on the wellbore tool initially abutting the setting means which, upon movement of the setting means, moves into a pin recess of the setting means to prevent movement of the setting means.

5. A wellbore tool side support for providing lateral support for a wellbore tool against an interior wall of a tubular or of a wellbore to prevent flexing of the wellbore tool, the wellbore tool side support comprising

at least one support movably secured to the wellbore tool,

the at least one support interconnected with a setting means for selectively moving the at least one support out from the wellbore tool, the setting means movably secured to the wellbore tool and movable to move the at least one support so that a portion of the at least one support projects from the wellbore tool to contact the interior wall to support the wellbore tool against the interior wall,

the setting means including a bar having a plurality of setting teeth projecting therefrom toward the at least one support, the at least one support having a support bar,

the support bar having a plurality of support teeth projecting therefrom toward and in contact with the setting teeth, and

the support teeth and setting teeth each having inclined complementary tooth surfaces so that movement of the setting bar forces the setting teeth to move against the support teeth forcing the support teeth and the at least one support bar outwardly from the wellbore tool.

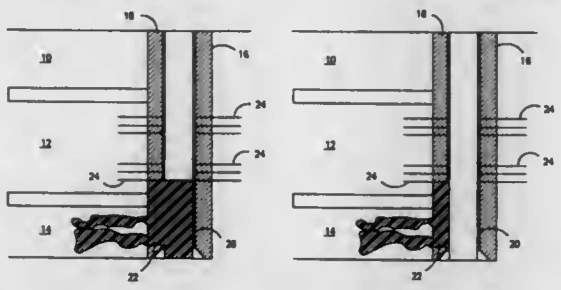
5,531,272
LOW TEMPERATURE UNDERWATER EPOXY SYSTEM FOR ZONE ISOLATION, REMEDIAL CEMENTING, AND CASING REPAIR

Ricky C. Ng, Dallas, Tex., and Thurman W. McPherson, II, Cortez, Colo., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 35,101, Mar. 19, 1993, Pat. No. 5,404,950, which is a continuation-in-part of Ser. No. 994,853, Dec. 22, 1992, Pat. No. 5,295,541. This application Mar. 28, 1995, Ser. No. 413,026

Int. Cl.^{6} E21B *29/10;33/138;43/24*

U.S. Cl. 166—277 **26 Claims**



1. A methods for isolating a zone of a formation or reservoir penetrated by a wellbore casing comprising:

a) directing a solidifiable epoxy resin mixture admixed with a curing agent into a desired zone of said information via the wellbore which solidifiable mixture is in an amount sufficient to fill said zone to a desired depth in said formation;

b) allowing said resin and curing agent to remain in said zone for a time sufficient to form a hardened solid able to withstand environmental conditions existing in the zone while precluding fluid flow therethrough; and

c) removing any excess solid material from the wellbore so as to form a solid wall bonded to and having a diameter substantially similar to said casing thereby isolating said zone from fluid flow.

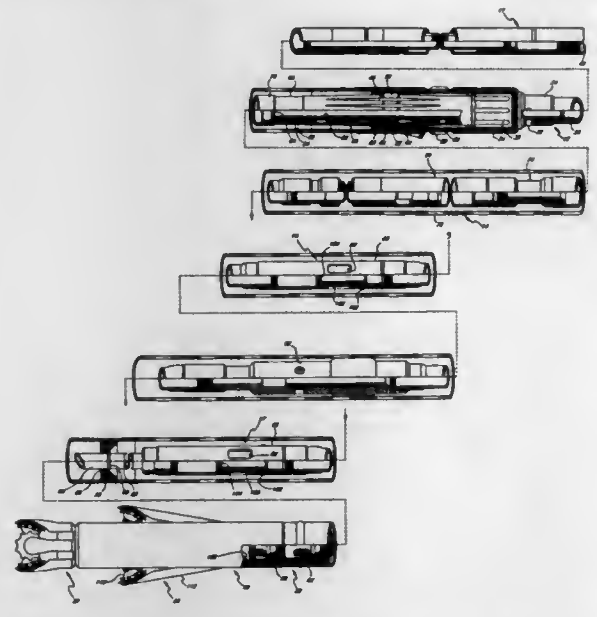
5,531,273
WELL COMPLETION TOOL AND PROCESS

Richard M. Dobson; Jefferey D. Herndon, and Leo D. Hudson, all of Bakersfield, Calif., assignors to Bestline Liner Systems, Bakersfield, Calif.

Continuation of Ser. No. 215,920, Mar. 22, 1994, Pat. No. 5,425,423. This application Jun. 7, 1995, Ser. No. 484,468

Int. Cl.^{6} E21B *43/04*

U.S. Cl. 166—278 **3 Claims**



3. A process for completing a well comprising the steps of:

placing a length of perforated liner in a well and extending across a first length of well and a second length of well displaced downwardly from the first length of well;

placing a tube in the perforated liner so that there is an annular space between the tube and the length of perforated liner;

establishing circulation radially through the wall of the tube at the second length of well;

completing the second length of well using circulation through the wall of the tube;

axially sealing the annular space above the second length of well;

establishing circulation radially through the wall of the tube at the first length of well;

completing the well using circulation through the wall of the tube at the first length of well; withdrawing the tube.

5,531,274
LIGHTWEIGHT PROPPANTS AND THEIR USE IN HYDRAULIC FRACTURING

Raymond L. Bienvenu, Jr., 4500 19th St. #48, Boulder, Colo. 80304

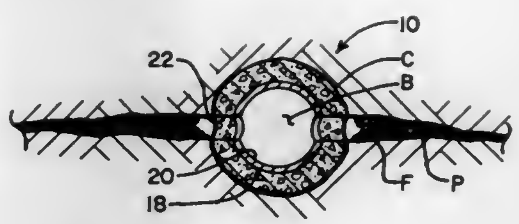
Filed Jul. 29, 1994, Ser. No. 282,905

Int. Cl.^{6} E21B *43/267*

U.S. Cl. 166—280 **9 Claims**

1. A method of fracturing a subsurface earth formation having a wellbore, comprising:

injecting into the wellbore a fluid at sufficiently high rates and pressures such that the formation fails and fractures to accept said fluid;



mixing a proppant into said fluid being injected into the wellbore, wherein said proppant is a styrene-divinylbenzene copolymer bead; and

filtering out said proppant from said fluid so as to produce a packed mass of particles adjacent the fracture, which packed mass will prop open the fracture thereby allowing produced fluids to flow towards the wellbore.

5,531,275
INSTALLATION FOR FIGHTING FIRE

Göran Sundholm, Ilmari Kiannon kuja 3, Fin-04310 Tuusula, Finland

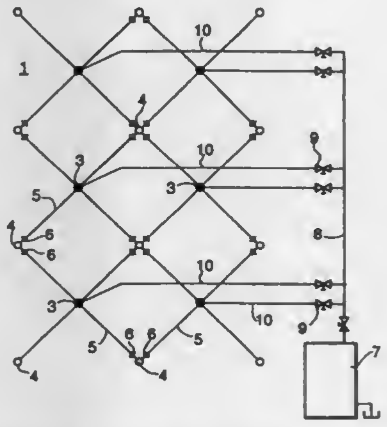
PCT No. PCT/FI92/00316, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/10860, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 25, 1992, Ser. No. 240,754

Claims priority, application Finland, Nov. 26, 1991, 915575; Nov. 29, 1991, 915669

Int. Cl.^{6} A62C *35/58*

U.S. Cl. 169—16 **9 Claims**



9. An installation for fighting fire comprising:

a group of spray heads, and at least one releasing means (**3;22;91–94**) reacting under an influence of an indication of fire for activating said group of spray heads (**4;23;95–103**),

wherein said releasing means is a spray head (**3**) which includes means for distributing extinguishing liquid directly to said group of spray heads (**4**).

5,531,276
FLIP-UP C-SHANK STANDARD FOR A CULTIVATOR

James T. Noonan, Johnston, and Warren L. Thompson, Elkhart, both of Iowa, assignors to Deere & Company, Moline, Ill.

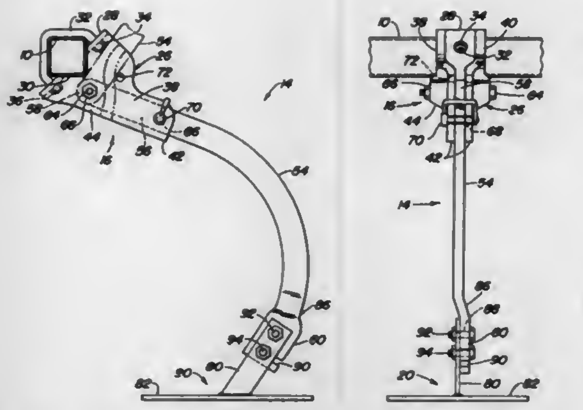
Filed Mar. 10, 1995, Ser. No. 402,271

Int. Cl.^{6} A01B *23/02;35/20*

U.S. Cl. 172—662 **16 Claims**

1. Cultivator shank structure for mounting on a tube, the shank structure adapted for forward movement over the ground and comprising;

a mounting bracket;

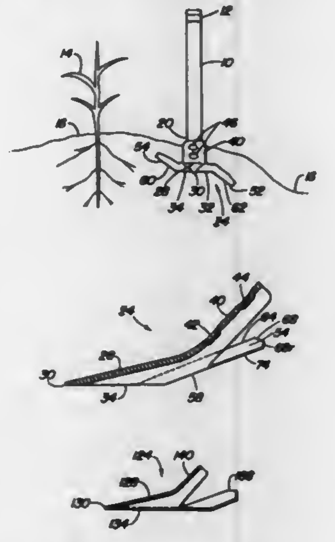


a C-shaped shank having a top portion pivotally connected to the mounting bracket for rocking about a transverse axis, the shank also including a lower tool receiving end;
the mounting bracket including a mounting portion for mating with the tube and sides generally embracing the top portion of the shank; and
releasable pin structure connected to the mounting bracket for selectively maintaining the shank in a preselected pivotal position corresponding to a working position of the shank, the pin structure when released facilitating upward pivoting of the shank about the transverse axis to a storage position wherein the lower tool receiving end is offset above the transverse axis; and
wherein the shank is edgebent to provide a narrow profile to soil while the shank is moved forwardly through the soil, and the top portion of the shank includes a widened pivot area, the mounting bracket including a forward mounting portion pivotally supporting the widened pivot area and a narrowed shank embracing portion rearwardly of the pivot area for receiving an edgebent portion of the shank and providing transverse stability to the shank.

5,531,277
BENT WING SWEEP

James T. Noonan, Johnston, and Warren L. Thompson, Elkhart, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 30, 1995, Ser. No. 413,312
Int. Cl.^{6} A01B *35/20*
U.S. Cl. 172—730 **23 Claims**

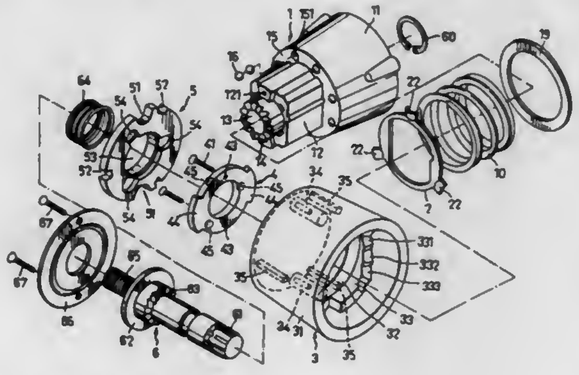


1. A cultivator sweep for row crop cultivation between rows of crops, wherein adjacent rows of crops are spaced a preselected distance apart and include plant beds that are higher than a middle area between the rows and define with the middle area a ground profile between adjacent rows of the plants, the sweep having a preselected working width and comprising:
a body having a point and a central lowermost portion, the body adapted for support by a shank with the lowermost portion being substantially horizontal;
a first wing extending outwardly from the body and adapted for working the soil around the plant bed;
wherein the first wing includes an inwardmost section generally level with the lowermost portion of the body, and an outermost portion angled upwardly from the inwardmost section about a generally straight and fore-and-aft extending bend line to generally match the ground profile of the plant bed so that the depth of the cultivation remains generally constant in the plant bed; and
wherein the first wing has a leading edge and a trailing edge, and a fore-and-aft extending line connecting a point on the leading edge with a point on the trailing edge lies at a substantially constant angle relative to a horizontal plane in both the inwardmost section and outermost portion of the first wing to provide constant soil lift along the wing.

5,531,278
POWER DRILL WITH DRILL BIT UNIT CAPABLE OF PROVIDING INTERMITTENT AXIAL IMPACT

Pi-Chu Lin, No. 157-8, Hu-Tzu-Nei, Hu-Nei Li, Chia-Yi City, Taiwan

Filed Jul. 7, 1995, Ser. No. 499,173
Int. Cl.^{6} E21C *1/12*
U.S. Cl. 173—176 **3 Claims**

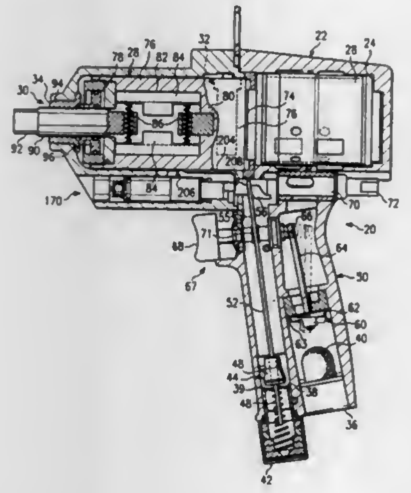


1. A power drill comprising:
a handle assembly;
a casing connected securely to said handle unit;
a drill bit unit having a bit-carrying shaft provided with a front toothed member which includes a plurality of axially extending teeth that are arranged annularly on said shaft;
a rear toothed member fixed on said casing and spaced apart from said front toothed member;
a rotatable driving unit rotating said bit-carrying shaft;
a speed reduction device interconnecting said driving unit and said shaft so that said shaft rotates at a speed smaller than that of said driving unit, said speed reduction device including a planetary gear train provided with an internal gear mounted in said casing;
a coiled compression spring pressing said internal gear against an inner wall of said casing so as to fix said internal gear in said casing; and
an adjustment member mounted rotatably on said casing in such a manner that axial movement of said adjustment member relative to said casing is prevented, said adjustment member including a circumferentially stepped portion which is arranged so as to position said compression spring between said internal gear and said stepped portion, said adjustment member being rotatable relative to said casing so as to reduce total length of said compression spring, thereby increasing push force of said compression spring toward said internal gear, and so as to interengage said front and rear toothed members, thereby urging said front toothed member and said shaft to move forward away from said rear toothed member, forward movement of said shaft away from said rear toothed member and from said casing being capable of providing an impact to a workpiece to be drilled, said compression spring providing a push action on said internal gear so as to enable rotation of said internal gear when said driving unit rotates and when said shaft cannot rotate, thereby avoiding damage to said drill.

5,531,279
SENSOR IMPULSE UNIT

Paul A. Biek, Houston, Tex., assignor to Indresco Inc., Dallas, Tex.

Filed Apr. 12, 1994, Ser. No. 226,810
Int. Cl.^{6} B25B *19/00*
U.S. Cl. 173—178 **18 Claims**

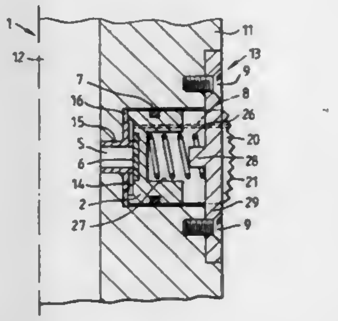


1. An impulse tool comprising:
a housing having an interior housing cavity and a plurality of openings;
a motor disposed in the interior housing cavity;
a drive means for coupling to a fastener and the drive means extending partially through one of the plurality of openings;
an fluid-filled impulse means containing an impulse fluid and disposed in the housing cavity and coupled to the motor and drive means for generating a torque urging the drive means to rotate;
a trigger means for selectively activating the motor;
a shut-off means for shutting of the tool once the shut-off means is activated;
a sensor means coupled to the impulse means for activating the shut-off means when a predetermined non-transient torque is reached; and
wherein the sensor means comprises:
  a sensor body having a sensor cavity, an entry orifice, and a first piston opening, the entry orifice in fluid communication with the impulse fluid of the impulse means;
  a ball sized to cover the entry orifice;
  a piston disposed in the sensor cavity having a first end and a second end, the first end slidably disposed in a portion of the first piston opening;
  a first spring means for developing a force urging the ball toward the entry orifice;
  a second spring means for urging the piston towards the entry orifice;
  an adjustment means for adjusting the force developed by the first spring means to select the predetermined non-transient torque; and
the first spring means urges the ball towards the entry orifice such that only when a predetermined non-transient torque is reached will the energy of the impulse fluid allowed to enter the sensor cavity be capable of moving the piston to where the piston sufficiently extends beyond an outer portion of the sensor body and triggers shut-down of the impulse tool.

5,531,280
DRILL STRING ANCHOR

Manfred Steinkamp, Westwinds, Cammachmore, Kincardine, Aberdeen AB3 2NY, Great Britain; Werner Lau, Grange Lodge, South Avenue, Cults, Aberdeen AB1 9LP, Great Britain, and Bruce McGarian, 23 East Glebe, Stonehaven, Aberdeen AB3 2HW, Great Britain

PCT No. PCT/GB93/01837, § 371 Date Jun. 14, 1995, § 102(e) Date Jun. 14, 1995, PCT Pub. No. WO94/05891, PCT Pub. Date Mar. 17, 1994
PCT Filed Aug. 31, 1993, Ser. No. 397,151
Claims priority, application United Kingdom, Sep. 2, 1992, 9218568
Int. Cl.^{6} E21B *4/18*
U.S. Cl. 175—230 **10 Claims**



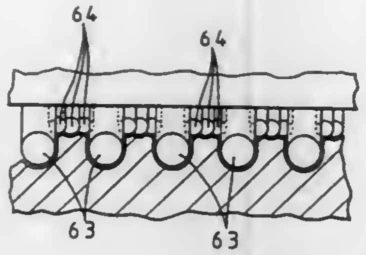
1. A drill string anchor for use in a well bore, the anchor comprising: a body (11); a through bore (12); and a plurality of anchor assemblies (13), each assembly comprising an anchor member (21), a piston (2) supported within the body, and a biasing means (3), the piston being radially movable in response to fluid pressure in the through bore between a first retracted position and a second extended position in which the piston drives the anchor member into contact with the wall of the well bore, and the biasing means acting to provide a force biasing the piston towards the first retracted position, wherein the effective area of the piston (2) which is exposed to the fluid pressure in the through bore when the piston is in the first retracted position is smaller than the effective area of the piston which is exposed to the fluid pressure in the through bore when the piston is displaced from the first retracted position.

5,531,281
ROTARY DRILLING TOOLS

Andrew D. Murdock, Stroud, England, assignor to Camco Drilling Group Ltd., Stonehouse, England

Filed Jul. 14, 1994, Ser. No. 275,145
Claims priority, application United Kingdom, Jul. 16, 1993, 9314954
Int. Cl.^{6} E21B *10/46*
U.S. Cl. 175—431 **2 Claims**

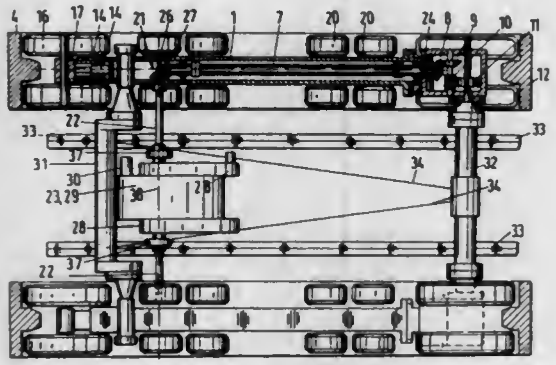
1. A rotary drilling tool comprising a tool body having a shank for connection to a drill string, a plurality of cutters mounted on the tool body and formed with cutting edges defining a cutting profile, the cutters including at least two concentric radially spaced arrays of primary preform polycrystalline diamond cutters where the cutters in each array are spaced circumferentially apart around the central axis of rotation of the tool and are so disposed radially



as to define between primary cutting edges of the two arrays an annular groove in the cutting profile, the deepest portion of said groove in the cutting profile being defined by secondary cutting edges on secondary preform polycrystalline diamond cutters located at a radial distance from the tool axis which is intermediate the radial distances from said axis of the primary cutting edges in said two cutter arrays respectively, and wherein each array includes a plurality of cutters located at different radial distances from the tool axis, the radial width of the array being determined by the width of the total path swept by the combination of cutters in the array, during one revolution.

5,531,282
ENDLESS TRACK MECHANISM

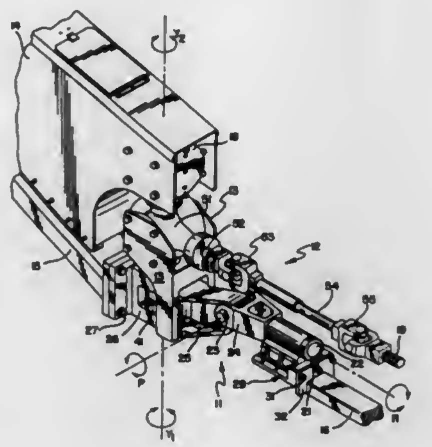
Wolfgang Jennen, Gaetersloh, Germany, assignor to Claas Ohg, Harsewinkel, Germany
Filed Oct. 7, 1994, Ser. No. 319,967
Claims priority, application Germany, Oct. 14, 1993, 43 35 657.5
Int. Cl.^{6} B62D *55/12*
U.S. Cl. 180—9.1 **8 Claims**



1. A vehicle, comprising a front axle and a rear axle; a machine drive; and an endless track mechanism comprising a plurality of endless track supports, an endless track supported by said endless track supports and having a drive wheel, an end transmission mounted at a rear end of said endless track supports for driving said drive wheel of said endless track, wherein each of said endless track supports has a closed hollow profile provided with mounting and service openings and non-rotatably connected in the region of its front end portion with the front axle, and also through said end transmission which is mounted on an opposite end with the rear axle, an input transmission connected at a drive side with said machine drive, said input transmission and said hollow shaft which transmits a drive movement being arranged in said hollow profile of each of said endless track supports, and bearings each provided in said input transmission and said end transmission, said hollow shaft being supported at an end side in said bearings, said input transmission including a bevel wheel set and a combined transmission; and a combined transmission including a switching transmission and two steering differential transmissions arranged in separate transmission housing and provided with service and parking brakes arranged on a drive shaft, said hinged shaft being mounted on said combined transmission.

5,531,283
DRIVETRAIN AND LOAD BEARING SWIVEL HITCH ASSEMBY AND COMBINE INCORPORATING SAME

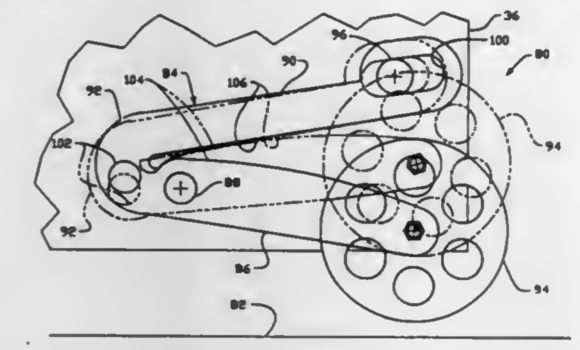
Gregg A. Austin, and Gary E. Coppock, both of Selma, Ala., assignors to Bush Hog Corporation, Selma, Ala.
Continuation of Ser. No. 98,135, Jul. 28, 1993, Pat. No. 5,355,971. This application Aug. 29, 1994, Ser. No. 297,602
Int. Cl.^{6} B60K *17/28*
U.S. Cl. 180—53.1 **30 Claims**



1. A combination comprising:
a pulling vehicle having a drawbar;
an agricultural implement combine having a frame component and a swivel hitch and drivetrain apparatus which includes:
  a load bearing swivel hitch assembly which operatively connects the frame component of the combine directly to the drawbar of the pulling vehicle and avoids attachment to the pulling vehicle through a three-point hitch and attendant change in operating angle of the combine, the combine having a draft and tongue load which is transferred to the drawbar of the pulling vehicle through the load bearing swivel hitch assembly, the load bearing swivel hitch assembly having three separate axes of rotation, one axis of said axes of rotation being generally coaxial with the drawbar of the pulling vehicle, another axis of said axes of rotation being generally horizontal and transverse to said one axis, the other axis of said axes of rotation being generally vertical and transverse to said one axis, and a tongue extension rotates with respect to a tongue clevis along said other axis;
  a drivetrain assembly having a swivel gearbox with a generally vertical rotation and drive axis parallel to said generally vertical other axis of rotation of the load bearing swivel hitch assembly, said drivetrain assembly also having a generally horizontal drive shaft assembly that is in driven connection between the pulling vehicle and said swivel gearbox, said drive shaft assembly having a substantially parallel relationship with respect to the drawbar of the pulling vehicle, which relationship remains constant during vertical movement of the pulling vehicle and combine with respect to each other; and
  a torque arm that is in operative engagement with both said tongue extension of the load bearing swivel hitch assembly and said swivel gearbox of the drivetrain assembly, whereby said tongue extension and swivel gearbox rotate substantially together with each other; and
said swivel hitch assembly allows freedom of rotation of any one of said three separate axes while rigidly restricting rotation along the other two of said three separate axes.

5,531,284
POWERED WHEELCHAIR WITH A DETACHABLE POWER DRIVE ASSEMBLY

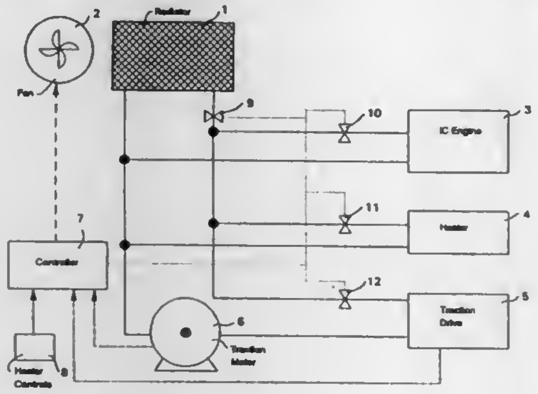
James Okamoto, Clovis, Calif., assignor to Quickie Designs Inc., Fresno, Calif.
Division of Ser. No. 892,276, Jun. 2, 1992, Pat. No. 5,351,774. This application Oct. 3, 1994, Ser. No. 316,931
Int. Cl.^{6} B60K *1/00*
U.S. Cl. 180—65.1 **32 Claims**



1. An anti-tip suspension for a wheelchair having a frame, said anti-tip suspension comprising:
  a mounting device;
  a ground engaging device; and
  a unitary molded suspension arm assembly pivotally mounted to said frame through said mounting device, and having a first arm portion extending away from said mounting device, said ground engaging device being mounted on said first arm portion at a spaced distance from said mounting device, said arm assembly further including a pivotal motion resisting portion resiliently coupled to said first arm portion as a unitary member for resisting pivoting of said first arm portion about said mounting while enabling substantial resilient deflection of said group engaging device when said wheelchair is tipped by an amount sufficient to cause said ground engaging device to contact the ground.

5,531,285
VEHICLE COOLING SYSTEM

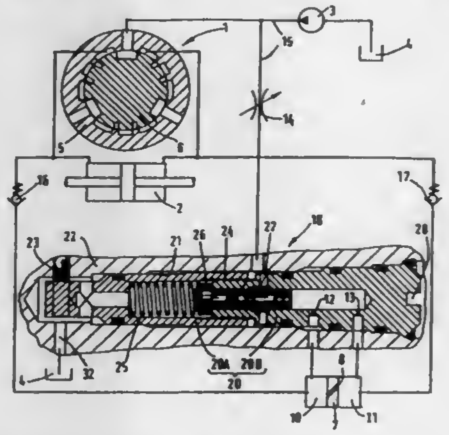
Ross M. Green, Cambridge, United Kingdom, assignor to Wavedriver Limited, Melbourn Royston, United Kingdom
Filed Jan. 28, 1994, Ser. No. 182,100
Claims priority, application United Kingdom, Aug. 1, 1991, 9116661
Int. Cl.^{6} B60K *6/02;11/02*
U.S. Cl. 180—65.2 **6 Claims**



1. An electric-hybrid vehicle, comprising:
a main electric drive, including an electric motor for driving the vehicle and a power supply therefor;
an auxiliary internal combustion engine drive for driving the vehicle; and
an integrated liquid cooling/heating system connecting the electric drive power supply and the auxiliary internal combustion engine, for removing heat from the electric drive power supply, and for supplying the heat removed by said integrated liquid cooling/heating system, to the auxiliary internal combustion engine in order to pre-heat the engine.

5,531,286
ASSISTED STEERING MECHANISM, IN PARTICULAR FOR MOTOR VEHICLES

Hans-Werner Majer; Jörgen Schöffel, both of Schwäbisch Gmünd, and Rainer Schänzel, Essingen, all of, Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany
PCT No. PCT/EP93/01170, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO93/23277, PCT Pub. Date Nov. 25, 1993
PCT Filed May 12, 1993, Ser. No. 335,813
Claims priority, application Germany, May 15, 1992, 42 16 053.7
Int. Cl.^{6} B62D *5/08;5/083*
U.S. Cl. 180—441 **6 Claims**

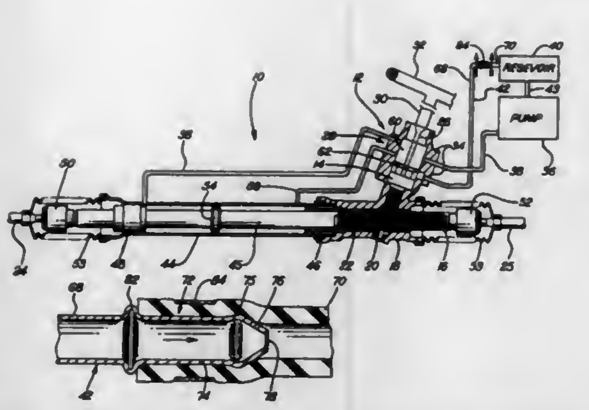


1. Auxiliary power steering, especially for motor vehicles, with a control valve which is a rotary slide valve for controlling a pressure medium conveyed via a pressure line by a servopump from a tank to and from working chambers of a servomotor,
  wherein the control valve includes two feedback chambers each of which is connected via a fixed throttle and via a common throttle to the pressure line of the servopump and
  where a feedback pressure, effective in the feedback chambers, can be limited to a maximum value by at least one cutoff valve,
characterized in that
  the cutoff valve is made as a pressure balance with a pick-up pressure that can be set without dismantling the valve and
  the cutoff valve is inserted in the pressure line of the servopump between the servopump and the feedback chambers.

5,531,287
POWER STEERING SYSTEM WITH VIBRATION AND NOISE SUPPRESSION

Howard M. Sherman, Clarkston, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.
Filed Mar. 27, 1995, Ser. No. 411,025
Int. Cl.^{6} B62D *5/06*
U.S. Cl. 180—417 **8 Claims**

1. A power steering system comprising steering gear having a pinion adapted to be rotated by the steering wheel of an automotive



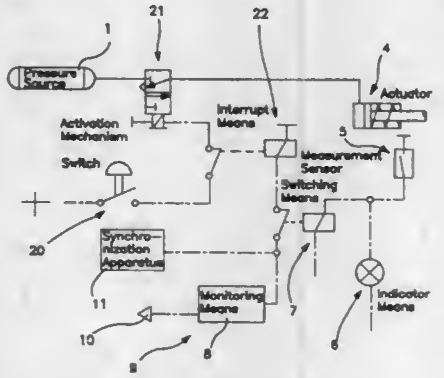
vehicle, a rack meshing with said pinion whereby the rotation of said pinion is converted to linear travel of said rack, a power assist for said rack comprising a hydraulic cylinder, a piston reciprocable in said cylinder operatively connected to said rack, first and second fluid lines communicating with said cylinder at opposite sides respectively of said piston, a control valve for directing hydraulic fluid to said cylinder selectively through said first and second fluid lines, a source of hydraulic fluid under pressure, a pressure line from said source of hydraulic fluid to said control valve to deliver fluid under pressure to said control valve, and a return line from said control valve to said source of hydraulic fluid for the return flow of hydraulic fluid to said source,

characterized in the provision of anti-rattle means for suppressing the transmission through the steering gear to the steering wheel of vibrations and noise due to irregularities in the road travelled by the vehicle, said anti-rate means comprising a restriction structure having an orifice of reduced area relative to the cross-sectional area of the return line,

said restriction comprising a tubular formation in said return line, said tubular formation having a cylindrical wall formed with a portion tapering radially inwardly in the direction of return flow to said source of hydraulic fluid and forming the orifice of reduced internal cross-section relative to said cylindrical wall.

5,531,288
DIFFERENTIAL PAWL ACTIVATION APPARATUS

Horst Deike, Clauen, and Erwin Petersen, Wunstorf, both of, Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Germany
Continuation of Ser. No. 261,546, Oct. 24, 1988, abandoned, which is a division of Ser. No. 940,704, Dec. 11, 1986, Pat. No. 4,805,715. This application Jul. 28, 1992, Ser. No. 921,319
Claims priority, application Germany, Dec. 12, 1985, 35 48 894.0
Int. Cl.⁶ B60K *23/04*
U.S. Cl. 180—197 **26 Claims**

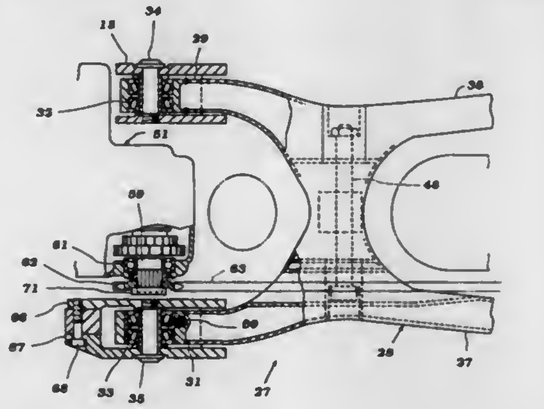


1. An activation apparatus for a differential pawl, said differential pawl being capable of rotating at least two drive wheels in a motor vehicle which can rotate independently of one another in synchronization, said activation apparatus having an actuator which can be pressurized at least in an engagement direction of said differential pawl and an activation mechanism which controls its connection in such engagement direction with a fluid pressure source, said activation mechanism opening said connection when electrically activated by a driver-controlled power circuit connected to said activation mechanism, said activation apparatus comprising:

(a) a monitoring means positioned on such motor vehicle for monitoring slip of at least one drive wheel, and for emitting a wheel-slip signal when said at least one drive wheel slips;
(b) an interrupt means connected to receive said wheel-slip signal which is able to interrupt, during a presence of said wheel-slip signal, said driver-controlled power circuit; and
(c) a disabling means connected to said interrupt means for disabling said interrupt means from interrupting said driver-controlled power circuit independently of said wheel-slip signal when said differential pawl is in an engaged position.

5,531,289
REAR ARM PIVOT STRUCTURE FOR MOTORCYCLE

Takayoshi Muramatsu, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Continuation of Ser. No. 124,841, Sep. 21, 1993, abandoned, which is a continuation of Ser. No. 773,514, Oct. 9, 1991, abandoned. This application Mar. 10, 1995, Ser. No. 401,659
Int. Cl.⁶ B62K *11/02*
U.S. Cl. 180—227 **11 Claims**

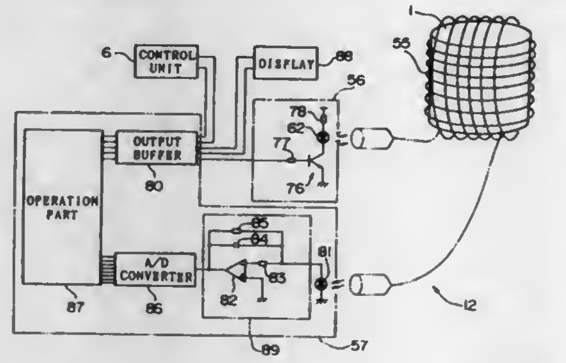


1. A motorcycle construction comprised of a frame assembly comprising a head pipe and a pair of main frame members fixed at their front ends to said head pipe, each of said main frame members extending generally downwardly and rearwardly from said head pipe in a direction longitudinally of said motorcycle in a line defining a respective center line inclined from the vertical and horizontal in a side elevation, a front fork rotatably journaling a front wheel and suspending said front wheel for suspension movement, said front wheel fork being dirigibly supported by said head pipe, at least one of said main frame members having means defining a pivot axis at its rear lower end lying substantially on said center lines both in side and in top views, a trailing arm having a front part lying on said center lines, nested within said one main frame member and pivotally journaled on said pivot axis, said trailing arm having a triangular configuration in side elevation, a suspension element carried by said frame assembly, a link pivotally connected 1o said trailing arm where said trailing arm has its greatest height in side elevation and to said suspension element for loading said suspension element upon pivotal movement of said trailing arm relative to said frame assembly, a rear wheel rotatably journaled by said trailing arm, a seat carried by said main frame members, a power means for driving said rear wheel suspended from said main frame members including a flexible transmitter driven by a driving sprocket positioned inboard of said trailing arm front part and rotatable about an axis of rotation substantially parallel to said pivot axis, and means for accessing

said driving sprocket through the trailing arm front part for removal of said driving sprocket and said flexible transmitter.

5,531,290
SAFETY APPARATUS FOR FUEL TANK

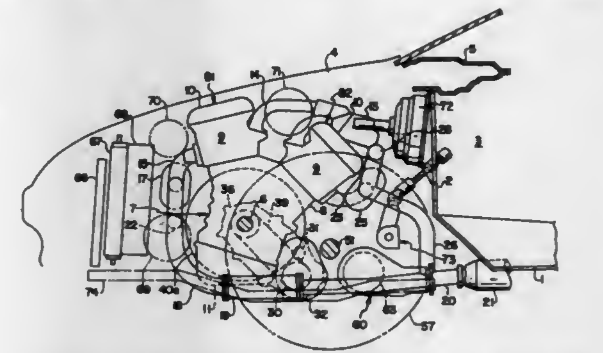
Kenji Furuichi, Tokyo, and Moritaka Gotoh, Chiba, both of, Japan, assignors to Fujikura Ltd., Tokyo, Japan
Filed Aug. 9, 1993, Ser. No. 103,525
Claims priority, application Japan, Aug. 10, 1992, 4-213041; Aug. 10, 1992, 4-213042; Dec. 16, 1992, 4-336409
Int. Cl.⁶ B60K *28/10;* **B60R** *21/00*
U.S. Cl. 180—271 **11 Claims**



1. A safety apparatus for a fuel tank in a vehicle comprising:
a fuel tank for storing fuel;
a gelling agent tank for storing a gelling agent which can gelatinize the fuel;
a supply system, connected between the gelling agent tank and the fuel tank, for supplying the gelling agent in the gelling agent tank to the fuel tank;
tank-emergency detecting means, coupled to the fuel tank, for detecting an emergency in the fuel tank and for outputting an emergency detection signal indicating said emergency;
a control means, coupled to the supply system and the tank emergency detecting system, for outputting a drive signal to drive the supply system;
wherein the control means outputs the drive signal under the condition that the tank-emergency detecting means outputs the emergency detection signal,
wherein the tank-emergency detecting means comprises:
an optical fiber provided on one of the fuel tank and a component that is attached to the fuel tank,
a light supply means, coupled to the optical fiber, for supplying a predetermined quantity of light to the optical fiber, and
a light quantity detecting means, coupled to the optical fiber, for detecting the quantity of the light which was transmitted from the light supply means through the optical fiber;
wherein the emergency detecting means compares change of the quantity of the light which is transmitted through the optical fiber when no large external force is applied to the fuel tank to change of the quantity of the light which is transmitted through the optical fiber when a large external force is present on the fuel tank and detects an emergency in the fuel tank on the basis of the results of the comparison; and said safety apparatus further comprising
a plurality of emergency detection means, including
(1) a temperature-emergency detection means for detecting temperature in the fuel tank and outputting an emergency detection signal when the temperature in the fuel tank exceeds a predetermined threshold value of temperature; and
(2) an acceleration-emergency detection means for detecting acceleration and outputting an emergency detection signal when the acceleration exceeds a predetermined threshold value of acceleration; and
wherein the control means outputs the drive signal, under the condition that at least one of the plurality of emergency detection means outputs an emergency detection signal.

5,531,291
POWER PLANT FOR AUTOMOBILE

Motoharu Sato, Hiroshima-ken, and Masaya Watanabe, Yokohama, both of, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan
Filed Jul. 21, 1993, Ser. No. 135,181
Claims priority, application Japan, Jul. 24, 1992, 4-218253
Int. Cl.⁶ B10K *5/04*
U.S. Cl. 180—297 **8 Claims**

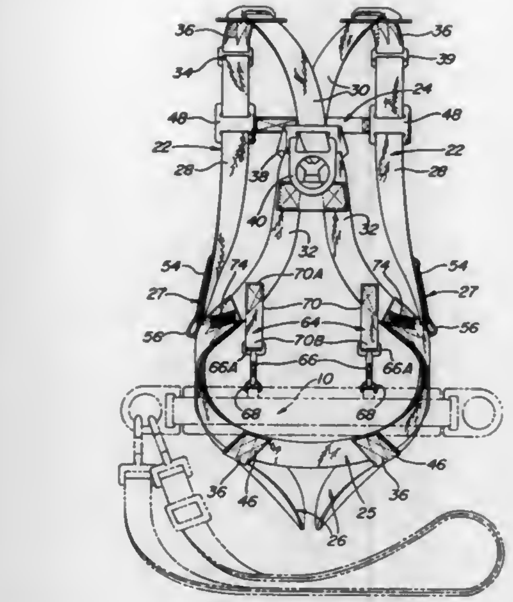


1. In a power plant for transmitting engine torque to drive shafts for drive wheels, the improvement comprising:
an engine with a crankshaft, mounted so as to orient an axis of the crankshaft transversely in an engine compartment, for providing torque;
a differential, disposed behind the engine, for driving the drive shafts differentially about axes parallel to said axis of the crankshaft; and
a transmission, including an input shaft, a primary output shaft and a counter output shaft, for multiplying engine torque and transmitting it to the differential, said transmission being mounted so that (1) the primary output shaft and the counter output shaft thereof extend along axes disposed transversely between the axis of the crankshaft and the axes parallel to said axis of the crankshaft and (2) the axis along which the primary output shaft extends is disposed below said axis of the crankshaft and the axes parallel to the axis of the crankshaft so as to place said input shaft, said primary output shaft and said counter output shaft of the transmission in parallel with the axis of the crankshaft.

5,531,292
HARNESS WITH ADJUSTABLE MEANS FOR SUPPORTING A TOOL BELT

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976
Filed Aug. 19, 1994, Ser. No. 292,906
Int. Cl.⁶ A62B *1/06*
U.S. Cl. 182—3 **7 Claims**

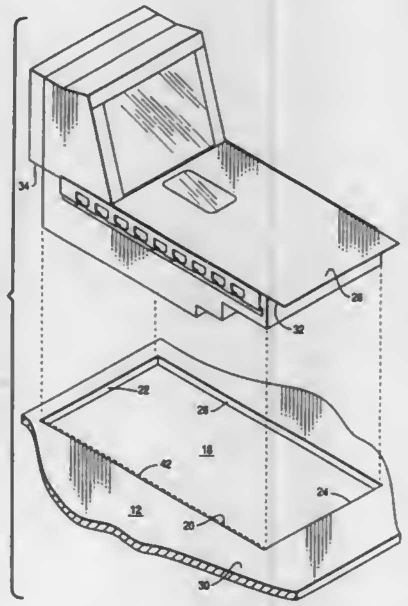
1. A harnesses for protecting a worker from a fall off of an elevated structure, said harness being formed of a flexible material to be worn by the worker for supporting a tool belt therefrom, said harness comprising a pair of leg straps, a pair of upper torso straps, and four belt suspenders, each of said leg straps being arranged for extending about a respective leg of the person, each of said upper torso straps including a chest strap portion and a back strap portion, with said chest strap portions extending across respective portions of the chest of the person, and with said back strap portions extending across respective portions of the back of the person, two of said belt suspenders being mounted on respective ones of said back strap portions of said pair of upper torso straps to form a right rear belt suspender and a left rear belt suspender and the other two of said belt suspenders being mounted on respective ones of said chest strap portions of said pair of upper torso straps to form a right front belt suspender and a left front belt suspender, each of said belt suspenders comprising connector means, said connector means being arranged to connect to respective portions of the tool belt to suspend the tool belt from said harness, one of said upper torso straps being adjustable in length to enable the



portions of the tool belt suspended by the one front belt suspender and the one rear belt suspender mounted on said one of said upper torso straps to be raised or lowered together by the adjustment of the length of said one of said upper torso straps, the other of said upper torso straps being adjustable in length to enable the portions of the tool belt suspended by the other front belt suspender and the other rear belt suspender mounted on said other of said upper torso straps to be raised or lowered together by the adjustment of the length of said other upper torso strap.

5,531,293
CHECKOUT COUNTER GAP FILLER

Rathindra Nahar, Duluth, Ga., assignor to AT&T Global Information Solutions Company, Dayton, Ohio
Filed Jul. 15, 1994, Ser. No. 275,866
Int. Cl.^{6} A47F *9/04*
U.S. Cl. 186—59 **10 Claims**

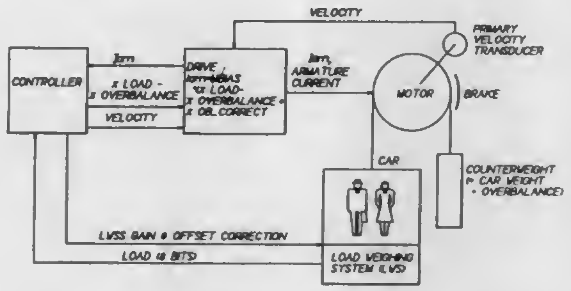


1. A device for filling a gap between a checkout counter and an optical scanner, which is mounted within an aperture within the checkout counter, the device comprising:

a rail member having an aperture through which liquids may pass, but having a size small enough to prevent money from passing, including an upper vertical portion adjacent the checkout counter and having top and bottom edges, a lower vertical portion adjacent the scanner and having top and bottom edges, and a horizontal shelf section linking the bottom edge of the upper vertical portion with the top edge of the lower vertical portion.

5,531,294
BIAS TORQUE FOR ELEVATOR HOIST DRIVE TO AVOID ROLLBACK, ROLLFORWARD

Douglas Burton, Unionville, and Eric K. Jamieson, Farmington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.
Continuation of Ser. No. 27,208, Mar. 4, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 313,943
Int. Cl.^{6} B66B *1/44;1/34*
U.S. Cl. 187—292 **3 Claims**


VELOCITY
PRIMARY VELOCITY TRANSDUCER
CONTROLLER
Iarm
% LOAD - % OVERBALANCE
VELOCITY
DRIVE, Iarm=MBIAS *(% LOAD- % OVERBALANCE + % OBLCORRECT
Iarm, ARMATURE CURRENT
MOTOR
BRAKE
CAR
COUNTERWEIGHT (= CAR WEIGHT + OVERBALANCE)
LVSS GAIN & OFFSET CORRECTION
LOAD (8 BITS)
LOAD WEIGHING SYSTEM (LVS)

1. A method of operating an elevator car within a hoistway in a succession of operating runs to service passengers, said car having a drive system including a counterweight, a brake and an electric motor with an armature, said car having a load weighing system, comprising:

initially:

providing pre-torque armature current to said motor to balance the torque in said drive system to achieve zero car velocity with said car empty and said brake released and providing an $I_{ARM}0$ signal indicative thereof;

providing pre-torque armature current to said motor to balance the torque in said drive system to achieve zero car velocity with said car carrying a full load and said brake released and providing an $I_{ARM}1$ signal indicative thereof;

calculating a pre-torque armature current gain in response to the difference between the current indicated by said $I_{ARM}1$ signal and the current indicated by said $I_{ARM}0$ signal and providing an MBIAS signal indicative thereof;

providing a % OVERBALANCE signal which approximates the amount by which the weight of said counterweight exceeds the weight of said car; and

providing a % OBCORRECT signal indicative of the difference between the actual amount by which the weight of said counterweight exceeds the weight of said car and the amount indicated by said % OVERBALANCE signal as the ratio of current indicated by said $I_{ARM}0$ signal to the gain indicated by said MBIAS signal, summed with said amount indicated by said % OVERBALANCE signal;

then, in conjunction with each operating run of the car:

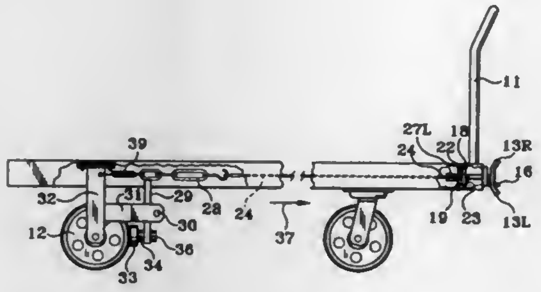
providing a signal, % LOAD, indicative of the load in said car as determined by said load weighing system; and

providing pre-torque armature current, I_{ARM}, to said motor, to balance the torque in said drive system to achieve zero car velocity with said brake released at the start of each run, the magnitude of which is

$$I_{ARM}=MBIAS*(\%\ LOAD-\%\ OVERBALANCE+\%\ OBCORRECT).$$

5,531,295
PARKING BRAKE FOR HAND TRUCK

Matthew W. Kopman, Hazel, and Glenn A. Sorlien, Watertown, both of S. Dak., assignors to FKI Industries, Inc., Fairfield, Conn.
Filed Mar. 14, 1995, Ser. No. 403,396
Int. Cl.^{6} B60T *1/00*
U.S. Cl. 188—21 **6 Claims**



1. In a braking system for a hand truck having four wheels and a frame supported by the wheels, the improvement comprising:

brake pads engageable with two of the wheels:

levers pivotally mounted to the frame, each of the levers having one or the other of the pads near one end of the lever,

return springs each having one end connected to the frame and another end connected to one or the other of the levers, the return springs normally biasing the pads away from the wheels,

a rocker shaft mounted to the frame,

crank arms extending out from the rocker shaft and having distal ends,

links, each having one end connected to the distal end of one or the other of the crank arms:

cables coupled to the links and the brake levers and maintaining the return springs constantly in tension;

a stop on the frame; and

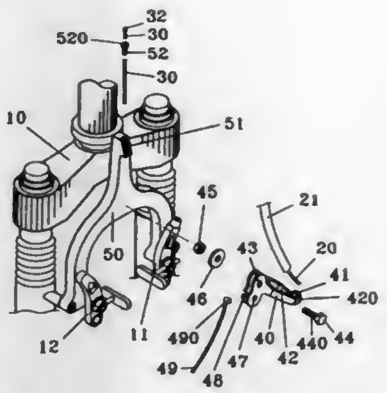
a pedal to the rocker shaft and movable against the stop to limit turning of the rocker shaft through an angle between a brake-engaged position and a brake disengaged position,

one of the positions limiting movement of the brake pads away from the wheels by the return springs, and

the other of the positions limiting movement of the pedal in a brake pad to wheel engaging direction.

5,531,296
BRAKE CONTROL MECHANISM FOR A BICYCLE

Robert Z. Liu, No. 9, Alley 62, Lane 168, Feng Dong Road, Feng Yuan City, Taichung County, Taiwan
Filed Apr. 4, 1995, Ser. No. 416,356
Int. Cl.^{6} B62L *1/14*
U.S. Cl. 188—24.21 **2 Claims**



1. A brake mechanism for coupling to a bicycle frame comprising:

a pair of brake arms for pivotal coupling to the bicycle frame,

a coupler including an opening formed therein and including a first end having a ring formed therein, said ring including a puncture communicating with said opening, said coupler including a middle portion and a second end,

a first cable means for coupling said middle portion of said coupler to the bicycle frame,

a second cable means coupling a first of said brake arms to said second end of said coupler,

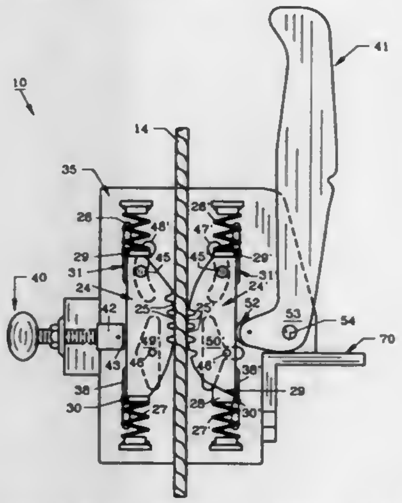
a sleeve including a first end engaged in said opening of said coupler and engaged with said ring, and

a third cable means engaged in said sleeve and including a first end engaged through said puncture of said ring and secured to a second of said brake arms,

said brake arms being operated and actuated when said second brake arm is pulled toward said coupler relatively by said third cable means.

5,531,297
ROPE LOCKING DEVICE

Gregory F. Pipan, Greensboro, N.C., assignor to Harris-Johnson Industries, Inc., Greensboro, N.C.
Filed Feb. 17, 1995, Ser. No. 390,033
Int. Cl.^{6} B65H *59/16;* **F16G** *11/00*
U.S. Cl. 188—65.1 **12 Claims**

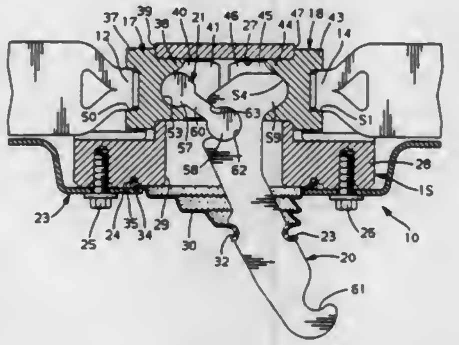


1. A rope locking device comprising: a housing, first and second opposing jaws, said jaws each having a top and a bottom, said jaws contained within said housing for engaging a rope passing therebetween, a means to adjust the tension of said jaws against the rope, said tension adjusting means positioned on said housing and in contact with said first jaw, a rope release handle, said release handle pivotally mounted on said housing to close said jaws, a first resilient member, said first resilient member contiguous to the top of said first jaw, and a second resilient member, said second resilient member in vertical alignment with said first resilient member, said second resilient member contiguous to the bottom of said first jaw.

5,531,298
BRAKE ACTUATOR

Frank W. Brooks, Sr., Dayton; Michael W. Fanelli; Ralph A. Gordon, both of Centerville; Douglas D. Willibey, West Carrollton; Jeremy H. Olson, Springfield, and Donald E. Holmes, Greenville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1995, Ser. No. 411,375
Int. Cl.^{6} F16D *51/00*
U.S. Cl. 188—78 **4 Claims**

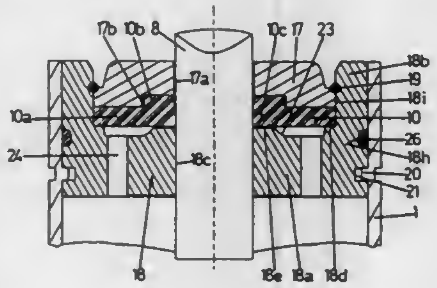


1. A brake actuator for positioning between two brake shoe ends comprising:
- an anchor having a mounting flange with an opening and having a bore oriented substantially perpendicular to the opening;
- a first piston having a first slot with a first socket slidably carried in the bore and engaging one brake shoe end;
- a second piston having a second slot with a second socket carried in the bore and engaging the other brake shoe end;
- a lever having a third socket, extending through the opening of the anchor, engaging the first piston in the first socket and having a stop; and
- a reversible strut having a first cylindrical segment engaging the second piston in the second socket and having a second cylindrical segment engaging the lever in the third socket the first and second cylindrical segments connected by a neck which is engageable by the stop of the lever.

5,531,299
ONE-PIECE OBTURATOR DEVICE WITH LUBRICATED CENTERING GUIDE FOR PRESSURIZED HYDRAULIC DAMPER TUBES

Alain Bataille, Paris, France, assignor to Societe Francaise Des Amortisseurs de Carbon, Du Vauvray, France

Filed Aug. 1, 1994, Ser. No. 283,626
Claims priority, application France, Aug. 6, 1993, 93 09743; Apr. 6, 1994, 94 04026
Int. Cl.^{6} F16F *9/36*
U.S. Cl. 188—322.17 **31 Claims**

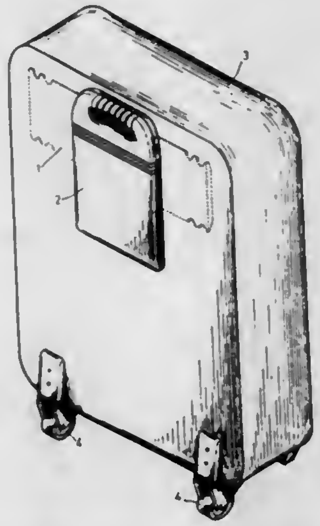


1. An obturator device for use with a pressurised hydraulic damper tube (1) of a single-tube type in which damper tube slides a piston (7) having an axial piston rod (8), said obturator device comprising: a plug (17), a seal (10), an expansion abutment member (11, 18) and fixing means (19 to 22) for fixing said obturator device in the tube, and said expansion abutment member comprising a cylindrical guide (18) having a guide base (18*a*) and an axial peripheral wall (18*b*) defining a circular housing for supporting and, with an interior surface of said axial peripheral wall, centering said seal and said plug, said guide base having a central opening (18*c*) to guide axial movement of the piston rod (8) and one or more perforations (24) to enable communication of damper fluid between an expansion volume defined by said seal and said base and an inside of the tube, and in that said plug (17) has a central opening (17*a*) through which the piston rod extends with said center opening having a diameter greater than a diameter of the piston rod of the tube to define a radial clearance for preventing mechanical contact between said plug and the piston rod during movement between the piston and damper tube, said plug having a circular housing (17*b*) around its central opening to receive part of said seal sandwiched between said plug and said cylinderical guide and said seal defining a central opening through which the piston rod extends.

5,531,300
RETRACTABLE HANDLE ASSEMBLY FOR A SUITCASE

James Tsai, 103, Ta Ming 1 Rd., Tung Pao Tsun, Tan Tzu Hsiang, Taichung Hsien, Taiwan

Filed Nov. 15, 1994, Ser. No. 340,892
Int. Cl.^{6} A45C *5/14;13/26*
U.S. Cl. 190—115 **2 Claims**

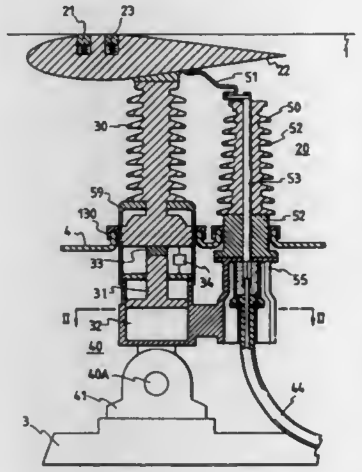


1. A retractable handle assembly for a suitcase comprising:
- (a) a handle including at least one slide slot having an upper stopping post and a lower stopping post, at least one slide rail secured to the slide slot and a recess;
- (b) a positioning bracket for attachment to a side of a suitcase opposite a pair of rollers at a bottom of the suitcase, the positioning bracket including a spring insert and at least one positioning member secured thereto;
- (c) the positioning member including a spring clip positioned for slidably engaging with the slide rail and a block positioned for slidably engaging with the slide slot;
- (d) the handle being slidable relative to the positioning bracket between a position of full retraction wherein the spring clip engages the upper stopping post for securing the handle in the position of full retraction and a position of full extension wherein the positioning member engages the lower stopping post for limiting the degree of full extension and the spring insert being positioned for engaging the recess of the handle and securing the handle in the position of full extension; and
- (e) wherein the handle is released from the position of full retraction by pulling same outwardly of the positioning bracket and released from the position of full extension by pushing the handle inwardly of the positioning bracket.

5,531,301
HIGH SPEED LOW NOISE CURRENT COLLECTING EQUIPMENT AND METHOD ON COLLECTING CURRENT

Toshiaki Makino; Katsuyuki Terada; Michio Sebata; Morishige Hattori, all of Kudamatsu; Hideo Takai, Hikari; Toshi Yasui, Kudamatsu; Masabumi Oshima, Hitachi; Akiyoshi Iida, Mitsukaido; Yasushi Takano, Chiyoda-machi; Chisachi Katoo, Ami-machi, and Kenji Kobayashi, Chiyoda-machi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,280
Claims priority, application Japan, Dec. 28, 1992, 4-347955; Feb. 16, 1993, 5-026500; Apr. 26, 1993, 5-099822
Int. Cl.^{6} B60L *5/08;5/16;5/28*
U.S. Cl. 191—55 **31 Claims**



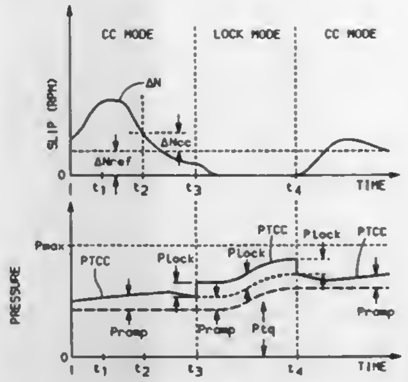
1. A current collector comprising: a current collecting member, a driving system to move said current collecting member relative to a current supplying body, and a conductive element coupled to said current collecting member to conduct electric power collected by said current collecting member from said current supplying body to a load, wherein said current collecting member is coupled to said driving system through a first insulating element, and further comprising a sensor for controlling said driving system positioned between said driving system and said first insulating element.

5,531,302
CONTROLLED CAPACITY TORQUE CONVERTER CLUTCH LOCK-UP TRANSITION CONTROL

Melissa M. Koenig, Ann Arbor, and William J. Vukovich, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1994, Ser. No. 300,261
Int. Cl.^{6} F16H *45/02;* **B60K** *41/02*
U.S. Cl. 192—3.3 **10 Claims**

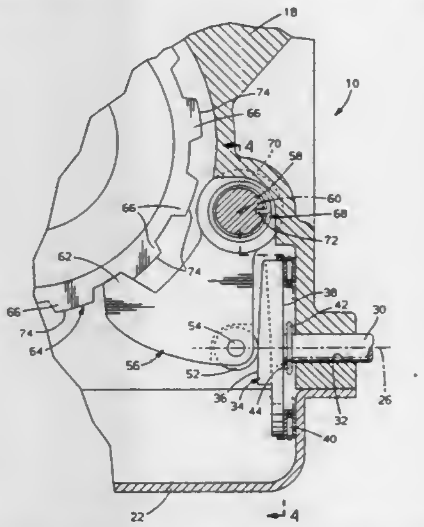
1. In a motor vehicle including a torque converter adapted to receive engine torque through an input member thereof and to supply torque to the vehicle drivetrain through an output member thereof, a clutch mechanism connected between the input and output members of said torque converter, the clutch mechanism being operative when fully engaged in a lock mode to prevent slip between such input and output members to thereby provide torque capacity at least as great as the engine torque, and when less than fully engaged in a controlled capacity mode to permit slip between such input and output members to thereby provide torque capacity less than the engine torque, and a clutch actuating mechanism for controlling the torque capacity of said clutch according to the net fluid pressure in a control chamber thereof, a method of operating said clutch mechanism so as to avoid perceptible transitions between the lock and controlled capacity modes, comprising the steps of:
- during controlled capacity mode operation, varying the net fluid pressure in said control chamber in response to torque converter slip deviation from a reference slip;
- at the onset of lock mode operation from controlled capacity mode operation, suspending further variance of the net fluid pressure in response to torque converter slip deviation from the reference slip and adding thereto a predetermined lock mode fluid pressure step to establish an initial net fluid pressure in the lock mode; and,
- at the onset of controlled capacity mode operation from said lock mode operation, reducing the net fluid pressure by the lock mode fluid pressure step to establish an initial net fluid pressure in the controlled capacity mode.



5,531,303
TORQUE MECHANISM FOR A POWER TRANSMISSION

James A. Raszkowski, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1994, Ser. No. 340,970
Int. Cl.^{6} B60K *41/26;* **B60T** *1/06;* **G05G** *5/18*
U.S. Cl. 192—4 A **2 Claims**



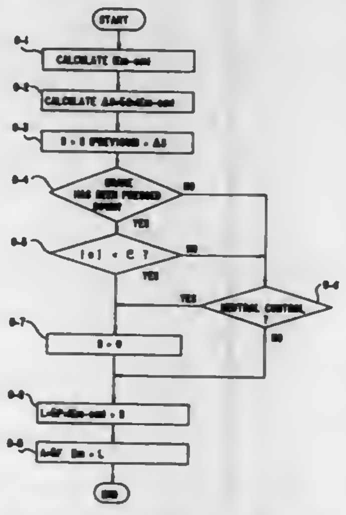
1. A park lock mechanism for a power transmission comprising:
- a transmission output shaft having an axis;
- a gear member continuously rotatable with the output shaft;
- a pawl;
- means for mounting the pawl on an axis substantially parallel with the axis of the gear member;
- a cam having an axial face engaging a portion of the pawl;
- control means for mounting and for rotating the cam to enforce pivoting of the pawl for controlled engagement of the pawl

with the gear member, said control means comprising an operator rotatable control shaft having a longitudinal axis disposed in a plane orthogonal to a plane containing the axis of the output shaft, and a spring drivingly connected between the control shaft and the cam for transmitting torque from the shaft to the cam and for providing lost motion means for permitting relative rotary movement between the cam and the control shaft during engagement of the pawl and gear member if the pawl abuts an outer tooth surface of the gear member.

5,531,304
CREEP PREVENTING CONTROL SYSTEM FOR HYDROSTATIC-MECHANICAL TRANSMISSIONS

Tsutomu Ishino, Osaka; Ryoichi Maruyama, Kanagawa; Hiroshi Nakagami, and Hisao Asada, both of Osaka, all of, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,690
Claims priority, application Japan, Feb. 18, 1994, 6-021575
Int. Cl.^{6} B60K *41/26;* **F16H** *47/04;59/46;61/20*
U.S. Cl. 192—4 R **4 Claims**



1. A creep preventing control system for a hydrostatic-mechanical transmission which is equipped with a mechanical transmission unit actuated through an input shaft connectable to a power source; a hydrostatic transmission unit which is connectable to the input shaft and comprises a pump and a motor having their respective discharge controlling swash plates, the angle of at least either of the swash plates being variable; and a differential unit for actuating both the mechanical transmission unit and the hydrostatic transmission unit by connecting an output shaft thereto,

wherein a target motor speed ratio which is a target value for the ratio of the revolution speed of the motor in the hydrostatic transmission unit to the revolution speed of the power source is set in accordance with the operational state of the power source, and the angle of at least either of the discharge controlling swash plates is controlled based on an operation amount which is the sum of a feedforward amount proportional to the set target motor speed ratio and a feedback amount comprising the proportional component and integral component of the difference between an actual motor speed ratio and the target motor speed ratio,

the system comprising:

(a) stop operation detecting means for detecting execution of operation for stopping the vehicle which is in a running state;

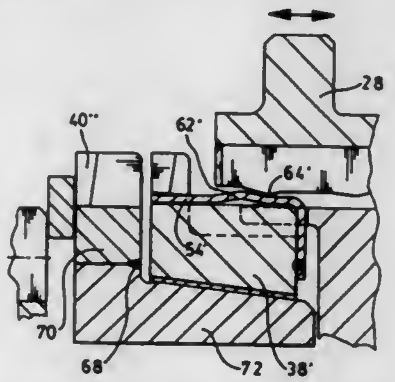
(b) speed ratio detecting means for detecting a drop in an actual speed ratio below a predetermined value, the actual speed ratio being the actual ratio of the revolution speed of the output shaft to the revolution speed of the power source; and

(c) operation amount computing means for computing the operation amount for the angular control of the discharge controlling swash plate with the integral component of the feedback amount set to zero, upon detection of execution of operation for stopping the running vehicle and of a drop in the actual speed ratio below the predetermined value by the stop operation detecting means and the speed ratio detecting means.

5,531,305
SYNCHRONIZER CLUTCH ASSEMBLY FOR MULTIPLE RATIO GEARING

Keith Roberts, Maesteg; Christopher D. Thomas, Swansea; James L. Lamin, Bridgend; Gary L Skipper, Swansea, and Jonathan G. Larsen, Bridgend, all of, Wales, assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 147,618, Nov. 5, 1993, abandoned. This application Jul. 26, 1994, Ser. No. 278,860
Int. Cl.^{6} F16D *23/06*
U.S. Cl. 192—53.332 **11 Claims**



1. A synchronizer clutch assembly for a manual transmission comprising torque transfer gears, a torque delivery shaft, at least one of said gears being journalled for rotation about the axis of said shaft, said clutch assembly comprising:

a clutch hub secured to said shaft, a clutch sleeve secured to said hub and adapted for axial shifting movement relative to said hub;

a blocker ring between said one gear and said hub, clutch teeth on said sleeve and on said one gear, blocker ring gear teeth between said sleeve clutch teeth and gear clutch teeth, said blocker ring and said one gear having engageable friction clutch surfaces; and

a spring element in cooperative engagement with said blocker ring including an axially disposed flexible portion engageable with said sleeve teeth as said sleeve is moved toward said blocker ring gear teeth whereby a clutch surface engaging force is developed on said blocker ring upon deflection of said spring element.

5,531,306
SPACER FOR WORN CLUTCH BRAKES

Ray Mason, Rte. 5, Box 554, Spring Lake, N.C. 28390

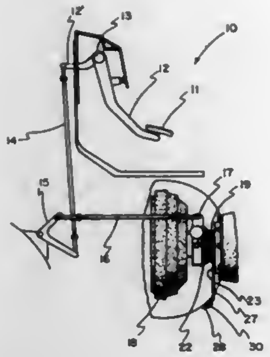
Filed Oct. 5, 1994, Ser. No. 318,094
Int. Cl.^{6} F16D *67/02;65/38;* **B23P** *6/00*
U.S. Cl. 192—13 R **10 Claims**

1. An improved heavy duty vehicle having a clutch assembly being operatively connected to a transmission drive shaft projecting from a transmission housing of said vehicle, said clutch assembly being disposed within a bell housing that is mechanically coupled to said transmission housing and encloses said clutch assembly, said bell housing including at least one inspection opening therein adjacent said transmission housing, said clutch assembly including a clutch release bearing housing slideably disposed about said drive shaft, said release bearing housing being operated by a clutch release fork through a clutch pedal linkage, said vehicle including a plate-like clutch brake disposed about said drive shaft so as to be continuously rotated said transmission housing, said clutch brake being adapted for longitudinal therewith and being positioned intermediate said release bearing housing and sliding movement on said drive shaft such that said release bearing housing functions to engage said clutch brake and to move the same into frictional engagement with a flat surface of said transmission housing each time said clutch assembly is operated to change gears, the improvement comprising:

a spacer having a plate portion fixedly secured to a foot portion at one end thereof;

a U-shaped opening in the opposite end of said plate portion; and

at least one opening in said foot portion adapted to receive securing means whereby when said clutch brake wears to the point where it no longer operates normally, said plate portion of said spacer can be inserted through said inspection opening and interposed between said clutch brake and said transmission housing and said securing means can be inserted through said at least one opening in said foot portion and secured to said bell homing to extend the useful life of said clutch brake.



9. A method of extending the useful life of a clutch brake in a heavy duty vehicle having a clutch assembly positioned in a operative relationship with a transmission drive shaft projecting from a transmission housing of said vehicle, said clutch assembly being disposed within a bell housing mechanically coupled to said transmission housing, said bell housing including an inspection opening therein adjacent said transmission housing, said clutch assembly including a clutch release bearing housing slideably disposed about said drive shaft, said release bearing housing being operated by a clutch release fork through a clutch pedal linkage, said vehicle including a plate-like clutch brake disposed about said drive shaft so as to be continuously rotated therewith and being positioned intermediate said release bearing housing and said transmission housing, said clutch brake being adapted for longitudinal sliding movement on said drive shaft such that said release bearing housing functions to engage said clutch brake and move the same into frictional engagement with a flat surface of said transmission housing thereby stopping the rotation of said drive shaft each time said clutch assembly is operated to shift gears, said method comprising:

forming a spacer having a plate portion with a U-shaped opening in one end thereof and a foot portion connected to the opposite end thereof;

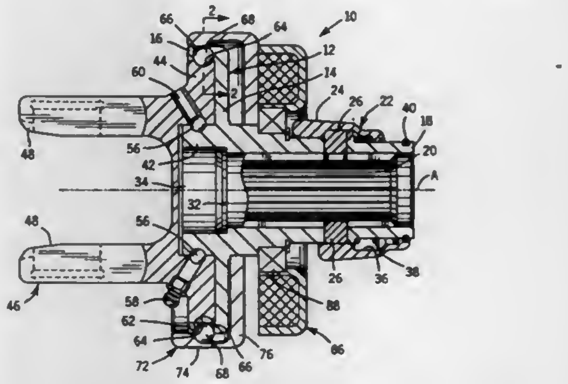
passing said plate portion of said spacer through said inspection opening in said bell housing between said clutch brake and said transmission housing with said drive shaft being disposed in said U-shaped opening in one end of said plate portion; and

securing said foot portion to said bell housing whereby the useable life of said clutch brake can be extended.

5,531,307
SHEAR ELEMENT TYPE CLUTCH

Mark A. Fechter, West Bend, and George N. P. Hansen, Milwaukee, both of Wis., assignors to Weasler Engineering, Inc., West Bend, Wis.

Filed Aug. 9, 1994, Ser. No. 287,740
Int. Cl.^{6} F16D *43/208;27/00*
U.S. Cl. 192—56.4 **12 Claims**



1. An overload clutch for transmitting torque from a driving member to a driven member, comprising:

an outer wheel adapted for rotary engagement with one of said members, said outer wheel having a flange portion extending axially and a disc portion extending radially inwardly from said flange portion, said flange portion having a radially outward facing surface and a radially inward facing surface;

an inner wheel adapted for rotary engagement with the other of said members, said inner wheel having a radially outward facing surface in face to face proximity with the radially inward facing surface of said flange portion;

wherein said flange portion has defined within it at angularly spaced locations holes which extend radially from the inward facing surface of said flange portion to the outward facing surface thereof;

said outward facing surface of said inner wheel having defined therein recesses at angularly spaced locations, said recesses being in registration with said holes in at least one angular position of said inner wheel relative to said outer wheel;

a shear element received in each said hole, each shear element being sized so as to be moveable radially in its corresponding hole into or out of said recesses, each said shear element always being at least partially engaged in a corresponding hole;

a collar, said collar being axially displaceable between an engaged position and a disengaged position, said collar retaining said shear elements at least partially in said recesses in said engaged position and allowing said shear elements to completely exit said recesses in said disengaged position, said collar being cup-shaped with an axially extending sleeve and a plate extending radially inwardly from said sleeve, said sleeve having a radially inner surface with a first portion for retaining said shear elements at least partially in said recesses in said engaged position of said collar and having a second undercut portion positioned axially between said first portion and said plate for receiving at least a portion of said shear elements in said disengaged position, said plate facing said disc portion of said outer wheel; and

an actuator for moving said collar from said disengaged position to said engaged position.

5,531,308

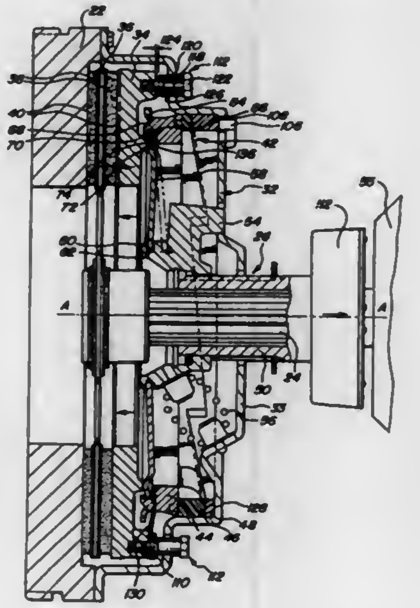
WEAR INDICATOR FOR AN AUTOMATICALLY ADJUSTING FRICTION TORQUE DEVICE

Daniel V. Gochenour, Auburn; Barry T. Adams, St. Joe; Martin E. Kummer, Auburn; Christopher M. Davis, Albion; Steven D. Lepard, Angola; Michael L. Bassett, and Kevin F. Schlosser, both of Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 263,315, Jun. 21, 1994. This application Jun. 7, 1995, Ser. No. 479,062

Int. Cl.^{6} F16D *13/75*

U.S. Cl. 192—70.25 **6 Claims**



1. A friction device having a driving member and a cover fixed thereto and a pressure plate disposed within the cover and a driven member interposed between the pressure plate and the driving member, the pressure plate being rotatively fixed relative to the cover and the driven member being coupled to an axially extending driven shaft for rotation therewith, an apply spring functionally disposed between the cover and the pressure plate axially biasing the pressure plate toward the driving member thereby rotatably engaging the driven member with the pressure plate, a release assembly mechanically connected to the apply spring and axially displaceable between an engaged position and a disengaged position wherein in the disengaged position the apply spring is deflected to rotatably disengage the driven member from the pressure plate, at least one of the driven member and the pressure plate having a friction surface, and including an adjustment mechanism comprising:

the cover having an arcuate opening;

a first adjusting member annular in shape and rotatable relative to the cover;

a second adjusting member annular in shape and engaging the first adjusting member and rotatably fixed relative to the cover wherein the first and second adjusting members cooperatively control an axial displacement as a function of relative rotative position;

a spring functionally disposed between the first adjusting member and the second adjusting member and rotatably biasing the first adjusting member with respect to the second adjusting member in a first rotative direction increasing the axial displacement; and

a wear indicator tab fixed relative to the first adjusting member and visible through the arcuate opening in the cover so as to be visible without disassembly of the friction assembly, wherein a relative rotative position of the wear indicator tab in the arcuate opening indicates the amount of wear on the friction surface of the members of the friction device.

5,531,309

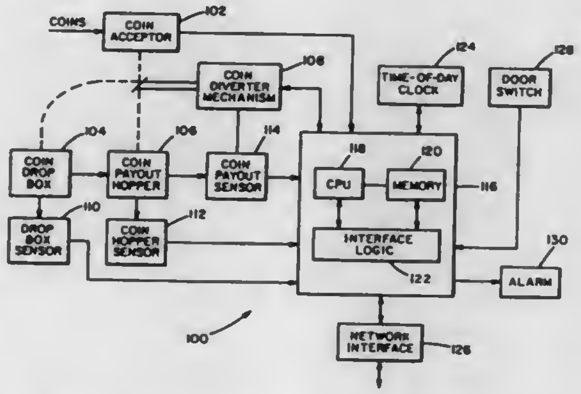
METHOD AND APPARATUS FOR DETECTING FRAUD OR THEFT IN A GAMING MACHINE

Hans G. Kloss, Berlin, Germany, and Raymond J. Heidel, Henderson, Nev., assignors to Bally Gaming International, Inc., Las Vegas, Nev.

Filed Aug. 28, 1995, Ser. No. 520,215

Int. Cl.^{6} G07F *17/34*

U.S. Cl. 194—202 **20 Claims**



1. A gaming machine comprising:

a coin payout hopper;

a hopper sensor operably connected to said coin payout hopper to detect a weight of any contents of said coin payout hopper;

a coin payout sensor for detecting passage of coins ejected from said coin payout hopper for receipt by a player of the gaming machine;

means for recording a total number of coins detected by said coin payout sensor;

means for converting the weight of the contents of said coin payout hopper into a number of coins in said coin payout hopper; and

means for comparing the number of coins in said coin payout hopper to the number of coins detected by said coin payout sensor to determine if there is a discrepancy therebetween.

5,531,310

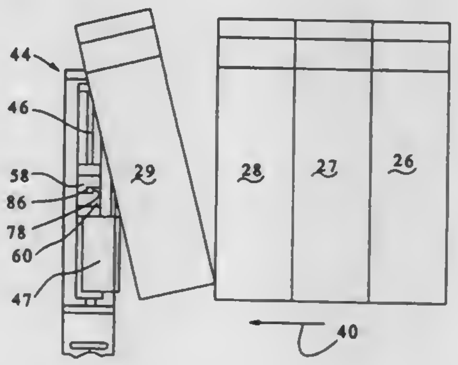
MECHANISM FOR RIGHTING A TIPPED PACKAGE ALONG A CONVEYOR LINE

Kosaku Itoh, Buffalo Grove, Ill., assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Sep. 28, 1994, Ser. No. 315,402

Int. Cl.^{6} B65G *47/24*

U.S. Cl. 198—395 **15 Claims**



1. A mechanism for righting a tipped package on a conveyor line, the mechanism comprising:

a) a first gate in fixed positional alignment with the conveyor and disposed for rotational movement about a first axis;

b) a second gate in fixed positional alignment with the conveyor and disposed for rotational movement about a second axis; and

c) interconnecting means for interconnecting the first and second gates to prevent opening of said first gate until the package has operatively engaged the second gate, a tipped package engaging the first gate prior to operative engagement of the second gate, operative engagement of the package with the second gate being indicative of an erect package.

5,531,311

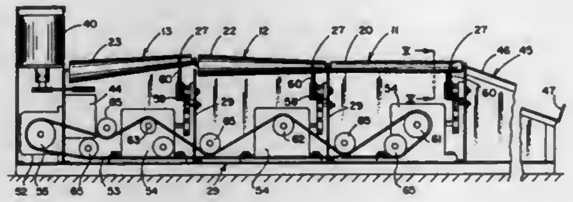
CONVEYOR ARTICLE PROPELLING ROLLER DRIVE SYSTEM

Curtis E. LeMay, Shelbyville; Bernard H. Woltjer, Jenison, and David H. Cotter, Coopersville, all of Mich., assignors to Rapistan Demag Corporation, Grand Rapids, Mich.

Division of Ser. No. 37,035, Mar. 25, 1993, Pat. No. 5,415,281. This application Dec. 13, 1994, Ser. No. 354,591

Int. Cl.^{6} B65G *47/12*

U.S. Cl. 198—448 **18 Claims**



1. A conveyor comprising:

a frame;

a multiplicity of rotatable article propelling rollers mounted in said frame generally normal to the direction of article movement, defining an article conveying surface;

a driven endless member extending below said rollers in the direction of article movement;

a plurality of drive pulleys below said rollers;

a plurality of idler pressure pulleys positioned below said drive pulleys opposite said endless member for applying pressure to said endless member in order to press said endless member against said drive pulleys to rotate said drive pulleys; and

a plurality of transmission elements each for providing a driving connection between one of said drive pulleys and at least one of said article propelling rollers;

wherein adjacent pairs of said pressure pulleys are supported by opposite ends of a leaf spring, which is attached at a mid portion to said frame.

5,531,312

APPARATUS AND METHOD FOR SINGULATING ARTICLES

Daniel M. Dickey, 2755 Verde Valley School Rd., Sedona, Ariz. 86351

Filed Oct. 24, 1994, Ser. No. 327,955

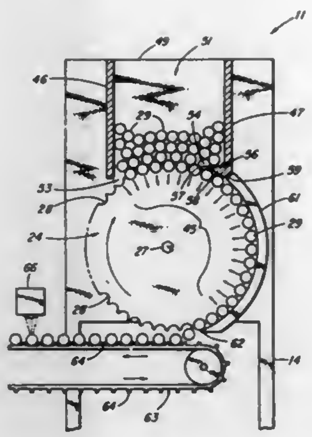
Int. Cl.^{6} B65G *47/12*

U.S. Cl. 198—450 **16 Claims**

1. An apparatus for singulating articles having an axis, comprising:

a. an article hopper for confining a plurality of the articles, said hopper having opposing front and rear walls, opposing side walls spanning said front and rear walls, an upper inlet port, and a lower discharge port, said lower discharge port having a width between an entry side and an exit side sufficient to accommodate at least two articles therein with their axes parallel to said side walls;

b. a rotary wheel, having a peripheral, outer edge portion thereof, rotating through said lower discharge port from said entry side to said exit side, thereof, said wheel having at least one article pocket along said peripheral edge portion, said pocket having at least one aperture therein;



c. vacuum means, operably connected to said aperture, at least when said article pocket is passing through said lower discharge port, for capturing a respective one of the articles within the pocket;

d. an article separator foot within said exit side of said lower discharge port, said foot having a leading end portion directed toward said entry side and having a bottom portion spaced from said wheel so as to allow an article captured within a pocket to pass therebetween.

5,531,313

DEVICE FOR CONVEYING A CONTINUOUS SHINGLED SHEET STREAM

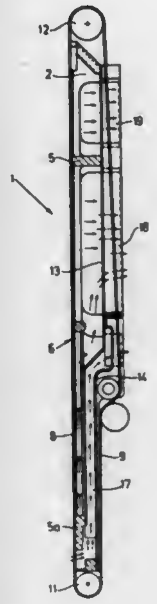
Burkhard Maass, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed May 8, 1995, Ser. No. 437,288

Claims priority, application Germany, May 7, 1994, 44 16 289.8

Int. Cl.^{6} B65G *17/46*

U.S. Cl. 198—689.1 **8 Claims**



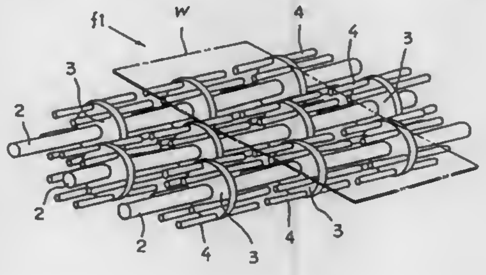
1. Device for conveying a continuous shingled or overlapping sheet or copy stream to a rotary printing press, with a conveying table, at least one endless, revolvingly drivable conveyor belt surrounding the conveying table, and at least one suction box disposed beneath the conveying table and being connected through suction openings with the underside of the conveyor belt, the

conveyor belt being formed with through-perforated suction holes, the suction box being formed with at least two suction chambers subjectible to negative pressure or vacuum independently of one another, comprising a base member forming a suction box, profiled guide sections accommodated in said base member, suction ducts formed between edges of said profiled guide sections and boundaries of said base member, said edges forming a seal, and said suction ducts extending in different planes in said base member.

5,531,314

Patent Not Issued For This Number

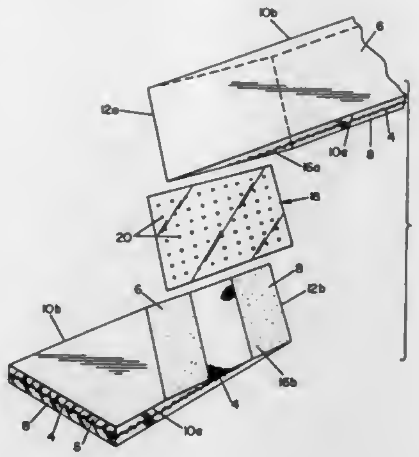
5,531,315
APPARATUS FOR CARRYING EXTRA-THIN PRINTED BOARDS, ETC.
Teruyuki Nakano, Hiroshima-ken, Japan, assignor to Kabushiki Gaisha Ishii Hyoki, Hiroshima, Japan
Filed Aug. 11, 1994, Ser. No. 288,907
Claims priority, application Japan, Aug. 12, 1993, 5-232598
Int. Cl.^{6} B65G *17/16*
U.S. Cl. 198—779 **6 Claims**



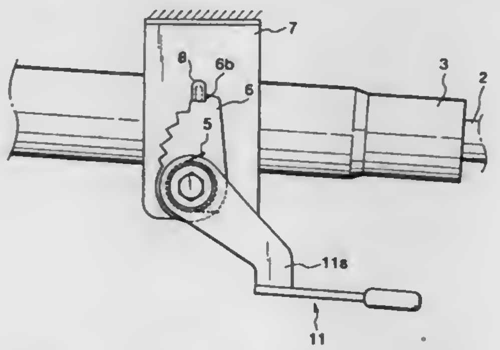
1. Apparatus for carrying extra-thin printed boards and the like, comprising:
  a plurality of rotation axles oriented in a direction perpendicular to a direction in which the printed boards are to be carried;
  a plurality of disks fixed at intervals to each of said rotation axles, each said disk having opposed side faces having rims, said disks on said axles which are adjacent to one another overlapping one another in the direction in which the printed boards are to be carried and being free from interference with one another; and
  a plurality of supporting shafts positioned on said disks at said rims, said supporting shafts on said disks on said axles which are adjacent to one another overlapping one another by a fixed length and being free from interference from one another.

5,531,316
CONVEYOR BELT AND METHOD OF MAKING SAME
Mark Savino, Wausau, Wis., assignor to Bearings, Inc., Cleveland, Ohio
Filed Feb. 21, 1995, Ser. No. 391,059
Int. Cl.^{6} B65G *15/34*
U.S. Cl. 198—844.2 **23 Claims**

1. In a continuous conveyor belt having a longitudinal axis and comprising an elongated tape with a first end and a second end spliced together, said tape comprising a polyamide core and an elastomerized surface coating on said core, the improvement wherein each end of the belt is feathered at a non-perpendicular angle relative to the longitudinal axis of said belt to provide opposed feathered surfaces in overlapping relationship with no overall increase in the thickness of the belt, said feathered surfaces being bonded together with a hot melt foil adhesive.



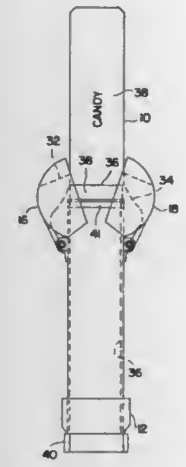
5,531,317
TILT-TYPE STEERING COLUMN DEVICE
Masaki Tomaru, Shibukawa, Japan, assignor to NSK Ltd., Tokyo, Japan
Filed Jun. 7, 1995, Ser. No. 480,408
Claims priority, application Japan, Jul. 4, 1994, 6-173143
Int. Cl.^{6} B62D *1/18*
U.S. Cl. 280—775 **5 Claims**



1. A tilt-type steering column device for use in a steering apparatus having a steering shaft and a steering wheel attached to the steering shaft, comprising:
  a steering column with front and rear ends through which the steering shaft is rotatably inserted,
  a lateral shaft to which the front end of the steering column is hinged so as to freely rock around the lateral shaft,
  a tiltable bracket secured between the front and rear ends of the steering column and having through-holes,
  a stationary bracket having a pair of vertical plate portions so as to hold the tiltable bracket therebetween, the vertical plate portions each having a slot in an up and down direction in alignment with the through-holes in the tiltable bracket, and one of the vertical plates having an outer surface formed with at least one protrusion,
  a rod inserted through the slots in the stationary bracket and through the through-holes in the tiltable bracket and having a base portion sized large enough so as not to pass through the slots, and an end portion projecting from the one of the vertical plates,
  a pressure member provided around the rod so as to be axially movably engaged with the end portion of the rod, and shaped so as not to pass through the slots,
  a control member for pressing the pressure member in the axial direction with respect to the rod,
  a rotating plate having an outer peripheral portion formed with stepped portions and placed around the pressure member between the control member and one of the vertical plates so as to rotate around the rod member, and

  a spring member connected to the control member and the rotating plate to force the rotating plate, so that one of the stepped portions of the rotating plate is engaged with the protrusion as the rotating plate is rotated.

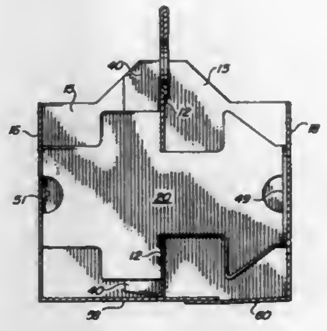
5,531,318
HOLDER AND ENCLOSURE FOR A PIECE OF HARD CANDY
Thomas J. Coleman, 89 Winding Way Rd., Bristol, Va. 24201; William K. Schlotter, IV, 175 Toluca Rd., Stafford, Va. 22554; Princess A. Coleman, 89 Winding Way Rd., Bristol, Va. 24201, and Ann M. Schlotter, 175 Toluca Rd., Stafford, Va. 22554
Filed Mar. 23, 1995, Ser. No. 408,963
Int. Cl.^{6} B65D *79/00;85/72;85/00;* **B43K** *21/02*
U.S. Cl. 206—738 **9 Claims**



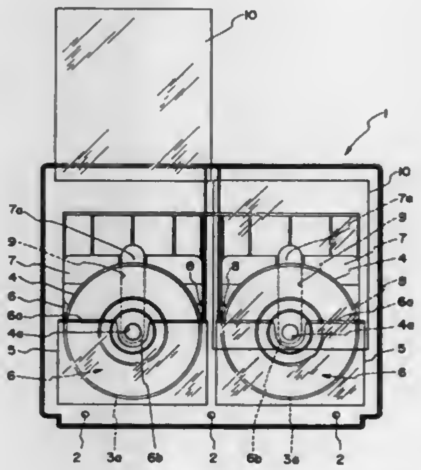
1. A holder and enclosure for an elongated object which comprises a cylindrical main housing having a smooth inner surface along a length thereof, a secondary cylindrical housing having smooth inner and outer surfaces along a length thereof, said secondary housing having one end that fits into a bottom end of said main housing and said one end supports said elongated object, a split cap secured to and enclosing an upper end of said main housing, said split cap being biased in a closing direction by a biasing spring means, and said main housing having a stop cap (**12**) on a bottom end thereof and said secondary housing having an end cap (**40**) on a bottom end thereof.

5,531,319
BASKET-STYLE ARTICLE CARRIER WITH A SINGLE INTEGRAL PARTITION
Glen R. Harrelson, Roswell, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.
Filed Feb. 21, 1995, Ser. No. 391,900
Int. Cl.^{6} B65D *75/00*
U.S. Cl. 206—162 **12 Claims**

1. A basket-style carrier for packaging four articles arranged in two adjacent rows, comprising:
  a bottom panel;
  a pair of opposite side panels connected to a pair of opposite end panels;
  a central handle panel having opposite ends connected to the end panels;
  a single partition panel extending transversely of the handle panel and connected thereto along a substantially vertical fold line located substantially midway between the end panels;
  the handle panel containing a cutout portion from which the partition panel has been formed; and
  the partition panel extending continuously between the side panels and having opposite ends connected to the side panels.



5,531,320
OPTICAL DISC ACCOMODATION DEVICE
Hiromichi Uchida, Tokyo, Japan, assignor to Toyo Chemical Co., Ltd., Tokyo, Japan
Filed Oct. 4, 1994, Ser. No. 324,756
Int. Cl.^{6} B65D *85/57*
U.S. Cl. 206—308.1 **7 Claims**



1. An optical disc accommodation device comprising:
  a first sheet having a first end portion, a second end portion, a front surface and a rear surface, said first sheet being formed with an optical disc accommodation recess;
  a second sheet, formed of a synthetic resin material, bonded to said front surface of said first sheet at a bottom edge thereof below said optical disc accommodation recess and extending upwardly to a location intermediate a top portion and a bottom portion of said optical disc accommodation recess, an upwardly directed opening of said optical disc accommodation recess being defined at an upper edge of said second sheet between said first and second sheets to allow an optical disc accommodated in said optical disc accommodation recess to be removed therefrom;
wherein a stepped recess, stepped rearwardly of said optical disc accommodation recess, is formed in said first sheet and is open to a central portion of said optical disc accommodation recess for providing a gap between a rear surface of an optical disc accommodated in said optical disc accommodation recess and a front surface of said first sheet at an upper portion of the optical disc accommodated in said optical disc accommodation recess, said stepped recess including a finger reception space for allowing the upper portion of the optical disc accommodated in said optical disc accommodation recess to be grasped with a finger; and
stopper projections disposed in said optical disc accommodation recess at opposite sides thereof and at locations corresponding to an upper half portion of the optical disc accommodated in said optical disc accommodation recess, said stopper projections having respective optical disc contacting surfaces con-

forming in shape to an outer periphery of the optical disc for contacting the outer periphery of the optical disc accommodated in said optical disc accommodation recess to prevent the optical disc from falling out of the optical disc accommodation recess through said opening thereof.

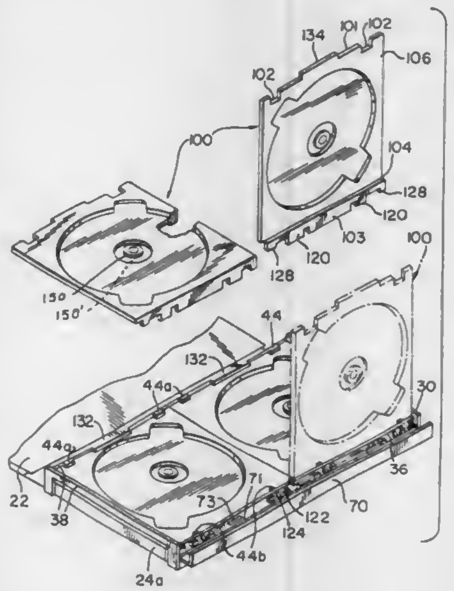
5,531,321
GLUELESS STORAGE PACKAGE

Patrick J. O'Brien, Hackensack, N.J.; Alvin Thomas, Pittsfield; George Rufo, Jr., Dalton, both of Mass.; Larry Durham, Terre Haute, Ind., and Anthony L. Gelardi, Kennebunkport, Me., assignors to Ivy Hill Corporation, New York, N.Y.

Division of Ser. No. 70,713, May 28, 1993. This application Sep. 19, 1993, Ser. No. 126,240

Int. Cl.^{6} B65D *69/00;85/30;85/57*

U.S. Cl. 206—232 **21 Claims**



9. A glueless package comprising:

(A) a pair of panels and a spine connecting said panels, said panels being movable between a closed orientation, wherein said panels are substantially overlying, and an open orientation, wherein said panels are not substantially overlying, one of said panels defining on at least one side thereof a side flap generally perpendicular to a first plane containing said one panel, said side flap defining an extension in a second plane containing said side flap and generally perpendicular to said first plane;

(B) a compartment formed of plastic and mounted on said one panel for receiving and maintaining an article, said compartment further defining on at least one side thereof a generally U-shaped slot configured and dimensioned to receive said side flap, said slot defining a slit configured and dimensioned to receive therein said side flap extension to limit movement of said side flap in said slot by abutment of said side flap extension and said slit.

5,531,322
STORAGE CASE

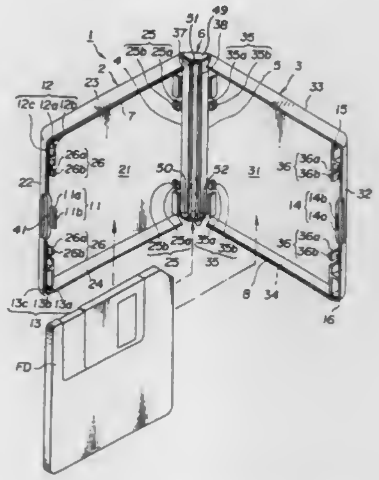
Yuji Iwaki; Shuichi Kikuchi, both of Miyagi, and Hiroshi Asakura, Saitama, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1993, Ser. No. 158,469

Claims priority, application Japan, Nov. 30, 1992, 4-320042; Nov. 30, 1992, 4-320043; Nov. 30, 1992, 4-320044; Dec. 25, 1992, 4-345780; Apr. 23, 1993, 5-097662

Int. Cl.^{6} B65D *85/30*

U.S. Cl. 206—308.3 **18 Claims**



1. A storage case for storing flat, uniformly shaped quadrilateral objects, comprising:

a substantially rectangular spine;

a quadrilateral base having a first plate, a first side of said first plate being attached to a first longitudinal side of said spine via a first hinge, a front wall of said base projected in a first direction from a second side of said first plate which is remote from said hinge, and side walls of said base projected in said first direction from third and fourth sides of said first plate, said first direction being substantially perpendicular to a plane containing said first plate;

a quadrilateral lid having a second plate, a first side of said second plate being attached to a second longitudinal side of said spine via a second hinge, a front wall of said lid projected in a second direction from a second side of said second plate which is remote from said second hinge, and side walls of said lid projected in said second direction from third and fourth sides of said second plate, said second direction being substantially perpendicular to a plane containing said second plate, said base and said lid being pivotable relative to said spine on said first and second hinges to form a substantially enclosed box;

a first closing member having a wall portion projecting from a central portion of said front wall of one of said base or said lid, said first closing member comprising a lip projected from a free end of said wall portion in a direction facing away from said spine;

a first engaging portion engageable with said first closing member provided in a central portion of the front wall of the other of said base or said lid, said first engaging portion comprising a projecting portion formed on an inner side of said front wall of the other of said base or said lid, said projecting portion being engageable under said lip of said first closing member;

second and third closing members provided respectively on each of said side walls of a first one of said base or said lid;

second and third engaging portions engageable with said second and third closing members and respectively provided at a corresponding position along a side wall of a second one of said base or said lid; and

two pair of opposed ribs provided on an inner surface of each of said base and said lid, each pair of opposed ribs providing means for snugly receiving a flat, uniformly shaped quadrilateral object for applying pinching pressure to the object.

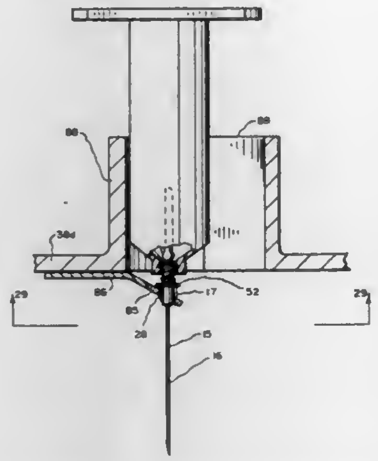
5,531,323
COOPERATIVE MEDICAL SAMPLING AND NEEDLE REMOVAL DEVICES

Lance P. Kelson, 300 N. 5555 West, and Ross J. Kelson, 436 N. 5550 West, both of Ogden, Utah 84404

Filed Jun. 22, 1992, Ser. No. 901,922

Int. Cl.^{6} B65D *83/10*

U.S. Cl. 206—366 **4 Claims**



1. A device for removal and disposal of a needle assembly with a hub threadably engaging a threaded nipple of a barrel sleeve of a body fluid specimen sampling assembly, said hub having a gripping portion engageable by a parallel sided tool, said device comprising:

a disposal container closed by a lid upwardly thereon, the lid comprising

a plate member covering an opening in the disposal container,

a perforation through the plate member,

a hub wrenching member sloping downwardly partially across the perforation and having a downwardly open ended slop with parallel vertical sides spaced to engage the gripping portion of the hub of the needle assembly when place thereinto, so that said needle assembly may be removed from the barrel sleeve by rotation thereof, to then fall from the slot through the portion of the perforation unobstructed by the wrenching member, into the disposal container; and

means carried by the lid for supporting the barrel sleeve vertically aligned with the lid perforation and the hub engaging slot.

5,531,324
CASE FOR FLAT OBJECTS

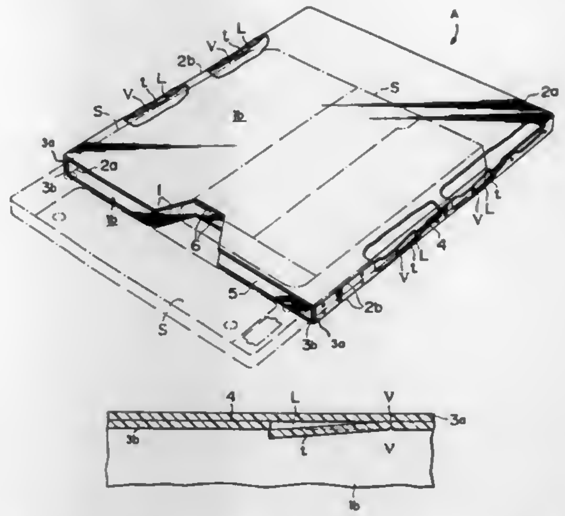
Shinichi Kosaki, Tokyo; Yoshito Tanaka, and Tadahiro Kuwa, both of Osaka, all of, Japan, assignors to Showa Yuki Kabushiki Kaisha, and Hitachi Maxell Kabushiki Kaisha, both of, Japan

Filed Nov. 15, 1994, Ser. No. 340,425

Claims priority, application Japan, Dec. 27, 1993, 5-348856

Int. Cl.^{6} B65D *85/57*

U.S. Cl. 206—449 **11 Claims**



1. A flat case for housing a flat shell comprising:

a rectangular rigid thermoplastic sheet having two substantially centrally located parallel fold lines, said sheet being folded along said two parallel fold lines so as to form an integral bottom wall, a pair of opposed parallel case walls separated from one another by said bottom wall, and an open end opposite said bottom wall;

said case walls integrally including pairs of adjacently overlapped and adhered side walls folded at right angles relative to said case walls and extending between said open end and said bottom wall thereby forming lateral sides of said case; wherein

one opposed pair of said side walls includes resilient tabs which make resilient contact with lateral surfaces of the flat shell inserted into the open end of the case; and wherein

each of said resilient tabs establishes a respective L-shaped cut-out in said one pair of said side walls, and includes (i) one end integral with a respective side wall of said one opposed pair of said side walls, (ii) a V-shaped notch forming a hinge region at said one end of said resilient tab, and (iii) a terminal end opposite to said one end which is partially overlapped with an edge of a respective said L-shaped cut-out so that said resilient tabs are each positioned on an inner surface of said respective side wall.

3. A case for flat objects comprising:

a pair of case walls;

a bottom wall and opposed side walls attached to said case walls so as to maintain said case walls in parallel separated relationship and establish an open end of the case opposite to said bottom wall;

said side walls including respective cut-out regions having edges which establish respective resilient tabs, said tabs having one end connected to a respective one of said side walls and an unconnected terminal end opposite to said one end;

said resilient tabs each including a notch formed in said one end thereof so as to establish a hinge region to allow said resilient tabs to be deflected inwardly of the case and thereby be in resilient contact with a lateral edge of a flat object within the case, and to lengthwise extend said resilient tabs so that said unconnected terminal ends thereof are partially overlapped with respective ones of said edges of said cut-out regions to thereby maintain said terminal ends inwardly of said respective one of said side walls.

5,531,325
STORING AND DISPENSING SYSTEM FOR PRODUCTS PACKED IN A SEALED POUCH

Joseph F. Deflander, Wespelaar; Robert De Caluwe, Londerzeel, and Marielle J. C. Stulens, Hoegaarden, all of, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US93/01896, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/17933, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 5, 1993, Ser. No. 295,893

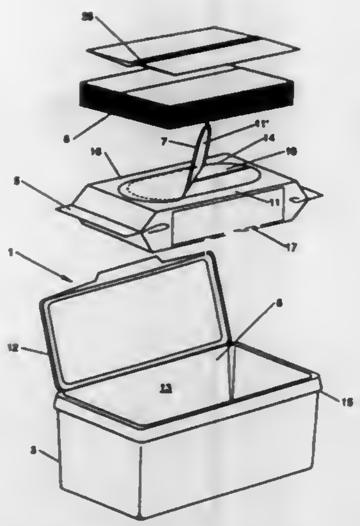
Claims priority, application European Pat. Off., Mar. 13, 1992, 92870043

Int. Cl.^{6} B65D *85/16;* **A47K** *10/20*

U.S. Cl. 206—494 **4 Claims**

1. A storing and dispensing system for a product packed in a sealed pouch, the system comprising:

a) a rigid container having a dispensing opening covered by a lid, said container being in its closed position sufficiently



air-tight to prevent free exchange of air between contents of said container and ambient air;

b) a sealed pouch containing a product, said pouch having a topface, said topface having an opening means for manually opening said pouch, said pouch being, after opening thereof, storable inside said container, said opening means having a pre-formed dispensing aperture sealed by a cover member, said cover member being removable from said dispensing aperture; and

c) an anti-slip member for preventing movement of said container on a surface, said container having a bottom, said bottom having at least one hole therethrough, said anti-slip member being a glue strip projecting from said hole in said container and contacting said surface, said glue strip being attached to said pouch.

2. An anti-slip member preventing movement of a container on a surface, said container containing a pouch and having a bottom, said bottom having at least one hole therethrough, said anti-slip member comprising a glue strip projecting outward from said hole in said container and contacting said surface, said glue strip being attached to said pouch inside said container.

5,531,326

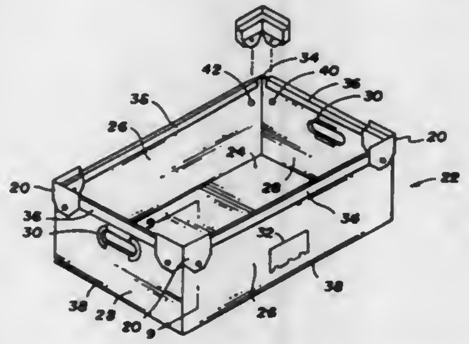
REINFORCEMENT AND CONTAINER USING SAME

Steven L. Hummel, Ortonville; James P. Olender, Fenton; James B. Johnson, Plymouth; JoAnn Reynolds, Fenton, and Bill A. Skaggs, Flint, all of Mich., assignors to Creative Foam Corporation, Fenton, Mich.

Filed Jan. 3, 1995, Ser. No. 367,816

Int. Cl.⁶ B65D *21/032*

U.S. Cl. 206—509 **20 Claims**



1. A reinforcement for an edge portion of a container, said reinforcement comprising:

a body for receiving said edge portion;

a pair of interlockable members integrally molded with and extending from said body, at least one of said interlockable members movable with respect to the other of said interlockable members; and

said interlockable members having cooperable lock portions adapted to removably interfit with each other when said at least one movable interlockable member moves with respect to the other of said interlockable members.

5,531,327

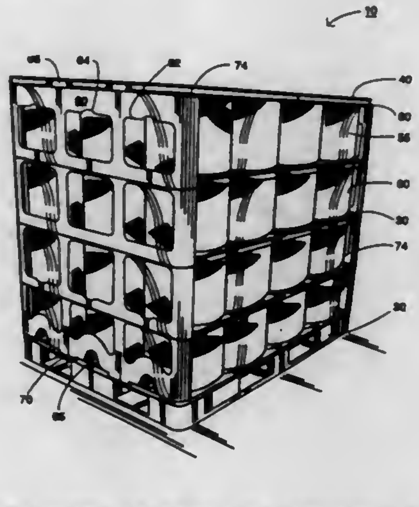
PALLET SYSTEM INCLUDING END PANELS

Robert J. Darby, Greensboro, N.C., assignor to T.H.E.M. Industries, Inc., Greensboro, N.C.

Filed Nov. 2, 1994, Ser. No. 333,436

Int. Cl.⁶ B65D *19/02;71/10*

U.S. Cl. 206—600 **10 Claims**



1. A pallet system for storing and transporting at least one package and for use with a wrapping film, said pallet system comprising:

a) a base pallet having a first end and a second end;

b) a top panel having a first end and a second end;

c) a first end panel extending between said first end of said base pallet and said first end of said top panel and forming an end wall extending therebetween, said first end panel having a left edge and a right edge;

d) a second end panel extending between said second end of said base pallet and said second end of said top panel and forming an end wall extending therebetween, said second end panel having a left edge and a right edge;

e) at least one intermediate panel interposed between said base pallet and said top panel;

f) wherein said first and second end panels include hooks and wherein said at least one intermediate panel includes a hook receiving recess formed adjacent an end thereof; and

g) wherein said left and right edges of respective end panels are configured such that, when at least one package having a periphery is disposed between said first and second end panels and the wrapping film is wrapped about said pallet system in tension, said left and right edges of respective end panels extend beyond the periphery of the at least one package, said left edges of said first and second end panels form a left side plane of film and said right edges of said first and second end panels form a right side plane of film, said left and right side planes of film being spaced from the at least one package.

8. A pallet system for storing and transporting at least one package and for use with a wrapping film, said pallet system comprising:

a) a base pallet;

b) a top panel overlying said base pallet;

c) an end panel adjacent said base pallet;

d) an intermediate panel;

e) securing means for detachably mounting said end panel on said pallet system and in engagement with said base pallet and said top panel, said securing means including means for attaching said end panel to said intermediate panel; and

f) wherein said end panel is arranged and configured such that, when at least one package is disposed between said base pallet and said top panel and wrapping film is placed around said pallet system, said end panel separates the wrapping film from at least a portion of the package.

5,531,328

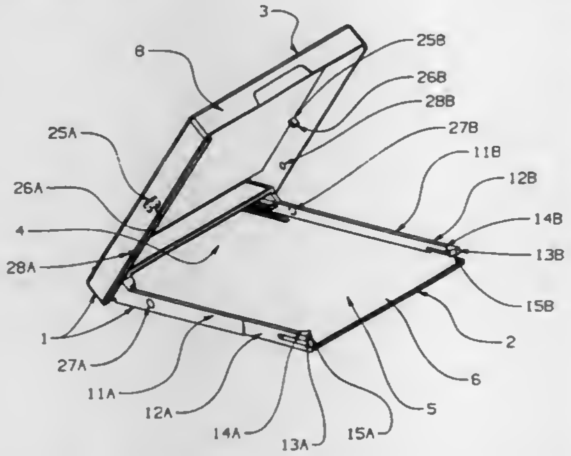
CONTAINER FOR ELECTRONIC CARD

Donald R. Rochelo, 66 Leona Dr., Pittsfield, Mass. 01201, and Robert W. Jones, P.O. Box 8, Dalton, Mass. 01226

Filed Oct. 20, 1994, Ser. No. 326,686

Int. Cl.⁶ B65D *85/30*

U.S. Cl. 206—706 **14 Claims**



1. An electronic card box for containing an electronic card that comprises:

a. a bottom portion having an area in which an electronic card can fit, said area defined by an end wall and two opposite side walls, an arm extended longitudinally therefrom and said arm enabled to flex laterally away from the other sidewall;

b. a cover portion adapted to fit over said bottom portion comprising a cover area that has an end wall and two opposite side walls, wherein, when said cover portion is fitted ever said bottom portion, there is sufficient space between each arm and its adjacent cover portion side wait for each arm to flex laterally into said space; and,

c. stop means for preventing said cover portion from contacting said arms in order to enable said arms to flex laterally when said cover portion is fitted over said bottom portion.

11. A container for an electronic card that comprises a container area in which an electronic card can fit;

wherein said container area is defined by two opposite side walls and an end wall, each side wall comprising an arm extended longitudinally therefrom and said arm enabled to flex laterally away from the other sidewall;

wherein each arm comprises a clasping member for clasping an edge of an electronic card in order to secure the card within the area of said container area, said clasping member having flex enabling means for flexing laterally its arm away from the other side wall when engaged by an edge of an electronic card that is against said flex enabling means in order to receive the electronic card into said container area.

5,531,329

IC CARRIER TO WHICH AN IC CAN BE MOUNTED WITH THE LEADS THEREOF SUPPORTED IN A NON-CONTACTING STATE

Nanahiro Hayakawa, and Satoshi Ohta, both of Tokyo, Japan, assignors to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 149,722, Nov. 10, 1993, abandoned.

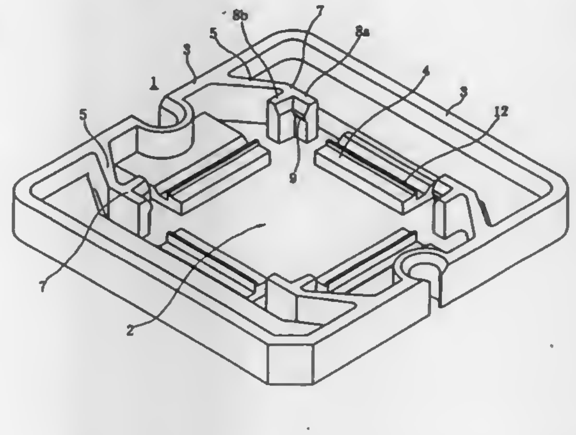
This appilcation Jan. 12, 1995, Ser. No. 371,615

Claims priority, application Japan, Nov. 11, 1992, 4-327425

The portion of the term of this patent subsequent to Nov. 30, 2013, has been disclaimed.

Int. Cl.⁶ B65D *73/02;85/42*

U.S. Cl. 206—722 **8 Claims**



1. An IC carrier comprising:

an IC carrier peripheral frame having an upper surface defining an upper plane and a lower surface defining a lower plane;

a rectangular IC receiving portion defined inwardly of the frame and between said upper and lower planes for receiving a rectangular IC package body of an IC package, said rectangular IC receiving portion including four corners and four sides;

four latch arms each extending in a direction from the frame toward said IC receiving portion, each of said latch arms being pivotable in a horizontal plane parallel to the upper and lower planes only within a space bounded by the upper and lower planes, each of said latch arms having a free end disposed at a respective corner of the rectangular IC receiving portion for engaging a respective corner of the IC package body, each of the free ends of said latch arms having a Y-shaped section as taken in said horizontal plane;

wherein IC lead-receiving open spaces are provided outwardly of the rectangular IC receiving portion at locations adjacent and extending along at least two of the sides thereof and between adjacent free ends of said latch arms that are spaced from one another along each of said at least two sides of said rectangular IC receiving portion; and

wherein said IC lead-receiving open spaces are uninterrupted spaces which extend in directions parallel to said at least two sides, respectively, of the IC receiving portion;

whereby the IC package having the rectangular IC package body and leads extending from the sides of the IC package body will be mounted in the IC receiving portion with the corners of the IC package body being restrained by the free ends of the latch arms and the leads being accommodated in said IC lead-receiving open spaces while out of contact with the IC carrier.

5,531,330
METHOD OF DEPRESSING NON-SULFIDE SILICATE GANGUE MINERALS

D. R. Nagaraj, Stamford, and Samuel S. Wang, Cheshire, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed Jun. 7, 1995, Ser. No. 474,805
Int. Cl.^{6} B03D *1/016;1/06*
U.S. Cl. 209—167 **17 Claims**

1. A method which comprises beneficiating value sulfide minerals from ores with selective rejection of non-sulfide silicate gangue minerals by:

a. providing an aqueous pulp slurry of finely-divided, liberation-sized ore particles which contain said value sulfide minerals and said non-sulfide silicate gangue minerals;

b. conditioning said pulp slurry with an effective amount of non-sulfide silicate gangue mineral depressant, a value sulfide mineral collector and a frothing agent, respectively, said depressant comprising a polymer or a mixture of polymers comprising:

(i) x units of the formula:

$$-\!\left[X \right]\!-$$

(ii) y units of the formula:

$$-\!\left[Y \right]\!-$$

(iii) z units of the formula:

$$-\!\left[Z \right]\!-$$

wherein X is the polymerization residue of an acrylamide monomer or mixture of such acrylamide monomers, Y is a hydroxy group containing polymer unit derived from a monoethylenically unsaturated monomer, Z is an anionic group containing polymer unit derived from a monoethylenically unsaturated monomer, x represents a residual mole percent fraction of over about 35%, y is a mole percent fraction ranging from about 1 to about 50% and z is a mole percent fraction ranging from about 0 to about 50% and

c. subjecting the conditioned pulp slurry to froth flotation and collecting the value sulfide mineral having a reduced content of non-sulfide silicate gangue minerals.

5,531,331
SORTING OF DIFFERENTLY IDENTIFIED ARTICLES

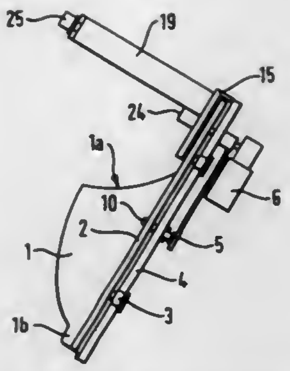
Adam J. Barnett, Hilltop, 26 Graham Road, Paignton, Devon, United Kingdom

PCT No. PCT/GB92/01450, § 371 Date Feb. 2, 1994, § 102(e) Date Feb. 2, 1994, PCT Pub. No. WO93/02814, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 4, 1992, Ser. No. 190,096

Claims priority, application United Kingdom, Aug. 6, 1991, 9116912

Int. Cl.^{6} B07C *5/342;* **B65G** *17/32*
U.S. Cl. 209—580 **21 Claims**

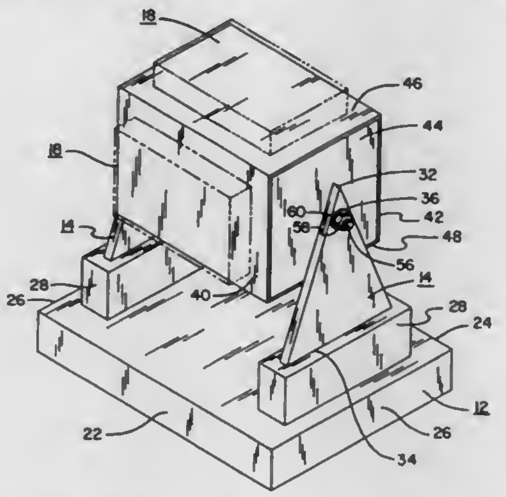


1. Apparatus for sorting a plurality of differently identified gaming chips, said apparatus comprising transfer means arranged to remove individual ones of said chips from a store of randomly arranged chips and transfer said chips in sequence to conveyor means, said conveyor means being located above said transfer means and arranged to carry said chips in sequence first to sensing means arranged to sense an identifiable characteristic of said individual chips, and subsequently to chip ejector means arranged to remove individual ones of said chips from said conveyor means and deposit individual said chips in a respective selected one of a plurality of receptacles depending on the characteristic of said individual chip identified by said sensing means, said transfer means comprising a substantially planar disc having a central axis and being rotatable about said central axis, the plane of the disc being inclined at an acute angle to the horizontal.

5,531,332
REMOTE CONTROL DEVICE CARROUSELS

Randy E. Monnens, 1240 Ruby La., Shakopee, Minn. 55379

Filed Sep. 13, 1994, Ser. No. 304,836
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—13 **2 Claims**



1. A new and improved remote control device carousel comprising, in combination:

a base formed in a generally rectangular configuration with an upper surface, a lower surface and a small thickness therebetween, the base being positioned horizontally in the operative orientation and including parallel long side edges and parallel short side edges, a first long side edge constituting the front edge of the base, a second long side edge constituting the rear edge of the base, the two short side edges constituting the side edges of the base, the base having two generally rectangular shaped risers positioned on its upper surface, the risers being shaped as generally rectangular shaped boxes with parallel short front and rear faces, the risers also having long parallel side faces, each riser being positioned parallel to and a short distance from each side edge of the block, the risers having a shorter length than each side edge of the base and being centrally positioned between the front and rear edge thereof;

two brackets being formed as generally planar triangular shaped members, each bracket being centrally positioned upon the upper surface of each riser, the point of each triangle being positioned upwardly, the linear side edge opposite the point being positioned upon the riser, each bracket including a generally circular shaped aperture located a short distance from its apex;

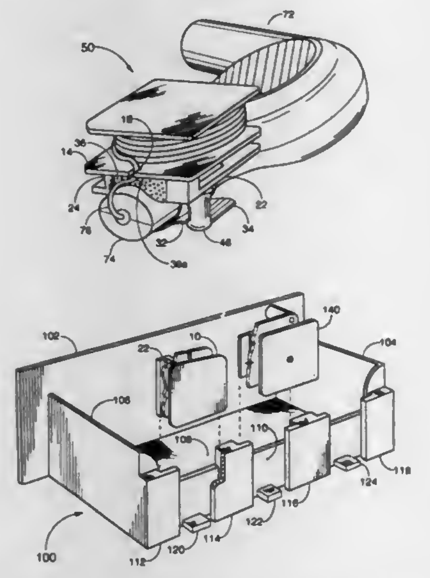
a rotatable block formed as a generally rectangular shaped hollow box, the block having a front face, a rear face, two side faces, a top face and a bottom face, the outer surface of the top, bottom, and rear faces of the block including a thin layer of magnetic sheet metal, each of the side faces including an aperture at its center point, the block being affixed between the triangular brackets with cooperatively coupled nuts and bolts, washers and bushings, the bushings being positioned between each side face of the block and the inner surface of each bracket, the washers being positioned on the outer surface of each bracket around the apertures, the bolts being positioned through the washers, bushings, block and brackets with the apertures in horizontal alignment, the nuts firmly couple the bolts in place, the block being adapted to rotate easily when touched by the user; and

a plurality of plastic, imitation remote control devices formed in a generally planar rectangular orientation, the imitation devices having an upper surface and a lower surface, the lower surface including a generally rectangular shaped magnetic strip with a self adhesive material affixed centrally thereupon, the imitation plastic devices adapted to evenly distributed weight on the carousel with less than a full complement of four functional remote control devices being mounted thereupon.

5,531,333
STORAGE SYSTEM FOR ELECTRICAL APPLIANCES, POWERCORDS AND ADAPTERS

James E. Vara, 8514 Londonderry Ave., Dallas, Tex. 75228

Filed Oct. 18, 1994, Ser. No. 325,039
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—13 **6 Claims**



1. An electrical powercord storage tool for retaining a powercord, for interface attachment to an electrical appliance, for storage in an electrical appliance storage bin rack, and alternatively for interface attachment to a storage bin rack as means for storing said powercord and appliance, comprising:

a base; and a retaining member attached to said base;

means on said retaining member for gripping, winding and retaining an electrical powercord comprising:

a spool, a fixed flange attached to one end of said spool, and a knob handle rotatably attached near a perimeter of said fixed flange;

said retaining member rotatably attached to said base;

first and second notches in said fixed flange;

said first notch comprising means for removably gripping one end of said powercord;

said knob comprising means for rotating said retaining member about said base for winding said powercord onto said retaining member;

said second notch comprising means for removably gripping the other end of said powercord;

means on said retaining member for interfacing with and attaching to an electrical appliance comprising:

said fixed flange further comprising a contact surface, an interface pad, and a rail-bracket on said fixed flange, all cooperatively shaped and arranged to match and interface with a portion of said electrical appliance; and

a quick-latching strap affixed to said fixed flange, removably latchable around said portion of said electrical appliance, and comprising means for quickly attaching said tool to said appliance;

means on said retaining member for interfacing with and attaching to an appliance storage bin rack, comprising:

said rack having a back, a left side, a right side, a front, and a bottom, cooperatively comprising means for receiving and holding a plurality of said appliances and powercord storage tools; and said rack further comprising:

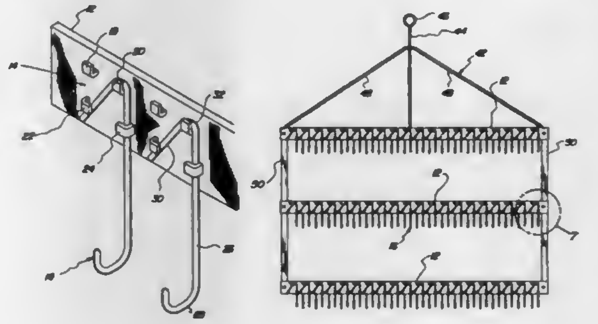
rack means affixed to said front for interfacing with and removably attaching one or more said powercord storage tools, said rack means comprising: a plurality of slots located on said front of said rack; each said slot formed by flanges attached to said front; each said slot shaped to interface with, receive and hold said rail-bracket of said powercord storage tool; each said slot being partially closed at its bottom end by a structure affixed to said front; and

said rail-bracket on said retaining member configured to interface and fit within one of said slots on said storage bin rack.

5,531,334
RECONFIGURABLE HOOK SUPPORT

Robert G. Forby, 433 Powell Ave., Colombus, Ohio 43204

Filed Dec. 1, 1994, Ser. No. 347,853
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—119 **7 Claims**

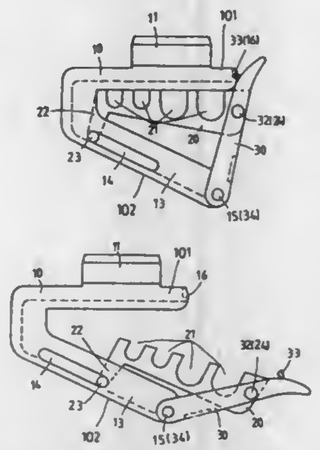


1. A reconfigurable hook support comprising:

a plurality of hook means for engaging parts to be hung; and

a substantially elongated bar having a plurality of mounting means extending therealong for coupling the hook means thereto comprising a first upper L-shaped bracket secured to a front face of the elongated bar and oriented so as to project towards an upper longitudinal edge thereof; a second upper L-shaped bracket secured to the front face of the elongated bar and oriented so as to project towards the upper edge thereof; a first lower L-shaped bracket secured to the front face of the elongated bar; and a second lower L-shaped bracket secured to the front face of the elongated bar, the lower L-shaped brackets being oriented so as to project towards one another.

5,531,335
HANGER SUPPORTER ASSEMBLY
Shou-Mao Chen, 58, Ma Yuan West St., Taichung, Taiwan
Filed Mar. 27, 1995, Ser. No. 412,903
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—124 **1 Claim**

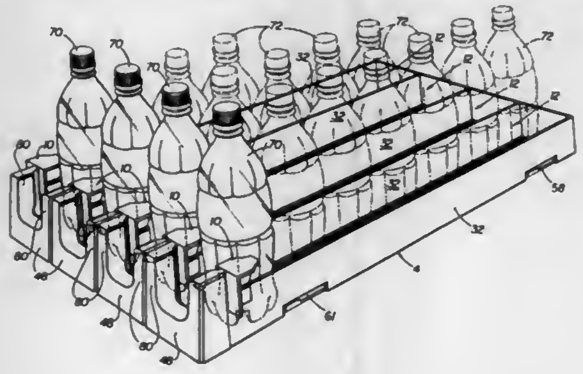


1. A hanger supporter assembly comprising:
- a frame including an upper beam having a front end and including a lower beam inclined relative to said upper beam and having a slot means formed therein, said lower beam including a front end having a pivot axis provided therein,
- a slide including at least one depression formed therein and including a first end having a pivot axle extended therefrom for slidably engaging with said slot means of said lower beam, said slide including a second end having a pivot shaft provided therein,
- a lever including a first end pivotally coupled to said front end of said lower beam at said pivot axis, including a middle portion pivotally coupled to said second end of said slide at said pivot shaft, and including a second end for engaging with said upper beam, and
- means for engaging said second end of said lever to said upper beam,
- said slide being disengaged from said upper beam when said second end of said lever is disengaged from said upper beam, and said slide being engaged with said upper beam when said second end of said lever is engaged with said upper beam.

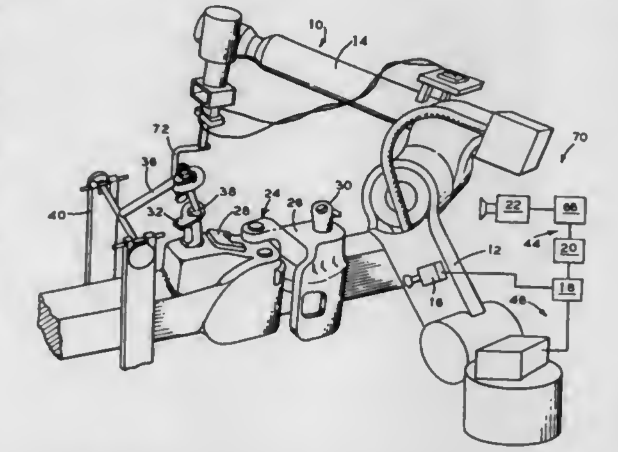
5,531,336
DEVICE FOR STABILIZING CONTAINERS IN A GRAVITY FEED TRAY
Dennis E. Parham, Kennesaw, and Mark J. Sampson, Atlanta, both of Ga., assignors to The Mead Corporation, Smyrna, Ga.
Filed Mar. 11, 1994, Ser. No. 212,022
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—183 **17 Claims**

1. An improvement for a gravity-feed type shelf unit for containers of the type having a channel for receiving containers in a row and for supporting and guiding the containers therein for movement along a path of travel, the channel having a front end and a rear end, the front end being defined by a front wall, the improvement comprising:

an abutment stop comprising:
- (a) a body portion comprising an upright section having a front face and a rear face, a lower end and an opposed upper end, the upper end of the body portion terminating in a projection which is perpendicular to the body portion the projection having a pair of opposed sides and a forward end;
- (b) means on the projection of the body portion for engaging the forwardmost container in the channel so as to prevent the forwardmost container from contacting the front wall comprising an acute-shaped cut-out in the projection interconnecting at least one side with the forward end; and
- (c) means for mounting the body portion onto the unit adjacent the front wall so as to dispose the engaging means towards the rear end of the channel and into the path of travel.



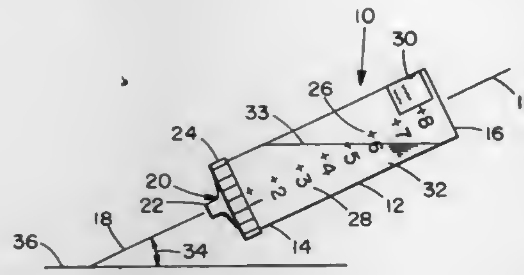
5,531,337
AUTOMATED DECOUPLER FOR RAIL CARS
Joseph Cappelletti, and Samir Zakaria, both of Sudbury, Canada, assignors to Inco Limited, Toronto, Canada
Filed May 30, 1995, Ser. No. 453,785
Int. Cl.^{6} B61G *7/00*
U.S. Cl. 213—211 **15 Claims**



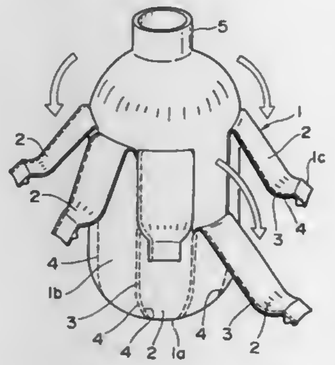
1. An automated system for uncoupling coupled cars having a shared coupling therebetween, the coupling having opposed engagable clamps, the engagable clamps having locking pins, and means for moving the locking pins, the automated system comprising an object identifying system adapted to: 1) identify at least one component of the coupling, 2) compare the identified component of the coupling with previously identified coupling values, and 3) locate the position of the locking pin moving means, a robot responsive to the object identifying system for actuating the locking pin moving means, and means for separating the resultant uncoupled cars.

5,531,338
INFANT NURSING DEVICE
Jeffrey S. Sklar, 18 Brooks Rd., Wayland, Mass. 01778
Filed Nov. 4, 1994, Ser. No. 334,139
Int. Cl.^{6} A61J *9/00*
U.S. Cl. 215—11.1 **9 Claims**

1. A nursing device comprising:
- a) a tubular container adapted for holding a liquid having a top end, a bottom end and a longitudinal axis, wherein said container has a symmetrical and uniform cross-sectional area substantially along the longitudinal axis;
- b) nursing means attached to the top end of said container;
- c) directional marking means on the surface of said container for orienting said tubular container to an inverted or semi-inverted position;
- d) a plurality of point markers located on the surface of said tubular container in spaced relationship from the top end of said tubular container and in a first plane formed with the longitudinal axis and which is perpendicular to a second plane formed by the longitudinal axis and directional marking means;
- e) indicia corresponding to the plurality of point markers, wherein said indicia have a lower value toward said top end of said container than the indicia at said bottom end of said container, for determining the volume of fluid in said container while said container is inverted or semi-inverted and at a plurality of angles to the horizontal.

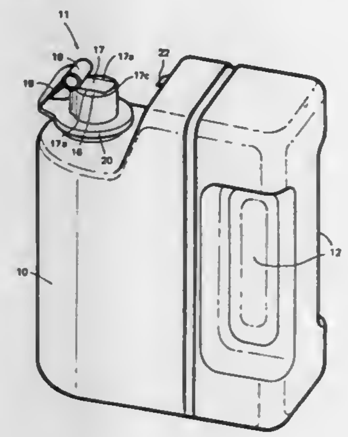


5,531,339
BOTTLE OF SYNTHETIC RESIN
Nobuo Yamanaka; Takashi Fujie; Hiroshi Hidaka, all of Tokyo, and Yoshio Akiyama, Tochigi, all of, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
PCT No. PCT/JP94/00413, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO94/21521, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 15, 1994, Ser. No. 335,883
Claims priority, application Japan, Mar. 22, 1993, 5-061866
Int. Cl.^{6} B65D *1/02;23/02*
U.S. Cl. 215—12.2 **12 Claims**



1. A bottle made of synthetic resin comprising:
- a bottom portion and a cylindrical body portion extending circumferentially upwards therefrom about a central axis, said cylindrical body portion having a plurality of fracturing walls each formed in longitudinal band shape and extending substantially in a direction of the central axis of said cylindrical body portion and a plurality of main walls, each of said main walls being disposed between and frangibly connected to adjacent fracturing walls at boundaries therebetween,
- said main walls being formed of a synthetic resin and said fracturing walls being made of a first material and a second material, said first material being a synthetic resin having good comparability with the synthetic resin of said main walls, said second material being a synthetic resin having poor comparability with the synthetic resin forming said main walls.

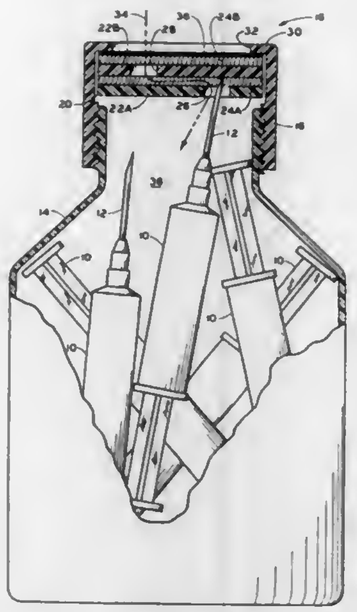
5,531,340
CLOSURE DEVICE WITH ROLLER-OPERATED TEAR TAB
Mark H. F. Dudzik, Forest Town, England, assignor to Galen (Chemicals) Limited, Foxrock, Ireland
Filed Nov. 22, 1994, Ser. No. 343,753
Claims priority, application Ireland, Nov. 25, 1993, S93/0903
Int. Cl.^{6} B65D *39/00;47/36*
U.S. Cl. 215—254 **10 Claims**



1. A tamper-evident closure device for a container, the closure device comprising
- a closure member;
- a tear tab formed integrally with the closure member and being at least partially detachable from the closure member by tearing to leave an opening in the closure member;
- a roller attached to the tear tab adjacent one edge of the tear tab; and
- an operating member attached to the roller for manually rotating the roller back across the tear tab from said one edge whereby during such rotation the tab is progressively torn away starting at the said one edge,
- the diameter of the roller being such that substantially the entire length of the tear tab is detached from the closure member by rotation of the roller through an angle of less than 360 degrees.

5,531,341
AUTOCLAVABLE CAP FOR A HAZARDOUS MATERIAL CONTAINER
Brian Shlisky, 48 Knight La., Kings Park, N.Y. 11754
Filed Jan. 13, 1995, Ser. No. 372,358
Int. Cl.^{6} B65D *51/16*
U.S. Cl. 215—308 **2 Claims**

2. A container cap for safe storage of sharp-pointed articles sterilized by steam autoclaving preparatory to a disposal thereof, said container cap comprising a cylindrical body having a top and internal threads on said body for threadable engagement to cooperating threads of a storage container for sharp-pointed articles, a superposed arrangement of discs of selected construction material disposed within said cap cylindrical body beneath said top thereof, at least a first and a second of said discs being of steam permeable construction material and at least a third and a fourth of said discs being of impenetrable construction material, said first, second, third and fourth discs being in alternating relation in said superposed arrangement and said third and fourth discs having steam passage openings therein characterized by said opening being in a

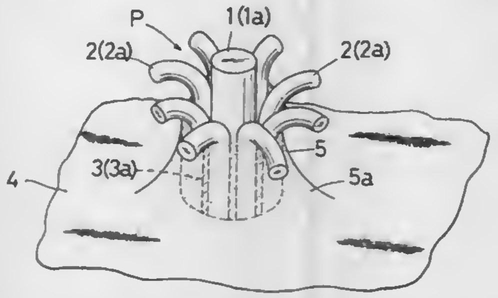


non-aligning relation to each other, whereby autoclaving steam flows externally into said storage container through said first and second discs and said third and fourth disc steam passage openings and any one of the stored sharp-pointed articles projecting through the steam passage opening of a first encountered one of said third and fourth discs is blocked from further projection by the next encountered other of said third and fourth discs as a result of said nonaligning relation of said third and fourth disc steam passage openings.

5,531,342

PRODUCTION METHOD FOR IMPLANTED HAIR ARTICLES COMPRISING SUPERFINE FIBERS

Hiroshi Ueda, 3-16, Imai 3-Chome, Ome-shi, Tokyo, Japan
Filed Apr. 11, 1994, Ser. No. 225,718
Claims priority, application Japan, Mar. 2, 1994, 6-056770
Int. Cl.^{6} A41G *5/00;* B05D *5/00*
U.S. Cl. 216—7 **15 Claims**

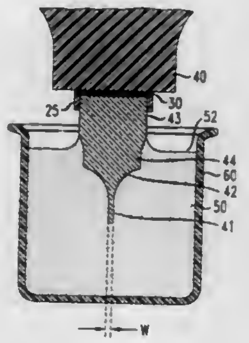


1. A method for producing implanted hair articles comprising superfine fibers wherein composite fibers composed of fiber-forming polymers of a plurality of components having different solubilities for a chemical or solvent are processed into piles, the piles are subjected to hair implantation on a face of a base material on which an adhesive for hair implantation is applied and are dried, subsequently a chemical reaction suppressing agent for said chemical or solvent is coated on the hair implantation face of said base material and on the surface of the piles, the chemical reaction suppressing agent permitted to move vertically downward on the piles toward root portions thereof, and thereafter said chemical or solvent is used to dissolve and treat components of the piles having larger solubilities, or each of the components is subjected to a peeling treatment, whereby roots of said piles are allowed to remain, and distal portions of the piles are divided into each of the polymers.

5,531,343

CYLINDRICAL FIBER PROBE DEVICES AND METHODS OF MAKING THEM

Robert W. Filas, Bridgewater, and Herschel M. Marchman, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.
Continuation-in-part of Ser. No. 173,298, Dec. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 91,808, Jul. 13, 1993, abandoned. This application May 20, 1994, Ser. No. 246,523
Int. Cl.^{6} C03C *15/00*
U.S. Cl. 216—11 **13 Claims**

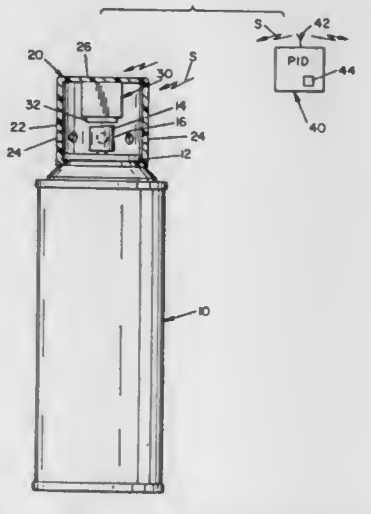


1. A method of making a probe device comprising the steps of:
(a) providing an initial cylindrical fiber segment;
(b) etching, prior to step (c), a lower cylindrical region of the fiber segment for a first time duration, whereby a width of the lower cylindrical region becomes less than that of an upper cylindrical region of the fiber segment;
(c) cleaving a tip of the lower region of the fiber, whereby a cleaved lower region of the fiber is formed; and
(d) etching, subsequent to step (c), the lower cylindrical region of the fiber for a second time duration, whereby the width of the lower cylindrical region is further reduced to a lower value, but the width of the upper cylindrical region remains essentially unchanged.

5,531,344

ACTUATOR FOR A PERSONAL PROTECTIVE SPRAY CANISTER

James E. Winner, Hollywood Beach, Fla., assignor to Winner International Royalty Corporation, Sharon, Pa.
Filed Nov. 14, 1994, Ser. No. 337,753
Int. Cl.^{6} G01F *11/00*
U.S. Cl. 222—1 **31 Claims**



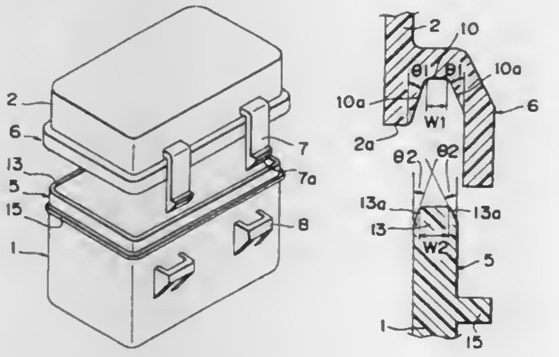
1. An actuator for a personal protective spray canister having a container means for holding a pressurized protective material capable of being propelled in a gaseous cloud to at least partially disable a person and a manipulative valving device protruding outwardly from said container means, with said valving device having an outlet for directing said gaseous cloud from said container means and a valve element movable between a first biased normal position closing said outlet and a second depressed operative position opening said outlet to allow said material to be propelled from said container means as said cloud, said actuator comprising: a radio frequency receiver means for detecting and receiving a coded radio frequency signal, a decoder means for creating an identification signal when said receiver means receives a radio frequency signal with a preselected code, mechanical means for moving said valve element into said second depressed, operative position in response to a danger signal, means for creating said danger signal in response to a given number of identification signals received within a given time, electrical means for providing power to operate said mechanical means to depress said valve element and means for mounting said actuator onto said container with said mechanical means operatively associated with said valve element.

30. A method of operating a personal protective spray canister having a container means for holding a pressurized protective material capable of being propelled in a gaseous cloud to at least partially disable a person and a manipulative valving device protruding outwardly from said container means, with said valving device having an outlet for directing said gaseous cloud from said container means and a valve element movable between a first biased normal position closing said outlet and a second depressed operative position opening said outlet to allow said material to be propelled from said container means as said cloud, and a cap mounted on said container means, said method comprising the steps of providing mechanical means in said cap for moving said valve element into said second position and moving said valve element into said second position in response to a danger signal created by a remotely created trigger signal having a preselected code.

5,531,345

FITTING CONSTRUCTION OF ELECTRICAL CONNECTION BOX

Masayoshi Nakamura, and Hiroki Ikeda, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Aug. 30, 1994, Ser. No. 297,788
Claims priority, application Japan, Oct. 12, 1993, 5-055048 U
Int. Cl.^{6} H02G *3/08*
U.S. Cl. 220—3.8 **6 Claims**

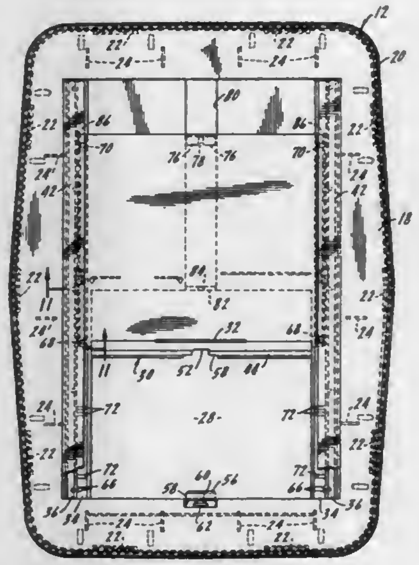


1. A fitting construction of an electrical connection box, comprising:
- a casing member which is made of resin and includes a first peripheral wall having an upper end, a projection being formed at the upper end of the first peripheral wall; and
- a cover member which is made of resin and includes a second peripheral wall having a lower face, a downwardly opening fitting groove being formed on the lower face of the second peripheral wall so as to be mounted on an upper portion of the casing member through fitting of the projection into the fitting grove;
- wherein the fitting grove is shaped so as to become wider towards a lower end of the fitting groove, while the projection is shaped so as to become wider towards a lower end of the projection;
- a locking member for locking the cover member and the casing member together, the locking member being formed separately from both the projection and the fitting groove;
- wherein the projection is brought into pressing contact with opposed side faces of the fitting groove at the time of fitting of the projection into the fitting groove so as to spread out the fitting groove and said projection includes a top portion which provides sealing engagement at a point spaced from the peripheral wall of the casing member when said cover member is locked by said locking member to said casing member.

5,531,346

BIOHAZARDOUS WASTE CONTAINER

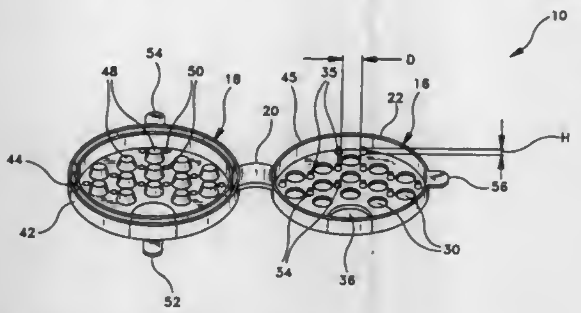
Donald J. Mosior, Lake Geneva, Wis., assignor to Sage Products, Inc., Crystal Lake, Ill.
Filed Oct. 13, 1994, Ser. No. 322,578
Int. Cl.^{6} B65D *51/18*
U.S. Cl. 220—254 **27 Claims**



1. A top for a waste container, comprising
- a. a lid portion,
- b. an access aperture in said lid portion,
- c. a sliding closure positioned to be closed over said access aperture,
- d. guide means on opposite sides of said access aperture for guiding sliding movement of said closure, said guide means including opposite guide channels,
- e. means for temporarily retaining said closure in a first closed position over said access aperture, said means for temporarily retaining including a stop to prevent sliding movement of said closure past said first closed position and a stay located in at least one of said channels, said stay comprising a foot extending from said closure and a corresponding depressible spring member in a said channel, and
- f. means for permanently retaining said closure in a second closed position over said access aperture.

5,531,347
PASTRY SUPPORTING CUP COVER

Charles T. Goulding, 5100 Mountain Top Rd., New Hope, Pa. 18938
Filed Mar. 17, 1995, Ser. No. 405,730
Int. Cl.^{6} B65D *51/18*
U.S. Cl. 220—256 **17 Claims**



1. A cover for a container, comprising:

a base surface having a peripheral edge;

engagement means disposed on said peripheral edge for engaging the container and selectively joining the cover to the container;

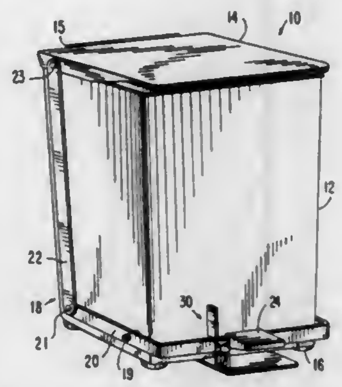
a removable drinking tab disposed on said base surface, wherein said removable drinking tab is selectively removable to expose an opening in said cover large enough for drinking;

at least four apertures disposed in said base surface, wherein said apertures are substantially evenly distributed across said base surface; and

a plurality of supports extending from said base surface, wherein said supports terminate in a plane a predetermined height above said base surface and are substantially evenly distributed across said base surface.

5,531,348
CHILD RESISTANT STEP-ON RECEPTACLE

Jeffrey J. Baker, Scotia, and Philip Jaros, Gloversville, both of N.Y., assignors to White Mop Wringer Company, Tampa, Fla.
Filed Sep. 15, 1993, Ser. No. 121,310
Int. Cl.^{6} B65D *43/16;43/22*
U.S. Cl. 220—264 **23 Claims**



1. A safety latch step-on container comprising:

a receptacle having a closed lower end and an open upper end;

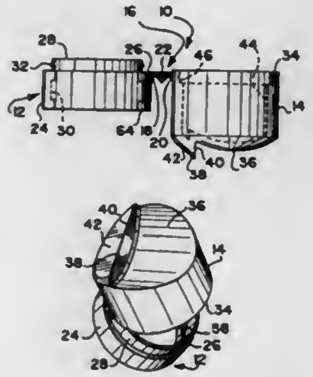
a lid member covering said open upper end of said receptacle;

a linkage mechanism having a generally horizontal bar and a generally vertical bar, wherein said vertical bar is pivotally linked to said lid member and depressing said horizontal bar causes said vertical bar to move said lid member to open said container; and

a safety mechanism coupled to said linkage mechanism and movable between a first position in which said safety mechanism prevents relative movement between said horizontal bar and said vertical bar to thereby lock said lid member down and keep said container closed, and a second position in which movement between said horizontal bar and said vertical bar is unrestricted so that said container is unlocked and may be opened.

5,531,349
FLIP-TOP CLOSURE

Michael A. Wojcik, and Michael J. Donnantuono, both of Naperville, Ill., assignors to Blistex Inc., Oak Brook, Ill.
Continuation of Ser. No. 994,891, Dec. 22, 1992, abandoned.
This application Mar. 29, 1995, Ser. No. 415,120
Int. Cl.^{6} B65D *41/16*
U.S. Cl. 220—339 **12 Claims**



1. A closure for a container comprising:

a collar adapted to snugly engage a portion of the container;

said collar having a cap engaging portion adapted to fit inside a cap when said cap is removably placed over said collar portion;

hinge means attaching said cap to said collar for pivotal movement of said cap relative to said collar whereby the arc of travel of said pivoting cap causes said pivoting cap to clear said cap engaging portion of said collar when said cap is pivoted about said hinge means and placed over said cap engaging portion;

said hinge means essentially consisting of a single unitary member integrally formed between said cap and said collar;

said hinge means having a body portion, said body portion attached to said cap and said collar along only a single uninterrupted portion of an outer sidewall of said cap and said collar, respectively; and

said body portion having two fold lines, each fold line being disposed on opposite sides of said body portion and disposed transverse to said arc of travel of said pivoting cap.

5,531,350
THERMAL POT

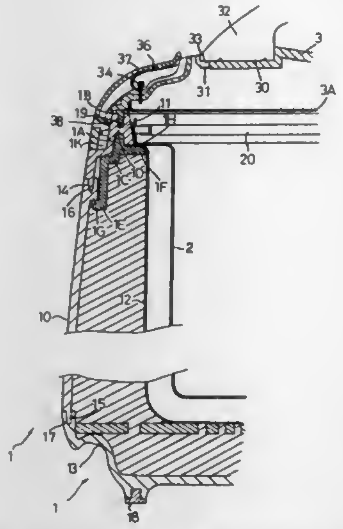
Yao K. Lu, P.O. Box 82-144, Taiwan City, Taiwan
Filed Jun. 12, 1995, Ser. No. 489,231
Int. Cl.^{6} A47J *41/00*
U.S. Cl. 220—421 **1 Claim**

1. A thermal pot of the type comprising a heat-insulative housing, a heat-insulative inner pot put in said heat-insulative housing, and a cover covered on said heat-insulative housing over said heat-insulative inner pot, wherein:

said heat-insulative housing comprises a hollow shell, a heat-insulative lining mounted around the inside wall of said hollow shell, a base covered on said hollow shell and said heat-insulative lining at a bottom side, and a rim fastened to said hollow shell and said heat-insulative lining at a top side by a connecting member, said hollow shell comprising an endless mounting groove around the topmost edge thereof, an endless mounting flange raised from the lowest bottom edge thereof, and an inside lip near the topmost edge, said base comprising an endless mounting groove fastened to the endless mounting flange on said hollow shell by ultrasonic welding, said rim comprising a downward mounting flange raised from a bottom side thereof and fastened to the endless mounting groove on said hollow shell by ultrasonic welding, a plurality of stop blocks and retaining grooves alternatively spaced around the periphery, an endless top mounting groove, an endless bottom mounting groove, and a top contact plate fastened to the top mounting groove on said rim, said heat-insulative lining having a coupling lip raised from a top side thereof, said connecting member comprising a first coupling portion fastened to the endless bottom mounting groove on said rim by ultrasonic welding, a second coupling portion coupled to the inside lip on said hollow shell, and a third coupling portion coupled to the top lip on said heat-insulative lining;

said heat-insulative inner pot has a pivoted handle at a top side thereof carrying by hand;

said cover comprises two recessed portions spaced at a top side thereof, two retaining holes respectively made in said recessed portions, a handgrip having two hooks at two opposite ends respectively inserted into said recessed portions and hooked in the retaining holes in said recessed portions, a lug near the border, a through hole adjacent to said lug, a pivot fixed to said lug, a spring, and a hook turned about said pivot and having one end supported on said spring and an opposite end inserted through said through hole for engaging one stop block on said rim to hook said cover in position, a gasket mounted on the inside for covering on said heat-insulative inner pot, and a plurality of retaining strips raised from an inside wall thereof around the border for engagement with the retaining grooves on said rim by rotating said cover relative to said rim.



5,531,351
MULTI-FUNCTION DRUM CAP

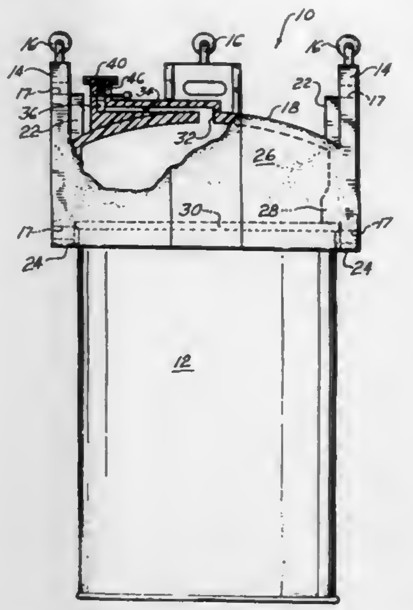
Dana K. Logsdon, 400 1/2 W. Main St., Beardstown, Ill. 62618
Filed Mar. 20, 1995, Ser. No. 406,395
Int. Cl.^{6} F16N *31/00;* B65D *1/34*
U.S. Cl. 220—571.1 **11 Claims**

1. A multi-function drum cap comprising;

a circular domed region which has an extended side border which frictionally abuts a drum top;

said circular domed region being bordered by at least four legs having raised ledges acting as first stop regions on the inside and situated on an upper surface of said circular domed region, said legs situated equidistantly from each other;

said at least four legs extending below said extended side border of said circular domed region to frictionally abut a rim of a drum top, wherein each leg has a removable caster;



a vertical pipe portion situated proximate to an edge of said circular domed region and having a horizontal extension extending to a center of said circular domed region and opening at a bottom surface of said circular domed region;

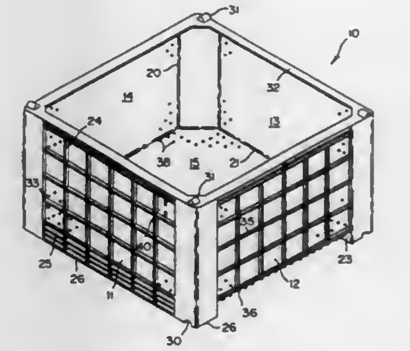
said vertical pipe portion containing a valve to control fluid flow passing through said vertical pipe portion; and

a circumferentially located second stop region which is integral with said legs and said extended side border, whereby

said multi-function drum cap can be utilized for the functions selected from a drum cap to protect a drum top from the elements, an oil drain pan for vehicles when turned upside down, and a drum funnel when turned upside down with or without a drum attached.

5,531,352
AGRICULTURAL CONTAINER

Larry Kraft, Yakima, and Don Holman, Cashmere, both of Wash., assignors to Kradon, Inc., Yakima, Wash.
Filed Jul. 9, 1993, Ser. No. 89,686
Int. Cl.^{6} B65D *19/04*
U.S. Cl. 220—675 **8 Claims**



1. A plastic fruit bin comprising:

four vertical walls forming, in plan view, a rectangular shape;

a bottom element joined to the four vertical walls;

two support elements, each extending along and attached to the bottom of each of two opposite walls and partly supporting and extending below the bottom element; and

an array of gas injection tubes disposed on the lower side of the bottom element and extending up the center of each of the four vertical walls.

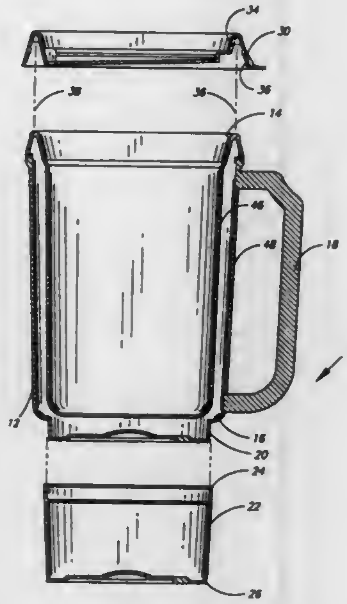
5,531,353
DRINKING CUP DEVICE

Ronald K. Ward, 600 W. Fredericksburg, and William M. Ward, 10700 S. Lynn La., both of Broken Arrow, Okla. 74011

Filed Oct. 26, 1994, Ser. No. 329,482

Int. Cl.^{6} A45F *3/18*

U.S. Cl. 220—729 **14 Claims**



1. A drinking cup device including a cup portion having an open top and a base, which drinking cup device comprises:
  a removable lid, said lid including an upper side and a lower side, said lower side mating with said cup portion open top;
  a portable storage portion;
  means to connect and disconnect said storage portion from said cup portion base; and
  means to receive said cup portion base in said lid upper side or to receive said storage portion in said lid upper side.

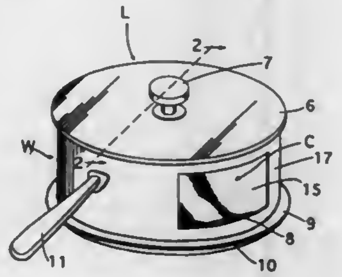
5,531,354
SPATTER SHIELDING AND VAPOR VENTING DEVICE FOR FRYING PAN

William C. Uy, 621 Parkridge Dr., Hockessin, Del. 19707

Filed Aug. 15, 1995, Ser. No. 515,488

Int. Cl.^{6} B65D *1/40*

U.S. Cl. 220—731 **7 Claims**



1. A spatter shielding and vapor venting device for mounting on a frying pan and covering the entire open area of said frying pan, said device comprising;
  a vertical hollow cylindrical wall having an open top with a top rim, a open bottom with a vertical bottom flange and a peripheral horizontal flange attached to and extending radially outwardly from said wall near the bottom flange, an opening in the wall spaced above the horizontal flange and forming a window through said wall, a window cover having an outer periphery the same shape as and substantially the same size as the opening to completely cover the opening, and a transparent lid covering the open top of said wall,
  said wall further having a handle attached to and extending radially outwardly from said wall, said handle being spaced from said opening, a horizontal plate attached to and extending radially inwardly from said wall and being located directly above said opening,
  said window cover further having a hinged top edge which is attached to said horizontal plate allowing said cover to swing to open and close said opening,
  said lid further having an outer perimeter, a bottom side, a cylindrical flange depending from said bottom side and spaced inwardly from the perimeter, and at least three radial ridges extending from said flange to the outer perimeter, said ridges engaging the top rim of the cylindrical wall when said lid is placed on said wall to space the bottom side of said lid from said rim to form a peripheral venting gap,
  whereby the shielding and venting device is placed onto the frying pan with the bottom and peripheral flanges of the cylindrical wall engaging the uppermost portion of the inner wall and the top wall of the pan respectively, the window cover allowing the insertion of a cooking utensil into the device to allow access to the pan interior without removal of the device from the pan and the peripheral venting gap allowing the pan to be vented without removal of the lid.

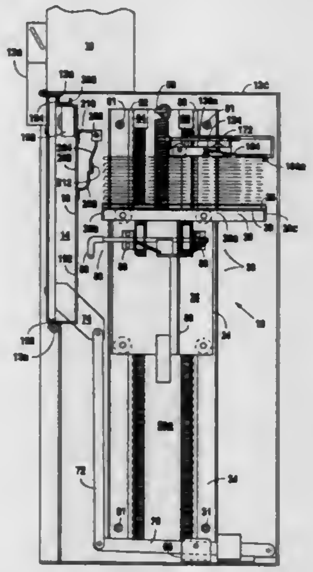
5,531,355
SINGLE VEND MACHINE

Ralph J. Ullmann, Rte. 2, Box 193, Shiner, Tex. 77995, and Harvey G. Kresta, P.O. Box 667, Shiner, Tex. 77984

Filed Sep. 8, 1994, Ser. No. 303,053

Int. Cl.^{6} B65H *3/00*

U.S. Cl. 221—191 **13 Claims**



1. An apparatus for dispensing and vending newspapers, one at a time, from a stack of newspapers, the apparatus comprising:
  a cabinet, said cabinet having walls defining a front opening;
  a movable shelf for holding a plurality of stacked newspapers within said cabinet;
  spring bias means to bias said shelf upward;
  a hinged door pivotable between a closed position and an open position, said door mounted in the front opening of said cabinet;
  an insert having a slot, the slot dimensioned for receipt of a paper therethrough, the insert dimensioned to fit within the front wall opening of said cabinet without interfering with the opening and closing of said hinged door;

  feed means for engaging newspapers and feeding a single newspaper from a stack of multiple newspapers through the slot of said insert, from a stack position to a vend position;
  lever means operatively engaging said door and said feed means wherein said door moving between a closed position and an open position moves said feed means to vend one of the stacked newspapers through the slot of said insert; and
  means to disengage said lever means from said feed means before said door reaches the open position.

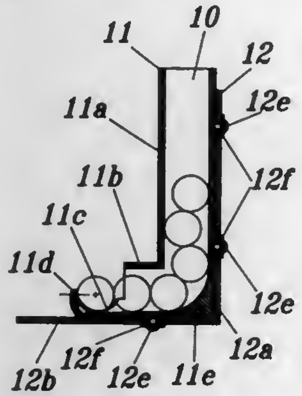
5,531,356
GOLF BALL DISPENSER

John R. Baker, 845B Stanley Ave., Evansville, Ind. 47711

Filed Dec. 30, 1994, Ser. No. 366,744

Int. Cl.^{6} B65G *59/00*

U.S. Cl. 221—281 **1 Claim**



1. A device for containing spherical objects such that the spherical objects can be poured into one end of said device in bulk and then removed one at a time from the other end, said device comprised of elements acting in combination as follows:
  a) a tube assembly comprised of a vertical standpipe, a horizontal leg, and an inner surface with a elliptical curve, said inner surface with an elliptical curve having its long side at a slight incline so as to encourage the aforesaid spherical objects towards a stop at the lower end of the aforesaid tube assembly and said inner surface with an elliptical curve having its short side at the juncture of the vertical standpipe and the horizontal leg so that the spherical objects pass through said juncture without jamming;
  b) a stand which is affixed to the tube assembly;
  c) a funnel at the top of the aforesaid vertical standpipe;
  d) a receiver at the top of the aforesaid funnel, into which the aforesaid spherical objects are dumped;
  e) clearances in the lower end of the aforesaid tube assembly such that allow for easy removal of the aforesaid spherical objects from the aforesaid device and
  f) a stop at the end of the lower end of the aforesaid tube assembly.

5,531,357
HOSE CONTAINMENT SYSTEM

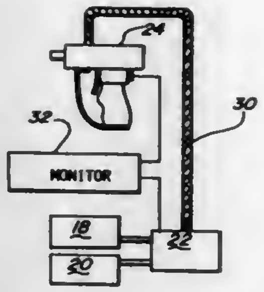
Bruce T. Guilmette, Ortonville, Mich., assignor to Foamseal, Inc., Oxford, Mich.

Filed Oct. 20, 1994, Ser. No. 326,589

Int. Cl.^{6} B67D *5/08*

U.S. Cl. 222—1 **19 Claims**

1. A method for containing and limiting leaks in a foam delivery system comprising the steps of:
  a. providing a pump which is operative for delivering a pressurized flow of a material;
  b. providing a gun which is selectably operable to permit or block the pressurized flow of the material;



  c. providing a flexible hose disposed to establish fluid communication, and convey the pressurized flow of material, between the pump and the gun;
  d. providing a flexible, expansible sheath around said hose, said sheath being operative to expand so as to contain any of the material which is released from a leak along said hose;
  e. providing a leak monitor which determines if leakage is occurring, said leak monitor being further operable to provide a control signal; and
  f. monitoring if leakage is occurring and stopping said pump if a leak is detected.

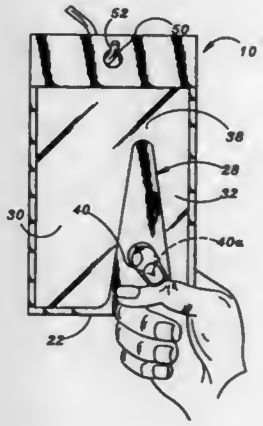
5,531,358
FLEXIBLE DISPENSING PACKAGE

Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602

Continuation-in-part of Ser. No. 14,753, Nov. 1, 1993, Pat. No. Des. 354,221. This application Oct. 3, 1994, Ser. No. 317,186

Int. Cl.^{6} B65D *35/08*

U.S. Cl. 222—107 **13 Claims**

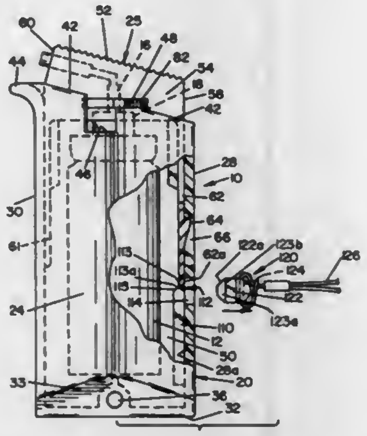


1. A dispensing package comprising:
  A sealed enclosure determined by superimposed first and second flexible sheets and a peripheral seal circumscribing the sheets, the seal comprising a top edge, a bottom edge, and opposed first and second side edges;
  means for dividing the sealed enclosure into a storage reservoir and a dispensing channel, the dispensing channel including an open distal end portion in fluid communication with the storage reservoir, and an opposed closed proximal end portion contiguous to a section of the bottom edge of the peripheral seal, said dividing means comprises a depending seal comprising an upper portion, an opposed lower portion, and a central portion disposed between the upper and lower portions, the upper portion being in spaced proximity to the top edge of the peripheral seal, and the lower portion being contiguous to the bottom edge of the peripheral seal; and
  tear open means, responsive to force means, for tearing open the proximal end portion and peripheral seal section, said tear open means being disposed within the central portion of said

depending seal and being defined by an aperture having a pointed portion and an opposed generally rounded portion.

5,531,359
HOLDER FOR PERSONAL PROTECTION DEVICES

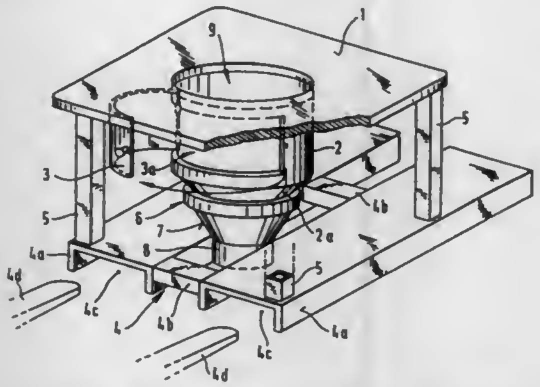
Kevin Winner, Hermitage, Pa., assignor to Guardian Royalty Corporation, Sharon, Pa.
Filed Nov. 25, 1994, Ser. No. 345,632
Int. Cl.^{6} B67D *5/33*
U.S. Cl. 222—153.11 **30 Claims**



1. A disarming device for a portable personal protection apparatus comprising housing means for at least partially enclosing said personal protection apparatus, actuator means including a leg on said housing means and displaceable relative thereto for for activating said personal protection device, and arming means removably supported on said housing for disabling and enabling said actuator means and interacting with said leg, said arming means including an arming member which disables said actuator means when removed from said housing means.

5,531,360
METERING PALLET

Norbert Berdel, Obertshausen, and Marian Chojnowski, Biebergemuend, both of, Germany, assignors to Cerdec Aktiengesellschaft Keramische Farben, Frankfurt am Main, Germany
Filed Jul. 14, 1994, Ser. No. 274,847
Claims priority, application Germany, Aug. 2, 1993, 43 25 908.1
Int. Cl.^{6} B67D *5/08;* **B65D** *35/56*
U.S. Cl. 222—185.1 **13 Claims**



1. A metering pallet for use in combination with bigbag receptacles, comprising a top receiving plate connected by a connecting member to a bottom baseplate with pockets for receiving the forks of fork-lift trucks, an upwardly open container positioned between said top receiving plate and said baseplate, and disposed under an opening in the receiving plate, the container having a side wall with an opening, said opening in said side wall being fitted with a means for closing said opening in said side wall, the container having an underside connected to a metering device, and wherein said opening in said sidewall is fitted with a closure door.

11. A metering pallet for use in combination with bigbag receptacles, comprising:

a top receiving plate having an opening for receiving a bigbag receptacle;

a bottom baseplate with pockets for receiving the forks of fork-lift trucks,

form supports extending between said top receiving plate and said bottom baseplate and connected with said top receiving plate and said bottom baseplate;

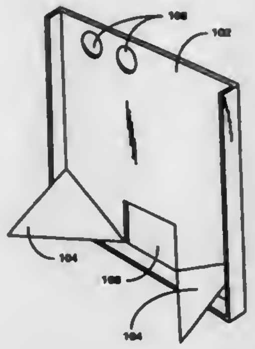
an upwardly open container positioned between said top receiving plate and said baseplate, and disposed under the opening in the receiving plate, said container having a side wall with an opening formed therein, said opening in said side wall and said form supports being dimensioned and arranged such that a bag outlet of a bigbag supported by said top receiving plate can be opened and closed by access gained through said opening in the side wall;

a closure supported by said container and dimensioned so as to cover the opening when not in use; and

a metering device connected to an underside of the container.

5,531,361
ACTIVE BULKHEAD CORNER WITH ENHANCED COMMODITY DISCHARGE

Victor T. Podd, 255 Beverly Avenue, Montreal, Quebec, Canada
Filed Aug. 26, 1994, Ser. No. 296,532
Int. Cl.^{6} B65D *83/00*
U.S. Cl. 222—198 **57 Claims**



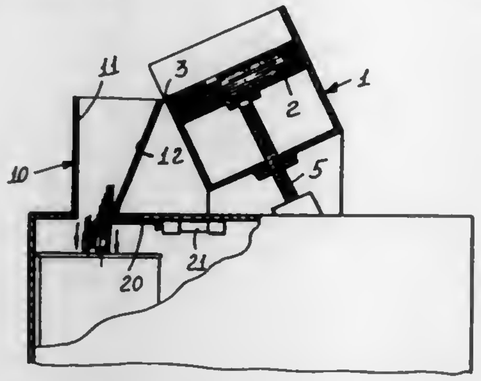
1. An active bulkhead corner for use with a cargo container bulkhead, comprising:

an inflatable bag, positioned upon inflation in a corner of a cargo container at an intersection of a floor of the cargo container, a first wall of a cargo container bulkhead and a second side wall of the cargo container, the bag configured upon inflation to displace cargo from the corner of the cargo container;

a support surface, the support surface having one side in contact with the inflatable bag, the support surface further having a first edge substantially parallel to the first wall of the cargo container bulkhead, a second edge substantially parallel to the second side wall of the cargo container, and a third edge substantially parallel to the floor of the cargo container.

5,531,362
AUTOMATIC APPARATUS FOR METERING SPAGHETTI AND THE LIKE

Carlo M. G. Bottacco, Montecarlo, Monaco, assignor to Forbrose B.V., Amsterdam, Netherlands
Filed Mar. 20, 1995, Ser. No. 414,122
Claims priority, application Italy, Mar. 21, 1994, MI94A0542
Int. Cl.^{6} G01F *11/00*
U.S. Cl. 222—390 **6 Claims**

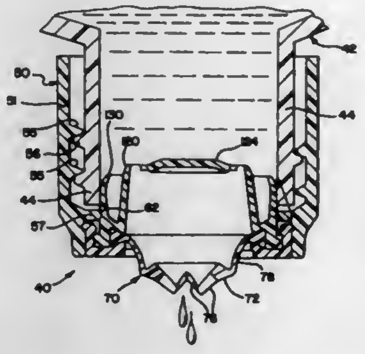


6. An automatic spaghetti metering apparatus, said apparatus comprising:

a) a vessel for spaghetti to be metered;
b) a bottom in said vessel which is adapted to be displaced;
c) controlled driving means for displacing said vessel bottom;
d) an overflow rim provided on said vessel;
e) a collecting bin adjoining said overflow rim;
f) a pouring outlet in said collecting bin controlled by shutter means; and
g) piston means arranged for driving said shutter means.

5,531,363
DISPENSING CLOSURE CARTRIDGE VALVE SYSTEM

Richard A. Gross, Brookfield, and Eldon W. Schaffer, II, East Troy, both of Wis., assignors to Aptargroup, Inc., Crystal Lake, Ill.
Filed Jun. 10, 1994, Ser. No. 258,659
Int. Cl.^{6} B65D *5/72*
U.S. Cl. 222—494 **16 Claims**



1. A cartridge for being received and retained in a hollow closure housing suitable for engagement with a container around an opening to the container interior, said cartridge comprising:

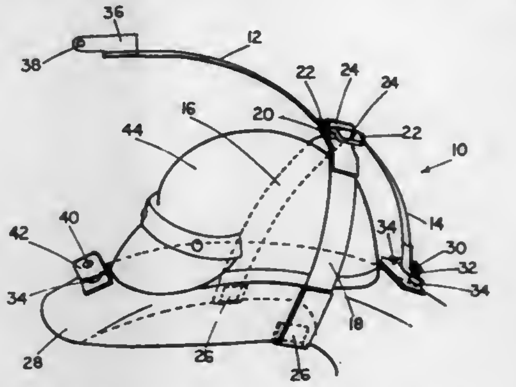
a body defining a dispensing passage for communicating with the container exterior and interior when said cartridge is received in said housing on said container;

a valve seated in said body for shifting between a closed configuration occluding said passage and an open configuration accommodating the dispensing of the container contents through said passage; and

a retainer engaged with said body to hold said retainer and body in a clamping relationship retaining said valve in said body, said retainer and body cooperating to maintain said engagement independently of said housing.

5,531,364
ANTI-THEFT CAGE FOR SECURING A HELMET ON A MOTORCYCLE

Joseph Buis, 1518 Rockwood St., Los Angeles, Calif. 90026
Filed Jun. 17, 1994, Ser. No. 262,017
Int. Cl.^{6} B62J *11/00*
U.S. Cl. 224—413 **11 Claims**



1. An anti-theft device for securing one object of a predetermined size to another object, comprising:

a plurality of elongated straps,

said straps each being fixed to a predetermined length for snugly holding said one object when said straps are connected together to form a cage for said one object,

said straps being connected together to form said cage for snugly holding said one object, and

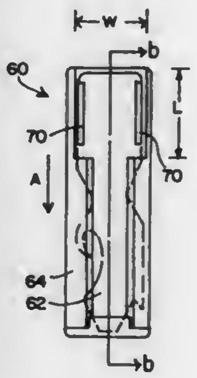
locking means for locking said cage onto said other object,

said locking means comprising a hole disposed on a lower end of one of said straps, a hook disposed on a lower end of each remaining strap, a plurality of hoop members attached to said other object for engaging said hooks, and a locking anchor attached to said other object, said locking anchor having a hole therein for aligning with said hole on said one of said straps, said aligned holes being adapted to receive a lock therein for locking said cage onto said other object,

whereby when said one object is received in said cage and said cage is locked onto said other object, said one object will be positively protected from theft and accidental damage.

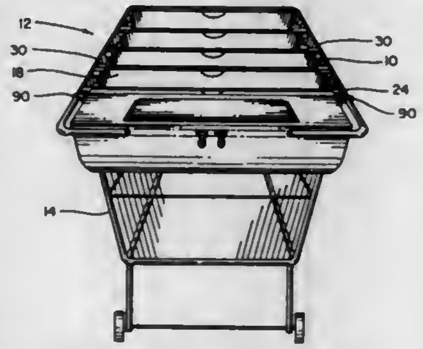
5,531,365
BELT CLIP INCORPORATING A MULTIPURPOSE TOOL

Michael Donnelly, 504 Borrie Ave., Brielle, N.J. 08730
Filed May 18, 1994, Ser. No. 245,661
Int. Cl.^{6} A45C *15/00;* **A45F** *4/00*
U.S. Cl. 224—576 **15 Claims**



1. A clip for securing a personal communications portable device having a first adapter to an article carrier, said clip comprising:
- a. plate-shaped first element including one or more tools;
- b. a second element having first and second ends for carrying said first element; and
- c. a second adapter for pivotally securing said first and second elements to the first adapter;
  - i. said second adapter comprising a pair of parallel flanges extending in a direction substantially perpendicular to one face of said first element, said flanges located proximate said first end of said second element; and
- d. means for biasing said second end of said second element toward the portable device wherein the article carrier is maintained between the clip and the portable device.

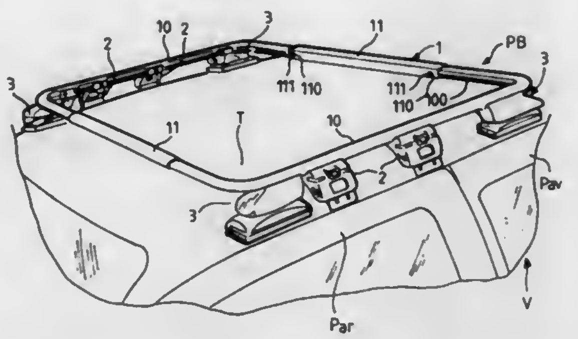
5,531,366
CARRY OUT CADDY FOR SHOPPING CARTS
Grant C. Strom, 11 Cobbler Ct., South Elgin, Ill. 60177
Filed Jul. 22, 1994, Ser. No. 278,758
Int. Cl.^{6} A45F *3/04*
U.S. Cl. 224—153 **26 Claims**



1. A reusable shopping bag structure comprising:
- (a) a collapsible and expandable soft sided bag which can be rolled up from an upper open end in a spiral shape; and
- (b) a pair of elongated hanger bars, the bag having hanger bars means for attaching the hanger bars to opposite sides of said bag adjacent the upper open end of the bag, opposite ends of each hanger bar extending beyond opposite sides of the bag for engagement with spaced apart upper edges of a shopping cart to suspend the bag in a shopping cart when the bag is unrolled and expanded for hanging in a shopping cart, the hanger bars adapted to extend substantially perpendicularly from the upper edges of the shopping cart with each hanger bar having means for slidably, telescopically varying the distance between of the hanger bar to provide a variable length hanger bar for extending between the spaced apart upper edges of shopping carts having varied widths between the spaced apart upper edges.

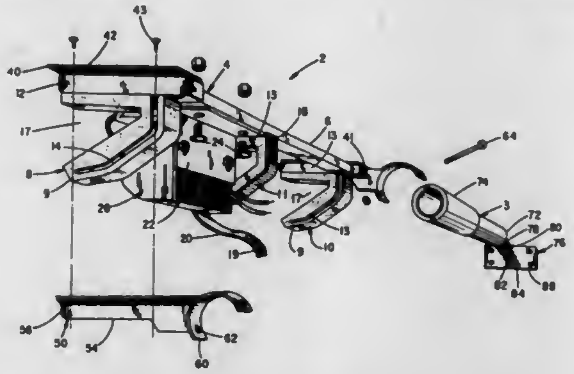
5,531,367
VEHICLE BAGGAGE-HOLDER DEVICE
Jean-Marie Ravier, Saint Malo, France, assignor to Automaxi Industries, Saint Malo, France
Filed Feb. 1, 1995, Ser. No. 382,065
Claims priority, application France, Feb. 10, 1994, 94 01497
Int. Cl.^{6} B60R *9/058*
U.S. Cl. 224—329.000 **8 Claims**

1. Baggage-holder device for vehicles comprising:
- a frame having two lateral bars and two transverse bars connected to said lateral bars;
- detachable means for attaching said frame to the bodywork of said vehicle;
- at least two support members associated with each said lateral bar for supporting said frame and resting on a particular area of said bodywork of said vehicle;



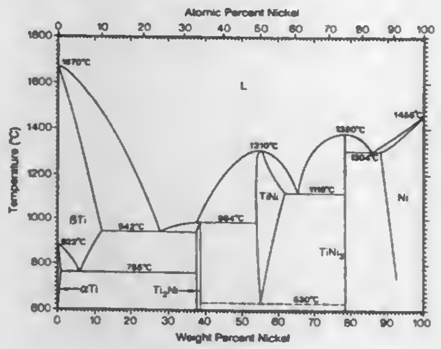
- said support members being separate from said detachable means and each having a main body on which said frame rests and support means having an elastic material shoe adapted to be in contact with said area of said bodywork of said vehicle;
- said main body and said support means of each of said support members being mechanically coupled by means of a ball-joint to allow oscillation in three dimensions about an axis substantially perpendicular to a plane of said frame;
- each of said transverse bars being made from a tube;
- said lateral bars each having ends joined to respective ends of said tubes;
- each of said lateral bars having a guide rail;
- said support means and said detachable means each having immobilizing means; and
- said immobilizing means forming with said guide rail a mutual mechanical coupling means for enabling said support members and said detachable means to adjustably slide along said guide rail and to be immobilized in adjustable positions, and said tubes forming the transverse bars having means for immobilizing the lateral bars to allow adjustment of a transverse dimension of said frame.

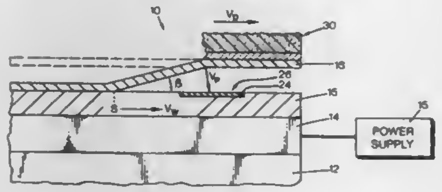
5,531,368
VEHICLE MOUNTED LOCKING FIREARM SUPPORT
Ted Morford, Bozeman, Mont., assignor to Big Sky Racks, Inc., Bozeman, Mont.
Continuation of Ser. No. 4,982, Jan. 15, 1993, Pat. No. 5,350,094, and Ser. No. 115, Oct. 1, 1992, Pat. No. Des. 356,541. This application Sep. 26, 1994, Ser. No. 312,413
Int. Cl.^{6} B60R *7/14*
U.S. Cl. 224—551 **14 Claims**



1. Firearm support apparatus comprising:
- (a) a vehicle support including means for mounting the vehicle support in substantially parallel relation to a planar surface of a motor vehicle;
- (b) a framework including i) a longitudinal member, ii) means for securing said longitudinal member to the vehicle support, iii) first and second arms projecting transverse to said longitudinal member and parallel to the planar surface, and iv) first and second concave cradles respectively secured to an unrestrained distal end of said first and second arms.

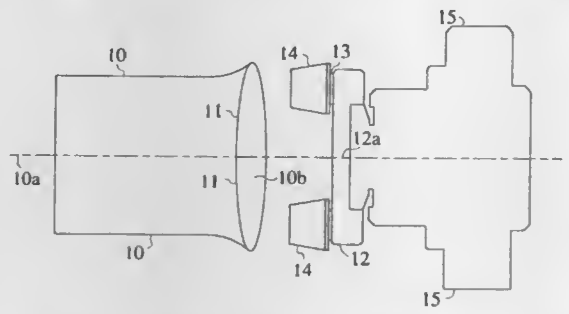
5,531,369
PROCESS FOR MAKING MACHINES RESISTANT TO CAVITATION AND LIQUID DROPLET EROSION
Roger H. Richman, Mountain View, Calif.; Osman T. Inal; Charles A. Zimmerly, both of Socorro, N.M., and Darel E. Hodgson, Palo Alto, Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.
Filed Aug. 2, 1993, Ser. No. 100,685
Int. Cl.^{6} B23K *20/08*
U.S. Cl. 228—109 **24 Claims**





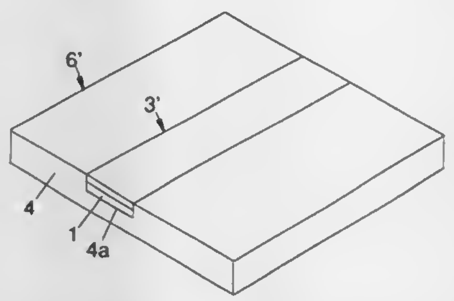
1. A method for making a NiTi-metal workpiece, comprising the steps of:
- providing a metal workpiece having a surface area;
- providing a sufficient amount of a NiTi alloy to at least partially cover the surface area of the workpiece, the alloy having a nickel content of from about 55 weight percent to about 60 weight percent; and
- explosively bonding the NiTi alloy to the workpiece.

5,531,370
HIGH-PRECISION SIZING, CUTTING AND WELDING TOOL SYSTEM FOR SPECIALTY AEROSPACE ALLOYS
Roderick G. Rohrberg, 2742 W. 234th St., Torrance, Calif. 90505
Continuation-in-part of Ser. No. 762,713, Sep. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 567,951, Aug. 14, 1990, abandoned. This application Jul. 9, 1993, Ser. No. 90,392
Int. Cl.^{6} B21D *39/04*
U.S. Cl. 228—173.4 **5 Claims**



1. A method of dynamic sizing for applying alternating tension and compression forces to decrease the ductility of an end portion of a hollow metal tube (**10**) through a progressive work-hardening process to permanently and exactly deform said hollow metal tube (**10**); said hollow metal tubes (**10**) each having an axis of revolution (**10***a*) and having a central aperture (**10***b*) comprising the steps of:
- engaging a plurality of movable tapered revolving rollers (**14**) into contact with said hollow metal tube (**10**) by moving said plurality of movable tapered revolving rollers (**14**) in a direction which is generally parallel to the longitudinal axis of said hollow metal tube (**10**);
  - said plurality of rollers (**14**) being mounted on a plate (**12**);
    - said plate (**12**) having an axis of revolution (**12***a*) that is generally colinear with said axis of revolution (**10***a*) of said hollow metal tube (**10**);
  - said plurality of rollers (**14**) each extending away from said plate (**12**) generally parallel to said axis of revolution (**12***a*) of said plate (**12**);
- repeatedly stretching said hollow metal tube (**10**) with gentle and progressive flexuring action by alternately thrusting said hollow metal tube (**10**) radially outward with said plurality of movable tapered revolving rollers (**14**) and allowing said hollow metal tube (**10**) to flex radially inward until said end portion of said hollow metal tube (**10**) is worked to the extent that it is work hardened to prevent springback;
- removing said plurality of movable tapered revolving rollers (**14**) from contact with said hollow metal tube (**10**) after a desired permanent deflection of said hollow metal tube (**10**) is achieved and
- joining two of said abutted hollow metal tubes (**10**).

5,531,371
PROCESS OF PREPARING CLAD CONTACT MATERIAL
Osamu Matsuzawa, Kanagawa, Japan, assignor to Tanaka Kikinzoku Kogyo, K.K., Japan
Filed Dec. 14, 1994, Ser. No. 355,554
Claims priority, application Japan, Dec. 15, 1993, 5-343045
Int. Cl.^{6} B23K *31/02;103/08*
U.S. Cl. 228—175 **2 Claims**



1. A process of preparing clad contact material which comprises forming a contact belt-shaped member formed by bonding an Au or Au alloy tape, thermally treating said contact belt-shaped member to the surface of an Ag or Ag alloy tape for forming an Au diffusion layer and, cladding said contact belt-shaped member having the Au diffusion layer to a base belt-shaped member made of Cu or a Cu alloy.

5,531,372
MOISTURE-FREE ATMOSPHERE BRAZING OF FERROUS METALS
Brian B. Bonner, Nesquehoning; Diwakar Garg, Emmaus, and Kerry R. Berger, Lehighton, all of Pa., assignors to Air Products And Chemicals, Inc., Allentown, Pa.
Filed Aug. 30, 1994, Ser. No. 298,004
Int. Cl.^{6} B23K *1/008*
U.S. Cl. 228—220 **7 Claims**

1. A process for brazing ferrous metals assembled for brazing with a brazing paste or preform in a continuous conveyor belt

furnace having a transition zone between heating and cooling sections comprising the steps of:

introducing the assembly into the furnace maintained at a temperature of at least 1080° C.;

introducing a mixture of gaseous nitrogen, hydrogen and carbon dioxide into said furnace at the transition zone, said hydrogen being at a minimum of 1% by volume of the mixture with said carbon dioxide being present in an amount so that said ratio of hydrogen to carbon dioxide is no greater than 15, said mixture being moisture-free;

holding said assembly at temperature and under atmosphere for a period sufficient to effect an acceptable brazed joint; and

cooling said assembly to room temperature.

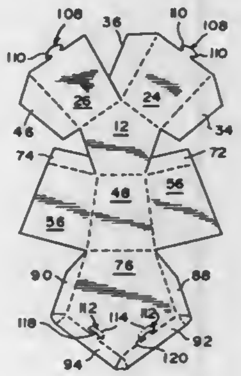
5,531,373
FOOD CARTON AND FOLDING BLANK THEREFOR

Larry Eisman, Elkins Park, Pa., assignor to Dopaco, Inc., Dowingtown, Pa.

Continuation-in-part of Ser. No. 277,070, Jul. 19, 1994. This application Nov. 21, 1994, Ser. No. 345,701

Int. Cl.^{6} B65D *5/10*

U.S. Cl. 229—108 **13 Claims**



5. For use in the formation of a folded covered carton, a planar blank of foldable material, said blank including a bottom panel with a periphery defined by angularly related straight edges, first, second and third side wall panels respectively integrally joined to three of said edges along fold lines and projecting outwardly coplanar therefrom, said first and second wall panels having opposed side edges and projecting outward from first and second adjacent ones of said bottom panel edges, said third side wall panel projecting outward from a third one of said bottom panel edges spaced from said first and second adjacent bottom panel edges by intermediate ones of said bottom panel edges, said third side wall panel having opposed side edges, fourth and fifth side wall panels positioned laterally, coplanar, adjacent and integral with said third side wall panel respectively along said opposed side edges thereof with corresponding fold lines defined along each of said side edges of said third side wall panel, said fourth and fifth side wall panels being of the same size as said third side wall panel, said fourth and fifth side wall panels each having a side edge laterally outward of said third side wall panel, glue flaps coplanar and integral with selected ones of said side edges of said side wall panels along fold lines, a top panel with edges defining a periphery of the same configuration as that of said bottom panel, said third bottom panel side wall panel having an outer edge integrally joined to one of said top panel edges along the length thereof, and top panel walls projecting outward from said top panel edges other than said top panel edge integrally joined to said third bottom panel side wall panel, said top panel walls having opposed end edges with glue flaps integral with selected ones of these end edges.

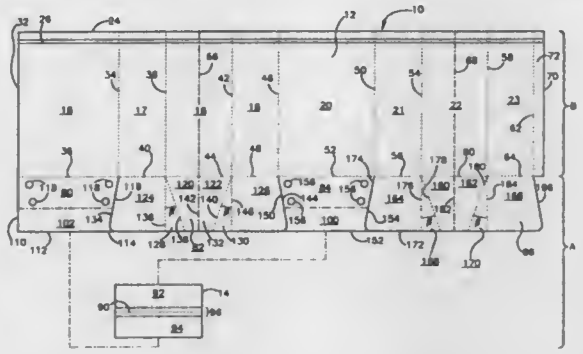
5,531,374
AUTOMATICALLY-OPERATING BOTTOM STRUCTURE IN A COLLAPSIBLE CONTAINER

Thomas M. Gasper, Ft. Wayne, Ind., assignor to Creative Tech Marketing, Strongsville, Ohio

Continuation-in-part of Ser. No. 344,989, Nov. 25, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,355

Int. Cl.^{6} B65D *5/36*

U.S. Cl. 229—109 **6 Claims**



1. A collapsible container adapted to be selectively moved between a folded-flat condition and a fully-expanded condition, said container having a plurality of panels being pivotally connected along adjacent longitudinal edges so as to be arranged in series with one another, said panels being arranged in opposing pairs when the container is in said fully-expanded condition, and an automatically-operating bottom structure comprising:

a band pivotally connected to each of a first pair of said panels, the band having two sections pivotally connected to one another about an intermediate pivotal axis substantially parallel to pivotal axes between said band and said first pair of panels, said two sections being arranged with respect to one another at an included angle of about 0° when said container is in said folded-flat condition and being arranged with respect to one another at an included angle of about 180° when said container is in said fully-expanded condition;

a first pair of bottom flaps each connected to a one of a second pair of said panels, each of said first pair of bottom flaps engaging a first surface of said band and forming an included angle of about 90° with respect to its associated panel when the container is in said fully-expanded condition;

a second pair of bottom flaps, each connected to a one of a third pair of said panels, each of said second pair of bottom flaps engaging a second surface opposite said first surface of said band and forming an included angle of about 90° with respect to its associated panel when the container is in said fully-expanded condition;

a third pair of bottom flaps, each connected to a one of a fourth pair of said panels, each of said third pair of bottom flaps engaging said second surface of said band and forming an included angle of about 90° with respect to its associated panel when the container is in said fully-expanded condition;

a first pair of web panels connecting a one of said first pair of bottom flaps with said second pair of bottom flaps; and

a second pair of web panels connecting the other of said first pair of bottom flaps with said third pair of bottom flaps.

5,531,375
PACKAGING CONTAINER AND BLANK FOR PRODUCING THE SAME

Lars-Erik Palm, Lund, Sweden, assignor to Tetra Laval Holdings & Finance SA, Pully, Switzerland

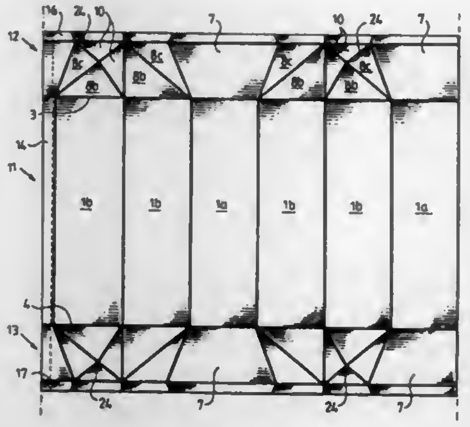
Filed Oct. 18, 1994, Ser. No. 324,970

Claims priority, application Sweden, Nov. 3, 1993, 9303628

Int. Cl.^{6} B65D *5/08*

U.S. Cl. 229—137 **21 Claims**

1. A packaging container comprising:



at least two main side wall panels and at least two other side wall panels, the total number of side wall panels being in excess of four;

a first end region and a second end region;

said first end region including two primary end panels adjacent said at least two main side wall panels and defined from said adjacent main side wall panels by crease lines, a plurality of secondary end panels which interconnect with the primary end panels and with the other side wall panels, and a sealing fin; and

said sealing fin being arranged for sealing edge regions of both the primary end panels and the secondary end panels with one another in a continuous double layer seal over the entire flat-laid width of the packaging container.

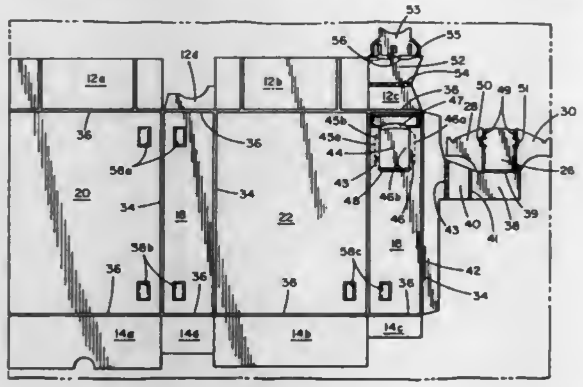
5,531,376
PAPERBOARD CONTAINER WITH INTEGRAL PAPERBOARD POUR SPOUT

Thomas J. Brink, Kentwood, and James L. Stone, Grand Rapids, both of Mich., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 14, 1995, Ser. No. 514,913

Int. Cl.^{6} B65D *5/74*

U.S. Cl. 229—215 **9 Claims**



1. A paperboard container composed of a unitary, continuous blank, comprising:

opposing top and bottom walls and a plurality of side walls bridging said top and bottom walls, said plurality of side walls including a first side wall having upper and lower ends;

an upper minor flap extending from said upper end of said first side wall, said upper minor flap forming a nonion of said top wall; and

a paperboard pour spout including a spout body and a pair of spout wings hingedly connected to opposing edges of said spout body, said pour spout being pivotally coupled said first side wall for movement between a closed position and an open dispensing position, said spout wings extending into the container via an opening in said first side wall, said pour spout further including a backboard hingedly connected to said upper minor flap and adhered to an inner surface of said first side wall, said backboard including a first section hingedly connected to said upper minor flap and having an inner surface adjacent to and substantially overlapping an inner surface of said upper minor flap, said backboard including a second section hingedly connected to said first section and adhered to the inner surface of said first side wall, said second section partially overlapping an upper portion of said spout body, said backboard forming a cutout between said first and second sections.

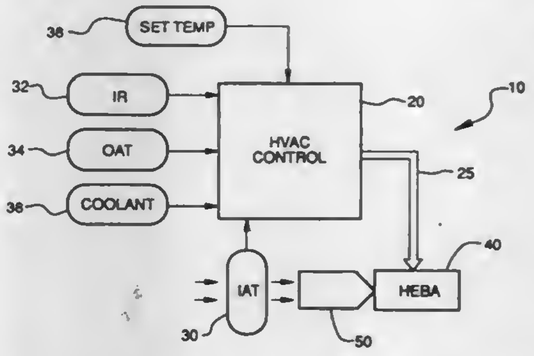
5,531,377
METHOD AND APPARATUS FOR CALIBRATION OF COMFORT CONTROL IR SENSOR

Peter A. Thayer, Indianapolis, and Morgan D. Murphy, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 1, 1995, Ser. No. 382,107

Int. Cl.^{6} G01J *5/00;* **G05D** *23/00*

U.S. Cl. 236—49.3 **11 Claims**



1. In a comfort control system having a thermal sensor including an IR sensor having an output responsive to interior vehicle radiant temperatures relative to the thermal sensor temperature and a thermistor circuit having an output responsive to the temperature of the thermal sensor, and a microprocessor based control receiving outputs of the IR sensor and the thermistor circuit to determine a value proportionate to the interior vehicle radiant temperature as the sum of the thermistor circuit output and a gain times the IR sensor output, the method of compensating for errors in the IR sensor signal comprising the steps of:

stabilizing the interior vehicle temperature;

detecting the sensor output values;

then heating the temperature sensor;

then again detecting the sensor output values; and

compensating for any error by adjusting the value of the gain in the microprocessor based control.

5,531,378
STEAM-HEATED RADIATOR SYSTEM

Hayden S. Roberts, 2172 Dean St., Brooklyn, N.Y. 11233

Filed Jan. 5, 1995, Ser. No. 369,089

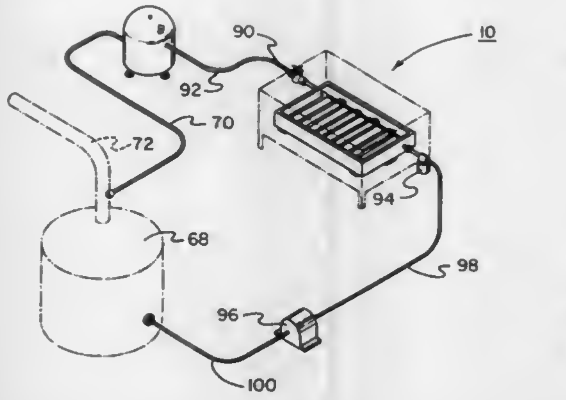
Int. Cl.^{6} F24D *1/02*

U.S. Cl. 237—67 **4 Claims**

1. A steam-heated radiator system for utilizing waste steam from a pressure boiler for heating water in a restaurant steam table comprising, in combination:

a radiator further comprising:

a rigid box-shaped reservoir for holding water therein and adapted to be positioned within a restaurant steam table with the reservoir having a bottom wall, a pair of opposed long walls, a pair of opposed short walls with the walls connected to the periphery of the bottom wall and extended



upwards therefrom to define a hollow interior and a top opening for allowing access to the interior, and a plurality of feet coupled to and extended downwards from the bottom wall for supporting the reservoir in a generally level orientation;
- a rigid elongated tubular heating coil disposed in the reservoir for heating water placed in the reservoir to form steam, the heating coil formed of a thermally conductive material, the heating coil having an inlet valve at one end extended through a short wall of the reservoir, an output valve at the other end extended through the other short wall of the reservoir, and a serpentine intermediate portion therebetween disposed within the interior of the reservoir; and
- a plurality of clamps coupled between the heating coil and reservoir for holding the heating coil in a stationary horizontal position;

a steam storage tank for storing steam from a pressure boiler for use at a later time, the steam storage tank further comprising:
- a rigid housing having a concave bottom wall with a plurality of feet extended downwards therefrom, a tubular side wall coupled to and extended upwards from the bottom wall to define a hollow interior and a top opening for allowing access to the interior, and a concave top wall removably secured to the side wall and over the opening of the housing;
- a steam chamber disposed within the interior, the steam chamber including a bottom portion with an inlet valve extended through the side wall of the housing and with the inlet valve adapted to be coupled to and placed in communication with a pressure boiler, a top portion including an outlet valve extended through the side wall at a location above the inlet valve, and an hollow fluted intermediate portion therebetween;
- a closable drain tap coupled to the bottom portion of the steam chamber and extended through the side wall for draining condensed water accumulated within the steam chamber;
- a pressure relief valve coupled to the top portion of the steam chamber and extended through the top wall for tapping excess steam pressure from the steam chamber;
- liquid oil disposed within the interior of the housing for insulating the steam chamber;
- a removable oil drain plug coupled to the bottom wall for allowing the oil to be drained from the interior; and
- an air vent coupled to the top wall of the housing for releasing air from the interior when the housing is being filled with oil;

a shut-off valve having an input end coupled to and in communication with the outlet valve of the steam storage tank and an output end coupled to and in communication with the inlet valve of the heating coil and with the shut-off valve having an opened orientation for allowing delivery of steam within the steam storage tank to the heating coil for dissipating heat and a closed orientation for preventing such delivery;

a steam trap and thermostatic valve having an input end and an output end with the input end coupled to the outlet valve of the coil for trapping water condensing from steam and regulating the temperature at which the condensed water is allowed to exit through the output end; and

a circulating boost pump having an input end coupled to and in communication with the output end of the steam trap and thermostatic valve and an output end adapted to be coupled to and placed in communication with a pressure boiler for transferring condensed water thereto for reheating.

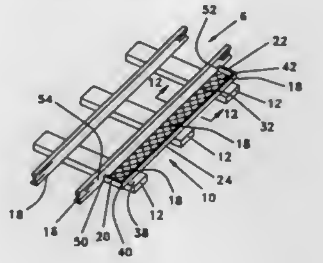
5,531,379
METHOD AND APPARATUS FOR HANDLING RAILCAR BRAKE SHOES

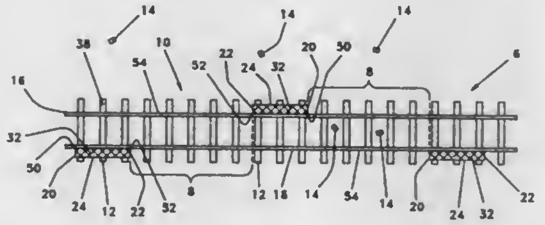
Eddie G. Hammett, 324 E. 5th St., Newton, Kans. 67114

Filed Dec. 16, 1994, Ser. No. 359,275

Int. Cl.⁶ E01B *26/00*

U.S. Cl. 238—1 **13 Claims**





1. A rack assembly for retaining railcar brake shoes comprising an end wall secured to a first side wall and a second side wall, said first wall having a first bottom edge, said second wall having a second bottom edge, said end wall having an end bottom edge, a grid member perimeterially secured to said first bottom edge, said second bottom edge, and said end bottom edge, and at least one railroad tie secured to said grid member.

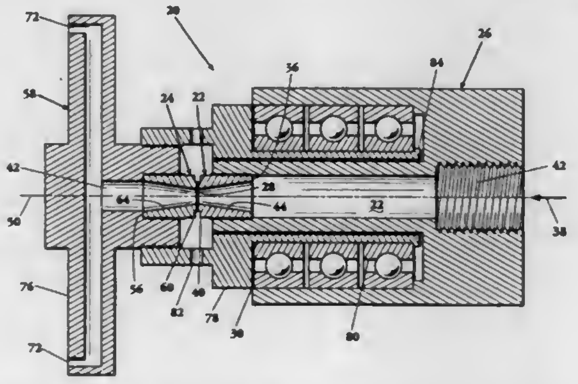
5,531,380
NOZZLE DEVICE WITH JET SEAL AND METHOD

Earl E. Thompson, Sr., 7515 S. Erie, Tulsa, Okla. 74136

Filed Mar. 15, 1994, Ser. No. 213,240

Int. Cl.⁶ B05B *3/06*

U.S. Cl. 239—1 **14 Claims**



8. A method of operating a fluid-conducting swivel, comprising the steps of:

(a) accelerating the velocity of a fluid flowing in a converging fluid passageway from a first end through a second end of an upstream acceleration nozzle;

(b) receiving the fluid discharged from the second end of the acceleration nozzle in a fluid stream in a diverging fluid passageway in the second end of a downstream deceleration nozzle and substantially

(c) restoring expansion of the fluid discharged from the acceleration nozzle to its original characteristics before acceleration; and substantially

(d) preventing expansion of the fluid within a gap between the second end of the upstream acceleration nozzle and the first end of the downstream deceleration nozzle by creating a vena contracta; and

(e) rotatably mounting one of the acceleration and deceleration nozzles for rotation about an axis extending through the adjacent second ends of the acceleration and deceleration nozzles; and

(f) maintaining a space between the adjacent second ends of the acceleration and deceleration nozzles.

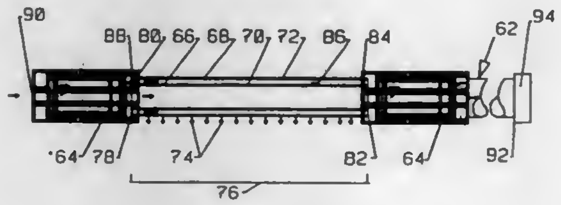
5,531,381
PULSATING DRIP LATERALS

Gideon Ruttenberg, 81-465 Date Palm Ave., Indio, Calif. 92201

Filed Oct. 5, 1994, Ser. No. 318,564

Int. Cl.⁶ B05B *1/08; 1/20*

U.S. Cl. 239—99 **9 Claims**



1. A pulsating drip lateral having a fluid inlet at one end and an other end is plugged and wherein fluid that flows into said drip lateral is ejected through multiple outlets along said drip lateral at high intermittent pulsating flows, said drip lateral comprising:

a. two or more pulsators where each pulsator is having:
  (1) an inlet and an outlet wherein said fluid can flow through it,
  (2) a receptacle,
  (3) an inlet to said receptacle,
  (4) an outlet from said receptacle,
  (5) means for controlling a continuous relatively low fluid flow into said receptacle,
  (6) tube connecting means at the inlet to the pulsator and tube connecting means at the outlet from the pulsator,

b. main fluid supply conduit,

c. distribution conduit having said multiple outlets,

d. means for connecting the fluid inlet of said drip lateral to a pressurized source of fluid,

e. means for plugging the other end of said drip lateral,

wherein said pulsators are connected in line with said main fluid supply conduit so that said fluid that enters said drip lateral can flow through said main fluid supply conduit and through said pulsators to said other end of said drip lateral,

said inlet to said receptacle is in fluid communication with said main fluid supply conduit,

said outlet from said receptacle of each said pulsator is in free fluid communication with said distribution conduit,

said main fluid supply conduit and said distribution conduit are connected in parallel to each other forming one continuous lateral,

and said pulsators are connected in line to said continuous lateral thereby forming a continuous pulsating drip lateral.

5,531,382
VALVE ARRANGEMENT

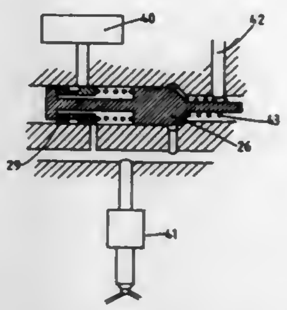
Paul Buckley, and Christopher Wood, both of Kent, England, assignors to Lucas Industries Public Limited Company, Solihull

Filed Sep. 29, 1994, Ser. No. 314,662

Claims priority, application United Kingdom, Oct. 8, 1993, 9320783

Int. Cl.⁶ F02M *51/04*

U.S. Cl. 239—124 **6 Claims**



1. An electromagnetically operable valve including a valve member movable between first and second settings by an electromagnetic device having an output member which is coupled to the valve member, the electromagnetic device when supplied with electric current, moving the valve member from its first setting to its second setting against the action of biasing means which returns the valve member to its first setting when the flow of electric current is discontinued, the valve further including a valve element movable between first and second positions, the valve element moving under its inertia from its first position to its second position a predetermined time after and in response to the movement of the valve member to its second setting, the valve element returning towards its first position after a second predetermined time, said valve element comprising a sleeve slidably mounted in a bore and loosely mounted about a stem of the valve member, a spring being provided to bias the sleeve towards an abutment on said stem.

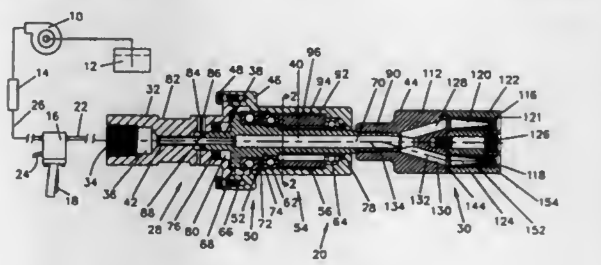
5,531,383
SWIVEL JET ASSEMBLY

Amos Pacht, Houston, Tex., assignor to Butterworth Jetting Systems, Inc., Houston, Tex.

Division of Ser. No. 250,442, May 27, 1994. This application Apr. 7, 1995, Ser. No. 418,509

Int. Cl.⁶ B05B *3/06*

U.S. Cl. 239—251 **17 Claims**



1. A nozzle assembly for discharging fluid from a rotatable hollow shaft having a central axis of rotation, an upstream end of the shaft positioned within a swivel housing and a downstream end of the shaft in fluid communication with the nozzle assembly, the nozzle assembly comprising:
- a nozzle base having an inlet port with a central axis substantially aligned with the central axis of the hollow shaft;
- a plurality of fluid transmission passageways within the nozzle base for transmitting fluid from the nozzle base inlet port;

a nozzle housing removably interconnected with the nozzle base, the nozzle housing having an end face spaced axially opposite the rotatable hollow shaft with respect to the nozzle base;

a plurality of nozzle jets each mounted within the nozzle housing and positioned for fluid communication with a respective one of the plurality of fluid transmission passageways for discharging fluid through the end face of the nozzle housing; and

a securing member for removably securing the nozzle base to the nozzle housing.

5,531,384
SPRAY GUN

Robert H. Greene, "Westfield", 5 Prospect Villas, Wetherby, Leeds LS22 4PL, United Kingdom; Andrew I. Cliffe, 1 New Townhouse, Mirfield, West Yorkshire WF14 9PB, United Kingdom, and Karl B. Hunziger, Hutzmannweg 14, CH-4202 Duggingen, Switzerland

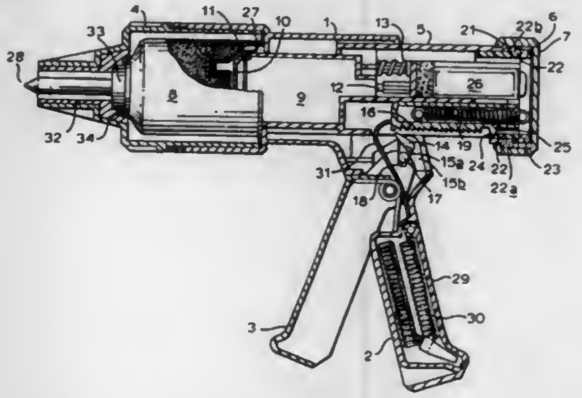
PCT No. PCT/GB93/01287, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO93/25317, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 17, 1993, Ser. No. 356,170

Claims priority, application United Kingdom, Jun. 18, 1992, 9212974; Feb. 15, 1993, 9302973

Int. Cl.⁶ B05B *5/16;11/04;5/35*

U.S. Cl. 239—708 **16 Claims**



11. A container of fluid for electrostatic spraying, for replaceable reception in an electrostatic spray gun having a housing for the container, a forward part from which the fluid is to be sprayed, means for expelling fluid from the container, and a high voltage generator for applying electrostatic potential to the fluid to form an electrically charged atomised spray, characterized in that the container is rigid and contains a piston disposed to receive when in place in the gun mechanical pressure to expel the fluid through a nozzle for generation of the spray, the piston having axially inner and outer parts with a fluid lubricant seal between them.

5,531,385
APPARATUS AND METHODS FOR WET GRINDING

Anthony Witsken, 4415 School Section Rd., Cincinnati, Ohio 45211

Filed May 7, 1993, Ser. No. 58,410

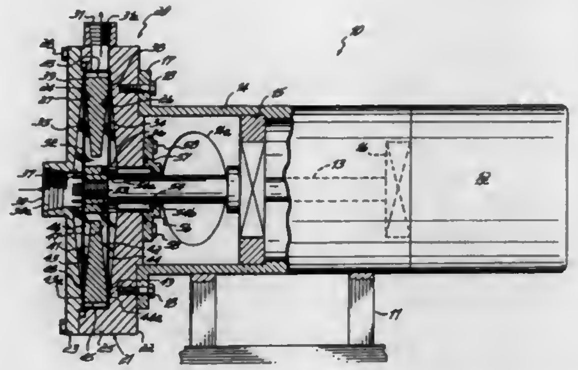
Int. Cl.⁶ B02C *7/12*

U.S. Cl. 241—21 **33 Claims**

27. A method of reducing the size of particles contained in a slurry solution comprising:

introducing said slurry solution into inner ends of a plurality of spaced, outwardly extending grooves in adjacent major faces of a pair of discs through an annular pattern of feed holes in one of said discs which communicate directly with the inner ends of respective grooves in said one disc and which are formed with a diameter approximately equal to a maximum width of a respective groove at said inner end, and

rotating at least one of said discs to simultaneously reduce the size of said particles in said slurry solution while transferring said slurry solution from the inner ends to outer ends of said grooves.



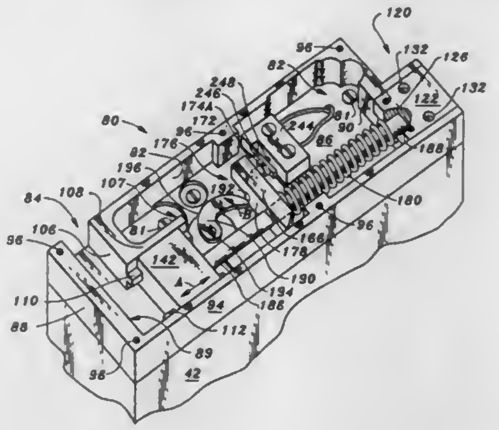
5,531,386
PILL PULVERIZER: APPARATUS

Reginald S. Jensen, 6945 Leibinger La., Roseville, Calif. 95661

Filed Apr. 1, 1994, Ser. No. 222,114

Int. Cl.⁶ B02C *1/14;19/08;25/00*

U.S. Cl. 241—36 **23 Claims**



1. A device for crushing pharmaceutical preparations to convert the preparations from a coherent mass to a powdered state comprising in combination:

energy storage means having an activated state and a quiescent state,

means for retaining said energy storage means in said activated state,

impact means operatively coupled to said energy storage means, and

anvil means cooperating with said impact means,

activation means to release said energy storage means from said activated state to said quiescent state whereby activation of said energy storage means causes said impact means to impart a blow to said anvil means, and

means for returning said energy storage means from said quiescent state to said activated state after said activation means is deactivated.

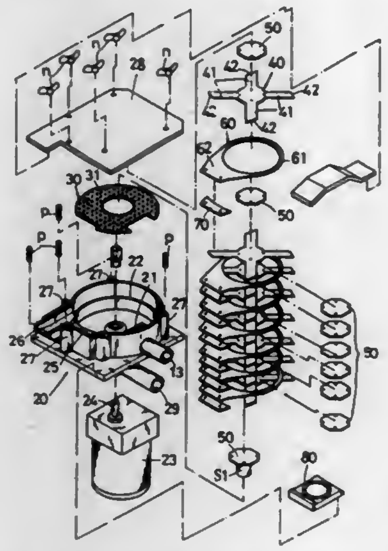
5,531,387
DEVICE FOR TREATING WASTE FROM WASH BASIN

Jehon-Fu Liu, 58, Ma Yuan West St., Taichung, Taiwan

Filed Jan. 30, 1995, Ser. No. 381,448

Int. Cl.⁶ B02C *23/36*

U.S. Cl. 241—46.013 **4 Claims**



1. A device for treating waste from a wash basin, said device comprising:

a pulverizer for crushing and for grinding waste from said wash basin,

a housing including an upper portion,

a casing secured in said upper portion of said housing and including a mouth connected to said pulverizer for receiving said waste, said casing including a trough formed therein,

a screen means disposed in said casing,

a large number of rotary members rotatably disposed in said casing and engaged above said screen means, and each of said rotary members including a plurality of blades radially extended outward therefrom for propelling said waste,

a large number of frames engaged between said rotary members and secured to said casing, each of said frames including a ring formed therein,

a large number of boards arranged between and secured to said rotary members so as to be rotated in concert with said rotary members, and

means for rotating said rotary members so as to drive said blades to move said waste radially outward in order to dry said waste and so as to propel said waste into said trough for collecting said waste.

5,531,388
AIR-SWEPT MILL

Horst Brundiek, Kaarst, and Willy Lohle, Neuss, both of, Germany, assignors to Loesche GmbH, Dusseldorf, Germany

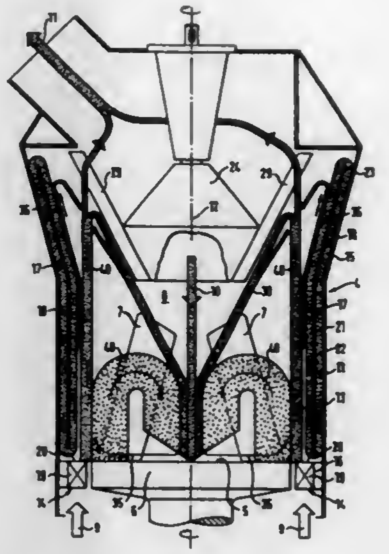
Filed Apr. 21, 1994, Ser. No. 230,946

Claims priority, application Germany, Jul. 14, 1993, 43 23 587.5

Int. Cl.⁶ B02C *23/12*

U.S. Cl. 241—48 **14 Claims**

1. An air-swept mill apparatus comprising, between a rotary grinding pan and a casing wall, an annular space with a blade ring for fluid delivery flow, for crushing material of different grain size, in which the material is supplied to a rotating, horizontally positioned grinding surface of a grinding-classifying chamber having a casing wall and is crushed to grinding material particles, in which the grinding material particles are supplied with the aid of a delivery flow introduced on a circumference of the grinding surface to a classifying process, and fine material particles are discharged and in which a portion of oversize material occurring as coarse material particles, is removed, wherein grinding material particles spun over an edge of the grinding surface are exposed to a rotary flow of the delivery flow, spun off grinding material particles are moved upwards in a helical flow, close to the casing wall a particle flow is formed as an almost vented concentrated flow and the vented concentrated flow is at least partly removed from the grinding-classifying chamber, wherein the annular space and the blade ring form a gas directing device for guiding gas for rotary flow and circulation flow of the fluid delivery flow and above the grinding pan in the casing wall there is at least one removal device for receiving an oversize fraction from an outer oversize flow.



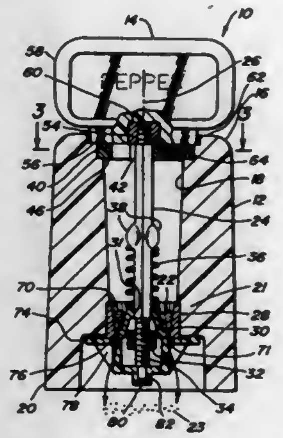
5,531,389
CONDIMENT MILL WITH A ONE-WAY CLUTCH

Wayne Husted, 415 Main St., Sausalito, Calif. 94965

Filed Feb. 24, 1995, Ser. No. 394,095

Int. Cl.⁶ A47J *42/04*

U.S. Cl. 241—169.1 **6 Claims**



1. A condiment mill adapted to grind condiments comprising:

a mill body defining an elongated mill cavity open at an upper end portion of the body and open at a lower end portion of the body and having an engaging notch in the upper end portion;

a grinding unit disposed within the mill cavity proximate to the lower end portion of the body positioned to receive unground condiment from the mill cavity;

an elongated shaft, drivingly engaging the grinding unit and extending upward therefrom toward the opening at the upper end portion, and threaded at an upper end portion;

a clutch disc rotatably fixed to the elongated shaft with a clutching tooth extending therefrom operably engaging the notch in the body; and

a mill top having a threaded portion receiving the threaded upper end of the shaft and being of sufficient size to cover the clutch disc wherein rotation of the mill top in a first direction relative to the mill body drives the grinding unit to grind the condiment in the cavity and rotation of the mill top in a second direction causes the clutch disc to engage the body and the mill top to thereby unthread from the elongated shaft.

5,531,390
METHOD OF WINDING A COIL ON A CHUCK HAVING GUIDE PINS

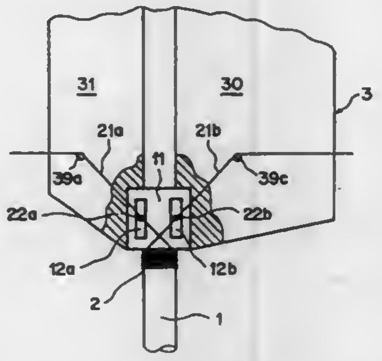
Ake Gustafson, Route Champ Thomas, 1618 Châtel-St-Denis, Switzerland

Division of Ser. No. 833,370, Feb. 10, 1992, Pat. No. 5,393,001. This application Aug. 19, 1994, Ser. No. 293,072

Claims priority, application Switzerland, Feb. 25, 1991, 552/91

Int. Cl.^{6} H01F *41/06*

U.S. Cl. 242—441.200 **6 Claims**



1. A coil-winding method utilizing a chuck having two jaws for holding a winding form having a head including at least one metal portion during winding of a winding wire about the winding form, the chuck comprising a plurality of guide pins for guiding the winding wire, and the jaw of the chuck being shaped in such a way as to give access to the at least one metal portion of the head of the winding form and having at least one front face thereof adapted to act as a wire guide, and a winding mechanism, comprising the steps of:

a.) leading the winding wire by relative movement between said chuck and said winding mechanism onto one of the metal portions, the winding wire being guided by one of the guide pins and by said front face;

b.) execution of the winding by relative rotational movement between said chuck and said winding mechanism; and

c.) leading the winding wire away by relative movement between said chuck and said winding mechanism, the winding wire being guided by another of the guide pins to pass over another of the metal portions.

5,531,391
METHOD AND APPARATUS FOR AUTOMATICALLY INSPECTING AND WINDING YARN, STOPPING AND REMOVING DEFECTIVE YARN AND RECONNECTING AND RESTARTING WINDING AFTER DEFECTIVE YARN IS REMOVED

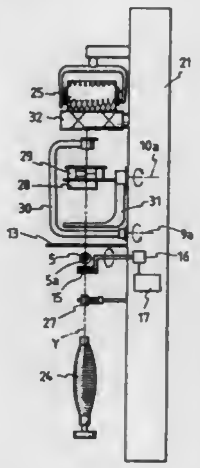
Atsushi Yamamoto, Ohtsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 28, 1994, Ser. No. 234,852

Claims priority, application Japan, May 12, 1993, 5-110629

Int. Cl.^{6} B65H *69/04;54/02*

U.S. Cl. 242—35.60 R **13 Claims**



1. A method for automatically taking up yarn from a yarn supply bobbin onto a package, detecting defect in the yarn being taken up, cutting said yarn when defect is detected and removing a length of said yarn with said detected defect, joining the leading end of said yarn being supplied from said supply bobbin to the trailing end of the yarn on said package and automatically restarting taking up the yarn, wherein, when the frequency of detection of a defect in said yarn, cutting, joining and automatic restarting becomes higher than a pre-set frequency, taking up is stopped and a pre-set length of the yarn of the yarn supply bobbin is removed and, the leading end of the yarn on the yarn supply bobbin is joined to the trailing end of the yarn on the package and taking up is restarted.

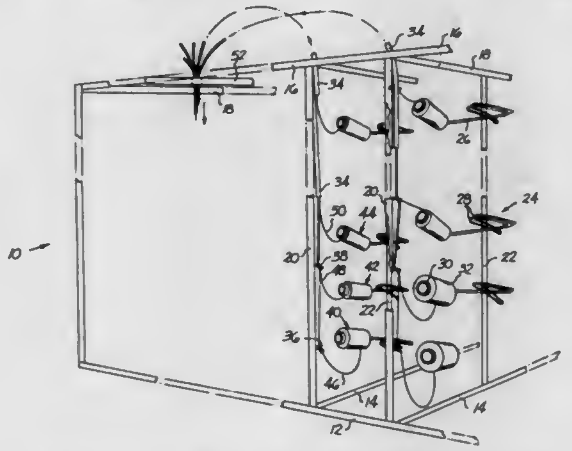
5,531,392
CREEL

Robert S. Weiner, 1016 Old Powers Ferry Rd., Atlanta, Ga. 30327

Filed Jan. 31, 1995, Ser. No. 381,084

Int. Cl.^{6} D02H *1/00;* **D04B** *27/10;* **B65H** *57/00*

U.S. Cl. 242—131 **8 Claims**



1. A method of feeding a group of at least two yarn strands to a textile machine using said yarn strands from a creel having a plurality of yarn cones mounted in an array including at least a first yarn cone and a second yarn cone, said method comprising directing a first strand of yarn from said first cone to an eyelet spaced laterally from said first cone, guiding said first strand of yarn through said eyelet to an inlet of an elongated guide tube having said inlet spaced vertically above said eyelet, directing a second strand of yarn from said second cone into said inlet, and feeding said first and second strands of yarn through said guide tube into a header towards said machine.

5. A creel for use with textile machinery having an array of vertical and horizontal support members, a header at a top portion of said creel, a plurality of vertical cone support posts, each cone support post having a plurality of cone holders for receiving and mounting corresponding cones of yarn, several of said plurality of cone holders of each post defining a group having a lowermost cone holder, an uppermost cone holder and at least one cone holder intermediate said lowermost and uppermost cone holders, a bottom eyelet spaced laterally from said lowermost cone holder and disposed vertically for receiving a yarn strand from a cone of yarn mounted on said lowermost cone holder, a single guide tube associated with said group, said guide having an inlet spaced laterally from said uppermost cone holder and disposed vertically for receiving a yarn strand from a cone of yarn mounted on said uppermost cone holder and extending from said inlet into said header, and an eyelet spaced laterally from each cone holder intermediate said lowermost and uppermost cone holders and disposed vertically for receiving a yarn strand from a cone of yarn mounted on a respective cone holder intermediate said lowermost and uppermost cone holders, said eyelets and said inlet of said guide tube being substantially vertically aligned whereby yarn from each eyelet may be received from a lower eyelet and be directed into said inlet, whereby the yarn from all of said cones from said group are received by said guide tube and fed into said header.

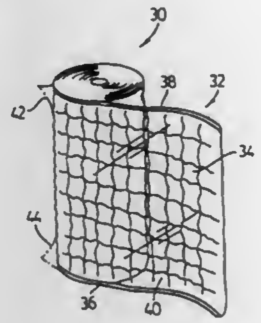
5,531,393
STRETCH FILM

Donald J. Salzsauler, and Richard J. Salzsauler, both of Box 25, R.R. 2, Georgetown, Ontario, Canada

Continuation of Ser. No. 885,742, May 19, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,487

Int. Cl.^{6} B65H *18/28;* **B32B** *3/04;3/00*

U.S. Cl. 242—160.400 **12 Claims**



1. A roll of stretched plastic film for wrapping a pallet load, said film having two opposite outermost side edges and an unstretched original length, said film being stretched along the length thereof between 50% and 300% of the original length, the two opposite outermost side edges being folded over along the lateral direction to the length for strengthening the outermost edges of the film, the stretched film then being rolled.

5,531,394
MAGNETIC TAPE CASSETTE HAVING VARIABLE FORCE REEL PRESSING DEVICE

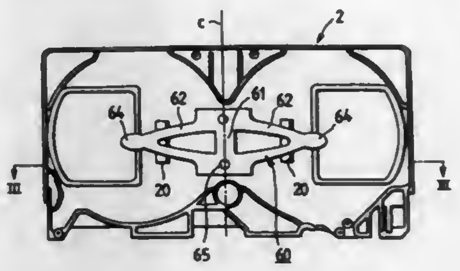
Hidetoshi Hirata, and Shingo Katagiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 20, 1992, Ser. No. 932,547

Claims priority, application Japan, Aug. 23, 1991, 3-074278 U

Int. Cl.^{6} G11B *23/087*

U.S. Cl. 242—345.2 **13 Claims**



1. A magnetic tape cassette, comprising:

a cassette casing comprising a first half casing and a second half casing;

a pair of tape winding members, received in said cassette casing, for winding a magnetic tape thereon;

a leaf spring secured to an inner surface of a first wall of said first half casing and arranged to depress said tape winding members in a direction away from said first half casing; and

means, provided on said first half casing, for varying a force of said leaf spring such that, when said leaf spring is being deformed by said tape winding members which are pushed by a drive device in a direction toward said first half casing during use, at least intermediate portions of said leaf spring are caused to abut said varying means on said first half casing thereby to vary the spring force of said leaf spring, said intermediate portions being separated from said first half casing when said tape winding members are not pushed.

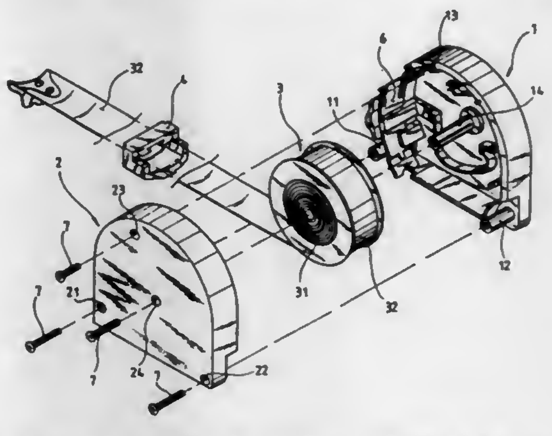
5,531,395
STOPPING DEVICE FOR TAPE MEASURES

Cheng-Hui Hsu, Tien, Taiwan, assignor to Pro-Techtor International

Filed Dec. 16, 1994, Ser. No. 357,691

Int. Cl.^{6} B65H *75/48*

U.S. Cl. 242—381.6 **1 Claim**



1. A stopping device for tape measures, consisting of

(a) a lower housing equipped with a mounting rod on each of two lower sides thereof, a center shaft at its center and a protruding rim at the bottom of said center shaft, an "X"-shaped mounting piece and "G"-shaped mounting piece, and a mounting piece on the upper and lower part of one side of an arc-shaped housing rim,

(b) a locking button, which has an "L"-shaped protruding mounting piece on one side, mounted onto the mounting pieces on the upper and lower part of one side of the arc-shaped housing rim,

(c) a stopping spring, which has a "3"-shaped configuration, with an upper end being mounted inside the "X "-shaped mounting piece of the lower housing, a middle mounting piece being mounted onto the "G"-shaped mounting piece of the lower housing and, a lower end being mounted onto the "L"-shaped protruding mounting piece on one side of the locking button,

(d) a tape roller equipped with an inner belical spring and an outer measuring tape, with one side of the tape roller being equipped with a recessed circular slot, possessing an outer stopping rim and a round protruding rim at the center of said circular slot, the round protruding rim being equipped with a center shaft through bole a front side of the tape measure being equipped with a stopping piece, the center of the belical spring of the tape roller being inserted into the center shaft of the lower housing, the stopping spring being mounted inside the circular slot on one side of the tape roller, and the center shaft through hole of the tape roller being mounted into the protruding rim of the lower part of the center shaft of the lower housing, and

(e) an upper housing mounted onto the aforementioned lower housing by means of four screws inserted through screw holes a center mounting screw hole into the mounting rods, a mounting screw hole and the center shaft of the lower housing, in such a way that when the locking button is pushed upwards, the lower part of the stopping spring is released from the outer stopping rim of the tape roller, allowing the tape to be retracted automatically using the tension of the helical spring of the tape roller; release of the locking button allows the tension of the helical spring to return to its initial position, which presses against the outer stopping rim on one side of the tape roller, thus providing the means for stopping the tape roller.

5,531,396

METHOD AND DEVICE FOR REELING A PAPER OR BOARD WEB IN A DRUM REEL-UP OR EQUIVALENT

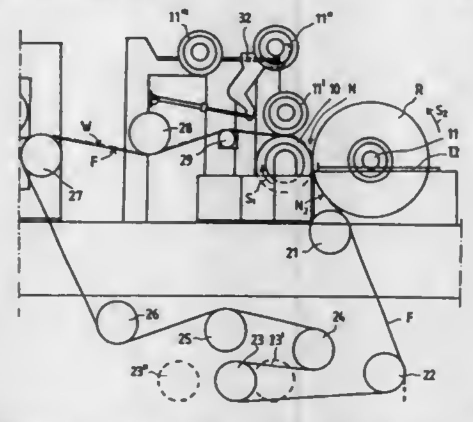
Jorma Kinnunen, Helsinki, and Silvo Mikkonen, Järvenpää, both of, Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Dec. 15, 1994, Ser. No. 356,887

Claims priority, application Finland, Dec. 16, 1993, 935669

Int. Cl.^{6} B65H *19/26;19/28*

U.S. Cl. 242—526.300 **20 Claims**



1. Method for reeling a web in a drum reel-up, wherein a first reel spool is in a reeling position in nip-defining relationship with a reel drum and an empty second reel spool is placed in a stand-by position and accelerated up to web speed when the reel of the web formed on the first reel spool is complete, comprising the steps of:

carrying the web on a belt until it is reeled onto the first reel spool,

guiding the belt in a run over the reel drum and a belt guide roll, and

transferring the reeling of the web from the first reel spool to the second reel spool, said transferring step comprising

displacing the first reel spool from the reeling position to an exchange position spaced from the reel drum, and

displacing the belt guide roll into nip-defining relationship with the reel being formed on the first reel spool at the time the first reel spool is displaced to the exchange position so that the belt carries the web into the nip defined between the guide roll and the reel on the first reel spool and through the nip defined between the guide roll and the reel on the first reel spool.

5,531,397

CONTINUOUS FEED AND DISCHARGE FLOW THROUGH CASSETTE LOADING APPARATUS AND SYSTEM

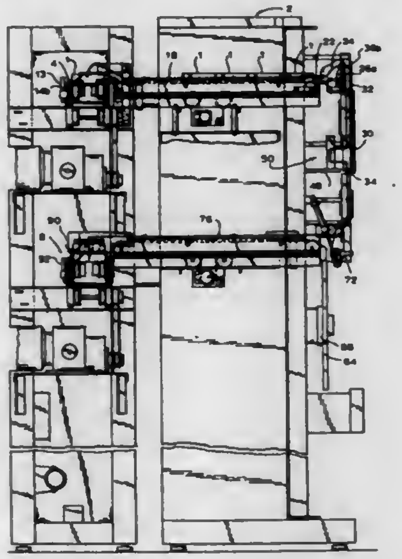
Luciano Perego, Mezzago, Italy, assignor to Tapematic U.S.A., Inc., Orlando, Fla.

Division of Ser. No. 201,480, Feb. 23, 1994, which is a continuation of Ser. No. 801,261, Dec. 3, 1991, abandoned, which is a division of Ser. No. 479,231, Feb. 12, 1990, Pat. No. 5,118,045, which is a continuation of Ser. No. 314,409, Feb. 22, 1989, abandoned. This application May 5, 1995, Ser. No. 435,192

Claims priority, application Italy, Dec. 29, 1988, 23152/88

Int. Cl.^{6} B65H *54/22*

U.S. Cl. 242—532.1 **4 Claims**



1. An apparatus for transferring a cassette to a tape loading machine from a conveyor having a supporting surface comprising:

pickup means movable between a first position below the supporting surface of the conveyor and a second position above said supporting surface; and

sensor means for generating a signal in response to the detection of the presence of a cassette in proximity to said pickup means, wherein said pickup means is movable from said first position to said second position in response to said signal such that a cassette slides, under the influence of gravity, into engagement with a tape loading machine.

5,531,398

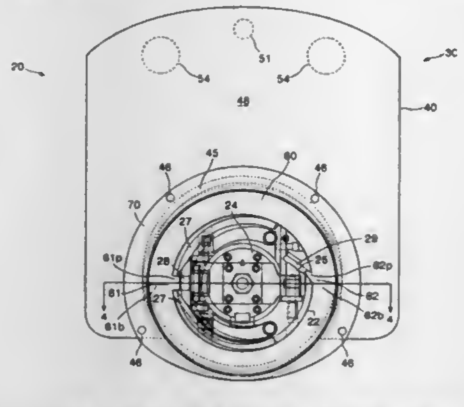
METHOD AND APPARATUS OF REMOVING A COIL OF MATERIAL FROM A MANDREL

Egon J. Krska, Downsview, Canada, assignor to Pro-Eco Limited, Oakville, Canada

Filed Feb. 10, 1995, Ser. No. 386,440

Int. Cl.^{6} B65H *67/00*

U.S. Cl. 242—533.7 **12 Claims**



1. In a coiling machine for coiling elongate sheets of thin flexible material onto a drum, said drum being removably mounted on a selectively rotatable mandrel configured for rotation about a longitudinal axis, so as to form a coil of said material in a retained position on said drum, a coil stripping apparatus for stripping said coil from said drum, said coil stripping apparatus comprising:

a non-rotating pusher plate slidably movable along the length of said drum in opposed first and second directions so as to provide displacement means for effecting the transport of said coil along said drum from said retained position to a removed position, said non-rotating pusher plate having opposed first and second drive surfaces, with said first drive surface generally facing said first direction and said second drive surface generally facing said second direction;

movement inducing means operatively connected to said pusher plate to selectively move said pusher plate along the length of said drum;

a stripper member having opposed first and second finger members, with said first and second finger members each having a base portion and a projecting portion;

wherein said base portions are retained with respect to said non-rotating pusher plate such that said stripper member is rotatably mounted with respect to said non-rotating pusher plate for co-rotation with said drum about said longitudinal axis, said stripper member being in contact with one or the other of said opposed first and second drive surfaces so as to be slidably movable along the length of said drum by said non-rotating pusher plate; and

wherein said projecting portions are shaped and dimensioned to enter respective co-operating substantially longitudinally disposed first and second generally opposed slots in said drum, thereby to permit said stripper member to engage the entire radius of said coil at two generally opposed orientations and so as to permit said coil to be subsequently moved by said stripper member longitudinally along said drum from said retained position to said removed position.

5,531,399

TAPE REEL

James T. Weisburn, Massillon, and Bruce C. Straslicka, Medina, both of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Sep. 28, 1994, Ser. No. 314,150

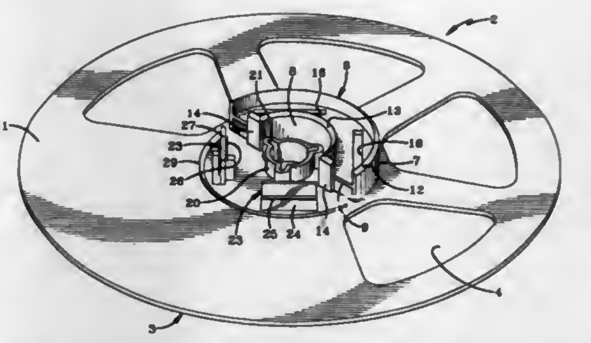
Int. Cl.^{6} B65H *75/14*

U.S. Cl. 242—608.6 **21 Claims**

1. A reel for carrying a tape thereon, said reel including:

first and second members joinable to form said reel, each of said members comprising a circular flange having inner and outer faces, an arcuate hub section extending from the inner face, said hub section having outer and inner concentric peripheral walls and an intervening web wall, said web wall being formed with a pair of slots;

a pair of flexible latching projections extending from the inner face of each of said members and complementary sized to the web wall slots so as to be receivable therein, each of said projections being formed with first and second catches extending outwardly in opposite directions from each other, said latching projections of the first and second members extending into the slots of the second and first end members, respectively, with one of said catches of each of said latching projections of each of said members engaging the web wall of the other of said members to join said members together, with said hub sections circumferentially aligning with each other to form a substantially cylindrical hub spacing the circular flanges a predetermined distance apart for receiving a length of tape therebetween.



5,531,400

AIRBORNE VEHICLE

German V. Demidov, ul. Frunze, d.9, kv.173, Kazan, Russian Federation, and Eduard S. Osipov, ul. M.Gorkogo, d.6 kv.22, Kazan, Russian Federation

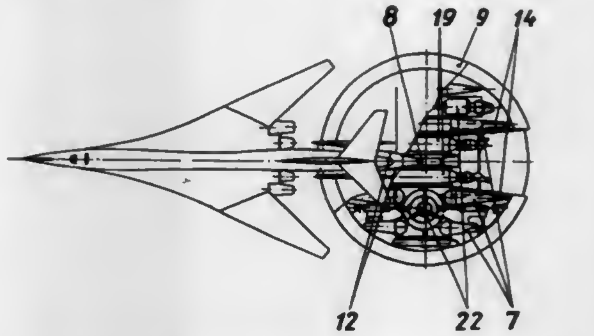
PCT No. PCT/RU94/00007, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994, PCT Pub. No. WO94/16943, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 20, 1994, Ser. No. 307,612

Claims priority, application Russian Federation, Jan. 20, 1993, 93003439

Int. Cl.^{6} B64C *36/00;37/02*

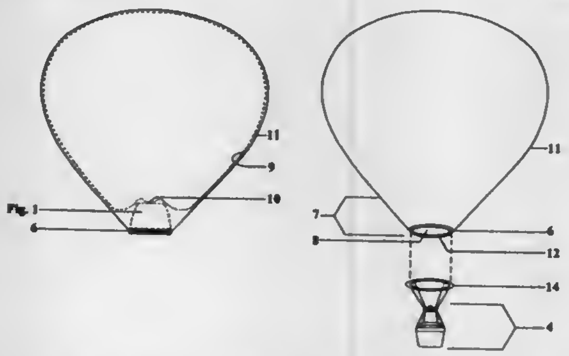
U.S. Cl. 244—2 **11 Claims**



1. An airborne vehicle, comprising a fuselage with a center line, a wing, a gas-turbine power plant situated under the wing and burning a hydrocarbon fuel, a landing gear, and flight controls, said vehicle comprising: a suspension unit that consists of shells of additional fuel reservoirs, an additional power plant, and cowlings forming an airfoil capable of developing an aerodynamic lift, said suspension unit being held to the fuselage and baving a front opening and a rear opening, said front and rear openings having shaped side faces and axes of symmetry in a vertical plane passing through the fuselage center line, the additional power plant being a ramjet engine interposed between the front and rear openings of

the suspension unit, said shaped side faces of the front opening forming an inlet device for the ramjet engine, said ramjet engine having an inlet section proper, said ramjet engine having a longitudinal axis and creating a velocity vector, said shaped side faces of the rear opening forming an exit device, said ramjet engine having a variable ratio of air stream compression in a flow-through section thereof from a minimum value at subsonic flight speeds when the ramjet engine inlet device and the inlet section proper of the ramjet engine is situated in an air shadow of the fuselage up to a maximum value at high supersonic flight speeds, the degree of airstream compression being varied by changing the position of the ramjet engine inlet device either through displacing the suspension unit downwards relative to the fuselage center line or by displacing the fuselage center line, using the flight controls, with respect to the velocity vector the ramjet engine exit device being deflectable from the ramjet longitudinal axis at high supersonic flight speeds, and said rear opening being closeable by panels at subsonic flight speeds, the suspension unit being additionally provided with a landing gear and motion controls.

5,531,401
TOY SIMULATED HOT-AIR BALLOON
Elliott S. Newcomb, 4019 Simms Dr., Kensington, Md. 20895
Continuation-in-part of Ser. No. 76,413, Jun. 14, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 302,257
Int. Cl.⁶ A63H *27/10*
U.S. Cl. 244—31 **10 Claims**



1. An insert for use with inner and outer toy balloons for accurately replicating in toy miniature the shape of a full sized hot air balloon, said insert comprising:

a hollow structure defining a sidewall, a first closed end and an opposed second open end;

said sidewall defining an outer surface and an opposed inner surface, wherein said inner surface defines a groove surrounding said second open end;

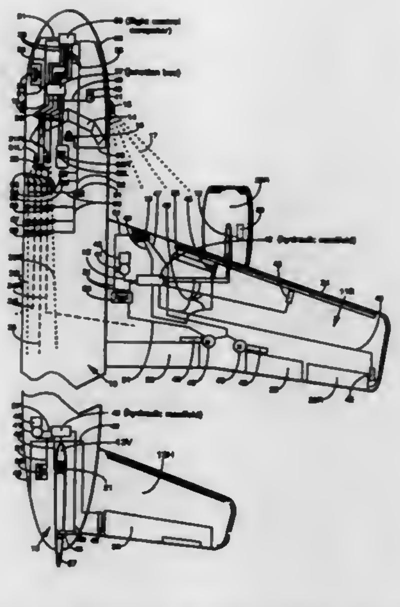
said groove removably accommodating a ring to which a toy gondola is attached to and suspended from;

a first ridge projecting from said outer surface and surrounding said second open end; and

a second ridge projecting from said outer surface and spaced apart from said first ridge by a predetermined distance for removably receiving a portion of said outer toy balloon between said first and second ridges.

5,531,402
WIRELESS FLIGHT CONTROL SYSTEM
Robert M. Dahl, 108-A Castle Rock Rd., Walnut Creek, Calif. 94598-4515
Filed Mar. 23, 1995, Ser. No. 409,323
Int. Cl.⁶ B64C *13/24*
U.S. Cl. 244—75 R **23 Claims**

1. An external wireless travel direction controller system for an enclosed vehicle having an internal direction controller system within said vehicle, comprising:



(a) at least one operator-controllable means for enabling an operator of said vehicle to make at least one adjustment for controlling said vehicle's travel direction,

(b) a wireless transmitter means mounted continuous with the external surface of said vehicle for converting operator-made adjustments of said operator controllable means into a signal containing encoded information indicative of said operator made adjustments, and transmitting said signal in a wireless, through-the-air mode, external to said vehicle

(c) a receiver means, located at an exterior surface of said vehicle and remote from said wireless transmitter means, for receiving said wireless signal on said vehicle and converting said signal to a wire-carried signal for controlling said at least one travel direction adjustment,

(d) an adjustment means for adjusting a travel-direction controlling means in response to said wire-carried signal, and

(e) a switching means for switching between said internal travel direction controller system and said external wireless controller system,

whereby directional control is maintained when an interruption of the internal controller system structure and/or function occurs.

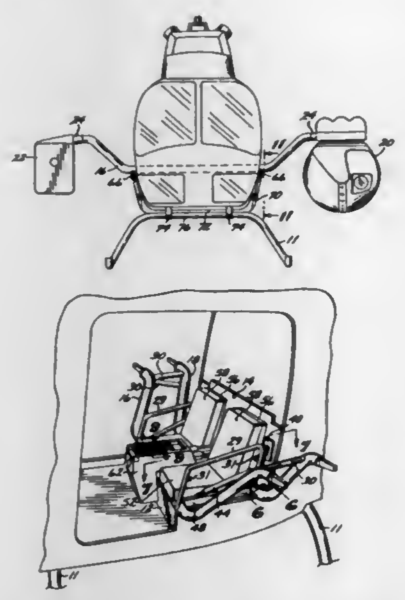
5,531,403
ATTACHMENT FRAME FOR MOUNTING CAMERA EQUIPMENT TO AN AIRCRAFT
Nelson Tyler, 15801 Royal Oak Rd., Encino, Calif. 90436
Filed May 31, 1994, Ser. No. 251,022
Int. Cl.⁶ B64D *9/00*
U.S. Cl. 244—118.1 **12 Claims**

1. An attachment frame for mounting camera equipment to an aircraft which includes a rear passenger compartment having a rear seat support, a rear bulkhead, and seat belt attachment tabs located adjacent the rear bulkhead, the attachment frame comprising:

elongated tubing means disposed through the rear passenger compartment and having opposite extremities extending out of the sides of the rear passenger compartment for externally supporting a camera pod and an accessories package, respectively, the tubing means having a rearward portion comprising a rear support tube attachable to the seat belt attachment tabs, the tubing means further having a forward portion comprising a pair of thrust elements fixedly coupled to the rear support tube and adapted to rest upon the rear seat support;

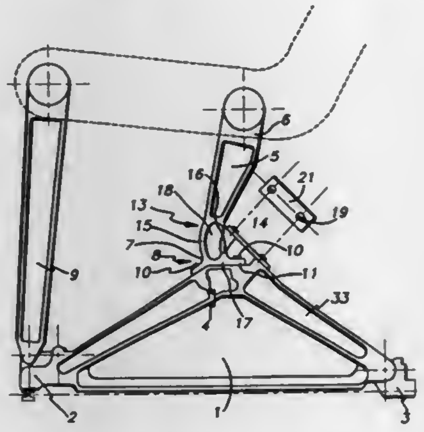
a pair of thrust pads adapted to rest against the rear bulkhead;

a pair of elongated pivot members having upper extremities pivotally mounted to the pair of thrust pads, respectively, and lower extremities pivotally coupled to the rearward portion of the tubing means; and



adjustment means having rearward extremities pivotally mounted to the pivot members, and forward extremities pivotally mounted to the forward portion of the tubing means, the adjustment means being adjustably extensible to urge the pair of thrust pads forcibly against the rear bulkhead to hold the attachment frame in position.

5,531,404
UNDERFRAME FOR A PASSENGER AIRCRAFT SEAT, AND A SEAT INCLUDING SUCH AN UNDERFRAME
Robert R. Marechal, Paris, France, assignor to Societe Industrielle et Commerciale de Materiel Aeronautique, Issoudun, France
Filed May 3, 1994, Ser. No. 237,396
Claims priority, application France, May 14, 1993, 93 05866
Int. Cl.⁶ B64D *25/02;25/04;* **B60N** *2/42;* **B60R** *21/00*
U.S. Cl. 244—118.6 **20 Claims**



1. An underframe for a passenger aircraft seat, the underframe including:

a triangular base defining a front anchor point and a rear anchor point, and a raised intermediate vertex, the triangular base being rigid in compression when the seat is subjected to deceleration above a predetermined value;

a leg having a top end connected to the structure of the seat, and a bottom end connected to the triangular base; and

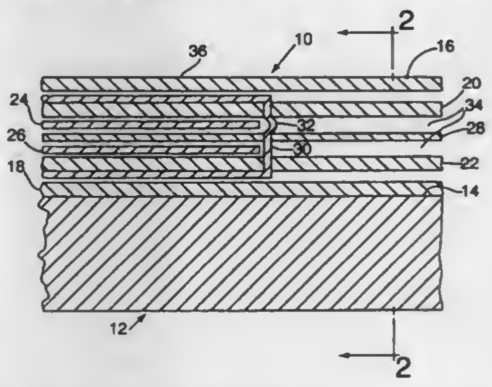
connection means of the bottom end of the leg with the triangular base;

wherein the connection means are arranged to connect rigidly the leg with the base during normal use of the seat, so as to hold the leg positively relative to the base, as to prevent any forward or backward pivoting of the leg;

the connection means being located between the leg and the triangular base;

and wherein the rigid connection means for rigidly connecting the leg with the base include energy absorption means which are active when the seat is subjected to deceleration above the predetermined value tending to cause the leg to pivot forward.

5,531,405
METHOD OF BUILDING AN EXPULSIVE BLANKET USING COMPOSITE MATERIALS AND STITCHED ATTACHMENT
Joshua I. Goldberg, Woodbridge, Conn., assignor to Dynamics Controls Corporation, South Windsor, Conn.
Filed Aug. 23, 1994, Ser. No. 294,640
Int. Cl.⁶ B64D *15/20*
U.S. Cl. 244—134 B **15 Claims**



1. An electro-expulsive blanket for shattering and removing ice and other fungible material from an accretion surface such as an airfoil, comprising:

a composite fabric layer including a lower layer to be attached to a protected surface and an upper layer having an ice-accretion surface to be exposed to the elements, the composite fabric layer having a relatively high modulus of elasticity with respect to elastomeric materials so that energy is efficiently transferred to the composite fabric layer for rapid movement of the upper layer away from the lower layer when the blanket is energized;

a plurality of upper conductor segments periodically spaced from one another and forming two-dimensional patterns extending in a plane parallel to the ice-accretion surface, the upper conductor segments attached to the upper layer;

a plurality of lower conductor segments periodically spaced from one another and forming two-dimensional patterns extending in a plane parallel to the ice-accretion surface, the lower conductor segments attached to the lower layer, each of the lower conductor segments arranged in an underlying relationship to respective upper conductor segments, the upper and lower conductor segments to be connected to one or more power sources and arranged in such a way that the upper conductor segments move rapidly and upwardly away from the lower conductor segments and the lower layer when the upper and lower conductor segments are energized by an electric current, the upwardly moving upper conductor segments transferring their motion to the upper layer and the ice-accretion surface; and

stitches connecting the upper layer to the lower layer, the stitches being bowed or slack when the conductor segments are unenergized, the slack of the stitches allowing the upper layer to move rapidly away from the lower layer when the conductor segments are energized until the slack is exhausted and the stitches become taut, and the stitches becoming taut causing the upper layer to rapidly decelerate so as to shatter any ice which may have accumulated on the ice-accretion surface of the blanket.

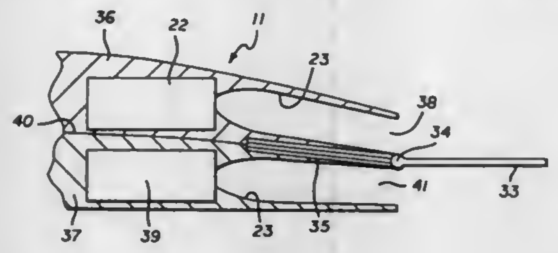
5,531,406
FLOW-VECTORED TRAILING-EDGE FOR AIRFOILS AND JETS

Larry G. Redekopp, Northridge, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed May 16, 1994, Ser. No. 243,231

Int. Cl.^{6} B64C *21/04*

U.S. Cl. 244—208 **26 Claims**



1. An airfoil having a blunt open edge,

divider means positioned within said airfoil and extending from said open edge for dividing the interior of said airfoil into separate upper and lower compartments,

suction means positioned for drawing air into said upper compartment, and blower means for exhausting air from said lower compartment.

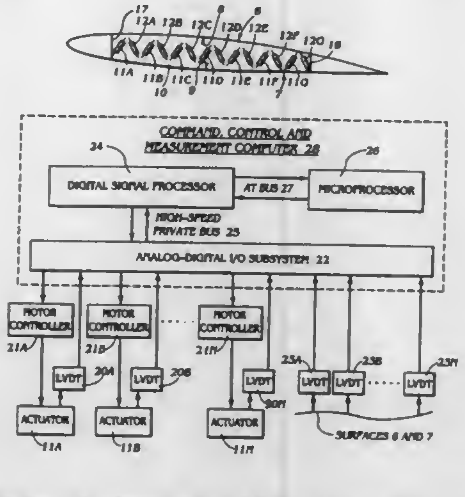
5,531,407
APPARATUS AND METHOD FOR CONTROLLING THE SHAPE OF STRUCTURES

Fred Austin, Commack; Gareth J. Knowles, Smithtown, and Michael J. Rossi, Huntington, all of N.Y., assignors to Grumman Aerospace Corporation, Los Angeles, Calif.

Continuation of Ser. No. 58,861, May 6, 1993, abandoned. This application Jul. 18, 1994, Ser. No. 277,416

Int. Cl.^{6} B64C *3/44*

U.S. Cl. 244—219 **27 Claims**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12A 12B 12C 12D 12E 12F 12G 18
11A 11B 11C 11D 11E 11F 11G
10 9 7
COMMAND, CONTROL AND MEASUREMENT COMPUTER 28
24
26
DIGITAL SIGNAL PROCESSOR
AT BUS 27
MICROPROCESSOR
HIGH-SPEED PRIVATE BUS 25
ANALOG-DIGITAL I/O SUBSYSTEM 22
MOTOR CONTROLLER
21A 21B 21N
LVDT
20A 20B 20N
25A 25B 25N
ACTUATOR
11A 11B 11N
SURFACES 6 AND 7

1. Apparatus for controlling the shape of a structure, comprising:

a structure having at least one surface;

a plurality of translational actuators capable of varying their lengths between first and second ends of each translational actuator, with the first end of each translational actuator being coupled by a first pivot pin connection to the structure, and the second end of each translational actuator being coupled by a second pivot connection to the at least one surface of said structure, with the actuators changing the shape of said structure by deforming the surface of the structure, wherein deforming the surface of the structure does not include and mean pivoting one or more control surfaces;

a plurality of sensing means for sensing deflections; and

control means electrically connected to said sensing means for processing sensed information and computing actuator commands, wherein said control means protects said structure from an overstressed condition caused by internal loads on the structure caused by deforming the shape of the surface of the structure with said actuators by

(i) multiplying desired surface deflections by a stress matrix and

(ii) comparing predicted stresses to allowable stresses

(iii) if said predicted stresses are one of

(a) equal to said allowable stresses and

(b) less than said allowable stresses, implementing the deflection command and

(iv) if any of said predicted stresses are greater than said allowable stresses, modifying said desired surface deflection.

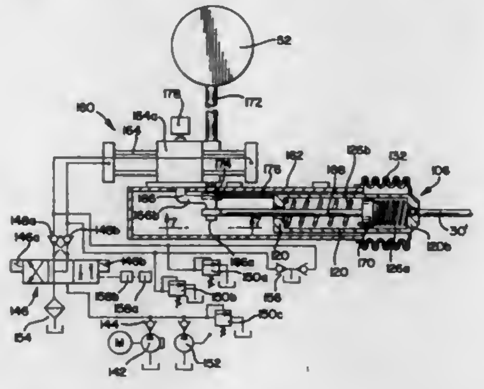
5,531,408
RAILROAD SWITCH STAND

Emmerich E. Wechselberger, Glen Ellyn, Ill., assignor to Chemetron-Railway Products, Inc., Wheeling, Ill.

Filed Oct. 7, 1993, Ser. No. 133,630

Int. Cl.^{6} E01B *7/00*

U.S. Cl. 246—257 **9 Claims**



1. A low profile railroad switch stand for use in actuating a rail switch of the type having a throw rod responsive to longitudinal movement to effect open and thrown positions of the rail switch, said switch stand comprising first actuator means including a longitudinally moveable actuating rod, and second actuator means including a constant force spring actuator including a housing adapted to receive said actuating rod therein, a piston fixed on said actuating rod internally of said housing, and constant force spring means cooperative with said housing and said piston to normally bias said housing to a position wherein said piston is generally centered along the longitudinal length of said housing, said housing having a closed end adapted for connection to the throw rod, said spring means being adapted to apply a substantially constant longitudinal force to the throw rod in response to actuation of said first actuator means so as to maintain the rail switch in thrown or open positions.

5,531,409
FLANGE BEARING BOLTED RAIL FROG FOR RAILROAD TURNOUTS AND CROSSINGS

Robert E. Willow, 118 Warwick Dr. #70, Benicia, Calif. 94510

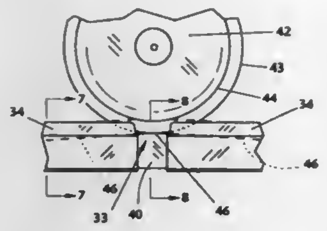
Filed Feb. 21, 1995, Ser. No. 391,213

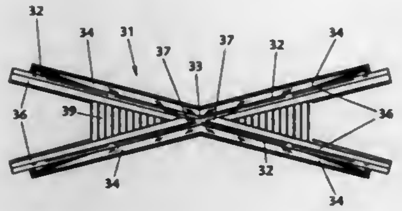
Int. Cl.^{6} E01B *7/10*

U.S. Cl. 246—458 **4 Claims**

1. A railroad frog, including;

a plurality of flangeways adapted to pass the flange of a railroad wheel, said plurality of flangeways radiating from a central flangeway gap;





each flangeway comprised of a pair of rail sections, a flangeway filler bar disposed between said pair of rail sections to define a flangeway spacing width therebetween, said flangeway filler bar extending from said flangeway gap to each longitudinally opposed end of said frog;

means for securing said rail sections and flangeway filler bar, including a plurality of bolts extending generally horizontally through the webs of said pair of rail sections and said flangeway filler bar disposed therebetween; and,

each flangeway filler bar including upper surface means to engage the wheel flange of a railroad wheel and lift the wheel tread off said rail sections over said central flangeway gap, said upper surface means including an upper surface formed integrally and extending longitudinally on said flangeway filler bar and ramped downwardly and longitudinally along said flangeway from said central flangeway gap toward said longitudinally opposed ends of said frog.

5,531,410
CABLE WAY FORMED BY WELDED TRELLISWORK

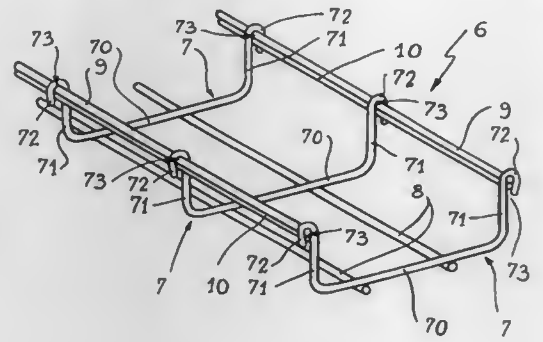
Bernard Simon, Caluire, France, assignor to Mavil, Llernais, France

Continuation of Ser. No. 4,270, Jan. 14, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,619

Claims priority, application France, Jan. 20, 1992, 92 00723

Int. Cl.^{6} F16L *3/00*

U.S. Cl. 248—49 **3 Claims**



1. In a cable way having welded trelliswork including generally U-shaped transverse wires having intermediate web segments and branch portions, and the web segments being secured to longitudinal wires, the improvement comprising, each of the branch portions of the transverse wires having outer ends bent in a configuration of a hook oriented outwardly with respect to the web segments, and at least one marginal wire being welded within said hooks to thereby reinforce the trelliswork.

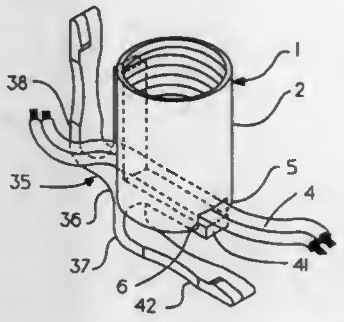
5,531,411
MOUNTING CLIP FOR DECORATIVE LIGHTS

William E. Adams, Portersville, Pa., assignor to Adams Mfg. Corp., Portersville, Pa.

Filed Nov. 14, 1994, Ser. No. 339,025

Int. Cl.^{6} F21V *21/08;21/34*

U.S. Cl. 248—65 **10 Claims**



6. A molded plastic mounting clip for a decorative light bulb socket of the type having a base with a channel extending transversely thereacross and an electrical wire placed therein, the mounting clip comprising a generally L-shaped clip body having a first leg, a second leg connected with the first leg, the first leg having a generally U-shaped leg body with a first finger, a second finger, and a first arcuate member connecting the first finger and the second finger, the first finger being configured and sized to fit securely on the channel and to hold the electrical wire in place, the first arcuate member being proximate to the second leg, the second leg having a generally U-shaped leg body with a third finger, a fourth finger, and a second arcuate member connecting the third finger and the fourth finger and having a continuously curved surface extending from the third finger to the fourth finger, the third finger being configured and sized to fit securely on the channel and to hold the electrical wire in place, and the second arcuate member being proximate to the first leg wherein the third finger and the fourth finger are spaced apart along of their respective lengths to permit a gutter lip to fit therebetween.

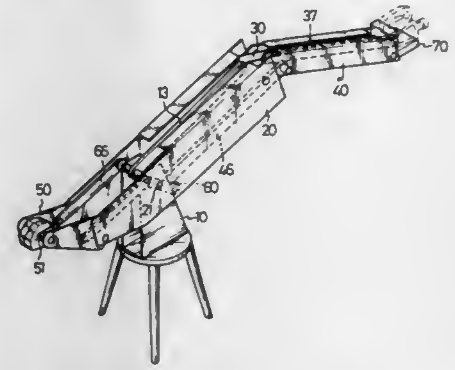
5,531,412
UNIVERSAL CAMERA SUPPORTING JIBS

Kuan-Jen Ho, 1 Fl., No. 8, Alley 3, Lane 60, Wenlin N. Rd., Peitou Dist., Taipei, Taiwan

Filed Sep. 19, 1994, Ser. No. 308,379

Int. Cl.^{6} F16M *13/00*

U.S. Cl. 248—123.2 **6 Claims**



1. A universal camera supporting jib for supporting a video camera or the like, comprising:

a first arm;

a second arm;

a shaft pivotably connecting with the first arm and the second arm and dividing them into a first portion and a second portion, respectively;

- a first four-link mechanism comprising the first portion of the first arm and second arm;
- a second four-link mechanism comprising the second portion of the first arm and second arm;
- a base means connected with the shaft for supporting the two four-link mechanisms;
- a camera receiving means attached to the first four-link mechanism for receiving a camera, the camera receiving means being attached to a first end of a first link of the first four-link mechanism in which the first link is spaced from and parallel to the second arm and the first end is other than the end that the first link connects with the first arm, and wherein the counter balance weight is attached to a second end of a second link of the second four-link mechanism in which the second link is spaced from and parallel to the second arm and the second end is other than the end that the second link connects with the first arm;
- a counter balance weight attached to the second four-link mechanism for balancing the moment produced by weight of the camera about the shaft and
- a joint, a first rod connecting the joint with the base, and a second rod connecting the joint with the camera receiving means, wherein a third four-link mechanism is formed by the base, the joint, the first portion of the first arm and the first rod, and a fourth four-link mechanism is formed by the joint, the first link, the camera receiving means and the second rod.

5,531,413
ADJUSTABLE-LENGTH COLUMN FOR CHAIRS, TABLES OR THE LIKE

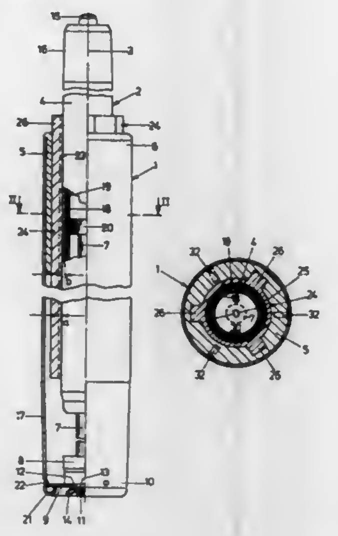
Herbert Wolf, Nürnberg, and Harald Harrer, Neumarkt, both of, Germany, assignors to Suspa Compart Aktiengesellschaft, Altdorf, Germany

Filed Apr. 12, 1994, Ser. No. 226,304

Claims priority, application Germany, Apr. 27, 1993, 43 13 766.0

Int. Cl.^{6} F16M *11/24*

U.S. Cl. 248—188.2 **13 Claims**



1. An adjustable-length column for chairs, tables or the like, comprising:
- an upright tube (1);
- a pneumatic or hydropneumatic length-adjusting element disposed in the tube (1) concentrically with a common central longitudinal axis (3), the length-adjusting element having a piston rod (7) and a housing (4) radically supported in a guide of the upright tube (1) and guided displaceably in the direction of the axis (3);
- a bottom plate (9) of said upright tube (1) to which the piston rod (7) of the element is secured in the vicinity of a free end thereof;
- wherein a profile (24) guarding against twisting and separate from the housing (4) is fastened on the housing (4), which profile (24) has at least one web (26) extending in parallel to the axis (3), and wherein the web (26) is guided in a groove-like recess (30) of the guide (5), which recess (30) is adapted in cross-section to the web (26), and which guide (5) is non-rotatable in relation to the upright tube (1);
- wherein the profile (24) guarding against twisting has an annular cylindrical section (25) with which the at least one web (26) is formed in one piece;
- wherein the profile (24) guarding against twisting consists of one of aluminium and an aluminium alloy;
- wherein the profile (24) guarding against twisting is connected with the housing (4) of the length-adjusting element by shrunk-on-press fit, and
- wherein the housing (4) of the length-adjusting element is made of steel.

5,531,414
DEVICE FOR MOUNTING TERMINAL STRIPS IN COMMUNICATIONS TECHNOLOGY

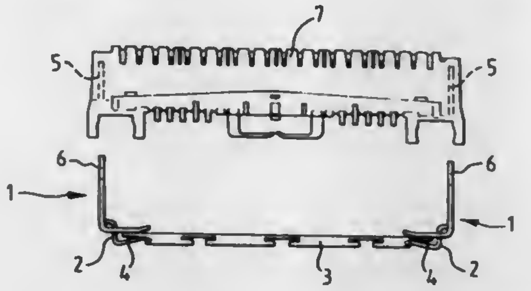
Adrian Benedetto, and Winfried Schachtebeck, both of Berlin, Germany, assignors to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany

Filed Jan. 10, 1994, Ser. No. 179,360

Claims priority, application Germany, Jan. 9, 1993, 9300339 U

Int. Cl.^{6} H01R *9/26*

U.S. Cl. 248—201 **11 Claims**



1. A device for mounting a terminal strip onto an installation profile with fish plate ends, the device comprising:
- a first shank having connection means designed for connecting to the terminal strip, said connection means including a connection cut-out defined by said first shank;
- a second shank angularly extending from said first shank, said second shank having clip-snap means designed for connecting to a first plate end of the installation profile, said second shank extends substantially perpendicular to said first shank, said clip-snap means includes opposite lateral parts of said second shank and a middle part of said second shank, said middle part being separate and spaced from said lateral parts by said second shank defining clip-snap cut-outs, said connection means includes a plane of said first shank being perpendicular to a plane of said second shank and also perpendicular to a longitudinal axis of said lateral parts.

5,531,415
TOOL HOLDER SYSTEM

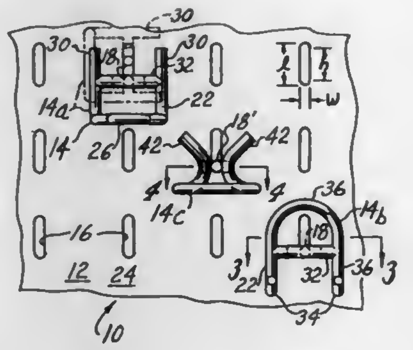
Hogen J. Kallemeyn, P.O. Box 2039, Blue Jay, Calif. 92317

Filed Sep. 21, 1994, Ser. No. 310,155

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 248—220.31 **11 Claims**

1. A tool holder for use in a wall panel having a panel thickness, a slotted passage formed through the panel, the passage being of uniform width within a minimum length thereof, comprising:



- (a) a cylindrical anchor bar having a lateral thickness not greater than the width of the passage, and a length greater than the width of the passage and not greater than the minimum length of the passage;
- (b) a cylindrical connector bar having opposite ends, one end thereof being rigidly connected perpendicular to the anchor bar, the connector bar having a cross-section inscribed within a diameter not greater than the width of the passage, the anchor bar extending beyond opposite sides of the connector bar;
- (c) a base rigidly connected to the other end of the connector bar and extending on opposite sides thereof, the base being spaced from the anchor bar by a spacing S not less than the panel thickness; and
- (d) a U-shaped arm projecting from the base for supporting an article thereon, the base comprising opposite leg portions of the arm, the leg portions being rigidly connected from medial locations thereon to opposite sides of the connector bar, the leg portions being coplanar at the spacing S from the anchor bar.

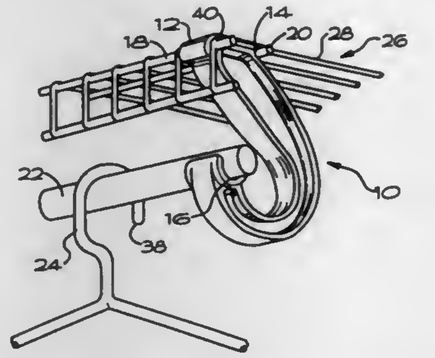
5,531,416
CONTINUOUS SLIDE BRACKET

Lee Remmers, Ocala, Fla., assignor to Clairson, Inc., Newark, Del.

Filed Sep. 30, 1994, Ser. No. 315,917

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 248—222.51 **15 Claims**



1. A continuous slide bracket for a hanger rod comprising:
- a body of J-shaped configuration having a downward terminating end including a U-shaped cradle for receiving a hanger rod therein;
- a pair of hooks mounted on an upper portion of said body and spaced on opposite sides of said body, each of said hooks being sized to receive a shelf wire therein.

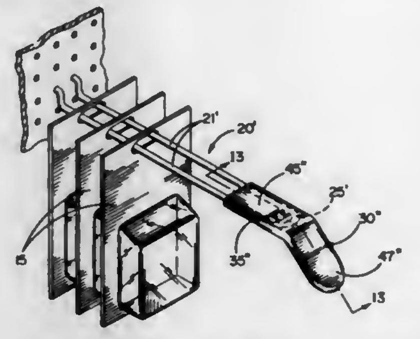
5,531,417
LOOP HOOK WITH LABEL HOLDER

Stanley J. Valiulis, and Stanley C. Valiulis, both of Rockford, Ill., assignors to Southern Imperial, Inc., Rockford, Ill.

Continuation of Ser. No. 123,211, Sep. 20, 1993, abandoned. This application Nov. 15, 1995, Ser. No. 559,410

Int. Cl.^{6} B42F *13/00*

U.S. Cl. 248—303 **2 Claims**



1. The combination of, a hanger made of a single piece of wire and comprising two laterally spaced and generally horizontally extending wire arms each having forward and rear end portions, said hanger having a generally U-shaped wire nose integral with and extending between the forward end portions of said arms, and means formed separately of said hanger and having an upwardly and forwardly facing surface for holding a label, said means being attached to and spanning said nose and permanently extending downwardly and forwardly from said arms at an included angle of at least 110 degrees relative to said arms whereby articles on said hanger may be removed therefrom by sliding the articles forwardly along said arms and then downwardly and forwardly along said means, said nose is disposed in generally the same plane as said arms, said means having a generally horizontal mounting portion attached to said nose and having a label holding portion integral with and extending downwardly and forwardly relative to said mounting portion and located forwardly of said nose, said label holding surface being defined by a surface of said label holding portion, and said mounting portion and said label holding portion are made from a single piece of plastic, said mounting portion comprising a sleeve telescoped over said nose.

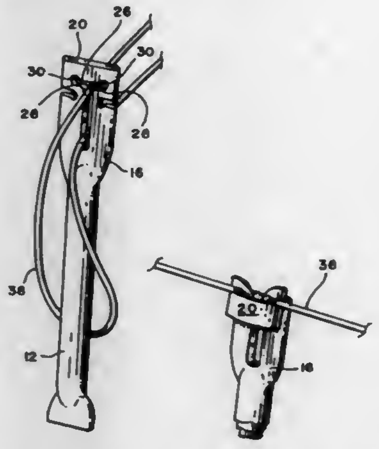
5,531,418
LINE ATTACHMENT MEANS AS FOR A CHEMICAL LIGHTSTICK

Peter B. Lindgren, 4491 Crystal lake Dr., Apt. 205A, Pompano Beach, Fla. 33064

Filed Jul. 7, 1994, Ser. No. 271,476

Int. Cl.^{6} A47H *1/10*

U.S. Cl. 248—317 **4 Claims**



1. A line attachment means comprising, in combination, a line;

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a flexible material having a bottom section, a center section, and a top section defining a flap;

a first set of two slots forming a T-shape where one of said two slots is positioned on the said flap and having eyelets terminating outwardly thereon of said T-shape, said eyelets having a diameter greater than or equal to that of a line intended to be threaded therethrough, and;

a second set of side slots defining a neck on the said center section, where said slots terminate inwardly in eyelets having a diameter greater than or equal to that of a line intended to be threaded therethrough.

5,531,419
MAST BASE, ESPECIALLY FOR A TEMPORARILY ERECTED MAST

Karl M. Gustafsson, Skellefteå, and Herman P. S. Sylvan, Lidingö, both of, Sweden, assignors to Cue Dee Produktor AB, Robertsfors, and Telefonaktiebolaget L M Ericsson, Stockholm, both of, Sweden

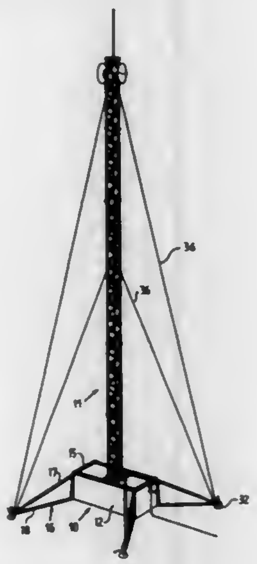
PCT No. PCT/SE93/00170, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO93/17208, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 26, 1993, Ser. No. 290,902

Claims priority, application Sweden, Feb. 28, 1992, 92 00608

Int. Cl.^{6} F16M *13/00*

U.S. Cl. 248—519 **17 Claims**



1. A mast base, especially for a temporarily erected mast, comprising:

a body, formed partly by

a generally rectangular container (12), provided with four upper corner fittings (13), located at an upper end thereof, and with four lower corner fittings (14), located at a lower end thereof, and partly by

a stationary supporting frame (15), placed upon the container (12) and attached to the four upper corner fittings (13) of the container (12); and

four supporting legs (16) supporting the body (12,15) in a stable position on the ground and arranged to be placed in positions, in which they project laterally each from one corner of the body (12,15), and which each includes one lower arm (18), at its inner end connected to a lower corner fitting (14) of the container (12), and one upper arm (17), at its inner end connected to the stationary supporting frame (15) or to an upper corner fitting (13) of the container (12), each supporting leg (16) being provided, at its outer end, with a supporting foot (32), by means of which it may be placed resting on the ground.

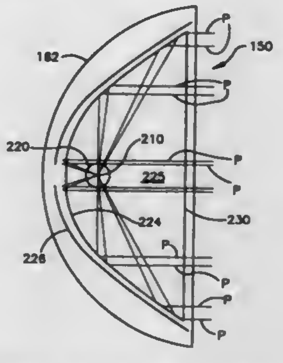
5,531,420
ION BEAM ELECTRON NEUTRALIZER

Victor M. Benveniste, Gloucester, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 1, 1994, Ser. No. 270,022

Int. Cl.^{6} H05H *3/00*

U.S. Cl. 250—251 **12 Claims**



1. An ion implanter for ion beam treatment of workpieces comprising:

a) an ion beam source that emits positively-charged ions used in treating the workpieces;

b) ion beam forming means comprising structure for forming an ion beam from ions exiting the ion beam source;

c) an implantation station comprising structure for positioning workpieces in the ion beam;

d) a controller for monitoring ion beam current and controlling dosage of ions impacting the workpieces; and

e) a beam neutralizer positioned relative to the ion beam to inject electrons into the ion beam before the ion beam reaches the implantation station including:

i) an electrically conductive reflector having a convex surface facing the ion beam for reflecting electrons into the ion beam;

ii) an electron source for emitting neutralizing electrons into a region between the convex surface of the reflector and the electron source;

iii) a first conductive grid spaced from the electron source for accelerating electrons entering the region between the convex surface of the reflector and the electron source toward the convex surface of the reflector;

iv) a second conductive grid spaced from the convex surface of the reflector in the region between the convex surface of the reflector and the electron source defining a region of electron envelope expansion between said first and second conductive grids and a region of electron reflection between the second conductive grid and the reflector;

v) conductive means for decelerating the electrons after they are reflected away from the reflector but before they enter the ion beam; and

vi) a power supply for electrically biasing the first and second grids and the reflector with respect to the electron source to cause the electrons to pass through the region of electron envelope expansion and reflect away from the reflector into the ion beam.

5,531,421
ANNULAR DAM SLIDE VALVE

Thomas Fenner, Eschborn, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 21, 1994, Ser. No. 308,496

Claims priority, application Germany, Sep. 23, 1993, 43 32 295.6

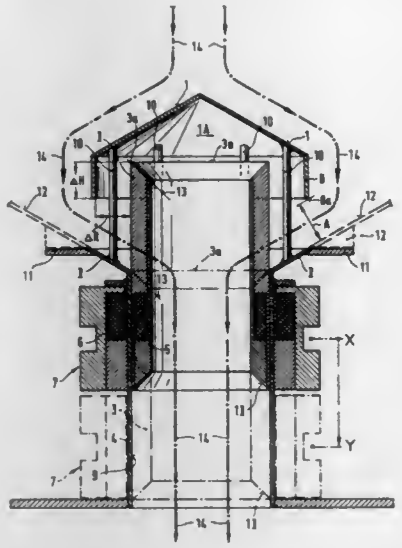
Int. Cl.^{6} F16K *31/08*

U.S. Cl. 251—65 **4 Claims**

1. An annular dam slide valve, comprising:

a tube having an internal passageway and a first opening;

a hopper adjacent the first opening of the tube;



a pyramidal roof, having peripheral eaves, supported within the hopper and above the first opening, the roof and hopper defining a flow path through the first opening and into the passageway;

a lining tube within the tube and coaxial with the passageway, the lining tube slidingly reciprocatable in an axial direction of the tube and movable between a first position for blocking the flow path and a second, unblocked position; and

an actuating device for moving the lining tube between the first and second positions.

3. The annular dam slide valve as claimed in claim 1 or 2, wherein the actuating device for the lining tube includes a drive movable relative to the tube and coupled to the lining tube via an axial magnetic coupling.

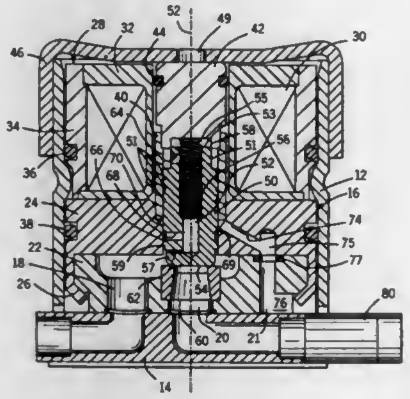
5,531,422
DOUBLE LATCHING VALVE

James R. Ward, Milwaukee, and Thomas J. Stobbs, Brookfield, both of Wis., assignors to Applied Power Inc., Butler, Wis.

Filed Apr. 12, 1994, Ser. No. 226,743

Int. Cl.^{6} F16K *39/00*

U.S. Cl. 251—282 **9 Claims**



1. In a hydraulic valve having a first port, a second port and a third port, a main valve seat between said first and second ports, a poppet moveable toward or away from said main valve seat to vary a flow area between said first and second ports, and a pressure chamber on a side of said poppet opposite from said valve seat in which a pressure in said pressure chamber urges said poppet toward said valve seat, the improvement wherein:

in an open position of said poppet communication is provided between said first port and said pressure chamber and communication is provided between said pressure chamber and said third port;

in a closed position of said poppet said communication between said pressure chamber and said third port is closed;

said communication between said pressure chamber and said third port in said open position is provided at least in part by a passageway through a sidewall of said poppet; and

wherein an outer end of said passageway seats against a bore in which said poppet slides in said closed position of said poppet.

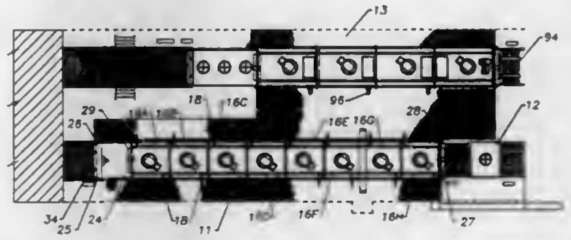
5,531,423
METHOD AND APPARATUS FOR HEAT TREATING METAL CASTINGS

Paul M. Crafton, Marietta, and Scott P. Crafton, Kennesaw, both of Ga., assignors to Consolidated Engineering Company, Inc., Kennesaw, Ga.

Continuation of Ser. No. 149,323, Nov. 9, 1993, Pat. No. 5,350,160, which is a division of Ser. No. 979,621, Nov. 20, 1992, Pat. No. 5,294,094, which is a continuation of Ser. No. 705,626, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 415,135, Sep. 29, 1989, abandoned. This application Aug. 1, 1994, Ser. No. 283,773

Int. Cl.^{6} C21D *5/00*

U.S. Cl. 266—44 **6 Claims**



1. A method for heat treating a casting having a sand core which comprises, at least, sand particles bound together by a binder material, the sand core defining a cavity within the casting, and the method comprising the following steps:

introducing the casting into a furnace, wherein the furnace defines a plurality of zones that are spatially displaced from one another;

heating the furnace to a temperature in excess of the combustion temperature of the binder material;

providing an oxygenated atmosphere in at least one zone of the plurality of zones;

conveying the casting along a path through the plurality of zones, whereby the casting, with the sand core therein, is exposed to the oxygenated atmosphere within the heated furnace to permit the binder material to combust; and

directing airflow at the casting while the casting is in the furnace so as to dislodge portions of the sand core from the casting, wherein the step of directing airflow includes, at least, a step of varying the direction from which airflow is directed at the casting as the casting is conveyed through the furnace, wherein the varying step includes, at least,

  directing a flow of air in a first direction in a first zone of the plurality of zones, and

  directing a flow of air in a second direction in a second zone of the plurality of zones, and

wherein the step of conveying includes, at least, conveying the casting sequentially through the first zone and the second zone.

5,531,424

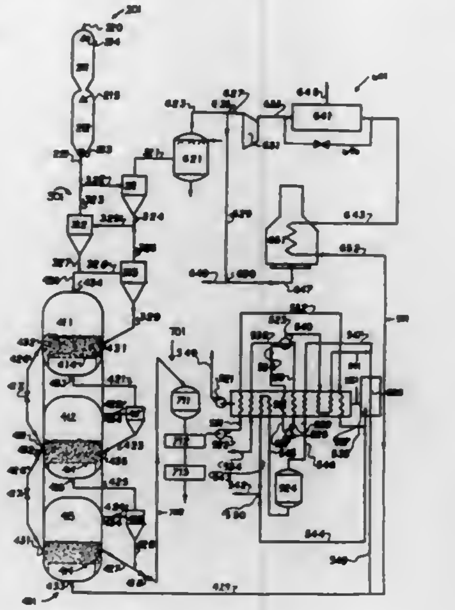
FLUIDIZED BED DIRECT REDUCTION PLANT

Roy H. Whipp, Miami, Fla., assignor to Flor de Venezuela, Caracas, Venezuela

Filed Apr. 19, 1993, Ser. No. 47,942

Int. Cl.^{6} C22B *5/14*

U.S. Cl. 266—156 **8 Claims**



1. A direct reduction plant for direct reduction of raw iron ore fines under ½" diameter in fluidized beds, comprising
   an ore feed assembly:
   a preheat assembly;
   a reactor assembly.;
   a compacting/inerting assembly;
   a reducing gas preparation assembly;
   a recycle gas assembly; and,
   reducing gas conduit means for continuously cycling exiting offgas from said preheat assembly through said recycle gas assembly, reducing reactor assembly, and preheat assembly; and,
   said ore feed, preheat, and reducing reactor assemblies being located in decreasing elevation series relation:
   said ore feed assembly including
      ore feed conduit means for transferring dry iron ore from said ore feed assembly to said preheat assembly: said ore feed conduit means including first isolation valve means for maintaining steady flow of fines; and, pressurizing means for pressurizing said ore feed conduit means;
   said preheat assembly including
      preheat means for preheating said fines to a pre-determined reaction temperature and removing entrained water from said fines prior to entry into said reactor assembly;
   said reactor assembly including
      at least three ore reactors pressurized to a pre-specified reactor pressure of at least five atmospheres and fixed in graduate decreasing beight; and,
      reactor conduit means for connecting flow of fines downward and flow of reducing gas upward in cross-current relation through said at least three ore reactors in series relation;
   said reducing gas assembly including
      reducing gas recycling means for recycling reducing gas exhausted from said reactor assembly.

5,531,425

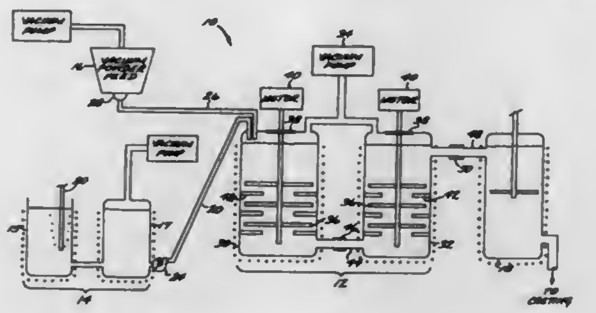
APPARATUS FOR CONTINUOUSLY PREPARING CASTABLE METAL MATRIX COMPOSITE MATERIAL

Michael D. Skibo, Leucadia; David M. Schuster, LaJolla, and Richard S. Bruski, Encinitas, all of Calif., assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Continuation of Ser. No. 667,558, Mar. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 259,581, Oct. 18, 1988, Pat. No. 5,167,920, which is a continuation of Ser. No. 856,338, May 1, 1986, Pat. No. 4,786,467, which is a continuation-in-part of Ser. No. 501,128, Jun. 6, 1983, abandoned. This application Feb. 7, 1994, Ser. No. 192,950

Int. Cl.^{6} B22B *11/00*

U.S. Cl. 266—208 **15 Claims**



1. Apparatus for preparing a continuous flow of a composite of a metallic alloy reinforced with a preselected volume fraction of nonmetallic particles, comprising:
   mixing means for mixing a flow of a molten metallic alloy with a flow of a particulate material to wet the molten metal to the particles, under conditions that the particles are distributed throughout a volume of a mixture and the means for mixing being operable to cause the particles and the molten metal to shear past each other to promote wetting of the particles by the metal, the means for mixing being operable to minimize the introduction of gas into, and to minimize the retention of gas within, the mixture of particles and molten metal, at a temperature whereat the particles do not substantially chemically degrade in the molten metal;
   metal supply means for introducing a flow of molten metal into the mixing means;
   particle supply means for introducing a flow of particulate into the mixing means, the metal flow rate of the metal supply means and the particle flow rate of the particle supply means being controllable; and
   means for removing a flow of mixed composite material from the mixing means, the means for removing being simultaneously operable with the metal supply means and the particle supply means.

5,531,426

HYDRAULIC SUPPORT

Hubert Brühl, Waldstetten, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

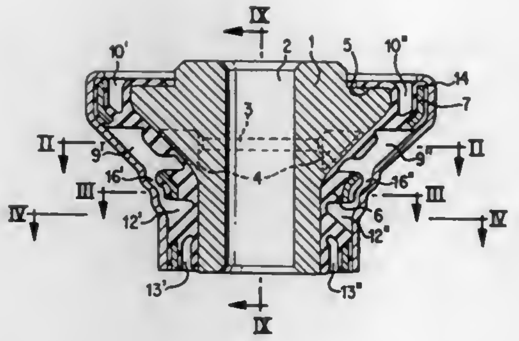
Filed Oct. 17, 1995, Ser. No. 544,165

Claims priority, application Germany, Oct. 31, 1994, 44 38 932.9

Int. Cl.^{6} F16F *13/00;13/14*

U.S. Cl. 267—140.12 **19 Claims**

1. Hydraulic support in the form of a hydraulically damped elastomer support with an inner supporting part and an outer supporting part, concentric with the latter, and an annular elastomer body which is arranged as a spring between these supporting parts and in which there are formed hydraulic chambers which communicate with one another via hydraulic restrictor sections and between which hydraulic medium is exchanged when the supporting parts move relative to one another in the axial or radial direction, there being at least two groups of chambers which are spaced apart in the circumferential direction of the supporting parts and which each have at least two chambers situated adjacent to one another in the axial direction, the restrictor sections connecting the chambers of each group to one another and in each case connecting one chamber of each group to the corresponding chamber of another group,
   wherein the elastomer body has embedded in it or vulcanized into it near to its outer circumference a reinforcing sleeve which is surrounded in leaktight fashion by the outer supporting part, which rests on an elastomer layer at the outside of the reinforcing sleeve, exerting pressure on it,
   wherein apertures in the reinforcing sleeve and recesses open to the apertures in the elastomer body are provided for the chambers, and
   wherein the restrictor sections are formed as a transverse hole in the inner supporting part and as channels running between the outer supporting part and the reinforcing sleeve in beads of the outer supporting part.



5,531,427

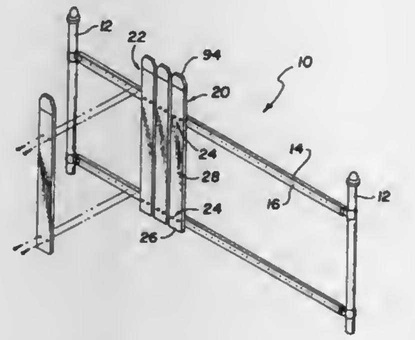
METALLIC FENCE SYSTEM

Dwight R. Quarles, 2100 Evergreen, Garland, Tex. 75041

Filed Feb. 28, 1994, Ser. No. 202,527

Int. Cl.^{6} E04H *17/16*

U.S. Cl. 256—22 **32 Claims**



1. A fence system comprising:
(a) at least one metal post;
(b) at least one metal cross-piece attached to said post;
(c) at least one metal hollow picket attached to said cross-piece and having a top end, a front wall, a rear wall, wherein said front and rear walls are separated by side walls, wherein said picket has a width which is adjustable.

5,531,428

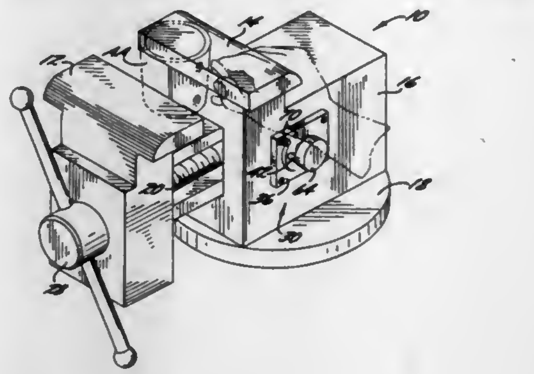
ADJUSTABLE CLOSURE FORCE CONTROL DEVICE FOR A BENCH VISE AND METHOD

Andrew E. Dembicks, 5308 Boca Marina Cir. North, Boca Raton, Fla. 33487, and James E. Herrmann, 1208 Fairfax Dr., Raleigh, N.C. 27609

Filed Dec. 19, 1994, Ser. No. 358,809

Int. Cl.^{6} B25B *1/02*

U.S. Cl. 269—172 **18 Claims**



1. An adjustable vise comprising:
a housing;
a pair of opposing jaws wherein at least one of said jaws is connected to said housing;
a rotatable threaded screw operatively connected to at least one of said jaws for causing movement of said at least one jaw relative to the other of said jaws responsive to rotation of said screw to thereby facilitate holding and release of an article positioned between said pair of jaws; and
a closure force control attached to said housing for allowing selective operation of a direct operating mode wherein jaw closure force directly relates to rotation of said screw, and a closure force limiting mode wherein a predetermined maximum jaw closure force is selected, such that rotation of said screw causes movement of said jaw relative to the other of said jaws only until the maximum jaw closure force is attained, thereby preventing damage to an article held between said pair of jaws.

5,531,429

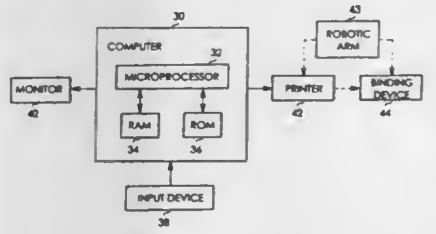
VARIABLE PRINTING AND SELECTIVE BINDING OF BOOKLETS

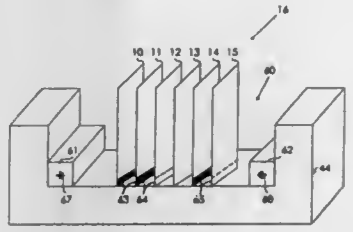
Jay V. Clark, West Liberty, Iowa, assignor to National Computer Systems, Inc., Minneapolis, Minn.

Filed Mar. 29, 1995, Ser. No. 413,162

Int. Cl.^{6} B42C *9/00*

U.S. Cl. 270—58.11 **32 Claims**



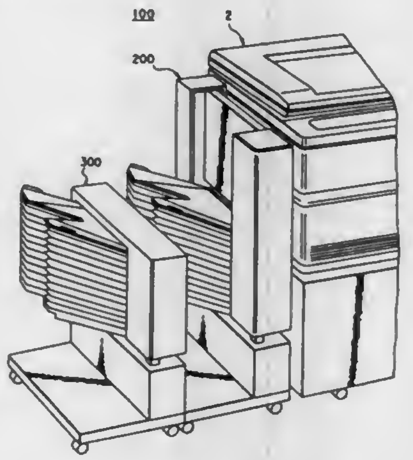


1. A method of variably printing information on a plurality of sheets and selectively binding the sheets, comprising the steps of:
using a printer in order to print variable sets of information on a plurality of sheets, sequence the printed sheets, and assemble the printed sheets into a stack; and
selectively binding together particular sheets within the stack of printed sheets.

16. A system for variably printing information on a plurality of sheets and selectively binding the sheets, comprising:
a printer;
a computer electrically coupled to the printer, the computer being programmed to control the printer in order to print variable sets of information on a plurality of sheets, sequence the printed sheets, and assemble the printed sheets into a stack; and
a device for selectively binding together particular sheets within the stack of printed sheets.

5,531,430
COPYING MACHINE WITH SORTER UNIT

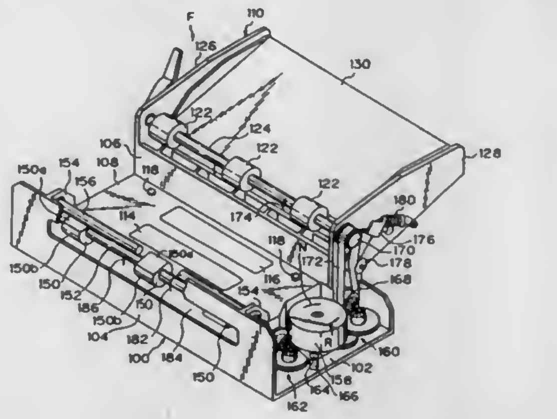
Yoshiaki Tokunoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 21, 1994, Ser. No. 277,264
Claims priority, application Japan, Jul. 27, 1993, 5-184864
Int. Cl.^{6} B65H *39/02;39/10*
U.S. Cl. 270—58.02 **9 Claims**



1. An image forming apparatus with a plurality of sorters, comprising:
a main body of said image forming apparatus for forming an image on paper, and discharging the paper on which the image is formed;
a first sorter, connected to said main body of the image forming apparatus, for containing the image formed paper discharged from said main body of the image forming apparatus, said first sorter having a plurality of bins for containing said paper and storing means with a first height having said plurality bins attached; and
a second sorter, connected between said first sorter and said main body of the image forming apparatus, for containing the image formed paper discharged from said main body of the image forming apparatus, said second sorter having storing means with a plurality of bins for containing said paper and a motor for moving said storing means to a position at least higher than said first height when the image formed paper discharged from said main body of the image forming apparatus is contained in the plurality of bins of said storing means.

5,531,431
PAPER FEEDER FOR PORTABLE PRINTER

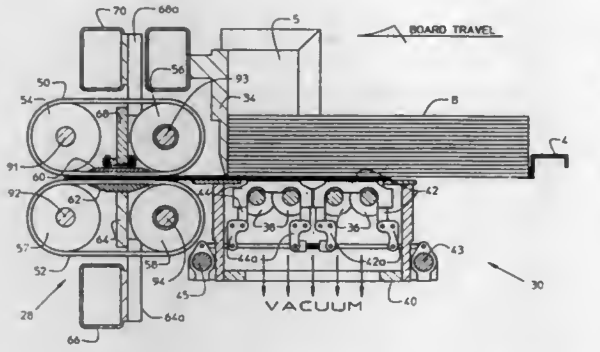
Yukio Saito; Takumi Kawamura; Masaki Okuyama, and Tsutomu Munekata, all of Inagi, Japan, assignors to Fujitsu Isotec Limited, Tokyo, Japan
Division of Ser. No. 323,055, Oct. 14, 1994, Pat. No. 5,423,529, which is a continuation of Ser. No. 79,455, Jun. 21, 1993, abandoned, which is a continuation of Ser. No. 827,630, Jan. 29, 1992, abandoned. This application Apr. 5, 1995, Ser. No. 417,244
Claims priority, application Japan, Jan. 29, 1991, 3-008908
Int. Cl.^{6} B65H *5/22*
U.S. Cl. 271—4.01 **23 Claims**



1. A paper feeder suitable for a hand-carry type portable printer, comprising:
base frame means for detachably mounting said printer thereon;
paper feed means for feeding a sheet of paper to be printed to said printer mounted on said base frame means, whereby printing on the paper can be performed by said printer;
paper discharge means for discharging said paper from said printer and said base frame means after printing thereon is completed, said paper discharge means being shiftable between a first state in which said paper discharge means positively engages the paper sheet for discharging same and a second state in which said paper discharge means is disengaged from the paper sheet whereby the paper sheet passes freely therethrough;
first shifting means for shifting said paper discharge means from said first state to said second state before each leading edge of each sheet of said paper to be printed reaches said paper discharge means; and
second shifting means for shifting said paper discharge means from said second state to said first state after the printing of each sheet of said paper is completed.

5,531,432
METHOD AND APPARATUS FOR FEEDING SHEETS

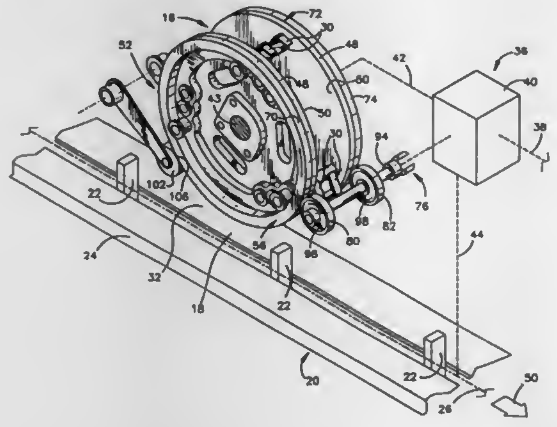
Louis M. Sardella, 518 Kinsale Rd., Timonium, Md. 21093
Continuation-in-part of Ser. No. 662,034, Feb. 28, 1991, which is a continuation of Ser. No. 257,063, Oct. 13, 1988, Pat. No. 5,184,811. This application Jun. 16, 1994, Ser. No. 260,808
Int. Cl.^{6} B65H *5/00*
U.S. Cl. 271—10.01 **29 Claims**



1. In combination with a box finishing machine having at least one station where an operation is performed on corrugated blanks; a first feeder for feeding corrugated blanks towards the station, comprising in combination; overlying and underlying endless timing belts trained about inlet and outlet pulleys for receiving blanks between the belts and feeding the blanks towards said station, said belts being spaced from each other to form a first gap at rectilinearly moving sections located between the inlet and outlet pulleys, and being spaced from each other at the inlet and outlet pulleys to form a second gap which is greater than said first gap whereby blanks enter said second gap at the inlet pulleys without being driven by said belts and are engaged and driven by said rectilinearly moving belt sections at said first gap and fed toward the outlet pulleys, and a second feeder located upstream of said first feeder for feeding blanks to said first feeder, said second feeder being located and having means for driving a blank through said second gap at the inlet pulleys and into said first gap at a constant velocity matched to the velocity of said belts, and wherein said inlet pulleys have axes of rotation and wherein said second gap is located along a line interconnecting said axes of the inlet pulleys.

5,531,433
SHEET MATERIAL HANDLING APPARATUS

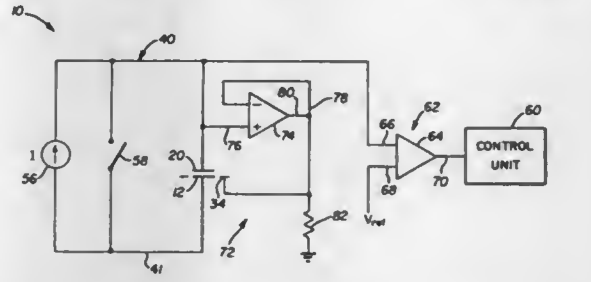
Richard B. Hawkes, Bethlehem, Pa., and Michael C. Buschhaus, Springboro, Ohio, assignors to AM International, Inc., Mount Prospect, Ill.
Filed Oct. 17, 1994, Ser. No. 324,252
Int. Cl.^{6} B65H *5/12*
U.S. Cl. 271—10.01 **22 Claims**



1. A sheet material handling apparatus comprising a rotatable sheet material feed drum having a gripper which is operable between a closed condition in which said gripper is effective to grip sheet material and an open condition in which said gripper is ineffective to grip sheet material, first drive means for rotating said feed drum to move said gripper and sheet material engaged by said gripper at a first speed, a conveyor having receiving locations which receive sheet material from said feed drum, second drive means for operating said conveyor to move said locations which receive sheet material at a second speed which is different than the first speed, and means for changing the speed of movement of the sheet material from the first speed to a speed which is different than the first speed while said gripper is in the open condition and prior to movement of the sheet material into one of the receiving locations in said conveyor.

5,531,434
MULTIPLE PAGE SENSOR FOR AUTOMATIC DOCUMENT FEEDER

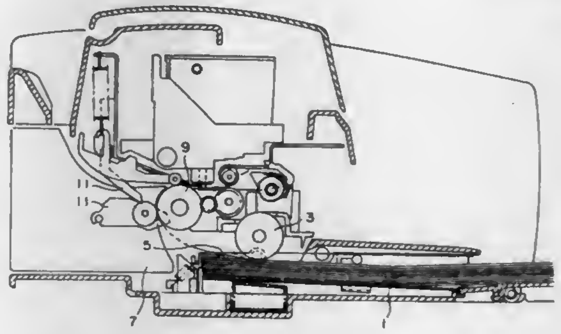
Ronald K. Kerschner, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 5, 1994, Ser. No. 349,641
Int. Cl.^{6} B65H *7/12*
U.S. Cl. 271—263 **14 Claims**



1. Page sensor apparatus for producing a signal related to a thickness of a sheet of paper, comprising:
a base plate;
a foot plate positioned in opposed relation to said base plate and arranged to allow the paper to pass therebetween and urge said base plate and said foot plate apart so that said base plate and said foot plate are separated by a distance substantially equal to the thickness of the sheet of paper;
a current source connected between said foot plate and said base plate; and
voltage comparator apparatus connected to said foot plate and said base plate for comparing a voltage potential between said foot and base plates with a known reference voltage and for generating a signal related to the voltage potential between said foot and base plates.

5,531,435
PAPER-FEED CONTROL APPARATUS FOR PRINTER

Hiroaki Momose, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo-to, Japan
Continuation of Ser. No. 185,715, Jan. 24, 1994, abandoned. This application Jul. 6, 1995, Ser. No. 500,313
Claims priority, application Japan, Feb. 1, 1993, 5-014565
Int. Cl.^{6} B65H *7/02*
U.S. Cl. 271—258.03 **4 Claims**



1. A paper-feed control apparatus for a printer that controls transfer of sheets of paper from a paper tray, one sheet at a time, along a paper conveyor path to a printer by operation of a paper-feed motor in response to a paper-feed control command, said paper-feed control apparatus comprising:
a paper sensor which is provided at a predetermined position in said paper conveyor path and which detects arrival of a paper sheet sent from said paper tray by the operation of said paper-feed motor;
a timer means which generates an output when a predetermined time has elapsed after said paper-feed command is issued;

a paper-feed halt means which issues a paper-feed halt signal if a paper detection signal is not received from said paper sensor after said output has been generated by said timer means; and

a paper feed-motor control means which produces a plurality of short-time intermittent operations of said paper-feed motor in response to said paper-feed halt signal and wherein if said paper-feed halt signal has been received, said paper-feed motor control means operates said paper-feed motor by an amount that is sufficient to allow the paper sheet to reach the position of said paper sensor after said short-time intermittent operations, said paper-feed motor comprising a step motor, said paper-feed motor control means operating said step motor intermittently in step by step operation for incrementally advancing said paper sheet after receipt of said paper-feed halt signal, said paper-feed motor being operated over a relatively large number of steps to transport the paper sheet from said tray to said paper sensor, said step motor being advanced step-by-step during each said short-time intermittent operation, with alternating advancing and halting, over a number of steps substantially less than the number necessary to transport the sheet from the tray to the paper sensor.

5,531,436

SHEET TRANSPORT APPARATUS WITH MINIMIZED LOAD BETWEEN ELECTROSTATIC GENERATING DEVICE AND TRANSPORT BELT

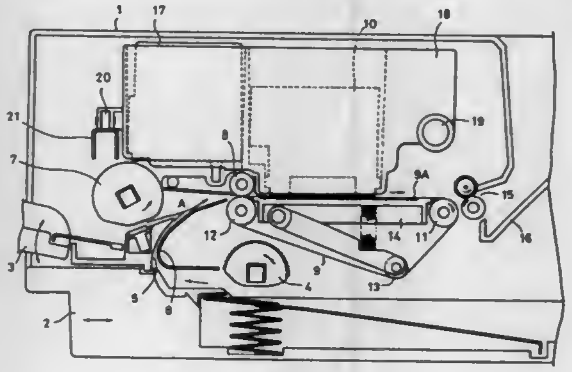
Kazuo Ohyama, Mitaka; Shigeyoshi Onoda, and Haruo Uchida, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,136

Claims priority, application Japan, Nov. 16, 1993, 5-309853

Int. Cl.⁶ B65H *5/02*

U.S. Cl. 271—275 **34 Claims**



25. A sheet transport apparatus comprising:

a transport belt for transporting a sheet member, the transport belt having an inner surface and an outer surface and the sheet member contacting the outer surface;

electrostatic attraction force generation means for generating an electrostatic force for attracting the sheet member to the outer surface of said transport belt, said electrostatic attraction force generation means being disposed adjacent the inner surface of said transport belt; and

reducing means for reducing a load between the inner surface of said transport belt and said electrostatic attraction force generation means.

5,531,437

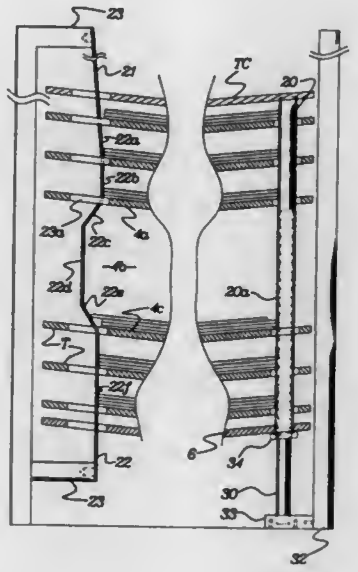
TELESCOPING REGISTRATION MEMBER FOR SHEET RECEIVERS

Peter M. Coombs, Tustin, Calif., assignor to Gradco (Japan) Ltd., Tokyo, Japan

Filed Nov. 7, 1994, Ser. No. 334,907

Int. Cl.⁶ B65H *39/10*

U.S. Cl. 271—292 **4 Claims**



1. In an in-bin stapling sorter comprising: a frame structure, a plurality of trays in a vertically spaced and movable stack, means for moving said trays vertically in said frame structure relative to a sheet infeed location to receive sets of sheets, stapling means for stapling sets of sheets in said trays, and alignment means for aligning the side edges of said sets of sheets in said trays, the improvement wherein: said alignment means includes an alignment surface extending vertically at one side of said trays and alignment means are provided at the other side of said trays for jogging sheets into engagement with said alignment surface, said alignment surface being on a member telescopically supported in said frame structure for vertical movement with said tray.

5,531,438

BATTING PRACTICE DEVICE

Deryl Corley, 7108 Carolenna Ct., North Richland Hills, Tex. 76180

Filed Oct. 26, 1994, Ser. No. 329,490

Int. Cl.⁶ A63B *69/00*

U.S. Cl. 273—26 E **19 Claims**

1. An apparatus for practicing at least one of batting and racketing techniques comprising:

a base for supporting said apparatus;

a vertical member attached to said base;

a rotational mechanism comprising:

a stud portion which is fixably attached to said vertical member, having a smooth portion and a threaded portion;

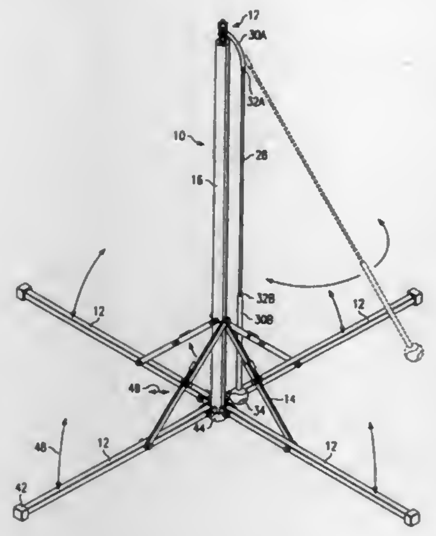
a plurality of washers rotatably mounted on said stud portion;

a bushing rotatably mounted on said stud portion; and

an eyelet rotatably mounted on said stud portion;

a rope having a first end fixably attached to said eyelet of said rotational mechanism; and

a ball fixably attached to a second end of said rope; said rope and ball being capable of withstanding repetitive strikes from a bat; said ball capable of orbiting said vertical member in a continuous relatively horizontal path such that said rope does not wrap about said vertical member.



5,531,439

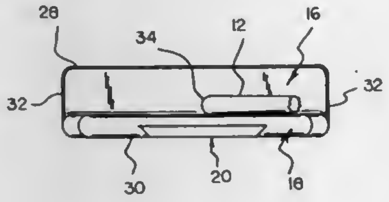
GOLF PUTTER

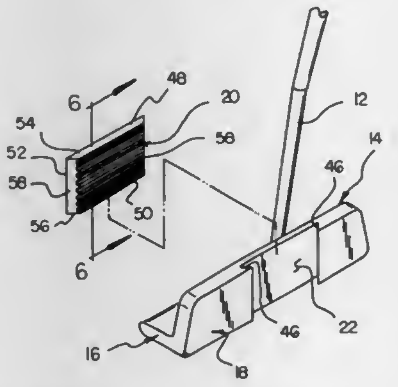
Charles W. Azzarella, R.D. 1, Pulaski, Pa. 16143

Filed Aug. 25, 1995, Ser. No. 519,295

Int. Cl.⁶ A63B *53/02;53/04*

U.S. Cl. 473—331 **1 Claim**





1. A stainless steel insert golf putter comprising:

an elongated handle;

a club head mounted to a lower end of the handle, the club head including a sole plate and a face plate projecting from a forward edge of the sole plate, the face plate being shaped so as to define a receiving slot directed thereinto, the face plate is oriented so as to extend at an orthogonal angle relative to the sole plate, the face plate of the club head is shaped so as to define a linear lower edge spaced from an upper edge, with lateral edges extending between the upper edge and the lower edge, the lateral edges of the face plate being oriented so as to extend at an oblique angle relative to the lower edge so as to define a substantially trapezoidal shape of the face plate;

the sole plate is shaped so as to define a top face spaced from a planar bottom face, a rear edge spaced from a forward edge of the sole plate, and orthogonal lateral edges extending substantially orthogonally between adjacent ends of the rear edge and the forward edge, the sole plate is further shaped so as to define a hosel directed thereinto and located medially between the orthogonal lateral edges, the hosel receiving and engaging a lower end of the handle;

the lower edge of the face plate extends into contiguous communication with the planar bottom face of the sole plate, the face plate being further shaped so as to define a planar front face spaced from a rear face, with the receiving slot being directed into the front face of the face plate and extending through the face plate to terminate proximal to a juncture of the face plate and the sole plate of the club head;

the receiving slot is shaped so as to define opposed and substantially parallel dovetail channels extending vertically and parallel through the front face along respectively opposed sides of the receiving slot from the upper edge of the face plate;

a frictional insert positioned within the slot of the face plate for frictionally engaging a golf ball during impacting thereof so as to impart a rotation to the ball, the frictional insert is shaped so as to fit into and frictionally engage surfaces of the receiving slot, the frictional insert being formed of stainless steel and having a plate member with a planar front face spaced from a planar rear face;

a top edge extending substantially orthogonally between the front face and the rear face, and a bottom edge extending in a substantially spaced and parallel orientation relative to the top edge, the plate member being further shaped so as to define dovetail lateral edges extending from the front face at an oblique angle relative thereto and into communication with the rear face, wherein the front face is of a first width measured between the lateral edges, and the rear face is of a second width measured between the lateral edges, with the second width being substantially greater than the first width so as to define the dovetail lateral edges extending between the front face and the rear face, the dovetail lateral edges operate to be received within the dovetail channel of the face plate; and

the front face of the plate member is shaped so as to define a plurality of grooves extending between the dovetail lateral edges, with the grooves being oriented in a substantially spaced and parallel orientation relative to one another and cooperating to define a plurality of projections extending between the dovetail lateral edges of the plate member, the grooves are substantially rectangular in cross section so as to define projections which are substantially rectangular in cross section, each of the projections having a pair of spaced and parallel orthogonally oriented corner edges which frictionally engage the exterior surface of the golf ball.

5,531,440

DOUBLE POKER

Stanley P. Dabrowski, and Mark Sincox, both of Las Vegas, Nev., assignors to Sevens Unlimited, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 47,715, Apr. 14, 1993, Pat. No. 5,356,140. This application Sep. 29, 1994, Ser. No. 315,294

Int. Cl.⁶ A63F *1/00*

U.S. Cl. 463—12 **59 Claims**

1. A method of playing a draw poker game comprising:

a) dealing a player a first five card hand from a first deck of playing cards,

b) dealing the player a second five card hand from a second deck of playing cards,

c) awarding the player a first predetermined amount if one or more of the cards from the first five card hand match one or more of the cards from the second five card hand,

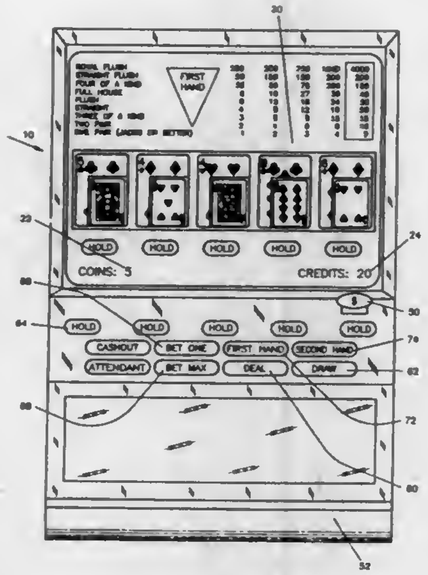
d) the player selecting either the first hand or the second hand,

e) the player either standing on the hand selected or discarding one or more cards from the hand selected,

f) dealing the player replacement cards for the discarded cards, if any,

g) determining a value for the player's selected hand based on conventional poker hand ranking, and

h) awarding the player a second predetermined amount based on the value of the player's selected hand.



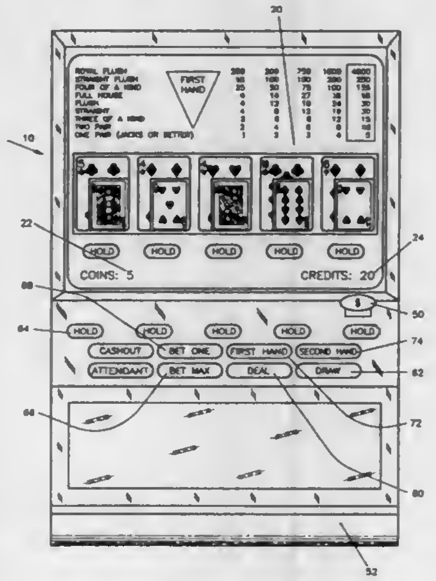
5,531,441
DOUBLE POKER

Stanley P. Dabrowski, and Mark Sincox, both of Las Vegas, Nev., assignors to Sevens Unlimited, Inc. a Nevada Corporation

Continuation-in-part of Ser. No. 315,294, Sep. 29, 1994, which is a continuation-in-part of Ser. No. 47,715, Apr. 14, 1993, Pat. No. 5,356,140. This application Oct. 18, 1994, Ser. No. 324,883

Int. Cl.^{6} A63F *1/00*

U.S. Cl. 463—12 **8 Claims**



1. An apparatus for conducting a draw poker game on an electronic gaming machine comprising:

a) means for displaying to a player a first five card hand from a first deck of playing cards,
b) means for displaying to the player a second five card hand from a second deck of playing cards,
c) means activated by the player for selecting either the first hand or the second hand,
d) means activated by the player for either standing on the hand selected or discarding one or more cards from the hand selected,
e) means for displaying replacement cards for the discarded cards, if any,
f) means for determining a value for the player's selected hand based on conventional poker hand ranking, and
g) means for awarding a first predetermined amount based on the value of the player's selected hand.

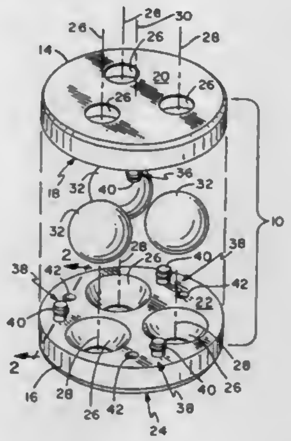
5,531,442
HOCKEY PUCK WITH INTEGRAL ROLLERS AND METHOD OF ASSEMBLY

John M. Gill, St. Louis Park, Minn., assignor to Sun Hockey, Inc., Edina, Minn.

Continuation of Ser. No. 247,502, May 23, 1994, abandoned, which is a continuation of Ser. No. 555,075, Jul. 18, 1990, abandoned. This application Dec. 29, 1994, Ser. No. 366,371

Int. Cl.^{6} A63B *67/00*

U.S. Cl. 273—128 R **5 Claims**



1. A hockey puck comprising:

a body comprising a first cylindrical body half and a second cylindrical body half, said first cylindrical body half and said second cylindrical body half each having an inner face, an outer face and a periphery;

at least three opposing pairs of equal, truncated hemispherical cavities, each said pair of truncated hemispherical cavities forming a receptacle, each said pair including a first truncated hemispherical cavity contained in said first cylindrical body half and a second truncated hemispherical cavity contained in said second cylindrical body half and each forming a circular edge at its intersection with the plane of the inner face, the equatorial plane of each said truncated hemispherical cavity being coplanar with said inner face of said first and second cylindrical body halves, each of said truncated hemispherical cavities having a diameter along said equatorial plane, each said truncated hemispherical cavity further having an axis perpendicular to the planes defined by said inner and outer faces of said cylindrical body halves, said axis of each said truncated hemispherical cavity spaced an equal distance from said axis of each adjacent said truncated hemispherical cavity;

spherical ball elements contained within said receptacles;

a plurality of elastic snap assemblies, said elastic snap assembly comprising a first projecting member on said inner face of said first cylindrical body half, a second projecting member on said inner face of said second cylindrical body half, a first receiving member on said inner face of said first cylindrical body half and a second receiving member on said inner face of said second cylindrical body half, whereby said first projecting member is matably opposed to said second receiving member to be securely and releasably received therein, and said second projecting member is matably opposed to said first receiving member to be securely and releasably received therein, a combination of said first projecting member and said first receiving member, and a combination of said second projecting member and said second receiving member defining an elastic fastening pair on said first and second cylindrical body halves respectively, said receiving members defining an outer most edge on said inner face of said halves, each one of said projecting and receiving members of said elastic fastening pair being positioned in close proximity to each other around the periphery of said halves in an alternating pattern such that each one of said elastic fastening pair being located on either side of an adjacent pair of said receptacles formed by said truncated hemispherical cavities, and whereby said first cylindrical body half and said second cylindrical body half may be subjected to uniform distribution of separation forces through said elastic fastening pairs,

the distance between the outer most reach of each circular edge and the periphery being equal to the distance between the outer most edge of each receiving member and the periphery.

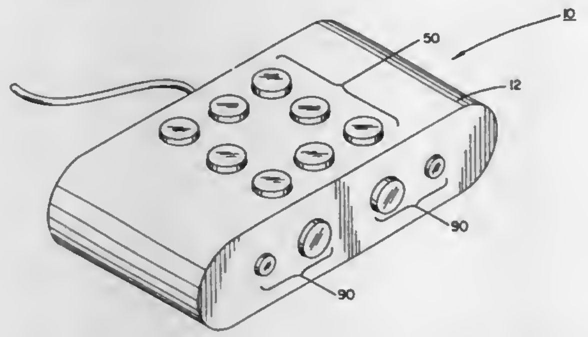
5,531,443
KEYPAD CONTROLLER FOR USE WITH A VIDEO GAME

Jose L. Cruz, 138-16-407st V. Carolina, Carolina, Puerto Rico

Filed Sep. 13, 1994, Ser. No. 304,884

Int. Cl.^{6} A63F *9/22*

U.S. Cl. 463—37 **2 Claims**



1. A keypad controller for use with a video game for generating directional and activation signals for controlling the direction and activation of events during play of a video game comprising, in combination:

a housing having a bottom wall, top wall, and a periphery interconnecting the top wall with the bottom wall with the periphery further having a front wall, a rear wall, and two opposed and outwardly curved side walls defining handles for allowing a user a firm grip;

a cable connector extended from the rear wall of the housing and coupleable to a plug end of a cable for connection and communication with a video game, the cable connector having a north terminal, a south terminal, an east terminal, a west terminal, event terminal, and ground terminal;

eight depressible directional switches coupled to and extended from the top wall of the housing with four of the switches each located at a vertex of an imaginary square defined upon the top wall to thereby define a northwest switch, a northeast switch, a southeast switch, and a southwest switch and with the remaining four switches each generally positioned between each pair of vertices of the imaginary square to define a north switch, a south switch, an east switch, and a west switch, each switch having an cathode terminal and a anode terminal with each anode terminal coupled to the ground terminal of the cable connector and with the cathode terminal of the north switch coupled to the north terminal of the cable connector, the cathode terminal of the south switch coupled to the south terminal of the cable connector, the cathode terminal of the east switch coupled to the east terminal of the cable connector, and the cathode terminal of the west switch coupled to the west terminal of the cable connector;

a first diode, a second diode, a third diode, a fourth diode, a fifth diode, a sixth diode, a seventh diode, and an eighth diode with the first diode having an anode terminal coupled to the cathode terminal of the northwest switch and a cathode terminal coupled to the north terminal of the cable connector, the second diode having an anode terminal coupled to the cathode terminal of northeast switch and a cathode terminal coupled to the north terminal of the cable connector, the third diode having an anode terminal coupled to the cathode terminal of the northeast switch and a cathode terminal coupled to the east terminal of the cable connector, the fourth diode having an anode terminal coupled to the cathode terminal of the southeast switch and a cathode terminal coupled to the east terminal of the cable connector, the fifth diode having an anode terminal coupled to the cathode terminal of the southeast switch and a cathode terminal coupled to the south terminal of the cable connector, the sixth diode having an anode terminal coupled to the cathode terminal of the southwest switch and a cathode terminal coupled to the south terminal of the cable connector, the seventh diode having an anode terminal coupled to the cathode terminal of the southwest switch and a cathode terminal coupled to the west terminal of the cable connector, and the eighth diode having an anode terminal coupled to the cathode terminal of the northwest switch and a cathode terminal coupled to the west terminal of the cable connector and with depression of the north switch generating a north directional signal, depression of the south switch generating a south directional signal, depression of the east switch generating an east directional signal, depression of the west switch generating a west directional signal, depression of the northeast switch generating a north directional signal and east directional signal, depression of the southeast switch generating a south directional signal and an east directional signal, depression of the southwest switch generating a south directional signal and a west directional signal, and depression of the northwest switch generating a north directional signal and a west directional signal; and

two pairs of actuation switches extended from the rear wall of the housing, each pair formed of a depressible action switch and a lock switch, the action switch having a cathode terminal coupled to the event terminal of the cable connector and an anode terminal connected to the ground terminal of the cable connector with depression of the action switch generating an activation signal, the lock switch coupled to the action switch and having an activated orientation for allowing the continual generation of the activation signal and a de-activated orientation for preventing such continual generation.

5,531,444
COATED GOLF CLUB AND APPARATUS AND METHOD FOR THE MANUFACTURE THEREOF

Dale Buettner, N163W19351 Cedar Run Dr., Jackson, Wis. 53037

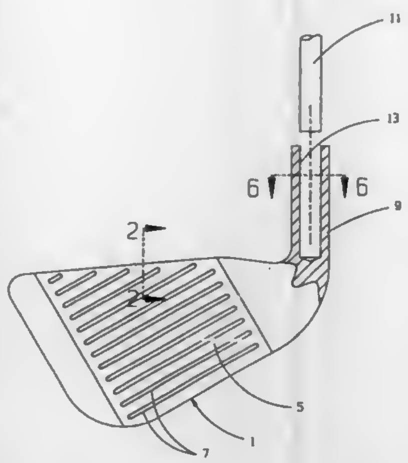
Filed May 10, 1994, Ser. No. 240,312

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—349 **2 Claims**

1. A golf club head comprising·

a. a head portion formed as a substrate from a ferrous material and having a face for striking a golf ball;
b. a generally tubular hosel having interior and exterior surfaces formed as a substrate from a ferrous material and joined to the head portion; and
c. a very thin, hard, tough, and low-friction coating having a thickness of approximately 0.0002 inches to 0.0004 inches deposited on the substrate only on the head portion and on the hosel exterior surface, the coating comprising a microcrystalline, single phase, solid solution structure comprising:
    i. about 20 to 70 percent by weight of at least one element from the group consisting of cobalt and nickel;
    ii. about 8 to 35 percent by weight of chromium;
    iii. about 3 to 20 percent by weight of at least one element from the group consisting of molybdenum and tungsten; and
    iv. about 0.5 to 10 percent by weight of at least one element from the group consisting of carbon, nitrogen, and boron,



wherein about 30 percent to 60 percent by volume of a material selected from the group consisting of nitrides, carbides, and borides of titanium, hafnium, and zirconium is dissolved therein.

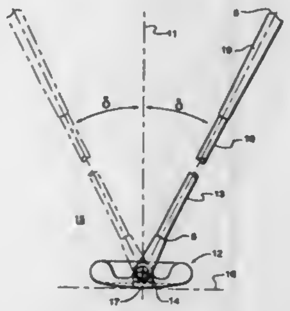
5,531,445
GOLF PUTTER

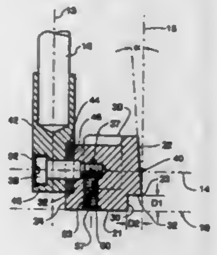
Reynold J. Levocz, 868 Penns Way, West Chester, Pa. 19382, and Joseph W. Szewc, 2971 Belgrade St., Philadelphia, Pa. 19134

Filed Jun. 16, 1995, Ser. No. 490,652

Int. Cl.^{6} A63B *53/08;53/16;53/04*

U.S. Cl. 473—341 **4 Claims**





1. A golf putter for striking a golf ball, said golf putter comprising:

a putter head, which with reference to a front vertical planar reference surface and a bottom horizontal planar reference surface, includes a top, a sole opposite said top and tangent to said bottom reference surface, a heel, a toe, a rear surface, and a striking face having a sweet spot and a striking axis extending therethrough;

the putter head further comprising a cut-out portion extending from the toe of the putter head to the heel of the putter head, at the intersection of the striking face and the sole of the putter head, the cutout portion defined by a first, substantially vertical plane, and a second, substantially horizontal plane, the second plane located at a distance D1 above said reference bottom surface, said first and second planes intersecting along a line located at a distance D2 equal to D1 from an outermost edge of the striking face, said outermost edge being the intersection of the striking face and said second substantially horizontal plane, and wherein D1 and D2 are between ⅛ and ⅝ inches; and

an elongated shaft having a distal end and a proximate end connected to said putter head at a point behind said rear surface on said striking axis of said sweet spot.

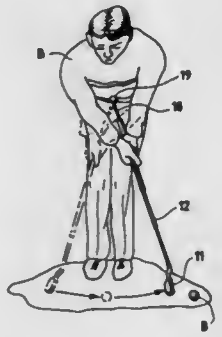
5,531,446
GOLFER'S PUTTING AID

Carl E. Schele, Libertyville, Ill., and Paul Guy, Omaha, Nebr., assignors to Wilson Sporting Goods Co., Chicago, Ill.

Filed Jan. 17, 1995, Ser. No. 373,553

Int. Cl.^{6} A63B *69/36*

U.S. Cl. 473—227 **7 Claims**



1. In combination, a golf putter and a putting aid, the golf putter including a putter head, a shaft, and a grip on the upper end of the shaft, the grip being formed of elastomeric material and having a butt end with an opening therein, the putting aid comprising an elongated rod slidably inserted through the opening in the butt end of the grip and an end member attached to the rod, the diameter of the rod being greater than the diameter of the opening in the butt end of the grip so that the elastomeric material of the butt end is resiliently deformed by the rod and the rod is frictionally retained in the opening whereby the distance of the end member from the butt end can be adjusted by sliding the rod within the opening, the end member having a generally spherical surface portion adapted to be pressed against a body of a golfer whereby the end member will move relative to the body of a golfer if the correct putting stroke is not used.

5,531,447
GAME DEVICE

Yoshizo Nagasaka, and Takao Namiki, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan

Filed May 25, 1995, Ser. No. 452,579

Claims priority, application Japan, Aug. 31, 1994, 6-011917 U

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—249 **3 Claims**

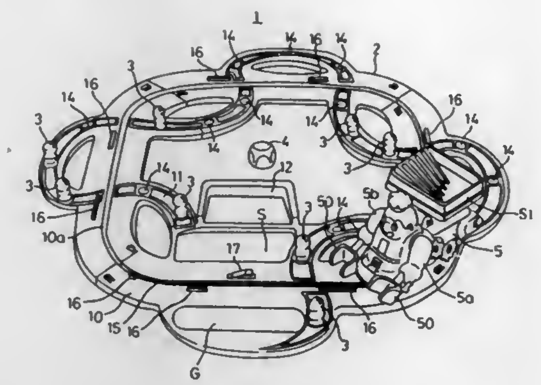
1. A game, comprising:

a game plate having a predetermined track formed thereon and at least one piece resting portion provided by said track,

a projection being provided in the vicinity of said piece resting portion of said track,

a piece which can be rested on said piece resting portion,

a running body mobile on said track having a scooping-up member for scooping up said piece and scooping-up member operating means for operating said scooping-up member including a scooping-up driving mechanism for temporary driving said scooping-up member while said running body is in the vicinity of said piece resting portion,



a restraining mechanism designed to intermittently operate so as to intermittently restrain a portion of said driving mechanism to prevent said scooping-up member driving mechanism from operating,

a lever coupled to said scooping-up member driving mechanism which operates, when it is brought into collision with said projection, and

a rotating body designed to rotate in a reciprocating manner by virtue of the operation of said lever.

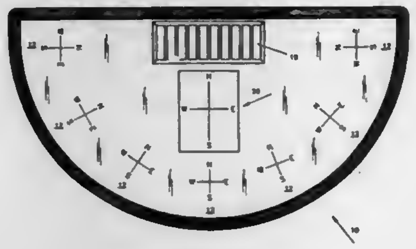
5,531,448
POKER-STYLE CARD GAME

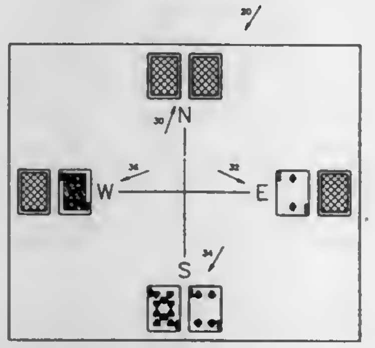
Ernest W. Moody, 4381 Pebble Beach Dr., Niwot, Colo. 80503

Filed Jun. 28, 1995, Ser. No. 495,952

Int. Cl.^{6} A63F *1/00*

U.S. Cl. 273—292 **33 Claims**





1. A method of playing a poker-style game using a standard deck of playing cards comprising:

a) dealing an initial hand of three cards to a player;

b) arranging a collection of community cards comprising eight cards from the deck in a predetermined pattern of distinct groups of two cards each in which a first group has two cards face down, a second group has one card face up and one card face down, a third group has one card face up and one card face down and a fourth group which has two cards face up;

c) the player selecting, prior to exposing any face down cards, one of the first group, the second group, the third group or the fourth group to comprise the player's hand;

d) exposing all of the cards which were face down; and

e) examining the player's completed hand to determine a poker hand ranking thereof.

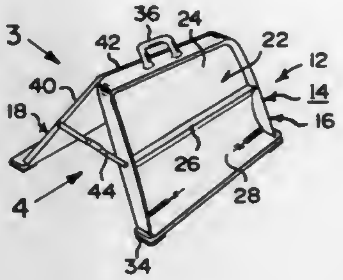
5,531,449
PORTABLE STOOPBALL STRIKER

William H. Denton, 12 E. Augusta Ave., Staten Island, N.Y. 10308

Filed Apr. 14, 1995, Ser. No. 421,853

Int. Cl.^{6} A63B *67/00*

U.S. Cl. 273—348 **7 Claims**



1. A portable stoop ball striker comprising:

a) a generally A-shaped framework having a rearward tilted front panel and a forward tilted rear panel, whereby said framework can sit upon a horizontal playing field; and

b) said front panel having striking face divided into a flat slopped upper surface, a horizontal edge and a curved lower surface, whereby a person can throw a ball against said striking face to rebound the ball at different angles and speeds into said playing field, depending on the skill and strength of the person throwing the ball.

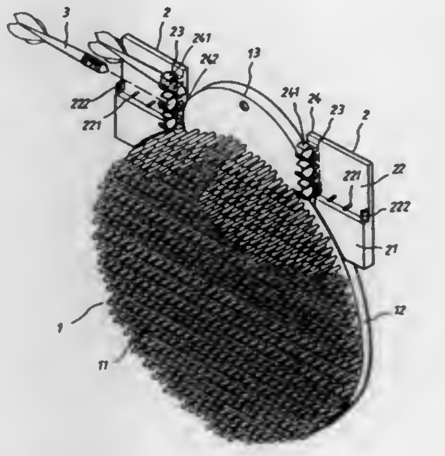
5,531,450
DART BOARD MOUNTING STRUCTURE

Kuo-Hui Lu, 3F, No. 50, Lane 2, Sec. 2, Yan Jiow Yuann Rd., and Chin-Huang Peng, 4-4F, No. 31, Sung Chang Rd., both of Taipei, Taiwan

Filed May 16, 1995, Ser. No. 441,746

Int. Cl.^{6} F41J *3/00*

U.S. Cl. 273—348 **11 Claims**



5. A dart board device, comprising:

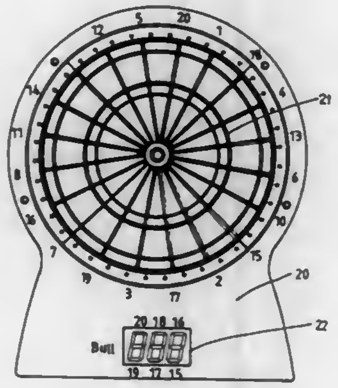
a dart board;

a stepped plate having a first step and a second step, said first step having means for mounting darts attached thereto, and said second step including means for securing said mounting means to said dart board;

wherein said dart board includes at least one area formed in a peripheral wall thereof that are shaped so as to connect to said securing means of said second step.

5,531,451
SCORING SYSTEM FOR DART GAMES

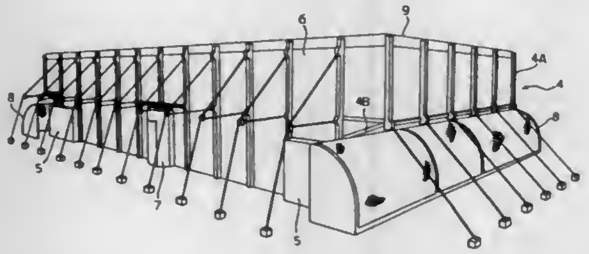
Chih-Hao Yiu, P.O. Box 1750, Taichung, Taiwan
Filed Apr. 14, 1995, Ser. No. 422,247
Int. Cl.^{6} F41J *3/02*
U.S. Cl. 273—371 **1 Claim**



1. A method for scoring a cricket dart game, said method comprising:
preparing a dart board having a scoring area provided therein for responding to a plurality of shots of at least one dart,
preparing three "8"-shaped display units and connecting said display units to said scoring area of said dart board, said display units each including seven strokes such that said three display units include twenty one strokes in total, said twenty one strokes being divided into seven groups each including three strokes for indicating three shots of a scoring, said twenty one strokes each being provided for indicating one of the shots, and
actuating said seven groups of said twenty one strokes for indicating the shots of the dart so as to score the cricket dart game.

5,531,452
SPORTS INSTALLATION FOR THE PRACTICE OF A GAME KNOWN AS HIT BALL

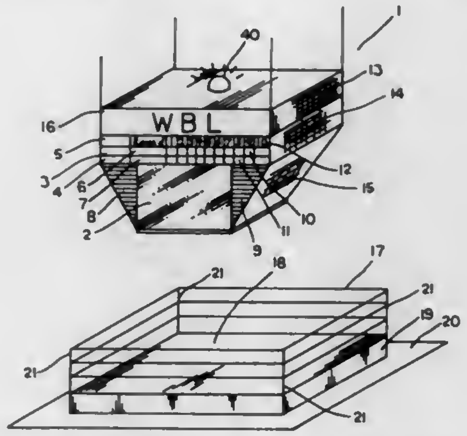
Luigi Gigante, Via Piedicavallo 37, I-10145 Turin, Italy
Filed Feb. 7, 1995, Ser. No. 385,116
Claims priority, application Italy, Feb. 7, 1994, TO94U0018 U
Int. Cl.^{6} A63B *71/02*
U.S. Cl. 273—411 **12 Claims**



1. A sports installation for the practice of a team game called Hit Ball, said installation comprising a wall structure including two end walls and two side walls with substantially smooth inner surfaces defining a substantially rectangular-box-shaped playing space, said end walls each defining a goal in its lower part extending the full length of said wall.

5,531,453
BOXING GAME SYSTEM AND METHOD OF PLAY

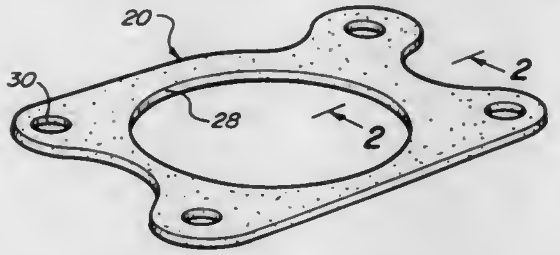
Philip A. Penston, III, 1031 Union St., Clearwater, Fla. 34615
Filed Oct. 26, 1994, Ser. No. 329,443
Int. Cl.^{6} A63B *71/02*
U.S. Cl. 273—440 **8 Claims**



1. A method for playing the sport of boxing, said method comprising the steps of:
(a) forming a plurality of boxing teams from a plurality of boxers, said boxing teams representing a plurality of cities,
(b) having said boxing teams from a plurality of said cities compete for a national title of a country,
(c) having said boxing teams from a plurality of countries compete for a world championship title.

5,531,454
EXPANDABLE GASKET, SEALED JOINT AND METHOD OF FORMING SAME

Hans G. Borneby, Talbott, Tenn., assignor to Indian Head Industries, Inc., Charlotte, N.C.
Filed Dec. 29, 1994, Ser. No. 365,705
Int. Cl.^{6} F16J *9/00;* **F16L** *17/00*
U.S. Cl. 277—26 **15 Claims**

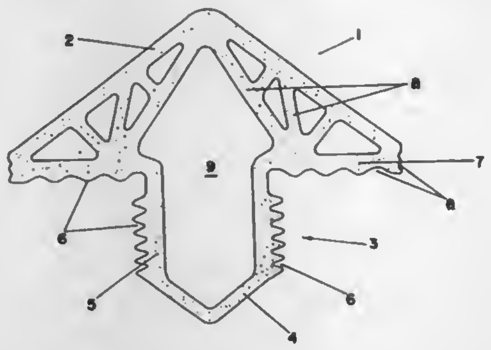


1. A heat expandable graphite gasket for sealing a joint subject to fluid pressure and heat, said gasket comprising:
a compressed mixture of expanded and unexpanded graphite containing at least 5% by weight unexpanded graphite flakes and said mixture compressed in the form of a gasket and said gasket expandable under pressure when heated to the exfoliation temperature of said unexpanded graphite flakes.

5,531,455
EXPANSION JOINT SEALING ELEMENT

Jorge Gabrielli Z. Calixto, Rua Gregorio Paes de Almeida, 960-Vila Madalena-CEP, 05450-001 Sao Paulo -SP, Brazil
Filed Sep. 16, 1993, Ser. No. 149,241
Int. Cl.^{6} F16J *15/46*
U.S. Cl. 277—34 **7 Claims**

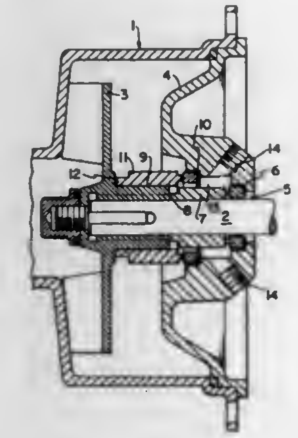
1. An expansion joint sealing element comprising:



an elongate elastomer strip having a longitudinal head portion and a longitudinal insertion portion operably connected to said longitudinal head portion such that said elongate elastomer strip is configured in cross-section to have a generally arrow shape with a first and second cross-sectional end;
said longitudinal head portion defined in cross-section by opposed panels that slope from said first cross-sectional end toward said second cross-sectional end, further comprising a base portion such that said adjacent panels of said longitudinal head portion and said base portion interact to form a generally triangular shaped head, said adjacent panels further configured to define a portion of a central internal strip chamber; and
said longitudinal insertion portion defined in cross-section by opposed lateral walls extending from said base portion of said longitudinal head portion and terminating in a rear wall at said second cross-sectional end, said rear wall defined by adjacent panels sloping from said second cross-sectional end toward said first cross-sectional end such that said adjacent panels of said longitudinal insertion portion and said opposed lateral walls further define said central internal strip chamber; and
a plurality of ridges formed on outer surfaces of said opposed lateral walls of said longitudinal insertion portion and on an outer surface of said base of said longitudinal head portion.

5,531,456
THRUST COVER FOR A CENTRIFUGAL PUMP HAVING DUAL SEALING ARRANGEMENT

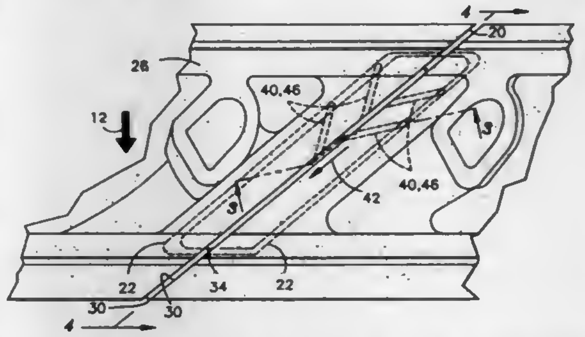
Axel Riel, Frankenthal, Germany, assignor to KSB Aktiengesellschaft, Frankenthal, Germany
Filed Feb. 23, 1995, Ser. No. 403,310
Claims priority, application Germany, Aug. 24, 1992, 42 28 042.7
Int. Cl.^{6} F16J *15/34*
U.S. Cl. 277—38 **5 Claims**



1. A centrifugal pump comprising:
liquid-filled interior space sealed by a thrust cover, the thrust cover being provided with an opening for the introduction of a shaft on the side of the thrust cover remote from the pump's interior space, a first counter abutment is disposed in the thrust cover for a first slip ring shaft seal the thrust cover is provided with a second counter abutment for a second slip ring seal, in that the first and second counter abutments are disposed at different diameters and are axially offset with respect to each other, the radial distance between the first and second counter abutments is of a predetermined magnitude so that the first slip ring seal and the second slip ring seal are disposed at two different diameters.

5,531,457
GAS TURBINE ENGINE FEATHER SEAL ARRANGEMENT

Ian Tibbott, Montarville, and Roger Gates, Montreal, both of, Canada, assignors to Pratt & Whitney Canada, Inc., Longueuil, Canada
Filed Dec. 7, 1994, Ser. No. 350,567
Int. Cl.^{6} F16J *15/447;* **F01D** *9/04*
U.S. Cl. 277—53 **8 Claims**

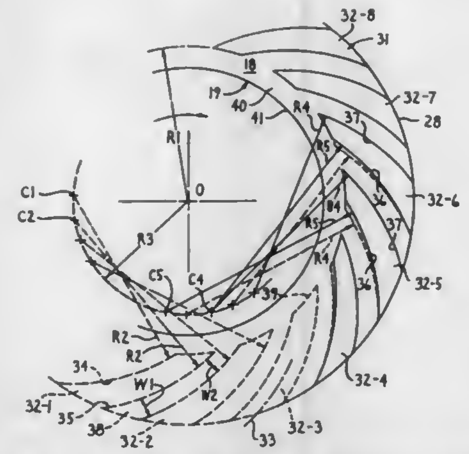


1. In a gas turbine engine having an axial gas flow therethrough:
a plurality of circumferentially adjacent segments, each segment having a first surface in contact with hot gas flow and an opposite surface in contact with a supply of cool air, each segment having two side surfaces, each side surface abutting a side surface of an adjacent segment leaving a gap between abutting segments, each side surface having a slot complementary to the slot in the side surface of the adjacent segment, each said slot having a hot side surface and a cold side surface;
a feather seal fitting into said slots between adjacent segments; and
a plurality of hot grooves in each hot side surface of said slots, each hot groove being in fluid contact with said supply of cool air, each hot groove having an opening into said gap which is staggered with respect to hot groove openings in adjacent segments so that, in use, each hot groove discharges cooling air into said gap at a location that is staggered with respect to the air that is discharged from hot grooves in the adjacent segment.

5,531,458
FACE SEAL WITH ANGLED GROOVES

Josef Sedy, Mount Prospect, Ill., assignor to Durametallic Corporation, Kalamazoo, Mich.
Continuation of Ser. No. 230,090, Apr. 20, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,932
Int. Cl.^{6} F16J *15/34*
U.S. Cl. 277—96.1 **4 Claims**

1. In a gas face seal arrangement of the noncontact type, said seal arrangement including first and second annular seal members having opposed and generally flat annular seal faces disposed in directly adjacent and opposed relationship, said seal members



being disposed in generally concentric relationship to a shaft, one said seal member being generally nonrotatably secured relative to the shaft and the other seal member being generally nonrotatably secured relative to a surrounding housing, the annular seal members being relatively axially urged toward one another so that the opposed seal faces create a seal interface between regions disposed radially outwardly and inwardly of the seal faces, one of said seal faces having a plurality of arcuate grooves formed therein in generally uniformly and circumferentially spaced relation therearound, said grooves projecting from one diameter of the seal interface and terminating at an intermediate diameter which is disposed radially between inner and outer diameters of the seal interface, each said groove being angled circumferentially and radially and defined by two side edges each being of circular configuration generated about a predetermined radius, one said side edge being a convex leading edge and the other said side edge being a concave trailing edge, and said seal face defining thereon a flat face land between each circumferentially-adjacent pair of said grooves, comprising the improvement wherein the convex leading edge and the concave trailing edge of each said groove are respectively generated about first and second radii which are of different lengths and wherein the concave trailing edge of one groove as generated about said second radius and the convex leading edge of the next adjacent groove as generated about said first radius are both generated about a common centerpoint so that the land between adjacent grooves is of a uniform transverse width throughout the angled extent thereof.

5,531,459

GROMMET FOR WIRE HARNESS WITH INNER SURFACE HAVING DENSELY ARRANGED PROJECTIONS OR PLATEAUS

Minoru Fukuda; Hiroyuki Ochi, and Takaaki Fukui, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

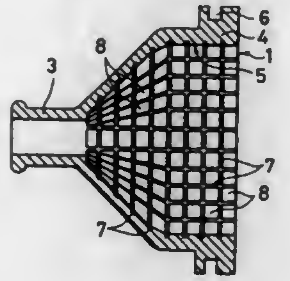
Filed Dec. 20, 1994, Ser. No. 360,055

Claims priority, application Japan, Dec. 27, 1993, 5-074632 U

Int. Cl.^{6} F16J *15/14;* **H01B** *17/26*

U.S. Cl. 277—178 **7 Claims**

1. A funnel-shaped grommet for a wire harness, comprising:



a wire-contacting tubular portion having a first diameter; and

a partition wall-mounting portion having a second diameter larger than the first diameter, said partition wall-mounting portion extending from said tubular portion, wherein a funnel-shaped inner wall surface of the partition wall-mounting portion has one of projections and plateaus densely-arranged and spaced from one another by grooves.

5,531,460

U-SHAPED SEALING DEVICE ON A PIPE

Lars Stefansson, and Kenneth Lennartsson, both of Torekov, Sweden, assignors to Lindab Aktiebolag, Bastad, Sweden

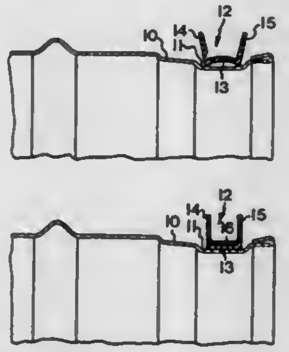
Filed Dec. 27, 1993, Ser. No. 173,767

Claims priority, application Sweden, Dec. 28, 1992, 9203911

Int. Cl.^{6} F16J *15/10*

U.S. Cl. 277—206 R **6 Claims**

1. A sealing ring having a generally U-shaped cross-section



comprising U-flanges connected by a U-web, the U-web in an unbiased state being retracted towards a space defined the U-flanges causing free ends of the U-flanges to diverge from the U-web, wherein force applied to the U-web, tends to move the free ends of the U-flanges towards each other.

5,531,461

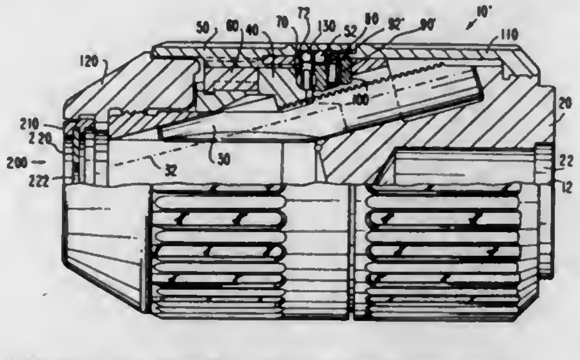
CHUCK WITH TORQUE LIMITING MECHANISM AND INCLINED PLANE FOR FINAL TIGHTENING

Robert O. Huff, Piedmont, and Louis M. Shadeck, Anderson, both of S.C., assignors to Jacobs Chuck Technology Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 127,621, Sep. 27, 1993, Pat. No. 5,411,275. This application Feb. 9, 1995, Ser. No. 385,970

Int. Cl.^{6} B23B *31/12*

U.S. Cl. 279—62 **10 Claims**



5. A chuck for releasably gripping a tool comprising:

a body structure having a longitudinal axis;

a plurality of longitudinal tool-gripping jaws mounted relative to said body structure so that the longitudinal axes of said jaws are inclined toward the longitudinal axis of said body structure in a distal direction along the longitudinal axis of said body structure, each of said jaws being movable relative to said body structure substantially parallel to the longitudinal axis of said jaw;

a jaw reciprocating structure mounted on said body structure, at least part of said jaw reciprocating structure being rotatable relative to said body structure about the longitudinal axis of said body structure in order to move said jaws relative said body structure substantially parallel to the respective longitudinal axes of said jaws; and

a plurality of substantially cylindrical roller bearing members disposed between a substantially distal-facing surface of said body structure and a substantially proximal-facing surface of the rotatable part of said jaw reciprocating structure, said roller bearing members facilitating rotation of said rotatable part of said jaw reciprocating structure relative to said body structure.

5,531,462

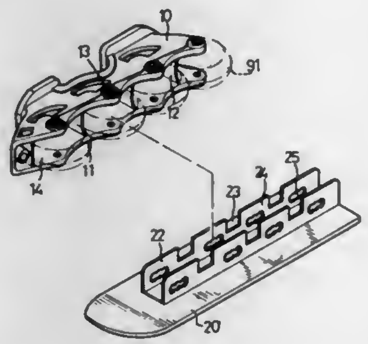
SKATE COMBINATION

Show M. Gu, No. 56, Min Sheng Street, Feng Yuan Taichung, Taiwan

Filed Mar. 27, 1995, Ser. No. 411,267

Int. Cl.^{6} A63C *17/18*

U.S. Cl. 280—7.13 **1 Claim**



1. A combination in-line roller skate and ski comprising:

a frame supporting a shoe thereon, the frame including left and right longitudinal side members spaced from each other and having at least two transverse partitions spanning between the left and right side members to form at least three longitudinally aligned chambers, with each of the chambers organized to receive removably therein a longitudinally oriented wheel journalled between the side members for in-line rotation;

a ski board with parallel longitudinal wall members extending upwardly therefrom for removably engaging with the side members, each of the wall members defining at least three upwardly extending flanges with at least two notches formed therebetween, each of the notches in the left wall member arranged in a pair with a corresponding notch in the right wall member, the partitions each adapted for insertion into one of the pairs of notches so as to position a flange of the left wall member and a flange of the right wall member into each of the chambers for stable engagement therewith;

each of the flanges provided with at least three longitudinally spaced hole sets, with each of the hole sets in one of the wall members paired with a corresponding one of the hole sets in the other of the wall members;

three securing bolts for securing the ski board to the side members on removal of the wheels so as to comprise a ski, one of the securing bolts each engageable in one pair of the three holes of each hole set so as to allow adjustment of longitudinal spacing of the ski board relative to the frame and the shoe.

5,531,463

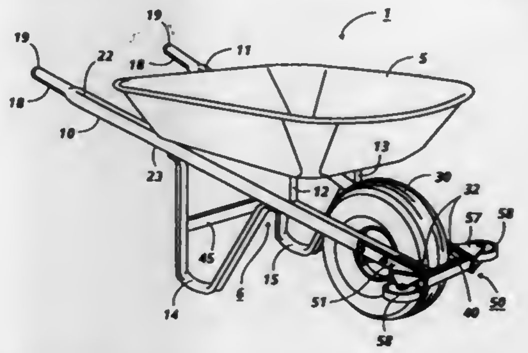
SUPPORT ATTACHMENT FOR EASE IN SIDE EMPTYING A WHEELBARROW

Willie Givens, 32 Fairgate St., Rochester, N.Y. 14606

Filed Apr. 6, 1995, Ser. No. 417,820

Int. Cl.^{6} B62B *1/18;5/00*

U.S. Cl. 280—47.2 **12 Claims**



1. An attachment for a wheelbarrow having a tray secured to a frame including a first member, a second member, and a wheel rotatably secured to said frame near a front end thereof, comprising:

a U-shaped member including a first leg, a second leg and a portion thereof connecting said first leg and said second leg at one end of each thereof;

a first bracket mounted wheel secured to said first leg a predetermined distance from one end of said first leg, and a second bracket mounted wheel secured to said second leg a predetermined distance from one end of said second leg, wherein said first bracket mounted wheel has an axis of rotation which is substantially parallel to the axis of rotation of said second bracket mounted wheel, and wherein each of said first bracket mounted wheel and said second bracket mounted wheel are substantially coplanar with said portion connecting said first leg and said second leg.

5,531,464

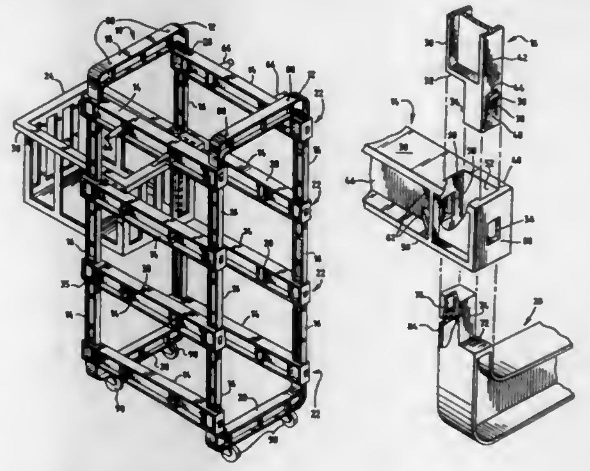
CART WITH SNAP-LOCKING MEMBERS

Raymond N. Maurer, 21771 Sunflower, Novi, Mich. 48375, and David A. Maurer, 30W077 Willow La., Warrenville, Ill. 60555

Filed Dec. 9, 1994, Ser. No. 352,599

Int. Cl.^{6} B62B *3/02*

U.S. Cl. 280—47.35 **10 Claims**



1. A cart comprising:

a frame having first and second substantially identical, rectangular end frame portions, said end frame portions defining first and second planes being positioned generally parallel one to the other, each said end frame portion having at least one pair of spaced apart vertical members and top and bottom rails extending between and connecting said vertical members, each of said vertical members having first and second ends having a notch formed therein defining an extended portion, and a biased latching member located on said extended portion movable between a first position and a second position and wherein said latching member extends outwardly relative to a surface of said extended portion;

at least one pair of substantially identical lateral rails extending generally transverse to said first and second planes and extending between and connecting said end frame portions, said rails have substantially identical ends, and being spaced apart and extending substantially parallel to one another, each of said ends defining a bore therethrough for receiving two of said vertical member extended portions inserted therein in generally opposing and abutting relation one with the other.

5,531,465

SUPPORTING DEVICE WITH ROLLERS, AND SUITCASES COMPRISING AT LEAST ONE SUCH DEVICE

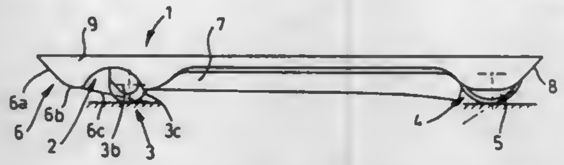
Michel Aumasson, Rueil Malmaison, France, assignor to Delsey (Societe Anonyme), Bobigny, France

Filed May 24, 1993, Ser. No. 64,934

Claims priority, application France, May 25, 1992, 92 06355

Int. Cl.^{6} B62B *3/00*

U.S. Cl. 280—63 **6 Claims**



1. A flexible suitcase or trunk comprising a bottom stiffened by a rigid plate and at least one supporting and rolling device attached to the rigid plate, the supporting and rolling device including an elongated body formed as a sliding block and having a front part that is sloped in relation to a rolling plane, a first housing embedded within the front part and a second housing embedded with a rear part of the elongated body, the first housing receiving an adjustable caster and the second housing receiving a fixed direction caster.

5,531,466

VEHICLE HAVING A FOUR-WHEEL STEERING DEVICE

Tetsuaki Hayashi, Sakai, Japan, assignor to Kubota Corporation, Osaka, Japan

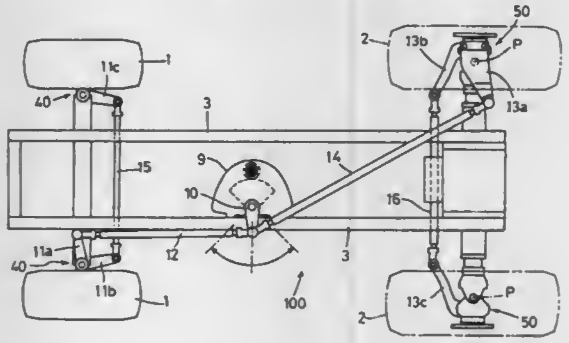
Filed Sep. 23, 1994, Ser. No. 311,602

Claims priority, application Japan, Mar. 24, 1994, 6-053393

Int. Cl.^{6} B62D *1/00*

U.S. Cl. 280—91.1 **6 Claims**

1. A four-wheel steering vehicle comprising:



an elongate body frame;

a steering wheel;

front wheels steerable by said steering wheel;

rear wheels steerable by said steering wheel; and

connecting means for operatively connecting said steering wheel to said front wheels and said rear wheels to transmit movement of said steering wheel to said front wheels and said rear wheels, said connecting means including:

a pitman arm overhanging outwardly and laterally of said body frame to be pivotable with turning of said steering wheel;

a first front wheel knuckle arm operatively connected to one of said front wheels;

a first rear wheel knuckle arm operatively connected to one of said rear wheels disposed at the same side as the other front wheel;

a front wheel drag link disposed laterally outwardly of said body frame and extending longitudinally of said body frame, said front wheel drag link connecting said pitman arm and said first front wheel knuckle arm;

a rear wheel drag link extending substantially horizontally over and across said body frame, said rear wheel drag link interconnecting said pitman arm and said first rear wheel knuckle arm;

front wheel tie rod means for interconnecting said front wheels; and

rear wheel tie rod means for interconnecting said rear wheels.

5,531,467

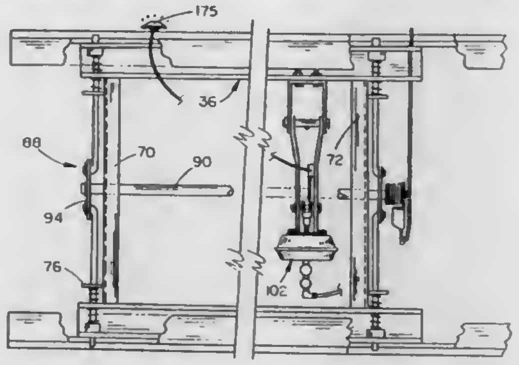
SAFETY MEANS FOR CONTROLLING AN AIR POWERED ACTUATOR FOR RETRACTING THE LOCKING PINS OF A SLIDER

Gerald L. Schueman, Oakland, Iowa, assignor to Schueman Enterprises, Inc., Oakland, Iowa

Continuation-in-part of Ser. No. 243,984, May 17, 1994, Pat. No. 5,460,237, which is a continnation-in-part of Ser. No. 195,852, Feb. 10, 1994, Pat. No. 5,449,187. This application Aug. 28, 1995, Ser. No. 519,988

Int. Cl.^{6} B60G *5/00*

U.S. Cl. 280—149.2 **8 Claims**



1. In combination:

a trailer including a body having a rearward end, a forward end, and a suspension system including a service air brake system;

hitch means at the forward end of said trailer;

said trailer including a service brake light circuit and a marker light circuit;

said trailer including a slider for the adjustment of said suspension system with respect to the body of said trailer;

a truck for connection to said hitch means on said trailer; said truck including means supplying air under pressure to said service air brake system;

said truck including a first means for actuating said service brake light circuit and a second means for actuating said marker light circuit;

said slider comprising a pair of side rails adapted to be secured to the left and right sides of the body in a fixed position extending longitudinally of the body, each of said side rails having a plurality of horizontally spaced openings formed therein, a frame adapted to carry the suspension comprising left and right slide members slidable longitudinally of the body on the side rails, at least one locking pin operatively mounted on each of said slide members for longitudinal movement therewith relative to said side rails, said locking pins being retractable for permitting adjustment of the frame to a selected position of adjustment and extensible into one of said openings in said side rails for locking the frame in a selected position of adjustment, air power actuator means for retracting said locking pins including linkage interconnecting said pins for conjoint movement of the pins between extended and retracted positions;

an electrical solenoid operatively connected to said air powered actuator means controlling the operation of said air powered actuator means;

and a control circuit operatively connected to said marker light circuit, said service brake light circuit and said solenoid whereby said first means must be actuated for a predetermined length of time and then said second means must be actuated a predetermined number of times within another predetermined length of time before said solenoid will actuate said air powered actuator means to retract said locking pins.

5,531,468

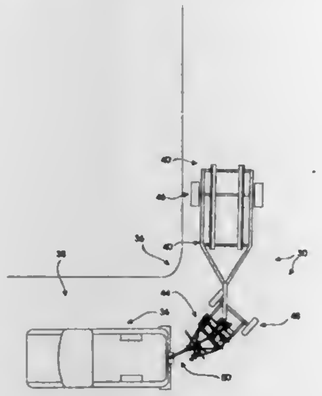
TRAILER ARTICULATION DEVICE

Donald White, Russellville, Ark., assignor to Sail D. White Enterprises, Inc., Russellville, Ark.

Filed Jan. 4, 1995, Ser. No. 368,490

Int. Cl.^{6} B60D *1/30*

U.S. Cl. 280—463 **21 Claims**



1. An articulated trailer for transporting loads, said trailer adapted to be pulled behind a draft vehicle, said trailer comprising:

an elongated carriage adapted to be selectively coupled to the vehicle by a rigid elongated draw bar, said carriage comprising a fixed, wheeled rear axle and a separate, spaced-apart, pivoting front axle assembly, said front axle assembly comprising:

a wheeled front axle;

a frame supported above said axle; and,

control means for controlling the transfer of angular movement from said draw bar to said frame, said control means comprising a remotely actuated electric motor system.

5,531,469

AIR BAG HOUSING PAD COVER AND PRODUCTION THEREOF

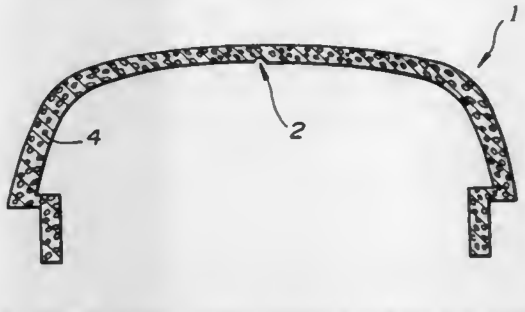
Yasuhiro Iino, Kodaira; Yosuke Matsushima, Sagamihara; Tomozane Terazawa, Kodaira, and Shozo Sugiki, Yokohama, all of, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 20, 1994, Ser. No. 262,456

Claims priority, application Japan, Jun. 18, 1993, 5-147697

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—728.3 **18 Claims**



1. An air bag housing pad cover which is formed as a single-layer structure from a compound composed of a thermoplastic elastomer and a light filler in an amount of 5 to 50 vol % of the compound, the thermoplastic elastomer having a tensile strength higher than 100 kg/cm^2 and a Shore indention hardness lower than 55 D, and the light filler having a true specific gravity lower than 0.7 and a compression strength higher than 50 kg/cm^2.

5,531,470

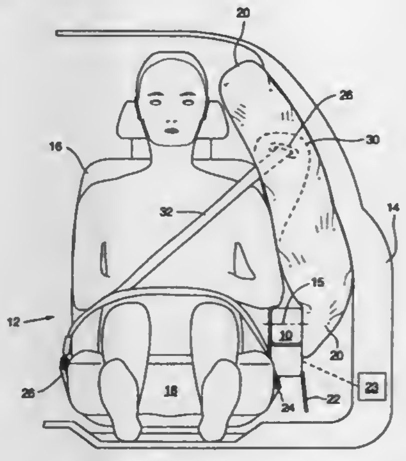
SIDE AIR BAG INCORPORATED IN VEHICLE OUTER ARMREST

John A. Townsend, Troy, Mich., assignor to Joalto Design, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 257,080, Jun. 9, 1994, which is a division of Ser. No. 912,790, Jul. 13, 1992, Pat. No. 5,378,036. This application Aug. 2, 1995, Ser. No. 510,514

Int. Cl.^{6} B60R *21/22*

U.S. Cl. 280—730.2 **6 Claims**



1. An air bag restraint apparatus for use in a vehicle having a body and a seat within the body, said apparatus arranged for protecting a vehicle occupant and comprising:

an armrest attached to and movable with the vehicle seat, the armrest located adjacent to an outboard side of the seat, said armrest having inboard and outboard sides,

an air bag stowed within the armrest for deployment through the outboard side thereof into a space between the outboard side of the armrest and the vehicle body, whereby the air bag deploys outward against the vehicle body and expands upward along the body to protect the occupant's torso, neck and head from side impact,

an impact sensor for triggering the deployment of the air bag during a collision, wherein the air bag is outwardly deployed away from the vehicle occupant.

5,531,471

AIR BAG AND LID ARRANGEMENT FOR VEHICLE

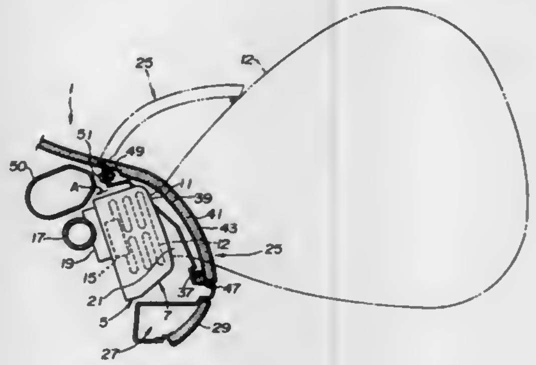
Takehiro Terai, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 903,787, Jun. 24, 1992, abandoned. This application Oct. 18, 1993, Ser. No. 137,214

Claims priority, application Japan, Jun. 26, 1991, 3-154535

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—732 **7 Claims**



1. An air bag, duct and lid arrangement for a vehicle comprising:

an opening provided in an instrument panel of said vehicle;

a facing portion disposed along one edge of said opening;

a lid member disposed over said opening, and including a flange portion integrally formed along an inner side of an edge thereof corresponding to said one edge of said opening and projected so as to form an acute angle relative to said inner side of said lid member, said flange portion corresponding to said facing portion of said opening and joined therewith via fastening means, said flange portion forming a hinge of said lid member, bendable along where said flange portion projects from said inner side of said lid member;

an air bag module mounted in said opening such that said air bag module is angularly oriented in the direction of said inner side of said lid member disposed over said opening, a positioning between said lid member and said mounted air bag module being established such that, in an early stage of inflation, in an inflation mode of an air bag of said air bag module, an expanding surface portion of said air bag will exert pressure directly on said inner side of said lid member at a location proximate said edge where said flange portion projects from said inner side of said lid member; and

further comprising a duct in combination with said air bag and lid member, said duct provided behind said instrument panel of said vehicle, disposed behind and proximate to a rear side of said air bag at a location substantially behind and proximate said hinge of said lid member, said duct being formed of a material resiliently deformable according to contact therewith by any portion of any one of said lid member, said facing portion and said air bag module during inflation of said air bag.

5,531,472

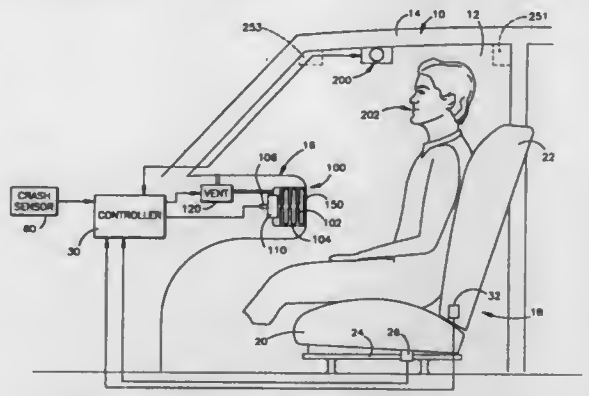
APPARATUS AND METHOD FOR CONTROLLING AN OCCUPANT RESTRAINT SYSTEM

John H. Semchena, Royal Oak; Ernest M. Faigle, Dryden; Richard J. Thompson, Imlay City; Joseph F. Mazur, and Charles E. Steffens, Jr., both of Washington, all of Mich., assignors to TRW Vehicle Safety Systems, Inc., Lyndhurst, Ohio

Filed May 1, 1995, Ser. No. 431,570

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—735 **29 Claims**



1. Apparatus for controlling an occupant restraint system in a vehicle having a seat, said apparatus comprising:

memory means for storing a block of image data which is representative of a viewing field within said vehicle and in which said field includes said seat when unoccupied;

image sensor means mounted in said vehicle for viewing said field including said seat with an occupant on said seat for providing a new block of image data;

control means including comparing means for comparing said new block of image data with said stored block of image data and providing a control signal having a value based on said comparison; and

restraint regulating means responsive to said control signal for controlling said occupant restraint system based on said control signal.

5,531,473

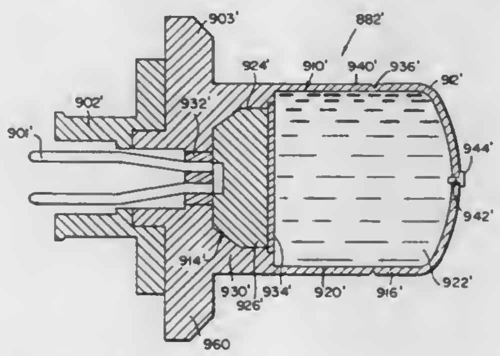
FLUID FUEL-CONTAINING INITIATOR DEVICE FOR AN AIR BAG INFLATOR

Karl K. Rink, Liberty; Glen S. Beus, Ogden; Kelly B. Johnson, Layton, and David B. Monk, Kaysville, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 252,036, May 31, 1994, Pat. No. 5,470,104. This application Nov. 15, 1994, Ser. No. 339,603

Int. Cl.⁶ B60R *21/26*

U.S. Cl. 280—737 **44 Claims**



1. An apparatus for inflating an inflatable device, said apparatus comprising:

a first chamber wherein a fuel is burned to produce combustion products and

an air bag inflator initiator device comprising:

container means defining a fluid fuel storage volume storing at least one fuel in the form of a fluid and an igniter charge storage volume adjacent said fluid fuel storage volume storing a charge of an igniter material; and

means for initiating the charge of igniter material to at least produce sufficient combustion products including heat to heat the fuel within said container means and non-mechanically increase the pressure of the fuel within the container means to rupture said container means to release the fuel therefrom into said first chamber.

5,531,474

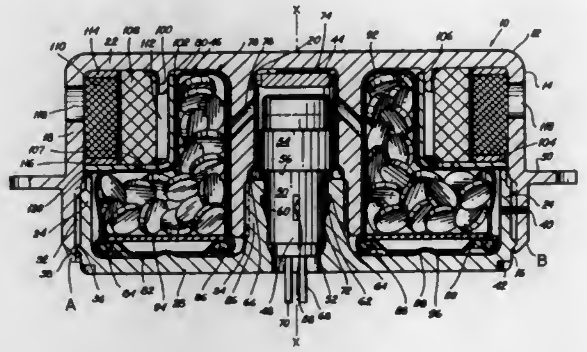
INFLATOR ASSEMBLY

Scott Osborne, Rochester Hills, Mich.; Roger E. Bates, Tampa, and Anthony C. Burgi, Lakeland, both of Fla., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Apr. 26, 1994, Ser. No. 233,357

Int. Cl.⁶ B60R *21/26*

U.S. Cl. 280—74 D **23 Claims**



1. An inflator assembly comprising:

a housing formed of a first cup and a second cup, each having an inner annular wall disposed about a longitudinal axis, an outer annular wall concentric with said inner wall and a circular base, said walls and base being made integrally and said cups being disposed in a facing relationship with said inner walls being interlocked and said outer walls being interlocked to form with said bases within said housing a central cylindrical chamber and an outer annular chamber;

an initiator disposed in said central chamber;

a retaining member disposed in said outer chamber and arranged for partitioning said outer annular chamber into a first portion and a second portion, said retaining member being a ring having a first ring portion disposed normal to said axis and a second portion disposed in parallel to said axis and to said inner wall;

gas generating material disposed in said first portion; and

a gas filter media disposed in said second portion, said retaining member forming an interference fit with said first cup to retain said filter media in said first cup, said first cup being formed with an annular retainer wall of relatively short length to form said interference fit with the second ring portion of said retaining member, said retainer wall being formed on said base of said first cup coaxially with said inner wall.

5,531,475

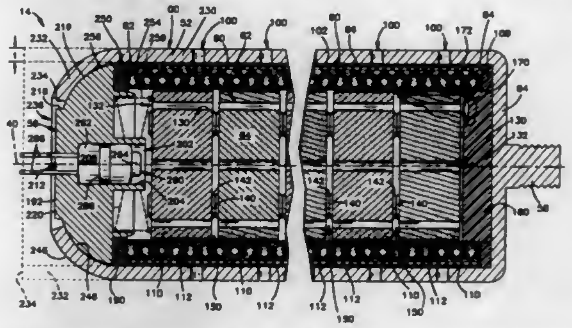
AIR BAG INFLATOR AND METHOD OF ASSEMBLY

Alex G. Meduvsky, Warren; George W. Goetz, Rochester Hills; Edward Q. Glac, Dryden; Steven W. Maurer, Clinton Township, all of Mich.; David L. Geyer, Mesa, Ariz.; Dennis J. Fiore, Macomb, Mich.; Heidi M. Westlake, Okemos, Mich., and William E. Gest, Troy, Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Oct. 21, 1994, Ser. No. 327,281

Int. Cl.⁶ B60R *21/26*

U.S. Cl. 280—741 **2 Claims**



1. Apparatus for inflating an inflatable vehicle occupant restraint, said apparatus comprising:

an ignitable gas generating material which, when ignited, generates gas for inflating the restraint;

an igniter having means for igniting said gas generating material when said igniter is actuated;

a housing having a tubular wall surrounding said gas generating material, said tubular wall having a longitudinal central axis, a plurality of outlet openings through which said gas flows radially outward, and an open end portion with the contour of a dome centered on said axis;

a circular end cap located coaxially within said tubular wall, said end cap having means for supporting said igniter on said axis, said end cap further having a peripheral surface portion with the contour of a dome centered on said axis, said open end portion of said tubular wall closely overlying said peripheral surface portion of said end cap; and

an annular elastomeric seal having a major portion and a relatively thin lip portion projecting axially from said major portion, said lip portion of said seal being compressively loaded radially between said open end portion of said tubular wall and said peripheral surface portion of said end cap.

5,531,476

OCCUPANT RESTRAINT SYSTEM FOR MOTOR VEHICLES WITH AN AIRBAG

Wolfgang Kerner, Rottenburg, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

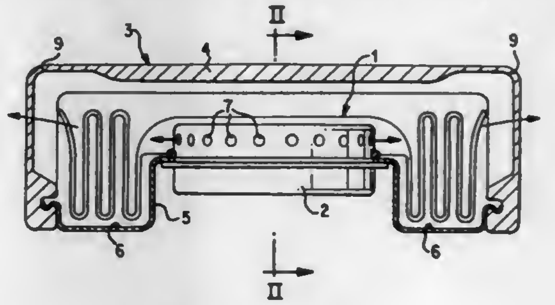
Filed Aug. 20, 1993, Ser. No. 109,240

Claims priority, application Germany, Aug. 20, 1992, 42 27 559.8

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—743.1 **8 Claims**

1. An airbag system for protecting vehicle passengers in the event of a vehicle collision, comprising:



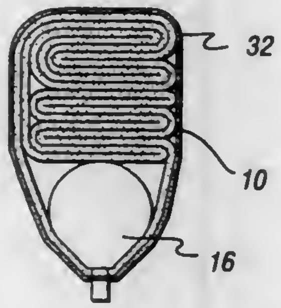
an airbag in a folded-up non-inflated condition,
a gas generator for inflating the airbag, and
a housing for accommodating the airbag;
said airbag having central regions axially facing a vehicle passenger when in an in-use position and lateral regions disposed laterally of the central regions, said lateral regions being folded in a zig zag shaped manner for being easily inflated and the central regions being folded in a different manner than the lateral regions so as to be retarded against axial expansion toward the passenger upon inflation of the airbag,
said housing being closed off by a cover which can be torn open by inflation of said airbag,
said cover having very thin-walled lateral parts covering the lateral regions of the airbag and a thick-walled central part having a predetermined rupture point and covering the central regions of the airbag, said cover being configured such that said lateral parts are torn open upon inflation of the airbag prior to the central part which tears open with a certain delay.

5,531,477
METHOD OF FOLDING AN AIRBAG

Alexander Madrigal, and Michael J. Watson, both of Waterford, Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Jun. 6, 1995, Ser. No. 471,040
Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—743.1 **4 Claims**



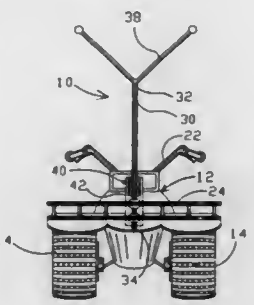
1. A method of folding a vehicle airbag having a first end, for enveloping an elongated, substantially cylindrically shaped inflator of length and width, and top and bottom portions as well as side portions that extend from the first end, wherein the bottom portion includes a peripheral portion and a face panel that extends between the top, bottom and side portions, the face panel being engagable with a vehicle occupant and having a first portion, the method comprising:
laying the airbag substantially flat, with the first portion closely adjacent the first end;
folding the side portions toward the first portion and collapsing the side portions to form a total collapsed width substantially equal to the length of the inflator;
folding the top portion toward the first portion and collapsing the top portion to a width substantially equal to the width of the inflator;
folding the peripheral portion of the bottom portion to a width substantially equal to twice the width of the inflator;
folding the folded peripheral portion toward the first portion to form a bubble portion; and
folding the bubble portion toward the first portion to a width substantially equal to the width of the inflator.

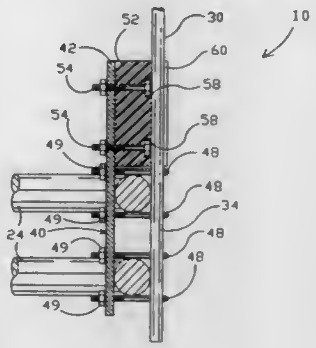
5,531,478
SPIDER WEB CLEARING DEVICE FOR ALL-TERRAIN VEHICLES

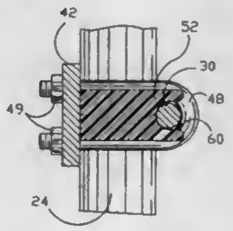
Rocky J. Houston, P.O. Box 418, Kingston, Tenn. 37763, and Clifford L. Houston, 412 Barnard Narrows Rd., Ten Mile, Tenn. 37880

Filed May 3, 1994, Ser. No. 237,270
Int. Cl.⁶ B60R *21/02*

U.S. Cl. 280—762 **8 Claims**







1. A spider web clearing device for clearing spider webs from a path of an all-terrain vehicle, said all-terrain vehicle having at least a front bumper and a rear bumper, said spider web clearing device comprising;
a flexible elongated member defining an upper end and a lower end wherein one end defines an attached end and one end defines a forked distal end;
clamping means for detachably mounting said spider web clearing device to the all-terrain vehicle such that said elongated member is forward of a rider of the all-terrain vehicle, wherein said clamping means is disposed proximate said attached end of said flexible elongated member
a stop member constructed of a resilient material, said stop member being carried by said clamping means, wherein said stop member includes a vertical groove for receiving said flexible elongated member.

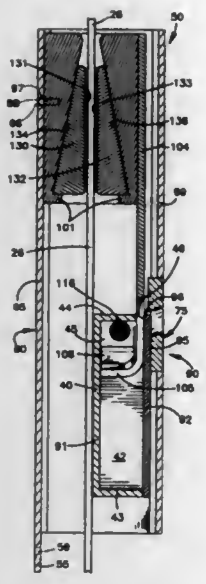
5,531,479
VEHICLE SEAT BELT RESTRAINT SYSTEM

Barney J. Bauer, Fenton, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jan. 20, 1995, Ser. No. 375,646
Int. Cl.⁶ B60R *22/36*

U.S. Cl. 280—806 **23 Claims**

1. Apparatus comprising:
seat belt webbing which is extensible about a vehicle occupant;
actuatable pretensioner means for, when actuated, tensioning said seat belt webbing against the vehicle occupant, said pretensioner means including a web clamp mechanism for, when said pretensioner means is actuated, clamping against said seat belt webbing and moving to an actuated position to tension said seat belt webbing against the vehicle occupant;
an energy absorbing mechanism for dissipating energy transferred to said seat belt webbing by the vehicle occupant after said web clamp mechanism moves to said actuated position, said energy absorbing mechanism comprising a member and a cutter for cutting said member;
said pretensioner means including means for connecting said web clamp mechanism to said member after said web clamp mechanism has moved to said actuated position to cause said web clamp mechanism and said member to move together when a predetermined force is applied to said seat belt webbing by the vehicle occupant; and
means for supporting said cutter in a position to cut said member as said member moves with said web clamp mechanism due to said predetermined force being applied to said seat belt webbing by the vehicle occupant.

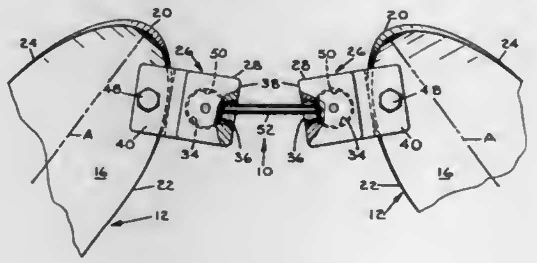


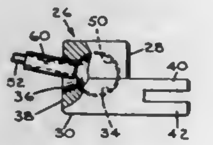
5,531,480
SKI STABILIZING DEVICE

Robert D. Foertsch, 343 W. Jefferson Rd., Butler, Pa. 16001

Filed Nov. 26, 1993, Ser. No. 157,567
Int. Cl.⁶ A63C *11/00;5/16*

U.S. Cl. 280—818 **2 Claims**





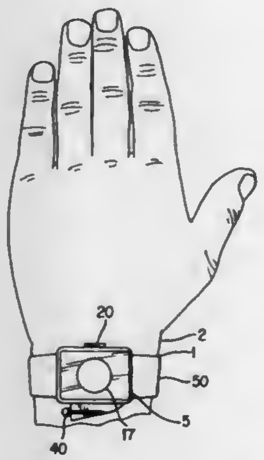
1. A ski stabilizing device for use in combination with a pair of skis disposed for skiing on a ski slope whose contour varies from level to irregular with each ski having a substantially elongated, flat portion, a front, inflected tip portion, and longitudinal inner and outer edges extending the length of the skis, the ski stabilizing device comprising:
a pair of block members with each block member encasing a spherical region which registers with a circular aperture that is located on an inside face of each block member, the circular apertures facing each other when the block members are mounted to the skis;
an attachment means projecting from each block member opposite the inside face of each block member for removably attaching the block members to the respective inflected tip portion of each ski edge so that the block members do not contact the slope and impede skiing;
a connecting rod which attaches one block member to the opposite block member for maintaining the skis at a generally fixed distance from each other during skiing but does not prevent the independent movement of the skis through a plurality of planes relative to the slope;
the connecting rod characterized by opposed rod ends which extend through each circular aperture and into the spherical region of each block member;
displacement means for allowing independent angular, rotational, and longitudinal movement of each ski with respect to the other ski while the skier is skiing down the slope;
the displacement means including a pair of balls with each ball fixed to a respective end of the connecting rod for encasement within the spherical region of each respective block member; and
a pair of slidable bushing members with each bushing member removably securable to the connecting rod adjacent a point where the balls are mounted to the rod ends so that each bushing member extends through each circular aperture for reducing the amount of angular and longitudinal movement of the skis.

5,531,481
MEMO PAD ASSEMBLY

Curtis B. Wiltshire, 11 Nomas La., Richmond, Va. 23233

Filed Apr. 14, 1995, Ser. No. 421,994
Int. Cl.⁶ B42D *17/00*

U.S. Cl. 281—44 **21 Claims**

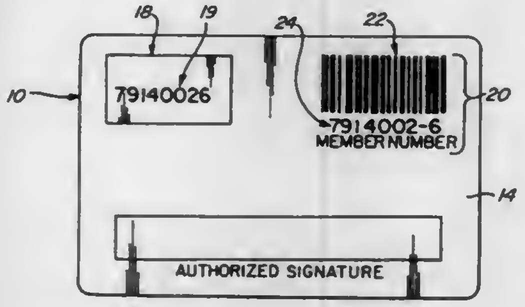


1. A memo pad assembly adapted to be worn around a person's wrist, ankle, and other body parts, and clothing, said memo pad assembly comprising:
(a) a plurality of containers having first slots formed within said containers;
(b) a strap having a center portion, and first and second ends having releasable securing means;
(c) a compartment section attached to said center portion and having a rear side with an outer surface, a second slot formed within said compartment section, and a drawer removably stored within said second slot;
(d) a plurality of sheets of paper removably stored within said drawer and being adapted to be removably inserted in said first slots of said containers;
(e) a writing instrument section located adjacent to said compartment section and comprising a writing instrument and a shelf extension, said shelf extension attached to said outer surface of said rear side of said compartment section and having a third slot formed in said shelf extension, said writing instrument adapted to be removably stored in said third slot; and

(f) a shelf section located above said compartment section and having a plurality of extensions protruding from spaced apart sides, and a support end, said extensions attached to said support end and forming a plurality of fourth slots, said support end connected to said compartment section, each of said fourth slots adapted to receive one of said containers.

5,531,482
CARD WITH REMOVABLE REUSABLE ELEMENT

Eric Blank, 81 New Bridge Rd., Sudbury, Mass.
Continuation of Ser. No. 119,871, Sep. 10, 1993, abandoned.
This application Mar. 28, 1995, Ser. No. 411,382
Int. Cl.⁶ B42D *15/10*
U.S. Cl. 283—67 **14 Claims**



1. A transaction card control system, comprising:

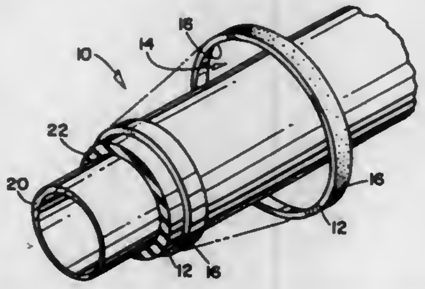
a plurality of individuated, non-interconnected transaction cards, wherein each of said transaction cards has

a) two opposing planar sides, at least one side having first indicia thereon, said first indicia allowing for matching of a transaction with an issuee of the transaction card, being unique to the transaction card upon which it resides, and distinguishing said transaction card from all other similar transaction cards of said plurality of transaction car;

b) at least one removable and reusable label having two opposing planar sides, a first side having unique second indicia thereon which corresponds to said first indicia of said card, and a second side having a reusable adhesive layer suitable for affixing the label to either planar side of the transaction card, the adhesive allowing the label to be removed leaving substantially no residue on either side of said transaction card.

5,531,483
HEAT SHRINKABLE HOSE CLAMP WITH HEATING INDICATOR

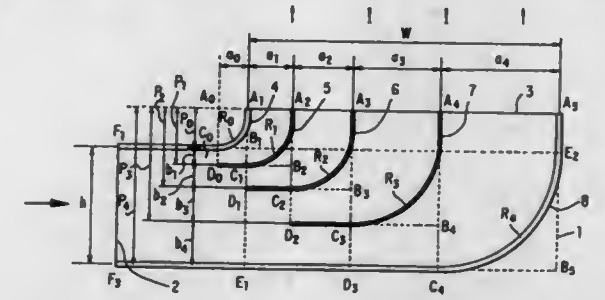
Richard E. Christian, Morrison, and Michael V. Peake, Evergreen, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.
Filed Dec. 6, 1993, Ser. No. 163,211
Int. Cl.⁶ F16L *35/00*
U.S. Cl. 285—93 **13 Claims**



1. An improved hose clamp of the type formed of a band of heat shrinkable polymer having a diameter reducing release temperature, an inside band surface and an outside band surface, wherein the improvement comprises, said hose clamp including a heating indicator means for visual indication by surface effect.

5,531,484
ELBOW PROVIDED WITH GUIDE VANES

Michihiko Kawano, 1-1-6-203 Tani, Chuo-ku, Fukuoka-shi, Fukuoka-ken, 810, Japan
Filed Jan. 30, 1995, Ser. No. 380,702
Claims priority, application Japan, Feb. 10, 1994, 6-016861
Int. Cl.⁶ F16L *41/00*
U.S. Cl. 285—156 **9 Claims**



1. An elbow provided with guide vanes wherein the guide vanes are disposed to make the shapes of sub-channels defined thereby similar to each other and the shape of the sub-channels are determined based on the following formulas:

$$P_0=h/\{[f/(f-r)]^m-1\} \quad (1)$$

$$a_n=P_0r[f/(f-r)]^n \quad (2)$$

$$b_n=a_n/f \quad (3)$$

h: inlet breadth of the elbow
P_0: overhang length of the guide vanes at the outlet of the elbow
f: enlargement ratio of the elbow expressed by outlet breadth/inlet breadth
r: aspect ratio of the sub-channels (r<f)
m: number of sub-channels
a_n: outlet breadth of n-th sub channel (a_n indicates the radius of curvature of the inner side wail when n=0 and indicates radius of curvature of the outer side wail when n=m)
b_n: inlet breadth of n-th sub-channel.

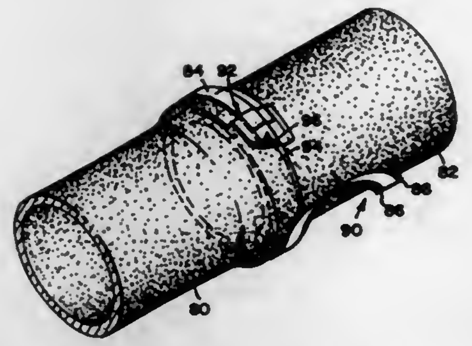
5,531,485
METHOD FOR SEALING A PIPE JUNCTURE

Jeffrey W. House, Marine of the St. Croix; William P. House, and William K. House, both of Forest Lake, all of Minn., assignors to Infi-Shield Inc., Forest Lake, Minn.
Continuation-in-part of Ser. No. 273,503, Jul. 11, 1994. This application Sep. 19, 1994, Ser. No. 308,256
Int. Cl.⁶ F16L *21/00*
U.S. Cl. 285—230 **3 Claims**

1. A method of sealing a pipe juncture, said method comprising the steps of:

a. providing an elastomeric tape and a connector, said tape having a first and second side and a first and second end, said tape comprising at least two strips of adhesive on said first side, with one strip of adhesive extending lengthwise along a top portion of said first side and a second strip of adhesive extending lengthwise along a bottom portion of said first side, said connector having adhesive substantially covering one side of said connector;

b. cutting a length of said tape, said length long enough such that said tape may be stretched to at least the length of the circumference of said pipe juncture;



c. placing a first portion of said connector on a first end of said tape, said adhesive on said portion of said connector attached to said tape;

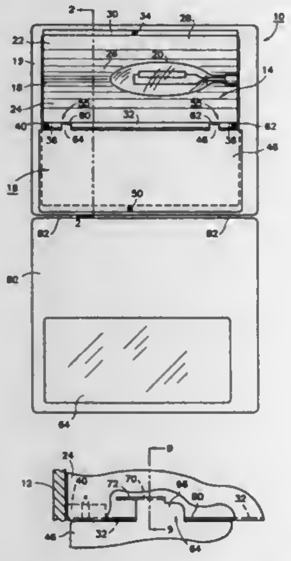
d. positioning said tape such that about one half of the width of said first side of said tape is on a first side of said pipe juncture and the remaining half of said tape is on a second side of said pipe juncture;

e. stretching the tape around said pipe juncture until said first and second ends of said tape overlap;

f. attaching said adhesive of said second portion of said connector to said second end of said tape, such that said tape is secured around said pipe juncture.

5,531,486
MOUNTING MEANS FOR A DOOR OF SHEET MATERIAL

Andrew J. Parker, Chapel Hill, N.C., assignor to Regent Lighting Corporation, Burlington, N.C.
Filed Mar. 13, 1995, Ser. No. 402,630
Int. Cl.⁶ E05C *5/00*
U.S. Cl. 292—63 **6 Claims**



1. A device that includes an access opening and comprises:

(a) support structure fixed relative to said access opening, located adjacent an edge of the access opening, and containing a plurality of slots,

(b) a sheet metal door having one edge located adjacent said support structure, having a closed position in which the door covers said access opening, and having a fully-open position in which the door is generally perpendicular to the position of the door when closed, the door being swingable between its closed and fully-open positions about a pivot axis located near said one door edge, and in which:

(c) said door includes a plurality of tabs projecting outwardly from said door edge, each of said tabs being of a generally L-shaped cross-section when viewed from a reference plane perpendicular to said pivot axis,

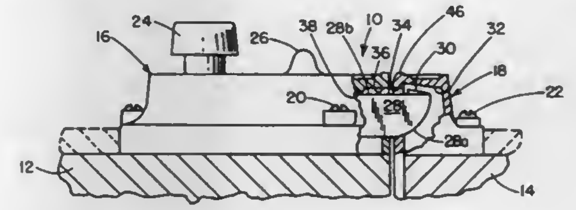
(d) each L-shaped tab comprises a first arm generally located in the major plane of said door, a second arm extending transversely of said first arm, the second arm of each tab fitting in an associated one of the slots in said support structure and including an extension that extends laterally of said second arm beyond one end of the associated slot into a region behind said support structure when said door is in its closed position,

(d) the door, when in its fully-open position, is laterally movable while said second arm is in its associated slot to a sufficient extent to shift said extension into a position of alignment with said slot, thereby allowing the second arm of the associated tab to be withdrawn from said support structure through said slot, thus allowing the door to be removed from said support structure, and

(e) one edge of each slot acts as a bearing surface on which the associated tab can pivot when the door is swung from its closed position to its fully-open position, such swinging of the door carrying said first arms into the slots associated with their respective tabs.

5,531,487
LOCK ASSEMBLY HAVING A BOLT WITH AN EXTENDING TANG

Thomas H. Beresheim, 5816 S. Washtenaw, Chicago, Ill. 60629
Filed Mar. 3, 1994, Ser. No. 205,112
Int. Cl.⁶ E05C *1/04*
U.S. Cl. 292—146 **9 Claims**



1. A lock comprising:

a housing mounted to an inner surface of a door, said housing including a first inner slot;

a striker mounted to an inner surface of a doorjamb disposed in close proximity to said door, wherein said striker is disposed adjacent said housing when said door is in a closed position, said striker including a second inner slot and an inwardly projecting lip disposed adjacent an outer edge of said second inner slot, wherein said second inner slot is disposed adjacent to and in alignment with said first slot when said door is in said closed position;

bolt means disposed in said first inner slot of said housing and movable between a retracted position and an extended position for insertion in the second inner slot of said striker for maintaining the door locked in said closed position, said bolt means including a generally flat inner surface and convex distal outer surface; and

latch means including a tang extending outwardly from the generally flat inner surface of said bolt means which engages the inwardly projecting lip in the second inner slot of said striker when the convex outer surface of said bolt means is engaged by an object and said bolt means is urged toward said inwardly projecting lip.

5,531,488
VEHICLE DOOR LOCK DEVICE

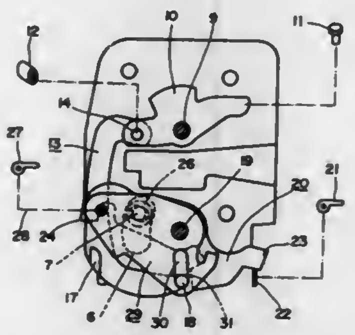
Masakatsu Yoshikuwa, Kofu, and Tsuguo Hoshikawa, Nirasaki, both of, Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1995, Ser. No. 442,961

Claims priority, application Japan, May 20, 1994, 6-131023; May 31, 1994, 6-140940; May 25, 1994, 6-135084

Int. Cl.^{6} E05C *3/16*

U.S. Cl. 292—216 **1 Claim**



1. A vehicle door lock device comprising:
a latch engageable with a striker fixed to a vehicle body;
a ratchet for maintaining engagement of the latch with the striker in engagement with the latch;
a lock body having a concave portion, which encloses the latch and the ratchet, in a front part thereof and also having first and second spaces in a rear part thereof;
a ratchet lever for rotating the ratchet;
an opening lever which is connected to an outer opening handle of a door and is provided in such a manner to have a same axis of rotation as of the ratchet lever and to overlap the ratchet lever, said opening lever having an elongated hole;
said opening lever and said ratchet lever being provided in one of the first and second spaces;
a lock lever which is connected to a door key cylinder and a lock button and is adapted to change a position thereof between a locked position and an unlocked position, said lock lever being provided in the other of the first and second spaces;
an interlocking link having an end rotatably connected to the lock lever and also having another end in which a pin engaging with the elongated hole is provided, said pin being able to engage with the ratchet lever and causing the ratchet through the ratchet lever to turn by the operation of the opening lever when the lock lever is in the unlocked position, said pin being disengaged from the ratchet lever and becoming unable to engage with the ratchet lever when the lock lever is in the locked position;
said ratchet lever having a lock releasing arm adapted to engage with the interlocking link when the ratchet lever turns, and to change the position of the lock lever from the locked position to the unlocked position;
and being characterized in that the ratchet lever consists of any one of:
(A) a first ratchet lever which is connected to the ratchet in such a manner to be integral with the ratchet and is formed in such a manner to be integral with an inner arm engaging with an inner opening handle of the door;
(B) a second ratchet lever which is connected to the ratchet in such a manner to be integral with the ratchet and does not have the inner arm; and
(C) a third ratchet lever which is connected to the ratchet in a one-way connection manner and has the inner arm;
in that the opening lever consists of any one of:
(a) a first opening lever which does not have the inner arm; and
(b) a second opening lever formed in such a manner to be integral with the inner arm,
whereby the lock device has a configuration which is selected from:
(1) a first variation having a combination of a first ratchet lever and a first opening lever, by which a one-motion opening mechanism and a self-canceling mechanism can be realized;
(2) a second variation having a combination of a third ratchet lever and a first opening lever, by which a one-motion opening mechanism can be realized but a self-canceling mechanism is removed from the lock device; and
(3) a third variation having a combination of a second ratchet lever and a second opening lever, by which a self-canceling mechanism can be realized but a one-motion opening mechanism is removed from the lock device.

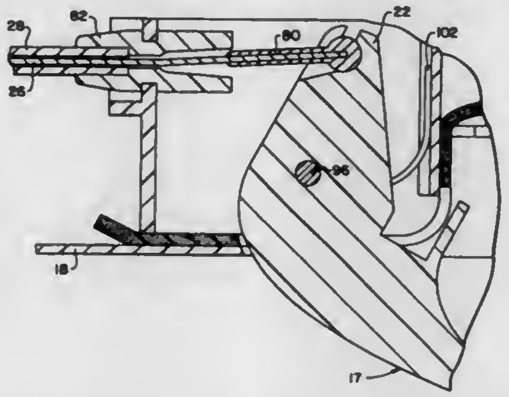
5,531,489
ANTI-KINK CABLE FOR AUTOMOTIVE DOOR HANDLES

Roman Cetnar, Newmarket, Canada, assignor to Atoma International Inc., Markham, Canada

Filed Sep. 23, 1994, Ser. No. 309,500

Int. Cl.^{6} F16L *21/02;* **F16C** *1/10*

U.S. Cl. 292—225 **8 Claims**



1. A vehicle door latch assembly for latching and unlatching a door structure including a frame supporting an exterior skin and interior panel with respect to a vehicle door opening catch, said door latch assembly including:
a latching mechanism constructed and arranged to be able to be carried by said door structure and to move between an unlatched relation with the door opening catch and a latched relation with the door opening catch;
said latching mechanism including a movable releasing component and a latch, said movable releasing component being movable between a first and a second position, said latch being constructed and arranged i) to be in a latching position when said latching mechanism is in latched relation with the door opening catch, and ii) to be moved from said latching position into a releasing position in response to movement of said movable releasing component from said first position to said second position so that the latching mechanism is moved into said unlatched relation with the door opening catch;
a manually operable releasing assembly mounted on said door frame for resiliently biased movement into an inoperative position, said releasing assembly having a manually engageable component disposed outwardly of said interior panel, said manually engageable component adapted to be manually engaged and pivotally moved to move the releasing assembly against the resilient bias thereof from the inoperative position thereof into an operative position, said releasing assembly being constructed and arranged so that upon manual release of the manually engageable component the resilient bias of said releasing assembly returns the releasing assembly into the inoperative position thereof;
a flexible cable having one end connected with said manually operable releasing assembly and a spaced portion connected with said movable releasing component so that (1) the movement of said manually operable releasing assembly from its inoperative position into its operative position is transmitted through tension in the flexible cable into movement of the releasing component from its first position to its second position so that said latch is moved from its latching position into its releasing position, and (2) the movement of said manually operable releasing assembly from its operative position to its inoperative position is transmitted through compression in the flexible cable into movement of the releasing component from its second position to its first position;
a cable-controlling assembly operatively associated with an end portion of the flexible cable generally at said one end;
said cable-controlling assembly including a rigid elongated member fixed to said cable generally at said one end and having a length at least as great as the extent of movement of said one end when said manually operable releasing assembly is moved between said inoperative and operative positions;
said cable-controlling assembly further including a tubular cable bushing disposed in surrounding relation to said cable generally at said one end, said tubular cable bushing having an interior surface defining a passage through said bushing and forming one opening at one end of said bushing and an opposite opening at an opposite end of said bushing, said one opening in said bushing being constructed and arranged to receive a portion of said rigid member in a coaxially extending relation therewith when said releasing assembly is in said inoperative position and to receive a relatively shorter portion of said rigid member in non-coaxially extending relation therewith when said releasing member is in said operative position, and wherein a diameter of said passage increases as it approaches said one opening at said one end of said bushing to permit said rigid member to be moved out of said coaxial relation with respect to said cable bushing when said rigid member is moved by said pivotal movement of said manually engageable component to move the releasing assembly from inoperative position to the operative position;
said cable-controlling assembly being constructed and arranged in surrounding relation to said cable end portion to prevent buckling of said flexible cable portion under compression during the resiliently biased return of said releasing assembly.

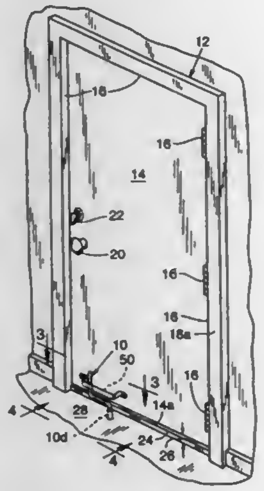
5,531,490
DOOR SECURITY DEVICE ALLOWING PARTIAL DOOR OPENING

Robert D. Parker, 2910 NE. 27th, Gresham, Oreg. 97030

Continuation of Ser. No. 42,038, Apr. 1, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 410,376

Int. Cl.^{6} E05F *5/00*

U.S. Cl. 292—262 **8 Claims**



1. In combination, a security device and a door, the security device comprising:
a pivot support mountable adjacent said door and defining an axis of rotation, said axis of rotation being spaced from an arcuate path of a vertical edge of said door by a given distance; and
a one-piece pivot bar having a first length portion arranged substantially parallel to a hinge axis of said door pivotally supported by said pivot support and having a second length portion coupled to said first length portion in spaced relation to said axis of rotation no greater than said given distance whereby said second length portion engages directly said door at a free end of said second length portion and rotates about said axis of rotation upon partial opening of said door to a given point, but beyond said given point ceases rotating about said axis and blocks further opening of said door, said first length portion being collinear with said axis of rotation, said first and second length portions extending in opposite and substantially parallel directions from said pivot bar, said first length portion being freely removable from said pivot support along said axis when said door is closed and blocked against removal along said axis when said door is partially open to said given point.

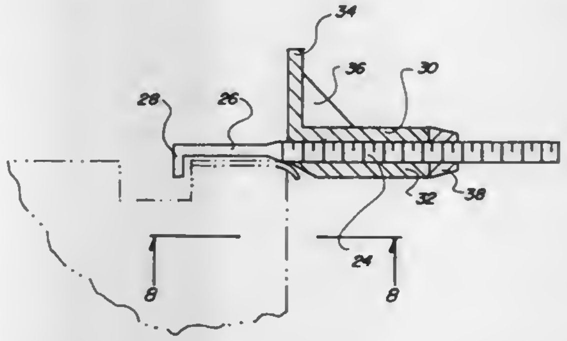
5,531,491
SECURITY DOOR LOCK

Wayne F. Skelton, 1431 Ocean Ave. #1011, Santa Monica, Calif. 90401

Filed Feb. 23, 1995, Ser. No. 393,355

Int. Cl.^{6} E05C *19/18*

U.S. Cl. 292—293 **1 Claim**



1. A portable door lock that can be used in conjunction with a door, door jamb and striker plate, the portable door lock comprising in combination:
a metal bolt between 3" and 3 ¾" in length having a first end, a second end and an intermediate extent therebetween, a cylindrical threaded portion comprising the first end of the bolt, the cylindrical threaded portion having an outer diameter defined by the threaded portion, a flat portion comprising the second end of the bolt, the flat portion having a width, the flat portion being approximately half the length of the bolt, the flat portion having a thickness which allows it to extend between a door and a door jamb, a hook portion extending from and integral with the second end of the bolt, the hook portion having a top surface and a bottom surface, the hook portion extending from the flat portion at an angle from between greater than 90 degrees and less than 180 degrees, the hook portion having a width which is larger than the width of the flat portion, the hook portion adapted to be engaged around the striker plate of the door jamb;
a metal securing fitting having a hollow cylindrical first end having a first side and a second side, and a flat plate at a second end, the flat plate extending 90 degrees relative to, and at one side of, the cylindrical first end, the cylindrical first end having an internal diameter which is larger than the outer diameter of the threaded portion of the metal bolt, the side of the cylindrical first end opposite the flat plate being tapered from the second towards the first end to allow for the posi-

tioning of the striker plate, the metal securing fitting positioned over the cylindrical threaded portion of the bolt;

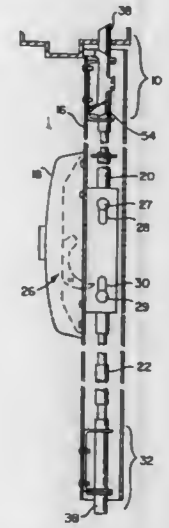
three strengthing flanges, equidistantly spaced from one another, each of the strengthing flanges being integral with and connected between the flat plate and the hollow cylindrical first end of the metal securing fitting, the strengthing flanges allowing the door lock to withstand greater amounts of applied force;

a wing nut having two finger engaging portions and an internal threaded aperture, the internal threaded aperture of the wing nut adapted to be secured over the threaded cylindrical portion of the metal bolt.

5,531,492

RATCHETING LATCH MECHANISM FOR A VERTICAL ROD DOOR EXIT DEVICE

Leo Raskevicius, North Haven, Conn., assignor to Sargent Manufacturing Company, New Haven, Conn.
Continuation of Ser. No. 131,128, Oct. 4, 1993, abandoned. This application Nov. 30, 1995, Ser. No. 565,011
Int. Cl.⁶ E05B *63/20*
U.S. Cl. 292—335 **3 Claims**



1. A ratcheting latch mechanism for a vertical rod door exit device to be mounted in a door hingedly attached to a door frame for motion between an open and a closed position comprising:

a chassis adapted for mounting within the door;

a latch rod slidingly held by the chassis for vertical motion from an extended to a retracted position and including:

a plurality of ratchet notches formed in the latch rod,

a first end of the latch rod adapted to protrude from the chassis and engage a latch socket, and

a second end of the latch rod adapted for connection to a vertical rod extending from a vertical rod door exit device;

a pawl having a plurality of teeth positioned to engage at least two of the ratchet notches to prevent motion of the latch rod towards the extended position, the pawl engaging the at least two of the ratchet notches responsive to motion of the door away from the closed position towards the open position, the pawl acting to engage the at least two of the ratchet notches and prevent motion of the latch rod towards the extended position when the latch rod is at the extended position, when the latch rod is at the retracted position and when the latch rod is at positions between the extended and retracted position; and

a release mechanism for releasing the pawl and allowing the latch rod to return to the extended position when the door is in the closed position, the release mechanism comprising:

a release frame having a pair of frame members with the pawl mounted therebetween the release frame being hingedly mounted to the chassis about a hinge axis located at a first end of the release frame to move between an engaged position in which the pawl engages the at least two ratchet notches and a released position in which the pawl does not engage the at least two ratchet notches;

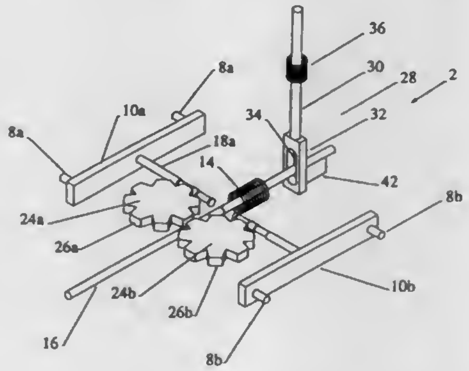
a contact piece mounted to the release frame at a second end of the release frame, the contact piece acting to move the release frame into the released position when the door reaches the closed position, the latch rod extending through the release frame between the pair of frame members with the hinge axis and the contact piece on one side of the latch rod and the notches and the pawl on an other side of the latch rod; and

a spring means mounted between the chassis and release frame for urging the release frame into the engaged position when the door moves away from the closed position.

5,531,493

RELEASABLE LOCKING MECHANISM

Amanda Reynolds, 4 Galsworthy Place, Spearwood, Western Australia 6163, Australia
PCT No. PCT/AU93/00057, § 371 Date Nov. 8, 1994, § 102(e) Date Nov. 8, 1994, PCT Pub. No. WO93/15634, PCT Pub. Date Aug. 19, 1993
PCT Filed Feb. 11, 1993, Ser. No. 284,622
Claims priority, application Australia, Feb. 11, 1992, PL0858
Int. Cl.⁶ E05C *1/00*
U.S. Cl. 292—32 **15 Claims**



1. A releasable locking mechanism to demountably connect an article with a support, said mechanism comprising:

at least one engaging means to releasably connect said article and said support, said at least one engaging means being movable between a first position in which the article is connected with said support and a second position in which the article is disconnected from said support thereby enabling removal of said article therefrom;

retracting means to retract said engaging means from said first position to said second position;

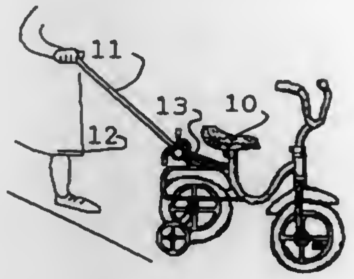
biasing means to bias said engaging means toward said first position; and

coupling means for coupling said retracting means to said engaging means such that movement of said retracting means causes said engaging means to move between said first and second positions, wherein said coupling means comprises a rotatable gear and wherein said engaging means and said retracting means are maintained in meshing contact with said gear.

5,531,494

HANDLE FOR CONTROL OF MOBILE RIDING TOYS

Ogle R. Singleton, Richmond, Va., assignor to Singleton Technology, Inc., Richmond, Va.
Filed Sep. 26, 1994, Ser. No. 312,563
Int. Cl.⁶ B62H *7/00*
U.S. Cl. 294—1.1 **13 Claims**



1. A handle device suitable for convenient attachment to and detachment from a child's vehicle for external control by an adult, comprising:

a component holdable by hand for controlling the device;

first and second straps for binding the device to part of a child's vehicle;

strap mounting means fixed to and supporting part of each strap;

means connecting said hand holdable component to the strap mounting means;

each strap having a free end extending from where the strap is fixed to the mounting means;

a pair of different surfaces on each strap which is capable of interlocking and thereby mating when pressed into face to face engagement with each other and of unlocking when peeled apart;

the first of said surfaces of each strap being outwardly facing and located, at least in part, on said part of the strap which is fixed to said mounting means;

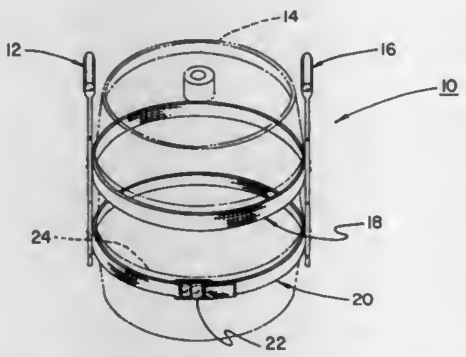
the second of said surfaces of each strap being on the free end of the strap; and

the free end of each strap being capable of being extended out to connect with a child's vehicle and looped back to bring its said second surface into face to face interlocking engagement with said first surface of at least one of said straps.

5,531,495

BEVERAGE KEG HANDLING DEVICE

Timothy R. Hohman, 74 Griesmere St., Pittsburgh, Pa. 15223
Filed Jun. 15, 1995, Ser. No. 490,662
Int. Cl.⁶ B65D *25/28;* **B65G** *7/12*
U.S. Cl. 294—31.2 **12 Claims**



1. A beverage keg handling device comprising:

a first handle means positionable vertically along a side wall of a beverage keg for being grasped and manipulated by an individual;

a second handle means positionable vertically along a diametrically opposed portion of the side wall of the beverage keg relative to the first handle means and for being grasped and manipulated by the individual;

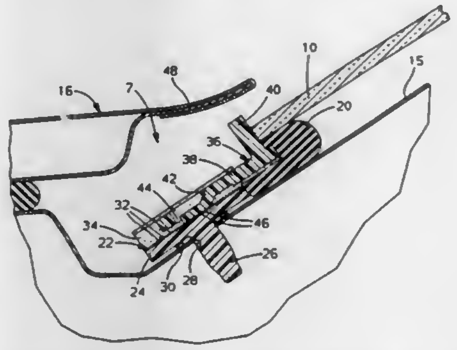
a securing strap of open annular configuration adapted to be positioned beneath an annular ridge of a beverage keg such that an individual can grasp the first handle means and second handle means to facilitate manual manipulation of the beverage keg; and

an alignment strap of closed annular configuration extending between the first handle means and the second handle means and being spaced from the securing strap for circumferential positioning about the beverage keg.

5,531,496

AUTOMOTIVE GLASS ENCLOSURE RETAINING FIXTURE

Lyn R. Zbinden, Troy; Robert Dallos, Jr., Canton, and Rodney G. Dick, Auburn Hills, all of Mich., assignors to Saturn Corporation, Troy, Mich.
Filed Jul. 28, 1994, Ser. No. 281,817
Int. Cl.⁶ B60J *1/04*
U.S. Cl. 296—96.21 **1 Claim**



1. A glass positioning fixture for retaining a glass enclosure in place while the glass enclosure is being adhesively joined onto an automotive frame, the fixture comprising:

a base, the base including a platform and a projecting compliant hook, the hook having a width generally larger than an insertion aperture provided in the frame and the hook expanding outwardly, permanently pivotally joining the base with the frame after insertion into the aperture, the base also having first ratchet teeth and facing channel lateral sides; and

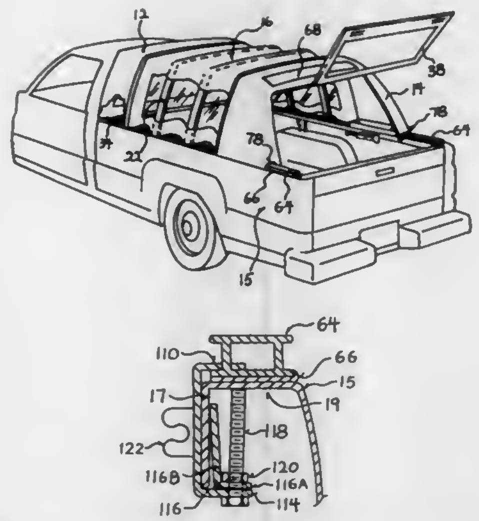
a linear slider, the slider having a main body captured adjacent the platform and held by the channel sides, the slider having a head for contact with the glass enclosure and the slider having a U-shaped slot providing a compliant finger with second ratchet teeth to interface with the first ratchet teeth, allowing the slider to be incrementally linearly adjustable with respect to the base to position and hold the glass enclosure.

5,531,497

TWO-POSITION COLLAPSIBLE CANOPY ASSEMBLY THAT ATTACHES TO A PICKUP TRUCK

John C. Cheng, Nine W. State St., Pasadena, Calif. 91105
Continuation-in-part of Ser. No. 59,650, May 10, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,974
Int. Cl.⁶ B60P *7/02*
U.S. Cl. 296—100 **5 Claims**

1. A two-position collapsible canopy assembly that attaches to a rearward extending bed of a pickup type truck, said truck bed having front, rear, and side walls with upper truck bed rails, a corrugated truck bed deck, and a front cab having a backside, said assembly comprising:



- a) a track secured to a top of the upper truck bed rails by a plurality of C-clamps that each comprises:
  - (1) a locking top lip inserted into a corresponding slot located on a bottom edge of said track,
  - (2) a bottom lip having a bore therethrough and inserted under a vertical lip of the upper truck bed rails,
  - (3) an L-bracket with a horizontal side that sits on top of the bottom lip and has a bore therethrough, and a vertical side designed with an obtuse angle that rests against an inside surface of the upper truck bed rails,
  - (4) a bolt inserted through the bore located on the bottom lip of said C-clamp and the horizontal side of the L-bracket, and
  - (5) a nut threaded onto the bolt whereupon when the bolt is tightened, it pushes upwards against an underside of the truck bed rails drawing said track down tight, and simultaneously the L-bracket, as it bottoms out on the bottom lip of said C-clamp, applies a lateral pressure against the sandwiched vertical lip of the upper truck bed rails to thus create a bilateral track securing force,
- b) a fore hard shell having a front section, a back section, and a bottom section, where the front section is placed against the backside of the front cab and the bottom section has means for being securely attached to the upper truck bed rails,
- c) an aft hard shell having a front section, a back section, and a bottom section having means for being slidably attached to said track,
- d) a plurality of ribs having means for being slidably attached to said track,
- e) a flexible canopy having terminating side ends, a front end, and a back end, where the side ends are attached to said ribs and said track by an attachment means and the front and back ends are rigidly attached to said fore hard shell and said aft hard shell respectively by an attachment means, where said attached canopy can be placed in either a forward retracted position or in an extended position that covers a length of the truck bed, and
- f) a mid-gate having means for being removably secured around the bottom section of said aft hard shell, the truck's side walls, and a liner located above the corrugated truck bed deck.

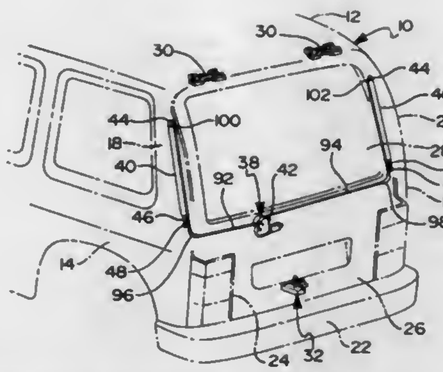
5,531,498
VEHICLE BODY WITH POWERED LIFT TYPE TAILGATE

David J. Kowall, Hartland, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 1, 1994, Ser. No. 348,007

Int. Cl.^{6} B60J *5/10*

U.S. Cl. 296—146.4 **7 Claims**



1. In combination, a vehicle body having a substantially vertical rear opening, a tailgate adapted to open and close said rear opening, hinge means mounting said tailgate on said vehicle body for swinging movement about a horizontal hinge axis located adjacent an upper edge of said tailgate so that said tailgate on upward lifting movement is moveable from a closed position closing said rear opening to a wide open position fully opening said rear opening, a pair of spring devices, each of said spring devices connected at opposite ends thereof to said tailgate and to said vehicle body at one side of said rear opening and so as to be parallel with the other spring device, said spring devices operable to together swing said tailgate upward from said closed position to said wide open position, a tailgate actuator mechanism mounted on said tailgate, said actuator mechanism comprising a reversible electric motor, a cable pulley, drive means operatively connecting said motor to said cable pulley, a pair of cable guides, each said cable guide mounted on said tailgate at a point adjacent where one of said spring devices is connected, a pair of cables, each of said cables connected to said vehicle body at a point adjacent where one of said spring devices is connected, each said cable guide receiving one of said cables and guiding same from a path along side one of said spring devices to a path along side said tailgate in line with said cable pulley, said cables connected to and wound in the same direction around said cable pulley, said motor operable to turn said cable pulley in one direction to unwind said cables to allow said spring devices to open said tailgate at a rate determined by the speed of said motor, and said motor operable to turn said cable pulley in the opposite direction to rewind said cables to collapse said spring devices and close said tailgate.

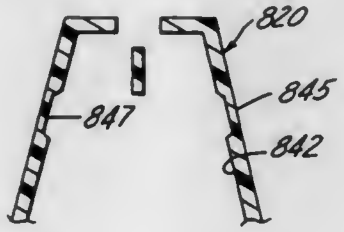
5,531,499
COLLAPSIBLE AUTOMOTIVE TRIM PANEL BOSS

Michael T. Vecchio, Livonia, and Thomas J. Luckett, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 11, 1994, Ser. No. 320,351

Int. Cl.^{6} B60J *5/04*

U.S. Cl. 296—146.7 **6 Claims**



6. An automotive door interior assembly comprising:
an interior door trim panel;
at least one boss extending from the trim panel having a plurality of sections of varying wall thickness for allowing energy absorption through columnar deformation of the boss, with at least one boss comprising at least one conically shaped hollow pedestal having:

a first end attached to the trim panel;
a truncated second end projected toward said inner door panel;
a wall connecting the first end and the second end; and
an inner surface on the wall having a groove thereon defining a grooved wall section of reduced thickness and two adjacent non-grooved sections of same thickness as the wall so that the two adjacent non-grooved sections of same thickness as the wall so that the two adjacent non-grooved sections collapse about the grooved wall section of reduced thickness when the pedestal is columnarly loaded along an axis generally perpendicular to a plane defined by the trim panel through the pedestal;
retaining means attached to the truncated second end, the retaining means comprising;
a spear-shaped attachment member;
a shaft extending axially from the spear-shaped attachment member and having a width smaller than the width of the spear-shaped attachment member;
a column member attached to the shaft and having a width wider than the shaft; and
an inner door panel having receiving means therein for receiving the retaining means to attach the trim panel to the inner door panel.

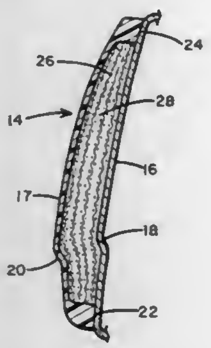
5,531,500
PROTECTIVE SHIELD FOR VEHICLE DOOR

Richard T. Podvin, 1391 Mississippi St. NE., Fridley, Minn. 55432

Filed Aug. 5, 1994, Ser. No. 286,459

Int. Cl.^{6} F41H *7/00*

U.S. Cl. 296—152 **10 Claims**



1. A bullet-proof panel for an automotive vehicle, said vehicle having a body and a plurality of doors hinged to said body to allow driver and passenger ingress and egress, said doors having outer sheet metal panels contoured for style, the bullet-proof panel comprising:

- a) an outer polymeric skin having an external surface and an internal surface, each of said external and internal surfaces having a contour corresponding to the contour of said outer sheet metal panels, said internal surface having a heightened stand-off portion integrally disposed about the periphery of said internal surface, said stand-off portion extending generally perpendicularly away from the plane defined by said internal surface to define a central pocket in said outer polymeric skin;
- b) means for affixing said stand-off portion of said outer polymeric skin to said outer sheet metal panels; and
- c) a bullet-proof barrier member disposed in said central pocket of said outer polymeric skin substantially co-extensive with said outer sheet metal panels of said plurality of doors.

5,531,501
ROOF PANEL ASSEMBLY

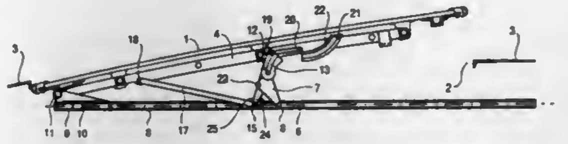
Martinus W. M. Nabuurs, Overloon, Netherlands, assignor to Inalfa Industries, B.V., Venray, Netherlands

Filed Jan. 6, 1995, Ser. No. 369,242

Claims priority, application Netherlands, Jan. 11, 1994, 9400043

Int. Cl.^{6} B60J *7/05*

U.S. Cl. 296—221 **6 Claims**



1. A roof panel assembly for a vehicle comprising a roof panel, which is intended for closing an opening in a roof of a vehicle and which is adjustable from a position closing the opening in the roof to a first ventilating position, in which the roof panel has been pivoted upwards from its closed position about a pivot axis located near one end of said roof panel and extending transversely to the longitudinal direction of the vehicle, and a second sliding position, in which the roof panel has at least partially been moved downwards from its closed position, in such a manner that the roof panel can at least partially be moved under the roof of the vehicle, whereby said roof panel assembly is provided with at least one guide rail to be secured to the roof, along which an operating means to be driven by a motor or by band is movable, whilst a first lift arm, which is pivotable about a first pivot axis located in said guide rail, is movably and pivotally connected with the roof panel by means of a second pivot axis and is provided with a guide groove for receiving a cam connected with said operating means, all this in such a manner that when the operating means moves along the guide rail, with the cam engaging in the guide groove in said first lift arm, said first lift arm is pivoted about said first pivot axis so as to move the roof panel towards the ventilating position, characterized in that a second lift arm is fixedly connected with the panel, said second lift arm being provided with a further guide groove for the cam of said operating means, all this in such a manner that in the at least substantially closed position of the panel an open end of the guide groove in said first pivotable lift arm is at least substantially contiguous to an open end of the guide groove in said second lift arm, and that in the closed position of the roof panel the guide groove in said first lift arm extends at least along part of its length from the end contiguous to the guide groove in said second lift arm in a direction away from the roof panel, whilst in the closed position of the roof panel the guide groove in said second lift arm extends at least along part of its length from the end contiguous to the guide groove in said first lift arm in a direction towards the panel.

5,531,502
COMBINATION CHAIR FOR CHILDREN

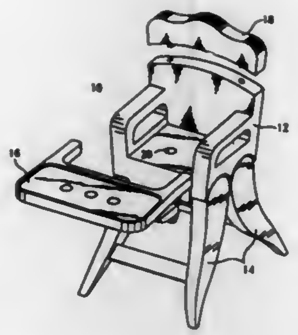
Peter G. Berggren, P.O. Box 373, Capitola, Calif. 95010

Filed Dec. 12, 1994, Ser. No. 354,470

Int. Cl.^{6} A47C *3/029*

U.S. Cl. 297—131 **11 Claims**

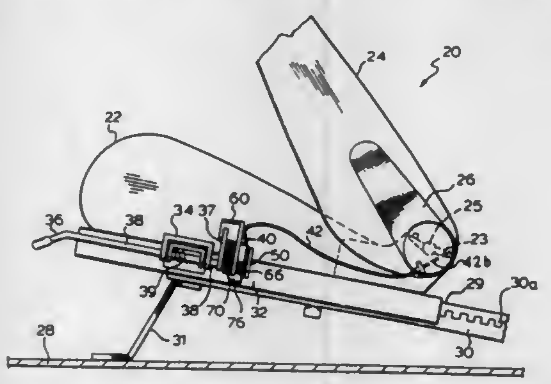
1. A combination chair for children having a plurality of configurations including a high chair position, a play chair position and a rocker position, the combination chair comprising:
a seat portion suitably designed for children;
two pairs of legs rotatably coupled to the seat portion, each of the legs having:
  an upper portion, the upper portion being rotatably coupled to the seat portion;
  an end tip opposite the upper portion; and
  an arcuate rocker portion lying between the upper portion and the end tip, the arcuate rocker portion operative for providing a rocking motion to the chair in the rocker position; and



a means for rotatably positioning the pairs of legs into predetermined positions whereby the height of the chair can be selected, the means comprising:
  a plurality of locking pins, the locking pins mounted in the seat portion;
  a plurality of locking pin receiving holes in a plurality of the legs, wherein the precise positions of the plurality of locking pin receiving holes in each of the legs are coordinated with each other such that when a predetermined height of the chair is selected the plurality of locking pins extend to engage the locking pin receiving holes in the legs and maintain the chair at the selected, predetermined height;
  a height selection lever;
  a height selection lever axle having a first end and a second end, the lever attached to the axle at the first end; and
  a plurality of linkages, the linkages eccentrically mounted on the axle and attached to the locking pins, wherein the height selection lever can turn the axle and retract the locking pins to change the height of the chair.

5,531,503
VEHICLE SEAT TRACK ASSEMBLY

Daniel Hughes, King City, Canada, assignor to Bertrand Faure Ltd., Mississauga, Canada
Filed Mar. 22, 1994, Ser. No. 210,759
Claims priority, application Canada, Jun. 4, 1993, 2097776
Int. Cl.^{6} B60N *2/02*
U.S. Cl. 297—341 **13 Claims**

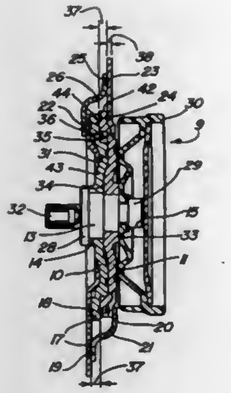


1. A vehicle seat track assembly for use with a vehicle seat having a seat cushion member and a seat back member pivotally movable over said seat cushion member from a first relatively upright position to a second relatively folded position said vehicle seat track assembly comprising:
  a first track member adapted for being securely mounted on a vehicle;
  a second track member for being securely affixed to said seat cushion member and being slidably mounted on said first track member;
  a track locking means mounted on one of said first and second track members and movable between a locking configuration wherein said track locking means physically engages the other of said track members so as to thereby lock the second track member in position with respect to the first track member in a selected one of a plurality of relative locking positions, and an unlocking configuration wherein said track locking means is disengaged from said other of said track members so as to thereby permit relative sliding movement of said second track member with respect to said first track member, wherein said track locking means is biased toward said locking configuration; and,
an actuating device for controlling movement of said track locking means between said locking and said unlocking configurations, said actuating device comprising:
  a frame member securely attached to a selected one of said first and second track members;
  an arm member movably mounted on the frame member in operative engagement with said track locking means for movement between a rest position, at which rest position said arm member is positioned to permit said track locking means to assume said locking configuration, and a cocked position, at which cocked position said arm member restrains said track locking means in said unlocking configuration;
  first biasing means acting on the arm member to bias the arm member to said rest position;
  link means for operative interconnection between said seat back member and the arm member to selectively move said arm member from its rest position to its cocked position against the action of said first biasing means upon said pivotal movement of the seat back member from its first relatively upright position to its second relatively folded position;
  a cam follower means movably mounted on said frame member so as to be in progressive operative contact with said arm member for movement between a first position corresponding with the rest position of the arm member and a second position corresponding with the cocked position of the arm member, at which second position the cam follower means restrainingly engages the arm member to hold fast said arm member in said cocked position against the spring biasing of said arm member, independently of the action of the link means; and,
  a cam member securely attached to the other of said first and second track members at a predetermined position along said other track member, said cam member being dimensioned and otherwise adapted to contact said cam follower means in its second position upon movement of said cam follower means therepast, thereby to urge said cam follower means to move from its said second position to its said first position so as to permit release of said arm member from the cocked position as aforesaid.

5,531,504
ARTICULATED ARMATURE FOR SEATS WITH ADJUSTABLE BACKS, IN PARTICULAR FOR MOTOR VEHICLES

Gerhard Schmale, Jung-stilling-Str. 68, Huckeswagen, Germany; Ralf Hoge, Espertstrasse 18, Radevormwald, Germany, and Martin Zynch, Reinwardstrasse 26, Remscheid, Germany
PCT No. PCT/EP92/01145, § 371 Date Nov. 24, 1993, § 102(e) Date Nov. 24, 1993, PCT Pub. No. WO92/21531, PCT Pub. Date Dec. 10, 1992
PCT Filed May 22, 1992, Ser. No. 142,406
Claims priority, application Germany, May 28, 1991, 41 17 497.6
Int. Cl.^{6} B60N *2/02*
U.S. Cl. 297—362 **13 Claims**

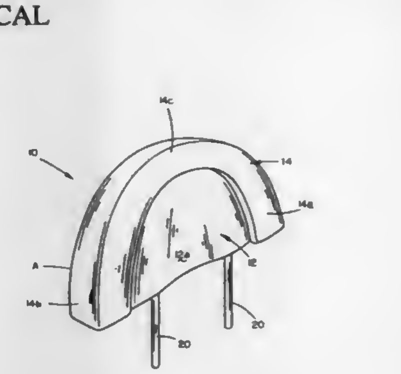
1. A hinge mounting for vehicle seats having a seat part proper and an adjustable backrest; said hinge mounting comprising; a fixed hinge means associated with the seat part proper, and a pivotable hinge means associated with the backrest, one of said hinge means including a pinion having an external tooth system including a plurality of teeth with gaps between the teeth on a first side of said pinion, and the other one of said hinge means including an internal gear having an internal tooth system including a plurality of teeth with gaps between the teeth on a first side of said internal gear, said internal tooth system meshing with said external tooth system and forming an eccentric planetary gear system for providing an inclination adjustment and securing mechanism for the vehicle seat, said pinion and said internal gear being formed from a starting material of a first thickness by a cold extrusion molding process, and said pinion and said internal gear having teeth of a width that is about the same as the thickness of the starting material, said pinion and said internal gear having second sides that are opposite to said first sides and which are formed through the extrusion molding process to have continuous first annular regions of material each having a thickness of at least 28% of the thickness of said starting material and adjoining annular conical regions of material, the material of said annular regions being at least in part made available both from the gaps between the teeth of said tooth systems and from further annular circular regions pressed in on said second sides, said pinion having a bearing face and said internal gear having a bearing face engaging said bearing face of said pinion, and wherein the center line of said external tooth system of said pinion and of said internal tooth system of said internal gear lie in the same plane as said bearing faces.

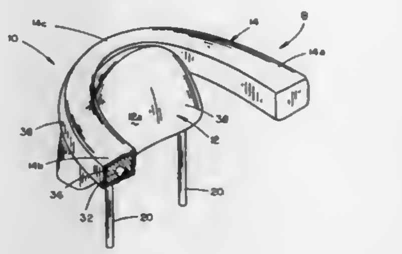


5,531,505
HEAD RESTRAINT FOR PASSENGER VEHICLES

Robert J. Baetz; John A. Dewar; Douglas K. Dunsmore; Christopher Harbowy; Dennis A. Majewski; Louis M. Shawbitz, and Thomas A. Welch, all of Auburn Hills, Mich., assignors to Tri-Con Industries, Ltd., Auburn Hills, Mich.
Filed Feb. 25, 1994, Ser. No. 201,546
Int. Cl.^{6} A47C *7/36*
U.S. Cl. 297—408 **30 Claims**

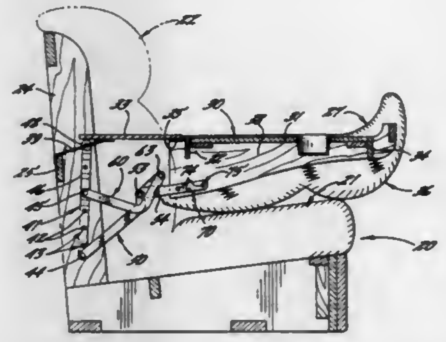
1. A head restraint, comprising:
  a main body having a forward face, a rearward face, an upper end, and opposing first and second side edges; and
  a generally U-shaped cradle operably connected to said main body for selective movement between an articulated position and a retracted position;
  said cradle including a pair of first and second leg members connected together at one end by a connecting member to form the U-shape, said leg members each including a free end opposite the end connected to the connecting member;
  said cradle being operably connected for selective movement between the articulated position, wherein said second free ends project forwardly beyond the forward most extent of the main body forward face and the connecting member projects rearwardly beyond the rearward most extent of the main body rearward face, and a retracted position, wherein said second ends do not project forwardly of the main body forward face and the connecting member does not project rearwardly of the rearward face.





5,531,506
RETRACTABLE SOFA TABLE WITH EXTENDED TABLE SURFACE

Donald G. Scott, Tupelo, Miss., assignor to Action Industries, Verona, Mich.
Division of Ser. No. 127,425, Sep. 27, 1993. This application Jul. 24, 1995, Ser. No. 506,266
Int. Cl.^{6} A47C *15/00*
U.S. Cl. 297—463.1 **4 Claims**



1. A mechanism suitable for use with a retractable sofa table that includes a panel pivotally attached to its rear edge, said mechanism comprising:
  (a) a mounting bracket adapted for mounting to a sofa frame, said mounting bracket having an upper end and a lower end;
  (b) panel supporting means for supporting the panel attached to said upper end of said mounting bracket configured so that the panel is free to slide thereon;
  (c) a lower pivot link pivotally interconnected with said lower end of said mounting bracket at a first pivot;
  (d) an upper pivot link pivotally interconnected with said mounting bracket at a second pivot intermediate of said first pivot and said panel supporting means;
  (e) a table mounting bracket adapted to be fixed to the retractable sofa table, pivotally interconnected to said lower pivot link at a third pivot, and further pivotally interconnected with said upper pivot link at a fourth pivot;
  said mechanism being configured so that in a first rotative orientation, said mounting bracket is generally upright, said upper end of said mounting bracket is facing upwardly, said fourth pivot is positioned upwardly and rearwardly of said third pivot, and said table mounting bracket has a first angular orientation, and in a second rotative orientation, said mounting bracket remains generally upright and said fourth pivot is positioned upwardly and forwardly of said third pivot, and

said table mounting bracket has a second angular orientation, the angular difference between the first angular orientation and the second angular orientation being between about 90 and 140 degrees.

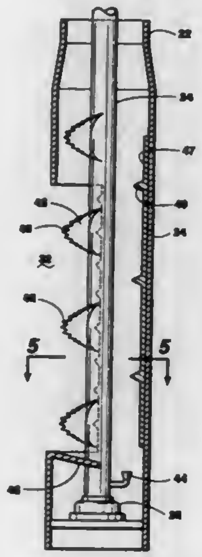
5,531,507
METHOD OF REMOVING A MINABLE PRODUCT FROM AN UNDERGROUND SEAM AND BOTTOM HOLE TOOL

Daryl L. Jackson, Rte. 2, Box 112, Spiro, Okla. 74959

Filed May 9, 1995, Ser. No. 438,186

Int. Cl.⁶ E21C *37/12;* **E21B** *43/29*

U.S. Cl. 299—13 **6 Claims**



6. A method of removing a minable product, such as coal, from an underground seam of minable product, such as a coal seam, comprising the steps of:

drilling a substantially vertical recovery hole from the earth's surface through a seam of minable product;
installing in the recovery hole a bottom hole tool;
installing casing pipe in said recovery hole;
said bottom hole tool having an elongated opening of substantially one-half the circumference of said tool, the opening positioned toward the ore seam,
said bottom hole tool being equipped with an auger device and a means for supporting said auger device and rotating same;
said means of rotating said auger comprising a hollow pipe with connections from said bottom hole tool to the earth's surface;
nozzles mounted radially outward from said hollow pipe spaced along the length of said pipe from the bottom of the bottom hole tool below the auger blades along the pipe to the surface, said nozzles forcing water up the recovery hole;
drilling a plurality of closely spaced-apart injection holes from the earth's surface through the seam of minable product, the injection holes being drilled in a pattern extending from said recovery hole;
inserting an explosive in said seam of minable product where penetrated by each of said injection holes;
sequentially igniting the explosive in each of the injection holes to blast fractured minable material from said seam;
injecting water sequentially in said injection holes to move fractured minable material toward said recovery hole;
operating the recovery hole auger and injecting water down the central hollow pipe and upward through the nozzles to raise said fractured minable product to the earth's surface.

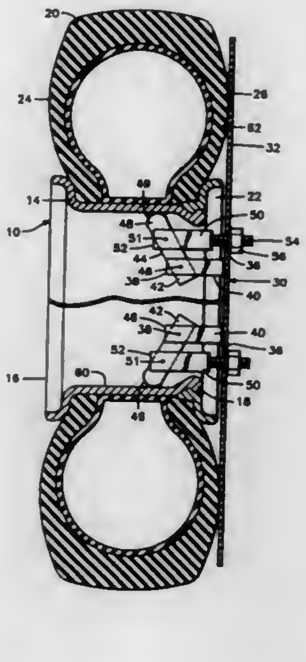
5,531,508
HEAVY CONSTRUCTION EQUIPMENT TIRE GUARD

Randall R. Bell, III, 4135 Baisden Dr., Pensacola, Fla. 32503

Filed Apr. 19, 1995, Ser. No. 424,970

Int. Cl.⁶ B60B *7/06*

U.S. Cl. 301—37.23 **2 Claims**



1. In combination, a vehicle wheel including an outer rim portion having inner and outer ends and a generally cylindrical inner rim surface, said outer rim portion including an outer circumference upon which a pneumatic tire is mounted, said tire, when inflated, projecting a predetermined radial extent beyond said outer rim portion, a tire side wall protector including a substantially circular plate, mounting means readily removably mounting said plate from said rim portion outwardly of said outer end and in substantially concentric relation with said wheel and tire, said plate being disposed at least closely adjacent and outwardly of said outer end and projecting radially outwardly beyond said outer rim portion an extent slightly less than said predetermined radial extent, said plate including a plurality of openings formed therethrough and spaced generally equally about the center of said plate, said openings being spaced inwardly of said outer rim portion, said mounting means including a U-shaped bracket spaced radially inwardly of each of said openings and projecting inwardly from the inner side of said plate, a threaded bolt extending through each of said openings and supporting a second U-shaped bracket on the end thereof projecting inwardly of said plate, a threaded nut threaded on each of said bolts outwardly of the outer side of said plate and a clamping bar having its opposite ends pivotally supported from corresponding pairs of said brackets and extending generally radially of said outer rim portion, said clamp bars including outer ends engaged with said inner rim surface, said clamping bar outer ends being inwardly inclined away from the inner side of said plate so that tightening of said nuts on said bolts will swing the clamping bar outer ends outwardly into tighter engagement with said inner rim surface and outwardly toward said clamp plate.

5,531,509
VEHICLE BRAKE SYSTEM

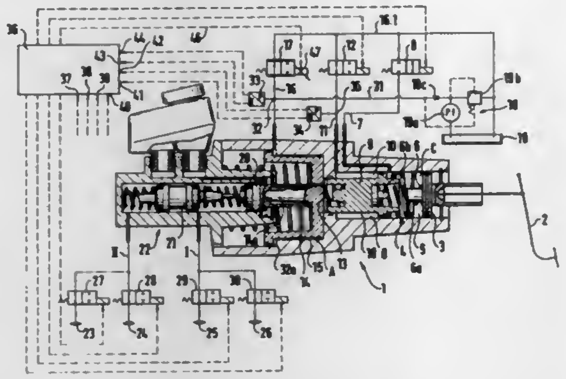
Andreas Kellner, Tamm, and Peter Schubert, Leingarten, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 5, 1995, Ser. No. 465,471

Claims priority, application Germany, Aug. 25, 1994, 44 30 168.5

Int. Cl.⁶ B60T *11/20;11/28;13/16;13/66*

U.S. Cl. 303—114.1 **25 Claims**



1. A vehicle brake system comprising a main cylinder for supplying wheel brake cylinders with brake pressure, a hydraulic brake booster which is assigned to the main cylinder for activating fluid pressure and which has a booster piston (**14**) which can be displaced in a booster pressure chamber (**15**) in a direction of the main cylinder, a reservoir, a hydraulic energy source connected with said reservoir, a pump (**19***a*) and a relief valve means (**19***b*) and a pressure line (**31**) for producing boosting pressure for the booster chamber for hydraulically displacing the booster piston, a brake pedal for emergency displacement of the booster piston when the energy source fails, a travel simulator (**4**) which is arranged between the brake pedal and the booster piston which has a simulator spring which can be compressed during a brake boosting mode, an electrically controllable throttle valve (**17, 48, 49, 63**) arrangement which is connected to the pressure line and from which a return line (**16.1**) leads to the reservoir for adjusting boosting pressure in the booster chamber, at least one first sensor in the form of at least one pressure sensor (**34, 34***a*) which can be adjusted by means of the brake pedal in order to output an electric reference signal variable as a function of the activation of the brake pedal and an electronic control unit which is connected to the at least one first sensor in order to control the throttle valve arrangement electrically dependent upon said electric reference signal variable when the brake pedal is activated, wherein the throttle valve arrangement normally has a wide flow area and the booster chamber (**15**) is permanently connected to the pressure line (**31**).

5,531,510
HUB MECHANISM FOR A BICYCLE

Takuro Yamane, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Apr. 28, 1994, Ser. No. 234,415

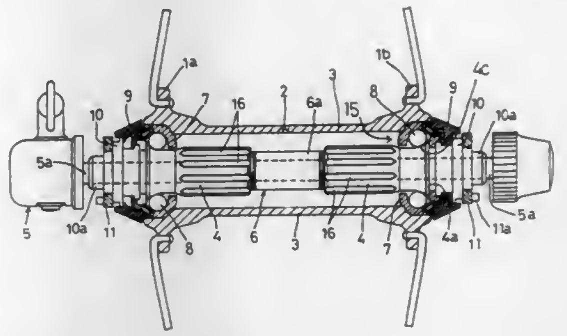
Claims priority, application Japan, Apr. 30, 1993, 5-023008 U

Int. Cl.⁶ B60B *27/06*

U.S. Cl. 301—110.5 **19 Claims**

1. A hub mechanism attachable to a bicycle frame with a quick release mechanism comprising:

a hub spindle supporting contact elements for contacting said frame to be fixed to said frame, said spindle defining a bore axially extending the entire length of said spindle for accommodating a part of said quick-release mechanism, said hub spindle including:
  small diameter portions disposed in axially opposite end regions thereof, respectively; and



  a large diameter portion disposed between said small diameter portions and having a substantially larger diameter than said small diameter portions;
a hub rotatably supported by said hub spindle; and
bearing means disposed between said hub spindle and said hub for allowing rotation of said hub relative to said hub spindle, said being means including:
a pair of bearing members disposed on said small diameter portions of said hub spindle, respectively; and
receivers disposed between said bearing members and said hub spindle for receiving said bearing members, respectively;
each of said receivers including an extension extending to said large diameter portion and engaging a periphery of said large diameter portion.

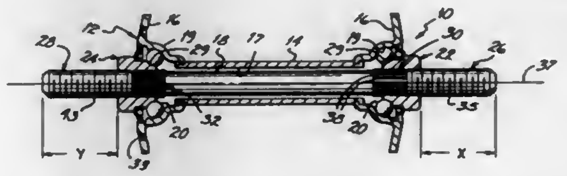
5,531,511
BICYCLE HUB CONE NUT LOCKING ARRANGEMENT

David K. McMurtrey, and Dennis P. Pawsat, both of Maysville, Ky., assignors to Wald Manufacturing Co., Inc., Maysville, Ky.

Filed Sep. 23, 1994, Ser. No. 311,200

Int. Cl.⁶ B60B *27/02*

U.S. Cl. 301—110.5 **12 Claims**



1. An axle for extending through the hub body of a bicycle wheel hub assembly having an improved cone nut locking mechanism comprising:

an elongated axle body having opposing ends with first and second endmost points;
a threaded end section formed on each opposing end of the axle body for threading cone nuts thereon;
a first resistance section formed on the axle adjacent one of the threaded end sections, the first resistance section configured for allowing a first cone nut to be rotated and threaded onto a portion of the resistance section;
a second resistance section formed on the axle adjacent the other threaded end section, the second resistance section configured for allowing a second cone nut to be rotated and threaded onto a portion of the resistance section;
the first and second resistance sections having greater magnitudes of resistance than the adjacent threaded end sections;
the first and second resistance sections operable for resisting said rotation and threading of a respective cone nut thereon, the first resistance section formed on the axle such that when said first cone nut is threaded onto the axle body a predetermined distance from the first endmost point it encounters a cumulative magnitude of resistance to threading greater than the cumulative magnitude of resistance to threading encountered by the second cone nut being threaded onto the axle

body approximately the same predetermined distance from the second endmost point, such that the first cone nut may be threaded onto the first resistance section and locked thereon and the second cone nut may be subsequently threaded onto the second resistance section without rotating the axle body and further threading the first cone nut onto the first resistance section.

5,531,512

BRAKE SYSTEM FOR A MOTOR VEHICLE

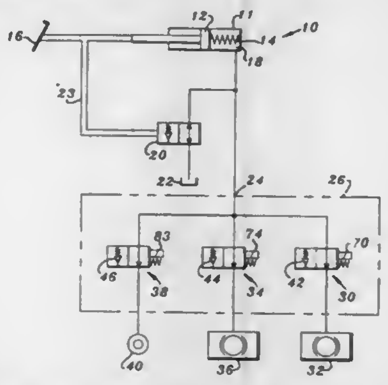
Graham Thompson, Mannheim, Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 20, 1995, Ser. No. 493,228

Claims priority, application Germany, Jun. 22, 1994, 44 21 831.1

Int. Cl.^{6} B60T *11/20;13/68;17/22;* **B62D** *11/08*

U.S. Cl. 303—9.61 **19 Claims**



1. A brake system for a motor vehicle for selectively braking single or multiple wheels, the brake system having a hydraulic master cylinder which is actuated by a brake pedal and which is connected by an electrically controlled valve arrangement to hydraulically operated brakes on both sides of the vehicle, and the brake system also having an electric switching device for controlling the valve arrangement in order to selectively connect the master cylinder with the brakes of both sides of the vehicle or with a brake on one side of the vehicles, characterized by:

an electrical switch contact connected with the brake pedal; and the electrical switching device including a manually operated, spring centered rocker switch which can be switched from a central position into two deflected positions, and the switching device including a locking circuit which establishes the connections between the master cylinder and the brakes on both sides of the vehicle after an end of an actuation of the rocker switch as soon as the brake pedal is moved beyond a pre-set contact point of the switch contact.

5,531,513

HIGH PRESSURE ACCUMULATOR/BYPASS VALVE WITH STATIONARY HIGH PRESSURE SEAL

Wendell D. Tackett, Ann Arbor, Mich., assignor to Kelsey-Hayes, Romulus, Mich.

Filed Dec. 16, 1994, Ser. No. 358,186

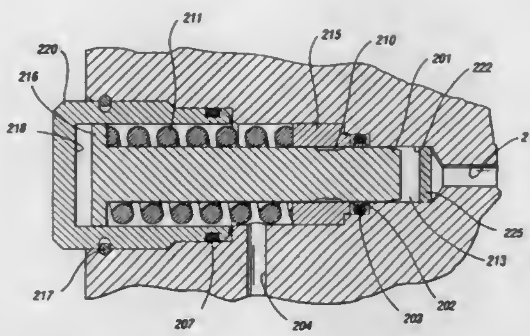
Int. Cl.^{6} F16K *11/07*

U.S. Cl. 303—84.2 **20 Claims**

1. A high pressure accumulator/bypass valve suitable for use in vehicle control systems, comprising:

a body having a stepped bore providing a first diameter and a second diameter immediately adjacent one another, said second diameter being larger than said first diameter, a radially extending shoulder located at the step between said first and second diameters;

a cylindrical piston element having a high pressure end and a low pressure end, the diameter of said low pressure end providing a sliding fit within said bore of said first diameter;



a cylindrical collar concentric to said piston, said collar having an outer diameter and an inner diameter, said inner diameter of said collar providing a sliding fit onto said piston element, the end faces of said collar defining a high pressure face and a low pressure face;

a stationary seal located in said bore of second diameter between said radially extending shoulder and said low pressure face of said collar in a stationary seal retainer space as thereby defined, said stationary seal sealingly engaging said piston element;

a hollow cylindrical retainer having a closed high pressure end, an open end and an internal diameter;

a prestressed coil spring receiving said piston element and having an inner diameter and an outer diameter, the ends of said spring bearing against said piston element and said high pressure face of said collar;

the interior of said retainer and that portion of said stepped bore located on the high pressure side of said stationary seal defining a high pressure fluid reservoir;

a high pressure fluid passage communicating with said high pressure fluid reservoir;

a fluid bypass passage communicating with that portion of said stepped bore located on the low pressure side of said stationary seal;

a relief flow groove in said piston element proximate said collar, the position and length of said relief flow groove selected so as to extend past said stationary seal when said piston element is driven beyond a fixed distance against the pressure of said spring by high pressure fluid allowing fluid from said high pressure reservoir to bypass said stationary seal, said relief flow groove positioned so as to prevent bypass of fluid from said high pressure reservoir when said piston element is not driven beyond said fixed distance.

5,531,514

HYDRAULIC BRAKE SYSTEM FOR VEHICLE

Michiharu Nishii; Hiroshi Toda; Akihito Kusano, and Yoshiki Noda, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 25, 1995, Ser. No. 450,722

Claims priority, application Japan, May 26, 1994, 6-113121; Mar. 17, 1995, 7-058815

Int. Cl.^{6} B60T *8/32*

U.S. Cl. 303—116.1 **7 Claims**

1. A hydraulic brake system for a vehicle comprising:

first and second wheel brakes;

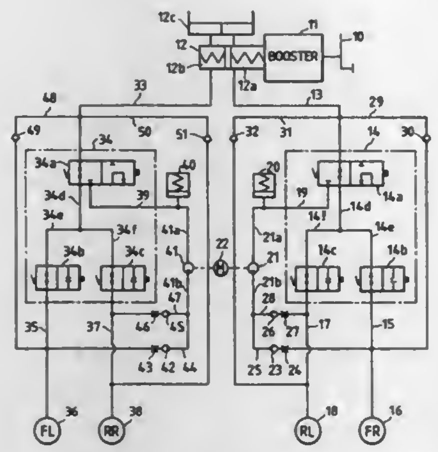
a master cylinder having a pressure generating chamber therein;

a passage through which said first and second wheel brakes are hydraulically connected to said pressure generating chamber in said master cylinder;

a low back pressure reservoir;

a pump for pumping brake fluid in said low back pressure reservoir into said first and second wheel brakes;

a control valve provided in said passage, in which, when said control valve hydraulically isolates said first and second wheel brakes from said pressure generating chamber and hydraulically connects said first and second wheel brakes to said low back pressure reservoir, the brake fluid in said first wheel brake and the brake fluid in said second wheel brake flow into said low back pressure reservoir so that said first and second wheel brakes are decreased in hydraulic pressure, and when said control valve hydraulically isolates said first and second wheel brakes from said pressure generating chamber and said low back pressure reservoir, and said pump pumps the brake fluid in said low back pressure reservoir into said first and second wheel brakes, said first and second wheel brakes are reincreased in hydraulic pressure;



a first check valve and a first orifice through which the brake fluid in said low back pressure reservoir flows into said first wheel brake by said pump; and

a second check valve and a second orifice through which the brake fluid in said low back pressure reservoir flows into said second wheel brake by said pump;

said control valve allowing hydraulic pressure in said first and second wheel brakes to be individually decreased by hydraulically isolating said first and second wheel brakes from said pressure generating chamber and hydraulically connecting said first and second wheel brakes to said low back pressure reservoir, and allowing hydraulic pressure in said first and second wheel brakes to be individually reincreased by hydraulically isolating said first and second wheel brakes from said pressure generating chamber and said low back pressure reservoir, said control valve including an electromagnetic change-over valve movable between one position for hydraulically connecting the pressure generating chamber to the first and second wheel brakes and another position in which said first and second wheel brakes are hydraulically isolated from the pressure generating chamber and are hydraulically connected to said low back pressure reservoir; and

wherein the flow rate of the brake fluid caused to flow into said first wheel brake by said pump is smaller than the flow rate of the brake fluid which is caused to flow from said first wheel brake into said low back pressure reservoir, and the flow rate of the brake Fluid which is caused to flow into said second wheel brake by said pump is smaller than the flow rate of the brake fluid which is caused to flow from said second wheel brake into said low back pressure reservoir.

5,531,515

AUXILIARY BRAKE SYSTEM FOR FOUR-WHEEL-DRIVE VEHICLE

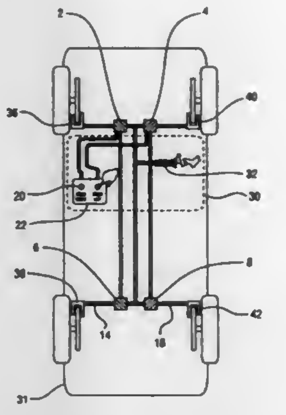
Vincent Circosta, 47989 Cochran Hill Rd., Clarington, Ohio 43915

Filed May 8, 1995, Ser. No. 437,470

Int. Cl.^{6} B60K *23/08*

U.S. Cl. 303—143 **4 Claims**

1. An auxiliary brake system for a four-wheel-drive vehicle which operates in conjunction with the vehicle's hydraulic brake system, comprising:



an electrically actuated, normally open, spring return solenoid valve in fluid communication with the left front brake line of said vehicle's braking system;

an electrically actuated, normally open, spring return solenoid valve in fluid communication with the right front brake line of said vehicle's braking system;

an electrically actuated, normally open, spring return solenoid valve in fluid communication with the left rear brake line of said vehicle's braking system;

an electrically actuated, normally open, spring return solenoid valve in fluid communication with the right rear brake line of said vehicle's braking system; and

engaging means for selectively controlling a plurality of combinations of said solenoids, wherein said engaging means comprises:

a contact closure push-button in electrical communication and control with the electrically actuated, normally open, spring return solenoid in fluid communication with the left front brake line of said vehicle's braking system;

a contact closure push-button in electrical communication and control with the electrically actuated, normally open, spring return solenoid valve in fluid communication with the right front brake line of said vehicle's braking system;

a contact closure push-button in electrical communication and control with the electrically actuated, normally open, spring return solenoid valve in fluid communication with the left rear brake line of said vehicle's braking system; and

a contact closure push-button in electrical communication and control with the electrically actuated, normally open, spring return solenoid valve in fluid communication with the right rear brake line of said vehicle's braking system.

5,531,516

CABINET FOR COMPACT DISK CONTAINERS

Jung-Ching Peng, P. O. Box 82-144, Taipei, Taiwan

Filed Sep. 16, 1994, Ser. No. 306,934

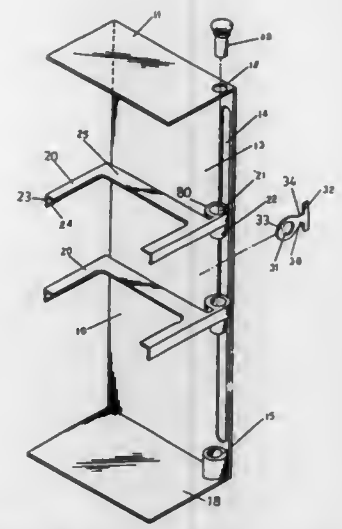
Int. Cl.^{6} A47B *81/06*

U.S. Cl. 312—9.46 **1 Claim**

1. A cabinet for compact disk containers comprising:

a stand provided with an upper plate and a lower plate connected by a side with a vertical slot, said upper plate having at least one corner and being formed at a corner with a hole having a center line in a plane going through a center line of said vertical slot, said lower plate being provided with the center line of a tubular member concentric with the hole of said upper plate;

a plurality of holders being a U-shaped member with a cross member and two legs each extending from an end of the cross member, each of said legs being formed at a lower end with a protruded portion, each of said holders having a tubular portion formed with a recess at an upper end and a cylindrical portion at a lower end, the cylindrical portion of one of said holders being adapted to be fitted in the recess of another one of said holders;



- a stud extending downwardly through the hole of said upper plate to engage the recess of one of said holders at an upper position; and
- a plurality of retainers each formed with a circular portion, a rectangular portion and a neck portion between the circular portion and the rectangular portion, said retainers being snugly fitted in the vertical slot of said stand with the circular portion having a central hole receiving the cylindrical portion of said holder.

5,531,517
INTERLOCKING FRONT-LOAD BULK STORAGE CONTAINERS

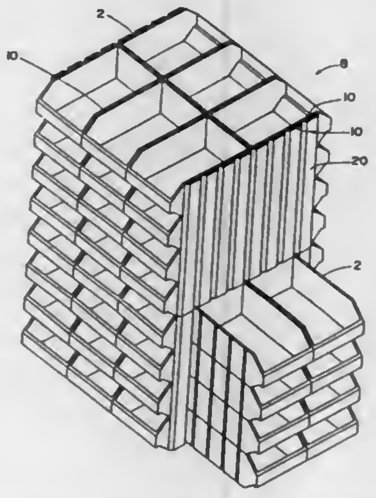
Richard Alpen, R.R. #2, Site 35 - Comp. 22, Penticton, British Columbia, Canada

Filed Sep. 9, 1993, Ser. No. 119,001

Claims priority, application Canada, Jul. 22, 1993, 2101139

Int. Cl.^{6} F16B *12/00*

U.S. Cl. 312—111 **1 Claim**



1. A front-loading interlocking modular merchandising display comprises:

first and second bins each having a top and a bottom, and each having front, rear and side surfaces, said front surfaces each having an opening therein, said side and rear surfaces each having at least one vertical groove on each of said surfaces, said at least one vertical groove extending vertically and continuously from said top to said bottom, whereby corresponding said at least one vertical grooves on said first and second bins are vertically aligned when said first bin is stacked on top of said second bin in vertical columnar relation, and whereby corresponding said at least one vertical grooves on said first and second bins are laterally aligned when said first bin is placed beside said second bin so as to place said side surfaces on each bin in adjacent side-by-side relation,

a rail for snug removable sliding engagement within said at least one vertical groove, said rail having, in cross-section, opposed ends wider than a middle section of said cross-section, wherein each of said at least one vertical groove has a front aperture and a recessed cavity behind said aperture for receiving one of said opposed ends of said cross-section of said rail, said recessed cavity wider in cross-section than said front aperture,

said rail for lateral interlocking mating engagement of said first and second bins when first and second bins are in said adjacent side-by-side relation,

said rail for vertical interlocking mating engagement of said first and second bins when said bins are stacked in said vertical columnar relation, said rail removably slidable along the entire length of said corresponding said at least one vertical grooves on said first and second bins when said first and seconds bins are in said vertical columnar relation,

whereby a first column of said first and second bins may be laterally releasably mated to a second column of said first and second bins when said second column is placed in adjacent side-by-side relation to said first column.

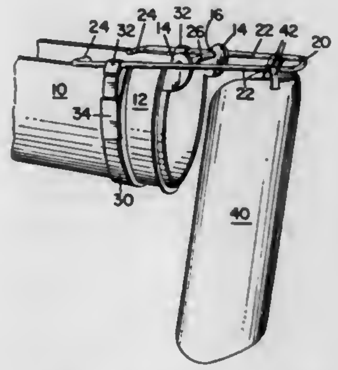
5,531,518
ATTACHMENT FOR DISPENSING CHUTE AND/OR SPLASH GUARD

Kenneth B. Alves, 22 Norwich Rd., Ludlow, Mass. 01056

Filed Jul. 12, 1995, Ser. No. 501,721

Int. Cl.^{6} B28C *7/16;* B65G *11/20*

U.S. Cl. 366—68 **1 Claim**



1. In a delivery system for delivering freshly mixed concrete, the improvement comprising:

an open-ended concrete conveyor chute for discharging concrete and having a concave inner guide surface and a convex outer surface defining a generally U-shape along a main axis and opposite termini defining an entry terminus and a discharge terminus,

an arcuate belly band sleeved over and fixed to the outer surface of the chute adjacent its discharge terminus with a forwardly-projecting ear on each end of the belly band and the ears extending forwardly of and upwardly above respective upper planes of the chute and belly band,

a rearwardly-facing notch in each ear,

a U-shaped frame defining a pair of oppositely-disposed rearwardly-projecting arms,

each arm disposed outboard of a respective ear of the belly band and each arm having an inwardly-facing lateral-extending lug at the distal end of each arm and with a cross arm extending between and connected to the arms and being receivable in the notches of the ears,

a ratchetable cinch strap looped over each arm of the frame adjacent the belly band and being tightenable against the chute outer surface for bringing the strap into tight embracing position against the chute, and

a deflecting skirt disposed forwardly of and in spaced relation to the discharge terminus of the chute for deflecting concrete charged thereagainst,

the skirt including loop means fixed at uppermost edge thereof and the apron being sleevable on the frame for allowing the dependence of the skirt from the frame and pivoting of the skirt in an arc according to the frame configuration and in an orthogonal orientation relative to the chute main axis.

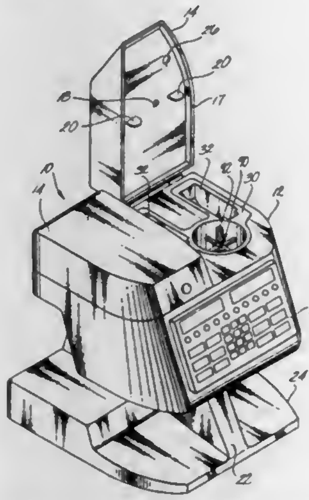
5,531,519
AUTOMATED BONE CEMENT MIXING APPARATUS

Michael L. Earle, 279 Old Ranch Rd., Sierra Madre, Calif. 91024

Division of Ser. No. 88,216, Jul. 6, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,924

Int. Cl.^{6} B01F *13/06*

U.S. Cl. 366—139 **6 Claims**



1. A method for preparing bone cement comprising:

placing dry components of the bone cement in a mixer;

placing vials containing catalyst for the bone cement in vial cavities within the mixer;

sealing the components of the cement within the mixer;

breaking the vials to release the catalyst into the dry components of the bone cement;

starting a preprogrammed mixing sequence; and

collecting mixed cement.

5,531,520
SYSTEM AND METHOD OF REGISTRATION OF THREE-DIMENSIONAL DATA SETS INCLUDING ANATOMICAL BODY DATA

W. Eric L. Grimson, Lexington; Steven J. White, Boston; Gil J. Ettinger, Lexington; William M. Wells, III, Cambridge; Tomas Lozano-Pérez, West Newton, and Ronald Kikinis, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge; TASC, Inc., Reading, and The Brigham & Women's Hospital, Inc., Boston, all of Mass.

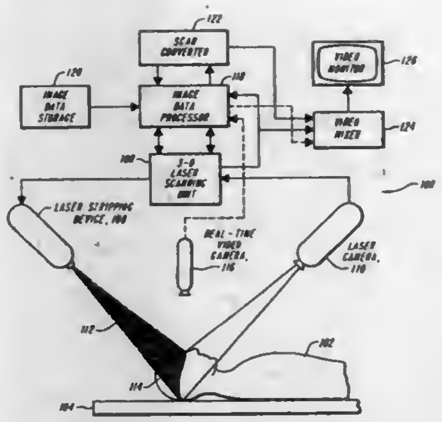
Filed Sep. 1, 1994, Ser. No. 299,378

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—131 **43 Claims**

1. An image data registration system comprising:

an image data storage unit for storing a first data set of three-dimensional image data associated with a predetermined portion of an anatomical body with reference to a first coordinate frame;



an image data acquisition and storage device for obtaining and storing a second data set of three-dimensional image data associated with a surface of said predetermined portion of said object with reference to a second coordinate frame, said image data acquisition and storage device comprises a surface sensing unit for sensing the outer skin surface of said predetermined portion of the body so as to obtain said second data set of three-dimensional image data; and

an image data processor for registering said first and second data sets to generate a matched image data set in which said first coordinate frame is relatively aligned with said second coordinate frame.

5,531,521
LINEAR ROLLING GUIDE UNIT

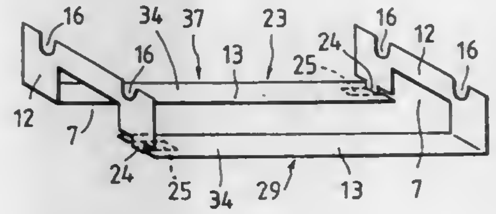
Isao Ochiai, and Osamu Satou, both of Seki, Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 395,103

Claims priority, application Japan, Mar. 4, 1994, 6-058301

Int. Cl.^{6} F16C *29/06*

U.S. Cl. 384—15 **7 Claims**



1. A linear rolling guide unit comprising:

a track rail having first raceway grooves formed on longitudinally extending side wall surfaces thereof;

a casing slidable relative to the track rail and having second raceway grooves formed at positions facing the first raceway grooves;

end caps mounted to the longitudinal ends of the casing;

rolling elements circulating between the opposing first and second raceway grooves;

end seals attached to outer end surfaces of the end caps;

an under seal arranged on the undersides of the casing and the end caps on both sides of the track rail, the under seal being adapted to seal between the casing and the track rail and between the end caps and the track rail;

wherein the under seal comprises a pair of bottom portions arranged on the undersides of the casing and the end caps on both sides of the track rail, and a pair of facing end portions bent integrally from the ends of the bottom portions and fixed to the outer end surfaces of the end caps.

5,531,522

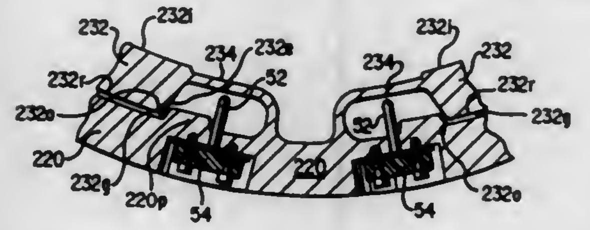
FLUID DAMPENED SUPPORT HAVING VARIABLE STIFFNESS AND DAMPING

Russell D. Ide, Exeter, and Fouad Y. Zeidan, Warwick, both of R.I., assignors to KMC, Inc., Providence, R.I.

Continuation of Ser. No. 945,694, Sep. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 876,718, Apr. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 309,081, Feb. 8, 1989, Pat. No. 5,137,373, which is a continuation-in-part of Ser. No. 283,529, Oct. 25, 1988, Pat. No. 5,112,143, which is a continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned, and a continuation-in-part of Ser. No. 878,601, May 5, 1992, Pat. No. 5,489,155, which is a continuation-in-part of Ser. No. 685,148, Apr. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 309,081, Feb. 8, 1989, Pat. No. 5,137,373. This application Oct. 13, 1994, Ser. No. 322,364

Int. Cl.⁶ F16C *23/08*

U.S. Cl. 384—99 **29 Claims**



1. A fluid dampened support structure
for supporting a bearing for at least radial movement, the support structure comprising a housing formed with a plurality of narrow cuts and grooves so as to define a plurality of circumferentially spaced beam members and a damping fluid filling these spaces formed by the cuts and grooves such that the support structure is fluid dampened; wherein the support structure comprises a plurality of circumferentially spaced pads each having two circumferential ends, each pad being supported on the outer periphery of the support structure by a beam network which acts as a structural spring, the beam network comprising a circumferential beam portion extending from each circumferential end of the pad and a radially extending beam portion extending between the circumferential beam and the outer periphery of the housing, the beam portions together acting as a structural spring having a predetermined spring constant;
means for changing the spring constant of the structural spring after the spring has deflected a predetermined amount; means for adjusting the predetermined amount of deflection which occurs before the spring rate changes.

5,531,523

ROTOR JOURNAL BEARING HAVING ADJUSTABLE BEARING PADS

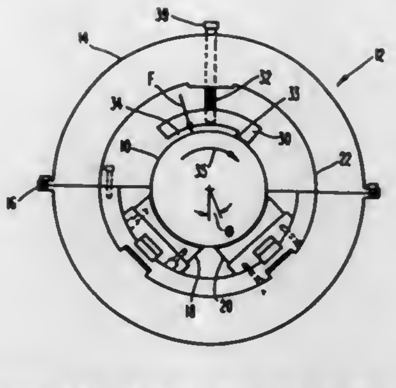
Rajagopal Subbiah, Orlando, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 2, 1995, Ser. No. 456,844

Int. Cl.⁶ F16C *17/03*

U.S. Cl. 384—117 **9 Claims**

1. A journal bearing for supporting a rotor shaft, said rotor shaft having a top and bottom half and a top half outer surface and a bottom half outer surface, said journal bearing comprising:
a bearing shell encasing a portion of said rotor shaft;
a bearing pad mechanically coupled to said bearing shell;
a fluid film disposed between said pad and said top half outer surface;
an adjustment member mechanically coupled to said bearing pad; and
said bearing pad having a pad surface positioned proximate said top half outer surface, said pad surface having a dam for collecting said fluid film therein upon rotation of said rotor shaft to exert a pre-load force upon said top half outer surface at a pre-load force angle, said adjustment member being actuatable to adjust the position of said pad surface in relation to said top half outer surface thereby adjusting said pre-load force angle.



5,531,524

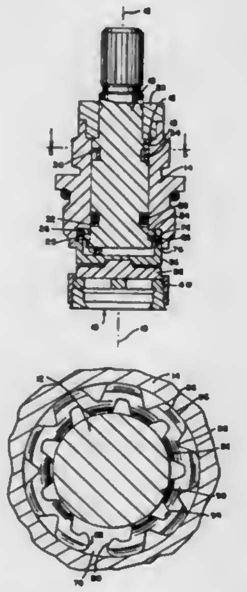
SELF-ADJUSTING BEARING

Douglas J. Brouwer, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Sep. 2, 1994, Ser. No. 300,027

Int. Cl.⁶ F16C *27/02*

U.S. Cl. 384—220 **4 Claims**



1. A bearing positionable around a shaft that is rotatable in a coaxial sleeve such that the bearing mediates between a circumferential outer surface of the shaft and a circumferential inner surface of the sleeve, the bearing comprising a generally ring-shaped member having:
a radially-outwardly undulating surface with a first set of radially extending peaks and valleys;
a radially-inwardly undulating surface with a second set of radially extending peaks and valleys; and
wherein the bearing is sufficiently flexible such that its radial width can be changed in response to radially exerted force and wherein at least one peak is a plateau that forms a bearing surface, said at least one peak being in the form of a truncated pyramid.

5,531,525

SEALED BALL BEARING

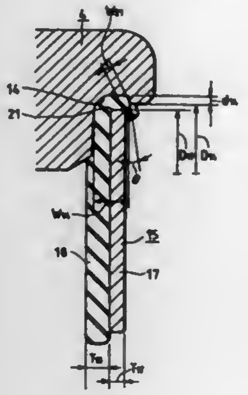
Tadayoshi Hida; Yasutaka Ishida, and Tohru Takamizawa, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 171,623

Claims priority, application Japan, Dec. 22, 1992, 4-092198 U

Int. Cl.⁶ F16C *33/78*

U.S. Cl. 384—482 **9 Claims**



1. A sealed ball bearing comprising:
an inner race having an inner raceway track on an outer surface thereof;
an outer race having an outer raceway track on an inner surface thereof and being arranged so as to be concentric with said inner race;
a plurality of balls arranged so as to be rollable between said inner raceway track and said outer raceway track;
at least one holding groove formed on an edge portion of said inner surface of said outer race over an inner circumference of said outer race; and
at least one seal plate formed into an annular shape and held by said holding groove, said seal plate including a reinforcing plate and an elastic member bonded on one surface of said reinforcing plate, said elastic member including an outer elastic projection projected at an outer circumferential end portion thereof from an end portion of said reinforcing plate on the side of said outer race,
wherein an elongation change ratio of said elastic member is at least 100 percent,
wherein a relationship between the volume of said outer elastic projection and the volume of said holding groove is set within a range of 0.5 to 0.9, and
wherein a clearance is formed between said outer circumference end portion of said reinforcing plate and said holding groove to project a part of said outer elastic projection from said clearance by forcing said outer elastic projection into said holding groove, a ratio of the width of said clearance to the thickness of said elastic member being maintained within the range of ⅓ to ½.

5,531,526

CARTRIDGE FOR A ROLLING BEARING HAVING AN OBLIQUE CONTACT AND THE APPLICATION THEREOF IN A VEHICLE STEERING COLUMN

Jean-Denis Labedan, Bourges, and Laurent Regnier, Vierzon, both of, France, assignors to Nadella, Vierzon Cedex, France

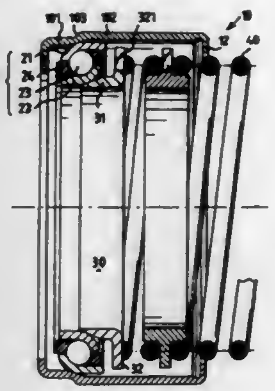
Filed Apr. 14, 1995, Ser. No. 421,925

Claims priority, application France, Apr. 15, 1994, 94 04546

Int. Cl.⁶ F16C *33/58;27/06*

U.S. Cl. 384—518 **22 Claims**

1. Cartridge for a rolling bearing having an oblique contact, which cartridge is intended to be placed in a housing and comprises in combination:



a case which has two successive axial sections of which one section is larger than the other section with an intermediate connection portion uniting said two sections, said case defining a chamber,
a rolling bearing disposed in said chamber and comprising an outer cup-shaped ring which has an outer bearing surface and a toric outer raceway, an inner cup-shaped ring which has an inner bearing surface and a toric inner raceway, and rolling members,
said case comprising a support region which is located partly on said connection portion for receiving said outer bearing surface of said outer ring, and
a collar disposed in said chamber and having an end portion for contacting said inner bearing surface of said inner ring.

5,531,527

APPARATUS AND METHOD FOR VIDEO PRINTING

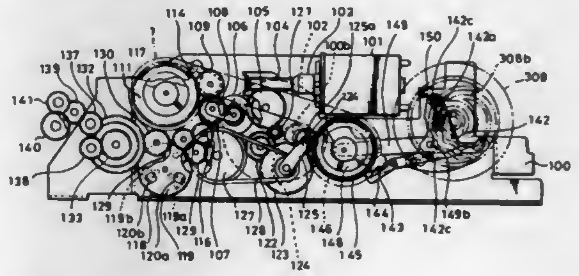
Tomohiro Maekawa; Hitoshi Kamoda; Yasuji Yui, all of Kanagawa; Shin Iima, Tokyo, and Takashi Bunya, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,980

Claims priority, application Japan, May 14, 1993, 5-113060

Int. Cl.⁶ B41J *23/00;33/14*

U.S. Cl. 400—185 **31 Claims**



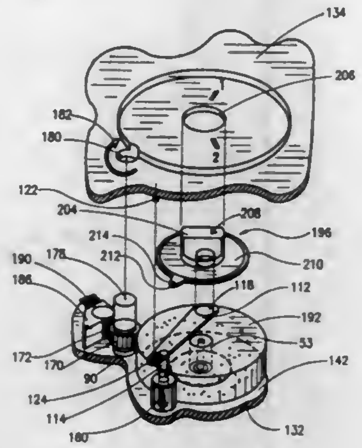
1. A video printer comprising:
a platen, printing head, ribbon cassette, ink ribbon, cam mechanism and a ribbon code ring;
a normally and reversely rotatable first drive motor, said first drive searching the ink ribbon of the ribbon cassette housed in said printer and taking up the ink ribbon by a take-up reel during a printing operation;
a normally and reversely rotatable second drive motor, the second drive feeding a printing paper housed in a tray through a carrying roller by a capstan and a pinch roller to a printing position and a paper delivering position;
a normally and reversely rotatable third drive motor for identifying said ink ribbon by said ribbon code ring and for moving said printing head, which subjects said printing paper to a printing processing, by pressing the ink ribbon thereon with said platen; and
said printing head moved by rotation of the cam mechanism drivingly connected to said third drive motor.

5,531,528
CARTRIDGE FOR PRINTERS

Karl W. Duerr, Watchung, and John J. Krivda, Ewing, both of N.J., assignors to Duerr Tool & Die Co., Inc., Kenilworth, N.J.

Filed Sep. 22, 1994, Ser. No. 310,884
Int. Cl.^{6} B41J *31/16*

U.S. Cl. 400—200 **18 Claims**



1. A replaceable ribbon cartridge for printers and which has a user-controllable re-inking capability, comprising

a casing;

an endless ribbon positioned within said casing so as to be disposed along a path which includes a portion outside of said casing at a printing location;

drive means for advancing said ribbon along said path and comprising a drive roller rotatably mounted in said casing adjacent said path and so as to be in contact with said ribbon;

an ink transfer roller rotatably disposed in said casing adjacent said path and so as to be in contact with said ribbon;

a mounting post attached to the casing;

a porous re-inking roller disposed for rotating concentrically around the mounting post in said casing, and

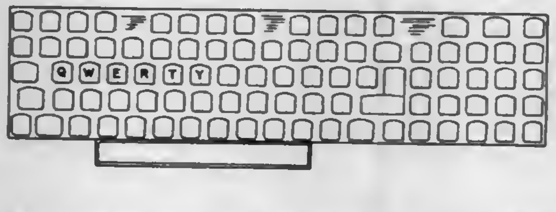
means for rotatably positioning said ink transfer roller in said casing and including means controllable by the user for laterally moving said ink transfer roller to any position between a first operative position, wherein there is no engagement between the ink transfer roller and the re-inking roller, and a second operative position, wherein there is an engagement between the ink transfer roller and the re-inking roller.

5,531,529
INPUT APPARATUS SCALED FOR NON-ADULTS AND ADULTS HAVING SMALL HANDS

Dennis W. Nusser, 512 N. Victoria Terrace, Fort Lauderdale, Fla. 33301

Continuation of Ser. No. 117,418, Sep. 7, 1993. This application Jan. 26, 1995, Ser. No. 378,946
Int. Cl.^{6} B41J *5/12*

U.S. Cl. 400—472 **8 Claims**



1. An ergonomic fixed key apparatus having keys for actuation by an operator for communicating to a processor, suitable for touch typing, said fixed key apparatus comprising:

a housing including a plurality of finger actuable keys, including alphanumeric keys, capable of being depressed through a keystroke travel range for generating desired inputs to be transmitted to the processor and arranged in substantially parallel rows to form an array;

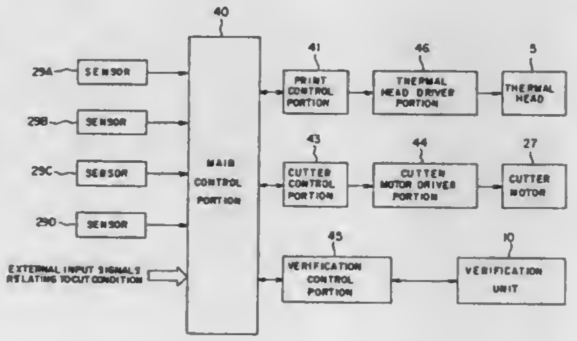
wherein the horizontal key spacing of said alphanumeric keys is 60–86% of the range of 18 to 19 millimeters, centerline to centerline, the vertical key spacing of said alphanumeric keys is 60–86% of the range of 18 to 21 millimeters, centerline to centerline and the keystroke travel range of said alphanumeric keys is 60–86% of the range of 1.5 to 6.0 millimeters.

5,531,530
PRINTER AND A METHOD OF SORTING OUT AND CUTTING PAPERS PRINTED THEREBY

Mitsuo Kuramoto; Seiji Fujioka; Nobuhiko Nii, all of Osaka-fu; Kimio Watanabe, Miyagi-ken; Yutaka Shibata, Miyagi-ken; Isamu Suzuki, Miyagi-ken; Daisuke Saito, Tokyo-to, and Hideaki Matsuda, Miyagi-ken, all of, Japan, assignors to Nitto Denko Corp., Ibaraki, and Tohoku Ricoh Co., Ltd., Shibata-gun, both of, Japan

Continuation of Ser. No. 178,549, Jan. 7, 1994, abandoned. This application Jul. 10, 1995, Ser. No. 500,128
Claims priority, application Japan, Jan. 12, 1993, 5-003514
Int. Cl.^{6} B41J *11/66*

U.S. Cl. 400—593 **9 Claims**



1. Apparatus for producing discrete paper strip elements containing groupings of interconnected job-identification tabs from a continuous paper strip, comprising:

means for feeding a continuous paper strip having opposed, parallel edges along a feed path;

printing means fixedly disposed along said feed path and operative to print job-identification data images at longitudinally spaced locations along said strip;

cutting means fixedly disposed along said feed path downstream of said printing means, said cutting means including:

a cutter operative to produce a transverse cut in said strip;

cutting amount determining means effective to determine the extent of cut produced by said cutter during each operation thereof to selectively extend said cut completely between said strip edges to sever said strip into discrete elements or incompletely transversely of said strip edges to produce in each discrete element a plurality of partially severed tabs interconnected by unsevered paper; and

cutter control means operative to move said cutter for cutting said strip from one edge or the other, said cutter control means cooperating with said cutting amount determining means and including first means operative to move said cutter repeatedly to produce a number of longitudinally spaced partial cuts in said strip corresponding to the number of job units to be identified, and second means operative to move said cutter to completely sever said strip to produce said discrete strip elements containing a grouping of interconnected job-identification tabs.

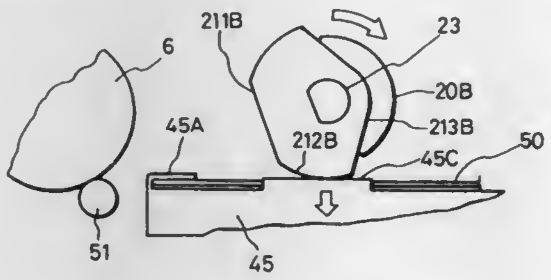
5,531,531
PAPER FEED DEVICE FOR A RECORDING APPARATUS

Hirofumi Hirano, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 72,868, Jun. 4, 1993, abandoned, which is a continuation of Ser. No. 668,397, Mar. 14, 1991, abandoned, which is a continuation of Ser. No. 355,878, May 23, 1989, abandoned, which is a continuation of Ser. No. 25,812, Mar. 13, 1987, abandoned. This application Dec. 27, 1994, Ser. No. 364,413

Claims priority, application Japan, Mar. 18, 1986, 61-58085; Mar. 18, 1986, 61-58086; Mar. 28, 1986, 61-68814; Mar. 28, 1986, 61-68815; Apr. 15, 1986, 61-85040; Apr. 15, 1986, 61-85041; Apr. 15, 1986, 61-85042
Int. Cl.^{6} B41J *11/58*

U.S. Cl. 400—629 **13 Claims**



1. An image forming apparatus, comprising:

sheet stacking means for supporting a stack of sheets;

separation means having a separation pawl for separating a sheet from the stack of sheets by regulating a front edge and upper surface of the stack of sheets and a holding member disposed at a side area of the sheet stack in said sheet stacking means for holding the separation pawl rockably in a sheet stack direction, said separation means being rockably supported;

a feed rotary member having an arc surface of predetermined radius for applying a feeding force to the uppermost sheet of the sheet stack and a cut portion which is formed such that a distance from a center to a contour of the cut portion is smaller than the radius of the arc surface;

bias means for biasing said sheet stacking means toward said feed rotary member; and

cam means for regulating the holding member, said cam means having a cam portion a distance of which from a center to a contour being larger than that of the cut portion of said feed rotary member, an escape cam portion distance of which from a center to a contour being smaller than that of the arc surface when the cut portion opposes the sheet, the cam portion regulating the holding member so that said separation pawl regulates the upper surface of the sheet stack to form a gap between the cut portion and the sheet,

wherein a position of the cam portion to release regulation of said holding member is set so that a step portion between the cut portion and the arc surface does not abut the sheet when the arc surface abuts the sheet; and

image forming means for forming an image onto a sheet fed by said feed rotary member.

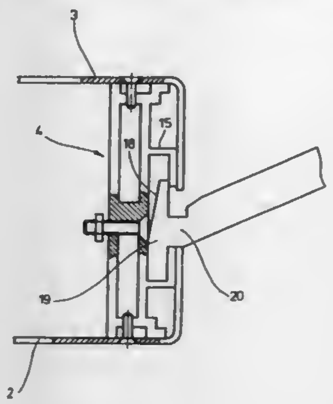
5,531,532
PRINTER AND A PRINTER WITH A FASTENING DEVICE FOR ATTACHING A PERIPHERAL DEVICE TO THE PRINTER

Dirk Umbach, Hattingen, Germany, assignor to Esselte Meto International GmbH, Heppenheim, Germany

Filed Sep. 21, 1994, Ser. No. 310,157
Claims priority, application Germany, Sep. 24, 1993, 43 32 575.0
Int. Cl.^{6} B41J *29/02*

U.S. Cl. 400—692 **20 Claims**

1. A printer, such as a retail printer, for printing an image on a carrier, said printer comprising:



a housing;

means for printing an image onto a carrier;

said printing means being disposed at said housing;

means for moving at least one of: the carrier and said printing means relative to one another;

means for attaching at least one peripheral device to said housing;

said means for attaching comprising:

means for anchoring the at least one peripheral device to said housing;

means for retaining said anchoring means at said housing, said retaining means comprising:

slot means for receiving said anchoring means;

said slot means having a length and a width transverse to said length, said length being greater than said width;

said slot means being disposed along at least a portion of said housing; and

said slot means for permitting said anchoring means to be slidably movable within and along said length of said slot means.

5,531,533

Patent Not Issued For This Number

5,531,534
PROTECTIVE COVER FOR A BALL JOINT ASSEMBLY

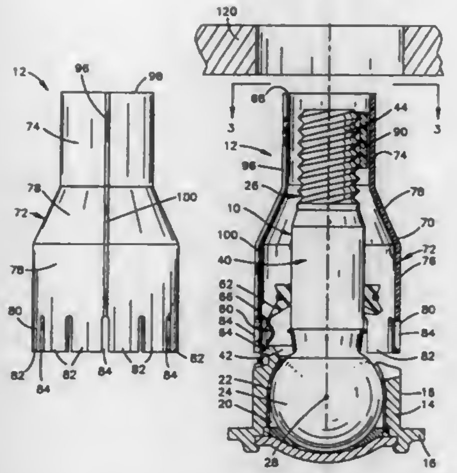
Brian A. Urbach, Rochester Hills, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jun. 23, 1994, Ser. No. 264,595
Int. Cl.^{6} B65D *59/00*

U.S. Cl. 403—12 **9 Claims**

1. A protective cover for a ball joint assembly having a socket with a ball stud and a seal between the socket and the ball stud, said cover comprising:

a generally cylindrical wall for enclosing the stud, said wall having an axially extending weakened portion, said weakened portion breaking in response to shear forces applied to said wall;



means for causing said weakened portion to break prior to any other portion of said wall in response to axial force applied to said wall; and

radially inwardly extending retaining means on said wall for applying a first retaining force to the stud and preventing removal of said cover from the ball joint assembly, said retaining means applying a second retaining force to the stud smaller than the first retaining force in response to breaking of said weakened portion to permit removal of said cover from the ball joint assembly.

5,531,535
DOUBLE CONNECTOR FOR CONNECTING TWO BODIES

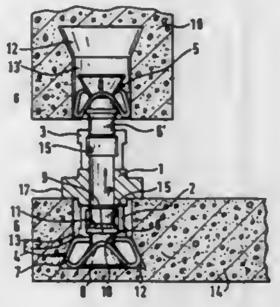
Stefan Lind, Waldachtal, Germany, assignor to fischerwerke, Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Aug. 12, 1994, Ser. No. 289,756

Claims priority, application Germany, Aug. 14, 1993, 9312195 U

Int. Cl.^{6} F16B *2/04*

U.S. Cl. 403—297 **14 Claims**



1. A double connector for connecting two bodies, said double connector consisting of a sleeve-like connecting piece (1) and two anchoring elements (4,5);

wherein said sleeve-like connecting piece (1) has opposite ends and includes a stud part (2,3) at each of said opposite ends;

wherein at least one (5) of the two anchoring elements (4, 5) consists of an expansion element (7) and an anchor core (6) including a bolt part (6') provided with a bolt collar (9); and

wherein at least one (2) of the stud parts (2,3) has an end face (E) for engaging said expansion element (7) and an undercut (15) into which said bolt collar (9) of said bolt part (6') is insertable to secure the at least one (2) of the stud parts and the at least one (5) of the two anchoring elements together as said expansion element (7) is expanded by said end face (E).

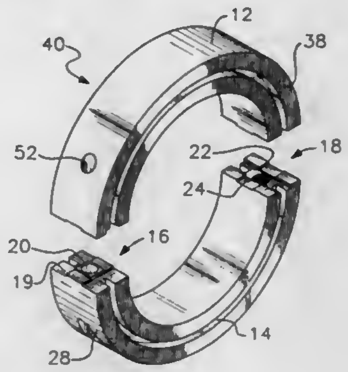
5,531,536
SPLIT SLITTER

Phillip Blanchfield, Greenville, and David Hiltunen, Greenleaf, both of Wis., assignors to Carolina Knife Company, Inc., Asheville, N.C.

Filed Jan. 24, 1995, Ser. No. 377,463

Int. Cl.^{6} F16D *1/00;* B65H *35/02*

U.S. Cl. 403—340 **12 Claims**



1. A cylindrical shaped member comprising:

first and second substantially semi-circular halves connectable and detachable from one another; each half having first and second mating ends;

said first mating end for each half including a first surface having a land projecting therefrom;

said second mating end for each half including a second surface having a major recess therein;

said major recess in said second surface of said first half receiving at least a portion of a corresponding land from said second half;

said major recess in said second surface of said second half receiving at least a portion of said corresponding land from said first half; said first mating end of said first half being engageable with said second mating end of said second half, said first mating end of said first half not being engageable with said first mating end of said second half whereby said first and second halves may be connected together only in one way to form said cylindrical shaped member, and whereby axial and radial movement of said first and second halves is inhibited when said first and second halves are connected together;

each of said semi-circular halves including an outer curved surface and an inner curved surface;

each of said lands including a first ledge adjacent to said outer curved surface and a second ledge adjacent to said inner curved surface;

each ledge having a top surface;

each of said halves including first and second opposed marginal faces;

a first portion of said first surface of said first mating end being located between said land and said first marginal face and a second portion of said first surface of said first mating and being located between said land and said second marginal face;

said lands each including a rectilinear cap extending above said top surface of each of said ledges; said rectilinear cap from said first half including a top surface for engaging with the major portion of said recess of said second half;

each of said lands includes first and second walls respectively extending above said top surfaces of said first and second ledges; said first wall extending from said top surface of said first ledge to said top surface of said cap; said second wall extending from said top surface of said second ledge to said top surface of said cap;

each of said lands includes a first step shaped wall adjacent to said first marginal face of each of said halves rising from said first surface to said top surface of said cap and to said top surface of each of said ledges, and a second step shaped wall adjacent to said second marginal face of each of said halves

rising from said first surface to the top surface of said cap and to said top surface of each of said ledges.

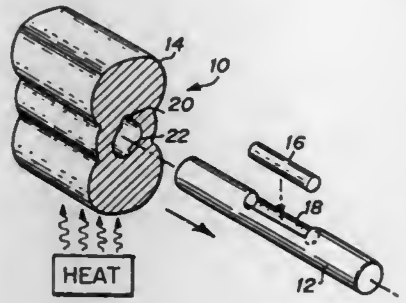
5,531,537
CYLINDRICAL KEY AND SLOT COUPLING

Edward N. Pink, Westlake Village, and Michael F. Johnson, Palmdale, both of Calif., assignors to Edelbrock Corporation, Torrance, Calif.

Filed Jul. 12, 1994, Ser. No. 274,396

Int. Cl.^{6} B25G *3/28*

U.S. Cl. 403—356 **6 Claims**



1. In a dry sump oil pump of the type containing a rotatable shaft for driving a pump rotor, said rotor containing a passage for receiving said shaft, and coupling means for linking said shaft to said pump rotor for joint rotational movement, the improvement therein wherein said coupling means comprises:

a cylindrical pin;

a first cylindrical groove formed in the outer surface of said shaft and extending parallel to the axis of said shaft;

a second cylindrical groove formed in said rotor opening into said passage and extending parallel to the axis of said shaft;

said first and second cylindrical grooves being aligned to define a passage of a size that substantially conforms to said pin for receiving said pin in mating engagement;

said pin being disposed in said passage with said pin having a portion disposed in said first groove and a complementary portion of said pin being disposed in said second groove to bridge any gap between said shaft and said rotor; and

wherein said first groove is of a first depth and said second groove is of a second depth and wherein said second depth is greater than said first depth, and wherein said first groove subtends an arc of less than 180 degrees and said second groove subtends an arc of greater than 180 degrees, whereby said complementary portion of said pin that is disposed in said second groove is greater than said portion that is disposed in said first groove and whereby said second groove essentially captures said pin and holds said pin within said first groove in a position spaced slightly above a bottom to said first groove;

wherein said cylindrical pin portion is received within said first groove with a clearance fit to said first groove and said complementary cylindrical pin portion is received within said second groove with a light press fit said second groove; and

wherein said rotor is formed of a first metal material having a first thermal coefficient of expansion characteristic, and said shaft and pin is formed of a second metal material having a lower thermal coefficient of expansion characteristic than said first metal material.

5,531,538
PORTABLE ELECTRIC POWER TOOL HOUSING

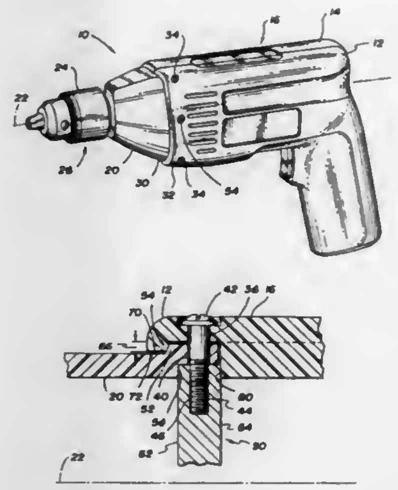
J. Timothy Stolzer, Pickens, S.C., assignor to Ryobi North America, Easley, S.C.

Filed Oct. 13, 1994, Ser. No. 322,221

Int. Cl.^{6} B23B *45/02*

U.S. Cl. 403—374 **13 Claims**

1. In a power tool, an apparatus comprising:



a nose cone having a front end and a rear end oriented along a tool axis, the nose cone containing at the rear end a bevel portion and at least one hole for reception of at least one fastener oriented generally transverse to the tool axis;

a clam shell housing comprising a first and second housing segment, the clam shell housing having a matching bevel portion for cooperation with the bevel portion of the nose cone, the clam shell housing further having at least one hole aligned with the at least one hole of the nose cone for simultaneous reception of the at least one fastener; and

a bearing plate having at least one threaded hole oriented generally transverse to the tool axis for engagingly receiving the at least one fastener;

wherein the matching bevel portion of the clam shell housing cooperates with the bevel portion of the nose cone to convert a generally transverse force resulting from the engaging reception of the at least one fastener to an axial force which acts to secure the nose cone to the clam shell housing.

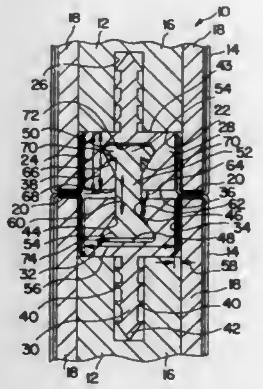
5,531,539
TIGHTLY FITTING PANEL CONNECTION ASSEMBLY

John Crawford, Valrico, Fla., assignor to Exposystems, Inc., Tampa, Fla.

Filed Feb. 12, 1993, Ser. No. 17,151

Int. Cl.^{6} A47G *5/00*

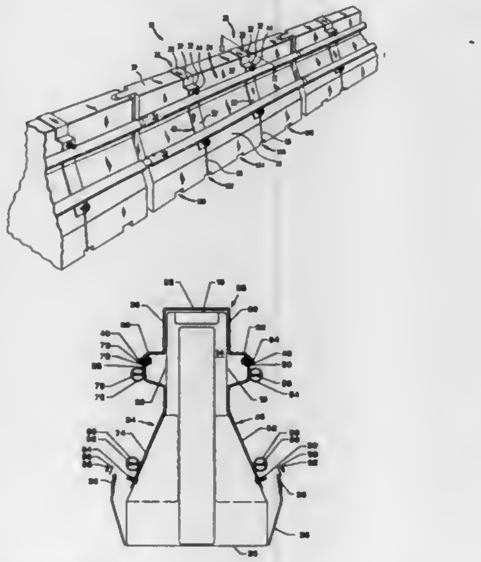
U.S. Cl. 403—381 **19 Claims**



1. An assembly for connecting a pair of panels comprising a pair of elongate first connector members, means for mounting said first connector members in elongate edge portions respectively of the panels, an elongate second connector member having a pair of elongate formations each including an elongate narrow portion and an elongate enlarged portion from which said narrow portion extends, said first connector members each comprising elongate opening means which includes narrow elongate throat means and elongate enlarged cavity means inwardly of said throat means and

which has a shape which is complementary to the shape of said respective formation for receiving said narrow portion and said enlarged portion respectively for connecting said first connector members, said enlarged portion being generally triangular-shaped in cross-section and including in cross-section a pair of sides which flare outwardly from said narrow portion at an angle relative to said narrow portion of between about 10 and 45 degrees.

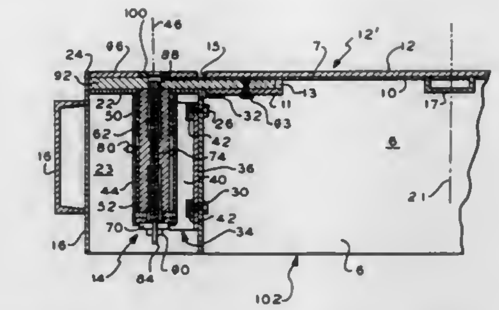
5,531,540
REINFORCEMENT SYSTEM FOR HIGHWAY BARRIERS
David E. Wasserstrom, Elkins Park, and Stuart S. Ostroff, Abington, both of Pa., assignors to Yew Corporation, Wilkes-Barre, Pa.
Filed Jan. 13, 1995, Ser. No. 372,286
Int. Cl.⁶ E01F *13/00*
U.S. Cl. 404—6 **33 Claims**



33. A highway barrier system comprising:
at least one highway barrier having a rigid structure defining a surface;
a frame structure mounted on the surface of said highway barrier; and
force distributing means for distributing forces along a substantially horizontal direction upon impact of a vehicle into said highway barrier so as to lessen the degree of force applied to said highway barrier, said force distributing means including at least one hollow pipe secured to said frame structure and extending substantially horizontally and parallel to the surface of said highway barrier and the road surface on which said highway barrier is arranged.

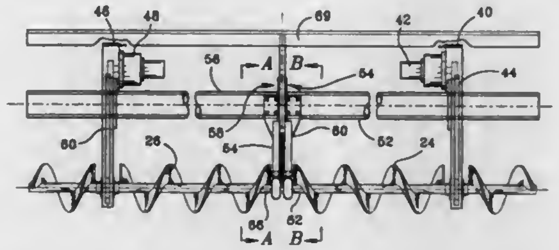
5,531,541
MANHOLE COVER LIFTING APPARATUS
Daniel S. Clover, Boonton, and Mark S. Sisco, Roseland, both of N.J., assignors to Fairfield Industries, Fairfield, N.J.
Filed Mar. 22, 1995, Ser. No. 408,075
Int. Cl.⁶ E02D *29/14*
U.S. Cl. 404—25 **19 Claims**

17. Manhole cover lifting apparatus for lifting the cover off a seat in a cover support structure, the cover support structure defining an access opening to a cavity covered by the cover, said apparatus comprising:
a cover support structure having a cover seat for receiving said cover;
a cover for seating in the support structure seat and for selectively covering and uncovering said opening; and



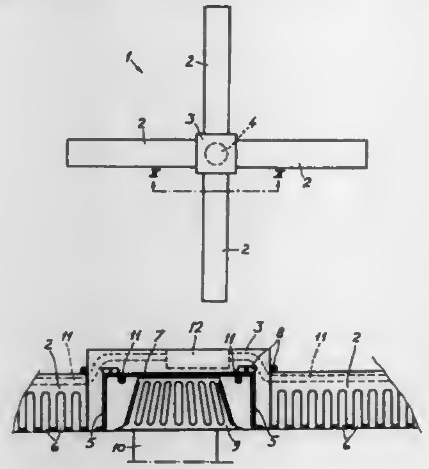
means secured to the cover and externally to the support structure for lifting the cover in translation parallel to the direction of the force of gravity free of the cover seat and for then permitting the freed lifted cover to rotate laterally transverse said direction away from vertical alignment with said opening to provide access to said opening, the means for lifting including rotatable drive means secured between and to the support structure and the cover for lifting the cover in response to rotation of the drive means;
said drive means including a bearing secured to said support structure in fixed axial position and a drive assembly means including screw means secured to the bearing and to the cover wherein the bearing vertically supports the drive assembly means and lifted cover while providing rotational support to the cover and means for lifting.

5,531,542
DUAL AUGER/CONVEYOR DRIVE FOR A PAVER
Paul E. Willis, Orrstown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Nov. 14, 1994, Ser. No. 339,440
Int. Cl.⁶ E01C *19/48*
U.S. Cl. 404—101 **5 Claims**



1. In a paving machine comprising a self propelled tractor carrying a first and second endless feed conveyor, said conveyors positioned on either side of a longitudinal centerline, said conveyors arranged to deliver paving material rearwardly from a hopper to a first and second transverse auger, said augers positioned on either side of said longitudinal centerline, said augers arranged to spread the material outwardly and deposit it onto the surface being paved forwardly of a leveling screed which trails the augers, the improvement comprising:
a. drive box means mounted at the rear of said tractor adjacent each side edge thereof, for rotatably supporting and drivingly engaging said first and second augers independently from each other;
c. support member means spaced above said first and second augers, extending laterally between said drive box means at each side edge, for supporting said augers;
d. controllable power actuator means for moving said first and second augers upwardly and downwardly independently from each other; and
e. said first and second augers and said first and second conveyors defining an unobstructed space therebetween generally at said longitudinal centerline for paving material to fall freely from said conveyors.

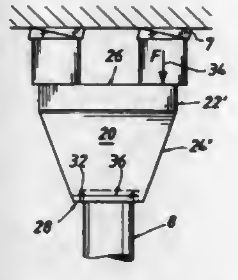
5,531,543
DEVICE FOR ENSURING FREE WATER PASSAGE TO ROOF RAINWATER OUTLETS IN CONNECTION WITH ICE FORMATION
Asle Johnsen, Bjørnsonsvei 13, N-3100, Tønsberg, Norway
PCT No. PCT/NO93/00110, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/01637, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 7, 1993, Ser. No. 362,536
Claims priority, application Norway, Jul. 8, 1992, 922688
Int. Cl.⁶ E04D *13/04;13/064*
U.S. Cl. 405—37 **13 Claims**



1. A device for ensuring free flow of water to roof rainwater outlets, especially on flat roofs, in connection with ice formation, comprising:
a feed means in the form of at least one channel member extending outwards from a gully on the roof surface and being provided with a plurality of side inlet openings along its length;
a heating cable disposed within said channel member, and being connected in an electric circuit for supply of current thereto;
a thermostat connected in said electric circuit for connecting said heating cable to said supply of current;
a temperature sensor mounted at the roof surface for sensing the roof surface temperature, and actuating said thermostat so as to connect the heating cable at a temperature of approximately 0° C.; and
a cycle timer connected in said electric circuit and being started by said thermostat at said temperature, the cycle timer disconnecting the heating cable from said supply of current after a chosen time period.

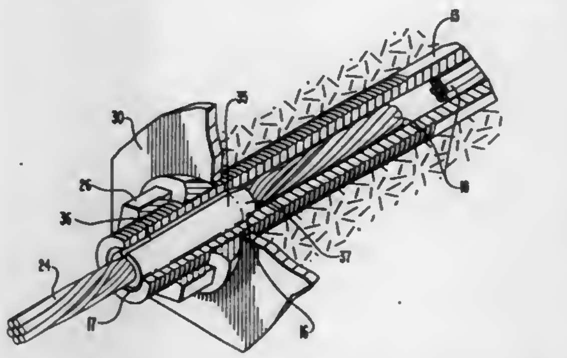
5,531,544
PILE CAP
Frederick E. Willcox, II, Houston, Tex., assignor to Perma Pile Foundation Restoration Systems, Inc., Houston, Tex.
Continuation of Ser. No. 854,775, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 628,459, Dec. 17, 1990, abandoned. This application Oct. 14, 1994, Ser. No. 323,502
Int. Cl.⁶ E02D *5/22*
U.S. Cl. 405—231 **1 Claim**

1. A positionable pile cap separate and apart from the structure supported by it, said pile cap being of homogeneous material for mounting on top of a construction piling and adapted to redistribute the downward force of the vertical load on the piling, comprising
an upper member and a base member;
said upper member being separate from the supported structure and having a substantially horizontal top surface area;
said base member being separate from the piling, and having a substantially horizontal bottom surface area of lesser dimension than said top surface area;



said top surface area and said bottom surface area being proportionally dimensioned;
said bottom surface area being recessed for placement on the piling;
tapered sides joining said upper member and said base member wherein the angle of the sides is proportional to the height of the pile cap; and
at least one of said tapered sides includes a vertical scale for allowing the monitoring of settlement of the vertical load by accessing the pile cap when it is in service.

5,531,545
CABLE BOLT STRUCTURE AND METHOD
Ben L. Seegmiller, 143 S. 400 East, Salt Lake City, Utah 84111, and John A. Reeves, Jr., 16653 W. Archer Ave., Golden, Colo. 80401
Filed May 11, 1995, Ser. No. 440,746
Int. Cl.⁶ G21D *21/00*
U.S. Cl. 405—259.4 **8 Claims**



1. A mine roof cable bolt structure including, in combination: an elongated metal tubular member having a hollow interior, reaction structure provided said tubular member, a cable bolt provided a cylindrical member whereby to create a peripheral sectional enlargement, as to a portion of said cable bolt, which has a nominal transverse peripheral dimension greater than the corresponding transverse cross-section of said hollow interior of said tubular member, said sectional enlargement thereby cooperating with said tubular member within an interference fit, whereby to expand radially outwardly said tubular member in said tubular member's elastic range, for creating a pressure bubble, whereby to offer elastic resistance to movement of said metal tubular member, over said sectional enlargement.

5,531,546
MORTAR COMPOSITION

Alwin Herdlicka, Bad Nauheim; Ludwig Gebauer, Olching, and Gabriele Grundmann, Landsberg, all of, Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 340,964, Nov. 17, 1994, abandoned, which is a continuation of Ser. No. 177,653, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 32,563, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 873,670, Apr. 23, 1992, abandoned, which is a continuation of Ser. No. 623,237, Dec. 4, 1990, abandoned. This application Apr. 19, 1995, Ser. No. 425,691

Claims priority, application Germany, Dec. 6, 1989, 39 40 309.2

Int. Cl.^{6} E21D *20/00;21/00;* **C08F** *26/02;* **C08J** *3/00*

U.S. Cl. 405—259.5 **2 Claims**

1. A method for fastening an anchor rod in a bore hole comprising placing a curable component for fastening an anchor rod in bore holes containing a curable component comprising in percent by weight about:

vinyl ester urethane resin 9 to 65, obtained from toluene diisocynate or diisocyanatodiphenyl methane,

reactive diluent	11.5 to 30,
accelerator	0.03 to 1.5,
mineral filler	15 to 85,
thixotropic agent	0 to 5

and the curing agent comprising in percent by weight about:

organic peroxide 0.2 to 5, in the bore hole and introducing the anchor rod to said bore hole so as to mix the curable component with the curing agent.

5,531,547
REINFORCED EARTH CONSTRUCTION

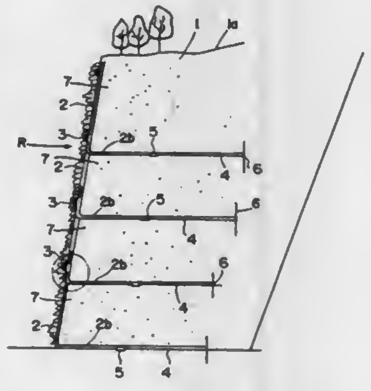
Shunsuke Shimada, Tokyo, Japan, assignor to Kyokado Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 320,961

Claims priority, application Japan, Oct. 20, 1993, 5-262343

Int. Cl.^{6} E02D *5/00*

U.S. Cl. 405—262 **18 Claims**



1. An earth retaining revetment comprising: reinforcing rods orthogonally arrayed and secured together to define a substantially vertical retaining wall frame having inner and outer frame wall surfaces; anchor rods having outboard and inboard ends, said outboard ends being secured to said retaining wall and said anchor rods extending horizontally away from said retaining wall frame inner surface for embedment in earth to be retained by said revetment, said inboard ends of said anchor rods being secured to cross member earth anchor plates; and means to individually adjust the lengths of said anchor rods, whereby vertical and horizontal alignment of said revetment may be obtained and the revetment may be tensioned and stabilized as required by individually adjusting the lengths of said anchor rods.

5,531,548
DRILL FOR HARDLY MACHINABLE MATERIALS AND DRILLING METHOD USING THE SAME

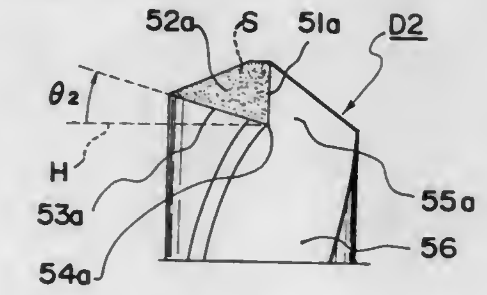
Taizo Shimomura, Seisakusho, Japan, assignor to Kabushiki Kaisha Shimomura Seisakusho, Kanagawa-ken, Japan

Filed Nov. 7, 1994, Ser. No. 335,326

Claims priority, application Japan, Jun. 8, 1993, 5-164281

Int. Cl.^{6} B23B *51/02*

U.S. Cl. 408—145 **1 Claim**



1. A drill to cut difficult machinable materials, comprising a drill body having major flanks extending in a backward direction of rotation from major cutting edges, said flanks having an ascending slope and ultra-hard cutting grains adhered thereto.

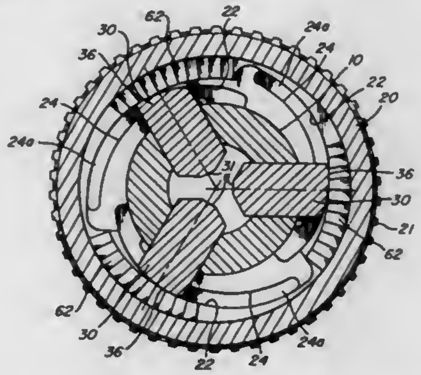
5,531,549
AUTO-LOCK DRILL CHUCK

Gregory Fossella, Osterville, Mass., assignor to Great Bay Tool Corporation, Hyannis, Mass.

Continuation-in-part of Ser. No. 221,384, Mar. 31, 1994, Pat. No. 5,448,931, which is a continuation-in-part of Ser. No. 638,828, Jan. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 387,220, Jul. 28, 1989, abandoned, Ser. No. 392,206, Aug. 10, 1989, Pat. No. 5,067,376, and Ser. No. 567,290, Aug. 14, 1990, Pat. No. 5,090,273. This application Nov. 4, 1994, Ser. No. 334,726

Int. Cl.^{6} B23B *31/171*

U.S. Cl. 408—240 **21 Claims**



1. A power drill for turning a drill bit having a keyless drill chuck comprising:

a drill housing and a motor in the housing for driving the drill,

a drive shaft rotatable about an axis and connected to the motor, the drive shaft having top and bottom ends and an axially extending chamber open at the bottom end of the drive shaft,

a support rigidly secured to the drive shaft and extending outwardly with respect to the axis,

a plurality of equally spaced radial slots extending upwardly from the bottom of the drive shaft and a shoulder provided in each slot spaced from the bottom of the drive shaft,

a plurality of chuck jaws, one for each slot, having narrow waists that are positioned in the slots, confining the jaws to radial motion in the slots for closing and opening the jaws, a jaw shoulder attached to the narrow waist and cooperating

with the shoulder on the drive shaft to secure the jaw in axial position with respect to the drive shaft, the jaws extending below the bottom end of the drive shaft, a gripping surface disposed on the jaws at an inside face with respect to the axis, and a cam surface disposed on the jaws,

an annular ring rotatable on and surrounding the drive shaft above the support and having cam surfaces which engage the jaws for moving the jaws radially in the slots in response to rotation of the adjusting ring with respect to the drive shaft,

a resilient material disposed on each jaw between the gripping surface and the cam surface for absorbing a compressive force between the drill bit and the adjusting ring when the adjusting ring is turned to secure the jaws about the drill bit,

a plurality interlocking ratchet teeth on the support and the adjusting ring which prevent the adjusting ring from rotating with respect to the shaft when the teeth are interlocked thereby preventing the jaws from opening, and

a spring located between the housing and the adjusting ring for yieldably biasing the adjusting ring toward the support to cause the teeth to interlock, said spring enabling a user to move the adjusting ring away from the support and disengage the teeth so that the adjusting ring may be rotated with respect to the drive shaft to open the jaws for releasing a drill bit.

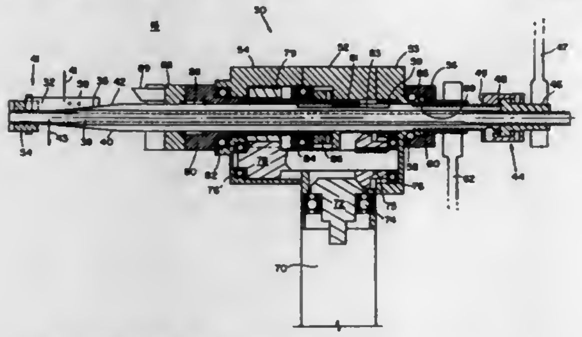
5,531,550
CLAMP RELEASE MECHANISM FOR AN END FINISHING TOOL

James A. Moruzzi, Sherborn, Mass., assignor to Esco Technologies, Inc., Medfield, Mass.

Filed Sep. 30, 1994, Ser. No. 316,221

Int. Cl.^{6} B23C *3/02*

U.S. Cl. 409—179 **12 Claims**



1. An end finishing tool, comprising:

a mandrel with a plurality of ribs at its distal end;

an actuator longitudinally movable in a first direction relative to said mandrel for moving said ribs radially outwardly in the installation mode to grip the inner surface of a conduit to be finished and in a second opposite direction for enabling said ribs to move radially inwardly in the extraction mode;

an actuator driver threadably engaged with said actuator for driving said actuator in said first and second directions; and

a clamp release device for arresting axial movement of said actuator driver in said extraction mode for compelling said actuator to move in said second direction for enabling said ribs to move radially inwardly and release the inner surface of said conduit.

5,531,551
RIVET ASSEMBLY

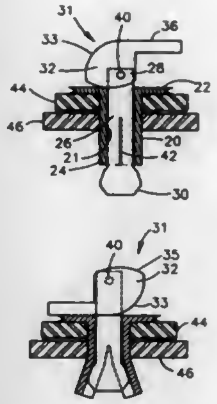
James D. Bowers, 6559 Quarry La., Dublin, Ohio 43017

Filed Sep. 29, 1994, Ser. No. 314,671

Int. Cl.^{6} F16B *19/00*

U.S. Cl. 411—70 **1 Claim**

1. A rivet type fastening device for fastening a first and second member together through aligned holes in said members, comprising, in combination:



a) a rivet body including resilient outer walls defining a centrally disposed axial bore having a predetermined unexpanded diameter defining an unset condition, a set head at one end of said bore and a free end at an opposing end of said bore, said rivet body being slideably insertable through said aligned holes in said first and second members in the unset condition with said set head engaging a surface surrounding the hole in said first member;

b) a pull shank slideably received within said axial bore of said rivet body and including a first end provided with an enlarged mandrel head having a diameter essentially equal to the outside diameter of said rivet body, said mandrel head extending beyond said free end when said rivet body is disposed in said unset condition, and an opposing second end extending outwardly from said rivet body and through said set head;

c) an actuator including an outwardly extending arm fixed to a body portion provided with a cam surface, said body portion being pivotally mounted about a pivot pin to said second end of said pull shank, said cam surface being engagable with said set head of said rivet body such that upon rotation of said arm through a predetermined arc in a first direction, said pull shank is slideably moved within said axial bore in a direction toward said set head to draw said mandrel head into the free end of said axial bore in a releasably fixed position to resiliently expand a portion of the outer walls of said rivet body into engagement with a surface of said second member and defining a set condition; and wherein rotation of said arm and cam surface through said predetermined arc in an opposite second direction releases said enlarged mandrel head for movement outwardly from the free end of said axial bore causing said outer walls to resiliently return to an unexpanded condition with said axial bore in said unset condition, whereby said rivet body, pull shank and actuator may be freely extracted from said aligned holes in said first and second member as an integrally connected unit.

5,531,552
SELF-ATTACHING NUT AND METHOD OF MAKING SAME

Takao Takahashi, Machida, and Hiroshi Takehara, Hachioji, both of, Japan, assignors to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 11,439, Jan. 29, 1993, Pat. No. 5,340,251, and a continuation-in-part of Ser. No. 285,201, Aug. 3, 1984. This application Aug. 22, 1994, Ser. No. 293,800

Claims priority, application Japan, Feb. 25, 1994, 6-215115

Int. Cl.^{6} F16B *37/04;* **B23P** *11/00*

U.S. Cl. 411—179 **13 Claims**

1. A self-attaching nut, said nut including a central annular projecting pilot portion having an axial bore therethrough, an annular flange portion generally surrounding said pilot portion having a generally flat end face extending generally perpendicular to an outer surface of said pilot portion, and an annular groove in said flange portion surrounding said pilot portion, said groove having opposed inner and outer side walls and on bottom wall, said

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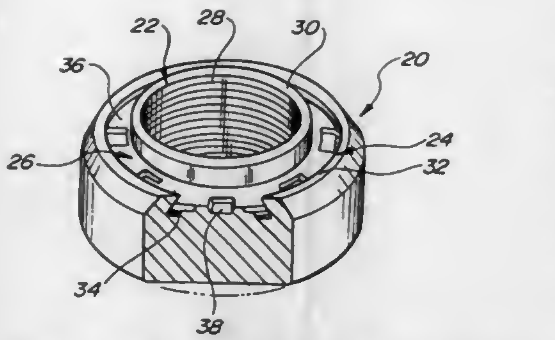


groove outer side wall including a portion inclined inwardly radially toward said pilot portion to define a restricted opening to said groove bottom wall, and said groove bottom wall including a plurality of circumferentially spaced protuberances separated by radially extending circumferentially spaced channels extending from adjacent said groove inner wall to said outer wall.

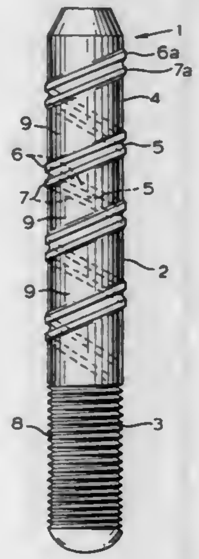
5,531,553
MASONRY FIXING

Charles Bickford, 10 Aldermans Hill, Hockley, SS5 4RW, United Kingdom

Continuation-in-part of Ser. No. 6,714, Jan. 20, 1993, Pat. No. 5,320,216. This application Jan. 19, 1994, Ser. No. 184,550

Int. Cl.^{6} F16B *35/00;35/04*

U.S. Cl. 411—389 **12 Claims**



1. A fixing device for use in fixing to masonry or timber substrates, the device comprising a shank having a bore entry end and an opposed end which is provided with a head and is separated from the bore entry end by the length of the shank, at least a portion of the shank length being configured with a thread rolled helical groove depressed into the blank circumference of the shank so as plastically to displace shank material to at least one of the groove sides, the groove being defined adjacent a helical ridge juxtaposed to a side of the groove and formed of said plastically displaced shank material, said ridge being upstanding from the blank circumference to the shank so as to function in use as a male thread, at least the leading end of the thread being a female thread-cutting male thread in relation to the material of the substrate, and helical ridge and defined helical groove forming a shank configuration whose convolutions are spaced apart by an intervening land in relation to which the ridge is raised and the groove is depressed, and wherein said land has a width measured axially with respect to the shank of at least 4 mm and at least 50% of the land shank diameter, and the helix angle of the helical ridge being at least 10°.

5,531,554
SELF-RETAINING MEANS FOR FASTENERS PARTICULARLY SCREWS

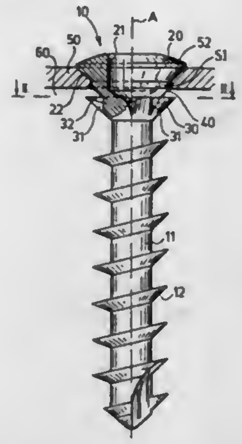
Jean-François Jeanson, Assenay, and Jean Huppert, L'Etrat, both of, France, assignors to JBS S.A., Troyes, Cedex, France

Filed Nov. 4, 1994, Ser. No. 336,655

Claims priority, application France, Nov. 5, 1993, 93 13165

Int. Cl.^{6} F16B *23/00;39/00*

U.S. Cl. 411—399 **5 Claims**



1. A fastener for insertion through aligned holes of two components to be secured to one another by the fastener, comprising

(a) a shaft portion having an end;

(b) a fastener head disposed at said end; and

(c) retaining means for maintaining the fastener captive by the components; said retaining means including

(1) a conical collar being situated between said shaft portion and said fastener head; said conical collar surrounding said axis and having a maximum diameter base oriented toward said fastener head; said conical collar having radial recesses; and

(2) a conical neck part surrounding said axis and disposed between said fastener head and said conical collar; said conical collar and said conical neck part having cone angles of identical magnitude and orientation.

5,531,555
BALE COLLECTOR WITH ROLLERS AND BALER SUITABLE THEREOF

Thomas H. D. Meijer, Stadsweg 123, 9792 Re Ten Post, Netherlands

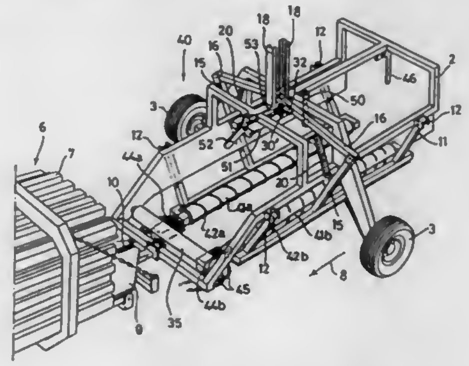
Division of Ser. No. 232,728, Apr. 25, 1994. This application Aug. 1, 1995, Ser. No. 509,830

Claims priority, application Netherlands, Apr. 26, 1993, 9300712

Int. Cl.^{6} A01D *85/00*

U.S. Cl. 414—24.5 **4 Claims**

1. Bale collector, comprising a frame provided with wheels for supporting the bale collector as it is moved in a direction of travel, bale-carrying means, and control means for taking the carrying means into a collecting state or into an unloading state for collecting bales on the carrying means or unloading bales from the carrying means and depositing collected bales on the ground, the carrying means comprising rollers with parallel horizontal axes, and the rollers being suitable for collecting a row of two or more bales thereon between a front end and a rear end of the carrying means, and drive means being disposed on the frame and coupled to the rollers, which drive means in the collecting state and during the unloading state drive the rollers for conveying the bales received backwards, wherein the axes of the rollers run parallel to the direction of travel, the rollers each have a conveyor screw thread, and the drive means drive the rollers in a direction of rotation which is such that a bale carried thereon is pushed backwards by the screw threads.



5,531,556
REARRANGEMENT APPARATUS FOR MANUFACTURING SYSTEM

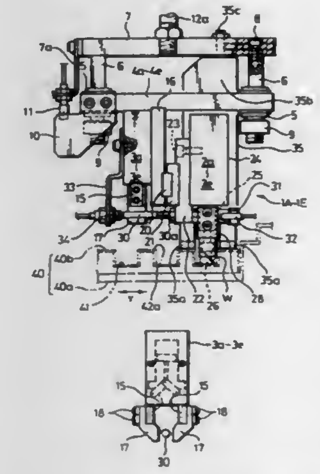
Kenji Kiyokawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 280,451

Claims priority, application Japan, Jul. 30, 1993, 5-190308

Int. Cl.^{6} B65H *9/08*

U.S. Cl. 414—225 **7 Claims**



1. A parts conveying apparatus for grasping parts accommodated in a first parts accommodating portion and for conveying the grasped parts to a second parts accommodating portion, comprising:

a plurality of main chucks, each having a first pair of chuck members movable in a first direction between a closed position wherein a part is grasped and an opened position;

a plurality of support members for supporting said plurality of main chucks so that said plurality of main chucks are each independently slidable in said first direction;

a plurality of sub-chucks each of which move in unison with one of said plurality of support members, each of said sub-chucks having a second pair of chuck members movable between a closed position wherein they grasp a rod-like member to fix a corresponding one of said plurality of main chucks in a predetermined position, and an opened position to allow said corresponding one of said main chucks to slide in said first direction along a support member; and

conveying means for conveying said plurality of main chucks and said plurality of sub-chucks from a first position in which said first parts accommodating portion can be accessed to a second position in which said second parts accommodating portion can be accessed, wherein when said parts are grasped in said first parts accommodating portion, said first chuck members are moved from said opened positions to said closed positions while said second chuck members are set in said opened positions, whereafter said second chuck members are closed and said plurality of main chucks become fixed in said predetermined positions.

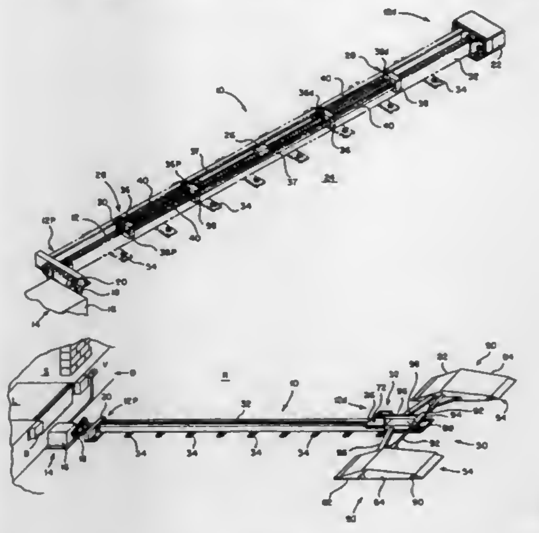
5,531,557
DRIVE SCREW SYSTEM WITH NESTED MOBILE SUPPORTS

Scott L. Springer, Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Jul. 1, 1994, Ser. No. 269,835

Int. Cl.^{6} B60T *3/00;* **B65G** *67/02;* **F16H** *25/20*

U.S. Cl. 414—401 **53 Claims**



1. A drive screw system comprising

a drive screw adapted for rotation having proximal and distal ends,

a drive nut threadedly engaging the drive screw for linearly displacement between the proximal and distal ends of the drive screw in response to rotation of the drive screw,

a track having a plurality of bearing assemblies coaxially disposed relative to each other from an inner to an outer bearing assembly and mounted to the track for supporting the drive screw and which automatically moves between the proximal and distal ends of the drive screw in response to the drive nut to automatically maintain a predetermined maximum unsupported length of the drive screw, and wherein each bearing assembly comprises two bearing supports connected at a fixed length.

5,531,558
SPARE TIRE LIFTING DEVICE

Edward H. Ruescher, 7714 Wild Eagle, San Antonio, Tex. 78255

Filed Jun. 22, 1994, Ser. No. 263,578

Int. Cl.^{6} B62D *43/04*

U.S. Cl. 414—463 **8 Claims**

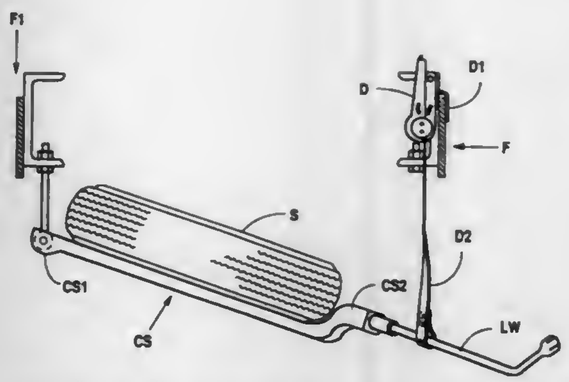
1. Apparatus for raising and lowering a spare tire for an automotive vehicle having a frame to a suspended position beneath the frame of the automotive vehicle, comprising, in combination:

an elongated lifting bar horizontally pivotally mounted at one end of said frame and shaped to underlie said spare tire in generally diametric relation thereto;

the other end of said bar extending beyond said spare tire, whereby a lifting force applied to said other end of said lifting bar will elevate said spare tire to a stowed position relative to said vehicle frame;

an elongated flexible lifting element;

a winch having a frame and a reel rotatably mounted on said frame for wrapping one end of said flexible lifting element thereon;



means for detachably mounting said winch frame to a portion of said vehicle frame at a position generally overlying all positions of said other end of said lifting bar;

means including a manual actuating lever pivoted on said winch frame for incrementally rotating said reel to wind said flexible lifting element; and

means for detachably securing the other end of said flexible lifting element to said other end of said lifting bar, whereby incremental rotation of said reel will wind said flexible lifting element thereon and elevate said tire to its said stowed position.

5,531,559

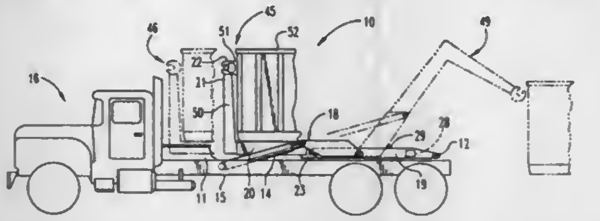
VEHICLE MOUNTED HOOK HOIST FOR LOADING, TRANSPORTING AND DUMPING CONTAINERS

Kent Kruzick, Winamac, Ind., assignor to Galbreath, Inc., Winamac, Ind.

Filed Oct. 1, 1993, Ser. No. 81,522

Int. Cl.^{6} B60P *1/28*

U.S. Cl. 414—498 **14 Claims**



1. A vehicle mounted hoist for loading, transporting and dumping containers, comprising;

a vehicle having a rear;

a tail frame pivotally mounted at a tail frame pivot pin to the rear of the vehicle;

a jib assembly pivotally mounted to said tail frame at a jib assembly pivot pin located forwardly of the tail frame pivot pin, said jib assembly including a telescopically extendable jib with an outboard end to which is connected a hook configured to engage with the container;

jib actuation means connected between the vehicle and said jib assembly and being for pivoting said jib assembly about one of the pivot pins;

a locking assembly connected with said tail frame and said jib assembly and having a locked condition wherein said jib assembly is locked to pivot as a unit with said tail frame about the tail frame pivot pin, and having an unlocked condition wherein said jib assembly is unlocked from said tail frame and able to be pivoted about the jib assembly pivot pin, and wherein said locking assembly is operably connected with the jib so that complete retraction of the jib changes said locking assembly from the locked to the unlocked condition only when said jib assembly and said tail frame are both in a rest position lying substantially horizontally atop the vehicle;

wherein said tail frame has at least one rearward end and at least one forward end, the at least one rearward end of said tail frame being pivotally mounted to the rear of the vehicle, and wherein said locking assembly includes at least one latch pivotally operable to engage and lock said tail frame with said jib assembly in the locked condition;

wherein the at least one latch is pivotally mounted to said jib assembly and the jib assembly pivot pin is located between the at least one rearward end and the at least one forward end, and wherein the at least one latch is biased for continuous locking engagement with the at least one forward end of said tail frame;

wherein said locking assembly further includes linkage elements connected with the at least one latch, and wherein, upon complete retraction of said jib, said jib engages with the linkage elements to urge the at least one latch out of locking engagement with the at least one forward end of said tail frame; and,

wherein said locking assembly includes latch control means operably connected with the at least one latch and for transmitting movement of the linkage elements upon complete retraction of said jib when said jib assembly and said tail frame are both in the rest position thereby allowing the linkage elements to pivot the at least one latch out of locking engagement with said tail frame, said latch control means further being operable to absorb movement of the linkage elements upon complete retraction of said jib when said jib assembly and said tail frame are in the locked condition and pivoted away from the rest position, said absorption of the linkage movement thereby precluding the linkage elements from pivoting the at least one latch out of locking engagement.

5,531,560

MOTORCYCLE TOWING DEVICE

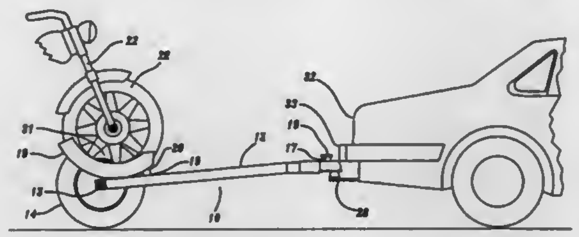
Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Bloomfield Hills, Mich.

PCT No. PCT/US92/02217, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/18936, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 19, 1992, Ser. No. 295,851

Int. Cl.^{6} B60P *3/06*

U.S. Cl. 414—563 **19 Claims**



1. A trailer for towing at least one vehicle having a single front wheel mounted on an axle with a towing vehicle, comprising:

a rotatable frame;

at least two wheels which support said frame, each wheel being rotatable about an axle, and the frame being rotatable about said at least two wheels;

means on said frame for retaining the front wheel of said vehicle, said means including one or more arcuate shaped carriage members substantially fixably mounted to said frame wherein said carriage members are rotatable about said at least two wheels in accordance with rotation of said rotatable frame to receive said front wheel of said vehicle, said carriage members serving to secure said at least one vehicle in an upright position, said carriage members being arranged to support said front wheel of said vehicle such that said axle of said vehicle is over and ahead of said trailer axle whereby weight of the front wheel of said vehicle being transferred to said trailer assists in maintaining said vehicle in an upright position during towing;

means for attaching said trailer to a towing device; and

means for securing said at least one vehicle to said trailer.

5,531,561

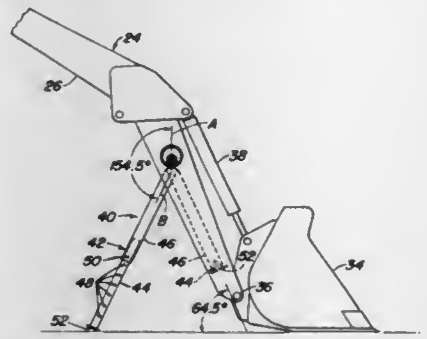
LOADER PARKING STAND SYSTEM

Rory Rae, Port Colborne; Ken K. Oka, St. Catharines; Gordon D. Hubbard, Beamsville; Frank F. Rocco, Welland; David W. Bratt, Fenwick; Dean R. Chalmers, Waterloo, and Ron M. Hind, Stevensville, all of, Canada, assignors to Deere & Company, Moline, Ill.

Filed Dec. 13, 1994, Ser. No. 354,298

Int. Cl.^{6} E02F *3/00*

U.S. Cl. 414—686 **9 Claims**



1. In a front end loader including a boom including a pair of parallel arms having their rear ends respectively pivotally mounted to upper ends of a pair of upright masts and having their respective forward ends pivotally attached to an implement, and a parking stand system including a pair of parking stands respectively mounted upwardly and rearwardly from the implement to a pair of transversely spaced locations of the boom, the improvement comprising: said parking stand system, as considered with the loader in a park attitude with the implement resting on the ground, including a pair of cylindrical mounting receptacles respectively fixed to said boom, in substantially vertical orientations, at said pair of locations; each of said pair of parking stands including a main leg portion located along a first axis and a connecting pin angled from said axis so as to define an included obtuse angle therewith; each connecting pin being received in a selected one of said mounting receptacles for movement between stored and park positions; and each stand including a releasably latch means for retaining its pin in said selected one of the receptacles and for selectively fixing each stand either in its stored or in its park position.

5,531,562

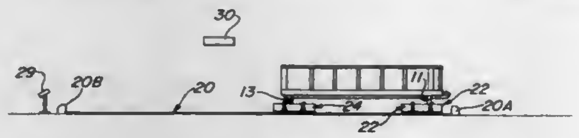
METHOD OF OPERATING A DUMPSTER HANDLING SYSTEM

Steven R. Cordell, 121 Burnish Ct., Silverdale, Pa. 18962

Division of Ser. No. 63,744, May 20, 1993, Pat. No. 5,405,233. This application Jan. 12, 1995, Ser. No. 371,839

Int. Cl.^{6} B65G *67/08*

U.S. Cl. 414—786 **4 Claims**



1. The method of using a dumpster handling system to collect and transport a loose solid material discharged from a fixed point of discharge into an interior of a roll-off dumpster having front end and rear end support means,

said dumpster handling system comprising

a track means extending laterally throughout a substantial distance underneath the point of discharge between a load/unload end and a back end of said track means,

a first dumpster supporting carrier for supporting the front end support means of a dumpster, said first carrier including means for securing and positioning the front end support means of the dumpster in position thereon and means adapted to engage said track means for supporting said first carrier for movement along the extent of said track means, and

a second dumpster supporting carrier for supporting the rear end support means of a dumpster, said second carrier including means for securing and positioning the rear end support means of the dumpster in position thereon and means adapted to engage said track means for supporting said second carrier for movement along the extent of said track means, said second carrier being located on said track means between said first carrier and said back end of said track means and being freely movable along said track means,

said method of operating said dumpster handling system comprising the steps of

(1) unloading an empty dumpster from a dump truck having a tiltable dumpster support means onto said first and second carriers, including

positioning said first carrier at the load/unload end of said track,

and said second carrier adjacent said first carrier at the load/unload end of said track means,

backing up the dump truck carrying an empty roll-off dumpster on a tiltable dumpster support means to the load/unload end of the track means, and

tilting the dumpster support means of said truck backward to allow the dumpster to move by gravity from the rear end of the dumpster support means onto said carriers, including an initial step of passing the rear end of the dumpster over said first carrier to position the rear end support means of the dumpster in a secure position on said second carrier, and a subsequent step of causing said second carrier to move along said track means toward the back thereof and away from the first carrier until the front end support means of the dumpster is positioned in a secure position on said first carrier to complete the unloading of the dumpster from the truck,

said unloaded dumpster being supported on said first and second carriers in an arrangement forming a unit with the dumpster supported in a horizontal position,

(2) operating a power-operated means to cause said first carrier engaged therewith and said unit to move along said track means so that said dumpster is moved underneath the point of material discharge for the even distribution of the material deposited into said dumpster, and

(3) returning a loaded dumpster back onto the dumpster support means of a dump truck.

5,531,563

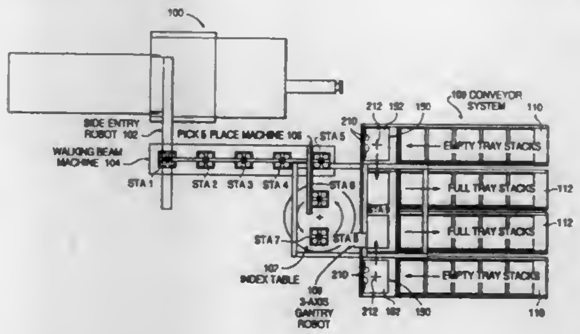
TRAY SADDLE ARRANGEMENT FOR AUTOMATED PRODUCT HANDLING SYSTEM

Robert N. Willis, Dothan, Ala., assignor to Sony Corporation, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Apr. 15, 1994, Ser. No. 228,430

Int. Cl.^{6} B65H *29/56*

U.S. Cl. 414—794.3 **7 Claims**



1. An automated product handling system comprising:
a stack of trays wherein at least a bottom tray of said stack is formed with a predetermined shaped recess in a lower surface thereof;
conveyor means for moving said stack of trays along a predetermined path;
a platform at an end of said predetermined path on which said stack of trays can be received;
tray saddle means on said platform for locating said stack of trays in a predetermined position and orientation on said platform, said tray saddle means being arranged to be received in said predetermined shaped recess; and
stopper means mounted on said platform for engaging said stack of trays and for limiting relative movement between said stack of trays and said platform and for positioning said stack of trays so that said tray saddle means is substantially aligned with said recess.

5,531,564
CENTRIFUGAL PUMP

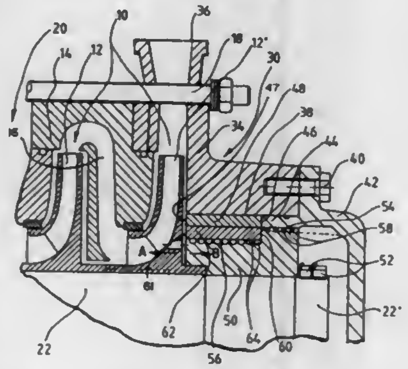
Kari Anttonen, Karhula; Seppo Hokkanen, Tavastila, and Jukka Timperi, Kotka, all of, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Feb. 10, 1995, Ser. No. 386,491

Claims priority, application Finland, Feb. 11, 1994, 940630

Int. Cl.^{6} F01D ***3/00***

U.S. Cl. 415—104 **22 Claims**



1. A multi-stage centrifugal pump comprising:
a rotatable elongated shaft having first and second ends;
a casing including a stationary end structure, an inlet for fluid to be pumped, and an outlet for pumped fluid;
a plurality of impellers mounted on said shaft within said casing, for rotation with said shaft; and
adjacent at least one end of said shaft within said casing first and second annular slide bearings, said first slide bearing mounted to said stationary end structure, and said second slide bearing mounted to said shaft for rotation therewith, and at least one of said slide bearings mounted by one or more flexible mounting devices.

5,531,565
APPLIANCE FOR EXTRACTING SECONDARY AIR FROM AN AXIAL COMPRESSOR

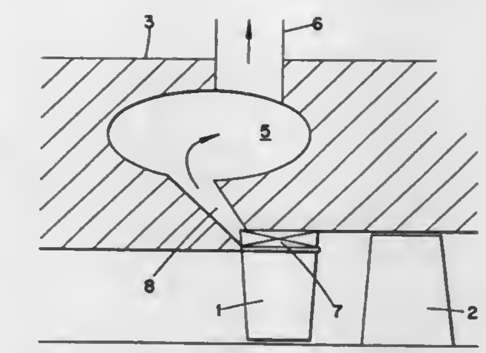
Thomas Meindl, Nussbaumen; Pierre Meylan, Neuenhof, and Thomas Zierer, Wettingen, all of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Aug. 2, 1994, Ser. No. 284,221

Claims priority, application Germany, Aug. 10, 1993, 43 26 799.8

Int. Cl.^{6} F01D ***9/04***

U.S. Cl. 415—144 **3 Claims**



1. An appliance for extracting secondary air from an axial compressor using a peripheral extraction slot which is at least partially configured as a diagonal diffuser, wherein a cascade of vanes for converting kinetic energy of a peripheral component of a flow velocity to static pressure are positioned on a compressor guide vane row at an inlet of the extraction slot, wherein the compressor guide vane row has a different deflection angle than the cascade vanes, the cascade vanes being angled to direct the peripheral flow at the inlet of the extraction slot in an axial direction.

5,531,566
SELF REGULATING BLEED VALVE

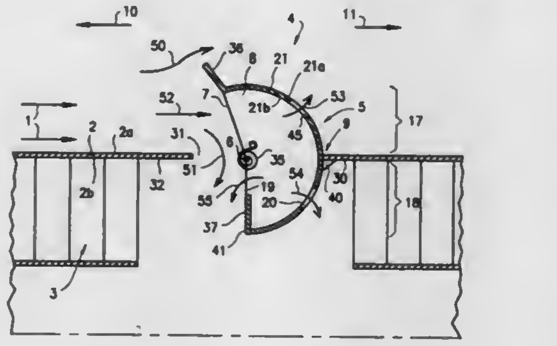
Patrick R. J. Derouet, Soignolles en Brie, and Michel S. Guimier, Grandpuits, both of, France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A., Paris Cedex, France

Filed Aug. 24, 1995, Ser. No. 518,721

Claims priority, application France, Aug. 24, 1994, 94 10237

Int. Cl.^{6} F01D ***17/00***

U.S. Cl. 415—145 **11 Claims**



1. A self regulating bleed valve for a gas turbine engine having a wall bounding a gas flow wherein the gas flows in an upstream to downstream direction, comprising:
a) a main opening formed in the wall;
b) a valve member having an internal cavity in communication with a gas inlet opening and a gas exhaust opening, said valve member being located in the main opening so as to pivot about a pivot axis extending substantially transverse to the gas flow between an extended position wherein the gas inlet opening extends into the gas flow and faces generally in an upstream direction, and a retracted position wherein the inlet opening is generally parallel to the gas flow; and,
c) control means fixedly attached to the valve member and acted on by the gas flow such that the gas flow causes the valve member to pivot between its extended and retracted positions.

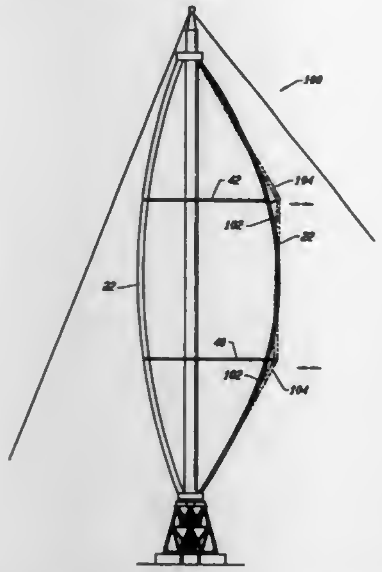
5,531,567
VERTICAL AXIS WIND TURBINE WITH BLADE TENSIONER

John R. Hulls, Point Reyes Station, Calif., assignor to FloWind Corporation, San Rafael, Calif.

Filed Jun. 20, 1994, Ser. No. 262,476

Int. Cl.^{6} F03D ***3/06***

U.S. Cl. 416—87 **15 Claims**



1. A Darrieus-type vertical axis wind turbine comprising:
a vertical tower supported for rotation;
one or more blades each coupled to the tower for rotation therewith, wherein each blade has an upper root coupled to the tower by a blade root attachment means proximate the top of the tower and a lower root coupled to the tower by a blade root attachment means proximate the bottom of the tower;
blade supporting means for supporting an intermediate portion of each blade away from the tower; and
blade tensioning means for changing the tensile forces on a blade.

5,531,568
TURBINE BLADE

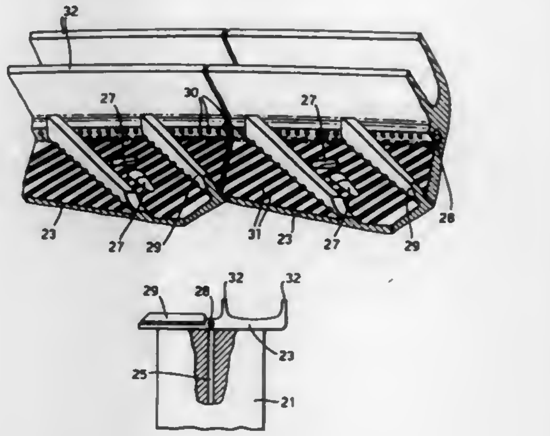
Peter Broadhead, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 5, 1995, Ser. No. 463,521

Claims priority, application United Kingdom, Jul. 2, 1994, 9413377

Int. Cl.^{6} F01D ***5/18***

U.S. Cl. 416—97 R **6 Claims**



3. A turbine blade for a gas turbine engine comprising an aerofoil cross-section portion having at least one cooling air passage extending lengthwise therethrough and a shroud located at one end thereof, said shroud having at least one cooling air passage therein which is in flow communication with said at least one lengthwise extending cooling air passage in said aerofoil cross-section portion and is apertured to exhaust cooling air therefrom as a film across that part of the exterior surface of said shroud which is remote from said aerofoil cross-section portion, said at least one cooling air passage being so disposed as to be generally circumferentially extending when said blade is mounted with a plurality of similar turbine blades in an annular array, said shroud being provided with a step on that part of the exterior surface thereof which is remote from said aerofoil cross-section portion and which defines a surface generally normal to said exterior surface part, said step being positioned adjacent said at least one cooling air passage within said shroud so that the apertures in said at least one cooling air passage terminate at said step on said surface thereof which is generally normal to said exterior shroud surface part.

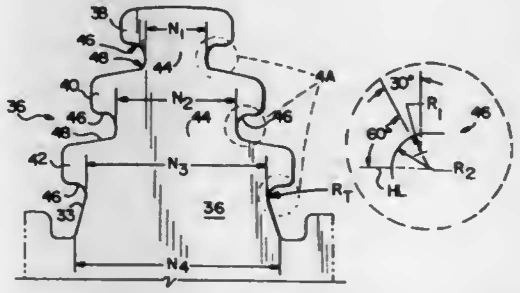
5,531,569
BUCKET TO WHEEL DOVETAIL DESIGN FOR TURBINE ROTORS

Robert E. Seeley, Broadalbin, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1994, Ser. No. 353,037

Int. Cl.^{6} F01D ***5/32***

U.S. Cl. 416—222 **10 Claims**



1. In a steam turbine rotor wheel and bucket dovetail joint construction wherein the wheel dovetail includes a plurality of radially adjacent hooks interconnected by respective necks, each having an upper and lower fillet, the improvement wherein each upper fillet has a compound radius.

5,531,570
DISTORTION CONTROL FOR LASER SHOCK PEENED GAS TURBINE ENGINE COMPRESSOR BLADE EDGES

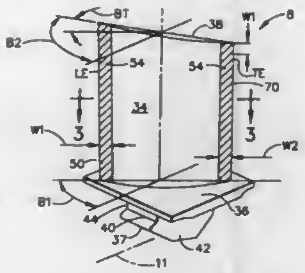
Seetha R. Mannava; James D. Risbeck, both of Cincinnati, and Larry G. Jacobs, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

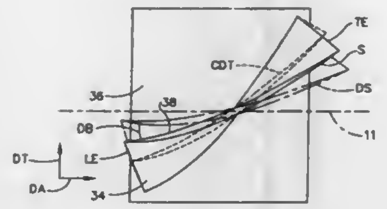
Filed Mar. 6, 1995, Ser. No. 399,287

Int. Cl.^{6} F01D ***5/14***

U.S. Cl. 416—241 R **24 Claims**

1. A gas turbine engine compressor blade comprising:
a metallic airfoil having a leading edge and a trailing edge,
at least one laser shock peened surface on at least one side of said airfoil of at least one of said leading and trailing edges,
said laser shock peened surface extending radially along at least a portion of and extending chordwise from said one of said edges,
a region having deep compressive residual stresses imparted by laser shock peening (LSP) extending into said airfoil from said laser shock peened surface, and
a means to counter distortion of said airfoil due to said laser shock peening.





5,531,571

REGULATING DEVICE WITH STARTING AND STOPPING DEVICE FOR SCREW-TYPE COMPRESSORS, AND STARTING AND STOPPING DEVICE USED HEREBY

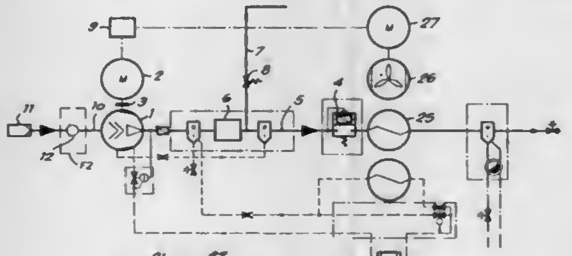
Christiaan Van Dyck, Lier, Belgium, assignor to Atlas Copco Airpower, naamloze vennootschap, Wilrijk, Belgium

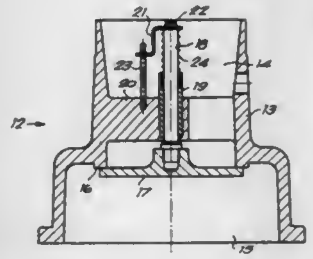
Filed Apr. 14, 1994, Ser. No. 227,378

Claims priority, application Belgium, Jun. 16, 1993, 09300612

Int. Cl.⁶ F04B *49/06*

U.S. Cl. 417—45 **6 Claims**





3. In a screw-type compressor system including a compressor element driven by an electric motor, a minimum pressure valve mounted at an outlet of the compressor element and a vessel positioned between the compressor element and the minimum pressure valve, a regulating device comprising: means for controlling the motor to turn at a frequency-regulated rotational speed at a substantially constant pressure in the vessel; and means for aiding the starting and stopping of the compressor element, said aiding means being mounted at an inlet of the compressor element and comprises a non-return valve including a housing defining a seating therein, a valve rod shiftably mounted within said housing, a valve member mounted to the valve rod and a spring element surrounding said rod, said spring element acting against a part of said housing and biasing said valve member into a closed position wherein said valve member engages said seating, and wherein said aiding means further comprises an element mounted to an end of said valve rod remote from said valve member and a guiding pin carried by said housing and extending substantially parallel to said valve rod, said element being shiftably mounted upon said guiding pin, said element and said guiding pin cooperating to prevent rotation of said non-return valve upon shifting of said valve rod.

5,531,572

CAPACITY CONTROL VALVE FOR A VARIABLE CAPACITY REFRIGERANT COMPRESSOR

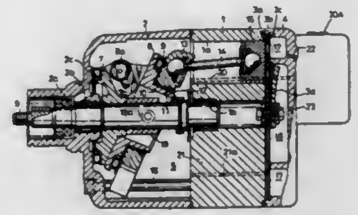
Kazuya Kimura; Kenji Takenaka, both of Kariya, and Takahiro Maeda, Minato-ku, all of, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

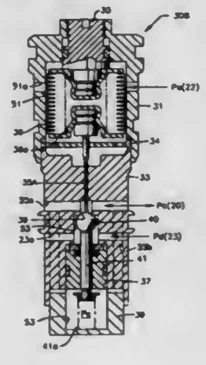
Filed Oct. 12, 1994, Ser. No. 321,752

Claims priority, application Japan, Oct. 15, 1993, 5-258741

Int. Cl.⁶ F04B *1/26*

U.S. Cl. 417—222.2 **6 Claims**





1. A capacity control valve for adjustably changing the capacity of a variable capacity refrigerant compressor comprising a suction chamber for a refrigerant gas before compression, a discharge chamber for the refrigerant gas after compression and a crank chamber capable of communicating with the suction and discharge chambers, said capacity control valve being incorporated in said variable capacity refrigerant compressor, comprising: a suction pressure responsive means arranged for exhibiting a first forward movement and a second reverse movement in response to a change in suction pressure of the refrigerant gas, a valve means arranged for controlling opening and closing of a gas-supply passageway means extending between said discharge chamber and said crank chamber of the variable capacity refrigerant compressor, said valve means reducing an opening area of said gas supply passageway means according to the first forward movement of said suction pressure responsive means when the suction pressure of the refrigerant gas is above a predetermined suction pressure level, and increasing the opening area of said gas-supply passageway means according to the second reverse movement of said suction pressure responsive means when the suction pressure of the refrigerant gas is below the predetermined suction pressure level so as to control the pressure level prevailing in said crank chamber of said compressor to thereby adjustably change the compressor capacity and a discharge pressure responsive means arranged to exhibit forward and backward movements in response to changes in discharge pressure of the refrigerant gas, said discharge pressure responsive means being operatively coupled with said valve means in such a manner that said valve means reduces the opening area of said gas-supply passageway means in response to one of said forward and backward movements of said discharge pressure responsive means only when the discharge pressure of the refrigerant gas is below a predetermined discharge pressure.

5,531,573

PUMP AND MOTOR INTERPOSED RUBBER SEALING GASKET HAVING PLURAL GUIDE PROTRUSIONS

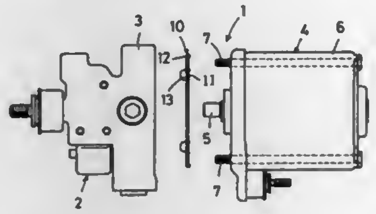
Seiji Nokubo, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

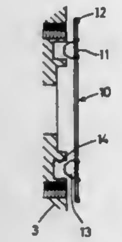
Filed Jul. 12, 1995, Ser. No. 501,678

Claims priority, application Japan, Jul. 13, 1994, 6-161102

Int. Cl.⁶ F04B *53/22;* **F16J** *15/02*

U.S. Cl. 417—360 **4 Claims**





1. A brake fluid pressure controller comprising:

a hydraulic unit including a housing, a pump mounted in said housing, and an end face having a plurality of holes formed therein;

a motor operatively engaging said pump, said motor having an end cover, an end face opposing said end face of said housing, and an output shaft received in said housing, said motor being coupled to said housing by a plurality of bolts extending through said end cover of said motor and engaging said housing; and

a rubber seal positioned between said opposing end faces of said motor and said housing,

said seal including a large diameter annular seal portion surrounding said output shaft,

a plurality of small diameter annular seal portions integrally connected to the periphery of said large diameter annular seal portion, wherein each of said small diameter annular seal portions surround one of said bolts, and

a plurality of protrusions on a side of said rubber seal facing said housing, wherein said protrusions are received in said holes formed in said housing end face.

5,531,574

CLOSED-TYPE COMPRESSOR

Hisanori Honma, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

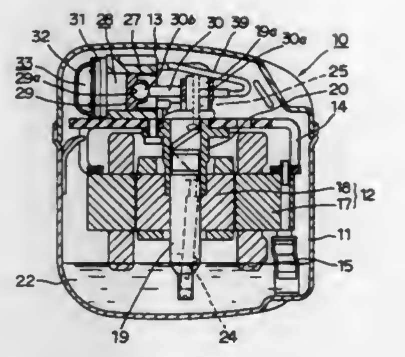
Filed Sep. 6, 1994, Ser. No. 301,025

Claims priority, application Japan, Feb. 28, 1994, 6-030468

Int. Cl.⁶ F04B *35/04*

U.S. Cl. 417—415 **14 Claims**

1. A closed-type compressor which comprises a closed casing accommodating an electric motor from which a rotational shaft extends and a compressing machine to be operated by the motor, the compressing machine being provided with a sliding portion, wherein a hydrofluorocarbon (HFC) refrigerant is used as a compressor refrigerant, wherein a refrigerator oil consisting essentially of ester is used as a lubricating oil and wherein the sliding portion of the compressing machine is formed of two members, one of which is made of cast iron subjected to an insoluble film forming process using manganese phosphate and another one of which is made of carbon steel.



5,531,575

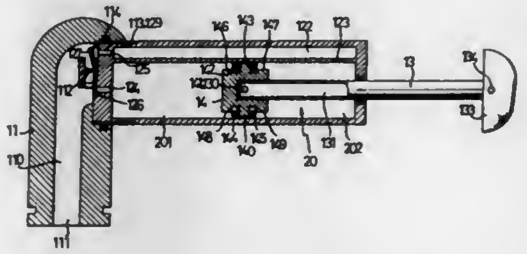
HAND PUMP APPARATUS HAVING TWO PUMPING STROKES

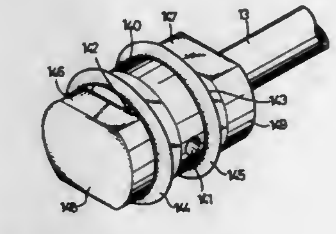
Gi S. Lin, No. 2,296 Lane Ming Sheng Rd, Wu Feng Hsiang, Taichung, Taiwan

Filed Jul. 24, 1995, Ser. No. 506,329

Int. Cl.⁶ F04B *21/04*

U.S. Cl. 417—526 **1 Claim**





1. A hand pump apparatus comprising:

a housing including a partition provided therein so as to separate said housing into a first chamber and a second chamber, said partition including a rear portion having a hole formed therein for communicating said first chamber with said second chamber, said housing including a rear portion and including a front portion having a first passageway and a second passageway formed therein and communicating with said first chamber and said second chamber respectively,

an attachment member secured to said front portion of said housing and including a bore communicating with said first chamber and said second chamber via said first and second passageways,

check valve means for allowing air to flow into said attachment via said first and second passageways and for preventing air from flowing into said first and second chambers via said first and said second passageways,

a piston slidably engaged in said second chamber so as to separate said second chamber into a front room and a rear room, said piston including a front annular groove and a rear annular groove formed therein so as to define a front ring and a middle ring and a rear ring, said piston including an aperture formed in said middle ring and communicating with said annular grooves, said front ring and said rear ring each including a cut off portion formed therein for communicating said annular rings with said front room and said rear room respectively, a first sealing ring and a second sealing ring engaged in and movable in said front annular groove and said rear annular groove respectively, and

a piston rod slidably engaging in said rear portion of said housing and including a first end secured to said piston and including an orifice formed in said first end thereof and communicating with said aperture of said piston, said piston rod including a hollow interior and including a second end extended outward of said housing,

said first sealing ring being engaged with said middle ring of said piston so as to make an air tight seal between said housing and said piston when said piston moves forward toward said attachment member, an air received in said front room being pumped into said attachment member via said second passageway and said check valve means, said second sealing ring being engaged with said rear ring of said piston when said piston moves forward toward said attachment member, air being allowed to flow into said rear room via said hollow interior of said piston rod and said orifice and said aperture and said rear annular groove and said cut off portion of said rear ring, and

said second sealing ring being engaged with said middle ring of said piston so as to make an air tight seal between said housing and said piston when said piston moves rearward, the air received in said rear room being pumped into said attachment member via said hole and said first chamber and said first passageway and said check valve means, said first sealing ring being engaged with said front ring of said piston when said piston moves rearward, air being allowed to flow into said front room via said hollow interior of said piston rod and said orifice and said aperture and said front annular groove and said cut off portion of said front ring.

5,531,576
WOBBLE PLATE PUMP WITH SIDE CHAMBERS THROUGH WHICH FLUID FLOWS

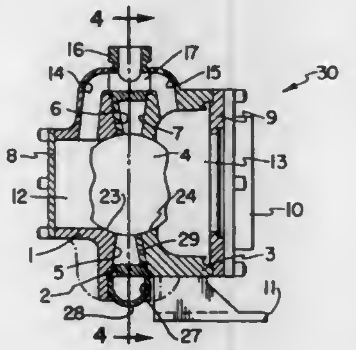
Wolfgang Kussmann, Altrip, Germany, assignor to KSB Aktiengesellschaft, Frankenthal, Germany

Filed Feb. 24, 1995, Ser. No. 393,870

Claims priority, application Germany, Feb. 24, 1994, 44 05 945.0

Int. Cl.^{6} F04C *2/00*

U.S. Cl. 418—53 **10 Claims**



1. A wobble plate pump having a wobble plate hub affixed to a wobble plate, said wobble plate pump comprising:

a housing defining a pump chamber;

a plurality of additional chambers, said additional chambers being defined, at least in part, by the wobble plate hub, said additional chambers being in fluid communication with one of a suction and a compression region of the pump, said additional chambers having means for permitting fluid to flow through said additional chambers, said housing having a plurality of integrated channels which are in fluid communication with said additional chambers and are fluidly connected to said one of the suction and compression region.

5,531,577
SCROLL TYPE FLUID MACHINE HAVING A LEVER DRIVING MECHANISM

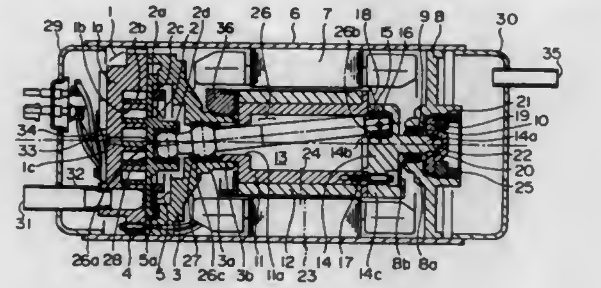
Isao Hayase, Katsuta; Shigeru Machida, Ibaraki-ken; Shunichi Mitsuya, Ibaraki-ken, and Takeshi Kouno, Ibaraki-ken, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1994, Ser. No. 185,391

Claims priority, application Japan, Jan. 26, 1993, 5-010470

Int. Cl.^{6} F01C *1/04;17/06*

U.S. Cl. 418—55.1 **15 Claims**



1. A scroll type fluid machine comprising a fixed scroll member having a scroll wrap portion standingly disposed on an end plate, an orbiting scroll member having a scroll wrap portion standingly disposed on an end plate, the orbiting scroll member being combined with the fixed scroll member so as for the scroll wrap portions thereof to face inwardly each other, a driving mechanism for giving the orbiting scroll member revolution, and a rotation preventing mechanism for preventing the rotation of the orbiting scroll member, the orbiting scroll member being caused to make an orbiting motion with respect to the fixed scroll member by the driving mechanism and the rotation preventing mechanism, wherein said driving mechanism includes a single rigid lever, a first supporting portion formed in a stationary member for supporting said lever through spherical surface contraposition, a second supporting portion formed in said orbiting scroll member for supporting said lever through spherical surface contraposition, and a third supporting portion formed in a rotary member for rotatably supporting said lever, and a distance between said first supporting portion and said third supporting portion is set longer than a distance between said first supporting portion and said second supporting portion.

5,531,578
SCROLL COMPRESSOR

Tsuyoshi Takemoto, Nukata-gun; Shigeru Hisanaga, Kariya; Yasushi Watanabe, Kariya, and Tetsuhiko Fukanuma, Kariya, all of, Japan, assignors to Nippondenso Co., Ltd., and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of Kariya, Japan

Filed Mar. 13, 1995, Ser. No. 403,522

Claims priority, application Japan, Mar. 14, 1994, 6-042842

Int. Cl.^{6} F01L *1/04*

U.S. Cl. 418—55.1 **13 Claims**

1. A scroll compressor for a gas including a lubricant, comprising:

a housing;

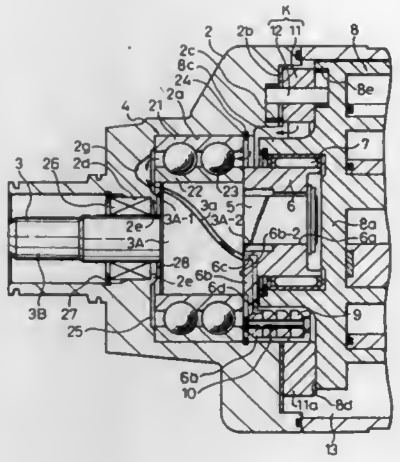
a drive shaft having an axis for a rotation, the drive shaft having a first portion of a small diameter and a second portion of a large diameter;

a radial bearing for supporting the drive shaft rotatably with respect to the housing;

a seal unit cooperating with the small diameter portion of the shaft for preventing the lubricant from leaking;

a stationary scroll member which is in a fixed relationship with respect to the housing;

a movable scroll member arranged eccentric with respect to the stationary scroll member so that at least one pump chamber is created between the scroll members;



the housing forming, at a front portion, a first axially extending opening and a second axially extending opening of a diameter smaller than that of the first opening;

the housing being further formed with a shoulder portion between the first and second axial openings, and an inwardly extending projection at an end of the second opening adjacent the radial bearing;

the radial bearing including an inner race fitted to the large diameter portion of the shaft, an outer race fitted to the first opening of the housing so that the outer race axially contacts with said shoulder portion and a plurality of circumferentially spaced bearing members;

the seal unit arranged adjacent to the radial bearing on the side opposite to the scroll members, the seal unit being axially engaged with the inwardly extending projection;

means for connecting the movable scroll member with respect to the drive shaft so as to obtain an orbital movement of the movable scroll about the axis of the shaft;

means for preventing the movable scroll member from being rotated, so that the orbital movement of the movable scroll member allows the pump chamber to be moved from an outward position to an inward position;

intake means for introducing gas to be compressed into the pump chamber when the pump chamber is located in the outward position;

outlet means for discharging the gas, as compressed, when the pump chamber is located in the inward position;

said housing forming, at a location inward of the shoulder portion, a recessed surface which is spaced from a faced end of the inner race of the radial bearing, so that a small space is formed between the housing and the radial bearing;

said inwardly extending projection being arranged adjacent a faced end surface of said increased diameter portion of the rotating shaft so as to form a sealing chamber therebetween, and;

lubricating means, on at least one of the housing, the radial bearing and the rotating shaft, for lubricating the radial bearing as well as the shaft seal unit.

5,531,579
SCROLL TYPE COMPRESSOR

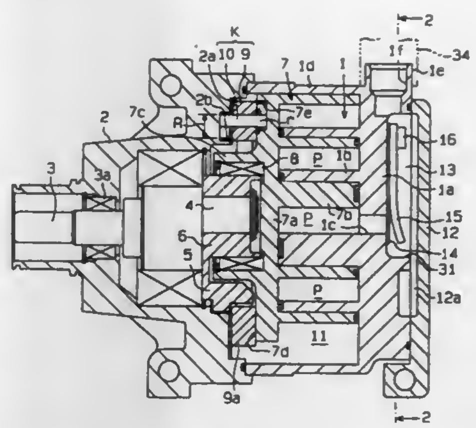
Tetsuhiko Fukanuma; Kunifumi Goto, both of Kariya; Yuichi Tsumagari, Toyokawa, and Shigeki Iwanami, Okazaki, all of, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, and Nippondenso Co., Ltd., both of Kariya, Japan

Filed Jan. 23, 1995, Ser. No. 376,839

Claims priority, application Japan, Jan. 25, 1994, 6-6650

Int. Cl.^{6} F01C *1/04*

U.S. Cl. 418—55.2 **13 Claims**



1. A scroll type compressor having a fixed scroll in a housing and a movable scroll opposed to the fixed scroll to define a compression chamber with the fixed scroll, wherein gas introduced into a suction chamber via an inlet is compressed in the compression chamber in accordance with the circular movement of the movable scroll and then is discharged to a discharge chamber via a discharge port to exhaust from an outlet providing communication from the discharge chamber to the outside of the compressor, wherein:

the fixed scroll has a spiral element with an adjacent integral base plate, and at least a part of the discharge chamber is defined in the fixed scroll; and

wherein an outlet boss protrudes from the outer periphery of the base plate, said outlet boss including the outlet.

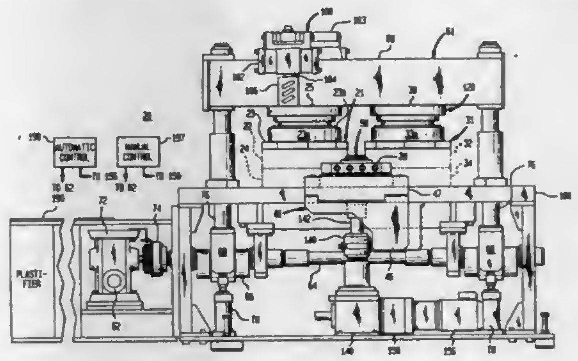
5,531,580
MACHINE FOR INJECTION BLOW MOLDING

Joseph S. Bonino, Vineland; Philip Sieri, and John F. Glowacki, both of Millville, all of N.J., assignors to Wheaton Inc., Millville, N.J.

Filed Mar. 29, 1995, Ser. No. 412,734

Int. Cl.^{6} B29C *49/56;49/78*

U.S. Cl. 425—136 **27 Claims**



25. In an injection blow molding machine for making hollow plastic articles including a parison mold having top and bottom portions for injecting a parison onto each of a plurality of core rods, and a blow mold having top and bottom portions for blowing said parisons into hollow work pieces, press clamping apparatus comprising:

a rotating crank shaft;

means for translating the rotation of said crank shaft to a vertical reciprocating motion;

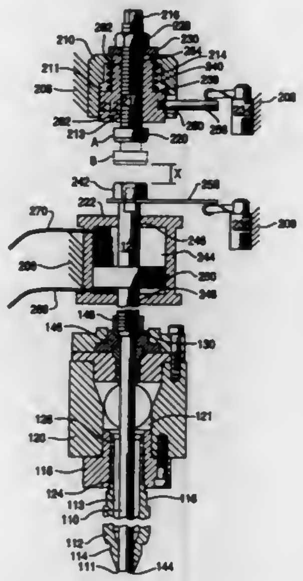
a clamp beam connected to said translating means and actuated by rotation of said crank shaft to move between raised and lowered positions which are separated by a fixed stroke; and

the top portion of each of said parison and blow molds fixed to and spaced from said clamp beam at a distance such that the distance between the top and bottom portions of each respective mold is less than said stroke while said clamp beam is in the raised position.

5,531,581
AJUSTABLE INJECTION MOLDING APPARATUS

Emerson B. Donnell, Jr., P.O. Box 386, Basking Ridge, N.J. 07920-0386

Filed Mar. 27, 1995, Ser. No. 411,192
Int. Cl.^{6} B29C *45/23*
U.S. Cl. 425—145 **19 Claims**



1. An adjustable injection molding apparatus for forming of products within a mold from melted thermoplastic material comprising:

(A) a frame;

(B) a cylinder fixedly mounted with respect to said frame and defining a cylinder bore extending therethrough, said cylinder defining a first end opening and a second end opening within said cylinder bore with said first end opening and said second end opening being spatially disposed from one another;

(C) a cylinder rod means movable with respect to said cylinder and extending through said cylinder bore thereof and through said first end opening thereof and said second end opening, said cylinder rod means further comprising a bumper means thereon located outside of said cylinder bore adjacent said first end opening;

(D) a nozzle rod means attached to said cylinder rod means and extending outwardly away therefrom and being movable therewith;

(E) a nozzle body attached with respect to said frame to be adjustably secured thereto, said nozzle body defining a nozzle channel means therethrough, said nozzle body further defining a tip opening means therein in fluid flow communication with respect to said nozzle channel means, said nozzle rod means being movably mounted within said nozzle channel means for selectively allowing dispensing therethrough, said nozzle rod means being selectively positionable with respect to said tip opening means to prevent dispensing therefrom when positioned therein;

(F) a piston means fixedly secured to said cylinder rod means at a position within said cylinder bore, said piston means being reciprocally movable within said cylinder bore between a position adjacent said first end opening with said nozzle rod means opened with respect to said tip opening means and a position adjacent said second end opening with said nozzle rod means closed with respect to said tip opening means;

(G) a housing fixedly secured to said frame and defining a housing bore extending therethrough;

(H) a block movably mounted within said housing bore of said housing, said block defining an adjustment bore extending therethrough;

(I) a resilient biasing means positioned within said housing bore between said block and said housing and being operative to urge said block away from said housing;

(J) an adjustment shaft means extending through said adjustment bore and being adjustably movably secured therewithin;

(K) a first limit switch fixedly secured to said frame at a position adjacent said housing, said first limit switch being adapted to be activated to indicate movement of said nozzle rod means to a fully opened position with respect to said tip opening means;

(L) a first flag arm means attached to said block, said first flag arm means being movable with said block to a position adjacent said first limit switch;

(M) a second limit switch fixedly secured to said frame at a position adjacent said bumper means, said second limit switch being adapted to be activated to indicate movement of said nozzle rod means to the fully closed position with respect to said tip opening means;

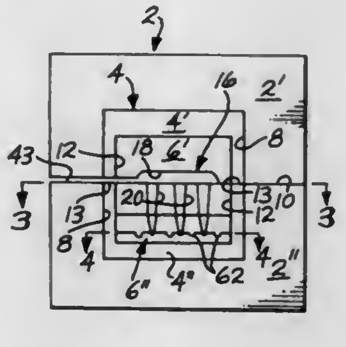
(N) a second flag arm means attached to said cylinder rod means adjacent said bumper means to be movable therewith, said second flag arm means being movable with said cylinder rod means to a position adjacent to said second limit switch; and

(O) a stop head means positioned on said adjustment shaft means and being spatially disposed from said bumper means of said cylinder rod means, said stop head being adapted to be abutted by said bumper means of said cylinder rod means responsive to movement of said nozzle rod means toward the opened position to urge said block to move toward said housing to compress said resilient biasing means and cause said first flag arm to activate said first limit switch to indicate said nozzle rod means being at the fully opened position.

5,531,582
APPARATUS FOR INJECTION MOLDING A PLASTIC MONOLITH

Ronald W. Klinkhammer, Seattle, Wash., assignor to Oral Logic, Inc., Minot, N. Dak.

Division of Ser. No. 989,125, Dec. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 499,022, Mar. 26, 1990, Pat. No. 5,171,066, and a continuation-in-part of Ser. No. 924,099, Aug. 3, 1992, Pat. No. 5,316,027. This application Nov. 21, 1994, Ser. No. 342,706
Int. Cl.^{6} B29C *45/34*
U.S. Cl. 425—190 **15 Claims**



1. In apparatus for injection molding a plastic monolith comprised of a base of plastic resin material having elongated bristles of the same resin material monolithically relatively upstanding on one side thereof so that the monolith can be used as a brush, the bristles having longitudinal axes relatively transverse the one side of the base, tips spaced apart from the one side of the base along the axes, shank portions relatively upstanding along the axes to points thereon relatively intermediate between the one side of the base and the tips of the bristles, and tip portions extending relatively outwardly along the axes of the bristles from the intermediate points thereon to the tips of the respective bristles,

a mold comprised of a pair of relatively reciprocable members which are disposed on opposite sides of a plane of the mold and have mutually opposing faces thereon which are operable to define a mold cavity having a cross section corresponding to the base of the monolith when the faces of the members are abutted with one another at the plane of the mold,

one of the mold cavity defining members having a set of elongated bristle defining branches of the cavity located therein, which extend relatively inwardly of the one mold cavity defining member from the face thereof along longitudinal axes transverse the plane of the mold,

the branches of the cavity having relatively proximal and distal ends disposed transverse the respective axes thereof at the face of the one mold cavity defining member and at points spaced apart from the face of the one mold cavity defining member, respectively, and annular walls circumposed about the respective axes thereof in the space between the relatively proximal and distal ends of the respective branches,

the branches having cross sections at the inner peripheries of the walls in planes transverse the axes of the respective branches, including cross sections in spaced first and second planes coinciding with the intermediate points on the axes of the bristles and with the relatively distal ends of the branches, respectively, adapted so that the branches are operable to form the shank and tip portions of the respective bristles,

means for injecting a mass of plastic resin material into the mold cavity, and in turn into the respective branches thereof through the relatively proximal ends of the branches,

means disposed at the distal ends of the respective branches to close the distal ends to the flow of resin material therethrough, and

means disposed about the walls of the respective branches in the space between the respective first and second cross sectional planes of the branches, to discharge gas displaced into the respective branches from the cavity when the plastic resin material occupies the branches through the relatively proximal ends thereof,

the closure means forming end walls for the relatively distal ends of the branches having cross sectional areas in planes transverse the axes of the branches no greater than the cross sectional areas of the distal ends of the branches in said second cross sectional planes thereof, and the annular walls of the respective branches having cross sections in planes coinciding with the axes of the respective branches that taper along straight lines relatively inwardly of the axes of the respective branches in the direction relatively axially inwardly of the one mold cavity defining member from the face thereof, relatively from the first cross sectional planes of the respective branches to the second cross sectional planes of the respective branches, so that the branches and the respective bristles formed therein relatively slideably disengage from one another when the mold cavity defining members are reciprocated in relation to one another to open the mold and the monolith is relatively retracted from the face of the one mold cavity defining member to remove the bristles therefrom.

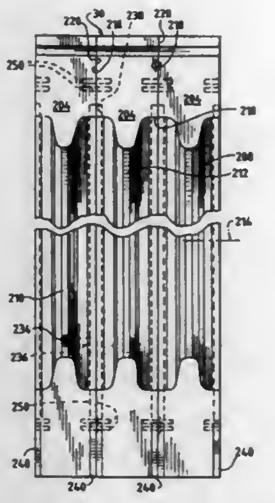
5,531,583
VACUUM MOLD BLOCKS WITH COOLING FOR CORRUGATED TUBING

John S. Berns, Cleveland, and Heinrich Dickhut, Charleston, both of Tenn., assignors to Cullom Machine Tool & Die, Inc., Cleveland, Tenn.

Division of Ser. No. 48,355, Apr. 15, 1993, abandoned. This application Mar. 21, 1994, Ser. No. 215,490
Int. Cl.^{6} B29C *33/36;49/38*
U.S. Cl. 425—193 **29 Claims**

26. A corrugated mold block for a machine for molding corrugated tubes, said block being movable about an endless path and cooperating with other blocks to define a molding tunnel along a portion of said path, said block comprising:

a plurality of sub-blocks secured end to end, each sub-block having



a face substantially arcuate about a longitudinal axis and corrugated with not more than one complete wavelength of circumferential grooves and lands for defining a portion of the mold tunnel,

two longitudinally spaced end surfaces wherein additional sub-blocks may be adjoined so as to extend said tunnel in a longitudinal direction, and

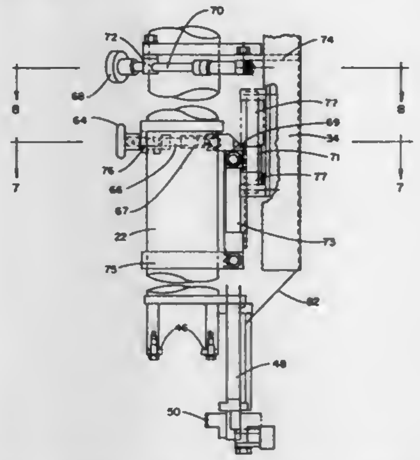
a cooling channel in one of said end surfaces and substantially concentric with said face; and

means for selectively connecting said cooling channel to a cooling source.

5,531,584
AUTOMATED TROWELLING SYSTEM

Carol Jacques, 35 Federal St., Walpole, Mass. 02081

Filed Oct. 28, 1994, Ser. No. 331,284
Int. Cl.^{6} B28B *11/08*
U.S. Cl. 425—221 **45 Claims**



22. A wall finishing system for providing a finished surface to solidifiable fluent material applied to a vertical wall, the system comprising:

an upper bracket disposed proximate an upper edge of said wall;

a lower bracket disposed proximate a lower edge of said wall and parallel to said upper bracket;

a vertical support structure suspended from said upper and lower brackets and parallel to a plane defined by said wall;

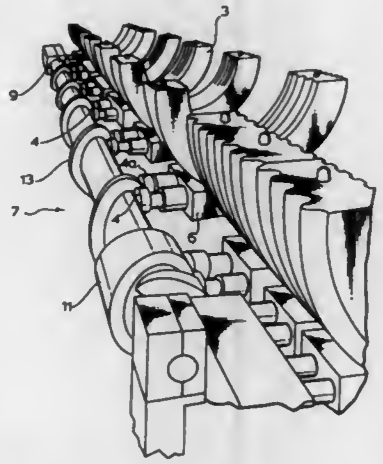
a main trowel having a planar operating surface parallel said plane defined by said wall, said main trowel disposed on said vertical support structure for vertically reciprocating motion;

a first drive disposed on said vertical support structure for horizontally translating said vertical support structure across said wall in a first direction of motion;

- a second drive disposed on said vertical support structure for imparting said vertically reciprocating motion to said main trowel; and
- a controller for controlling operation of said first and second drives.

5,531,585
TRAVELLING MOLD WITH SEPARATION OF MOLD BLOCKS

Manfred A. A. Lupke, 92 Elgin Street, Thornhill, Ontario, Canada
Filed May 6, 1994, Ser. No. 239,124
Int. Cl.⁶ B29C *44/28;33/36*
U.S. Cl. 425—233 **6 Claims**

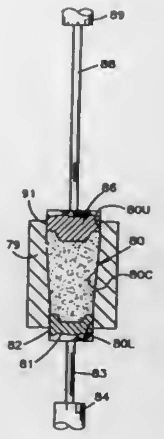


1. A travelling mold having mold block sections which are driven around at least one endless track, said mold having a drive system including a first drive component which drives the mold block sections in abutting positions with one another to a second component comprising auger means in said drive system, said auger means accelerating and separating said mold block sections and then decelerating and regrouping said mold block sections side by side with one another before returning said mold block sections to said first drive component.

5,531,586
INTERLOCKING CHECKER BRICK MOLD

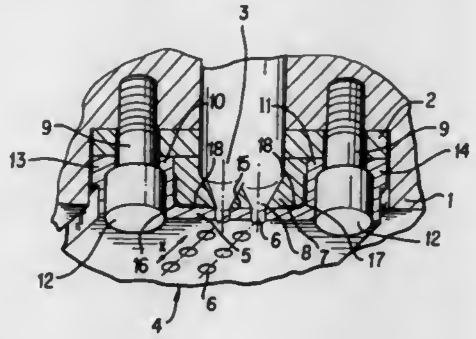
Jack Hyde, Pittsburgh, Pa., assignor to North American Refractories Company, Cleveland, Ohio
Division of Ser. No. 222,694, Apr. 4, 1994, Pat. No. 5,474,726, which is a division of Ser. No. 48,981, Apr. 16, 1993, Pat. No. 5,358,031, which is a continuation-in-part of Ser. No. 899,873, Jun. 12, 1992, Pat. No. 5,299,629. This application May 5, 1995, Ser. No. 435,857
Int. Cl.⁶ B29C *43/02;* **B30B** *11/02;* **B28B** *3/08*
U.S. Cl. 425—352 **4 Claims**

1. A checker brick mold comprising:
- a. a mold body having walls defining an internal cavity having spaced cavity entrances;
- b. a pair of side ones of the walls being laterally spaced and each including longitudinally spaced and parallel cavity entrance portions respectively adjacent said entrances;
- c. the entrance portions at one entrance being transversely spaced less than the entrance portions at the other entrance;
- d. the side walls also each including a central portion between and adjacent its entrance portions and flaring outwardly from said one entrance portion to said other entrance portion;
- e. a spaced pair of mold entrance sections each adapted to be inserted into an associated one of the entrances and having surfaces complemental to the entrance portions of its associated entrance; and
- f. prime mover means operatively connected to the entrance sections for moving the sections toward one another to compress a mass in the cavity and away from one another to remove a compressed mass from the cavity.



5,531,587
CLOSABLE EXTRUSION NOZZLE FOR THERMOPLASTIC MATERIALS

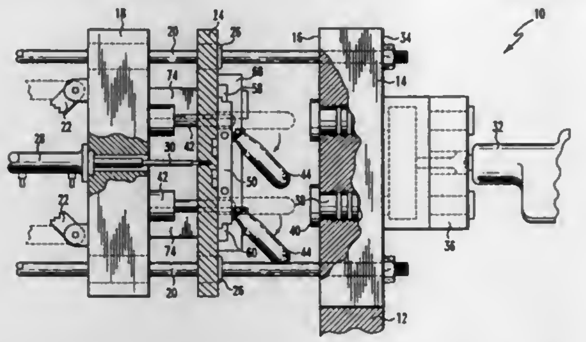
Helmuth Meidhof, Grossostheim, Germany, assignor to Rieter Automatik GmbH, Germany
PCT No. PCT/EP94/00361, § 371 Date Dec. 16, 1994, § 102(e) Date Dec. 16, 1994, PCT Pub. No. WO94/19169, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 8, 1994, Ser. No. 318,735
Claims priority, application Germany, Feb. 18, 1993, 43 05 037.9
Int. Cl.⁶ B29C *47/12*
U.S. Cl. 425—382 R **3 Claims**



1. A closable extrusion nozzle for thermoplastic materials comprising a nozzle plate (4) containing nozzles (6) that permit extrusion of the plastic material from a tank (1), and a perforated plate (7) arranged upstream of the nozzle plate (4), whose apertures (8) can be brought in and out of alignment with the nozzles (6) by displacing the perforated plate (7) in a sliding direction relative to the nozzle plate (4), wherein the nozzle plate (4) is designed as a housing (5, 10, 11) with a U-shaped cross section perpendicular to the sliding direction of the enclosed perforated plate (7) wherein a sealing surface (15) of the perforated plate (7) rests against a flat bottom (5) of the housing (5, 10, 11) in which the nozzles (6) are located, wherein a gap (18) is provided between the perforated plate (7) and the housing (5, 10, 11) at least in curved areas (16, 17) of the housing (5, 10, 11), and wherein the sealing surface (15) that faces the bottom (5) is restricted to a narrow area around the nozzles (6).

5,531,588
ADJUSTABLE CAM TRACK FOR AN INJECTION MOLDING MACHINE

Charles J. Brun, Jr., Xenia; Dwayne Bercot, Fletcher, and Anthony Newport, New Carlisle, all of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio
Filed May 5, 1995, Ser. No. 435,702
Int. Cl.⁶ B29C *45/40*
U.S. Cl. 425—556 **20 Claims**

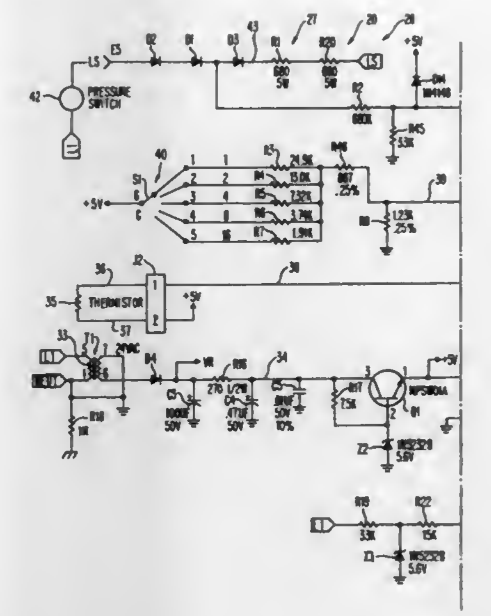


1. An adjustable cam track for an injection molding machine, said machine including a base, a first platen fixed to the base and having a mold cavity assembly, a second platen movable with respect to the base and said first platen and having a mold core assembly, a stripper platen movably interposed between the first and second platens and having at least one pair of space defining surfaces which together with the mold cavity and mold core assemblies defines at least one space for receiving plastic material injected therein to form at least one molded article, a first motive means for moving the second platen and the stripper platen away from the first platen to remove the at least one molded article from the mold cavity assembly, and a second motive means for separating the second platen and the stripper platen to remove the at least one molded article from the mold core assembly, the adjustable cam track comprising: a guide fixed to the second platen for guiding the movement of the stripper platen with respect to the second platen, a cam follower coupled to said at least one pair of space defining surfaces for causing relative movement of each pair of space defining surfaces to release the molded article from the molding machine, a cam insert engaging the cam follower, said cam insert being adjustably positionable with respect to the guide to adjust the point of release of the at least one molded article, the cam insert including a first toothed rack, and a second toothed rack removably fixed to the guide and engaging the first toothed rack to fix the position of the cam insert relative to the guide only at certain preselected locations.

5,531,589
FUEL CONTROL SYSTEM, CONTROL DEVICE THEREFOR AND METHODS OF MAKING AND OPERATING THE SAME

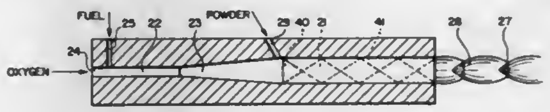
Kurt T. Williams, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Feb. 10, 1994, Ser. No. 194,244
Int. Cl.⁶ F23N *5/20*
U.S. Cl. 431—6 **20 Claims**

1. A fuel control system comprising a source of fuel, a burner means, an electrically operated valve means adapted to be opened to interconnect said source of fuel to said burner means when said valve means is energized, said valve means having coil means, an electrical power source having a value sufficient for opening said valve means when operatively interconnected to said coil means to energize said coil means, a control means for operatively and selectively interconnecting said power source to said coil means when said control means determines that fuel should be directed to said burner means, said control means comprising an interconnecting means which includes a solid state electrical circuit directly connecting said power source and said coil means.



5,531,590
SHOCK-STABILIZED SUPERSONIC FLAME-JET METHOD AND APPARATUS

James A. Browning, Hanover, N.H., assignor to DRACO, Hanover, N.H.
Filed Mar. 30, 1995, Ser. No. 414,780
Int. Cl.⁶ F23C *5/00*
U.S. Cl. 431—8 **9 Claims**

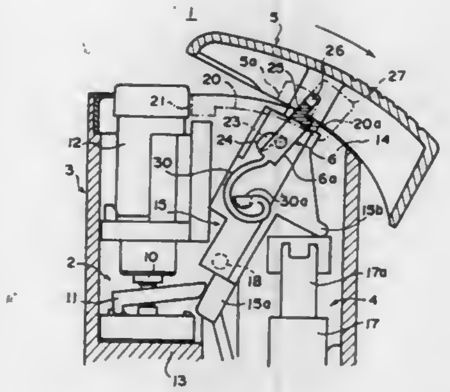


1. A method for producing a supersonic jet stream of high temperature extending beyond the exit of an internal burner, said method comprising introducing a mixed flow of oxidizer gas and fuel to flow at supersonic speed through an initial portion of an extended duct, causing a shock to form within said duct forcing a sufficient change in pressure, temperature, velocity, and turbulence of the gas flow to initiate and/or maintain combustion reactions downstream of said shock, said combustion extending through the remaining duct length, with said gas flow extending beyond the duct exit in the form of a supersonic jet stream.

5,531,591
SAFETY DEVICE FOR USE IN LIGHTER

Nobuo Yamazaki, Shizuoka-ken, Japan, assignor to Tokai Corporation, Shizuoka-ken, Japan
Filed Mar. 17, 1995, Ser. No. 406,363
Int. Cl.⁶ F23D *11/36*
U.S. Cl. 431—153 **2 Claims**

1. A safety device for use in a gas lighter comprising:
- a) an actuating member which covers the upper end of a lighter body like a cap, said actuating member having
  - a leg rotatably attached to said lighter body by means of a rotation axis projecting from said leg, and
  - a regulation groove formed in said leg;
- b) a tank side surface, one of two wider surfaces of said lighter body, having
  - a circular-arc-shaped guide groove formed at the upper end of said tank side surface and
  - an end recessed groove formed at one end of said circular-arc-shaped guide groove in the vicinity of the center of said upper end of said tank side surface; and



c) a lock member made up by integration of
  - a base portion which travels in a regulated manner by means of said regulation groove,
  - a stopper portion which is joined to the upper end of said base portion and is engageable with said guide groove and said end recessed groove,
  - a finger grip portion which permits a lock release operation and is connected to said stopper portion in such a way as to be kept a certain distance apart from said stopper portion toward the outside, said finger grip portion displacing said stopper portion from a locked position, where said stopper portion engages with said end recessed groove, to an unlocked position, where said stopper portion engages with said guide groove, along said regulation groove, and
  - a spring member for forcefully urging said base portion toward the center of said lighter body and holding the same attracted at said locked position and said unlocked position, whereby

said stopper portion engages with said end recessed groove to prevent pivotal movement of said actuating member when said lock member is situated at said locked position, and said actuating member becomes pivotable when said lock member is displaced to said unlocked position, and also said lock member is displaced to said locked position to the other end of said guide groove as a result of pivotal movement of said actuating member.

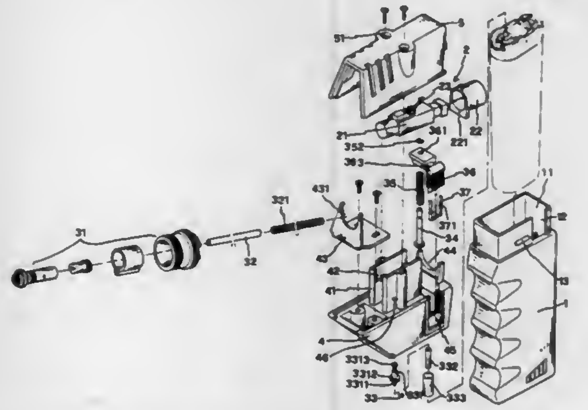
5,531,592
HANDY GAS TORCH

Chin-Lin Tasi, 3F, No. 94, Sec. 4, Chung Hsin Rd., San Chung City, Taipei Hsien, Taiwan

Filed Feb. 28, 1994, Ser. No. 203,334

Int. Cl.^{6} F23Q ***7/12***

U.S. Cl. 431—255 **5 Claims**



1. A handy gas torch comprising: a holder for accommodating a fuel gas container of the type having a fuel gas nozzle and a push button for controlling the passage of the fuel gas nozzle, said holder having a top flange around a top opening thereof, said top flange having a side opening at one side and elongated tenons horizontally raised from two opposite sides thereof on the outside; a firing device, said firing device comprising a spark emitting device, and a depressible firing button controlled to trigger said spark emitting device causing it to produce sparks through a spark emitting tip thereof; a fuel gas control device, said fuel gas control device comprising a torch nozzle disposed near said spark emitting tip, a connecting tube assembly connected to the fuel gas nozzle of the fuel gas container being received in said holder, and a nozzle tube connected between said torch nozzle and said connecting tube assembly; the improvement comprising:
  - a mount mounted on said top flange of said holder and retained in place by said tenons, said mount having a vertical track at one side in parallel with the side opening on said top flange of said holder, a through hole in the middle, through which said connecting tube assembly passes, two upright walls bilaterally spaced at the top and defining a chamber, which receives said said firing device, and a torch nozzle support at one end, which supports the torch nozzle of said fuel gas control device;
  - a slide switch having one end disposed out of the side opening on the top flange of said holder and being moved to slide in the vertical track on said mount between the operative position at an upper limit and the non-operative position at a lower limit;
  - a pressure rod having a top end inserted through a hole on said slide switch and retained in place by a clamp, and a headed bottom end stopped at the push button of the fuel gas container being received in said holder;
  - a coil spring mounted around said pressure rod and retained between said slide switch and the headed bottom end of said pressure rod; and

wherein when said slide switch is moved to the lower limit, the push button of the fuel gas container is depressed by said pressure rod, and the fuel gas in the fuel gas container is driven out of the fuel gas nozzle and sent out of said torch nozzle for burning by sparks being produced by said firing device.

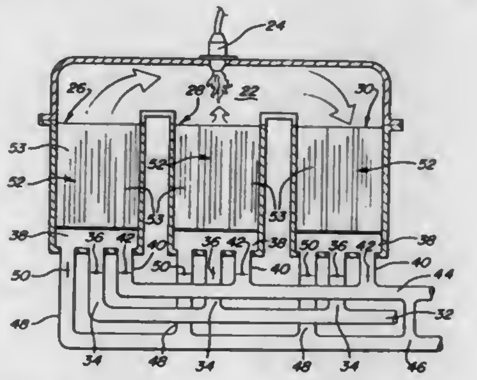
5,531,593
REGENERATIVE THERMAL OXIDIZER WITH HEAT EXCHANGER COLUMNS

Joseph M. Klobucar, Plymouth, Mich., assignor to Durr Industries, Inc., Plymouth, Mich.

Continuation-in-part of Ser. No. 89,722, Jul. 12, 1993, Pat. No. 5,352,115. This application Sep. 26, 1994, Ser. No. 312,234

Int. Cl.^{6} F27D ***17/00***

U.S. Cl. 432—181 **10 Claims**



1. A regenerative thermal oxidizer comprising:
a combustion chamber;
  - at least two heat exchangers, each having a heat exchanger passage leading into said combustion chamber and having a heat transfer column located therein;
  - an inlet line connected to a source of gas having entrained pollutants, said inlet line communicating with an inlet branch leading to each of said heat exchangers, and an inlet valve located in each said inlet branch;
  - an outlet branch leading from each heat exchanger, each said heat exchanger outlet including an outlet valve;
  - gas to be cleaned being delivered through said inlet line, and into one of said heat exchanger inlets by opening said inlet valve and closing said outlet valve on one of said heat exchangers in an inlet mode, moving a gas to be cleaned through said one heat exchanger and into said combustion chamber, combusting such gas and leading the cleaned gas from said combustion chamber through a second heat exchanger having a closed inlet valve and an open outlet valve in an outlet mode, and delivering the cleaned gas to said outlet branch;
  - said heat transfer columns including a solid body formed of a heat resistant, heat retaining material having a plurality of spaced axial gas flow passes, said heat transfer column having a substantially constant cross-sectional area, and said flow passages having a substantially constant cross-section, and extending over at least about 50 percent of said cross-sectional area, and the pressure drop across said heat transfer column being less five inches of water when the superficial flow rate is greater than 100 feet per minute; and
  - there are two said heat exchangers, said heat exchangers being arranged on opposed sides of said combustion chamber, said axial gas flow passages in one of said heat exchangers extending in a direction towards the other of said heat exchangers.

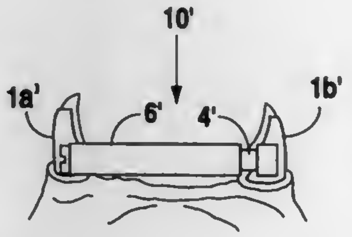
5,531,594
ORTHODONTIC JAW SCREW

Joseph F. Cukjati, 1916 Wendy St., Irving, Tex. 75060

Filed Oct. 5, 1994, Ser. No. 318,346

Int. Cl.^{6} A61D ***5/00***

U.S. Cl. 433—1 **4 Claims**



1. A veterinary adjustable jaw screw, attachable to the crowns of symmetrically spaced forward jaw teeth of a mammalian patient, for compressing and retaining the symphyseal area, comprising:
  - a pair of rigid symmetrically spaced mounting members respectively contoured to abut the outer surface of the crowns of the forward jaw teeth;
  - means for securing said mounting members to respective tooth crowns;
  - two rigid cylindrical tubes disposed in telescopic and slidable relation, each said tube having one end integrally connected to one of said mounting members;
  - means for axially displacing said tubes towards each other thereby compressing and retaining the symphyseal area;
  - a substantially flat rectangular mounting member having one surface disposed adjacent to the symphyseal area when installed in a patient and said flat mounting member having one long side integrally attached along the longitudinal length of one said tube; and
  - means for securing said flat mounting member to the symphyseal area.

5,531,595
DENTAL ARTICULATOR AND METHOD

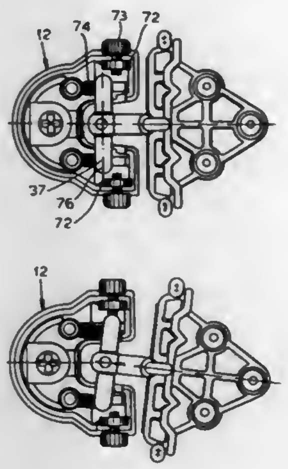
Ioannis Kontavas, 5-9 Vapbeiochoriou Street, GR-114 76 Athens, Greece

Continuation-in-part of Ser. No. 50,070, Apr. 27, 1993, Pat. No. 5,380,199. This application Oct. 31, 1994, Ser. No. 331,937

Claims priority, application Greece, Jul. 17, 1991, 910100316

Int. Cl.^{6} A61C ***11/00***

U.S. Cl. 433—65 **13 Claims**



1. A dental articulator, comprising:
  - a base;
  - a post extending upwardly from the base;
  - a head vertically adjustable on the post;
  - a lower metal bracket bar on the base projecting forwardly therefrom and provided with upwardly directed formations;
  - a lower disposable plastic holder formed with a plate provided with formations interfitting with the formations of the lower bracket bar and engageable therewith, and a tongue projecting forwardly from the plate and adapted to be embedded in a lower jaw cast;
  - an upper metal bracket bar projecting forwardly from the head and provided with upwardly directed formations;
  - an upper disposable plastic holder formed with a plate provided with formations interfitting with the formations of the upper bracket bar and engageable therewith, and a tongue projecting forwardly from the plate and adapted to be embedded in an upper jaw cast; and
  - means in the head enabling pivotal movement of the upper metal bracket bar about a vertical axis and movement of a horizontal axis in a horizontal plane relative to the head.

5,531,596
DENTAL HAND PIECE WITH WATER DISTRIBUTION SYSTEM

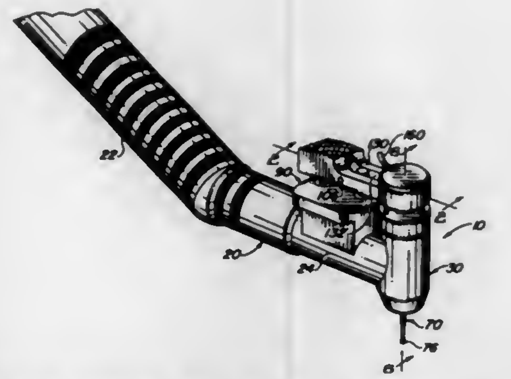
Chris R. Melde, 10029 N. 60th Pl., Scottsdale, Ariz. 85253

Filed May 25, 1995, Ser. No. 450,416

Int. Cl.^{6} A61C ***1/02***

U.S. Cl. 433—104 **27 Claims**

1. Dental drill apparatus comprising in combination:
  - a handpiece;
  - a head connected to the handpiece;
  - a burr, including a shank rotatably secured to the head and extending outwardly therefrom;
  - a bore extending through the burr for conveying a cooling liquid from the head;
  - a liquid distribution system connected to the head for providing liquid to the bore of the burr, including
    - a block disposed adjacent to the head and the burr removable relative to the head for changing the burr, and
    - a liquid delivery bore in the block through which the cooling liquid flows to the bore in the burr; and

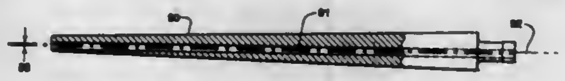


means for sealing the block and the burr, including a conical element on the block.

5,531,597
TRANSDUCER ACTIVATED TOOL TIP

Harvey B. Foulkes, Commack; George E. Warrin, North Merrick, both of N.Y.; Huy-Can Dao, Linden, N.J., and Rene Perdreaux, Brooklyn, N.Y., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 26, 1994, Ser. No. 268,418
Int. Cl.^{6} A61C *1/07;3/03;3/08;5/00*
U.S. Cl. 433—119 **28 Claims**



1. A transducer activated tool for contacting workpiece surfaces and directing a fluid adjacent to said surfaces, comprising:

an activated tip having distal surfaces shaped to contact said workpiece surfaces and a fluid passageway internal to said tip formed generally along the longitudinal center axis of the tip but offset such that a fluid discharge orifice is formed displaced from said tip axis;

an activating transducer connecting body connecting said tip to an activating transducer; and

a fluid source connected to said tip fluid passageway and providing a flow of fluid discharging from said tip fluid passageway discharge orifice, said tip fluid passageway orifice being eccentrically offset from said tip axis, wherein the passageway is substantially parallel to the center axis of the tip but displaced from said axis by 0.1 to 0.5 mm.

5,531,598
PORTABLE ULTRASONIC DENTAL CLEANING DEVICE

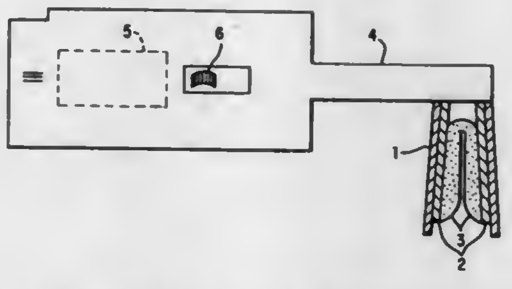
Marvin Rosenberg, 125 Chateaux Dr., Palm Drive, Fla. 33480, and Irving Wasson, Apartment 4F, 2000 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Sep. 30, 1994, Ser. No. 312,958
Int. Cl.^{6} A61C *1/07;3/03;3/08*
U.S. Cl. 433—119 **5 Claims**

1. A portable ultrasonic dental cleaning device, comprising:

a housing provided with a proximal section and a distal section, said proximal section provided with a cylindrical handle and including therein a source of electrical power, said distal section provided with a semi-rigid rectangularly shaped connector; and

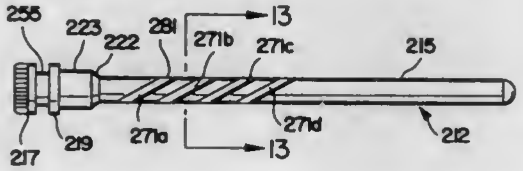
an applicator connected to said distal section, said applicator provided with an applicator housing, a transducer provided within said applicator housing and a closed liquid-filled membrane in direct contact with said transducer, said transducer provided with only first and second opposed members, said first and second opposed members configured and sized to cover only a portion of either the individual's top or bottom teeth when said applicator housing is inserted into the individual's mouth.



5,531,599
DISPOSABLE DENTAL PROPHYLAXIS CONTRA-ANGLE, METHOD OF MAKING IT, AND DRIVE GEAR FOR USE THEREIN

Ronald L. Bailey, Harvester, Mo., assignor to Young Dental Manufacturing Company, Inc., Earth City, Mo.

Continuation-in-part of Ser. No. 963,132, Oct. 19, 1992, Pat. No. 5,328,369, which is a continuation-in-part of Ser. No. 613,366, Nov. 15, 1990, Pat. No. 5,156,547. This application Jul. 11, 1994, Ser. No. 273,182
Int. Cl.^{6} A61C *3/06;* **F16C** *3/00*
U.S. Cl. 433—125 **16 Claims**



1. In a dental angle for attachment to a dental handpiece, the angle comprising:

a body having a generally cylindrical sleeve with an open rear end, a neck, and a hollow head, an axial bore extending through the sleeve and neck and into the head;

a drive gear including a gear and a flexible shaft, the shaft extending rotatably from the open rear end of the sleeve through the first bore into the head bore; and

a driven gear rotatably mounted in the head and operatively connected to the drive gear, the driven gear including means for retaining a dental bit,

the improvement wherein said gear and said shaft of said drive shaft are molded of plastic as a single piece, the shaft comprising a plurality of grooves formed at an angle to a long axis of the shaft in a relaxed condition of the shaft as molded to increase the flexibility of the shaft in an area between the gear and a free end of the shaft opposite the gear.

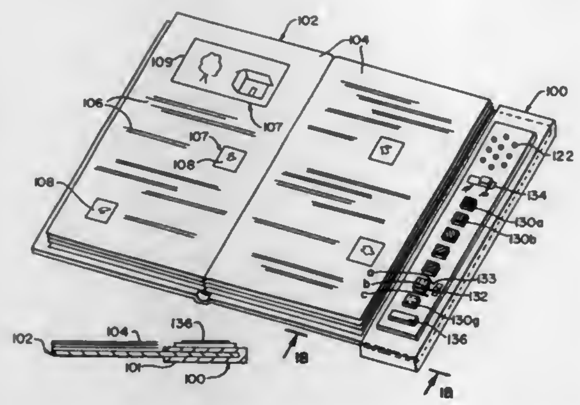
5,531,600
INTERACTIVE AUDIO-VISUAL WORK

Ralph H. Baer, Manchester, N.H., and Philip E. Orbanes, Topsfield, Mass., assignors to Western Publishing Co., Inc., Racine, Wis.

Continuation of Ser. No. 106,422, Aug. 13, 1993, Pat. No. 5,437,552. This application May 26, 1995, Ser. No. 451,524
Int. Cl.^{6} G09B *5/00*
U.S. Cl. 434—317 **22 Claims**

1. Apparatus for use in conjunction with a book containing intermixed text and a symbol, said apparatus comprising:

(A) A microprocessor;



(B) a sound storage-and-playback memory having an addressable storage location;

(C) an actuatable selector associated with a symbol corresponding to the symbol in the book;

(D) means for selecting between a recording mode of operation and a playback mode of operation;

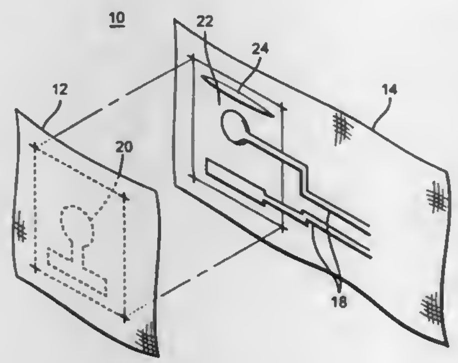
(E) means for recording at said addressable storage location in said memory a sound produced by the user, said recording means being active during the selected recording mode of operation; and

(F) means for playback from said memory of the recorded sound, said playback means being active upon actuation of said selector during the selected playback mode of operation.

5,531,601
FABRIC BATTERY POUCH

Eugene C. Amoroso, 23656 N. 44th La., Glendale, Ariz. 85310

Filed Jun. 23, 1995, Ser. No. 494,101
Int. Cl.^{6} H01R *33/00;* **F21L** *15/08*
U.S. Cl. 439—37 **15 Claims**



1. A flexible battery pack for holding and connecting a battery comprising:

a first fabric;

a first conductive trace upon said first fabric;

a second fabric;

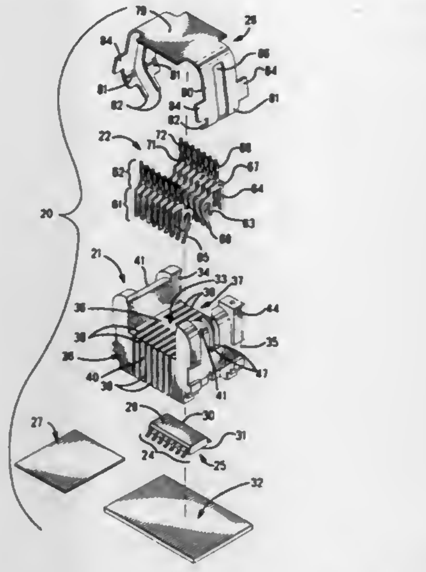
a second conductive trace upon said second fabric; and

wherein the first fabric is attached to the second fabric such that said first and second conductive traces are configured to electrically connect to a said battery when placed between said first and second fabrics.

5,531,602
ADAPTER ASSEMBLY FOR A SMALL OUTLINE PACKAGE

Donald K. Harper, Jr., Harrisburg; Michael F. Laub, Etters; James P. Pacelli, Lancaster, and William J. Schnoor, Hummelstown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 30, 1994, Ser. No. 315,368
Int. Cl.^{6} H01R *23/68*
U.S. Cl. 439—70 **14 Claims**



1. An adapter assembly for electrical connection with an integrated circuit (IC), the IC including an IC body having a pair of sides, at least one of the sides of the IC body having respective spaced-apart leads, said adapter assembly comprising:

an adapter housing including a main body portion, and further including first and second spaced-apart walls integrally connected by the main body portion, the spaced apart walls being raised above the main body portion of the adapter housing,

the main body portion including a plurality of spaced-apart slots substantially parallel with the respective first and second walls of the adapter housing,

and a plurality of contacts, each contact having a respective lower portion and a respective upper portion, said lower portions of the contacts being received in the slots of the main body portion of the adapter housing, each contact being electrically connected by its respective lower portion to a respective lead on the IC body,

the upper portions of the contacts being accommodated between the respective first and second walls above the main body portion of the adapter housing,

the first wall of the adapter housing including at least one opening for receiving respective electrical conductors, each electrical conductor being in electrical connection with the upper portion of the respective contact,

wherein said adapter housing further includes a cavity for receiving the IC body, the IC body having a plurality of spaced-apart side retention areas and first and second end retention areas, respectively, and

wherein said adapter housing further includes a first and a second retention means disposed within said cavity,

said first retention means being in a frictional interference with the respective side retention areas of the IC body, and said second retention means being in a frictional interference with the respective end retention areas of the IC body, thereby retaining the IC within the adapter housing in predetermined interposition,

wherein the side retention areas of the IC body are located between two adjacent leads,

wherein the cavity is located in the bottom part of the adapter housing and includes a first and a second spaced-apart sidewalls,

wherein the first retention means includes a plurality of spaced-apart retention teeth located on the first and the second respective sidewalls of the cavity, and
wherein each retention tooth engages the respective side retention area on the IC body,

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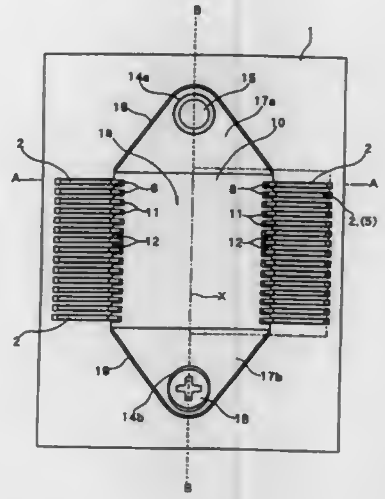
5,531,603
DEVICE FOR ALIGNING CONTACTING PORTIONS OF CONTACTS IN IC SOCKET

Masaaki Kubo, and Nanahiro Hayakawa, both of Tokyo, Japan, assignors to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,737
Claims priority, application Japan, Nov. 11, 1993, 5-307406
Int. Cl.⁶ H01R *9/09*
U.S. Cl. 439—72 **3 Claims**

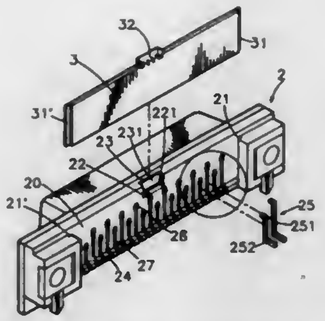


1. In an IC socket including an IC placing section at a generally central area thereof and a large number of contacts arranged in an array along a pair of opposing sides of said IC placing section, so as to be electrically and physically connected to leads of an IC placed on a socket body, a device for aligning contacting portions of said contacts in said IC socket comprising a ruler plate mounted on said IC placing section, said ruler plate being provided at a pair of opposing sides thereof with grooves or holes for allowing contacting portions of said contacts to be loosely inserted therein and partition walls for isolating the respective adjacent grooves or holes, said ruler plate being fitted to said IC placing section and firmly secured to a predetermined position through positioning means, said contacting portions being inserted respectively in said grooves or holes and side surfaces of said contacting portions being abutted with inner surfaces of said partition walls at said position where said ruler plate is firmly secured, thereby establishing relative positions of said contacting portions.

5,531,604
ELECTRIC CONNECTOR

Huang C. Huang, 5th Fl., No. 59-1, section 1, Jiow Juang Street, Nang Kang, Taipei, Taiwan

Filed Jul. 12, 1994, Ser. No. 274,177
Int. Cl.⁶ H01K *9/09*
U.S. Cl. 439—79 **1 Claim**

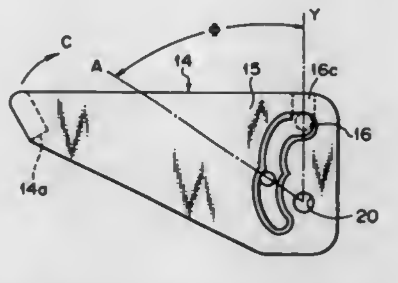


1. An electric connector comprising:
a base block, said base block comprising two opposite slideways on each of two sides thereof, a center hole near a front top portion and spaced from a center opening on a top surface thereof, and said base block having an inwardly inclined plane, a plurality of projections perpendicularly extended from a front bottom portion, a plurality of parallel grooves spaced from each other at equal intervals and respectively extended from between two adjacent projections to a plurality of through holes arranged in two rows;
a plurality of terminals each of which is bent at 90 degrees twice to form an upper and a lower connecting end perpendicular to a central portion, with said upper connecting end inserted into one of said through holes, said central portion is tightly fitted into one of said grooves, and said lower connecting end protrudes from between said two projections on either side of the same groove; and
a rectangular cover plate made from a flexible material, comprising two tongues extended outward from a first and a second end thereof, said tongues are received in said two slideways, and a center catch means at a rear top portion to engage with said center hole for positioning.

5,531,605
LEVER TYPE CONNECTOR

Osamu Taniuchi; Hitoshi Okumura; Hajime Kawase; Youichi Nankoh, and Hiroyuki Nakata, all of Mie-ken, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie-ken, Japan

Division of Ser. No. 425,708, Apr. 19, 1995, which is a continuation of Ser. No. 177,394, Jan. 5, 1994, abandoned. This application May 23, 1995, Ser. No. 448,102
Claims priority, application Japan, Jan. 6, 1993, 5-017009; Jan. 6, 1993, 5-017010
Int. Cl.⁶ H01R *13/62*
U.S. Cl. 439—157 **1 Claim**

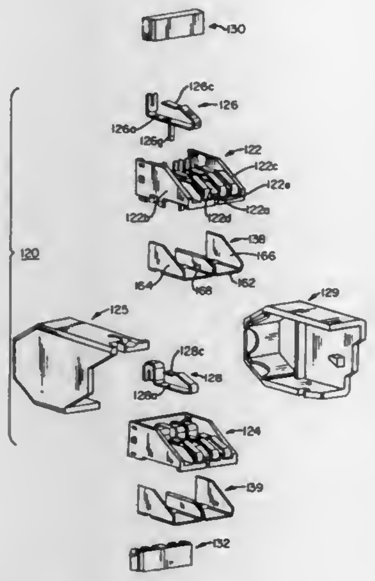


1. A lever type connector wherein one and the other of a pair of connector housings are provided with one and the other of sets of male terminals and female terminals to be coupled to each other, a lever is rotatably connected to one of said connector housings to be coupled to each other, a cam follower boss is provided on the other of said connector housings, said cam follower boss is operative to engage with a grooved cam formed in said lever, said sets of terminals are inserted into and extracted from each other by turning said lever so that said cam follower boss is displaced along a cam face on said grooved cam, and more than two sets of terminals are provided which are different in size and therefore have different timings of inserting and extracting of said terminals such that inserting and extracting resistances change discontinuously;
wherein a shape of said grooved cam on which said cam follower boss contacts upon inserting and extracting of said terminals is formed as a curve having two circular arcs combined by a point of inflection and two peaks so as to be discontinuous in accordance with the inserting and extracting resistances of said terminals.

5,531,606
SHIELDED VERTICALLY ALIGNED ELECTRICAL CONNECTOR COMPONENTS

Julio F. Rodrigues, Collierville, and Paul Bartholomew, Memphis, both of Tenn., assignors to Thomas & Betts Corporation

Continuation-in-part of Ser. No. 13,452, Feb. 4, 1993. This application Jul. 14, 1993, Ser. No. 92,142
Int. Cl.⁶ H01R *33/96*
U.S. Cl. 439—188 **25 Claims**



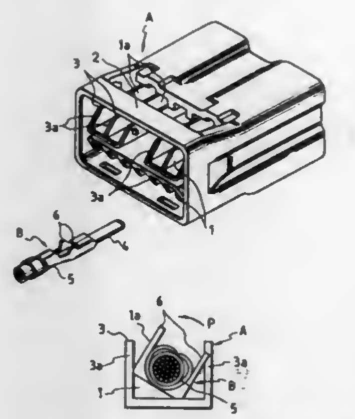
1. An electrical connector comprising:
an insulative housing having a mating end for engagement with a mating electrical connection device and a terminal end;
plural electrical contacts supported within said housing, said contacts being arranged in vertically spaced horizontally extending upper and lower rows, each contact of one row being paired in vertically stacked relationship with a contact of said other row;
shunting means for operatively electrically shunting said contact of each said vertically stacked pair;
a conductive shield supported within said insulative housing, said shield including a vertical shield portion extending vertically between portions of said shunting means associated with two contacts of at least one of said rows of contacts and a horizontal shield portion extending horizontally between said upper and lower rows of contacts.

5,531,607
CONNECTOR

Sakai Yagi; Masanori Tsuji, and Motohisa Kashiyama, all of Shizuoka, Japan, assignors to Yazaki Cororation, Tokyo, Japan

Continuation of Ser. No. 963,679, Oct. 20, 1992, abandoned. This application Dec. 3, 1993, Ser. No. 161,093
Claims priority, application Japan, Oct. 21, 1991, 3-272443
Int. Cl.⁶ H01R *13/64*
U.S. Cl. 439—246 **9 Claims**

4. A connector comprising:
a connector housing;
at least one terminal insertable into said connector housing along an insertion axis; and



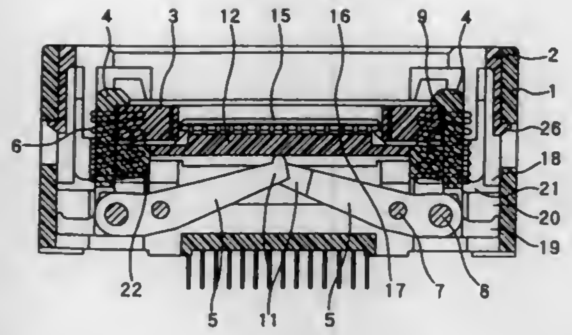
cam means for rotating said terminal about said insertion axis in association with an insertion motion of said terminal into said connector housing to correctly position said terminal relative to said connector housing without stopping said insertion motion, wherein
said cam means includes a projection formed on said terminal between an electrical contact portion and a wire connection portion of said terminal, and an end wall formed on said connector housing and abuttable against said projection during said insertion motion, at least one of mutually abuttable surfaces of said protection and said end wall being formed with a chamfered portion to allow said projection to slide on said end wall to cause rotation of said terminal in association with said insertion motion thereof.
6. A connector, comprising:
a connector housing having a rearwardly-opening terminal receiving chamber at least partially defined by a pair of substantially parallel side walls; and
an elongate terminal having an electrical contact portion (4) at a front end of said terminal, a wire connection portion (5) at a rear end of said terminal, and at least two stabilizers protruding from a portion of said terminal substantially midway between said electrical contact portion and said wire connection portion and in a direction substantially perpendicular to a direction in which the terminal is inserted into the chamber, wherein
at least one of a front end of said stabilizers and a rear end of said side walls, said front end of said stabilizers contacting said rear end of said side walls when said terminal is inserted in a tilted manner in said receiving chamber, being chamfered along substantially the entire length thereof so as to facilitate rotation of said terminal about its longitudinal axis when inserted in the tilted manner.

5,531,608
IC RETAINER IN IC SOCKET

Shunji Abe, Yokohama, Japan, assignor to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1995, Ser. No. 390,486
Claims priority, application Japan, Feb. 24, 1994, 6-05292
Int. Cl.⁶ H01R *13/62*
U.S. Cl. 439—330 **3 Claims**

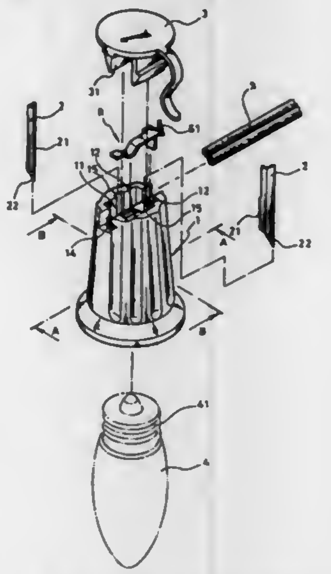
1. An IC retainer in an IC socket comprising a lock lever for engaging and disengaging from an IC or an IC carrier in accordance with upward and downward motion of a cover, a turnable lever for transforming the upward and downward motion of said cover to upward and downward motion of said lock lever, means for shifting said lock lever to a backward disengaging position when said lock lever is moved upwardly and to a forward engaging position when said lock lever is lowered, and spring means for applying a downward turning force to an external end portion of said turnable lever while applying a lowering force to a side of said lock lever on which the external end portion of said turnable lever acts, an internal end portion of said turnable lever opposite to that end portion on which said spring means acts being turned



upwardly by the downward turning force applied to said external end portion of said turnable lever, so that an upwardly directing force is applied to the cover.

5,531,609
STRUCTURE OF LAMP SOCKET

You-Jen Cheng, and Tzu-Ling Cheng, both of 2nd Fl., 18-9, Tienmu W. Road, Taipei City, Taiwan
Filed Jul. 5, 1994, Ser. No. 270,600
Int. Cl.⁶ H01R *4/50*
U.S. Cl. 439—340 1 Claim



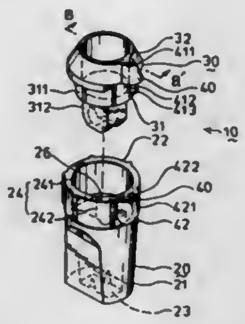
1. A lamp socket of the type having an internally threaded socket body having a wire groove, a socket cap fastened to said socket body to hold down an electric wire in said wire groove, a first contact metal plate and a second contact metal plate respectively fastened in a respective hole on said socket body and having each a top end connected to either conductor of said electric wire and a bottom end disposed inside said socket body, and a bulb threaded into the inside wall of said socket body and electrically connected to said electric wire through said first and second contact metal plates, the improvement comprising

two vertical mounting holes longitudinally bilaterally made on the inside wall of said socket body, each vertical mounting hole having a blocked bottom end and an open top end in communication with said wire groove; and

two locating plates respectively inserted into said vertical mounting holes, each locating plate having a beveled bottom end engaged into the blocked bottom end of either vertical mounting hole and a toothed portion vertically disposed at one side and meshed with the threaded base of said bulb to prohibit said bulb from being pulled out of said socket body in the axial direction.

5,531,610
CONNECTING MECHANISM FOR BULB HOLDER AND SOCKET

Chen Y. Chen, No. 191, Gi Yang Road, Hsin Chu, Taiwan
Filed Apr. 8, 1994, Ser. No. 224,756
Int. Cl.⁶ H01R *13/627*
U.S. Cl. 439—356 2 Claims



1. An improved light bulb holder and socket comprising:

a socket having a tubular body, an opening being defined at a top of said tubular body of said socket and a passage being provided at a bottom of the tubular body of said socket for receiving a pair of conducting wires therethrough, a receiving chamber being defined within said tubular body of said socket, said receiving chamber including a first chamber adjacent said top of said tubular body of said socket having a circular cross section and a second chamber adjacent the bottom of said tubular body of said socket having a rectangular cross section, said second chamber being partitioned from said first chamber by a step, said second chamber being in communication with the passage of said tubular body of said socket, a pair of conducting plates being disposed inside said second chamber and connected to said conducting wires;

a bulb holder having a tubular body for receiving a light bulb, a top of the tubular body of said bulb holder being provided with a flange which extends to the same diameter as said tubular body of said socket, said tubular body of said bulb holder being coaxially and removable received in said receiving chamber of said tubular body of said socket, said tubular body of said bulb holder having a first body portion adjacent said top of said tubular portion of said bulb holder which has a circular cross section and a second body portion adjacent a bottom of said tubular portion of said bulb holder which has a rectangular cross section, said first and second body portions being partitioned by a shoulder, said first and second body portions being received by said first chamber and said second chamber of said socket, respectively, to electrically connect the light bulb to said conducting plates, said bulb holder being positioned with respect to said socket by the abutment of said shoulder of said bulb holder with said step of said socket so that said flange of said bulb holder is spaced from the top of said tubular body of said socket; and

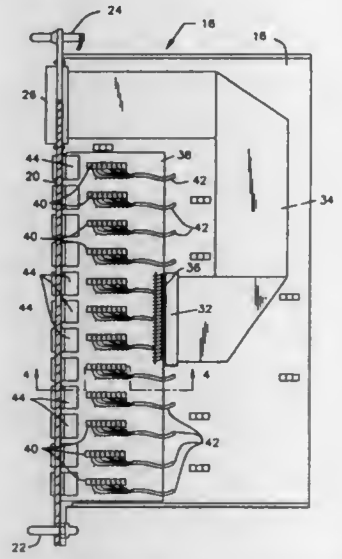
a connecting mechanism for removably attaching said bulb holder to said socket, said connecting mechanism including

a latch member including a boss which extends radially from the exterior of the flange of said tubular body of said bulb holder, a securing rod which has a preset length provided at an underside of said boss to extend along the exterior of said tubular body of bulb holder in a direction toward the bottom thereof; and

a securing seat including a projected portion extending from the top of the outer wall of said tubular body of said socket, said projected portion having a securing bore for receiving a portion of said securing rod to attach said bulb holder to said socket, said bore surrounding the portion of the securing rod inserted therein.

5,531,611
CONNECTOR MODULE FOR LOCAL AREA NETWORK

Steven J. Reed, Cordova; Scott T. Davies, Germantown; Robert L. Wallgren, Bartlett, and George R. Wojtan, Germantown, all of Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.
Filed May 4, 1994, Ser. No. 237,752
Int. Cl.⁶ H01R *13/60*
U.S. Cl. 439—540.1 10 Claims



1. A connector module for use in a local-area network having a plurality of workstations in communication with a hub having a port associated therewith, said port being adapted for operative connection with a first end of a cable, said module being operative to interconnect at least one workstation to the hub, said module comprising:

a panel, having a face portion;

a first connector disposed within said face portion of said panel, said first connector being adapted for operative connection to a second end of said cable;

a printed circuit board mounted to said panel, having at least one electrically conductive path disposed thereon;

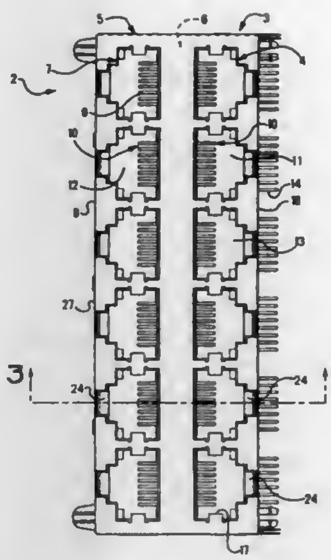
a second connector removably attached to said circuit board and electrically connected to said at least one path;

wiring means electrically interconnecting said first and second connectors; and

a third connector mounted on said printed circuit board and in electrical connection with said at least one path, said third connector being adapted for operative connection to said workstation, whereby connection of said workstation to said third connector electrically interconnects said workstation and said hub.

5,531,612
MULTI-PORT MODULAR JACK ASSEMBLY

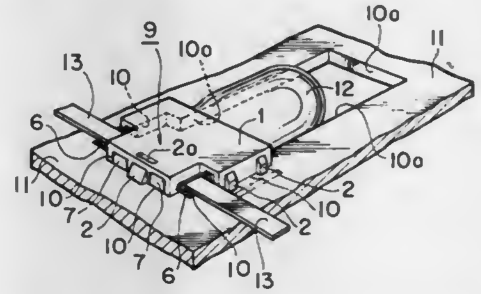
Roy J. Goodall, 21 Vicar's Close, Enfield, Middlesex, England, and Richard F. Gandy, 2 Rowlatt Drive, St. Albans, Hertfordshire, England
Filed Nov. 25, 1994, Ser. No. 345,061
Claims priority, application United Kingdom, Dec. 14, 1993, 9325594
Int. Cl.⁶ H01R *25/00*
U.S. Cl. 439—541.5 11 Claims



1. An electrical connector assembly for mounting on a printed circuit board (PCB), comprising a plurality of receptacle connectors, and a common main housing, each receptacle connector having an insert comprising a plurality of juxtaposed terminals mounted in an insulative portion thereof, the terminals each comprising a plug contact portion and printed circuit board contact portion extending at approximately 90° therefrom, the receptacle connectors securely mountable in the common main housing, the assembly characterized in that the receptacle connectors each have printed circuit board mounting sections, and plug receiving sections for mating with substantially identical complementary plug connectors, the receptacle connectors arranged in an upper row and a lower row such that the plug receiving sections of the upper and lower rows are in a substantially mirror-image disposition relative to a line between the upper and lower rows, whereby the rows are substantially parallel to the PCB when the connector assembly is assembled thereto.

5,531,613
CONNECTOR ATTACHMENT COMPONENT

Tsunesuke Takano, and Kouichi Sinzawa, both of Tokyo, Japan, assignors to Daiichi Denso Buhin Co., Ltd., Japan
Filed Jun. 6, 1994, Ser. No. 254,076
Claims priority, application Japan, Jun. 15, 1993, 5-037573 U
Int. Cl.⁶ H01R *13/73*
U.S. Cl. 439—544 4 Claims



1. A connector for an electrical component comprising:

(A) an electrically-insulated base formed of a heat-resistant plastics material and having a generally square tubular shape;

said base including a rearward constricted portion having a lesser widthwise dimension as compared to a forward portion of said base so as to establish a pair of lateral recesses rearwardly of said forward portion of said base;

a pair of protruding locking tabs protruding from sides of said forward portion of said insulating base;

said forward portion of said base including a pair of side relief holes extending in a lengthwise direction interiorly adjacent said sides of said forward portion;

at least one pair of projections protruding from opposed upper and lower interior surfaces of said rearward portion of said base;

(B) a pair of resilient generally U-shaped connector each having a pair of clamps formed of a resilient electrically conductive strip, said connector clamps being inserted into said rearward portion of said base so that said connector clamps face forwardly to receive a connection end of an electrical component inserted into the forward portion of said base; wherein each of said connector clamps includes,
  (I) at least one attachment hole which receives a respective one of said projections when said connector clamp is inserted into said rearward portion of said base, and
  (II) an insertion connection piece integrally connected, and laterally positioned relative, to said connector clamp so that said insertion connection piece of said connector clamp is disposed within one of said established recesses rearwardly of said forward portion of said base when said connector clamp is inserted into said rearward portion of said base; and
(C) an attaching body having a mounting aperture formed slightly larger than a perimetrical outline of said insulating base, said base being received within said mounting aperture, wherein said attaching body includes locking tabs formed adjacent to said mounting aperture and sized so as to be engaged with said base and thereby couple said base to said attaching body.

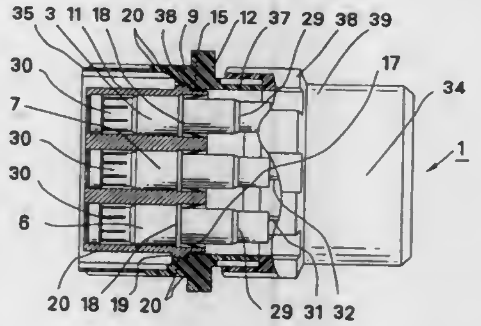
5,531,614
COMPOSITE CANNED DATA BUS COUPLER CONNECTOR

David O. Gallusser, Oneonta; James B. LeBaron, and Robert G. Wheeler, both of Sidney, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 8, 1991, Ser. No. 696,962

Int. Cl.^{6} H01R *13/648*

U.S. Cl. 439—607 **12 Claims**



1. A shielded electrical connector, comprising electrical contact means for receiving a corresponding electrical contact connected to electrical signal carrying lines, wherein said connector includes a housing made of a composite material substrate and a conductive shield electrically connected to said contact means, wherein said composite material includes an organic composite matrix and reinforcing fibers, wherein said organic matrix is formed from polyetheretherketone (PEEK), wherein said reinforcing fibers are carbon fibers comprising approximately 45% by weight of said composite material, and wherein said conductive shield comprises metal plating on said substrate, and
  further comprising a conductive insert for electrically connecting said contact means to said conductive shield, wherein said conductive insert comprises contact retention means for retaining said contact means in said connector, and said retention means comprises a resilient finger extending from an aperture in said insert and adapted to engage a collar member extending from said contact means, thereby sandwiching said collar member between said finger, and a shoulder in said insert to prevent axial movement of said contact means.

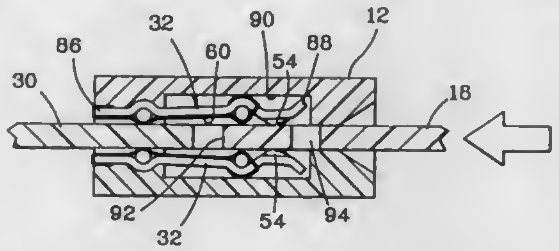
5,531,615
COPLANAR COMPUTER DOCKING APPARATUS

Robert D. Irlbeck, Greensboro; Robert M. Renn, Pfafftown; Keith L. Volz, Jamestown; Frederick R. Deak, Kernersville; David C. Johnson, and Warren A. Bates, both of Winston-Salem, all of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 102,659, Aug. 5, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,702

Int. Cl.^{6} H01R *23/70*

U.S. Cl. 439—631 **6 Claims**



1. An electronic docking connector for edge mounting an electronic device, such as a daughter board, to a motherboard, said connector comprising a pair of housing members assembled to define an elongated slot planarly aligned with the edge of said mother board, a pair of opposed force applying, resilient spring members having first and second ends, where said first ends are fixedly secured within the assembled housing members in a cantilevered fashion and said second ends are free to move away and toward each other, said spring members further including a pair of laterally extending mounting tabs joined to a flexible central portion by narrow webs, where said mounting tabs are fixedly secured within said assembled housing, and that said central portion includes at least a pair of laterally extending grooves for receiving an elastomeric compressive member, having a flexible film thereabout adjacent to said member, whereby said spring members are operatively mounted within said housing members for receiving and applying a compressive force against said electronic device, and that said flexible film includes electrical circuitry thereon for electrically interconnecting corresponding circuitry on said mother board and said electronic device.

5,531,616
INDICATOR LAMP

Philippe Forestello, Soyaux, France, assignor to Schneider Electric SA, Boulogne Billancourt, France

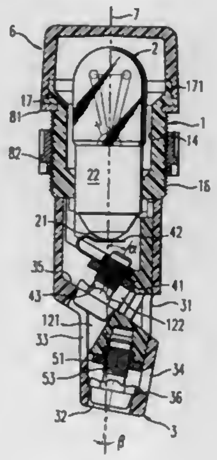
Filed Jul. 12, 1994, Ser. No. 273,934

Claims priority, application France, Jul. 12, 1993, 93 08657

Int. Cl.^{6} H01R *17/18*

U.S. Cl. 439—668 **11 Claims**

1. Indicator lamp comprising;



a hollow body;
a luminous component positioned in the hollow body, said luminous component being supplied with power by conductors connected to first and second screw terminals and closed at a front portion thereof by a transparent cap, wherein said terminals are staggered along the longitudinal axis of the indicator lamp and wherein a longitudinal screw axis of one of the first and second screw terminals is at an acute angle with respect to the indicator lamp longitudinal axis.

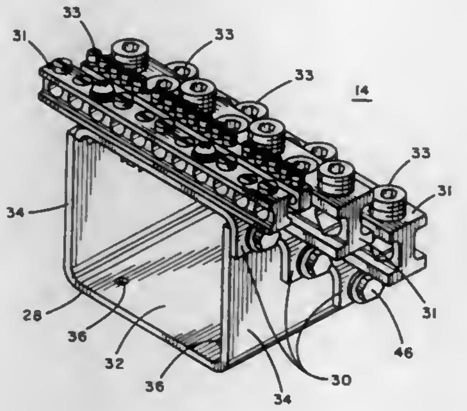
5,531,617
NEUTRAL LUG ASSEMBLY FOR A PANELBOARD

Robert J. Marks, Rockvale, Tenn., assignor to Square D Company, Palatine, Ill.

Filed Jun. 3, 1994, Ser. No. 253,540

Int. Cl.^{6} H01R *11/09*

U.S. Cl. 439—723 **5 Claims**



1. A neutral lug assembly for coupling neutral wire conductors to a neutral plate in a panelboard, said neutral lug assembly comprising:
  a generally u-shaped bracket having generally stair-step shaped first and second side portions, including at least one slot in said first side portion and an aperture in said second side portion;
  a plurality of generally u-shaped cross straps coupled to said bracket, each of said cross straps including a first end portion having a tab extending therefrom and including a second end portion having an aperture therein, said tab extending into said slot in said first side portion of said bracket, each of said cross straps further including a pin member extending through said apertures in said second end portion of said cross strap and said second side portion of said bracket; and
  a wire connector coupled to each one of said plurality of cross straps;
  said bracket being adapted to dispose said plurality of cross straps in different planes thereby accommodating more of said wire connectors in a given space in the panelboard and allowing said wire connectors to be interchangeable.

5,531,618
APPARATUS AND METHOD OF CONNECTING AND TERMINATING ELECTRICAL CONDUCTORS

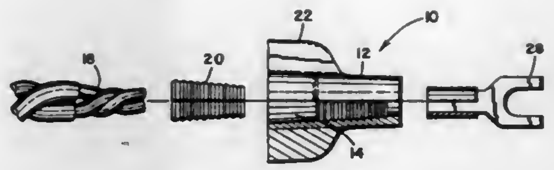
Roger A. Market, 3108 Riverview Dr., Eau Claire, Wis. 54703

Continuation of Ser. No. 912,224, Jul. 10, 1992, abandoned, which is a continuation of Ser. No. 593,314, Oct. 1, 1990, abandoned, which is a continuation of Ser. No. 358,669, May 30, 1989, abandoned. This application Jun. 4, 1993, Ser. No. 72,343

Int. Cl.^{6} H01R *13/33*

U.S. Cl. 439—840 **18 Claims**

1. An electrical connector-terminal comprising:



(a) a rigid insulator construction having a bore defined therein and an open end;
(b) a conductive coiled spring received with the bore, said spring adapted for selectively retaining and releasing a conductor element within the bore;
(c) a electrical connector-terminal adapted for selective engagement with an electrical terminal, said connector-terminal being non-removably mounted on said insulator construction, and said connector-terminal being non-removably mounted on and in direct contact with said conductive coiled spring; and
(d) conductor means adapted for providing electrical continuity between said connector-terminal and the conductor element.

5,531,619
CONTROL DEVICE FOR MARINE PROPULSION UNIT ENGINE

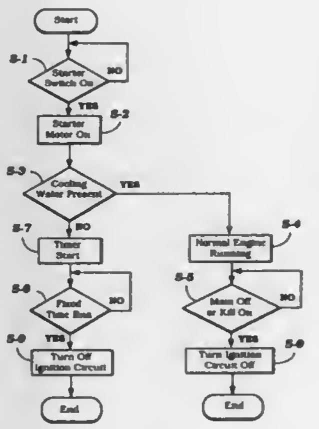
Ryoichi Nakase, and Shigeyuki Ozawa, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiski Kaisha, Hamamatsu, Japan

Filed Oct. 25, 1993, Ser. No. 143,342

Claims priority, application Japan, Oct. 24, 1992, 4-309245

Int. Cl.^{6} B63H *21/38*

U.S. Cl. 440—1 **10 Claims**



1. A device for assisting a purging of water from a watercraft marine engine having a cooling jacket though which coolant is circulated from a body of water when said engine is propelling an associated watercraft, said device comprising means for sensing the flow of water through said cooling jacket and means for automatically running said engine for only a pre-determined time period after the flow of coolant to said cooling jacket is sensed to have been discontinued for purging said cooling jacket of water, comprising a timer set to begin timing upon the sensing of discontinuance of flow for running the engine at the pre-set time so as to insure that the engine will reach an appropriate temperature for purging the water without over beating of the engine.

5,531,620
WATER-COOLED EXHAUST SYSTEM FOR WATERCRAFT

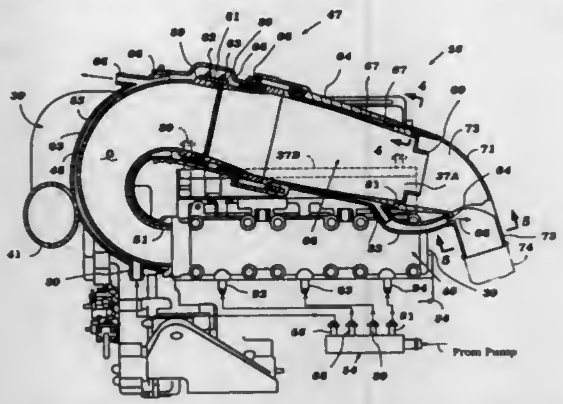
Shigeyuki Ozawa, and Ryoichi Nakase, both of Hamamatsu, Japan, assignors to Sanshin Industries Co., Ltd., Hamamatsu, Japan

Filed Dec. 5, 1994, Ser. No. 349,680

Claims priority, application Japan, Dec. 6, 1993, 5-305484

Int. Cl.^{6} B63H *21/32*

U.S. Cl. 440—89 **25 Claims**



1. An exhaust system for a watercraft powered by a water cooled internal combustion engine having at least one exhaust port, an exhaust conduit extending from said exhaust port through said hull to an outlet for discharge of exhaust gases from said engine to the atmosphere, said exhaust conduit having a double-wall section with the area between said double walls forming a cooling jacket through which water is circulated, the inner member of said double-walled portion forming an exhaust gas flow path through which exhaust gases pass in their path from said exhaust port to said outlet, the downstream end of said inner member terminating short of the outer member so that a portion of said outer member extends beyond the downstream end of said inner member, seal means for sealing at least the portion of said cooling jacket adjacent said downstream end of said inner member, and means for discharging a major portion of water from said cooling jacket into said exhaust conduit downstream of said inner member downstream end not contiguous to said end.

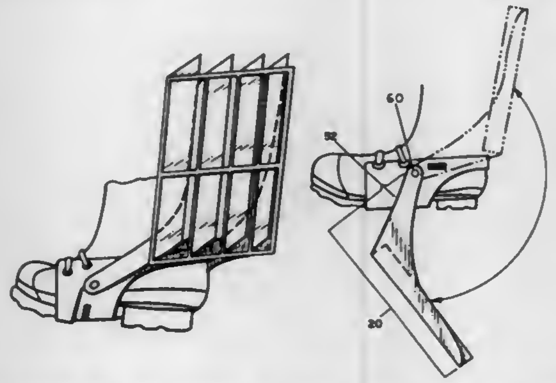
5,531,621
FORWARD PROPELLING, RETRACTABLE FLOAT TUBE FIN, WITH AUTOMATIC PROPULSION VANES

Carroll L. Johnson, 2658 Paradise Way, Grand Junction, Colo. 81506

Filed Feb. 23, 1994, Ser. No. 200,751

Int. Cl.^{6} A63B *31/11*

U.S. Cl. 441—61 **20 Claims**



1. A retractable fin assembly for attachment to the boot of a float tube user, said boot having a heel and a sole, said assembly comprising:

a fin member movable between a first position projecting below said boot adapted for propelling said float tube user forwardly in the water and a second position adapted for retraction relative to the heel of said boot to permit walking on land by said float tube user;

propulsion vane means carried by said fin member and having a closed position providing substantial resistance to the flow of water as said fin member is moved in a rearward direction relative to said user, and an open position for providing substantially reduced resistance to the flow of water as said fin member is moved in a forward direction relative to said user; and

means for attaching said fin member to the boot of a user such that said first position provides an acute angle between said fin member and said boot sole as said fin member projects downwardly and away from the toe of said boot, and said second position aligns said fin member behind said heel above said sole proximate the leg of said user.

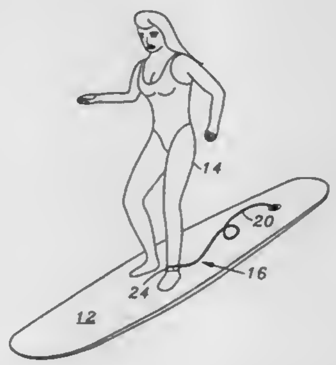
5,531,622
QUICK DISCONNECT LEASH FOR SURFBOARD AND THE LIKE

Robert B. Nealy, P.O. Box 3154, San Clemente, Calif. 92672

Filed Mar. 15, 1995, Ser. No. 404,730

Int. Cl.^{6} B63B *21/28*

U.S. Cl. 441—75 **2 Claims**



2. A surfboard ankle leash comprising a length of resilient cord adapted at one end for attachment to a surfboard and having an ankle strap at its opposite end, said ankle strap having a fastener comprising a side release fastener consisting of a housing and a clip, said housing having top, bottom and side walls defining an interior and an open mouth for receiving said clip, said clip including a pair of extending elongated resilient prongs each having an enlarged tip portion defining a generally rearwardly outwardly outer surface terminating in a shoulder at the juncture of said prong and said enlarged tip portion, an elongated opening medially disposed in each sidewall of said housing through which extends the outer surface of an enlarged tip portion a prong when said clip is fully received in said housing, a stop being formed by each said sidewall at the edge of each elongated opening adjacent said open mouth being aligned with said shoulder of said prongs to lock said clip in said housing, quick release means cooperating with said fastener to release said clip from said housing, said quick release means including a pull and a connector, said connector of said quick release means consisting of an extending resilient loop surrounding said housing, the diameter of said loop being less than the distance between the outer surfaces of the prongs when said clip is fully received in said housing.

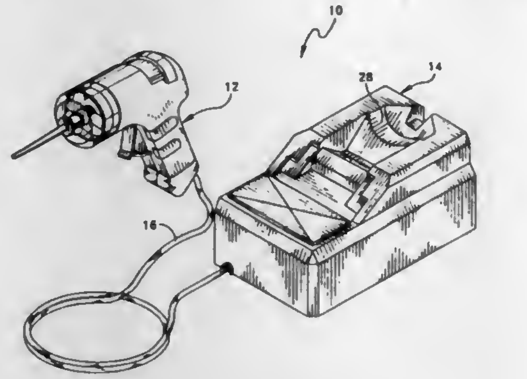
5,531,623
TOY WELDING APPARATUS WITH SPARKING MECHANISM

Harold E. Garner, Long Beach, and Michael W. Nuttall, S. Pasadena, both of Calif., assignors to Universal Product Innovations, Inc., Carson, Calif.

Filed Oct. 14, 1994, Ser. No. 323,333

Int. Cl.^{6} A63H *33/36*

U.S. Cl. 446—22 **8 Claims**



1. A toy spin welding apparatus comprising:

a thermoplastic rod having an end;

rotating means for rotating said rod at a rate sufficient so that when said end is placed in contact with a joint between two articles made from thermoplastic materials which are compatible with said rod, the friction between said rod and said two articles is sufficient to melt said rod and to thereby weld said two articles together; and

sparking means on said rotating means for producing sparks when said rotating means is actuated so as to cause the operation of said apparatus to simulate that of an arc welder.

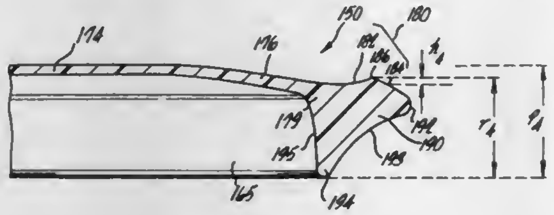
5,531,624
FLYING DISC

David B. Dunipace, Fontana, Calif., assignor to Innova Champion Discs, Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 18,864, Feb. 14, 1994. This application Mar. 2, 1994, Ser. No. 205,516

Int. Cl.^{6} A63B *65/10*

U.S. Cl. 446—46 **36 Claims**



1. A flying disc for catching and/or throwing, comprising

a single piece structure integrally molded from flexible plastic material and having a central flight plate section, an outer rim, and a shoulder section connecting said central flight plate section to said outer rim,

said outer rim extending downwardly from said shoulder section bounding a central cavity below said central flight plate section, said outer rim having an outer rounded edge and a lower rounded corner,

the disc including a top surface having a generally flat center portion outwardly transitioning to a downwardly curved convex section, outwardly transitioning to an upwardly sloping surface to an abrupt transition point above said outer rim, and then outwardly transitioning to a downwardly sloping upper rim surface to said outer rounded edge,

the disc having a transition point height h to rim height r ratio $h/r \leqq 10\%$, wherein the transition point height h is measured from a lowest point on said upwardly sloping surface to said transition point and total rim height r is measured from a bottom of the lower rounded corner to said transition point,

said upwardly sloping surface being non-convex, and

said downwardly sloping upper rim surface being generally convex.

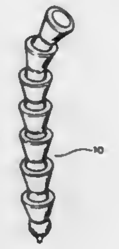
5,531,625
UNIVERSAL JOINT DEVICE FOR A TOY

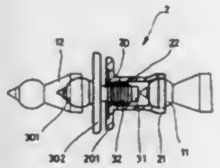
Chun-Chium Zhong, 58, Ma Yuan West St., Taichung, Taiwan

Filed May 18, 1995, Ser. No. 443,732

Int. Cl.^{6} A63H *33/08*

U.S. Cl. 446—120 **1 Claim**





1. A universal joint device comprising:

at least one coupler including a first spherical head and a first frustum portion having a neck portion formed between said first spherical head and said first frustum portion,

a tube including a first end having a second frustum portion formed therein for engaging with said first spherical head of said coupler, and including a second end having an annular rib extended radially inward therefrom,

a rod including a first end adapted to be engaged in said tube and including a plurality of teeth for engaging with said annular rib so as to secure said rod to said tube, said rod including a second end having a second spherical head formed thereon for engaging with said first frustum portion of said coupler, and

said first spherical head of said coupler including a tip for engaging with said second frustum portion so as to limit a rotational movement of said first spherical head relative to said second frustum portion.

5,531,626
TOY WATER BOMB DEVICE

Jeffry T. Deal, 278 Goat Hill Rd., Lambertville, N.J. 08530

Filed Jul. 8, 1994, Ser. No. 272,091

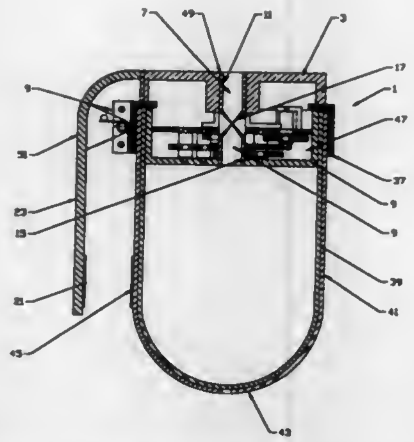
Int. Cl.^{6} A63H *33/00*

U.S. Cl. 446—473 **17 Claims**

1. A toy water bomb device, comprising:

(a) a main housing having an upper portion and a lower portion rotatably connected to one another and having a passageway through both of said upper portion and lower portion for receiving a shut off valve;

(b) a shut off valve located within said main housing and connected to said upper portion and said lower portion of said



main housing and adapted so that when said upper portion and said lower portion of said main housing are rotated relative to one another, said shut off valve is moved from an open position to a closed position;

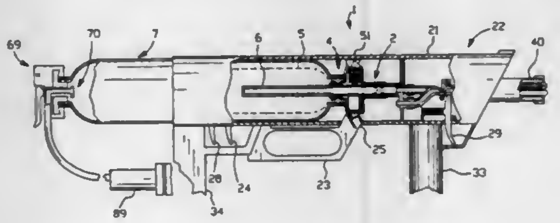
(c) locking means connected to one of said upper portion and said lower portion of said main housing and releasably connected to the other of said upper portion and said lower portion of said main housing such that said upper portion may be rotated relative to said lower portion to move said shut off valve to a closed position and said locking means may then be used to releasably lock said upper portion and said lower portion relative to one another to hold said shut off valve in its closed position until subsequently released; and,

(d) an expandable bladder connected to said lower portion of said main housing so that fluid may pass through said shut off valve and expand said expandable bladder to a predetermined volume of fluid, said upper portion of said main housing may be rotated relative to said lower portion so as to move said shut off valve to its closed position, and said locking means may then lock said device in a filled bladder, closed valve position, whereby said locking means may be subsequently released such that said expandable bladder will rapidly contract and expel fluid through said shut off valve to simulate a water explosion.

5,531,627

CARTRIDGE-TYPE WATER BOMB WATER GUN CONVERSION DEVICE

Jeffry T. Deal, 278 Goat Hill Rd., Lambertville, N.J. 08530
Continuation-in-part of Ser. No. 272,091, Jul. 8, 1994, and Ser. No. 318,138, Oct. 5, 1994. This application Feb. 15, 1995, Ser. No. 389,713
Int. Cl.^{6} A63H *33/00*
U.S. Cl. 446—473 **20 Claims**



1. A cartridge-type water bomb water gun conversion device, comprising:

(a) a cartridge-type water bomb, comprising:

(1) a main housing having a frontward portion and a rearward portion rotatably connected to one another and having a passageway with a discharge outlet through both of said frontward portion and rearward portion for receiving a shut off valve;

(2) a shut off valve located within said passageway of said main housing and connected to said frontward portion and said rearward portion of said main housing and adapted so that when said frontward portion and said rearward portion of said main housing are rotated relative to one another, said shut off valve is moved from an open position to a closed position;

(3) a locking means connected to one of said frontward portion and said rearward portion of said main housing and releasably connected to the other of said frontward portion and said rearward portion of said main housing such that said frontward portion may be rotated relative to said rearward portion to move said shut off valve to a closed position and said locking means may then be used to releasably lock said frontward portion and said rearward portion relative to one another to hold said shut off valve in its closed position until subsequently released; and,

(4) an expandable bladder connected to said rearward portion of said main housing so that fluid may pass through said shut off valve in the open position and expand said expandable bladder to a predetermined volume of fluid, said frontward portion of said main housing may be rotated relative to said rearward portion so as to move said shut off valve to its closed position, and said locking means may then lock said frontward portion with said rearward portion, with said expandable bladder filled and said shutoff valve in its closed position, whereby said locking means may be subsequently released such that said expandable bladder filled with fluid will rapidly contract and expel fluid through said shut off valve to simulate a water explosion;

wherein said cartridge-type water bomb may be used by itself to be released and generate a water burst, and, alternatively, may be mounted on a water gun for multiple firings by trigger action;

(b) a water gun comprising:

(1) a gun housing;

(2) a nesting section inside and attached to said gun housing, said nesting section for receiving said cartridge-type water bomb;

(3) a gun barrel extending outwardly form said gun housing;

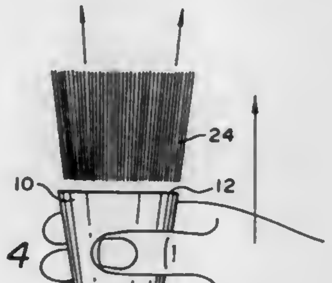
(4) an exit tube and discharge orifice on said gun barrel, said exit tube being connected to said nesting section on one end and connected to said discharge orifice on the other end; and,

(4) a pinch trigger movably connected to said gun housing of said water gun and functionally connected to said exit tube so as to have a first, closed position wherein said exit tube is pinched closed, and a second, open position caused by activation of said trigger wherein said exit tube is open.

5,531,628

CONFETTI PARTY FAVOR

James O. Watkins, 14920 Mt. Nebo Rd., Poolesville, Md. 20837
Continuation-in-part of Ser. No. 51,355, Apr. 23, 1993, Pat. No. 5,352,148. This application Jul. 11, 1994, Ser. No. 273,115
Int. Cl.^{6} A63H *37/00*
U.S. Cl. 446—475 **18 Claims**



1. A party favor capable of projecting confetti upwardly into the air comprising:

(a) a cup having a bottom, an open top and an annular wall extending between said bottom and said open top;

(b) a large plurality of pieces of confetti positioned in said cup, at least some of said pieces of confetti being aligned in a stack and said stack being wrapped by a wrapper around said stack; and

(c) a removable cover extending over said top whereby said pieces of confetti are retained in said cup until said cover is removed by the user and the confetti is manually ejected from the cup and projected upwardly into the air by upward movement of the hand.

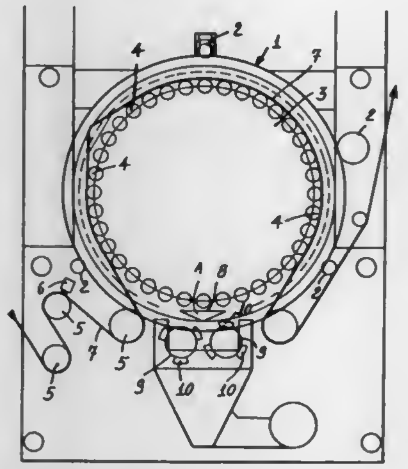
5,531,629

Patent Not Issued For This Number

5,531,630

SEAM PROTECTING DEVICE FOR DRUM GRINDING OR RAISING MACHINES

Emanuele Crosta, Corso Semplone, 67, 21052 Busto Arsizio (Varese), Italy
Filed Mar. 1, 1994, Ser. No. 204,766
Claims priority, application Italy, Mar. 4, 1993, MI93A0417
Int. Cl.^{6} B24B *49/00*
U.S. Cl. 451—5 **14 Claims**

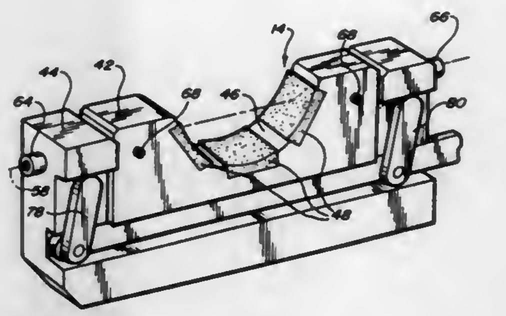


1. In a grinding machine which comprises a drum, cylinder means for driving the fabric to be processed, said fabric having regions with seams, said regions having threads for connecting two adjoining pieces of fabric, a sensor to detect the presence of seams in the fabric, a seam protecting device which comprises at least one pair of concentric annular members (1), a drum (3) having bearing means (2) and a bottom portion, means for connecting said annular members to each other, driving cylinders (5) for supplying said fabric (7) to said drum at a controllable advancing speed, and grinding cylinders (4), a sensor (6) connected to said driving cylinders (5), a cusp-shaped member (8) located at said bottom portion of said drum, said cusp-shaped member being applied to said annular members (1) and rotating about said drum at a peripheral speed equal to said advancing speed of said fabric, said cusp-shaped member rotating around said drum, through 360 degrees, then stopping, whereby said seamed regions are separated from said cylinders (4) and breakage of said threads is prevented.

5,531,631

MICROFINISHING TOOL WITH AXIALLY VARIABLE MACHINING EFFECT

Edward E. Judge, Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.
Filed Apr. 28, 1994, Ser. No. 234,170
Int. Cl.^{6} B24B *49/00*
U.S. Cl. 451—5 **20 Claims**



1. A microfinishing tool assembly for machining an external cylindrical surface of a workpiece using a machine of the type using a flexible abrasive coated microfinishing film which is pressed against said workpiece surface by said tool assembly as said workpiece and said film are moved relative to one another, said tool assembly comprising:

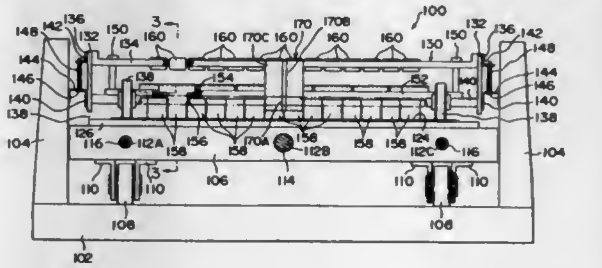
a shoe defining an aperture for engaging said workpiece and having a shoe surface for pressing said film against said workpiece surface, said shoe surface wrapping around a portion of the perimeter of said workpiece surface and extending axially in the direction of the longitudinal center axis of said workpiece surface, and

machining control means for causing the center of pressure applied by said shoe surface distributed axially along said shoe surface to be moveable axially along said shoe surface.

5,531,632

APPARATUS FOR DETECTING THE SURFACE OF A MEMBER TO BE GROUND, METHOD OF MANUFACTURING FEELERS, AND AUTOMATIC INSPECTION/GRINDING APPARATUS

Shigemitsu Mizutani, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 14, 1994, Ser. No. 355,970
Claims priority, application Japan, Dec. 14, 1993, 5-313081; Dec. 28, 1993, 5-337697
Int. Cl.^{6} B24B *49/00*
U.S. Cl. 451—6 **16 Claims**



8. An automatic inspection/grinding apparatus for determining the presence or absence and position of a projection by inspecting a surface of a member to be ground and for grinding the detected projection, said apparatus comprising:

a moving table which moves on a base;

an inspection base disposed above said moving table and extending in a direction horizontally perpendicular to a main moving direction of said moving table;

a plurality of feelers arranged in a longitudinal direction of said inspection base, each of said plurality of feelers being rotatably supported about a lower end face of a shoulder portion straddling over a through hole provided in said inspection base, a distal end of a tongue portion extending from the shoulder portion and passing through the through hole being disposed with a predetermined gap with respect to the surface of the member to be ground, and each of said plurality of feelers being normally maintained in a balanced state;

a plurality of sensors provided respectively for said plurality of feelers, a contact of each of said plurality of sensors being changed over when a state of said feeler changes between a normal state in which said feeler is balanced and an inclined state in which said feeler is rotated about the lower end face of the shoulder portion when the member to be ground is moved in conjunction with the movement of said moving table, and the projection comes into contact with said feeler;

a determining device for determining the presence or absence of the projection on the basis of an output signal from said sensor and for determining the position of the projection on the basis of an amount of movement of said moving table;

a grinding roller for grinding the projection;

a grinding unit including a supporting member for supporting said grinding roller with a predetermined gap with respect to the surface of the member to be ground, and a lifting device for moving said grinding roller in directions toward and away from the member to be ground during the grinding of the projection, said grinding unit being disposed by being offset in the main moving direction of said moving table with respect to said inspection base, and said grinding unit being supported movably in the direction horizontally perpendicular to the main moving direction of said moving table;

a moving device for moving said grinding unit in the direction horizontally perpendicular to the main moving direction of said moving table;

a positioning device for determining a position of said grinding unit in the direction horizontally perpendicular to the main moving direction of said moving table by controlling said moving device on the basis of positional information obtained by said determining means; and

a controller for executing grinding by causing said grinding unit to be brought into contact with the member to be ground, by controlling said lifting device on the basis of the amount of movement of said moving table at a time of detection of the projection by said feeler and an amount of offset between the position detected by said feeler and a grinding position of said grinding unit.

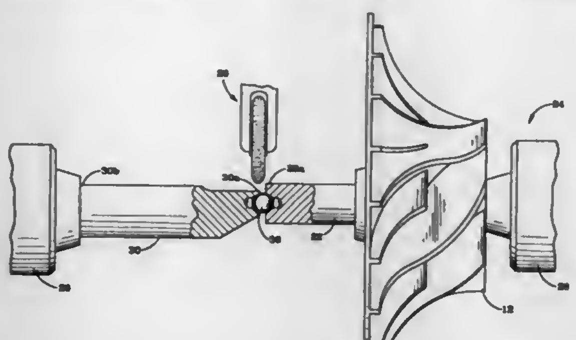
5,531,633
METHOD OF MACHINING A METAL WORKPIECE

James R. Riley, Mayfield, and Othel C. Richards, Clinton, both of Ky., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 24, 1994, Ser. No. 217,788

Int. Cl.⁶ B24B *1/00*

U.S. Cl. 451—28 **6 Claims**



1. In combination with a metalworking machine in which a metal workpiece is rotated about a horizontal axis which extends from a machine headstock to a machine tailstock, a method of machining the metal workpiece comprising the following steps:

forming in a first end of the metal workpiece a cavity having predetermined dimensions;

positioning a spherical member in a predetermined position within the cavity such that a portion of the spherical member extends out from the cavity past the first end of the metal workpiece;

fixedly locating the spherical member in the predetermined position;

mounting a second end of the metal workpiece in driving relation with the machine headstock;

providing a means for rotatably supporting the first end of the metal workpiece;

forming in a first end of the rotatable support means a cavity suitably dimensioned to conformably receive a predetermined portion of the spherical member;

mounting a second end of the rotatable support means in the tailstock;

mounting the first end of the metal workpiece in rotatable supporting relation with respect to the first end of the rotatable support means such that the cavity of the first end of the rotatable support means supportingly receives a predetermined portion of the spherical member which extends from the first end of the metal workpiece;

rotating the metal workpiece about the horizontal axis such that the predetermined portion of the spherical member spins freely within the cavity of the rotatable support means; and

machining the metal workpiece to a predetermined shape.

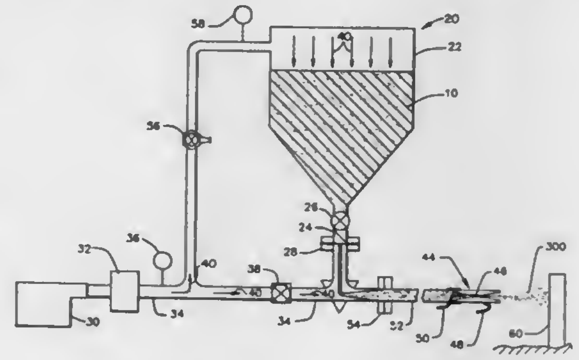
5,531,634
METHOD OF USING AN ABRASIVE MATERIAL FOR BLAST CLEANING OF SOLID SURFACES

Paul Schott, 66 High St., Perth Amboy, N.J. 08861

Filed Feb. 3, 1995, Ser. No. 383,206

Int. Cl.⁶ B24B *1/00;* B24C *1/00;7/00*

U.S. Cl. 451—39 **30 Claims**



1. A method for blast cleaning a solid surface using an abrasive composition of calcium carbonate, wherein the abrasive-blasting operation uses blasting apparatus including a blasting pot, a blasting hose and spray nozzle connected to the blasting pot, an air compressor and compressor air lines connected to the blasting pot, blasting hose, and spray nozzle, comprising the steps of:

a) filling said blasting pot with an abrasive composition of a coarse grade of calcium carbonate, wherein the calcium carbonate has the following properties: a diameter in the range of 4 MESH to 200 MESH and 90% of the particles are retained on a screen of 100 MESH; a bulk density in the range of 103 to 105 lbs/ft^3 and a density in the range of 179 to 183 lbs/ft^3; a MOH hardness in the range of 4.00 to 4.50; and said calcium carbonate being at least 96.0% by weight of the composition;

b) selecting a blasting spray nozzle having an orifice size in the range of ⅜" to ¾";

c) adjusting a media flow valve connected to said blasting pot to set a blasting flow rate in the range of 700 to 4600 lbs/hr;

d) setting the air pressure on said compressor air line connected to said spray nozzle to a pressure in the range of 30 to 120 psig;

e) setting the air volume flow rate on said compressor air line to a rate in the range of 75 to 750 cfm;

f) holding said spray nozzle a distance of 6" to 24" away from the surface to be cleaned; and

g) moving said spray nozzle across the surface to be cleaned.

5,531,635
TRUING APPARATUS FOR WAFER POLISHING PAD

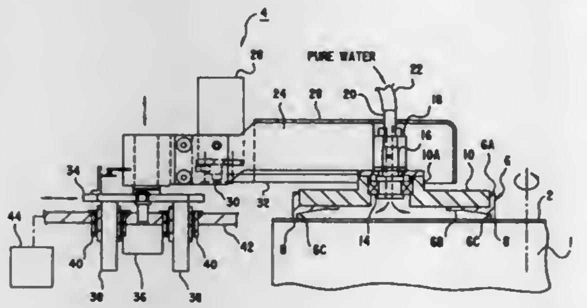
Katsumi Mogi, and Osamu Endo, both of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Mar. 20, 1995, Ser. No. 406,527

Claims priority, application Japan, Mar. 23, 1994, 6-052275

Int. Cl.⁶ B24B *53/00*

U.S. Cl. 451—72 **8 Claims**



1. A truing apparatus for truing a wafer polishing pad, which apparatus is attached to a wafer polishing apparatus for polishing a plurality of wafers while the wafers are rotated on a polishing pad attached to a platen and which apparatus trues the surface of said polishing pad, said truing apparatus comprising:

a truing grinding wheel having an annular abrasive grain layer including ultra-abrasive grains electrodeposited therein in a metallic plating bath;

a grinding wheel support means for rotatably supporting said truing grinding wheel in a state in which the polishing surface of said abrasive grain layer is brought into abutment with the surface of the polishing pad;

a grinding wheel rotation means for rotating said truing grinding wheel about its axis;

a self-aligning bearing means, disposed between said truing grinding wheel and said grinding wheel rotation means, for allowing the tilted movement of the truing grinding wheel; and

pure water supply means for supplying pure water from the interior of said truing grinding wheel to a region between the polishing surface and the polishing pad, wherein the outer diameter of said truing polishing surface is greater than the outer diameter of a wafer to be polished by said polishing pad, and said grinding wheel support means brings the polishing surface of said truing grinding wheel into abutment with the polishing pad over the overall width of one circumferential portion of an annular wafer polishing area on the surface of said polishing pad.

5,531,636
OSCILLATING DRUM SANDER

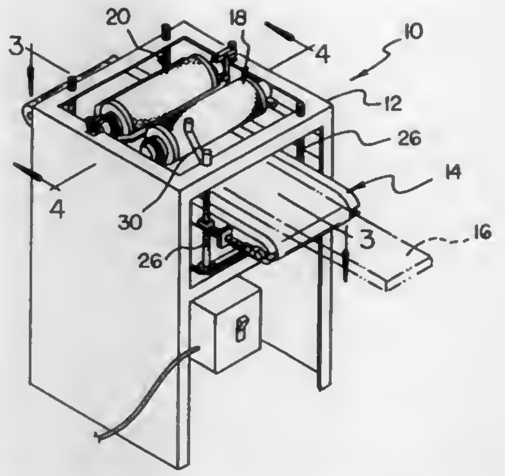
Eugene T. Bissen, 726 S. East St., Cale Doriu, Minn. 55921

Filed May 18, 1995, Ser. No. 443,729

Int. Cl.⁶ B24B *7/06*

U.S. Cl. 451—130 **16 Claims**

1. An oscillating drum sander comprising:



a main frame defining a longitudinal axis along which a workpiece is adapted to move;

an oscillating sanding drum assembly mounted to the main frame and caused to both rotate and axially oscillate relative to an axis transverse to the longitudinal axis of the main frame so as to sand a workpiece when positioned in contact with the oscillating sanding drum assembly,

further comprising a drive motor mounted to the main frame, the oscillating sanding drum assembly being positioned in mechanical communication with the motor,

wherein the oscillating sanding drum assembly comprises an axle supported by said frame and defining said transverse axis; and an abrasive cylinder mounted about said axle, the abrasive cylinder being positioned in mechanical communication with said motor,

wherein the oscillating sanding drum assembly further comprises transverse rotational bearing means for supporting the axle relative to the main frame so as to permit both rotation of said axle and axial movement thereof relative to the main frame, and

wherein the transverse rotational bearing means comprises a pair of spaced pillow block bearings, respectively, each engaged to an individual opposed end of said axle, said pillow block bearings each being supported for movement in the direction of said transverse axis relative to a portion of the main frame.

5,531,637
AUTOMATIC CENTRIFUGAL FLUIDIZING BARREL PROCESSING APPARATUS

Akihiro Kimura, Nagoya, Japan, assignor to Kabushiki Kaisha Nagao Kogyo, and Kimura Drawing Co., Ltd., both of Nagoya, Japan

Filed May 6, 1994, Ser. No. 238,940

Claims priority, application Japan, May 14, 1993, 5-112602; May 14, 1993, 5-112603; May 14, 1993, 5-112604; May 14, 1993, 5-112609; May 14, 1993, 5-112694; May 14, 1993, 5-112696

Int. Cl.⁶ B24B *31/02*

U.S. Cl. 451—329 **11 Claims**

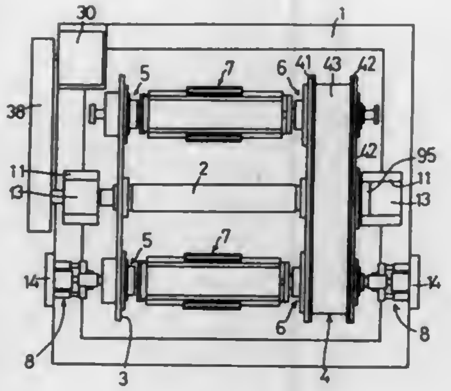
1. An automatic centrifugal fluidizing barrel processing apparatus, comprising:

a revolutionary shaft having a pair of disk members, horizontally held by a frame, and connected to a revolution driving source;

a plurality of pairs of rotary shafts which are rotatably held by said disk members and positioned on axes parallel to said revolutionary shaft and dividing a periphery of said revolutionary shaft equally;

a planetary moving mechanism which moves in conjunction with said revolutionary shaft and rotates said rotary shafts;

a plurality of airtight cylindrical barrels each having an engaging centering portion on both ends thereof and being capable of containing workpieces and polishing materials;

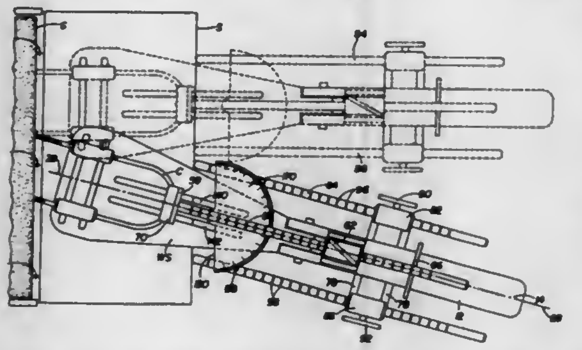


- a barrel pinching mechanism which detachably pinches said barrels by moving, in the longitudinal direction, pinching shafts which are installed in said pairs of rotary shafts in a manner to permit axial sliding, and engaging said pinching shafts with said engaging centering portions;
- a barrel handling mechanism which separately handles to carry out a treated barrel released at a predetermined stop phase of said disk members and to carry in an untreated barrel to be installed.

5,531,638
MULTIPURPOSE HAND-HELD TOOL DESIGNED FOR USE WITH GRINDER

Stewart C. Duncan, 609 State St., Holly Hill, Fla. 32117, and Ambers H. Capps, 61 Sherwood Forest Dr., Arden, N.C. 28704

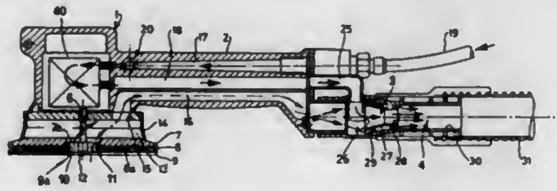
Filed Mar. 31, 1994, Ser. No. 220,666
Int. Cl.⁶ B24B *41/06*
U.S. Cl. 451—364 23 Claims



23. A device for supporting a workpiece for being ground to size by the use of mechanical grinding means, said device comprising a base member and a work-supporting means, said work-supporting means having thereon a work-clamping device, interconnection means operably interconnecting said work-supporting means with said base member, with said interconnection means enabling said work-supporting means to be relatively movable with respect to said base member in a substantially vertical plane passing through said base member, said work-supporting means being movable into and out or an operative relationship with base member, said work-clamping device having means for holding a workpiece in a selected position, such that a portion of the workpiece held in said work-clamping device can be brought into direct contact with the selected grinding means when said work-supporting means has moved into said operative relationship with said base member, a depth-controlling member mounted upon said base member, with a part of said depth-controlling member being positioned to contact a workpiece held in said work-clamping device when said work-supporting means has been brought into said operative relationship, means for adjusting the position of said depth-controlling member, so that the amount of material to be removed from the workpiece by the grinding means can be selectively controlled, said interconnection means making readily possible a motion of said work-supporting means in the substantially vertical plane away from said operative relationship with respect to said base member such that the workpiece can be removed from said work-clamping device without altering the position of said depth controlling member.

5,531,639
SMOOTHING MILL WITH SUCTION, BY DEPRESSION IN THREE STAGES, OF DUST SO GENERATED

Giuseppe Catalfamo, Via Sanvito Silvestro, 14, Varese, Italy
PCT No. PCT/IT93/00004, § 371 Date Jul. 8, 1994, § 102(e) Date Jul. 8, 1994, PCT Pub. No. WO93/14904, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 22, 1993, Ser. No. 256,480
Claims priority, application Italy, Jan. 24, 1992, MI92A0124
Int. Cl.⁶ B24B *55/06*
U.S. Cl. 451—456 4 Claims



1. Smoothing mill with abrasive disc supported by a first surface of a plate rotatably driven by a motor, the other side of the plate forming one of the walls of a dust suction chamber, central apertures being provided through the abrasive disc, said apertures being able to communicate with the dust suction chamber through corresponding central apertures in the supporting plate, the smoothing mill further comprising a suction duct that communicates with the suction chamber by means of apertures in the walls of the dust suction chamber that lies opposite to the supporting plate characterized in that one or more ejectors are inserted in the suction duct, there being upstream for each ejector a truncated-cone shaped chamber which is connected, at its lesser diameter, to a cylindrical chamber downstream, one placed partially inside the other and coaxially with a nozzle through which compressed air is introduced into the first of said ejectors to obtain progressively greater capacity and suction power, the first surface of the plate being substantially circular and comprising radial grooves that extend from the periphery of said plate towards a central zone, said first surface further comprising the central apertures through which the dust suction chamber is able to communicate with the central apertures of the abrasive disc, beld in place by a retaining part having radial arms that compress said disc and bend it inside said radial grooves, said grooves providing dust suction paths which will not become logged during the work even when the abrasive disc is in contact with the working surface and where the motor is driven by compressed air, the compressed air discharged from said motor being used to supply the nozzle.

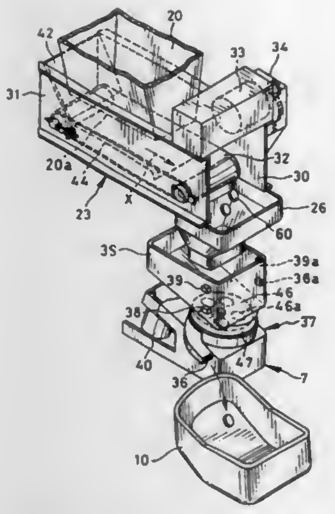
5,531,640
COIN DISPENSER

Haruo Inoue, Tokyo, Japan, assignor to Eagle Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,525
Claims priority, application Japan, Nov. 8, 1993, 5-278193
Int. Cl.⁶ G07D *1/00*
U.S. Cl. 453—17 14 Claims

1. A coin dispenser having a coin receptacle adapted to store a number of coins, and provided with a coin outlet formed at the bottom of the receptacle, and a hopper for paying out coins from a bucket coin by coin, the coins in the coin receptacle being supplied to the bucket through the outlet, said coin dispenser comprising:

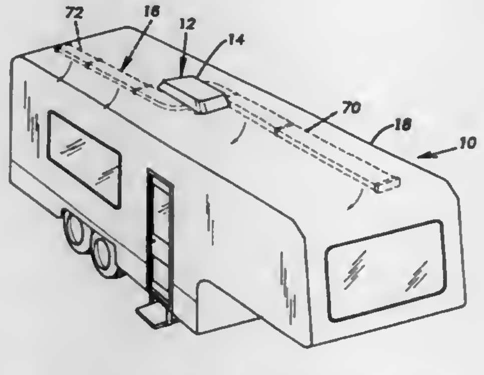
- a coin conveyor disposed under said outlet, said coin conveyor transporting coins supplied from said outlet to said bucket during operation of said coin conveyor but retaining coins supplied from said outlet when said coin conveyor is stopped; and
- a plurality of upright walls surrounding and spaced outwardly from said outlet, said walls defining a space closed downwardly by said conveyor and limiting the number of coins that can emerge from said outlet and rest on said conveyor when said conveyor is stopped.



5,531,641
RECREATIONAL VEHICLE AIR CONDITIONER CEILING GRILLE WITH REGISTER

Roger L. Aldrich, LaGrange, Ind., assignor to The Dometic Corporation, LaGrange, Ind.

Filed Sep. 7, 1994, Ser. No. 302,582
Int. Cl.⁶ B60H *1/26*
U.S. Cl. 454—100 15 Claims

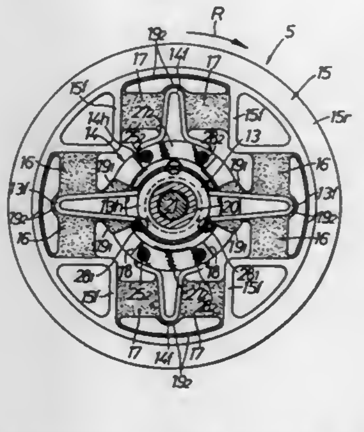


1. A grille for use with an air conditioning system of a recreational vehicle, the air conditioning system including an air conditioning unit mounted on a roof of the recreational vehicle, a ceiling template mounted to the air conditioning unit at the ceiling of the recreational vehicle and spaced from the air conditioning unit to form a plenum chamber between the ceiling template and the air conditioning unit, the ceiling template having first and second openings, a divider mounted within the plenum chamber to divide the plenum chamber into a return portion and a discharge portion, the return portion in communication with the inlet of the air conditioning unit and the first opening of the ceiling template, the discharge portion in communication with the outlet of the air conditioning unit and the second opening of the ceiling template, at least one duct in communication with the discharge portion of the plenum chamber, and registers located in the duct to distribute conditioned air from the air conditioning unit to various areas within an interior of the recreational vehicle, said grille comprising a panel, a return air grille mounted within said panel and positioned to communicate the first opening of the ceiling template with the interior of the recreational vehicle, and a closable register mounted within said panel and positioned to communicate the second opening of the ceiling template with a predetermined area of said interior of the recreational vehicle, wherein said closable register is located in a plane generally perpendicular to a direction of flow of conditioned air entering the discharge portion of the plenum chamber through the outlet of the air conditioning unit so that a larger amount of conditioned air is discharged from the discharge portion of the plenum chamber through said closable register than through the registers of the duct when said closable register is open.

5,531,642
VIBRATION-PROOF POWER TAKE-OFF DEVICE FOR ENGINE INCLUDING TWO DISPLACEMENT ABSORBING JOINT MEMBERS CONNECTED BY A RESILIENT MEMBER

Kazuyuki Shiomi; Hiroshi Mizuguchi, and Shoji Imakado, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

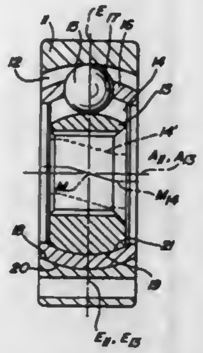
Filed Jan. 5, 1994, Ser. No. 177,681
Claims priority, application Japan, Nov. 16, 1993, 5-286525; Nov. 16, 1993, 5-286526
Int. Cl.⁶ F16D *3/50*
U.S. Cl. 464—74 20 Claims



1. A vibration-proof power take-off device for an engine comprising:

- resilient support means through which the engine is carried on a support; and
- a displacement absorbing joint for connecting an output shaft of said engine to a power take-off member, said displacement absorbing joint being comprised of a first joint member for connection to the output shaft of said engine, a second joint member for connection to said power take-off member, and at least one resilient member for resiliently interconnecting both the first and second joint members,
- wherein said second joint member is rotatably carried on said support through a bearing means, and
- wherein said second joint member is disposed concentrical with said first joint member,
- wherein said output shaft of the engine is disposed horizontally in relation to the ground, wherein said resilient support means for supporting said engine on said support comprises a pair of resilient support members, and wherein said engine is supported at three support points, one support member of said pair of resilient support members being located at each of two of the support points and said displacement absorbing joint being located at the remaining one support point.

5,531,643
CONSTANT VELOCITY UNIVERSAL BALL JOINT
Hans-Heinrich Welschof, Rodenbach, Germany, assignor to GKN Automotive AG, Lohmar, Germany
Filed Jul. 7, 1993, Ser. No. 87,984
Claims priority, application Germany, Jul. 7, 1992, 42 22 205.2
Int. Cl.^{6} F16D *3/223*
U.S. Cl. 464—144 **12 Claims**

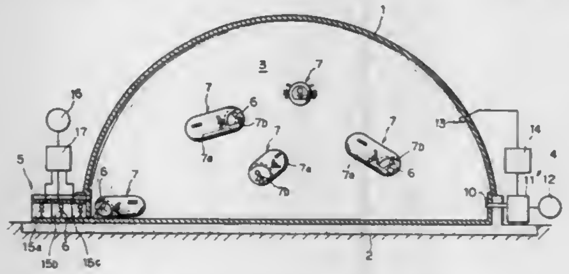


1. A constant velocity universal ball joint comprising;

an outer joint part with circumferentially distributed, substantially longitudinally extending inner ball tracks;

an inner joint part with circumferentially distributed, substantially longitudinally extending outer ball tracks, said inner and outer ball tracks arranged in pairs and positioned opposite one another each jointly accommodating a torque transmitting ball and participating in controlling the balls towards the angle-bisecting plane when the rotational axes of the outer joint part and inner joint part are articulated relative to one another, and a cage having circumferentially distributed windows to accommodate said balls in a common plane (E) and which said cage guides said balls to the angle-bisecting plane when the rotational axes of the outer joint part and inner joint are articulated relative to one another, wherein said inner ball tracks and said outer ball tracks are designed in such a way that, with coaxial rotational axes of said inner and outer joint parts and corresponding central planes of said inner and outer joint parts, the center lines of said pairs of said inner ball tracks and said outer ball tracks and straight lines parallel to said rotational axes of said inner and outer joint parts intersecting said center lines form respective angles relative to one another said respective angles deviating from zero and decreasing with respect to one another towards the axial ends of said ball tracks on both sides of the respective central planes.

5,531,644
SPACE GAME FLOATER APPARATUS
Masakazu Marumo, 1-7 417, 1-chome, Kamata, Ohta-ku, Tokyo 144, Japan
Filed May 31, 1995, Ser. No. 455,406
Claims priority, application Japan, Apr. 28, 1994, 6-113496
Int. Cl.^{6} A63G *31/16*
U.S. Cl. 472—68 **8 Claims**



1. A space game floater apparatus comprising:

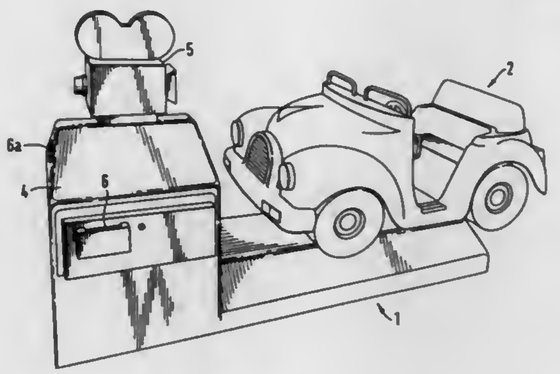
a space floating shell made of a pressure-bearing gas-tight material and defining an inner artificial floating space;

pressurized gas supply means for supplying pressurized gas capable of pressure control to the artificial floating space in the floating space shell;

gate means provided on the floating space shell for maintaining the gas pressure in the artificial floating space and also guiding a floating person when entering and getting out of the floating space shell; and

a floater including a buoyancy vessel part made of a gas-tight material having pressure-bearing property with respect to gas pressure in the artificial floating space and containing sealed gas, and a support part provided adjacent to the buoyancy vessel part for supporting the floating person, the floater being provided in the artificial floating space and capable of floating with the gas pressure.

5,531,645
AMUSEMENT RIDE
Laurence H. Collins, 4 Enterprise Rd., Mablethorpe, United Kingdom
Filed Jan. 30, 1995, Ser. No. 380,352
Int. Cl.^{6} A63G *13/06*
U.S. Cl. 472—97 **17 Claims**



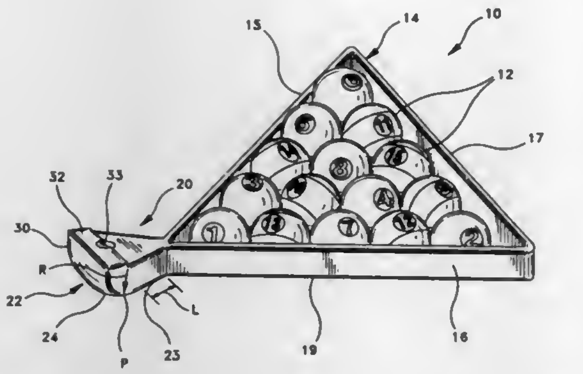
1. An amusement ride comprising a base including drive means and a seat mounted on the base and movable relative thereto by the drive means, first payment means for causing operation of the drive means in response to receipt of a payment, photographic means attached to the base and arranged to produce a photograph of the seat and any occupant thereof, and control means operatively connected to the drive means and to the photographic means to enable operation of the photographic means when the drive means is operating.

5,531,646
ROCKABLE BILLIARD BALL RACK AND METHOD OF RACKING BALLS
Patrick Boyle, 2248 Forest Glen Dr., Warrington, Pa. 18976
Filed Jun. 26, 1995, Ser. No. 494,419
Int. Cl.^{6} A63D *7/00*
U.S. Cl. 473—40 **12 Claims**

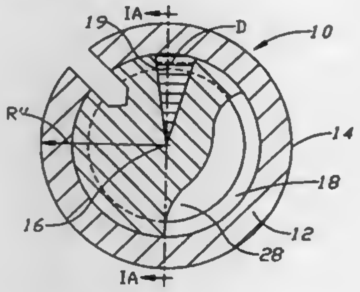
1. A rack assembly for arranging balls on a flat surface, comprising:

a plurality of rail elements joined together to form a racking frame having an open bottom and an open top, wherein each of said rail elements has a bottom edge that terminates in a common bottom plane capable of laying flush on the flat surface;

a handle coupled to at least one of said rail elements, said handle having a contact surface and a curved section wherein said curved section intersects said bottom plane at a tangent, whereby a predetermined force applied to said contact surface causes said curved section to rock on the flat surface and raises said racking frame above the flat surface.



5,531,647
BOWLING BALL
George Zelinski, 17311 McCarron Rd., Lockport, Ill. 60441
Continuation of Ser. No. 430,270, Apr. 28, 1995, abandoned, which is a continuation of Ser. No. 237,327, May 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 815,414, Dec. 31, 1991, abandoned. This application Aug. 23, 1995, Ser. No. 518,261
Int. Cl.^{6} A63B *37/04;37/06;37/10*
U.S. Cl. 473—126 **8 Claims**



1. The bowling ball (10) having a spherical mass (12) of preselected density and a spherical surface (14) equidistant from a center (16) of the spherical mass (12), the improvement being a weight block assembly, comprising:

annular-like weight block member (18) having a plane of symmetry (38), and an elongate dimension extending in a direction parallel to the plane of symmetry (38); and

a top weight block member (19) embedded in the annular-like weight block member (18) and having a density greater than that of the annular-like weight block (18) and an elongate dimension (D) extending in a direction transverse to a radius (R") of the spherical surface (14) and aligned with the plane of symmetry (38).

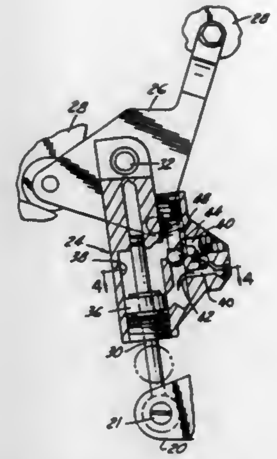
5,531,648
ACCESSORY DRIVE SYSTEM FOR AN AUTOMOTIVE ENGINE
Richard J. Meckstroth, Northville, and Gerard S. Toth, Belleville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of Ser. No. 223,250, Apr. 4, 1994, Pat. No. 5,439,420. This application May 5, 1995, Ser. No. 437,103
Int. Cl.^{6} F16H *7/08*
U.S. Cl. 474—110 **8 Claims**

1. An accessory drive system for an automotive engine, comprising:

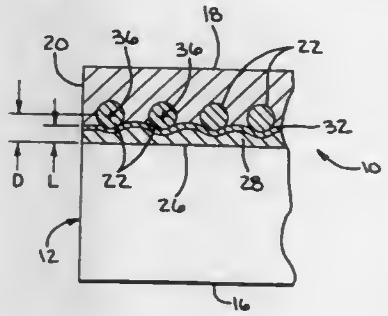
a drive pulley attached to an output shaft of the engine;

a flexible drive belt for connecting the drive pulley with a plurality of driven pulleys, with one driven pulley located upon each of a plurality of driven devices; and

a tensioner for maintaining the drive belt in contact with each of said drive and driven pulleys, with said tensioner comprising an arm which is rotatably mounted to the engine and which has a wheel for contacting the drive belt, with the wheel being urged into contact with the drive belt by the arm, and with said tensioner further comprising a hydraulic governor having a sliding valve for hydraulically damping rotational motion of the arm such that at relatively lower rotational speeds of the arm motion of the arm will be damped equally in both directions, but at higher rotational speeds, motion of the arm in the direction away from the drive belt will be resisted by a hydrostatic lock within the governor.



5,531,649
TOOTHED POWER TRANSMISSION BELT
Nobutaka Osako; Kazutoshi Ishida; Yasunori Nakai, and Takeshi Murakami, all of Kobe, Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan
Filed Oct. 12, 1994, Ser. No. 321,726
Claims priority, application Japan, Oct. 13, 1993, 5-280420
Int. Cl.^{6} F16G *1/28*
U.S. Cl. 474—205 **24 Claims**



1. A power transmission belt comprising:

a belt body having a length, an inside, an outside, a backing layer, a plurality of longitudinally spaced teeth, and a land surface with portions between adjacent teeth and facing in one of an inside and outside direction,

there being at least one longitudinally extending load carrying cord in the belt body,

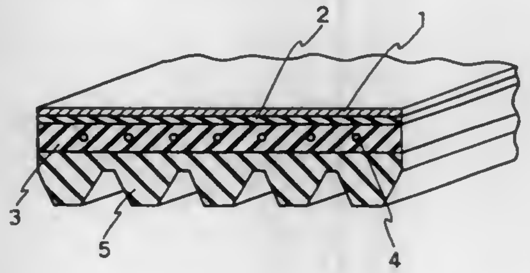
said load carrying cord having a diameter and a center,

wherein the distance between the land surface and the load carrying cord as measured from one of the inside and outside of the belt is between 0.30 and 0.50 mm,

further wherein the distance between the land surface and the center of the load carrying cord as measured from one of the inside and outside of the belt is between 0.73 and 0.85 mm, there further being a rubber layer between the one of the inside and outside of the belt and the load carrying cord along the entire length of the belt.

5,531,650
POWER TRANSMISSION BELT

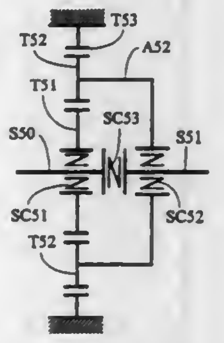
Atsushi Azuma, Hyogo-ku, Japan, assignor to Bando Chemical Industries, Ltd., Hyogo, Japan
PCT No. PCT/JP94/02115, § 371 Date Aug. 11, 1995, § 102(e) Date Aug. 11, 1995, PCT Pub. No. WO95/16865, PCT Pub. Date Jun. 22, 1995
PCT Filed Dec. 15, 1994, Ser. No. 501,023
Claims priority, application Japan, Dec. 17, 1993, 5-317922
Int. Cl.^{6} F16G *1/10*
U.S. Cl. 474—260 **2 Claims**



1. A power transmission belt comprising a laminate composed of an adhesive rubber layer in which core wires are buried and a compressed rubber layer, to the periphery of which being adhered canvas, characterized in that the above-mentioned canvas is impregnated with an aqueous latex composition comprising 2-chloro-1,3-butadiene-2,3-dichloro-1,3-butadiene copolymer latex.

5,531,651
DIFFERENTIAL GEAR SYSTEM USING THE CHANGE IN INPUT DIRECTION TO CONTROL THE OUTPUT SPEED RATIO

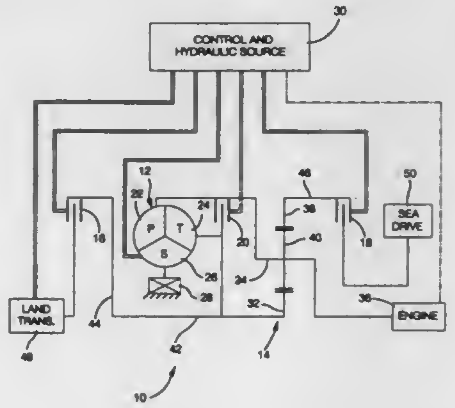
Tai-Her Yang, No.32 Lane 29, Taipin St., Si-Hu Town Dzan-Hwa, Taiwan
Filed Feb. 7, 1994, Ser. No. 193,353
Int. Cl.^{6} F16H *3/04;3/54*
U.S. Cl. 475—12 **5 Claims**



1. I claim a differential motion gear system to control a speed ratio by changing the input direction comprising:
- a) an input shaft rotatable in opposite directions;
- b) an output shaft;
- c) a first one way drive mechanism connected between the input shaft and the output shaft;
- d) a sun gear connected to the input shaft;
- e) a differential motion gear engaged with the sun gear;
- f) a ring gear engaged with the differential motion gear;
- g) a stationary case; and,
- h) means attaching the ring gear to the stationary case so as to prevent relative rotation between the ring gear and the stationary case, wherein the means attaching the ring gear to the stationary case fixedly attaches the ring gear to the stationary case so as to prevent any relative rotation of the ring gear relative to the stationary case.

5,531,652
POWER TRANSMISSION

Arthur Hall, III, Cicero, and Ralph L. Najmon, Danville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 7, 1995, Ser. No. 385,030
Int. Cl.^{6} F16H *47/08;* **B60F** *3/00*
U.S. Cl. 475—36 **3 Claims**

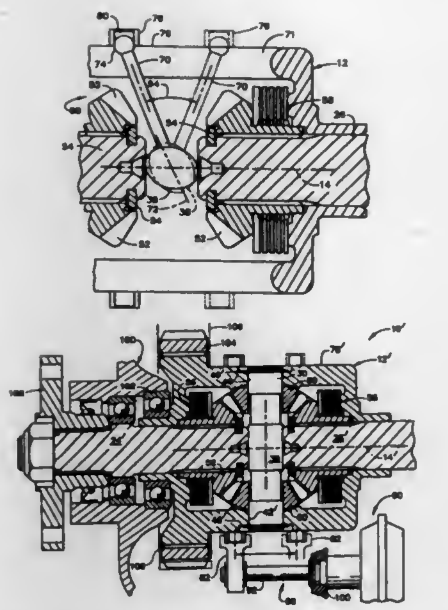


1. A power transmission in an amphibious vehicle comprising:
- an engine driven input shaft;
- an input planetary gear set having a carrier assembly drivingly connected with the input shaft, a sun gear and a ring gear;
- a torque converter having a pump drivingly connected with the carrier assembly and a turbine drivingly connected with the sun gear;
- a land drive output;
- a water drive output;
- a first clutch selectively connecting the ring gear with the water drive output;
- a second clutch selectively connecting the turbine and sun gear with the land drive output; and
- a third clutch selectively directly connecting the input shaft with the second clutch means in bypassing relation with the torque converter.

5,531,653
SELECTIVELY LOCKABLE DIFFERENTIAL ASSEMBLY

Mark C. Barnholt, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Jan. 13, 1995, Ser. No. 372,109
Int. Cl.^{6} F16H *48/22*
U.S. Cl. 475—234 **20 Claims**

1. A selectively lockable differential assembly comprising: a rotatable case;
- first and second output shafts journalled in said case for rotation relative thereto;
- a differential mechanism disposed within said case and linking said first and second output shafts so as to permit differential rotation therebetween;

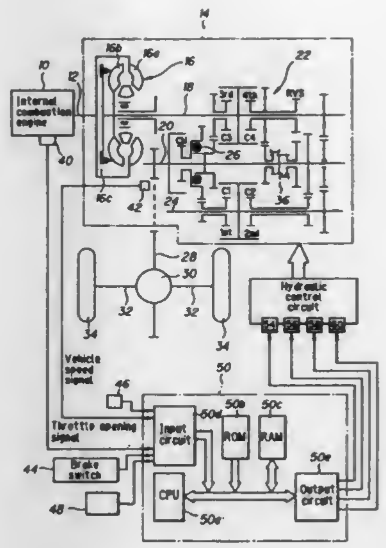


- at least one clutch connected to said case and coupled with one of said output shafts, wherein engagement of said at least one clutch limits differential rotation between said shafts;
- wherein said differential mechanism includes a pinion shaft having a longitudinal centerline axis and a cam portion disposed between said first and second output shafts, said pinion shaft being supported within said case for rotation therewith and so as to permit rotation relative to said case about said centerline axis;
- wherein rotation of said pinion shaft about said centerline axis from an unlocked position to a locked position causes said cam portion to contact said first and second output shafts resulting in engagement of said at least one clutch thereby limiting differential rotation between said first and second output shafts.

5,531,654
CONTROL SYSTEM FOR VEHICLE AUTOMATIC TRANSMISSION

Hiroshi Ishikawa; Hideo Furukawa; Masatoshi Shimizu, and Norio Nakauchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 25, 1994, Ser. No. 295,553
Claims priority, application Japan, Aug. 31, 1993, 5-238897
Int. Cl.^{6} F16H *59/48*
U.S. Cl. 477—120 **5 Claims**

1. A system for controlling an automatic transmission of a vehicle, having an internal combustion engine connected to said automatic transmission for driving one or more wheels of said vehicle, comprising:
- a hydraulic control circuit connected to said automatic transmission;
- an electronic control means for controlling said automatic transmission through said hydraulic control circuit;
- a load detecting means for detecting an operating load on said engine and sending a first output signal representing the engine load to said electronic control means;
- a vehicle speed detecting means for detecting the vehicle speed and sending a second output signal representing the vehicle speed to said electronic control means;
- a driver's deceleration intention estimating means for estimating a degree of driver's intention to decelerate the vehicle speed based at least on said second output signal;
- wherein said electronic control means computes an index indicative of a driving resistance of the vehicle based at least on said second output signal, and compares said index with a predetermined reference value stored in a memory in said electronic control means to determine if the vehicle is hill descending;
- said electronic control means actuating said hydraulic control circuit for carrying out gear shifting control including changing the gear shifting characteristics of said transmission to determine a gear ratio to be suitable for hill descending based on said determination and said degree of driver's intention to decelerate; and
- wherein said electronic control means estimates a grade of hill which the vehicle is descending based on said index and corrects said degree of driver's intention to decelerate based on said estimated grade of hill.



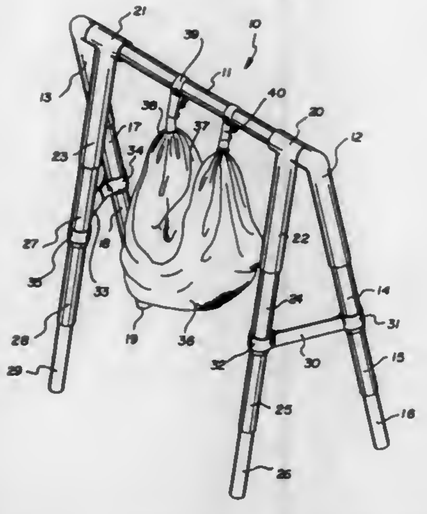
5,531,655

Patent Not Issued For This Number

5,531,656
PORTABLE BABY SWING

John K. Varghese, 46 Ellmyer Rd., Edison, N.J. 08820
Filed Mar. 1, 1995, Ser. No. 402,890
Int. Cl.^{6} A63B *22/00*
U.S. Cl. 482—69 **1 Claim**

1. A portable baby swing, comprising,
- a support shaft, the support shaft having a shaft first end spaced from a shaft second end, with the shaft first end having fixedly secured thereto a first telescoping leg section, and the shaft second end having secured thereto a second telescoping leg section, a third telescoping leg section is pivotally mounted relative to the support shaft adjacent the first telescoping leg section, and a fourth telescoping leg section is pivotally mounted about the support shaft adjacent to the second telescoping leg section, each said telescoping leg section having a plurality of leg members telescopingly received relative to one another, and
- a first strap means for securing selectively the first telescoping leg section and the third telescoping leg section together, and second strap means for selectively securing the second telescoping leg section and the fourth telescoping leg section together, and
- swing means removably mountable relative to the support shaft for receiving a child therewithin,
- the swing means comprises, a bag member of flexible construction, having a cavity therewithin arranged in a facing relation-



ship relative to the support shaft, and the bag member having a peripheral edge and an entrance to said cavity, and a first support strap and a second support strap secured to the peripheral edge of diametrically opposed orientations relative to the peripheral edge, and the first support strap having first latch means for securing the first support strap about the support shaft, and the second support strap having second latch means for securing the second support strap about the support shaft,

the first strap means comprising a first rigid plate, and the second strap means comprising a second rigid plate, the first rigid plate having a first plate first strap and a first plate second strap secured at opposed ends of the first plate, with the first plate first strap and the first plate second strap arranged for securement about the first telescoping leg section and the third telescoping leg section respectively, the second plate having a second plate first strap and a second plate second strap at opposed ends of the second plate, and the second plate first strap and the second plate second strap arranged for securement about the second telescoping leg section and the fourth telescoping leg section respectively.

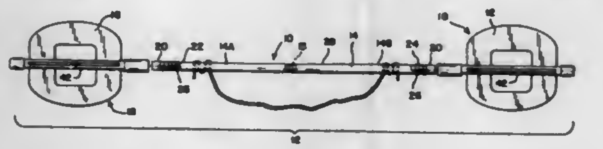
5,531,657
MODULAR AQUATIC EXERCISE EQUIPMENT ASSEMBLY

Antone Macedo, Manville, R.I., assignor to ERO Industries, Inc., Mt. Prospect, Ill.

Filed Nov. 8, 1994, Ser. No. 335,893

Int. Cl.^{6} A63B *21/075*

U.S. Cl. 482—111 **22 Claims**



1. Modular aquatic exercise equipment assembly, for performing exercises in water, comprising:

an elongated shaft for gripping by a user in performing said exercises;

a pair of water-resistance members removeably attached to opposite ends of the shaft, the water-resistance members cooperating with said shaft, when attached to said shaft to define an aquatic barbell, each water-resistance member providing an aquatic dumbbell when removed from said shaft;

each of said water-resistance members including a shaft portion and a plurality of apertured planar fin-portions extending radially outwardly from the shaft portion, said shaft portions providing a means for the user to grip said water resistance members, the planar fin-portions providing a plurality of hydrodynamic resistance surfaces for said water-resistance members which confront water when submerged and create a pressure head as the resistances surfaces are moved in water by the user, said planar fin-portions including centrally disposed openings in said fin-portions disposed adjacent said shaft portions, said planar fin-portion openings of each water-resistance member cooperating to define areas adjacent to said shaft portions at which the user may grip said shaft portions without interference with said planar fin-portions during exercise, each of said water resistance-members including first and second handle-fin components which cooperatively engage each other to define said water resistance-member, each of said handle-fin components including a half-shaft portion extending in alignment along a longitudinal axis and a pair of apertured planar fin members extending radially outwardly from said half-shaft portions.

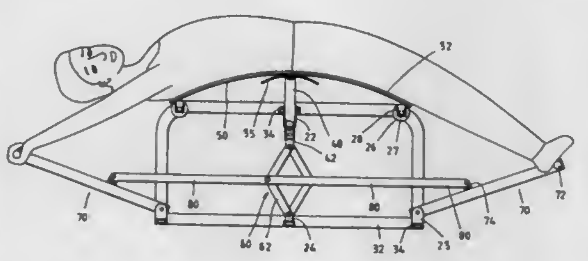
5,531,658
EXERCISE DEVICE FOR BUILDING AND REHABILITATING WAIST

Liao L. S. C., No. 264, Sec. 2, Shi-Tung Rd., Taichung, Taiwan

Filed Oct. 18, 1995, Ser. No. 544,585

Int. Cl.^{6} A63B *26/00*; A61H *1/00*

U.S. Cl. 482—142 **6 Claims**



1. A waist building device, which comprises:

a frame provided centrally with a shaft hole and further provided respectively at both ends of a longitudinal axis thereof with an urging member;

a shaft slidably received in said shaft hole of said frame;

a flexible piece fastened at a center of an underside thereof with a top end of said shaft such that both ends of a longitudinal axis of said flexible piece are urged respectively by said urging member 5;

a linking mechanism disposed at a bottom portion of said frame to change a horizontal motion to a vertical motion and vice versa, said linking mechanism being connected with said shaft which is actuated by said linking mechanism to move in said shaft hole at the time when said linking mechanism is exerted on by an external force;

two pull rods provided respectively with a foot rest and fastened pivotally and respectively with both ends of said frame along the longitudinal axis of said frame; and

two connection rods each having a first and second end said first and second end respectively pivotally connected to a pull rod of said pull rods, and said linking mechanism wherein an exerciser lies on said flexible piece such that his or her waist is corresponding in location to the shaft and that his or her hands hold the foot rest, of the pull rod, and further that his or her feet rest on the foot rest of the other of said pull rod, and said pull rods are then push outward by both hands and both feet of the exerciser lying on the flexible piece, the two connecting rods are actuated to trigger the linking mechanism to bring about a vertical motion of the shaft so as to raise the flexible piece against the waist of the user.

5,531,659
ROLL CASTER SHELL FOR USE IN A CONTINUOUS SHEET CASTING MACHINE

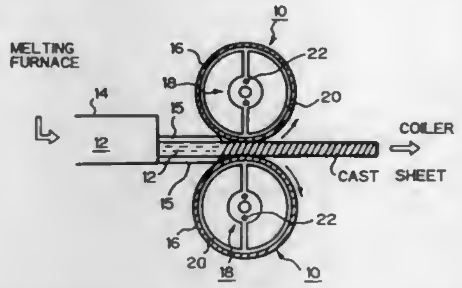
Tamotsu Fusada, Fujisawa, Japan, assignor to Kanto Special Steel Works, Ltd., Kanagawa, Japan

Filed Feb. 14, 1995, Ser. No. 388,446

Claims priority, application Japan, May 18, 1994, 6-104123

Int. Cl.^{6} C22C *38/30*; B22C *11/06*

U.S. Cl. 492—48 **14 Claims**



1. A roll caster shell for use in a continuous, thin plate casting machine which is made of an alloy which consists essentially of, in weight %,:

C: 0.35–0.55%, Si: 0.10–0.50%, Mn: 0.20–0.70%,
P: 0.03% or less, S: 0.02% or less, Ni: 0.60% or less,
Cr: 0.80–1.50%, Mo: 0.80–1.50%, V: 0.30–0.60%,
Co: 0.30–1.00%,
Fe and incidental impurities: balance

with the total amount of elements other than Fe and C not exceeding 5.0 atomic %.

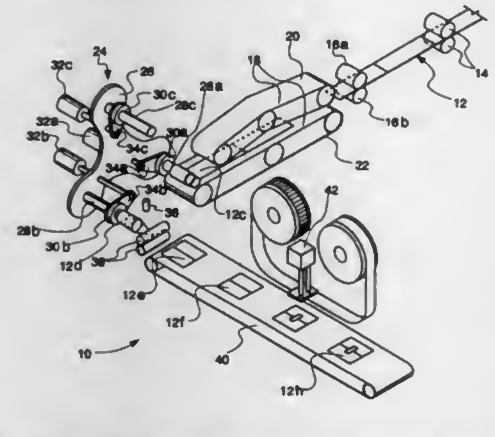
5,531,660
BAG FOLDING APPARATUS

John R. Biese, Hortonville, and Gregory J. Vanden Heuvel, Kaukauna, both of Wis., assignors to Reynolds Consumer Products Inc., Appleton, Wis.

Filed Jan. 18, 1995, Ser. No. 374,353

Int. Cl.^{6} B31B *1/32*; B65H *45/12*

U.S. Cl. 493—243 **20 Claims**



18. A method of folding a bag segment, comprising the steps of:

feeding the bag segment to a spindle having a stripper slidably mounted on the spindle, the stripper being disposed in a retracted position;

winding the bag segment about the spindle by rotating the spindle;

stripping the wound bag segment from the spindle by moving the stripper from the retracted position to a forward position; and

feeding the stripped bag segment between a pair of folding nip rollers positioned adjacent the spindle so as to flatten the stripped bag segment.

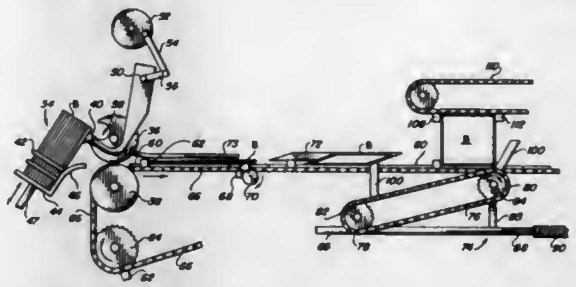
5,531,661
CARRIER SLEEVE ERECTING APPARATUS AND METHOD

Frank Moncrief, Acworth, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Oct. 3, 1994, Ser. No. 316,752

Int. Cl.^{6} B31B *3/78;1/52*; B65G *15/10*

U.S. Cl. 493—313 **23 Claims**



1. Apparatus for opening a collapsed article carrier sleeve of the type having upper and lower layers foldably connected together when in collapsed form and being rectilinear in shape when open, the upper layer comprising an upper panel connected to a trailing panel along a first fold line, the lower layer comprising a lower panel connected to a leading panel along a second fold line, the upper panel connected to the leading panel along a third fold line and the lower panel connected to the trailing panel along a fourth fold line, the apparatus comprising:

means for moving the collapsed carrier sleeve in a downstream direction with the third fold line facing downstream and the fourth fold line facing upstream;

means for causing the leading panel to pivot up about the second fold line to an interim position to partially open the collapsed carrier sleeve; and

means for contacting and pushing up against the leading panel of the partially open sleeve to cause the leading panel to further pivot up about the second fold line until the sleeve is fully open.

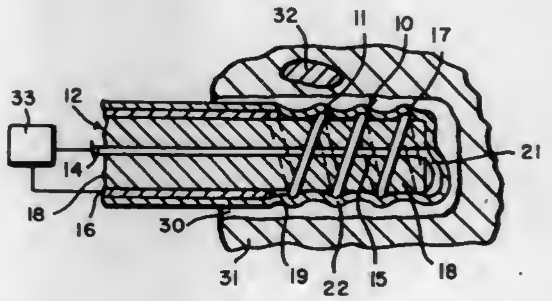
5,531,662
DUAL MODE MICROWAVE/IONIZING PROBE

Kenneth L. Carr, Harvard, Mass., assignor to Microwave Medical Systems, Inc., Littleton, Mass.

Continuation-in-part of Ser. No. 126,106, Sep. 23, 1993, Pat. No. 5,364,336, which is a continuation of Ser. No. 995,326, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 628,579, Dec. 17, 1990, abandoned. This application Dec. 20, 1993, Ser. No. 170,064

Int. Cl.^{6} A61N *5/02*

U.S. Cl. 600—2 **14 Claims**



1. A therapeutic system for delivery of microwave radiation and ionizing radiation to living tissue comprising:

a microwave current generator,

a coaxial conduit having a central electrical conductor and a coaxial electrically-conducting jacket and having a first end connected to the generator and a second end,

- a microwave antenna attached to said conduit second end, said antenna being adapted to be placed adjacent living tissue,
- a radiation source-receiving cavity in said conduit, said cavity extending to a location in said conduit adjacent to said antenna, and
- an ionizing radiation source sized to be received in said cavity for placement at said location.

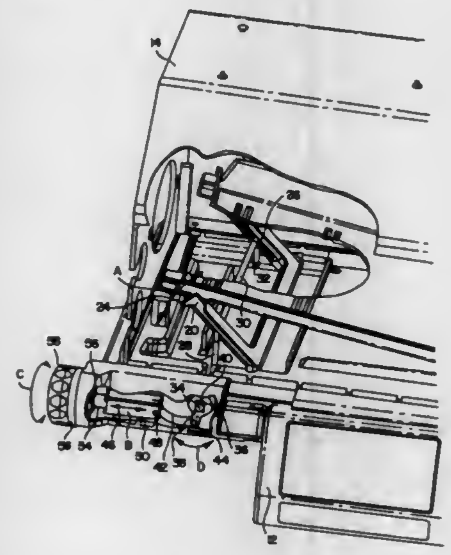
5,531,663
INCUBATOR MATTRESS TILT MECHANISM

David A. Gloyd; Colin G. Hodge; Thomas C. Jones, all of Columbia; Vladimir Kremenchugsky, Reisterstown, and Robert M. Siminauer, Ellicott, all of Md., assignors to Ohmeda Inc., Liberty Corner, N.J.

Filed Nov. 8, 1994, Ser. No. 335,612

Int. Cl.⁶ A61G *11/00*

U.S. Cl. 600—22 **17 Claims**



1. An infant incubator having an infant bed contained therein adapted to underlie an infant, said infant incubator having a tilt mechanism for adjusting the angular position of said infant bed, said tilt mechanism comprising:

- at least one bent rod contained within said infant incubator and having one free end thereof, said at least one bent rod rotatably mounted to said infant incubator along an axis of rotation and having an offset portion located beneath the infant bed, said offset portion adapted to move said bed upwardly or downwardly as said one free end thereof is rotated about said axis of rotation, a lead screw affixed to said incubator exterior to said incubator and being rotatable along a fixed axis of rotation with respect to the incubator, linkage means connected to said lead screw and said one free end of said bent rod, said linkage means adapted to translate the rotation of said lead screw to cause corresponding rotation of said one free end of said bent rod to thereby raise or lower said infant bed to a desired position and to retain said infant bed in said desired position.

5,531,664
BENDING ACTUATOR HAVING A COIL SHEATH WITH A FIXED DISTAL END AND A FREE PROXIMAL END

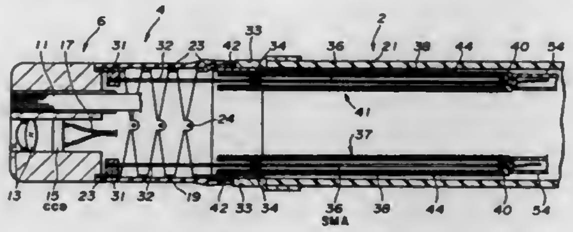
Hideyuki Adachi, Hachioji; Sakae Takehana, Machida; Yasuhiro Ueda, Kokubunji; Yasuo Hirata, and Kazuhiro Takahashi, both of Hachioji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 812,929, Dec. 24, 1991, abandoned. This application Jul. 25, 1994, Ser. No. 280,564

Claims priority, application Japan, Dec. 26, 1990, 2-406838; May 24, 1991, 3-120181; Sep. 17, 1991, 3-236239; Nov. 14, 1991, 3-299021; Nov. 14, 1991, 3-299022

Int. Cl.⁶ A61B *1/00;1/12*

U.S. Cl. 600—149 **15 Claims**



1. A bending tube for use with an endoscope comprising:

- an elongate tube having flexibility including a plurality of ring-like bending pieces extending in the lengthwise direction of said tube, wherein every two adjacent pieces are pivotally coupled to each other in a rotatable manner;
- a non-compressive member arranged to extend in the lengthwise direction of said tube, having a distal end thereof fixed to said tube with a predetermined space from a tip of said tube and the proximal end thereof as a free end in the lengthwise direction of said tube, and not being contractile in the lengthwise direction of said tube;
- an operating member having a shape memory member arranged to extend in the lengthwise direction of said tube, having one end thereof attached to near the distal end of said tube and the other end thereof attached to said proximal end of said non-compressive member, and having a length variable in the longitudinal direction upon heating at least a part thereof; and
- an electric cable electrically connected with at least said shape memory member to transmit a drive signal for heating said shape memory member.

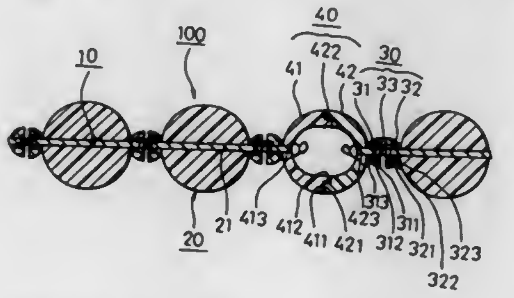
5,531,665
ROLLING MASSAGING DEVICE

Ping Chen, No. 20, Nan-Mei St., Taichung City, Taiwan

Filed Dec. 29, 1994, Ser. No. 368,147

Int. Cl.⁶ A61H *1/00*

U.S. Cl. 601—118 **4 Claims**



1. A massaging device, comprising:

- a cord;
- a plurality of massaging balls strung on said cord;
- a plurality of biasing units strung on said cord, each of said biasing units being disposed respectively between adjacent two of said massaging balls, each of said biasing units including a hollow round bead having left and right bead halves that are formed as complementary hemispherical shells, said bead halves confining a respective receiving space and being formed with aligned cord holes to permit extension of said cord therethrough, and a coiled compression spring sleeved on said cord and extending into said receiving spaces of said bead halves, said spring biasing said bead halves away from each other; and
- a connecting unit for joining two ends of said cord together.

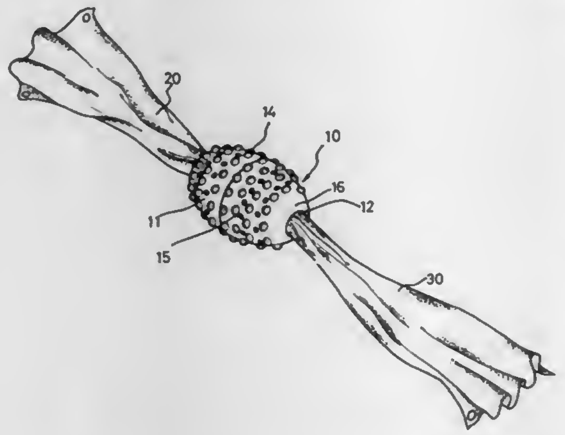
5,531,666
TOWELS HAVING A MASSAGE DEVICE DISPOSED THERETO

Chien-chuan Hung, No. 8, Lane 782, Sec. 2, Chunghwa Rd., Taitung, Taiwan

Filed May 8, 1995, Ser. No. 438,096

Int. Cl.⁶ A61H *7/00;15/00*

U.S. Cl. 601—129 **2 Claims**



1. In combination, a first towel, a second towel, and a massage device disposed between said first and said second towels:

- said massaage device comprising a first compartment and a second compartment, each of said first compartment and said second compartment having a plurality of bosses extending outwardly from an outer surface thereof and having a plurality of apertures defined in said outer surface thereof, said first compartment having a first end and a second end, said first end thereof being an open end and having a first engaging structure defined therein and said second end thereof having a first hole defined therein communicating with said first end, said second compartment having a first end and a second end, said first end of said second compartment being an open end and having an engaging structure defined there in for engagement with said first engaging structure of said first compartment and said second end of said second compartment having a hole defined therein communicating with said first end of said second compartment, and
- said first towel having one end thereof tied into a knot and disposed in said first compartment via said first hole and said second towel having one end thereof tied into a knot and disposed in said second compartment via said second compartment bole.

5,531,667
ORTHOPAEDIC CASTING BANDAGES

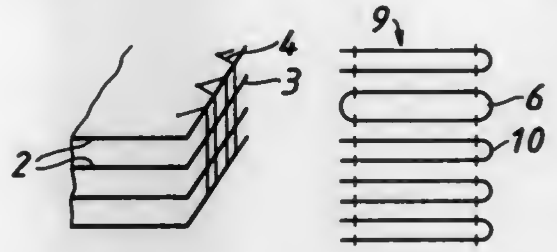
Julian A. Webb, Clifton, and Patrick L. Blott, York, both of, United Kingdom, assignors to Smith & Nephew plc, London, England

Filed Feb. 17, 1994, Ser. No. 197,823

Claims priority, application United Kingdom, Feb. 17, 1993, 9303200

Int. Cl.⁶ A61F *5/00*

U.S. Cl. 602—8 **22 Claims**



1. A tubular orthopaedic casting bandage comprising a stack formed of a plurality of layers of hardenable casting material, having first and second opposed longitudinal side edges, said stack comprising at least one folded sheet member, said folded sheet member forming two layers in said stack, said layers being joined together at said first and second opposed longitudinal side edges thereof by zig-zag joining means, two adjacent layers of the stack defining a sleeve for receiving a body member.

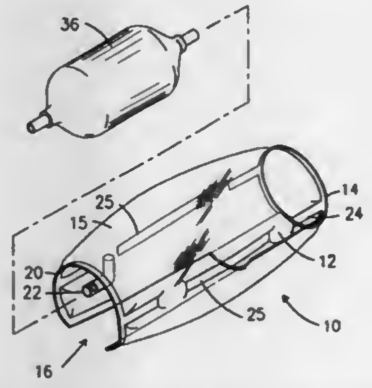
5,531,668
INFLATABLE PALMAR BLADDER

Donaerl B. Mann, and Don M. Mann, both of High Springs, Fla., assignors to D'Mannco, Inc., High Springs, Fla.

Filed Feb. 6, 1995, Ser. No. 384,517

Int. Cl.⁶ A61F *5/00*

U.S. Cl. 602—13 **19 Claims**



1. An apparatus for facilitating the movement of the fingers of a patient's constricted hand, the apparatus comprising:

- an inflatable bladder adapted for inserting into the palmar region of the patient's constricted hand, the inflatable bladder having a first end and a second end and being constructed from a top and bottom sheet of flexible material sealed together around a peripheral edge to form an interior area for retaining a fluid;
- a pair of opposed tabs extending outwardly and attached to the first end of the inflatable bladder and permanently sealed together forming a longitudinal cylindrically shaped inflatable bladder;
- a plurality of sealed partitions extending longitudinally along the inflatable bladder forming a network of connected fluid retaining pockets within the interior area;
- an open channel formed by spaced apart peripheral edges of the inflatable bladder, the open channel being positioned from the

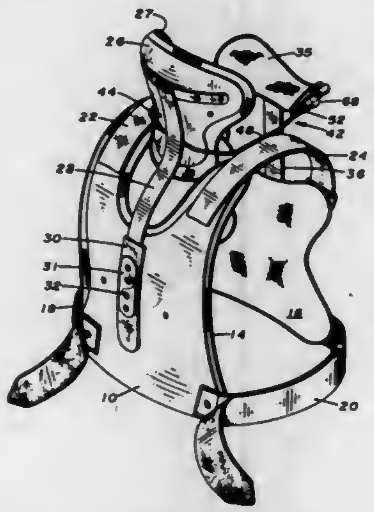
second end of the inflatable bladder to the pair of opposed tabs for receiving an end portion of a static hand orthosis; and means for introducing and removing the fluid to and from the inflatable bladder.

5,531,669
CERVICAL BRACE WITH INTERLOCK ASSEMBLY

David Varnau, Lynnwood, Wash., assignor to Center for Prosthetics Orthotics, Inc., Seattle, Wash.

Filed Nov. 18, 1994, Ser. No. 342,164
Int. Cl.^{6} A61F *5/02*

U.S. Cl. 602—18 **9 Claims**



1. A cervical brace, comprising back and chest plates with interconnecting strap means to hold them in fixed position on the torso of a patient,
  an occipital support fixedly mounted on said back plate,
  a chin support fixedly mounted on said chest plate,
  elongate, rigid support bar means pivotally secured in the coronal plane directly to said occipital support and extending over the shoulders of a patient to said chin support, and means rigidly and adjustably connecting and securing the support bar means directly to the chin support and holding the chin support in fixed position relative to the occipital support during use.

5,531,670
HEAT CONSERVING BANDAGE

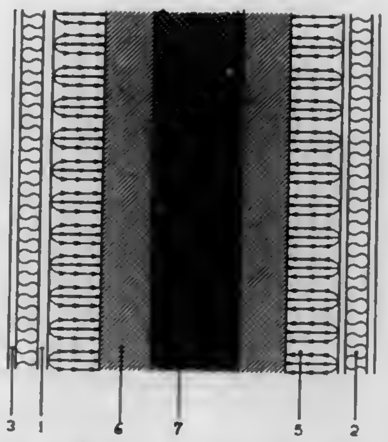
Reidar Westby, Littlehampton, and David W. Talbot, Newmarket, both of, United Kingdom, assignors to Anette Dobloug, Sande I Vestfold, Norway

PCT No. PCT/NO92/00009, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/13735, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 17, 1992, Ser. No. 256,529
Int. Cl.^{6} A61F *13/00*

U.S. Cl. 602—41 **11 Claims**

1. A heat conserving bandage to cover human or animal tissue comprising,
  a layer of heat reflecting material adapted for placement adjacent said tissue for reflecting heat from said tissue,
  a layer of insulation material having a closed cell structure covering said heat reflecting material,
  a layer of textile material covering said insulation material such that said insulation material is disposed between said heat reflecting layer and said textile layer,
and wherein said heat reflecting material includes a sandwich structure of a first foil of plastic material adapted for placement adjacent said tissue, a second foil of aluminum covering said first foil and bonded thereto and a glass fiber weave layer covering said second foil and bonded thereto, such that said aluminum foil layer is disposed between said plastic foil and said glass fiber weave layer.

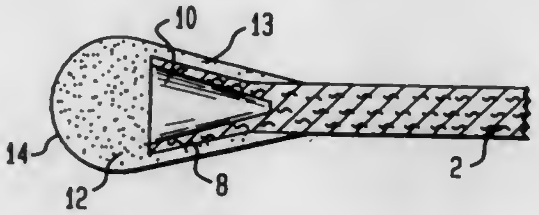


5,531,671
COTTON SWABS WITH EXPANDED TIPS

Robert Bennett, Easton, Conn., assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Mar. 28, 1995, Ser. No. 412,048
Int. Cl.^{6} A61M *35/00*

U.S. Cl. 604—1 **6 Claims**



1. A swab comprising:
an elongate stem with first and second ends opposite one another;
a conical member formed at each of the first and second ends, the conical member continuously flaring outwardly from each of said first and second ends and having a hollow center the stem and conical members being formed unitarily from a single paper; and
an absorbent covering surrounding each of the conical members.

5,531,672
BLOOD ASPIRATION ASSEMBLY COMPONENTS AND BLUNT NEEDLE ASPIRATORS

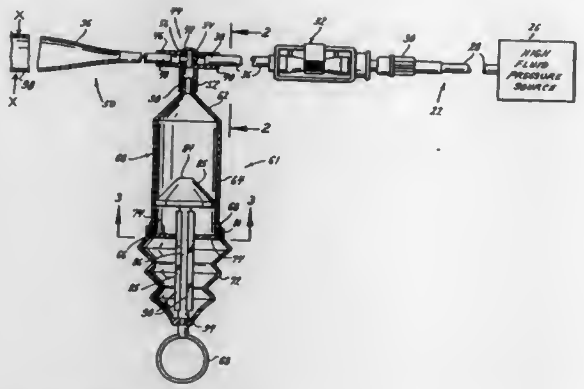
Lawrence A. Lynn, 862 Curleys Ct., Worthington, Ohio 43085, assignor to Lawrence A. Lynn, Columbus, Ohio

Division of Ser. No. 935,907, Aug. 27, 1992, Pat. No. 5,466,219, which is a division of Ser. No. 594,677, Oct. 10, 1990, Pat. No. 5,178,607, which is a continuation of Ser. No. 302,835, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 80,406, Jul. 31, 1987, Pat. No. 4,838,855.

This application Jan. 11, 1995, Ser. No. 371,127
Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—4 **19 Claims**

1. An assembly for use with a blood access device inserted in a patient's blood vessel for obtaining undiluted blood samples, the assembly comprising:



a sub-assembly including:
  a first segment having distal and proximal ends and a flow path defined therethrough, defining a first internal volume which, in use, may be filled with a resident fluid, the first segment having means at said distal end thereof for coupling to a blood access device and having a blood receiver at said proximal end thereof and in flow communication therewith, said blood receiver having a chamber defined therein and a flow path defined therethrough together defining a second internal volume which, in use, may be filled with a resident fluid, the blood receiver having structure permitting a separate blood removal device to repetitively access the chamber; and
  a second segment having distal and proximal ends and a flow path defined therethrough, defining a third internal volume which, in use, may be filled with a resident fluid, the second segment being operatively coupled at said distal end thereof to said blood receiver so as to be in flow communication therewith; and
a reservoir operatively coupled to the proximal end of said second segment so as to be in selective flow communication therewith, the reservoir having a sufficient internal volume to selectively receive a volume (X) of fluid from the sub-assembly sufficient to ensure that undiluted blood is selectively present in said chamber, said third internal volume being such that when said volume (X) is received by the reservoir an entire volume of mixed resident fluid and blood created by the flow of the volume (X) from the sub-assembly is contained within said second segment.

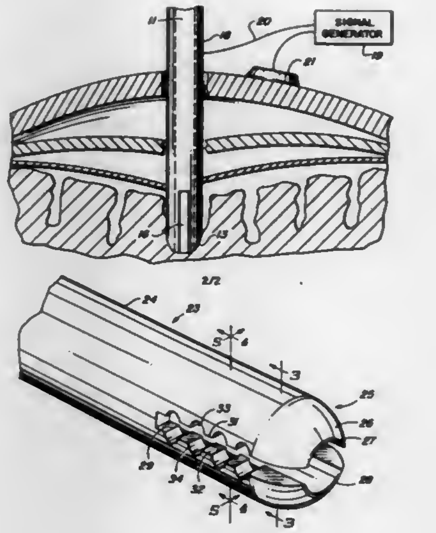
5,531,673
VENTRICULAR CATHETER

Tomasz K. Helenowski, 936 Burnham Ct., Glenview, Ill. 60025-4140

Filed May 26, 1995, Ser. No. 452,015
Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—9 **7 Claims**

1. A ventricular catheter adapted to be incorporated into a fluid shunt system comprising:
  a) an elongated tubular body providing an open rounded end,
  b) means extending from said rounded end and partially through the longitudinal length of said body providing open communication with the lumen thereof through which cerebrospinal fluid is shunted, and
  c) a low level electrical signal generator, and means for transmitting a signal therefrom to said tubular body to restrict growth of choroid plexus or other brain tissue into the lumen of the catheter.

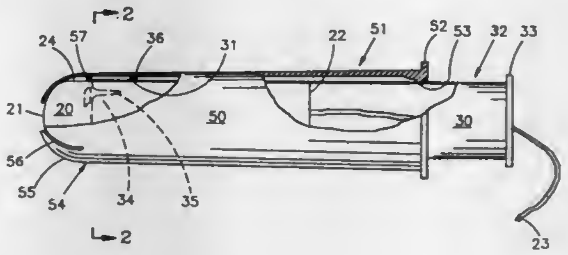


5,531,674
COMPACTLY ASSEMBLED TAMPON APPLICATOR

Max Frayman, 25 Quinnehtuk Cir., Longmeadow, Mass. 01106

Filed Jan. 6, 1995, Ser. No. 369,713
Int. Cl.^{6} A61F *13/20*

U.S. Cl. 604—11 **4 Claims**



1. A compactly assembled tampon applicator and tampon comprising;
  an elongated catamenial tampon shaped for vaginal insertion and having a predetermined diameter;
  an inner tube having a proximal end for storing of said tampon so that a small portion of said tampon is protruding from said proximal end;
  an outer tube dimensioned to fit telescopically over said inner tube and having a proximal discharge end, an inner surface, and an inner space defined by said inner surface; and
  a tampon holding means associated with said outer tube to prevent distal movement of said tampon during partial withdrawal of said inner tube over said tampon;
  said holding means comprises at least one pivotable clamp dog, wherein said clamp dog is attached to said inner surface of said outer tube at a location where said tampon protrudes from said proximal end of said inner tube; said location defining an attachment point, said attachment point allowing said clamp dog to pivot with respect to a longitudinal axis of said outer tube;
  said clamp dog extending radially from said inner surface of said outer tube towards a center of said outer tube, said clamp dog further comprising a first and second laterally extending projection such that when said clamp dog is pivoted in a first direction said first laterally extending projection will abut said inner surface of said outer tube to limit the distance said clamp dog can pivot in said first direction, and when said clamp dog is pivoted in a second direction, which is opposite the first direction, said second laterally extending projection will abut said inner surface of said outer tube to limit the distance said clamp dog can pivot in said second direction.

5,531,675
MICRO-ACUPUNCTURE NEEDLE FOR A FINGER OF A HAND

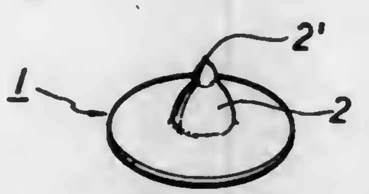
Tae W. Yoo, 807 1-Dong, Hanyang Apt., San 189-1, Seocho-dong Seocho-Ku, Seoul, Rep. of Korea

Continuation of Ser. No. 388,700, Aug. 2, 1989, abandoned. This application May 6, 1992, Ser. No. 882,352

Claims priority, application Rep. of Korea, May 10, 1989, 19896089 U

Int. Cl.⁶ A61M *1/30*

U.S. Cl. 604—20 **2 Claims**



1. A micro-acupressure needle comprising a sharp needle edge of a substantially cone-shaped sole protuberance which has a rounded lower portion and a rounded upper portion which peaks in said sharp needle edge, said rounded lower portion being constricted inwardly at a region thereof contiguous with said rounded upper portion and which protuberance is a portion of and extends from a metal sheet formed from one or more materials selected from the group consisting of aluminum and copper.

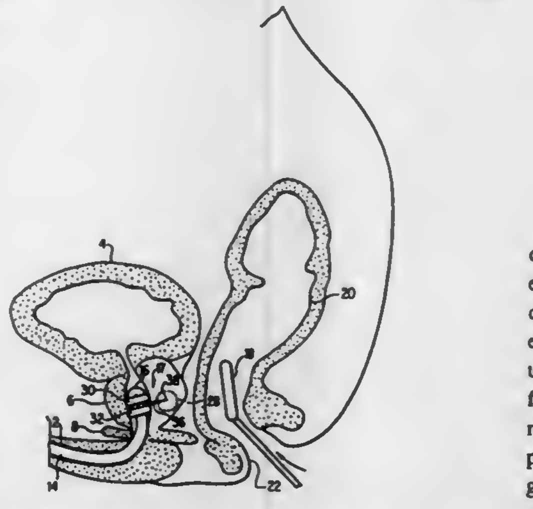
5,531,676
MEDICAL PROBE DEVICE AND METHOD

Stuart D. Edwards, Los Altos; Ronald G. Lax, Grass Valley; Ingemar H. Lundquist, Pebble Beach, and Hugh R. Sharkey, Redwood City, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation of Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, which is a continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned. This application Sep. 27, 1994, Ser. No. 313,715

Int. Cl.⁶ A61B *17/20*

U.S. Cl. 604—22 **38 Claims**



1. A medical probe device for treatment of a prostate of a human male having a bladder with a base with a urethra formed by a urethral wall extending into the base of the bladder with the prostate having tissue surrounding the urethra near the base of the bladder comprising a catheter having a control end and a probe end and a passageway extending from the control end to the probe end along a longitudinal axis, a flexible stylet assembly slidably mounted in the passageway in the catheter and having a distal extremity, said stylet assembly comprising a conductive electrode and a sleeve of insulating material surrounding the conductive electrode and permitting a predetermined portion of the conductive electrode to be exposed, control means secured to the stylet assembly and to the control end of the catheter for causing movement of the distal extremity of the stylet assembly between a retracted position disposed within the passageway and an extended position disposed outwardly from the probe end whereby the stylet assembly can extend through the urethral wall into the tissue of the prostate with the conductive electrode being exposed in the tissue of the prostate and the sleeve being disposed in the urethral wall and means coupled to the control means and to the conductive electrode for supplying radio frequency energy to the conductive electrode for causing ablation of tissue in the prostate while the urethral wall is protected from the radio frequency energy supplied to the electrode.

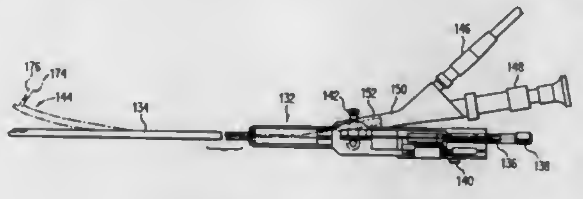
5,531,677
STEERABLE MEDICAL PROBE WITH STYLETS

Ingemar H. Lundquist, Oakland, and Stuart D. Edwards, Los Altos, both of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation of Ser. No. 109,190, Aug. 19, 1993, Pat. No. 5,409,453, which is a continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819, Ser. No. 61,072, May 14, 1993, Pat. No. 5,385,544, and a continuation-in-part of Ser. No. 945,666, Sep. 16, 1992, abandoned. This application Apr. 11, 1995, Ser. No. 420,304

Int. Cl.⁶ A61B *17/20*

U.S. Cl. 604—22 **16 Claims**



1. A medical probe for the treatment by radio frequency ablation of a target volume in tissue of a human having a urethral channel extending into a base of a bladder along a longitudinal axis comprising an elongate probe member having proximal and distal extremities and being sized so that it can be introduced into the urethra, said elongate probe member having a passage extending from the proximal extremity to the distal extremity, guide cannulae mounted in the passage of the elongate probe member and having proximal and distal extremities with the distal extremities of the guide cannulae being in the vicinity of the distal extremity of the elongate probe member, each of said guide cannulae having a lumen extending therethrough from the proximal extremity to the distal extremity, a radio frequency conductive electrode disposed in each lumen, an insulating sleeve coaxially disposed on each radio frequency electrode, a control handle secured to the proximal extremity of the elongate probe member and means carried by the control handle and secured to each radio frequency electrode and each insulating sleeve whereby each radio frequency electrode and each insulating sleeve can be advanced and retracted.

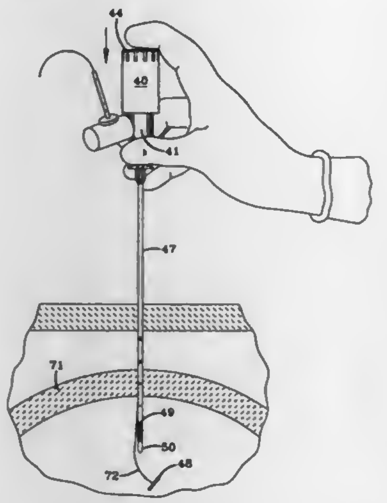
5,531,678
METHOD OF USING A SPRING-LOADED RECIPROCABLE STYLET HOLDER TO EJECT A T-FASTENER

Todd C. Tomba, Dublin; Edgar G. Manosalva, Worthington; Donald J. Goldhart, Grove City, all of Ohio, and James D. Morrow, Oak Park, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 308,242, Sep. 19, 1994. This application Apr. 14, 1995, Ser. No. 422,297

Int. Cl.⁶ A61M *31/00*

U.S. Cl. 604—51 **2 Claims**



1. A method of controllably holding and ejecting a T-fastener from a hypodermic needle tip during placement in a hollow organ of a patient comprising the steps of:

(a) providing an assembly of a spring-loaded reciprocable stylet holder comprising:
- a cap having a closed end and an open end and a longitudinal axis;
- a hollow body element having a longitudinal axis and an open end portion partially nested within and reciprocable partially into the cap, and an opposite end that is substantially closed, having a borehole therethrough, the longitudinal axes of the cap and body element being coincidental;
- a spring within the stylet holder assembly urging the body element outwardly of the cap;
- a stylet supported at one end thereof by and within the cap and along the longitudinal axis thereof, the stylet slideably extending through and beyond a borehole in the substantially closed end of the body element along the longitudinal axis thereof;
- the substantially closed end of the body element having means for attaching a hypodermic needle thereto so as to telescopically cover with the hypodermic needle the portion of the stylet extending beyond the substantially closed end of the body element; and
- a hypodermic needle held by the attachment means with the stylet extending therethrough to adjacent the tip thereof, the needle being of the requisite gauge and length for insertion of a T-fastener within a hollow organ of a patient and having a slotted tip portion to slideably receive and hold a T-fastener;

(b) placing a T-fastener with an attached filament within the slot of the needle with the distal end of the stylet resting within the needle closely adjacent the T-fastener;

(c) inserting the needle into a hollow organ of the patient at a pre-selected site;

(d) sufficiently pressing down the cap of the stylet holder over the body element and against the urging of the spring within the stylet holder to move the stylet to eject the T-fastener from the tip of the needle; and

(e) releasing the cap to allow the spring to urge the cap, stylet and body element back in the opposite direction to the original position of each element.

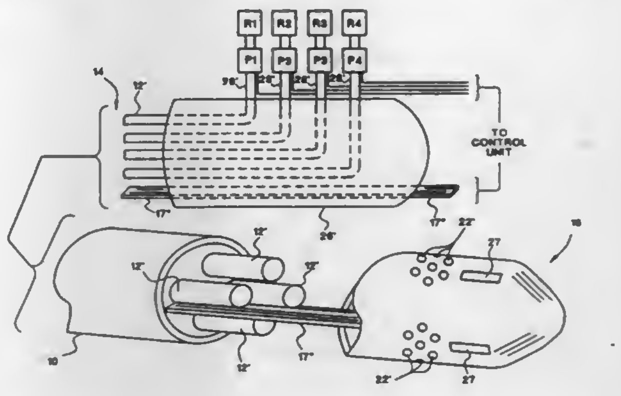
5,531,679
FLUIDIC INFUSION SYSTEM FOR CATHETER OR PROBE

Joseph H. Schulman, 10650 Comet Way, Santa Clarita, Calif. 91351, and Orville R. Rule, III, 2572 Basil La., Los Angeles, Calif. 90077

Filed Mar. 14, 1994, Ser. No. 212,226

Int. Cl.⁶ A61M *31/00*

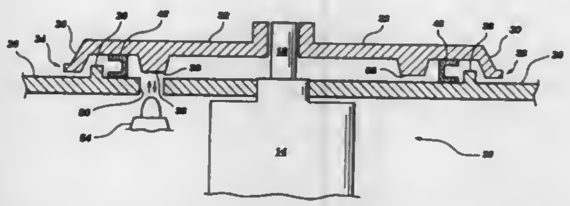
U.S. Cl. 604—65 **25 Claims**



18. A fluidic infusion system including an in vivo catheter for introducing a select fluid into the environment surrounding a functional end of said catheter, comprising:
- a catheter for in vivo placement having a tubulus configuration, said catheter including,
  - at least one axially extending lumen through which fluid is transported from an opening formed by said lumen in a commencing end of said catheter to a closed distal end thereof,
  - a plurality of circumferentially spaced radial openings formed through a body of said catheter and communicating with said fluidic lumen to introduce fluid into the environment surrounding the distal end of the catheter, said radial openings being axially spaced from said distal end by a select spacing,
  - a material which closes the distal end of said catheter; and
  - a sensor or electrode for performing a measurement, sensing or stimulation function of the bodily liquids or tissue in which the catheter is implanted embedded in the material which closes the distal end of the catheter;
- reservoir means for storing said select fluid;
- pump means for transporting said fluid with volumetric control through said fluidic infusion system, said pump means being responsive to control signals for continuous or selectively intermittent operation and for metering the volume of fluid flowed therethrough;
- means for controlling said pump means, said control means including,
  - electronic circuitry for generating and providing said control signals to said pump means to determine continuous or selectively intermittent operation and to determine the metered volume of fluid flowed thereby, and
  - synchronizing means for controlling said pump means to cease fluid flow for a select period during which a measurement, sensing or stimulation function is being performed by a sensor or electrode of said catheter;
- first fluid conduit means for transporting fluid to said pump means from said reservoir means;
- manifold means for introducing fluid into said fluidic lumen of said catheter for transport thereby to the distal end; and
- second fluid conduit means for transporting fluid to said manifold means from said pump means.

5,531,680
ENTERAL FEEDING PUMP MOTOR UNIT AND METHOD OF USE

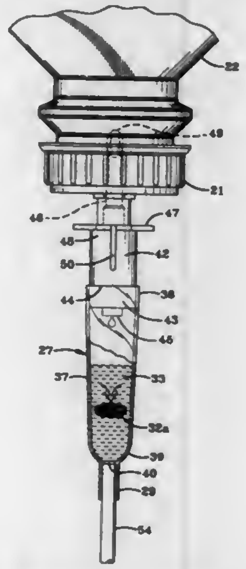
Chris Dumas, Midvale, and Sean Winterer, Sandy, both of Utah, assignors to Zevex, Inc., Salt Lake City, Utah
Filed May 5, 1995, Ser. No. 435,735
Int. Cl.⁶ A61M *31/00*
U.S. Cl. 604—67 **22 Claims**



1. An enteral feeding pump motor unit for moving fluid through a tube of a delivery set at a desired rate, the motor unit comprising:
- rotatable platen means disposed for receiving a tube of the delivery set and rotating to apply a moving mechanical force to at least one side of the tube and thereby move fluid through the tube when a tube is received by the platen means;
- optical sensing means disposed adjacent the platen means for sensing rotation rate of the platen means, and for producing a signal indicative of the rate, at least a portion of the optical sensing means being disposed on the platen means; and
- control means responsive to the signal produced by the optical sensing means for signalling the platen means to modify the rotation period of the platen means to achieve fluid flow through the tube at the desired rate.

5,531,681
APPARATUS FOR ALTERING COMPOSITION OF NUTRITIONAL PRODUCT DURING ENTERAL TUBE FEEDING

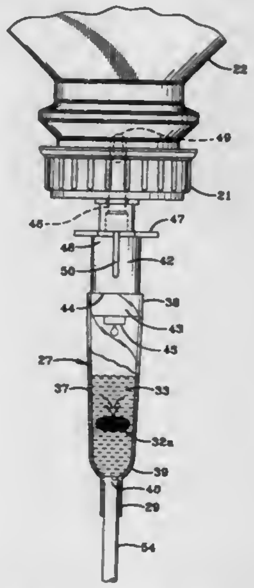
Joseph E. Walton, Westerville; Terrence B. Mazer, Reynoldsburg; Ronita K. Geckle, Columbus; Carl J. Piontek, Powell, all of Ohio; Susan B. Duel, Laurinburg, N.C.; Andre Daab-Krzykowski, Columbus, Ohio; Mark A. McCamish, Worthington, Ohio; Robert L. Joseph, Columbus, Ohio, and William G. Pierson, Canal Winchester, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jan. 13, 1995, Ser. No. 372,407
Int. Cl.⁶ A61M *37/00*
U.S. Cl. 604—83 **37 Claims**



1. An apparatus for modifying a liquid enteral nutritional product during the feeding thereof comprising:
- a formulation chamber, the formulation chamber having an inlet and an outlet and the inlet connected to a container with a liquid enteral nutritional product having a viscosity in the range of about 5 to about 300 centipoises so as to receive said product therefrom,
- the formulation chamber further comprising at least one beneficial agent in at least one controlled release dosage form unit and the formulation chamber containing the at least one controlled release dosage form unit,
- each beneficial agent being selected from the group consisting of nutrients, medicaments, probiotics and diagnostic agents that are each dispersed in said liquid enteral nutritional product, the controlled release dosage form unit being capable of delivering each beneficial agent into said liquid enteral nutritional product over a time period in the range of at least about 30 minutes during the feeding thereof to a patient.

5,531,682
APPARATUS FOR ADDING MARKER DYE TO NUTRITIONAL PRODUCT DURING ENTERNAL TUBE FEEDING

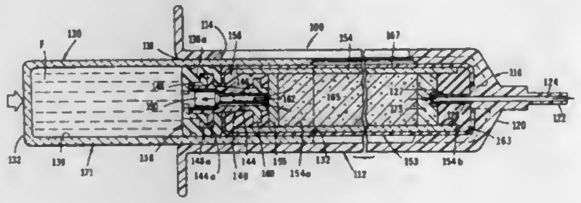
Terrence B. Mazer, Reynoldsburg; Joseph E. Walton, Westerville; Ronita K. Geckle, Columbus; Carl J. Piontek, Powell, all of Ohio; Susan B. Duel, Laurinburg, N.C.; Andre Daab-Krzykowski; Robert L. Joseph, both of Columbus, Ohio; William G. Pierson, Canal Winchester, Ohio; Thomas D. Loughrin, Columbus, Ohio, and Thomas W. Osip, Dublin, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jan. 13, 1995, Ser. No. 372,266
Int. Cl.⁶ A61M *37/00*
U.S. Cl. 604—84 **30 Claims**



1. An apparatus for liquid enteral nutritional product feeding comprising:
- a formulation chamber having an inlet and an outlet and connected to a supply container of a liquid enteral nutritional product having a viscosity in the range of about 5 to about 300 centipoises, so as to receive said product therefrom;
- the formulation chamber further comprising at least one physiologically acceptable marker dye, the at least one marker dye being contained within at least one sustained release reservoir positioned within the formulation chamber so as to be in physical contact with said liquid enteral nutritional product in said formulation chamber, the at least one marker dye being soluble in the medium of the liquid enteral nutritional product, said at least one sustained release reservoir containing marker dye being a means for providing and dispensing marker dye into said liquid enteral nutritional product when the sustained release reservoir is physically contacted thereby during the feeding thereof to a patient over a time period of about 2 to about 24 hours; and
- fluid communication means capable of operatively connecting the outlet of the formulation chamber to a device for feeding the dye-marked liquid enteral nutritional product into the gastrointestinal tract of a patient.

5,531,683
MIXING AND DELIVERY SYRINGE ASSEMBLY

Marshall S. Kriesel, St. Paul, and Thomas N. Thompson, Richfield, both of Minn., assignors to Science Incorporated, Bloomington, Minn.
Continuation-in-part of Ser. No. 930,749, Aug. 13, 1992, Pat. No. 5,330,426. This application Jul. 6, 1994, Ser. No. 271,378
Int. Cl.⁶ A61M *37/00*
U.S. Cl. 604—89 **38 Claims**



1. A device for intermixing a first component with a second component and for dispensing the mixture from the device comprising:

(a) a housing having first and second end portions, and an internal chamber with an outlet;

(b) container means connected to said second end portion of said housing containing a first component, said container means being movable relative to said chamber from a first position to a second position;

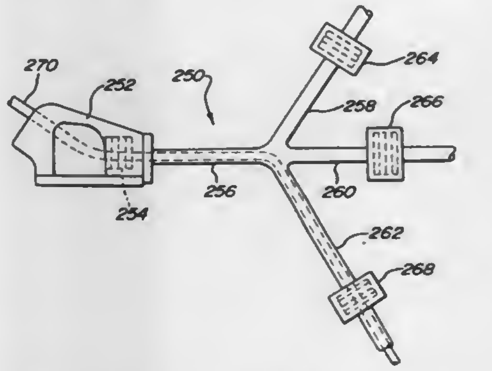
(c) adding means disposed within said internal chamber for adding a second component to said first component to form an infusible mixture upon movement of said container means toward said second position, said adding means comprising a scaffold upon which said second component is removably carried in a manner such that said second component will be presented to said first component for removal thereby from said scaffold upon movement of said container means toward said second position;

(d) valve means for controlling the flow of said first component from said container means toward said adding means; and

(e) flow means for permitting fluid flow between said adding means and said outlet of said internal chamber upon movement of said container means toward said second position.

5,531,684
IMPLANTABLE ACCESS DEVICES

William D. Ensminger, and Robert F. Gavin, both of Ann Arbor, Mich., assignors to Michigan TransTech Corporation, Ann Arbor, Mich.
Continuation of Ser. No. 407,483, Mar. 15, 1995, Pat. No. 5,476,451, which is a continuation of Ser. No. 259,053, Jun. 13, 1994, Pat. No. 5,417,656, which is a continuation of Ser. No. 148,394, Nov. 8, 1993, Pat. No. 5,350,360, which is a division of Ser. No. 940,619, Sep. 4, 1992, Pat. No. 5,281,199, which is a continuation-in-part of Ser. No. 818,626, Jan. 10, 1992, Pat. No. 5,226,879, which is a continuation-in-part of Ser. No. 654,661, Feb. 15, 1991, Pat. No. 5,180,365, which is a continuation-in-part of Ser. No. 539,793, Jul. 18, 1990, Pat. No. 5,053,013, which is a continuation-in-part of Ser. No. 487,541, Mar. 1, 1990, Pat. No. 5,057,084. This application Jun. 6, 1995, Ser. No. 467,269
Int. Cl.⁶ A61M *11/00*
U.S. Cl. 604—93 **18 Claims**

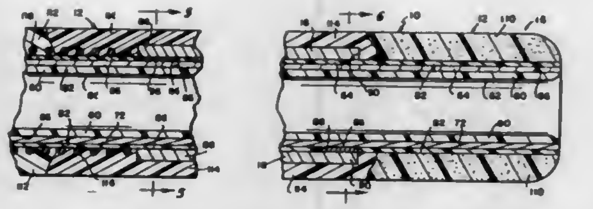


1. An implantable access device for permitting access to a predetermined tissue within a patient by a filament, such as a needle, external catheter, steerable wire or optic fiber, percutaneously inserted into said device, said device comprising:
- a housing including a funnel shaped entrance orifice and a focus area, said entrance orifice having a shape of decreasing cross sectional area defining a target area for insertion of said filament into said device, said entrance orifice causing said filament introduced thereinto to be directed to said focus area;
- a body defining a passageway extending from said entrance orifice and said focus area, said passageway terminating in an exit orifice at said predetermined tissue, said passageway receiving said filament from said entrance orifice when said filament is inserted into said device;
- valve means positioned in said passageway and normally remaining closed for providing resistance to fluid flow through said passageway, said valve means also permitting passage of said filament therethrough for enabling said filament to communicate across said valve means with said predetermined tissue, said passageway branching into at least two subpassageways, one of said subpassageways having said valve means located therein; and
- mounting means for subcutaneously mounting said access device.

5,531,685
STEERABLE VARIABLE STIFFNESS DEVICE

Chad G. Hemmer, Indianapolis; John A. Steen, Zionsville, both of Ind.; Michael R. Forman, St. Paul, and Jonathan R. McGrath, Chanhassen, both of Minn., assignors to Catheter Research, Inc., Indianapolis, Ind., and Schneider (USA) Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 76,113, Jun. 11, 1993, Pat. No. 5,334,168. This application Aug. 1, 1994, Ser. No. 284,076
Int. Cl.⁶ A61M *37/00;25/00*
U.S. Cl. 604—95 **50 Claims**

1. An apparatus comprising



- a flexible, elongated tubular member having a central axis extending therethrough,
- a shape-memory tube made of temperature-activated shape-memory material and formed to include a lumen extending therethrough, the shape-memory tube being arranged in the tubular member to cause the lumen to extend along the central axis of the tubular member,
- a liner sleeve positioned to extend through the lumen of the shape-memory tube and lie inside the tubular member, the liner sleeve being configured to have an annular exterior surface, and

control means for selectively heating the shape-memory tube to move the shape-memory tube to assume a stiff predetermined shape, thereby stiffening and moving the tubular member so that it moves toward a corresponding predetermined shape, the control means including a first electrically conductive coating around the liner sleeve, a second electrically conductive coating around the liner sleeve and positioned to lie in spaced-apart relation to the first electrically conductive coating, insulator means for preventing establishment of an electrical connection between the shape-memory tube and each of the first and second electrically conductive coatings, the insulator means being positioned to lie around the annular exterior surface of the liner sleeve and formed to include first and second openings, first conductor means passing through the first opening in the insulator means for electrically connecting the first electrically conductive coating to the shape-memory tube, and second conductor means passing through the second opening in the insulator means for electrically connecting the shape-memory tube to the second electrically conductive coating.

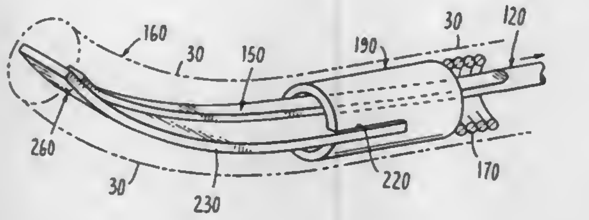
5,531,686
CATHETER STEERING MECHANISM

Ingemar Lundquist, Pebble Beach, and Russell B. Thompson, San Leandro, both of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 99,603, Jul. 30, 1993, Pat. No. 5,395,327, which is a continuation of Ser. No. 991,474, Dec. 16, 1992, Pat. No. 5,254,088, which is a continuation of Ser. No. 736,384, Jul. 26, 1991, abandoned, which is a division of Ser. No. 473,667, Feb. 2, 1990, abandoned. This application Dec. 23, 1994, Ser. No. 363,294

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—95 **7 Claims**



1. A steering mechanism comprising:
- a steering shaft having a proximal end and a distal end and a lumen therethrough;
- a ferrule mounted in the steering shaft and having a distal end that terminates within the steering shaft short of the distal end of the steering shaft, the distal end of the steering shaft being free of any portion of the ferrule;
- a lead spring attached to the ferrule, the lead spring having an axis and a bendable portion extending outside the distal end of the ferrule but still within the distal end of the steering shaft that is free of any portion of the ferrule for bending the distal end of the steering shaft in response to an applied force relative to the ferrule;
- a steering wire extending through the lumen, said steering wire having a first end attached to the lead spring at a first location outside the distal end of the ferrule and having a second end exiting the proximal end; and
- a controller positioned at the proximal end and attached to the second end of said steering wire for placing tension on said steering wire, for applying force to said steering wire to bend the distal end of the steering shaft toward said tensed steering wire.

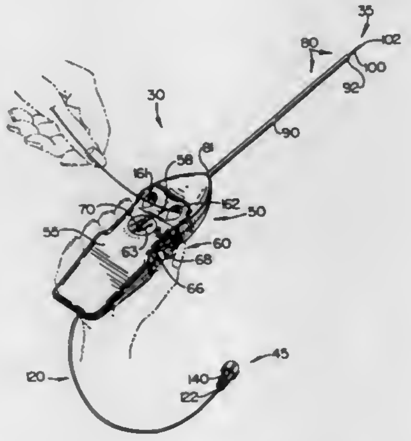
5,531,687
STEERABLE CATHETER

Phillip J. Snoke, Atlanta; David S. Rowley; David G. Lincoln, both of Smyrna, and Kirk W. Charles, Austell, all of Ga., assignors to Catheter Imaging Systems, Atlanta, Ga.

Continuation of Ser. No. 279,500, Jul. 22, 1994, Pat. No. 5,437,636, which is a division of Ser. No. 908,403, Jul. 6, 1992, Pat. No. 5,342,299. This application Dec. 30, 1994, Ser. No. 367,105

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—95 **13 Claims**



1. A catheter for use in body vessels or cavities, comprising:
- a housing having a clam-shell configuration and having side peripheries of a medial portion thereof inwardly recessed so as to define a generally hourglass shape to be readily held in the hand of a user for responsively manipulating the catheter;
- elongate tube means having a proximal end connected to said housing and extending outwardly therefrom and being formed of a material having sufficient stiffness to maintain said elongate tube means in a substantially straight condition in the absence of an external force being applied thereto, said elongate tube means having a flexible distal end portion and at least one lumen longitudinally extending from said distal end portion to said proximal end portion;
- guide wires having proximal ends positioned within and connected to said housing and extending outwardly therefrom through said elongate tube means, distal ends of said guide wires being connected to said flexible distal end portion of said elongate tube means; and
- a control wheel rotatably mounted within said recessed medial portion of said housing, for engaging a portion of said guide wires so that rotation of said control wheel responsively moves said guide wires and thereby changes an angular attitude of said distal end portion of said elongate tube means.

5,531,688
APPARATUS FOR DOSING A LIQUID MEDICINE

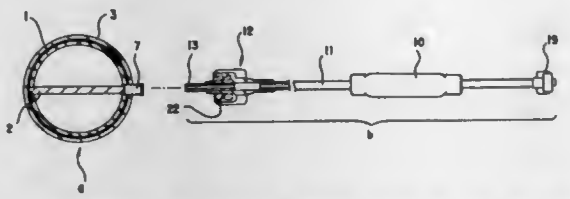
Katsuhiro Hiejima, Ootsu, and Hidekazu Miyauchi, Kusatsu, both of, Japan, assignors to Nissho Corporation, Osaka, Japan

Filed Sep. 5, 1995, Ser. No. 523,629

Claims priority, application Japan, Sep. 2, 1994, 6-209628

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—96 **7 Claims**



1. An apparatus for dosing a liquid medicine, the apparatus including a balloon assembly and a delivery assembly connected thereto, the balloon assembly comprising:
- flat and flexible circular sheet-shaped balloon members inflatable to define therebetween an inside space for accommodating an amount of a liquid medicine in a pressurized state;
- a housing for enclosing the balloon members in an inflated state thereof; and
- a short cylindrical frame between the balloon members and having a narrow peripheral wall in which a primary mouth is formed which is directly or indirectly in fluid communication with the space inside the frame, the primary mouth capable of fluid communicating with the delivery assembly,
- and the delivery assembly extending outwardly from the primary mouth to discharge the liquid medicine out of the balloon assembly, wherein edges of the balloon members are secured to opposite side rims of the cylindrical frame so as to assume a drum shape.

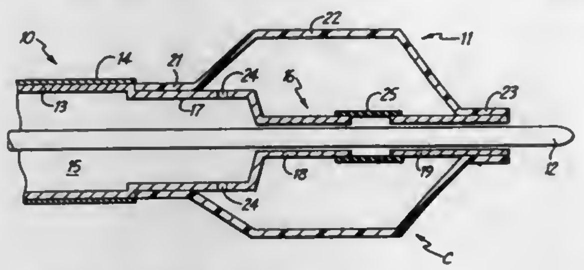
5,531,689
INNERLESS DILATATION BALLOON CATHETER

Matthew M. Burns, Orono, and David W. Lodin, Maple Grove, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation of Ser. No. 313,533, Sep. 27, 1994, Pat. No. 5,454,789, which is a continuation of Ser. No. 185,311, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 79,151, Jun. 17, 1993, abandoned, which is a continuation of Ser. No. 748,255, Aug. 21, 1991, Pat. No. 5,221,260, which is a continuation-in-part of Ser. No. 596,573, Oct. 11, 1990, Pat. No. 5,085,636, which is a continuation of Ser. No. 297,078, Jan. 13, 1989, abandoned, which is a continuation of Ser. No. 730,224, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 337,272, Apr. 13, 1989, Pat. No. 5,032,113. This application Jun. 6, 1995, Ser. No. 467,749

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—99 **9 Claims**



1. A balloon catheter assembly comprising:
- a. a shaft having a proximal end, a distal end, and a lumen which extends between the proximal end and the distal end;
- b. a balloon having a first end and a second end, the first end of the balloon being attached to the shaft near the distal end of the shaft, the second end of the balloon being attached to the shaft proximal of the distal end of the shaft, said balloon being in fluid communication with the lumen to permit inflation and deflation of the balloon;
- c. a guide wire disposed within said lumen;
- d. a fluid resistance member positioned around the guidewire and carried by the shaft, the fluid resistance member having an inner diameter which permits relative movement of the guide wire with respect to the balloon catheter and also provides a resistance to fluid flow past the guide wire, the resistance to fluid flow provided by the fluid resistance member being greater than the resistance to fluid flow between the lumen and the interior of the balloon; and
- e. a valve responsive to inflation pressure operatively mounted with the lumen of the shaft for reducing fluid flow through the lumen.

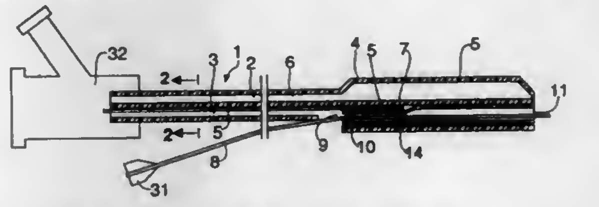
5,531,690
RAPID EXCHANGE CATHETER

Ronald J. Solar, San Diego, Calif., assignor to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 969,887, Oct. 30, 1992, abandoned. This application Oct. 21, 1994, Ser. No. 327,134

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—102 **2 Claims**



1. A balloon dilatation catheter system comprising:
- (a) a guidewire and;
- (b) two or more catheters which each comprise
- an elongate flexible tubular shaft having a proximal end and distal end;
- an inflatable dilatation balloon forming part of the distal end of the shaft, the dilatation balloon having a proximal end and a distal end;
- a first, inflation lumen extending through the shaft and having a proximal end and a distal end, the distal end of the first lumen opening into and being in fluid communication with the dilatation balloon;
- a second lumen extending through the shaft and having a proximal end, an open distal end, and an opening proximal to said distal end; and
- a pushing wire having a proximal end and a distal end and extending through the second lumen, the distal end of the pushing wire being fixed in the second lumen proximal to the distal end of the second lumen,
- wherein the portion of the second lumen distal of said second lumen opening is enlarged as compared to the portion of the second lumen proximal to said opening to facilitate receiving a guidewire in a sliding fit,
- which catheters can be sequentially exchanged over the guidewire, and wherein the guidewire has a slitter for slitting the enlarged distal portion of each lumen.

5,531,691
SINGLE USE SYRINGE ASSEMBLY

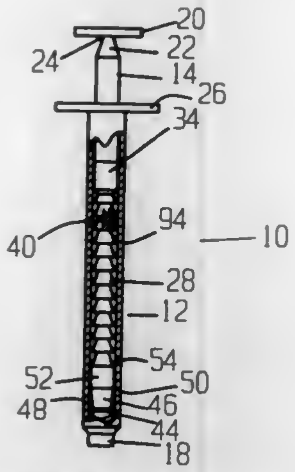
David Shonfeld, Great Neck, and Joel S. Schoenfeld, Woodbury, both of N.Y., assignors to Univec Inc., Garden City, N.Y.

Filed Feb. 14, 1994, Ser. No. 195,302

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—110 **17 Claims**

1. A single use syringe comprising:



- a hollow barrel having an interior cylindrical side wall, a hub for a needle tip at the distal end of said barrel and a proximal end opposite to said hub for a needle tip end of said barrel;
- a plunger rod having a longitudinal axis located within said barrel for axial movement therein for drawing fluid into and expelling fluid out of said barrel through said hub for a needle tip, said plunger rod extending beyond said barrel at said proximal end and having a sealing piston at said hub for a needle tip end;

said plunger rod comprised of two or more ratchet teeth extending along said longitudinal axis;

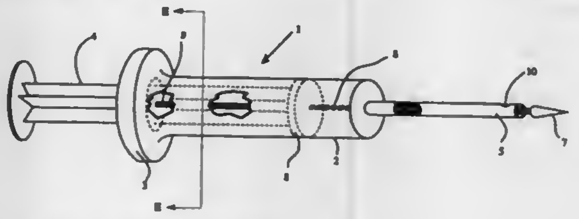
an open-ended resilient locking spring, locatable on any one of said ratchet teeth, said locking spring extending around the circumference of said plunger rod by more than about 180 degrees but less than 360°, said locking spring having at least one inwardly directed, ratchet tooth-engaging tab and at least one, outwardly-directed contact point;

said plunger rod being free to move a first time toward the proximal end of said barrel, said tab camming over the surface of said ratchet teeth as said plunger rod moves proximally while said locking spring is held in position by the frictional engagement of said contact point against said interior cylindrical sidewall and, yet, distal movement of said plunger rod causes said tab to engage the base of one of said ratchet teeth such that said locking spring moves along with said plunger rod in said distal direction;

whereby said locking spring permits the syringe to be loaded with medication in the volume of said barrel defined by the predetermined location of said locking spring on said plunger rod and by proximal movement of said sealing piston as far as the distal end of said locking spring, and, after distal movement of said plunger rod to expel said medication, a second proximal movement of said plunger rod is prevented by frictional engagement between said contact point and said interior cylindrical sidewall.

5,531,692
SAFETY SYRINGE

William D. Rogers, 363 Hill St., Southampton, N.Y. 11968
Filed Oct. 6, 1994, Ser. No. 318,966
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—110 7 Claims



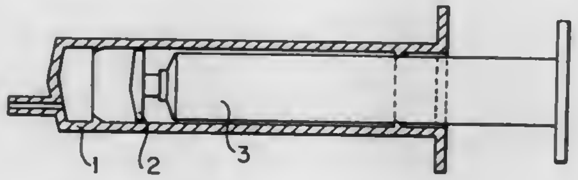
1. A safety syringe, comprising:

- a generally cylindrical needle body having first and second opposite ends and an interior volume, said first end being open and said second end having a opening;
- a needle member extending from said second end of the needle body and being in communication with said in error volume through said opening;
- a plunger having a central bore and piston secured to an end of the plunger, said plunger and piston being inserted through said first end of the needle body, said piston sealingly engaging an inner surface of the needle body;
- a stylette having a sharp point, said stylette extending through the needle member, penetrating through and frictionally engaging said piston and extending into the central bore of the plunger, said piston being slidable with respect to and over a length of said stylette, wherein

said sharp point of the stylette is normally retracted into the needle member to prevent needle-stick injuries, and extends from the needle member upon applying a biasing force to said piston by depressing said plunger, whereby frictional engagement between the piston and the stylette forces said sharp point to be exposed from said needle member.

5,531,693
SINGLE-USE SYRINGE

Constantin Vounatsos, 19, rue des Bois, 78490 Galluis, France
PCT No. PCT/FR93/00362, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO93/20873, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 9, 1993, Ser. No. 343,538
Claims priority, application France, Apr. 10, 1992, 92 04384
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—110 7 Claims

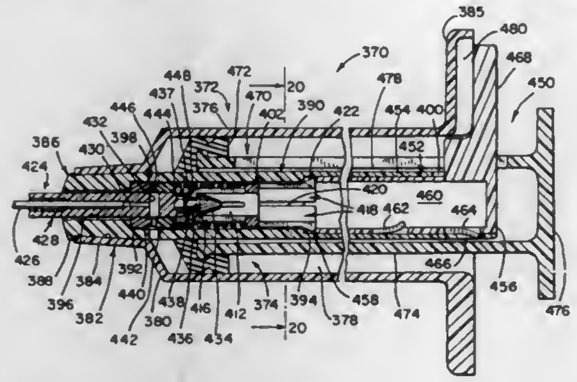


1. A single-use syringe comprising:

- a syringe body;
- a plunger enclosed and slidable within the syringe body, the plunger including
  - a) a head serving as a piston and located within the syringe body;
  - b) an elongated rod-like body for actuating movement of the syringe head;
  - c) an intermediate stem directly connected between the head and the plunger body;
  - d) a slotted cavity formed in the stem for receiving a mating projection on a confronting surface of the elongated body, to form a releasable connection therebetween, disconnection occurring in response to attempted withdrawal of the plunger;
- a first continuous annular raised stop transversely formed on an interior wall of the syringe body, at a first end of the syringe, to resist plunger head withdrawal in response to attempted retraction, after full insertion of the plunger head into the syringe body; and
- a second continuous annular raised stop transversely formed on an interior wall of the syringe body, at a second end of the syringe, to resist plunger head withdrawal beyond the second stop, in response to retraction of the plunger head beyond the first stop.

5,531,694
NEEDLE RETRACTION SYSTEM

Anton H. Clemens, 5854 Schumann Dr., Madison, Wis. 53711, and Victor M. Haughton, 1071 Waterville Rd., Oconomowoc, Wis. 53066
Continuation-in-part of Ser. No. 114,472, Aug. 31, 1993, Pat. No. 5,395,337. This application Mar. 6, 1995, Ser. No. 398,543
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—110 17 Claims



1. A medical assembly, comprising:

- a barrel having an internal cavity extending along a longitudinal axis;
- a plunger assembly adapted for longitudinal sliding movement within the barrel cavity;
- a sleeve mounted to the barrel, the sleeve defining a forward end and a rearward end and an internal passage extending therebetween;
- a hub member mounted within the sleeve in a first position toward the forward end of the sleeve;
- a needle mounted to the hub member, the needle defining a lumen;

passage means interposed between the needle lumen and the barrel cavity for establishing communication therebetween;

bias means for urging the hub member toward the rearward end of the sleeve;

- a releasable retainer mechanism engageable with the hub member for retaining the hub member in its first position against the force of the bias means and movable to a release position for disengaging the hub member; and
- a trigger for selectively moving the releasable retainer mechanism to its release position in response to either engagement of the plunger assembly with the trigger or manual engagement with the trigger by a user regardless of the position of the plunger, wherein engagement of the hub member is released and the bias means functions to draw the hub member rearwardly to withdraw the needle into the internal passage defined by the sleeve.

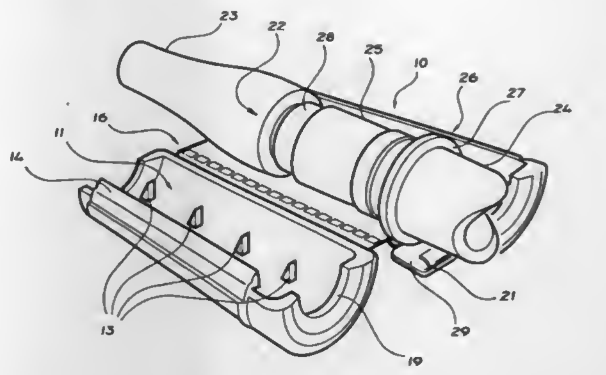
5,531,695
TAMPER EVIDENT SLEEVE

David R. Swisher, Maryland Heights, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed Dec. 22, 1994, Ser. No. 362,704
Int. Cl.⁶ A61M *5/00*
U.S. Cl. 604—111 7 Claims

1. A tamper-evident sleeve in combination with a tube connector that joins a first tube and a second tube, said first and second tubes each having an exterior surface and said tube connector having a distal end connected to said second tube, said sleeve comprising:

- a first cover portion, a second cover portion and a peel tab, said first and second cover portions each forming a hollow semi-cylindrical shape and each having an interior surface, and being joined to each other by said peel tab;

said first and second cover portions each have a plurality of barbs attached to the interior surfaces of said cover portions, said peel tab having a proximal end and a distal end; and,

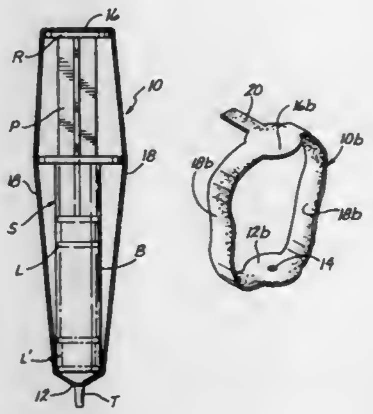


each of said first and second cover portions further including first and second clasp portions respectively which are interattachable to lock said cover portions into a closed position about said tube connector,

whereby said peel tab is tearable and severable from said first and second cover portions.

5,531,696
ELASTOMERIC DRIVER FOR EPIDURAL RESISTANCE SYRINGE

Cesar M. Menes, 12905 E. Wolverton, Cerritos, Calif. 90701
Filed Dec. 13, 1993, Ser. No. 166,213
Int. Cl.⁶ A61M *37/00*
U.S. Cl. 604—131 21 Claims



1. A syringe with elastomeric driver comprising:

- a syringe having a barrel, a tip for mounting a hypodermic needle to one end of said barrel, a plunger movable into an opposite end of the barrel, and a thumb rest at a free end of said plunger; and
- a unitary elastomeric band having opposite ends and a midportion, said ends being perforated for being fitted onto said tip between said hypodermic needle and said barrel, said midportion being engaged to said thumb rest for urging said plunger into said barrel, further comprising adhesive on said midportion for retaining the midportion to said thumb rest, said elastomeric band having a length between said ends and said midportion so as to urge said plunger to full depression into said barrel.

5,531,697

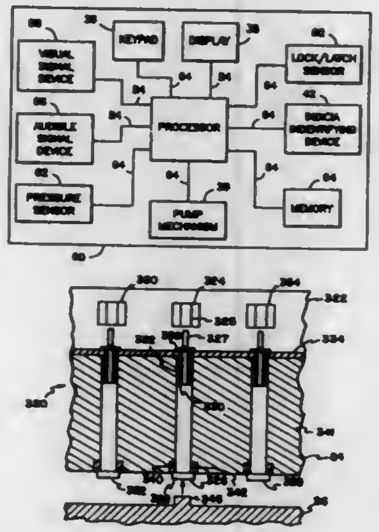
SYSTEMS AND METHODS FOR CASSETTE IDENTIFICATION FOR DRUG PUMPS

James M. Olsen, Plymouth; Jay G. Johnson, Maple Plain, and Jia Hu, New Brighton, all of Minn., assignors to SIMS Deltec, Inc., St. Paul, Minn.

Filed Apr. 15, 1994, Ser. No. 228,508

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—131 **17 Claims**



1. A pump apparatus comprising:

a control module including a processor and a pumping mechanism for pumping fluid through a fluid tube;

a base plate selectively mounted to the control module;

a fluid tube positioned between the base plate and the pumping mechanism of the control module;

a projection extending from the base plate toward the control module; two reciprocally mounted plungers mounted to the control module; and

two optical sensors mounted to the control module, each of which is capable of sensing a portion of one of the plungers and sending a signal to the processor, the plungers being movable between first and second positions, the first position including the portion of the plunger positioned in a first position relative to the optical sensor, and the second position including the portion of the plunger positioned in a second position different from the first position, at least one of the plungers being moved by the projection.

5,531,698

OPTICAL REFLECTION SYSTEMS AND METHODS FOR CASSETTE IDENTIFICATION FORDRUG PUMPS

James M. Olsen, Plymouth, Minn., assignor to SIMS Deltec, Inc., St. Paul, Minn.

Division of Ser. No. 228,508, Apr. 15, 1994. This application Jun. 6, 1995, Ser. No. 471,859

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—131 **10 Claims**

1. A pump apparatus comprising:

a control module including a processor and a pumping mechanism for pumping fluid through a fluid tube;

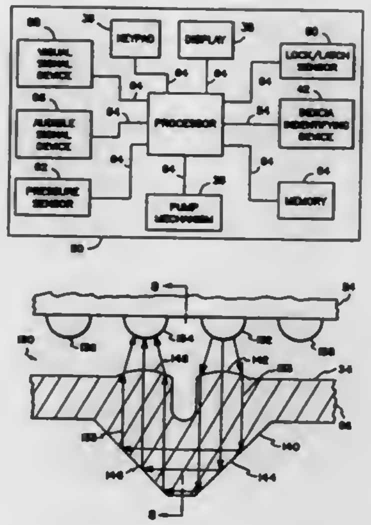
a base plate selectively mounted to the control module;

a fluid tube positioned between the base plate and the pumping mechanism of the control module;

a light emitter associated with the control module for directing light toward the base plate;

a light reflector associated with the base plate for reflecting light toward the control module;

a light receiver associated with the control module for receiving light reflected from the light reflector of the base plate;



means associated with the light receiver for sending a signal to the processor indicative of the light being sensed.

5,531,699

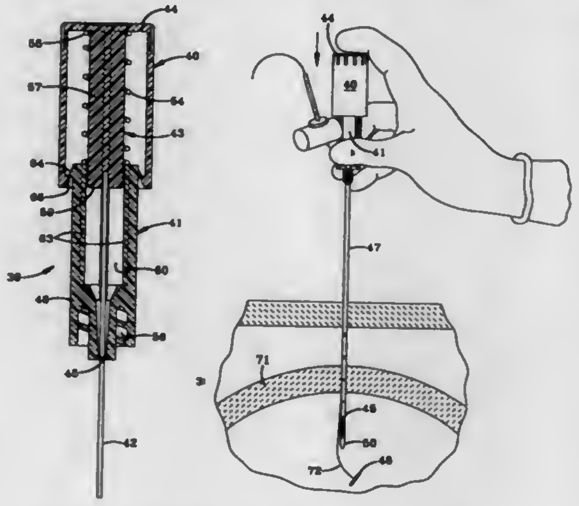
SPRING-LOADED RECIPROCABLE STYLET HOLDER

Todd C. Tomba, Dublin, Ohio; Edgar G. Manosalva, Worthington, Ohio; Donald J. Goldhardt, Grove City, Ohio, and James D. Morrow, Oak Park, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 19, 1994, Ser. No. 308,242

Int. Cl.^{6} A61M *5/178*

U.S. Cl. 604—164 **17 Claims**



1. A spring-loaded reciprocable stylet holder assembly comprising:

a cap having a closed end and an open end and a longitudinal axis, an inner engagement means located adjacent the open end and a post extending from the closed end of the cap along the longitudinal axis thereof;

a hollow body element having a longitudinal axis and an open end portion, the open end portion being partially nested within and reciprocable partially into the cap, and an opposite end that is substantially closed, having a borehole therethrough, the longitudinal axes of the cap and body element being coincidental; the hollow body element further comprising an outer engagement means located adjacent the open end for cooperation with the inner engagement means of said cap to retain the open end portion of the body element partially within the cap

a spring within the stylet holder assembly biased between a portion of the cap and a portion of the body element urging the body element outwardly of the cap; and

a stylet supported at one end thereof by and within the cap and along the longitudinal axis thereof, the stylet being supported by attachment to the post extending from the closed end of the cap, the stylet slideably extending through and beyond a borehole in the substantially closed end of the body element along the longitudinal axis thereof; and

the substantially closed end of the body element having means for attaching a hypodermic needle thereto so as to telescopically cover with the hypodermic needle the portion of the stylet extending beyond the substantially closed end of the body element.

5,531,700

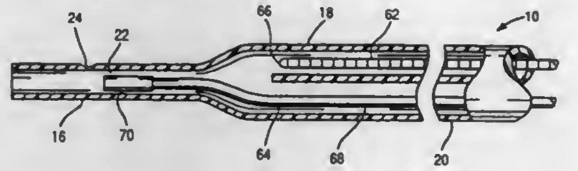
CONVERTIBLE TIP CATHETERS AND SHEATHS

Thomas C. Moore, Santa Clara, and Yue-Teh Jang, Fremont, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Filed Jul. 29, 1994, Ser. No. 282,864

Int. Cl.^{6} A61M *25/09*

U.S. Cl. 604—164 **26 Claims**



1. A vascular catheter, comprising:

a catheter body having a proximal end and a distal end, wherein the catheter body has a proximal region having at least one lumen and a first outside diameter and a distal region having a single lumen and a second outside diameter which is less than the first diameter, wherein a distal guide wire exit port is disposed in the distal region of the catheter body within 5 cm of the distal end, the catheter body being formed such that a guidewire may be advanced into the single lumen from the distal end, the catheter body being formed such that a guidewire may be advanced into the single lumen from the distal end of the catheter body and selectively directed through the exit port or advanced further through the catheter body and into the proximal region.

5,531,701

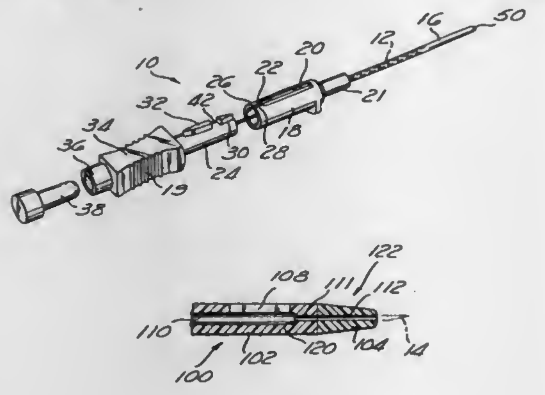
OVER-THE-NEEDLE CATHETER

Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.

Filed Jun. 6, 1994, Ser. No. 254,133

Int. Cl.^{6} A61M *25/06*

U.S. Cl. 604—165 **21 Claims**



1. A catheter insertable into an anatomical structure utilizing an introducer, said catheter comprising:

a) an elongate flexible catheter body having a distal end;

b) an abutment member formed proximate the distal end of said catheter body so as to abut a portion of the introducer in a manner which inhibits proximal movement of the distal end of said catheter body relative to said introducer; and

c) whereby abutment of said catheter body abutment member and the introducer portion prevents the catheter body from being pushed proximally over the introducer so as to collapse during insertion of the catheter.

5,531,702

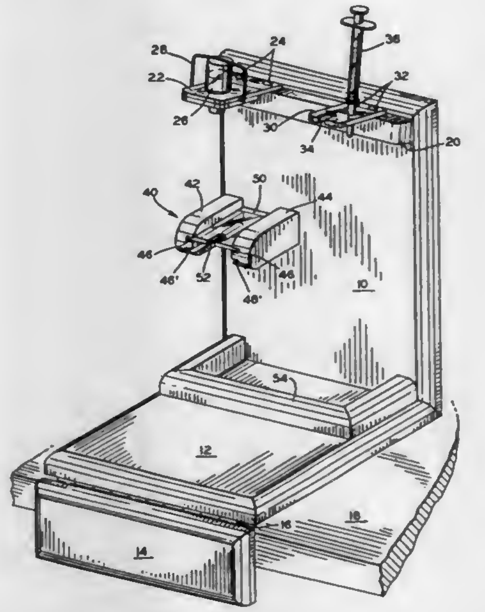
PATIENT CONTROLLED SELF INJECTION AID

Denise J. Baker; Glenn D. Blankenhorn, III; Lonnie R. Freeman, all of Massillon; Heather B. Hann, Navarre; Judy A. Hesse, North Canton; Judy M. Kaforey, Akron, and Darlene K. Piero, Canton, all of Ohio, assignors to Massillon Community Hospital, Massillon, Ohio

Filed May 4, 1995, Ser. No. 434,577

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—181 **6 Claims**



1. A patient controlled self injection aid for disposition on a supporting surface for facilitating the removal of a protective cap from the needle portion of a syringe, the filling of a dose of medicament from a reservoir, and the single handed manipulation of the medicament containing syringe to perform a self injection, the improvement comprising:

a main frame including a first upstanding member and a cooperating second member connected thereto for maintaining the first member in a predetermined relative position;

a medicament container holder mounted on the first member of said frame;

a first syringe holder plate mounted on the first member of said frame, said plate including a syringe receiving aperture and a slot for engaging the protective cap of the needle of the syringe;

a second syringe holder plate mounted on the first upstanding member of said frame beneath and in spaced alignment with said medicament container holder to hold the syringe during the filling thereof with medicament from the container in said container holder; and

means for militating against movement of said frame relative to the supporting surface.

5,531,703

APPLICATOR FOR SEMISOLID MEDICATIONS

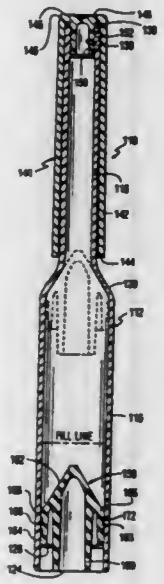
Gary M. Skwarek, Memphis, and Stephen J. Morfit, Germantown, both of Tenn., assignors to Schering-Plough HealthCare Products, Inc., Memphis, Tenn.

PCT No. PCT/US93/03747, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO93/21986, PCT Pub. Date Nov. 11, 1993

Continuation of Ser. No. 874,887, Apr. 28, 1992, abandoned. This PCT application Apr. 28, 1993, Ser. No. 325,380

Int. Cl.⁶ A61M *5/315*

U.S. Cl. 604—187 **28 Claims**



1. An applicator for introducing a semisolid medicinal into a body cavity, comprising:
  - a) barrel means for containing the medicinal, said barrel means including:
    - i) an inner surface defining an internal cavity for containing the medicinal,
    - ii) a first end with a first opening in communication with said internal cavity,
    - iii) a second opposite end with a second opening in communication with said internal cavity, and
    - iv) evacuation channel means for venting air out of said barrel means when said internal cavity is filled with said medicinal, said evacuation channel means being formed on said inner surface;
  - b) plunger means for pushing said medicinal through said first opening, said plunger means being slidably positioned in said barrel means in sealing contact with the inner surface thereof;
  - c) removable cap means for sealingly closing off said first opening and for applying a pushing force to said plunger means when said cap means is removed from said sealing relationship with said barrel means in order to slidably move said plunger means in said barrel means to expel said medicinal from said first opening, said cap means including an open end; and
  - d) connection means for removably connecting said cap means to said barrel means such that said cap means sealingly closes off said first opening.

5,531,704

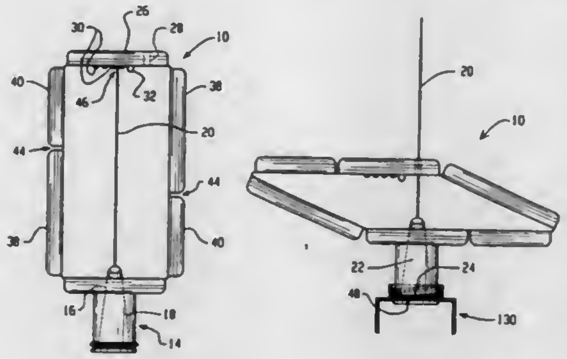
NEEDLE PUNCTURE PREVENTION DEVICE

Evan M. Knotek, Wilmington, N.C., assignor to EMK Enterprises, LLC, Wilmington, N.C.

Filed Mar. 3, 1995, Ser. No. 398,300

Int. Cl.⁶ A61M *5/32*

U.S. Cl. 604—192 **22 Claims**



1. A needle puncture prevention device, comprising:
  - a) a base member having a top surface and a bottom surface and a first opening therethrough, said bottom surface being contiguous with a needle hub housing having a second opening aligned with said first opening for allowing passage therethrough of a needle comprising a needle tip and a needle hub, at least one of said first and second openings being shaped to frictionally engage said needle hub;
  - b) a top member having a longitudinal axis, said top member further having a top surface and a bottom surface and a third opening therethrough for allowing passage of a needle therethrough, said third opening positioned eccentrically on said longitudinal axis, said bottom surface of said top member being opposed to said top surface of said base member, said bottom surface having a needle tip engaging configuration;
  - c) a primary sidewall comprising a first sidewall member having a first longitudinal dimension and a second sidewall member having a second longitudinal dimension, said first and second longitudinal dimensions being unequal, in length and said first and second sidewall members being connected to each other by a primary sidewall living hinge, said first sidewall member further being connected to said base member by a living hinge, and said second sidewall member further being connected to said top member by a living hinge; and
  - d) a secondary sidewall comprising a first sidewall member and a second sidewall member, said first sidewall member having the same length dimension as said primary first sidewall member, said first and second sidewall members being connected to each other by a secondary sidewall living hinge, said first sidewall member further being connected to said top member by a living hinge, and said second sidewall member further being connected to said base member by a living hinge;

wherein when said device is in a relaxed condition, said primary and secondary sidewall hinges are open, and said third opening in said top member is aligned with said first and second openings of said base member to allow extension of a needle therethrough; and wherein, when said device is in an extended condition, said primary and secondary sidewall hinges are closed, the needle is housed within said device, said third opening in said top member is eccentric to the needle tip, and the needle tip is secured by said needle tip engaging configuration of said top member to prevent the needle from reentering said third opening, thereby preventing unintended needle punctures.

5,531,705

SYRINGE UNIT

Konrad G. Alter, Maylands, and Newton J. Herbert, Peppermint Grove, both of, Australia, assignors to Nujenko Pty Ltd, Australia

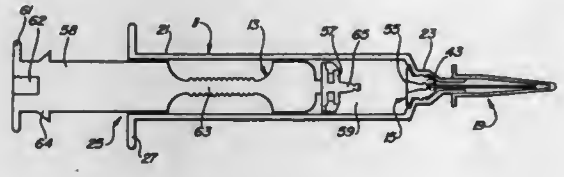
PCT No. PCT/AU91/00558, § 371 Date Jun. 21, 1993, § 102(e) Date Jun. 21, 1993, PCT Pub. No. WO92/09320, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 29, 1991, Ser. No. 66,108

Claims priority, application Denmark, Nov. 30, 1990, 2859/90

Int. Cl.⁶ A61M *5/32*

U.S. Cl. 604—195 **16 Claims**



1. A syringe unit comprising a barrel substantially closed at one end by an end wall and open at the other end, a piston receivable in the barrel and movable therealong, a fluid chamber defined within the barrel between said piston and said end wall, a base for supporting a cannula, securing means for releasably securing the base to the barrel with the cannula extending outwardly from the barrel and the bore of the cannula communicating with said fluid chamber, said securing means being arranged to effect release of said base from the barrel upon rotation of the base relative to the barrel, and engaging means for releasably engaging the piston with said base whereby when so engaged with the base the piston can be rotated to effect release of the base from the barrel and then retracted to move the cannula into a protective position within the barrel, said engaging means comprises a cavity provided on the base and a projection provided on the piston for reception in the cavity and engagement therewith such that said projection is snap fit into said cavity so as to define means defining a fluid flow passage between the cavity and the protection, said cavity providing for fluid communication between the barrel and the cannula, and said fluid flow passage contributing to provision of fluid communication between the fluid chamber and the bore of the cannula.

5,531,706

SAFETY SYRINGE

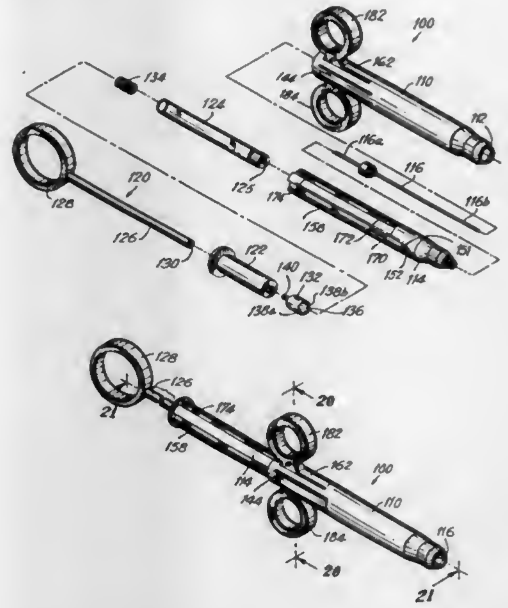
Ricardo L. de la Fuente, Coral Gables, Fla., assignor to Protecs Syringes International Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 679,753, Apr. 3, 1991, Pat. No. 5,306,258. This application Mar. 18, 1994, Ser. No. 214,618

Int. Cl.⁶ A61M *5/32*

U.S. Cl. 604—198 **20 Claims**

1. A safety syringe comprising:
  - a) an elongated sheath defining an axial bore and opposed proximal and distal end portions;
  - b) a needle body mounted to translate within said axial bore of said sheath;
  - c) a needle extending from a distal end of said needle body;
  - d) a plunger assembly mounted for movement within said needle body; and
  - a locking mechanism for securing said needle body relative to said sheath in a locked position wherein said needle is shielded by said sheath, said locking mechanism including:
    - i) a pair of opposed flexible locking struts formed integral with said sheath, said locking struts each having opposed proximal and distal ends fixed to said sheath;
    - ii) at least one locking peg extending radially inward from each of said flexible locking struts; and
    - iii) a pair of opposed locking ports defined in said needle body for receiving said locking pegs to secure said needle body in said locked position.



5,531,707

DEVICE FOR INTRODUCING A SUBSTANCE INTO A BODY CAVITY OF A PATIENT

Tore A. Kers, Södertälje, and Kenneth B. Andersson, Kristinehamn, both of, Sweden, assignors to Ab Astra, Sodertalje, Sweden

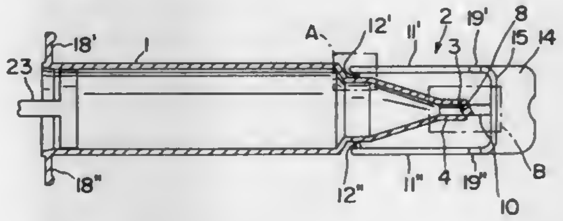
PCT No. PCT/SE91/00391, § 371 Date Jan. 15, 1992, § 102(e) Date Jan. 9, 1992, PCT Pub. No. WO91/18640, PCT Pub. Date Dec. 12, 1991

PCT Filed Jun. 4, 1991, Ser. No. 956,758

Claims priority, application Sweden, Jun. 8, 1990, 9002065; Australia, Mar. 27, 1991, 73833/91

Int. Cl.⁶ A61M *5/24;5/28*

U.S. Cl. 604—200 **16 Claims**



1. A prefilled, disposable device for introducing a pharmacologically active substance into a body cavity of a patient, comprising:
  - a container for the substance said container having opposite ends;
  - a tubular part integrally formed with and extending from one end of said container, said tubular part having a first end communicating with the container and having a second end, intended to be inserted into said cavity, including a rounded forward edge forming an opening, wherein said rounded forward edge acts to alleviate any discomfort which may be experienced by the patient when the second end is inserted into said cavity;

a frangible seal integrally formed with said tubular part and sealing said opening, said seal having an inner side facing the inside of said device and an outer side facing the outside, said seal being located a slight distance within said opening;

an actuating rod integrally formed with and extending from the outer side of said seal and projecting through said opening to the outside of the device, said actuating rod being arranged to rupture and remove said seal upon actuation and before the insertion of said second end into said body cavity;

at least one supporting rod formed integrally with said actuating rod and extending toward said container, said supporting rod being connected to said container by means of a frangible connection; and

means for sealing the opposite end of said container and for forcing said active substance from said container and through said opening after said seal is ruptured;

wherein said supporting rod serves as a safeguard against an accidental rupturing of said seal and as a guide for a controlled movement of said actuating rod, when actuated, in order to ensure a correct rupture of said frangible seal as well as to serve as a handle for actuating said actuating rod, said supporting rod in conjunction with said actuating rod also defining and protecting an area of said tubular part which is to be kept sterile.

5,531,708

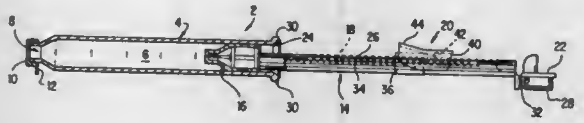
SYRINGE FOR DISPENSING MULTIPLE DOSAGES

Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 796,046, Nov. 19, 1991, Pat. No. 5,328,486. This application Jul. 1, 1994, Ser. No. 270,132

Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—208 **15 Claims**



1. In a syringe including a container for storing material to be discharged therefrom, a plunger mounted behind said container and having a forward end adapted to be received within a rear opening in said container for selective movement thereof relative to said container for discharging material from said container, and means for measuring the quantity of material to be discharged from said container, the improvement comprising:

said means for measuring including a scale calibrated to correspond to the quantity of material within said container, means for selectively moving said scale relative to said container conjointly with said plunger, and means for selectively moving said scale longitudinally independent of the movement of said plunger;

said scale including a zero reference indicia thereon, said scale being calibrated and oriented relative to said plunger such that said zero reference indicia is moved by the plunger into substantial alignment relative to a predetermined portion of the container as the plunger is advanced forwardly in a direction towards said container for discharging a preselected quantity of material from said container.

5,531,709

SYRINGE FOR THE CONTROLLED DISCHARGE OF VISCOUS MATERIALS

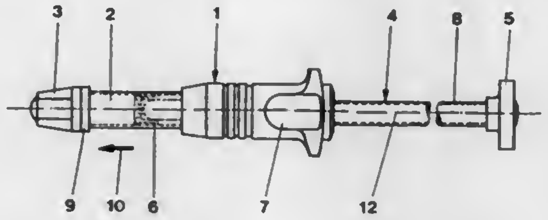
Rudolf Eykmann, Wehrheim; Joachim Fritze, Friedrichsdorf; Birgit Uhrig, Neu-Anspach, and Dieter Schödel, Wiesbaden, all of, Germany, assignors to Heraeus Kulzer GmbH, Wehrheim/Ts., Germany

Filed Sep. 23, 1994, Ser. No. 311,782

Claims priority, application Germany, Sep. 23, 1993, 43 32 310.3

Int. Cl.⁶ A61M *5/315*; A61C *5/04*

U.S. Cl. 604—218 **20 Claims**



1. A syringe for the controlled discharge of viscous materials for use in dental applications, said syringe comprising:

a cartridge for holding the dental viscous material;

a stopper mounted within said cartridge;

a rotary piston configured to be inserted into one end of said cartridge;

a bearing holding said piston; and

a material discharge nozzle located at another end of said cartridge, wherein said discharge nozzle includes an opening at a discharge end thereof having a width which is smaller than an inside diameter of said cartridge, wherein said rotary piston includes an insertion end pressing against said stopper, wherein said rotary piston is movably held in said bearing, wherein at least an end of said material discharge nozzle which is connected to said cartridge is made of plastic, and wherein a connecting surface of said discharge nozzle is fastened by means of ultrasonic welding to an end of said cartridge to a connecting surface of said cartridge, and wherein one said connecting surface includes an elevation extending away therefrom which forms an indicator of energy flow.

5,531,710

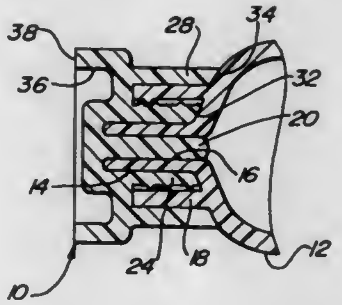
COMBINATION CLOSURE AND SYRINGE

Nguyen T. Dang, Glendale; Lawrence B. Martin, Palmdale, and Richard Jerrard, La Crescenta, all of Calif., assignors to Courtaulds Aerospace, Inc., Burbank, Calif.

Filed Feb. 24, 1995, Ser. No. 393,860

Int. Cl.⁶ A61M *5/315*

U.S. Cl. 604—238 **9 Claims**



1. In combination, a syringe and a closure for said syringe of the type having a housing with a substantially tubular cylindrical neck, said neck having a longitudinal through bore through which contents of the syringe are dispensed, said closure comprising:

an elongated probe having a free end and a cross sectional area substantially the same as the syringe through bore,

a first tubular and cylindrical sealing ring, said first sealing ring having a free end and an inner diameter substantially the same as an outer diameter of the syringe neck,

a second tubular and cylindrical sealing ring, said second sealing ring having a free end and positioned concentrically around said first sealing ring,

wherein said sealing rings and probe are dimensioned so that, with said probe inserted into the syringe through bore, said free ends of said sealing rings sealingly engage an outer surface of the syringe housing while said probe and said first sealing ring respectively continuously sealingly engage an internal surface and external surface of the syringe neck along the entire length and circumference of said probe and said first sealing ring, wherein said closure further comprises a base plate, said base plate having a flat surface substantially perpendicular to a longitudinal axis of said probe, said base plate being attached to the ends of said probe and sealing rings opposite from said free ends, said base plate having a cross-section greater in size than the cross-sectional shape of the second sealing ring, said base plate having an axial end facing away from said syringe, said axial end of said base plate having an annular flat surface about its outer periphery, said annular flat surface lying in a plane perpendicular to the axis of the syringe neck, and wherein an area of said base plate end enclosed by said base plate planar surface is axially recessed from said base plate planar surface.

5,531,711

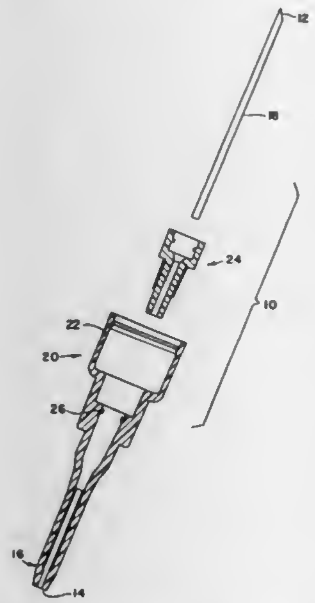
SAFETY CANNULA

Kurt Attermeier, Spring Grove; Thomas E. Dudar, Palatine, both of Ill.; Mark A. Stiebl, Rochester, N.Y., and Joseph M. Tartaglia, Los Altos, Calif., assignors to Sterling Winthrop, Inc., New York, N.Y., and Baxter International, Inc., Deerfield, Ill.

Continuation of Ser. No. 909,546, Jul. 6, 1992, Pat. No. 5,389,086. This application Jan. 23, 1995, Ser. No. 376,727

Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—242 **11 Claims**



1. A coupling system-cartridge assembly comprising in combination,

(1) a cartridge, comprising a hollow body prefilled with a medication having a sealed diaphragm on the distal end thereof and a piston axially and reciprocally slidable through the interior of said body; and

(2) a coupling system for transferring fluids from said cartridge to an injection site, said coupling system comprising:

a fluid flow channel having proximal and distal ends;

a stainless steel needle cannula defining the proximal end of said fluid flow channel; and

a hub attached to the distal end of said cartridge comprising a blunt cannula portion defining the distal end of said fluid flow channel and a sleeve portion which extends beyond the proximal end of said needle cannula

wherein said hub is attached to said cartridge by snapping said sleeve over the distal end of said cartridge,

wherein said piston can be activated through said cartridge to expulse the medication contained in said cartridge through said fluid flow channel into said injection site.

5,531,712

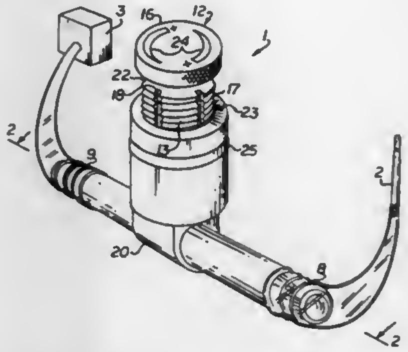
SURGICAL SUCTION REGULATOR VALVE

Roger J. Malcolm, 920-C Calle Negocio, San Clemente, Calif. 92672, and Kevin T. Foley, 2771 Hunter Forrest, Germantown, Tenn. 38138

Filed Sep. 30, 1994, Ser. No. 316,117

Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—247 **11 Claims**



1. A relief valve for installation in series with a fluid-carrying conduit, said valve comprising:

a hollow body having an intake port, an exit port, and relief port, and means for adjustably closing said relief port; wherein

said means for adjustably closing comprises a cylindrical channel having internal threads; and

a cylindrical plunger commensurate with said channel having first and second opposite ends and having peripheral threads shaped and dimensioned to match said internal threads and at least one longitudinal slot across said threads along a side of said plunger, said plunger being adjustably engaged into said channel.

5,531,713

NEEDLE CATHETER WITH SAFETY DEVICE

Pasquale Mastronardi, Napoli; Antonio E. Rossi, Aversa, and Fiorentino Fraganza, Cancello Arnone, all of, Italy, assignors to Industria Prodotti Medicinali I.PM. S.r.L., Calcio, Italy

PCT No. PCT/EP92/02458, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO93/08865, PCT Pub. Date May 13, 1993

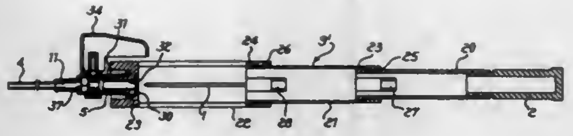
PCT Filed Oct. 28, 1992, Ser. No. 232,202

Claims priority, application Italy, Oct. 31, 1991, MI91A2897

Int. Cl.⁶ A61M *5/00*

U.S. Cl. 604—263 **5 Claims**

1. A needle catheter, which comprises a metallic needle-guide (1) consisting of a cannula having an end grip (2), a catheter (4), said catheter having an end casing (5) and covering said needle-guide (1), said casing having a lumen, an extensible element (9') positioned between said grip (2) of the needle-guide (1) and said casing (5) of said catheter (4), whereby said needle-guide (1) is



covered when it is retracted, said extensible element (9') consisting of a telescopic group including inner, middle and outer tubular elements (**20**), (**21**), (**22**), said tubular element (**20**) being the innermost one and being fixed to said end grip (**2**) of said needle, the tubular element (**22**) being the outermost one and being fixed to said casing (**5**) of said catheter, a blocking system (**27**,**28**) for said needle when said needle is in the retracted position, said inner, middle and outer tubular elements (**20**,**21**,**22**) having walls, said blocking system being integral with said walls, means (**33**) for occluding the lumen of said casing, wherein said blocking system consists of elastic stop tongues, said middle and outer tubular elements (**21**) and (**22**) being adjacent and said inner and middle tubular elements (**20**) and (**21**) being adjacent, said inner and middle tubular elements (**20**) and (**21**) having rear edges, said elastic stop tongues bearing on said rear edges, said needle catheter further comprises stop means (**23**,**24**; **25**,**26**) for limiting the maximum extension of said tubular elements, said needle catheter further comprises a rubber seal (**30**) closure attached to said casing (**5**) of said catheter (**4**), at least a part (**32**) of said rubber seal being made of spongy material, said needle-guide (**1**) penetrating said spongy material prior to the stage when the needle-guide is retracted, wherein said telescopic group (**9'**) is movably fixed to said casing (**5**) of said catheter (**4**), and wherein said means for occluding the flow in the lumen (**11**) of said casing (**5**) of said catheter (**4**) consists of a tap (**33**), and the needle catheter comprises a lever (**34**), said lever being adapted to rotate, whereby rotation of said lever by 90° causes said tap to occlude the lumen of the casing.

5,531,714

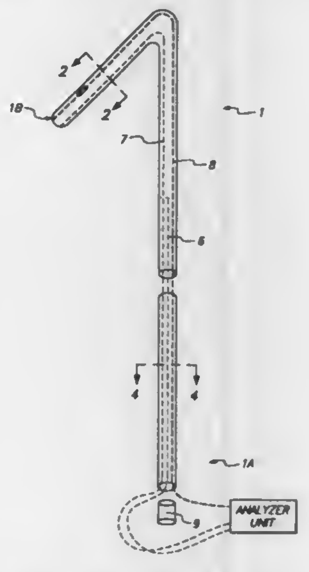
SELF-GUIDING, MULTIFUNCTIONAL VISCERAL CATHETER

Michael S. Dahn, Farmington Hills, Mich., and M. Patricia Lange, 32209 Hull, Farmington Hills, Mich. 48336, assignors to M. Patricia Lange, Farmington Hills, Mich.

Continuation-in-part of Ser. No. 332,715, Nov. 1, 1994. This application Mar. 27, 1995, Ser. No. 411,101

Int. Cl.^{6} A61M *5/00;25/00;* **A61B** *5/00*

U.S. Cl. 604—264 **20 Claims**



1. A visceral catheter, comprising:

a catheter body;

sensor means for detecting values of a predetermined analyte both within and outside a predetermined visceral venous system and for outputting signals related thereto, said sensor means being disposed on a portion of said main catheter body which, in an operable position of said catheter, is positioned within said predetermined visceral venous system;

said sensor means being selectively connected to detector means for receiving and processing signals from said sensor means;

said predetermined analyte having a specific relationship to an organ associated with said predetermined visceral venous system such that values of said analyte within said visceral venous system are substantially lower than systemic values of said analyte outside said visceral venous system;

said sensor means comprising a fiberoptic sensor system; and

said detector means processes said signals from said fiberoptic sensor system and alerts a user to a substantial decrease in said values of said analyte when said sensor means is disposed within said predetermined venous system in said operable position of said catheter.

5,531,715

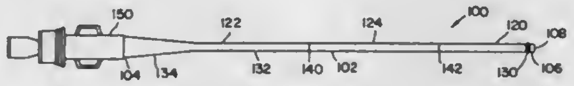
LUBRICIOUS CATHETERS

Erik T. Engelson, Menlo Park; Robert Hergenrother, Fremont, and Joseph Eder, Los Altos, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Filed May 12, 1993, Ser. No. 60,401

Int. Cl.^{6} A61M *5/32*

U.S. Cl. 604—265 **16 Claims**



1. A catheter assembly, said catheter comprising an elongate tubular member having proximal and distal ends and an inner lumen extending between these ends, said member comprising:

(a) a relatively stiff proximal segment;

(b) a relatively flexible distal segment; and

(c) a transition section between said proximal and said distal segments that is less flexible than the distal segment but more flexible than the proximal segment,

which at least the distal segment has been coated with a lubricious coating comprising a polymer or oligomer comprising monomers of mono-alkoxy polyethylene glycol mono(meth) acrylates.

5,531,716

MEDICAL DEVICES SUBJECT TO TRIGGERED DISINTEGRATION

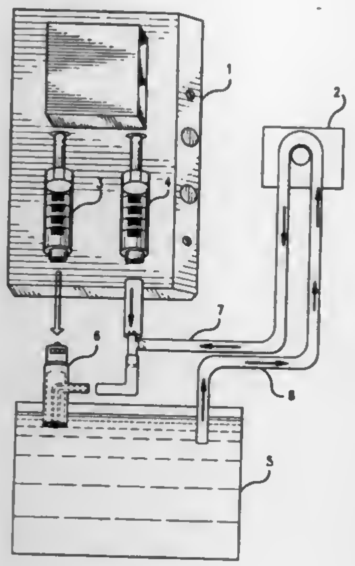
Gary A. Luzio, Newark, and Samuel A. Thompson, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sep. 29, 1993, Ser. No. 128,952

Int. Cl.^{6} A61M *5/32*

U.S. Cl. 604—265 **105 Claims**

1. A medical device comprising at least one member selected from the group consisting of stents, catheters, cannulas, plugs and constrictors, wherein said medical device comprises ionically crosslinked polymer and has sufficient mechanical strength to serve as a stent, catheter, cannula, plug or constrictor.



5,531,717

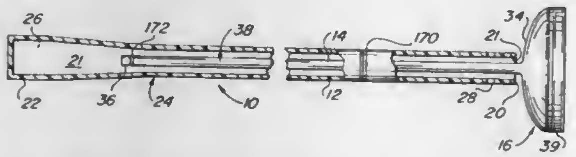
NON-CONTAMINATING PROBE AND METHODS OF MAKING AND USING SAME

Feliziani Roberto, Pesaro, Italy, and Marc L. Jaker, New Brighton, Minn., assignors to RTC, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 157,145, Dec. 12, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,571

Int. Cl.^{6} A61M *25/01*

U.S. Cl. 604—271 **19 Claims**



2. A catheter for effectively preventing the passage of infectious material when inserted into an anatomical canal, said catheter comprising:

a hollow catheter tube having first and second open ends;

a membrane formed from a sintered, tensilized, modified polytetrafluoroethylene generally tubular resin, said membrane having a thickness of less than about 0.004 in. and an operative length of about 10 cm; and

wherein said membrane is disposed within said catheter tube and is suitably removed from said first open end of said catheter tube such that said membrane is interposed between said catheter and said anatomical canal as said catheter is inserted into said anatomical canal.

5,531,718

TUBE-SHAPED URETER SPLINT

Hans Sachse, Lerchenstr. 55, D-90425 Nürnberg, Germany

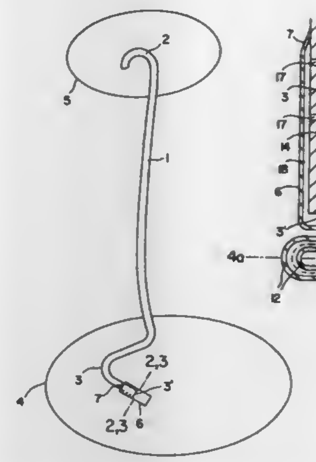
Filed Oct. 29, 1993, Ser. No. 143,113

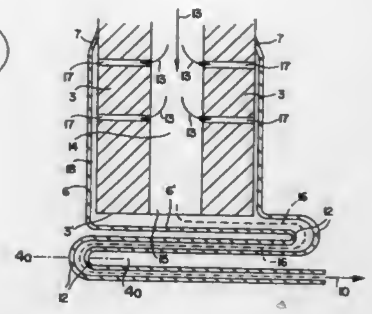
Claims priority, application Germany, Oct. 29, 1992, 42 36 571.6

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—280 **10 Claims**

1. A pipe-shaped ureter splint of a resilient material, in particular a plastic material, which in its position of use is located in the renal pelvis with one of its ends and with the other end in the bladder, wherein on the outside of the end provided for insertion into the bladder a thin-walled, soft, collapsible hose, of one-piece construction at least in its cross-section, is closely attached and projects beyond the front face of this end of the ureter splint, characterized in that the cross-section of the hose has a shape that is oval, elliptical, or approximately the shape of an elongated rectangle wherein the transitions from the long to the short sides are rounded off, and the hose functions as an anti-backflow valve.





5,531,719

VASCULAR CATHETER WITH HELICAL SPACE

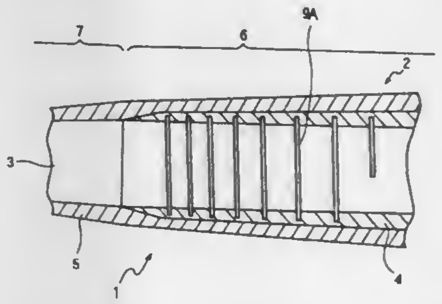
Tohru Takahashi, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 266,553

Claims priority, application Japan, Jun. 29, 1993, 5-159790

Int. Cl.^{6} A61M *25/00*

U.S. Cl. 604—280 **29 Claims**



1. A vascular catheter comprising a flexible slender catheter body which is made up of an inner tube formed of a synthetic resin and an outer tube formed of a synthetic resin covering the outside surface of the inner tube and having a main portion, tip portion and a lumen, wherein

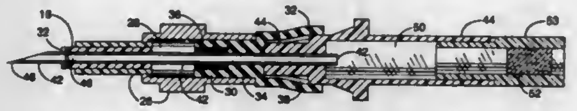
said main portion of said catheter body is made up of said inner tube and said outer tube,

said tip of said catheter body is made up of a portion of said outer tube which extends from a distal end of said inner tube, and

said inner tube has at least one helical space contained in a distal portion of said inner tube, and wherein said distal portion having said helical space exhibits gradually increasing flexibility from a proximal end to a distal end of said distal portion which contains the helical space.

5,531,720
I.V. STARTING KIT AND COUPLING, AND METHOD

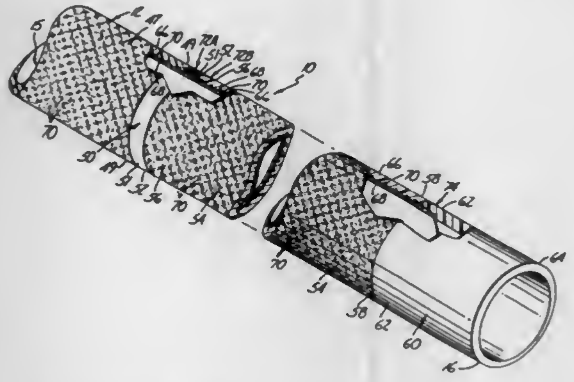
Stephen L. Atkins, 1018 Blair Ave., Modesto, Calif. 95350
Filed Jul. 8, 1994, Ser. No. 272,688
Int. Cl.^{6} A61M *39/10*
U.S. Cl. 604—280 **23 Claims**



1. A one-piece, leak-preventing coupling in an I.V.-starting catheter's hub having a vein engaging cannula, wherein said hub is directly contiguous with said catheter's vein-engaging cannula the coupling comprising:
a. a first resilient tubular portion;
b. a second resilient tubular portion integral with, and in coaxial relation with, said first tubular portion; and,
c. a resilient, pierceable, self-sealing septum between, and integral with, said first and second tubular portions.

5,531,721
MULTIPLE MEMBER INTRAVASCULAR GUIDE CATHETER

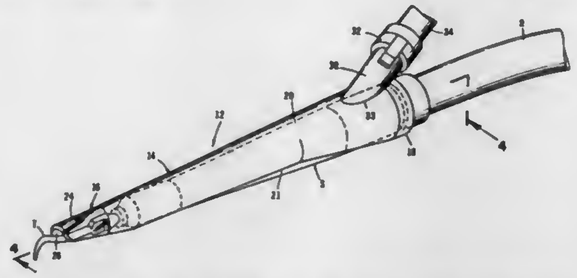
Henry J. Pepin, Loretto; Brian J. Scovil, New Hope, and Jeffrey M. Welch, Bloomington, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 177,701, Jan. 4, 1994, abandoned, which is a continuation of Ser. No. 908,250, Jul. 2, 1992, abandoned. This application Dec. 9, 1994, Ser. No. 353,142
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—282 **39 Claims**



1. An intravascular catheter comprising:
an elongate shaft formed from at least three discrete tubular shaft members which have been joined together, the shaft including:
a main shaft member formed of a material having a first hardness, the main shaft member including a proximal end and a mating distal end;
an intermediate shaft member formed of an elastomeric material having a first reinforcing layer embedded therein and having a second hardness which is lower than the first hardness of the material of the main shaft member, the intermediate member including a mating proximal end, which is secured to the mating distal end of the main member, and a mating distal end, the first reinforcing layer being made of a wire braiding that extends from the mating proximal end to the mating distal end of the intermediate member; and
a terminal shaft member formed of a material free of a reinforcing layer and having a third hardness which is lower than the second hardness of the material of the intermediate shaft member, the terminal member including a mating proximal end, which is secured to the mating distal end of the intermediate member, and a distal end.

5,531,722
ASPIRATION UNIT

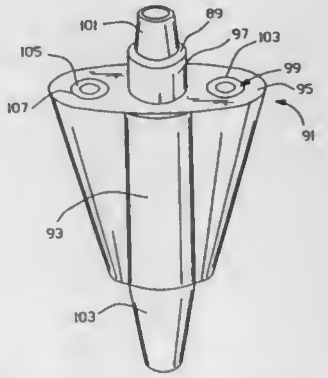
Gregory L. Van Hale, 247 W. Glenoaks, Glendale, Calif. 91202
Filed Nov. 21, 1994, Ser. No. 343,038
Int. Cl.^{6} A61M *25/00;* **A61B** *17/20;* **A61C** *17/06;1/16*
U.S. Cl. 604—280 **18 Claims**



1. An aspiration unit usable in connection with a dental instrument having a hand grip portion and a tooth-engaging portion, said aspiration unit comprising:
(a) an elongated body having a distal end, a proximal end and a wall defining an elongated interior space, said wall being generally semi-circular in cross section;
(b) connector means for operably interconnecting said body with the dental instrument so that said wall of said body at least partially circumscribes the hand grip portion of the dental instrument;
(c) intake means connected to said body proximate said distal end thereof in communication with said interior space of said body and at least partially circumscribing the tooth engaging portion of the dental instrument when said body is connected to the dental instrument for capturing particulate matter located proximate the tooth engaging portion of the dental instrument and for channeling said particulate matter into said interior space; and
(d) vacuum means connected to said body proximate said proximal end thereof for creating a vacuum at said intake means.

5,531,723
URETERAL CATHETER CONNECTOR ADAPTER

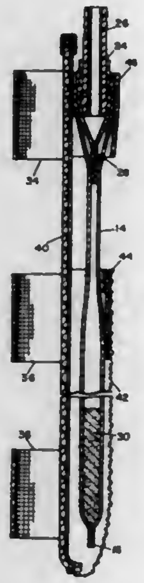
Anthony Solazzo, 904 Oak Tree Rd., South Plainfield, N.J. 07080
Filed Apr. 20, 1994, Ser. No. 230,099
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—283 **8 Claims**



1. A ureteral catheter-foley catheter connector adapter, which comprises:
a main body having a top and a bottom and having a first hollow orifice located therein with an inlet at said top of said main body and an outlet at said bottom of said main body, and having at least one shoulder on said main body extending outwardly therefrom, each of said at least one shoulder having an orifice therein and each such orifice forming a shoulder inlet, each of said shoulder orifices being connected to said first hollow orifice of said main body, said shoulder inlets having a series of increasingly reduced diameter sections adapted to receive ureteral catheter distal ends of predetermined different outer diameters.

5,531,724
FLUID CONTAINMENT BAG

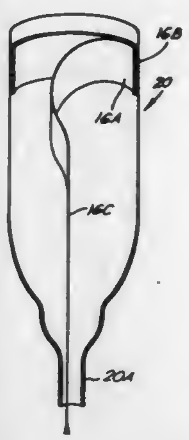
Ruth E. Young; Daniel L. Young, both of Escondido; Richard E. Warrick, Encinitas; Clarence A. Cassidy, and Terry H. Cassidy, both of Carlsbad, all of Calif., assignors to American Innotek, Inc., San Marcos, Calif.
Continuation-in-part of Ser. No. 865,454, Apr. 9, 1992, Pat. No. 5,354,132, which is a division of Ser. No. 657,354, Feb. 15, 1991, Pat. No. 5,116,139, which is a continuation-in-part of Ser. No. 404,734, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 3,848, Jan. 14, 1987, abandoned. This application Aug. 29, 1994, Ser. No. 296,187
Int. Cl.^{6} A61B *1/00*
U.S. Cl. 604—327 **3 Claims**



1. A method for sequestering a fluid in a bag, comprising the steps of:
receiving said fluid into an envelope through a one-way valve, said envelope containing a hydrophilic material, said fluid contacting said hydrophilic material;
closing said one-way valve in response to contact between said one-way valve and said fluid in said envelope to prevent escape of said fluid from said envelope;
gelling said fluid to form a gelled material in response to contact between said fluid and said hydrophilic material; and
closing said one-way valve in response to contact between said one-way valve and said gelled material in said envelope to prevent escape of said gelled material from said envelope.

5,531,725
MALE INCONTINENCE DEVICE

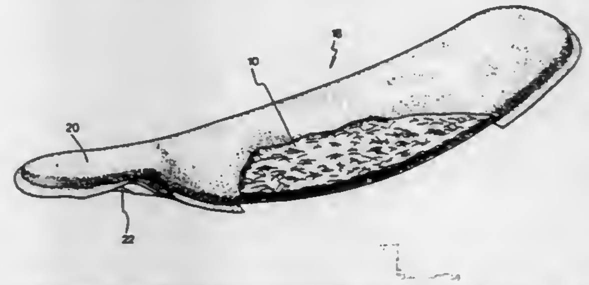
Graham E. Steer, Fulham, United Kingdom, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Feb. 2, 1995, Ser. No. 383,148
Claims priority, application United Kingdom, Feb. 2, 1994, 9401984
Int. Cl.^{6} A61F *5/44*
U.S. Cl. 604—349 **7 Claims**



1. A male incontinence device comprising:
a condom having an inner and outer surface;
a strip of tape having two opposite surfaces with a medical grade adhesive on one surface and a release layer strip on the other surface, said strip of tape being helically wound and adhered to the inner surface of said condom; and
a pull cord member attached to an end of said release layer strip, said release layer strip being removable upon pulling said pull cord member so as to expose the medical grade adhesive and facilitate adhesion of the condom to the male wearer.

5,531,726
SPHAGNUM MOSS COMPOSITION FOR THE PRODUCTION OF SHEETED ABSORBENT AND METHOD FOR EVALUATING THE POTENTIAL OF SPHAGNUM MOSS MATERIAL FOR ABSORBING LIQUID

Yvon Levesque, Montreal; Sylvaine Cote, St-Gédéon, and Denis Gallagher, Jonquiere, all of, Canada, assignors to Johnson & Johnson, Inc., Montreal, Canada
Filed Sep. 21, 1993, Ser. No. 124,907
Int. Cl.^{6} A61F *13/15;13/20*
U.S. Cl. 604—367 **20 Claims**



1. A liquid-absorbent article primarily having an absorbent core wherein said core contains substantially pure, undecomposed particles of sphagnum moss plants that belong to one species selected from the group consisting of:
1) all species from the botanical section ACUTIFOLIA;
2) all species from the botanical section RIGIDA;
3) all species from the botanical section SUBSECUNDA;
4) all species from the botanical section CUSPIDATA;

5) *Sphagnum centrale, Sphagnum erythrocalyx, Sphagnum henryense, Sphagnum perichaetiale, Sphagnum portoricence* from the botanical section PALUSTRIA.

5,531,727
FLUID ABSORBING ARTICLE UTILIZING A FLOW CONTROL COVER SHEET

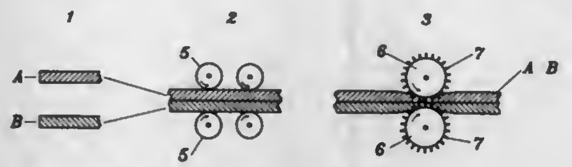
Richmond R. Cohen, Hockessin, Del., and Edward J. Engle, Conyers, Ga., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 82,687, Jun. 25, 1993, abandoned, which is a continuation of Ser. No. 964,483, Oct. 21, 1992, Pat. No. 5,257,982, which is a continuation of Ser. No. 633,907, Dec. 26, 1990, abandoned. This application Oct. 25, 1994, Ser. No. 328,938

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—378 **52 Claims**



1. A fluid-absorbing article comprising, in combination, a nonwoven coverstock component having fluid flow-controlling properties, a fluid-retaining core component, and a fluid impervious backing component, the core component being located between the coverstock and the backing components, the coverstock component having a generally constant density in a range of 0.2 g/cc to 0.02 g/cc and comprising an oriented nonwoven material comprised of at least two layers, each of the layers being layered in a predetermined sequence, compressed together and bonded together, the layers comprising:
- (a) a first exterior layer having a first average denier per filament value, the first exterior layer being comprised of at least one filament; and
- (b) a second interior layer adjacent the first exterior layer and having a second average denier per filament value lower than the first average denier per filament value, the second interior layer being comprised of at least one filament.

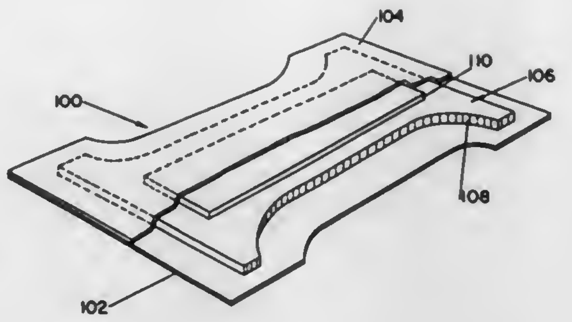
5,531,728
ABSORBENT STRUCTURES CONTAINING THERMALLY-BONDED STIFFENED FIBERS AND SUPERABSORBENT MATERIAL

Glen R. Lash, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 625,776, Dec. 17, 1990, Pat. No. 5,360,420, which is a continuation-in-part of Ser. No. 468,549, Jan. 23, 1990, abandoned. This application Oct. 31, 1994, Ser. No. 332,238

Int. Cl.^{6} A61F *13/20*

U.S. Cl. 604—378 **25 Claims**



1. An absorbent article for acquisition, distribution, and storage of bodily fluids, said article comprising:
- (a) a fluid pervious topsheet;
- (b) a fluid impervious backsheet affixed to said top sheet; and
- (c) an absorbent core disposed between said topsheet and said backsheet, said absorbent core having:
  - (i) a thermally bonded hydrophilic fluid acquisition/distribution layer having an average dry density of less than 0.30 g/cc and an average dry basis weight of from about 0.001 to about 0.10 g/cm^2, said acquisition/distribution layer comprising a web of from about 50% to 90%, dry weight basis, hydrophilic chemically stiffened cellulosic fibers and from about 10% to about 50%, dry weight basis, of a thermoplastic bonding material forming bond sites at intersections of said hydrophilic stiffened fibers; said acquisition/distribution layer having been made by preparing a web of a blend of said hydrophilic stiffened fibers and from about 10% to about 50%, by weight of the dry web, of thermoplastic fibrous material, heating the web to melt the thermoplastic fibrous material to provide said thermoplastic bonding material, and cooling the web, whereby said thermoplastic bonding material, upon melting and subsequent cooling, migrates to and forms said bond sites at said intersections of said hydrophilic stiffened cellulosic fibers; and
  - (ii) a fluid storage layer, positioned beneath said acquisition/distribution layer relative to said topsheet, comprising at least about 15%, by weight of said storage layer, of superabsorbent material and from 0% to about 85% of a carrier means for said superabsorbent material;

said acquisition/distribution layer having a top surface area which is at least about 15% of the top surface area of said fluid storage layer.

5,531,729
ELASTIC NET-LIKE SUBSTRATE HAVING A LAYER OF FIBERS PRE-BONDED THERETO FOR USE IN AN ABSORBENT ARTICLE

Peter Coles, Kelkheim Fischbach, and Attila Tamer, Schwalbach/Ts., both of, Germany, assignors to The Procter & Gamble Company, Cincinnati, Ohio

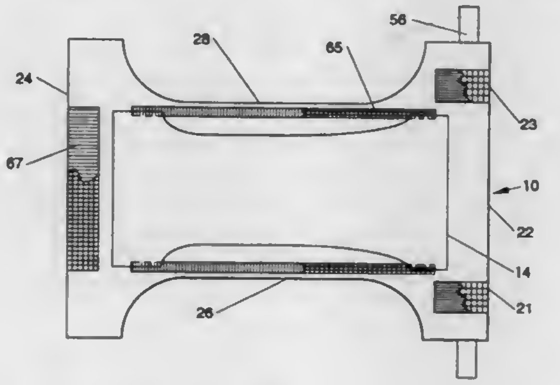
PCT No. PCT/US93/02151, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO93/18729, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 11, 1993, Ser. No. 307,674

Claims priority, application European Pat. Off., Mar. 24, 1992, 92870047

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—384 **6 Claims**



1. Absorbent article comprising:
- a topsheet,
- a liquid impervious backsheet joined to the topsheet,

- an absorbent core disposed between the topsheet and the backsheet, a periphery of the absorbent article comprising two longitudinal sides and two lateral sides extending transversely to the longitudinal sides, and
- an elastic member connected to a body-facing side of the backsheet, the elastic member comprising an elastomeric net having a first side and a second side opposite said first side, a first layer of fibers joined to said first side of said elastomeric net, and a second layer of fibers joined to said second side of said elastomeric net, said first layer of fibers being oriented in a first direction and said second layer of fibers being oriented in a direction substantially perpendicular to said first direction.

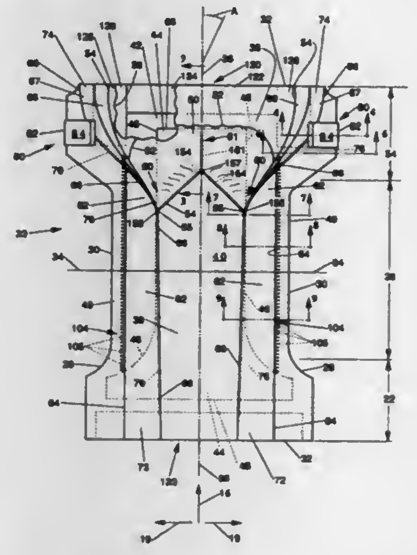
5,531,730
ABSORBENT ARTICLE HAVING A POCKET CUFF

Kimberly A. Dreier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 302,569, Sep. 8, 1994, which is a continuation-in-part of Ser. No. 75,205, Jun. 10, 1993, Pat. No. 5,397,318. This application May 15, 1995, Ser. No. 441,145

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **14 Claims**



1. A disposable absorbent article having a front waist region, a rear waist region longitudinally spaced from the front waist region, a crotch region disposed between the front and rear waist regions, longitudinal edges, end edges, a longitudinal centerline and a lateral centerline, the disposable absorbent article comprising:
- a liquid pervious topsheet;
- a liquid impervious backsheet joined to the topsheet;
- an absorbent core positioned between the topsheet and the backsheet, the absorbent core having side edges and front and rear waist edges;
- a side flap extending laterally outward from each side edge of the absorbent core;
- a fastening means for securing the disposable absorbent article on the wearer;
- a barrier cuff disposed adjacent each longitudinal edge of the disposable absorbent article, each barrier cuff extending longitudinally from a first barrier cuff end in the front waist region to a second barrier cuff end in the rear waist region, and each barrier cuff having a proximal edge and a distal edge, each proximal edge joined to a side flap, each barrier cuff being inflected to have the distal edge extending laterally inward of the proximal edge at the first barrier cuff end and the distal edge extending laterally outward of the proximal edge at the second barrier cuff end;
- spacing means operatively associated with each barrier cuff for spacing a portion of each barrier cuff distal edge apart from the topsheet; and
- a pocket cuff positioned intermediate the barrier cuffs and operatively associated with the fastening means, the pocket cuff having an open edge extending intermediate the inflected barrier cuffs.

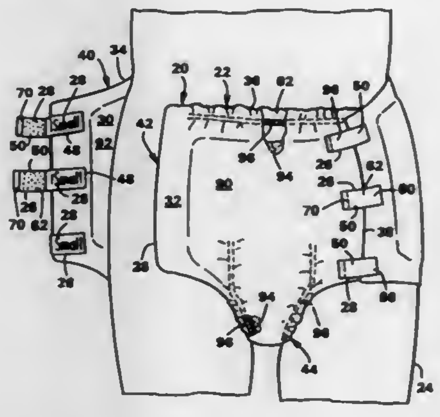
5,531,731
TAPE FASTENER FOR CONVEYING INFORMATION AND METHOD OF MANUFACTURE

Carl J. Brusky, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 7, 1994, Ser. No. 301,935

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—390 **10 Claims**



1. An article, comprising:
- a garment having an inner surface intended to face the body during use, an opposite outer surface intended to face away from the body during use, first and second waistband sections, and an intermediate section which interconnects the waistband sections; and
- a tape fastener bonded to the first waistband section, the tape fastener comprising:
  - an interior tape member containing printed information and bonded to the inner surface; and
  - an exterior tape member having a factory-bond section bonded to the first waistband section and a user-bond section comprising an adhesive surface adapted to releasably engage the interior tape member, the user-bond section formed of a transparent material and the printed information being visible through the user-bond section when the user-bond section is releasably engaged with the interior tape member.

5,531,732
ADJUSTABLE FIT DISPOSABLE TRAINING PANT OR INCONTINENCE GARMENT HAVING DISPOSABLE MEANS

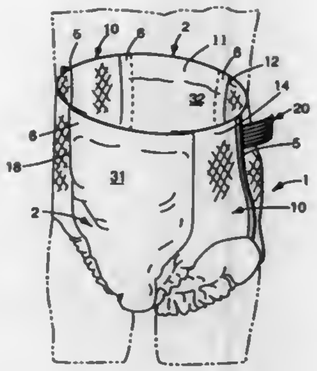
Leigh E. Wood, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 14, 1994, Ser. No. 259,525

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—391 **20 Claims**

1. A disposable training pant comprising an absorbent core structure formed by an absorbent pad with a liquid-permeable topsheet covering one face and a liquid-impermeable outer layer covering the opposing face of the absorbent pad, at least two side panel portions joining a front panel and a rear panel of the absorbent core structure so as to form a waist opening and two leg openings, at least one mechanical fastening tab, having male



mechanical fastening elements on at least one face, said mechanical fastening tab male mechanical fastening elements permanently bonded to at least one panel portion at a manufacturers bond end, mechanical fastening elements on a free end of the mechanical fastening tab being releasably engagable with a first fibrous web on the outer face of the disposable training pant, wherein by placement of the free end of the mechanical fastening tab on the outer face fibrous web, said side panel portion can be gathered between the manufacturers bond end and the free end of the mechanical fastening tab.

5,531,733
HANGER STRAP

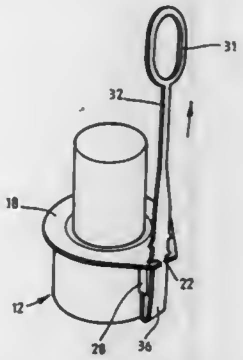
David Scarrow, Avon, United Kingdom, assignor to Rexam Medical Packaging Limited, United Kingdom

Filed Jul. 26, 1994, Ser. No. 280,589

Claims priority, application United Kingdom, Jul. 26, 1993, 9315427

Int. Cl.^{6} A61B *19/00;* A47H *1/10;* B65D *33/14*

U.S. Cl. 604—411 **9 Claims**



1. A hangable assembly comprising a component having a body with a web portion defining a narrow-mouth slot; and an elongate hanger strap having a connection portion at one end connected to the component, hanging means at the other end and a flexible strap body connecting the connection portion to the hanger means, said strap body having a narrow portion adjacent the hanger means and a wider portion remote from the hanger means, the wider portion being accommodated within the narrow-mouthed slot but not readily passable through the narrow-mouthed slot, the narrow portion being readily passable through the narrow-mouthed slot.

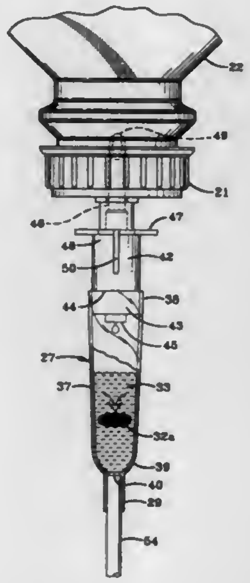
5,531,734
METHOD OF ALTERING COMPOSITION OF NUTRITIONAL PRODUCT DURING ENTERAL TUBE FEEDING

Ronita K. Geckle, Columbus; Terrence B. Mazer, Reynoldsburg; Joseph E. Walton, Westerville; Carl J. Piontek, Powell, all of Ohio; Susan B. Duel, Laurinburg, N.C.; Andre Daab-Krzykowski, Columbus, Ohio; Mark A. McCamish, Worthington, Ohio; Robert L. Joseph, Columbus, Ohio, and William G. Pierson, Canal Winchester, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 13, 1995, Ser. No. 372,408

Int. Cl.^{6} A61K *9/22*

U.S. Cl. 604—890.1 **14 Claims**



1. A method of modifying a liquid enteral nutritional product during the flow thereof from a supply container containing such liquid enteral nutritional product to a feeding tube leading into the gastrointestinal tract of a patient, comprising the steps of:

(a) providing an apparatus comprising:
  a formulation chamber having an inlet and an outlet and the inlet being connectable to a supply container of the liquid enteral nutritional product so as to receive said product therefrom;
  at least one beneficial agent in at least one controlled release dosage form unit and the formulation chamber comprising the at least one controlled release dosage form unit disposed therein so as to be wetted by or immersed in said liquid enteral nutritional product traversing therethrough, each beneficial agent being selected from the group consisting of nutrients, medicaments, probiotics and diagnostic agents that are each dispersible in said liquid enteral nutritional product; and
  fluid communication means capable of operatively connecting the outlet of the formulation chamber to a feeding tube which feeds said liquid enteral nutritional product into the gastrointestinal tract of a patient;
(b) providing a supply container containing said liquid enteral nutritional product having a viscosity in the range of about 5 to about 300 cps.;
(c) placing the apparatus in communicative series in the fluid flow between the supply container and said feeding tube; and,
(d) flowing the liquid enteral nutritional product through the apparatus and into said feeding tube throughout the feeding of a given quantity of the liquid enteral nutritional product.

5,531,735
MEDICAL DEVICES CONTAINING TRIGGERABLE DISINTEGRATION AGENTS

Samuel A. Thompson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 27, 1994, Ser. No. 312,844

Int. Cl.^{6} A61K *9/22;9/14;* A61F *2/00*

U.S. Cl. 604—891.1 **37 Claims**

1. A composition suitable for use in the fabrication of medical devices comprising:
  a) a matrix polymer which is essentially insoluble in body fluids and;
  b) a disintegration agent which acts to decompose said matrix polymer when contacted therewith, said disintegration agent being contained within and chemically isolated from said matrix polymer by encapsulation in an ionically crosslinked second polymer or by presence in an interpolyelectrolyte complex,
wherein said disintegration agent is selected from the group consisting of enzymes, acids, bases and electrolytes, and
wherein said interpolyelectrolyte complex is a complex of the disintegration agent with an oppositely charged partner.

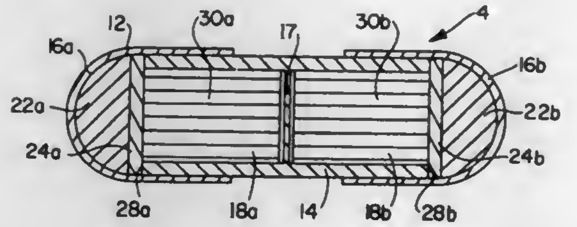
5,531,736
OSMOTIC DEVICE FOR DELAYED DELIVERY OF AGENT

Patrick S.-L. Wong, Palo Alto; Felix Theeuwes, Los Altos Hills; Steven D. Larsen, Dublin, and Liang C. Dong, Mountain View, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 109,120, Aug. 19, 1993, Pat. No. 5,443,459, which is a continuation-in-part of Ser. No. 830,160, Jan. 31, 1992, Pat. No. 5,312,388, and Ser. No. 871,465, Apr. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 745,822, Aug. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 648,270, Jan. 30, 1991, abandoned, said Ser. No. 830,160is a continuation-in-part of Ser. No. 648,270. This application Apr. 19, 1995, Ser. No. 424,692

Int. Cl.^{6} A61K *9/22*

U.S. Cl. 604—892.1 **22 Claims**



1. A fluid-imbibing dispensing device for the initial delayed delivery of an active agent to a fluid environment of use, the device comprising:
  (a) a housing comprising a first wall section and a second wall section in reversibly sliding telescopic arrangement with each other, the first wall section comprising an open end adapted to fit within the second wall section and the second wall section comprising in at least a portion a semipermeable composition, which housing maintains its integrity in the environment of use;
  (b) an internal compartment surrounded and defined by said housing;
  (c) at least one active agent formulation in a portion of the compartment defined by the first wall section;
  (d) an expansion agent in a portion of the compartment defined by the second wall section, for separating apart the first and second wall sections of the housing after exposure to the environment of use; and
  (e) a push plate between the expansion agent and the open end of the first wall section;
wherein, the volume of the portion of the compartment defined by the first wall section and containing the active agent formulation remains constant until the first and second wall sections are separated.

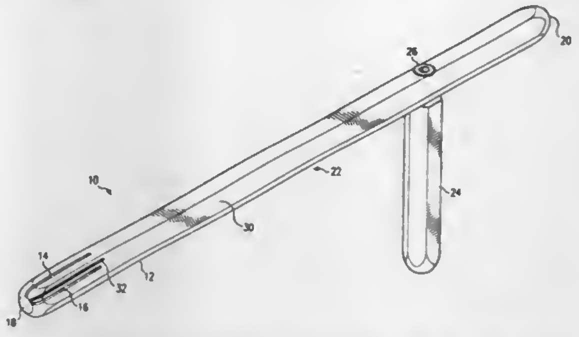
5,531,737
SURGICAL X-RAY INSTRUMENT FOR GUIDING NEEDLES

Christy M. Schade, 2692 W. Walnut, Suite 105, Garland, Tex. 75042

Continuation of Ser. No. 131,723, Oct. 5, 1993, abandoned. This application May 26, 1995, Ser. No. 453,570

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 606—1 **16 Claims**



1. An instrument for assisting a physician with the placement of a needle on a specified portion of a patient's body during procedures involving radiation, the instrument comprising:
  a unitary, longitudinal body having a first end, a second end, an outer surface defining a periphery of said longitudinal body and a longitudinal axis, the longitudinal body formed to have a first needle-receiving slot located substantially at the first end of the longitudinal body sized end configured for receiving and directing the needle substantially parallel to the longitudinal axis of the longitudinal body, said outer surface of said longitudinal body remaining substantially constant while said needle is directed substantially parallel to the longitudinal axis, the needle-receiving slot extending from an exterior surface of the longitudinal body to the first end of the longitudinal body;
  a handle coupled to the longitudinal body proximate the second end of the longitudinal body, the handle for holding and controlling the instrument by the physician; and
  a second needle-receiving slot located substantially at the first end of the longitudinal body and circumferentially offset with respect to said first needle-receiving slot along the periphery of said longitudinal body; wherein
the longitudinal body sized so that the handle is located outside a primary area of the radiation during the procedure; and wherein
said first needle-receiving slot secured without movement on said longitudinal body with respect to said handle.

5,531,738
PROCESS FOR OPERATING A LASER

Stefan Hessel, Munich; Frank Frank, Ebersberg; Gerhard Hauptmann, and Werner Hiereth, both of Munich, all of, Germany, assignors to Deutsche Aerospace AG, Munich, Germany

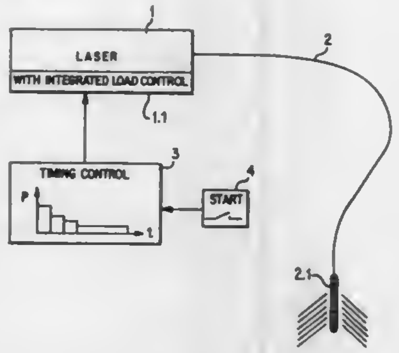
Filed Dec. 9, 1994, Ser. No. 352,569

Claims priority, application Germany, Dec. 9, 1993, 43 41 967.4

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 606—2 **13 Claims**

1. Method for operating a continuous wave laser generating radiation under laser power for an interstitial thermotherapeutic

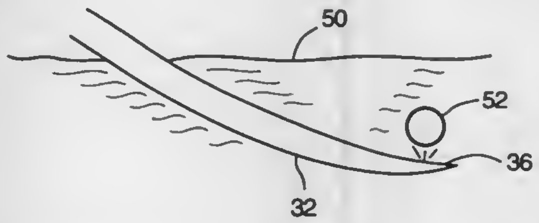


treatment of biological tissue generating a coagulation necrosis in a volume range of at least several cm^3, the method comprising the steps of:

guiding the radiation of the laser into the tissue interstitially by way of a fiber optic waveguide within a radiation period; and

reducing the laser power under a time sequence control during the radiation period.

5,531,739
METHOD OF TREATING VEINS
Mario A. Trelles, Cambrils, Spain, assignor to COHERENT, INC., Santa Clara, Calif.
Filed Sep. 23, 1994, Ser. No. 311,509
Int. Cl.^{6} A61B *17/22;17/36*
U.S. Cl. 606—2.5 **14 Claims**



1. A method of treating a blood vessel located beneath the surface of the skin using a fiber optic probe-having a tip comprising the steps of:

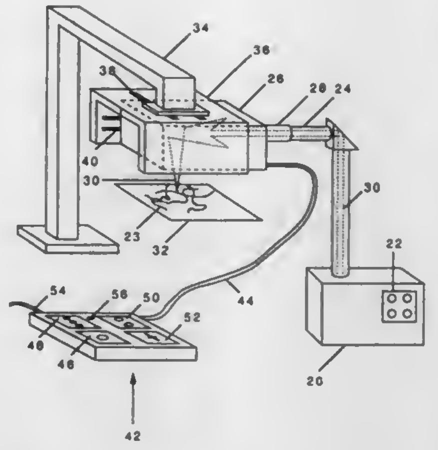
piercing the skin with the tip of the fiber optic probe;

irradiating the region below the skin with a low power aiming beam to diffusely illuminate the region below the skin in order to locate the vessel to be treated;

advancing the probe laterally beneath the skin so that the delivery end of the probe is adjacent the vessel to be treated; and

irradiating the vessel with a high power treatment laser beam to coagulate the vessel and causing the vessel to collapse.

5,531,740
AUTOMATIC COLOR-ACTIVATED SCANNING TREATMENT OF DERMATOLOGICAL CONDITIONS BY LASER
Michael Black, Foster City, Calif., assignor to Rapistan Demag Corporation, Grand Rapids, Mich.
Filed Sep. 6, 1994, Ser. No. 300,969
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—9 **8 Claims**



5. An apparatus for delivering a light beam to a region of a treatment area having a predetermined color, said apparatus comprising:

a light source for generating and delivering said light beam, said light beam creating an optical path from said light source to a region on said treatment area,

a shutter positioned in said optical path for interrupting the delivery of said light beam to said area,

an illumination source for visibly illuminating said area, thereby generating reflected light from said area,

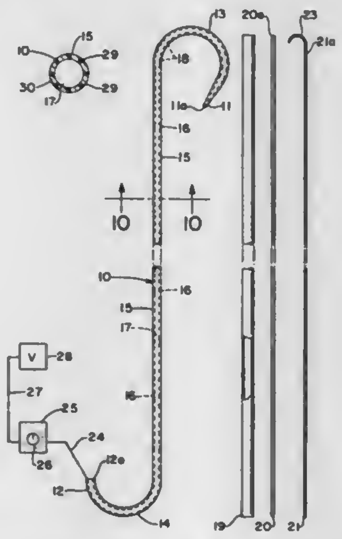
a color-discriminating detector means positioned in said optical path between said shutter and said area for detecting the color of said reflected light,

a control system for opening said shutter when said color-discriminating detector means indicates that said reflected light from said area has said predetermined color,

an X–Y motion control means for adjusting said optical path to guide said light beam to a surface of said treatment area,

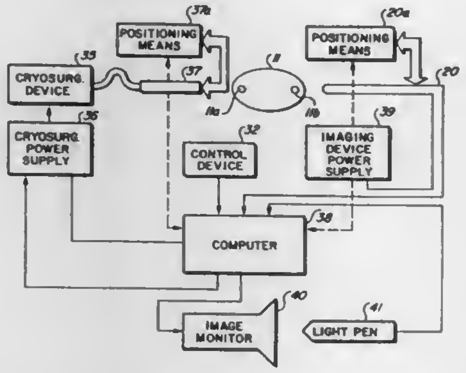
whereby said light beam is delivered to said region of said treatment area having a predetermined color as said optical path scans over the surface of said treatment area.

5,531,741
ILLUMINATED STENTS
Josephine A. Barbacci, 3533 Woodmont, Toledo, Ohio 43606
Filed Aug. 18, 1994, Ser. No. 292,436
Int. Cl.^{6} A61B *17/00;* **A61M** *25/00*
U.S. Cl. 606—15 **8 Claims**



1. An improved ureteral stent having an elongated tubular member made of a light transmissive material, of substantially uniform outside diameter throughout its length and having a proximal and a distal end, the stent having a central lumen and at least one drainage opening extending through a wall connecting the lumen to the outside, the improvement which comprises said tubular member having a fiber optic means embedded within the tubular member, the means radially emitting light along at least a portion of the stent to provide a visual detection means for the pathway of a ureter.

5,531,742
APPARATUS AND METHOD FOR COMPUTER CONTROLLED CRYOSURGERY
Israel Barken, 6823 Deer Hollow Pl., San Diego, Calif. 92120
Filed Jan. 15, 1992, Ser. No. 821,492
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—21 **12 Claims**



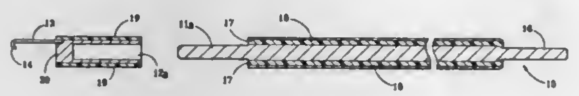
1. Apparatus for destroying unwanted internal tissue comprising:

imaging means for applying imaging signals to an internal body region of a patient, receiving the imaging signals and generating a real-time image of the internal body region of the patient;

cryosurgery means for freezing predetermined areas of said internal body region of said patient; and

control means for controlling the cryosurgery means in conjunction with the imaging means.

5,531,743
RESPOSABLE ELECTRODE
William S. Nettekoven, Sandy, and Eric S. Steckel, Salt Lake City, both of Utah, assignors to MegaDyne Medical Products, Inc., Draper, Utah
Filed Nov. 18, 1994, Ser. No. 342,215
Int. Cl.^{6} A61B *17/39*
U.S. Cl. 606—41 **19 Claims**



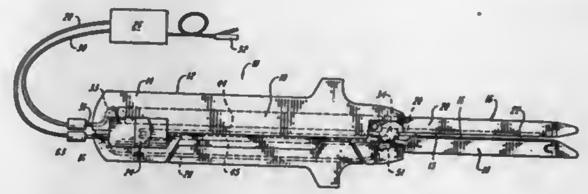
1. An electrosurgical instrument comprising:

(a) an electrosurgical member having an elongated body; said member having a principal exterior working surface;

(b) a first layer of insulating material on said principal exterior working surface; and

(c) a second layer of other material on said first layer of insulating material, said second layer being selected to have a lesser life expectancy than that of said insulating material and to exhibit its remaining life expectancy by changes in its visual appearance.

5,531,744
ALTERNATIVE CURRENT PATHWAYS FOR BIPOLAR SURGICAL CUTTING TOOL
Paul C. Nardella, Wareham, Mass.; David C. Yates, West Chester, Ohio; Jesse J. Kuhns, Cincinnati, Ohio; Richard P. Nuchols; Martin Madden, both of Loveland, Ohio, and Steven H. Mersch, Germantown, Ohio, assignors to Medical Scientific, Inc., Taunton, Mass., and Ethicon Endo-Surgery, Cincinnati, Ohio
Continuation-in-part of Ser. No. 285,413, Aug. 3, 1994, which is a continuation of Ser. No. 5,006, Jan. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 786,752, Nov. 1, 1991, abandoned. This application Dec. 1, 1994, Ser. No. 348,038
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—48 **26 Claims**



1. A bipolar electrosurgical device, comprising:

a proximal handle region;

a distal, tissue affecting portion adjacent to the handle portion, the tissue affecting portion including opposed first and second tissue engaging surfaces;

a cutting element disposed within one of the first or second tissue engaging surfaces, the cutting element including at least one first electrode serving as a first pole of a bipolar system;

at least one second electrode disposed within the first and/or second tissue engaging surfaces, the second electrode being electrically isolated from the first electrode and serving as an opposite pole of the bipolar system;

one or more surgical staples disposed within one of the first or second tissue engaging surfaces of the tissue affecting portion;

a driver means, disposed adjacent the surgical staples, for deploying the surgical staples;

anvil means for effecting closure of one or more of the surgical staples, the anvil means being disposed within one of the first or second tissue engaging surfaces opposite the surgical staples; and

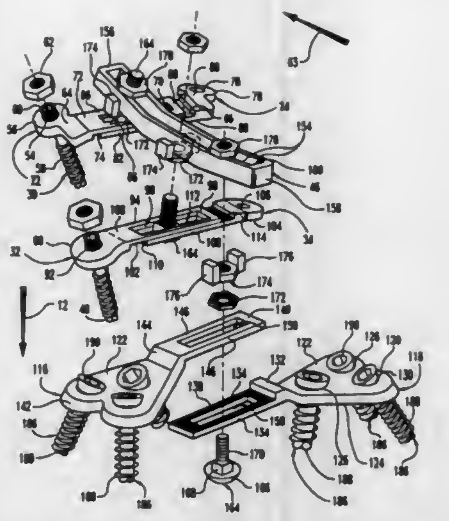
electrosurgical current delivery means, disposed within the electrosurgical device, for communicating electrical energy through the energy delivering electrode to tissue to effect cutting and/or cauterization of tissue.

5,531,745
SYSTEM FOR STABILIZING THE SPINE AND REDUCING SPONDYLOLISTHESIS
R. Charles Ray, Tacoma, Wash., assignor to Danek Medical, Inc., Memphis, Tenn.
Continuation of Ser. No. 31,374, Mar. 11, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 339,580
Int. Cl.^{6} A61B *17/70*
U.S. Cl. 606—61 **9 Claims**

6. A system for stabilizing the lumbar region of the spine and reducing displacement of the spine resulting from spondylolisthesis, comprising:

a first transverse plate adapted for connection to a left pedicle of a first vertebra, the first transverse plate including a first elongated slot therein;

a second transverse plate adapted for connection to a right pedicle of the first vertebra, the second transverse plate including a second elongated slot therein; a third transverse plate adapted for connection to a left pedicle of a second vertebra, the third transverse plate including a third elongated slot therein;



- a fourth transverse plate adapted for connection to a right pedicle of the second vertebra, the fourth transverse plate including a fourth elongated slot therein;
- a longitudinal member having a longitudinal slot therein;
- a first fastener for securing the first and second transverse plates to one another and to the longitudinal member, the first fastener passing through the first, second, and longitudinal slots when fastened;
- a second fastener for securing the third and fourth transverse plates to one another and to the longitudinal member, the second fastener passing through the third, fourth, and longitudinal slots when fastened, and

wherein the first and second transverse plates include respective first and second textured surfaces, the first and second textured surfaces adapted to engage one another when the first fastener is fastened; and

the third and fourth transverse plates include respective third and fourth textured surfaces, the third and fourth textured surfaces adapted to engage one another when the second fastener is fastened.

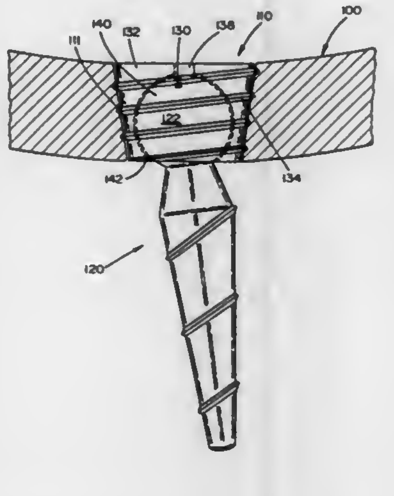
5,531,746
POSTERIOR SPINAL POLYAXIAL LOCKING LATERAL MASS SCREW PLATE ASSEMBLY

Joseph P. Errico, Hempstead, N.Y.; Thomas J. Errico, Summit, and James Ralph, Oakland, both of N.J., assignors to Fastenetix, L.L.C., Summit, N.J.

Continuation-in-part of Ser. No. 421,087, Apr. 13, 1995. This application May 22, 1995, Ser. No. 446,222

Int. Cl.^{6} A61B *17/70*

U.S. Cl. 606—61 **7 Claims**



1. A polyaxial locking screw and plate assembly for the immobilization of vertebral bones, via fixation to posterior surfaces thereof, comprising:
- an elongate plate having at least two through holes disposed in spaced relation with respect to each other along a longitudinal axis thereof;
- a plurality of coupling elements, each having a semi-spherical interior volume, and each of said coupling elements being insertable into a corresponding through hole; and
- a plurality of bone screws, each of said bone screws having a semi-spherical head portion and a shaft, said shaft portion being insertable through the corresponding through hole and into the vertebral bone, and said semi-spherical head portion being rotationally freely mounted within the semi-spherical interior volume of the coupling element prior to insertion and such that the shaft of the bone screw and the coupling element may be inserted into a corresponding through hole and said shaft of the bone screw may be inserted into the lateral mass at a selected angle within a predetermined range of angles including non-perpendicular angles relative to the plate and thereby locking said coupling element and said semi-spherical head to said plate at said selected angle as said semi-spherical head and said coupling element are advanced into said corresponding through hole.

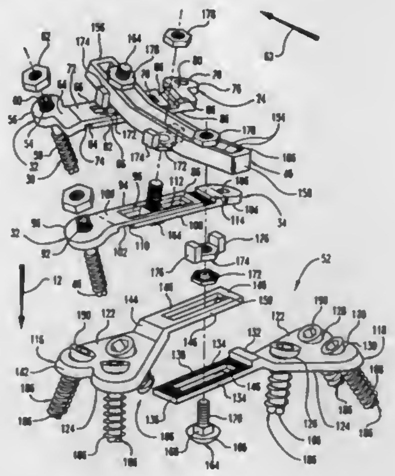
5,531,747
SYSTEM FOR STABILIZING THE SPINE AND REDUCING SPONDYLOLISTHESIS

R. Charles Ray, Tacoma, Wash., assignor to Danek Medical Inc., Memphis, Tenn.

Division of Ser. No. 339,580, Nov. 14, 1994, which is a continuation of Ser. No. 31,374, Mar. 11, 1993, abandoned. This application May 30, 1995, Ser. No. 453,504

Int. Cl.^{6} A61B *17/70*

U.S. Cl. 606—61 **4 Claims**



1. A transverse plate system for use in the treatment of spondylolisthesis, comprising:
- a pair of transverse plates, each of said plates including
- an eye for receiving a bone screw along a first axis;
- two spaced-apart substantially parallel fingers extending in a direction transverse to said first axis, said fingers including a posterior surface and an opposing anterior surface, and said fingers further defining a slot therebetween; and
- said posterior surface of said fingers of a first one of said transverse plates, and said anterior surface of said fingers or a second one of said transverse plates each being textured with a repetitive pattern to prevent slippage between said posterior surface and said anterior surface when said pair of transverse plates are in contact; said system further including
- a longitudinal member configured to extend along the length of the spine; and
- a fastener for extending between said slot of each of said transverse plates when said plates are in contact, and having means for engaging said transverse plates to said longitudinal member.

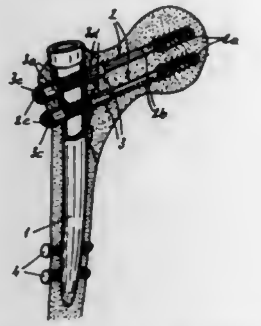
5,531,748
OSTEOSYNTHESIS DEVICE FOR TROCHANTERIC OR TROCHANTERIC-DIAPHYSEAL FRACTURE

Jean-Yves de la Caffiniere, Paris, France, assignor to Fixano, Bourg En Breese, France

Filed May 17, 1994, Ser. No. 245,239

Int. Cl.^{6} A61B *17/76*

U.S. Cl. 606—62 **6 Claims**



1. An osteosynthesis device for a trochanteric or trochanteric-diaphyseal fracture, comprising:
- a rod having at least one threaded hole at a proximal portion;
- at least one screw passable through the at least one hole and having a distal portion engageable with a bone; and
- at least one cylindrical sleeve comprising:
  - a bore fittable around a proximal portion of the at least one screw;
  - a threaded intermediate exterior portion threadably engageable with the at least one hole;
  - a shoulder on a proximal exterior portion engageable with the rod for immobilizing the sleeve with respect to the rod when the sleeve is threaded into the at least one hole; and
  - means for threading the sleeve into the at least one hole formed at a proximal end portion.

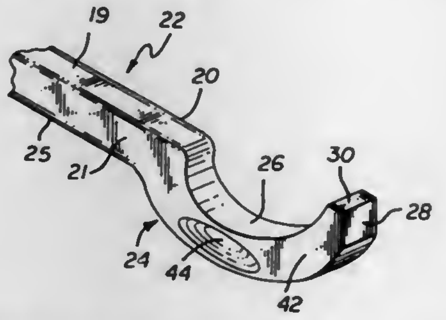
5,531,749
SPINAL BONE WAXER

Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291, assignor to Gary K. Michelson, Venice, Calif.

Continuation of Ser. No. 74,780, Jun. 10, 1993, abandoned. This application Nov. 9, 1994, Ser. No. 336,556

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—93 **41 Claims**



1. A spinal bone waxer comprising: a handle; a substantially rigid shaft having a longitudinal axis terminating at a substantially rigid working waxer tip, said working waxer tip having means for applying bone wax to the vertebrae of the spine, said means for applying bone wax comprising a plurality of different shaped surfaces proportionate for the purpose of applying bone wax to the vertebrae of the spine during surgery, said plurality of surfaces comprising upper and lower curved surfaces and side walls, at least one of said side walls being substantially flat.

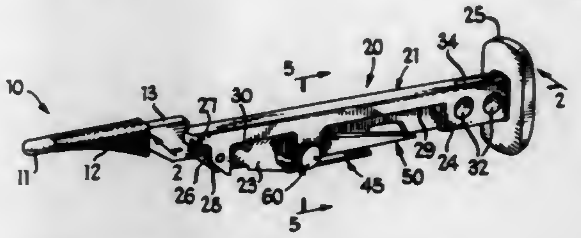
5,531,750
SURGICAL TOOL AND ADJUSTABLE LOCKING HANDLE THEREFOR

Alexander Even-Esh, Edison, N.J., assignor to Snap-on Incorporated, Kenosha, Wis.

Filed Jul. 15, 1994, Ser. No. 275,850

Int. Cl.^{6} A61B *17/56*

U.S. Cl. 606—79 **13 Claims**



1. An adjustable locking handle for a surgical tool comprising: an elongated body having a tool end; a fixed jaw on said body adjacent to said tool end; a movable jaw; a pivot on said body adjacent to said tool end having a fixed pivot axis fixed relative to said body, said pivot being coupled to said movable jaw for pivotal movement of said movable jaw between locking and unlocking conditions relative to said fixed jaw; a manually operable locking linkage mounted on said body, said linkage including a cam follower surface, a lever pivotally movable relative to said body about a movable pivot axis, and a locking member coupled to said lever and to said movable jaw for effecting movement of said movable jaw between the locking and unlocking conditions thereof; and a cam member carried by said body for rotation relative to said body about a rotation axis fixed on said body and having said movable pivot axis eccentrically disposed on said cam member parallel to said rotation axis, said cam member being disposed for camming engagement with said cam follower surface.

5,531,751
AIMING TUBE ASSEMBLY

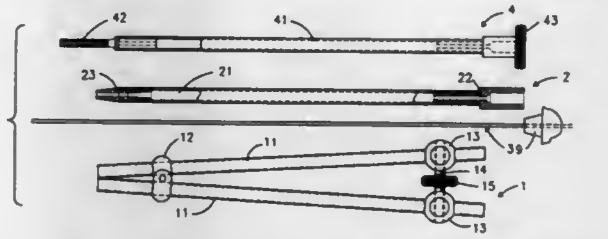
Rolf Schultheiss, Bonn, and Gerhard Weber, Oberndorf, both of, Germany, assignors to Gerhard Weber, Germany

Filed Jun. 1, 1994, Ser. No. 252,183

Claims priority, application Germany, Jun. 2, 1993, 9308276 U

Int. Cl.^{6} A61B *17/88;17/17*

U.S. Cl. 606—96 **4 Claims**



1. A device for use in ventral screwing together of dens fractures with compression screws, said device comprising an aiming tube assembly (1), said aiming tube assembly comprising two aiming tube casings (11) which are pivotably joined by means of an articulated joint (12), said aiming tube assembly being precisely adjustable within a predetermined range of angles and by means of an adjusting means (13, 14, 15), said adjusting means comprising a

threaded bolt (14) with a first and a second threaded section, the two threaded sections being counter-rotating with respect to each other, the first threaded section being in engagement with a threaded block (14) provided on one of the aiming tube casings (11), the second threaded section being in engagement with a threaded block (14) provided on the other of the aiming tube casings (11).

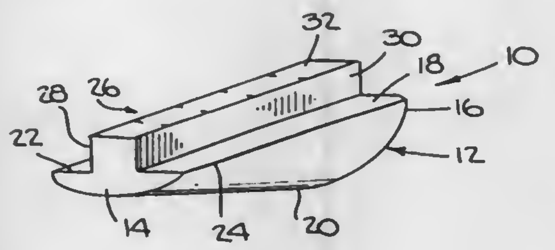
5,531,752
VOCAL CORD MEDIALIZATION TOOL

James L. Netterville, Nashville, Tenn., and James B. Hissong, Jacksonville, Fla., assignors to Xomed, Inc., Jacksonville, Fla.

Division of Ser. No. 763,390, Sep. 20, 1991, Pat. No. 5,201,765. This application Jan. 29, 1993, Ser. No. 10,914

Int. Cl.^{6} A61B *17/58*

U.S. Cl. 606—99 **9 Claims**



1. A vocal cord medialization tool comprising,
a) an elongated stem having opposite longitudinal end portions,
b) a vocal cord engagement surface proximate one of said longitudinal end portions for displacing a vocal cord from a thyroid cartilage,
c) a thyroid cartilage engaging surface proximate said one of said longitudinal end portions and spaced from said vocal cord engagement surface,
d) said vocal cord engagement surface having laterally spaced end portions, said vocal cord engagement surface projecting away from said thyroid cartilage engaging surface and having a first range of steadily increasing elevation from said thyroid cartilage engaging surface, from a minimum elevation at one said lateral end portion of said vocal cord engagement surface to a maximum elevation at the other said lateral end portion of said vocal cord engagement surface, and
e) a first size indicator on said stem for indicating the elevation of said vocal cord engagement surface from said thyroid cartilage engaging surface in a longitudinal direction between said minimum and said maximum elevations.

5,531,753
SURGICAL CORRECTION OF ASTIGMATISM

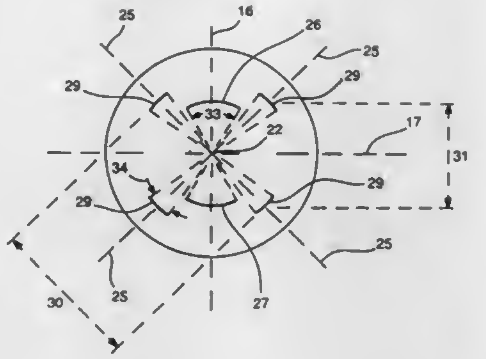
Canrobert Oliveira, Brasilia, Brazil, assignor to Philip Stephen Cantor, Brasilia, Brazil

Filed Aug. 18, 1994, Ser. No. 292,517

Int. Cl.^{6} A61F *9/00;* **A61B** *19/00*

U.S. Cl. 606—166 **26 Claims**

1. A surgical procedure for correcting astigmatism, comprising:
(a) executing on the cornea a first set of incisions comprising two opposed incisions generally transverse to the steepest meridian along a first optical zone,
(b) executing on the cornea a second set of incisions comprising from two to four incisions each generally transverse to a bisector meridian along a second optical zone which is larger than the first optical zone.



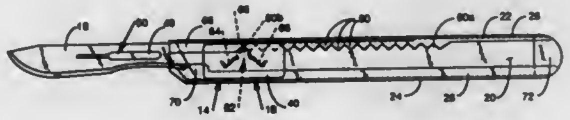
5,531,754
RETRACTABLE SURGICAL BLADE DEVICE AND ASSOCIATED METHOD

Howard L. Shackelford, Sr., and Howard L. Shackelford, Jr., both of R.D. 2, 292 Dement St., Triadelphia, W. Va. 26059

Continuation of Ser. No. 131,047, Oct. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 867,069, Jul. 24, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,275

Int. Cl.^{6} A61B *17/32;* **B26B** *3/06*

U.S. Cl. 606—167 **15 Claims**



1. A retractable surgical blade device comprising:
a handle having a front end and a back end, said handle including a base wall and a pair of opposed sidewalls extending generally perpendicularly from said base wall, said sidewalls each including a flange extending generally perpendicularly therefrom;
said base wall, said sidewalls and said flanges defining a channel;
a surgical blade member having a body member which defines a pair of opposed longitudinal slots and a surgical blade secured to said body member;
said flanges engaging into said slots to guide and maintain said surgical blade member in said channel;
said surgical blade member being movable between a cutting position wherein said surgical blade projects from said front end of said handle and said device can be employed in a surgical procedure and a retracted position wherein said surgical blade is disposed in said channel so that said surgical blade is unable to cut or stab persons associated with a surgical procedure;
said handle includes a front end stop means comprising a section extending from said flange to resist said surgical blade member from disengaging from said front end of said handle and a back end stop means comprising a cantilevered end portion that is crimped to resist said surgical blade member from disengaging from said back end of said handle; and
said device further including cooperating locking members on said handle and said body member, said locking members positioning and securing said surgical blade in a desired position.

5,531,755
COBALT BASE ALLOY END EFFECTORS FOR LAPAROSCOPIC SURGICAL SCISSORS

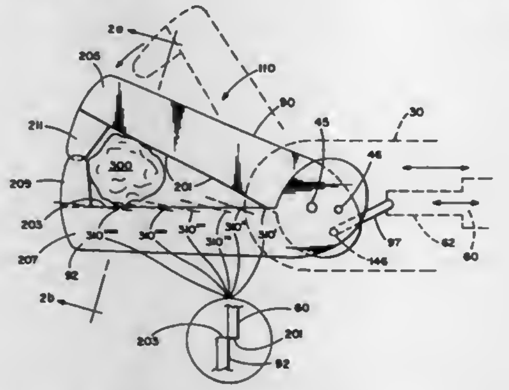
Kevin W. Smith, Miami, and Thomas O. Bales, Coral Gables, both of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation of Ser. No. 780,034, Oct. 21, 1991, Pat. No. 5,234,453, which is a continuation-in-part of Ser. No. 521,766, May 10, 1990, Pat. No. 5,133,727. This application Aug. 9, 1993, Ser. No. 104,325

The portion of the term of this patent subsequent to Aug. 10, 2010, has been disclaimed.

Int. Cl.^{6} A61B *10/00*

U.S. Cl. 606—170 **29 Claims**



1. A scissors device, comprising:
a) a pair of investment cast homogeneous scissor elements each comprised of a cobalt based alloy, each said investment cast homogeneous scissor element having in its as-cast form an elongate portion having an integral cutting edge and an adjacent base portion, and at least one of said investment cast homogeneous scissor elements having a through-hole in said base portion transverse to said elongate portion, wherein said pair of investment cast homogeneous scissor elements are laterally offset one to the other with respective said integral cutting edges oppositely adjacent each other, and each said scissor element has a length, a height, and a thickness, said height being less than about 0.4 inches, and said thickness being less than about 0.2 inches;
b) a pivot means extending transverse said pair of investment case homogeneous scissor elements and extending through said through-hole of said at least one of said scissor elements, said pivot means for permitting pivoting of at least said one of said pair of investment cast homogeneous scissor elements relative to the other of said pair of scissor elements; and
c) actuation means coupled to at least a first of said pair of investment cast homogeneous scissor elements for causing said first of said pair of investment cast homogeneous scissor elements to pivot relative to a second of said pair of investment cast homogenous scissor elements.

5,531,756
ARTHROSCOPIC SURGICAL PUNCH

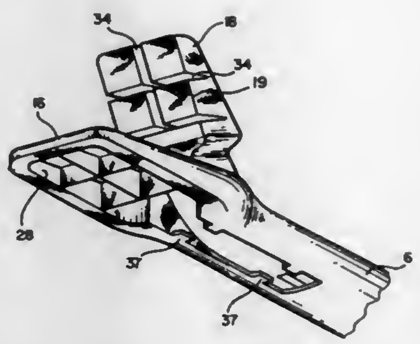
Daniel J. Larose, 1408 Skyline Dr., Council Bluffs, Iowa 51503

Filed Aug. 2, 1994, Ser. No. 284,110

Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—184 **21 Claims**

1. A surgical punch for cutting body tissue, comprising:
a) an axially elongated support having first and second end portions;
b) first and second cutting jaws operably associated with said first end portion and movable between an open position and a closed position relatively toward and closely past each other in tissue-severing shearing action;
c) an actuator operably associated with said second end portion for providing relative motion between said first and second jaws;



d) said first jaw having an opening adapted to receive said second jaw in tissue-severing shearing action in the closed position, said second jaw including an outer periphery adapted to be received within said first jaw opening in the closed position, thereby to provide the tissue-severing shearing action;
e) a plurality of blades disposed within said opening for dividing said opening into a plurality of smaller through openings; and
f) said second jaw cooperating with said blades when in the closed position, thereby to cut the tissue in one cutting action into smaller fragments substantially corresponding to the sizes of said smaller openings, whereby the cut fragments are adapted to be released from said cutting jaws.

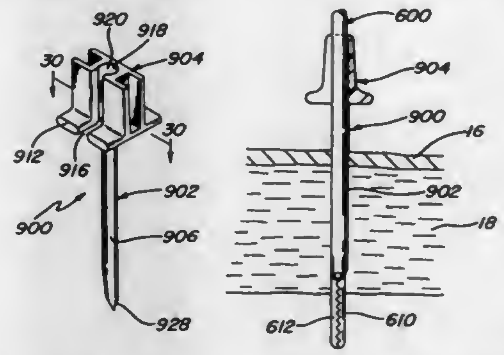
5,531,757
METHODS AND STABILIZED INSTRUMENTS FOR PERFORMING MEDICAL PROCEDURES PERCUTANEOUSLY WITHOUT A TROCAR

Kenneth Kensey, 8 Hickory La., Chester Springs, Pa. 19425; James Meikle, Jr., 56 Sonia La., Broomall, Pa. 19008; Harold Clupper, 1024 Little Shiloh Rd., West Chester, Pa. 19380, and John E. Nash, 145 Oak St., Downingtown, Pa. 19335

Continuation-in-part of Ser. No. 35,333, Mar. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,625, Oct. 30, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 198,429

Int. Cl.^{6} A61B *17/34*

U.S. Cl. 606—185 **35 Claims**



1. A piercing device for use by a person performing minimally invasive surgery, the surgery being performed by extending a medical instrument through the skin and underlying tissue to an internal portion within the body of a living being, the instrument having a proximal portion and a distally located working portion arranged for performing some medical procedure in the internal portion of the body of the being, said piercing device comprising:
(A) a guide member comprising an elongated trough shaped sidewall having:
(1) an inner surface defining a trough shaped recess,
(2) an outer surface,
(3) a distal end portion, and
(4) a proximal portion,

said distal end portion comprising a piercing tip, said trough shaped recess having a pair of marginal edges,

(B) a head portion being located at said proximal portion of said guide member and being shaped to enable said head portion to be readily held by the person,

said piercing tip in engagement with the skin of the being, said proximal portion of said guide member being located outside of the body of the being over the internal portion of the being's body and extended through the skin and at least a portion of the underlying tissue, wherein said elongated trough shaped sidewall forms a trough shaped percutaneous puncture which extends to the surface of the skin, said trough shaped sidewall being configured so that the tissue contiguous with the puncture engages both of said inner and outer surfaces of said sidewall to form a substantially fluid-tight interface therewith, said inner surface of said guide member being shaped to slidably receive said working portion of the instrument thereon, wherein said working portion can be readily slid therealong and guided thereby after said device has formed the puncture so that said working portion passes through the puncture into the internal portion, said marginal edges of said guide member being spaced apart sufficiently to enable said piercing device to be readily removed from the puncture and the instrument to leave the instrument in place within the puncture by passing the working portion of the instrument between said marginal edges of said guide member without deforming the working portion so that the instrument can be operated by the person to perform the medical procedure within the internal portion of the body of the being.

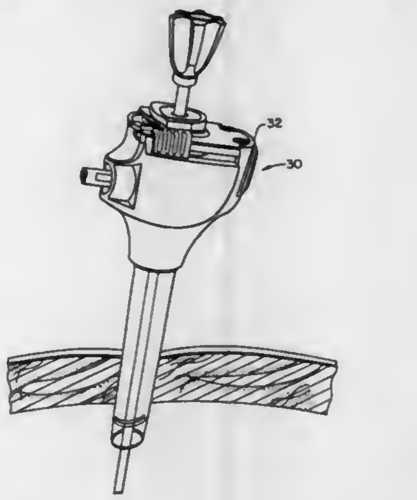
5,531,758

SLIDING REDUCER SEAL FOR SURGICAL TROCAR

Robert C. Uschold, Cincinnati; Randy R. Stephens, Fairfield, both of Ohio; Jeffrey Mauch, Lynchburg, Va.; Richard C. Smith, Loveland, and Kevin Houser, Centerville, both of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Mar. 25, 1994, Ser. No. 217,991
Int. Cl.^{6} A61M *5/00*

U.S. Cl. 606—185 **14 Claims**



1. In combination:

a trocar cannula having a cylindrical opening with an inner diameter, and a cannula handle attached to said cannula, said cannula handle having a cylindrical opening extending therethrough; and

said handle having a proximal end containing a planar surface; and a lip on the perimeter of said surface, said lip having a height extending from said surface in a proximal direction; and said handle cylindrical opening extending through said planar surface; and

a reducer mechanism attached to said planar surface and slidable with respect thereto, said reducer mechanism having an opening with a smaller inner diameter than said opening in said cannula handle, and said reducer mechanism having a height extending from said lip surface in a proximal dimension said reducer height no greater than the height of said lip; and

wherein said reducer mechanism is removably attached to said handle.

5,531,759

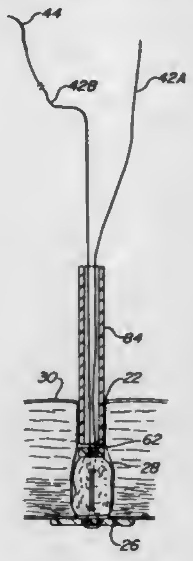
SYSTEM FOR CLOSING A PERCUTANEOUS PUNCTURE FORMED BY A TROCAR TO PREVENT TISSUE AT THE PUNCTURE FROM HERNIATING

Kenneth Kensey, Chester Springs; John E. Nash, Downington, and Douglas Evans, Devon, all of Pa., assignors to Kensey Nash Corporation, Exton, Pa.

Filed Apr. 29, 1994, Ser. No. 235,825
Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—213 **61 Claims**

1. A device arranged for introduction through a percutaneous puncture into the abdomen of a living being formed during a minimally invasive surgical procedure to prevent the formation of a hernia thereat, the puncture comprising an opening in the peritoneum and a tract extending from the skin of the being to the opening, said device including a portion arranged for disposition within the puncture and constructed of a material which serves to improve the long-term strength of tissue forming at the opening when said device is in place within the puncture, said device comprising a first member, a second member, and suturing means, said first member being arranged to be extended through the tract and the opening and into engagement with the interior of the peritoneum adjacent the opening to render said first member resistant to passage back through the opening, said second member being arranged for extension through the tract outside the peritoneum and coupled to said first member and cooperating with said first member for holding said first member in engagement with the interior of the peritoneum adjacent the opening, said suturing means being coupled to said second member and operative to cause a part of said second member to penetrate tissue of the being contiguous with the tract to permanently hold said device in place within said puncture.



5,531,760

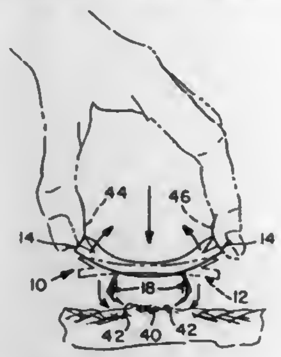
SKIN CLOSURE CLIP

Mohammed G. Alwafaie, P.O. Box 3854, Alkhobar 31952, Saudi Arabia

Filed Apr. 14, 1995, Ser. No. 421,862
Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—216 **7 Claims**

1. A skin closure clip, for closing a wound by grabbing skin surrounding the wound, comprising:



a) a body, the body being elongated and flexible, the body having a pair of handle ends, a middle with a cross section, and a lower surface extending between the pair of handle ends, each of the pair of handle ends having a top, bottom, a surface extending from the top to the bottom, and a cross section, the body further having an upper surface with a concave shape extending smoothly from substantially the top of one of the pair of handle ends to substantially the top of another of the pair of handle ends, the upper surface of the body having a middle that is midway between the pair of handle ends and is lower than the top of each of the pair of handle ends so as to provide the cross section area of the middle of the body to be less than the cross sectional area of each of the pair of handle ends; and

b) a pair of jaws, the pair of jaws extending downward from the lower surface of the body, the pair of jaws having hooks for grabbing skin surrounding the wound, so that when compressive pressure is applied to each of the pair of handle ends the body flexes downwardly at the middle of the body due to the cross sectional area of the middle of the body being less than the cross sectional area of each of the pair of handle ends and therefore spreading the pair of jaws equally apart from the middle of the body.

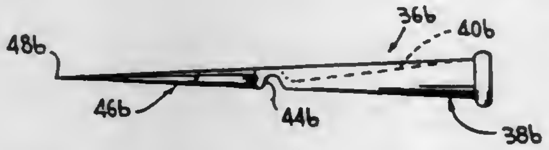
5,531,761

METHODS FOR SUTURING TISSUE SECTIONS

Inbae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Continuation of Ser. No. 855,053, Mar. 13, 1992, abandoned, which is a division of Ser. No. 744,406, Aug. 13, 1991, Pat. No. 5,222,976, which is a division of Ser. No. 352,337, May 16, 1989, Pat. No. 5,053,047. This application Oct. 28, 1993, Ser. No. 144,590
Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—223 **12 Claims**



1. A method of suturing first and second tissue sections comprising the steps of

penetrating an external wall of the first tissue section at a position closely spaced from the end thereof with a sharp distal end of a suture device made of bioabsorbable material and having protrusions therealong, including protrusions immediately adjacent the sharp distal end, for permitting movement of the suture device only forwardly through the tissue sections such that the sharp distal end passes through an internal wall of the first tissue section;

penetrating an internal wall of the second tissue section at a position closely spaced from the end thereof with the sharp distal end of the suture device such that the sharp distal end protrudes from an external wall of the second tissue section;

pulling the protruding sharp distal end of the suture device to move the suture device forwardly through the first and second tissue sections to approximate the ends thereof; and

leaving the suture device in the first and second tissue sections to allow joining of the ends thereof prior to absorption of the suture device.

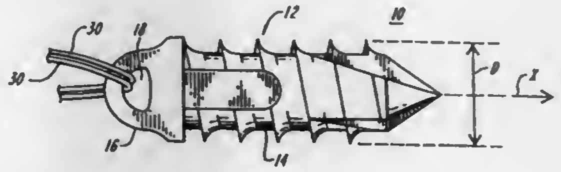
5,531,762

SUTURE ANCHOR ASSEMBLY

Kevin R. Stone, 1 Throckmorton La., Mill Valley, Calif. 94941, and Allen H. DeSatnick, Marblehead, Mass., assignors to Kevin R. Stone, San Francisco, Calif.

Continuation-in-part of Ser. No. 349,677, Dec. 5, 1994, Pat. No. 5,443,482, which is a continuation of Ser. No. 81,516, Jun. 23, 1993, Pat. No. 5,370,662. This application Feb. 15, 1995, Ser. No. 388,951
Int. Cl.^{6} A61B *17/00;* A61F *1/00*

U.S. Cl. 606—232 **15 Claims**



1. A surgical suture anchor assembly, comprising:

an elongated, generally cylindrical member extending along a central axis and having a maximum outer diameter D, said member including an anchor portion at a first end thereof rigidly coupled to a suture/drive portion at a second end thereof, said second end being opposite said first end,

wherein said anchor portion includes a self-drilling contour at least at points near said first end, and

wherein said suture/drive portion includes:

A. at least one eyelet positioned at or near said second end, said eyelet having a central aperture, whereby a suture path extending between two end points is defined by a region adjacent to said second end, through said aperture of said eyelet and back to said region adjacent to said second end, wherein the end points of said suture path are less than a distance equal to D'/2 from said central axis, where D' is less than or equal to said maximum outer diameter D; and

B. coupling means for receiving a distal tip of a cannulated driver rotatable about a drive axis, whereby said cylindrical member and said distal tip are mechanically coupled for mutual rotation with said drive axis and said central axis being coaxial when said distal tip of said driver is received by said coupling means, and

wherein said anchor portion and said suture/drive portion have a continuous self-tapping thread pattern on the outer surfaces thereof, said pattern extending at least from points near said first end to points near said second end.

5,531,763

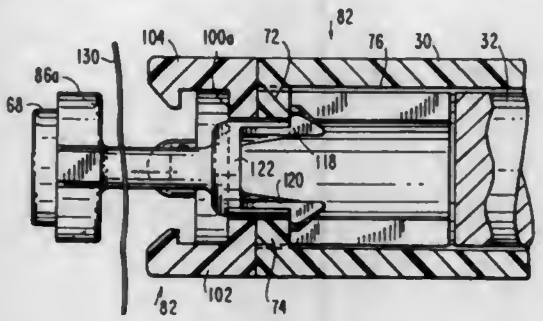
SUTURE CINCHING APPARATUS

Dominick L. Mastri, Bridgeport; Michael S. Kolesa, Norwalk, and Thomas R. Hessler, Danbury, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 7, 1994, Ser. No. 319,912

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **15 Claims**



1. Device for cinching surgical sutures, which comprises:

a) first generally elongated member defining a generally longitudinal axis; and having a generally elongated neck portion having a distal end and a proximal end, and a head portion connected to the distal end of the neck portion, the head portion, the head portion having at least two extension flanges and

b) second generally elongated member defining a generally longitudinal axis and positionable at least partially within the first member with the generally longitudinal axis in alignment with the axis of the first member, the first member movable between a first position which permits reception of a surgical suture between the first and second member in a direction generally transverse to the longitudinal axis and a second position in engagement with wherein said at least two extension flanges are the second member which cinches the suture between the first and second members.

5,531,764

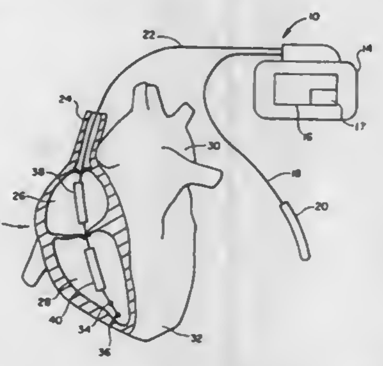
IMPLANTABLE DEFIBRILLATOR SYSTEM AND METHOD HAVING SUCCESSIVE CHANGEABLE DEFIBRILLATION WAVEFORMS

Theodore P. Adams, Edina, and Mark W. Kroll, Minnetonka, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Continuation of Ser. No. 856,982, Mar. 24, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,563

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **6 Claims**



1. An improved implantable defibrillator system adapted to be implanted in a human patient for producing a capacitive-discharge countershock, the implantable defibrillator system being a self-contained device including a capacitor system, a battery system, a switching system and a sensing system all of which are connected to and controlled by a programmable computer system having a memory for storing a plurality of physician programmable charging voltage parameters, one parameter for each countershock in a sequence of countershocks to be delivered to the human patient as part of a multiple-countershock therapy regimen, and computer programming stored in the memory and executing in the computer system that, in response to an initial cardiac arrhythmia in the human patient sensed by the sensing system, selectively charges the capacitor system from the battery system in accordance with a first of the charging voltage parameters stored in the memory for the multiple-countershock therapy regimen and then selectively discharges the capacitor system as a first of the sequence of multiple countershocks delivered through the switching system to a plurality of electrodes adapted to be implanted in the human patient, after which, in response to a continuing cardiac arrhythmia in the human patient sensed by the sensing system, selectively charges the capacitor system from the battery system in accordance with a second of the charging voltage parameters stored in the memory for the multiple-countershock therapy regimen and then selectively discharges the capacitor system as a second of the sequence of multiple countershocks, the improvement comprising:

a data structure located in the memory for defining a plurality of different possible waveforms and a plurality of different possible wavepaths for individual countershocks in the multiple-countershock therapy regimen by storing a plurality of sets of physician programmable waveform parameters in the data structure, a unique set of waveform parameters being associated with each countershock in the sequence of multiple countershocks, the waveform parameters including both wave phase information and wave path information such that each set of waveform parameters defines a selected one of the different possible waveforms and defines a selected one of the different possible wave paths definable in the data structure; and

computer programming stored in the memory and executing in the computer system that selectively charges and then discharges the capacitor system in accordance with a first one of the unique sets of waveform parameters stored in the data structure as a first countershock in the sequence of multiple countershocks and, in response to a continuing cardiac arrhythmia in the human patient sensed by the sensing system, selectively charges and discharges the capacitor system in accordance with a subsequent one of the unique sets of waveform parameters stored in the data structure as a subsequent countershock in the sequence of multiple countershocks,

such that the first and subsequent countershocks delivered by the implantable defibrillator system as part of the sequence of multiple countershocks can be independently programmed for different waveforms and wave paths.

5,531,765

METHOD AND APPARATUS FOR PRODUCING CONFIGURABLE BIPHASIC DEFIBRILLATION WAVEFORMS

Benjamin D. Pless, Atherton, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 37,482, Mar. 24, 1993, Pat. No. 5,352,239, which is a continuation of Ser. No. 629,252, Dec. 18, 1990, abandoned. This application Jul. 15, 1994, Ser. No. 275,852

Int. Cl.^{6} A61N *1/39*

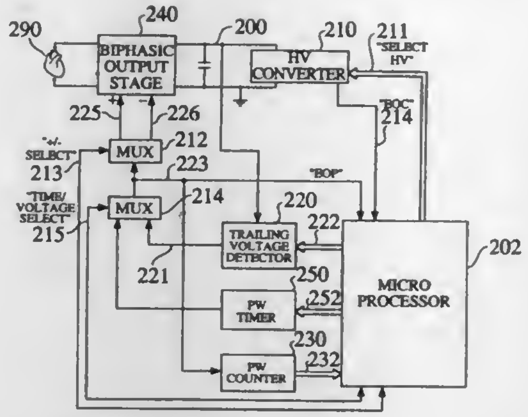
U.S. Cl. 607—5 **2 Claims**

1. An implantable medical device utilizable for delivering a configurable biphasic defibrillation waveform to a patient's heart, the medical device comprising:

(a) charge storage means;

(b) charging circuitry for charging the storage means to an initial selected voltage; and

(c) control means for initiating delivery of a first defibrillation pulse of a first polarity to the heart after the storage means stores the initial selected voltage and for initiating delivery of a second defibrillation pulse of a second polarity to the heart when the voltage of the charge storage means decays to a programmed decay voltage, said control means including timer means for measuring the duration of said first pulse and for controlling the duration of the second pulse as a function of the duration of said first pulse.



5,531,766

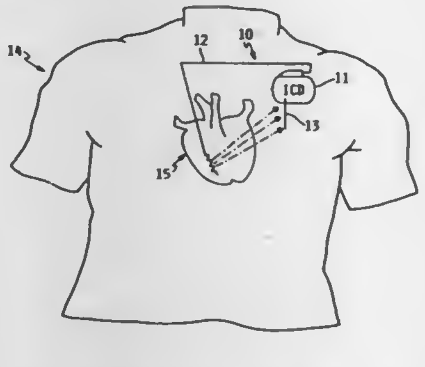
IMPLANTABLE CARDIOVERTER DEFIBRILLATOR PULSE GENERATOR KITE-TAIL ELECTRODE SYSTEM

Mark W. Kroll, Minnetonka; Randall S. Nelson, Pine Springs, and Theodore P. Adams, Edina, all of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Filed Jan. 23, 1995, Ser. No. 376,806

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **12 Claims**



1. In an implantable cardioverter defibrillator pulse generator including a housing having an exterior surface, an interior surface defining a sealed interior space containing pulse generation circuitry, and means, disposed on said exterior surface, to connect an external electrode to said pulse generation circuitry, the combination with said cardioverter defibrillator pulse generator of a conductive tail electrode physically connected to said exterior surface of said housing, said tail electrode having a predetermined surface area, said tail electrode further having a length of 2–30 cm. and a diameter of 0.5–10 mm.

5,531,767

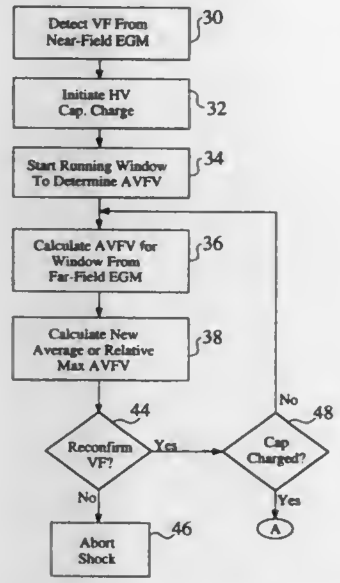
METHOD AND APPARATUS FOR DELIVERING DEFIBRILLATION SHOCKS WITH IMPROVED EFFECTIVENESS

Eric S. Fain, Menlo Park, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Division of Ser. No. 219,605, Mar. 29, 1994, Pat. No. 5,500,008. This application May 25, 1995, Ser. No. 450,168

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **15 Claims**


Detect VF From Near-Field EGM
30
Initiate HV Cap. Charge
32
Start Running Window To Determine AVFV
34
Calculate AVFV for Window From Far-Field EGM
36
Calculate New Average or Relative Max AVFV
38
44
Reconfirm VF?
Yes
No
48
Cap Charged?
No
Yes
Abort Shock
46
A

1. A method for defibrillating a patient's heart with an implantable defibrillator having first and second implanted electrodes spaced apart from each other by at least 4 centimeters, comprising the steps of:

(a) detecting fibrillation in said patient's heart;

(b) monitoring a fibrillation voltage across said first and second implanted electrodes, a waveform of said fibrillation voltage including peaks and troughs;

(c) determining absolute value amplitudes of the peaks and troughs of said fibrillation voltage;

(d) averaging a portion of said absolute value amplitudes to provide an average amplitude;

(e) comparing said average amplitude with the absolute values of the peaks and troughs of said fibrillation voltage to determine if a measure of the absolute values of the peaks and troughs of said fibrillation voltage exceeds said average amplitude determined in step (d) by a predetermined amount; and

(f) delivering a defibrillation shock to said patient's heart during a period of ventricular fibrillation when the measure of the absolute values of the peaks and troughs of said fibrillation voltage exceeds said average amplitude determined in step (d) by said predetermined amount.

5,531,768

IMPLANTABLE ATRIAL DEFIBRILLATOR HAVING ISCHEMIA COORDINATED INTERVENTION THERAPY AND METHOD

Clifton A. Alferness, Redmond, Wash., assignor to InControl, Inc., Redmond, Wash.

Filed Feb. 21, 1995, Ser. No. 391,156

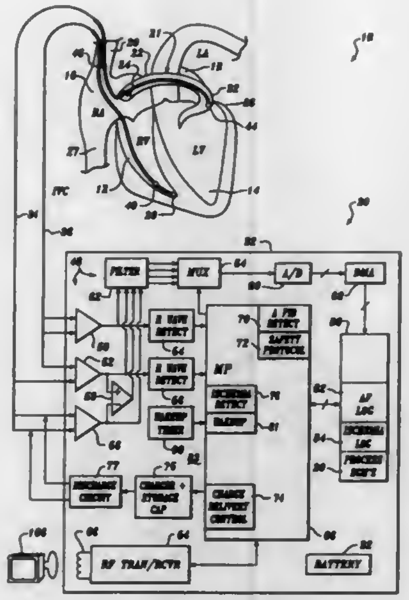
Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—6 **33 Claims**

1. An atrial defibrillator comprising:

sensing means for sensing electrical activity of a heart;

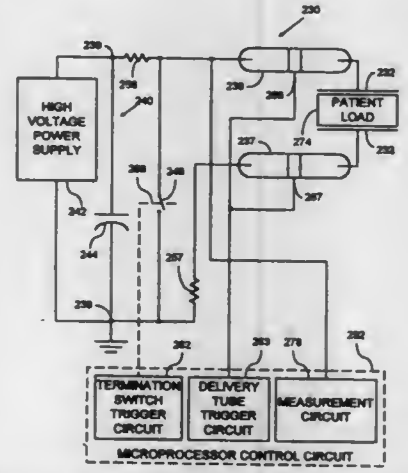
an ischemia detector responsive to the sensed electrical activity of the heart for detecting ischemia of the heart;



an atrial fibrillation detector responsive to the sensed electrical activity of the heart for determining if the atria are in need of cardioversion; and

cardioverting means for applying cardioverting electrical energy to the atria of the heart if the atria of the heart are in need of cardioversion and if the ischemia detector fails to detect ischemia of the heart.

5,531,769
TRUNCATED PULSE DEFIBRILLATOR WITH FLASH TUBE SWITCH
Helge Fossan, Stavanger, Norway, and Jonathan M. Benson, Oregon City, Oreg., assignors to Laerdal Manufacturing Corp., Tualatin, Oreg.
Filed Dec. 29, 1994, Ser. No. 366,664
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—7 25 Claims


230
238
236
240
238
288
232
PATIENT LOAD
HIGH VOLTAGE POWER SUPPLY
237
274
233
248
242
287
244
257
239
262
263
278
282
TERMINATION SWITCH TRIGGER CIRCUIT
DELIVERY TUBE TRIGGER CIRCUIT
MEASUREMENT CIRCUIT
MICROPROCESSOR CONTROL CIRCUIT

1. A circuit for terminating heart tachyarrhythmias, comprising:

an energy source having positive and negative terminals, and having stored electrical energy;

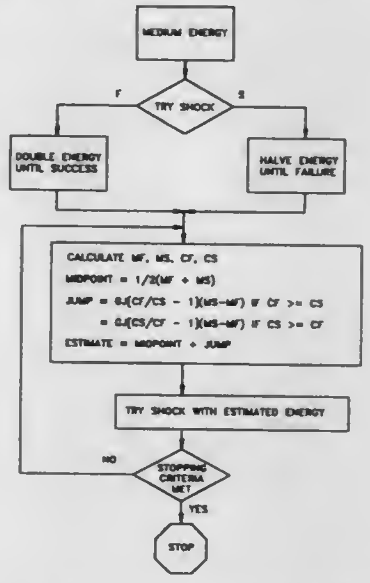
first and second patient contactors for making contact with a patient;

at least one delivery flash tube having a pair of main electrodes and a control electrode, the main electrodes of the delivery flash tube being coupled in series with the patient contactors between the positive and negative terminals of the energy source;

a delivery control circuit connected to the control electrode of the delivery flash tube for applying a triggering pulse to said control electrode so that electrical current from the energy source is conducted through the delivery flash tube and patient; and

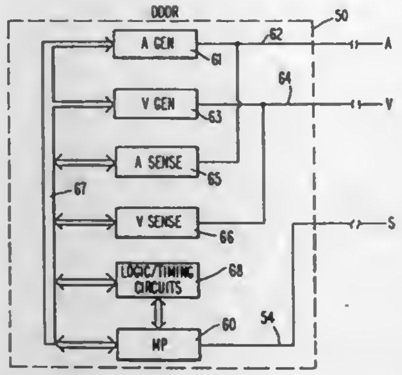
switching means for interrupting the electrical current through the delivery flash tube, whereby a defibrillation pulse applied to the patient is truncated.

5,531,770
DEVICE AND METHOD FOR DETERMINING DEFIBRILLATION THRESHOLDS
Mark W. Kroll, Minnetonka; Gary L. McQuilkin, Plymouth, and Kai C. Kroll, Minnetonka, all of Minn., assignors to Angeion Corporation, Plymouth, Minn.
Filed Sep. 3, 1993, Ser. No. 115,736
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—8 15 Claims


MEDIUM ENERGY
TRY SHOCK
F
S
DOUBLE ENERGY UNTIL SUCCESS
HALVE ENERGY UNTIL FAILURE
CALCULATE MF, MS, CF, CS
MIDPOINT = 1/2(MF + MS)
JUMP = 0.5(CF/CS - 1)(MS-MF) IF CF >= CS
= 0.5(CS/CF - 1)(MS-MF) IF CS >= CF
ESTIMATE = MIDPOINT + JUMP
TRY SHOCK WITH ESTIMATED ENERGY
NO
STOPPING CRITERIA MET
YES
STOP

1. A method for determining defibrillation thresholds, comprising the steps of delivering an initial shock series to a patient, said shock series comprising a number of shocks determined by delivering a first shock of a predetermined energy level, determining whether said first shock yields either a positive or negative defibrillation event, and delivering successive shocks of increasing energy levels until a positive defibrillation event is yielded if said first shock yielded a negative defibrillation event, and delivering successive shocks of decreasing energy levels until a negative defibrillation event is yielded if said first shock yielded a positive defibrillation event, determining an estimated shock level adjustment based on a statistical analysis of said initial shock series, and delivering at least one adjusted shock of a predetermined energy level based on said estimated shock level adjustment.

5,531,771
DUAL CHAMBER PACEMAKER SYSTEM AND METHOD WITH IMPROVED SWITCHING BETWEEN SYNCHRONOUS AND ASYNCRHONOUS BEHAVIOR
Johannes S. van der Veen, Dieren, Netherlands, assignor to Vitatron Medical, B.V., Dieren, Netherlands
Filed Oct. 26, 1994, Ser. No. 329,232
Int. Cl.^{6} A61N *1/36*
U.S. Cl. 607—9 14 Claims



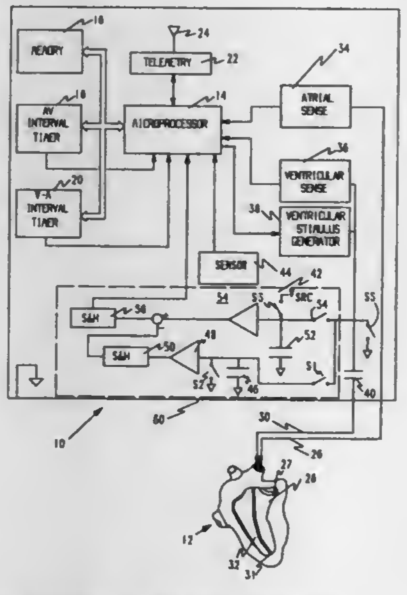
10. A dual chamber pacemaker system for pacing a patient, having stimulus means for generating and delivering pace pulses to the patient's ventricle, atrial sensing means for sensing atrial signals from the patient's atrium, means for determining atrial rate from said atrial signals, phys means for determining a physiological rate as a function of atrial rate and control means for controlling said stimulus means, wherein said control means further comprises:

tracking means for establishing a tracking rate limit, sync means for controlling said stimulus means to provide sync pace pulses in timed relation to sensed atrial signals which occur at rates below said tracking rate limit, and async means for controlling said stimulus means to provide async pulses in the absence of sensed atrial signals below said tracking rate limit;

maintaining means for maintaining a substantial representation of said tracking rate limit when async pulses are first provided; and

re-sync means for enabling providing of sync pace pulses following the occurrence of atrial signals sensed at a rate below said maintained tracking rate limit.

5,531,772
RATE RESPONSIVE CARDIAC PACEMAKER WITH FILTERED IMPEDANCE SENSING AND METHOD
David Prutchi, Lake Jackson, Tex., assignor to Intermedics, Inc., Angleton, Tex.
Filed Nov. 18, 1994, Ser. No. 342,436
Int. Cl.^{6} A61N *1/365*
U.S. Cl. 607—17 26 Claims



1. A cardiac stimulation apparatus comprising

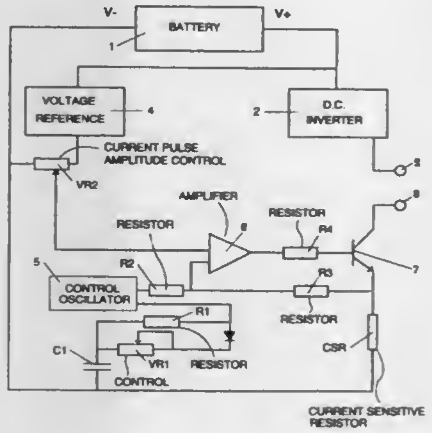
means for pacing a patient's heart;

means for measuring impedance within the patient's body, said impedance measuring means including means for sampling an intrinsic voltage condition of the patient's body at at least one location within the patient's body and for producing a first signal correlated to said intrinsic voltage condition, means for applying an electric current between at least two points on said apparatus, means for sensing a voltage in response to the application of said electrical current and for producing a second signal correlated to said voltage, and means for combining said first and second signals to produce a combined signal;

means for deriving a metabolic demand parameter from said combined signal; and

means for adjusting a pacing parameter in relation to said metabolic demand parameter.

5,531,773
METHOD AND APPARATUS FOR HANDLING ANIMALS
Lancelot H. Lines, Mount Bryan, Australia, assignor to Australian Meriono Wool Harvesting, LTD., Elizabeth Downs, Australia
Continuation of Ser. No. 8,692, Jan. 25, 1993, abandoned.
This application Sep. 27, 1994, Ser. No. 312,663
Claims priority, application Australia, May 1, 1992, 15992/92
Int. Cl.^{6} A61N *1/18*
U.S. Cl. 607—046 22 Claims



1. A method of controlling pain or providing a pain block and immobilization in an animal undergoing husbandry without rendering the animal unconscious, wherein the animal is of the type having a spinal column, comprising the steps of applying spaced electrodes to the animal, with at least one electrode located near the spinal column of the animal, and snpplying to the electrodes as a function of time a current of spaced apart pulses of relatively low voltage, each of said pulses having a width which is small in relation to the spacing between the pulses, and gradually varying the widths of the pulses from initial small or zero pulse widths to greater pulse widths with corresponding increase in pain blockage until the desired degree of pain blockage is reached with accompanying immobilization.

5,531,774

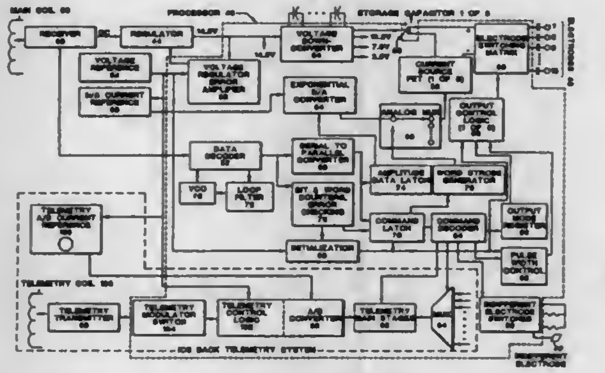
MULTICHANNEL IMPLANTABLE COCHLEAR STIMULATOR HAVING PROGRAMMABLE BIPOLAR, MONOPOLAR OR MULTIPOLAR ELECTRODE CONFIGURATIONS

Joseph H. Schulman, Santa Clarita; John C. Gord, Venice; Primoz Strojnik, Granada Hills; David I. Whitmoyer, Los Angeles, and James H. Wolfe, Canyon Country, all of Calif., assignors to Alfred E. Mann Foundation For Scientific Research, Sylmar, Calif.

Continuation-in-part of Ser. No. 23,584, Feb. 26, 1993, which is a continuation of Ser. No. 752,069, Aug. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 411,563, Sep. 22, 1989, abandoned. This application Oct. 12, 1994, Ser. No. 322,065

Int. Cl.^{6} A61N *1/36;1/32;* **H04R** *25/00*

U.S. Cl. 607—56 **16 Claims**



1. A multichannel implantable cochlear stimulator (ICS) for use with an external wearable processor (WP) system, said ICS comprising:

receiver means for receiving a data signal from the WP, the data signal comprising a series of data frames containing an end of frame signal, each data frame comprising a plurality of data words, each data word defining an amplitude for an output stimulation current for a different output channel of the ICS, and a command word for controlling a processor means in the ICS;

power supply means coupled to said receiver means for extracting a raw power signal from the data signal and generating a plurality of power signals therefrom that provide operating power to the ICS;

a multiplicity of output stages within said ICS, one for each of a multiplicity of output channels provided by said ICS, with each output stage having an "A" and a "B" stimulating electrode connected thereto;

indifferent electrode switch means within said ICS for connecting an indifferent electrode to each output stage;

processor means coupled to said receiver means, multiplicity of output stages, and power supply means for serially processing the plurality of data words and command word in each data frame received by the receiver means, said processor means comprising:

command detector means responsive to the command words for controlling the functions of the processor means, including setting an electrode configuration in each output stage of the ICS,

data word latching means for successively storing the data words,

switch means for successively generating and coupling a signal voltage representative of the output stimulation signal defined by the data word stored by the data word latching means to successive ones of the multiplicity of output stages; and wherein

each of the multiplicity of output stages is contained within the ICS, is powered by the power signals generated by the power supply means, and includes:

refresh voltage controller means for generating an isolated refresh voltage for the output channel,

a voltage controlled current source powered by the isolated refresh voltage controller means for amplitude controlling, in accordance with the signal voltages coupled from the switch means, an output stimulation current,

electronic switching matrix means responsive to the command detector means for configuring the "A" and "B" electrodes of each output stage, and the indifferent electrode, in a selected one of at least the following four electrode configurations: (1) bipolar stimulation, wherein the output stimulation current flows between the "A" and "B" electrodes of the output stage, (2) monopolar A stimulation, wherein the output stimulation current flows between the "A" electrode of the output stage and the indifferent electrode, (3) monopolar B stimulation, wherein the output stimulation current flows between the "B" electrode of the output stage and the indifferent electrode, and (4) multipolar stimulation, wherein the output stimulation current flows between the "A" or "B" electrode of one output stage and the "A" or "B" electrode of another output stage.

5,531,775

SKIN ATTACHMENT TYPE ELECTRIC THERMAL TREATMENT DEVICE

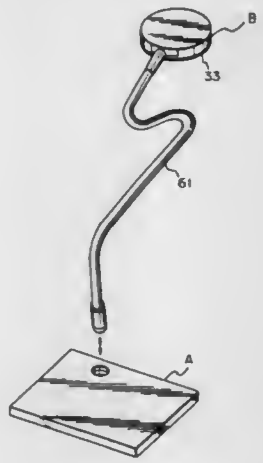
Minoru Sasaki, Yokohama, and Sinichirou Watanabe, Tokyo, both of, Japan, assignors to Kabushiki Kaisya Advance, Tokyo, Japan

Continuation of Ser. No. 3,486, Jan. 12, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 266,877

Claims priority, application Japan, Jul. 19, 1991, 3-84712 U

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—96 **4 Claims**



1. A skin attachment type electric thermal treatment device, comprising:

a heating unit including a capacitor charge storage means, a heating means that generates heat using current discharged from said capacitor, and an attaching means for attaching the device to the skin; and

a power supply unit for supplying charge to said capacitor of said heating unit;

said heating unit being electrically coupled with said power supply unit to receive a charge, then attached to the skin of a human body after decoupled from said power supply unit; and a control means comprising a switching device and a microcomputer, said control means controlling the temperature of said heating means by intermittently supplying current to said heating means.

5,531,776

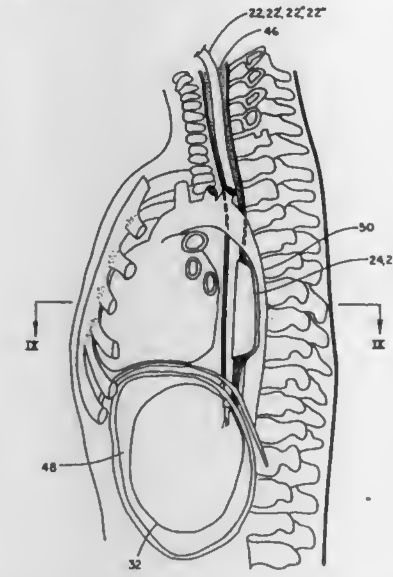
NON-INVASIVE AORTIC IMPINGEMENT AND CORE AND CEREBRAL TEMPERATURE MANIPULATION METHOD

Kevin R. Ward; Charles G. Brown, and Roger R. Dzwonczyk, all of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Continuation-in-part of Ser. No. 126,542, Sep. 24, 1993. This application Jun. 27, 1994, Ser. No. 266,201

Int. Cl.^{6} A61F *7/12*

U.S. Cl. 607—105 **32 Claims**



26. A non-invasive method of manipulating core and cerebral temperature of a patient, including:

positioning in the patient's esophagus a device having a heat transfer surface in a manner that said heat transfer surface is at the juxtaposition with a vessel through which blood is flowing; and

exchanging heat between said heat transfer surface and blood flowing through said vessel across said wall of said tube and a wall of said vessel.

5,531,777

HEAT AND COLD PACKS CONTAINING GARNET CRYSTALS

Karen L. Goldstein, and Kirby L. Mannon, both of 115 4th Ave. W., Kalispell, Mont. 59901

Filed Jan. 30, 1995, Ser. No. 380,582

Int. Cl.^{6} A61F *7/03*

U.S. Cl. 607—114 **13 Claims**

1. A composition for heat and cold packs comprising crystalline minerals which vibrate without decomposing when excited by heat to a temperature of 350° F., moisture-absorbing fibers, and temperature-retention solid particles.

5,531,778

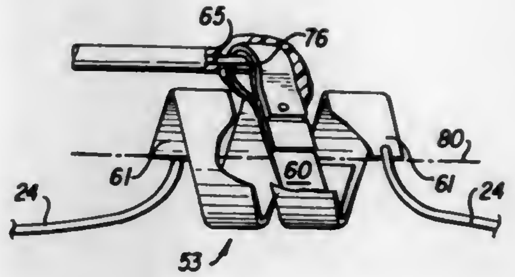
CIRCUMNEURAL ELECTRODE ASSEMBLY

Steven Maschino, Angleton, and Ross G. Baker, Jr., Houston, both of Tex., assignors to Cyberonics, Inc., Webster, Tex.

Filed Sep. 20, 1994, Ser. No. 308,978

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—118 **8 Claims**



1. An electrode assembly for a lead to be implanted on a patient's nerve, comprising:

a flexible electrically insulative carrier having a helical configuration with an inner surface, an outer surface and a longitudinal axis,

a flexible ribbon electrode secured to the inner surface of at least one segment of the helical configuration,

elongate conductor means for electrical connection to said ribbon electrode, said elongate conductor means having a proximal end, a distal end and a longitudinal axis, and

flexible conducting spacing means electrically connected to said ribbon electrode and to said elongate conductor means for separating said elongate conductor means from said helical configuration while maintaining electrical connection between said elongate conductor means and said ribbon electrode at said distal end with said distal end projecting directly and tangentially from a curved portion of said flexible conducting spacing means in a direction substantially parallel to the longitudinal axis of the helical configuration; wherein,

said flexible ribbon electrode occupies a single substantially complete turn of the helical configuration, and has an inner surface and an outer surface, and

said flexible conducting spacing means comprises a curved second ribbon conductor having an inner surface and an outer surface and tangentially connected to the outer surface of said flexible ribbon electrode along one of the inner and outer surfaces of said curved second ribbon conductor.

5,531,779

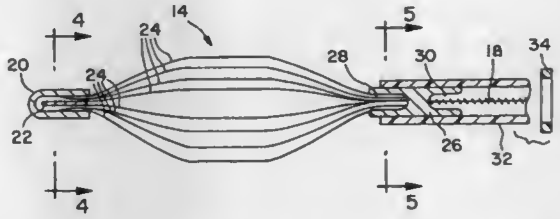
STENT-TYPE DEFIBRILLATION ELECTRODE STRUCTURES

Roger W. Dahl, Andover; Robert W. Wickham, deceased, late of Harris, both of Minn.; David K. Swanson, Roseville, Minn., and David Lipson, Poway, Calif., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 243,656, May 16, 1994, abandoned, which is a continuation of Ser. No. 955,166, Oct. 1, 1992, abandoned. This application Jan. 24, 1995, Ser. No. 377,494

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—119 **36 Claims**



1. In an apparatus for applying electrical therapy to a patient's heart for treatment of cardiac arrhythmias, including tachycardias and fibrillations, comprising pulse generator means for generating pulses, at least two electrode structures implantable within the patient's body, and means, electrically connecting the at least two electrode structures to the pulse generator means, for discharging electricity through the heart in response to pulses generated by the pulse generator means, the improvement wherein at least one of said electrode structures comprises an expandable electrically conducting intravascular stent for location in or adjacent the heart and providing substantially unimpeded blood flow therethrough when positioned in the vascular system, the stent comprising an array of substantially linear wire filaments and end members interconnect-

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1
JL
2
996
MI

ing the filaments at opposite ends thereof, the filaments being shaped into a radially compressible basket-like configuration.

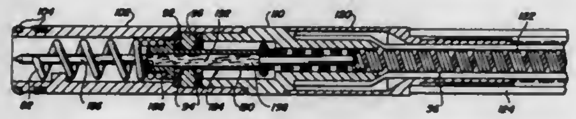
5,531,780
IMPLANTABLE STIMULATION LEAD HAVING AN ADVANCEABLE THERAPEUTIC DRUG DELIVERY SYSTEM

David J. Vachon, Granada Hills, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Division of Ser. No. 132,545, Oct. 6, 1993, Pat. No. 5,447,533, which is a continuation-in-part of Ser. No. 940,140, Sep. 3, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 268,701

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—120 **28 Claims**



1. An implantable pacing lead for use with a cardiac pacemaker, said pacing lead comprising:
an electrical conductor having a proximal end and a distal end;
an insulation sheath encasing said electrical conductor;
an electrical connector affixed to said proximal end of said conductor;
an active fixation electrode assembly affixed to said distal end of said conductor, said electrode assembly having a helical electrode capable of axial advancement outward relative to said distal end for penetrating into myocardial tissue; and
therapeutic delivery means for delivering a therapeutic compound, axially advanceable outward relative to said distal end along an axis of the helical electrode simultaneously with the advancing of said active fixation electrode assembly, said therapeutic delivery means comprising intrahelix means for penetrating myocardial tissue at a center of the helical electrode.

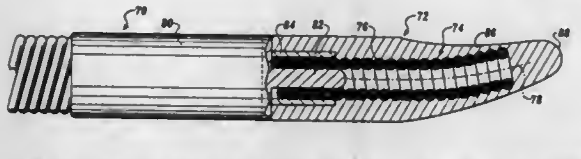
5,531,781
IMPLANTABLE LEAD HAVING A STEERING DISTAL GUIDE TIP

Clifton A. Alferness, 2022 235th Place NE., Redmond, Wash. 98053; John R. Helland, 2414 239th Place NE., Redmond, Wash. 98053, and Paul Kreyenhagen, 5508 160th Avenue NE., Redmond, Wash. 98052

Filed Nov. 2, 1993, Ser. No. 145,716

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—122 **58 Claims**



1. A lead for implantation within an artery or vein of a human heart, said lead including a lead body having a longitudinal hollow core defining a longitudinal center axis and dimensioned for receiving a styler during implantation, a distal end, and a proximal end, an electrode affixed to said lead body and coaxially disposed with respect to said longitudinal center axis on said lead body and a guide tip positioned at said distal end of said lead body and including a tip end, said guide tip including a tapered portion forming said tip end wherein only said tip end is offset in a direction from said lead body longitudinal center axis so that when said lead body is rotated about a stylet during implantation, said tapered portion of said guide tip serves to steer the distal end of said lead body.

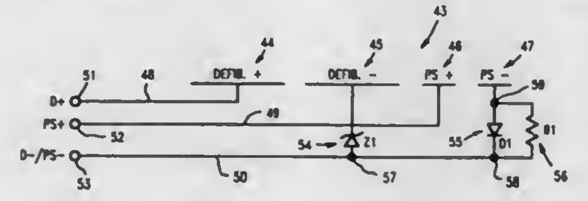
5,531,782
IMPLANTABLE MEDICAL ELECTRODE WITH REDUCED NUMBER OF CONDUCTORS

Mark W. Kroll, Minnetonka; Theodore P. Adams, Edina; Joseph S. Perttu, Chanhassen, and Charles Supino, Arden Hills, all of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Continuation of Ser. No. 991,132, Dec. 16, 1992, Pat. No. 5,325,870. This application May 9, 1994, Ser. No. 239,778

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—122 **3 Claims**



1. An implantable defibrillation electrode apparatus, comprising:
a. a flexible, elongated, non-conductive body structure for insulating and supporting lead members and electrode members, and for enabling conduction of defibrillation voltages of up to 750 volts;
b. a number "X" of electrode members, wherein X is at least 3, disposed on said body structure for electrical communication with the exterior environment, said electrode members including at least 2 defibrillation electrodes and at least 1 pace/sense electrode;
c. a number "X-Y" of lead members, wherein Y is a whole number at least equal to 1 and not greater than X-2, being disposed in said body structure, each said lead member being communicatively connected to at least one said electrode member and extending therefrom to a predetermined point on said body structure, and wherein each said electrode member is connected to at least one said lead member and at least one said lead member is connected to more than one said electrode member; and
d. solid state means, connected along at least one said lead member, for controlling electrical pace/sense and defibrillation communication between said lead members and said electrode members.

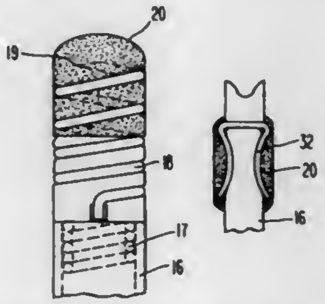
5,531,783
PACING LEAD WITH X-RAY VISIBLE SOLUBLE COVERING AND METHOD OF INSERTING SAME INTO A PATIENT'S HEART

Vincent Giele, Dieren, Netherlands, and Marc Berkhof, Kapellen, Belgium, assignors to Vitatron Medical, B.V., Dieren, Netherlands

Filed Jan. 17, 1995, Ser. No. 372,971

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—126 **12 Claims**



1. An implantable lead having a distal end and an electrode near said distal end, a proximal end, a flexible length between said distal and proximal ends, and a conductor connecting said proximal end and said electrode, said lead having a fixation element at about said distal end for effecting fixation to body tissue at a selected location in a patient, and a covering over at least a portion of said fixation element to facilitate insertion of said lead to a point where said fixation element is proximate to said location, said covering being soluble in body fluids and having dissolving characteristics selected so that it dissolves only after being in said body fluids for at least a predetermined time, whereby said covering maintains its structural integrity for at least said predetermined time after being inserted into the patient, said covering having a radiopaque material within at least a portion thereof to provide an x-ray visible target until said covering dissolves but not thereafter, whereby it can be determined when said covering has dissolved by monitoring said lead distal end with x-ray equipment.

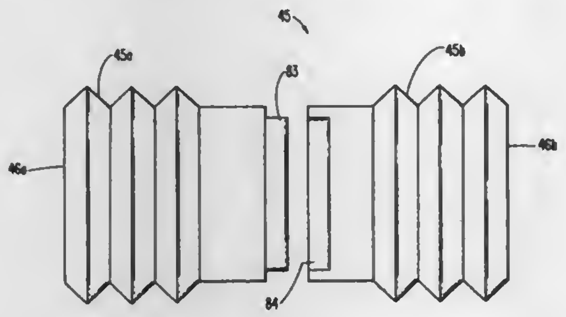
5,531,784
TEST DEVICE FOR AND METHOD OF TESTING RAPID ASSEMBLY TISSUE HEART VALVE

Charles S. Love, Camarillo; Jack W. Love, Santa Barbara, and John H. Calvin, Carpenteria, all of Calif., assignors to Autogenics, Newbury Park, Calif.

Continuation of Ser. No. 925,586, Aug. 3, 1992, abandoned, which is a division of Ser. No. 646,001, Jan. 24, 1991, Pat. No. 5,163,955. This application Mar. 10, 1994, Ser. No. 209,598

Int. Cl.^{6} A61F *2/24*; G01M *3/02*

U.S. Cl. 623—2 **1 Claim**



1. A tester for rapidly testing a tissue heart valve comprising:
a chamber made of a material which allows the user of the chamber to visually inspect the sides and top-end view of a mounted heart valve;
a plurality of size-specific mounts for mounting the valve within the chamber; and
means coupled to the chamber for displacing a volume of solution through the valve in a primary direction of blood flow to test both the opening and closing of the valve and to determine the amount of leakage through the valve when said valve is in a closed position, wherein said displacing means comprises a double bellows arrangement in which one side of said double bellows applies pressure across said valve in an opposite direction to the primary direction of blood flow after a volume of saline solution has been displaced through said valve.

5,531,785
PROSTHETIC HEART VALVE HOLDER

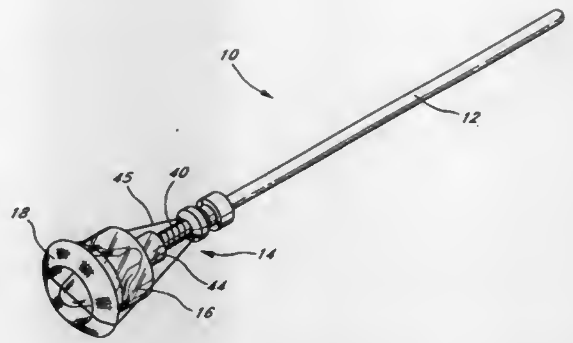
Jack W. Love, Santa Barbara; Charles S. Love, Newbury Park; Philip J. Hudak, Burbank, and Robert W. Suggitt, Newbury Park, all of Calif., assignors to Autogenics, Inc., Newbury Park, Calif.

Filed May 6, 1994, Ser. No. 239,345

Int. Cl.^{6} A61F *2/24*; A61B *17/00*

U.S. Cl. 623—2 **16 Claims**

1. A valve holder for holding a prosthetic heart valve having an inflow portion and an outflow portion so that the valve is (i) accurately positioned at an annulus of a patient's heart remaining after removal of a patient's diseased heart valve, (ii) temporarily held in place without substantially obstructing the valve while a surgeon or technician attaches the valve within the patient's heart while said valve is temporarily held in place by the bolder, and (iii) quickly and easily removed after the prosthetic heart valve has been permanently attached at said annulus, said valve holder comprising:
a cup shaped retainer defining an inner cavity, said retainer having an open receiving end configured to accept said outflow portion of said prosthetic heart valve within said cavity;
a valve capture loop assembly comprising a base, a loop of suture attached to said base, and a spring for biasing said base and its attached loop of suture; and
a rod member inserted through said base and said spring and attached to said cup shaped retainer opposite its open receiving end, said rod member serving (i) as a handle for the surgeon or technician attaching said valve, (ii) for slidably mounting said base member, and (iii) for retaining said spring between said cup shaped retainer and said base of said valve capture loop assembly;
said holder configured to capture said prosthetic heart valve to the holder with said loop of suture so that (i) only a very minimal area of said valve is obstructed when said valve is held in place within said patient's heart, and (ii) configured such that said prosthetic heart valve is very easily removed from said holder after its attachment within said heart by simply cutting said loop of suture to completely release said prosthetic heart valve from said holder.



5,531,786
MEDICAL PROTHESES CONTAINING A GEL-FILLER COMPRISING PRINCIPALLY WATER AND CELLULOSE DERIVATIVE

Larry C. Perry, 3333 Country Ridge Dr., Antioch, Tenn. 37013, and G. Patrick Maxwell, 4416 Gerald Pl., Nashville, Tenn. 37205

Continuation-in-part of Ser. No. 867,417, Apr. 13, 1992, Pat. No. 5,282,857. This application Jan. 28, 1994, Ser. No. 188,107

The portion of the term of this patent subsequent to Apr. 13, 2012, has been disclaimed.

Int. Cl.^{6} A61F *2/12*

U.S. Cl. 623—8 **22 Claims**

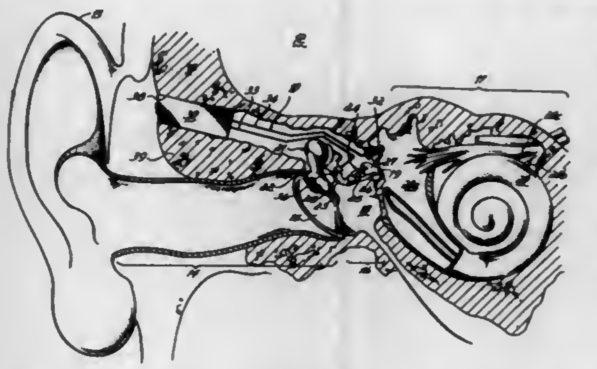
1. A sealed implantable prosthesis for implantation into soft tissue for replacing or augmenting the tissues, comprising an outer envelope forming a hollow sealed shell defining an enclosed volume, the hollow shell being made from a biocompatible medical-grade elastomer suitable for implantation into a human body and being filled with a gel filler with a predetermined density to provide a feel simulating the characteristic of the corresponding tissue part, wherein the gel filler of said predetermined density is obtained from a colloidal mixture of water and a cellulose derivative selected from the group consisting of an alkylcellulose, a hydroxyalkylcellulose, a hydroxyalkyl alkylcellulose, a metal carboxyalkylcellulose, a metal carboxyalkyl hydroxyalkylcellulose, a cross-linked cellulose derivative, and mixtures of two or more thereof, provided that the gel filler is free of polyethyleneoxide,

wherein the gel filler is retained in the sealed shell to maintain constant its determined density.

5,531,787
IMPLANTABLE AUDITORY SYSTEM WITH MICROMACHINED MICROSENSOR AND MICROACTUATOR

S. George Lesinski, 324 Bishopsbridge Dr., Cincinnati, Ohio 45255, and H. Thurman Henderson, 4010 Clifton Ave., Cincinnati, Ohio 45220

Filed Jan. 25, 1993, Ser. No. 8,663
Int. Cl.^{6} A61F *2/18;* A61N *1/08;* H04R *25/00*
U.S. Cl. 623—10 30 Claims



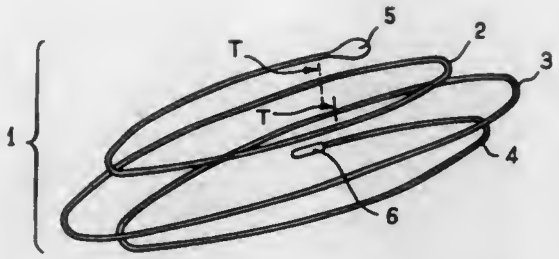
1. An implantable auditory system for a human subject having an ear drum, a middle ear, an inner ear with fluid therein and an ossicular chain of bones spanning the middle ear from the ear drum to the inner ear, the human subject further having auditory nerve fibers which sense vibrations of the inner ear fluid and signal the brain of the human subject to perceive the sensed signals as sound, the system comprising:
- a microsensor implantable in the middle ear of the human subject, the microsensor responsive to sound waves in the middle ear to convert said sound waves into electrical signals corresponding to said sound waves;
- a processor operatively connected to the microsensor to receive the electric signals from the microsensor and to generate processed signals in response thereto, the processor being subcutaneously implantable in the human subject and including a battery to supply electrical power to the system; and
- a microactuator implantable in the middle ear and operatively connected to the processor, the microactuator including a first plate and a flexible diaphragm substantially parallel to and spaced from the first plate, the first plate receiving the processed signals and generating electrostatic forces which vibrate the flexible diaphragm, and the vibrations of the flexible diaphragm are transmitted to the fluid of the inner ear, thereby to actuate the auditory nerve fibers which signal the brain of the human subject to perceive the fluid vibrations as sound.

5,531,788
ANTI-PULMONARY EMBOLISM FILTER

Alain Dible, Paris, and Dominique Musset, Rueil, both of, France, assignors to Foundation pour l'Avenir pour la Recherche Medicale Appliquee, Paris, and Association pour la Recherche en Imagerie de l'Hopital Antoine Beclere, Clamart, both of, France

Continuation of Ser. No. 844,617, Apr. 9, 1992, abandoned.
This application May 2, 1994, Ser. No. 239,831
Claims priority, application France, Dec. 14, 1989, 89 16538; Oct. 9, 1990, 89 13160
Int. Cl.^{6} A61F *2/02;* A61B *17/08;* A61M *29/00*
U.S. Cl. 623—11 27 Claims

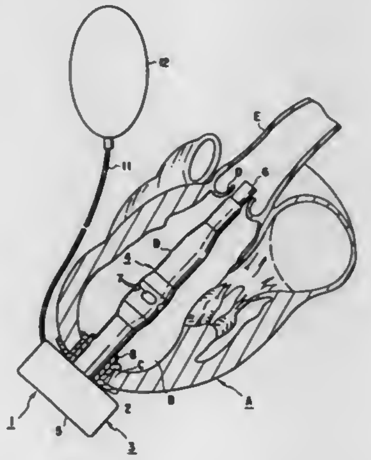
1. An anti-embolism filter for implanting in a vena cava comprising a rectilinear resilient wire having a remanent spring effect shaped into a spiral structure comprising three substantially circular non-touching coaxial turns formed of a middle turn and two lateral turns, with the two lateral turns having at least substantially equal diameters, while the middle turn has a diameter greater than the diameter of each of the two lateral turns, said diameter of the middle turn being greater than 16 mm so as to be about one-half a circumference of the vena cava in a zone where the filter is to be implanted in order to ensure that the filter is optimally held in place by flattening of the vena cava when said filter is implanted in said vena cava with its axis perpendicular to the axis of said vena cava, wherein each of a proximal end and a distal end of the filter are provided with a radio-opaque element and, when implanted in the vena cava, the filter retains any clot migrating with the blood before said clot penetrates into the heart to avoid pulmonary embolism while allowing free flowing of the fluid blood in the vena cava.



5,531,789
SEALING SYSTEM OF AN ARTIFICIAL INTERNAL ORGAN

Kenji Yamazaki, Koganei, and Toshio Mori, Chino, both of, Japan, assignors to Sun Medical Technology Research Corporation, Nagano-ken, Japan

Filed Dec. 21, 1994, Ser. No. 360,411
Claims priority, application Japan, Dec. 24, 1993, 5-354938; Feb. 9, 1994, 6-050040; Apr. 11, 1994, 6-107367
Int. Cl.^{6} A61M *1/12*
U.S. Cl. 623—12 5 Claims



1. An artificial internal organ comprising:
- a pump unit through which blood circulates, a driving unit for driving the pump unit, a driving shaft connecting the driving unit and the pump unit to each other, and driving shaft-sealing means for preventing the blood from flowing from the pump unit into the driving unit,

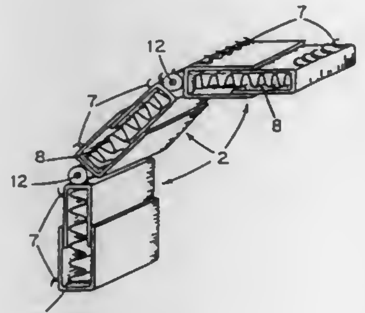
said driving shaft-sealing means including:
- a sealing member for sealing an outer circumference of the driving shaft;
- a sealing solution chamber defined between the sealing member and the driving unit and surrounding the driving shaft, said sealing solution chamber being filled with a sealing solution;
- a sealing solution bag containing the sealing solution and communicating with the sealing solution chamber by way of a supply tube and a return tube; and
- a unidirectional dynamic pressure bearing for rotatably supporting the driving shaft, said unidirectional dynamic pressure bearing including a rotor side member and a stator side member which are arranged in the sealing solution chamber and are slidable relative to each other, said sealing solution in the sealing solution chamber being supplied to the sealing member through a region defined between sliding surfaces of the rotor and stator side member, thereby circulating the sealing solution between the sealing solution bag and the sealing solution chamber,

said sealing solution containing a protease or an aminopeptide or both.

5,531,790
DEVICE FOR EXTENDING LIVING TISSUE

Patrick Frechet, 92, Avenue Mozart, 75016 Paris; Georges Fraisse, Saint Laurent du Var, and Guy Charvin, Antibes, all of, France, assignors to MXM, Antibes, and Patrick Frechet, Paris, both of, France

PCT No. PCT/FR93/00441, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/21849, PCT Pub. Date Nov. 11, 1993
PCT Filed May 7, 1993, Ser. No. 244,508
Claims priority, application France, May 7, 1992, 92 05893
Int. Cl.^{6} A61F *2/10*
U.S. Cl. 623—15 2 Claims



1. A device for extending living tissue having a deep fibrous layer, the device surgically implantable under the living tissue, the device comprising at least one resilient means and at least two fastening means, each fastening means coupled to a respective end of the resilient means, whose outside dimensions, in its active position, are such that a portion of its perimeter corresponds substantially to and is supported with edges of an area of tissue to be treated, wherein said resilient means is constituted by an envelope made up of two hollow cylindrical pieces that are open at least one end that slide one in the other, a compressible spring system being placed therein and tending to move said pieces apart to a position of maximum separation limited by an abutment system, the fastening means being fixable to the rigid fibrous layer near the edges of the tissue, which ends of the resilient means are opposite to each other in the direction of active resilience of said resilient means.

5,531,791
COMPOSITION FOR REPAIR OF DEFECTS IN OSSEOUS TISSUES, METHOD OF MAKING, AND PROSTHESIS

Lloyd Wolfinbarger, Jr., Norfolk, Va., assignor to Bioscience Consultants, Norfolk, Va.

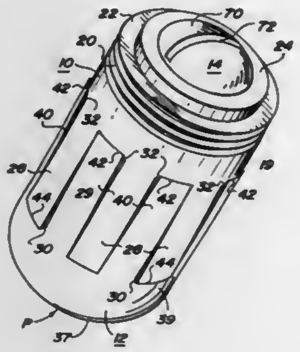
Filed Jul. 23, 1993, Ser. No. 95,020
Int. Cl.^{6} A61F *2/28;* A61K *35/32;37/12*
U.S. Cl. 623—16 27 Claims

1. A non-immunogenic composition for the promotion of allogenic bone growth and repair in an individual, comprising:
- demineralized human bone powder, and
- type-I telopeptide containing human collagen.

5,531,792
BONE PLUG FIXATION ASSEMBLY, EXPANSIBLE PLUG ASSEMBLY THEREFOR, AND METHOD OF FIXATION

Donald R. Huene, 201 N. Valeria, Fresno, Calif. 93701

Filed Jun. 14, 1994, Ser. No. 261,111
Int. Cl.^{6} A61F *2/08;2/28*
U.S. Cl. 623—16 17 Claims



1. An expansible bone plug assembly, comprising:
- a) a first member closed by a substantially planar surface at one end thereof and having a cylindrical outer surface, a central bore through said planar surface and a plurality of longitudinally directed radially extendable fingers;
- b) a second member closed by a hemispherical surface at one end thereof and having a cylindrical outer surface, and a plurality of longitudinally directed radially extendable fingers, said second member fingers being interdigitated with said first member fingers and bearing against said first member and said first member fingers bearing against said second member;
- c) an axially extensible and retractable compression member extending through said bore and engaged with said second member and causing said first and second members to be drawn together when said compression member is retracted so that said fingers of said first and second members are thereby caused to extend radially outwardly; and
- d) threads extend about said first member one end for threaded engagement with a manipulator, said threads being radially inwardly spaced relative to said first member outer surface.

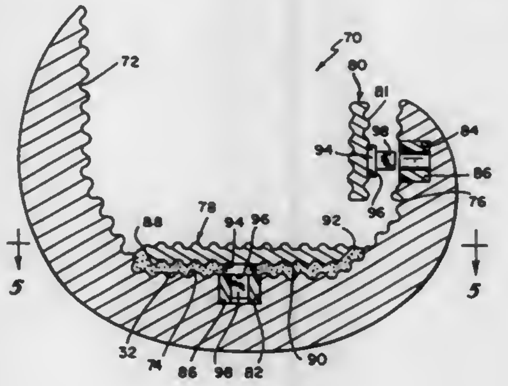
5,531,793
ORTHOPEDIC IMPLANT AUGMENTATION AND STABILIZATION DEVICE

David C. Kelman, Winona Lake; Donald E. McNulty, and Daniel L. Anderson, both of Warsaw, all of Ind., assignors to DePuy Inc., Warsaw, Ind.

Division of Ser. No. 952,921, Sep. 28, 1992, Pat. No. 5,370,693. This application Aug. 25, 1994, Ser. No. 295,936

Int. Cl.^{6} A61F *2/28;2/38*

U.S. Cl. 623—16 **7 Claims**



1. A prothesis for replacing a bone surface, the prosthesis comprising:

an implant having a surface for abutting a bone, the surface of the implant being formed to include an aperture therein;

an augment configured to be inserted between the bone surface and the surface of the implant to compensate for bone loss, said augment including an implant facing surface and a peg coupled to said implant facing surface;

a plastic retaining ring located in the aperture formed in the surface of the implant; and

the peg coupled to the augment, the peg being configured to be inserted into the aperture and to engage the plastic retaining ring for retaining the augment in a fixed spaced apart relation relative to the implant such that there is a gap between the implant facing surface and the surface of the implant.

5,531,794
CERAMIC DEVICE PROVIDING AN ENVIRONMENT FOR THE PROMOTION AND FORMATION OF NEW BONE

Shigehide Takagi, Tokyo; Kuniomi Ito, Tochigi-ken, and Tsuneo Hidaka, Tokyo, all of, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

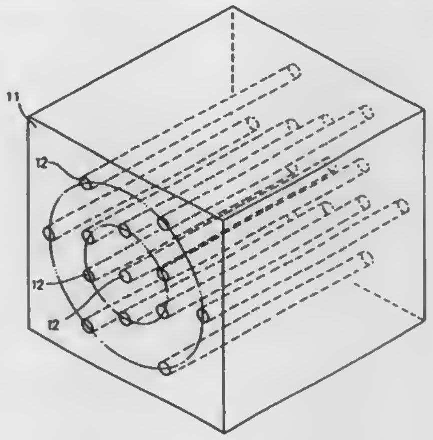
Filed Sep. 13, 1994, Ser. No. 305,440

Claims priority, application Japan, Sep. 13, 1993, 5-227127

Int. Cl.^{6} A61F *2/28*

U.S. Cl. 623—16 **6 Claims**

1. A ceramic device providing an environment for promotion and formation of new bone, wherein said ceramic device is made of a sinter of calcium phosphate compound, containing a plurality of perfect spherical pores whose diameters are in a ranger of 10–450 μm to provide said environment for formation of a new bone, and a plurality of micro pores whose diameters are in a range 0.01–0.5 μm, which surround said perfect spherical pores to connect said perfect spherical pores with an outer surface of said ceramic device, wherein said micro pores interconnect with each other.



CHEMICAL

5,531,795
METHOD FOR CASEIN FINISHING OF LEATHER

Lars Rasmussen, Allerød; Annette Møligaard, Hellerup; Bent R. Petersen, København, and Niels H. Sørensen, Skævinge, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK93/00412, § 371 Date Jul. 10, 1995, § 102(e) Date Jul. 10, 1995, PCT Pub. No. WO94/13839, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 8, 1993, Ser. No. 432,152

Claims priority, application Denmark, Dec. 10, 1992, 1484/92

Int. Cl.^{6} C14C *11/00*

U.S. Cl. 8—94.21 **4 Claims**

1. A method for casein finishing of a leather, comprising

(a) adding a transglutaminase to a solution which comprises a casein or a partially decomposed casein to form a gel;

(b) coating the leather with said gel to form a finished leather; and

(c) drying the finished leather.

5,531,796
PROCESS FOR DESIZING AND COLOR FADING GARMENTS

Eric Wasinger, Applegate Apartments, 5100 Mira Mesa, Apt. 1413, San Antonio, Tex. 78240, and David Hall, Auburn, Ala., assignors to Eric Wasinger, San Antonio, Tex.

Continuation-in-part of Ser. No. 895,920, Jun. 9, 1992, Pat. No. 5,366,510. This application Oct. 18, 1993, Ser. No. 137,369

Int. Cl.^{6} D06L *3/00*

U.S. Cl. 8—102 **13 Claims**

1. A method of simultaneously desizing and decolorizing a wetted fabric or garment having a sizing agent and a reducible coloring agent which comprises treating said fabric or garment with an effective amount of a reducing gas or a reducing vapor to provide a reductive gaseous phase or a reductive vaporous phase where in the fabric or garment is both desized and decolorized.

5,531,797
AQUEOUS DYE PREPARATIONS CONTAINING COUMARIN DYES

Rudolf Bermes, and Walter Breitschaft, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

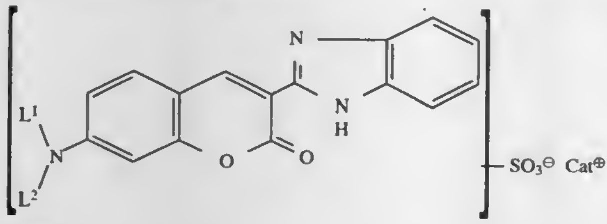
Filed Mar. 6, 1995, Ser. No. 398,767

Claims priority, application Germany, Mar. 7, 1994, 44 07 496.4

Int. Cl.^{6} D06P *3/60;1/40;* **C09B** *7/02*

U.S. Cl. 8—648 **9 Claims**

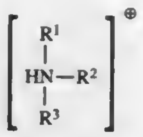
1. An aqueous paper stock dye preparation comprising a paper stock obtained from a paper pulp and from 0.01 to 1.5% by weight of a coumarin dye of the formula 1



(I)

where

L^1 and L^2, independently of one another, are each C_1–C_4-alkyl and Cat$^\oplus$ is an alkali metal ion or an ammonium ion of the formula



$$\left[HN(R^1)(R^2)(R^3) \right]^{\oplus}$$

where R^1, R^2 and R^3, independently of one another, are each hydrogen, C_1–C_4-alkyl or C_2–C_4-hydroxyalkyl, based on the weight of dry paper pulp and pure dye, and an amount of water sufficient to dissolve said dye.

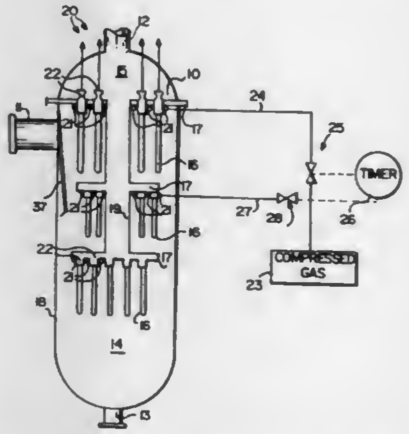
5,531,798
ELIMINATING ASH BRIDGING IN CERAMIC FILTERS

Folke Engström, Kotka, and Juhani Isaksson, Karhula, both of, Finland, assignors to Foster Wheeler Energia Oy, Karhula, Finland

Filed May 26, 1994, Ser. No. 249,216

Int. Cl.^{6} C10J *3/84;* **B01D** *46/04*

U.S. Cl. 48—77 **23 Claims**



1. A method of operating a pressurized gas filtering system comprising a plurality of filtering elements having a first side for contact with particle laden gas, and a second side through which filtered gas passes, and mounted by or adjacent supporting and surrounding surfaces; said method comprising the steps of:

(a) substantially continuously introducing superatmospheric pressure particle laden gas into contact with the first side of the filtering elements so that the gas passes through the filtering elements, and the filtering elements remove particles therefrom;

(b) withdrawing filtered gas from the second side of the filtering elements; and

(c) while practicing step (a), at spaced points in time automatically cleaning the supporting and surrounding surfaces of filtering elements to prevent buildup of particles on at least one of the supporting and surrounding surfaces that would adversely act upon the filtering elements.

5,531,799
CERAMIC CORUNDUM ABRASIVE

Eckhard Wagner, Elmshorn; Günter Becker, Hamburg, and Günter Bartels, Reinbek, all of, Germany, assignors to Hermes Schleifmittel GmbH & Co, Hamburg, Germany

Filed Apr. 28, 1994, Ser. No. 234,222

Claims priority, application European Pat. Off., Apr. 30, 1993, 93107085

Int. Cl.^{6} B24D *3/24*

U.S. Cl. 51—309 **18 Claims**

1. In a sintered abrasive material based on ceramic corundum of polycrystalline structure obtained by the sol gel process, the improvement wherein the polycrystalline structure contains therein at least 0.01% by weight of tin calculated as tin oxide.

5,531,800

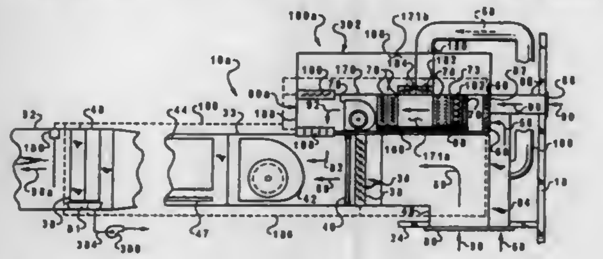
LIQUID SPRAY AIR PURIFICATION AND CONTROLLED HUMIDIFICATION APPARATUS

Frederic D. Sewell, 9644 Rocky Branch Dr., Dallas, Tex. 75243, and Barry D. Jones, 14 Flourite Ct., Little Rock, Ark. 77212

Continuation-in-part of Ser. No. 192,988, Feb. 8, 1994, Pat. No. 5,389,120. This application Jan. 5, 1995, Ser. No. 368,845

Int. Cl.^{6} B01D *47/06*

U.S. Cl. 55—223 **26 Claims**



1. An air handling unit comprising:
a housing having an inlet opening, an outlet opening, and an internal flow path extending between said inlet opening and said outlet opening;
blower means for sequentially flowing air inwardly through said inlet opening, through said internal flow path, and outwardly through said outlet opening;
air purification means, positioned in said internal flow path, for receiving pressurized liquid from a source thereof, creating a spray from the received liquid, using the spray to purify air traversing said internal flow path, and then permitting the sprayed liquid to drain therefrom;
sump means for holding a supply of liquid to be operatively supplied to said air purification means, and for receiving liquid draining from said air purification means;
filter means having therein a filtering flow path through which liquid may be forced to trap pollutants from the liquid, and a backwashing flow path through which liquid may be forced to cleanse said filter means of trapped pollutants;
a pump having an inlet communicatable with liquid in said sump means, and an outlet;
conduit means interconnecting said pump outlet with said filtering flow path and said backwashing flow path, and said filtering flow path with said air purification means,
switching means coupled with said conduit means and being selectively operative in a first mode to cause sump liquid discharged from said pump to be forced through said filtering flow path to said air purification means, or in a second mode to cause sump liquid discharged from said pump to be forced through said backwashing flow path; and
first monitoring means for detecting a change in an apparatus operating parameter, indicative of a predetermined lessening in the filtration efficiency of said filter means, and temporarily changing said switching means from said first mode thereof to said second mode thereof.

5,531,801

LIQUID SPRAY AIR PURIFICATION AND CONTROLLED HUMIDIFICATION APPARATUS WITH AIR QUALITY MONITOR AND CONTROLLER

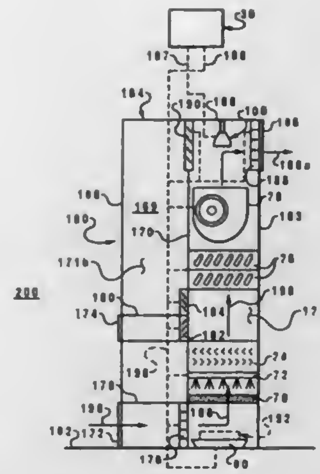
Frederic D. Sewell, 9644 Rocky Branch Dr., Dallas, Tex. 75243, and Barry D. Jones, 14 Flourite Ct., Little Rock, Ark. 72212

Continuation-in-part of Ser. No. 368,845, Jan. 5, 1995, which is a continuation-in-part of Ser. No. 192,988, Feb. 8, 1994, Pat. No. 5,389,120. This application Sep. 28, 1995, Ser. No. 535,740

Int. Cl.^{6} B01D *47/06*

U.S. Cl. 55—223 **27 Claims**

22. An air handling unit comprising:
a housing having an inlet opening, an outlet opening, and an internal flow path extending between said inlet opening and said outlet opening;



blower means for sequentially flowing air inwardly through said inlet opening, through said internal flow path, and outwardly through said outlet opening;
air purification means, positioned in said internal flow path, for receiving pressurized liquid from a source thereof, creating a spray from the received liquid, using the spray to purify air traversing said internal flow path, and then permitting the sprayed liquid to drain therefrom;
sump means for holding a supply of liquid to be operatively supplied to said air purification means, and for receiving liquid draining from said air purification means;
filter means having therein a filtering flow path through which liquid may be forced to trap pollutants from the liquid, and a backwashing flow path through which liquid may be forced to cleanse said filter means of trapped pollutants;
a pump having an inlet communicatable with liquid in said sump means, and an outlet;
conduit means interconnecting said pump outlet with said filtering flow path and said backwashing flow path, and said filtering flow path with said air purification means,
switching means coupled with said conduit means and being selectively operative in a first mode to cause sump liquid discharged from said pump to be forced through said filtering flow path to said air purification means, or in a second mode to cause sump liquid discharged from said pump to be forced through said backwashing flow path;
first monitoring means for detecting a change in an apparatus operating parameter, indicative of a predetermined lessening in the filtration efficiency of said filter means, and temporarily changing said switching means from said first mode thereof to said second mode thereof; and
second monitoring means for detecting a change in selected environmental operating parameters and responsively controlling the operation of said air handling unit and said air purification means to maintain said selected environmental operating parameters within predetermined ranges therefor, said second monitoring means including:
multi-parameter sensing means for sensing the level of at least one pollutant in air discharged from said air handling unit and responsively generating a sensed parameter signal, and
air quality monitor and controller means, interconnected between (1) said multi-parameter sensing means and (2) said air handling unit and said air purification means, for receiving said sensed parameter signal and responsively generating system output control signals operative to regulate the operation of said air handling unit and said air purification means.

5,531,802

SUCTION DEVICE WITH A FILTER INSERT IN THE SUCTION LINE

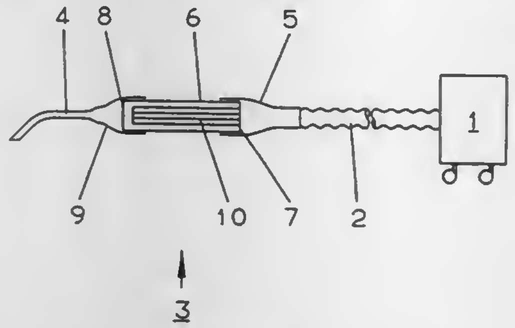
Georg Schlör, Lübeck; Hans-Karsten Reimers, Hamberge; Dietrich Vosberg, Lübeck, and Holmer Röhling, Reinfeld, all of, Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Germany

Filed May 2, 1994, Ser. No. 236,455

Claims priority, application Germany, May 29, 1993, 43 18 021.3

Int. Cl.^{6} B01D *46/24*

U.S. Cl. 55—274 **19 Claims**



1. A suction device comprising:
a suction line;
a substantially cylindrical sleeve with end openings;
an upstream side connecting piece and a downstream side connecting piece supporting said cylindrical sleeve in a suction-tight manner adjacent said end openings, said cylindrical sleeve being provided in said suction line;
a rod-shaped perforated support tube connected to said downstream connecting piece; and
a substantially cylindrical folded filter having a nonpermeable front surface aligned in a direction of flow, said cylindrical folded filter being attached to said perforated support tube whereby ambient air is drawn into said support tube radially from outside, through said filter whereby said filter separates harmful substances from ambient air;
a suction snorkel positioned on said upstream connecting piece.

5,531,803

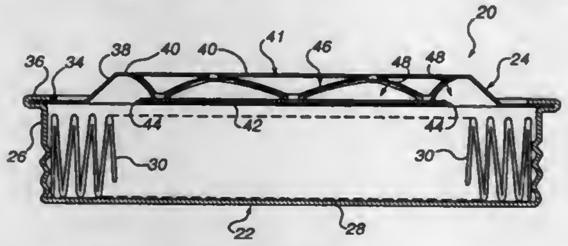
METAL COVER FOR RESPIRATOR CARTRIDGE

Thomas M. Salapow, Pittsburgh; Roger P. Wolf, Butler; Thomas J. Scanlo, Verona, and John F. Kuhn, Wexford, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Oct. 21, 1994, Ser. No. 327,198

Int. Cl.^{6} B01D *46/00*

U.S. Cl. 55—498 **16 Claims**



1. A metal respirator cartridge including:
a metal cartridge body having a threaded peripheral wall and a perforated bottom wall;
a filter disposed within said metal cartridge body;
a unitary metal cover formed from a flat sheet of metal and connected to said metal cartridge body, said metal cover comprising:
a central opening having an annular rim;
a top wall having an outer edge spaced apart from said annular rim;
an air inlet opening presented between said outer edge of said top wall and said rim; and
a support connecting said top wall to said annular rim and keeping said top wall at a level between said annular rim and said filter.

5,531,804

PLUNGER ASSEMBLY ADAPTER

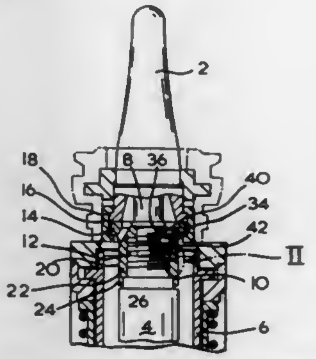
Vladimir Vajda, Nussbaumen, Switzerland, assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Feb. 22, 1995, Ser. No. 392,432

Claims priority, application United Kingdom, Feb. 24, 1994, 9403559

Int. Cl.^{6} C03B *11/06*

U.S. Cl. 65—362 **4 Claims**



1. A plunger adapter for use in securing a plunger assembly to a screw threaded upper end portion of a piston rod in a parison forming mechanism in a glassware forming machine comprising
a sleeve having a wall portion with an
outer cylindrical surface and an internal threaded bore adapted to screw onto the upper end portion of said piston rod
two segmental slots in the wall portion one of which overlies the other, each slot extending from the outer surface of said sleeve to the internal threaded bore, said slots thus providing a strip of the wall portion with inwardly facing threads which strip is supported only at spaced end portions thereof
a screw threaded locking bore in the wall portion opening into one of the slots
screw means in said locking bore adapted on tightening to bear on the strip, thus to deflect it and provide a locking action between the strip and the upper end portion of the piston rod.

5,531,805

SMELTING FERROUS MATERIALS

Howard K. Worner, Wollongong, Australia, assignor to The Illawarra Technology Corporation Limited, New South Wales, Australia

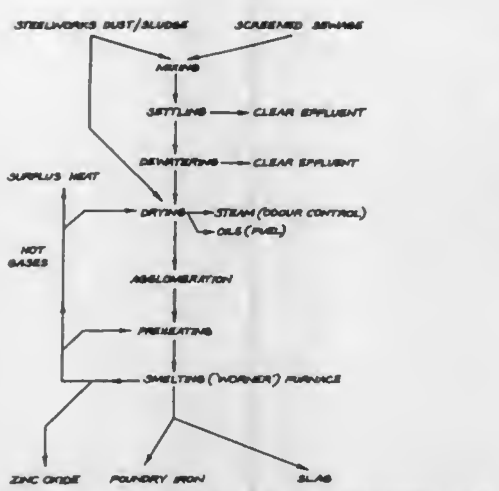
Continuation-in-part of Ser. No. 916,983, Aug. 13, 1992, Pat. No. 5,364,441. This application Oct. 4, 1994, Ser. No. 317,857

Claims priority, application Australia, Feb. 13, 1990, PJ8617; May 9, 1994, PM7925

Int. Cl.^{6} C21B *11/10*

U.S. Cl. 75—10.63 **19 Claims**

1. A method of smelting in a continuous process, comprising intimately mixing ferrous material in particulate form with a mixture of a high reactivity carbonaceous material and a low reactivity carbonaceous material in particulate form, and wherein the low reactivity carbonaceous material is at least 5% by weight of the mixture forming a pelletised feedstock from an agglomeration of the ferrous material, the pelletised feedstock tolerating as minor components non-ferrous metal values, and carbonaceous material, said carbonaceous material having at least 5% by weight low reactivity form carbon, supplying the feedstock to an electric arc bath smelting furnace, with counter flow of slag and metal configured to operate in a counterflow of slag and metal fashion, and

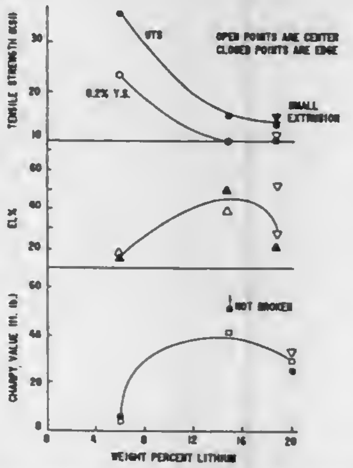


operating the furnace to maintain an iron bath temperature of at least about 1420° C. and to use the carbonaceous material to reduce iron compounds in the feedstock, to provide a source of fuel for maintaining the selected elevated temperature in the furnace and to carburise molten iron in the bath, and processing of gases from the reduction furnace to retrieve any metal values in the off-gas, the pelletized feedstock being supplied to the furnace in a controlled manner and the high reactivity form carbonaceous material in the pelletised feedstock being a sufficient proportion to maintain an iron bath temperature of at least about 1420° C. and the proportion of low reactivity carbonaceous material in the pelletised feedstock being sufficient to carburise the iron.

5,531,806
MAGNESIUM-LITHIUM ALLOYS OF HIGH TOUGHNESS
Donald Webster, Saratoga, Calif., assignor to Comalco Aluminium Limited, Melbourne, Australia

Division of Ser. No. 76,117, Jun. 14, 1993, Pat. No. 5,422,066, which is a continuation-in-part of Ser. No. 946,245, Sep. 17, 1992, abandoned, and Ser. No. 771,907, Oct. 4, 1991, Pat. No. 5,320,803, which is a continuation-in-part of Ser. No. 328,364, Mar. 24, 1989, Pat. No. 5,085,830, said Ser. No. 946,245is a continuation-in-part of Ser. No. 328,364. This application Apr. 19, 1995, Ser. No. 424,794
Int. Cl.^{6} C22B ***26/00***

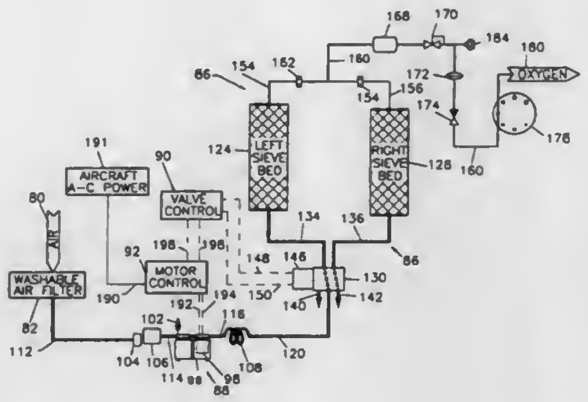
U.S. Cl. 75—594 **9 Claims**



1. A process for making a high strength, high toughness magnesium alloy comprising the steps of preparing a melt comprised of magnesium and lithium metals including a total of more than 5 ppm of alkali metal impurities selected from the group consisting of sodium, potassium, rubidium and cesium; and reducing the alkali metal impurities by vacuum refining so that the total concentration of said alkali metal impurities in the alloy is less than about 5 ppm.

5,531,807
APPARATUS AND METHOD FOR SUPPLYING OXYGEN TO PASSENGERS ON BOARD AIRCRAFT
Norman R. McCombs, Tonawanda, N.Y., assignor to AirSep Corporation, Buffalo, N.Y.
Filed Nov. 30, 1994, Ser. No. 347,808
Int. Cl.^{6} B01D ***53/47***

U.S. Cl. 95—26 **20 Claims**



1. A method for on-board supply of oxygen in an aircraft having a source of electrical power thereon wherein a PSA unit including a pair of beds of molecular sieve material is located in a housing having a shape and size allowing it to be positioned under a seat on the aircraft, wherein self-contained compressed air supply means is located in said housing, and wherein there is provided means for supplying electrical power to said self-contained compressed air supply means from said source of electrical power on the aircraft, said method comprising the steps of:

a) providing four-way valve means of the slide type for connecting said compressed air supply means to said pair of beds in a controlled manner;

b) providing pilot valve means operatively associated with said four-way valve means;

c) providing timing and control means connected in controlling relation to said four-way valve means and to said pilot valve means for operating said pilot valve means to provide an initial pressure in said PSA unit for operating said four-way valve means a predetermined time thereafter;

d) utilizing said electrical power supplied to said self-contained compressed air supply means also for operating said timing and control means; and

e) operating said PSA unit to provide output oxygen.

5,531,808
REMOVAL OF CARBON DIOXIDE FROM GAS STREAMS
Adeola F. Ojo, Chatham, N.J.; Frank R. Fitch, Bedminster, N.Y., and Martin Bülow, Basking Ridge, N.J., assignors to The Boc Group, Inc., New Providence, N.J.
Filed Dec. 23, 1994, Ser. No. 363,187
Int. Cl.^{6} B01D ***53/047***

U.S. Cl. 95—96 **23 Claims**

1. A method of removing carbon dioxide from a gas stream comprised of carbon dioxide and gases less polar than carbon dioxide, comprising subjecting said gas stream to adsorption using as adsorbent a type X zeolite having a silicon to aluminum atomic ratio in the range of about 1.0 to about 1.15 at a temperature in the range of about −50° to about 80° C., thereby adsorbing carbon dioxide from said gas stream and producing a nonadsorbed product gas enriched in said gases less polar than carbon dioxide.

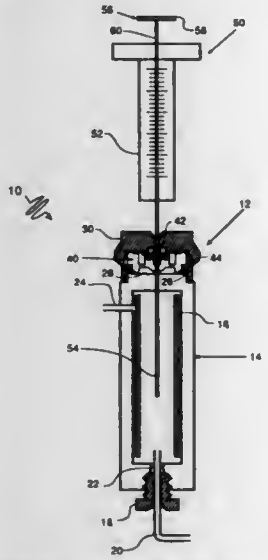
5,531,809
PRETREATMENT LAYER FOR CO-VSA
Timothy C. Golden, Allentown; Paul A. Webley, Macungie; Steven R. Auvil, Macungie, and Wilbur C. Katz, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Sep. 14, 1994, Ser. No. 307,985
Int. Cl.^{6} B01D ***53/047***

U.S. Cl. 95—101 **10 Claims**

1. A method of preferentially adsorbing carbon monoxide from a feed gas stream comprising at least hydrogen, carbon monoxide, carbon dioxide, methane, nitrogen and moisture, comprising contacting said feed gas stream at elevated pressure with an adsorbent bed in an adsorbent vessel having a feed orifice and a product orifice, a cuprous compound-containing main adsorbent near the product orifice for reversibly, by pressure swing, adsorbing carbon monoxide preferentially over hydrogen, methane, nitrogen and carbon dioxide, a pretreatment layer between the feed orifice and the main adsorbent comprising at least a 3A molecular sieve zeolite which reversibly, by pressure swing, adsorbs moisture preferentially over carbon monoxide, methane, nitrogen and carbon dioxide and an intermediate adsorbent layer of a low surface area basic metal compound, which preferentially adsorbs acidic compounds which migrate from the main adsorbent, situated between said pretreatment layer and said main adsorbent.

5,531,810
INJECTION SEPTUM WITH DUST WIPER
James S. Fullemann, Half Moon Bay, Calif., assignor to Merlin Instrument Company, Half Moon Bay, Calif.
Filed Sep. 21, 1994, Ser. No. 310,276
Int. Cl.^{6} B01D ***15/08***

U.S. Cl. 96—105 **5 Claims**



1. A septum assembly for permitting injection of a fluid by extension of a needle therethrough, said needle having a needle diameter, said septum comprising:

an elastic duckbill seal having a duckbill aperture with a duckbill perimeter, said perimeter being at least as great as said needle diameter, said duckbill seal contacting and generally conforming to the cross section of said needle when said needle extends completely through said duckbill aperture, said duckbill aperture closing when said needle is withdrawn therefrom;

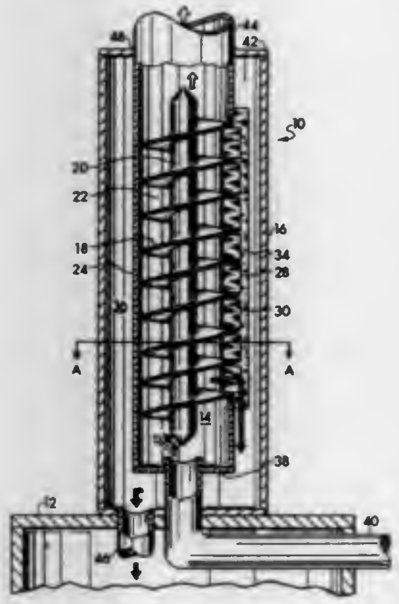
an elastic syringe seal having a generally annular aperture of varying diameter, said syringe seal mating with said duckbill seal so that said annular aperture and said duckbill aperture are aligned, said syringe seal having

annular wipe, seal, and alignment elements, the diameters of said annular aperture at each of said elements being less than said needle diameter when said needle is not inserted therethrough, said wipe element being at an insertion end of said annular aperture, said seal element being at an opposite end of said aperture, said alignment element being between said wipe element and said seal element, said alignment element being closer to said seal element than to said wipe element, and

annular wipe and seal pockets, the diameters of said annular aperture at each of said pockets being greater than said needle diameter when said needle is inserted through said annular aperture, said wipe pocket being between said wipe element and said alignment element, said seal pocket being between said seal element and said alignment element.

5,531,811
METHOD FOR RECOVERING ENTRAINED LIQUID FROM NATURAL GAS
Thomas W. Kloberdanz, Rawlins, Wyo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Aug. 16, 1994, Ser. No. 291,261
Int. Cl.^{6} B01D ***19/00***

U.S. Cl. 95—261 **16 Claims**



1. A method for recovering entrained liquid from natural gas produced via at least one well penetrating a subterranean formation, the method comprising the steps of:

(a) flowing the gas and entrained liquid through a helical ramp in a gas/liquid separator which is located at the surface and in a fluid flow path between the at least one well and a storage tank, thereby separating the liquid from the gas via centrifugal force, the gas and entrained liquid entering the separator at a pressure greater than about 100 psi;

(b) removing the liquid from the separator via at least one longitudinal slit formed in the wall of the separator by means of a liquid impingement device which is mounted at the edge of the at least one slit;

(c) collecting the liquid in the storage tank; and

(d) vending the gas from the separator.

5,531,812

IMPREGNATING EMULSION FOR MINERAL BUILDING MATERIALS

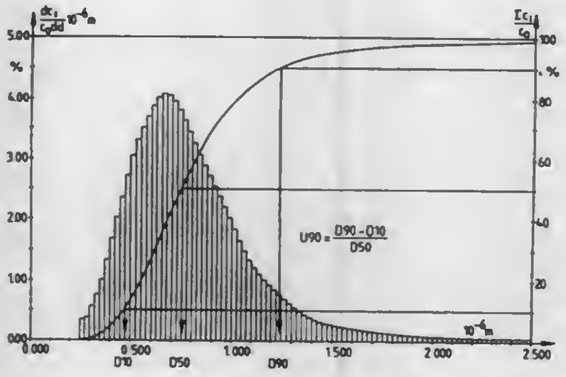
Armand de Montigny, Leverkusen; Hermann Kober; Bernd Klinksiek, both of Bergisch Gladbach, and Ottfried Schlak, Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 210,218, Mar. 18, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 402,404

Claims priority, application Germany, Mar. 26, 1993, 43 09 971.8

Int. Cl.^{6} C04B *41/49;* C08J *3/03;* C09D *183/04*

U.S. Cl. 106—2 **5 Claims**



1. A waterproofing agent for mineral building materials comprising an aqueous emulsion of dispersed organosilanes, organosiloxane resins, or both, wherein the disperse phase has an average particle size of about 0.3 to 1.1 μm and a scope of particle size range of less than about 1.3, and wherein the emulsion contains about 5 to 70 wt. % of a mixture of alkyl alkoxyl silane and alkyl alkoxy siloxane in which the ratio of alkyl alkoxy silane to alkyl alkoxy siloxane ranges from about 0.5:1 to 0.98:1 at maximum, and wherein the alkoxy alkyl silane is of the formula

$$R^1\text{—}Si(OR^2)_3 \qquad (I)$$

or

$$CH_3R^1Si(OR^2)_2 \qquad (Ia)$$

or mixtures thereof, in which

R^1 is an alkyl radical with 3 to 18 C atoms, and

R^2 is an alkyl radical with 1 to 2 C atoms,

and wherein the alkyl alkoxy siloxane is of the formula

$$(CH_3)_xR^3{}_y\text{—}Si(OR^2)_z(O)_{(4-x-y-z)/2} \qquad (II)$$

which

R^2 is an alkyl radical with 1 or 2 C atoms,

R^3 is an alkyl radical with 3 to 18 C atoms,

x+y has a value of about 0.75 to 1.5, wherein

y has a value greater than 0.1 and

z has a value of about 0.2 to 2.0,

and has a viscosity of 2 to 2000 mPa.s, and which contains about 0.01 to 3.5% emulsifier and about 30 to 95% water, and an alkaline pH.

5,531,813

FUSING SYSTEM WITH MONOAMINO FUNCTIONAL SILICONE RELEASE AGENT

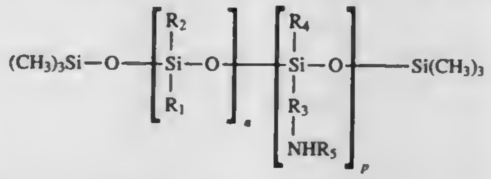
Arnold W. Henry; Donald A. Seanor, both of Pittsford; George J. Heeks, Rochester; Clifford O. Eddy, Webster; Che C. Chow, Penfield; Santokh S. Badesha, Pittsford; Samuel Kaplan, Webster, and David H. Pan, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 164,853, Dec. 10, 1993, abandoned. This application Sep. 29, 1994, Ser. No. 314,759

Int. Cl.^{6} C09D *5/00*

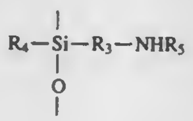
U.S. Cl. 106—2 **5 Claims**

1. A fluid release agent for application to a fuser member having a thermally stable hydrofluoroelastomer surface for fusing thermoplastic resin toners to a substrate in an electrostatographic printing apparatus comprising an amino functional oil having the formula:



$$(CH_3)_3Si-O-\left[\begin{array}{c}R_2\\ |\\ Si-O\\ |\\ R_1\end{array}\right]_n-\left[\begin{array}{c}R_4\\ |\\ Si-O\\ |\\ R_3\\ |\\ NHR_5\end{array}\right]_p-Si(CH_3)_3$$

where 50≦n≦200, p is 1 to 5 and R_1, R_2 and R_3 are selected from the group consisting of alkyl and arylalkyl radicals having 1 to 18 carbon atoms, R_4 is selected from the group consisting of alkyl and arylalkyl radicals having 1 to 18 carbon atoms and a polyorganosiloxane chain having 1 to 100 diorganosiloxy repeat units, and R_5 is selected from the group consisting of hydrogen, alkyl and arylalkyl radicals having 1 to 18 carbon atoms, wherein at least 85% of the polyorgano amino functional siloxane chains have p equal to 1 and the



$$\begin{array}{ccccc} & & | & & \\ R_4 & - & Si & - & R_3-NHR_5\\ & & | & & \\ & & O & & \\ & & | & & \end{array}$$

groups are situated at random along the chain, said oil having predominantly monoamino functionality per active molecule to interact with said hydrofluoroelastomer surface to provide an interfacial barrier layer to said toner and a low surface energy film to release said toner from said surface.

5,531,814

SELF-LEVELING SILICONE POLISH

Bradley C. Bahr, and David B. Selley, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 25, 1995, Ser. No. 429,256

Int. Cl.^{6} C09G *1/16*

U.S. Cl. 106—3 **14 Claims**

1. A method of polishing a hard surface comprising applying to the hard surface an abrasive free composition formed from an aqueous phase and a silicone phase; the phases having refractive indices within 0.002 of one another; the aqueous phase containing water and a water soluble hydrophilic organic solvent; the silicone phase containing a volatile methyl siloxane, a siloxane polyether, and an organosilicon resin; the water soluble hydrophilic organic solvent being selected from the group consisting of ethylene glycol, propylene glycol, trimethylene glycol, ethylene glycol n-butyl ether, ethylene glycol phenyl ether, diethylene glycol methyl ether, diethylene glycol n-butyl ether, propylene glycol methyl ether, propylene glycol n-propyl ether, propylene glycol n-butyl ether, propylene glycol phenyl ether, dipropylene glycol methyl ether, dipropylene glycol n-propyl ether, dipropylene glycol n-butyl ether, triethylene glycol methyl ether, triethylene glycol n-butyl ether, tripropylene glycol methyl ether, and tripropylene glycol n-butyl ether.

5,531,815

THERMAL INK JET COMPOSITION

Kurt B. Gundlach, Pittsford, and Richard L. Colt, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1995, Ser. No. 474,597

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—20 R **21 Claims**

1. An ink jet printing composition containing a liquid vehicle, a colorant and a surfactant comprising 10 to 20 wt. % betaine zwitterionic base and 2 to 5 wt. % quasisurfactant penetrant.

5,531,816

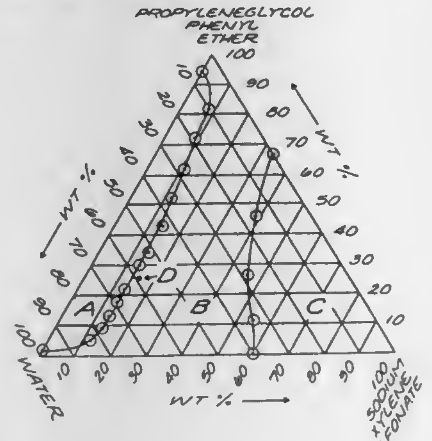
BLEED-ALLEVIATED, WATERFAST, PIGMENT-BASED INK-JET INK COMPOSITIONS

Palitha Wickramanayake, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 14, 1995, Ser. No. 528,077

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—20 R **22 Claims**



1. A pigment-based ink-jet ink composition comprising:

(a) at least one deagglomerated pigment;

(b) at least one water-insoluble organic compound;

(c) at least one amphiphile; and

(d) water,

wherein said amphiphile is present in an amount sufficient to solubilize said at least one water-insoluble organic compound.

5,531,817

USE OF HIGH VISCOSITY, MELTABLE GEL INKS FOR CONTROLLING BLEED

James P. Shields, Philomath, and John R. Moffatt, Corvallis, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 1, 1994, Ser. No. 300,495

Int. Cl.^{6} C09D *11/02;11/04;11/14*

U.S. Cl. 106—22 R **19 Claims**

1. A thermal ink-jet ink having the following composition:

(a) a color bleed control agent selected from the group consisting of (1) about 0.05 to 2 wt % of a high molecular weight polymer having a molecular weight of at least 10,000 and (2) about 15 to 45 wt % of an amine oxide surfactant;

(b) about 0.5 to 20 wt % of at least one low vapor pressure solvent;

(c) at least one water-soluble dye; and

(f) the balance water, wherein said thermal ink-jet ink is a gel at ambient temperatures and is adapted to be heated as necessary to achieve a temperature such that said thermal ink-jet ink has a viscosity within the range of about 1.2 to 12 cP immediately prior to jetting said thermal ink-jet ink from an ink-jet pen.

5,531,818

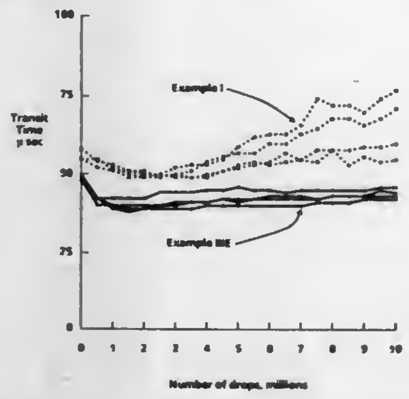
INK JET INK COMPOSITIONS AND PRINTING PROCESSES

John W.-P. Lin, Webster, and W. Conrad Richards, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1994, Ser. No. 347,668

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—23 C **23 Claims**



1. A thermal ink jet printing process which comprises (a) incorporating into a thermal ink jet printer an ink composition comprising water, a dye, and pigment particles having an average particle diameter of from about 0.001 micron to about 10 microns, said pigment particles being present in the ink in an amount of less than 0.1 percent by weight; and (b) causing droplets of the ink to be ejected in an imagewise pattern onto a recording medium by selectively heating the ink in the printer in an imagewise pattern, thereby generating images on the recording medium.

5,531,819

HOT MELT INK

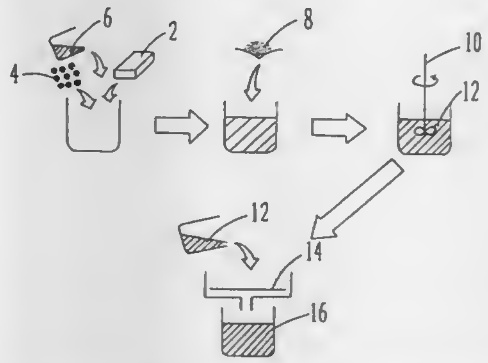
Hidemasa Sawada, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 16, 1995, Ser. No. 441,921

Claims priority, application Japan, Jun. 22, 1994, 6-139884

Int. Cl.^{6} C09D *11/12*

U.S. Cl. 106—31 R **18 Claims**



1. A hot melt ink for use in a hot melt ink jet recording device in which recording is conducted by melting ink under heating at a temperature higher than room temperature, said ink comprising:

a wax which is solid at room temperature and has a melting point of from 50° C. to 150° C.;

5% to 70% by weight of said hot melt ink of a resin having a weight average molecular weight of 500 or greater;

a colorant; and

a plasticizer selected from the group consisting of phthalic acid ester, phosphoric acid ester, polyester plasticizer, epoxy plasticizer and trimellitic acid plasticizer.

5,531,820

COMPOSITION AND METHOD FOR TREATMENT OF PHOSPHATED METAL SURFACES

George J. Gorecki, Niles, Ill., assignor to Brent America, Inc., La Mirada, Calif.

Continuation-in-part of Ser. No. 197,245, Feb. 16, 1994, Pat. No. 5,397,390, which is a continuation-in-part of Ser. No. 106,070, Aug. 13, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 348,044

Int. Cl.^{6} C09K *3/00;* **B05D** *3/02*

U.S. Cl. 106—287.11 **32 Claims**

1. A rinse solution for the treatment of conversion-coated metal substrates for improving the adhesion and corrosion resistance of siccative coatings, comprising an aqueous solution of a Group IVA metal ion selected from the group consisting of zirconium, titanium, hafnium, and mixtures thereof, and an organosilane in a concentration of about 0.1 to 7.0% w/w and selected from the group consisting of methyltrimethoxysilane, phenyltrimethoxysilane, and mixtures thereof, with the Group IVA metal ion concentration selected to provide a pH for the entire solution about 2.0 to 9.0.

5,531,821

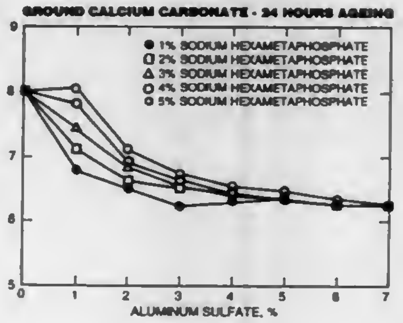
SURFACE MODIFIED CALCIUM CARBONATE COMPOSITION AND USES THEREFOR

Kuan-Ting Wu, Sandersville, Ga., assignor to ECC International Inc., Atlanta, Ga.

Filed Aug. 24, 1995, Ser. No. 518,757

Int. Cl.^{6} C09C *1/02*

U.S. Cl. 106—464 **9 Claims**



1. An acid resistant calcium carbonate comprising a mixture of calcium carbonate with at least about 0.5 to about 10 percent, based on the dry weight of the calcium carbonate, of a cationic salt, together with at least about 0.5 to about 10 percent, based on the dry weight of the calcium carbonate, of an anionic salt.

5,531,822

MODIFIER FOR POROUS MATERIALS AND METHOD OF MODIFYING POROUS MATERIALS

Toshinori Morizane, 26-12, Hazawa 2-chome, Nerima-ku, Tokyo, Japan

Division of Ser. No. 202,219, Feb. 25, 1994, Pat. No. 5,449,533. This application May 3, 1995, Ser. No. 434,369

Claims priority, application Japan, Mar. 1, 1993, 5-64698

Int. Cl.^{6} C04B *12/04*

U.S. Cl. 106—600 **4 Claims**

1. A modifying agent for porous materials, which consists essentially of an aqueous solution of an alkali silicate in a concentration of from 10 to 50% by weight, 0.01 to 1.0 mol/kg of ammonium ions and 0.01 to 1.0 mol/kg of halogen ions.

5,531,823

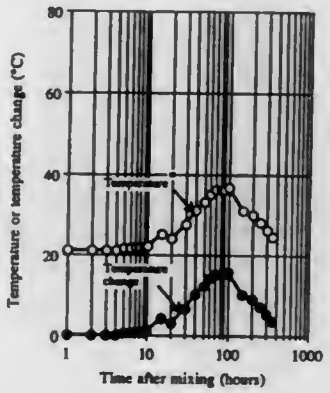
LOW-HEAT HIGH-PERFORMANCE CONCRETE

Dannys Breton, Sherbrooke, Canada, assignor to Atomic Energy Of Canada Limited, Ottawa, Canada

Filed Feb. 6, 1995, Ser. No. 384,645

Int. Cl.^{6} C04B *7/02*

U.S. Cl. 106—713 **11 Claims**



1. A cementitious composition comprising:

a. Portland cement;

b. pozzolanic silica;

c. inert mineral flour;

d. aggregate;

e. superplasticizer; and

f. water;

wherein the amount of Portland cement in the composition is in the range of 3% to 10%, the ratio of Portland cement to pozzolanic silica is between 1:0.8 and 1:1.2, the ratio of Portland cement to inert mineral flour is between 1:1.6 and 1:2.4 and the water/cementitious materials ratio of the composition is in the range of 0.40–0.55.

5,531,824

METHOD OF INCREASING DENSITY AND STRENGTH OF HIGHLY SILICEOUS CEMENT-BASED MATERIALS

J. Pate Burkes, 349 Funches Rd; Philip G. Malone, 107 Fox Run La., and Lillian D. Wakeley, 104 Quail Run, all of Vicksburg, Miss. 39180

Filed May 25, 1995, Ser. No. 451,082

Int. Cl.^{6} C04B *14/04;14/06*

U.S. Cl. 106—737 **4 Claims**

1. A method of preparing cement-based products of increased hardness, increased compressive strength, and decreased permeability to liquids comprising the steps of

(a) mixing portland cement, water, and aggregate with from 10 to 46 percent by weight reactive silica;

(b) pouring the mixture into a form and allowing it to cure until it attains a 28-day strength and forms a cured product;

(c) immersing the cured product in an aqueous alkali metal hydroxide solution containing 3–6 gram-moles per liter of an alkali metal hydroxide and 0.2–0.8 gram-moles per liter aluminum nitrate at about 60°–110° C. from 3–14 days; and

(d) cooling the product to room temperature.

5,531,825

HYDRAULIC CEMENT SET ACCELERATORS BASED ON NITROALCOHOLS

Ellis M. Gartner, Silver Spring; Joseph A. Cogliano, Pasadena, both of Md.; Ahmad Arfaei, Chelmsford, Mass.; Leslie A. Jardine, Andover, Mass.; Paul Scheiner, Maynard, Mass., and Heyman C. Duecker, Chelmsford, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 7, 1995, Ser. No. 486,425

Int. Cl.^{6} C04B *24/12*

U.S. Cl. 106—808 **9 Claims**

1. A cement composition comprising a hydraulic cement binder and a set accelerating amount of a nitroalcohol.

5,531,826

GRANULAR MATERIAL COATING APPARATUS

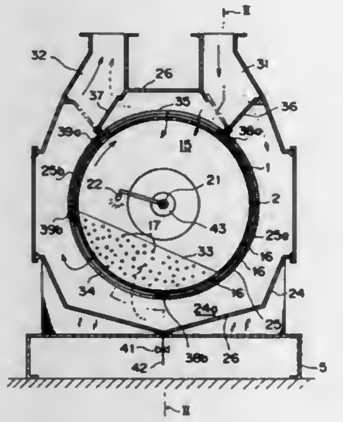
Yasutoyo Fusejima; Tsugutoshi Yamada; Shuri Yamada, and Narimichi Takei, all of Tokyo, Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,991

Claims priority, application Japan, Oct. 12, 1993, 5-253950; Oct. 3, 1994, 6-239288

Int. Cl.^{6} A23G *7/00*

U.S. Cl. 118—19 **9 Claims**



1. A granular material coating apparatus for spraying a liquid coating solution onto a granular material to apply coating to said granular material, comprising:

a rotary drum rotated about a substantially horizontal axis and rotatably supported by a support base;

a coating chamber including a spraying nozzle therein formed in said rotary drum, said coating chamber arranged to accumulate said granular material at bottom portion thereof;

a tubular body portion formed in said rotary drum;

a multiplicity of vent holes formed in said tubular body portion, said vent holes communicating with said coating chamber;

an annular duct fixed to said support base surrounding said rotary drum and forming a vent path positioned outside of said tubular body portion;

a gas supply duct connecting to said annular duct for supplying drying gas;

an exhaust duct connecting to said annular duct for exhausting the drying gas;

said annular duct including partition walls disposed about said drum, said walls including openings forming a flowing path from said gas supply duct to said exhaust duct through the bottom portion of said coating chamber; and

separation means disposed within said vent path between said gas supplying duct and said gas exhaust duct and movable between first and second positions wherein at said first position the drying gas flow is from said gas supply duct into an upper portion of said rotary drum, through said bottom portion of said rotary drum and to said exhaust duct, and at said second position the drying gas flow is from said gas supply duct, through said bottom portion of said rotary drum, out said upper portion of said rotary drum and to said exhaust duct.

5,531,827

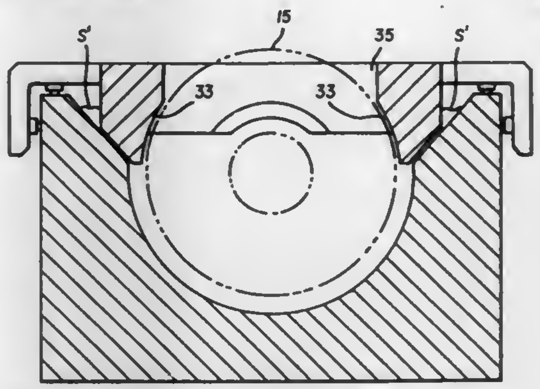
COATING APPARATUS HAVING A STAGNATION PREVENTION DEVICE

Jeffrey A. Trest, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1995, Ser. No. 418,037

Int. Cl.^{6} B05C *1/00*

U.S. Cl. 118—258 **2 Claims**



1. A coating apparatus comprising:

an open mouth hopper having a first end and a second end containing a coating solution, said hopper having an inlet for supplying coating solution and an outlet for withdrawing coating solution;

an application roller having a first end and a second end and having a length, said application roller rotatably mounted in said hopper having a portion of an outer surface dipping into the coating solution;

means connected to the roller for rotating the roller;

a stagnation prevention device immersed in said open mouth hopper comprising;

a first elongated bar extending the length of said roller, the first bar having an arcuate surface spaced a first distance from the outer surface of said application roller;

a second elongated bar extending the length of said roller, the second bar having an arcuate surface spaced a second distance from the outer surface of said application roller, said first and second distances being from about 0.040 inches to about 0.060 inches thereby creating a tight gap between said first and second elongated bars and the roller such that a laminar flow condition is produced in the coating solution;

a first cross piece connected to a first end of the first bar and a first end of the second bar, the first cross piece extending between the first end of said hopper and the first end of said roller; and

a second cross piece connected to a second end of the first bar and a second end of the second bar, the second cross piece extending between the second end of said hopper and the second end of said roller wherein said stagnation prevention device reduces turbulence around said application roller, said first and second elongated bars, said roller, and said first and second cross pieces substantially covering the surface of the coating solution such that evaporation is substantially prevented.

5,531,828

ADHESIVE MOISTENER

William Whang, 16161 Nordhoff #278, North Hills, Calif. 93143

Filed Apr. 10, 1995, Ser. No. 419,090

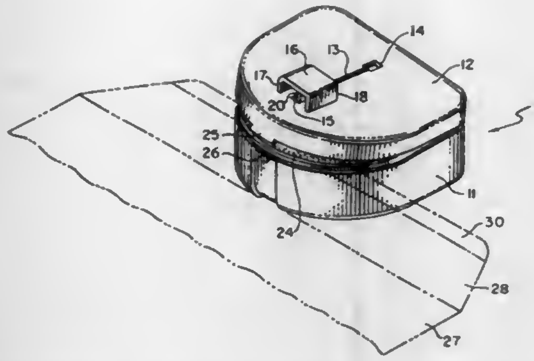
Int. Cl.^{6} B05C *1/00*

U.S. Cl. 118—264 **9 Claims**

1. An adhesive sheet moistener comprising:

a container having an internal storage compartment;

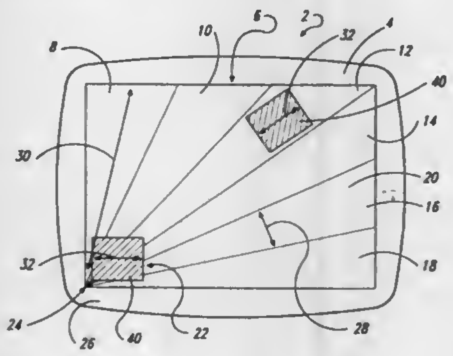
a block of porous composition holding a moisturizing substance disposed in said storage compartment and having an upper portion exposed beyond said container storage compartment;



- a lid hingeably carried on said container operable to selectively expose said upper portion when said lid is in its open position and to conceal said upper portion when in its closed position;
- pressure plate means slidably carried on said lid operable in a forward operative position to effect depression of said upper portion when said lid is in its open position and pressure is applied thereto; and
- an entrance defined between said lid and said container for insertably accepting the adhesive sheet between said pressure plate means and said upper portion when said pressure plate means is in its forward operative position.

5,531,829
FAN-SHAPED STAMP PAD

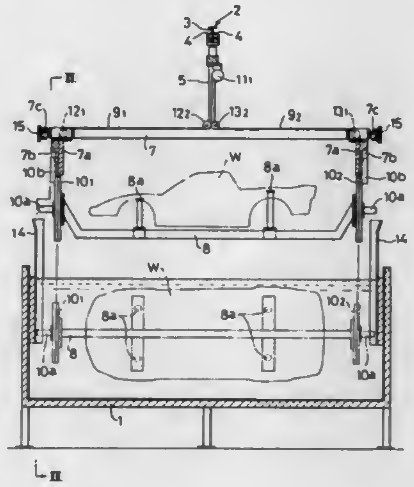
Haruo Yasoshima, Tokyo, Japan, assignor to Tsukineko, Inc., Redmond, Wash.
Filed Dec. 21, 1994, Ser. No. 361,334
Int. Cl.⁶ B05C *1/00*
U.S. Cl. 118—264 **4 Claims**



1. A stamp kit comprising:
- a stamp pad, which comprises at least three sections containing differently colored inks, said at least three sections meeting at a series of junctures and radiating from a central region of said stamp pad, and each of said at least three sections having a proximal region located near said central region and a distal region located distant from said central region, said proximal region having a shorter width than said distal region, and
- a stamp, which is sized such that a single diameter of said stamp contacts said at least three sections of said stamp pad when applied to said central region of said stamp pad, but contacts only one of said at least three sections when said stamp is applied far from said central region.

5,531,830
SURFACE TREATMENT APPARATUS

Kiyohiro Ichinose; Hirofumi Hara, and Hiroshi Ochiai, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 41,342, Apr. 1, 1993, Pat. No. 5,433,783, which is a continuation of Ser. No. 580,680, Sep. 11, 1990, abandoned. This application Dec. 6, 1994, Ser. No. 354,040
Claims priority, application Japan, Sep. 26, 1989, 1-248169; Jun. 12, 1990, 2-61279; Jun. 12, 1990, 2-151679
Int. Cl.⁶ B05C *3/09*
U.S. Cl. 118—423 **6 Claims**

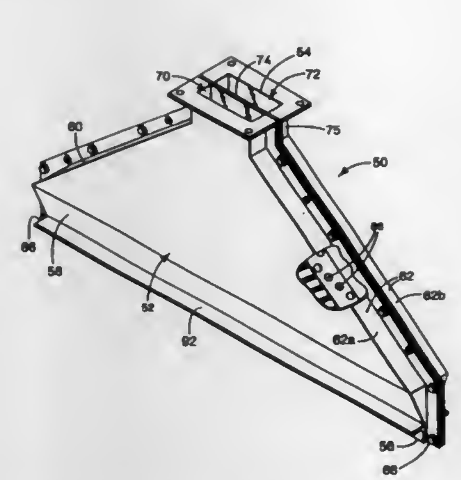


1. A surface treatment apparatus having a treatment bath for immersing and treating a workpiece therein with the workpiece being put into and taken out of said treatment bath by the lifting and lowering thereof and with the workpiece being rotatable about a horizontal axial line while in the bath, said apparatus comprising:
- a jig for holding the workpiece;
- a pair of jig-rotating wheels fixed on the same horizontal axial line at both ends of said jig, each of said jig-rotating wheels having a shaft extension portion extending axially along said horizontal axial line;
- suspending means for suspending said jig respectively wound around said jig-rotating wheels;
- a pair of hoisting apparatuses;
- one end of each of said suspending means being connected to one of said hoisting apparatuses and the other end of each of said suspending means being connected to the other of said hoisting apparatuses; and
- a pair of guide frames vertically provided in said treatment bath, said guide frames engaging with said shaft extension portions for guiding the lifting and lowering of said jig.

5,531,831
STATIC BLENDING DEVICE

Kenneth W. Sweeney, Minocqua, Wis., and Harold G. Converse, Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 12, 1994, Ser. No. 354,464
Int. Cl.⁶ B05C *19/00*
U.S. Cl. 118—600 **18 Claims**

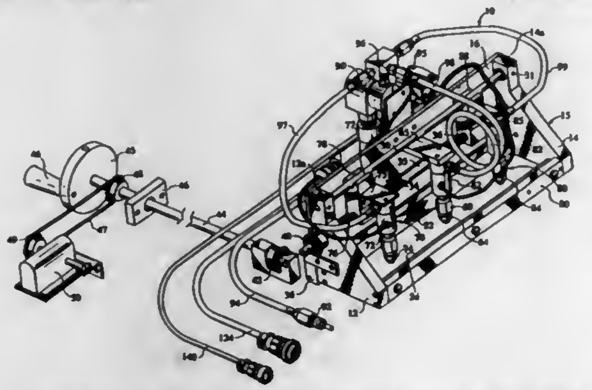
1. A static blending device for receiving and dispersing particulate matter comprising:
- an inlet having transverse inlet ends for receiving particulate matter, wherein a transverse width of said inlet is defined between said transverse inlet ends;
- an outlet having transverse outlet ends for dispensing particulate matter, wherein a transverse width of said outlet is defined between said transverse outlet ends and said transverse width of said outlet is larger than said transverse width of said inlet, and;



- a dispersing section provided intermediate of said inlet and said outlet, said dispersing section being divided into a first compartment and a second compartment by a splitter element that extends in the direction of said transverse width of said outlet and said transverse width of said inlet, wherein said first compartment is defined between a side wall and said splitter element and said second compartment is defined between another side wall and said splitter element, and wherein means are provided within said first compartment for moving particulate matter that falls within said first compartment toward one of said transverse outlet ends as it travels from said inlet to said outlet and means are provided within said second compartment for moving particulate matter that falls within said second compartment toward the other of said transverse outlet ends as it travels from said inlet to said outlet.

5,531,832
NOZZLE ASSEMBLY FOR PAN OILER

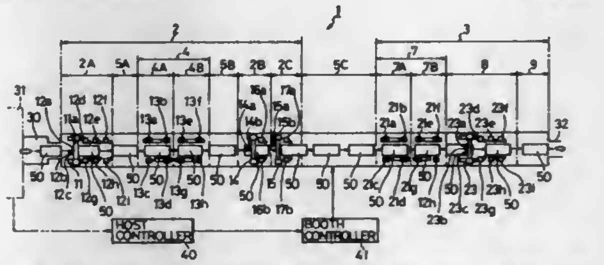
Timothy I. McCalip, Lindsay; Jimmy R. Frazier, and John E. Fagan, both of Norman, all of Okla., assignors to Burford Corporation, Maysville, Okla.
Continuation-in-part of Ser. No. 370,290, Jun. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 231,588, Aug. 8, 1988, Pat. No. 4,925,699, which is a continuation of Ser. No. 937,961, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 796,083, Nov. 7, 1985, abandoned. This application Mar. 18, 1994, Ser. No. 215,050
Int. Cl.⁶ B05B *5/00*
U.S. Cl. 118—622 **11 Claims**



1. Apparatus for applying a film of cooking oil to a pan surface comprising: a source of electrically non-conductive cooking oil; a frame; a pair of horizontally spaced elongated electrodes on said frame; a plurality of nozzle assemblies on said frame adjacent said electrodes connected to said source of cooking oil; conveyor means adjacent said nozzle assemblies for moving pans adjacent said nozzle assemblies, said electrodes extending transversely of said conveyor and said nozzle assemblies being positioned between said electrodes; means electrically charging said electrodes to a potential, each said nozzle assembly projecting droplets of liquid between said spaced elongated electrodes at a velocity such that said droplets become electrically neutral polarized droplets; and a pan guide roller on said frame for positioning each said nozzle assembly and said spaced electrodes adjacent the pan surface, said nozzle assemblies projecting droplets of liquid between said electrodes to propel the electrically neutral polarized droplets along a trajectory to impinge against surfaces of a pan on said conveyor means.

5,531,833
APPARATUS FOR COATING VEHICLE BODY

Toshifumi Ogasawara, and Masafumi Shinoda, both of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Continuation of Ser. No. 15,088, Feb. 9, 1993, abandoned, which is a continuation of Ser. No. 677,693, Mar. 29, 1991, abandoned. This application Dec. 30, 1994, Ser. No. 366,447
Claims priority, application Japan, Mar. 30, 1990, 2-87196; Mar. 28, 1991, 3-089672
Int. Cl.⁶ B05B *12/04*
U.S. Cl. 118—698 **9 Claims**

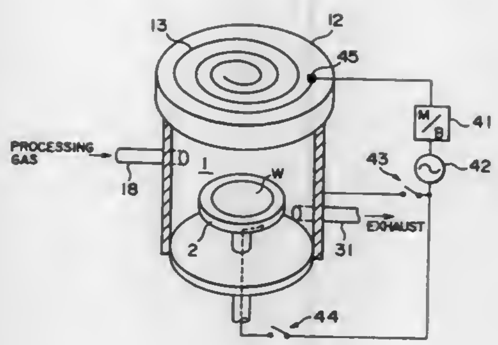


5. An apparatus for coating a substrate with paint during conveyance of the substrate, comprising:
- a rotary-type atomizing coating unit disposed along a coating line on which the substrate is conveyed and operable to coat the substrate with paint; and
- an air-nozzle type coating unit disposed along the coating line on which the substrate is conveyed and operable to coat the substrate with paint, said air-nozzle type coating unit being positioned downstream of said rotary-type atomizing coating unit relative to a direction of motion of the substrate and being spaced from said rotary-type atomizing coating unit so that the paint applied by said rotary-type atomizing coating unit does not dry prior to application of paint by said air-nozzle type coating unit.

5,531,834
PLASMA FILM FORMING METHOD AND APPARATUS AND PLASMA PROCESSING APPARATUS

Shuichi Ishizuka, Nirasaki; Kohei Kawamura; Jiro Hata, both of Yamanashi-ken, and Akira Suzuki, Nirasaki, all of, Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1994, Ser. No. 273,878
Claims priority, application Japan, Jul. 13, 1993, 5-195379; Aug. 19, 1993, 5-226417; Aug. 19, 1993, 5-226418; Nov. 24, 1993, 5-317375; Mar. 1, 1994, 6-056752
Int. Cl.⁶ C23C *16/00*
U.S. Cl. 118—723 I **10 Claims**

1. A plasma processing apparatus comprising:
- a mount for carrying an object for processing in an airtight processing chamber;
- a flat coil opposed to the mount and having one end connected to nothing, a middle portion connected to nothing, and another end, the diameter of the flat coil being larger than that of the object of processing; and
- application means for applying radio-frequency power to said another end of the coil and the mount or a container in the



processing chamber, a plasma being generated such that plasma processing is effected through reaction or ions or active seeds in the plasma.

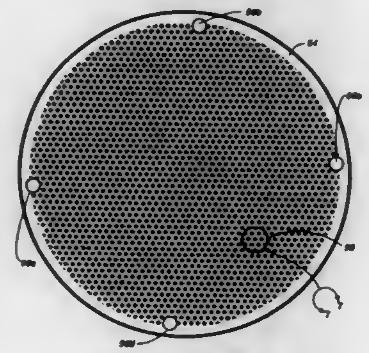
5,531,835
PATTERNED SUSCEPTOR TO REDUCE ELECTROSTATIC FORCE IN A CVD CHAMBER

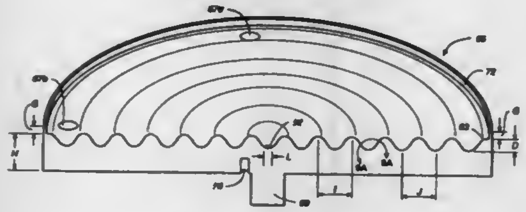
Mark A. Fodor, Los Gatos; Craig A. Bercaw, Sunnyvale, and Charles Dornfest, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 18, 1994, Ser. No. 246,015

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—728 6 Claims





1. A plasma enhanced chemical vapor deposition substrate processing chamber comprising:
- a gas distribution plate through which a process gas is directed into the processing chamber;
- a susceptor located opposite said gas distribution plate;
- wherein said susceptor is electrically grounded and said gas distribution plate is charged to create a plasma between said distribution plate and said susceptor,
- wherein when a substrate is disposed on said susceptor said substrate becomes coated with a product of gas constituent reactants;
- wherein said susceptor includes a wafer supporting surface having a pattern of high regions above a low region, said high regions defining a reference plane on which said wafer can be supported above and separated from said low region wherein said high regions include the crests of waves in a circular pattern appearing to emanate from a center point.

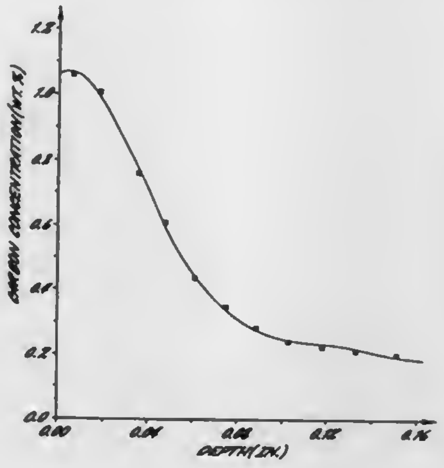
5,531,836
ROLLING BEARING AND METHOD OF MAKING SAME

Michael M. Dezzani, Torrington, and David E. Beauregard, Burlington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Dec. 22, 1994, Ser. No. 362,285

Int. Cl.^{6} C22C *38/22;* C21D *9/40;* C23C *8/22*

U.S. Cl. 148—233 5 Claims



1. A Steel alloy bearing having an inner race, an outer race and rolling elements comprising at least one of said elements being made of alloy steel which constitutes from 10.0 to 18.0 wt % chromium, 0.05 to 0.30 wt % carbon, 0.8 to 1.2 wt % tungsten, 0.20 to 0.30 wt % vanadium and 0.2 to 1.0 wt % nickel; and said at least one element having been carburized in an atmosphere having from 0.25 to about 0.40 percent carbon potential.

5,531,837
METHOD FOR INCREASING OXIDATION RESISTANCE OF FE-CR-AL ALLOY

Tsuneaki Ohashi, Ohgaki; Nobuo Tsuno, Kasugai, and Teruhisa Kurokawa, Ama-gun, all of, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 16, 1994, Ser. No. 213,507

Claims priority, application Japan, Mar. 25, 1993, 5-090883

Int. Cl.^{6} C23C *8/10;8/14;* C22C *38/06*

U.S. Cl. 148—280 7 Claims

1. A method for increasing the oxidation resistance of a Fe-Cr-Al alloy, which comprises placing said Fe-Cr-Al alloy in an atmosphere having an oxygen partial atmosphere of 0.02–2 Pa at a temperature of 950°–1,200° C. to form, on the surface of said alloy, an alumina-based protective film having excellent oxidation resistance.

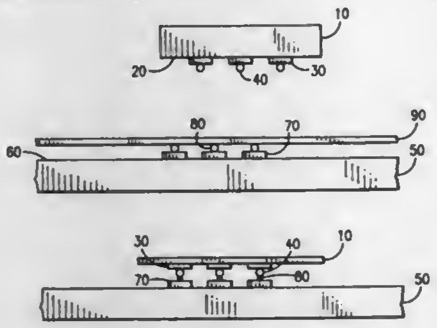
5,531,838
FLUX COMPOSITION AND CORRESPONDING SOLDERING METHOD

Roy L. Arldt, Georgetown; Susan H. Downey; Harry J. Goldlen, both of Austin, all of Tex.; Issa S. Mahmoud, Apalachin, N.Y.; Clement A. Okoro, Round Rock, Tex., and James Spalik, Kirkwood, N.Y., assignors to International Business Machines Corporation, Endicott, N.Y.

Division of Ser. No. 251,806, May 31, 1994. This application May 5, 1995, Ser. No. 435,896

Int. Cl.^{6} B23K *35/34*

U.S. Cl. 148—23 6 Claims



1. A single phase flux composition comprising:
- (a) 1 to 6% by weight pimelic acid,
- (b) 25 to 75% by weight of a first organic solvent, and
- (c) 10 to 35% by weight of a second organic solvent having a higher evaporation temperature than said first organic solvent, said second organic solvent being (i) soluble in said first organic solvent (ii) capable of substantially dissolving the pimelic acid in said composition upon evaporation of said first organic solvent therefrom, and (iii) capable of dissolving any water in said composition in an amount of up to 2% by weight upon evaporation of said first organic solvent therefrom.

5,531,839
CONTINOUSLY ANNEALED COLD-ROLLED STEEL SHEET EXCELLENT IN BALANCE BETWEEN DEEP DRAWABILITY AND RESISTANCE TO SECONDARY-WORK EMBRITTLEMENT AND METHOD FOR MANUFACTURING SAME

Yoshihiro Hosoya; Masaya Morita, and Seishi Tsuyama, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

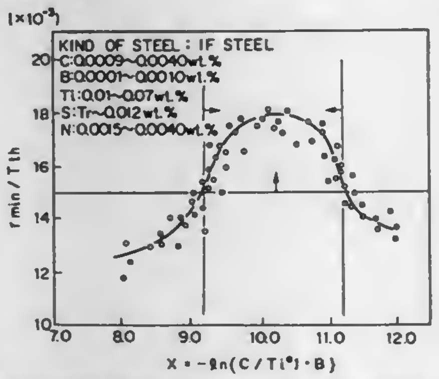
PCT No. PCT/JP94/01663, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO95/09931, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 5, 1994, Ser. No. 407,011

Claims priority, application Japan, Oct. 5, 1993, 5-273126; Oct. 13, 1993, 5-280224

Int. Cl.^{6} C21D *8/04;* C22C *38/14*

U.S. Cl. 148—330 6 Claims



1. A continuously annealed cold-rolled steel sheet excellent in balance between deep drawability and resistance to secondary-work embrittlement, which consists essentially of:

carbon (C): under 0.0030 wt. %,
silicon (Si): up to 0.05 wt. %,
manganese (Mn): from 0.05 to 0.20 wt. %,
phosphorus (P): up to 0.02 wt. %,
sulfur (S): up to 0.015 wt. %,
acid-soluble aluminum (sol.Al): from 0.02 to 0.06 wt. %,
nitrogen (N): up to 0.0030 wt. %,
titanium (Ti): from 0.02 to 0.10 wt. %,
boron (B): from 0.0003 to 0.0010 wt. %, and the balance being iron (Fe) and incidental impurities,

where, a value of an index (X) representing a content rate of titanium to boron, as calculated by the following formulae (1) and (2), is within a range of from 9.2 to 11.2:

$$X=-\ln\{(C/Ti^*)B\} \quad (1)$$

in said formula (1):

$$Ti^*=Ti-(48/14)N-(48/32)S>0 \quad (2).$$

5,531,840
METHOD OF PRODUCING SUPPORT FOR PLANOGRAPHIC PRINTING PLATE

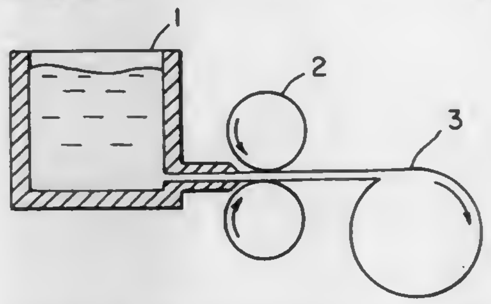
Akio Uesugi, and Tsutomu Kakei, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., LTD., Kanagawa, Japan

Filed Nov. 15, 1994, Ser. No. 340,886

Claims priority, application Japan, Nov. 15, 1993, 5-307109

Int. Cl.^{6} C22F *1/04*

U.S. Cl. 148—552 2 Claims



1. A method for producing a support for a planographic printing plate, which comprises after continuous casting an aluminum plate having a thickness of not more than 3 mm from molten aluminum by a twin roller continuous casting method, heat-treating the aluminum plate at a temperature of at least 300° C. with a temperature raising speed of at least 1° C./second, and then reducing the thickness of the plate to 0.5 mm or less by cold rolling.

5,531,841
FLUOROPOLYMER ALUMINUM LAMINATE

Lawrence F. O'Melia, Hampshire, and Anthony J. Lalikos, Hampden, both of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Continuation of Ser. No. 57,213, May 4, 1993, Pat. No. 5,401,334, which is a continuation of Ser. No. 613,267, Nov. 14, 1990, abandoned. This application Nov. 4, 1994, Ser. No. 334,401

Int. Cl.^{6} B23B *31/00;* B05D *1/00*

U.S. Cl. 148—265 17 Claims

1. A method for bonding a fluoropolymer structure to aluminum, the method comprising:
- applying a chromate conversion coating to aluminum to provide a conversion coated aluminum surface, the chromate conversion coating provided by a coating composition which comprises hexavalent chromium and a compound which includes fluorine, the conversion coating have a consistency of a gel;
- contacting a surface of the fluoropolymer structure with the conversion coated aluminum surface to provide a superposed

fluoropolymer-conversion coated aluminum laminate, the fluoropolymer structure and conversion coated aluminum having thicknesses wherein the ratio of the thickness of the fluoropolymer structure to the conversion coated aluminum is in the range of from about 0.05 to about 20, the fluoropolymer structure selected from the group consisting of fluoroethylene copolymer and alkoxy fluoroethylene copolymer; and

heating the superposed conversion coated fluoropolymer laminate to at least about 600° F. for at least one minute to provide a fluoropolymer-aluminum laminate when the fluoropolymer structure is fluoroethylene copolymer, or heating the type superposed conversion coated laminate to at least 650° F. for at least one minute when the fluoropolymer structure is alkoxy fluoroethylene copolymer to provide a fluoropolymer aluminum laminate.

5,531,842

METHOD OF PREPARING A HIGH STRENGTH DUAL PHASE STEEL PLATE WITH SUPERIOR TOUGHNESS AND WELDABILITY (LAW219)

Jayoung Koo, and Michael J. Luton, both of Bridgewater, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 6, 1994, Ser. No. 349,856

Int. Cl.⁶ C21D *8/02*

U.S. Cl. 148—654 **14 Claims**

1. A method for preparing a dual phase steel comprising ferrite and about 40–80% martensite/bainite phases which comprises:

(a) heating a steel billet to a temperature sufficient to dissolve substantially all vanadium carbonitrides and niobium carbonitrides;

(b) rolling the billet, and forming plate, in one or more passes to a first reduction in a temperature range in which austenite recrystallizes;

(c) finish rolling of the plate in one or more passes to a second reduction in a temperature range below the austenite recrystallization temperature and above the Ar_3 transformation point;

(d) cooling the finished rolled plate to a temperature between the Ar_3 transformation point and about 500° C.;

(e) water cooling the finished rolled plate to a temperature ≦400° C.

5,531,843

EXPLOSIVES USING GLYCOL STILL BOTTOMS

Donald M. Stromquist, 33 "C" St., Salt Lake City, Utah 84103, and Boyd J. Wathen, 7045 W. 9600 North, Lehi, Utah 84043

Filed Dec. 13, 1993, Ser. No. 165,477

Int. Cl.⁶ C06B *31/28;31/30*

U.S. Cl. 149—46 **17 Claims**

1. An explosive composition comprising at least one nitrate salt oxidizer and glycol still bottoms.

5,531,844

ENERGETIC COMPOSITIONS CONTAINING NO VOLATILE SOLVENTS

Jerry S. Brown, Woodford, Va., and John A. Conkling, Chestertown, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1994, Ser. No. 195,249

Int. Cl.⁶ C06B *45/10*

U.S. Cl. 149—19.3 **4 Claims**

1. An energetic composition comprising a mixture of a fluorelastomer terpolymer latex and a metal fuel;

said fluorelastomer comprising an emulsion of fluorinated terpolymer fluoroelastomer in water; and

said emulsion containing at lest 70% solids, by weight, and said solids containing at least 68% fluorine, by weight, wherein following evaporation of the water, said composition readily ignites and burns.

5,531,845

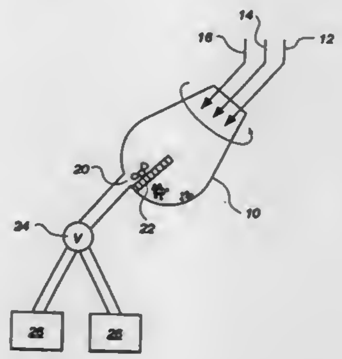
METHODS OF PREPARING GAS GENERANT FORMULATIONS

David A. Flanigan, Ogden; Vincent E. Mancini, North Ogden, and Michael R. Harper, Brigham City, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Jan. 10, 1994, Ser. No. 179,728

Int. Cl.⁶ D03D *23/00*

U.S. Cl. 149—109.6 **6 Claims**



1. A method for preparing gas generant feed stock, comprising the steps of:

obtaining a desired quantity of ingredients measured in predetermined ratios according to the composition of a gas generating material;

mixing together the ingredients of the gas generating material in a carrier solvent wherein at least one of the ingredients of the gas generating material becomes dissolved in the solvent;

freezing the carrier solvent;

applying sufficient quantities of heat while controlling the pressure to cause sublimation of the frozen solvent, thereby inducing the ingredients to fall out of solution;

including a binding agent in the mixture in sufficient quantities that the ingredients of the gas generating material will agglomerate to form non-curable, agglomerated granules as the ingredients are mixed; and

compacting the agglomerated granules to form a predetermined shape.

5,531,846

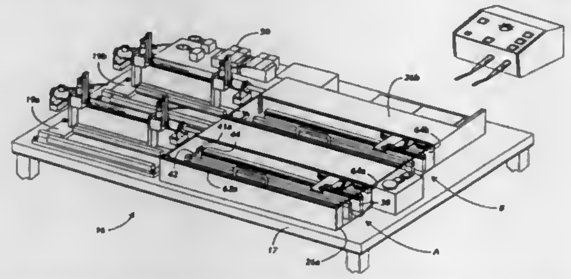
APPARATUS AND METHOD FOR RESEALING TONER CARTRIDGES

Phillip Miraglia, Woodstock, Ga.; Dennis Christopherson, Englewood, Colo.; Robert Carter, Denver, Colo., and Tadatoshi Umeda, Aruaoa, Colo., assignors to Recycling Concepts, Ltd., Marietta, Ga.

Filed Mar. 24, 1994, Ser. No. 218,019

Int. Cl.⁶ B23B *31/00*

U.S. Cl. 156—64 **8 Claims**



8. Method for resealing a toner cartridge, comprising the steps of:

providing a fixture for supporting a toner cartridge to maintain an unsealed opening of the cartridge in a certain attitude;

providing a guide located in predetermined alignment with the fixture and operative to receive a seal insertion tool carrying a seal, such that the guide supports the tool for movement along a predetermined path leading to the unsealed opening of a cartridge maintained by the fixture in said certain attitude;

placing in the guide a seal insertion tool with a seal disposed thereon;

extending the seal insert-ion tool in the guide to transfer the tool along the predetermined path until the tool and the seal carried by the tool become juxtaposed with the cartridge with the seal aligned to cover the unsealed opening;

producing a signal when the seal insertion tool is so extended;

responsive to the signal, applying a clamping force to the cartridge to urge the seal insertion tool toward the unsealed opening so that the seal carried by the tool becomes in intimate contact with the cartridge surrounding the unsealed opening, and

heating the seal insertion tool sufficiently to make the seal adherent to the cartridge:

allowing the seal insertion tool to cool so that the seal becomes affixed to the cartridge; and

retracting the seal insertion tool from the fixture while the seal remains affixed to the cartridge to seal the opening.

5,531,847

ULTRASONIC METHOD FOR FORMING INDIVIDUAL PILLOWED CHIPS OF LIGHT LOCK MATERIAL

Wallace S. Stewart, Penfield; Gary E. Merz, Rochester, and Dale C. Marshall, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 4,819, Jan. 15, 1993, Pat. No. 5,433,816. This application May 19, 1995, Ser. No. 445,001

Int. Cl.⁶ B32B *31/18*

U.S. Cl. 156—73.1 **3 Claims**

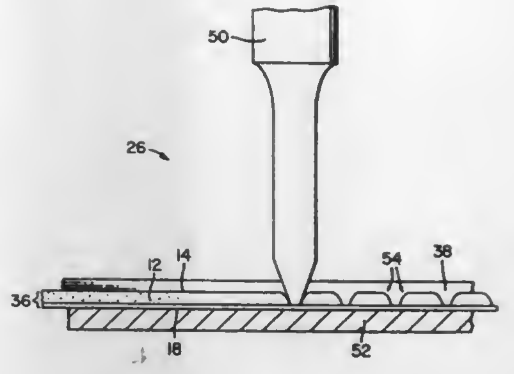
1. A method of forming individual chips of light lock material for placement in a cartridge, said method comprising:

positioning a web of light lock material between a retractable ultrasonic horn and an ultrasonic anvil;

extending said ultrasonic horn toward said ultrasonic anvil so as to compress said web of light lock material between said ultrasonic horn and said ultrasonic anvil;

energizing said extended ultrasonic horn so as to seal said compressed web of light lock material into a transverse seam, said seam extending partially widthwise of the web;

repeating so as to form a series of transverse seams in said web of light lock material;



forming notches in said web of light lock material between said transverse seams; and

cutting said web of light lock material at said transverse seams and said notches so as to form individual chips of light lock material.

5,531,848

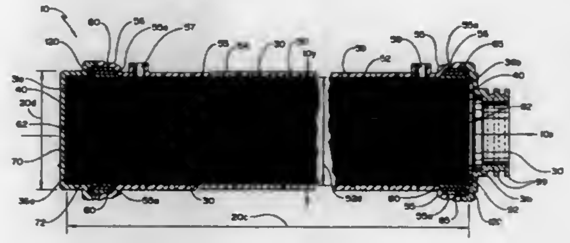
METHOD OF MANUFACTURING OF HOLLOW FIBER CARTRIDGE WITH POROUS RING

Paul D. Brinda, Robbinsdale, and Louis C. Cosentino, Deephaven, both of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Division of Ser. No. 296,728, Aug. 26, 1994, which is a division of Ser. No. 885,149, May 18, 1992. This application May 17, 1995, Ser. No. 443,187

Int. Cl.⁶ B01D *63/04*

U.S. Cl. 156—77 **6 Claims**



1. A method of sealingly coupling a hollow fiber bundle to a casing for encasing a bundle of hollow fibers comprising:

(a) providing an annular porous collar having first and second outer peripheral edges, said collar including pores having a pore size distribution of from about 5 μm to about 500 μm;

(b) providing a casing having first and second longitudinal ends, said casing defining a central chamber, said chamber having a first and second open ends wherein said longitudinal ends of said casing each include an inner, lateral, annular lip proximal to each of said open ends;

(c) coupling said first outer peripheral edge of said annular porous collar to at least one of said inner, lateral, annular lips of said casing;

(d) retaining a bundle of hollow fibers having first and second longitudinal ends within said chamber;

(e) permeating said longitudinal ends of said hollow fiber bundle with a fluid impermeable material;

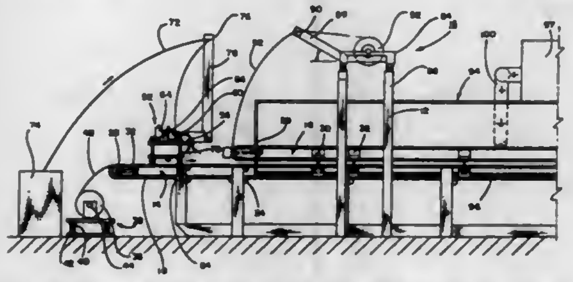
(f) joining said porous collar coupled to said casing to said hollow fiber bundle by penetration of said fluid impermeable material through said pores of said porous collar; and

(g) curing said fluid impermeable material, wherein a fluid impermeable seal is formed between said bundle of hollow fibers, said casing and said annular porous collar.

5,531,849
METHOD OF MANUFACTURING CARPED PADS

Burley B. Collins, 1312 John McCain, Colleyville, Tex. 76034, and Miller D. Collins, 13919 Sugarberry Wds., San Antonio, Tex. 78249

Filed Feb. 7, 1995, Ser. No. 384,823
Int. Cl.^{6} B32B *5/18*
U.S. Cl. 156—78 **21 Claims**



1. A method of manufacturing padding material for underlying a carpet floor covering comprising of the steps of:

feeding a first liner sheet having an exposed surface along a conveyor path;

depositing an amount of uncured, resilient polymeric foam material on the exposed surface of the first liner sheet as the first liner sheet is fed along the conveyor path so that the foam material is deposited as a generally uniform layer over the exposed surface of the first liner sheet;

positioning a second liner sheet over the layer of polymeric foam material as the first liner sheet is fed along the conveyor path so that the layer of foam material is sandwiched between the first and second liner sheets;

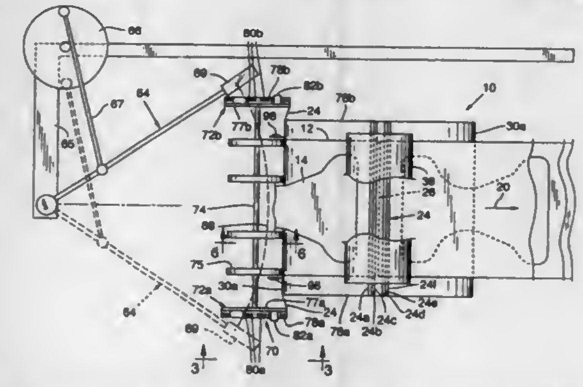
feeding the sandwiched layer of foam material along the conveyor path between a pair of opposite facing parallel conveyor belts which are spaced apart so that the sandwiched layer of polymeric foam material is compressed to a selected uniform thickness; and then

allowing the sandwiched layer of polymeric foam material to at least partly cure as the foam material is compressed between the conveyor belts so that the first and second sheets adhere to the foam material to form a foam laminate, the foam layer of the foam laminate having a density greater than about 2.5 pounds per cubic foot.

5,531,850
APPARATUS AND METHOD FOR APPLYING TRANSVERSE TENSIONED ELASTIC

Thomas R. Herrmann, Federal Way, Wash., assignor to Paragon Trade Brands, Inc., Federal Way, Wash.

Filed Jun. 21, 1994, Ser. No. 263,872
Int. Cl.^{6} B65H *57/28;* **B32B** *31/06*
U.S. Cl. 156—161 **27 Claims**



1. A method for applying elongate tensioned elastic to material moving along a flow path with the elastic extending transversely of the flow path comprising the steps of:

moving said material in one direction along said flow direction;

providing a quantity of elongate elastic;

drawing an elongate section of elastic from such reservoir of elastic;

stretching said section of elastic to a desired tension;

feeding said elastic reciprocatively in a feeder path that is substantially transverse of the flow path and has opposed ends adjacent opposite sides of the flow path;

grasping transverse portions of said elastic at spaced apart regions adjacent the opposed ends of the feeder path as the elastic is reciprocatively fed along the feeder path;

moving said transverse portions along an applicator path to the flow path while maintaining the transverse portions extending transversely of the flow path;

depositing the transverse portions onto the material while further stretching the transverse portions and maintaining a selected spacing between the transverse portions relative to the flow path; and

cutting the transverse portions inboard of the spaced apart regions to sever the transverse portions from remainder portions of the elastic.

7. Apparatus for applying elongate tensioned elastic to material moving along a flow path with the elastic extending transversely of the flow path comprising:

a first conveyor having an outer conveyor face for carrying material in one direction along the flow path;

elastic storage for holding a quantity of elongate elastic;

an elastic conveyor operable to draw elastic from said storage and move the elastic longitudinally;

an elastic tensioning device positioned along the elastic conveyor and through which the elastic is conveyed, the tensioning device operable to stretch the elastic conveyed along the elastic conveyor;

a transverse elastic applicator receiving elastic substantially continuously from the elastic conveyor, the elastic applicator being positioned adjacent the first conveyor and movable toward the flow path, the elastic applicator having enlarged opposing end portions with spaced guide members mounted thereon outboard of opposite sides of the first conveyor to hold tensioned elastic suspended therebetween and transversely of the flow path, the enlarged end portions and guide members operable to hold the elastic in suspended tensioned position as the elastic applicator moves the elastic to the flow path, the elastic applicator receiving the first conveyor between the opposing enlarged end portions and guide members such that the opposing enlarged end portions overlap the opposite sides of the first conveyor and the first conveyor presses against the suspended elastic to further stretch the elastic between the enlarged end portions as the elastic applicator applies the elastic to the material on the first conveyor; and

cutters positioned inboard of the guide members operable to sever the elastic from the positioning members after it has been applied to the material.

5,531,851
PROCESS FOR MAKING METALLIZED PLASTIC MOLDING PELLETS FOR SHIELDING ELECTROMAGNETIC INTERFERENCE

Ching-Bin Lin, and Tung-Han Chuang, both of c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan

Filed Apr. 28, 1995, Ser. No. 431,137
Int. Cl.^{6} B29B *9/06;11/16;* **B23B** *31/18*
U.S. Cl. 156—180 **8 Claims**

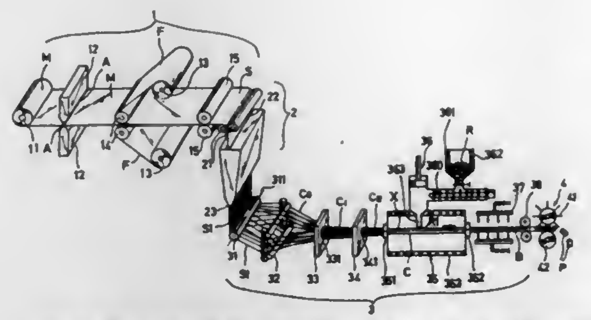
1. A process for making metallized plastic molding pellets comprising:

a. sandwiching an electrically conductive metal foil in between two thermoplastic plastic films to form a metallized laminated plastic sheet by a sheet metallizing means;

b. slicing the metallized laminated plastic sheet by a slicing means into a plurality of metallized plastic strips;

c. radially arranging the metallized plastic strips in a pultrusion means, and wetting and binding the metallized plastic strips, which have been radially arranged, with a thermoplastic resin matrix in said pultrusion means to form a metallized plastic bar, and cooling said metallized plastic bar as pultruded from said pultrusion means; and

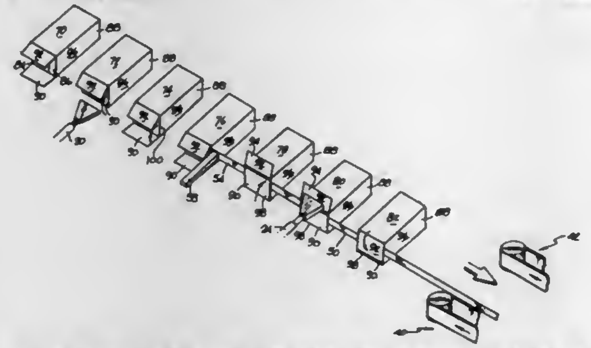
d. cutting the metallized plastic bar by a cutting means to obtain a plurality of metallized plastic pellets each said pellet having a plurality of metal thin pieces radially disposed in the resin matrix about a longitudinal axis in each said pellet.



5,531,852
APPARATUS AND METHOD FOR END SEALING A CARTON

Joseph C. Walsh, and Robert L. Conatser, both of Longmont, Colo., assignors to Graphic Packaging Corporation, Paoli, Pa.

Filed Apr. 28, 1994, Ser. No. 234,824
Int. Cl.^{6} B32B *31/26;* **B31B** *1/00*
U.S. Cl. 156—227 **16 Claims**



13. A method for sealing at least one open end portion of a carton having at least one surface formed from a material that functions as an adhesive when heated to a predetermined temperature and wherein the at least one end portion has minor flaps integral with opposite sidewalls of the carton and joined thereto by fold lines, a first major flap and a second major flap and wherein the minor flaps of each carton have been folded inwardly to cover at least a portion of the opening and the carton has been placed on a moving conveyor comprising:

moving said carton pass a relatively fixed reinforcing means so that said first major flap passes below said relatively fixed reinforcing means and said second major flap passes above said relatively fixed reinforcing means;

heating at least a portion of said material on said first major flap to said predetermined temperature;

folding said first major flap so that at least a portion of said reinforcing means is located between at least portions of said fold lines of said folded minor flaps and at least a portion of said folded first major flap;

folding said second major flap to a location superposed over said first major flap;

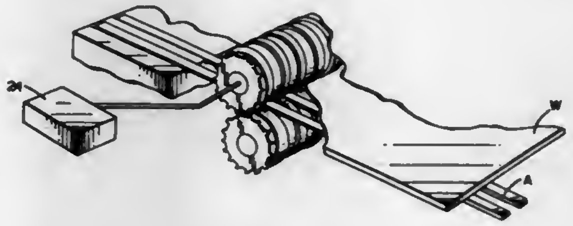
applying pressure to said folded first and second major flaps against said reinforcing means while continuing the movement of said cartons to seal at least portions of said first and second major flaps together; and

restraining inward movement of said first and second major flaps by contact between portions of said reinforcing means and at least portions of said fold lines of said folded minor flaps.

5,531,853
LINERLESS LABEL APPLICATOR

Joseph Cubow, Vero Beach, and Charles Tritt, Sebastian both of Fla., assignors to Booth Manufacturing Company, Fort Pierce, Fla.

Filed Oct. 31, 1994, Ser. No. 332,483
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—521 **17 Claims**



1. An applicator for applying to an article a linerless label having an adhesive exposed along one side thereof, comprising:

a label feed device including a pair of nip rollers having a plurality of circumferentially extending, axially spaced grooves forming circumferentially extending, axially spaced ribs along the outer surfaces of said rollers for engaging and displacing the label in a downstream direction upon rotation of said rollers, the ribs of one of said rollers having circumferentially extending plasma-coated surfaces for engaging at least the side of the label having the exposed adhesive;

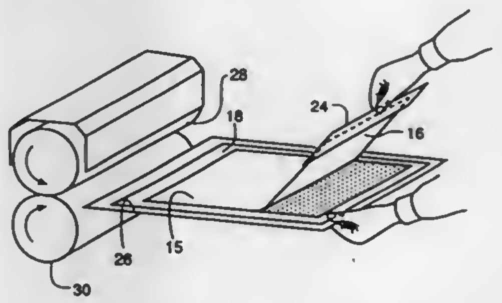
a plurality of feed fingers disposed along at least the side of the web of labels having the exposed adhesive and located within the grooves of said one roller for engagement with and to facilitate transport of the web through the rolls; and

an applicator head for applying the label to the article.

5,531,854
DE-LAMINATOR APPARATUS AND METHOD

Roger S. Kerr, Brockport, and Hugh A. Cunningham, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1994, Ser. No. 347,765
Int. Cl.^{6} G03C *11/12;1/805*
U.S. Cl. 156—234 **6 Claims**



1. (Amended) In a laminating system for bonding to receiver stock, a lamination sheet of the type including a carrier and a material to be applied to the receiver stock, and for delaminating the carrier from the receiver stock after the material has been applied to the receiver stock, the improvement comprising;

a superposed sandwich of the lamination sheet and the receiver stock: and

a de-lamination leader associated with one edge of the lamination sheet and the receiver wherein the leader has a pair of adhesive stripes, one stripe being more adhesive than the other, whereby the carrier can be easily peeled from the receiver stock starting at the one edge.

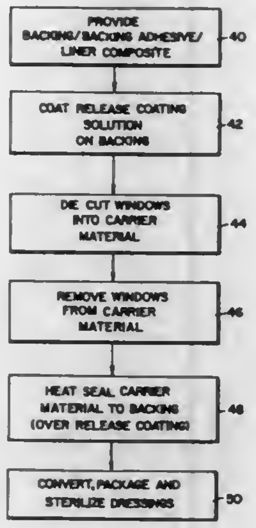
5,531,855
CARRIER DELIVERED DRESSING AND METHOD OF MANUFACTURE

Steven B. Heinecke, New Richmond, Wis., and Donald G. Peterson, Shoreview, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 34,306, Mar. 22, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 258,789

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—252 **14 Claims**


PROVIDE BACKING/BACKING ADHESIVE/ LINER COMPOSITE
40
COAT RELEASE COATING SOLUTION ON BACKING
42
DIE CUT WINDOWS INTO CARRIER MATERIAL
44
REMOVE WINDOWS FROM CARRIER MATERIAL
46
HEAT SEAL CARRIER MATERIAL TO BACKING (OVER RELEASE COATING)
48
CONVERT, PACKAGE AND STERILIZE DRESSINGS
50

1. A method of manufacturing an adhesive composite dressing comprising the steps of:

(a) providing a conformable backing having top and bottom faces, a pressure sensitive adhesive on at least a portion of the bottom face of the backing and a liner on the pressure sensitive adhesive;

(b) nonpermanently sealing a carrier to the top face of the backing, the bond between the carrier and the top face of the backing being greater than the bond between the liner and the pressure sensitive adhesive; the carrier having a cut defining a window proximate the center of the backing and a nonlinear cut connecting the perimeter of the carrier to the window-defining cut.

5,531,856
ENDOSCOPIC INFLATABLE RETRACTION DEVICES

Frederic H. Moll; Charles Gresl, Jr., both of San Francisco; Albert K. Chin, Palo Alto, and Philip K. Hopper, Laverne, all of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.

Division of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Ang. 13, 1993, Ser. No. 106,538

Int. Cl.^{6} B32B *3/10;27/00;31/26*

U.S. Cl. 156—290 **10 Claims**

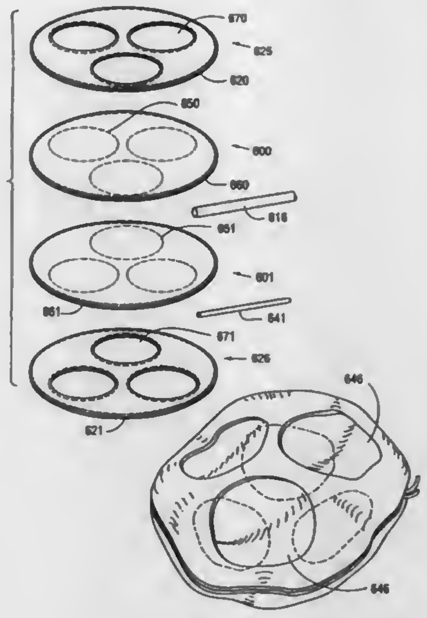
1. A method of making an inflatable apparatus for retracting an organ, the inflatable apparatus including a main chamber and an additional chamber, the method comprising steps of:

providing a main envelope and an additional envelope;

forming the main chamber from the main envelope; and

peripherally attaching the additional envelope to the main envelope to enclose the additional chamber and to form an arrangement in which one of the main envelope and the additional envelope is nested within the other of the main envelope and the additional envelope, and to provide

a piercable window in a part of the main envelope not covered by the additional envelope.



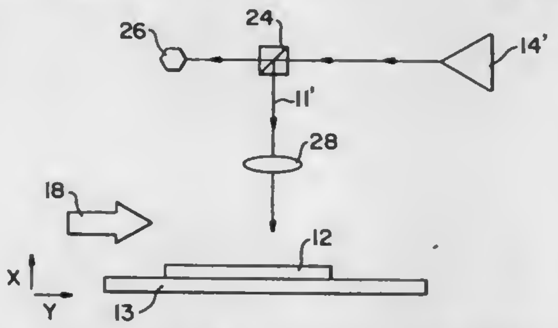
5,531,857
REMOVAL OF SURFACE CONTAMINANTS BY IRRADIATION FROM A HIGH ENERGY SOURCE

Audrey C. Engelsberg, Milton, Vt., and Joseph A. Dehais, Washington, D.C., assignors to Cauldron Limited Partnership, Bethesda, Md.

Continuation of Ser. No. 865,039, Mar. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 611,198, Nov. 9, 1990, Pat. No. 5,099,557, which is a division of Ser. No. 216,903, Jul. 8, 1988, Pat. No. 5,024,968. This application Sep. 15, 1994, Ser. No. 309,593

Int. Cl.^{6} B08B *7/00*

U.S. Cl. 156—345 **18 Claims**



1. An apparatus for removing contaminants from the surface of a substrate while preserving the molecular crystal structure of the substrate treatment surface, said apparatus comprising:

a source of gas inert to the substrate treatment surface;

a gas conduit for conveying a gas from said gas source, said gas conduit having a longitudinal axis and a discharge end being movable relative to the treatment surface;

a radiation conduit for conveying radiation to the substrate treatment surface, said radiation conduit having a longitudinal axis, an inlet end, and a discharge end, said discharge end being movable relative to the substrate treatment surface;

a source of radiation coupled to said inlet end of said radiation conduit and irradiating into said inlet end radiation having an energy density and duration sufficient to release surface contaminants from the substrate treatment surface but insufficient to alter the molecular crystal structure of the substrate treatment surface, said discharge end of said radiation conduit and said discharge end of said gas conduit being disposed so that gas discharged from said gas conduit flows across the portion of the treatment surface irradiated by radiation discharged from said radiation conduit; and

means coupled to said gas conduit for directing the flow of gas from said discharge end of said gas conduit radially outwardly away from the longitudinal axis of said gas conduit; and

means coupled to said radiation conduit for directing radiation from said discharge end of said radiation conduit radially outwardly away from the longitudinal axis of said radiation conduit.

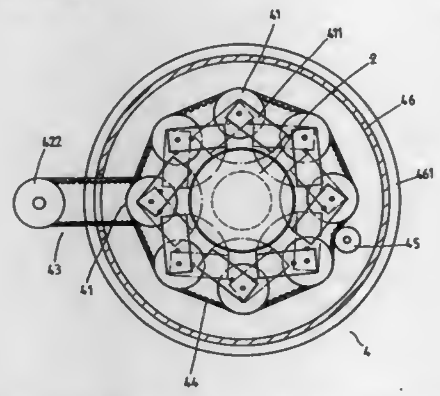
5,531,858
SHRINKABLE LABEL INSERTING MACHINE

Chin-Tan Hong, No. 42-35, Shuang-Fu Village, Min-Hsiung Shiang, Chia-I Hsien, Taiwan

Filed Jan. 20, 1995, Ser. No. 375,669

Int. Cl.^{6} B23B *31/00*

U.S. Cl. 156—556 **4 Claims**



1. A machine for applying shrinkable labels to containers, comprising:

a support frame having a deck portion vertically displaceable thereon, said deck portion having a centrally disposed opening formed therein;

label feed means coupled to said frame for feeding a continuous web of tubular shrinkable labels in a flat condition from a roll thereof;

a central holder disposed above a bottle to be labeled and coupled to said frame for passage of said continuous web of tubular shrinkable labels thereover, said central holder passing through said opening formed in said deck portion and having an upper portion adapted to unflatten said continuous web of tubular shrinkable labels as said continuous web is displaced over said central holder, said central holder having an annular groove formed therein;

means for cutting a tubular label section from said continuous web of tubular shrinkable labels coupled to said deck portion and surrounding said central holder, said cutting means including (1) a plurality of pulleys circularly arranged about an intermediate portion of said central holder, said plurality of pulleys being defined by a first pulley and a plurality of second pulleys, (2) a drive motor coupled to said deck portion, (3) a first drive belt rotatably coupling said first pulley to said drive motor, (4) a second drive belt extending about said plurality of pulleys for rotation of said second pulleys responsive to rotation of said first pulley, and (5) a plurality of cutting blades respectively coupled to said plurality of pulleys, each of said plurality of cutting blades having a cutting arc disposed in aligned relationship with said annular groove of said central holder and in overlapping relationship with adjacent other of said plurality of cutting blades;

a driving system coupled to said deck portion above said cutting means and contacting said central holder for displacing said continuous web of tubular shrinkable labels on said central holder to said cutting means;

a loading system coupled to said frame below said cutting means and contacting said central holder for displacing said tubular label section cut from said continuous web onto the bottle to be labeled; and,

means for conveying bottles coupled to said frame.

5,531,859
ELECTRONIC COMPONENT FEEDER

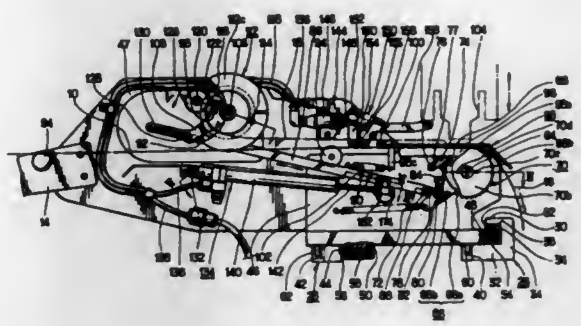
Jung D. Lee, and Yong G. Lee, both of Seoul, Rep. of Korea, assignors to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea

Filed Dec. 14, 1994, Ser. No. 355,776

Claims priority, application Rep. of Korea, Dec. 29, 1993, 93-30448

Int. Cl.^{6} B65H *5/28*

U.S. Cl. 156—584 **10 Claims**



1. An electronic component feeder for supplying a succession of electronic components borne by a carrier tape towed a pickup position one after another, the carrier tape including a backing strip adapted to support the electronic components thereon and a protective cover strip adhesively bonded to the backing strip to hold electronic components in position, which comprises:

(a) means for supplying the carrier tape;

(b) transfer means for intermittently transferring the carrier tape from the supplying means toward the pickup position each time at a predetermined pitch;

(c) takeup means intermittently operable in synchronism with the transfer means for winding up the protective cover strip peeled from the carrier tape;

(d) a shuttle rod operatively interconnecting the transfer means and the takeup means and having a plurality of locator holes each disposed along a length of the shuttle rod;

(e) an actuator for causing intermittent reciprocating movement of the shuttle rod to drive the transfer means and the takeup means in concert, the actuator including a cylinder and a piston rod extendibly fitted into the cylinder;

(f) an interconnector block fixedly attached to the piston rod at a first end and slidably engaged with the shuttle rod at a second end; and

(g) a locator pin carried by the interconnector block for selective engagement with one of the locator holes of the shuttle rod to permit change of the predetermined pitch at which the carrier tape is transferred toward the pickup position.

5,531,860
STRUCTURE AND METHOD FOR PROVIDING A LEAD FRAME WITH ENHANCED SOLDER WETTING LEADS

Tung L. Li, Hong Kong, Hong Kong, assignor to QPL Limited, Hong Kong, Hong Kong

Division of Ser. No. 125,638, Sep. 22, 1993, Pat. No. 5,444,293. This application May 4, 1995, Ser. No. 434,110

Int. Cl.^{6} B44C *1/22*

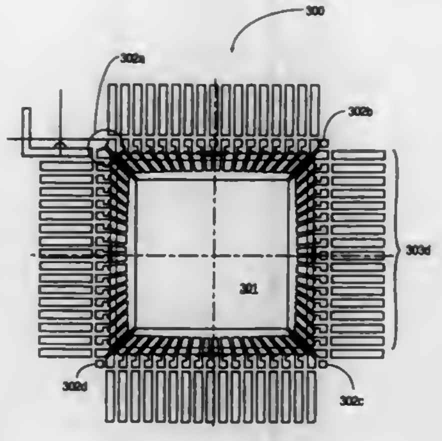
U.S. Cl. 156—625.1 **6 Claims**

1. A method for providing a lead frame having leads with solder wetting tips, comprising the steps of:

forming a lead frame in which a lead of said lead frame is provided a notch at a position on said lead, said notch reducing the cross sectional area of said lead at said position;

coating said leads of said lead frame with a solder material; and

trimming said leads at said position.



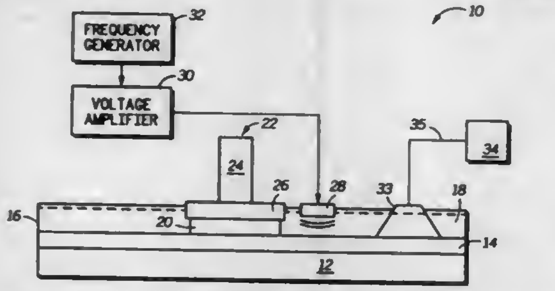
5,531,861
CHEMICAL-MECHANICAL-POLISHING PAD CLEANING PROCESS FOR USE DURING THE FABRICATION OF SEMICONDUCTOR DEVICES

Chris C. Yu, Irvine, Calif., and Tat-Kwan Yu, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 143,020, Sep. 29, 1993, Pat. No. 5,399,234. This application Jan. 17, 1995, Ser. No. 373,804

Int. Cl.^{6} H01L *21/306;21/304;* **B08B** *3/12;5/02*

U.S. Cl. 156—636.1 **12 Claims**



1. A chemical-mechanical-polishing process for fabricating a semiconductor device comprising the steps of:

providing a polishing apparatus having a polishing pad submerged in a liquid;
imparting a dislodging force to the polishing pad; and
removing polishing debris from the polishing pad by vacuum withdrawal.

5,531,862
METHOD OF AND APPARATUS FOR REMOVING FOREIGN PARTICLES

Toru Otsubo, Fujisawa; Yasumichi Suzuki; Shinji Sasaki, both of Yokohama; Kazuhiro Ohara, Kudamatsu, and Ichirou Sasaki, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 277,017

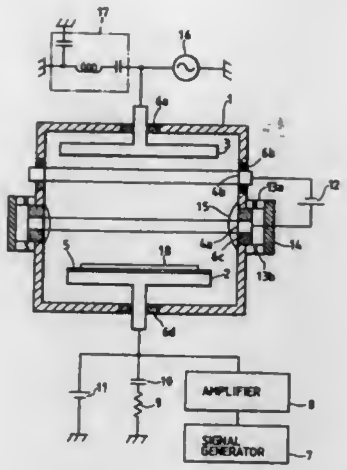
Claims priority, application Japan, Jul. 19, 1993, 5-178067

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 156—643.1 **23 Claims**

16. A method for removing foreign particles adhering to a surface of a processed substrate, said method comprising the steps of:

applying a separating force to the foreign particles in a direction of separating the foreign particles from the processed substrate;
applying a vibrating force to the foreign particles; and
varying a frequency of the vibrating force;
whereby foreign particles are removed from the surface of the processed substrate.



5,531,863
METHOD OF RECYCLING PLASTIC COATED CONTAINERS

Charles Propst, Gettysburg, Pa., assignor to Timbarco, Corp. c/o Belfint, Lyons & Schuman, Wilmington, Del.

Division of Ser. No. 257,518, Jun. 9, 1994, Pat. No. 5,429,294, which is a division of Ser. No. 966,835, Oct. 27, 1992, Pat. No. 5,393,566. This application Feb. 9, 1995, Ser. No. 385,792

Int. Cl.^{6} D21C *5/02*

U.S. Cl. 162—5 **8 Claims**

1. A method of recycling corrugated or folding boxes comprising:

providing a corrugated or folding box containing a component having an aqueous acrylic resin coated component thereof, communicating the corrugate of folding box to term particles,
contacting the particles with water to form a pulp including the aqueous acrylic resin coated components;

wherein said aqueous acrylic resin coated component includes a zinc oxide solution in an amount sufficient to cross-link the acrylic resin, said coated component is provided as a uniform thin film on the component of the box.

5,531,864
METHOD OF MOLDING SHAPED PULP ARTICLES FROM FIBER PULP, AND SHAPED PULP ARTICLE

Yasuhiro Miyamoto, Handa; Toshiaki Ishihara, Nagoya, and Minoru Uda, Handa, all of, Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 25,342, Mar. 3, 1993, Pat. No. 5,399,243. This application Dec. 21, 1994, Ser. No. 360,621

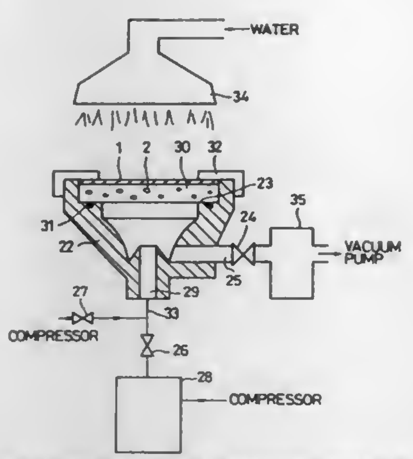
Claims priority, application Japan, Mar. 6, 1992, 4-49355; Jun. 11, 1992, 4-151956; Sep. 3, 1992, 4-235928; Feb. 24, 1993, 5-35840

Int. Cl.^{6} D21J *1/00*

U.S. Cl. 162—199 **5 Claims**

1. A method of molding shaped pulp articles from fiber pulp, comprising the steps of:

(1) providing a pulp molding die comprising a porous molding layer having a porosity of at least 5% and an average pore diameter in a range of 60 to 1000 μm, said porous molding layer having a molding surface shaped to the configuration of the article to be molded; a porous support layer disposed adjacent said porous molding layer on the opposite side thereof from said molding surface, said porous support layer having a porosity of at least 20% and an average pore diameter in a range of 0.6 to 10 mm, said average pore diameter being larger than that of said porous molding layer; and means for holding water in said die by capillary attraction, said means comprising a pore structure defined by at least one of said porous molding layer and said porous support layer;



(2) molding a pulp article on said molding surface of said die by suction through said die;
(3) removing the molded pulp article from the die; and
(4) after repeating steps (2) and (3) at least once, applying cleaning water to said die to incorporate water in said pore structure of said die and thereafter applying air pressure to said die from inside said die to drive said incorporated water from the die, thereby removing fibers trapped in said die.

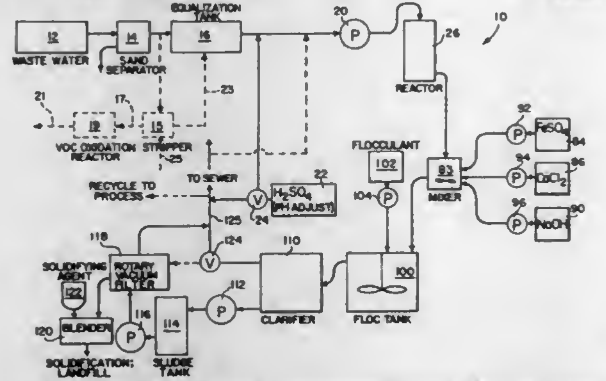
5,531,865
ELECTROLYTIC WATER PURIFICATION PROCESS

Leland G. Cole, 1667 Lake Front Rd., Lake Oswego, Oreg. 97034

Continuation-in-part of Ser. No. 279,629, Jul. 25, 1994, abandoned, which is a continuation of Ser. No. 932,316, Aug. 19, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 395,917

Int. Cl.^{6} C02F *1/463;1/461*

U.S. Cl. 205—751 **31 Claims**



1. A method for removing contaminants from a flow of wastewater using a purification apparatus which includes conduit means and an electrolytic oxidation vessel provided with a chamber and inlet and outlet fittings in communication with the chamber, the inlet and outlet fittings being coupled to the conduit means, the vessel having at least one elongate cathodic electrode and a plurality of elongate sacrificial anodic electrodes aligned in parallel with the cathodic electrode in the chamber, comprising the steps of directing the flow of wastewater through the conduit means and through the chamber of the electrolytic oxidation vessel in a direction parallel with the cathodic and anodic electrodes so that the flow of wastewater engages the cathodic and anodic electrodes, applying a voltage across the cathodic electrode and the sacrificial anodic electrodes to create a current having a density ranging from approximately 5–50 ma/sq. cm. so as to release ions from the anodic electrodes which oxidize and render insoluble contaminants in the flow of wastewater and create insoluble contaminants and substantially cleansed water, separating the insoluble contaminants from the substantially cleansed water, disconnecting the inlet and outlet fittings of the vessel from the conduit means, selecting another vessel similar to said first named vessel and having inlet and outlet fittings which were hermetically sealed prior to use so as to inhibit corrosion of the anodic electrodes, unsealing the inlet and outlet fittings of said another vessel, coupling the inlet and outlet fittings of said another vessel to the conduit means and repeating said directing, applying and separating steps.

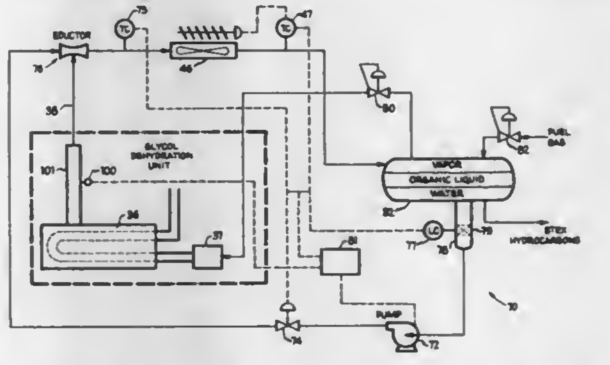
5,531,866
WATER AND ORGANIC CONSTITUENT SEPARATOR SYSTEM AND METHOD

Vijay K. Pathak, Edmonton, Canada, and Dennis Leppin, Chicago, Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Dec. 6, 1994, Ser. No. 349,951

Int. Cl.^{6} B01D *3/00;11/00*

U.S. Cl. 202—185.2 **14 Claims**



1. A system for separating water recovered during the dehydration of a gas, which contains water therein, wherein the system is employed to act upon a dehydrating solution which has been used to initially absorb water from the gas, the system comprising:

means for distilling water from the dehydrating solution after the solution has been used for the dehydration of the gas, to yield a flow of uncondensed water vapor emanating from the distilling means; and
means, for applying a suction pressure on the distilling means by merging the flow of uncondensed water vapor from the distilling means with a second, positively propelled fluid flow, for positively drawing the uncondensed water vapor from the distilling means.

5,531,867
INHIBITION OF 141B DECOMPOSITION

Richard M. Crooker, Lehigh; Maher Y. Elsheikh, Tredyffrin, both of Pa.; Anthony D. Kelton, Graves; Morris P. Walker, Marshall, both of Ky., and Danny W. Wright, Owatonna, Minn., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation of Ser. No. 983,919, Dec. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 869,225, Apr. 14, 1992, abandoned. This application Sep. 10, 1993, Ser. No. 119,905

Int. Cl.^{6} B01D *3/00;* **C07C** *27/28*

U.S. Cl. 203—86 **4 Claims**

1. A method for inhibiting the formation of vinylidene chloride during the heating or distilling of 1,1-dichloro-1-fluoroethane, which method comprises heating or distilling 1,1-dichloro-1-fluoroethane in a distillation column made of a nickel alloy.

3. In a process for separating 1,1-dichloro-1-fluoroethane from a liquid mixture containing 1,1,1,2-tetrachloroethane in a distillation column wherein the 1,1-dichloro-1-fluoroethane comes off as an overhead product and the 1,1,1,2-tetrachloroethane comes off as a bottoms product, the improvement which consists essentially of feeding said liquid mixture through a distillation column made of a nickel alloy so as to inhibit formation of vinylidene chloride during the separation process.

5,531,868

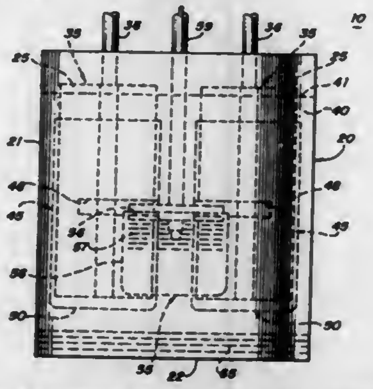
ADVANCED ELECTROREFINER DESIGN

William E. Miller, Naperville; Eddie C. Gay, Park Forest, and Zygmunt Tomczuk, Lockport, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 6, 1994, Ser. No. 267,949

Int. Cl.^{6} C25C *3/34*

U.S. Cl. 205—44 **19 Claims**



9. A process for refining spent nuclear fuel containing uranium and plutonium, comprising the steps of: providing an electrolytic cell having a molten electrolyte pool containing mixed metal chloride salts, a hollow cathode in contact with the electrolyte pool, an anode containing spent nuclear fuel positioned inside the hollow cathode such that a portion of the anode is near the cathode, a porous retaining member connected to the bottom of the cathode electrically insulated therefrom, mechanism providing relative movement between the anode and the cathode during deposition of uranium metal on the inside surface of said cathode during operation of the electrorefiner to refine spent nuclear fuel, electrical power means selectively connectable to the anode and the hollow cathode for providing electrical power to the cell components, electrically transferring uranium values and plutonium values from the anode to the electrolyte, and electrolytically depositing substantially pure uranium on the hollow cathode.

5,531,869

METAL CATALYST CARRIED ON CARRIER MAKING USE OF TOURMALINE AND ITS PRODUCTION

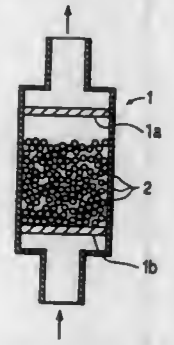
Tetsujiro Kubo, Tokyo, Japan, assignor to Kubo Technical Office, Tokyo, Japan

Continuation-in-part of Ser. No. 978,510, Nov. 18, 1992, abandoned, and Ser. No. 105,159, Aug. 12, 1993, abandoned, which is a division of Ser. No. 949,372, Sep. 23, 1992, abandoned, which is a continuation of Ser. No. 660,022, Feb. 25, 1991, abandoned. This application Nov. 12, 1993, Ser. No. 151,261

Claims priority, application Japan, Feb. 27, 1990, 2-46449; Nov. 18, 1991, 3-328312

Int. Cl.^{6} B01J *21/00*

U.S. Cl. 502—202 **16 Claims**



7. A process for preparing a metal catalyst carried on a carrier material, which comprises the steps of:

immersing the carrier material in an aqueous solution of at least one metal ion, said carrier material being selected from the group consisting of a powder of fine tourmaline crystals possessing polarity and a formed body containing a plurality of fine tourmaline crystals possessing polarity,

mixing and stirring the aqueous solution until said at least one metal ion is deposited on poles of said tourmaline crystals of said carrier material,

separating said carrier material from the aqueous solution,

evaporating off traces of the aqueous solution from said carrier material, and

drying said carrier material to obtain the metal catalyst carried on the carrier material.

5,531,870

POTENTIOMETRIC ION DETERMINATIONS USING ENHANCED SELECTIVITY ASYMMETRIC ION-SELECTIVE MEMBRANES

Geun Sig Cha, Seodaemun-ku, Rep. of Korea, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 156,180, Nov. 22, 1993, Pat. No. 5,415,746, which is a continuation-in-part of Ser. No. 994,234, Dec. 21, 1992, abandoned. This application May 5, 1995, Ser. No. 437,117

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 205—778 **19 Claims**

1. A process for performing potentiometric ion determinations on biological samples using an ion selective asymmetric membrane electrode and a reference electrode electrolytically connected to the ion-selective asymmetric membrane electrode which comprises:

(a) contacting a biological sample suspected of containing an ion of interest with the ion-selective asymmetric membrane electrode, the ion-selective asymmetric membrane electrode having an asymmetric membrane with an ion selective layer and a hydrophilic layer fused to the ion-selective layer, the ion-selective layer containing an ion-selective agent and a plasticizing agent, the hydrophilic layer being in contact with the sample,

(b) measuring the potential difference between the ion-selective asymmetric membrane electrode and the reference electrode; and

(c) relating the potential difference to the concentration of the ion of interest in the sample, thereby enhancing potentiometric ion selectivity.

5,531,871

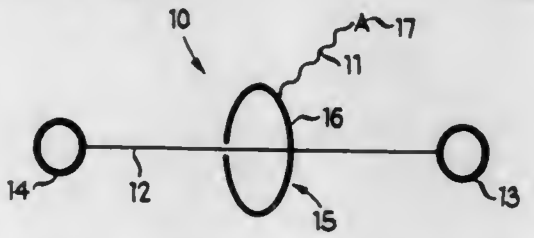
MOLECULAR COMPLEXES FOR USE AS ELECTROLYTE COMPONENTS

Denis G. Fauteux, Acton; Martin van Buren, Chelmsford, and John Powell, Burlington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 268,229, Jun. 29, 1994. This application Apr. 27, 1995, Ser. No. 429,717

Int. Cl.^{6} B01D *61/42*

U.S. Cl. 205—688 **2 Claims**



1. A method of transporting an ion within an electrolyte composition, comprising the steps of:

providing an electrolyte composition comprising a linear molecule associated with a cyclic molecule, the cyclic molecule

comprising a functional group attached thereto, said functional group capable of interacting with an ion,

wherein said cyclic molecule is located between a pair of blocking groups of the linear molecule,

wherein the cyclic molecule is capable of motion along the length of the linear molecule between the blocking groups;

introducing an ion into the electrolyte composition; and

applying a voltage across the electrolyte composition sufficient to cause the ion to migrate, wherein the functional group interacting with the ion moves along the length of the linear molecule in the same direction as the ion and transfers the ion to a functional group of an adjacent cyclic molecule.

2. A method of transporting an ion within an electrolyte composition, comprising the steps of:

providing an electrolyte composition comprising a linear molecule associated with a cyclic molecule, the cyclic molecule having limited mobility in the electrolyte composition,

wherein said cyclic molecule is located between a pair of blocking groups of the linear molecule, said blocking groups capable of interacting with an ion,

wherein the linear molecule is capable of motion along a length of the linear molecule between the blocking groups;

introducing an ion into the electrolyte composition; and

applying a voltage across the electrolyte composition sufficient to cause the ion to migrate, wherein the blocking group interacting with the ion moves along the length of the linear molecule in the same direction as the ion and transfers the ion to a blocking group of an adjacent linear molecule.

5,531,872

PROCESSES FOR PREPARING PHOTOCONDUCTIVE MEMBERS BY ELECTROPHORESIS

Rachael A. Forgit, Rochester; Ronald E. Godlove, Bergen; John S. Chambers, Rochester; Huoy-Jen Yuh, Pittsford; Robert E. McCumiskey, Rochester; Kamran U. Zaman, Henrietta, and William G. Herbert, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1994, Ser. No. 288,860

Int. Cl.^{6} C25D *13/00*

U.S. Cl. 204—486 **7 Claims**

1. A process for fabricating a photoconductive member comprising:

(a) depositing electrophoretically a layer of an organic charge generating material onto a substrate from a liquid composition; and

(b) depositing by dip coating a layer of a charge transport material onto the organic charge generating material layer.

5,531,873

ELECTRODE ARRANGEMENT TO BE USED IN THE CATHODIC PROTECTION OF CONCRETE STRUCTURES AND A FIXING ELEMENT

Martti Pulliainen, Anttola, and Tarja Haapamāki, Töysä both of, Finland, assignors to Savcor-Consulting Oy, Mikkeli, Finland

Continuation of Ser. No. 834,297, Feb. 19, 1992, abandoned. This application May 27, 1994, Ser. No. 250,476

Claims priority, application Finland, Jun. 20, 1990, 903119

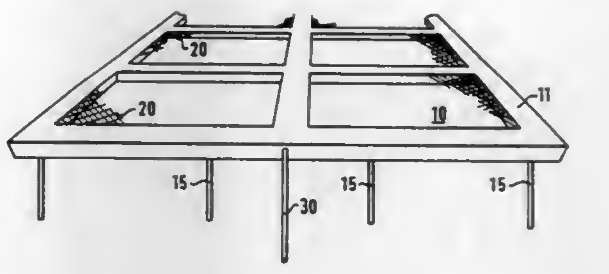
Int. Cl.^{6} C23F *13/00*

U.S. Cl. 204—196 **13 Claims**

1. An electrode arrangement to be used in the cathodic protection of concrete structures, comprising

a framework having a plurality of open interior spaces extending from a first side of said framework to a second side of said framework opposed to said first side, said framework being made of an electrically insulating material or an electrolytically conductive material,

a plurality of anodes, each of said anodes being arranged in a respective one of said open interior spaces and being attached to said framework, and



fixing means attached to said framework for fixing said framework to steel parts of a structure to be cast with concrete,

said fixing means being attachable to the steel parts to define a continuous open space into which concrete is to be poured, said anodes and the steel parts of the structure being situated in said continuous open space before concrete is poured therein such that a uniform and continuous concrete structure is formed between said anodes and the steel parts upon pouring of concrete into said continuous open space.

5,531,874

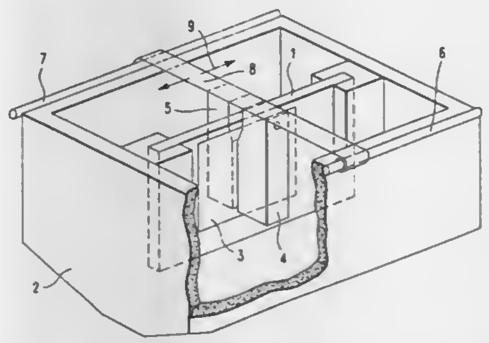
ELECTROETCHING TOOL USING LOCALIZED APPLICATION OF CHANNELIZED FLOW OF ELECTROLYTE

Denis J. Brophy, Staatsburg; Madhav Datta, Yorktown Heights; Derek B. Harris, Dryden, all of N.Y.; Frank S. Ryan, Boulder, Colo., and Frank A. Spera, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1994, Ser. No. 261,170

Int. Cl.^{6} C25F *7/00*

U.S. Cl. 204—224 M **14 Claims**



1. An electroetching tool comprising a tank for holding electrolyte,

means for holding a masked workpiece plate to be etched, said workpiece plate adapted to be positioned in a vertical direction when said workpiece is in said tank,

at least one cathode assembly having a narrow rectangular orifice extending In said vertical direction within said tank,

means for causing said electrolyte to flow from said tank and through said orifice for impingement upon said plate when in place,

means for scanning said assembly so that said orifice is moved in a direction perpendicular to said vertical direction across the face of said plate, and

means for applying an electric potential across said plate and said assembly, said assembly being negatively energized relative to said plate,

whereby uniformity of current distribution across the face of said plate is achieved by the integrated effect of scanning the orifice of each said at least one cathode assembly across the face of said workpiece.

5,531,875
ELECTRODE SUBSTRATE FOR ELECTROLYSIS AND PRODUCTION METHOD THEREOF

Takayuki Shimamune, and Yasuo Nakajima, both of Tokyo, Japan, assignors to Permelec Electrode Co., Ltd., Kanagawa, Japan

Filed Aug. 24, 1994, Ser. No. 294,046

Claims priority, application Japan, Aug. 24, 1993, 5-230841

Int. Cl.^{6} C25B *11/04;11/10*

U.S. Cl. 204—290 R **2 Claims**

2. An electrode substrate for electrolysis comprising an electrically conductive metallic base material, a bonding layer composed of metal oxides formed on the surface of the base material, and a coating layer having a thickness of from 10 to 200 μm composed of a platinum group metal and a partial oxide of a non-stoichiometric composition containing at least one kind of metal selected from the group consisting of titanium, tantalum and niobium, and oxygen formed on the surface of the bonding layer.

5,531,876
SPUTTER CATHODE

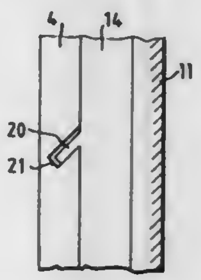
Mark Saunders, Rodenbach, and Berthold Ocker, Hanau, both of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Feb. 23, 1995, Ser. No. 392,709

Claims priority, application Germany, Apr. 26, 1994, 44 14 470.9

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—298.12 **3 Claims**



1. Sputter cathode assembly comprising,

an electrode having a vertical front surface with upward pointing slot means therein,

target means,

metallic backing plate means permanently bonded to said target means, said backing plate means having substantially the same coefficient of thermal expansion as said target means,

said backing plate means having downward pointing hanger lug means received in said upward pointing slot means so that said backing plate means is held in contact with the front surface of the electrode by virtue of the weight of the target means and backing plate means.

5,531,877
MICROWAVE-ENHANCED SPUTTERING CONFIGURATION

Rudolf Latz, Rodgau, and Roland Gesche, Seligenstadt, both of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Aug. 17, 1993, Ser. No. 108,078

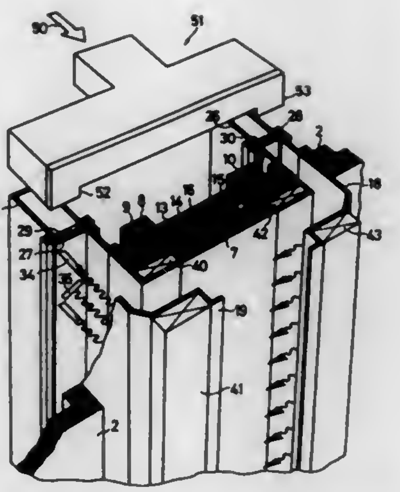
Claims priority, application Germany, Sep. 10, 1992, 42 30 291.9

Int. Cl.^{6} C23C *14/34*

U.S. Cl. 204—298.19 **8 Claims**

1. Microwave-enhanced sputtering configuration of the magnetron type comprising

a) a vacuum chamber;



b) an elongate target in the vacuum chamber which is connected to an electrode connected to a power supply, said target having parallel long sides;

c) a magnet device whose magnetic field exits from the target and again enters into it;

d) microwave distribution means comprising first and second spaced apart elongate cavity resonators which supply microwaves at wavelength λ to respective first and second elongate waveguides, each said cavity resonator being separated from the respective waveguide by an elongate pane permeable to microwaves and an elongate wall having a row of slits with centers spaced at a distance of λ/2, said waveguides providing microwaves into a volume in front of the target from said long sides of said target, and

e) an electromagnet placed around the periphery of the target.

5,531,878
SENSOR DEVICES

Pankaj M. Vadgama, Manchester, and Sêamus P. J. Higson, Sheffield, both of, United Kingdom, assignors to The Victoria University of Manchester, Manchester, England

PCT No. PCT/GB93/00982, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO93/24828, PCT Pub. Date Dec. 9, 1993

PCT Filed May 13, 1993, Ser. No. 343,534

Claims priority, application United Kingdom, May 29, 1994, 9211402

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—415 **23 Claims**

1. A sensor device, useful for electrolytic analytical procedures, incorporating a carbonaceous material having characteristics comparable with that of diamond known as diamond-like carbon which serves as a shield to exclude interferents.

5,531,879
HEGO SENSOR WITHOUT CHARACTERISTIC SHIFT DOWN

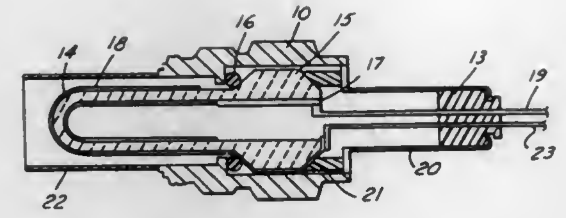
Margherita Zanini-Fisher, Bloomfield Township; Richard E. Soltis, Redford; Eleftherios M. Logothetis, Birmingham, and Carlos M. Barrera, Milford, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1995, Ser. No. 498,453

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—427 **7 Claims**

1. An exhaust gas oxygen sensor for use with an internal combustion engine producing an exhaust gas said sensor including an outer electrode exposed to the exhaust gas and an inner reference electrode exposed to ambient air as a reference, said inner reference electrode being formed of a non-catalytic material.



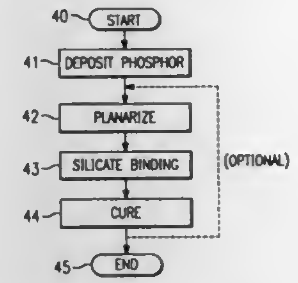
5,531,880
METHOD FOR PRODUCING THIN, UNIFORM POWDER PHOSPHOR FOR DISPLAY SCREENS

Chenggang Xie, Cedar Park; Donald E. Patterson, Houston, and Nalin Kumar, Canyon Lake, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, and SI Diamond Technology, Incorporated, Houston, both of Tex.

Filed Sep. 13, 1994, Ser. No. 304,918

Int. Cl.^{6} C25D *13/02*

U.S. Cl. 204—478 **22 Claims**



1. A process comprising the steps of:

depositing a phosphor on a support;

planarizing said deposited phosphor with a mechanical press;

curing said planarized deposited phosphor; and

repeating said planarizing step after said curing step.

5,531,881
METHOD FOR CORRECTING DEFECT IN COLOR FILTER

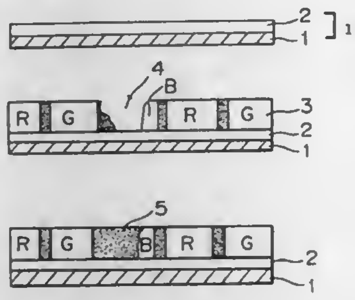
Akira Matsumura, Hirakata; Masashi Ohata, Neyagawa, and Mamoru Seio, Takatsuki, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

Filed Mar. 27, 1995, Ser. No. 411,147

Claims priority, application Japan, Mar. 28, 1994, 6-057036

Int. Cl.^{6} C25D *13/00*

U.S. Cl. 204—507 **12 Claims**



1. A method for correcting defective portions of a color filter, the color filter including a transparent substrate, a transparent electrode formed on at least a portion of the transparent substrate, and a color layer having a multi-color pattern formed on at least a portion of the transparent electrode, the color layer being removable by a laser beam and containing the defective portions at which the color layer is incomplete, said method comprising:

electrodepositing a black film on the defective portions of the color filter such that the black film covers exposed portions of the transparent electrode underlying the defective portions; and,

curing the black film electrodeposited on the defective portions.

5,531,882
PROCEDURE FOR CLEANING THE ANODES OF ELECTROLYTIC TANKS

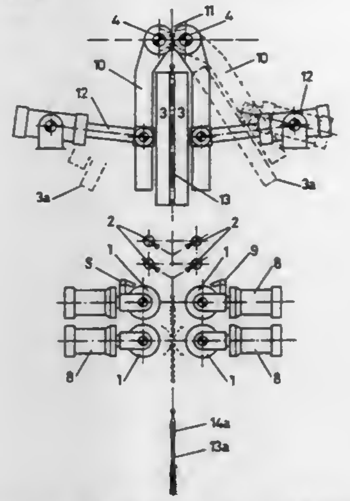
Francisco Javier Sitges Menendez, Madrid; Fernando Sitges Menendez, Salinas (Asturias); Francisco Alvarez Tamargo, Luanco (Asturias), and Jose Maria Martinez Valdes, Arnao-Castrillon (Asturias), all of, Spain, assignors to Asturiana De Zinc, S.A., Spain

Division of Ser. No. 261,402, Jun. 17, 1994. This application Sep. 28, 1995, Ser. No. 535,455

Claims priority, application Spain, Sep. 24, 1993, 9302030

Int. Cl.^{6} C25C *7/06*

U.S. Cl. 205—602 **7 Claims**



1. A procedure for cleaning the anodes of electrolytic tanks, in particular for eliminating the deposits of impurities which adhere to the surfaces of the anodes during the process of producing non-ferrous metals by electrolysis, characterized in that it comprises, in combination, the following stages: a) mechanically breaking the deposits on the surfaces of the anodes; b) detaching and separating the deposits, once broken, from the surfaces of the anodes; and c) subjecting the surfaces of the anodes to a flattening operation; said breaking being carried out by means of closely spaced cutting lines made in the deposits, and said detaching and separating stage being carried out by means of jets of water under pressure incident on the surfaces of the anodes.

5,531,883
ELECTRODE

Donald S. Cameron, Emmer Green, and John M. Gascoyne, High Wycombe, both of, United Kingdom, assignors to Johnson Matthey Public Limited Company, London, United Kingdom

PCT No. PCT/GB94/00057, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO94/17223, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 12, 1994, Ser. No. 360,818

Claims priority, application United Kingdom, Jan. 23, 1993, 9301330

Int. Cl.^{6} C25B *1/00;11/00*

U.S. Cl. 205—626 **5 Claims**

1. An air-breathing electrode suitable for use in low temperature ozone generation cells having an air contacting side and an electrolyte contacting side, said electrode comprising, in the following order, a mesh current collector layer, a hydrophobic support layer,

a catalyst layer for contacting the electrolyte, a porous thermal insulating layer, and a retardant catalyst decomposition barrier layer in or on said insulating layer.

5,531,884
FCC CATALYST STRIPPER

David L. Johnson, Glen Mills, Pa., and Richard C. Senior, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 3, 1994, Ser. No. 285,248
Int. Cl.⁶ C10G *9/36*
U.S. Cl. 208—150 **18 Claims**

1. A fluidized catalytic cracking process wherein a heavy hydrocarbon feed comprising hydrocarbons having a boiling point above about 650° F. is catalytically cracked to lighter products by contact with a circulating fluidizable catalytic cracking catalyst inventory consisting of particles having a size ranging from about 20 to about 100 microns, comprising:

a. catalytically cracking said feed in a catalytic cracking reactor operating at catalytic cracking conditions by contacting feed with a source of regenerated catalyst to produce a cracking reactor effluent mixture comprising cracked products and spent catalyst containing coke and strippable hydrocarbons;
b. discharging and separating said effluent mixture into a cracked product rich vapor phase and a solids rich phase comprising spent catalyst;
c. removing said vapor phase as a product;
d. stripping said solids rich spent catalyst phase by countercurrent contact with a stripping vapor to produce stripped catalyst and stripper vapor in a stripper vessel having:
  a plurality of slant trays for horizontal and vertical transfer of catalyst as it passes down through said stripper, each slant tray having a slanted surface affixed at an upper edge portion thereof to a wall portion of said stripping vessel and a lower edge or lip portion, and wherein each slant tray has an upper and a lower surface;
  at least one inlet in a lower portion of said stripping vessel for stripping vapor;
  at least one outlet in a lower portion of said stripping vessel for discharge of stripped catalyst;
  at least one outlet in an upper portion of said stripping vessel for discharge of stripper vapors; and
  wherein downcomers are provided in at least some of said slant trays having:
  a downcomer catalyst inlet in an upper portion thereof fluidly connected with the upper surface of said slant tray;
  a generally vertical catalyst downcomer section having an upper portion terminating in said downcomer catalyst inlet and a lower portion terminating a downcomer catalyst outlet;
e. transporting stripped catalyst discharged from said stripper to a catalyst regenerator;
f. regenerating stripped catalyst by contact with oxygen containing gas to produce regenerated catalyst; and
g. recycling said regenerated catalyst to said cracking reactor.

5,531,885
HYDROCONVERSION PROCESS FOR HEAVY HYDROCARBON OIL

Yoshihiro Mizutani; Takeshi Tomino; Yasuo Yamamoto; Yukio Shibata, and Hatsutaro Yamazaki, all of Saitama, Japan, assignors to Cosmo Oil Co., Ltd., and Cosmo Research Institute, both of Tokyo, Japan

Filed Feb. 15, 1995, Ser. No. 388,999
Claims priority, application Japan, Feb. 19, 1994, 6-044920
Int. Cl.⁶ C10G *65/02*
U.S. Cl. 208—210 **5 Claims**

1. A process for hydroconverting a heavy hydrocarbon oil in a reactor under high-temperature and high-pressure conditions,
wherein said hydroconversion is carried out using at least three desulfurization catalysts which each contain as active metals transition metals of Group VI and VIII in the Periodic Table supported on an alumina carrier and which have different stability indices of 40 or higher, 30 or higher and below 40, and lower than 30, respectively,
and wherein said at least three catalysts are packed into the reactor in a descending order of stability index from the inlet to the outlet of the reactor, with the proportion of the catalyst having the stability index of 40 or higher being at least 10% by volume, that of the catalyst having the stability index of 30 or higher and below 40 being at least 20% by volume, and that of the catalyst having the stability index of lower than 30 being at least 30% by volume, wherein said hydroconverting is conducted at a temperature of from about 250° to 500° C. a hydrogen/oil ratio of from about 500 to 3,000 NL/L, a hydrogen partial pressure of from about 25 to 190 kg/cm^{2}G and an LSHV from about 0.05 to 1 h^{-1}.

5,531,886
PROCESS FOR THE ELIMINATION OF ARSENIC FROM HYDROCARBONS BY PASSAGE OVER A PRESULPHURATED RETENTION MASS

Charles Cameron, Paris; Jean Cosyns, Maule; Patrick Sarrazin, Rueil Malmaison; Jean Paul Boitiau, Poissy, and Philippe Courty, Houilles, all of, Japan, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Feb. 8, 1994, Ser. No. 193,591
Claims priority, application France, Feb. 8, 1993, 93 01442
Int. Cl.⁶ C10G *45/02*
U.S. Cl. 208—251 H **18 Claims**

1. A process for the elimination of arsenic from a hydrocarbon feedstock containing arsenic which comprises mixing the feedstock, which contains from 0 to 1000 mg of sulfur/kg, with hydrogen and contacting it, at a temperature of 120°–250° C., a pressure of 1–40 bars and a volume flow of 1 to 50 h^{-1}, with a retention mass comprising a support and at least one metal selected from the group consisting of iron, nickel, cobalt, molybdenum, tungsten, chromium and palladium, 5–50% by weight of said metal or metals being in the form of a sulfide, and wherein the retention mass is obtained by impregnating a precursor comprising said supported metal or metals, in the metallic or oxide form, with an aqueous or organic solution or an aqueous or organic suspension comprising at least one reducing agent and at least one sulfur containing agent selected from the group consisting of

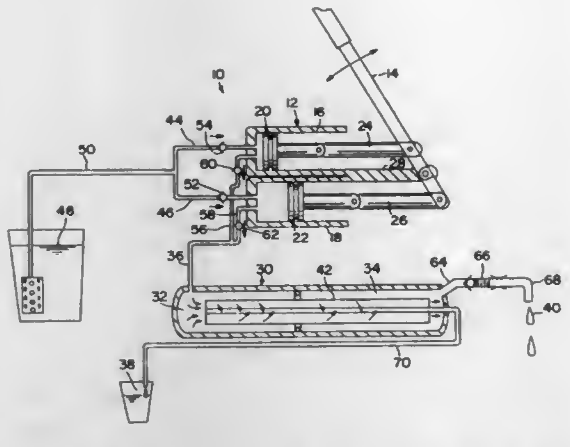
a) at least one organic polysulfide mixed with elemental sulfur,
b) at least one organic disulfide, optionally mixed with elemental sulfur,
c) at least one organic or inorganic sulfide, optionally mixed with elemental sulfur, and
d) elemental sulfur,
and thermally treating the precursor after impregnation, but before contacting it with the feedstock.

5,531,887
MANUALLY OPERATED REVERSE OSMOSIS DESALINIZATION SYSTEM

Gary L. Miers, Poland Springs, Me., assignor to Howell Laboratories, Inc., Bridgton, Me.

Filed May 24, 1995, Ser. No. 449,080
Int. Cl.⁶ B01D *21/30;24/00*
U.S. Cl. 210—135 **3 Claims**

1. A manually operated apparatus for the desalinization of a feed stream which comprises:
a pump having at least two cylinders and two associated pistons received in the cylinders, the pistons each including a piston rod;
the cylinders disposed in side by side relationship, a pump arm pinned to a support wall which functions as a fulcrum, the support wall positioned between the cylinders, a handle connected to the piston rods to drive the pistons into and out of their associated cylinders in reciprocating opposite fashion such that when one piston is being withdrawn from its cylinder the other piston is introduced into its cylinder;
a source of feed stream to be purified in fluid flow communication with each of the cylinders including first and second feed conduits to provide for the flow of the feed stream from the source to the first and second cylinders respectively, each of the conduits having a check valve therein to prevent back flow of the feed stream from the chamber with which the conduit is associated back to the source, such that as the feed stream is being drawn into one first cylinder from the source of supply the feed stream in the other cylinder is being driven under pressure to a membrane assembly and is prevented from returning to the source;
first and second discharge conduits to provide for fluid flow communication between the first and second cylinders and the membrane assembly, each of said conduits having a check valve therein;
the membrane assembly in fluid flow communication with the first and second cylinders the assembly comprising a membrane having a feed side and a permeate side whereby the feed stream is separated into a permeate fraction and a concentrate fraction, a first conduit secured to the membrane assembly to discharge the concentrate fraction from the membrane assembly, the first conduit having a pressure relief valve therein and a second conduit to discharge the permeate fraction;
the dimensioning of the cylinders, pistons and piston rods, membrane assembly and associated relief valve configured such that the pressure and flow rate of the saline solution flowing into the membrane assembly ensures that the membrane surface on the feed side of the membrane assembly is continuously swept at constant pressure and flow rate to prevent or inhibit concentration polarization.

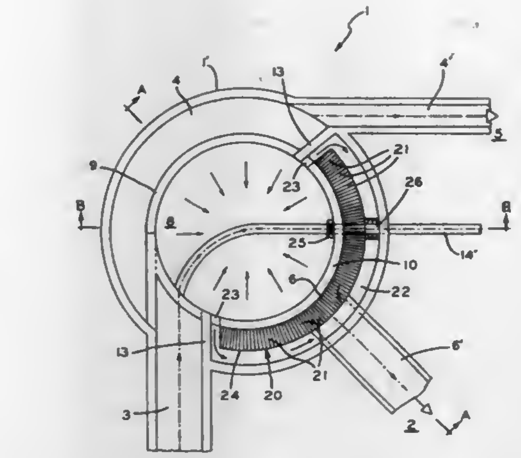


5,531,888
ARRANGEMENT FOR SEPARATION OF COARSE MATTER AND/OR BULKY SOLIDS IN RAINWATER RELIEF STRUCTURES

Wolfgang Geiger, Gräfelfing, and Erwin Ruhl, Herbstein, both of, Germany, assignors to VSB VOGELSBERGER Umwelttechnischer Anlagenbau GmbH, Lautertal, Germany

Filed Jul. 27, 1994, Ser. No. 281,462
Claims priority, application Germany, Jul. 28, 1993, 43 25 278.8; Oct. 23, 1993, 43 36 228.1
Int. Cl.⁶ E03F *5/10*
U.S. Cl. 210—162 **14 Claims**

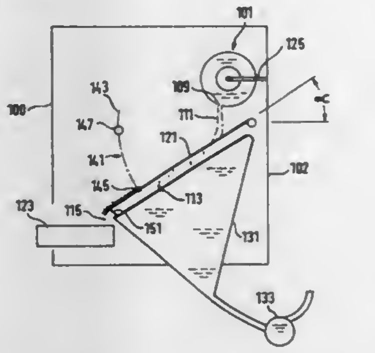
1. In combination:
a rainwater relief structure comprising an inlet connected to a rainwater collection system and a plurality of outlets, said plurality of outlets including an excess water relief outlet, said rainwater relief structure further comprising a relief weir between said inlet and said relief outlet; and
an arrangement for the separation of at least one of coarse matter and bulky solids from water in said rainwater relief structure, comprising:
  an interceptor arranged in the area of said relief weir and comprised of spaced bar elements, wherein said bar elements are arranged on an overflow side of said relief weir for retaining at least one of the coarse matter and bulky solids within water overflowing said relief weir toward said relief outlet; and
  a separate pollutant channel positioned to receive at least one of the coarse matter and bulky solids retained by said interceptor.



5,531,889
METHOD AND APPARATUS FOR REMOVING RESIST PARTICLES FROM STRIPPING SOLUTIONS FOR PRINTED WIREBOARDS

David T. Baron, Worcestershire; Alexander R. Taylor, Ayrshire, and Kuldip S. Johal, Willenhall, all of, England, assignors to Atotech USA, Inc., Somerset, N.J.

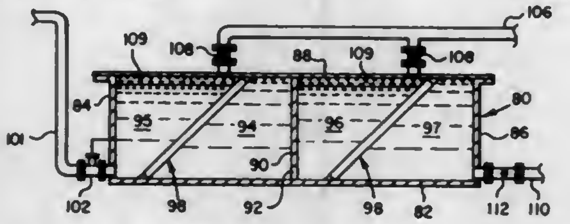
Filed Mar. 8, 1994, Ser. No. 207,991
Int. Cl.⁶ B01D *29/90;33/72;* **C23F** *1/00;* **H01L** *21/3105*
U.S. Cl. 210—167 **16 Claims**



1. A method for the continuous separation of resist particles from a dispersion of the particles in a resist stripping solution, which comprises passing the dispersion through a curtain tube means to provide a uniform distribution of particles in the stripping solution, the curtain tube means comprising an inner tube with a plurality of holes therein and an outer concentric tube having a slot therein for mixing the resist particles and stripping solution and uniformly dispensing the resist particles and stripping solution and thereafter passing the uniform dispersion through a filter screen separator to separate the resist particles from the stripping solution, the filter screen separator being at a sufficient angle to the horizontal whereby gravity causes the resist particles to proceed downwardly along the filter screen separator and separately recovering the stripping solution and resist particles.

5,531,890
OIL SEPARATION AND DISPOSAL SYSTEMS

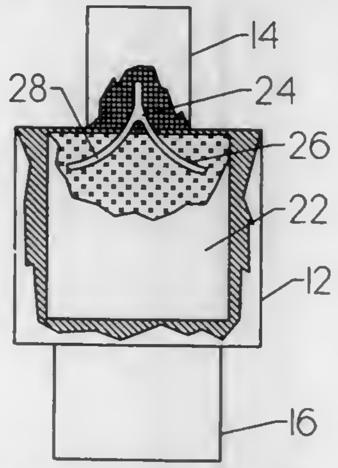
Alexander J. Keenan, Ancorage, Ak., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Continuation-in-part of Ser. No. 68,936, May 28, 1993, abandoned. This application May 3, 1995, Ser. No. 434,265
Int. Cl.^{6} B01D *17/022*
U.S. Cl. 210—242.4 **5 Claims**



1. A system for separating oil and water from an oil-water mixture, said system comprising:
- a tank, said tank defining means for containing said oil-water mixture;
- a first chamber in said tank;
- an oil-water inlet conduit in fluid communication with said first chamber, said inlet conduit defining means for introducing said oil-water mixture into said tank;
- an oil-water separator element effective to permit the passage of water therethrough and to substantially refuse the passage of oil therethrough and dividing said tank to form a well between said first chamber and a second chamber in said tank so that water passes through said element from said first chamber into said second chamber;
- an oil recovery line in fluid communication with an upper portion of said first chamber; and a water outlet in fluid communication with a lower portion of said second chamber;
- wherein said material consists essentially of a copolymer of styrene and maleic anhydride and a multi-arm block copolymer of styrene and ethylene oxide or a copolymer of recurring units of at least one alpha, beta unsaturated monomer and recurring units of at least one copolymerizable comonomer comprising from about 20% to about 80% pendant carboxylate acid units and from about 80% to about 20% pendant carboxylic salt units blended with at least one monomer containing at least two hydroxyl groups.

5,531,891
PRE-SEPTIC TANK FLUID FILTER

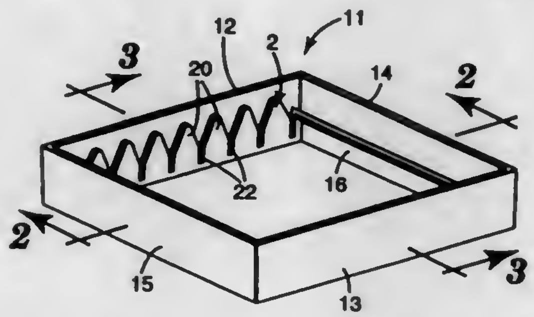
James J. vonMeier, 14622 - 268th Ave., Zimmerman, Minn. 55398
Filed Feb. 16, 1995, Ser. No. 389,266
Int. Cl.^{6} B01D *35/02;27/00*
U.S. Cl. 210—251 **11 Claims**



1. Pre-septic tank filter apparatus comprising:
- a structure defining a filter cavity, and having a fluid input port and a fluid output port;
- a filter mounted in said cavity, and having an open upper portion and a closed lower portion; and,
- a fluid deflector having vanes fixedly mounted in said input port extending into said filter upper portion to deflect input fluid laterally through said filter upper portion into said cavity and to said output port, such that contaminants collected in said filter upper portion are attracted by gravity to said filter closed lower portion.

5,531,892
ZIGZAG FILTER MEDIA AND FRAME HAVING TRIANGULAR PLEAT STABILIZING ELEMENTS

Dean R. Duffy, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 15, 1995, Ser. No. 529,144
Int. Cl.^{6} B01D *27/08*
U.S. Cl. 210—493.1 **24 Claims**



1. A zigzag filter comprising a zigzag pleated filter media and a filter frame. said filter frame having two continuous outer sidewalls and two inner sidewalls each of said inner and outer sidewalls are separated by a continuous fluid impermeable spacer element, the inner sidewalls having a plurality of upstanding triangular pleat stabilizing elements with first pleat stabilizing element sidewalls tapering outward from a peak toward second pleat stabilizing element sidewall segments, two adjacent second sidewalls segments on separate pleat stabilizing elements forming pleat tip retaining gaps, the pleat stabilizing elements having a shape such that the pleat stabilizing elements support and engage the zigzag filter media first pleat tips on a first face of the pleated filter media, second pleat tips being frictionally engaged by the pleat retaining gaps on said first face of the pleated filter media such that the filter media second face pleat tips are partially compressed in said pleat tip retaining gaps, said continuous fluid impermeable spacer element being downstream of said pleat tip retaining gaps.

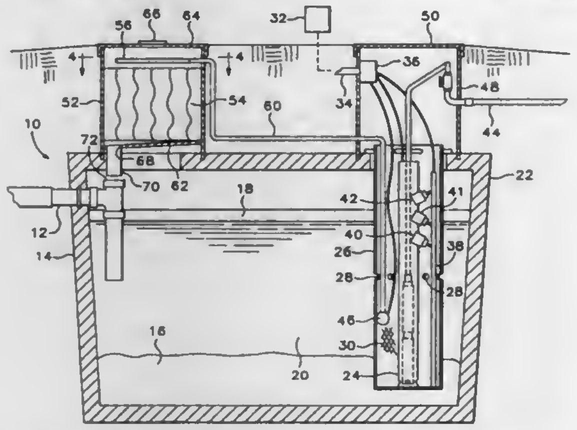
5,531,893
INTER-PENETRATING NETWORK CHARGE MODIFIED MICROPOROUS MEMBRANE

Hopin Hu, Ann Arbor, Mich., and Chung-Jen Hou, Pensacola, Fla., assignors to Gelman Sciences Inc., Ann Arbor, Mich.
Continuation-in-part of Ser. No. 17,036, Feb. 12, 1993, Pat. No. 5,277,812. This application Dec. 1, 1993, Ser. No. 160,427
Int. Cl.^{6} B01D *71/68*
U.S. Cl. 210—500.35 **31 Claims**

1. A hydrophilic inter-penetrating network cationic charge modified microporous filtration membrane having a pore size range between approximately 0.01 μm and 10 μm and further having low membrane extractables and fast recovery of ultrapure water resistivity, comprising:
- a microporous membrane matrix, having therewithin a cross-linked inter-penetrating polymer network structure, said matrix being formed by casting in a film a blended polymer membrane solution comprising polyethersulfone, polyfunctional glycidyl ether, polyamine, polyethylene glycol and a solvent, precipitating the resulting film as a membrane having said network structure in a quench bath, and washing and drying the thus precipitated membrane.

5,531,894
METHOD OF TREATING WASTEWATER

Harold L. Ball; Terry R. Bounds, both of Roseburg; Eric S. Ball, Winchester, and Jeffrey L. Ball, Roseburg, all of Oreg., assignors to Orenco Systems, Inc., Roseburg, Oreg.
Filed Nov. 18, 1993, Ser. No. 154,592
Int. Cl.^{6} C02F *3/30*
U.S. Cl. 210—605 **10 Claims**

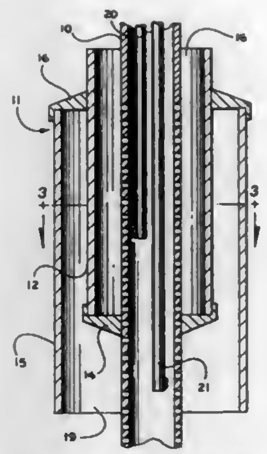


1. A method of treating sewage wastewater, comprising:
- (a) flowing sewage wastewater having a significant concentration of waste solids into a septic tank through an inlet which is in fluid communication with said septic tank, and allowing said solids to separate from said wastewater and to distribute into a lower horizontal sludge layer and an upper horizontal scum layer with a relatively clear horizontal layer of liquid therebetween;
- (b) flowing at least a portion of said liquid from recirculation outlet, which is in fluid communication with said liquid and which is spaced apart from said inlet, through an aerobic filter to produce a filter effluent, and while in said aerobic filter, flowing said liquid through a filter media containing microorganisms from said septic tank which have adhered to and are growing on said media and thereby forming nitrate in said filter effluent;
- (c) flowing substantially all of said aerobic filter effluent resulting from said portion into said septic tank after removal thereof from said filter, while maintaining the content of said septic tank primarily anaerobic and while in said septic tank converting a substantial portion of said nitrate by denitrification to gaseous nitrogen compounds;
- (d) repeating steps (b) and (c); and
- (e) permanently discharging from said septic tank a septic tank effluent from a septic tank discharge outlet which is spaced apart from said inlet and which is in fluid communication with said liquid.

5,531,895
METHOD AND APPARATUS FOR INSTALLING AND REMOVING BIOLOGICALLY STRUCTURED WALL SYSTEMS

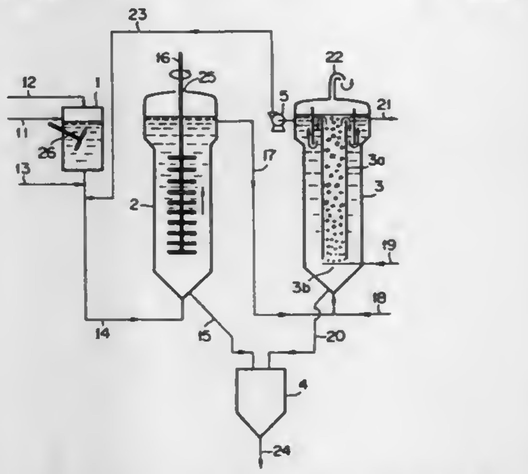
George Alford, 1954 Old Daytona Rd., Daytona Beach, Fla.; D. Roy Cullimore, 3303 Grant Road, Regina, Saskatchewan, Canada, and Al T. Mikell, 2226 Lee Loop, Oxford, Miss.
Filed Jan. 18, 1995, Ser. No. 374,238
Int. Cl.^{6} B09C *1/10*
U.S. Cl. 210—610 **11 Claims**

1. A method for providing a temporary barrier in a selected site within a porous formation by clogging said formation by forming a biowall, comprising the steps of adjusting the environment at said selected site to promote the growth of selected microorganisms, said step of adjusting the environment including applying nutrients for said selected microorganisms, and continuing said step of applying nutrients until said temporary barrier is formed.



5,531,896
PROCESS FOR DISPOSING OF WASTE WATER

Norihito Tambo, 10-33, Tonden 2jo 4-chome, Kita-ku, Sapporo-shi, Hokkaido 060, and Tatsuo Shimizu, 6-7-33, Hachiken 3jo Nishi 3-chome, Nishi-ku, Sapporo-shi, Hokkaido 063, both of, Japan, assignors to Norihito Tambo; Tatsuo Shimizu, both of Hokkaido, and Tsukishima Kikai Co., Ltd., Tokyo, all of, Japan
Division of Ser. No. 912,519, Jul. 13, 1992, Pat. No. 5,407,566. This application Jan. 20, 1995, Ser. No. 375,729
Claims priority, application Japan, Jul. 12, 1991, 3-197265
Int. Cl.^{6} C02F *3/30*
U.S. Cl. 210—605 **5 Claims**



1. A process for disposing of waste water by providing a first anaerobic disposal process and a second aerobic disposal process in series and continuously removing at least suspended solids, microbially decomposable organic substances, nitrogen compounds and phosphorus compounds in waste water, which comprises:
- a) adding a dephosphorization flocculating agent to waste water feed until phosphorus-containing flocs are produced, and mixing the waste water with a recycling solution from the second aerobic disposal process said recycling solution containing at least nitrates and nitrites, to produce mixed waste water containing the phosphorus-containing flocs,
- b) introducing the mixed waste water containing the phosphorus-containing flocs into the first anaerobic disposal process containing at least denitrifying bacteria, converting therein the nitrates and nitrites to nitrogen gas, anaerobically

decomposing the microbially decomposable organic substances and exhausting resulting gas from said first anaerobic disposal process,

c) removing solids from waste water which has been treated in said anaerobic disposal process to obtain a supernatant solution,

d) introducing said supernatent solution resulting from the anaerobic disposal process into the second aerobic disposal process containing at least nitrifying bacteria, converting therein ammonium compounds in the supernatent solution to nitrates and nitrites and aerobically decomposing residual microbially decomposable organic substances, and exhausting gases from said second aerobic disposal process, and

e) recycling at least a part of a solution aerobically treated or a part of a supernatent solution obtained after suspended solid components have been removed from the solution aerobically treated, into said anaerobic disposal process.

5,531,897

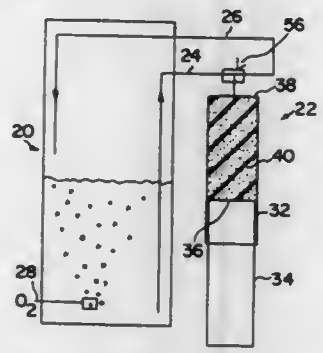
DYNAMIC BED REACTOR

Keith E. Stormo, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Oct. 13, 1992, Ser. No. 960,963

Int. Cl.^{6} C02F *3/00;1/28*

U.S. Cl. 210—606 **28 Claims**



1. A method of transporting liquid through a reactive or adsorptive matrix, comprising the steps of:

providing a resilient compressible open cell foam matrix, a reactive or adsorptive material within the matrix, and liquid in the matrix that contains a reactant or an adsorbate which undergoes a reaction in the matrix or is adsorbed in the matrix;

compressing the foam matrix to expel substantially all of a first sample of liquid from the matrix; and

allowing the resilient matrix to expand and draw a second sample of liquid into the matrix, wherein the liquid that is drawn into the matrix is substantially free of the liquid that was expelled from the matrix in the immediately preceding compressing step.

5,531,898

SEWAGE AND CONTAMINATION REMEDIATION AND MATERIALS FOR EFFECTING SAME

Daniel E. Wickham, Sebastopol, Calif., assignor to International Organic Solutions Corp., Mill Valley, Calif.

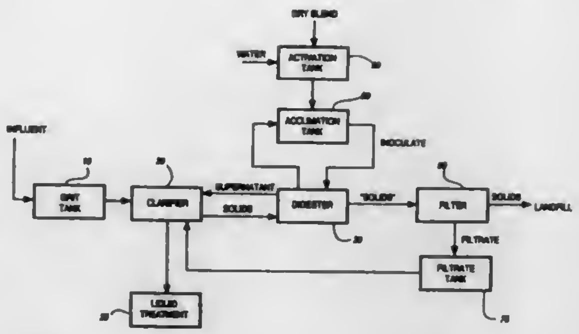
Filed Apr. 6, 1995, Ser. No. 418,589

Int. Cl.^{6} C02F *3/34;* **C12N** *9/00*

U.S. Cl. 210—606 **27 Claims**

1. A method for the continuous biological treatment of sewage to reduce the volume of aqueous sludge in a sewage treatment plant comprising the steps of:

(A) providing a mixture comprising
  (1) active amounts of an enzyme mixture comprising amylase, lipase, protease, and cellulase;



  (2) active amounts of bacteria comprising *Bacillus subtilis* and *Pseudomonas fluorescens*; and
  (3) a nutrient source having a chemical oxygen demand of 10,000 mg/kg or less;

(B) immersing said mixture in fresh water for from about 6 hours to about 48 hours at a temperature of at least 60° F. to produce an activated mixture;

(C) mixing a volume of aqueous sludge from said sewage treatment plant with a volume of said activated mixture for from about 6 hours to about 48 hours at a temperature of at least 60° F. to produce an acclimated mixture; and

(D) adding a volume of said acclimated mixture of step (C) to a sludge treatment tank in said sewage treatment plant and maintaining said mixture and said sludge in contact at a temperature of at least 60° F. for at least two days to reduce the volume of aqueous sludge and suspended solids in the sewage treatment plant.

21. A composition for treating waste and contaminants comprising:

an enzyme mixture comprising active amounts of amylase, lipase, protease, and cellulase;

bacteria comprising active amounts of *Bacillus subtilis* and *Pseudomonas fluorescens*; and

used mushroom compost.

5,531,899

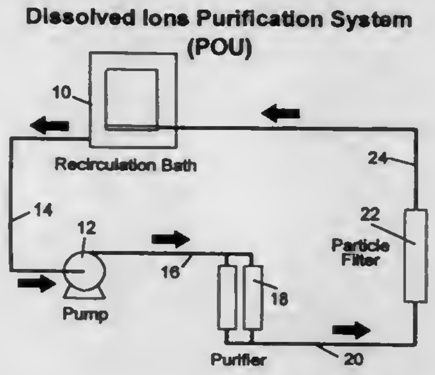
ION EXCHANGE POLYETHYLENE MEMBRANE AND PROCESS

Larry Y. Yen, Tewksbury, Mass.; Ven Anantharaman, Salem, N.H., and Bipin Parekh, Chelmsford, Mass., assignors to Millipore Investment Holdings Limited, Wilmington, Del.

Filed Jun. 6, 1995, Ser. No. 467,259

Int. Cl.^{6} B01D *69/02*

U.S. Cl. 210—638 **24 Claims**



1. An ion exchange composite membrane comprising a microporous matrix of UHMW-PE and water swellable particles of an ion exchange resin having a particle size between about 3 and about 50 microns, said particles comprising between about 50 and about 95 weight percent of said composition, said matrix retaining its microporous property when immersed in an aqueous liquid.

5,531,900

MODIFICATION OF POLYVINYLIDENE FLUORIDE MEMBRANE AND METHOD OF FILTERING

Srini Raghavan; Der'e Jan, and Raghunath Chilkunda, all of Tuscon, Ariz., assignors to University of Arizona, Tucson, Ariz.

Filed Jul. 7, 1994, Ser. No. 271,646

Int. Cl.^{6} B01D *71/34*

U.S. Cl. 210—651 **24 Claims**

10. A method for ultrapurifying a liquid having macromolecular contaminants therein comprising passing the liquid through a microporous polyvinylidene fluoride membrane having a polymer of vinyltriphenyl phosphonium bromide and a member of the group consisting of an acrylate and a methacrylate grafted thereto in a concentration sufficient to provide a surface of said membrane with a positive charge such that there is a minimal susceptibility to the extraction of the polymer.

5,531,901

METHOD OF TREATMENT OF A FLUID CONTAINING VOLATILE ORGANIC HALOGENATED COMPOUNDS

Kanji Miyabe; Nobuhiro Orita; Makoto Iwasaki; Yohka Tsurumaru, and Toshitsugu Nakahara, all of Tokyo, Japan, assignors to Kurita Water Industries, Ltd., Tokyo, Japan

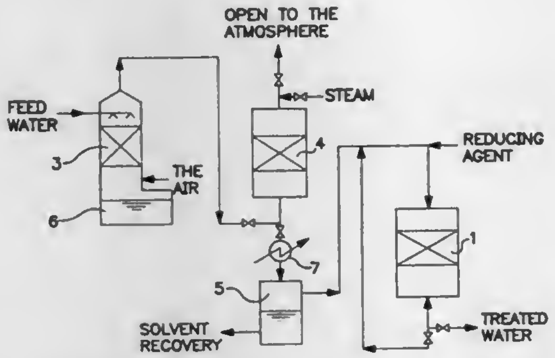
Division of Ser. No. 32,573, Mar. 17, 1993, Pat. No. 5,490,941.

This application May 25, 1995, Ser. No. 450,573

Claims priority, application Japan, Mar. 25, 1992, 4-98727; Apr. 23, 1992, 4-129975

Int. Cl.^{6} B01D *53/34*

U.S. Cl. 210—668 **10 Claims**



1. A process for decomposing a volatile organic halogenated compound in a water-containing composition which contains the volatile organic halogenated compound in an amount of not more than 20 ppm and contains at least one of the metal ions of iron, manganese or a hardness component, which process comprises the steps of removing the metal ions from the water-containing composition by at least one treatment selected from the group consisting of ion exchange treatment, chelate resin treatment and oxidation-coagulation-precipitation treatment and then contacting the water-containing composition having metal ions removed with a hydrogen gas reducing agent in the presence of a palladium or a platinum catalyst.

5,531,902

METHOD FOR WATER REMEDIATION

Darrell L. Gallup, Chino Hills, Calif., assignor to Union Oil Company of California, El Segundo, Calif.

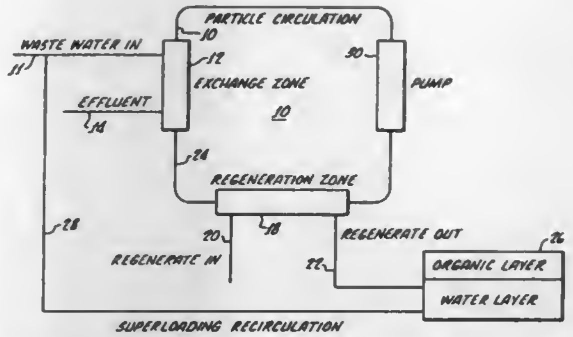
Continuation of Ser. No. 996,310, Dec. 23, 1992, abandoned.

This application Jul. 12, 1994, Ser. No. 273,602

Int. Cl.^{6} C02F *1/28*

U.S. Cl. 210—673 **30 Claims**

1. A method for removing dissolved contaminant hydrocarbons from a waste water stream, the method comprising:



contacting the waste water stream containing a mixture of at least three dissolved contaminant hydrocarbons selected from the group consisting of benzene, toluene, ethyl benzene, xylene and styrene, with a bed of adsorbent particles comprising a carbonaceous resin in an exchange zone consisting essentially of (1) waste water containing the dissolved contaminant hydrocarbons and (2) the adsorbent particles, to preferentially remove at least 75% of the total dissolved contaminant hydrocarbons from the waste water stream without changing the relative proportions of the components comprising the dissolved contaminant hydrocarbons by more than 50%, and wherein the bed being stationary while the waste water flows through the bed and after the waste water flow is momentarily stopped the bed being moved in a direction opposite to that of the waste water flow.

5,531,903

FLUORIDE REMOVAL FROM METAL SULPHATE SOLUTION AND A METHOD OF WASTE UTILIZATION

Cashman R. S. M. Hampton, Rossland; Victor E. Steiner, Trial, and Daniel A. D. Boateng, Montrose, all of, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Mar. 15, 1995, Ser. No. 404,754

Int. Cl.^{6} C02F *1/28*

U.S. Cl. 210—683 **19 Claims**

1. A method of removing fluoride from an aqueous metal sulphate solution comprising the steps of:

mixing the metal sulphate solution with a predetermined amount of an aluminum anodizing waste treatment sludge for a predetermined period of time to form a slurry mixture; and

performing a solid/liquid separation on said slurry mixture to obtain a fluoride loaded sludge and a treated metal sulphate solution.

5,531,904

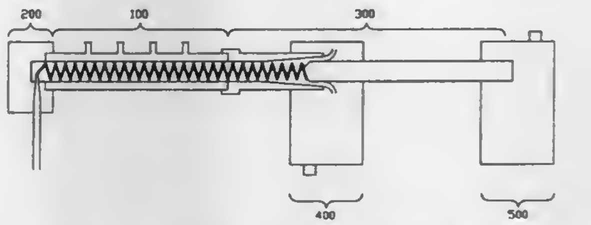
GAS SPARGING METHOD FOR REMOVING VOLATILE CONTAMINANTS FROM LIQUIDS

Thomas L. Grisham, Tyler, and Janet K. Peters, Gilmer, both of Tex., assignors to Revtech Industries, Inc., Kilgore, Tex.

Filed Mar. 20, 1995, Ser. No. 406,502

Int. Cl.^{6} C02F *1/24*

U.S. Cl. 210—703 **19 Claims**



1. A method of removing volatile contaminants from a liquid utilizing apparatus having an elongate disposed tube with first and second ends, with a wall, and with a porous section for the

sparging of cleaning gas therethrough to the interior of the tube, having a nonporous degassing section adjacent to the second end of the tube, and also having a cylindrical gas duct in coaxial alignment with the tube, comprising the steps of

introducing a stream of liquid contaminated by volatile components to be removed from said liquid to the first end of the porous section of the cylindrical tube tangential to the interior surface of said tube;

controlling the flow of said liquid in a spiral pattern around and along said inner surface of said tube from said first end to the second end, such that each incremental volume of liquid moves around said inner surface of said tube between about 20 and about 35 times;

sparging a cleaning gas through the wall of said porous section of said tube and through said liquid spiraling through said tube at a gas to liquid volumetric flow ratio between about 20 to 1 and about 35 to 1, with said volumetric flow ratio equal to the number of times each incremental volume of said liquid moves around the inner surface of said porous section of said tube, whereby contaminant components are transferred from said liquid to said gas;

ceasing sparging of cleaning gas into said liquid in the degassing section adjacent to said second end of said tube while allowing said liquid to continue spiraling toward said second end of said tube for a sufficient distance and time to allow degassing of said liquid and separation of said gas and said liquid into an annular film of liquid around the inner circumference of said tube and a column of gas at the center of said tube;

drawing said column of gas toward the second end of said tube in co-current flow with the movement of liquid along said tube;

physically dividing said liquid from said gas at said second end of said tube by interposing said cylindrical gas duct between said gas and said liquid at the gas-liquid interface;

collecting the cleaned liquid in a first collection vessel; and

conveying the contaminant laden gas through said cylindrical gas duct from the apparatus.

5,531,905

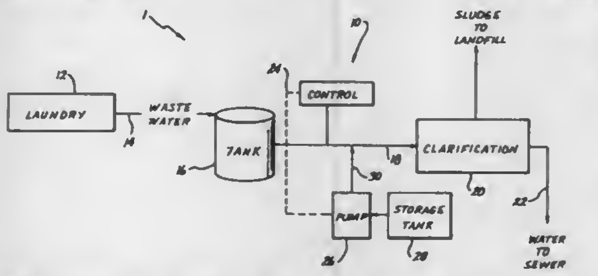
SYSTEM AND METHOD TO CONTROL LAUNDRY WASTE WATER TREATMENT

John G. Dobrez, Flossmoor, and Frank T. Prendergast, Woodridge, both of Ill., assignors to Dober Chemical Corporation, Midlothian, Ill.

Filed Dec. 2, 1994, Ser. No. 349,554

Int. Cl.^{6} B01D *21/32;21/01*

U.S. Cl. 210—709 **14 Claims**



9. A method of controlling the amount of cationic coagulant to be introduced into a waste water from a laundry which waste water has a non-solid FOG level which is to be reduced, said method comprising:

determining the electric charge value of a material comprising the waste water having a non-solid FOG level and being substantially free of cationic coagulant, said determining occurring upstream of the introduction of said cationic coagulant and upstream of the reduction of the non-solid FOG level;

generating a signal which is indicative of said electric charge value;

providing said signal to an automatic processor;

providing said automatic processor with a relationship of the amount of cationic coagulant to be introduced into said material to reduce the non-solid FOG level of said material to a given level as a function of only said signal;

generating a control signal from said automatic processor, said control signal being based on said automatic processor processing said signal in accordance with said relationship;

providing said control signal to a source of cationic coagulant which provides said cationic coagulant to said material; and

operating said source of cationic coagulant in response to said control signal to control the amount of said cationic coagulant from said source of cationic coagulant to said material.

5,531,906

PROCESS FOR TREATMENT OF SODIUM HYDROXIDE WASTE LIQUOR CONTAINING ALUMINUM

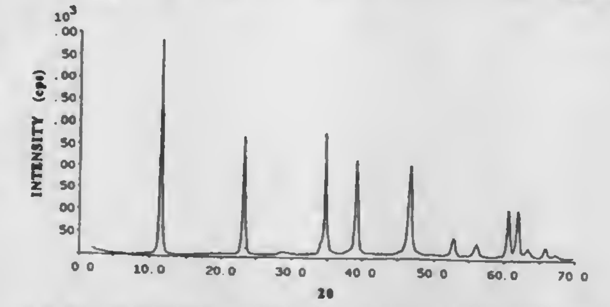
Susumu Takayama; Yasuie Mikami; Nobuyoshi Iyatomi, and Minoru Orikasa, all of Tokyo, Japan, assignors to Nittetsu Mining Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1994, Ser. No. 283,532

Claims priority, application Japan, Jul. 30, 1994, 5-208784

Int. Cl.^{6} C02F *1/62*

U.S. Cl. 210—712 **13 Claims**



1. A process for treating aluminum-containing sodium hydroxide waste liquor produced by treating an aluminum article with a sodium hydroxide solution, comprising the steps of:

adding, to aluminum-containing sodium hydroxide waste liquor, at least one of MgO and $Mg(OH)_2$ in an amount of 0.5 to 3 moles with respect to 1 mole of aluminum to cause a reaction at 70° C. or more, said reaction being carried out for at least 4 hours; and

separating and removing a precipitated magnesium-aluminum compound.

5,531,907

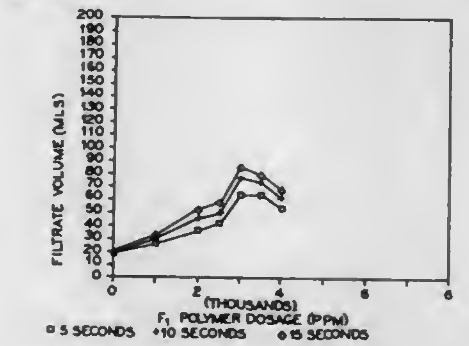
TREATMENT OF AGRICULTURAL WASTE

Paul J. Williams, and Susan Tolkien, both of Cheshire, England, assignors to Nalco Limited, Cheshire, United Kingdom

Filed Aug. 30, 1994, Ser. No. 298,407

Int. Cl.^{6} C02F *1/52*

U.S. Cl. 210—727 **11 Claims**



1. A settlement method for treating agricultural liquid waste to provide a purified effluent portion and a dewatered organic mass ready for composting, said method comprising the steps of:

providing agricultural liquid waste to be treated;

treating the agricultural liquid waste by adding a polymer flocculent selected from the group consisting of latex polymers and dispersion polymers, an organic coagulant selected from the group consisting of an epichlorohydrin-dimethylamine condensation polymer and a polydiallyl-dimethylammonium chloride polymer, alone or in combination, with an inorganic coagulant, and a precipitant selected from the group consisting of an alkaline sodium aluminate liquor, an acidic magnesium salt in phosphoric acid/magnesium phosphate solution, and mixtures of the foregoing precipitants to form a mixture;

mixing the mixture to provide a treated liquid waste; and

permitting the treated liquid waste to settle to form a purified effluent portion and a dewatered organic mass.

5,531,908

GERM-FREE LIQUID DISPENSER

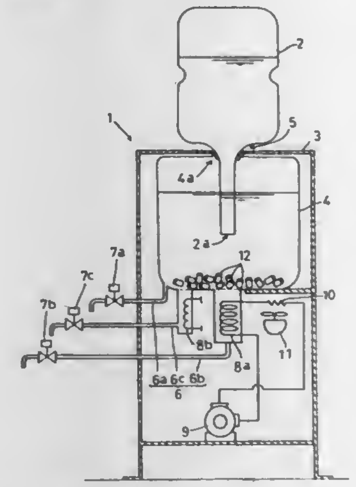
Nobuya Matsumoto, Osaka; Yasuhiro Morimura, Tokyo; Shinichi Kunisaki, Osaka; Goro Fujiwara, Osaka; Mitsunobu Masuda, Osaka, and Masaru Kanazawa, Osaka, all of, Japan, assignors to Suntory Limited, and Takuma Co, Ltd., both of Osaka, Japan

Filed Apr. 14, 1994, Ser. No. 227,394

Claims priority, application Japan, Aug. 20, 1993, 5-206001

Int. Cl.^{6} C02F *1/78;1/50*

U.S. Cl. 210—760 **11 Claims**



1. A germ-free liquid dispenser comprising:

a liquid container having a liquid outlet opening;

a reservoir for receiving and reserving liquid from said container;

a holder means for detachably holding said liquid container at a supply posture for orienting said liquid outlet opening downward to allow said liquid within said container to flow down through said liquid outlet opening into said reservoir;

a dispensing means for dispensing said liquid from said reservoir by allowing said liquid to flow down from said reservoir; and

an antibacterial element having an antibacterial surface capable of killing germs through a physical contact therewith, said element being disposed inside said reservoir in such a manner as to contact said liquid inside said reservoir while allowing said reservoir to dispense said liquid therefrom, said antibacterial element comprising a resin substrate containing 5 to 30 wt % of antibacterial material prepared by combining an antibacterial metal ion with an ion exchanger through an ion exchange reaction, said antibacterial metal ion comprising silver ions alone or a combination of silver, copper and zinc ions;

wherein a flow-down tube of said dispensing means is connected to a bottom of said reservoir, and a temperature-conditioning means is provided for conditioning temperature of said liquid at a base end of said flow-down tube.

5,531,909

Patent Not Issued For This Number

5,531,910

BIODEGRADABLE FABRIC SOFTENER COMPOSITIONS WITH IMPROVED PERFUME LONGEVITY

John C. Severns, West Chester; Mark R. Sivik, Fairfield; Frederick A. Hartman, Cincinnati, all of Ohio; Hugo R. G. Denutte, Hofstade, Belgium; Jill B. Costa, Cincinnati, and Alex H. Chung, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1995, Ser. No. 499,282

Int. Cl.^{6} D06M *13/224;13/46*

U.S. Cl. 510—102 **16 Claims**

1. A rinse-added rinse cycle fabric softening composition selected from the group consisting of:

I. a solid particulate composition comprising:
  (A) from about 50% to about 95% of biodegradable cationic quaternary ammonium fabric softening compound;
  (B) from 0.01% to about 15% by weight of the composition, of a diester having the formula $R_1R'R_2$ wherein R' is a residue of an acid forming diester selected from the group consisting of succinic acid or maleic acid; and wherein R_1 and R_2 independently represent a residue of an alcohol forming diester selected from the group consisting of phenoxanol, floralol, B-citronellol, nonadyl, cyclohexyl ethanol, phenyl ethanol, isoborneol, fenchol, isocyclogeraniol, 2-phenyl-1-propanol, 3,7-dimethyl-1-octanol and mixtures thereof;
  (C) optionally, from about 0 to about 30% of dipsersibility modifier; and
  (D) optionally, from about 0% to about 15% of pH modifier; and

II. a liquid composition comprising:
  (A) from about 0.5% to about 80% of biodegrable cationic quaternary ammonium fabric softening compound;
  (B) from 0.01% to about 15% by weight of the composition, of a diester having the formula $R_1R'R_2$ wherein R' is a residue of an acid forming diester selected from the group consisting of succinic acid or maleic acid; and wherein R_1 and R_2 independently represent a residue of an alcohol forming diester selected from the group consisting of phenoxanol, floralol, B-citronellol, nonadyl, cyclohexyl ethanol, phenyl ethanol, isoborneol, fenchol, isocyclogeraniol, 2-phenyl-1-propanol, 3,7 -dimethyl-1-octanol and mixtures thereof;
  (C) optionally, from about 0 to about 30% of dipsersibility modifier; and
  (D) the balance comprising liquid carrier selected from the group consisting of water, C_{1-4} monohydric alcohol, C_{2-6} polyhydric alcohol, propylene carbonate, liquid polyethylene glycols and mixtures thereof.

5,531,911

METAL FREE HYDRAULIC FLUID WITH AMINE SALT

Paul E. Adams, Willoughby Hills; Thomas G. Hach, Cleveland, and James N. Vinci, Mayfield Heights, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 194,897, Feb. 11, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 474,051

Int. Cl.^{6} C10M *137/10;135/10*

U.S. Cl. 508—408 **44 Claims**

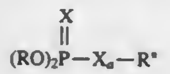
1. A functional fluid comprising:

(a) an oil of lubricating viscosity;

(b) the reaction product of an amine and a sulfonic acid; and

(c) a mixture comprising
  (i) a triarylthiophosphate; and

(ii) a compound of the structure



$$(RO)_2\overset{\overset{\displaystyle X}{\|}}{P}-X_a-R''$$

where a is zero or 1, each X is independently sulfur or oxygen, provided that at least one X is sulfur, and each R and R" is independently an alkyl group or a substituted alkyl group;

wherein components (i) and (ii) together provide at least 0.04 percent by weight phosphorus to the functional fluid, and wherein the ratio of the amounts of (i) and (ii), by weight, is about 20:80 to about 60:40.

5,531,912
COMPOSITION AND PROCESS FOR LUBRICATING METAL BEFORE COLD FORMING

Richard J. Church, Madison Heights, and Kenneth J. Hacias, Sterling Heights, both of Mich., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Sep. 2, 1994, Ser. No. 300,665

Int. Cl.^{6} C10M *173/00*

U.S. Cl. 508—507 **20 Claims**

1. An aqueous liquid composition of matter consisting essentially of water and:

(A) an at least partially neutralized film forming copolymer ("ionomer") of an alkene that contains no carboxyl or carboxylate groups and comonomer that is an organic acid that contains the moiety C═C—COOH; and

(B) an alkoxylated alcohol film forming component.

5,531,913
HAZE-FREE TRANSPARENT FILM-FORMING AQUEOUS COATING COMPOSITIONS FOR MAGNETIC RECORDING LAYERS

Mridula Nair, Penfield; Lloyd A. Lobo, Webster, and George L. Oltean, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1995, Ser. No. 402,460

Int. Cl.^{6} G11B *5/702;5/633;5/712;* **G03C** *7/24*

U.S. Cl. 252—62.53 **22 Claims**

1. An aqueous coating composition for forming a transparent magnetic recording layer comprising a fine solid particle aqueous dispersion of dispersed magnetic particles, gelatin, and from 0.1–50 wt. %, based on the weight of the gelatin, of a polyelectrolyte having a molecular weight of at least about 50,000.

5,531,914
MAGNETIC COATING COMPOSITION

Charles B. Mallon, Belle Mead; James R. Harvey, Bridgewater, and Claudio F. Nicolini, Princeton, all of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 34,973, Mar. 22, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,302

Int. Cl.^{6} G11B *5/00*

U.S. Cl. 252—62.54 **6 Claims**

1. A magnetic coating composition for a magnetic recording medium which comprises, as dissolved or dispersed in an organic solvent:

(A) a copolymeric resin consisting essentially of the following monomeric moieties:

(a) from 65 to 95 percent by weight of a first monomeric moiety of vinyl chloride of the formula —CH_2—CHCl—;

(b) from 3 to 15 percent by weight of a second monomeric moiety of vinyl acetate of the formula —CH_2—CH—(O—CO—CH_3)—; and

(c) from 0.1 to 5 percent by weight of a third monomeric moiety of an acrylate or methacrylate having a sulfonic acid group —SO_3H or a metal or amine salt thereof other than sulfomethyl methacrylate; and

(B) particles of a ferromagnetic material dispersed in the copolymeric resin as a vehicle.

5,531,915
DETERGENT COMPOSITIONS CONTAINING ETHYLENEDIAMINE-N,N'-DIGLUTARIC ACID OR 2-HYDROXYPROPYLENEDIAMINE-N,N'-DISUCCINIC ACID

Christopher M. Perkins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Ohio

Continuation of Ser. No. 26,884, Mar. 5, 1993, abandoned. This application Oct. 3, 1994, Ser. No. 317,096

Int. Cl.^{6} C11D *3/386*

U.S. Cl. 510—294 **11 Claims**

1. A detergent composition comprising from about 1% to about 75% by weight of detersive surfactants and from about 0.1% to about 20% by weight of a biodegradable chelant which is a member selected from the group consisting of ethylenediamine-N-N'-diglutaric acid (EDDG) or salt thereof, 2-hydroxypropylenediamine-N,N' -disuccinic acid (HPDDS), or salt thereof, or mixtures of said chelants, and 1 to 80% of a builder component.

5,531,916
HYDROFLUOROCARBON CLEANING COMPOSITIONS

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 787,998, Nov. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 595,833, Oct. 11, 1990, Pat. No. 5,064,559, Ser. No. 595,834, Oct. 11, 1990, Pat. No. 5,064,560, and Ser. No. 723,312, Jun. 28, 1991, Pat. No. 5,100,572, which is a continuation-in-part of Ser. No. 592,565, Oct. 3, 1990, abandoned. This application Oct. 13, 1993, Ser. No. 135,242

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.^{6} C11D *7/30;7/50;* **C23G** *5/028;* **B08B** *3/04*

U.S. Cl. 510—412 **9 Claims**

1. A composition comprising a major amount of at least one hydrofluorocarbon represented by the formula:

$$CH(CF_3)_2CHFCF_2CF_3$$

and about 1–45 weight percent of at least one co-solvent boiling between 20° C.–105° C. at atmospheric pressure selected from the group consisting of methanol, and ethanol.

2. A composition comprising a major amount of at least one straight chain hydrofluorocarbon represented by the formula:

$$C_xH_yF_{2x+2-y}$$

where x is 5, y is 2 or 3 and about I-45 weight percent of at least one co-solvent selected from the group consisting essentially of methanol, and ethanol.

5,531,917
METHOD FOR STABILIZING AN AGENT FOR CONTACT LENSES

Hisayuki Nakayama, Akashi; Akihiro Kimoto, Kobe, and Kuniko Tsuchino, Kashiwara, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 7, 1994, Ser. No. 192,606

Claims priority, application Japan, Jul. 14, 1993, 5-174185; Jan. 28, 1994, 6-008290

Int. Cl.^{6} C11D *3/386*

U.S. Cl. 510—114 **4 Claims**

1. A method for producing a stable lyophilized enzyme composition for cleaning contact lenses, which comprises the steps of:

preparing an aqueous mixture comprising a proteolytic enzyme in a concentration of 10–5,000 units/ml and an enzyme stabilizing surfactant in an amount of 0.01–10% weight per volume which stabilizes the enzyme, wherein the enzyme stabilizing surfactant is at least one selected from the group consisting of anionic surfactants, amphoteric surfactants and nonionic surfactants, and

lyophilizing the aqueous mixture to obtain a stable lyophilized enzyme composition.

5,531,918
NOVEL PROTEASES

Helle Outtrup, Ballerup; Claus Dambmann, Soeborg; Dorrit A. Aaslyng, Roskilde, and Poul Lindegaard, Copenhagen, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK93/00074, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/18140, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 3, 1993, Ser. No. 290,932

Claims priority, application Denmark, Mar. 4, 1992, 287/92

Int. Cl.^{6} C11D *3/386*

U.S. Cl. 510—320 **8 Claims**

1. A protease obtained from a strain of *Bacillus sp.* PD138 having the following properties:

(a) an apparent molecular weight of 28 kD;

(b) an isoelectric point above 9.5;

(c) a pH optimum above 10 at 25° C. and with casein as substrate; and

(d) a temperature optimum in the range of from 45° to 55° C. at pH 9.5 and with casein as substrate.

5,531,919
WALLPAPER STRIPPER

Gerald M. Russo, Oak Park; Kardar M. Majeed, Elk Grove, both of Ill., and Merle L. Houck, Griffith, Ind., assignors to Roman Adhesives, Inc., Calumet City, Ill.

Continuation of Ser. No. 154,291, Nov. 18, 1993. This application Mar. 27, 1995, Ser. No. 410,836

Int. Cl.^{6} C11D *3/386;* **B08B** *1/00*

U.S. Cl. 510—200 **9 Claims**

1. An aqueous stripper for removing wallpaper that is bonded to a surface, the stripper comprising:

water;

an enzyme selected from the group consisting of amylase and cellulase for degrading the bond in an amount of about 20% to about 40% by weight;

an enzyme stabilizer;

a polyalkylene glycol humectant, wherein the alkylene group has about 2 to about 6 carbon atoms in an amount of about 5% to about 15% by weight, wherein the weight ratio of humectant to enzyme is in the range of about 1:0.5 to 1:2;

a surfactant in an amount of about 5% to about 15% by weight, wherein the weight ratio of surfactant to humectant is in the range of about 1:2 to about 1:8;

an alkylene glycol alkyl ether solvent in an amount of about 30% to about 50% by weight; and

wherein percentages are based on the weight of enzyme, humectant, surfactant and alkylene glycol alkyl ether solvent.

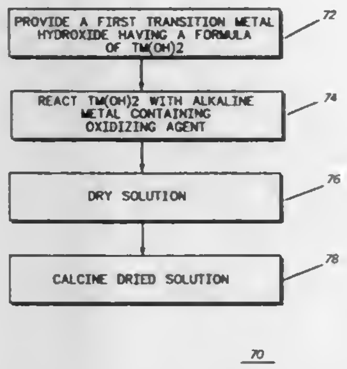
5,531,920
METHOD OF SYNTHESIZING ALKALINE METAL INTERCALATION MATERIALS FOR ELECTROCHEMICAL CELLS

Zhenhau Mao, Coral Springs, and Dee Newton, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 315,782

Int. Cl.^{6} H01M *4/88*

U.S. Cl. 252—182.1 **5 Claims**


PROVIDE A FIRST TRANSITION METAL HYDROXIDE HAVING A FORMULA OF TM(OH)2
72
REACT TM(OH)2 WITH ALKALINE METAL CONTAINING OXIDIZING AGENT
74
DRY SOLUTION
76
CALCINE DRIED SOLUTION
78
70

1. A method of fabricating an alkaline metal intercalation, transition metal oxide material of the formula:

$$A_xTMO_2$$

wherein A is an alkaline metal selected from the group of Li, Na, K, and combinations thereof, TM is a transition metal selected from the group of Ti, V, Mn, Cr, Fe, Ni, Co, and combinations thereof, and wherein $0.5 \leqq x \leqq 1.2$, said method comprising the steps of:

combining a transition metal hydroxide of the formula $TM(OH)_2$ with an alkaline metal-containing oxidizing agent selected from the group of Li_2O_2, $LiNO_3$, $LiClO_4$, Na_2O_2, K_2O_2, and combinations thereof, in the presence of a liquid organic solvent;

removing said organic solvent to collect a powdered alkaline metal intercalation transition metal oxide material; and

calcining said powdered material in an oxygen free, inert gas atmosphere.

5,531,921

Patent Not Issued For This Number

5,531,922
GRANULATED PARTICLES FOR MAGNETIC PARTICLES FOR MAGNETIC RECORDING, AND PROCESS FOR PRODUCING THE SAME

Kenji Okinaka; Yasutaka Ota; Kohji Mori, all of Hiroshima; Hirofumi Kawasaki, Hiroshima-ken; Masayuki Uegami, Onoda; Akio Mishima; Katsumi Yamashita, both of Hiroshima; Minoru Yamasaki, Ohtake; Manabu Matsumoto, Hiroshima; Kunihiro Konchi, Hiroshima, and Hiroki Kamon, Hiroshima, all of, Japan, assignors to Toda Kogyo Corporation, Hiroshima-ken, Japan

Continuation of Ser. No. 98,001, Jul. 29, 1993, abandoned.

This application Sep. 12, 1995, Ser. No. 527,017

Claims priority, application Japan, Aug. 4, 1992, 4-229213; Sep. 30, 1992, 4-286604

Int. Cl.^{6} C01G *49/02*

U.S. Cl. 252—62.56 **20 Claims**

1. Granulated particles for magnetic particles for magnetic recording, comprising:

acicular ferric oxide hydroxide particles or acicular iron oxide particles and at least one member selected from the group consisting of soluble starches, cationic starches, starches substituted with a carboxymethyl group or dialdehyde group, viscose and celluloses substituted with a methyl group, ethyl group, hydroxyl ether group or carboxyl group, in an amount not less than 0.1 part by weight and less than 5.0 parts by weight based on 100 parts by weight of the acicular ferric oxide hydroxide particles or acicular iron oxide particles;

said granulated particles having a bulk density of not less than 0.3 g/cm^3 and a powdering ratio of not more than 40% as measured by the following method:

(1) charging 100 g of granulated particles having a diameter of more than 1 mm and 200 g of steel balls each having a diameter of 12.5 mm into a steel container having an inner diameter of 8.5 cm, a height of 8.5 cm and an inner volume of 482 cm^3, and stirring the resultant mixture at a peripheral speed of 50 rpm for 1 hour;

(2) measuring the weight of the granulated particles having a diameter of less than 1 mm in the steel container and

(3) determining the powdering ratio from the following formula:

Powdering ratio (%) = (the weight of the granulated particles having a diameter of less than 1 mm)/(the weight (100 g) of the granulated particles before measurement) × 100.

5,531,923
TWIN-SCREW EXTRUSION OF SILICONE DOUGHS SUITED FOR SIH/SIVI RTV COMPOSITIONS

Loic Le Blanc, Oullins, and Rene Pagliari, Marennes, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 714,829, Jun. 13, 1991, abandoned.

This application May 4, 1994, Ser. No. 237,997

Claims priority, application France, Jun. 13, 1990, 90 07609

Int. Cl.^{6} C09K *3/00*

U.S. Cl. 252—182.14 **28 Claims**

1. A process for the formulation of a dough component crosslinkable into elastomeric state when combined with a catalyst component, comprising continuously and simultaneously individually introducing along the longitudinal axis of a twin-screw extruder, via a plurality of longitudinally spaced discrete inlet entries, and twin-screw extruding (a) a polydiorganosiloxane oil having a viscosity at 25° C. of less than 500,000 mPa.s and containing at least two $\equiv Si{-}CH{=}CH_2$ functional groups per molecule, (b) water, (c) silica, and (d) a polysilazane which is liquid at a temperature of 23° C. and a pressure of 760 mm of mercury, said oil (a) being introduced into a most upstream inlet and said polysilazane (d) being introduced via both an intermediate inlet and a most downstream inlet, the intermediate inlet being located downstream from the most upstream inlet, and the most downstream inlet being located downstream from the intermediate inlet.

5,531,924
LIQUID URETHANE-CONTAINING POLYISOCYANATE MIXTURES WHICH CAN BE USED TO PREPARE THE POLYURETHANE FOAM

Peter Horn, Heidelberg; Erhard Reich, Damme; Stefan Adams, Ludwigshafen, and Sarbananda Chakrabarti, Mannheim, all of, Germany, assignors to BASF Aktiengesellschaft, Germany

Division of Ser. No. 802,074, Dec. 3, 1991, Pat. No. 5,334,448.

This application Feb. 9, 1994, Ser. No. 194,547

Claims priority, application Germany, Dec. 5, 1990, 40 38 783.6

Int. Cl.^{6} C09K *3/00*

U.S. Cl. 252—182.18 **5 Claims**

1. A liquid, urethane-containing, polyisocyanate mixture containing from 15 to 32 percent by weight of isocyanate groups, comprising a urethane-containing reaction product comprising reacting:

a mixture of a diphenylmethane diisocyanate and a polyphenyl-polymethylene polyisocyanate, with

at least α,β-olefinically unsaturated polyester having a molecular weight factor per double bond of from 150 to 3000, a functionality of from 2 to 6, a hydroxyl number of from 20 to 800, and an acid number of from 0 to 15 or, a mixture of at least one of said α,β-olefinically unsaturated polyesters and at least one polyoxyalkylene-polyol having a functionality of from 2 to 4 and a hydroxyl number of from 20 to 400,

or by reacting:

4,4'-diphenylmethane diisocyanate or a mixture of diphenylmethane diisocyanate isomers, with

at least one of said α,β-olefinically unsaturated polyesters, or a mixture of at least one of said α,β-olefinically unsaturated polyesters and at least one polyoxyalkylene polyether polyol having a functionality of from 2 to 4 and a hydroxyl number of from 20 to 400,

subsequently mixing the urethane-containing reaction product with a mixture of diphenylmethane diisocyanates and a polyphenyl-polymethylene polyisocyanate.

5,531,925
PARTICLES, METHOD OF PREPARING SAID PARTICLES AND USES THEREOF

Tomas Landh, Lund, and Kåre Larsson, Bjärred, both of, Sweden, assignors to GS Biochem AB, Malmo, Sweden

PCT No. PCT/SE92/00692, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/06921, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 211,293

Int. Cl.^{6} C09K *19/00;* **A61K** *9/66;* **B01J** *13/00*

U.S. Cl. 252—299.01 **35 Claims**

1. Particles comprising

(A) an interior phase of (1) a non-lamellar lyotropic liquid crystalline phase selected from the group consisting of a reversed cubic liquid crystalline phase and a reversed hexagonal liquid crystalline phase, or (2) a homogeneous L3 phase, or any combination thereof, and

(B) a surface phase (1) selected from the group consisting of a lamellar crystalline phase and a lamellar liquid crystalline phase, or (2) an L3 phase, or any combination thereof

wherein said surface phase and said interior phase are distinct.

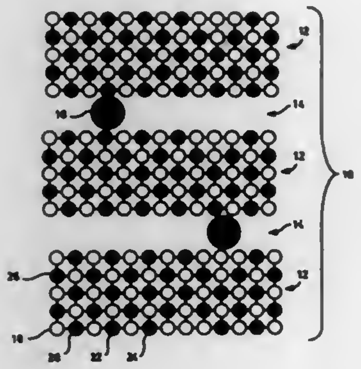
5,531,926
PHOSPHOR AND METHOD OF MAKING SAME

Ru-Yi Qi, and Ronald E. Karam, both of Towanda, Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 189,012, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 999,637, Dec. 31, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,536

Int. Cl.^{6} C09K *11/59;11/61*

U.S. Cl. 252—301.4 F **12 Claims**



1. A phosphor having the general formula $NaMg_{2.5}Si_4O_{10}F_2{:}A_y$, where A is an activator selected from Eu, Mn, and Tb and y ranges from about 0.02 to about 0.12.

5,531,927
STAIN REMOVING COMPOSITIONS AND METHODS OF USING THE SAME

Donald F. Peters, Lakewood, Ohio, assignor to Bio-Safe Specialty Products, Inc., Mayfield Hts., Ohio

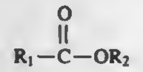
Continuation of Ser. No. 855,224, Mar. 20, 1992, abandoned.

This application Sep. 21, 1994, Ser. No. 309,799

Int. Cl.^{6} C11D *7/50;3/43;3/44*

U.S. Cl. 510—281 **22 Claims**

1. A fabric stain removing composition comprising (A) from 25 to about 80 percent by weight of a polyol having from 2 to about 6 carbon atoms and 2 to about 6 hydroxyl groups, (B) from about 0.1 to about 10 percent by weight ammonia, (C) from 8 to about 20 percent by weight of an ester represented by the formula



$$R_1-\overset{O}{\overset{\|}{C}}-OR_2$$

wherein R_1 is an alkyl group containing from 1 to about 21 carbon atoms and R_2 is an alkyl group containing from 1 to about 30 carbon atoms, and (D) water, wherein the composition is free of chlorinated and petroleum distillate solvents.

5,531,928
PHOSPHOR AND METHOD OF MAKING SAME

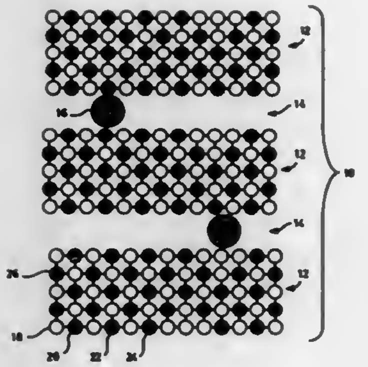
Ronald E. Karam, Towanda; Vaddi B. Reddy, Sayre; Shellie K. Northrop, Sayre, and Yan Zhang, Sayre, all of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Division of Ser. No. 189,012, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 999,637, Dec. 31, 1992, abandoned. This application May 9, 1995, Ser. No. 444,476

Int. Cl.^{6} C09K *11/59;11/55*

U.S. Cl. 252—301.4 F **34 Claims**

1. A phosphor comprising a fluorophlogopite having the general formula $KMg_3(Si_3Al)O_{10}F_2$ activated with an activator selected from niobium, thulium and zirconium.



5,531,929
SILICONE ANTIFOAM COMPOSITIONS

Hideki Kobayashi, Ichihara, Japan, assignor to Dow Corning Toray Silicone Co., LTD., Tokyo, Japan

Filed Aug. 9, 1994, Ser. No. 287,737

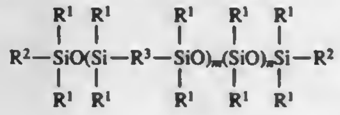
Claims priority, application Japan, Aug. 26, 1993, 5-234245

Int. Cl.^{6} B01D *19/04*

U.S. Cl. 252—321 **20 Claims**

1. An antifoam composition comprising:

(A) an organosilicon polymer having the general formula:



$$R^2-\underset{R^1}{\overset{R^1}{SiO}}(\underset{R^1}{\overset{R^1}{Si}}-R^3-\underset{R^1}{\overset{R^1}{SiO}})_m(\underset{R^1}{\overset{R^1}{SiO}})_n\underset{R^1}{\overset{R^1}{Si}}-R^2$$

wherein R^1 denotes a monovalent hydrocarbon group free of aliphatic unsaturation, R^2 is a group selected from the group consisting of hydrogen, monovalent hydrocarbon groups, and a hydroxyl group, R^3 denotes an alkylene group, m has a value of at least 2, n has a value of zero or greater than zero with the proviso that m is greater than or equal to n; and

(B) silica micropowder having a specific surface area of at least 50 m^2/g.

19. In a process of controlling foam, which includes the addition of an antifoam composition to a medium, the improvement which comprises using as the antifoam composition, the composition of claim 1.

5,531,930
ALUMINUM METAL COMPOSITION FLAKE HAVING REDUCED COATING

Yishai Karton, Ness-Ziona, and Moshe Kleiman, Yavne, both of, Israel, assignors to Israel Institute for Biological Research, Ness Ziona, Israel

Filed Apr. 12, 1994, Ser. No. 225,999

Int. Cl.^{6} C09K *3/00;* **B22F** *1/02;* **B32B** *15/02*

U.S. Cl. 252—363.5 **17 Claims**

1. Flakes of aluminum metal composition, having lateral face dimensions within the range of about 1.5 to about 20 microns and thickness within the range of about 0.03 to about 0.3 micron, wherein the amount of manufacturing process additive with which said flakes are coated has been reduced to between 0 and 2.0 weight percent.

5,531,931

CORROSION-INHIBITING SALT DEICERS

Robert S. Koefod, Minnetonka, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 30, 1994, Ser. No. 367,503

Int. Cl.^{6} C09K *3/18;* **C23F** *11/12;11/18*

U.S. Cl. 252—387 **36 Claims**

1. A deicing composition comprising about 94.0 to 99.8 weight percent of a deicing salt, about 0.1 to 3.0 weight percent of a water-soluble rare earth salt, and about 0.1 to 3.0 weight percent of a water-soluble organic acid salt selected from the group consisting of gluconate salts, ascorbate salts, tartrate salts, and saccharate salts.

17. A method for deicing ice- or snow-covered surfaces, said method comprising applying an effective amount of a deicing composition to the surface to be deiced and allowing the deicing composition to melt or partially melt the ice or snow covering the surface, wherein the deicing composition comprises about 94.0 to 99.8 weight percent of a deicing salt, about 0.1 to 3.0 weight percent of a water-soluble rare earth salt, and about 0.1 to 3.0 weight percent of a water-soluble organic acid salt selected from the group consisting of gluconate salts, ascorbate salts, tartrate salts, and saccharate salts.

5,531,932

METAL COMPOUND/PROTONIC ACID CONTAINING ELECTRICALLY CONDUCTIVE COMPOSITIONS AND METHODS FOR THEIR PREPARATION

Toivo Kärnä, Porvoo; Jukka Laakso, Helsinki; Timo Niemi, Jyväskylä ; Heikki Ruohonen, Helsinki; Esko Savolainen, Hollola; Helge Lindström, Hamari; Esa Virtanen, Porvoo, and Olli Ikkala, Helsinki, all of, Finland, assignors to Neste Oy, Kulloo, Finland

Division of Ser. No. 927,858, Aug. 11, 1992, Pat. No. 5,340,499. This application Apr. 28, 1994, Ser. No. 234,870

Int. Cl.^{6} H01B *1/00;1/12*

U.S. Cl. 252—518 **13 Claims**

1. Method for making an electrically conductive polymer composition, the electrically conductive polymer composition comprising an admixture of:

(a) a complex having an electrical conductivity of at least about 10^{-6} S/cm, of:

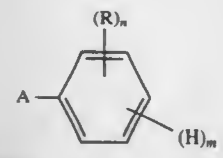
  (i) a conjugated polymer, having substituted or unsubstituted aniline repeating units and being selected from the group consisting of polyaniline, substituted polyanilines, or copolymers thereof; and

  (ii) a first protonic acid, the first protonic acid being selected to impart said electrical conductivity to said conjugated polymer;

(b) a reaction product having a softening temperature of below about 300° C., of (1) a metal compound MX wherein M is selected from the group consisting of Zn, Cu, Mg, Ba, Al, Ca, Ti, Fe, Zr, Cd, Pb and Sn, and X is selected from the group consisting of oxides, hydroxides, halides, stearates, carbonates, palmitates, octoates, laurates, phenolares, maleares, and octylthioglycolates, and (2) a second protonic acid, which may be the same or different from the first protonic acid of said complex, having a structural formula I-II:

$$A-R_1 \qquad \text{I}$$

or



II

wherein:

"A" is sulfonic acid, selenic acid, phosphonic acid, boric acid or a carboxylic acid group; or hydrogen sulphate, hydrogen selenate or hydrogen phosphate;

"n" is an integer in the range of 0–5 inclusive; "m" is an integer in the range of 0–4 inclusive, with the proviso that the sum of n+m is 5;

"R_1" is an alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, alkylthioalkyl containing 1–20 carbon atoms; or alkylaryl, arylalkyl, alkylsulphinyl, alkoxyalkyl, alkylsulphonyl, alkoxycarbonyl, carboxylic acid, where the alkyl or alkoxy has from 0 to about 20 carbon atoms; or alkyl having from 3–20 carbon atoms substituted with one or more sulfonic acid, carboxylic acid, halogen, nitro, cyano, diazo or epoxy moieties; or a substituted or unsubstituted 3, 4, 5, 6, or 7 membered alicyclic carbon ring, which ring may include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen such as thiophenyl, pyrolyl, furanyl, pyridinyl; or a polymeric backbone to which A units are attached;

R is the same or different at each occurrence and is an alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, alkylsulphinyl, alkoxyalkyl, alkylsulphonyl, aryl, arylthio, arylsulphinyl, alkoxycarbonyl, arylsulphonyl, carboxylic acid, halogen, cyano, or alkyl which has been substituted with one or more sulfonic acid, carboxylic acid, halogen, nitro, cyano, diazo or epoxy moieties; or any two R substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring or multiples thereof, which ring or rings may include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen, with R typically having from 1 to about 20 carbons;

said method comprising contacting said metal compound MX with a mixture comprising said electrically conductive complex of said conjugated polymer and said first protonic acid and said second protonic acid wherein the molar ratio between the acidic protons of said first protonic acid and the aniline repeat units of said conjugated polymer is at least about 0.5; and wherein said metal compound MX reacts with the excess of said first and second protonic acids to yield a reaction product of said metal compound and said first and second protonic acids; wherein said reaction product neutralizes and plasticizes said electrically conductive polymer composition.

5,531,933

LIQUID HARD SURFACE DETERGENT COMPOSITIONS CONTAINING SPECIFIC POLYCARBOXYLATE DETERGENT BUILDERS

Ronald A. Masters, Loveland; Michael S. Maile, Maineville; David C. Underwood, Cincinnati; Michael J. Kupneski, Maineville, and Timothy C. Roetker, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 175,832, Dec. 30, 1993, abandoned. This application Aug. 23, 1994, Ser. No. 294,256

Int. Cl.^{6} C11D *1/12;1/92;3/33;3/30*

U.S. Cl. 510—429 **8 Claims**

1. An aqueous liquid hard surface detergent composition having excellent filming/streaking characteristics, comprising:

(A1) from about 0.02%–1.0%, by weight of the composition, of detergent surfactant having the generic formula:

$$R^3\text{-}[C(O)\text{-}N\text{-}(R^4)(CH_2)_n]\text{-}N(CH_3)_2{}^{(+)}\text{-}(CR^5)_3\text{-}SO_3{}^{(-)}$$

wherein R^3 is an alkyl or alkylene group containing from about 10 to 15 carbon atoms; R^4 is selected from the group consisting of hydrogen, methyl, ethyl, propyl, hydroxyl substituted ethyl or propyl and mixtures thereof; each R^5 is selected from the group consisting of hydrogen and hydroxy groups wherein one of the R^5 groups between the (+) and the (−) charge centers is a hydroxy group and the remaining R^5 groups are hydrogen with no more than one hydroxy group in the $(CR^5{}_2)_3$ moiety and n is a number from 1 to about 4;

(A2) from about 0.01 to about 1.0%, by weight of the composition, of a C_{12}–C_{18} alkyl sulfate detergent surfactant;

(B) from about 2% to about 15%, by weight of the composition, of hydrophobic solvent, having a hydrogen bonding parameter of from about 2 to about 7.7, wherein said solvent comprises no more than about 0.4%, by weight of the composition of mono or sequiterpenes;

(C) from about 0.05% to about 10%, by weight of the composition, of alkaline material;

(D) from about 0.05% to about 0.5%, by weight of the composition, of detergent builder selected from the group consisting of water soluble salts of ethylenediaminetetraacetic acid; and

(E) the balance being an aqueous co-solvent system comprising any organic co-solvent having a hydrogen bonding parameter of greater than about 7.8.

5,531,934

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS USING POLY(AMINO ACIDS)

Michael B. Freeman, Harleysville; William M. Hann, Gywnedd, both of Pa.; Yi H. Paik, Princeton, N.J., and Graham Swift, Blue Bell, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed Sep. 12, 1994, Ser. No. 304,063

Int. Cl.^{6} C11D *3/06;3/37*

U.S. Cl. 252—390 **2 Claims**

1. A method of inhibiting corrosion, comprising: contacting ferrous metals in an aqueous system with greater than 1 milligram per liter of at least one homopolymer selected from the group consisting of poly(aspartic acid) and poly(glutamic acid) and from 0.5 milligrams per liter to 100 milligrams per liter of one or more pyrophosphates; and inhibiting corrosion of the ferrous metals;

wherein the aqueous system is operated at a pH from 3 to 12.

5,531,935

PHOTOCHROMIC NAPHTHOPYRAN COMPOUNDS

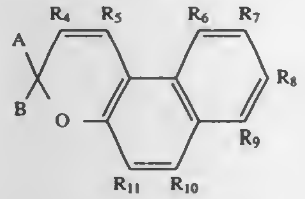
Frank J. Hughes, Edina, Minn., and Edward A. Travnicek, Coral Springs, Fla., assignors to BMC Industries, Inc., Minneapolis, Minn.

Division of Ser. No. 282,278, Jul. 28, 1994. This application May 31, 1995, Ser. No. 456,071

Int. Cl.^{6} G02B *5/23;24/00*

U.S. Cl. 252—586 **24 Claims**

1. A photochromic article comprising a host material and a photochromic amount of a naphthopyran compound, the naphthopyran compound represented by the formula:



wherein,

R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, and R_{11} are each selected from the group consisting of hydrogen, alkyl, alkoxy, and cycloalkyl;

A and B are each selected from the group consisting of hydrogen, unsubstituted or substituted phenyl and unsubstituted or substituted naphthyl, provided that at least one of A or B is substituted phenyl or substituted naphthyl; and

any substituent of any substituted phenyl or substituted naphthyl at A or B is selected from the group consisting of phenyl, naphthyl, alkyl, alkoxy, and cycloalkyl, provided that at least one substituent of at least one substituted phenyl or substituted naphthyl at either A or B is phenyl or naphthyl.

5,531,936

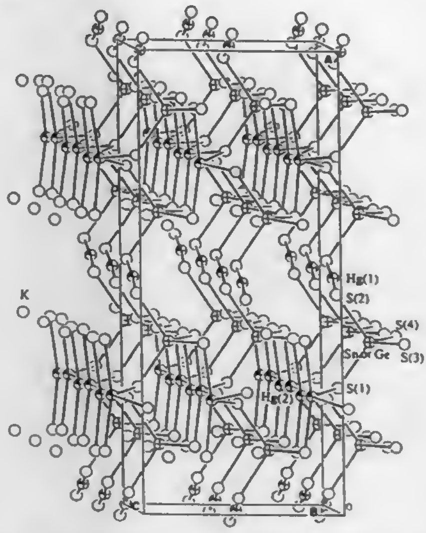
ALKALI METAL QUATERNARY CHALCOGENIDES AND PROCESS FOR THE PREPARATION THEREOF

Mercouri G. Kanatzidis, Okemos; Ju H. Liao, Lansing, and Gregory A. Marking, Okemos, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Aug. 31, 1994, Ser. No. 298,620

Int. Cl.^{6} F21V *9/04;* **G02B** *5/20;* **C01B** *19/00;17/00*

U.S. Cl. 252—587 **25 Claims**



1. A crystalline alkali metal quaternary chalcogenide of the formula $A_xB_yC_zD_n$ containing $(CD_4)^{4-}$ or $(C_2D_6)^{4-}$ ions where A is selected from the group consisting of an alkali metal and a mixture of alkali metals, B is selected from the group consisting of mercury, zinc and manganese, C is a metal selected from the group consisting of germanium and tin and D is selected from the group consisting of sulfur and selenium, wherein x is a number selected from the group consisting of 2 and 6, y is a number selected from the group consisting of 1, 3 and 4, z is a number selected from the group consisting of 2 and 5 and n is a number selected from the group consisting of 6, 8 and 17 which provide non-linear optical transmission properties.

5,531,937

WATER SOLUBLE CYCLIC AMINE-DICARBOXYLIC ACID-ALKANOL AMINE SALT CORROSION INHIBITOR

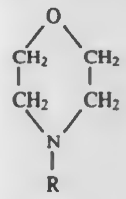
Ljiljana V. Minevski, The Woodlands, Tex., and Edmund J. Bockowski, Chalfont, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 336,144, Nov. 8, 1994, abandoned, and a continuation-in-part of Ser. No. 336,145, Nov. 8, 1994, abandoned, and a continuation-in-part of Ser. No. 367,643, Jan. 3, 1995, abandoned. This application Sep. 12, 1995, Ser. No. 527,146

Int. Cl.^{6} C23F *11/12;11/14*

U.S. Cl. 252—394 **9 Claims**

1. A method for inhibiting the corrosion of ferrous metals in contact with an aqueous oxygen-free solution comprising adding to said aqueous oxygen-free solution a corrosion inhibiting amount of a composition comprising n-alkyl morpholine having the formula:



where R is an n-alkyl having from about 1 to about 4 carbon atoms; a saturated dicarboxylic acid having the formula:

$$HOOC—CH_2—(CH_2)_z—CH_2—COOH$$

where z=6 to 14; optionally an alkanol amine having the formula:

$$(OH—R_1)_xNH_{x-y}$$

where R_1 is an alkyl having from about 2 to 5 carbon atoms, x=2 or 3 and y=3; and optionally a surfactant.

5,531,938

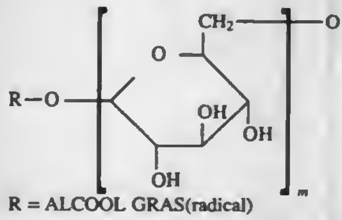
MICROEMULSION LIGHT DUTY LIQUID CLEANING COMPOSITIONS

Rita Erilli, Liege, Belgium, assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Nov. 23, 1994, Ser. No. 344,059
Int. Cl.^{6} C11D ***1/831;1/84***

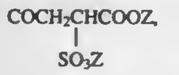
U.S. Cl. 510—417 **11 Claims**

1. A light duty liquid microemulsion composition consisting essentially of approximately by weight: 10% to 34% of a mixture of a sulfonate surfactant and an alkyl ether polyethyenoxy sulfate surfactaant; 0 to 25% of a zwitterionic surfactant, 1% to 10% of a biodegradable anionic surfactant selected from the group consisting of an alkyl ethoxy citrate and a alkyl polyglucoside; 0.4% to 8.0% of a water insoluble hydrocarbon, essential oil or perfume; 0 to 25% of a cosurfactant, and the balance being water, wherein said alkyl polyglycoside is depicted by the formula

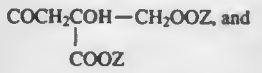


R = ALCOOL GRAS(radical)

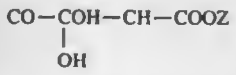
wherein R is a C_{10} to C_{16} alkyl group, m is a number average which is less than 4 and is of such a value to provide a number molecular weight of about 500 to 1000, and X is selected from the group consisting of



$$\begin{array}{l}\mathrm{COCH_2CHCOOZ,}\\ \qquad\;\;|\\ \qquad\mathrm{SO_3Z}\end{array}$$



$$\begin{array}{l}\mathrm{COCH_2COH-CH_2OOZ,\ and}\\ \qquad\quad\;|\\ \qquad\;\;\mathrm{COOZ}\end{array}$$



$$\begin{array}{l}\mathrm{CO-COH-CH-COOZ}\\ \qquad\;\;|\\ \qquad\;\mathrm{OH}\end{array}$$

wherein Z is selected from the group consisting of sodium, potassium, ammonium, triethanol amine, diethanoi amine and monoethanol amine, and said light duty liquid microemulsion composition has a light transmission of at least 95%.

5,531,939

CONCENTRATED GLASS AND WINDOW CLEANING COMPOSITION AND METHOD OF USE

Kalliopi S. Haley, Byron Center, and Jeffrey J. Fisher, Grand Rapids, both of Mich., assignors to Amway Corporation, Ada, Mich.

Flied Mar. 23, 1994, Ser. No. 216,678
Int. Cl.^{6} C11D ***3/20***

U.S. Cl. 510—182 **14 Claims**

1. A concentrated liquid glass and window cleaning composition comprising:

(a) from about 0.1% to about 20% of at least one anionic surfactant selected from the group consisting of sulfosuccinates derived from mono or diesters of maleic acid, taurates derived as condensation products of C_8–C_{20} fatty acids and taurines and mixtures thereof; and

(b) from about 10% to about 75% of a mixture of at least two glycol ether solvents selected from the group consisting of ethylene glycol monoalkyl ethers and propylene glycol monoalkyl ethers.

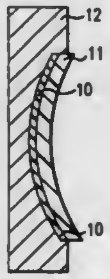
5,531,940

METHOD FOR MANUFACTURING PHOTOCHROMIC LENSES

Amitava Gupta, Bethesda, Md., and Ronald D. Blum, Roanoke, Va., assignors to Innotech, Inc., Roanoke, Va.

Filed Dec. 10, 1993, Ser. No. 165,056
Int. Cl.^{6} B29D ***11/00***

U.S. Cl. 264—1.700 **16 Claims**



1. A method for making photochromic composite plastic lenses, preforms or semifinished blanks comprising:

providing a finished or semifinished plastic lens, preform or semifinished blank having a bonding surface;

providing a mold having a molding surface, at least a portion of the molding surface having a profile substantially matching the bonding surface of the plastic lens, preform or semifinished blank;

providing an uncured resin that, upon curing, has a cross link density that is lower than that of said plastic lens, preform or semifinished blank and forms a soft matrix;

arranging the plastic lens, preform or semifinished blank, the uncured resin and the mold such that the uncured resin is disposed between the bonding surface of the plastic lens, preform or semifinished blank and the molding surface of the mold;

curing the uncured resin composition to form a composite plastic lens, preform or semifinished blank having a cured plastic attached portion that is bonded to the bonding surface of the plastic lens, preform or semifinished blank; and

impregnating the cured plastic attached portion with a photochromic material.

5,531,941

PROCESS FOR PREPARING AZIDE-FREE GAS GENERANT COMPOSITION

Donald R. Poole, Woodinville, Wash., assignor to Automotive Systems Laboratory, Inc, Farmington Hills, Mich.

Division of Ser. No. 101,848, Aug. 4, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,182
Int. Cl.^{6} C06B ***21/00***

U.S. Cl. 264—3.4 **3 Claims**

1. A process for preparing an azide-free gas generant composition that produces exhaust gases on combustion for inflating vehicle or aircraft occupant restraint devices, said composition comprising a mixture of phase stabilized ammonium nitrate (PSAN) and triaminoguanidine nitrate (TAGN), said process comprising the steps of (a) mixing weighed amounts of ammonium nitrate and potassium nitrate with wet triaminoguanidine nitrate

and drying and grinding the resulting dry mixture to a powder, and (b) molding the powder under pressure into pellets.

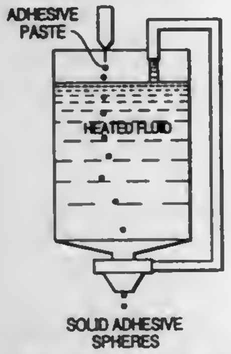
5,531,942

METHOD OF MAKING ELECTROCONDUCTIVE ADHESIVE PARTICLES FOR Z-AXIS APPLICATION

Kenneth B. Gilleo, West Kingston, R.I., and Michael C. Corey, Morristown, N.J., assignors to Fry's Metals, Inc., Providence, R.I.

Filed Jun. 16, 1994, Ser. No. 261,912
Int. Cl.^{6} B29B ***9/10***

U.S. Cl. 264—5 **14 Claims**



1. A method of making a substantially spherically shaped, electroconductive adhesive body, comprising the steps of:

depositing a small amount of electroconductive, fusible resin adhesive into a fluid medium which is effective to enable the adhesive to assume a substantially spherical shape; and

maintaining the adhesive in the fluid medium for a time sufficient to cause the adhesive to assume such shape; and

removing the adhesive from the fluid medium.

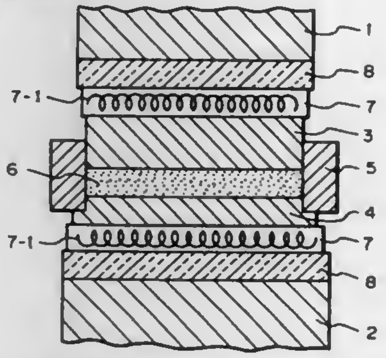
5,531,943

METHOD OF MAKING A CARBON/METAL COMPOSITE

Kiyoshi Sudani, Ibaraki-ken; Masato Kano, Chiba-ken; Yukihiro Sugimoto, Ibaraki-ken; Takashi Fukuda, Kobe, and Toru Iwahashi, Yamato-Koriyama, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Division of Ser. No. 907,805, Jul. 2, 1992, abandoned, which is a division of Ser. No. 422,898, Oct. 17, 1989, Pat. No. 5,158,828. This application Jan. 5, 1994, Ser. No. 177,791
Claims priority, application Japan, Oct. 17, 1988, 63-262110; Dec. 13, 1988, 63-315611; Dec. 13, 1988, 63-315612; Dec. 13, 1988, 63-315613; Dec. 13, 1988, 63-315614; Apr. 12, 1989, 1-93842; Jun. 26, 1989, 1-162891; Jun. 26, 1989, 1-162892; Jun. 26, 1989, 1-162893; Jun. 29, 1989, 1-167320; Aug. 14, 1989, 1-209771; Sep. 25, 1989, 1-249962
Int. Cl.^{6} C01B ***31/02;*** **B22D** ***19/14***

U.S. Cl. 264—29.1 **8 Claims**



1. A method for manufacturing a carbon/metal composite comprising a carbon matrix and metal fibers distributed in the carbon matrix, comprising:

forming a molding mixture comprising a carbon raw material and at least one component selected from (a) metal fibers at least a portion of which are coated with another material having a tendency to form carbides which is equal to or lower than that of the metal constituting the metal fibers, (b) metal fibers at least a portion of which have surfaces alloyed with another metal having a tendency to form carbides which is equal to or lower than that of the metal constituting the metal fibers, and (c) a mixture of metal fibers with a metal powder, said metal powder having a tendency to form carbides which is lower than that of the metal constituting the metal fibers;

molding the molding mixture to form a molding; and

baking the molding to carbonize the carbon raw material, thereby forming a carbon/metal composite.

5,531,944

EMBOSSING COMPOSITION FOR PREPARING TEXTURED POLYMERIC MATERIALS

Rudolf Frisch, Yardley, Pa., assignor to Congoleum Corporation, Lawrenceville, N.J.

Division of Ser. No. 983,119, Nov. 30, 1992, Pat. No. 5,336,693, which is a continuation of Ser. No. 759,837, Sep. 13, 1991, abandoned, which is a continuation of Ser. No. 118,973, Nov. 10, 1987, abandoned. This application Aug. 9, 1994, Ser. No. 289,003
Int. Cl.^{6} B29C ***59/00***

U.S. Cl. 264—52 **32 Claims**

1. A method for preparing a foamable polymeric material which is capable of being chemically embossed comprising:

(a) providing a foamable polymeric material comprising a resin and a blowing agent which is capable of effecting expansion of said material at elevated temperature;

(b) treating said material by contacting predetermined portions of the surface thereof with a water-based liquid, embossing composition comprising a modifier which is effective, as the treated material is heated, in modifying the activity of the blowing agent in those portions of the material to which the embossing composition is applied, said modifier being in the form of particulate solids which are substantially insoluble and uniformly dispersed in the liquid medium of said composition; and

(c) drying the embossing composition after it has been applied to said surface.

5,531,945

PROCESS FOR THE PRODUCTION OF BASE BOARD FOR PRINTED WIRING

Kazuyuki Ohya, and Norio Sayama, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 45,473, Apr. 13, 1993, abandoned. This application May 20, 1994, Ser. No. 246,497
Claims priority, application Japan, Apr. 13, 1992, 4-92772; Nov. 13, 1992, 4-303796
Int. Cl.^{6} C04B ***41/81;*** **B28B** ***11/02***

U.S. Cl. 264—60 **11 Claims**

1. A process for the production of a base board for printed wiring, which comprises the steps of wrapping a block of continuous porous ceramic material with a cloth, impregnating the wrapped block continuous porous ceramic material with a thermosetting resin under reduced pressure, curing the thermosetting resin to form a composite material, and slicing the composite material into base boards having a thickness of 0.2 to 2 mm and a thickness allowance of ±5 μm or less.

5,531,946

PROCESS FOR THE PRODUCTION OF STAFF PANELS ACCORDING TO A SEMIDRY METHOD AND INSTALLATION FOR IMPLEMENTING THE PROCESS

Jörg Bold, Kaiserslautern, Germany, assignor to Babcock BSH Aktiengesellschaft Vormals Buttner-Schilde-Haas AG, Krefeld, Germany

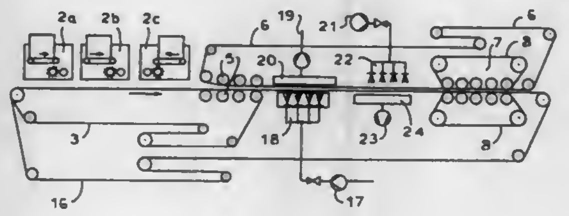
PCT No. PCT/EP92/02055, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/04830, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 4, 1992, Ser. No. 204,220

Claims priority, application Germany, Sep. 5, 1991, 41 29 466.1

Int. Cl.^{6} B28B *3/00*

U.S. Cl. 264—102 **15 Claims**



1. A process for producing plasterboard which comprises the steps of:

(a) forming a mixture of gypsum, fibers and water in an amount less than necessary for hardening;

(b) spreading said mixture onto a continuously moving belt to form a spread layer;

(c) precompressing said layer to 110% to 180% of a final plasterboard thickness;

(d) at least upon precompression successively wetting said layer from a top side and a bottom side; and

(e) thereafter compressing the wetted layer to said final plasterboard thickness.

10. An apparatus for producing plasterboard, comprising:

means for mixing gypsum, fibers and water in an amount less than required for hardening of said gypsum to form a mixture;

at least one forming belt;

means juxtaposed with said belt and receiving said mixture for spreading said mixture in at least one layer on said belt;

means forming a preliminary press along said belt downstream of said means for spreading, for compressing said spread layer to 110 to 180% of a final thickness of said plasterboard;

means downstream of said means for spreading for successively applying water to upper and lower parts of a layer of said mixture precompressed on said belt and including upper and lower wetting devices;

a main press downstream of said preliminary press along said belt for pressing said layer after wetting of upper and lower parts thereof to a final plasterboard thickness;

an upper screen belt guided through said preliminary press and said lower wetting device;

a lower screen belt above said forming belt, said forming belt being returned downstream of said preliminary press and said lower screen belt extending at least through said lower wetting device.

5,531,947

PROCESS AND INSTALLATION FOR THE MANUFACTURE OF PENCILS

Burkhard Metzger, and Hans Ziolkowski, both of Ingelheim, Germany, assignors to Bellaform Extrusionstechnik GmbH, Ingelheim, Germany

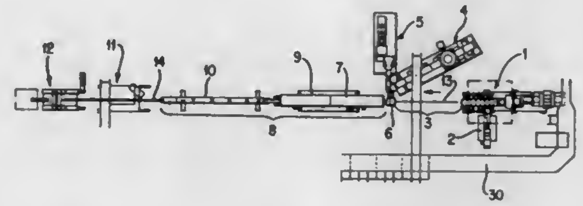
PCT No. PCT/EP93/02461, § 371 Date May 13, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO94/06615, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 12, 1992, Ser. No. 240,789

Claims priority, application Germany, Sep. 15, 1992, 42 30 793.7

Int. Cl.^{6} B29C *47/02*

U.S. Cl. 264—102 **15 Claims**



1. Process to manufacture pencils with a firm lead and at least one coating, whereby polymer is used as a binding material and the lead material and the coating material are extruded, comprising the steps of:

melting the polymer binding material to manufacture the lead,

adding a mixture in powder form consisting of known additives such as colors, gliding and adhesive substances and possibly filling substances to the melted polymer substance whereby the melting of the binding material and the mixing of the additives in powder form take place in an extruder,

mixing the melted polymer material with the additional substances the lead material is extruded as a lead profile,

cooling the lead profile only to the point that the lead profile is not plastic anymore,

extruding the coating material for the formation of the pencil profile onto the cooled but not yet cold lead profile, and subsequently cooling the pencil profile completely.

10. An apparatus for manufacturing pencils that includes a lead extruder and at least one coating extruder that is connected with a coating nozzle, wherein the lead extruder (**1**) includes a first loading station (**18**) and a second loading station (**19**) at least one melting and transportation range (**20, 21**) and at least one mixing and kneading range (**24, 25, 26**) downstream of the second loading station (**19**), a first cooling range (**3**) between the lead extruder (**1**) and the coating nozzle (**6**) and a second cooling range (**8**) downstream of the coating nozzle (**6**).

5,531,948

PROCESS FOR THE PRODUCTION OF PARTIALLY REDUCED INDIUM OXIDE-TIN OXIDE TARGETS

Martin Schlott, Hanau; Martin Kutzner, Neuberg; Martin Weigert, Hanau; Wolfgang Dauth, Frankfurt am Main, all of, Germany, and Bruce Gehman, Morgan Hill, Calif., assignors to Leybold Materials GmbH, Hanau, Germany

Filed Feb. 6, 1995, Ser. No. 384,181

Claims priority, application Germany, Apr. 18, 1994, 44 13 344.8

Int. Cl.^{6} B29C *43/02*

U.S. Cl. 264—122 **5 Claims**

1. Process for the production of a partially reduced indium oxide-tin-oxide target comprising

preparing a powder mixture comprising SnO and In_2O_3, and

sintering said mixture under an argon atmosphere in a hot press at an applied pressure above 10 MPa, up to a maximum of 18 MPa.

5. Partially reduced indium-tin-oxide sputtering target consisting of a homogenous sintered mixture comprising SnO and In_2O_3 .

5,531,949

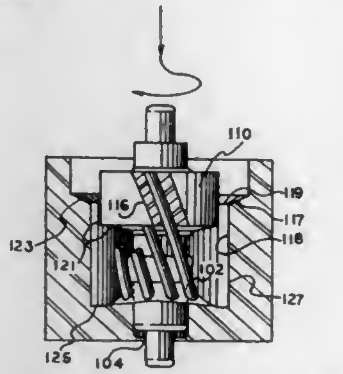
METHODS AND MOLDS FOR MAKING A ROLLER SKATING WHEEL HAVING CURVILINEAR PATHS THROUGH THE HUB

Richard V. Heitfiled, Reston, Va., assignor to Creative Urethanes, Purcellville, Va.

Continuation-in-part of Ser. No. 258,222, Jun. 10, 1994, abandoned, which is a division of Ser. No. 15,154, Feb. 11, 1993, Pat. No. 5,320,417. This application Jun. 13, 1994, Ser. No. 259,002

Int. Cl.^{6} B29C *33/40;33/50;39/10*

U.S. Cl. 264—135 **15 Claims**



1. A mold apparatus for making a hub of a roller skate wheel, the hub having curvilinear air passages therethrough, said apparatus comprising:

a mold member having an open top and a bottom having a bore formed therethrough;

a plurality of flexible fingers projecting from the bottom of said mold member and circumferentially surrounding said bore;

a pin disposable within said mold member and having a bottom portion selectively engageable with mold surfaces defining said bore;

a finger alignment member operatively associated with said pin and having a plurality of circumferentially arranged curvilinear paths therethrough, said curvilinear paths extending obliquely with respect to a center axis of said finger alignment member and being dimensioned to receive said flexible fingers such that when said flexible fingers are received by said curvilinear paths said flexible fingers assume a curvilinear shape.

5,531,950

METHOD OF MANUFACTURING A CASING FOR AN ELECTRONIC APPARATUS

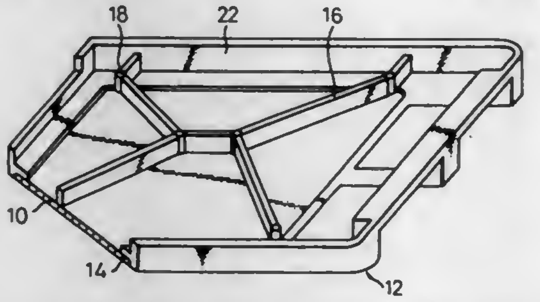
Kouichi Kimura; Kouta Nishii, and Masanobu Ishizuka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 31, 1994, Ser. No. 251,818

Claims priority, application Japan, Sep. 7, 1993, 5-222406; Jan. 20, 1994, 6-004730

Int. Cl.^{6} B29C *45/14*

U.S. Cl. 264—135 **21 Claims**



1. A method of manufacturing a composite hybrid housing or casing for an electronic apparatus, said housing or casing including a metal component and a resin component, said resin component having a rib or boss portion, said method comprising:

coating a flowable adhesive on a surface of said metal component;

allowing said adhesive to dry; and

joining said metal and resin component by injection molding said resin component onto said metal component and into contact with said dried adhesive, said resin being introduced onto said metal component and into contact with said adhesive using an area where said rib or said boss is to be formed as a flow path.

5,531,951

METHOD OF FORMING STAPLE FIBERS FROM SELF-TEXTURING FILAMENTS

Fred L. Travelute, Charlotte, N.C., and Robert E. Hoffman, Catawba, S.C., assignors to Wellman, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 156,237, Nov. 22, 1993, Pat. No. 5,407,625. This application Nov. 4, 1994, Ser. No. 334,418

Int. Cl.^{6} D01D *5/24;5/26;* **D02G** *1/00*

U.S. Cl. 264—143 **13 Claims**

1. A method of producing staple fibers from self-texturing filaments that exhibit a desirable tendency to coil rather than to bend sharply or zig zag, the method comprising:

directing a quenching fluid at extruded hollow filaments of a liquid polymer predominantly from one side of the hollow filaments to thereby produce hollow filaments with different orientations on each side;

thereafter raising the temperature of the hollow filaments to a temperature sufficient for the filaments to relax but less than the temperature at which the filaments would shrink;

drawing the relaxed hollow filaments;

releasing the drawn filaments to coil in the absence of any control of their length; and

cutting the released coiled filaments into staple lengths.

5,531,952

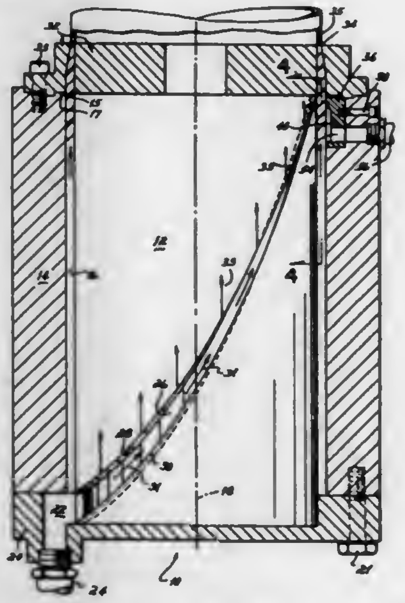
METHOD AND APPARATUS FOR FORMING TUBULAR PLASTIC FILM

Eric P. Hatfield, Montgomery, Ohio, assignor to James River Paper Company, Inc., Milford, Ohio

Filed Dec. 27, 1994, Ser. No. 364,606

Int. Cl.^{6} B29C *47/06;47/20*

U.S. Cl. 264—171.260 **22 Claims**



1. Apparatus for producing a tubular plastic product comprising:

a die body having inner and outer die members and defining therebetween an annular space having a longitudinal axis;

a first inlet for feeding a first stream of resin into said annular space;

said inner and outer die members further defining an annular chamber communicating between said first inlet and said annular space such that the first resin stream flows from said annular space into said annular chamber and divides into two substreams as the resin flows against said inner die member, the substreams flowing laterally in opposite directions around said inner die member and converging on the side of said die body opposite said first inlet to form an annular stream of resin having a weld line where the two substreams join;

a second inlet downstream of said first inlet for feeding a second stream of resin into said annular space, said second inlet being disposed where the two substreams converge to form the weld line so that the second stream of resin is fed over the weld line of the annular resin stream so as to place a discrete longitudinal patch over the weld line to reinforce the weld line;

said die body further having an annular orifice through which the annular resin stream is expressed to form the tubular product.

18. A method of producing a tubular plastic product comprising the steps of:

feeding a stream of resin into an annular space;

dividing the resin stream into two substreams which flow laterally in opposite directions around the annular space and then converge to form an annular stream of resin having a weld line where the two substreams join;

feeding the substreams into a discrete relieved area defining a mixing chamber in the annular space, the relieved area being disposed where the two substreams converge to from the weld line so the two resin substreams are allowed to mix where the substreams join to form an annular stream of resin so as to avoid forming a distinct weld line where the substreams join; and

expressing the annular resin stream through an annular orifice to form the tubular product.

5,531,953

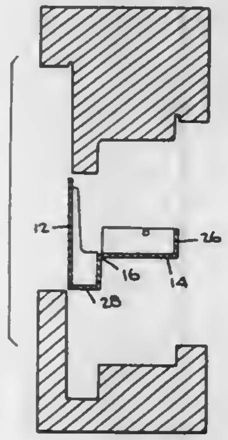
PROCESS OF MAKING A ONE-PIECE BOX

John A. Gelardi, Kennebunkport, Me., assignor to DIC Digital Supply Corp., Fort Lee, N.J.

Division of Ser. No. 145,680, Nov. 4, 1993, Pat. No. 5,368,163, which is a continuation of Ser. No. 925,216, Aug. 6, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 272,845

Int. Cl.^{6} B29C *45/00*

U.S. Cl. 264—296 **4 Claims**



1. A method of molding a one piece box having a front panel, a back panel, a cover and a base for the storage of articles, which comprises the steps of:

injecting a composition comprising a plastic polymer into a mold having a cavity and a core, which results in a plastic box;

arranging said cavity and said core such that an integrally molded hinge member is located at the midsection of said base and said box is molded in an open position such that said cover, back panel and base are molded in a fixed relation where a portion of said base located between said back panel and hinge member is generally parallel to the length of said cover;

retaining said plastic polymer in said mold for a time sufficient to form said box; and

releasing said box from said mold while said box is in the open position.

5,531,954

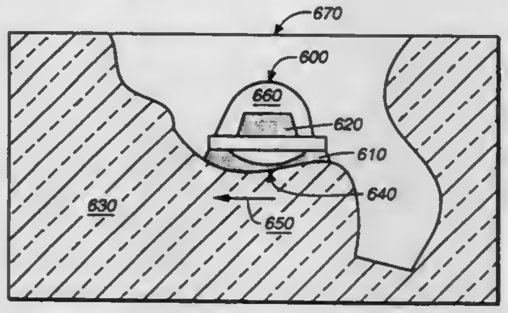
METHOD FOR FABRICATING A HEARING AID HOUSING

Jorgen Heide, El Granada, and Ole R. Olsen, Pleasanton, both of Calif., assignors to ReSound Corporation, Redwood City, Calif.

Filed Aug. 5, 1994, Ser. No. 286,522

Int. Cl.^{6} B29D *22/00*

U.S. Cl. 264—496 **11 Claims**



1. A method for fabricating a shell made of radiation-reactive material and having an inner compartment therein, comprising the steps of:

providing a hollow positive mold of the cavity for which the shell is being made, said mold being made of molding material and having an opening for providing access thereto;

placing the inner compartment within said positive mold, said inner compartment having a door wherein said door is positioned such that said door is sufficiently flush with an inner surface of said positive mold; and

casting the shell in the hollow positive mold, said shell being made of radiation-reactive material.

5,531,955

METHOD OF MANUFACTURING A METALLIC POROUS SHEET HAVING PORES SURROUNDED BY A THREE-DIMENSIONAL NET-SHAPED FRAMEWORK OF METALLIC LAYERS

Hirofumi Sugikawa, Toyonaka, Japan, assignor to Katayama Special Industries, Ltd., Osaka, Japan

Division of Ser. No. 305,351, Sep. 13, 1994, Pat. No. 5,496,650. This application Feb. 8, 1995, Ser. No. 385,422

Claims priority, application Japan, Sep. 14, 1993, 5-229283; Sep. 14, 1993, 5-229284; Oct. 26, 1993, 5-267591

Int. Cl.^{6} H05K *3/10*

U.S. Cl. 419—2 **21 Claims**

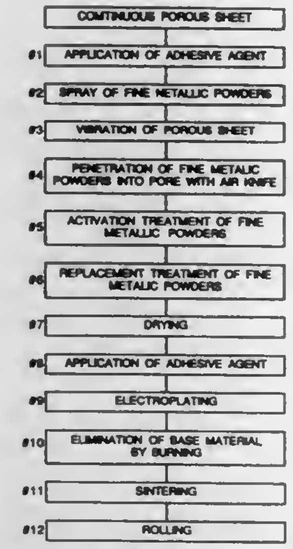
1. A method of manufacturing a metallic porous sheet comprising pores surrounded by a three-dimensional net-shaped framework comprising the steps of:

forming a conductive metallic layer by applying fine metallic powders to all surfaces of a three-dimensional net-shaped porous sheet, including the surfaces which define the pores, by using an adhesive agent;

forming a metallic plated layer on the conductive metallic layer by electroplating the surface thereof,

heating the conductive metallic layer and the metallic plated layer to burn out the porous sheet and adhesive agent, and then

continuously sintering the conductive metallic layer and the metallic plated layer.


CONTINUOUS POROUS SHEET
#1 APPLICATION OF ADHESIVE AGENT
#2 SPRAY OF FINE METALLIC POWDERS
#3 VIBRATION OF POROUS SHEET
#4 PENETRATION OF FINE METALIC POWDERS INTO PORE WITH AIR KNIFE
#5 ACTIVATION TREATMENT OF FINE METALLIC POWDERS
#6 REPLACEMENT TREATMENT OF FINE METALIC POWDERS
#7 DRYING
#8 APPLICATION OF ADHESIVE AGENT
#9 ELECTROPLATING
#10 ELIMINATION OF BASE MATERIAL BY BURNING
#11 SINTERING
#12 ROLLING

5,531,956

RIBBED ELECTRODES FOR MOLTEN CARBONATE FUEL CELLS

Estela T. Ong, Chicago, and Nellie Burton-Gorman, Justice, both of Ill., assignors to Institute of Gas Technology, Des Plaines, Ill.

Filed Apr. 27, 1995, Ser. No. 429,718

Int. Cl.^{6} B22F *7/00*

U.S. Cl. 419—2 **9 Claims**

1. A method for producing an electrode for a fuel cell comprising the steps of:

setting a suspension comprising at least one powdered electrode metal onto a face of a substantially flat pre-dried porous electrode metal substrate, forming a plurality of raised structures of said suspension on said face; and

sintering said porous electrode metal substrate and said raised structures.

5,531,957

METHOD FOR MANUFACTURING A MOUNTING OBJECT PROVIDED WITH A METALLIC HEAT-RESISTANT TWO-DIMENSIONAL FASTENER

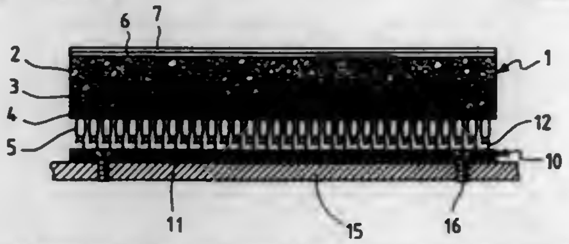
Osamu Okamoto, and Teruomi Nakaya, both of Tokyo, Japan, assignors to National Aerospace Laboratory of Science & Technology Agency, Tokyo, Japan

Division of Ser. No. 985,660, Dec. 7, 1992, Pat. No. 5,429,875. This application Apr. 12, 1995, Ser. No. 420,587

Claims priority, application Japan, Jul. 15, 1992, 209466

Int. Cl.^{6} B22F *7/04*

U.S. Cl. 419—8 **5 Claims**



1. A method for manufacturing a mounting object provided with a metallic heat-resistant two-dimensional fastener comprising the steps of: covering and fixing engaging portions of fastener elements constituting a two-dimensional fastener within a mold form with a layer of inorganic powder such as carbon powder having a higher melting temperature than said fastener elements and providing on said inorganic powder layer to an extent to cover and fix base portions of said two-dimensional fastener a raw material powder layer for molding a mounting object body to obtain a mounting object body molded article; sintering said mounting object body molded article at a temperature less than a melting temperature of said inorganic powder layer; and removing the inorganic powder which covers the engaging portions of said fastener elements after cooling, whereby a heat-resistant mounting object body integrally having metallic fastener elements is manufactured.

5,531,958

PROCESS FOR IMPROVING THE DEBINDING RATE OF CERAMIC AND METAL INJECTION MOLDED PRODUCTS

David C. Krueger, Grosse Ile, Mich., assignor to BASF Corporation, Mount Olive, N.J.

Continuation of Ser. No. 130,223, Oct. 1, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 544,149

Int. Cl.^{6} B22F *3/10*

U.S. Cl. 419—44 **28 Claims**

1. A process for controlling debinding of a powder injection molded part formed of a powder injection molding feedstock which includes a polymeric binder, said process comprising:

(a) placing the molded part to be debound in a debinding oven;

(b) introducing a purge gas into the oven so as to purge the oven with the purge gas;

(c) heating the oven to an oven operating temperature below the softening point of the polymeric binder; and

(d) introducing a debinding catalyst into the oven to effect debinding of the molding feedstock and to form a debound mold and formaldehyde; and

(e) controlling the catalyst level within the oven to less than about 4.0 vol. % by controlling at least one of (i) the volumetric rate at which the purge gas is introduced into the oven, and (ii) the volumetric rate at which the catalyst is introduced into the oven to thereby achieve a debinding rate of between about 1 mm/Hr to about 6 mm/hr.

5,531,959

AUTOMATED LIQUID HANDLING AND COMPUTER CONTROLLED SYSTEM AND METHOD FOR SOLID PHASE CHROMATOGRAPHIC EXTRACTIONS

James E. Johnson; Christopher B. Shumate; Andy W. Siu, and Ronald Gundlach, all of Reno, Nev., assignors to Hamilton Company, Reno, Nev.

Filed Jan. 31, 1994, Ser. No. 381,559

Int. Cl.^{6} G01N *30/02*

U.S. Cl. 422—70 **14 Claims**

1. A chromatographic device comprising, in combination:

a sample holder;

a sample having a plurality of constituents;

a chromatographic barrier;

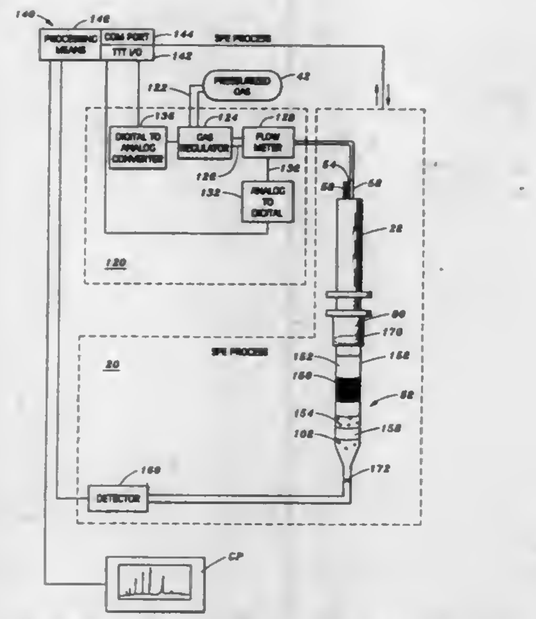
said sample and said barrier stratified in said sample holder in which said sample is initially impeded by said barrier;

pressure means operatively coupled to said sample holder to push said sample beyond said barrier to a detector;

means to adjust said pressure means;

and means to sense flow rate of each said constituent of said sample as it passes through said barrier,

control means for providing a closed feedback loop to operatively couple said flow rate sensing means to said pressure adjusting means whereby the means to adjust the pressure means is controlled in response to sensed flow rate;



whereby as said flow rate sensing means denotes passage of one of said plural constituents beyond said barrier, said one constituent passes to said detector for analysis.

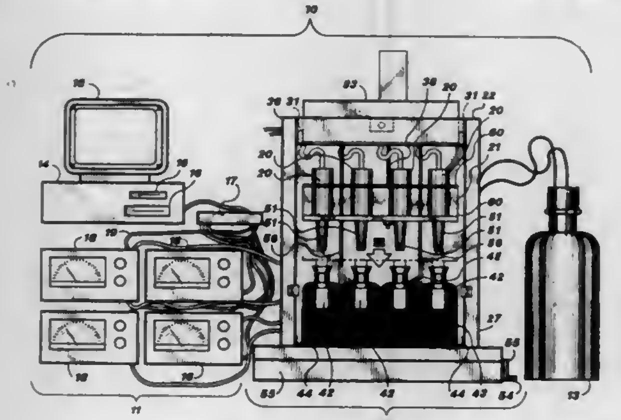
5,531,960
AUTOMATED DISSOLVED OXYGEN AND BIOCHEMICAL OXYGEN DEMAND ANALYZER

Gregory A. Zelinka, Waunakee, Wis., assignor to Madison Metropolitan Sewerage District, Madison, Wis.

Filed Nov. 28, 1994, Ser. No. 346,380

Int. Cl.^{6} G01N *31/00*

U.S. Cl. 422—79 **22 Claims**



1. An automated testing apparatus for determining the dissolved oxygen (DO) values of test samples comprising:

a. a frame structure;
b. a sample set which contains a row of multiple spaced test sample containers and which rests adjacent to the frame structure;
c. a moveable robotic arm which is supported by the frame structure and which is adapted to move towards and away from the sample set;
d. a DO probe;
e. attachment means on the robotic arm for releasibly attaching the DO probe to the robotic arm in such a position that the DO probe, once releasibly attached, may communicate with a test sample container within the sample set when the robotic arm moves towards the sample set;
f. at least one sprayer nozzle on the robotic arm for administering a fluid rinse to a DO probe releasibly attached to the robotic arm; and
g. control means for controlling the robotic arm and delivering fluid rinse through the sprayer nozzle when the robotic arm rests in a plane between adjacent test sample containers, thereby allowing the fluid rinse to clean the DO probe and drain from the DO probe between the adjacent test sample containers.

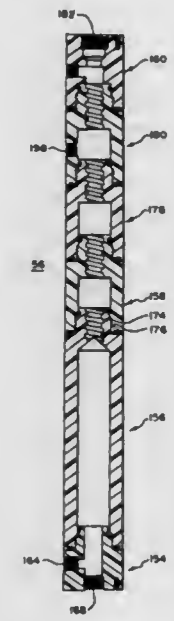
5,531,961
WATER IMPURITY ANALYZER

Paul G. Wright, Pleasant Dale, Nebr.; Curtis W. Nicholls, Kingwood, and Clifford L. McDonald, Jr., Alvin, both of Tex., assignors to Isco, Inc., Lincoln, Nebr.

Filed Feb. 10, 1995, Ser. No. 386,699

Int. Cl.^{6} G01N *21/75;33/18*

U.S. Cl. 422—80 **12 Claims**



1. Apparatus comprising:

a plurality of stages adapted to be connected one to the other to form a vertical column;
at least one of said stages including a residence chamber and a reaction chamber;
a central opening in said vertical column adapted to receive an ultraviolet lamp;
reactant, water and carrier gas inlet ports near the bottom of said vertical column;
at least one outlet port near the top of said vertical column; and
at least one of said reaction stages including helical grooves formed of helical lands and helical recessions;
said helical lands forming an inner diameter substantially the same as the outer diameter of said ultraviolet lamp, wherein helical passageways are formed around said lamp to permit the rapid movement of liquid close to and adjacent to said ultraviolet lamp between residence chambers.

5,531,962
CADMIUM-FREE SILVER ALLOY BRAZING SOLDER, METHOD OF USING SAID SOLDER, AND METAL ARTICLES BRAZED WITH SAID SOLDER

Wolfgang Weise, Frankfurt am Main; Alexander Voelcker, Rodenbach; Dieter Kaufmann, Birstein; Willi Malikowski, Aschaffenburg; Joerg Beuers, Gelnhausen, and Harald Krappitz, Hanau, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Continuation-in-part of Ser. No. 114,164, Sep. 1, 1993, abandoned. This application Aug. 3, 1994, Ser. No. 283,919

Claims priority, application Germany, Sep. 2, 1992, 42 29 189.5; May 7, 1993, 43 15 189.2

Int. Cl.^{6} C22C *5/08;30/00*

U.S. Cl. 420—587 **5 Claims**

1. A cadmium-free silver alloy brazing solder consisting of 45 to 80 wt. % silver, 14 to 25 wt. % copper, 10 to 25 wt. % gallium, 1 to 7 wt. % zinc, and 0 to 5 wt. % indium and/or tin.

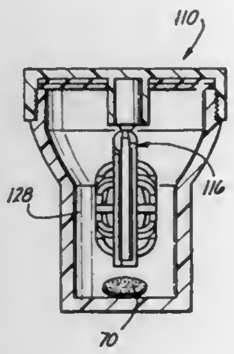
5,531,963
METHOD FOR DISINFECTING A CONTACT LENS AND DETECTING THE PRESENCE OF AN OXIDATIVE DISINFECTANT

Charles H. Powell, Jr., Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation of Ser. No. 588,086, Sep. 25, 1990, abandoned. This application Oct. 24, 1991, Ser. No. 782,899

Int. Cl.^{6} A61L *2/16*

U.S. Cl. 422—30 **17 Claims**



15. A method for disinfecting a contact lens comprising:

contacting a contact lens to be disinfected with a liquid aqueous medium containing hydrogen peroxide and having a pH of less than about 8 at conditions to effectively disinfect said contact lens, thereby disinfecting said contact lens, said contacting occurring in the presence of an iodine component bonded, irreversibly at said contacting conditions, to a solid anion exchange resin which is and remains insoluble in said liquid aqueous medium throughout said method, said bonded iodine component being present in an amount to provide a first color indication of the presence of hydrogen peroxide in said aqueous liquid medium, said bonded iodine component being present in an oxidized state during said contacting; and, thereafter,
contacting said liquid aqueous medium with a peroxidase component present in an amount effective to destroy substantially all of the hydrogen peroxide in said liquid aqueous medium and a reducing component present in an amount effective to chemically reduce said bonded oxidized iodine component so that a second color indication of the substantial absence of hydrogen peroxide in said liquid aqueous medium is provided.

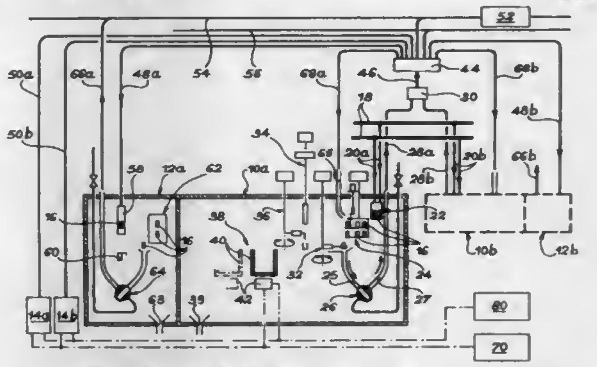
5,531,964
AUTOMATED ANALYSIS CHAIN

Joseph Besnier, Acqueville, France, assignor to Compagnie Generale Des Matieres Nucleaires, Velizy-Villacoublay, France

Filed Oct. 25, 1994, Ser. No. 328,802

Int. Cl.^{6} G01N *35/02;35/04*

U.S. Cl. 422—63 **8 Claims**



1. Automated analysis apparatus comprising:

at least one analysis box able to receive sealed containers containing a liquid to be analyzed;
a container transfer system including a tube network and air pressure transfer control means adapted to automatically transfer the containers into the analysis box via the tube network;
a central control unit controlling the transfer system; and
wherein said analysis box comprises:
  automated processing means controlled by the central control unit including means for opening the containers, sampling means for taking samples from open containers, analysis means for analyzing the samples, means for resealing the open containers, and first means for redespatching the containers to the transfer system;
  container storage means controlled by the central control unit including an ejection station in communication with the first redespatching means; and
  said automated processing means further including means for gripping the containers at a location between the ejection station and the first redespatching means to transfer them to the opening means and gripping containers at the resealing means to transfer them to said location between the ejection station and the first redespatching means.

5,531,965
APPARATUS FOR DETERMINING DECOMPOSABLE ORGANIC CARBON COMPOUNDS PRESENT IN A GASEOUS PHASE

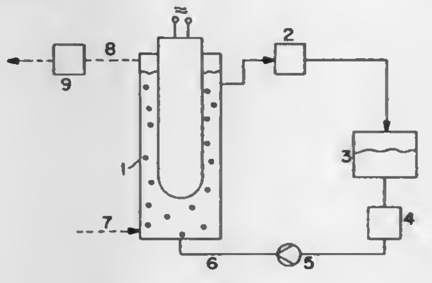
Hans Duve, Duelmen, Germany, assignor to HULS Aktiengesellschaft, Marl, Germany

Division of Ser. No. 284,394, Jun. 1, 1994, which is a continuation-in-part of Ser. No. 492,970, Mar. 13, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 487,892

Claims priority, application Germany, Mar. 21, 1989, 39 09 227.5

Int. Cl.^{6} G01N *31/12*

U.S. Cl. 422—80 **7 Claims**



1. An apparatus for determining decomposable organic carbon compounds present in a gaseous phase, comprising;

a decomposition reactor containing an ultraviolet lamp;

a closed aqueous circuit including said decomposition reactor, a circulation pump, at least one ion detector, and an ion exchanger; wherein said circulation pump establishes a continuous liquid flow in said closed aqueous circuit through said reactor, said at least one ion detector and said ion exchanger, sequentially;

a gas feed line feeding the gaseous phase to be tested into said aqueous circuit, and

a gas discharge line discharging the gaseous flow leaving said aqueous circuit.

5,531,966

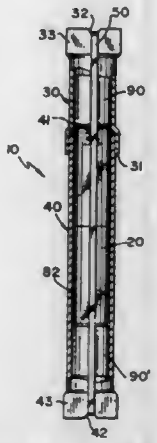
SPECIMEN CONTAINER

Emilio A. Brouwer, 6061 Collins Ave., #17-F, Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 96,349, Jul. 23, 1993, Pat. No. 5,384,097. This application Dec. 30, 1994, Ser. No. 366,636

Int. Cl.^{6} B01L *3/00;* B65D *69/00*

U.S. Cl. 422—102 **5 Claims**



1. A container assembly for collecting specimens, comprising:

a) elongated tube means having first and second ends;

b) first elongated jacket means for cooperatively receiving said first end, said first elongated jacket means having two ends;

c) second elongated jacket means for cooperatively receiving said second end and adapted to enclose said elongated tube means in cooperative combination with said first elongated jacket means, said second elongated jacket means having two ends and one of said ends of said first and second jacket means engage each other making a sealed interface;

d) each of said first and second elongated jacket means having a notch formed at a top portion thereof; and

e) rubber band means for urging said first and second elongated jacket means against each other, said rubber band means stretched between said first and second elongated jacket means, held within each said notch means.

5,531,967

APPARATUS FOR REDUCING POLYMERIZATION INHIBITOR IN RECYCLE STREAMS

Jose M. Sosa, Deer Park, and Stan Beisert, Houston, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

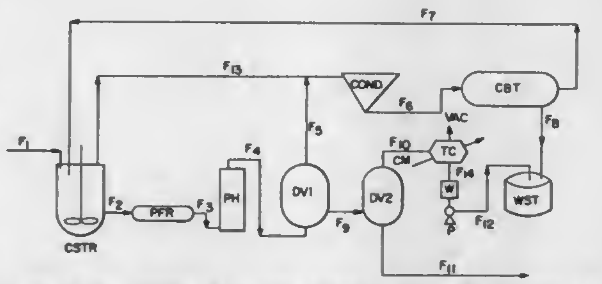
Filed Feb. 11, 1991, Ser. No. 653,210

Int. Cl.^{6} C08F *2/02*

U.S. Cl. 422—131 **3 Claims**

1. Apparatus for purifying monovinyl aromatic streams in a polymerization process, said apparatus comprising:

a monovinyl aromatic polymerization reactor system adapted to polymerize monomeric monovinyl aromatic feedstock;



a vapor line coming off of said reactor system for bleeding off vaporized volatiles in said reactor system and for removing heat of polymerization from said reactor system;

a condenser arranged to receive and condense said vaporized volatiles from said vapor line;

a filter system arranged to receive said condensed volatiles and further arranged to filter undesirable compounds from said condensed volatiles;

a recycle line leading from said filter, communicating filtered condensate back to said reactor system;

a first devolatilizer arranged to receive the monovinyl aromatic stream from said reactor system and adapted to vaporize lower boiling point volatiles from said stream and communicate said vaporized volatiles to said condenser;

a final devolatilizer arranged to receive said monovinyl aromatic stream and adapted to vaporize higher boiling point volatiles therefrom; and,

a vapor line leading from said final devolatilizer and arranged to conduct said higher boiling point volatiles away from said reactor system.

5,531,968

CATALYTIC CONVERTER FOR THE CATALYTIC TREATMENT OF EXHAUST GAS

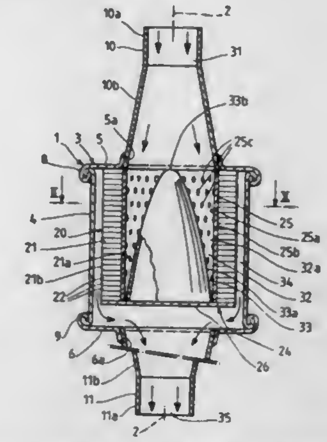
Pieter D. Steenackers, Heverlee, Belgium, assignor to Scambia Industrial Developments AG, Schaan, Liechtenstein

Filed Jun. 3, 1994, Ser. No. 253,894

Claims priority, application Switzerland, Jun. 4, 1993, 1678/93

Int. Cl.^{6} B01D *53/94*

U.S. Cl. 422—176 **19 Claims**



1. A catalytic converter for the catalytic treatment of exhaust gas comprising an axis, a housing and catalyst means for purifying the exhaust gas arranged therein, the housing having a lateral wall surrounding the axis, an inlet, and an outlet, the catalyst means having an inner surface bordering an inner space, an outer surface facing the lateral wall and a packet of sheet metal members, wherein the sheet metal members which are adjacent to one another and define passages for the exhaust gas running at angles to the axis, from the inner surface to the outer surface, wherein the sheet metal members support catalytically active material to purify the exhaust gas flowing through the passages, wherein the inlet is connected to the inner space, wherein an outer cavity is present between the lateral wall and the outer surface of the catalyst means, wherein a limiting member is located at least partly in the inner space and has a substantially parabolic limiting surface which, together with the inner surface of the catalyst means, borders a free inner space region, has a curved axial section at an end of the limiting member located closer to the inlet and approaches the inner surface of the catalyst means along the axis away from the inlet, so that the cross-sectional area of the free inner space region decreases along the axis linearly away from the inlet along an entire axial dimension of the inner surface of the catalyst means.

5,531,969

SOLAR ENERGY INSTALLATION FOR CHEMICAL CONVERSIONS

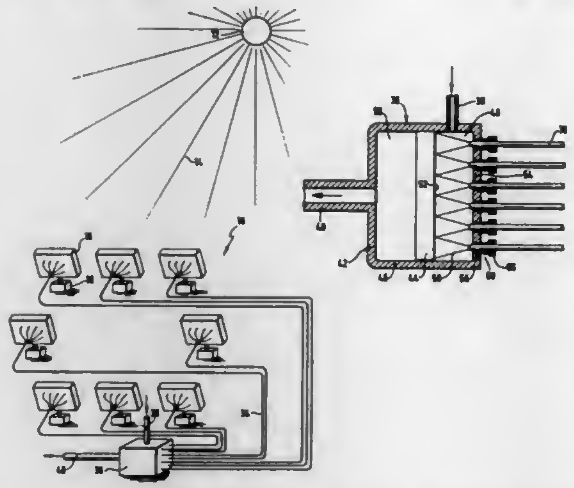
Rainer Tamme, Ostfildern, and Karin Huder, Filderstadt, both of, Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Germany

Filed Oct. 13, 1992, Ser. No. 960,530

Claims priority, application Germany, Oct. 19, 1991, 41 34 614.9

Int. Cl.^{6} B01J *19/12*

U.S. Cl. 422—186 **30 Claims**



1. A solar energy installation for chemical conversions comprising:

a plurality of light concentrators each having a respective light guide for receiving solar radiation from each light concentrator; and

a stationary chemical reactor extending in a given direction, said light guides being connected to said reactor to introduce radiation therein with intensity variable in a predeterminable manner in the given direction.

5,531,970

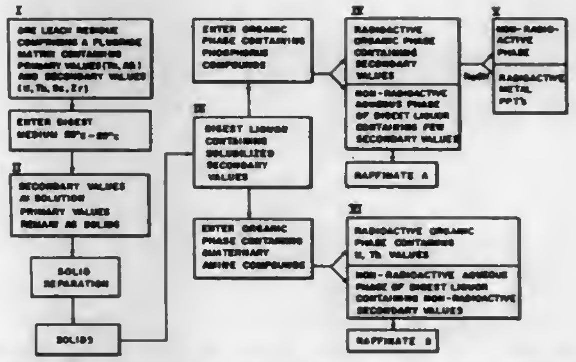
METAL AND FLUORINE VALUES RECOVERY FROM MINERAL ORE TREATMENT

Bryan J. Carlson, Little River, S.C., assignor to Advanced Recovery Systems, Inc., Erwin, Tenn.

Continuation-in-part of Ser. No. 341,020, Nov. 17, 1994, abandoned, and a continuation-in-part of Ser. No. 153,820, Nov. 15, 1993, Pat. No. 5,384,105, and a continuation-in-part of Ser. No. 891,167, May 29, 1992, Pat. No. 5,273,725. This application Apr. 26, 1995, Ser. No. 429,341

Int. Cl.^{6} C01G *33/00*

U.S. Cl. 423—3 **23 Claims**


I
ORE LEACH RESIDUE COMPRISING A FLUORIDE MATRIX CONTAINING PRIMARY VALUES (Ta, Nb) AND SECONDARY VALUES (U, Th, Sc, Zr)
ENTER DIGEST MEDIUM 55°C - 85°C
II
SECONDARY VALUES IN SOLUTION PRIMARY VALUES REMAIN AS SOLIDS
SOLID SEPARATION
SOLIDS
ENTER ORGANIC PHASE CONTAINING PHOSPHORUS COMPOUNDS
III
DIGEST LIQUOR CONTAINING SOLUBILIZED SECONDARY VALUES
ENTER ORGANIC PHASE CONTAINING QUATERNARY AMINE COMPOUNDS
IV
RADIOACTIVE ORGANIC PHASE CONTAINING SECONDARY VALUES
NON-RADIOACTIVE AQUEOUS PHASE OF DIGEST LIQUOR CONTAINING FEW SECONDARY VALUES
RAFFINATE A
V
NON-RADIOACTIVE PHASE
RADIOACTIVE METAL PPT'S
VI
RADIOACTIVE ORGANIC PHASE CONTAINING U, Th VALUES
NON-RADIOACTIVE AQUEOUS PHASE OF DIGEST LIQUOR CONTAINING NON-RADIOACTIVE SECONDARY VALUES
RAFFINATE B

1. The process for separating primary values of Ta and Nb from at least one of secondary values of U or Th, and from one or more secondary values selected from the group consisting of Sc, Zr, Ti or other values of non-radioactive metals, all of the aforesaid values being contained in highly fluorinated ore feed materials, said process comprising:

(a) contacting said feed materials with an aqueous, acidic, digest medium containing one or more complexing materials selected from the group consisting of H_3BO_3, or ions of group 2A, 3A, 4A, 5A, 6A, or 7A metals, Fe, B, Al or Si, and an acid component comprising HNO_3 or HCl or mixtures thereof, wherein the ratio of said reaction medium in liters (L) to said feed materials (Kg) on dry basis ranges from about 1/1 to about 20/1, the total concentrations of all of said acids being sufficient to solubilize said values at commercially acceptable rates, and wherein the molar ratio of said acid component to said complexing material ranges from about 20 to about 0.5;

(b) maintaining the temperature of said medium between about 55° C. and about 85° C.;

(c) reacting said materials in said medium for a sufficient period to solubilize the major portion of said secondary values and to leave said Ta and Nb values substantially insolubilized in said medium;

(d) separating the solids containing said Ta and Nb values from said medium to provide a digest liquor containing said solubilized secondary values;

(e) intimately contacting said liquor with an organic phase to transport at least major portions of said U and Th values thereinto from said liquor; and

(f) separating said organic phase from said liquor to form a substantially non-radioactive raffinate.

5,531,971

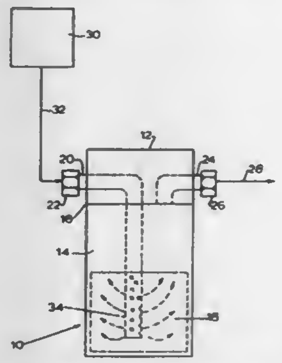
PROCESS FOR PURIFYING SEMICONDUCTOR PROCESS GASES TO REMOVE LEWIS ACID AND OXIDANT IMPURITIES THEREFROM

Glenn M. Tom, New Milford, and James V. McManus, Danbury, both of Conn., assignors to Millipore Investment Holdings Limited, Wilmington, Del.

Division of Ser. No. 84,414, Jun. 29, 1993, Pat. No. 5,385,369. This application Oct. 13, 1994, Ser. No. 322,315

Int. Cl.^{6} B01D *53/04*

U.S. Cl. 423—210 **7 Claims**



1. A process for purifying a gaseous mixture comprising (i) a primary component selected from one or more members of the

group consisting of hydrogen, nitrogen, noble gases, diborane, and Group IVA–VIA hydride gases, and (ii) impurities selected from one or more members of the group consisting of Lewis acids and oxidants, to remove said impurities therefrom, comprising contacting the mixture with a scavenger including:

an inert support having a surface area in the range of from about 50 to about 1000 square meters per gram, and at least thermally stable from about 125° C. to about 225° C.; and,

associated with said support, an active scavenging species formed by the deposition on the support of a Group IA metal selected from sodium, potassium, rubidium, and cesium and their mixtures and alloys and pyrolysis thereof on said support giving an interaction of the metal with said support at a temperature of from about 125° C. to about 225° C., said metal having a concentration of from about 0.01 to about 1.0 moles per liter of support.

5,531,972

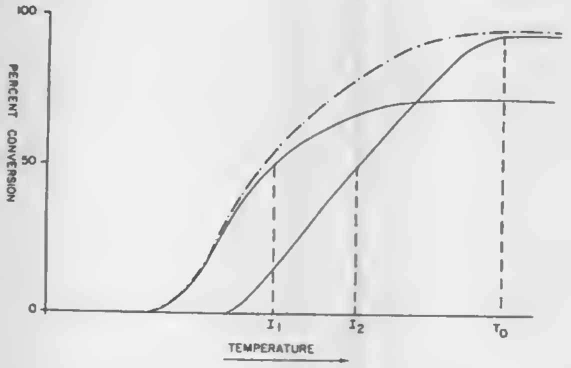
STAGED THREE-WAY CONVERSION CATALYST AND METHOD OF USING THE SAME

Wayne M. Rudy, Morristown, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Division of Ser. No. 433,890, Nov. 8, 1989, Pat. No. 5,010,051. This application Jan. 30, 1991, Ser. No. 647,908

Int. Cl.^{6} B01D *53/92;53/56;53/62;53/72*

U.S. Cl. 423—212 **10 Claims**



1. A method of substantially simultaneously converting HC, CO and NO_x pollutants contained in a gaseous stream, the method comprising:

(a) flowing the gaseous stream through a first catalyst zone and therein contacting the gaseous stream with a first catalyst member comprising a first catalytic material having an ignition temperature for substantially simultaneous conversion of HC, CO and NO_x, when the gaseous stream is a substantially stoichiometric exhaust gas mixture, which is lower than the corresponding ignition temperature of a second catalytic material defined below, the gaseous stream being introduced into the first catalyst zone at a temperature at or above the ignition temperature of the first catalytic material but below an operating temperature range, defined below, to convert within said first catalyst zone some, but less than all, of each of the HC, CO and NO_xcontent of the gaseous stream to innocuous substances and thereby increase the temperature of the gaseous stream, and

(b) flowing the gaseous stream from the first catalyst zone to a second catalyst zone and wherein contacting the gaseous stream with a second catalyst member comprising a second catalytic material having a higher conversion efficiency for substantially simultaneous conversion of HC, CO and no_x at temperature within the operating temperature range than does the first catalytic material, the gaseous stream being contacted with the second catalytic material at a temperature within the operating temperature range to substantially simultaneously convert at least some of the remaining HC, CO and NO_x to innocuous substances.

5,531,973

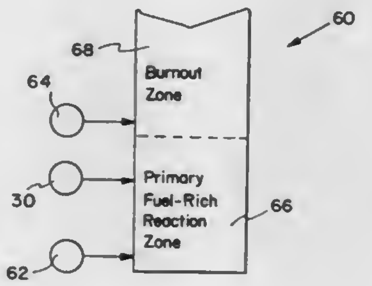
PRODUCTION OF PLASMA GENERATED NO_X REDUCING PRECURSORS FROM A MOLECULAR NITROGEN AND HYDROCARBON MIXTURE

Hamid Sarv, Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 198,929, Feb. 18, 1994, abandoned. This application Feb. 23, 1995, Ser. No. 393,600

Int. Cl.^{6} B01D *53/56*

U.S. Cl. 423—235 **11 Claims**



1. A method for reducing NO_x produced by a burning of a fuel, the method comprising the steps of:

burning a fuel with a low NO_x burner to produce a primary fuel-rich combustion zone which produces NO_x followed by a burnout zone;

providing a hydrocarbon and nitrogen mixture;

providing a plasma generator;

supplying the hydrocarbon and nitrogen mixture to the plasma generator for producing NO_x reducers; and

providing the NO_x reducers to the fuel-rich combustion zone which is at a temperature exceeding 1000° C. for reacting with the NO_x.

5,531,974

FLUX GROWN, MONOSIZE OXIDE PARTICLES

Chan S. Bak, Newberry Park; Hiroshi Kimura, Northridge, and Ricardo C. Pastor, Manhattan Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 910,591, Jul. 8, 1992, abandoned. This application Mar. 17, 1994, Ser. No. 210,109

Int. Cl.^{6} C01F *17/00;* **C01G** *23/00;* **C01B** *33/26*

U.S. Cl. 423—263 **16 Claims**

1. A method of forming crystalline oxide particles having a narrow size distribution, comprising:

(a) providing precursor components to an oxide;

(b) forming an amorphous phase of said oxide by

(1) dissolving said precursor components in a solvent, and

(2) coprecipitating said precursor components to form an amorphous gel of a hydrated multicomponent oxide;

(c) forming seeds in said amorphous phase of said oxide by incubating said amorphous phase at an incubating temperature below that at which spontaneous crystallization occurs and above that at which said seeds form; and

(d) converting said amorphous phase to said crystalline oxide particles by

(1) mixing said amorphous phase with a flux in which said amorphous phase is soluble at an elevated temperature and in which said seeds are substantially insoluble at said elevated temperature to form a mixture,

(2) heating said mixture to a crystal growth temperature not exceeding said incubating temperature to grow said seeds, thereby forming said crystalline oxide particles, and

(3) separating said crystalline oxide particles from said flux.

5,531,975

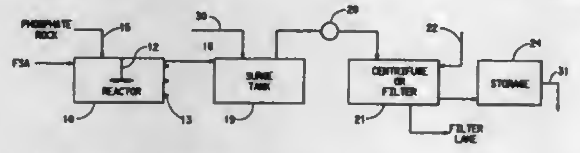
PROCESS FOR THE PRODUCTION OF PHOSPHORIC ACID AND CALCIUM FLUORIDE

William R. Erickson, Lakeland, and Leif E. Bouffard, Mulberry, both of Fla., assignors to Phosphate Engineering and Construction Co., Inc., Lakeland, Fla.

Continuation-in-part of Ser. No. 160,629, Dec. 2, 1993, Pat. No. 5,427,757, which is a continuation of Ser. No. 962,271, Oct. 16, 1992, abandoned, which is a division of Ser. No. 808,641, Dec. 17, 1991, Pat. No. 5,180,569, which is a continuation-in-part of Ser. No. 636,254, Dec. 31, 1990, abandoned. This application May 9, 1995, Ser. No. 437,671

Int. Cl.^{6} C01B *25/22;* **C01F** *11/22*

U.S. Cl. 423—319 **5 Claims**



1. A process comprising:

reacting phosphate rock and fluosilicic acid to produce a reaction slurry comprising phosphoric acid, calcium fluoride, silicon dioxide and undigested phosphate rock and wherein an excess stoichiometric amount of calcium to fluorine is initially present in the slurry and, thereafter

separating phosphoric acid and calcium fluoride from the undigested phosphate rock and silicon dioxide.

5,531,976

PREPARATION OF ALUMINA HAVING INCREASED POROSITY

Lewis B. Decker, Jr., Lago Vista, Tex.; Dwight D. Erickson, Oakdale, Minn., and David A. Barclay, Austin, Tex., assignors to Condea Vista Company, Houston, Tex.

Continuation of Ser. No. 143,982, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 849,747, Mar. 12, 1992, abandoned. This application Feb. 22, 1995, Ser. No. 392,610

Int. Cl.^{6} C01F *7/02*

U.S. Cl. 423—625 **10 Claims**

1. A process for increasing the porosity of boehmite alumina comprising:

forming a gel of a treated boehmite alumina, said gel containing from about 15 to about 55 % by weight Al_2O_3, said treated boehmite alumina being obtained by hydrothermally treating an aqueous mixture of precursor boehmite alumina and acid for a period of time sufficient to convert the greater portion of said precursor boehmite alumina to a colloidal sol of treated boehmite alumina having a pH of above about 4; and

subjecting said gel to a sufficient shearing force at a temperature of from ambient to about 100° C. for a sufficient period of time to increase the pore volume of said treated boehmite alumina in said gel by at least 30% and the median pore radius of said treated boehmite alumina in said gel by at least 20% over that of said boehmite alumina in said gel prior to shearing.

5,531,977

PROCESS FOR PRODUCING ACICULAR γ-FEOOH PARTICLES

Kaoru Sakurai, Yokkaichi, Japan, assignor to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

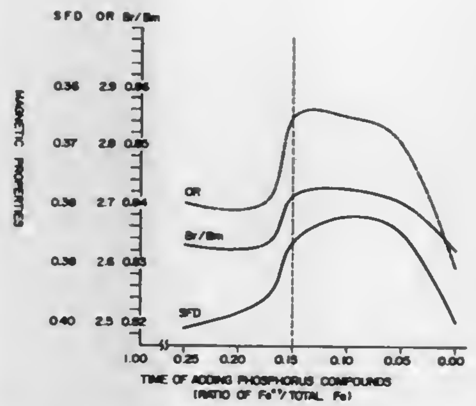
Continuation of Ser. No. 92,422, Jul. 16, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 400,004

Claims priority, application Japan, Jul. 17, 1992, 4-213666

Int. Cl.^{6} C01G *49/06*

U.S. Cl. 423—634 **10 Claims**

1. A process for producing acicular γ-FeOOH particles comprising the following steps:



forming a suspension containing γ-FeOOH seed crystals and a ferrous salt solution;

growing said γ-FeOOH seed crystals by oxidizing all of the Fe^{2+} in the salt solution while neutralizing with alkali, wherein a phosphorus compound is added to the suspension and all of said phosphorus compound is added at the time before the end of said growing step when the ratio of Fe^{2+}/total Fe in the suspension is in the range of 0.15 to 0.05.

5,531,978

AMINOPOLYCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Arne Berg, Blommenholm, Norway; Torsten Almén, Malmö, Sweden; Jo Klaveness, Oslo, Norway; Pal Rongved, Hellvik, Norway; Terje Thomassen, and Harald Dugstad, both of Oslo, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

Continuation-in-part of Ser. No. 457,717, Mar. 16, 1990, Pat. No. 5,198,208, and Ser. No. 934,742, Nov. 20, 1992, abandoned. This application Feb. 8, 1993, Ser. No. 14,569

Claims priority, application United Kingdom, Jul. 16, 1987, 87 16778; Jul. 17, 1987, 87 16914; Apr. 9, 1990, 90 07965

Int. Cl.^{6} A61K *51/00;49/00*

U.S. Cl. 424—1.11 **7 Claims**

1. A method of generating enhanced images of the human or non-human animal body, which method comprises administering to said body a diagnostic agent and generating an X-ray, MR-diagnostics, ultrasound or scintigraphic image of at least a part thereof, wherein the diagnostic agent comprises a metal chelate, whereof the chelating entity is a residue of formula (III)

$$(X\text{—}CHR_1^*)_2\text{—}N\text{—}(CHR_1)_n(NY\text{—}(CHR_1)_m)_x\text{—}N\text{—}(CHR_1^*\ X)\text{hd}_{2} \qquad \text{(III)}$$

(wherein

x is 0 or 1;

Y is a group $—(CHR_1)_p—N(CHR_1^*X)_2$ or a group $—CHR_1^*X$;

n, m and p are each 2, 3 or 4;

each group X, which may be the same or different, is a group R_1^* or a carboxyl group or a derivative thereof selected from the group consisting of amide, ester and carboxylate salt groups;

each group R_1 or R_1^*, which may be the same or different, is a hydrogen atom, a hydroxyalkyl group or an optionally hydroxylated alkoxy or alkoxyalkyl group, with the provisos that at least two nitrogens carry a $—CHR_1^*X$ moiety wherein X is a carboxyl group or a derivative thereof selected from the group consisting of amide, ester and carboxylate salt groups, that each $—CHR_1^*X$ moiety is other than methyl and that either at least one R_1 group is other than hydrogen or three of the X groups are carboxyl groups or derivatives thereof selected from the group consisting of amide, ester and carboxylate salt groups and the remaining X groups are hydroxylated alkoxy or alkyl groups) or a salt thereof, together with at least one pharmaceutical or veterinary carrier or excipient.

5,531,979

COMPOSITIONS OF IODOPHENOXY ALKANES AND IODOPHENYL ETHERS AND PHARMACEUTICALLY ACCEPTABLE CLAYS FOR VISUALIZATION OF THE GASTROINTESTINAL TRACT

Stephen B. Ruddy, Schwenksville; Mary E. Roberts, Downingtown; Gregory L. McIntire, West Chester; Eugene R. Cooper, Berwyn, and Edward R. Bacon, Audubon, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

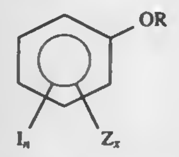
Continuation-in-part of Ser. No. 12,189, Feb. 2, 1993, Pat. No. 5,316,755. This application May 23, 1994, Ser. No. 247,438

Int. Cl.^{6} A61K *119/04*

U.S. Cl. 424—945 **32 Claims**

1. An x-ray contrast composition for oral or retrograde examination of the gastrointestinal tract comprising on a % weight per volume basis:

(a) from about 5 to 45% of an x-ray contrast producing agent having the formula, or a pharmaceutically acceptable salt thereof



or a pharmaceutically acceptable salt thereof wherein

Z=H, halo, C_1–C_{20} alkyl, cycloalkyl, lower alkoxy, cyano, where the alkyl and cycloalkyl groups can be substituted with halogen or halo-lower-alkyl groups;

R=methyl, ethyl, propyl, C_9–C_{25} alkyl, cycloalkyl, or halo-lower-alkyl, optionally substituted with halo, fluoro-lower-alkyl, aryl, lower-alkoxy, hydroxy, carboxy, lower-alkoxy carbonyl or lower-alkoxy-carbonyloxy, $(CR_1R_2)_p$—$(CR_3{=}CR_4)_mQ$, or $(CR_1R_2)_p$—C≡C—Q;

R_1, R_2, R_3 and R_4 are independently lower-alkyl, optionally substituted with halo;

x is 1–4;

n is 1–5;

m is 1–15;

p is 1–10; and

Q is H, lower-alkyl, lower-alkenyl, lower-alkynyl, lower-alkylene, aryl, or aryl-lower alkyl;

(b) from about 0.1 to 10% of a pharmaceutically acceptable clay selected from the group consisting of: montmorillonite, beidelite, nontronite, hectorite and saponite;

(c) from about 1.0 to 20% of a surfactant selected from the group consisting of nonionic, anionic, cationic and zwitterionic surfactants;

(d) from about 0 to 15% of an excipient; and

(e) water to make 100% by volume.

5,531,980

STABLE MICROBUBBLES SUSPENSIONS INJECTABLE INTO LIVING ORGANISMS

Michel Schneider, Trolnex, Switzerland; Daniel Bichon, Montpeliler, France; Philippe Bussat, Collonges S/Saleve, France; Jerome Puginier, Le Chable-Beaumont, France, and Eva Hybl-Sutherland, Wiesbaden, Germany, assignors to Bracco International BV, Netherlands

Division of Ser. No. 128,540, Sep. 23, 1993, Pat. No. 5,380,519. This application Sep. 30, 1994, Ser. No. 315,347

Claims priority, application European Pat. Off., Apr. 2, 1990, 9081029262; WIPO, Apr. 2, 1991, PCT/EP91/00620

Int. Cl.^{6} A61K *49/00*

U.S. Cl. 424—9.52 **21 Claims**

1. A composition suitable for injection into the bloodstream and body cavities of living beings, said composition comprising a suspension of stabilized air or gas microbubbles in a physiologically acceptable aqueous carrier phase having from 0.01 to about 20% by weight of one or more dissolved or dispersed surfactants, at least one of said surfactants being a film-forming surfactant present in a composition at least partially in lamellar or laminar form, in which the surfactant comprises, bound thereto, bioactive species designed for specific targeting purposes.

5,531,981

METHOD FOR TREATMENT OF TERMITE

Yosei Kuwazuru, Toyonaka; Akira Igarashi, Takarazuka, and Isao Minamida, Kawabe-gun, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

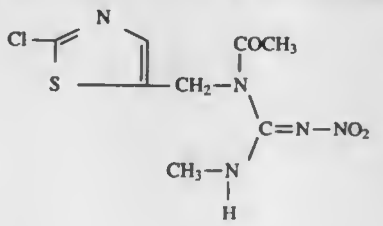
Continuation of Ser. No. 190,616, Feb. 2, 1994, abandoned, which is a continuation of Ser. No. 53,361, Apr. 28, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,368

Claims priority, application Japan, May 1, 1992, 4-155540

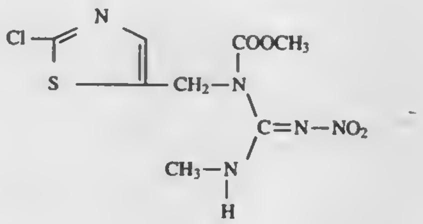
Int. Cl.^{6} A01N *25/06;25/04;27/00*

U.S. Cl. 424—45 **13 Claims**

1. A method for controlling termites, comprising applying to a termite colony an effective amount of a composition comprising a compound selected from the group consisting of:



or



or a salt thereof and an agrochemically acceptable vehicle.

5,531,982

ANTIMICROBIAL ORAL COMPOSITION

Abdul Gaffar, Princeton; Nuran Nabi, Cranbury, and John Afflitto, Brookside, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 161,033, Dec. 3, 1993, which is a division of Ser. No. 981,723, Nov. 25, 1992, Pat. No. 5,344,641, which is a division of Ser. No. 754,887, Sep. 6, 1991, Pat. No. 5,192,530, and Ser. No. 655,571, Feb. 14, 1991, Pat. No. 5,178,851, which is a continuation of Ser. No. 398,566, Aug. 25, 1989, Pat. No. 5,032,386, said Ser. No. 754,887is a continuation of Ser. No. 398,606, Aug. 25, 1989, abandoned, said Ser. No. 398,566and Ser. No. 398,606, , each is a continuation-in-part of Ser. No. 291,712, Dec. 29, 1988, Pat. No. 4,894,220, and Ser. No. 346,258, May 1, 1989, abandoned, said Ser. No. 291,712and Ser. No. 346,258, , each is a continuation-in-part of Ser. No. 8,901, Jan. 30, 1987, abandoned. This application Jul. 14, 1994, Ser. No. 275,469

Int. Cl.^{6} A61K *7/16;7/18*

U.S. Cl. 424—49 **19 Claims**

1. An antimicrobial oral composition which has anticaries effectiveness in reducing caries incidence in dentinal fissures even without a fluoride ion source essentially comprising an aqueous humectant vehicle, and when said oral composition is a dentifrice, about 10–30% by weight of a water-insoluble dentally acceptable siliceous polishing agent, said oral composition comprising an effective antiplaque active ingredient amount of a substantially

water insoluble noncationic antimicrobial agent, an antibacterial-enhancing agent in amount of about 0.05–4% by weight and at least about 0.1% by weight of xylitol, said oral composition containing at least one of a surface active agent and a flavor oil to facilitate dispersion of said antibacterial agent in said composition.

5,531,983

ORAL HYGIENE PREPARATION

John A. Van Velthuijsen, Gorinchem, Netherlands, assignor to Purac Biochem B.V., Gorinchem, Netherlands

Continuation of Ser. No. 39,225, May 10, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 305,808

Claims priority, application Netherlands, Oct. 8, 1990, 9002184

Int. Cl.^{6} A61K *9/16;9/18*

U.S. Cl. 424—49 **5 Claims**

1. A homogeneous dentifrice toothpaste or mouthwash for combating tartar formation, which consists essentially of: a single homogeneous, aqueous, physiologically acceptable toothpaste or mouthwash medium; and incorporated in said medium in an amount of 1–10% based on total weight of the product, a tartar-formation inhibiting agent selected from the group consisting of calcium lactate, calcium lactophosphate, the double salts of calcium lactate and mixtures thereof, said homogeneous dentifrice toothpaste or mouthwash for combating tartar formation being further characterized by the absence of inorganic fluoride, phosphate, pyrophosphate salt as well as malic acid and any salt of malic acid.

5,531,984

ANTIMICROBIAL COMPOSITION

Victor Staats, Miami Beach, Fla., assignor to International Laboratory Technology Corp., Miami Beach, Fla.

Continuation-in-part of Ser. No. 106,513, Aug. 16, 1993, Pat. No. 5,417,968. This application Aug. 8, 1994, Ser. No. 287,206

Int. Cl.^{6} A61K *31/74;9/70;* **A01N** *25/08;25/34*

U.S. Cl. 424—78.07 **4 Claims**

1. A composition comprising:

a first quaternary ammonium compound including a blend of n-alkyl dimethyl benzyl ammonium chloride and n-alkyl dimethyl ethylbenzyl ammonium chloride in an amount of between 0.02%–1.0% by weight of said composition,

a second quaternary ammonium compound in an amount of between 0.1%–0.13% by weight of said composition,

a nonionic surfactant in an amount of between 1%–10% by weight of said composition,

1,3 butylene glycol in an amount of between 1%–10% by weight of said composition, and

deionized water in an amount of between 80%–97.8% by weight of said composition.

5,531,985

VISIBLY TRANSPARENT UV SUNBLOCK COMPOSITIONS AND COSMETIC PRODUCTS CONTAINING THE SAME

Kim Mitchell, Granada Hills, Calif., and Mark Mitchnick, Wainscott, N.Y., assignors to SunSmart, Inc., Wainscott, N.Y.

Division of Ser. No. 651,696, Feb. 5, 1991, Pat. No. 5,223,250. This application Apr. 6, 1993, Ser. No. 44,442

Int. Cl.^{6} A61K *7/40;7/42;7/48*

U.S. Cl. 424—59 **23 Claims**

1. A substantially transparent topical sunblock formulation for shielding skin from ultraviolet radiation, said formulation comprising a plurality of particles of a visibly transparent UV absorbing crystal glass with a bandgap energy of about 400 nm and an average symmetrical particle diameter of between about 0.01–100 microns, said particles having a substantially smooth outer surface and being substantially free of internal fractures and imperfections, said particles dispersed within a substantially colorless dermatologically acceptable liquid carrier in at least an amount effective to shield substantially all of said skin over which said formulation is applied from hazardous effects of ultraviolet radiation.

5,531,986

LOW RESIDUE ANTIPERSPIRANT SOLID STICK COMPOSITION

Makarand Shevade, Plainsboro; Robert J. Bianchini, Belle Mead, and Wilson Lee, Bloomfield, all of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Jul. 1, 1994, Ser. No. 269,786

Int. Cl.^{6} A61K *7/38;7/32*

U.S. Cl. 424—68 **28 Claims**

1. A low-residue, silicone-based antiperspirant solid stick composition comprising:

(a) a volatile silicone material;

(b) a non-volatile silicone material;

(c) a high-melting-point wax;

(d) a low-melting-point wax;

(e) dimethicone copolyol; and

(f) an antiperspirant active material, wherein a total of volatile silicone material, non-volatile silicone material and dimethicone copolyol included in the composition is at least 40% by weight of the total weight of the composition, the composition comprising, in percent by weight of the total weight of the composition, 10%–60% volatile silicone material, 5.01%–50% non-volatile silicone material, 2%–10% high-melting-point wax, 2%–30% low-melting-point wax, 1%–15% dimethicone copolyol, and 10%–30% antiperspirant active material.

5,531,987

METHOD FOR EXTRACTING MALODOROUS COMPOUNDS PRESENT IN A FORMULATION CONTAINING AT LEAST ONE COMPOUND CARRYING A THIOL GROUP AND DEODORIZED COMPOSITIONS THUS OBTAINED

Daniel Bauer, Le Raincy; Françoise Richard, Montreuil sous Bois; Muriel Hassoun, Villepinte; Gérard Malle, Villiers sur Morin, and Henri Samain, Blevres, all of, France, assignors to L'Oreal, Paris, France

Filed Aug. 2, 1994, Ser. No. 285,541

Claims priority, application France, Aug. 2, 1993, 93 09486

Int. Cl.^{6} A61L *9/01;* **A61K** *7/11*

U.S. Cl. 424—76.21 **15 Claims**

1. A method for extracting a malodorous compound present in a liquid formulation containing a compound bearing a thiol functional group and having the formula

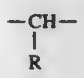
$$HS—A—Y—B \quad (I)$$

wherein

Y represents —COO— or —NH— and

(a) when Y represents —COO—,

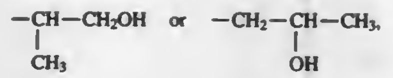
A represents —$(CH_2)_n$— wherein n is 1 or 2 or



$$-\underset{\underset{R}{|}}{CH}-$$

wherein R represents linear or branched C_1–C_3 alkyl, and

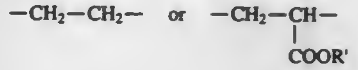
B represents —H, —CH_2—CH_2OH, —CH_2—CHOH—CH_2OH,



$-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2OH$ or $-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3,$

or

(b) when Y represents —NH—,
A represents



$-CH_2-CH_2-$ or $-CH_2-\underset{\displaystyle COOR'}{\underset{|}{CH}}-$

wherein R' represents methyl or ethyl, and

B represents —H or, when A represents —CH_2—CH_2—, B also represents —CO—R" wherein R" represents linear or branched C_1–C_4 alkyl,

the method comprising placing the liquid formulation in contact with a pulverulent absorbing agent to obtain a deodorized composition, the pulverulent absorbing agent being insoluble in the liquid formulation and, when suspended in an aqueous solution containing 92 g/l of thioglycolic acid, the aqueous solution also contains at least 30 percent by weight of initial thioglycolic acid after contact for 15 minutes.

5,531,988

BACTERIA AND IMMUNOGLOBULIN-CONTAINING COMPOSITION FOR HUMAN GASTROINTESTINAL HEALTH

Stephen M. Paul, San Clemente, Calif., assignor to Metagenics, Inc., San Clemente, Calif.

Filed Oct. 28, 1994, Ser. No. 331,140

Int. Cl.^{6} A01N *63/04;* **A61K** *35/00;39/395;47/00*

U.S. Cl. 424—93.4 **35 Claims**

1. A bacteria and immunoglobulin-containing composition for promoting gastrointestinal health comprising

(a) an effective amount of a beneficial human intestinal microorganism; and

(b) an effective amount of an immunoglobulin composition comprising concentrated immunologically active immunoglobulins.

5,531,989

IMMUNOGLOBULIN AND FIBER-CONTAINING COMPOSITION FOR HUMAN GASTROINTESTINAL HEALTH

Stephen M. Paul, San Clemente, Calif., assignor to Metagenics, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 331,140, Oct. 28, 1994. This application May 9, 1995, Ser. No. 437,316

Int. Cl.^{6} A01N *63/04;* **A61K** *39/02;39/395;39/40*

U.S. Cl. 424—93.4 **40 Claims**

1. An immunoglobulin and fiber-containing composition comprising in percent by weight

(a) about 40 to about 60% of an immunoglobulin composition comprising concentrated immunologically active immunoglobulins; and

(b) about 40 to about 60% of soluble dietary fiber, wherein said fiber is a member selected from the group consisting of inulin, fructo-oligosaccharides, pectin, guar gum, and mixtures thereof.

5,531,990

METHOD OF RAISING AN IMMUNE RESPONSE WITH AN ANTI-IDIOTYPIC ANTIBODY HAVING CORRESPONDENCE WITH HUMAN HEPATITIS B SURFACE ANTIGEN

Yasmin Thanavala; Arvind Thakur, both of Williamsville, N.Y.; Ivan Roitt, Golders Green, United Kingdom, and Michael Pride, Houston, Tex., assignors to Health Research, Inc., Buffalo, N.Y., and University College London, London, England

Filed Dec. 15, 1993, Ser. No. 167,336

Int. Cl.^{6} A61K *39/395;38/03;* **C07K** *16/08;16/42*

U.S. Cl. 424—131.1 **1 Claim**

1. A method for causing an immune response to human Hepatitis B surface antigen which consists essentially of raising an immune response to an antiidiiotypic antibody designated 2F10 produced by a monoclonal antibody having ATCC deposit number HB 11966 or to a 15 amino acid sequence of the heavy chain hypervariable region of the antiiodotypic antibody 2F10, said sequence being partially homologous with the group specific "a" determinant of Hepatitis B surface antigen, wherein said 15 amino acid sequence can duplicate the B and T cell stimulatory activity of said antiiodotypic antibody 2F10 and Hepatitis B surface antigen.

5,531,991

COMPOSITION AND METHOD FOR TREATING HYPERGLYCEMIA UTILIZING AN EXTRACT OF *POLYGONUM MULTIFLORUM*

Nan-Zheng Cheng, Beltsville, Md., and Barbara Stoecker, Stillwater, Okla., assignors to The Board of Regents of Oklahoma State University, Stillwater, Okla.

Filed May 4, 1994, Ser. No. 237,627

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 424—195.1 **7 Claims**

1. In a host with an unduly elevated blood glucose concentration, a method for treating hyperglycemia, which comprises:

a. grinding a sample of *Polygonum multiflorum* to obtain a fine powder;

b. stirring said powder with 0.1N NH_4OH to obtain an extract;

c. centrifuging said extract to obtain a supernatant;

d. applying the supernatant to a medium grade separator column of Sephadex G-25 to obtain a first fraction having a dark brown color; and

e. ingesting a blood glucose lowering effective amount of said first fraction.

5,531,992

LOW MOLECULAR WEIGHT VEGETABLE COMPOSITION

Hiroko Yamazaki, Koganei; Masahiro Kuroda, Toyonaka, and Kozo Niwa, Kouchi, all of, Japan, assignors to Kozo Niwa, Kouchi, Japan

Continuation of Ser. No. 927,465, Aug. 10, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 253,423

Claims priority, application Japan, Aug. 14, 1991, 3-204207

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 424—195.1 **5 Claims**

1. A method of preparing an anti-inflammatory composition which consists of the steps:

heating seed of milk thistle by far-infrared rays for the cleaving of polymers of components that are found in seed of milk thistle at a temperature near to but not exceeding 100° C. for ½ to 2 hours; and

brewing the heated seed of milk thistle with brewing material selected from the group consisting of brewing bacteria, digestive enzyme and protein hydrolyze, whereby an orally administrable anti-inflammatory composition is provided without any oil added, an anti-inflammatory activity of the composition being significantly higher than that seen with untreated seed of milk thistle.

5,531,993

STABLE ACIDIC OIL-IN-WATER TYPE EMULSIONS AND COMPOSITIONS CONTAINING THEM

Jacqueline Griat, Ablon, France, assignor to L'Oreal, Paris, France

Filed Sep. 15, 1994, Ser. No. 305,912

Claims priority, application France, Sep. 15, 1993, 93 10966

Int. Cl.^{6} A61K *7/00;9/10*

U.S. Cl. 424—401 **14 Claims**

1. An oil-in-water emulsion, which is stable and has a pH of less than or equal to 3.0, comprising:

a) an oily phase; dispersed in

b) an aqueous phase;

c) as a stabilizing agent, a substantially water-soluble cross-linked anionic copolymer comprising about 40% of a cross-copolymer consisting of about 60 mol % of acrylamide and about 40 mol % of AMPS sodium salt, and about 4% of an ethoxylated alcohol having a HLB value of about 12.5; and

d) an acid in an amount such as to maintain the pH of the emulsion below or equal to 3.0, and being selected from the group consisting of ascorbic acid, kojic acid, caffeic acid, salicylic acid, lactic acid, methyllactic acid, glucuronic acid, glycolic acid, pyruvic acid, 2-hydroxybutanoic acid, 2-hydroxypentanoic acid, 2hydroxyhexanoic acid, mandelic acid, benzylic acid, phenyllactic acid, gluconic acid, galactauronic acid, citric acid, aleuritic acid, tartronic acid, tartaric acid, malic acid, fumaric acid, benzene-1,4-bis(3-methylidene-10camphorsulfonic) acid, the mixtures thereof, and plant and fruit extracts containing said acids.

5,531,994

FEED ADDITIVE CONTAINING ZINC BACITRACIN

Michael Schmidt, Hammergasse 88; Werner Bomann, Albrecht-Dürer Strasse No. 21; Dietrich W. Janott, Mühlstrasse 13, and Herbert Werner, Binger Strasse 228, all of D-6507 Ingelheim am Rhein, Germany

Continuation of Ser. No. 124,131, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 929,737, Aug. 13, 1992, abandoned, which is a continuation of Ser. No. 792,547, Nov. 15, 1991, abandoned, which is a continuation of Ser. No. 655,268, Feb. 13, 1991, abandoned, which is a continuation of Ser. No. 487,688, Mar. 2, 1990, abandoned, which is a continuation of Ser. No. 211,347, Jun. 24, 1988, abandoned, which is a continuation of Ser. No. 745,919, Jun. 18, 1985, abandoned. This application May 12, 1994, Ser. No. 241,514

Claims priority, application Germany, Jun. 20, 1984, 34 22 782.2

Int. Cl.^{6} A01N *25/00;* **A23K** *1/18;* **A61K** *9/16;9/50;38/16*

U.S. Cl. 424—405 **12 Claims**

1. A zinc bacitracin—containing animal feed additive, in particulate form, having an external coating of an alkyl cellulose polymer.

5,531,995

LOW ECOTOXIC FORMULATIONS OF PESTICIDES

David Lubetzky, Lehavim, and Maurice Frances, Beer Sheva, both of, Israel, assignors to Makhteshim Chemical Works Ltd., Beer-Sheva, Israel

Continuation-in-part of Ser. No. 988,800, Dec. 10, 1992, abandoned. This application Jan. 20, 1995, Ser. No. 375,707

Claims priority, application Israel, Oct. 29, 1992, 103585

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 424—409 **20 Claims**

1. A stable and non-separated EW pesticidal emulsion formulation consisting essentially of:

(a) 190 g/l to 350 g/l of at least one pesticide selected from the group consisting of Chlorpyrifos, endosulfan, and imazalil;

(b) 150 g/l to 400 g/l of the methyl ester of rosin;

(c) 30 g/l to 200 g/l of at least one surfactant;

(d) water to make up to one liter, but not less than 200 g/l; and

(e) optionally up to 200 g/l of at least one polar solvent which is at least partially soluble in water.

5,531,996

Patent Not Issued For This Number

5,531,997

COATED TRANSPLANT AND METHOD FOR MAKING SAME

Kent C. Cochrum, Davis, Calif., assignor to The Regents of University of California, Oakland, Calif.

Division of Ser. No. 255,577, Jun. 8, 1994, Pat. No. 5,470,731, which is a continuation of Ser. No. 890,896, May 29, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 463,747

Int. Cl.^{6} A61F *2/02;* **A61K** *9/107;* **A01N** *1/02;* **C12N** *11/04*

U.S. Cl. 424—424 **14 Claims**

1. A transplant suitable for transplantation from a donor into an immunologically incompatible individual, said transplant being coated with an insoluble immunological barrier immunological barrier membrane, said membrane comprising:

a) a non-cytotoxic first layer comprising a gellable polymer and a cationic amino acid polymer; and

b) a non-cytotoxic second layer covering and chemically bonded to said non-cytotoxic first layer, the second layer comprising an anionic amino acid polymer.

5,531,998

POLYCARBONATE-BASED BLOCK COPOLYMERS AND DEVICES

Frank Mares, Whippany; William J. Boyle, Jr., Denville; Reginald T.-H. Tang, Warren; Kundanbhai M. Patel, Landing; Abraham M. Kotliar, Westfield, and Tin-Ho Chiu, Millburn, all of N.J., assignors to United States Surgical Corporation, Norwalk, Conn.

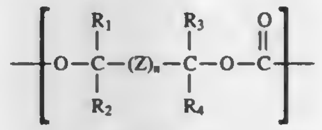
Continuation of Ser. No. 843,116, Feb. 28, 1992, abandoned, which is a division of Ser. No. 134,339, Dec. 17, 1987, Pat. No. 5,120,802. This application Dec. 3, 1993, Ser. No. 162,814

Int. Cl.^{6} A61K *9/70;* **A61L** *17/00;31/00;15/00*

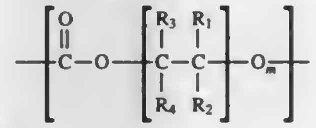
U.S. Cl. 424—426 **23 Claims**

1. A fiber comprising a biodegradable block copolymer consisting essentially of at least one crystalline or semi-crystalline rigid "A" block, and at least one flexible, amorphous "B" block,

said "A" block formed from at least one type of recurring monomeric unit of the following General Structure I or II:

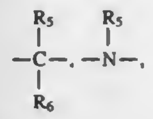


Structure I



Structure II

wherein
Z is



$-\underset{\displaystyle R_6}{\underset{|}{\overset{\displaystyle R_5}{\overset{|}{C}}}}-,\ -\overset{\displaystyle R_5}{\overset{|}{N}}-,$

or a combination thereof

where Z is selected such that there are no adjacent heteroatoms;

n and m are the same or different at each occurrence and are integers from 1 to 8;

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, alkoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, aryloxyalkyl, alkyl, aryl, alkylcarbonylalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylaryl, alkoxyalkyl, or aryl or alkyl substituted with one or more substituents selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, dialkylamino, diarylamino or alkylarylamino;

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl; or any two of R_1 to R_8 substituents together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic, fused, spiro, bicyclic and/or tricyclic ring system, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups; and

said "B" block is different from said A-block and consists of at least one type of recurring unit derived from monomers selected from the group consisting of lactones, hydroxycarboxylic acids, lactides, epoxides, cyclic ethers, dioxanones other than carbonates, polyols, orthoesters, carbonates, and epoxides/CO_2.

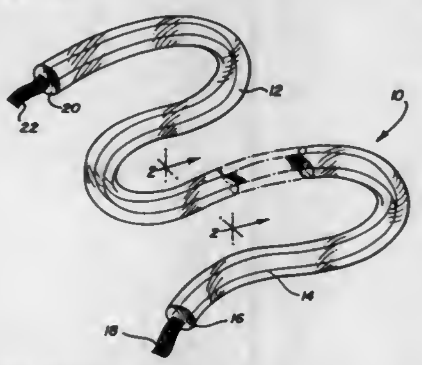
5,531,999
ROPE-SHAPED WOUND DRESSING

James V. Cartmell, Xenia; Wayne R. Sturtevant, Centerville; Michael L. Wolf, West Milton, and Michael J. Allaire, Cincinnati, all of Ohio, assignors to NDM, Inc., Utica, N.Y.

Filed Dec. 19, 1991, Ser. No. 810,685

Int. Cl.⁶ A61F *13/00*

U.S. Cl. 424—445 **20 Claims**



1. A wound dressing comprising:

a hydrogel material substantially in the form of an elongated member having a predetermined length for filling the cavity of a wound, said hydrogel material capable of being removed from said wound substantially as a single piece; and

a dressing removal layer disposed in and surrounded by said hydrogel material, said hydrogel material being impregnated in said dressing removal layer to thereby allow removal of said hydrogel material substantially as a single piece upon absorption of exudate emitted from said wound.

5,532,000
AQUEOUS COSMETIC OR DERMO-PHARMACEUTICAL COMPOSITION CONTAINING, IN SUSPENSION, HYDRATED SPHEROIDS OF A HYDROPHILIC LIPIDIC SUBSTANCE

Myriam Kauffmann, Lyons, France, assignor to L'Oreal, Paris, France

Filed Apr. 4, 1991, Ser. No. 678,870

Claims priority, application France, Apr. 5, 1990, 90 04387

Int. Cl.⁶ A61K *9/127;47/00*

U.S. Cl. 424—450 **8 Claims**

1. An aqueous composition for application to the skin, said composition having emollient and lubricating properties and comprising, in suspension in a continuous water-containing external phase, selected from the group consisting of a lotion, an emulsion and a gel, creamy spheroids having and average particle diameter ranging from 100 to 5,000 μm, said creamy spheroids resulting from the hydration of solid spheroids of a hydrophilic lipidic substance having a melting point greater than 20° C. and a hydration capacity such that said solid spheroids absorb 1.3 to 8 times their weight of water, and said hydrophilic lipidic substance being selected from the group consisting of:

(1) a C_{12}–C_{24} fatty alcohol having a melting point between 20° and 80° C. and having a hydroxyl index ranging from 100 to 300,

(2) a partial ester of a C_{12}–C_{24} fatty acid with a polyol or polyol oligomer, said partial ester having a melting point ranging from 20° to 80° C. and a hydroxyl index ranging from 50 to 500,

(3) an oxyethylenated derivative of a fatty body with 2 to 50 moles of ethylene oxide per mole of fatty body and having a melting point of 20° to 80° C.,

(4) a product resulting from the alcoholysis reaction between a natural triglyceride and a polyoxethylenated glycol, having a melting point ranging from 20° to 80° C., and hydroxyl index ranging from 50 to 500,

(5) a phospholipid and sphingolipid, or a derivative thereof, having a melting point ranging from 20° to 80° C., and hydroxyl index ranging from 50 to 500, and

(6) an amphiphilic silicone having a melting point ranging from 20° to 80° C. and having 2 to 50 moles of ethylene oxide per mole of product,

said spheroids being present in an amount ranging from 0.1 to 50 percent by weight based on the total weight of said composition.

5,532,001
STIMULATION OF TANNING BY DNA FRAGMENTS OR SINGLE-STRANDED DNA

Barbara A. Gilchrest, Brookline; Mina Yaar, Sharon, and Mark Eller, Boston, all of Mass., assignors to Trustees of Boston University, Boston, Mass.

Division of Ser. No. 8,251, Jul. 7, 1993. This application May 26, 1995, Ser. No. 451,317

Int. Cl.⁶ A61K *9/127*

U.S. Cl. 424—450 **8 Claims**

1. A method of increasing pigmentation in the epidermis of a mammal, comprising applying topically to the epidermis DNA fragments selected from the group consisting of: single-stranded DNA fragments, double-stranded DNA fragments, a mixture of single- and double-stranded DNA fragments, and deoxynucleotides, in a sufficient quantity to stimulate enhanced melanin production.

5,532,002
GELATIN PHARMACEUTICAL FORMULATIONS

Michael J. Story, Glenside, Australia, assignor to Cortecs Limited, Isleworth, United Kingdom

Continuation of Ser. No. 834,316, Apr. 10, 1992, abandoned. This application May 13, 1994, Ser. No. 242,078

Claims priority, application United Kingdom, Aug. 17, 1989, 8918809

Int. Cl.⁶ A61K *9/48*

U.S. Cl. 424—456 **22 Claims**

1. A hard gelatin capsule comprising a non-gellable fill which is liquid at 25° C. said fill further comprising (a) a fat-soluble nutrient; (b) a nonionic surfactant; and (c) a gelatin softening agent.

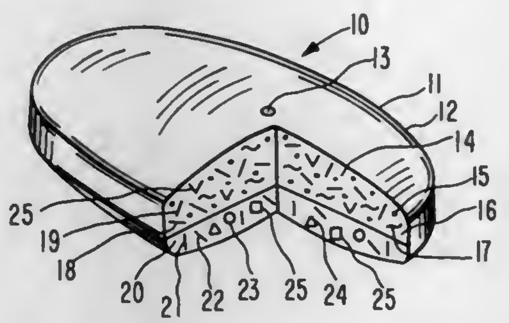
5,532,003
PENTOXIFYLLINE THERAPY

Patrick S.-L. Wong, Palo Alto; George V. Guittard, Cupertino, and Atul D. Ayer, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Jan. 18, 1994, Ser. No. 183,007

Int. Cl.⁶ A61K *9/22*

U.S. Cl. 424—473 **2 Claims**



1. A pharmaceutical granular composition comprising 20 wt % to 85 wt % of pentoxifylline, 5 wt % to 35 wt % of a polyethylene oxide possessing a 175,000 to 225,000 molecular weight, 0 wt % to 40 wt % of a hydroxypropylalkylcellulose possessing a 9,200 to 240,000 molecular weight, and 0 wt % to 15 wt % of a hydroxyalkylcellulose possessing a 7,200 to 650,000 molecular weight, which pharmaceutical granular composition in dosage form is indicated for the continuous-release of pentoxifylline to a patient over an extended time up to 24 hours.

5,532,004
CHEWING GUM CONTAINING HYDROPHOBIC FLAVORANT ENCAPSULATED IN A HYDROPHILIC SHELL

Joseph W. Bell, Bethlehem, Pa.; Thomas J. Carroll, Oak Ridge, N.J., and Wayne J. Puglia, New York, N.Y., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation of Ser. No. 81,535, Jun. 23, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 424,238

Int. Cl.⁶ A23G *3/30*

U.S. Cl. 426—5 **6 Claims**

1. A chewing gum comprising a flavoring component, said flavoring component comprising particles having a water-soluble hydrophilic shell encapsulating one or more hydrophobic liquid flavorants, wherein said one or more flavorants are releasable from said shell upon chewing of said gum, wherein said shell consists of gelatin; said one or more flavorants comprise 70 wt. % to 90 wt. % of said particles, and said particles are 0.1 mm to 1.0 mm in diameter.

5,532,005
PROCESS FOR REMOVAL OF RESIDUAL CYCLODEXTRIN

Allan Hedges; Wen Shieh, both of Crown Point, and Robert Ammeraal, Worth, all of Ind., assignors to American Maize-Products Company, Hammond, Ind.

Filed May 29, 1992, Ser. No. 891,224

Int. Cl.⁶ A23L *1/00*

U.S. Cl. 426—7 **16 Claims**

1. A process for removing uncomplexed, residual cyclodextrin from a system which has been subjected to a step wherein a complex of cyclodextrin has been removed and which contains other material besides uncomplexed, residual cyclodextrin and water, said process comprising the steps of treating said system containing uncomplexed, residual cyclodextrin and water with a CGTase and an amylase simultaneously at a pH of about 4 to about 6, a temperature of about 40° to about 80° C., for a period of time of about 1 to about 48 hours to hydrolyze the uncomplexed, residual cyclodextrin.

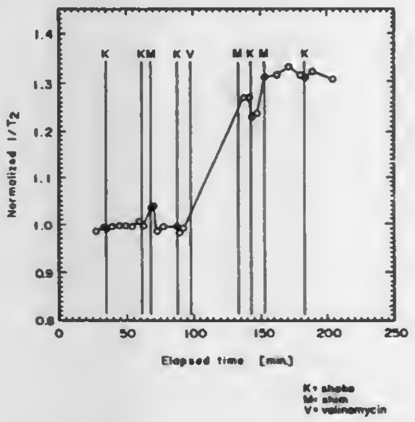
5,532,006
MAGNETIC GELS WHICH CHANGE VOLUME IN RESPONSE TO VOLTAGE CHANGES FOR MRI

Paul C. Lauterbur, Urbana, Ill., and Shachar Frank, Hertslia, Israel, assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Apr. 23, 1993, Ser. No. 51,965

Int. Cl.⁶ A61B *5/055*

U.S. Cl. 424—9.322 **28 Claims**



1. A method of imaging a human or non-human body or a selected region thereof, comprising:

(a) administering to said body or region a diagnostically effective amount of a diagnostic agent, said diagnostic agent comprising a matrix whose specific volume undergoes a change from a first value to a second value in response to an electric field, said matrix further comprising a magnetic component distributed therethrough; and

(b) generating a nuclear magnetic resonance image of said body or region by

  (i) applying an electric field sufficient to effect said specific volume change; and

  (ii) detecting said specific volume change in said matrix of said diagnostic agent.

5,532,007
METHOD FOR PRODUCTION OF A MEAT HYDROLYZATE

Hanne H. Pedersen, Lyngby; Hans S. Olsen, Holte, and Per M. Nielsen, Hillerød, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK93/00215, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO94/01003, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 30, 1993, Ser. No. 351,289

Claims priority, application Denmark, Jul. 3, 1992, 0876/92

Int. Cl.⁶ A23L *1/31;* **A23J** *1/02;3/00*

U.S. Cl. 426—56 **7 Claims**

1. Method for production of a meat hydrolyzate, wherein

a) raw meat is mechanically pretreated,

b) water is added in an amount which makes the mixture of the mechanically pretreated meat and water stirrable and treatable in a centrifuge,

c) pH is adjusted to a value between 5.5 and 7.5,

d) a neutral protease producible by means of a Bacillus strain and an alkaline protease producible by means of a Bacillus strain is added in a proportion, which will result in a final meat hydrolyzate with a bitterness below the threshold value for bitterness, and a hydrolysis is carried out to a DH between 3 and 20%,

e) the proteases in the hydrolyzed mixture are inactivated by heating, whereby the temperature during the steps a) to d) inclusive does not exceed 70° C., and

f) the inactivated mixture from step e) is converted to a fat free meat hydrolyzate.

5,532,008

FEEDSTUFF FOR RUMINANT

Seiji Sasaoka; Izuo Aoki, both of Ichihara, and Hiroshi Maruyama, Niigata, all of, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 73,025, Jun. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 4,355, Jan. 14, 1993, abandoned, which is a continuation of Ser. No. 768,251, Oct. 15, 1991, abandoned. This application Apr. 18, 1995, Ser. No. 424,029

Int. Cl.⁶ A23K *1/18*

U.S. Cl. 426—73 **16 Claims**

1. A ruminant feedstuff comprising an effective amount of a biologically active substance dispersed in a protectant wherein said protectant contains a bi-valent amorphous metal salt of mixed fatty acids and wherein said feedstuff has a void ratio from 1% to 15% and a moisture content not to exceed 2% by weight.

5,532,009

FAT SUBSTITUTES CONTAINING WATER SOLUBLE BETA-CAROTENE

Nancy E. Fortier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 7, 1995, Ser. No. 473,889

Int. Cl.⁶ A23D *7/005*

U.S. Cl. 426—73 **4 Claims**

1. A composition of matter, comprising:

a) an edible, non-absorbable, non-digestible fat, and;

b) beta-carotene; wherein the beta-carotene is complexed with a cyclodextrin selected from the group consisting of water soluble beta-cyclodextrin or beta-cyclodextrin derivatives and mixtures thereof having a molecular weight of at least 972 grams/mole.

5,532,010

COATED CANINE BISCUITS AND PREPARATION PROCESS

Henry C. Spanier, West Milford; William M. Bungo, Morris Plains, and John W. Stevenson, Wharton, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Filed May 28, 1993, Ser. No. 68,937

Int. Cl.⁶ A21D *13/00*

U.S. Cl. 426—94 **12 Claims**

1. A coated, baked canine biscuit, the edible coating comprising:

(a) about 20 to about 40 weight percent of at least one dextrin or at least one maltodextrin;

(b) about 0.2 to about 2 weight percent of citric acid;

(c) about 0.1 to about 1 weight percent of at least one edible antimycotic agent;

(d) about 0.5 to about 5 weight percent of lecithin or at least one modified lecithin;

(e) about 0.3 to about 5 weight percent of at least one polysaccharide gum;

(f) about 1 to about 10 weight percent of at least one flavorant;

(g) about 1 to about 10 weight percent of at least one member selected from the group consisting of food starches and modified food starches;

(h) about 1 to about 10 weight percent of vegetable fat;

(i) about 30 to about 70 weight percent of a dry composition comprising meat solids; and

(j) about 3 to about 16 weight percent of animal fat; all of the above-mentioned weight percents being based on the total weight of the dried coating minus the moisture content thereof,

said coated biscuit having a hard, coherent coating and a moisture content of less than or equal to about 13% by weight and a water activity of less than or equal to about 0.7.

5,532,011

PROCESS FOR PACKAGING COFFEE

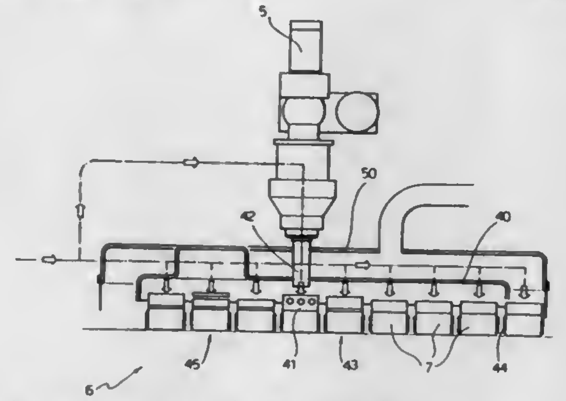
Luigi Goglio, Via Frua 11, 20146 - Milano, Italy

Filed Aug. 1, 1994, Ser. No. 283,260

Claims priority, application Italy, Aug. 11, 1993, MI93A1817

Int. Cl.⁶ B65B *31/00*

U.S. Cl. 426—316 **3 Claims**



1. A process for packaging coffee comprising:

forming a gas filled container by forming a strip of sheet material comprising one or more layers around a mandrel so that the container is closed at the bottom and open at the top and during the forming step, filling the container with a coffee grinder gas;

temporarily closing the top of the gas filled container with an openable closure;

opening the temporary closure and immediately introducing coffee in either ground or bean form into the gas filled container; and then sealing the top of the container by welding and subsequent creasing;

said opening, introducing and sealing steps being carried out in an atmosphere comprising coffee grinder gas with or without an additional inert gas and such that the coffee is packaged surrounded by its own aroma.

5,532,012

PROCESS FOR PREPARATION OF PURIFIED TEA COMPONENTS USING PRECONCENTRATION BY CREAM SEPARATION AND SOLUBILIZATION FOLLOWED BY MEDIUM PRESSURE CHROMATOGRAPHY AND/OR PREPARATIVE HPLC

Douglas A. Balentine, River Vale, and Matthew E. Harbowy, New Brunswick, both of N.J., assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed Jun. 2, 1995, Ser. No. 458,526

Int. Cl.⁶ A23F *3/18;3/20*

U.S. Cl. 426—425 **11 Claims**

1. A method for producing a mixture of theaflavins closely approximating the natural mixture of said theaflavins existing in tea cream comprising:

(a) obtaining said tea cream from black tea;

(b) solubilizing said tea cream in water at a temperature of about 140° F. to 220° F. and a concentration of about 15 to 40% by weight of said tea cream to form a tea cream solution;

(c) mixing said tea cream solution with an organic liquid to form a mixed liquid solution, said organic liquid having a boiling point less than water, being miscible in all proportions with water and having a hydrophobicity such that when mixed with water and theaflavins from said solubilized tea cream, the theaflavins preferentially extract into said mixed liquid to solubilize said tea cream theaflavins, said organic liquid being present in an amount of about 1 part by weight to 9 parts water by weight in said mixed liquid to about 9 parts by weight of organic liquid to 1 part by weight of water, in said mixed liquid;

(d) cooling said mixed liquid solution to a temperature of about 30° F. to 70° F. to precipitate out undesirable materials;

(e) removing insoluble materials to form a solution containing about 4 to 20% by weight tea cream solids and containing said theaflavins.

5,532,013

METHOD FOR THE PREPARATION OF INSTANT FRESH CORN DOUGH OR MASA

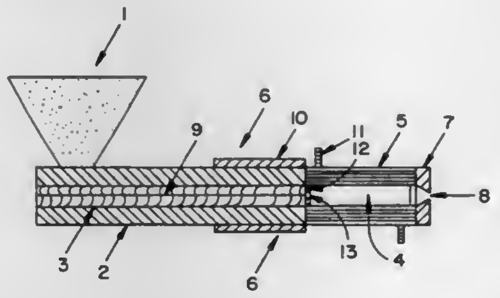
Fernando Martinez-Bustos, Orizaba; Juan D. D. Figueroa C., Valle Hermoso; Feliciano Sanchez-Sinencio, Tecamachalco; Jesus Gonzalez-Hernandez, Mexico; Jose D. L. L. Martinez, Puebla, and Maximiano Ruiz-Torres, Morelia, all of, Mexico, assignors to Centro de Investigacion y de Estudios Avanzados del I.P.N., Mexico, Mexico

Filed Oct. 20, 1994, Ser. No. 326,519

Claims priority, application Mexico, Oct. 21, 1993, 936344

Int. Cl.⁶ A21D *8/00*

U.S. Cl. 426—496 **6 Claims**



1. A method for the preparation of fresh corn dough or masa for use in the preparation of tortillas which comprises the steps of:

a) milling corn kernels in order to obtain a corn flour having a particle size suitable for the manufacture of tortillas;

b) admixing the thus obtained flour with lime and water in amounts sufficient to provide from about 25 to about 60% by weight of moisture and a pH of from about 6 to about 7.5;

c) subjecting the mixture to kneading by extrusion under low compression and shear rate for a period of time of from about 0.5 to about 5 minutes;

d) heating the kneaded dough to a temperature of from about 60° to about 95° C. for a period of time of from about 1 to about 2 minutes;

e) cooling the heated and kneaded dough until a temperature of from about 40° to about 70° C. is reached; and

f) expelling the cooled dough through a die in order to obtain a homogenized fresh corn dough or masa.

5,532,014

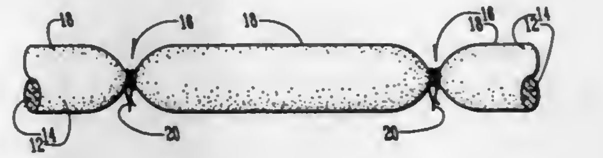
METHOD OF LINKING A STRAND OF UNCASED COEXTRUDED MEAT EMULSION PRODUCT

Jos Kobussen; Mart Kobussen, both of Indianola, Iowa, and Jaap Kobussen, La Veghel, Netherlands, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Aug. 16, 1995, Ser. No. 515,674

Int. Cl.⁶ A22C *13/00*

U.S. Cl. 426—513 **17 Claims**



1. A method for linking a strand of an elongated coextruded food emulsion product having an outer surface exposed to the atmosphere without the benefit of an enclosed casing, and having a substantially uniform diameter, comprising,

subjecting said strand to a constrictive force at spaced intervals along its length to create a plurality of link points of reduced diameter along said length, and

surrounding said link points with an edible linking material capable of holding said link points in a condition of reduced diameter.

5,532,015

PROCESS FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Atsuhiko Hirano, Kawasaki; Satoshi Yamahara, Yokkaichi; Takehiko Kataoka, and Shinichi Kishimoto, both of Kawasaki, all of, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 21, 1994, Ser. No. 345,469

Claims priority, application Japan, Nov. 19, 1993, 5-290453

Int. Cl.⁶ A23L *1/236;* **C07C** *229/24*

U.S. Cl. 426—548 **10 Claims**

1. A process for controlling the water content of α-L-aspartyl-L-phenylalanine methyl ester which comprises: drying wet crystals of α-L-aspartyl-L-phenylalanine methyl ester obtained upon crystallization to adjust the water content to not more than 5 wt % on a wet basis, followed by contacting dried α-L-aspartyl-L-phenylalanine methyl ester with a gas adjusted to a temperature of 20°–80° C. and relative humidity of 20–90 RH % to control water content.

5,532,016

COUSCOUS-LIKE PRODUCT MADE FROM PASTA SCRAP

Dhyaneshwar B. Chawan, Liverpool; Carleton G. Merritt, Phoenix, and Stephen R. Gillmore, Port Byron, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Jun. 7, 1995, Ser. No. 484,271

Int. Cl.⁶ A23L *1/16*

U.S. Cl. 426—557 **7 Claims**

1. A method for making a couscous-like product comprising: mixing durum wheat and water to produce a conventional alimentary paste, forming said paste into an elongated non-cooked alimentary paste; drying said elongated alimentary paste to a moisture content of about 11–13% to produce a dry storage-stable product, grinding said product and sifting said product to produce uniform couscous-size granules.

5,532,017
MELT RESTRICTED MARSHMALLOW

Lisa T. O'Donnell, Cordova, Tenn., and Ralph S. Wirebaugh, Waucanda, Ill., assignors to Favorite Brands International, Inc., Lincolnshire, Ill.

Filed Nov. 14, 1994, Ser. No. 340,088
Int. Cl.^{6} A23G *3/00;* **A23L** *1/05*
U.S. Cl. 426—571 **26 Claims**

1. A melt restricted marshmallow product having heat stability to about 375° F. comprising corn syrup, sugar, dextrose, water, starch, gelatin, microcrystalline cellulose and a phosphate wherein the microcrystalline cellulose is present in the level of from about 0.5% to about 2.0% and the level of starch is present at a level of from about 1.5% to about 5% by weight.

5,532,018
METHOD FOR MANUFACTURE OF LOW FAT NATURAL CHEESE

Mark S. Miller, Arlington Heights; Kevin J. Surber, Lombard; David Mehnert, Antioch; Paul Wrezel, Chicago; Sylvia L Crawford, DesPlaines, and Ronald L. Meibach, Deerfield, all of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Feb. 14, 1994, Ser. No. 195,270
Int. Cl.^{6} A23C *19/00*
U.S. Cl. 426—582 **20 Claims**

1. A method for manufacture of low fat natural cheese comprising the steps of;

(a) adding a gel-forming fat mimetic which has been blended with an aqueous fluid and formed into a gel to skim milk to provide a cheese substrate;
(b) setting, cutting, cooking and draining said substrate to provide a cheese curd;
(c) curing said cheese curd to provide low-fat skim milk cheese having a gelled matrix dispersed therein;
(d) comminuting said skim milk cheese and heating said cheese to an elevated temperature of from about 140° F. to about 180° F.;
(e) holding said cheese at said elevated temperature for a period of from about 0.5 minutes to about 8 minutes; to provide a homogeneous cheese mass; and
(f) packaging said cheese mass to provide a low-fat natural cheese.

5,532,019
PROCESS FOR MAKING STABLE EMULSIFIED DRESSINGS WITH POLYOL FATTY ACID POLYESTERS

Mark S. Miller, Arlington Heights, and Kevin J. Surber, Lombard, both of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Jun. 5, 1995, Ser. No. 466,993
Int. Cl.^{6} A23L *1/24*
U.S. Cl. 426—589 **23 Claims**

1. A method for making a stable emulsified dressing containing a polyol fatty acid polyester, said method comprising:

(1) forming a preemulsion containing at least a portion of the polyol fatty acid polyester in an aqueous solution thickened with a thickening agent;
(2) combining the preemulsion with a mixture containing an egg yolk-containing material, an acidifying ingredient, and water; and
(3) subjecting the combined preemulsion and mixture to shear to provide a stable emulsified dressing having mayonnaise-like properties.

5,532,020
LOW CALORIE TABLESPREAD MADE FROM LIQUID TRIGLYCERIDE OILS

Richard S. Silver, Wilmette, Ill., assignor to Nabisco, Inc., Parsippany, N.J.

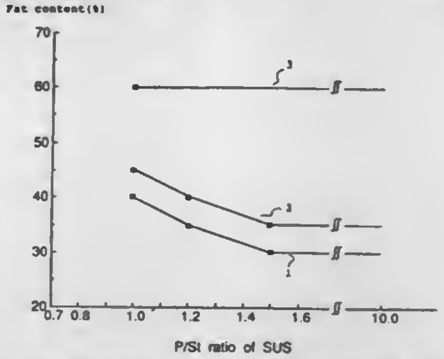
Filed May 24, 1995, Ser. No. 448,673
Int. Cl.^{6} A23D *7/01*
U.S. Cl. 426—604 **13 Claims**

1. A two-phase emulsion comprising a continuous aqueous phase and a dispersed liquid oil phase, said emulsion containing from about 45% to about 65% liquid vegetable oil, from about 15% to about 20% of calcium gluconate, from about 18% to about 28% of water and from about 0.2% to about 1.2% of a hydrophilic emulsifier.

5,532,021
CHOCOLATE

Haruyasu Kida, Kitasoma-gun; Masako Arai, Tsukuba-gun; Yoichi Tashiro, Kitasoma-gun, and Hideki Baba, Sennan-gun, all of, Japan, assignors to Fuji Oil Company, Limited, Osaka-fu, Japan

Filed Jun. 2, 1995, Ser. No. 459,767
Claims priority, appilcation Japan, Sep. 22, 1994, 6-227851
Int. Cl.^{6} A23G *1/00*
U.S. Cl. 426—607 **8 Claims**



1. Chocolate subjected to tempering treatment and having a softening point of 15° to 30° C., wherein its fat ingredient comprises:

95 to 40% by weight of fats rich in 2 -unsaturated-1,3-disaturated triglycerides (SUS) the main constituent fatty acids of which are palmitic acid (P) and stearic acid (St) with a P/St ratio of at least 1.0 and 5 to 40% by weight of lauric fats,
the relation of P/St ratio of SUS to the fat content (% by weight) in the chocolate being on or in the higher fat content region above the line drawn by taking the points of
1.0 of the P/St ratio and 40% of the fat content,
1.2 of the P/St ratio and 35% of the fat content, and
1.5 of the P/St ratio and 30% of the fat content in a graph plotting the fat content as ordinate and the P/St ratio as abscissa.

5,532,022
AQUEOUS GEL MATRIX FOR REPLACEMENT OF CONFECTION FATS

Mark S. Miller, Arlington Heights, and Kevin J. Surber, Lombard, both of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 42,990, Apr. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 869,392, Apr. 16, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,392
Int. Cl.^{6} A23G *1/00*
U.S. Cl. 426—660 **35 Claims**

1. A confection product having a continuous gel matrix which replaces the fat in the confection product, said confection product comprising between about 8 to about 22 percent of a gelling type maltodextrin having a D.E. in the range of from about 1 to below 20, between about 20% to about 32% of sugar, between about 5% to about 20% of flavor particles having a particle size of less than about 50 microns and added water, said added water being present at a level of from about 30% to about 60%, said confection product being a continuous gelled sugar solution having said flavor particles embedded therein and said confection product having a firmness at freezing temperatures, room temperatures and when melted which is similar to that of full fat milk chocolate.

5,532,023
WRINKLE REDUCING COMPOSITION

Alice M. Vogel, Middletown; Errol H. Wahl; Jerome P. Cappel, both of Cincinnati, all of Ohio, and Thomas C. Ward, Blacksburg, Va., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 10, 1994, Ser. No. 337,921
Int. Cl.^{6} B05D *3/02*
U.S. Cl. 427—8 **11 Claims**

1. A process for determining acceptable commercial wrinkle reducing active mixtures, which comprises:

A. mounting a fabric swatch in a tangential fiber extensional geometry in a Dynamic Mechanical Analyzer;
B. applying to said swatch, a fixed volume of a wrinkle reducing active mixture in a liquid carrier;
C. at a time no greater than 2 minutes,
  1. reading a sample height, instrumentally;
  2. setting stress values;
  3. allowing temperature to equilibrate;
  4. running said Analyzer;
  5. collecting data and calculating an average between wet and dry fabric ranges;
D. monitoring a change in the fabric's ability to dampen an applied stress over time as the fabric dries; and
E. determining whether said wrinkle reducing active has a Loss Modulus Difference of from about 3.3×10^7 Pascal to about 5.5×10^7 Pascal by subtracting wet region ranges from dry region ranges.

5,532,024
METHOD FOR IMPROVING THE ADHESION OF POLYMERIC ADHESIVES TO NICKEL SURFACES

Steven F. Arndt, Endwell; Luis J. Matienzo, Endicott; Irving Memis, Vestal; James Spalik, Kirkwood, and Tien Y. Wu, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1995, Ser. No. 431,545
Int. Cl.^{6} B05D *3/00;3/12*
U.S. Cl. 427—327 **17 Claims**

1. A method for improving the adhesion of polymer to nickel comprising the following steps:

(a) providing a nickel surface;
(b) providing a polymer;
(c) contacting the nickel surface with a hydrogen peroxide solution having a temperature of at least about 40° C. for a time sufficient to form a wettable nickel-oxide surface on the nickel surface;
(d) applying the polymer to the nickel-oxide surface.

5,532,025
CORROSION INHIBITING COMPOSITIONS

Patrick J. Kinlen, 1348 Remington Oaks Ter., Fenton, Mo. 63026; David C. Silverman, 14314 Strawbridge Ct., Chesterfield, Mo. 63017; Edward F. Tokas, 6 N. Tealbrook, St. Louis, Mo. 63141, and Christopher J. Hardiman, 534 West Dr., St. Louis, Mo. 63130

Filed Jul. 23, 1993, Ser. No. 96,661
Int. Cl.^{6} C23F *13/00;* **C09D** *5/08*
U.S. Cl. 427—388.1 **6 Claims**

1. A method for inhibiting corrosion on a corrodible metal surface in an alkaline environment, said method comprising:

applying a first coating on said metal surface, the coating comprising a composition adapted for inhibiting corrosion on a metal surface, the composition comprising an intrinsically conducting polyaniline blended in a matrix comprising an inorganic silicate or an organic resin capable of adhering to said metal surface; and
applying a second coating over the first coating wherein said second coating consists essentially of an inorganic silicate or an organic resin.

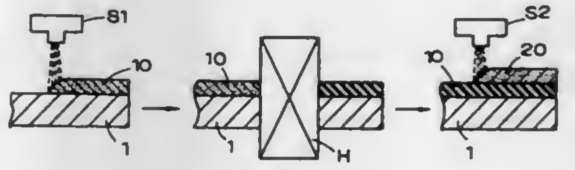
4. A method for inhibiting corrosion on a corrodible metal surface in an alkaline and salt environment, said method comprising:

applying a first coating on said metal surface, the coating comprising a composition adapted for inhibiting corrosion on a metal surface, the composition comprising an intrinsically conducting polyaniline blended in a matrix comprising an inorganic silicate or an organic resin capable of adhering to said metal surface; and
applying a second coating over the first coating wherein said second coating consists essentially of an inorganic silicate or an organic resin.

5,532,026
METHOD OF MANUFACTURING A METAL GASKET

Osamu Jinno, Nagoya, Japan, assignor to Taiho Kogyo Co., Ltd., Toyota, Japan

Division of Ser. No. 995,969, Dec. 23, 1992, Pat. No. 5,354,074. This application Jun. 10, 1994, Ser. No. 258,484
Claims priority, application Japan, Dec. 27, 1991, 3-359037
Int. Cl.^{6} B05D *1/36;7/14;3/02*
U.S. Cl. 427—409 **10 Claims**



10. A method of manufacturing a metal gasket comprising the steps of:

depositing a cold vulcanizing coating layer which is vulcanized at room temperature;
heating said cold vulcanizing coating layer to form a vulcanized layer; and
depositing on said vulcanized layer a hot vulcanizing coating layer which is only vulcanized when heated at a higher temperature than room temperature, to form an unvulcanized layer which has not been heated at the higher temperature.

5,532,027
UV LIGHT TREATMENT OF CLEAR COAT TO IMPROVE ACID ETCH RESISTANCE

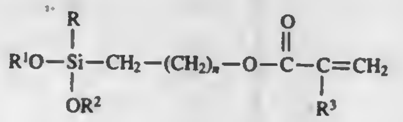
J. David Nordstrom, Detroit; Hisanori Omura, Farmington Hills; Alan E. Smith, Troy, and David M. Thomson, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1994, Ser. No. 360,557
Int. Cl.^{6} B05D *3/06*
U.S. Cl. 427—493 **7 Claims**

1. In a process for forming multiple coats of finishes on a substrate used as the exterior of a motor vehicle other than a testing specimen comprising the sequential steps of (a) applying to the substrate a layer of a color basecoat composition comprising a film forming binder and pigment; (b) applying to the layer of color basecoat composition before the basecoat is fully cured a clear coat composition and subsequently (c) simultaneously curing the basecoat composition and clear coat composition to form a coating; the improvements used therewith comprise the use of a clear coating composition comprising about 40–80% by weight, based on the weight of the clear coating composition, of a binder of an acrylosilane polymer in a liquid carrier and exposing the clear coat of the substrate after curing to an artificial ultraviolet light source under ambient temperature and atmospheric conditions to a sufficient degree to increase the resistance of the coating to water spotting and acid etching when the substrate is exposed to natural outdoor weathering; wherein the acrylosilane polymer consists essentially of polymerized monomers of

(1) a hydroxy containing monomer selected from the group consisting of a hydroxy alkyl methacrylate having 1–4 carbon atoms in the alkyl group or a hydroxy alkyl acrylate having 1–4 carbon atoms in the alkyl group;

(2) a silane containing monomer having the following structural formula:



$$R^1O-\underset{OR^2}{\overset{R}{Si}}-CH_2-(CH_2)_n-O-\overset{O}{\overset{\|}{C}}-\underset{R^3}{C}=CH_2$$

wherein:

R is selected from the group consisting of CH_3, CH_3CH_2, CH_3O, or CH_3CH_2O;

R^1 and R^2 are individually selected from the group consisting of CH_3, or CH_3CH_2; and

R^3 is selected from the group consisting of H, CH_3, or CH_3CH_2 and n is 0 or a positive integer of 1–10; and

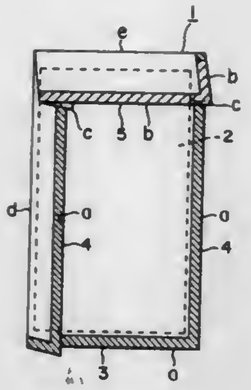
(3) monomers selected from the group consisting of an alkyl methacrylate having 1–12 carbon atoms in the alkyl group, an alkyl acrylate having 1–12 carbon atoms in the alkyl group, styrene or a mixture of these monomers.

5,532,028
EASILY OPENABLE PACKAGE OF PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS AND PRODUCING THE SAME

Mutsuo Akao; Hiroyuki Osanai, and Makoto Kawamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jun. 26, 1992, Ser. No. 904,456
Claims priority, application Japan, Jun. 28, 1991, 3-158957
Int. Cl.^{6} B65D *85/00;* **B32B** *7/04;7/14*
U.S. Cl. 428—35.2 **15 Claims**

1. An easily openable package of photographic photosensitive materials which comprises one or a plurality of photographic photosensitive materials and a light-shielding bag having a heat-sealed portion formed on the periphery and packaging; the photographic photosensitive materials, the heat-sealed portion comprising a strongly joined portion formed of a polyolefin resin layer containing more than 5 wt. % of ethylene copolymer resin and a lubricant, said strongly joined portion further having a thickness of not less than 20 μm and having a joining strength of not less than 1300 g/15 mm width and a weakly joined resin portion having a joining strength of 10 to 1200 g/15 mm with and wherein the joining strength of the weakly joined resin portion is less than or equal to 0.7 time as much as the joining strength of the strongly joined portion, the strongly joined portion of the light-shielding bag being larger than the photographic photosensitive materials being packaged therein thereby forming a space, and the light-shielding bag being turned over at least at the edge of the photographic photosensitive materials on an opening side formed of the weakly joined resin portion so that when the light-shielding bag has the edge in the turned over position, the photographic photosensitive materials can not contact the weakly joined portion.



5,532,029
MATERIALS AND METHODS UTILIZING A TEMPORARY VISUAL INDICATOR

Ronnie S. Fuerst, 2510 NW. 26th Pl.; Richard Melker, 6101 NW. 19th Pl., both of Gainesville, Fla. 32605, and Christopher D. Batich, 3733 NW. 40th St., Gainesville, Fla. 32606

Division of Ser. No. 242,517, May 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 61,412, May 13, 1993.
This application Feb. 14, 1995, Ser. No. 388,402
Int. Cl.^{6} B32B *1/06;* **F42B** *8/14;* **A61K** *7/42;31/34*
U.S. Cl. 428—35.7 **6 Claims**

1. A paint ball comprising:

(a) an indicator for which a change of pH from a first pH to a second pH causes either (i) a change from one color to another color, or (ii) a change from colorless to a color, or (iii) a change from a color to colorless; and

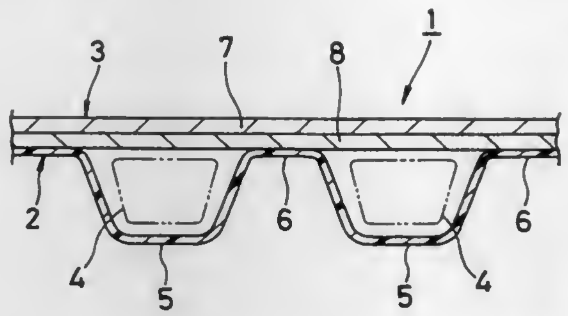
(b) a pH-modifying substance in an amount sufficient to establish the pH of a mixture of said indicator and said pH-modifying substance at said first pH and which evaporates or degrades thereby causing the pH to change to said second pH, wherein said indicator and said pH-modifying substance are enclosed in an outer shell suitable for projectile motion, and wherein said outer shell releases said indicator and said pH-modifying substance upon contact with an object or person.

5,532,030
POLYOLEFIN MULTILAYER LAMINATE, VESSEL AND PACKAGING MATERIAL

Toshiyuki Hirose; Shigetoshi Nishijima; Yohzoh Yamamoto; Hideshi Kawachi, and Michio Tsugawa, all of Kuga-Gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 329,262, Oct. 26, 1994, abandoned.
This application May 26, 1995, Ser. No. 451,812
Claims priority, application Japan, Oct. 26, 1993, 5-267045; Jul. 5, 1994, 6-153986
Int. Cl.^{6} B29D *22/00;23/00*
U.S. Cl. 428—35.7 **15 Claims**

1. A polyolefin multilayer laminate, comprising



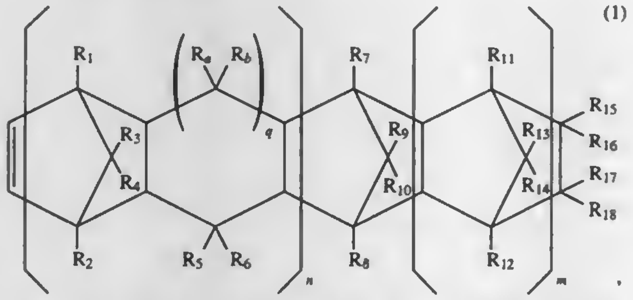
(A) a first layer made of a cycloolefin-based resin composition composed of at least one cycloolefin-based resin selected from the group consisting of

(a-1) an ethylene/cycloolefin random copolymer obtained by copolymerizing a cycloolefin represented by the general formula (1) or (2) given below with ethylene,

(a-2) a ring-opening (co)polymer of cycloolefin(s) represented by the general formula (1) or (2) given below or its hydrogenation product, and

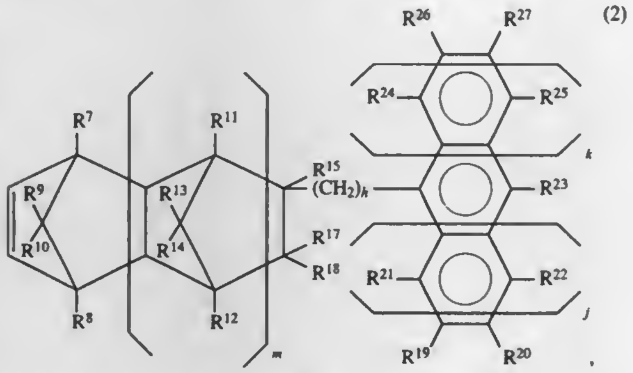
(a-3) a graft-modification product of said ethylene/cycloolefin random copolymer (a-1) or of the ring-opening (co)polymer or its hydrogenation product (a-2), and a polyolefin, and

(B) a second layer made of an olefin (co)polymer or a composition containing it:



(1)

wherein n is zero or 1, m is zero or any positive integer, q is zero or 1, R^1–R^{18} as well as R^a and R^b represent each independently of each other an atom or a radical selected from the group consisting of hydrogen atom, halogen atoms and hydrocarbon groups, wherein R^{15}–R^{18} may form a monocyclic ring or a polycyclic ring by combining with each other or may form an alkylidene group by a chemical combination of R^{15} with R^{16} or R^{17} with R^{18} and wherein the monocyclic or polycyclic ring formed from R^{15}–R^{18} may have one or more double bonds and, in the case of q=0, a five-membered ring is formed thereby joining the chemical bonds together; and



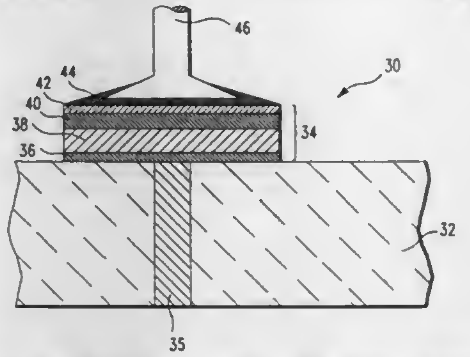
(2)

wherein m is zero or any positive integer, h is zero or any positive integer, j and k denote each zero, 1 or 2, R^7–R^{15} as well as R^{17}–R^{18} represent each independently of each other an atom or a radical selected from the group consisting of hydrogen atom, halogen atoms and hydrocarbon groups and R^{19}–R^{27} represent each independently of each other an atom or a radical selected from the group consisting of hydrogen atom, halogen atoms, hydrocarbon groups and alkoxy groups.

5,532,031
I/O PAD ADHESION LAYER FOR A CERAMIC SUBSTRATE

Shaji Farooq, Hopewell Junction; Sampath Purushothaman, Yorktown Heights; Srinivasa S. N. Reddy, LaGrangeville, and Vivek M. Sura, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1992, Ser. No. 827,657
Int. Cl.^{6} B32B *15/04;* **H01L** *23/48*
U.S. Cl. 428—623 **14 Claims**

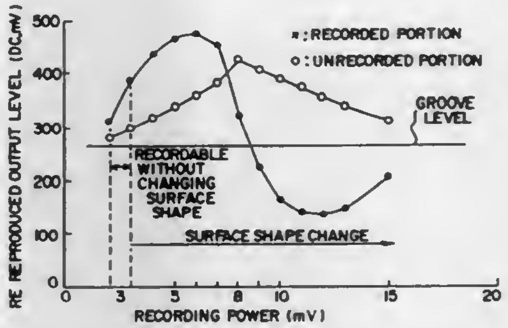


1. A ceramic structure for electronic applications comprising:
a ceramic substrate;
an I/O pin pad wherein said I/O pin pad comprises an adhesion layer of TiO in direct contact with said ceramic substrate, a layer of Ti in direct contact with said TiO layer, and a solder wettable layer over said Ti layer;
a layer of solder in contact with said I/O pin pad; and
an I/O pin in contact with said solder layer.

5,532,032
RECORDING METHOD FOR AN OPTICAL RECORDING MEDIUM

Kumi Kawano, and Fumio Matsui, both of Saitama-ken, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 19, 1994, Ser. No. 183,309
Claims priority, application Japan, Jan. 22, 1993, 5-009525
Int. Cl.^{6} B32B *3/00*
U.S. Cl. 428—64.1 **6 Claims**



1. A recording method for an optical recording medium having a substrate and a recording film, which contains organic coloring matter, provided on the substrate, wherein the method comprises:

irradiating the recording film with a laser beam having a recording power of 8 mW or less, passing through the substrate so that substances of the coloring matter are associated with each other.

5,532,033

OPTICAL INFORMATION RECORDING MEDIUM

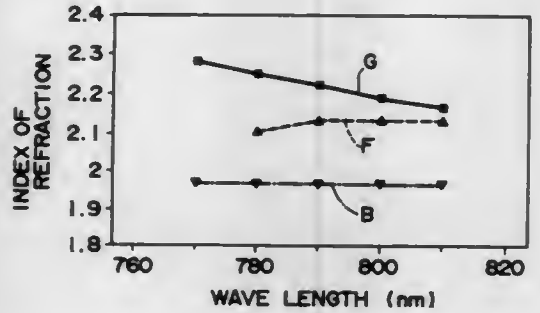
Toru Yashiro, Kamakura, Japan, assignor to Ricoh Company, Ltd., Tokyo, and Yamada Chemical Co., Ltd., Kyoto, both of, Japan

Filed Apr. 19, 1995, Ser. No. 424,088

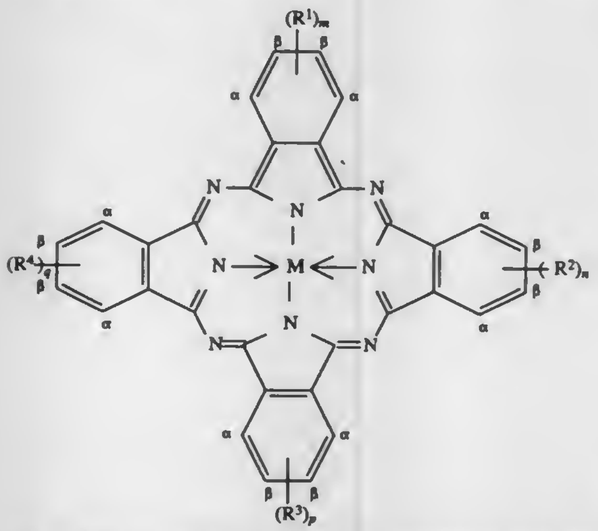
Claims priority, application Japan, Apr. 20, 1994, 6-104501

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—64.1 **4 Claims**



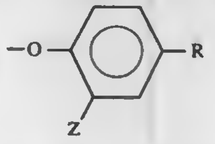
1. An optical information recording medium, comprising a substrate, and an information recording layer provided on said substrate and containing a phthalocyanine compound having the following formula (I):



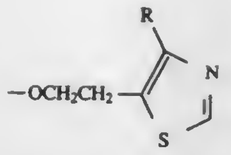
(I)

wherein M stands for $M^1Y^1{}_{w-2}$ where M^1 represents a metal having a valence of 2–4, Y^1 represents a group selected from the group consisting of H, a halogen atom, —OH, —Z where Z represents an alkyl group, a phenyl group or a naphthyl group and —OZ where Z is as defined above and w is the valence of said metal or $M^2=Y^2$ where M^2 represents a metal having a valence of 4 and Y^2 represents an atom selected from the group consisting of O and S,

R^1 through R^4 stand, independently from each other, for (a) a halogen atom, (b) an alkyl group or (c) a group selected from —NH—R where R represents a lower alkyl group,



where R represents a lower alkyl group and Z represents a piperidinomethyl group, or



where R represents a lower alkyl group, with the proviso that at least one of the groups R^1 through R^4 stands for the group (c), and m, n, p and q stand, independently from each other, for an integer of 0–4 provided that m+n+p+q is 1 or more.

5,532,034

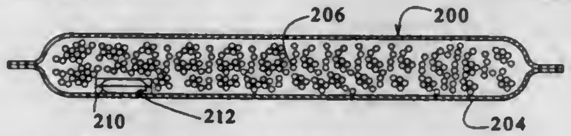
GETTER SYSTEM FOR VACUUM INSULATION PANEL

David B. Kirby, St. Joseph Township, Berrien County, and Nihat O. Cur, Royalton Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 6, 1994, Ser. No. 349,836

Int. Cl.^{6} B32B *1/06*

U.S. Cl. 428—69 **12 Claims**



1. An evacuated container comprising:

- an outer barrier wall defining a compartment;
- a microporous insulation filler container within said compartment;
- a first getter material contained within said compartment capable of gettering at least a first gas or vapor and a second, different gas or vapor;
- a second getter material also contained within said compartment capable of gettering said first, but not said second, gas or vapor;
- packaging containing said first and second getter materials and excluding said microporous insulation filler, such that said second getter material will be more readily exposed to said first gas or vapor than said first getter material, wherein said first getter material will be more readily exposed to said first gas or vapor than said first getter material, wherein said first getter material will be protected from said first gas or vapor.

5,532,035

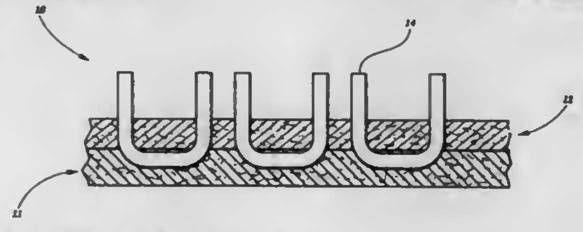
RECYCLABLE TUFTED FABRIC

James A. Corbin, Spartanburg, S.C.; Robert D. Johnson, Charlotte, N.C.; William G. Neely, Charlotte, N.C.; Ian S. Slack, Charlotte, N.C., and Barrie L. Davies, Weddington, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 876,617, May 1, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,290

Int. Cl.^{6} B32B *3/02;* D03D *27/00;* D04H *1/04*

U.S. Cl. 428—95 **6 Claims**



1. A tufted carpet comprising

- a fibrous primary backing layer comprising thermoplastic binder fibers, a plurality of fibrous tufts extending through a face of said fibrous backing layer to form a plurality of anchoring loops projecting from an opposing face of said fibrous primary backing layer, and
- a nonwoven, fibrous, secondary backing layer needled to said opposing face of said fibrous primary backing layer and comprising thermoplastic finder fibers, the foregoing structure being heatset to secure said anchoring loops of said fibrous tufts wherein said thermoplastic binder fibers of the primary backing layer and nonwoven, fibrous, secondary backing layer are of the same thermoplastic material.

5,532,036

METHODS FOR REDUCING VOLATILE ORGANIC CHEMICAL CONTENTS OF CARPETS

John M. Wilkerson, III, Hixson; Daniel W. Verstrat, Ooltewah, and Milagros C. Barron, Hixson, all of Tenn., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 339,612, Nov. 15, 1994, Pat. No. 5,442,091, which is a division of Ser. No. 172,626, Dec. 22, 1993, Pat. No. 5,412,142, which is a division of Ser. No. 85,851, Jun. 30, 1993, Pat. No. 5,294,692. This application Apr. 27, 1995, Ser. No. 430,068

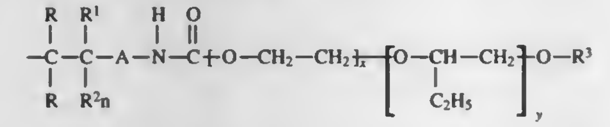
Int. Cl.^{6} B32B *33/00*

U.S. Cl. 428—96 **4 Claims**

1. A method for reducing the volatile organic chemical contents of carpet, comprising the steps:

a. fabricating carpet from a plurality of yarn loops or tufts inserted into a backing; and

b. coating the backing with a coating composition comprising 10 to 70% by weight of a latex binder, 30 to 90% by weight of at least one filler, and 0.5 to 15% by weight of at least one thickener, wherein the thickener is a polymer prepared from a non-ionic urethane monomer comprising at least two repeating units of the structure:



$$-\underset{R}{\overset{R}{C}}-\underset{R^2n}{\overset{R^1}{C}}-A-\overset{H}{N}-\overset{O}{\overset{\|}{C}}\!\left\{O-CH_2-CH_2\right\}_x\left[O-\underset{C_2H_5}{CH}-CH_2\right]_y O-R^3$$

wherein R, R^1 and R^2 are, independently, H, $—CH_3$ or $—CH_2CH_3$; R^3 is a C_1-C_4 linear or branched alkyl group; y is an integer from 1 to 50; x is an integer from 1 to 50; the sum of x+y is less than or equal to 100; A is a C_2-C_{20} alkyl, aryl, alkaryl or alkylene group; and n is at least 1, and wherein the polymer is used to replace a thickener having a volatile organic chemical content of at least 1.0 mg/m^2 thereby reducing the volatile organic chemical content of the carpet.

5,532,037

WATERPROOF COLLAR CONNECTION DEVICE

Johann Aumann, Bergham 2, 83052 Bruckmühl, Germany

Filed Oct. 5, 1994, Ser. No. 318,589

Claims priority, application Germany, Oct. 5, 1993, 9315095 U

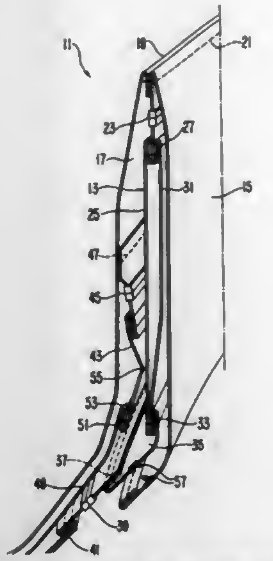
Int. Cl.^{6} A41D *3/04*

U.S. Cl. 428—99 **13 Claims**

1. A waterproof collar connection device for use with a garment which has a detachable lining and a functional layer garment equipped with a waterproof, water vapor permeable functional layer, the garment having a double-layer collar with an outer collar layer and an inner collar layer and where the device is arranged between the garment and lining, said device comprising:

(a) a first functional layer strip located between the two collar layers, said strip having an upper edge connected to an upper collar edge by a first openable closure and a lower edge connected to the lining by a second openable closure; and

(b) a second functional layer strip having an upper edge connected to the inside of the outer collar layer by a third



openable closure and a lower edge connected to the functional layer garment, wherein the two functional layer strips are attached in a line located between an upper edge and a lower edge of the second functional layer strip, about parallel to the upper edge of the first functional layer strip by a waterproof adhesive seam and wherein the lower edge of the inner collar layer may be turned away from the outer collar layer by a fourth openable closure.

5,532,038

Patent Not Issued For This Number

5,532,039

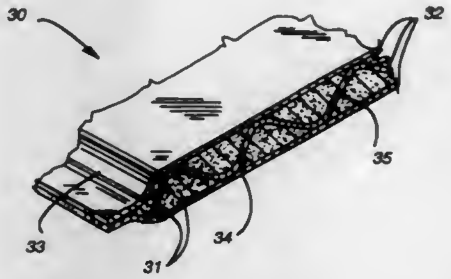
THERMAL BARRIERS FOR BUILDINGS, APPLIANCES AND TEXTILES

Ed Payne, Longmont; Bernard T. Perry, Boulder, and Terry D. Walker, Englewood, all of Colo., assignors to Gateway Technologies, Inc., Boulder, Colo.

Filed Apr. 25, 1994, Ser. No. 232,737

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—116 **29 Claims**



1. A flexible thermal barrier comprising:

- two spaced apart opposing sheets defining a chamber therebetween;
- a flexible, cell-defining structure positioned between and attached to said opposing sheets and defining a plurality of discrete cells of said chamber; and
- a temperature stabilizing material containing a heat storage material selected from the group consisting of phase change materials and plastic crystals, said heat storage material having a predetermined temperature at which heat is controllably absorbed or released therefrom, said temperature stabilizing material substantially filling each said cell such that a substantially uniform distribution of said temperature stabilizing

material is maintained across said flexible thermal barrier by said flexible cell-defining structure.

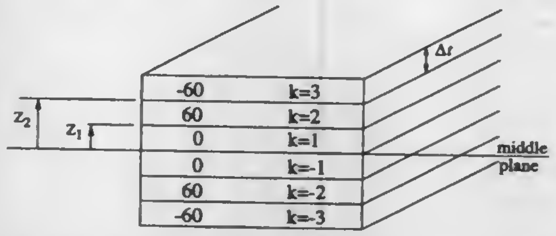
5,532,040
MULTIMATERIAL FULLY ISOTROPIC LAMINATES AND MULTIMATERIAL QUASI-HOMOGENEOUS ANISOTROPIC LAMINATES

Kuang-Ming Wu, and Thomas J. Wu, both of 1321 Timberly La., McLean, Va. 22102

Filed Apr. 15, 1994, Ser. No. 228,256

Int. Cl.^{6} D06N *7/04*

U.S. Cl. 428—141 **10 Claims**



1. A multimaterial multi-ply laminate, which consists of at least four plies of at least two different materials, wherein the plies are bonded to each other wherein each material is either isotropic or nonisotropic, wherein each ply is of an identical uniform thickness, wherein on either side of the midplane of the laminate

A. each nonisotropic material forms at least one evenly-oriented sublaminate, wherein each evenly-oriented sublaminate has at least three orientation angles, wherein each angle is equally spaced with one another, wherein each angle has the same total number of plies,

B. each isotropic material forms at least one ply interleaving with plies of other isotropic or nonisotropic materials;

C. the layup is defined by the following:

(a) each ply is assigned a value, k, an integer starting from 1 and representing the stacking order of the ply from the midplane; each ply is also assigned a weighting factor equal to $3k^2-3k+1$;

(b) in each evenly-oriented sublaminate of a nonisotropic material, the sums of weighting factors of all the plies aligned in each orientation are identical;

(c) for a laminate consisting of only isotropic materials, the proportion of the sums of weighting factors of all the plies of each material equals to the proportion of the total numbers of plies of each material;

wherein both sides of the laminate have the same isotropic and nonisotropic materials, the same total numbers of plies of each material, and the same sums of weighting factors of each material; wherein the resulting laminate has concomitant isotropy in extensional, shear, bending, and twisting stiffnesses.

5,532,041
MAGNETIC RECORDING MEDIA AND METHOD FOR MAKING THEM

Yoshihiro Honjo, Saku; Yoshisuke Yamakawa, Niiza; Hiroshi Kawahara, Saku, and Eizo Tsunoda, Komoro, all of, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 968,451, Oct. 29, 1992, abandoned, which is a continuation of Ser. No. 553,641, Jul. 18, 1990, abandoned. This application Jun. 20, 1994, Ser. No. 262,366

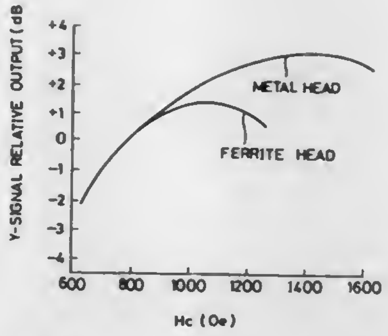
Claims priority, application Japan, Jul. 18, 1989, 1-185345

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.^{6} G11B *5/66;* B32B *3/10;5/16*

U.S. Cl. 428—141 **23 Claims**

1. A magnetic recording medium in a direct recording system for recording at least two signals having different frequency bands by frequency multiplex recording, said medium comprising:



a non-magnetic substrate;

a first magnetic layer on the substrate and a second magnetic layer on the first magnetic layer; and

wherein said second magnetic layer has a thickness within the range between 0.2 and 0.58 μm,

both said first and second magnetic layers have a total thickness between 2.0 and 4.0 μm, and

said first magnetic layer has a coercivity of between 600 and 800 Oe, and

said second magnetic layer has a coercivity of between 850 and 1000 Oe.

5,532,042
MAGNETIC RECORDING MEDIUM

Seigi Kawarai, Ashiya; Kenichiro Yoshida, Kyoto, and Akira Kato, Takarazuka, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 613,708, Jan. 17, 1991, abandoned. This application Sep. 22, 1994, Ser. No. 310,043

Claims priority, application Japan, Apr. 5, 1989, 1-86157

Int. Cl.^{6} B32B *3/10;5/16;* G11B *5/66*

U.S. Cl. 428—141 **12 Claims**

1. A magnetic recording assembly which comprises a magnetic tape and a cassette casing, said magnetic tape comprising a substrate, a magnetic layer on one surface of said substrate and a backcoating layer on an opposite surface of said substrate, wherein said magnetic layer contains a magnetic metal powder having a major axis size of not larger than 0.2 μm to achieve high density recording at a center recording wavelength of 0.8 μm or less and an inorganic powder having a Mohs' hardness of at least 5, said magnetic layer having a thickness not greater than 3.0 μm, a surface roughness of not greater than 0.004 μm in terms of center line average roughness, and a squareness ratio of at least 0.85 under an applied magnetic field of 10 KOe and said backcoating layer contains a carbon black and an inorganic powder having a particle size smaller than said major axis size of said magnetic metal powder, and has a surface roughness of not greater than 0.01 μm in terms of center line, and a Mohs' hardness of at least 5, and said cassette casing is made of an ABS resin containing a pigment having a Moh's hardness of from 2 to 4.

5,532,043
PHOTOREFLECTIVE SHEET

Mitugi Terashi, Matutou; Masaharu Inoue, Osaka, and Yutaka Usijima, Takarazuka, all of, Japan, assignors to Takase Dyeing & Printing Works, Ltd., Osaka, Japan

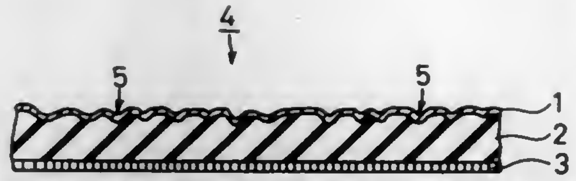
Continuation of Ser. No. 118,196, Sep. 9, 1993, abandoned. This application Dec. 19, 1994, Ser. No. 358,986

Claims priority, application Japan, Nov. 4, 1992, 4-337766; May 17, 1993, 5-114530

Int. Cl.^{6} A01N *25/34;* B32B *5/14;15/04*

U.S. Cl. 428—152 **11 Claims**

1. A photoreflective sheet comprising a resin foam sheet, a continuous metal foil laminated on a first face of said resin foam sheet wherein the metal foil covers all of the first face of the resin foam sheet, and a thermally-shrinkable base cloth laminated on a second face of said resin foam sheet, wherein said metal foil has an uneven surface with creases to provide photodiffused reflection and wherein the creases are formed by thermally-shrinking said thermally-shrinkable base cloth laminated on said resin foam sheet.



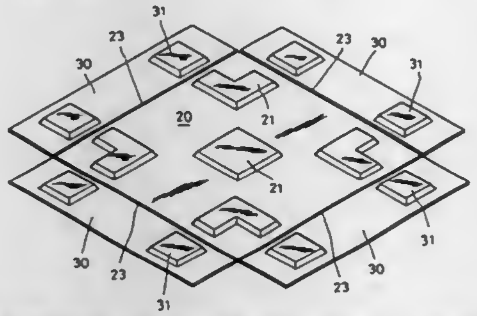
5,532,044
FOLDABLE PULP MOLDED CUSHIONING MATERIAL

Hsieh C. Jen, No. 22-26, Lin 1, Hsia-Tien Village, Hsin Wu Shian, Taoyuan Shien, Taiwan

Filed Dec. 6, 1994, Ser. No. 350,298

Int. Cl.^{6} B32B *3/28*

U.S. Cl. 428—167 **2 Claims**



1. A foldable pulp-molded cushioning material comprising a flat body on which a plurality of raised portions are formed to serve as shock absorbers and a plurality of notches are provided so as to allow said flat body to be folded along said notches to form a three-dimensional box-like means to wrap therein an article to be packed, whereby said folded pulp-molded cushioning material causes said article to be cushioned and protected from potential collisions and impacts that impinge upon it.

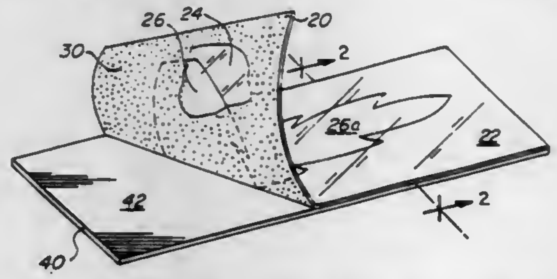
5,532,045
VEHICLE PART HAVING WEATHER SEALED MIRROR FINISH DECORATIVE PORTION INTEGRAL THEREWITH

Linwood E. Wade, Weston, Conn., assignor to Hicks & Otis Prints, Inc., Norwalk, Conn.

Division of Ser. No. 204,769, Mar. 2, 1994. This application Apr. 26, 1995, Ser. No. 429,518

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—187 **21 Claims**



1. A vehicle part having a weather sealed mirror finish decorative portion integral therewith, comprising a sheet of relatively clear, weather resistant polymeric material having two surfaces, an external surface and an internal surface and a sheet of a formable substrate material having a internal surface and an external surface wherein a portion of at least one of the internal surfaces of the polymeric material and the substrate material being metallized in a desired pattern, such that metallization is contained within the edge of the metallized material; the internal surface of the substrate material being adhered to the internal surface of the polymeric material such that the metallization is disposed between the polymeric material and the substrate material to form a sandwich; the sandwich being formed into a vehicle part having a weather sealed mirror finish decorative portion.

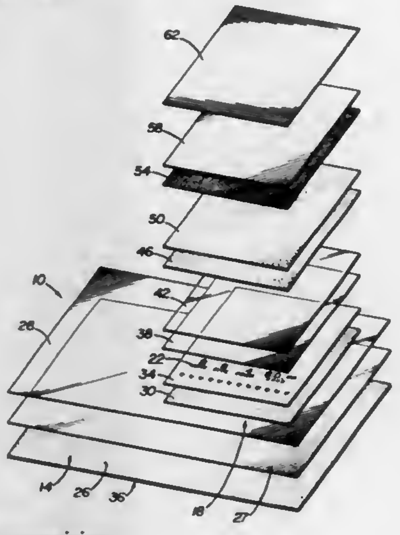
5,532,046
SIMULATED FOIL CARD

Benny R. Rich, Oakwood, and Jon M. Brawner, Duluth, both of Ga., assignors to Dittler Brothers Incorporated, Atlanta, Ga.

Continuation-in-part of Ser. No. 195,759, Feb. 14, 1994, abandoned. This application Jun. 16, 1994, Ser. No. 260,699

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 428—202 **3 Claims**



1. A card comprising:

a. a paper substrate;

b. an ink, applied atop the paper substrate, comprising metal particles suspended in a resinous binder;

c. an overcoat, applied atop the ink, comprising a resinous binder;

d. a vinyl chloride resin with titanium dioxide pigment applied atop the overcoat;

e. symbols printed atop the vinyl chloride resin;

f. a sealant applied atop the symbols;

g. a release coating applied atop the sealant; and

an opaque covering comprising a solvent-soluble synthetic rubber applied atop the release coating.

5,532,047
BIAXIALLY ORIENTED, LAMINATED POLYESTER FILM

Iwao Okazaki, Kyoto; Tohru Miyake, Otsu; Koichi Abe, Kyoto, and Keisuke Ohshima, Otsu, all of, Japan, assignors to Toray Industries, Inc., Japan

Filed Aug. 29, 1994, Ser. No. 297,611

Claims priority, application Japan, Aug. 30, 1993, 5-235879

Int. Cl.^{6} B32B *7/02*

U.S. Cl. 428—213 **12 Claims**

1. A biaxially oriented, laminated polyester film comprising:

at least two laminated polyester layers with at least one of said laminated polyester layers being biaxially oriented, said laminated polyester layers including two outermost layers, at least one of said outermost layers being a thin laminated layer A having a lamination thickness in the range of 0.01–3 μm, at least said thin laminated layer A containing internally formed particles, and

said thin laminated layer A further containing mono-dispersed particles having a mean degree of agglomeration of less than 5 and a mean primary particle diameter in the range of 0.05–3 μm, said mono-dispersed particles being present in the range of 0.01– 3% by weight.

5,532,048

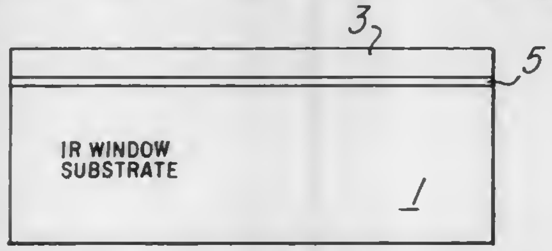
POLYMERIC INFRARED OPTICAL PROTECTIVE COATING

Paul Klocek, Dallas, and James T. Hoggins, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 939,256, Sep. 2, 1992, Pat. No. 5,324,586. This application Jan. 11, 1994, Ser. No. 180,091

Int. Cl.^{6} B32B *27/36*

U.S. Cl. 428—215 **8 Claims**



1. A method of protecting an optically transmissive surface, comprising the steps of:

(a) providing an optically transmissive surface for transmission of infrared light frequencies; and

(b) providing a polymer as a protective coating for said optically transmissive surface for transmission of infrared light frequencies which is optically transmissive in said infrared frequency range and which has low hardness, high strength and low elastic (Young's) modulus.

5,532,049

MAGNETIC RECORDING MEDIUM HAVING A CALENDERED POLYESTER LAYER WITH A SPECIFIED DEFORMATION RATIO

Narihiro Masuda, and Chikakazu Kawaguchi, both of Nagahama, Japan, assignors to Diafoil Hoechst Company, Limited, Tokyo, Japan

Filed Oct. 25, 1994, Ser. No. 329,156

Claims priority, application Japan, Nov. 1, 1993, 5-273753; May 25, 1994, 6-110867

Int. Cl.^{6} G11B *5/704*

U.S. Cl. 428—216 **10 Claims**

1. A magnetic recording medium comprising a biaxially oriented, laminated polyester film having a Young's modulus in the longitudinal direction of not less than 350 kg/mm^2, which is produced by coextrusion, comprising

a polyester A layer subject to plastic deformation by calendaring treatment at 60° to 100° C. under a linear pressure of from 100 to 300 kg/cm, and wherein the polyester A layer has a first thickness and a calendared thickness and wherein the plastic deformation ratio of said calendared thickness to said first thickness is less than 0.94, and

a polyester B layer comprising polyethylene terephthalates or polyethylene naphthalates, the polyester B layer containing particles having an average particle size of 0.001 to 5.0 μm; and

a magnetic layer formed on the surface of the polyester A layer and composed of a magnetic substance dispersed in a resin binder,

the thickness (t_A) of the polyester A layer in said magnetic recording medium and the thickness (t_M) of the magnetic layer in said magnetic recording medium satisfying the following formulae at the same time,

$$0.01\ \mu m \leqq t_M \leqq 2.0\ \mu m \qquad (1)$$

$$0.05\ \mu m \leqq t_A \qquad (2)$$

$$t_A + t_M \leqq 5\ \mu m \qquad (3).$$

5,532,050

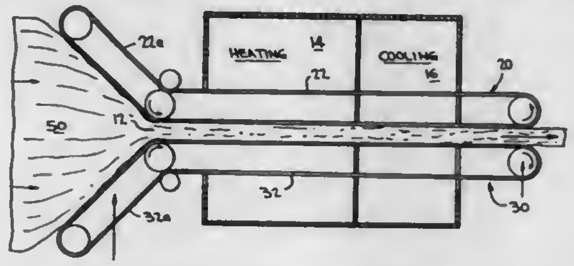
DENSIFIED THERMO-BONDED SYNTHETIC FIBER BATTING

Troy L. Brooks, Gastonia, N.C., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed Jun. 30, 1986, Ser. No. 880,276

Int. Cl.^{6} D04H *1/08*

U.S. Cl. 428—220 **15 Claims**



1. A stable, densified batting having substantial uniformity in thickness and controlled density throughout comprised of thermo-bonded, crimped, staple, manmade synthetic fibers having a denier of 4.5 to 40, a density greater than about 1.5 ounces per board foot, and a thickness greater than about 2.33 inches; said densified batting being a product made by providing a mixture of low-melting and high-melting crimped synthetic fibers, or high-melting crimped synthetic fibers coated with a low-melting material, said high-melting crimped synthetic fibers having a melting point at least 50° F. higher than the low-melting component; arranging said fibers as a batt, and compressing the batt to the extent that the batt has a height of at most one-third the height before compression and the batt has a density of at least about 1.5 ounces per board foot, and a thickness greater than about 2.33 inches; heating the batt by passing a hot fluid through the batt at a temperature above the melting point of said low-melting component, with said heating being below a temperature at which the crimp characteristics of the high-melting fibers are altered; and cooling the compressed batt below the melting point of said low-melting component to bond said high-melting fibers, with said cooling being such that the batt maintains its resiliency and with the batt bonding to provide a stable, densified batting.

5,532,051

STEEL SHEET EXCELLENT IN COATING SHARPNESS, DEFECT-FORMATION RESISTANCE AND WORKABILITY

Tetsuya Nishiura; Motofumi Kurahashi; Masanori Takemoto; Hiroyuki Kawano; Motohiro Nakayama, and Masato Yamada, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

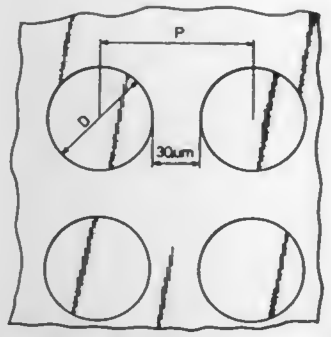
PCT No. PCT/JP92/01369, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO93/12897, PCT Pub. Date Jul. 8, 1993

PCT Filed Oct. 21, 1992, Ser. No. 256,226

Claims priority, application Japan, Dec. 25, 1991, 3-356482; Dec. 27, 1991, 3-358155

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—217 **8 Claims**



1. A steel sheet excellent in workability comprising recesses thereon which have each a flat portion at their bottom, form oil pools covering an area of at least 30% of the surface of the steel sheet and are uniformly distributed.

5,532,052

WARP-KNITTED CAMOUFLAGE MATERIAL

Kjell Eng, Mullsjö, and Erik Wallin, Gamleby, both of, Sweden, assignors to Barracuda Technologies AB, Gamleby, Sweden

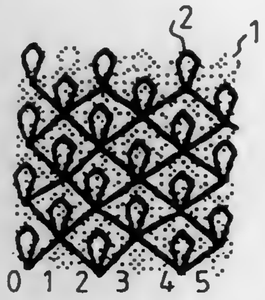
PCT No. PCT/SE94/00325, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/24510, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 13, 1994, Ser. No. 343,564

Claims priority, application Sweden, Apr. 15, 1993, 9301235-9

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 428—229 **8 Claims**



1. A camouflage material having a radar screening effect, comprising a warp knitted fabric in which at least a part of the yarn contains metal fibres, characterized in that the yarn containing the metal fibres is laid with a lay-out technique such that the sum of the extensions of said yarn will be essentially the same in each direction in the plane of the fabric.

5,532,053

HIGH MOISTURE TRANSMISSION MEDICAL FILM

Walter B. Mueller, Inman, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Mar. 1, 1994, Ser. No. 203,540

Int. Cl.^{6} B32B *27/02;27/08;27/36;* **C08G** *63/668*

U.S. Cl. 428—287 **10 Claims**

1. A laminate film comprising: a first layer, a second layer, and a third layer; with the first layer comprising a first polyetherester copolymer produced from the condensation reaction of dimethyl-1,4-cyclo hexane dicarboxylate and 1,4-cyclo hexane dimethanol and poly(tetramethylene ether glycol);

the second layer comprising a material selected from the group consisting of an ethylene-vinyl acetate copolymer, an ethylene methacrylate copolymer, an anhydride modified polyolefin copolymer, and a polyether block amide copolymer; and

the third layer comprising a blend of an ethylene methacrylate copolymer and a second polyetherester copolymer, wherein the second polyetherester copolymer is selected from the group consisting of: said first polyetherester copolymer; a block copolymer of polybutylene terephthalate and polyether glycols with the polybutylene terephthalate being formed from dimethyl terephthalate and 1,4-butane diol; and blends thereof; and

wherein the total amount of said first polyetherester copolymer in the laminate film is greater than or equal to about 35 wt. % with respect to the total weight of the laminate film, and wherein said laminate film has a moisture vapor transmission rate greater than or equal to about 750 grams/m^2 per 24 hours.

5,532,054

MOLDING MATERIAL

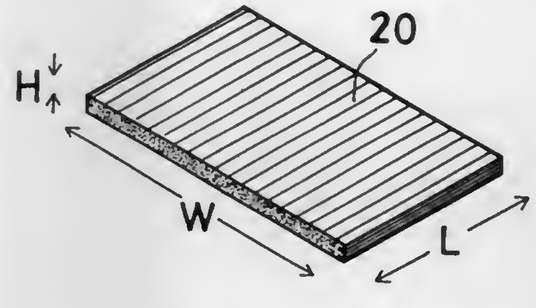
Tomohita Koba; Toshiyuki Nakakura, both of Yokohama; Hideo Sakai, Ebina; Misao Masuda, Fujisawa; Satoru Kishi, Yokosuka, and Chiaki Maruko, Kamakura, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 870,117, Apr. 17, 1992, abandoned, which is a continuation of Ser. No. 398,451, Aug. 25, 1989, abandoned. This application Sep. 16, 1994, Ser. No. 307,031

Claims priority, application Japan, Sep. 20, 1988, 63-237261

Int. Cl.^{6} D04H *1/00*

U.S. Cl. 428—294 **19 Claims**



1. A molding material having a three-dimensional shape with length, thickness and width dimensions, and a specific surface (SS) larger than 20 cm^2/g as defined by the equation $SS=2\{L\times H+W\times(L+H)\}/(L\times W\times H\times P)$ wherein L is the length dimension, H is the thickness dimension, W is the width dimension and P is the specific weight of the molding material, said material comprising reinforcing fibers, each fiber thereof comprising a plurality of filaments, and a thermoplastic resin coated around the filaments of the reinforcing fibers and impregnated therein, wherein the reinforcing fibers are uniformly dispersed and aligned uniformly either along the length of the molding material or along the width of the molding material, wherein the length of the reinforcing fibers ranges from 1 to 30 mm and is substantially the same as the length of the molding material when uniformly dispersed and aligned uniformly along the length of the molding material or substantially the same as the width of the molding material when uniformly dispersed and aligned uniformly along the width of the molding material, wherein the amount of reinforcing fibers ranges from 50 weight % to 90 weight % with the proviso that the amount and type of reinforcing fibers together with the amount and type of thermoplastic resin is selected to provide a specific weight for the molding material effective to provide a specific surface larger than 20 cm^2/g, and wherein the thickness of the molding material is shorter than 1 mm with the proviso that the length, width, and thickness of the molding material, together with the specific weight of the molding material, are selected to provide a specific surface of the molding material larger than 20 cm^2/g.

5,532,055

COMPOSITE FOAM MOLDED ARTICLE PROCESS FOR PRODUCTION THEREOF, AND FOAMABLE POWDER COMPOSITION

Toshio Igarashi, Kyoto; Sueharu Shinohara, Takatsuki; Masayuki Tatsumi, Ibaraki; Tadashi Hikasa, Sodegaura, and Hiroaki Mendori, Ichihara, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 886,410, May 21, 1992, abandoned. This application Nov. 13, 1992, Ser. No. 975,966

Claims priority, application Japan, May 23, 1991, 3-118712; Jun. 24, 1991, 3-151595; Aug. 29, 1991, 3-218506; Aug. 29, 1991, 3-218523; Nov. 21, 1991, 3-306163

Int. Cl.^{6} B32B *3/26;27/32*

U.S. Cl. 428—318.6 **8 Claims**

1. A foamable powder molding composition which comprises 2 to 11 parts by weight of a heat decomposable foaming agent and 100 parts by weight of a thermoplastic elastomer powder selected from the group consisting of (a) a composition of an ethylene-alpha-olefin copolymer rubber and a polyolefin resin, and (b) a composition obtained by partially cross-linking an ethylene-alpha-olefin copolymer rubber and a polyolefin resin, said thermoplastic elastomer powder having a complex dynamic viscosity $\eta^*(1)$ at 250° C. and a frequency of 1 radian/sec of not more than 1.5×10^5 poise and having a Newtonian viscosity index n, calculated by the following formula using the above-mentioned complex dynamic viscosity $\eta^*(100)$ at a frequency of 100 radians/sec, of not more than 0.67:

$$n=\{\log \eta^*(1)-\log \eta^*(100)\}/2$$

wherein the Mooney viscosity (ML_{1+4} 100° C.) of the ethylene-alpha-olefin copolymer rubber is 130 to 350.

5,532,056

FIXING BELT

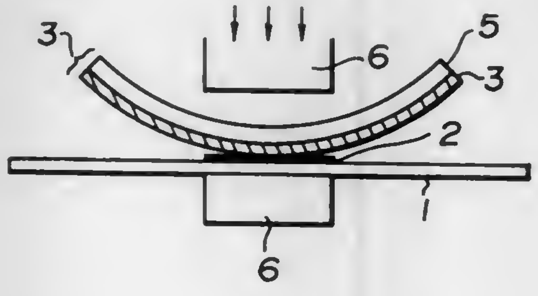
Makoto Satoh; Noboru Shimamoto, both of Annaka; Hiroshi Takei, Usui-gun, and Takeshi Hashimoto, Annaka, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,546

Claims priority, application Japan, Dec. 28, 1992, 4-361088

Int. Cl.^{6} B32B *15/08;* **G03G** *15/20*

U.S. Cl. 428—332 **11 Claims**



1. A fixing belt of comprising an endless body having a layer of fluorocarbonsiloxane rubber formed on the outer surface thereof wherein said fluorocarbonsiloxane rubber has a perfluoroalkyl ether and/or perfluoroalkyl group in a backbone.

5,532,057

INDIA-STABILIZED ZIROCONIA COATING FOR COMPOSITES

Robert L. Jones, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 198,702, Feb. 18, 1994, Pat. No. 5,418,060, which is a division of Ser. No. 589,230, Sep. 30, 1990, Pat. No. 5,288,205. This application Apr. 27, 1995, Ser. No. 430,049

Int. Cl.^{6} F01D *11/08*

U.S. Cl. 428—334 **3 Claims**

1. A composite structure comprising a self-supporting substrate and having improved resistance to corrosion from sodium vanadates and sodium sulfates, said composite structure comprising metal surfaces and including a coating of tetragonal zirconia, stabilized with about 2.5 and 20.0 mole percent india, on said surfaces, said coating being exposed to sulfate and vanadates under combustion conditions.

5,532,058

DRY-BONDED FILM LAMINATE EMPLOYING POLYURETHANE DISPERSION ADHESIVES WITH IMPROVED CROSSLINKERS

Thomas E. Rolando, Maple Grove; Peter A. Voss, Plymouth, and Christopher M. Ryan, Dayton, all of Minn., assignors to H. B. Fuller Licensing & Financing, Inc., Arden Hills, Minn.

Continuation-in-part of Ser. No. 43,565, Apr. 7, 1993, Pat. No. 5,494,960, and Ser. No. 973,221, Nov. 6, 1992, abandoned, which is a continuation of Ser. No. 624,618, Dec. 10, 1990, abandoned. This application Aug. 12, 1993, Ser. No. 105,441

Int. Cl.^{6} B32B *15/08;27/32;27/36;27/40*

U.S. Cl. 428—341 **21 Claims**

1. A dry-bonded film laminate comprising a pair of flexible film substrates bonded with a curable adhesive, prepared by blending two parts at the time of use,

the first part comprising a polyurethane polymer dispersed in an aqueous vehicle, the polymer having a plurality of carboxylic or sulfonic acid groups thereon which are neutralized with a tertiary amine, said neutralized carboxylate or sulfonic acid groups being derived from a polyol having at least one carboxylic or sulfonic acid group thereon, said polyol having been incorporated into said polyurethane polymer by reaction of the polyol with a polyisocyanate, and

the second part being a crosslinker for the polyurethane polymer of the first part and comprising a compound having a plurality of carbodiimide groups or a compound having a plurality of aziridine groups,

the laminate prepared by applying to a first flexible film substrate an aqueous dispersion of said two-parts; drying the applied adhesive; and then applying a second flexible film substrate to the dried adhesive.

5,532,059

POLY(P-PHENYLENE TEREPHTHALAMIDE) PULP

Kiu-Seung Lee, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1994, Ser. No. 315,180

Int. Cl.^{6} C08L *77/06;* **D02G** *3/00*

U.S. Cl. 428—359 **6 Claims**

1. A process for making a fibrous pulp of poly(p-phenylene terephthalamide) and poly(vinyl pyrrolidone) comprising the steps of:

(a) combining, with agitation, to establish an agitated polymerization system, a solvent for polymerization components and poly(vinyl pyrrolidone) having a viscosity average molecular weight of at least 100,000 to yield a concentration, in the polymerization system, of 5 to 30 weight percent, based on the weight of the polymer to be made;

(b) adding stoichiometric quantities of poly(p-phenylene terephthalamide) polymerization components to make reactive contact in the polymerization system;

(c) continuing reactive contact of the polymerization components for a time sufficient to (i) achieve an anisotropic polymerization system, (ii) permit complete reaction of the poly(p-phenylene terephthalamide) polymerization components, and (iii) combine the poly(p-phenylene terephthalamide) with the poly(vinyl pyrrolidone) to yield a solid polymerization system;

(d) breaking up the solid polymerization system; and

(e) separating a fibrous pulp of the combination of poly(p-phenylene terephthalamide) and poly(vinyl pyrrolidone) from the polymerization system.

5,532,060

CONTINUOUS HOLLOW FILAMENTS, YARNS, AND TOWS

Arun P. Aneja, Greenville; James H. Drew, Goldsboro, both of N.C., and Benjamin H. Knox, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 979,776, Nov. 9, 1992, Pat. No. 5,356,582, which is a continuation-in-part of Ser. No. 753,529, Sep. 3, 1991, Pat. No. 5,229,060, Ser. No. 753,769, Sep. 3, 1991, Pat. No. 5,261,472, Ser. No. 786,582, Nov. 1, 1991, Pat. No. 5,244,616, Ser. No. 786,583, Nov. 1, 1991, Pat. No. 5,145,623, Ser. No. 786,584, Nov. 1, 1991, Pat. No. 5,223,197, Ser. No. 786,585, Nov. 1, 1991, Pat. No. 5,223,198, Ser. No. 925,042, Aug. 5, 1992, abandoned, Ser. No. 925,041, Aug. 5, 1992, abandoned, and Ser. No. 926,538, Aug. 5, 1992, Pat. No. 5,219,736, said Ser. No. 786,582Ser. No. 786,583, Ser. No. 786,584, and Ser. No. 786,585, , each is a continuation-in-part of Ser. No. 338,251, Apr. 14, 1989, Pat. No. 5,066,447, which is a continuation-in-part of Ser. No. 53,309, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,363, Jan. 30, 1986, abandoned, said Ser. No. 925,042Ser. No. 925,041, and Ser. No. 926,538, , each is a continuation-in-part of Ser. No. 647,381, Jan. 29, 1991, abandoned, and Ser. No. 860,776, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,371, Jan. 29, 1991, abandoned. This application Aug. 12, 1994, Ser. No. 289,553

The portion of the term of this patent subsequent to Mar. 1, 2015, has been disclaimed.

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—398 **11 Claims**

1. A polyester continuous hollow filament yarn, wherein said polyester is of LRV about 13 to 23 with a zero-shear melting point ($T_M{}^{\circ}$) of about 240° to 265° C., and a glass-transition temperature (Tg) of about 40° C. to 80° C., the hollow filaments are of denier about 1 to about 5 and have one or more longitudinal voids with a void content (VC) comprising at least 10% of total filament volume, and said yarn is of elongation-to-break (E_B) about 40% to about 160%, tenacity-at-7% elongation (T_7) about 0.5 to 1.75 g/d, break tenacity $(T_B)_n$, normalized at 20.8 polymer LRV, of about 5 g/d or more, $(1-S/S_m)$ value of 0.4 or more, differential shrinkage (DHS-S) about +2% or less, where S is the boil-off shrinkage, S_m is the maximum shrinkage potential and DHS is the dry heat shrinkage (measured at 180° C.), and peak shrinkage tension temperature $T(ST_{max})$ about 5° to about 30° C. greater than the polymer glass transition temperature T_g.

5,532,061

CARBAMATE-FUNCTIONAL POLYESTER POLYMER OR OLIGOMER HAVING PENDANT CARBOMATE GROUPS

Gregory L. Menovcik, Farmington Hills, and Walter H. Ohrbom, Commerce Township, both of Mich., assignors to BASF Corporation, Southfield, Mich.

Filed Dec. 21, 1994, Ser. No. 361,245

Int. Cl.^{6} B32B *27/36;* **C08G** *63/02*

U.S. Cl. 428—423.1 **25 Claims**

1. A method of preparing a polyester having pendant carbamate groups comprising the steps of

(a) reacting a compound having a plurality of cyclic carbonate groups with ammonia, ammonium hydroxide, or a primary amine to ring open the cyclic carbonate groups to form a polyol having at least one pendant carbamate group, and

(b) reacting a mixture comprising the polyol from (a) having at least one pendant carbamate group appended thereto and a polyacid to form a polyester having pendant carbamate groups.

5,532,062

LOW EMISSIVITY FILM

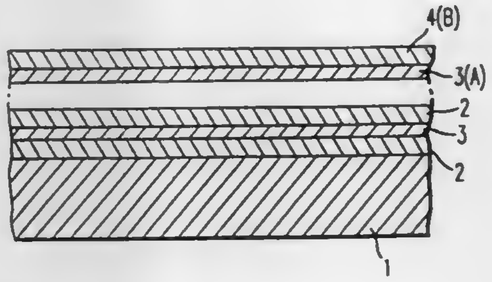
Masami Miyazaki, and Eiichi Ando, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 996,062, Dec. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 799,306, Nov. 27, 1991, Pat. No. 5,419,969, which is a continuation-in-part of Ser. No. 726,263, Jul. 5, 1991, Pat. No. 5,413,864. This application Sep. 14, 1994, Ser. No. 305,812

Claims priority, application Japan, Jul. 5, 1990, 2-176282; Nov. 27, 1990, 2-321273; Nov. 29, 1990, 2-325914; Jul. 5, 1991, 3-191063; Dec. 26, 1991, 3-357810; Sep. 9, 1992, 4-266689

Int. Cl.^{6} B32B *15/04*

U.S. Cl. 428—432 **21 Claims**



1. A low emissivity film comprising:

a substrate and a coating of an oxide film, a metal film, an oxide film and so on alternately formed on said substrate in this order in a total of (2n+1) layers where n is an integer being equal to or more than 1,

wherein an oxide film (B) formed on the side opposite to a metal film (A) being most remote from said substrate in view from the substrate, contains at least one layer of a zinc oxide film doped with at least one dopant selected from the group consisting of Si, Ti, Cr, B, Mg and Ga by 1 through 10 atomic % with respect to the total amount of dopant and Zn,

said oxide film (B) formed on the side opposite to a metal film (A) being most remote from the substrate having a thickness of 200 to 700 Å and said metal film having a thickness of 50 to 160 Å.

5,532,063
SILICON OXIDE DEPOSITING SOURCE AND COATED FILM

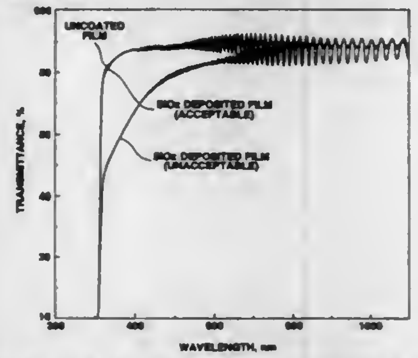
Toshihiko Shindoh, Annaka; Takeshi Kakegawa, Tomioka; Kazuhiko Urano; Toshimasa Okamura, both of Annaka; Tetsuo Suzuki, and Masatoshi Sato, both of Chigasaki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, and Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa-ken, both of, Japan

Filed Jul. 15, 1994, Ser. No. 276,058

Claims priority, application Japan, Jul. 20, 1993, 5-200318

Int. Cl.^{6} B32B *9/04;* C09D *1/00*

U.S. Cl. 428—446 **2 Claims**



1. A silicon oxide depositing source comprising a metallic silicon powder and a silicon dioxide powder both having a mean particle size of up to 10 μm, the atomic ratio of oxygen atom to silicon atom being from 1.5:1 to 1.7:1.

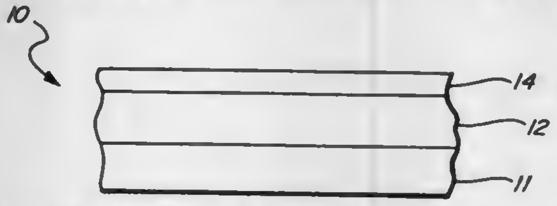
5,532,064
FILM ARTICLE

Michael J. Lubar, Endicott, N.Y., assignor to Azon Corporation, Johnson City, N.Y.

Continuation of Ser. No. 253,015, Jun. 2, 1994, abandoned. This application Oct. 10, 1995, Ser. No. 541,289

Int. Cl.^{6} B05D *5/04;* B41M *5/00*

U.S. Cl. 428—478.2 **16 Claims**



1. An ink jet recording medium comprising:

a film base;

an ink jet receiving layer supported by said film base, and including gelatin, water in the form of water of hydration, and an amide; whereby said amide causes said image receiving layer to retain said water of hydration.

5,532,065
COMPOSITE ARTICLE OF A CARRIER LAYER AND DECORATIVE LAYER, AND A PROCESS FOR ITS PRODUCTION

Franz Gübitz; Jean-Pierre Nething, both of Kelkelm, and Mathias Schremmer, Frankfurt am Main, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 958,288, Oct. 8, 1992, abandoned. This application Sep. 27, 1993, Ser. No. 127,086

Claims priority, application Germany, Oct. 10, 1991, 41 33 600.3

Int. Cl.^{6} B32B *27/36*

U.S. Cl. 428—480 **8 Claims**

1. A composite article comprising:

a voidless carrier layer comprising a thermoplastic polyester wherein the carrier layer is produced by extrusion or injection molding of a thermoplastic melt, wherein the thermoplastic melt consists essentially of:

a) a thermoplastic polyester,

b) optionally, up to 50% by weight based on the total weight of the sum of a)+b) of another polymer material which is compatible with the thermoplastic polyester, and

c) optionally, up to 50% by weight, based on the total weight of the carrier layer, of reinforcing additives, filling additives, other auxiliaries or mixtures thereof; and

a decorative layer which comprises a plurality of layers, wherein each layer of the decorative layer consists essentially of a polyester material or a polyurethane foam, wherein

the polyurethane foam is based on polyesters containing hydroxyl groups or polyethers containing hydroxyl groups;

the outer layer of the decorative layer comprises a textile material;

the carrier layer is firmly secured to the decorative layer which is in contact with it; and

each of the layers is formed from a composition which can be recycled to produce a structural element which is mechanically sound.

5,532,066
LAMINATE OF ETHYLENE-ALKYL ACRYLATE COPOLYMER AND POLYESTER

Jerry G. Latiolais, Groves; J. Paul Gathright, Orange; Nicholas R. Galante, Orange; M. Stephen Galland, Orange; J. Diores Gallet, Orange; Lewis R. Compton, Orange; George L. Baker, Bridge City, all of Tex., and James H. Wang, Appleton, Wis., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 233,180, Apr. 26, 1994, which is a continuation-in-part of Ser. No. 764,861, Sep. 24, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 462,335

Int. Cl.^{6} B32B *27/08;27/30;* C08F *20/18;10/02*

U.S. Cl. 428—483 **6 Claims**

1. A laminate comprising:

A) a first film comprising a copolymer of ethylene and alkyl acrylate polymerized by feeding different ratios of ethylene to alkylacrylate comomer in at least two reaction zones of a multi-zone autoclave reactor;

B) a second film comprising polyester; wherein said second film is coextruded with and is contiguous to said first film, and the adhesive strength between said first film and said second film is at least about twice the adhesive strength of a reference composition which comprises a first film comprising said polyester and a coextruded contiguous second film comprising a reference copolymer of ethylene and alkyl acrylate, wherein said reference copolymer has the same amount and type of alkyl acrylate and ethylene, and wherein said reference copolymer is made in a multi-zone autoclave reactor where the ratio of alkyl acrylate to ethylene in a reaction zone is about equal to the overall ethylene to alkyl acrylate ratio fed to the multi-zone autoclave reactor.

5,532,067
COMPATIBLE POLYMER BLENDS

Jens-Dieter Fischer, Bickenbach, and Werner Siol, Darmstadt-Eberstadt, both of, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Continuation of Ser. No. 2,319, Jan. 8, 1993, Pat. No. 5,380,801, which is a division of Ser. No. 718,435, Jun. 20, 1991, Pat. No. 5,218,050. This application Aug. 22, 1994, Ser. No. 292,963

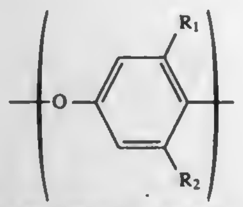
Claims priority, application Germany, Jun. 20, 1990, 40 19 626.7

Int. Cl.^{6} C08L *33/08;33/10;71/12;77/00*

U.S. Cl. 428—500 **12 Claims**

1. A polymer article having a layer of polyaryl(meth)acrylate copolymer over a surface containing polyphenylene ether and polyamide, comprising:

A) said polyphenylene ether having monomer units of formula (I)

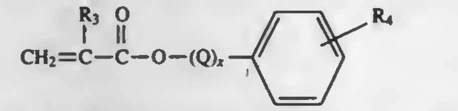


(I)

wherein R_1 and R_2 are methyl, isopropyl, C_{1-8}-cycloalkyl, C_{1-8}-alkoxy, C_{6-10}-aryl or chlorine, and

B) said polyaryl(meth)acrylate copolymer which is miscible with said polyphenylene ether comprising:

b1) 99.9–35 wt. % of monomer units having formula (II)



(II)

wherein R_3 is hydrogen or methyl, Q is a C_{1-6}-alkylidene group or the group —$(CH_2)_m$—O—, wherein m is a number from 2 to 6, x is zero or 1 and R_4 is hydrogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-6}-alkylamino or C_{1-6}-alkylamino substituted at nitrogen with a C_{-1-6}-alkyl group, and

b2) 0.1–65 wt. % of comonomers capable of absorbing UV light or low molecular weight UV absorbing compounds, or mixtures thereof.

5,532,068
RESIN COMPOSITE AND GASKET

Masabumi Oshima, and Yoshiyuki Watanabe, both of Nagoya, Japan, assignors to Mitsubishi Chemical MKV Company, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,834

Claims priority, application Japan, Jan. 25, 1994, 6-006263; Feb. 21, 1994, 6-022829; Nov. 10, 1994, 6-276614

Int. Cl.^{6} B32B *27/08;27/30;27/22*

U.S. Cl. 428—520 **14 Claims**

1. A resin composite having a soft resin composition combined to a hard resin, wherein the soft resin composition consists essentially of 100 parts by weight of a vinyl chloride resin, from 10 to 400 parts by weight of a rubber material containing at least 30 wt % of a tetrahydrofuran-insoluble rubber component and from 30 to 300 parts by weight of a plasticizer, and the hard resin consists of a chlorinated vinyl chloride resin, or a mixture of a chlorinated vinyl chloride resin and a vinyl chloride resin in which the chlorinated vinyl chloride resin is in an amount of at least 20 wt %.

5,532,069
ALUMINUM ALLOY AND METHOD OF PREPARING THE SAME

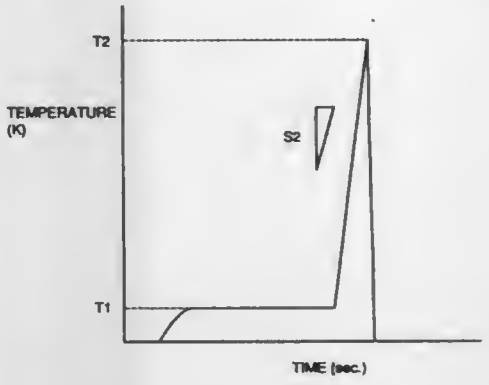
Tsuyoshi Masumoto, 8-22, Kamisugi 3-chome, Aoba-ku, Sendai-shi, Miyagi-ken; Akihisa Inoue, c/o Tohoku University Institute for Material Research, 1-1, Katahira 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken; Toshihiko Kaji, Hyogo-ken; Junji Iihara, Hyogo-ken, and Yoshishige Takano, Hyogo-ken, all of, Japan, assignors to Tsuyoshi Masumoto, and Akihisa Inoue, both of Sendai, Japan

Filed Dec. 22, 1994, Ser. No. 363,367

Claims priority, application Japan, Dec. 24, 1993, 5-328222

Int. Cl.^{6} B22F *3/24*

U.S. Cl. 428—552 **21 Claims**



1. A method of preparing a dispersion-strengthened aluminum alloy having a composite structure containing a matrix of α-aluminum and not more than 35 vol. % of a precipitation phase of an intermetallic compound, said method comprising:

(a) preparing a sample to be treated, of gas-atomized powder containing at least 10 vol. % of an amorphous phase;

(b) heat treating said sample at an elevated first temperature above room temperature;

(c) heat treating said sample at a second temperature greater than said first temperature; and

(d) performing hot plastic working on said sample.

18. A dispersion-strengthened aluminum alloy having a composite structure containing a matrix of α-aluminum and not more than 35 vol. % of a precipitation phase of an intermetallic compound, wherein said α-aluminum has a crystal grain size not more than 200 nm, and wherein said precipitation phase has an aspect ratio of not more than 3.0 and a crystal grain size not more than half of said crystal grain size of said α-aluminum.

5,532,070
SOLDER-PRECOATED CONDUCTOR CIRCUIT SUBSTRATE AND METHOD OF PRODUCING THE SAME

Shinji Takahashi, Ogaki, and Toshihisa Tuchiya, Ibi-gun, both of, Japan, assignors to Ibiden Co., Ltd., Ogaki, Japan

PCT No. PCT/JP93/00736, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO93/25060, PCT Pub. Date Dec. 9, 1993

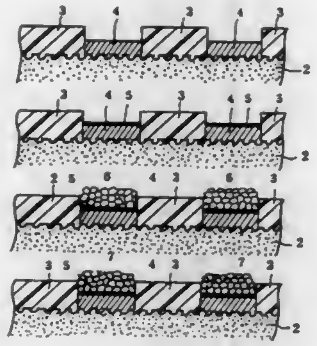
PCT Filed Jun. 1, 1993, Ser. No. 338,531

Claims priority, application Japan, Jun. 2, 1992, 4-165479; Feb. 22, 1993, 5-032085

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—643 **13 Claims**

1. A solder-precoated conductor circuit substrate formed by previously disposing a solder layer required for mounting onto conductors for the connection of an electronic component, said solder layer comprising an Sn thin-film layer and a Pb-coated Sn layer in which at least a part of Sn crystal grains is coated with Pb film.



5,532,071

PROCESS FOR SEALING HIGH-TEMPERATURE FUEL CELLS

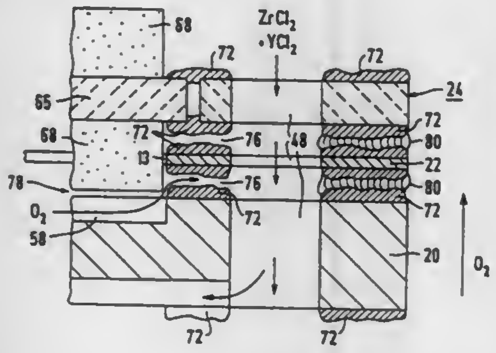
Uday Pal, Needham, Mass.; Harald Landes, Rückersdorf, and Horst Greiner, Forchheim, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 19, 1995, Ser. No. 426,561

Claims priority, application Germany, Oct. 28, 1992, 42 36 441.8; Sep. 20, 1993, 43 31 912.2

Int. Cl.^{6} H01M *8/04*

U.S. Cl. 429—12 **23 Claims**



1. In a process for sealing leaks in at least one of gas spaces and gas channels located between individual components of high-temperature fuel cells having electrolyte material, a bipolar plate and electrodes each containing at least one metal, the improvement which comprises:

introducing at least first and second different gases at high temperature from the outside into at least one of the gas spaces and gas channels to be sealed off from one another, for flushing every leak with the first gas on one side of said space or channel and with at least the second gas on the other side of said space or channel;

the first gas comprising at least one gaseous compound to be oxidized to form at least one of a metal ion-conducting and an oxygen ion-conducting oxide, and at least the second gas comprising oxygen and/or being able to give off oxygen; and

the first gas comprising at least one metal selected from the group consisting of at least one oxidizable compound selected from the group of metals consisting of the electrolyte material, the bipolar plate, the electrodes, and one element of the group consisting of zirconium, nickel, calcium, magnesium, cerium and rare earth metal.

5,532,072

SERIALLY ARRANGED FUEL CELLS FOR LARGE SCALE POWER GENERATION

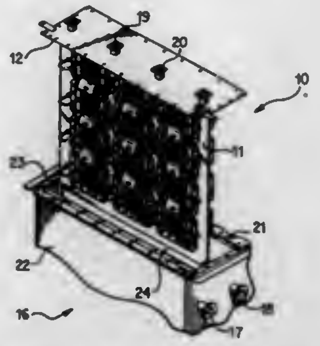
Richard Spaeh, Ueberlingen; Manfred Westphal, Bermatingen; Erich Erdle, Immenstaad, and Klaus-Peter Zurell, Friedrichshafen, all of, Germany, assignors to Dornier GmbH, Friedrichshafen, Germany

Filed Jul. 25, 1994, Ser. No. 279,650

Claims priority, application Germany, Jul. 24, 1993, 43 24 907.8

Int. Cl.^{6} H01M *2/00*

U.S. Cl. 429—34 **12 Claims**



1. A serially arranged fuel cell apparatus for power generation, comprising fuel cells in a flat configuration in blocks constituting modular units and operatively associated with fuel gas and oxidation gas conducting devices, electric connections, carrier structures, sealing elements and thermal insulation, gastight connection elements operatively associated with the modular units for fuel gas and exhaust gas and pipes are associated with the elements for feeding fuel gas and returning exhaust gas, wherein a front side and a rear side of the fuel cell blocks are physically separated to provide a pressure difference therebetween so that air flows through the corresponding ducts of individual fuel cells, without connection elements for conducting incoming and outgoing air, and a carrier plate arranging to separate spaces between the front side and the rear side and for fixing the fuel cell blocks and the associated fuel gas feeding pipes.

5,532,073

FUEL CELL

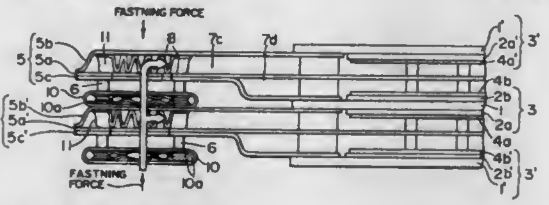
Haruhiko Hirata; Michio Hori, both of Kanagawa-ken, and Toru Umiji, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Nov. 28, 1994, Ser. No. 348,968

Claims priority, application Japan, Nov. 29, 1993, 5-297976

Int. Cl.^{6} H01M *8/04;8/02*

U.S. Cl. 429—34 **26 Claims**



1. A fuel cell comprising:

a plurality of unit cells stacked in layers, each of said unit cells including an electrolyte, a pair of electrodes, a first primary surface and a second primary surface;

a plurality of separator elements interposed between fuel gas channel in fluid communication with said first primary surface of each of said unit cells and an oxidant gas channel in fluid communication with said second primary surface of each of said unit cells; and

manifold portions, each of said manifold portions contacting said separator elements to form a gas-tight fluid communication with said fuel gas channel and said oxidant gas channel via holes formed in said separator elements,

each of said manifold portions including a dielectric manifold ring, a spacer arranged between a pair of the separator elements so that the spacer contacts the pair of separator elements, and a manifold portion fastener for fastening said manifold portion by pressing the pair of separator elements toward the spacer so that opposite surfaces of said spacer contact respective surfaces of the pair of separator elements.

5,532,074

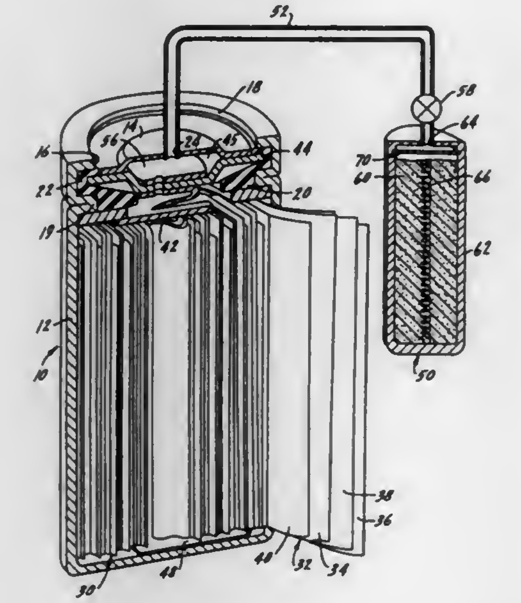
SEGMENTED HYDRIDE BATTERY

P. Mark Golben, Florida, N.Y., assignor to Ergenics, Inc., Ringwood, N.J.

Filed Jun. 27, 1994, Ser. No. 267,038

Int. Cl.^{6} H01M *10/52*

U.S. Cl. 429—53 **19 Claims**



1. A segmented metal hydride battery system comprising:

a) a containment can;

b) a stack of hydrogen-metal oxide cells, defining a hydrogen-metal oxide battery, disposed within the containment can, each-said cell comprising at least a positive and a negative electrode;

c) a hermetically enclosed hydrogen storage vessel containing a metal hydride material for retaining and storing a concentrated volume of hydrogen, said metal hydride material being capable of releasably absorbing and discharging gaseous hydrogen, and including an aperture in the vessel;

d) a communication means disposed between said hydrogen-metal oxide battery, and the enclosed hydrogen storage vessel for permitting a reversible communication of a hydrogen gas stream flow between them;

e) a means for selectively opening and closing said communication means to permit and restrict hydrogen gas flow between the hydrogen battery and the enclosed hydrogen storage vessel; and

f) a filter comprising a thin film material disposed in the hydrogen gas stream flow between the hydrogen battery and the enclosed metal hydride material, the filter being capable of diffusing hydrogen therethrough but being essentially impervious to oxygen, carbon dioxide and water vapor, said filter providing an effective enclosure for inhibiting oxygen, carbon dioxide and water vapor from reaching the metal hydride, hydrogen storage material.

5,532,075

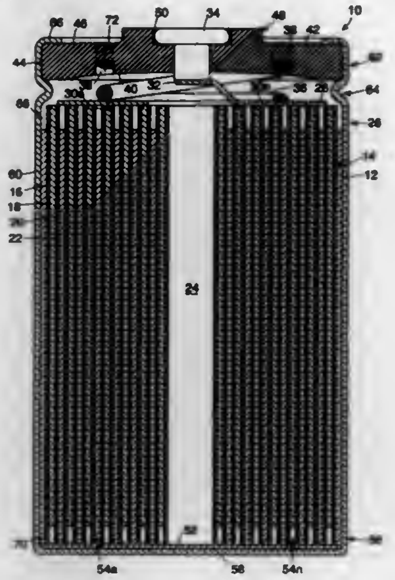
SMALL BATTERY CELL

Richard B. Alexandres, Clear Lake, Iowa, and Elmer Hughett, Oneida, Tenn., assignors to Alexander Manufacturing Corporation, Mason City, Iowa

Filed Jul. 6, 1994, Ser. No. 271,416

Int. Cl.^{6} H01M *2/12;6/10*

U.S. Cl. 429—54 **14 Claims**



1. A battery cell comprising:

a. a case;

b. an electrode assembly comprising a positive electrode and a negative electrode disposed within said case;

c. a positive current collector within said case in firm engagement with said positive electrode;

d. a negative current collector within said case in firm engagement with said negative electrode;

e. a cover at an end of said case, said cover being spaced from said positive current collector;

f. a positive contact member extending through said cover;

g. a flexible electrical conductor member connecting said positive current collector to said positive contact member; and,

h. a spring positioned between said positive current collector and said cover and bearing against said cover and said positive current collector and urging said positive current collector into said firm engagement with said positive electrode, said positive current collector being held in said firm engagement with said positive electrode solely by the force exerted on said positive current collector by said spring, whereby upon occurrence of a force sufficient to overcome the tension of said spring, said positive current collector will move out of engagement with said positive electrode, and upon cessation of said force sufficient to overcome the tension of said spring, said spring will again force said positive current collector into said firm engagement with said positive electrode.

5,532,076

HYDROGEN STORAGE ALLOY AND ELECTRODE THEREFROM

Yasuharu Yamamura, Katano; Hajime Seri, Izumiotsu; Yoichiro Tsuji, Hirakata; Naoko Owada, Katano, and Tsutomu Iwaki, Yawata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Mar. 29, 1994, Ser. No. 219,697

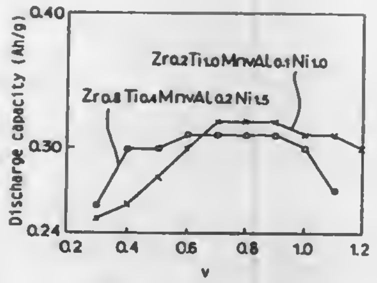
Claims priority, application Japan, Apr. 20, 1993, 5-092865

Int. Cl.^{6} H01M *4/38*

U.S. Cl. 429—59 **11 Claims**

1. A hydrogen storage alloy represented by the general formula:

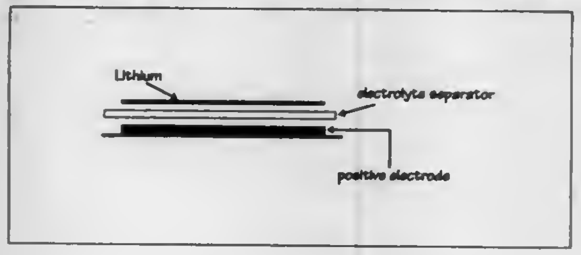
$$Zr_{1.2-a}Ti_aMn_vAl_wNi_xM_yCr_z$$



wherein M represents at least one element selected from the group consisting of Si, Zn, Sn, Fe, Mo, and Cu; and wherein $0.1 \leqq a \leqq 1.2$, $0.4 \leqq v \leqq 1.2$, $0 < w \leqq 0.3$, $0.8 \leqq x \leqq 1.6$, $0 \leqq y \leqq 0.2$, $0 \leqq z \leqq 0.3$, and $1.7 \leqq (v+w+x+y+z) \leqq 2.7$; said alloy having at least one of a Laves phase which has a crystal structure of the $MgZn_2$-type (C14) and a Laves phase which has a crystal structure of the $MgCu_2$-type (C15).

5,532,077
RECHARGEABLE POSITIVE ELECTRODE

May-Ying Chu, Oakland, Calif., assignor to PolyPlus Battery Company, Inc., Berkeley, Calif.
Division of Ser. No. 344,384, Nov. 23, 1994. This application May 25, 1995, Ser. No. 450,988
Int. Cl.^{6} H01M *4/60*
U.S. Cl. 429—102 **37 Claims**



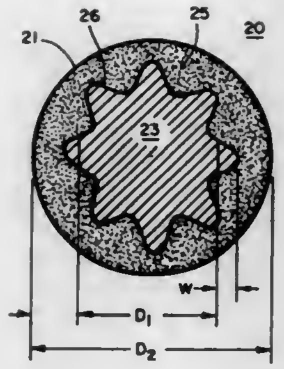
Schematic of a Li / electrolyte separator / sulfur electrode cell.

1. A positive electrode comprising,
a) active-sulfur;
b) an electronically conductive material mixed with the sulfur so that electrons can move between the sulfur and the electronically conductive material; and
c) an ionically conductive material mixed with the active-sulfur so that ions can move between the ionically conductive material and the sulfur, wherein at least about 10% of the active-sulfur is accessible to electrons and ionic charge carriers.

5,532,078
ELECTROCHEMICAL CELL

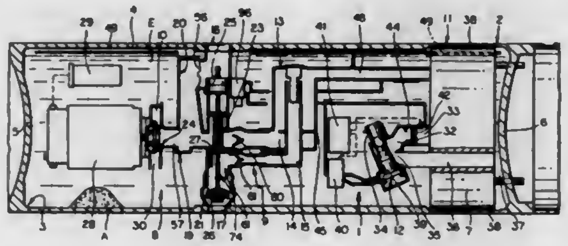
Laszlo L Redey; Kevin M. Myles, both of Downers Grove; Donald R. Vissers, Naperville, and Jai Prakash, Downers Grove, all of Ill., assignors to The University of Chicago, Chicago, Ill.
Continuation-in-part of Ser. No. 901,547, Jun. 19, 1992, Pat. No. 5,283,135, which is a continuation-in-part of Ser. No. 830,719, Feb. 4, 1992, Pat. No. 5,340,668, which is a continuation-in-part of Ser. No. 774,204, Oct. 10, 1991, abandoned. This application Sep. 26, 1994, Ser. No. 312,053
Int. Cl.^{6} H01M *6/20*
U.S. Cl. 429—104 **45 Claims**

1. An electrochemical cell comprising a positive electrode, a negative electrode of an alkali metal and a compatible electrolyte including an alkali metal salt molten at cell operating temperature, said electrolyte being at least partially present as a corrugated β" alumina tube in sealing contact with an α-alumina header.



5,532,079
ELECTROLYTE-ACTIVATED BATTERY

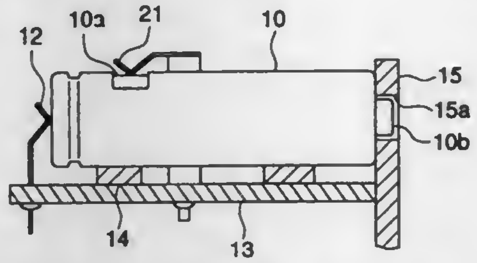
Slivano Tribioli; Vito Giardinelli, both of Leghorn; Francesco Rocco, and Franco Cerrano, both of Turin, all of, Italy, assignors to Whitehead Alenia Sistemi Subacquei S.p.A., Genoa, and Microtecnica S.p.A., Turin, both of, Italy
Filed Feb. 24, 1995, Ser. No. 393,871
Claims priority, application Italy, Feb. 25, 1994, TO94A0127
Int. Cl.^{6} H01M *6/34*
U.S. Cl. 429—119 **12 Claims**



1. An electrolyte-activated battery, particularly for the propulsion of underwater systems, and comprising:
an electrochemical cell (**7**);
a reservoir (**8**) containing at least one anhydrous alkaline compound (A) dissolvable in sea water to form a liquid electrolyte (E); and
a system (**9**) for forming and circulating the liquid electrolyte (E) between the reservoir (**8**) and the electrochemical cell (**7**);
said system (**9**) in turn comprising:
an inlet conduit (**20**) communicating with the outside environment;
a pump (**10**) for circulating the electrolyte (E), and connected at an intake side to the inlet conduit (**20**), and at a delivery side to the reservoir (**8**);
electrolyte temperature regulating means (**11**, **12**, **40**, **41**) interposed between the reservoir (**8**) and an inlet of the electrochemical cell (**7**);
a gas separator (**13**) presenting an inlet (**46**) connected to an outlet of the electrochemical cell (**7**);
a gaseous phase outlet (**15**) connected to the outside environment; and a liquid phase outlet (**14**); and
a switching device (**95**) for selectively connecting the liquid phase outlet (**14**) of the gas separator (**13**) to the intake side (**24**) of the pump (**10**);
characterized in that said battery comprises connecting means (**21**) for connecting said liquid phase outlet (**14**) of said gas separator (**13**) to the outside environment; said switching device (**95**) comprising closure means (**27**) for selectively connecting said liquid phase outlet (**14**) of said gas separator (**13**) to said inlet conduit (**20**) and to said means (**21**) for connection to the outside environment.

5,532,080
CYLINDRICAL TYPE DRY BATTERY AND BATTERY CHAMBER

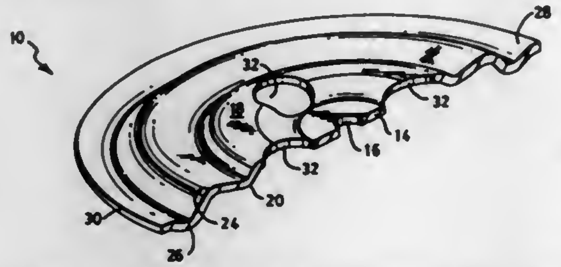
Shuri Mizoguchi; Ken Ishida; Kazuo Todo; Kiyoaki Hazama, and Koujiro Yoshida, all of Hino, Japan, assignors to Konica Corporation, Japan
Filed Jun. 23, 1994, Ser. No. 264,723
Claims priority, application Japan, Jul. 2, 1993, 5-164737; Oct. 14, 1993, 5-257243
Int. Cl.^{6} H01M *2/02*
U.S. Cl. 429—164 **7 Claims**



1. An electrical power source circuit for use with a dry battery, comprising:
the dry battery including
a cylindrical housing,
a first end plate provided at one end of the cylindrical housing,
a first terminal provided on the first end plate so as to protrude from the first end plate, the first terminal having a cylindrical side wall and a tip end plate provided at one end of the cylindrical side wall, wherein the cylindrical housing, the first end plate, the cylindrical side wall and the tip end plate each made of a conductive material are electrically connected with each other so as to form a first conductive surface, and
a second end plate provided at the other end of the cylindrical housing, the second end plate electrically isolated from the first conductive surface and used as a second terminal;
a first contactor arranged to come in contact with a part of the first conductive surface other than the tip end plate of the first electrode; and
a second contactor arranged to come in contact with the second end plate.

5,532,081
UPWARD DEFLECTING SUPPORT DISK FOR ELECTROCHEMICAL CELL SEAL

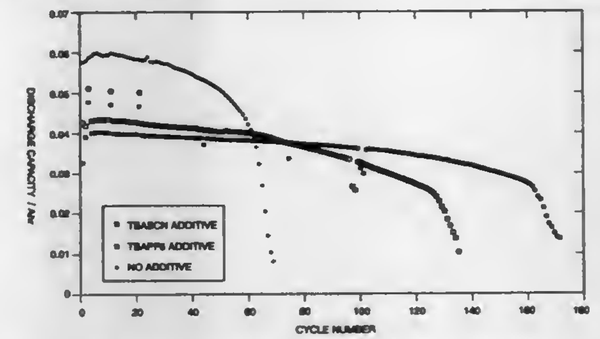
Christopher L. DePalma, Framingham, Mass.; Peter J. Pope, Balcombe, England; Sean A. Sargeant, Westford; Marian Wlacek, Holliston, both of Mass., and Robert A. Yoppolo, Woonsocket, R.I., assignors to Duracell Inc., Bethel, Conn.
Filed Aug. 24, 1994, Ser. No. 295,313
Int. Cl.^{6} H01M *2/04*
U.S. Cl. 429—171 **33 Claims**



1. A support useful in sealing an electrochemical cell comprises a generally planar disk having a central, circular platform connected to an outer sealing edge by an annular flexure means which permits radial inward and outward movement of said edge, said flexure means comprising a sequence of concentric, annular, curved ribs, wherein adjacent ribs have different curvature and wherein at least two adjoining ribs are connected by a ring angled upward from the plane of said disk.

5,532,082
SOLID ELECTROLYTES CONTAINING TETRABUTYL AMMONIUM THIOCYANATE AND ELECTROCHEMICAL CELLS PRODUCED THEREFROM

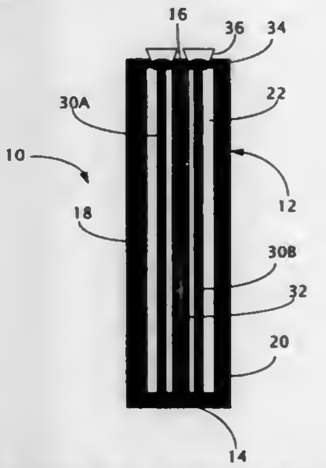
Eileen S. Saidi, 492 Capitol Village Cir., San Jose, Calif. 95136
Filed Jun. 27, 1994, Ser. No. 267,067
Int. Cl.^{6} H01M *6/18*
U.S. Cl. 429—192 **16 Claims**



1. A solid solvent-containing electrolyte which comprises:
a solid polymeric matrix;
a suitable-electrolytic solvent;
a source of lithium cations; and
a source of thiocyanate anions, said source of thiocyanate anions being tetrabutyl ammonium thiocyanate.

5,532,083
FLEXIBLE CARBON FIBER ELECTRODE WITH LOW MODULUS AND HIGH ELECTRICAL CONDUCTIVITY, BATTERY EMPLOYING THE CARBON FIBER ELECTRODE, AND METHOD OF MANUFACTURE

Francis P. McCullough, 104 Fir Dr., Lake Jackson, Tex. 77566
Filed Jul. 26, 1994, Ser. No. 280,708
Int. Cl.^{6} H01M *6/42;6/48*
U.S. Cl. 429—210 **27 Claims**



26. A bipolar secondary energy storage device comprising a gas and water vapor impervious housing, said housing forming a chamber an interior surface of which is electrically non-conductive, at least one electrically insulating separator wall for separating the chamber into at least a pair of terminal cells, each terminal cell containing a terminal electrode which is provided with a current collector, and each said terminal electrode being electrically connected to a terminal on the exterior of the housing to facilitate the flow of stored energy out of and the charge of

energy into the storage device, a bipolar electrode extending from one terminal cell into the adjacent terminal cell and forming counter electrodes with each said terminal electrode, wherein said terminal electrodes and said counterelectrodes in each cell are electrically isolated or insulated from each other, said bipolar electrode being formed of an electrically conductive carbon article that is flexible and has a Young's modulus of less than 1 MM psi (6.89 GPa), and an electrolyte in each cell comprising an ionizable salt in a non-aqueous liquid or paste.

5,532,084

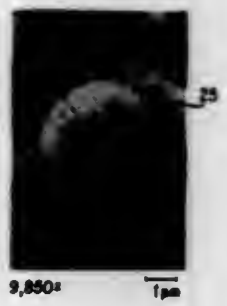
MANGANESE DIOXIDE PRODUCT

Enoch I. Wang, Mansfield, Mass.; William L. Bowden, Nashua, N.H., and Lifun Lin, Lincoln, Mass., assignors to Duracell Inc., Bethel, Conn.

Continuation-in-part of Ser. No. 237,434, May 3, 1994, Pat. No. 5,482,796, which is a division of Ser. No. 122,966, Sep. 20, 1993, Pat. No. 5,348,726, which is a division of Ser. No. 952,034, Sep. 28, 1992, Pat. No. 5,277,890. This application May 22, 1995, Ser. No. 446,370

Int. Cl.^{6} H01M *4/50;* **C01G** *45/02*

U.S. Cl. 429—224 **14 Claims**



1. A particulate MnO_2 material comprising particles having filamentary protrusions of MnO_2 jutting out from the surfaces of said particles, wherein at least the majority by weight of the MnO_2 in said filamentary protrusions is ramsdellite MnO_2.

5,532,085

ADDITIVES FOR ALKALINE ELECTROCHEMICAL CELLS HAVING MANGANESE DIOXIDE CATHODES

Stuart M. Davis, Norfolk; Christopher P. Haines, Westford; Alexander A. Leef, Waltham, all of Mass., and Peter R. Moses, Windham, N.H., assignors to Duracell Inc., Bethel, Conn.

Filed Aug. 22, 1995, Ser. No. 518,120

Int. Cl.^{6} H01M *4/50;4/42*

U.S. Cl. 429—224 **14 Claims**

1. An electrochemical cell comprising an anode, an aqueous alkaline electrolyte solution, a separator and a cathode comprising manganese dioxide, said cathode further comprising an additive selected from the group of compounds consisting of $CaWO_4$, $MgTiO_3$, $BaTiO_3$, $CaTiO_3$, $ZnMn_2O_4$, and $Bi_{12}TiO_{20}$, and combinations thereof.

5,532,086

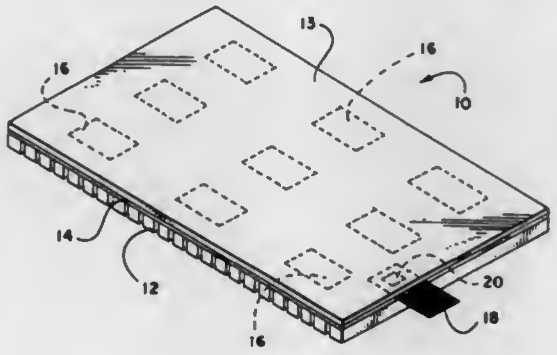
ANODE ASSEMBLY WITH THIN METAL CURRENT COLLECTOR AND ELECTROCHEMICAL CELL COMPRISING AN ANODE SUPPORT STRUCTURE AND A GAS RELEASE SYSTEM

William C. Thibault, Powder Springs, and Edward S. Buzzrelli, Kennesaw, both of Ga., assignors to AER Energy Resources, Inc., Atlanta, Ga.

Filed Jun. 30, 1994, Ser. No. 269,658

Int. Cl.^{6} H01M *4/66*

U.S. Cl. 429—245 **59 Claims**



39. An electrochemical cell comprising:

a. a case;

b. a cathode disposed in the cell case;

c. an anode disposed in the cell case, the anode comprising:
  an anodic layer of a metal which is capable of being oxidized in the cell to produce electricity during discharge of the cell; and a current collector layer of metal capable of conducting electricity produced during discharge of the cell but not being oxidized during discharge of the cell, the current collector layer extending adjacent one side of the anodic layer;

d. electrolyte disposed in the cell case between the anode and the cathode; and

e. a rigid support comprising a material that is not capable of being oxidized during discharge of the cell, the rigid support extending adjacent one side of the current collector layer so that the current collector layer is sandwiched between the anodic layer and the rigid support, the anode being between the cathode and the rigid support; the cell case having an opening for releasing gas produced at the anode, and the rigid support mounted in the case and spaced apart from at least a portion of the case so as to form a flow path for the gas to follow from the anode, to and through the opening in the case.

5,532,087

ELECTROCHEMICAL CELL

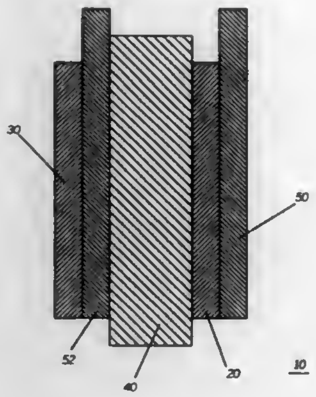
John E. Nerz, Hawthorn Woods; Han Wu, Barrington, and Sanjay Goel, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1994, Ser. No. 362,347

Int. Cl.^{6} H01M *4/70;4/74*

U.S. Cl. 429—248 **5 Claims**

1. An electrochemical cell having a first zinc foil electrode, a second electrode, and a separator disposed therebetween, said electrochemical cell further including a current collecting layer disposed between said separator and said first zinc foil electrode.



5,532,088

SHADOW MASK PLATE MATERIAL AND SHADOW MASK

Koichi Teshima; Yoshinori Fujimori, both of Tokyo; Shin-ichi Nakamura, Yokohama; Masayuki Fukuda, Yokohama; Michihiko Inaba, Yokohama; Emiko Higashinakagawa, Kawasaki; Yasuhisa Ohtake, Fukaya, and Eiichi Akiyoshi, Hyogo-ken, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1994, Ser. No. 193,867

Claims priority, application Japan, Mar. 12, 1993, 5-079116

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—4 **14 Claims**

1. A shadow mask comprising a plate material consisting of an Fe-Ni-based alloy, a plurality of fine electron beam apertures formed in said plate material, and a black film formed on the surface of said plate material, and
  manufactured by a method comprising the steps of:
  forming a plurality of fine electron beam apertures in a plate material consisting of an Fe-Ni-based alloy which contains iron and nickel as main constituents, and having an unrecrystallized texture with a grain size of not more than 10 μm;
  press-molding said plate material; and
  forming a black film on the surface of said plate material.

5,532,089

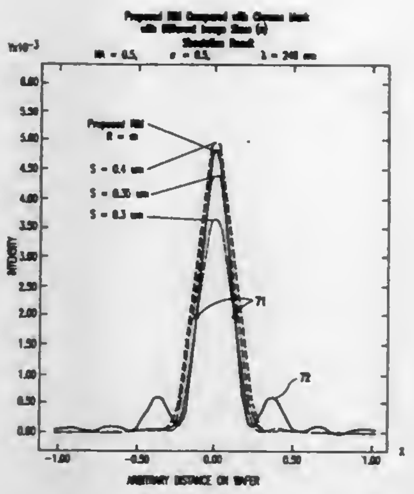
SIMPLIFIED FABRICATION METHODS FOR RIM PHASE-SHIFT MASKS

William J. Adair, Underhill, Vt.; Timothy A. Brunner, Ridgefield, Conn.; Derek B. Dove, Mt. Kisco; Louis L. Hsu, Fishkill, both of N.Y., and Chi-Min Yuan, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1993, Ser. No. 173,383

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **16 Claims**



1. A method of fabricating a lithography exposure mask for exposing at least one area and including at least one feature including at least one phase shift region adjacent an opaque region of the mask, said method including the step of
  patterning a layer of opaque material deposited on a substrate in accordance with said at least one feature wherein said feature corresponds in size to said area and said phase shift region,
  conformally depositing at least one of a phase shift material and a sidewall spacer material over said opaque material and said substrate, and
  anisotropically removing a portion of said at least one of a phase shift material and a sidewall spacer material deposited during said conformally depositing step, said portion being limited by an edge of said phase shift region.

5,532,090

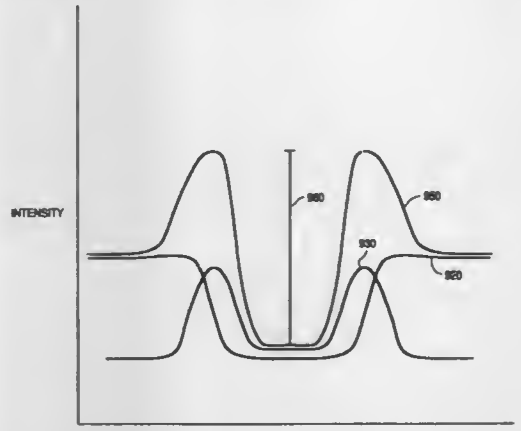
METHOD AND APPARATUS FOR ENHANCED CONTACT AND VIA LITHOGRAPHY

Yan A. Borodovsky, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 1, 1995, Ser. No. 396,961

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **23 Claims**



1. A method of forming a pattern in a photosensitive layer comprising the steps of:
  performing a first exposure to radiation, said first exposure exposing a first region of said photosensitive layer while leaving a second region substantially unexposed;
  performing a second exposure to radiation, said second exposure exposing a third region of said photosensitive layer while leaving a fourth region substantially unexposed, wherein at least a portion of said third region is disposed near, adjacent to, or overlapping an edge of said second region such that an intensity profile with improved contrast is realized compared with said first and second exposures alone; and,
  developing said photosensitive layer.

5,532,091

ALIGNING METHOD

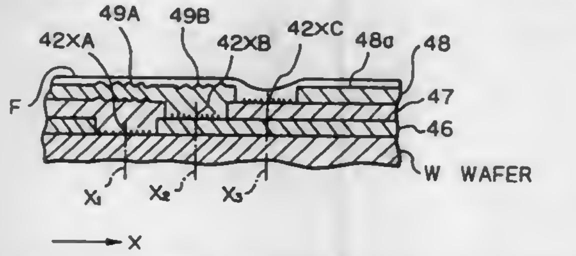
Shinji Mizutani, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,564

Claims priority, application Japan, Mar. 9, 1994, 6-038076

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—22 **8 Claims**



1. An aligning method for performing alignment between a mask pattern and a predetermined exposure area on a substrate on which a plurality of layer patterns have been formed, when said mask pattern is projected onto said exposure area, comprising the steps of:

selecting a first alignment mark formed on a first layer pattern and a second alignment mark formed on a second layer pattern which is different from said first layer pattern, among said plurality of layer patterns, each of said first and second alignment marks being in a plurality of slit-shaped patterns extending in a first direction and spaced apart from each other by a predetermined pitch in a second direction which is perpendicular to said first direction;

determining coordinate values of said first alignment mark and said second alignment mark;

determining an alignment reference coordinate value on the basis of the coordinate values of said first alignment mark and said second alignment mark; and

effecting alignment between said predetermined exposure area and said mask pattern on the basis of said determined alignment reference coordinate value.

5,532,092

EDGE RAGGEDNESS AND BACKGROUND REMOVAL BY POST DEVELOPMENT MEMBER

Lloyd F. Bean, Rochester, and Victor Berko-Boateng, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 328,798, Oct. 31, 1994. This application Apr. 24, 1995, Ser. No. 427,324

Int. Cl.^{6} G03G *13/095*

U.S. Cl. 430—42 **10 Claims**

1. Method of removing edge raggedness and background from tri-level images, said method including the steps of:

forming a tri-level latent electrostatic image on a charge retentive surface, said image comprising a first image area at a relatively high voltage level, a second image area at a relatively low voltage level and a background area half way between the voltage levels of said relatively high and low voltage levels;

electrically biasing a first developer member to a voltage level that is offset from said background area, in the direction of said first image area;

electrically biasing a second developer member to a voltage level that is offset from said background area, in the direction of said second image area;

using said first developer member to develop a first image area;

using said second developer member to develop said second image area in a color different from said first image area; and then

positioning a post development member downstream of said second developer member and using said post development member to reestablish the imaging fields of said first image area in order to diminish edge raggedness and background from the tri-level images.

5,532,093

IMAGING MEMBER

Huoy-Jen Yuh, Pittsford; William G. Herbert, Williamson, and Gary J. Maier, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1995, Ser. No. 395,133

Int. Cl.^{6} G03G *5/14*

U.S. Cl. 430—58 **10 Claims**

1. An electrostatographic imaging member comprising:

(a) a supporting substrate including an electrically conductive surface;

(b) a nickel containing layer comprised of nickel, oxygen, and sulfur, wherein the nickel containing layer is the sole charge blocking layer; and

(c) at least one electrostatographic imaging layer.

5,532,094

COMPOSITION FOR TREATING COPPER OR COPPER ALLOY SURFACES

Maki Arimura; Daisaku Akiyama, and Toshiko Nakagawa, all of Amagasaki, Japan, assignors to MEC Co., Ltd., Amagasaki, Japan

Filed Feb. 27, 1995, Ser. No. 394,809

Claims priority, application Japan, Mar. 4, 1994, 6-034005; Aug. 25, 1994, 6-200459

Int. Cl.^{6} C09K *13/00*

U.S. Cl. 252—79.1 **6 Claims**

1. A method for roughening surfaces of copper or copper alloy to provide an excellent adhesion of a coated or laminated layer thereon, comprising treating said surfaces with an amount and for a time effective to roughen them with an aqueous solution comprising: an azole compound, a copper compound dissolvable in the solution, an organic or inorganic acid and a halogen ion.

5,532,095

MAGNETIC TONER

Masumi Asanae, Kumagaya; Masahisa Ochial, Fukaya; Fumio Kimura, Isezaki; Akihiko Funakawa, and Toshihiko Noshiro, both of Kumagaya, all of, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Aug. 24, 1994, Ser. No. 294,968

Claims priority, application Japan, Aug. 26, 1993, 5-234153

Int. Cl.^{6} G03G *9/083*

U.S. Cl. 430—106.6 **3 Claims**

1. A magnetic toner including at least a binding resin and a magnetic powder having a saturation magnetization of 50 emu/g or more and a coercive force of 0.1 Oe or less as measured under a magnetic field of 10 kOe, wherein the magnetic powder is a soft ferrite powder having a composition represented by a general formula, $(MO)_{100-x}(Fe_2O_3)_x$, where x is 45 to 70 mol % and MO includes an oxide of Zn and an oxide of at least one element selected from the group consisting of Li, Mn, Ni, Mg, and Cu.

5,532,096

ELECTROPHOTOGRAPHIC CARRIER AND PRODUCTION PROCESS THEREFOR

Masayuki Maruta, Osaka, and Jun Shimizu, Wakayama, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,525

Claims priority, application Japan, Dec. 24, 1993, 5-326392

Int. Cl.^{6} G03G *9/113*

U.S. Cl. 430—108 **7 Claims**

1. A developer composition which comprises a toner and an electrophotographic carrier core particle comprising an electrophotographic particle and a coated layer on the surface thereof, said coated layer obtained by curing a partially hydrolyzed sol obtained from at least one alkoxide selected from the group consisting of silicon alkoxides, titanium alkoxides, aluminum alkoxides and zirconium alkoxides.

5,532,097

POSITIVELY CHARGED TONER FOR USE IN ELECTROSTATOGRAPHY

Serge Tavernier, Lint; Werner Op de Beeck, Keerbergen; Jean-Pierre Ghekiere, Lint, and Gustaaf Van Tendeloo, Poederlee, all of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

PCT No. PCT/EP94/01565, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO94/29770, PCT Pub. Date Dec. 22, 1994

PCT Filed May 13, 1994, Ser. No. 347,347

Claims priority, application European Pat. Off., Jun. 8, 1993, 93201644

Int. Cl.^{6} G03G *9/087;9/097*

U.S. Cl. 430—110 **13 Claims**

1. A dry toner powder the toner particles of which are triboelectrically positively charged and are suited for development of an electrostatic charge pattern, wherein said toner particles contain:

(1) one or more triboelectrically positively chargeable thermoplastic resins serving as binder having a volume resistivity of at least 10^{13} Ω-cm, and

(2) at least one substance having a volume resistivity lower than the volume resistivity of said binder, and

wherein said substance(s) (2) when present in said binder in a concentration of 5% by weight lower(s) the volume resistivity of said binder by a factor of at least 3.3, and

wherein said toner powder containing particles including a mixture of said ingredients (1) and (2) under triboelectric charging conditions is capable of obtaining an absolute median (q/d) charge/diameter value (x) lower than 10 fC/10 μm but not lower than 1 fC/10 μm, and said toner powder under the same triboelectric charging conditions but free from said substance(s) (2) then has an absolute median q/d value (x) at least 50% higher than when said substance(s) (2) is (are) present, and wherein the distribution of the charge/diameter values of the individual toner particles is characterized by a coefficient of variation $v \leqq 0.33$.

5,532,098

TONER COMPOSITIONS WITH NEGATIVE CHARGE ENHANCING ADDITIVES

Beng S. Ong, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 5, 1995, Ser. No. 523,576

Int. Cl.^{6} G03G *9/097*

U.S. Cl. 430—110 **24 Claims**

1. A toner composition comprised of toner resins, colorants, optional surface additives, and a charge enhancing additive obtained from the reaction of an aluminum ion-containing compound with a molar equivalent of an aromatic carboxylic acid, and an excess of an N-alkyl or N-aryl-substituted bis(hydroxyalkyl)amine in an aqueous medium at a temperature ranging from about 25° C. to about 100° C.

5,532,099

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Seiji Horie; Kenji Sano; Nobno Suzuki, and Shu Watarai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

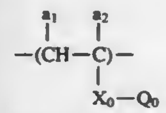
Continuation of Ser. No. 2,029, Jan. 8, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,883

Claims priority, application Japan, Jan. 10, 1992, 4-020786

Int. Cl.^{6} G03G *9/13;9/135*

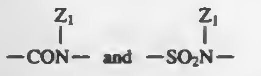
U.S. Cl. 430—115 **6 Claims**

1. A liquid developer useful for developing a latent image having been electrophotographically formed on a printing plate precursor into a toner image during manufacture of a printing plate, said printing plate precursor comprising an electrically conductive substrate having a hydrophilic surface and a layer containing an organic photoconductive compound on said hydrophilic surface, said toner image being fixed, and a non-image area of said layer other than said toner image area being removed by etching with an alkaline etching solution to provide said printing plate, said liquid developer comprising at least resin grains dispersed in a non-aqueous solvent having a volume specific resistivity of at least 10^9 Ωcm, wherein said resin grains are obtained by polymerizing (a) at least one monomer selected from the group consisting of methyl methacrylate and ethyl methacrylate soluble in the non-aqueous solvent, and (b) at least one monomer selected from the group consisting of alkyl acrylate having an alkyl group of up to 4 carbon atoms and butyl methacrylate, said alkyl acrylate and butyl methacrylate being soluble in the non-aqueous solvent but which become insoluble therein upon being polymerized, in the presence of a dispersion stabilizing resin which is dissolved or dispersed in a colloidal form in the non-aqueous solvent and which comprises a graft copolymer composed of (1) at least one macromonomer (M) having a weight average molecular weight of from 1×10^3 to 1×10^5 and having a polymerizable double bond group represented by the general formula (II) below bonded at a terminal of the main chain of a polymer composed of at least one of a styrene polymer component and a polymer component represented by the general formula (I) described below, and (2) at least one monomer represented by the general formula (III) below;



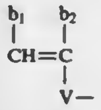
$$-(\overset{\overset{a_1}{|}}{\mathrm{CH}}-\underset{\underset{X_0-Q_0}{|}}{\overset{\overset{a_2}{|}}{\mathrm{C}}})- \qquad \text{(I)}$$

wherein X_0 represents at least one linking group selected from the group consisting of —COO—, —OCO—, —$CH_2)_k$—OCO—, —$(CH_2)_k$—COO—, —O—, —CONHCOO—, —CONHCO—, —SO_2— CO—,



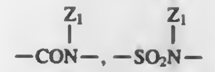
$$-\mathrm{CO}\overset{\overset{Z_1}{|}}{\mathrm{N}}- \quad \text{and} \quad -\mathrm{SO_2}\overset{\overset{Z_1}{|}}{\mathrm{N}}-$$

(wherein Z_1 represents a hydrogen atom or a hydrocarbon group, and k represents an integer of 1 to 3); a_1 and a_2, which may be the came or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z_2 or —COO—Z_2 bonded via a hydrocarbon group (wherein Z_2 represents a hydrogen atom or a hydrocarbon group which may be substituted); and Q_0 represents an aliphatic group having from 1 to 3 carbon atoms;



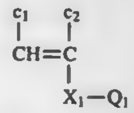
$$\overset{\overset{b_1}{|}}{\mathrm{CH}}=\underset{\underset{V-}{|}}{\overset{\overset{b_2}{|}}{\mathrm{C}}} \qquad \text{(II)}$$

wherein V represents —COO—, —OCO—, —$(CH_2)_k$—OCO—, —$(CH_2)_k$—COO—, —O—, —CONHCOO—, —CONHCO—, —SO_2—, —CO—,



$$-\overset{Z_1}{\overset{|}{CON}}-,\ -\overset{Z_1}{\overset{|}{SO_2N}}-$$

or a phenylene group (wherein Z_1 represents a hydrogen atom or a hydrocarbon group, and k represents an integer of 1 to 3); b_1 and b_2, which may be the same or different, have the same meanings as a_1 and a_2 defined in the general formula (I); and



$$\overset{c_1}{\overset{|}{CH}}=\overset{c_2}{\overset{|}{C}}-X_1-Q_1 \qquad \text{(III)}$$

wherein X_1 has the same meaning as X_0 defined in the general formula (I), Q_1 represents an aliphatic group having from 4 to 22 carbon atoms, and c_1 and c_2, which may be the same or different, have the same meanings as a_1 and a_2 defined in the general formula (I).

5,532,100

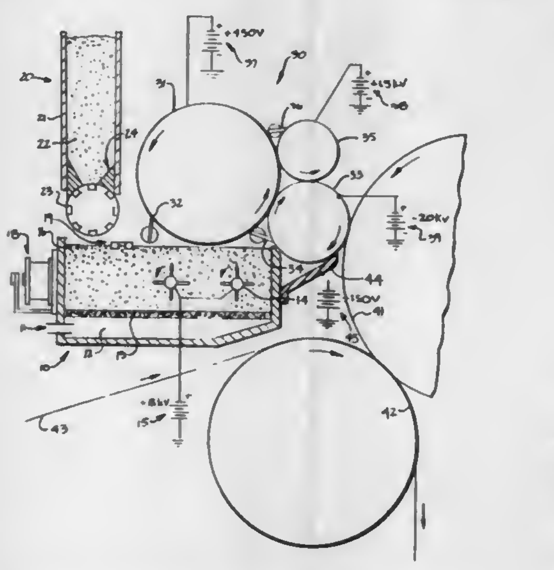
MULTI-ROLLER ELECTROSTATIC TONING

Orrin D. Christy, North Tonawanda; Daniel E. Kanfoush, Grand Island; Mark A. Matheis, North Tonawanda; John E. Pickett, Williamsville, and Robert I. Thomson, Niton, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jan. 9, 1991, Ser. No. 639,360

Int. Cl.^{6} G03G *9/08*

U.S. Cl. 430—120 **28 Claims**



1. Apparatus for applying non-magnetic and non-conductive toner to a member containing an electrostatic pattern, comprising:
(a) a container having a closed bottom and sides, for containing powdered toner;
(b) means for fluidizing the toner in the container;
(c) means for simultaneously stirring and electrically charging the powdered toner in the container; and
(d) means for transferring toner from the container to a member containing an electrostatic pattern.

5,532,101

IMAGE FORMING METHOD

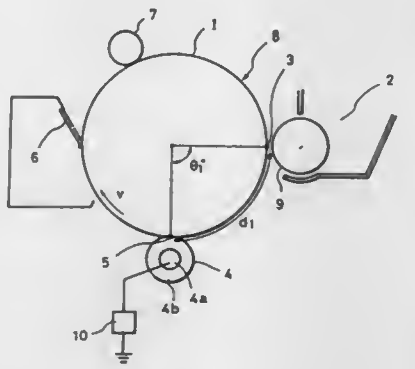
Keita Nozawa; Satoshi Yoshida, and Tsutomu Kukimoto, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 74,567, Jun. 10, 1993, abandoned. This application Sep. 11, 1995, Ser. No. 526,564

Claims priority, application Japan, Jun. 15, 1992, 4-178904

Int. Cl.^{6} G03G *13/16;21/10*

U.S. Cl. 430—125 **21 Claims**



1. An image forming method comprising:
(a) charging a cylindrical photosensitive member with a diameter of 35 mm or less and rotating at a peripheral speed v (mm/sec.);
(b) exposing said photosensitive member so that an electrostatically charged image is formed;
(c) developing said electrostatically charged image at a developing position with a toner having a triboelectric charge of |5| to |50| μc/g and containing 30% by number or less of toner particle having sizes below 4 μm so that a toner image is formed;
(d) transferring said toner image at a transfer position to a transfer member by a contact transfer means, said transfer means disposed so that the distance from the developing position on said photosensitive member to the transfer position in a direction of rotation of said photosensitive member is d_1 (mm), wherein the ratio d_1/v is 0.17 sec. or less; and
(e) cleaning residual toner particles on said photosensitive member by cleaning means after said toner image has been transferred.

5,532,102

APPARATUS AND PROCESS FOR PREPARATION OF MIGRATION IMAGING MEMBERS

Philip H. Soden, Oakville, and Arnold L. Pundsack, Georgetown, both of, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1995, Ser. No. 413,667

Int. Cl.^{6} C23C *14/00;14/24*

U.S. Cl. 430—128 **28 Claims**

1. An apparatus for evaporation of a vacuum evaporatable material onto a substrate, said apparatus comprising (a) a walled container for the vacuum evaporatable material having a plurality of apertures in a surface thereof, said apertures being configured so that the vacuum evaporatable material is uniformly deposited onto the substrate; and (b) a source of heat sufficient to effect evaporation of the vacuum evaporatable material from the container through the apertures onto the substrate, wherein the surface of the container having the plurality of apertures therein is maintained at a temperature equal to or greater than the temperature of the vacuum evaporatable material.

5,532,103

MULTILAYER ELECTROPHOTOGRAPHIC IMAGING MEMBER

James M. Markovics, Rochester, and Richard H. Nealey, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 932,150, Aug. 19, 1992. This application Feb. 14, 1994, Ser. No. 195,427

Int. Cl.^{6} G03G *5/043*

U.S. Cl. 430—131 **21 Claims**

1. A process for preparing an electrophotographic imaging member having a charge generating layer, a charge transport layer and an interphase region, said interphase region comprising a mixture of charge generating material and charge transport material between the charge generating layer and the charge transport layer, the process comprising: a) applying a charge generating material to form a wet underlying layer; b) prior to drying the underlying layer, overcoating a charge transport material onto the underlying layer to form a charge transport layer; and c) allowing charge transport material to diffuse into the wet underlying layer to form said interphase region.

5,532,104

INVISIBLE INFORMATION RECORDING MEDIUM

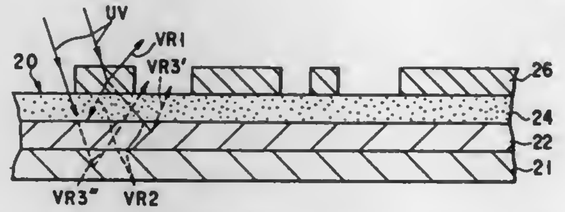
Atsuo Goto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1994, Ser. No. 291,624

Claims priority, application Japan, Aug. 19, 1993, 5-205360; Sep. 6, 1993, 5-221243; Dec. 27, 1993, 5-331801

Int. Cl.^{6} G06K *19/02*

U.S. Cl. 430—139 **12 Claims**



1. An invisible information recording medium comprising:
(a) an underlying layer;
(b) an invisible information recording layer which is provided above said underlying layer, is invisible under visible light, and generates fluorescent light upon being contacted with light having a particular wavelength, except for visible light, thus becoming visible; and
(c) an optical modulation layer provided between said underlying layer and said invisible information recording layer, and optically modulating the fluorescent light which is generated in said invisible information recording layer and is emitted on said optical modulation layer.

5,532,105

PHOTOLITHOGRAPHICALLY VIAHOLE-FORMING PHOTOSENSITIVE ELEMENT COMPRISING TWO PHOTOSENSITIVE LAYERS FOR THE FABRICATION PROCESS OF MULTILAYER WIRING BOARD

Takashi Yamadera; Kazumasa Takeuchi; Ritsuko Obata, all of Tsukuba; Naoki Fukutomi, Yuki, and Kazuko Suzuki, Tsukuba, all of, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Aug. 9, 1993, Ser. No. 103,873

Claims priority, application Japan, Aug. 7, 1992, 4-211385

Int. Cl.^{6} G03F *7/095;7/008;7/031/7/032*

U.S. Cl. 430—156 **5 Claims**

1. A photolithographically viahole-forming photosensitive element comprising:
a light-transmitting base material;
a first photosensitive resin composition laminated as a first layer on the light-transmitting base material; and
a second photosensitive resin composition laminated as a second layer on the first layer;
wherein said first photosensitive resin composition comprises:
(a) 100 parts by weight of a first mixture comprising:
  (a-1) 10 to 70 parts by weight of a rubber per 100 parts by weight of said first mixture;
  (a-2) 5 to 40 parts by weight of a phenol resin per 100 parts by weight of said first mixture; and
  (a-3) 10 to 80 parts by weight of an epoxy resin per 100 parts by weight of said first mixture;
(b) 0.1 to 10 parts by weight of an epoxy resin photoinitiator per 100 parts by weight of said first mixture; and
(c) 0.1 to 10 parts by weight of an aromatic bisazide compound per 100 parts by weight of said first mixture;
and wherein said second photosensitive resin composition comprises:
(d) 100 parts by weight of a second mixture comprising:
  (d-1) 20 to 80 parts by weight of a film-forming polymer per 100 parts by weight of said second mixture, and
  (d-2) 20 to 80 parts by weight of an ethylenically-unsaturated monomer per 100 parts by weight of said second mixture; and
(e) 1 to 10 parts by weight of a photopolymerization initiator per 100 parts by weight of said second mixture.

4. A photolithographically viahole-forming photosensitive element comprising:
a light-transmitting base material;
a first photosensitive resin composition laminated as a first layer on the light-transmitting base material; and
a second photosensitive resin composition laminated as a second layer on the first layer;
wherein said first photosensitive resin composition comprises:
(a) 100 parts by weight of a first mixture comprising:
  (a-1) 10 to 90 parts by weight of a rubber per 100 parts by weight of said first mixture;
  (a-2) 10 to 90 parts by weight of a epoxy resin per 100 parts by weight of said first mixture; and
  (a-3) 0 to 60 parts by weight of an acrylic resin per 100 parts by weight of said first mixture;
(b) 1 to 10 parts by weight of an aromatic bisazide compound per 100 parts by weight of said first mixture;
(c) 1 to 80 parts by weight of a heat-curable crosslinking agent per 100 parts by weight of said first mixture; and
(d) 0 to 10 parts by weight of a thermo-polymerization initiator per 100 parts by weight of said first mixture;
and wherein said second photosensitive resin composition comprises:
(e) 100 parts by weight of a second mixture comprising:
  (e-1) 20 to 80 parts by weight of a film-forming polymer per 100 parts by weight of said second mixture, and
  (e-2) 20 to 80 parts by weight of an ethylenically-unsaturated monomer per 100 parts by weight of said second mixture; and
(f) 1 to 10 parts by weight of a photopolymerization initiator per 100 parts by weight of said second mixture.

5,532,106

POSITIVE-TONE PHOTORESIST CONTAINING DIESTER DISSOLUTION INHIBITORS

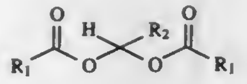
Jean M. J. Fréchet, Ithaca, N.Y., and Sze-Ming Lee, Pittsburgh, Pa., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Aug. 31, 1994, Ser. No. 299,213

Int. Cl.^{6} G03F *7/023*

U.S. Cl. 430—191 **21 Claims**

1. A positive-tone photoresist comprising a polymer, a photoactive agent, and a dissolution inhibitor, said dissolution inhibitor comprising a compound of Formula I:


(I)

wherein:

- R_1 is a C_1–C_{20} alkyl, cyclo alkyl, benzyl, phenyl, alkyl substituted cyclo alkyl, alkoxy substituted cyclo alkyl, alkyl substituted phenyl, acetoxy substituted phenyl, hydroxy substituted phenyl, t-butyloxycarbonyloxy substituted phenyl, diphenyl alkyl, alkyl substituted diphenyl, alkoxy substituted diphenyl, alkyl substituted diphenyl alkyl, or alkoxy substituted diphenyl alkyl; and
- R_2 is a C_1–C_{20} alkyl, cyclo alkyl, benzyl, phenyl, alkyl substituted cyclo alkyl, alkoxy substituted cyclo alkyl, alkyl substituted phenyl, alkoxy substituted phenyl, hydroxy substituted phenyl, acetoxy substituted phenyl, or t-butyloxycarbonyloxy substituted phenyl.

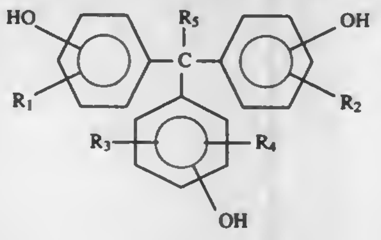
5,532,107
POSITIVE RESIST COMPOSITION

Masayuki Oie, Kamakura; Shoji Kawata, Kawasaki; Takamasa Yamada, Komaki, and Shinya Ikeda, Yokohama, all of, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 603,597, Oct. 26, 1990, Pat. No. 5,306,596. This application Apr. 13, 1994, Ser. No. 227,145
Claims priority, application Japan, Nov. 17, 1989, 1-298857
The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.
Int. Cl.⁶ G03F *7/023;* **C07C** *245/00*
U.S. Cl. 430—192 **22 Claims**

1. A positive resist composition comprising in admixture:

(i) 100 parts by weight of an alkali-soluble phenolic resin;

(ii) 5–50 parts by weight, per 100 parts by weight of the alkali-soluble phenolic resin, of a photosensitive agent formed of a quinonediazide sulfonate of at least one of the phenolic compounds represented by the following general formula (I)


(I)

wherein

- R_1 through R_4 mean individually a hydrogen or halogen atom, a hydroxyl group, an alkyl or alkenyl group having 1–3 carbon atoms, or a hydroxyalkyl group having 1–3 carbon atoms, and may be equal to or different from one another, and
- R_5 denotes a hydrogen atom, an alkyl or alkenyl group having 1–3 carbon atoms, or an aryl group with the proviso that the number of hydroxyl groups in formula (I) is 3 or 4, in which the —OH groups of the phenolic compound have been converted into the ester groups with a quinonediazide sulfonic compound to an extent of 85– 100% mol; and

(iii) sufficient solvent to dissolve the foregoing components.

5,532,108
GENE DELETED IN COLORECTAL CANCER OF HUMANS

Bert Vogelstein, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.
Continuation of Ser. No. 460,981, Jan. 4, 1990, abandoned. This application Apr. 14, 1994, Ser. No. 227,527
Int. Cl.⁶ C12N *15/12;15/63;1/21;5/10*
U.S. Cl. 435—240.2 **7 Claims**

1. An isolated, purified DNA molecule which encodes the amino acid sequence shown in FIG. 4, amino acids 202 through 1648.

5,532,109
AZO DYES AS ADHESION PROMOTION ADDITIVE IN POLYDIMETHYLGLUTARIMIDE

Mohamad T. Krounbi; Alfred F. Renaldo, both of San Jose, and Douglas J. Werner, Fremont, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 180,588, Jan. 12, 1994, abandoned. This application Oct. 13, 1995, Ser. No. 542,479
Int. Cl.⁶ G03F *7/26*
U.S. Cl. 430—271 **9 Claims**

1. In a method of forming a bi-layer lift-off structure having a release layer of polydimethylglutarimide formed on a substrate and a patterned photoresist layer formed on said release layer, the improvement comprising the steps of:

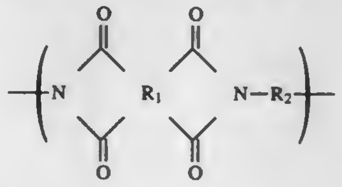
adding a predetermined amount of a selected azo dye to polydimethylglutarimide, said selected azo dye for promoting adhesion between a release layer of polydimethylglutarimide formed on a substrate and said substrate; and

heating said release layer in a prebake step at a predetermined temperature for a predetermined period of time.

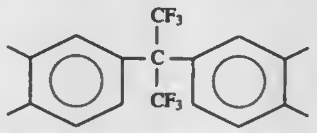
5,532,110
PHOTOIMAGEABLE POLYIMIDE COATING

David D. Ngo, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.
Division of Ser. No. 269,698, Jul. 1, 1994, Pat. No. 5,501,941, , which is a continuation of Ser. No. 522,363, May 8, 1990, abandoned. This application May 26, 1995, Ser. No. 450,915
Int. Cl.⁶ G03C *1/492*
U.S. Cl. 430—275.1 **15 Claims**

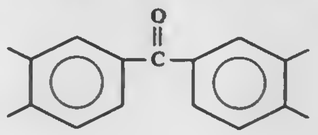
1. An interlevel dielectric comprising a layer of a photoimageable polyimide comprising recurring units of



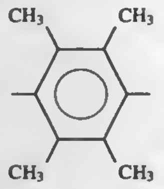
wherein R_1 comprises from about 70 to about 10 mole percent


I

and from about 30 to about 90 mole percent


II

and wherein R_2 consists essentially of



coated on a substrate to form a coated substrate overlaid with an adhering layer of a metal or an inorganic material.

5,532,111
REACTIVE POLYMERIC DYES

Gary L. Holmes, Vadnais Heights; Terrance P. Smith, Woodbury; Mahfuza B. Ali, Mendota Heights, and David W. Macomber, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 52,337, Apr. 23, 1993, Pat. No. 5,362,812. This application Nov. 4, 1994, Ser. No. 334,202
Int. Cl.⁶ G03F *7/029*
U.S. Cl. 430—281.1 **7 Claims**

1. A colorant layer formulation comprising

(a) a reactive polymeric dye, wherein the reactive polymeric dye comprises:

repeating units of azlactone wherein 0.1 to 99.9% by mole of the azlactone repeating units are functionalized with a nucleophilic dye selected from the group consisting of metal-azo, metal-ago methine, anthraquinone, hydrazone, indoaniline, and aminostyryl dyes and the remaining azlactone repeating units are functionalized with one or more nucleophilic groups, such that one or more of the nucleophilic groups contain a free-radically polymerizable group, an aqueous solubilizing group or combination thereof,

(b) a photoinitiator,

(c) a multi functional acrylate,

(d) a surfactant,

(e) a sensitizing dye,

or a mixture of components (b) through (e).

5,532,112
COREACTIVE PHOTOINITATORS

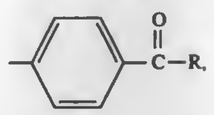
Manfred Köhler, Darmstadt; Jörg Ohngemach, Reinheim; Eike Poetsch; Rudolf Eidenschink, both of Mühtal, all of, Germany; Gerhard Greber, Bad Vöslau, Austria; Dieter Dorsch, Darmstadt, Germany; Jürgen Gehlhaus, Lautertal, Germany; Konrad Dorfner, Darmstadt, Germany, and Hans L. Hirsch, Reinheim, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.
Continuation of Ser. No. 951,299, Sep. 24, 1992, abandoned, which is a continuation of Ser. No. 720,141, Jun. 24, 1991, abandoned, which is a continuation of Ser. No. 167,060, Mar. 11, 1988, abandoned. This application Jun. 2, 1994, Ser. No. 252,729
Claims priority, application Germany, Mar. 12, 1987, 37 07 891.7; Nov. 13, 1987, 37 38 567.4
Int. Cl.⁶ G03C *1/73*
U.S. Cl. 430—281.1 **1 Claim**

1. A process for photopolymerizing a radiation curable system by attaching a photoinitiator of the formula:

RG—A—IN

in which

IN is of the formula



wherein

- R is $CR_3R_4R_5$,
- R_3, R_4 in each case independently of one another are H,C_1–C_{12}alkyl,C_{1-C12}alkoxy, phenyl or together form C_2–C_6alkylene,
- R_5 is $-OR_7$,
- R_7 H or C_1–C_6alkyl,
- A is a spacer group $Z[(CH_2)_oY]_n\text{-}[(CH_2)_mX]_l$, wherein
- X is —O—,
- Y is —O—,—NH— or —O—CO—,
- Z is a single bond, —NH—, —NHCO—or—CONH—,
- l is 1
- m is an integer from 1 to 4,
- o is an integer from 0 to 4,
- n is 1, if Y is —O—CO— and
- n is an integer from 0 to 4, if Y is —O— or —NH—,
- RG is $(R_e)_3Si$—or N_3— and
- R_e is C_1–C_{12}alkoxy,

directly to a substrate with the reactive group RG by heating, applying at least one ethylenically unsaturated compound and subjecting said radiation curable system to activating radiation with wavelengths from 250–500 nm.

5,532,113
METHOD OF MAKING MICROELECTRONIC STRUCTURES UTILZING PHOTORESISTS CONTAINING C_3C_{12} WATER SOLUBLE SUGAR CROSSLINKING AGENTS

Jean M. J. Fréchet, Ithaca, N.Y., and Sze-Ming Lee, Pittsburgh, Pa., assignors to Cornell Research Foundation, Ithaca, N.Y.
Division of Ser. No. 309,864, Sep. 21, 1994. This application Sep. 21, 1995, Ser. No. 531,429
Int. Cl.⁶ G03F *7/38*
U.S. Cl. 430—296 **12 Claims**

1. A method of making microelectronic structures comprising the steps of:

(a) forming a photoresist on a microelectronic substrate, said photoresist comprising a polymer, a photoactive agent, and a crosslinking agent, wherein said crosslinking agent is a C_3–C_{12} water soluble sugar;

(b) irradiating predetermined sites of said photoresist to activate said photoactive agent at said predetermined sites, and to create exposed and unexposed sites of said photoresist;

(c) heating said photoresist; and

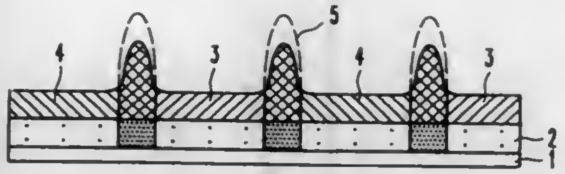
(d) removing matter from said unexposed sites to provide a microelectronic structure.

5,532,114
METHOD OF FORMING A PHOTORESIST PATTERN IN A SEMICONDUCTOR DEVICE

Sang M. Bae, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyunghi-Do, Rep. of Korea
Filed Feb. 3, 1995, Ser. No. 383,006
Claims priority, application Rep. of Korea, Feb. 7, 1994, 94-2240
Int. Cl.⁶ G03C *5/00*
U.S. Cl. 430—312 **4 Claims**

1. A method of forming a photoresist pattern in a semiconductor device, comprising:

providing a first photo mask having a plurality of chromium patterns and a plurality of phase shift patterns on a quartz



substrate, and a plurality of shift patterns formed between said chromium patterns, with widths of each of said chromium patterns being substantially the same, widths of each of said phase shift patterns being substantially the same, a distance between adjacent chromium patterns being substantially the same and a distance between one of said phase shift patterns and one of said chromium patterns being substantially the same;

providing a wafer on which a photoresist is coated;

loading said first photo mask and said wafer into a stepper which has a capability to produce light;

performing a first exposure process using the light of said stepper to form first light heavily exposed portions which have been heavily exposed by opened portions of said quartz substrate of said first photo mask, and first light lightly exposed portions, which have been lightly exposed by said phase shift patterns of said first photo mask, on said photoresist;

unloading said first photo mask from said stepper;

providing a second mask which has identical dimensions to said first photo mask, except that an arrangement of chromium patterns and phase shift patterns on its quartz substrate are a reverse to those of said first photo mask;

loading said second photo mask into said stepper;

performing a second exposure process using the light of said stepper to form second light heavily exposed portions which have been heavily exposed by opened portions of said quartz substrate of said second photo mask, and second light lightly exposed portions, which have been lightly exposed by said phase shift patterns of said second photo mask, on said photoresist;

unloading said second photo mask from said stepper;

providing a third photo mask which has identical dimensions to said second photo mask, except that each chromium pattern and phase shift pattern on its quartz substrate are located at positions of said opened portions of said photo mask, respectively;

loading said third photo mask into said stepper;

performing a third exposure process using the light of said stepper, to form third light heavily exposed portions, which have been heavily exposed by opened portions of said quartz substrate of said third photo mask, and third light lightly exposed portions, which have been lightly exposed by phase shift patterns on said quartz substrate of said third photo mask, on said photoresist;

unloading said third photo mask from said stepper;

providing a fourth photo mask which has identical dimensions to said third photo mask, except that the arrangement of chromium patterns and phase shift patterns on a quartz substrate are a reverse to those of said third mask;

loading said fourth photo mask into said stepper;

performing a fourth exposure process using the light of said stepper to form fourth light heavily exposed portions, which have been heavily exposed by opened portions of said quartz substrate of said fourth photo mask, and fourth light lightly exposed portion, which have been lightly exposed by phase shift patterns on said quartz substrate of said fourth photo mask, are formed on said photoresist;

unloading said wafer from said stepper; and

removing all of said light heavily exposed portions by a developing process, thereby forming a plurality of photoresist patterns.

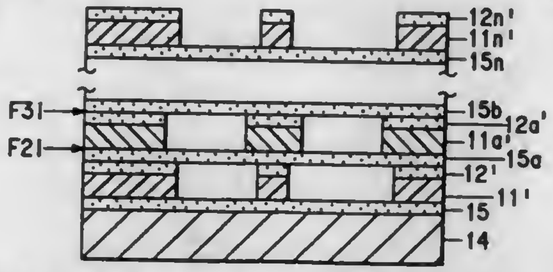
5,532,115
PROCESS FOR FORMING A COLORED IMAGE UTILIZING A NON-PHOTOSENSITIVE/PHOTOSENSITIVE COMBINATION

Gregory A. Bodager, Monroeton, Pa., and Phillip L. Beighle, Colts Neck, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1994, Ser. No. 315,738

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—325 **17 Claims**



1. A process for forming a colored image comprising, in order:

(A) applying at least one aqueous-permeable, colorant-containing composition to a photosensitive element comprising, in order,

(1) a permanent carrier element, that is resistant to aqueous liquid development,

(2) a carrier surface selected from the group consisting of (i) a surface treated to promote adhesion, (ii) an anchor layer, and (iii) combinations thereof,

(3) an unpigmented, first photosensitive layer consisting essentially of a photosensitive composition which is developable in aqueous liquid wherein an aqueous-permeable, colorant-containing layer formed by the application of the aqueous-permeable colorant composition is in contact with the first photosensitive layer;

(B) imagewise exposing to actinic radiation the photosensitive element from step (A) having applied thereon the permeable, colorant-containing layer; and

(C) developing the exposed element from step (B) by washing with an aqueous liquid which is selected from water or an aqueous solution that consists essentially of water, thereby removing either the imagewise exposed or imagewise unexposed regions of the unpigmented first photosensitive layer and its overlying aqueous-permeable, colorant-containing layer, to produce a first colored pattern.

5,532,116
AQUEOUS ALKALINE DEVELOPING SOLUTION

Tamotsu Suzuki; Mikio Totsuka; Chiyomi Niitsu, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

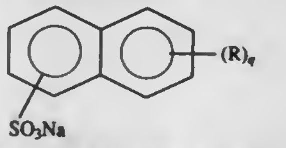
Continuation-in-part of Ser. No. 2,584, Jan. 11, 1993, abandoned. This application Feb. 25, 1994, Ser. No. 201,693

Claims priority, application Japan, Jan. 13, 1992, 4-23249; Jan. 24, 1992, 4-34149

Int. Cl.^{6} G03F *7/32*

U.S. Cl. 430—331 **7 Claims**

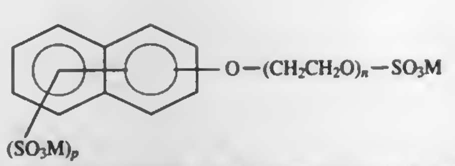
1. An aqueous alkaline developing solution comprising a mixture of an alkali compound, water and an alkylnaphthalene sulfonate having the following formula (I):



(I)

in which R represents an alkyl group of 3 to 5 carbon atoms and q is 0 or an integer of 1 to 3, in the amount of 0.5 to 20 weight %;

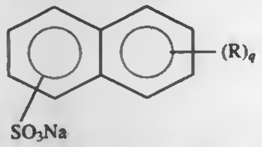
and which contains an anionic surface active agent having the following formula (II):



(II)

in which M represents Na, K or NH_4, p is 0 or 1 and n is 2 to 20, in the amount of 0.1 to 10 weight % and an nonionic surface active agent having a polyoxyethylene moiety and an aromatic ring in its structure in the amount of 0.01 to 4 weight %.

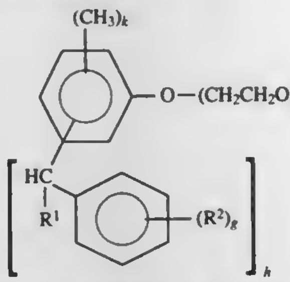
4. An aqueous alkaline developing solution comprising a mixture of an alkali compound, water and an alkylnaphthalene sulfonate having the following formula (I):



(I)

in which R represents an alkyl group of 3 to 5 carbon atoms q is 0 or an integer of 1 to 3, in the amount of 0.5 to 20 weight %;

and which contains an anionic surface active agent having the following formula (III):



(III)

in which each of R^1 and R^2 represents alkyl of 1 to 5 carbon atoms, M represents Na, K or NH_4, g is 0, 1 or 2, k is 0, 1 or 2, h is an integer of 1 to 3, and n is 2 to 20, in the amount of 0.1 to 20 weight %.

5,532,117
PHOTOGRAPHIC ELEMENT CONTAINING CERTAIN AZOANILINE DYES

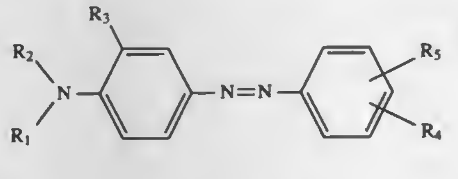
Paul B. Merkel; James P. Merrill; Jeffrey W. Schmoeger, and Jared B. Mooberry, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1995, Ser. No. 431,234

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—504 **15 Claims**

1. A multicolor negative photographic elements which contains a support bearing a yellow dye forming silver halide emulsion layer sensitive to blue light, a magenta dye forming silver halide emulsion layer sensitive to green light, and a cyan dye forming silver halide emulsion layer sensitive to red light, the element comprising a layer containing a yellow or orange-yellow azoniline dye of structure I



wherein:

R_1 is an alkyl group or a phenyl group;

R_2 is hydrogen or an alkyl group;

R_3 is an alkoxy, aryloxy or alkyl group when R_2 is hydrogen, or is hydrogen when R_2 is an alkyl group;

R_1 and R_2 or R_1 and R_3 may join to form a ring;

R_4, which may be in the para or meta position relative to the azo group, is an electron-withdrawing group selected from the group consisting of trifluoromethyl, cyano, halogen, alkoxycarbonyl, aryloxycarbonyl, acyloxy, carbonamido, sulfonamido, carbamoyl, sulfamoyl, alkylsulfonyl, arylsulfonyl, sulfonyloxy (—OSO_3R), alkoxysulfonyl aryloxysulfonyl, and sulfoxide groups;

R_5 is hydrogen or, can be a chlorine in one meta position relative to azo group when R_4 is a chlorine in the para position relative to the azo group; and

the total number of carbon atoms in R_1, R_2, R_3, and R_4 taken together is at least 9;

wherein said above substituents are selected to provide a spectral absorption maxima in the range of 430 nm to 465nm; and

wherein neither a layer sensitive to blue light nor a layer sensitive to green light is located between the support and the layer in which the azoaniline dye is located.

5,532,118
LIGHT-SENSITIVE IMAGING ELEMENT

Charles L. Bauer, Webster; Mary A. Krenceski, Delmar, and John J. Fitzgerald, Clifton Park, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1995, Ser. No. 459,247

Int. Cl.^{6} G03C *1/79*

U.S. Cl. 430—533 **10 Claims**

1. An imaging element comprising a light-sensitive imaging layer and a polyester film support having coated thereon greater than 0.17 gm/m^2 of a layer of a self-crosslinking polyurethane derived from an isocyanate terminated prepolymer extended with an aliphatic polyamine and end-capped with N-methylol hydrazide groups, the prepolymer being derived from (a) a diisocyanate, and (b) a polyester polyol and having pendant water dispersing, carboxylic salt groups on the polymer chain and a hydrophilic colloid layer coated on the layer of self-crosslinking polyurethane.

5,532,119
HIGH-SPEED DIRECT-POSITIVE PHOTOGRAPHIC ELEMENTS UTILIZING CORE-SHELL EMULSIONS

Robert A. Arcus, and Alfred P. Marchetti, both of Penfield, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1993, Ser. No. 37,066

Int. Cl.^{6} G03C *1/035*

U.S. Cl. 430—567 **19 Claims**

1. A direct-positive photographic element comprising a support and a silver halide emulsion layer containing core-shell silver halide grains comprising a chemically sensitized core and a chemically sensitized shell, at least one of said core and said shell comprising a band of dopant, characterized in that said dopant is hexacyano ruthenium (II).

5,532,120
SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING SELENIUM COMPOUND

Morio Yagihara; Hirotomo Sasaki; Hiroyuki Mifune, all of Kanagawa, and Shinji Kato, Gifu, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

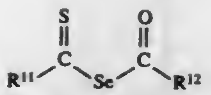
Continuation of Ser. No. 310,488, Sep. 22, 1994, abandoned. This application Oct. 4, 1995, Ser. No. 539,043

Claims priority, application Japan, Sep. 22, 1993, 5-236538

Int. Cl.^{6} G03C *1/09*

U.S. Cl. 430—600 **21 Claims**

1. A silver halide photographic material comprising a silver halide emulsion layer provided on a support, wherein the silver halide emulsion layer contains a selenium compound represented by the formula (I):



(I)

in which each of R^{11} and R^{12} independently is hydrogen, an aliphatic group, an aromatic group, a heterocyclic group, —OR^{13} or —$NR^{14}R^{15}$; each of R^{13}, R^{14} and R^{15} independently is hydrogen, an aliphatic group, an aromatic group or a heterocyclic group; and each of R^{11}, R^{12}, R^{13}, R^{14} and R^{15} may have one or more substituent groups.

5,532,121
MOTTLE REDUCING AGENT FOR PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC ELEMENTS

Roger K. Yonkoski, Woodbury, and Patricia M. Savu, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 24, 1995, Ser. No. 410,332

Int. Cl.^{6} G03C *1/498*

U.S. Cl. 430—617 **21 Claims**

1. A photothermographic element comprising a substrate coated with a photothermographic composition comprising:

(a) a photosensitive silver halide;

(b) a non-photosensitive, reducible source of silver;

(c) a reducing agent for the non-photosensitive, reducible source of silver;

(d) a binder; and

(e) a fluorinated polymer consisting essentially of two different groups within the polymer chain derived from reactive monomers, the monomers consisting essentially of:

(i) at least one fluorinated, ethylenically unsaturated monomer; and

(ii) at least one polar ethylenically unsaturated monomer, wherein the ratio of said at least one fluorinated, ethylenically unsaturated monomer to said at least one polar ethylenically unsaturated monomer is in the range of about 35/65 to about 50/50.

5,532,122
QUANTITATION OF GAMMA AND X-RAY EMITTING ISOTOPES

Andrzey K. Drukier, Greenbelt, Md., assignor to BioTraces, Inc., Fairfax, Va.

Filed Oct. 12, 1993, Ser. No. 133,919

Int. Cl.^{6} C12Q *1/68;* **G01N** *23/00;33/534;* **G01T** *1/00*

U.S. Cl. 435—5 **91 Claims**

2. A method for selective quantitation of a coincident gamma/X-ray (CGX) emitter in a sample, comprising:

(a) placing the sample between separate radiation detectors and obtaining outputs from the radiation detectors comprising coincident and non-coincident output pulses, the coincident output pulses comprising pulses characteristic of coincident gamma and x-ray emissions from the CGX emitter,

(b) analyzing the shape and height of the output pulses from the detectors,

(c) discriminating and rejecting non-coincident output pulses,

(d) discriminating and rejecting coincident output pulses that are not characteristic of coincident gamma/x-ray emissions from the CGX emitter, and

(e) using the remaining output pulses to quantify the CGX emitter in the sample.

5,532,123
RECEPTOR-TYPE PHOSPHOTYROSINE PHOSPHATASE-γ

Joseph Schlessinger, New York, N.Y., assignor to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 654,188, Feb. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 551,270, Jul. 11, 1990, abandoned. This application Feb. 10, 1993, Ser. No. 15,986

Int. Cl.^{6} C12N *15/55;9/16;15/63;* **C12Q** *1/68*

U.S. Cl. 435—6 **15 Claims**

2. An isolated nucleic acid molecule comprising a nucleotide sequence that (a) encodes a polypeptide having the amino acid sequence SEQ ID No: 2 or SEQ ID No: 3; or (b) is the complement of the nucleotide sequence of (a).

5,532,124
GENETICALLY ENGINEERED BACTERIA TO IDENTIFY AND PRODUCE MEDICALLY IMPORTANT AGENTS

Timothy M. Block, Doylestown, and Robert H. Grafstrom, Lansdowne, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

PCT No. PCT/US92/01188, § 371 Date Oct. 6, 1993, § 102(e) Date Oct. 6, 1993, PCT Pub. No. WO92/13972, PCT Pub. Date Aug. 20, 1992

Continuation-in-part of Ser. No. 654,064, Feb. 11, 1991, abandoned. This PCT application Feb. 11, 1992, Ser. No. 98,313

Claims priority, application WIPO, Oct. 4, 1991, PCT/US91/07294

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **11 Claims**

1. A method of identifying an inhibitor of a viral enzyme comprising:

(a) providing a microorganism having a first expression vector encoding a viral enzyme and a second expression vector comprising a nucleotide sequence encoding a modified tetracycline resistance protein, said modified tetracycline resistance protein having a function which may be deactivated by said viral enzyme;

(b) culturing the microorganism in a culture medium in the presence of test compound;

(c) adding tetracycline to said culture medium; and

(d) determining the activity of the modified tetracycline resistance protein function, thereby identifying an inhibitor of a viral enzyme.

5,532,125
METHOD FOR ASSAYING NUCLEIC ACIDS

Satoshi Fujita; Naoto Kagiyama, and Masayoshi Momiyama, all of Sapporo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 738,517, Jul. 31, 1991, abandoned. This application Apr. 6, 1993, Ser. No. 44,098

Claims priority, application Japan, Aug. 7, 1990, 2-210055

Int. Cl.^{6} C12Q *1/68;1/42*

U.S. Cl. 435—6 **1 Claim**

1. A method for determining a presence of nucleic acid in a sample, comprising

(A) contacting phosphatase with said sample, such that any nucleic acid in said sample binds to phosphatase to form a modified phosphatase;

(B) contacting any modified phosphatase produced in step (A) with a 3-hydroxy-2-naphthoic-acid-2'-phenyl anilide phosphate to form a reaction product;

(C) irradiating said reaction product with an excited light source; and

(D) detecting any fluorescence produced in step (C);

wherein nucleic acid is determined to be present if fluorescence is detected.

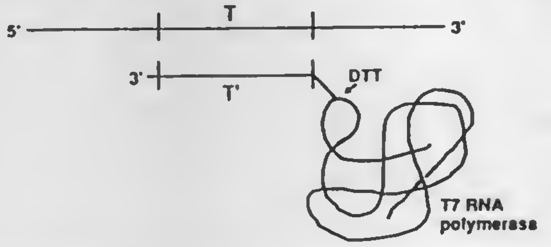
5,532,126
REPLICATIVE RNA-BASED AMPLIFICATION/DETECTION SYSTEMS

Barbara C. Chu, Del Mar; Gerald F. Joyce, Encinitas, and Leslie E. Orgel, La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation of Ser. No. 656,181, Feb. 28, 1991, abandoned, which is a continuation of Ser. No. 241,942, Sep. 8, 1988, abandoned, and Ser. No. 241,969, Sep. 8, 1988, abandoned. This application Sep. 27, 1993, Ser. No. 127,986

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **10 Claims**



1. A method for the detection of at least one specific nucleic acid target sequence in a sample, said method comprising detecting self-replicated RNA transcript,

wherein said transcript is the transcription product of DNA encoding said replicatable RNA transcript,

wherein said DNA is operably linked to a promoter, and wherein said promoter is either

recognizable by a polymerase associated in a probe with an oligonucleotide capable of hybridizing with said target nucleic acid sequence, or

said promoter is single stranded and is associated in a probe with an oligonucleotide capable of hybridizing with said target nucleic acid sequence.

5,532,127
ASSAY FOR I-CAM RELATED PROTEIN EXPRESSION

W. Michael Gallatin, and Rosemay Vazeux, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation of Ser. No. 894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,724, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 827,689, Jan. 27, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 314,362

Int. Cl.^{6} C12Q *1/68;* **C07K** *14/725;* **C07H** *17/00*

U.S. Cl. 435—6 **1 Claim**

1. A method for detecting a cell expressing ICAM-R comprising hybridizing a detectably labeled polynucleotide with mRNA of said cell and detecting hybridization by detecting the presence of said labeled polynucleotide, wherein said labeled polynucleotide encodes the ICAM-R polypeptide set out in SEQ ID NO: 1 or encodes an ICAM-R specific polypeptide fragment of SEQ ID NO: 1.

5,532,128
MULTI-SITE DETECTION APPARATUS

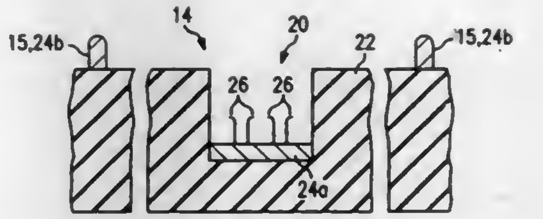
Mitchell D. Eggers; Michael E. Hogan; Kenneth L. Beattie, all of The Woodlands; John Shumaker, Houston, all of Tex.; Daniel J. Ehrlich, Lexington, and Mark Hollis, Concord, both of Mass., assignors to Houston Advanced Research Center, The Woodlands, Tex.

Continuation of Ser. No. 794,036, Nov. 19, 1991, abandoned. This application Dec. 12, 1994, Ser. No. 353,957

Int. Cl.^{6} G01N *33/543;27/22*

U.S. Cl. 435—16 **30 Claims**

1. Apparatus for identifying molecular structures within a sample substance, comprising:



a plurality of test sites formed in a single substrate, said test sites having respective probes attached thereto which specifically bind to a target molecular structure, such that different test sites have probes which specifically bind to different target molecular structures;

a plurality of electrodes associated with the test sites, each test site having at least one electrode attached thereto for electrical coupling with a second electrode, wherein the one electrode and the second electrode are disposed adjacent to said test sites to form a capacitor in conjunction with the sample substance;

circuitry, coupled to said electrodes, for applying an electronic signal to the test sites at multiple frequencies; and

circuitry for detecting one of a plurality of frequency dependent electrical properties of the test sites to determine which probes have bound to an associated target molecular structure by measuring a dielectric property over a range of frequencies, wherein the plurality of frequency dependent electrical properties comprises permittivity, a dielectric relaxation frequency, and a dispersion of the test sites.

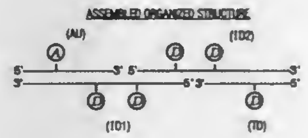
5,532,129
SELF-ORGANIZING MOLECULAR PHOTONIC STRUCTURES BASED ON CHROMOPHORE- AND FLUOROPHORE-CONTAINING POLYNUCLEOTIDES AND METHODS OF THEIR USE

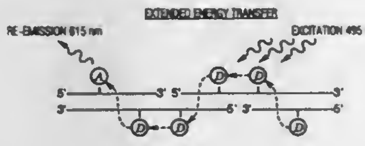
Michael J. Heller, Encinitas, Calif., assignor to Enterprise Partners II, L.P., La Jolla, Calif.

Continuation of Ser. No. 790,262, Nov. 7, 1991, abandoned. This application May 27, 1994, Ser. No. 250,951

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68*

U.S. Cl. 435—6 **21 Claims**





1. A polynucleotide having a terminal donor chromophore, at least one intermediate donor-acceptor chromophore, and at least one acceptor chromophore all said chromophores are linked to said polynucleotide by linker arms, wherein the distance between said terminal donor chromophore and one said acceptor chromophore is greater than 5 nm and there is at least one said intermediate donor chromophore within said distance.

5,532,130

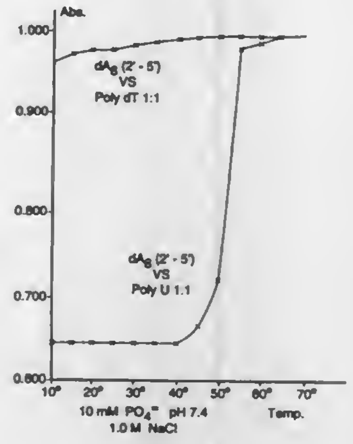
METHODS AND COMPOSITIONS FOR SEQUENCE-SPECIFIC HYBRIDIZATION OF RNA BY 2'-5' OLIGONUCLEOTIDES

Rushdi Alul, Columbia, Md., assignor to Dyad Pharmaceutical Corporation, Columbia, Md.

Filed Jul. 20, 1993, Ser. No. 93,757

Int. Cl.^{6} C12Q ***1/68***

U.S. Cl. 435—6 **14 Claims**



1. A method of selectively hybridizing an oligonucleotide to RNA comprising hybridizing in a sequence specific manner at least one complementary oligonucleotide to said RNA, said oligonucleotide comprising at least one 2'–5' internucleotide linkage, wherein said oligonucleotide does not hybridize to complementary single stranded DNA in a sequence specific manner.

5,532,131

FORENSICALLY-ACCEPTABLE DETERMINATIONS OF GESTATIONAL FETAL EXPOSURE TO DRUGS AND OTHER CHEMICAL AGENTS

Douglas E. Lewis, 1131 W. Oakdale, Chicago, Ill. 60657, assignor to Douglas Edward Lewis, Chicago, Ill.

Continuation-in-part of Ser. No. 115,902, Sep. 1, 1993, Pat. No. 5,326,708, which is a continuation of Ser. No. 843,526, Feb. 28, 1992, abandoned. This application May 13, 1994, Ser. No. 242,185

Int. Cl.^{6} G01N ***33/53;33/00***

U.S. Cl. 435—7.9 **16 Claims**

1. A method for preparing a concentrated neonatal meconium extract containing both basic and acidic-neutral target analytes present, if any, in a sample of infant meconium suspected of containing said target analytes, said method comprising:

providing a test sample of newborn meconium suspected of containing said target analytes;

adding substantially non-aqueous methanol solution to said sample to form a first mixture;

agitating said first mixture for a time sufficient to release substantially all of said target analytes from the meconium sample, until a substantially uniform homogenate is obtained, said homogenate including a liquid organic component;

separating said liquid organic component from said homogenate; and,

separating said target analytes from said organic component by sequential extraction through mixed mode extraction columns, at least one of said columns comprising a cationic exchange resin and at least one of said columns comprising an anionic exchange resin.

5,532,132

METHOD FOR REGULATING FORMATION OF A COMPLEX OF PLASMINOGEN ACTIVATOR, ITS RECEPTOR AND INHIBITOR

Ning Wang, Wuhan, China; Georgia Barlovatz-Meimon, Paris, France, and Jeffrey J. Fredberg, Sharon, Mass., assignors to President and Fellows of Harvard University, Cambridge, Mass., and University of Paris, France

Filed Sep. 28, 1993, Ser. No. 127,977

Int. Cl.^{6} G01N ***33/567***

U.S. Cl. 435—7.21 **2 Claims**

1. A method of screening for a test compound which has an effect on the cytoskeletal stiffness of a target cell having a plasminogen activator receptor comprising:

(a) contacting the target cell with a plasminogen activator, the plasminogen activator inhibitor and the test compound; and

(b) measuring the effects of the test compound on cytoskeletal stiffness of the target cell by comparing the resulting cytoskeletal stiffness against the cytoskeletal stiffness measured when the target cell is contacted only with the plasminogen activator and the inhibitor.

5,532,133

PLASMODIUM VIVAX BLOOD STAGE ANTIGENS, PVESP-1, ANTIBODIES, AND DIAGNOSTIC ASSAYS

John W. Barnwell, New York, N.Y., assignor to New York University, New York, N.Y.

Filed Jun. 2, 1993, Ser. No. 72,610

Int. Cl.^{6} G01N ***33/53;33/543;33/569;*** **C07K** ***16/20***

U.S. Cl. 435—7.22 **7 Claims**

1. Isolated and purified antibody specifically binding a peptide antigen comprising the amino acid sequence of a species-specific secreted blood-stage protein from *P. vivax*, or an immunoreactive fragment thereof, said protein being present in detectable amounts in biological fluids of individuals infected with *P. vivax* malaria, wherein said blood stage protein is PvESP-1.

5,532,134

MYCOPLASMA DIAGNOSTIC ASSAY

Shyh-Ching Lo, Potomac; James W. K. Shih, and Richard Y.-H. Wang, both of Bethesda, Md., assignors to American Registry of Pathology, Washington, D.C.

Continuation-in-part of Ser. No. 800,370, Dec. 2, 1991, Pat. No. 5,215,914, which is a continuation-in-part of Ser. No. 710,361, Jun. 6, 1991, Pat. No. 5,242,820, which is a continuation-in-part of Ser. No. 265,920, Nov. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 875,535, Jun. 18, 1986, abandoned. This application Nov. 25, 1992, Ser. No. 981,341

Int. Cl.^{6} G01N ***33/53***

U.S. Cl. 435—7.32 **12 Claims**

7. A diagnostic assay for detecting and differentiating infection in a test subject by at least one preselected mycoplasma species, comprising, for each preselected mycoplasma species:

(a) providing a species-specific LAMP antigen comprising a TRITON® X-114 nonionic detergent extract of lipid-associated membrane proteins (LAMP) from said preselected mycoplasma species;

(b) immobilizing said species-specific LAMP antigen on a solid phase;

(c) contacting said immobilized species-specific LAMP antigen with an aliquot of the biological sample from said test subject to form solid phase immunocomplexes between said immobilized species-specific LAMP antigen and any polyclonal antibodies specific thereto in said aliquot;

(d) washing said contacted solid phase of step (c);

(e) measuring any polyclonal antibodies bound in said solid phase immunocomplexes of step (d);

(f) repeating steps (a)–(e) with an aliquot of a pooled biological sample from control subjects free of past or present mycoplasma infection;

(g) comparing the amount of bound polyclonal antibodies measured in step (e) with the amount of bound polyclonal antibodies measured in step (f), wherein said at least one predetermined mycoplasma species-specific polyclonal antibodies are present in said biological sample from said test subject when the amount of bound polyclonal antibodies measured in step (e) exceeds the amount of bound polyclonal antibodies measured in step (f) by a predetermined cut-off value; and,

(h) identifying the presence of infection in said test subject caused by said at least one preselected mycoplasma based upon the presence of polyclonal antibodies specific to said predetermined mycoplasma species in said biological sample from said test subject.

5,532,135

SOLID-PHASE COMPETITIVE ASSAY UTILIZING A FUSION PROTEIN

Roberto L. Ceriani; Jerry A. Peterson, both of Lafayette, and David J. Larocca, San Leandro, all of Calif., assignors to Cancer Research Fund of Contra Costa, Walnut Creek, Calif.

Continuation of Ser. No. 473,673, Feb. 2, 1990, abandoned. This application Apr. 8, 1993, Ser. No. 46,103

The portion of the term of this patent subsequent to Sep. 30, 2013, has been disclaimed.

Int. Cl.^{6} G01N ***33/537;33/543;33/544;33/574***

U.S. Cl. 435—7.92 **60 Claims**

1. An in vitro competitive assay for detecting the presence of an analyte peptide in a biological sample, comprising

providing a first antibody or fragment thereof specifically binding a site of a first peptide which is absent from a second peptide, the first antibody or fragment thereof being bound to a solid support at a site other than the first peptide binding site;

adding thereto a fusion protein comprising said first peptide and said second peptide, and allowing the solid supported first antibody to bind the first peptide portion of the fusion protein;

adding thereto a biological sample suspected of comprising an analyte peptide specifically binding to a second antibody or fragment thereof;

admixing thereto in the presence of the biological sample a stoichiometric amount of said second antibody or fragment thereof specifically binding to the analyte peptide and to a site of the second peptide that is absent from the first peptide, and allowing the formation of free complexes of analyte-second antibody or fragment thereof and/or solid supported complexes of fusion protein-second antibody or fragment thereof;

adding thereto a labeled molecule selectively binding the second antibody or fragment thereof and allowing the formation of solid supported complexes of fusion protein-labeled antibody or fragment thereof;

removing unbound labeled material; and

determining the amount of solid supported label present and comparing it with the amount of label bound to the solid support in a similar assay conducted by substituting an equivalent volume of buffer for the biological sample, whereby when the amount of analyte peptide in the sample increases the amount of solid supported label decreases.

5,532,136

MONOCLONAL ANTIBODY ASSAY AND KIT FOR DETECTING METAL CATIONS IN BODY FLUIDS

Randall R. Carlson; Jay S. Stout; Dwane E. Wylie, all of Lincoln; Fred W. Wagner, Walton, all of Nebr., and Malcolm Riddell, Vero Beach, Fla., assignors to BioNebraska, Inc., Lincoln, Nebr.

Filed Jun. 22, 1993, Ser. No. 96,671

Int. Cl.^{6} G01N ***33/53***

U.S. Cl. 435—7.92 **18 Claims**

1. A method for detecting a metallic cation in a sample of a body fluid of an animal, which comprises:

contacting an effective amount of a first antibody specific for a naturally occurring polypeptide or a functional portion of the polypeptide with the sample of body fluid containing the metallic cation to form a first antigen-antibody complex, wherein the naturally occurring polypeptide can bind the metallic cation;

adding an effective amount of a second antibody specific for the metallic cation to the first antigen-antibody complex to form a second antigen-antibody complex; and

determining the amount of the metallic cation in the sample of the body fluid by detecting the amount of the second antigen-antibody complex.

5,532,137

ANTI-FR-900506 SUBSTANCE ANTIBODIES AND HIGHLY-SENSITIVE ENZYME IMMUNOASSAY METHOD

Mineo Niwa, Muko; Kouichi Tamura, Daito; Tsutomu Kaizu, Tsukuba, and Masakazu Kobayashi, Ikeda, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 337,206, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 164,777, Dec. 10, 1993, abandoned, which is a continuation of Ser. No. 928,771, Aug. 17, 1992, abandoned, which is a continuation of Ser. No. 769,486, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 504,722, Apr. 3, 1990, abandoned, which is a continuation of Ser. No. 198,868, May 26, 1988, abandoned. This application Jun. 6, 1996, Ser. No. 465,934

Claims priority, application Japan, Jun. 5, 1987, 62-141776

Int. Cl.^{6} C07K ***16/00;*** **G01N** ***33/53;33/543***

U.S. Cl. 435—7.92 **13 Claims**

1. A monoclonal antibody capable of recognizing antigenic determinant(s) located on the FR-900506 substance, which is prepared by:

i) performing cell fusion between (a) a spleen cell immunized with a FR-900506 substance conjugate with a suitable carrier which is prepared by reacting the suitable carrier with a hydroxyl group on the cyclohexyl moiety of the FR-900506 substance, and (b) a myeloma cell.

ii) screening the hybridoma producing a monoclonal antibody specific to the FR-900506 substance, and

iii) obtaining the monoclonal anti-FR-900506 substance antibody, the class of which is IgG,

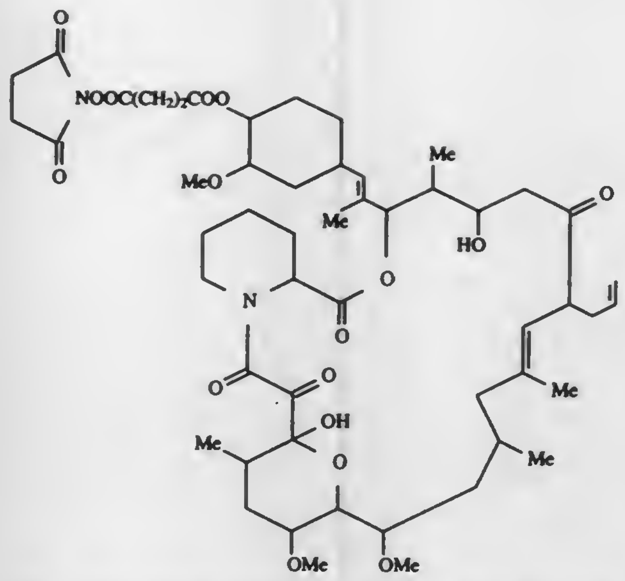
in which the FR-900506 substance conjugate with a suitable carrier is the one made by

a) converting the FR-900506 substance to a half ester of a dicarboxylic acid,

b) activating its half ester, and

c) reacting its activated ester with a suitable carrier which can increase the immunogenicity of the FR-900506 substance,

in which the FR-900506 substance conjugate with a suitable carrier is the one made by reacting the activated ester of FR-900506 substance hemisuccinate of the following formula:



with a carrier selected from bovine serum albumin, gelatin and hemocyanine.

5,532,138
METHOD AND KITS FOR DETERMINING PEROXIDATIVELY ACTIVE CATALYSTS

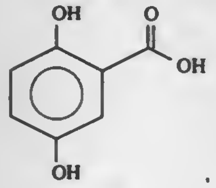
Sharat Singh, San Jose; Arthur C. Switchenko, Palo Alto; Cheng-I Lin, Cupertino; Nurith Kurn, Palo Alto, and Edwin F. Ullman, Atherton, all of Calif., assignors to Behringwerke AG, Marburg, Germany

Continuation of Ser. No. 951,922, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 516,022, Apr. 26, 1990, abandoned. This application Jun. 21, 1994, Ser. No. 263,164

Int. Cl.^{6} G01N *33/546;* C12Q *1/28*

U.S. Cl. 435—7.93 **13 Claims**

11. An assay for an analyte which is a member of a specific binding pair (sbp), which assay comprises:
  combining a medium suspected of containing said analyte, a first sbp member that binds said analyte, and a peroxidase enzyme conjugated to a second sbp member, wherein said second sbp member binds to said analyte or to said first sbp member when said second sbp member is an analyte analog to form a complex, and
  examining for the presence or absence of activity of said peroxidase enzyme in said complex by treating said peroxidase enzyme with a hydroperoxide, a benzidine wherein at least one amino group of said benzidine is a primary amine and at least one substituent positioned ortho thereto is a hydrogen atom, and a coupler selected from the group consisting of:



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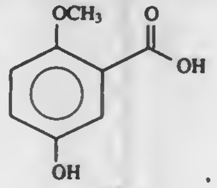

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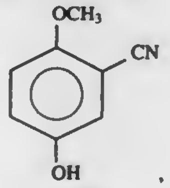

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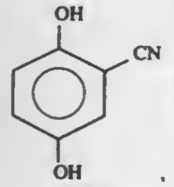

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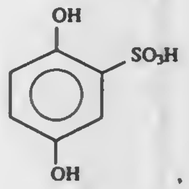

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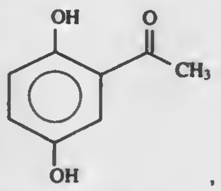

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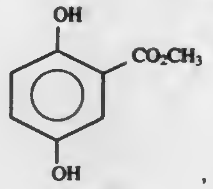

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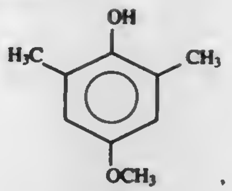

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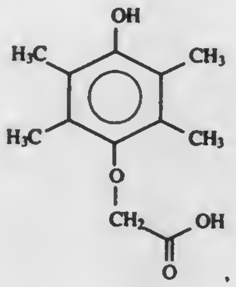

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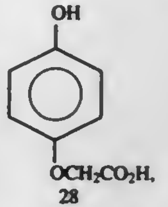

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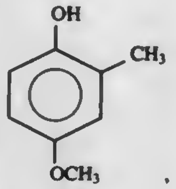

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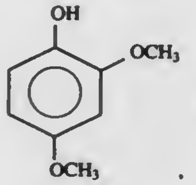

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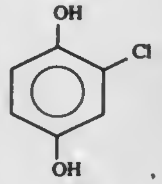

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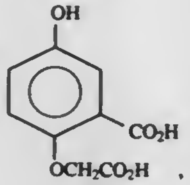

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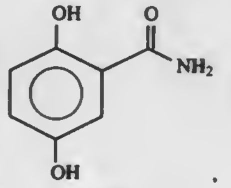

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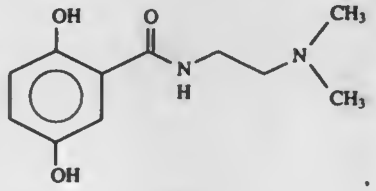

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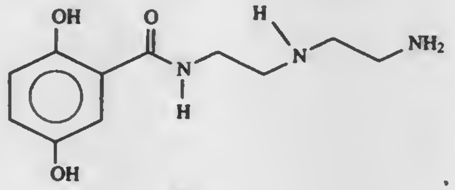

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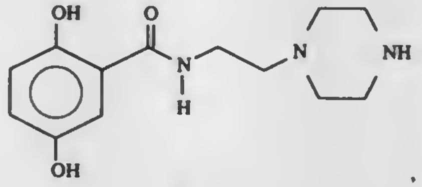

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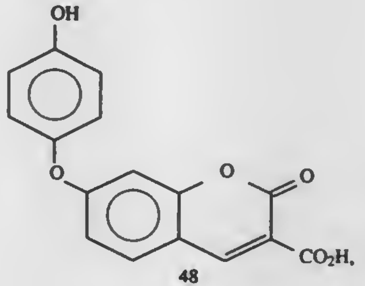

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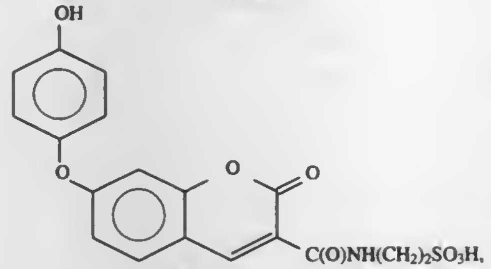

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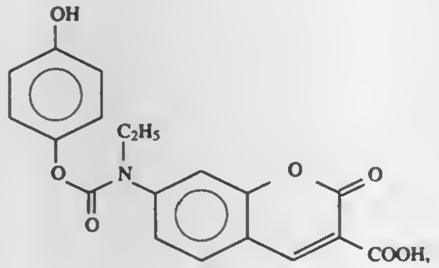

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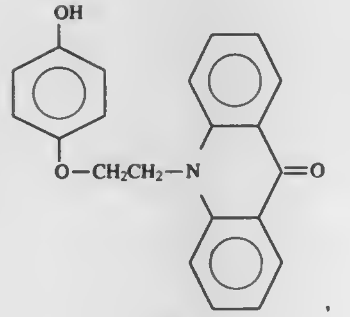

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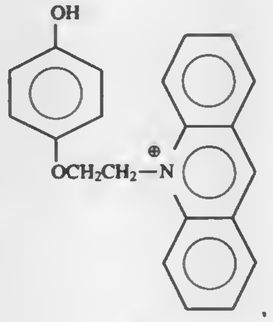

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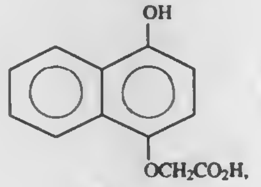

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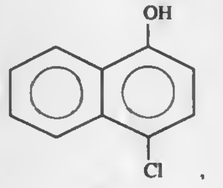

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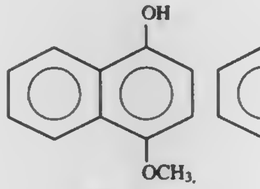

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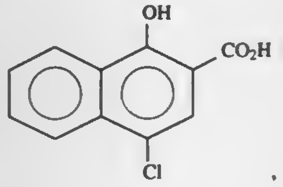
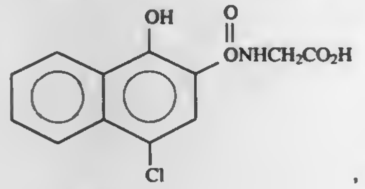


61,



62, and

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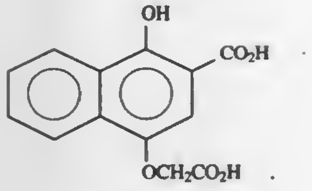


63.

5,532,139
MICRO LYSIS-ANALYSIS PROCESS TO MEASURE CELL CHARACTERISTICS AND DIAGNOSE DISEASES

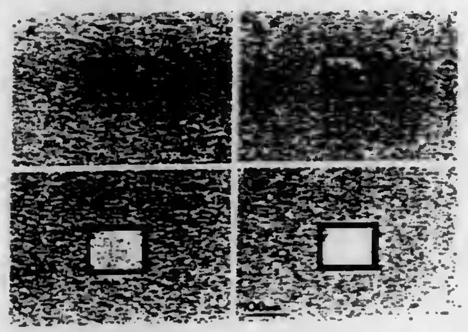
Frederick N. Miller, Louisville, Ky., assignor to Micro-Med, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 969,764, Oct. 30, 1992. This application Mar. 31, 1995, Ser. No. 414,376

The portion of the term of this patent subsequent to Oct. 30, 2012, has been disclaimed.

Int. Cl.^{6} C12Q *1/02*

U.S. Cl. 435—29 **44 Claims**



1. A micro lysis-analysis process for measuring the strength of a cell membrane and detecting abnormalities thereof by applying precise quantities of a first focused photo energy of a selected frequency and energy density to a precise microscopic area of a cell sample containing test cells for measuring as a function of time the precise degree of cell disruption, applying a second focused photo energy of a second selected frequency and energy density to said cell sample thereby photo-activating a photo-activated cell-attack agent for attacking cell membranes in said microscopic area of photo-stimulated cell-attack providing a quantitative, time-related, photo-dose dependent measure of cell fragility, comprising the steps of:
  suspending test cells whose membrane strength is to be measured in a solution forming a cell containing solution;
  adding an inactive photo-activated cell-attack agent to said cell containing solution, said inactive cell-attack agent comprising molecules absorbing photo energy in a known range of excitation frequencies producing a photosensitive chemical solution;
  preparing a micro-sample of said photosensitive chemical solution containing said test cells;
  identifying a localized microscopic area within said micro-sample of said photosensitive solution;
  applying a specific amount of the first focused photo energy in a cell absorption range to said micro-sample of said photosensitive chemical solution exposing said cells in said micro-sample to said first focused photo energy for a selected period of time for determining photo energy absorption by intact test cells in said localized microscopic area of said micro-sample at any time period;
  determining the photo energy absorption and number of intact test cells in said localized microscopic area by measuring the amount of said first focused photo energy passing through said test cells in said micro-sample of said photosensitive chemical solution in said localized microscopic area;

applying a specific amount of the second focused photo energy for a selected time at a second selected wavelength, said second focused photo energy being capable of exciting said inactive cell-attack agent, and said second focused photo energy photo-activating said photosensitive chemical solution forming a cell-reacting medium in said localized microscopic area containing said test cells;

reacting said cell-reacting medium containing said test cells to disrupt cell membranes of said test cells permitting loss of said cell contents and changing the absorption of said first focused photo energy by said test cells in said localized microscopic area:

analyzing the strength of said cell membrane quantitatively by comparing the amount of said first focused photo energy passing through said test cells in said micro-sample after micro-sample exposure to said second focused photo energy, with the amount of said first focused photo energy passing through said test cells in said micro-sample before micro-sample exposure to said second focused photo energy for determining photo energy absorption by remaining intact test cells in said localized microscopic area at selected time intervals; and

coordinating and comparing the analyzed cell membrane strength to values for normal cells to measure changes in cell fragility.

5,532,140

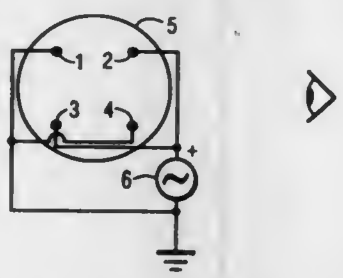
METHOD AND APPARATUS FOR SUSPENDING MICROPARTICLES

Stephen Arnold, New York, N.Y.; Piers Hendrie, Austin, Tex., and Burt V. Bronk, Abingdon, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1994, Ser. No. 216,863

Int. Cl.⁶ C12M *1/34;* C12Q *1/04;* G01N *27/62;* H01J *49/42*

U.S. Cl. 435—34 16 Claims



1. A method for joining charged particles comprising the steps of:

injecting a first charged particle into a quadrupole mass analyzer;

applying a first electrical potential to said quadrupole mass analyzer for positioning said charged particle at a first location in said quadrupole mass analyzer;

applying a second electrical potential to said quadrupole mass analyzer for advancing said first charged particle from said first location in said quadrupole mass analyzer to a second location in said quadrupole mass analyzer;

injecting a second charged particle into said quadrupole mass analyzer;

applying a third electrical potential to said quadrupole mass analyzer to advance said second charged particle to said first location; and

applying a fourth electrical potential to said quadrupole mass analyzer for causing said first charged particle to move toward said first location and said second charged particle to move toward said second location, said first and second charged particles being joined by collision, the resulting combined particle remaining suspended in said quadrupole mass analyzer.

5,532,141

PROCESS FOR OBTAINING GANGLIOSIDE LIPIDS

Larry D. Holler, South Dakota State University, Brookings, S. Dak. 57007

Filed Jun. 13, 1995, Ser. No. 489,804

Int. Cl.⁶ C12P *19/26;19/44;* C08B *37/00;* C07G *3/00*

U.S. Cl. 435—74 10 Claims

1. Process for obtaining a ganglioside lipid molecule comprising: contacting a sample of neural tissue obtained from an ovine animal afflicted with GM1 gangliosidosis with an extracting agent, under conditions favoring extraction of ganglioside lipid molecules from said neural tissue, and removing extracted ganglioside lipid molecules from said extracting agent, wherein the amount of ganglioside lipid molecules obtained are enhanced as compared to the amount of ganglioside lipid molecules obtained from non-afflicted ovine animals.

5,532,142

METHOD OF ISOLATION AND PURIFICATION OF FUSION POLYPEPTIDES

Stephen A. Johnston, Dallas, Tex., and William G. Dougherty, Philomath, Oreg., assignors to Board of Regents, the University of Texas System, Austin, Tex., and State of Oregon, The, Acting By and Through the Oregon State System of Higher Education, on Behalf of Oregon State University, Corvallis, Oreg.

Filed Feb. 12, 1993, Ser. No. 21,603

Int. Cl.⁶ C12N *9/52;* C12P *21/00*

U.S. Cl. 435—69.1 20 Claims

1. A method of producing and isolating a recombinant polypeptide, comprising:

transforming a yeast or gram-negative bacterial cell with a recombinant DNA molecule that comprises a first DNA encoding a matrix-binding protein, a second DNA encoding a tobacco etch virus NIa proteinase cleavage site, and a third DNA encoding a polypeptide;

binding the expressed fusion protein to a matrix to a matrix that selectively binds the matrix-binding protein; and

contacting matrix bound fusion protein with active, soluble recombinant 27 kDa tobacco etch virus NIa proteinase fused with a tag that selectively binds to an adsorbent material;

wherein said proteinase selectively cleaves said cleavage site to release the recombinant polypeptide.

5,532,143

ISOLATED DNA MOLECULES FOR INTERGRATION SITE INDEPENDENT GENE EXPRESSION IN MAMMALIAN HOST CELLS

Franklin G. Grosveld, and Dimitris Kioussis, both of London, United Kingdom, assignors to The Medical Research Council, London, United Kingdom

Continuation of Ser. No. 920,536, Jul. 28, 1992, which is a continuation of Ser. No. 346,996, May 11, 1989. This application Sep. 26, 1994, Ser. No. 312,498

Claims priority, application United Kingdom, Aug. 7, 1987, 8718779

Int. Cl.⁶ C12N *5/16;15/10;15/11;15/67*

U.S. Cl. 435—69.1 24 Claims

1. An isolated DNA molecule, comprising:

(i) a dominant activator sequence that is specific for a particular mammalian cell-type,

(ii) a promoter that is functional in said particular mammalian cell-type, and

(iii) a structural gene operatively linked to said promoter, wherein

the region in said DNA consisting of (i), (ii) and (iii) and DNA therebetween has a nucleotide sequence different from that of naturally occurring DNA, and

said dominant activator sequence being characterized in that in naturally occurring DNA:

(I) it is associated with a naturally occurring gene that is expressed in a tissue-specific manner; and

(II) it is locatable in naturally occurring DNA by association with a DNase I super hypersensitive site;

wherein said dominant activator sequence is characterized in that it stimulates expression of said structural gene when said DNA molecule is integrated into a genome of a host cell of said mammalian cell-type, such that said expression:

(a) is dependent on the number of copies of said gene that are integrated into said genome in that said expression increases as said number of copies of said gene increases; and

(b) is independent of the integration site of said DNA molecule in said genome.

5,532,144

PROCESS FOR PREPARING HUMAN DERIVED MONOCYTE ATTRACTING PURIFIED PEPTIDE PRODUCTS USEFUL IN A METHOD OF TREATING INFECTION AND NEOPLASMS IN A HUMAN BODY

Teizo Yoshimura, Frederick; Elizabeth A. Robinson, Bethesda; Ettore Appella, and Edward J. Leonard, both of Chevy Chase, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 686,264, Apr. 15, 1991, which is a continuation of Ser. No. 304,234, Jan. 31, 1989, abandoned. This application May 24, 1995, Ser. No. 449,552

Int. Cl.⁶ C12P *21/02*

U.S. Cl. 435—70.1 6 Claims

1. A method of preparing a pure peptide product, that consists essentially of a peptide having a molecular weight of about 8,400 daltons, and exhibiting optimal monocyte chemotactic activity at a concentration of 1 nM; said method comprising the steps of:

(I) culturing live cells derived from:

(a) human glioma cell line U-105MG, or

(b) human peripheral blood mononuclear leukocytes, in a growth medium;

(II) separating said cells from said growth medium;

(III) chromatographing said growth medium on an Orange-A Sepharaose column, utilizing a solvent, and collecting fractions which contain the peptide;

(IV) chromatographing said peptide containing fractions obtained in Step III on a cation-exchange HPLC column, utilizing a solvent, and collecting the fractions which contain the peptide;

(V) chromatographing said peptide containing fractions obtained in Step IV on a reverse phase HPLC column, utilizing a solvent, and collecting the fractions containing said peptide; and

(VI) removing liquids from said peptide containing fractions obtained in Step V, to give said pure peptide product in a solid form.

5,532,145

METHODS FOR TREATMENT OF ENZYME PREPARATIONS

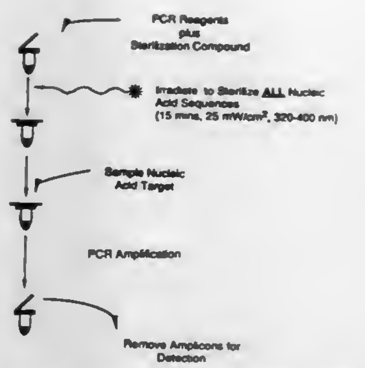
John W. Tessman, San Leandro; George D. Cimino, Richmond; Stephen T. Isaacs, Orinda, and John E. Hearst, Berkeley, all of Calif., assignors to Steritech, Inc., Concord, Calif.

Continuation-in-part of Ser. No. 428,494, Oct. 26, 1989, Pat. No. 5,221,608. This application Nov. 20, 1992, Ser. No. 979,789

Int. Cl.⁶ C12P *19/34;* C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—91.2 7 Claims

1. A method for rendering nucleic acid in *Thermus aquaticus* polymerase preparations unamplifiable, comprising, in the order named:


PCR Reagents
plus
Sterilization Compound
Irradiate to Sterilize ALL Nucleic Acid Sequences
(15 mins, 25 mW/cm², 320-400 nm)
Sample Nucleic Acid Target
PCR Amplification
Remove Amplicons for Detection

a) providing in any order, as reaction components:

i) a *Thermus aquaticus* polymerase preparation suspected of containing amplifiable contaminating bacterial nucleic acid,

ii) a furocoumarin;

b) adding in any order

i) said *Thermus aquaticus* polymerase preparation, and

ii) said furocoumarin;

to make a reaction mixture;

c) removing oxygen gas from said reaction mixture; and

d) activating said furocoumarin with ultraviolet irradiation to create a treated *Thermus aquaticus* polymerase preparation such that said amplifiable contaminating nucleic acid is rendered unamplifiable; and

e) utilizing said treated *Thermus aquaticus* polymerase preparation with primers in cycles of amplification to increase the concentration of a desired amplified segment of a target sequence so that it becomes the predominant sequence in a mixture of nucleic acids.

5,532,146

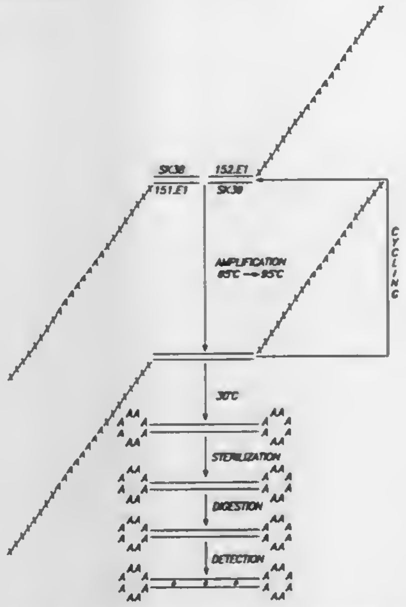
METHOD FOR RENDERING LIGASE-BASED AMPLIFICATION PRODUCTS UNAMPLIFIABLE

George D. Cimino, Richmond; Stephen T. Isaacs, Orinda, and John W. Tessman, San Francisco, all of Calif., assignors to HRI Research, Inc., Concord, Calif.

Continuation of Ser. No. 729,972, Jul. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 428,494, Oct. 26, 1989, Pat. No. 5,221,608. This application Jun. 20, 1994, Ser. No. 263,020

Int. Cl.⁶ C12P *19/34;* C07H *21/00*

U.S. Cl. 435—91.2 16 Claims



1. A method for rendering ligase-based amplification product unamplifiable, comprising the sequential steps:

a) providing in any order,
  i) at least two primers each of said primers comprising a self-hybridizing region of at least four bases, said region having a T_m such that self-hybridization occurs at a temperature below that used for amplification, and a non self-hybridizing region of greater than seven bases, and
  ii) sample template,
  iii) amplification reagents,
  iv) at least one enzyme having ligase activity, and
  v) means for containing a reaction;

b) adding to said reaction containing means, in any order, said primers, said sample template, said amplification reagents, to make a reaction mixture;

c) adding said enzyme having ligase activity to said reaction mixture, at a temperature above said T_m of said self-hybridizing region of said primers, to create a ligase-based amplification product; and

d) cooling said reaction mixture to a temperature at or below said T_m of said self-hybridizing region of said primers, so that said self-hybridizing region of said primers self-hybridizes to form a loop in said non self-hybridizable region of said primers, under conditions such that said enzyme having ligase activity creates a circular amplification product that is unamplifiable in any subsequent amplification reaction having conditions similar to those used in step c) above.

5,532,147

ENZYMATIC METHOD FOR SYNTHESIS OF CARBOHYDRATES

Kurt Nilsson, Andjaktsv. 6, Lund, Sweden

PCT No. PCT/SE92/00541, § 371 Date Apr. 6, 1994, § 102(e) Date Apr. 6, 1994, PCT Pub. No. WO93/03168, PCT Pub. Date Feb. 18, 1993

PCT Filed Jun. 8, 1992, Ser. No. 190,162

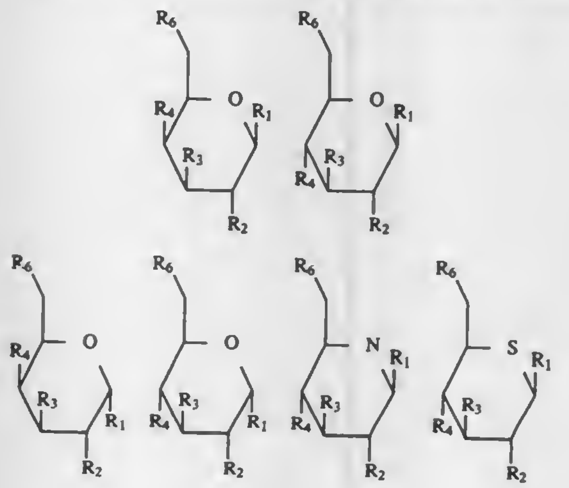
Claims priority, application Sweden, Aug. 6, 1991, 9102292

Int. Cl.^{6} C12P *19/12;19/64*

U.S. Cl. 435—100 **34 Claims**

1. A method for synthesizing a di-, tri- or higher oligosaccharide product, said method comprising

(1) reacting
  (a) a glycosyl donor comprising a monosaccharide, disaccharide, oligosaccharide or glycoside,
  (b) an acceptor represented by one of the following formulae:



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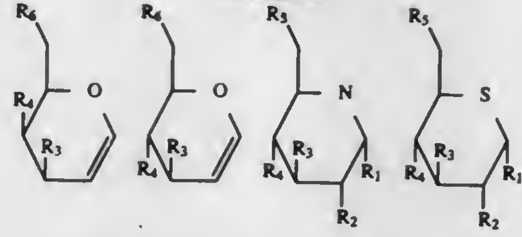


wherein R_1, R_2, R_3, R_4, or R_6 is —OH, —F, or an inorganic or organic group as defined below,

wherein at least one and a maximum of three of R_2, R_3, R_4. and R_6 are not —OH,

wherein if R_1 is an organic or inorganic group then said organic or inorganic group is selected from the group consisting of —OMe, —OAll, —OPh, —$\mathrm{OCH_2Ph}$, —OEtBr, —$\mathrm{OEtSiMe_3}$, —$\mathrm{O(CH_2)_3CH{=}CH_2}$, —SMe, —SEt, and —SPh,

where in if R_2, R_3, R_4 and/or R_6 is an organic or inorganic group then said organic or inorganic group is selected from the group consisting of —OMe, —OAll, —Oph, —$\mathrm{OCH_2Ph}$, —OEtBr, —$\mathrm{OEtSiMe_3}$, —$\mathrm{O(CH_2)_3CH{=}CH_2}$, —SMe, —SEt, —SPh, —NHAc, N-chloromethoxyacetyl-, N-phenoxyacetyl-, —NHBOC, —NHOH, —$\mathrm{N_3}$, p-methoxybenzyl ether, trityl, trialkylsilyl ether, pivaloyl, tetrahydropyranyl, (2-methoxyethoxy)methylisopropylidene ketal, cyclohexylidene ketal, benzylidene acetal, orthoester, —$\mathrm{ONO_3}$, tosylate, mesylate, sulfate, phosphate, and carboxylate, with the proviso that R_2 is not —NHAC, and

  (c) an E.C. group 3.2 endo- or exoglycosidase to form said product,

wherein said glycosyl donor transfers a carbohydrate group to said acceptor to form said product, and

(2) optionally isolating said product.

5,532,148

PROCESS FOR PRODUCING OF CITRIC ACID AND MONOVALENT CITRATE SALTS

Rathin Datta, Chicago, and Eugene P. Bergemann, Hoffman Estates, both of Ill., assignors to NTEC, Inc., Hoffman Estates, Ill.

Filed Aug. 30, 1995, Ser. No. 521,210

Int. Cl.^{6} C12P *7/48*

U.S. Cl. 435—144 **11 Claims**

1. A process for preparing citric acid that comprises the steps of:

(a) culturing *Aspergillus Niger* conidia at a concentration of about 1×10^5 to about 1×10^6 conidia/mL in an aqueous solution of decationized glucose syrup to form a fermentation medium, said fermentation medium (i) containing salts suitable for germinating said conidia and forming mycelia pellets in a submerged culture, (ii) containing about 2.5 to less than 20 parts per billion Mn^{+2} ions and (iii) having a pH value of about 1.5 to about 3.0;

(b) maintaining said fermentation medium at said pH value and at a temperature of about 25° to about 35° C. under aerobic conditions for a time period of about 4 to about 7 days to form mycelia pellets in an aqueous product broth;

(c) filtering said product broth to remove said mycelia pellets and form a clear, citric acid-containing aqueous broth;

(d) electrodialyzing said citric acid-containing aqueous broth to form a citric acid-containing aqueous concentrate; and

(e) decolorizing and ion-exchanging said citric acid-containing aqueous concentrate to remove color and inorganic ions therefrom and form an aqueous citric acid solution in which citric acid constitutes at least 98 percent of the organic acid present.

5,532,149

REMOVAL OF PHTHALYL GROUPS FROM AMIDES AND ESTERS USING AN AMIDASE ISOLATED FROM *XANTHOBACTER AGILIS*

Barbara S. Briggs, Indianapolis, and Milton J. Zmijewski, Jr., Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 275,488, Jul. 15, 1994, Pat. No. 5,445,959. This application May 22, 1995, Ser. No. 446,380

Int. Cl.^{6} C12N *1/12;1/20;9/80*

U.S. Cl. 435—122 **3 Claims**

1. A method of removing the phthalyl moiety from a phthalyl-containing compound comprising contacting phthalyl amidase with said compound under mildly basic conditions.

5,532,150

LOW DIOL POLYALKYLENE OXIDE BIOLOGICALLY ACTIVE PROTEINACEOUS SUBSTANCES

Robert A. Snow, West Chester; David L. Ladd, Wayne, and Denton W. Hoyer, Exton, all of Pa., assignors to Sterling Winthrop, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 936,416, Aug. 27, 1992, abandoned. This application May 19, 1994, Ser. No. 245,999

Int. Cl.^{6} C12N *9/96*

U.S. Cl. 435—188 **8 Claims**

1. A biologically active proteinaceous composition comprising: polyethylene glycol having a molecular weight of from about 1,000 to about 15,000 daltons and consisting essentially of less than about 10% w/w non-monomethoxylated polyethylene glycol and at least about 90% w/w monomethoxylated polyethylene glycol covalently attached to superoxide dismutase;

said proteinaceous composition having an immunoreactivity of less than 50% to mammalian antibodies than the immunoreactivity to mammalian antibodies of a proteinaceous composition comprising: polyethylene glycol having a molecular weight of from about 1,000 to about 15,000 daltons and consisting essentially of more than 10% w/w non-monomethoxylated polyethylene glycol and less than 90% w/w monomethoxylated polyethylene glycol covalently attached to superoxide dismutase.

5,532,151

G PROTEIN-COUPLED RECEPTOR KINASE GRK6

David Chantry; Patrick W. Gray, both of Seattle, and Merl F. Hoekstra, Snohomish, all of Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 123,932, Sep. 17, 1993, abandoned. This application Mar. 31, 1994, Ser. No. 221,817

Int. Cl.^{6} C12N *9/12;* **C12Q** *1/68;* **C07H** *19/00;21/00*

U.S. Cl. 435—194 **14 Claims**

1. A purified and isolated polynucleotide encoding a mammalian GRK6 enzyme.

5,532,152

PLATELET-ACTIVATING FACTOR ACETYLHYDROLASE

Lawrence S. Cousens, Oakland, Calif.; Christine D. Eberhardt, Auburn, Wash.; Patrick Gray, Seattle, Wash.; Larry W. Tjoelker, Bothell, Wash.; Cheryl L. Wilder, Bellevue, Wash., and Hai Trong, Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation of Ser. No. 133,803, Oct. 6, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,187

Int. Cl.^{6} C12N *9/18;15/55;5/10;1/15*

U.S. Cl. 435—197 **15 Claims**

1. A purified and isolated polynucleotide consisting of a polynucleotide encoding the plasma platelet-activating factor acetylhydrolase (PAF-AH) amino acid sequence set out in SEQ ID NO: 8.

2. A DNA according to claim 1.

8. A purified and isolated DNA consisting of a DNA encoding platelet-activating factor acetylhydrolase (PAF-AH) enzyme capable of hydrolyzing ^{3}H-acetate from PAF selected from the group consisting of:

(a) a DNA having the sequence set out in SEQ ID NO: 7;

(b) a DNA which hybridizes under stringent conditions to the non-coding strand of the DNA of (a); and

(c) a DNA which, but for the redundancy of the genetic code, would hybridize under stringent conditions to the non-coding strand of said DNA sequence of (a) or (b).

5,532,153

METHOD FOR CLONING AND PRODUCING THE SACI RESTRICTION ENDONUCLEASE

Shuang-yong Xu, Lexington, and Jianping Xiao, Wenham, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Mar. 23, 1995, Ser. No. 409,199

Int. Cl.^{6} C12N *9/22;15/55*

U.S. Cl. 435—199 **6 Claims**

1. Isolated DNA coding for the SacI restriction endonuclease, wherein the isolated DNA is obtainable from the host *Streptomyces achromogenes.*

5,532,154

MUTATED ALPHA VIRUS

Dennis T. Brown, Austin, Tex., assignor to Research Development Foundation, Carson City, Nev.

Filed Mar. 21, 1994, Ser. No. 213,860

Int. Cl.^{6} C12N *7/04;7/00;15/40;* **A61K** *39/12*

U.S. Cl. 435—235.1 **12 Claims**

1. A non-infectious, mutated alphavirus suitable for use in preparing a vaccine, wherein said virus is mutated by replacing a conserved cysteine amino acid with a different amino acid in the El protein and wherein said conserved cysteine is in a domain of the virus protein responsible for thiol-reductase/protein disulfide isomerase activity.

5,532,155

SPONTANEOUS CYCLE FERTILIZATION METHOD

Claude Ranoux, 2 Beverly Rd., Arlington, Mass. 02174

PCT No. PCT/FR92/00615, § 371 Date Apr. 30, 1993, § 102(e) Date Apr. 30, 1993, PCT Pub. No. WO93/00863, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 1, 1992, Ser. No. 977,409

Claims priority, application France, Jul. 1, 1991, 9108177

Int. Cl.^{6} A61B *17/43*

U.S. Cl. 435—240.2 **20 Claims**

1. In an in vitro fertilization method, for human beings, in which one or more oocytes are retrieved, and the one or more oocytes and spermatozoa are introduced into culture medium in a container; the container is closed substantially without the introduction of CO2 enriched air and is placed in the vaginal cavity or the uterus for fertilization and culture or culture of the one or more oocytes; estradiol (E2) and the LH measured by means of blood tests; the improvement comprising effecting oocyte retrieval without cycle stimulation or injecting chorionic gonadotropin by monitoring E2 levels after the measured LH level is double the baseline LH value, and in response to (i) a first measured LH level which is double the baseline LH value and (ii) a subsequent drop of 30% of the E2 level or relative stability of the E2 level, defined as a change less than about 10% of the previously measured E2 level, performing oocyte retrieval 34 to 36 hours after said first measured LH level.

5,532,156
HEPATOCYTE CELL LINE DERIVED FROM THE EPIBLAST OF PIG BLASTOCYSTS

Neil Talbot, Silver Spring; Caird E. Rexroad, Jr., Gambrills; Vernon G. Pursel, Highland, and Anne M. Powell, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 8, 1993, Ser. No. 133,589

Int. Cl.^{6} C12N *5/00*

U.S. Cl. 435—240.2 **5 Claims**

1. An isolated cell line of normal pluripotent parenchymal hepatocytes derived from a primary culture of pig epiblast cells.

3. A method of preparing a cell line from the epiblast of the pig blastocyst, wherein said cell line comprises normal pluripotent parenchymal hepatocytes, said method comprising,

a) removing a blastocyst from the uterus of a pig,
b) immunodissecting the inner cell mass from said blastocyst,
c) dissecting the epiblast from the inner cell mass and culturing the epiblast for a time sufficient for colony formation, wherein a primary culture is obtained,
d) subculturing the epiblast colonies, from step c) to obtain a secondary culture, and
e) isolating said hepatocytes from the secondary culture of step d).

5,532,157
HOST CELL LINE LVIP2.0ZC, USEFUL IN ASSAYS TO IDENTIFY LIGANDS AND ANT AGONISTS OF G PROTEIN-COUPLED RECEPTORS

J. Stephen Fink, Wellesley, Mass., assignor to The United States of America as represented by the Secretary, Department of Health and Human Resources, Washington, D.C.

Continuation of Ser. No. 768,053, Oct. 1, 1991, abandoned. This application Jan. 3, 1994, Ser. No. 176,310

Int. Cl.^{6} C12N *5/10*

U.S. Cl. 435—240.2 **1 Claim**

1. A mouse L cell line designated LVIP2.OZc having ATCC Accession No. CRL 10871.

5,532,158
INTERLEUKIN-2 RECEPTOR DEFICIENT MAMMALS

Haruhiko Suzuki, and Tak W. Mak, both of Toronto, Canada, assignors to Ontario Cancer Institute, Toronto, Canada

Filed Oct. 21, 1994, Ser. No. 326,896

Int. Cl.^{6} C12N *5/00;15/00*

U.S. Cl. 435—240.2 **2 Claims**

1. A DNA construct comprising a mouse IL-2Rβ gene fragment spanning the region between the Bgl II site of intron 5 and the Nde I site at the 3' end of exon 7, wherein a neo gene cassette is inserted into the Aat II site of exon 6.

2. A mouse D3 embryonic stem cell line comprising the DNA construct of claim 1.

5,532,159
MONOCLONAL ANTIBODY TO CANINE PLACENTAL ONCOFETAL PROTEIN FOR DETECTING CANCER

Thomas E. Webb, Columbus; Paul C. Stromberg, Westerville, and Dorothy E. Schumm, Patroit, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Apr. 1, 1994, Ser. No. 222,201

Int. Cl.^{6} C12N *5/12;* C12P *21/08;* C07K *16/18;16/30*

U.S. Cl. 435—240.27 **4 Claims**

1. A hybridoma which produces a monoclonal antibody which binds canine placental oncofetal protein.

5,532,160
ICE NUCLEUS-FORMING BACTERIUM STRAIN *XANTHOMONAS CAMPESTRIS* FERM BP-4191 AND PROCESS FOR CULTIVATION OF THE SAME

Michiko Watanabe, Higashimurayama; Takahiro Makino, Hamamatsu, and Kazuo Honma, Tama, all of, Japan, assignors to Q. P. Corporation, Tokyo, Japan

PCT No. PCT/JP93/00217, § 371 Date Oct. 17, 1994, § 102(e) Date Oct. 17, 1994, PCT Pub. No. WO93/17096, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 23, 1993, Ser. No. 290,771

Claims priority, application Japan, Feb. 24, 1992, 4-036665

Int. Cl.^{6} A01N *63/00;* C12N *1/12;1/20*

U.S. Cl. 435—252.1 **4 Claims**

1. A biologically pure bacterium strain *Xanthomonas campestris* FERM BP-4191.

5,532,161
PHTHALYL AMIDASE-PRODUCING *XANTHOBACTER AGILIS*

Barbara S. Briggs, Indianapolis, and Milton J. Zmijewski, Jr., Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 275,488, Jul. 15, 1994, Pat. No. 5,445,959. This application May 22, 1995, Ser. No. 446,374

Int. Cl.^{6} C12N *7/80;1/12;1/20*

U.S. Cl. 435—252.1 **1 Claim**

1. A biologically pure culture of *Xanthobacter agilis* NRRL B-21115 or mutants of said culture that produce a phthalyl amidase that has the following properties:

a) Reactivity: the amidase catalyzes the removal of the phthalyl group from phthalyl amides generating phthalate and an amine;
b) Substrate specificity: the amidase hydrolyzes phthalylated amino acids, peptides, betalactams, aromatic and aliphatic amines; substitutions allowed on the phthalyl group include 6-F, 6-NH_2, 3-OH, and a nitrogen in the aromatic ring ortho to the carboxyl group attached to the amine;
c) Reactive pH range: 5.5 to 9.0, with optimum pH of 8.0±0.4;
d) Reactive temperature range: 10° to 50° C., with optimum temperature of 30° C.±4° C. at pH 8.0;
e) Temperature stability: At 200 mM buffer, 80% of enzyme activity retained at 35° C. for 48 hours;
f) Influence of effectors: Iodocetate, p-HMB, and Cu++ exert inhibitory activity;
g) Molecular weight: approximately 49,900 daltons;
h) Subunits: one;
i) K_m: 0.9 mM in 50 mM potassium phosphate buffer, 30° C., pH 8.0, when phthalamido carbacephem is the substrate.

5,532,162
ELIMINATION OF USED DEGREASING SOLUTION THROUGH BIOLOGICAL DEGRADATION

Haldor Aamot, Bahnhofstr. 39, Schwieberdingen, Germany

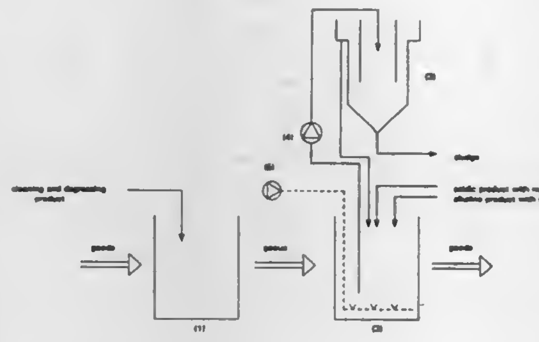
Continuation-in-part of Ser. No. 944,699, Sep. 14, 1992, abandoned. This application Nov. 29, 1994, Ser. No. 346,145

Int. Cl.^{6} C12S *9/00;11/00;* C02F *3/02;3/00*

U.S. Cl. 435—264 **29 Claims**

1. A method for degrading organic matter and residual cleaning agent from a used cleaning and degreasing solution in situ comprising:

providing goods cleaned in an aqueous degreasing or cleaning bath, the goods containing organic matter and residual cleaning agent;
providing a closed rinsing system containing an aqueous rinse liquid which is recycled within the system;
placing the cleaned goods into the closed rinsing system;
providing microorganisms capable of degrading the organic matter and the residual cleaning agent contained on the goods in the rinse liquid;
controlling the condition of the rinse liquid to promote the growth of the microorganisms;
rinsing the goods with the aqueous rinse liquid such that the residual cleaning agent and organic matter are removed and dispersed in the rinse liquid; and
using the microorganisms in the rinse liquid to degrade the cleaning agent and organic matter in the rinse liquid.



5,532,163
PROCESS FOR REFINING OIL AND FAT

Takashi Yagi; Masakazu Higurashi; Hiroka Tsuruoka, all of Chiba, and Isao Nomura, Ibaraki, all of, Japan, assignors to Showa Sangyo Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1994, Ser. No. 231,842

Claims priority, application Japan, Apr. 25, 1993, 5-132284; Mar. 31, 1994, 6-097847

Int. Cl.^{6} C12S *3/18;3/00;* C11B *3/02*

U.S. Cl. 435—271 **7 Claims**

1. A process for removing phospholipids in refining of oil and fat containing about 100 to 10,000 ppm of phospholipids which comprises:

reacting, in an emulsified condition, said oil and fat with an enzyme having activity to decompose glycerol-fatty acid ester bonds in phospholipids present in said oil and fat, to achieve treated oil and fat having lower amounts of said phospholipids,
wherein said emulsified condition is a condition in which oil and fat is dispersed in an aqueous dispersion medium, in the form of fine particles having an average particle size of from about 0.1 to 50 μm and is formed using 30 weight parts or more of water per 100 weight parts of said oil and fat;
and separating, the treated oil and fat from the decomposed phospholipids present in the emulsified condition.

5,532,164
BIOLOGICAL CONTROL FOR WOOD PRODUCTS

Robert A. Blanchette, Shoreview, Minn.; Roberta L. Farrell, Groton, Mass., and Chad J. Behrendt, St. Paul, Minn., assignors to Sandoz Ltd., Basel, Switzerland

Filed May 20, 1994, Ser. No. 247,131

Int. Cl.^{6} D21C *5/00;9/08;* C12N *1/14*

U.S. Cl. 435—277 **13 Claims**

1. A method of reducing the amount of color staining caused by wood staining fungi on logs to be cut into structural wood comprising inoculating the ends of a log to be cut into structural wood with an amount of at least one fungus of the class Basidiomycetes effective to reduce the amount of color staining caused by the wood staining fungi and which grows white and/or colorless and which reduces the pitch content of the wood, allowing the at least one white and/or colorless fungus to grow on and into the log ends to thereby reduce the amount of color staining caused by the wood staining fungi and thereafter cutting the log into structural wood.

5,532,165

Patent Not Issued For This Number

5,532,166
QUANTITATIVE RETINOL ASSAY FOR SERUM AND DRIED BLOOD SPOTS

Yinfa Ma, 712 E. Meadow La., Kirksville, Mo. 63501

Continuation-in-part of Ser. No. 228,674, Apr. 18, 1994, abandoned. This application Jul. 27, 1995, Ser. No. 508,353

Int. Cl.^{6} G01N *21/64;33/50*

U.S. Cl. 436—86 **16 Claims**

1. A method for directly measuring the retinol concentration of a blood serum sample of 8–10 nl which comprises the steps of:

(a) collecting a sample of serum, said serum obtained from a blood sample;
(b) pretreating said serum sample to dissociate transthyretin from a TTR-retinol-RBP complex;
(c) separating said serum sample through a capillary by electrophoresis through a capillary said electrophoresis including a running buffer with a pH in the range of from about 7.5 to about 10.3;
(d) exciting said sample with an emission source at 325 nm
(e) collecting and measuring the fluorescence given off by said separated sample
(f) converting said fluorescence measurement to grams of retinol per liter.

5,532,167
SUBSTRATE SPECIFICITY OF PROTEIN KINASES

Lewis C. Cantley, Cambridge, and Zhou Songyang, Brookline, both of Mass., assignors to Beth Israel Hospital, Boston, Mass.

Filed Jan. 7, 1994, Ser. No. 178,570

Int. Cl.^{6} G01N *33/00*

U.S. Cl. 436—89 **32 Claims**

1. A method for determining an amino acid sequence motif for a phosphorylation site of a protein kinase, comprising:

a) contacting the protein kinase with an oriented degenerate peptide library comprising non-phosphorylated peptides with a phosphorylatable amino acid residue at a fixed non-degenerate position under conditions which allow for phosphorylation of a substrate by the protein kinase;
b) allowing the protein kinase to phosphorylate peptides within the oriented degenerate peptide library having a phosphorylation site for the protein kinase to form a population of phosphorylated peptides;
c) separating the population of phosphorylated peptides from non-phosphorylated peptides;
d) determining the amino acid sequences of the population of phosphorylated peptides; and
e) determining an amino acid sequence motif for a phosphorylation site of the protein kinase based upon the relative abundance of different amino acid residues at each degenerate position within the population of phosphorylated peptides.

5,532,168
TISSUE BIOPSY SPECIMEN STRAINER AND METHOD

Calvin Marantz, 6250 Westview Dr., Orange, Calif. 92669

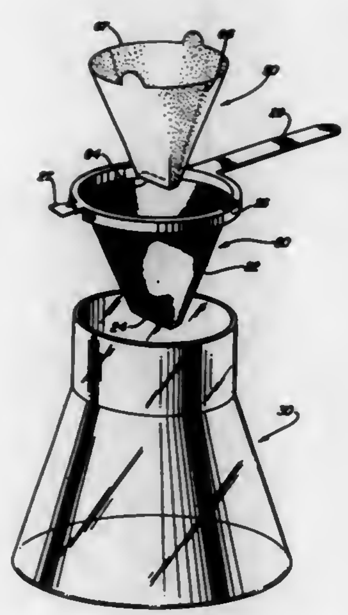
Filed Aug. 18, 1994, Ser. No. 292,714

Int. Cl.^{6} G01N *1/36;* C12M *1/00*

U.S. Cl. 436—176 **23 Claims**

1. A system for separating tissue biopsy samples from a fixative for further tissue processing, the system consisting essentially of:

a strainer of substantially conical shape, the strainer comprising:
  a strainer body being a hollow cone constructed of a perforated, inert material;



a support ring attached to an upper edge of the strainer body; and

a substantially planar perforated collection disc of a diameter less than a maximum diameter of the strainer body, the disc inserted into the hollow cone parallel to an upper edge of the strainer body and attached to an inner surface of the strainer body; and

a preformed filter constructed of a thin, permeable material, the filter having a truncated conical shape and sized to fit the strainer with a planar region of the filter coincident with the collection disc, the planar region sized to fit a tissue processing cassette when the filter is inserted therein.

5,532,169
METHODS OF DETECTING COLLAGEN DEGRADATION IN VIVO

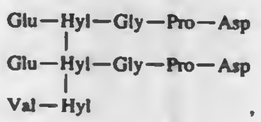
David R. Eyre, Mercer Island, Wash., assignor to Washington Research Foundation, Seattle, Wash.

Division of Ser. No. 444,881, Dec. 1, 1989, Pat. No. 5,140,103, which is a continuation-in-part of Ser. No. 118,234, Nov. 6, 1987, Pat. No. 4,973,666. This application Jan. 16, 1992, Ser. No. 823,270

Int. Cl.⁶ G01N *33/538; C07K 16/18*

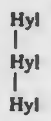
U.S. Cl. 436—518 **15 Claims**

1. A method of determining cartilage degradation in vivo, comprising quantitating the concentration of a peptide in a body fluid sample, said peptide comprising:



$$\begin{array}{l}\text{Glu}-\text{Hyl}-\text{Gly}-\text{Pro}-\text{Asp}\\ \qquad\;\;|\\ \text{Glu}-\text{Hyl}-\text{Gly}-\text{Pro}-\text{Asp}\\ \qquad\;\;|\\ \text{Val}-\text{Hyl}\end{array},$$

wherein



$$\begin{array}{c}\text{Hyl}\\ |\\ \text{Hyl}\\ |\\ \text{Hyl}\end{array}$$

is hydroxylysyl pyridinoline.

5,532,170
PROCESSING ANALYTICAL REAGENTS

Philip E. Buckle, Chatteris, and Denise V. Pollard-Knight, St Albans, both of, United Kingdom, assignors to Fisons plc, Ipswich, England

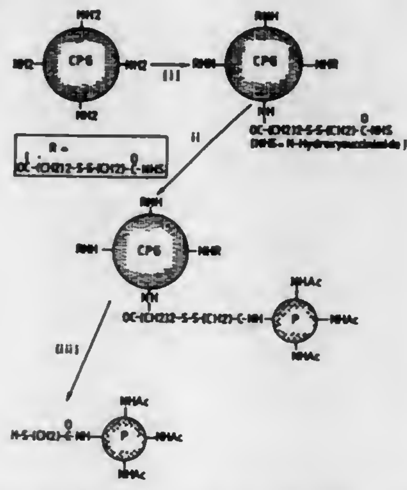
PCT No. PCT/GB92/00413, § 371 Date Aug. 6, 1993, § 102(e) Date Aug. 6, 1993, PCT Pub. No. WO92/15882, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 9, 1992, Ser. No. 104,076

Claims priority, application United Kingdom, Mar. 9, 1991, 9105031

Int. Cl.⁶ G01N *33/531*

U.S. Cl. 436—527 **9 Claims**



1. A method of conjugating a biomolecule with a particle in the form of a bead having a diameter of 5–1000 nm, which method comprises the steps of

(a) treating an activated substrate with a bifunctional cross-linking agent containing a cleavable bond so as to immobilize the cross-linking agent,

(b) conjugating the particle with the immobilized cross-linking agent,

(c) cleaving the clearable bond so as to separate the particle from the substrate,

(d) collecting the particle so released from the substrate, and

(e) reacting the particle with the biomolecule.

5,532,171
PHENOTHIAZINE DERIVATIVES, THEIR PRODUCTION AND USE

Marvin A. Motsenbocker, Amagasaki, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 868,100, Apr. 14, 1992, Pat. No. 5,344,928. This application May 23, 1994, Ser. No. 247,552

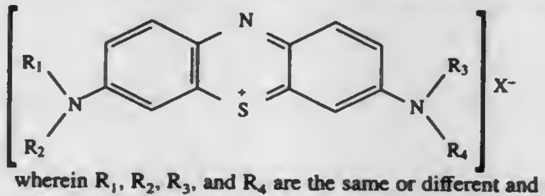
Claims priority, application Japan, Apr. 26, 1991, 3-096930

Int. Cl.⁶ G01N *33/546;33/567*

U.S. Cl. 436—533 **12 Claims**

1. A method for determining the concentration of an analyte in a solution, comprising the steps of:

(a) contacting said solution with a conjugate formed by coupling a binding molecule capable of binding specifically to the analyte to a phenothiazine derivative of general formula (I):



(I)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is a C_{1-6} alkyl group, wherein at least one of said alkyl groups is substituted with a substituent so as to react with an amino group, thiol group, or carboxyl group on said binding molecule, and X^- is a counter ion, and

(b) measuring the amount of said conjugate that binds to said analyte.

5,532,172
PROCESS AND REAGENT FOR THE DETERMINATION OF LOW DENSITY LIPOPROTEINS (LDL)

Joachim Ziegenhorn, Starnberg; Sigbert Schiefer, Pähl, and Brigitte Dräger, Tutzing, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Division of Ser. No. 85,456, Jun. 30, 1993, Pat. No. 5,407,836, which is a continuation of Ser. No. 596,757, Oct. 10, 1990, abandoned, which is a continuation of Ser. No. 423,515, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 484,679, Apr. 13, 1983, abandoned. This application Dec. 28, 1994, Ser. No. 364,702

Claims priority, application Germany, Apr. 23, 1982, 32 15 310.4

Int. Cl.⁶ G01N *33/539;33/543;33/92*

U.S. Cl. 436—539 **15 Claims**

1. A method for determining low density lipoproteins or at least one component thereof in a body fluid sample which contains at least one additional lipoprotein fraction other than a low density lipoprotein fraction, said at least one additional lipoprotein fraction being selected from the group consisting of a high density lipoprotein fraction, a very low density lipoprotein fraction and a chylomicron fraction, comprising:

(a) adding to said body fluid sample polyclonal antibodies which bind to apolipoprotein A and to apolipoprotein E, wherein said polyclonal antibodies are obtained by immunizing a first animal with apolipoprotein A, and a second animal with apolipoprotein E and bind to and precipitate all of (i) high density lipoproteins, (ii) very low density lipoproteins, and (iii) chylomicrons in said body fluid sample when contacted thereto, but do not precipitate low density lipoproteins, under conditions favoring binding and precipitating all of (i), (ii), and (iii) present in said body fluid sample,

(b) separating any precipitate formed in (a) from said body fluid sample, and (c) determining low density lipoproteins or at least one component thereof in said body fluid sample.

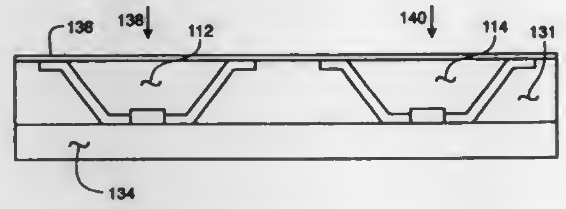
5,532,173
FET OPTICAL RECEIVER USING BACKSIDE ILLUMINATION, INDIUM MATERIALS SPECIES

Eric A. Martin, Medford; Kenneth Vaccaro, Acton, both of Mass.; William Waters, Glassborn, N.J.; Joseph P. Lorenzo, Stow, Mass., and Stephen Spaziani, Nashua, N.H., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 14, 1994, Ser. No. 274,930

Int. Cl.⁶ H01L *31/18*

U.S. Cl. 437—2 **11 Claims**



1. The method of fabricating an indium inclusive photo field effect transistor of high optical energy sensitivity comprising the steps of:

growing, on an indium phosphide surrogate temporary first substrate member, an indium phosphide lattice-matched epitaxial layer having a composition taken from the materials group consisting of indium gallium arsenide and indium aluminum arsenide;

etching said epitaxial layer until a plurality of upstanding mesas thereof remain, said etching including removal of said epitaxial layer material from a top surface down to said substrate member at locations intermediate of said mesas;

depositing ohmic metal source and drain contacts on laterally segregated exposed top surface portions of said epitaxial layer mesas;

etching a gate recess into said epitaxial layer top surface at a location intermediate said ohmic metal contacts in each of said mesas;

forming a metallic electrically insulated Shottky gate member in said top surface gate recess of each said mesa;

covering said top surface, said Shottky gate member and said adjacent source and drain ohmic contact metal with an inert material passivation layer;

filling said locations intermediate of said mesas with an inert filling material to form a co-planar surface with said passivated top surface, Shottky gate member and adjacent source and drain ohmic contact metal;

bonding said planar surface to a second permanent substrate member to form a covered topside assembly;

removing said indium phosphide surrogate first substrate member from said covered topside assembly to expose an optical energy receptive and unencumbered backside epitaxial layer surface of said mesas and optical energy receptive and unencumbered backside portions of said Shottky gate member metal, and said source and drain ohmic contact metal;

making external circuit communication connections with said Shottky gate metal, and said source and drain ohmic contact metal; and

overlaying said exposed backside epitaxial layer surface with an inert second material passivation layer.

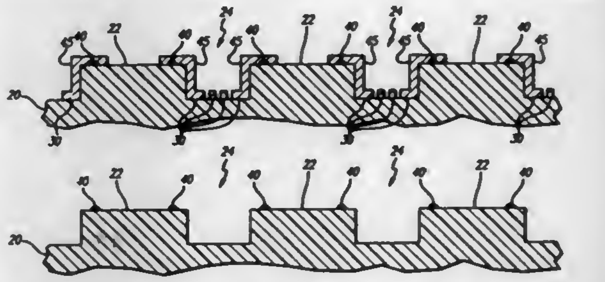
5,532,174
WAFER LEVEL INTEGRATED CIRCUIT TESTING WITH A SACRIFICIAL METAL LAYER

Wilfred J. Corrigan, Los Altos Hills, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 22, 1994, Ser. No. 232,963

Int. Cl.⁶ H01L *21/66*

U.S. Cl. 437—8 **10 Claims**



1. A method of forming integrated circuits on a wafer testable before separating the wafer into individual integrated circuit dies, comprising:

forming on a wafer a plurality of integrated circuits having input/output pads, along with a plurality of conductive paths extending from regions on the wafer to at least some of the input/output pads of the integrated circuits; and

heating the wafer without etching to remove the conductive paths from the wafer; wherein

the conductive paths are formed from a first conductive material differing from a second conductive material forming the input/output pads of the integrated circuits; and

the first and second conductive materials are selected, and the conductive paths are formed sufficiently thin, that the heating will remove the conductive paths and substantially not affect the input/output pads.

5,532,175

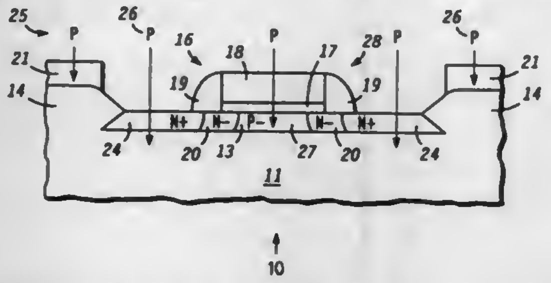
METHOD OF ADJUSTING A THRESHOLD VOLTAGE FOR A SEMICONDUCTOR DEVICE FABRICATED ON A SEMICONDUCTOR ON INSULATOR SUBSTRATE

Marco Racanelli, Phoenix; Bor-Yuan C. Hwang, Tempe; Juergen Foerstner, Mesa, and Wen-Ling M. Huang, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1995, Ser. No. 423,614

Int. Cl.^{6} H01L *21/226;21/335*

U.S. Cl. 437—29 **20 Claims**



1. A method of adjusting a threshold voltage for a semiconductor device with a channel of a first conductivity type fabricated on a semiconductor on insulator (SOI) substrate, the method comprising: providing the semiconductor on insulator substrate; isolating an active region on the semiconductor on insulator substrate; forming a gate structure on the active region; forming a patterned photoresist layer on the semiconductor on insulator substrate while leaving the active region exposed; implanting a first dopant of the first conductivity type into the active region, wherein the first dopant is implanted with a first implant energy and with a first implant dose, wherein the gate structure prevents the first dopant from penetrating the active region under the gate structure during implanting of the first dopant, and wherein the first dopant does not pass through the patterned photoresist layer during implanting of the first dopant; implanting a second dopant of a second conductivity type into the active region, wherein the second dopant is implanted with a second implant energy and with a second implant dose, wherein the second dopant penetrates the active region under the gate structure by passing through the gate structure during implanting of the second dopant, wherein the second dopant does not pass through the patterned photoresist layer during implanting of the second dopant, and wherein the patterned photoresist layer used to block the first dopant is also used to block the second dopant; removing the patterned photoresist layer; and annealing the first dopant and the second dopant.

5,532,176

PROCESS FOR FABRICATING A COMPLEMENTARY MIS TRANSISTOR

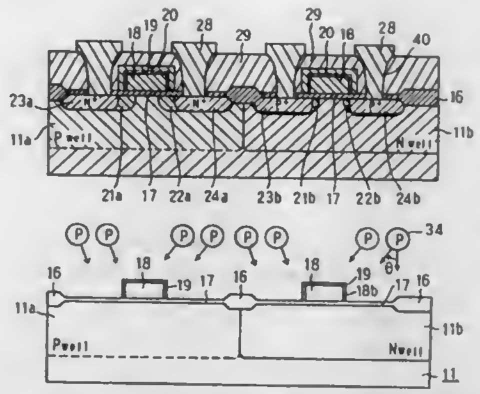
Mitsutaka Katada, Kariya; Hidetoshi Muramoto, Nagoya; Seizi Fuzino, Toyota; Tadashi Hattori, Okazaki, and Katsunori Abe, Obu, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 46,699, Apr. 16, 1993, Pat. No. 5,334,870. This application Jul. 26, 1994, Ser. No. 280,922

Claims priority, application Japan, Apr. 17, 1992, 4-125606

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—34 **18 Claims**



1. A method for fabricating a complementary MIS transistor, comprising the steps of:
- defining a P-type well and an N-type well in a substrate;
- providing an insulating gate on each of said P-type well and said N-type well;
- forming an N-type diffusion region in each of said P-type well and said N-type well simultaneously, such that said N-type diffusion regions have an impurity concentration level that is higher than an impurity concentration level in said P-type well and said N-type well, and such that said N-type diffusion region extends laterally into a region located immediately below said insulating gate in each of said P-type well and said N-type well from a first edge and a second edge of said insulating gate, said step of forming said N-type diffusion regions being conducted, in each of said P-type well and said N-type well, by applying an ion implantation process of N-type dopant ions such that said N-type dopant ions are implanted at an oblique angle with respect to a principal surface of said substrate while using said insulating gate as a mask;
- forming an N-type source region and an N-type drain region in said P-type well, such that said N-type source region and said N-type drain region have an impurity concentration level larger than the impurity concentration level of said N-type diffusion region in said P-type well, and such that said N-type source region and said N-type drain region have a depth at least equal to a depth of said N-type diffusion region in said P-type well, said step of forming said N-type source region and said N-type drain region being conducted in self-alignment to said insulating gate provided on said P-type well, such that said N-type source region and said N-type drain region have respective junctions defining a lateral boundary thereof, respectively in alignment to said first and second edges of said insulating gate on said P-type well; and
- forming a P-type source region and a P-type drain region in said N-type well, such that said P-type source region and said P-type drain region have an impurity concentration level larger than the impurity concentration level of said N-type diffusion region in said N-type well, and such that said P-type source region and said P-type drain region have a depth at least equal to a depth of said N-type diffusion region in said N-type well, said step of forming said P-type source region and said P-type drain region being conducted in self-alignment to said insulating gate provided on said N-type well, such that said P-type source region and said P-type drain region have respective junctions defining a lateral boundary thereof, respectively in alignment to said first and second edges of said insulating gate on said N-type well.

5,532,177

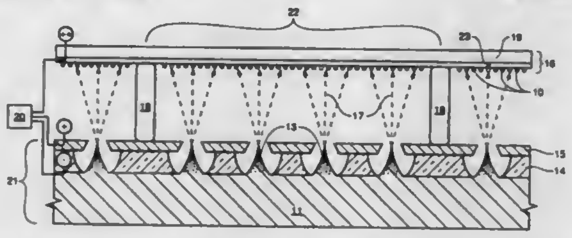
METHOD FOR FORMING ELECTRON EMITTERS

David A. Cathey, Boise, Id., assignor to Micron Display Technology, Boise, Id.

Filed Jul. 7, 1993, Ser. No. 89,166

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—40 **8 Claims**



1. A process for fabricating emitters, said process comprising the following steps of:

- forming a dopant concentration gradient of a dopant in a substrate, wherein said substrate has a surface and said dopant substantially covers said surface;
- patterning said substrate;
- selectively removing portions of said substrate, thereby defining emitters; and
- sharpening said emitters, wherein said sharpening comprises oxidation, said emitters oxidize at a rate which is a function of said dopant concentration gradient.

5,532,178

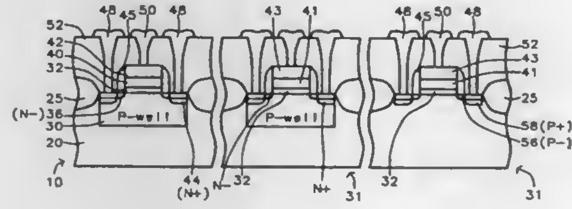
GATE PROCESS FOR NMOS ESD PROTECTION CIRCUITS

Shiou H. Liaw, and Jiaw-Ren Shih, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Apr. 27, 1995, Ser. No. 429,726

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—57 **14 Claims**



1. The method of simultaneously fabricating CMOS input product device circuits having n+ doped gate electrodes in product areas on a semiconductor substrate and an NMOS ESD protection circuit in ESD circuit areas, the NMOS ESD protection circuit having an undoped polysilicon gate electrode, the semiconductor substrate having a n-type background conductivity type, the method which comprises:
- forming p wells in the substrate in product areas and in ESD circuit areas;
- forming a gate insulating layer on the surface of the semiconductor substrate;
- forming a polysilicon layer on said gate insulating layer;
- forming a tungsten silicide layer over said polysilicon layer;
- forming a photoresist layer on said tungsten silicide layer covering ESD circuit areas;
- implanting N+ impurity ions into said tungsten silicide layer and polysilicon layer using said photoresist layer as a mask thereby forming a N+ doped tungsten silicide layer in the product areas wherein said N+ impurity ions are not implanted into said tungsten silicide layer and said polysilicon layer in the ESD circuit areas;
- removing the photo resist layer;
- patterning said polysilicon layer and said tungsten silicide layer into gate electrodes having vertical sidewalls and a top surface in said product areas and said ESD circuit areas;
- implanting ions into the substrate forming lightly doped source and drain regions;
- forming spacers on the vertical sidewalls of said gate electrodes;
- ion implanting impurities into the substrate using said spacers as masks forming highly doped source and drain regions;
- forming a dielectric layer over the substrate;
- forming contacts to said highly doped source and drain regions, and said gate electrodes through the dielectric layer; and
- forming an interconnecting metallurgy pattern that connects said highly doped source regions, drain regions, and gate electrodes thereby completing the NMOS ESD protection circuit and the CMOS product device circuits.

5,532,179

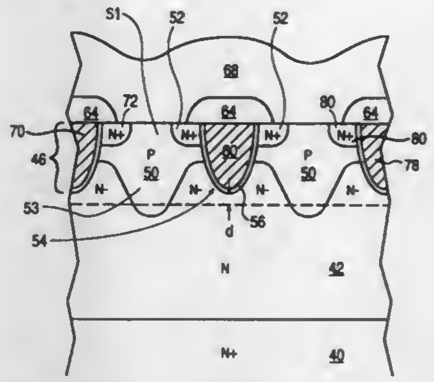
METHOD OF MAKING A FIELD EFFECT TRENCH TRANSISTOR HAVING LIGHTLY DOPED EPITAXIAL REGION ON THE SURFACE PORTION THEREOF

Mike F. Chang, Cupertino; Fwu-Iuan Hshieh, San Jose; Sze-Hon Kwan, San Francisco, and King Owyang, Atherton, all of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Division of Ser. No. 918,954, Jul. 24, 1992. This application May 23, 1995, Ser. No. 447,484

Int. Cl.^{6} H01L *21/335;21/20*

U.S. Cl. 437—40 **2 Claims**



1. A method of making a field effect transistor comprising the steps of:
- providing a substrate of a first conductivity type and having a principal surface;
- growing a first epitaxial layer of the first conductivity type on the principal surface, the first epitaxial layer having a doping level less than that of the substrate;
- growing a second epitaxial layer of the first conductivity type on the first epitaxial layer, the second epitaxial layer having a doping level less than that of the first epitaxial layer;
- forming a body region of a second conductivity type in the second epitaxial layer and extending to a principal surface thereof, the body region extending at least partly into the first epitaxial layer;
- forming a source region of the second conductivity type in the body region and extending to the principal surface thereof;
- forming a trench extending from the principal surface of the second epitaxial layer through the source region and the body region, but not extending into the first epitaxial layer; and
- filling the trench at least partially with a conductive gate electrode material.

5,532,180

METHOD OF FABRICATING A TFT WITH REDUCED CHANNEL LENGTH

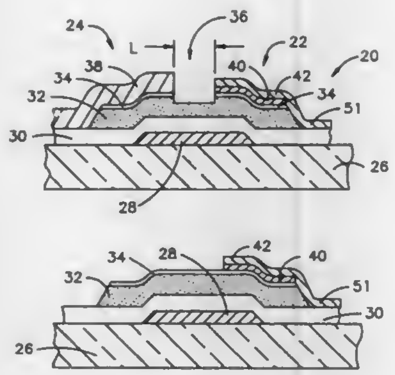
Willem den Boer, and Tieer Gu, both of Troy, Mich., assignors to OIS Optical Imaging Systems, Inc., Northville, Mich.

Filed Jun. 2, 1995, Ser. No. 460,248

Int. Cl.^{6} H01L *21/28;21/84*

U.S. Cl. 437—40 **14 Claims**

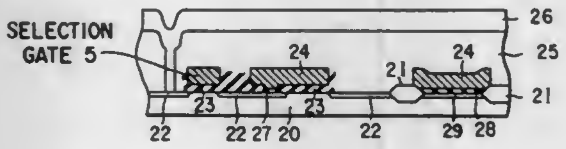
1. A method of making a thin film transistor (TFT), the method comprising the steps of:
- providing a substrate;
- depositing and patterning a gate electrode on said substrate;
- depositing a gate insulating layer over said gate electrode;
- vapor depositing a semiconductor layer and a doped semiconductor layer over said gate insulating layer;
- depositing a source metal layer over said doped semiconductor layer;
- patterning said source metal layer, said doped semiconductor layer, and said semiconductor layer so as to form a thin film transistor area or island;
- depositing a substantially transparent metal layer over said substrate and said patterned source metal layer;



patterning said substantially transparent metal layer into a pixel electrode portion and a source electrode portion;
etching said source metal so as to leave said source metal in the transistor area substantially only under the source electrode portion of the patterned substantially transparent metal layer to form a source electrode; and
depositing and patterning a drain metal layer to form a drain electrode in order to form the thin film transistor, whereby the channel length of the transistor is defined by and between said source and drain electrodes.

5,532,181
METHOD OF MANUFACTURING SEMICONDUCTOR NON-VOLATILE MEMORY DEVICE HAVING DIFFERENT GATE INSULATING THICKNESSES

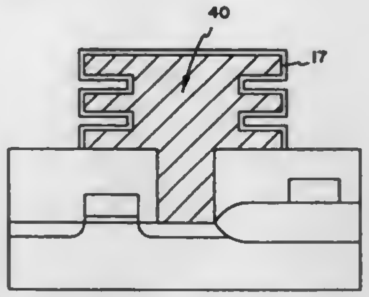
Masataka Takebuchi, Yokohama; Daisuke Tohyama, Tokyo, and Hidemitsu Ogura, Kawasaki, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 986,731, Dec. 8, 1992, Pat. No. 5,324,972. This application Apr. 5, 1994, Ser. No. 223,052
Claims priority, application Japan, Dec. 9, 1991, 3-324648; Sep. 16, 1992, 4-246827
Int. Cl.⁶ H01L *21/8247*
U.S. Cl. 437—43 **10 Claims**



1. A method of manufacturing a semiconductor nonvolatile memory device, comprising the steps of:
performing dement isolation to isolate an element active region from a field region;
performing photoetching of a part of said element active region;
selectively implanting ions;
forming a first insulating film;
etching a part of said first insulating film using photoetching;
forming a second insulating film;
etching parts of said first and second insulating films using photoetching;
forming a third insulating film; and
depositing a first polysilicon layer,
wherein id first insulating film is a high breakdown voltage insulating film, said second insulating film is a gate insulating film, and said third insulating film is a tunnel insulating film.

5,532,182
METHOD FOR FABRICATING STACKED CAPACITOR OF A DRAM CELL

Sang H. Woo, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea
Filed Dec. 28, 1994, Ser. No. 365,562
Claims priority, application Rep. of Korea, Dec. 28, 1993, 93-30484
Int. Cl.⁶ H01L *21/70;27/00*
U.S. Cl. 437—52 **7 Claims**

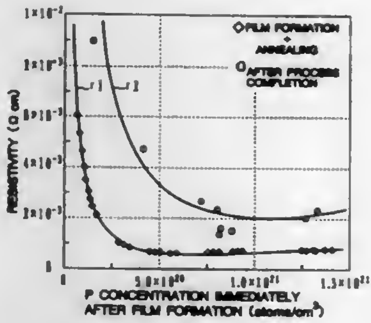


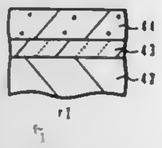
1. A process for fabricating a capacitor of a DRAM cell, comprising the steps of:
forming an MOS transistor on a semiconductor substrate, depositing an insulation layer for planarization on the MOS transistor and forming a storage electrode contact hole;
then depositing an undoped, first amorphous silicon layer, a doped, second amorphous silicon layer, a doped, third amorphous silicon layer, a doped, fourth amorphous silicon layer and an undoped, fifth amorphous silicon layer;
forming a photosensitive film pattern for a storage electrode mask on the fifth amorphous silicon layer;
etching the fifth through the first amorphous silicon layers to form a pattern of the fifth through first amorphous silicon layers with the photosensitive film pattern serving as a mask, and then, removing the photosensitive film pattern;
annealing the pattern of the first through fifth amorphous silicon layers under a condition, to transform the first through fifth amorphous silicon layers into corresponding first through fifth polysilicon layers with dopants contained in the doped layers being activated and not diffused into the undoped layers;
treating the first through fifth polysilicon layers with a selective chemical etchant to form grooves only in the doped second polysilicon layer and the doped fourth polysilicon layer;
diffusing dopants in the second and fourth polysilicon layers into the first, third and fifth polysilicon layers by use of a heat treatment, to form a storage electrode;
depositing a phosphorous-doped polysilicon film on an entire surface of the storage electrode; and
diffusing dopants contained in the polysilicon film into the storage electrode through a heat treatment, to form a bellows storage electrode.

5,532,183
SEMICONDUCTOR DEVICE HAVING HEAVILY DOPED SILICON FILM

Shigekazu Sugawara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 12, 1994, Ser. No. 354,351
Claims priority, application Japan, Feb. 28, 1994, 6-029667
Int. Cl.⁶ H01L *21/20*
U.S. Cl. 437—101 **12 Claims**

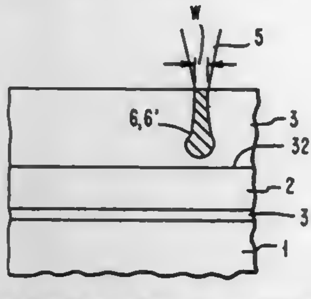
1. A method of manufacturing a semiconductor device comprising the steps of:
depositing a film of amorphous silicon on an underlying layer from a gas stream containing a silane and a phosphine, said film being doped with phosphorus to a concentration of 7×10^{20} to 2×10^{21} atoms/cm^3; and
then heating said film to convert the amorphous silicon in the film to polycrystalline silicon.





5,532,184
METHOD OF FABRICATING A SEMICONDUCTOR DEVICE USING QUANTUM DOTS OR WIRES

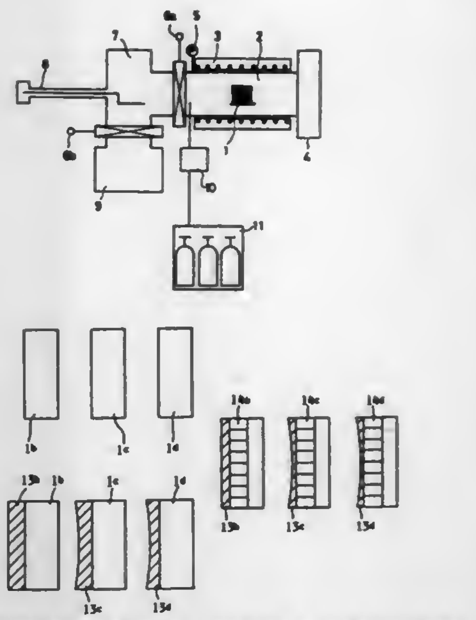
Yoshimine Kato, Sagamihara, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 172,446, Dec. 22, 1993, Pat. No. 5,479,027. This application Sep. 6, 1995, Ser. No. 523,829
Int. Cl.⁶ H01L *21/20*
U.S. Cl. 437—133 **9 Claims**



1. A method for fabricating a semiconductor device that contains a carrier gas selected from the group consisting of a one-dimensional carrier gas and a zero-dimensional carrier gas, comprising the steps of:
forming a substantially undoped first semiconductor layer;
forming a substantially undoped second semiconductor layer on said first semiconductor layer, the bandgap of said second semiconductor layer being wider than that of said first semiconductor layer; and
implanting a pattern selected from the group consisting of a zero-dimensional carrier gas pattern and a one-dimensional carrier gas pattern of dopant ions into said second semiconductor layer from the surface thereof opposite said first semiconductor layer, and to a depth such that the dopant ions are located away from said first semiconductor layer by a distance whereby carriers are supplied to said first semiconductor layer.

5,532,185
IMPURITY DOPING METHOD WITH ADSORBED DIFFUSION SOURCE

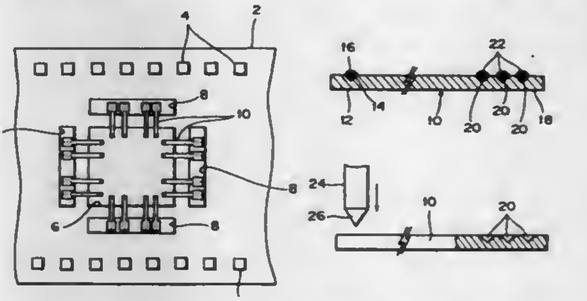
Tadao Akamine; Naoto Saito, and Kenji Aoki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan
Filed Mar. 27, 1992, Ser. No. 858,173
Claims priority, application Japan, Mar. 27, 1991, 3-063323; May 17, 1991, 3-113544
Int. Cl.⁶ H01L *21/385*
U.S. Cl. 437—141 **10 Claims**



1. A method for doping a region below a surface of a semiconductor substrate with an impurity comprising: removing any inert film from the semiconductor surface; applying to the semiconductor surface a gas containing impurity atoms to form a layer containing the impurity atoms with an impurity concentration; and effecting diffusion into the region below the surface of the semiconductor substrate using the layer as an impurity diffusion source and effecting activation of the impurity; wherein said step of applying is carried out in a manner to keep the impurity concentration at the semiconductor surface at least equal to the solid solubility until completion of said steps of effecting diffusion and effecting activation.

5,532,186
PROCESS FOR MANUFACTURING BUMPED TAB TAPE

Yasushi Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 958,637, Oct. 9, 1992, abandoned. This application Oct. 7, 1994, Ser. No. 319,486
Claims priority, application Japan, Oct. 11, 1991, 3-263632
Int. Cl.⁶ H01L *21/48;21/71*
U.S. Cl. 437—182 **6 Claims**



1. A manufacturing method for producing a TAB tape containing leads provided with metal bumps for subsequent connection to associated conductors, comprising the steps of:
providing a belt-shaped tape member having a plurality of sprocket holes formed along opposite side edges, a plurality of first openings for inner lead bonding formed at a transversely substantially central portion so as to be arranged at equal intervals in a longitudinal direction, and a plurality of second openings for outer lead bonding formed around each of said first openings;
providing a plurality of sheet-like leads having oppositely facing surfaces, one of which defining a contact surface for bonded engagement with a facing surface of an associated conductor,
fixing each of said leads to said tape with a first end portion of said contact surface exposed to each of said first openings and

a second end portion of said contact surface exposed to each of said second openings;

pressing a pyramidal or conical point onto said contact surface of said each lead to form at least one recess therein at each of said first and second end portions of said each lead;

seating a piece of bondable metal in said each recess; and

melting said metal piece seated in said each recess and cooling it to permit it to solidify so that, when solidified upon cooling, said metal piece is bonded to said lead and a part thereof substantially hemispherically projects from said contact surface of said each lead to form a plurality of bumps of bondable metal projecting from the contact surface of said each lead which are effective for subsequently engaging and thereby effecting a bonded connection to an associated conductor.

5,532,187

PROCESS FOR SEALING APERTURES IN GLASS-SILICON-GLASS MICROMECHANICAL ACCELERATION SENSORS

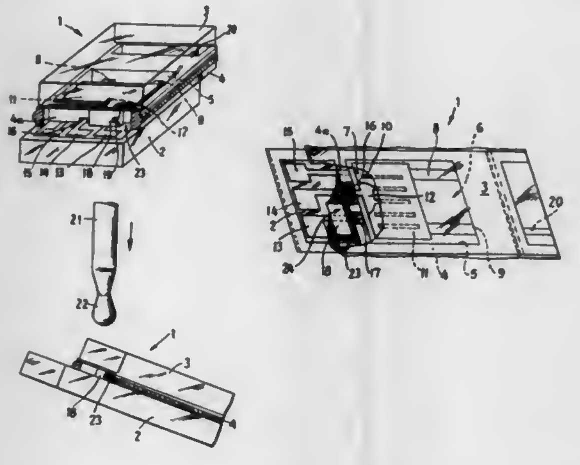
Wolfgang Schreiber-Prillwitz, and Horst Plankenhorn, both of Villingen-Schwenningen, Germany, assignors to VDO Kienzle GmbH, Villingen-Schwenningen, Germany

Filed Dec. 16, 1994, Ser. No. 357,801

Claims priority, application Germany, Dec. 16, 1993, 43 42 890.8

Int. Cl.^{6} H01L *21/48;21/52;21/54;21/60*

U.S. Cl. 437—182 **4 Claims**



1. A method for sealing apertures in a micromechanical acceleration sensor caused during manufacture, which sensors are fabricated as differential capacitances in the form of a glass-silicon-glass layered package, which comprises the steps of:

allocating counter electrodes on the inner faces of the glass layers to the osciliating mass of a flexural resonator structured out of a silicon layer doped so as to be electrically conductive, wherein said counter electrodes are electrically conductively connected by means of equiplanar conductor paths with junction contacts located outside the oscillation space;

forming recesses into the silicon layer surrounding the oscillation space, wherein said recesses serve for leading the conductor paths out of the oscillation space without causing short circuits;

sealing the recesses by applying a quantity of adhesive, which can be cured by light and which is applied at a point of the acceleration sensor, wherein adhesive migration is caused by capillary forces; and

curing said adhesive by exposure to light after a distribution time period has elapsed.

5,532,188

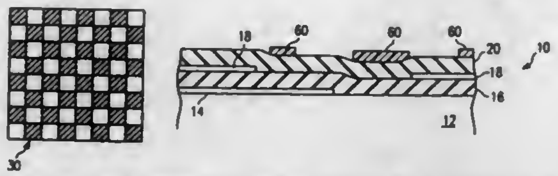
GLOBAL PLANARIZATION OF MULTIPLE LAYERS

Peter J. Wright, 6800 Arapaho Rd. #2072, Dallas, Tex. 75248

Filed Mar. 30, 1994, Ser. No. 220,309

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—195 **16 Claims**



7. A method for performing global planarization of the top layer of a structure having multiple patterned layers, during fabrication of an integrated circuit having a plurality of patterned layers interleaved with a plurality of unpatterned layers wherein each of said patterned layers is associated with a pattern mask and wherein one of the layers is a topmost layer, comprising the steps of;

creating a weighted spatial interpolation of each of said pattern masks;

taking the inverse of each of said weighted spatial interpolations to form inverse interpolation masks;

forming a planarizing block mask by multiplying said inverse interpolation masks;

forming a planarizing block layer on top of said topmost layer using said planarizing block mask;

forming an unpatterned planarizing film layer on top of said planarizing block layer; and

etching said unpatterned planarizing film layer, said planarizing block layer, and said topmost layer to cause planarization of said topmost layer.

5,532,189

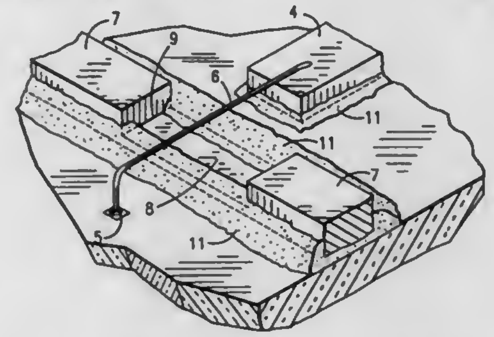
METHOD OF MAKING SEMICONDUCTOR PACKAGE

Satsuo Kiyono, Moriyama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 252,858, Jun. 2, 1994. This application May 22, 1995, Ser. No. 445,532

Int. Cl.^{6} H01L *21/60*

U.S. Cl. 437—209 **20 Claims**



1. A method for forming an insulating portion on a bus bar used in a semiconductor package having a lead-on-chip structure, comprising the steps of:

providing a semiconductor chip having bonding pads thereon;

providing a plurality of inner leads for being electrically coupled to said bonding pads;

forming a long and narrow bus bar for being positioned on said semiconductor chip between said bonding pads and said inner leads;

forming, in advance, bus bar regions within said bus bar which are to be traversed by said bonding wires;

attaching one surface of an adhesive-containing insulating tape to the surfaces of said inner leads and said bus bar;

heating said insulating tape while pressing it onto said inner leads and said bus bar;

attaching another surface of said insulating tape attached to said inner leads and said bus bars to said semiconductor chip using heat and pressure to cause formation of a plurality of fillets of the adhesive of said tape along the sides of said bus bar regions; and

connecting a plurality of bonding wires to said bonding pads and said inner leads across said bus bar regions.

5,532,190

PLASMA TREATMENT METHOD IN ELECTRONIC DEVICE MANUFACTURE

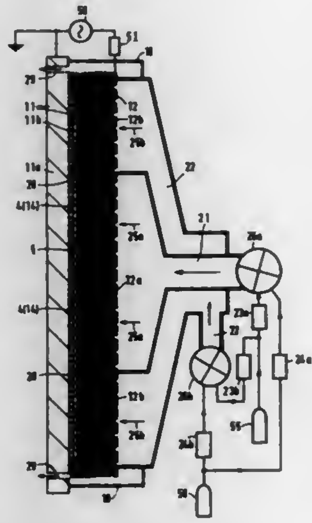
Andrew L. Goodyear, Clevedon, and Ian D. French, Hove, both of, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1995, Ser. No. 442,579

Claims priority, application United Kingdom, May 26, 1994, 9410567

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 437—225 **9 Claims**



1. A method of manufacturing an electronic device in which a plasma treatment is carried out on a device substrate which is mounted on a supporting electrode facing a perforated gas-feeding electrode, a reactive plasma being generated in a space between the electrodes from a mixture of reaction gases which is fed into the space through at least the perforated electrode, wherein a primary mixture of gases flows in a direction across the substrate from a first area of the space to which it is supplied by a first supply line, and a second supply line feeds a secondary mixture of gases to a second area of the space through the perforated electrode, the second area being excluded from the first area and the second area being along the flow direction from the first area, the primary mixture of gases comprising a first reaction gas which is depleted at a faster rate in the plasma treatment than a second reaction gas in the primary mixture, and the second supply line supplying a secondary mixture which is richer in the first reaction gas than the primary mixture supplied by the first supply line, whereby the plasma treatment is carried out more uniformly over the area of the supporting electrode.

5,532,191

METHOD OF CHEMICAL MECHANICAL POLISHING PLANARIZATION OF AN INSULATING FILM USING AN ETCHING STOP

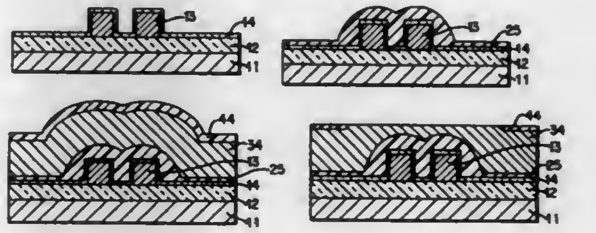
Tadashi Nakano; Nobuyoshi Sato; Tomohiro Ohta, all of Chiba, and Hiroshi Yamamoto, Tokyo, all of, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 23, 1994, Ser. No. 216,410

Claims priority, application Japan, Mar. 26, 1993, 5-068844; Apr. 22, 1993, 5-096032; Apr. 22, 1993, 5-096033; Jun. 30, 1993, 5-162826

Int. Cl.^{6} H01L *21/3105*

U.S. Cl. 437—228 **15 Claims**



1. A method of planarizing an insulating film comprising the steps of:

(a) preparing a semiconductor substrate;

(b) forming an insulating film on an uneven surface of the substrate by one of a chemical vapor deposition using an organic silicon compound as a raw material, coating a solution of an insulating substance on the uneven surface, and coating a solution of a precursor of an insulating substance on the uneven surface;

(c) forming a film having a chemical mechanical polishing etching speed slower than that of the insulating film by depositing one of silicon oxide and silicon oxynitride by performing a chemical vapor deposition using an inorganic silicon compound as a raw material; and

(d) etching back at least a part of the insulating film formed on the uneven surface of the substrate by a chemical mechanical polishing process using the film having a slower chemical mechanical polishing etching speed as an etching stop.

5,532,192

METHOD OF SPIRAL RESIST DEPOSITION

Thomas E. Adams, Emmaus, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 118,538, Sep. 8, 1993, Pat. No. 5,395,803. This application Dec. 14, 1994, Ser. No. 355,757

Int. Cl.^{6} H01L *21/312*

U.S. Cl. 437—229 **7 Claims**

1. A method of semi-conductor integrated circuit fabrication comprising:

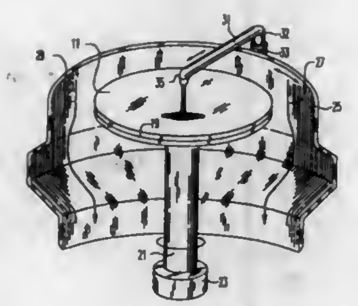
spinning a wafer at a speed of r_1;

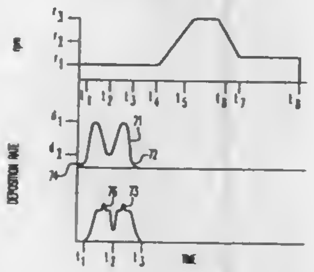
commencing deposition of resist material;

and continuously depositing said resist;

terminating said deposition;

spinning said wafer at a faster speed, r_3, for a period of time and further including the step of reducing the spinning speed of said wafer from wafer from r_3 to speed r_2 where $r_3>r_2>r_1$, and continuing to spin said wafer for a period of time.





5,532,193

METHOD FOR FORMING INSULATING FILM

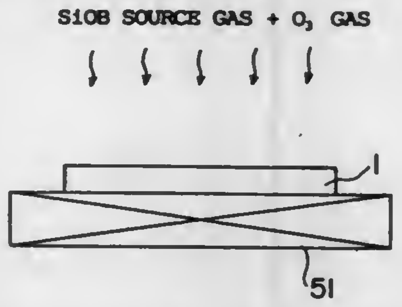
Kazuo Maeda; Noboru Tokumasu, and Yoshiaki Yuyama, all of Tokyo, Japan, assignors to Canon Sales Co., Inc.; Alcan-Tech Co., Inc., and Semiconductor Process Laboratory Co., Ltd., all of, Japan

Filed Oct. 31, 1994, Ser. No. 331,737

Claims priority, application Japan, Nov. 10, 1993, 5-281157

Int. Cl.⁶ H01L *21/02*

U.S. Cl. 437—243 **12 Claims**



1. A method for forming a film, comprising forming a borosilicate glass film on a substrate using a mixed gas of an organometallic compound having a Si—O—B bond and ozone.

5,532,194

CORDIERITE GLASS-CERAMIC AND METHOD FOR MANUFACTURING THE SAME

Yasuyuki Kawashima, and Naoyuki Goto, both of Sagamihara, Japan, assignors to Kabushiki Kaisya Ohara, Japan

Filed Mar. 23, 1995, Ser. No. 409,320

Claims priority, application Japan, Nov. 18, 1994, 6-309713

Int. Cl.⁶ G03C *10/08*

U.S. Cl. 501—9 **7 Claims**

1. A cordierite glass-ceramic having a cordierite crystal phase comprising crystal grains as a predominant crystal phase obtained by melting a base glass consisting in weight percent of:

SiO_2	42–47%
Al_2O_3	18–30%
MgO	10–20%

the ratio in weight of Al_2O_3 to MgO being 1.2 to 2.3

B_2O_3	0–5%
CaO	0–5%
BaO	0–5%
SrO	0–5%
ZnO	0.5–7.5%
TiO_2	8–12%
ZrO_2	0–5%
$As_2O_3 + Sb_2O_3$	0–2%

and forming the glass and subjecting the glass to heat treatment.

5,532,195

DOPED QUARTZ GLASS, AND ENCLOSURES FOR ELECTRICAL APPARATUS MADE THEREFOR

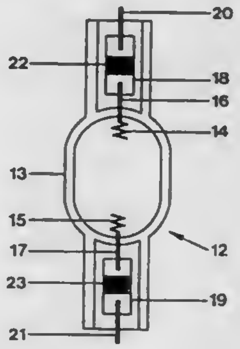
Werner Weiss, Stadtbergen, Germany, and Gerhard Wagner, Brig, Switzerland, assignors to Patent-Treuhand-Gesellschaft fuer Elektrische Gluehlampen mbh, Munich, Germany

Continuation of Ser. No. 148,822, Nov. 4, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 345,005

Claims priority, application Germany, Dec. 7, 1992, 42 41 152.1

Int. Cl.⁶ C03C *3/06*

U.S. Cl. 501—54 **13 Claims**



1. A quartz glass body consisting essentially of high purity SiO_2 and 0.05 to 0.8% by weight of doping substances which consist essentially of alkaline earth oxides and boron oxide, said glass not containing any alkali metal oxides and having a thermal expansion of about 0.6×10^{-6}/K.

5,532,196

INORGANIC RESINS, PROCESS FOR THEIR PREPARATION AND MATERIALS FOR HEAT PROTECTION

Claude L'Hernault, Evry, and Ludovic Neel, Villequier, both of, France, assignors to Societe National Des Poudres et Explosifs, Paris, France

Filed Jul. 1, 1994, Ser. No. 269,732

Claims priority, application France, Jul. 6, 1993, 93 08238

Int. Cl.⁶ C04B *33/04*

U.S. Cl. 501—128 **9 Claims**

1. Curable inorganic resins based on alkali metal boroaluminosilicates and comprising, before curing, inorganic elements in the reactive state in the following proportions expressed as their molar ratio of oxides:

$$2\leqq SiO_2/Al_2O_3\leqq 4$$

$$1.3\leqq X_2O/Al_2O_3\leqq 3.8$$

$$10\leqq H_2O/Al_2O_3\leqq 28$$

$$0.5<B_2O_3/Al_2O_3\leqq 2.0$$

X_2 denoting one or more alkali metal oxides chosen from Na_2O, K_2O and Li_2O, with boron optionally present in a supersaturated state.

5,532,197

DIELECTRIC MATERIAL FOR HIGH FREQUENCIES

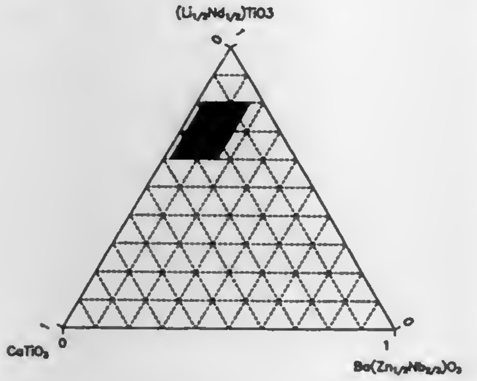
Kyung Yong Kim, Seoul; Wang Sup Kim, Suwon; Jung Rak Yun, Cheonan, and Kwang Ho Chang, Seoul, all of, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jun. 2, 1995, Ser. No. 459,543

Claims priority, application Rep. of Korea, Jul. 27, 1994, 18288/1994

Int. Cl.⁶ C04B *35/46*

U.S. Cl. 501—136 **3 Claims**



1. A dielectric material for high frequencies comprising a composition system represented by the following formula:

$$x(Li_{1/2}Nd_{1/2})TiO_3—yCaTiO_3— zBa(Zn_{1/3}Nb_{2/3})O_3$$

wherein

$0.60\leqq x\leqq 0.8$

$0.04\leqq y\leqq 0.38$ and

$0.02\leqq z\leqq 0.16$.

5,532,198

ZIRCONIUM/CERIUM MIXED OXIDE CATALYST/ CATALYST SUPPORT COMPOSITIONS HAVING HIGH/ STABLE SPECIFIC SURFACES

Thierry Chopin, Saint Denis, France, and Gabriel Vilmin, Princeton, N.J., assignors to Rhone-Poulenc Chimie, Cedex, France

Filed Feb. 10, 1994, Ser. No. 194,416

Claims priority, application France, Feb. 10, 1993, 93 01451

Int. Cl.⁶ B01J *23/10*

U.S. Cl. 502—304 **14 Claims**

1. A process for the preparation of a zirconium/cerium mixed oxide, comprising (i) intimately admixing a zirconium sol with a cerium sol, a ratio r of the mean diameter r_1 of the particles of said zirconium sol to the diameter r_2 of the particles of said cerium sol being at least 5, (ii) spray drying the admixture thus obtained, and (iii) calcining the dried material.

5,532,199

CARRIER-SUPPORTED CATALYST FOR THE SYNTHESIS OF UNSATURATED ALDEHYDES AND UNSATURATED CARBOXYLIC ACIDS AND PROCESS FOR PREPARING THE SAME

Seigo Watanabe, Otake, and Motomu Oh-Kita, Tokyo, both of, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 76,978, Jun. 16, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 359,430

Claims priority, application Japan, Jun. 19, 1992, 4-161410

Int. Cl.⁶ B01J *23/31*

U.S. Cl. 502—311 **26 Claims**

1. A carrier-supported catalyst for the synthesis of unsaturated aldehydes and unsaturated carboxylic acids, comprising a catalyst active substance comprising at least molybdenum and bismuth as its components, glass fiber having an average diameter in a range of more than 5 μm and not more than 200 μm and an average length in a range of from 50 μm to 1 mm, said glass fiber being used as a carrier assistant in an amount of 0.5 to 50% by weight based on the catalyst active substance, and a carrier.

5,532,200

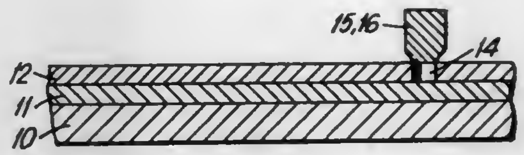
LATENT IMAGE PRINTING PROCESS AND APPARATUS AND SUBSTRATE THEREFOR

Arshavir Gundjian, Montreal, Canada, assignor to Nocopi International Inc., Wayne, Pa.

Continuation of Ser. No. 808,331, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 685,575, Apr. 15, 1991, abandoned. This application Nov. 16, 1994, Ser. No. 341,328

Int. Cl.⁶ B41M *5/30;5/40*

U.S. Cl. 503—201 **11 Claims**



1. A printing process comprising the steps of: providing a first sheet member having one surface with a colorless planar first layer of particles of only one of a pair of a color developer and a color former dye and a colorless continuous planar second shielding layer over the first layer; removably mounting a second sheet member having an uncoated surface on the first sheet member with the uncoated surface adjacent the shielding layer, wherein the uncoated surface of the second sheet member has a background color, wherein particles of said one of the pair are reactable with the other of the pair only when carried in a solvent to produce a spectral response which is visible relative to the background color of the uncoated surface of the second sheet member and wherein the shielding layer has a thickness of 0.1 to 10 microns and a melting point of from 50° to 200° C.; and transferring selected portions of the first and second layers to the uncoated surface of the second sheet member corresponding to a desired latent image by applying heat to one of the first and second sheet members to form the desired latent image on the uncoated surface of the second sheet member which is not visible until activated by the other of the pair carried in the solvent.

5,532,201

THERMOSENSITIVE RECORDING MEDIUM

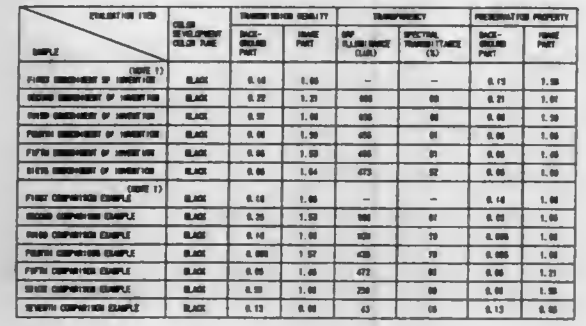
Hiroshi Goto, Fuji, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 355,974

Claims priority, application Japan, Dec. 15, 1993, 5-343114; Dec. 9, 1994, 6-331852

Int. Cl.^{6} B41M *5/30;5/40*

U.S. Cl. 503—213 **9 Claims**



1. A thermosensitive recording medium comprising:

a carrier body: and

a thermosensitive recording layer provided on said carrier body, said thermosensitive recording layer mainly composed of electron donative coloration compound, and electron acceptor compound, together with binder resin;

and wherein said thermosensitive recording medium includes 500 through 5,000 ppm of organic solvent,

said organic solvent having a dielectric constant of 2.0 through 25.0 at 20° C., and having a steam pressure of 10 through 200 mmHg at 20° C.

5,532,202

THERMAL TRANSFER SHEET

Kazuya Yoshida, Tokyo-to, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

Filed Dec. 28, 1994, Ser. No. 365,436

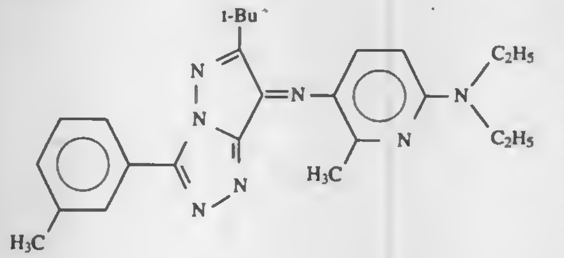
Claims priority, application Japan, Dec. 28, 1993, 5-349359

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **3 Claims**

1. A thermal transfer sheet comprising a substrate sheet and a dye layer provided on one surface of said substrate sheet, said dye layer comprising a binder and a dye represented by the following formula A:

(A)



5,532,203

SELECTIVE SAFENED HERBICIDAL COMPOSITION

Werner Föry, Riehen, Switzerland; Elmar Kerber, Görwihl, Germany, and Manfred Hudetz, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 291,319, Aug. 16, 1994, abandoned, which is a continuation of Ser. No. 157,870, Nov. 24, 1993, abandoned. This application May 1, 1995, Ser. No. 434,902

Claims priority, application Switzerland, Dec. 2, 1992, 3697/92; Jan. 25, 1993, 213/93; Feb. 10, 1993, 397/93; Mar. 25, 1993, 906/93

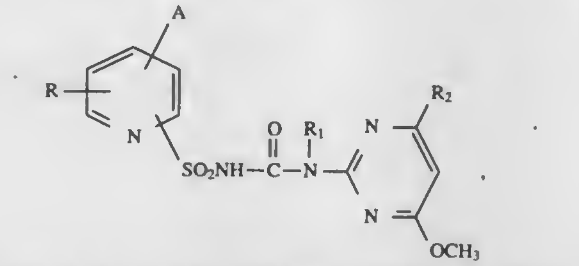
Int. Cl.^{6} A01N *25/32;47/36;* **C07D** *239/47;239/52*

U.S. Cl. 504—105 **23 Claims**

1. A composition for the selective control of weeds in crops of useful plants, which comprises, as active ingredient, together with inert carriers and adjuvants, a mixture comprising

a) a herbicidally effective amount of a pyridylsulfonylurea of formula I

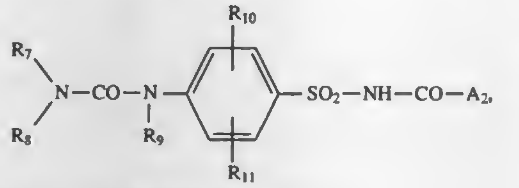
(I)



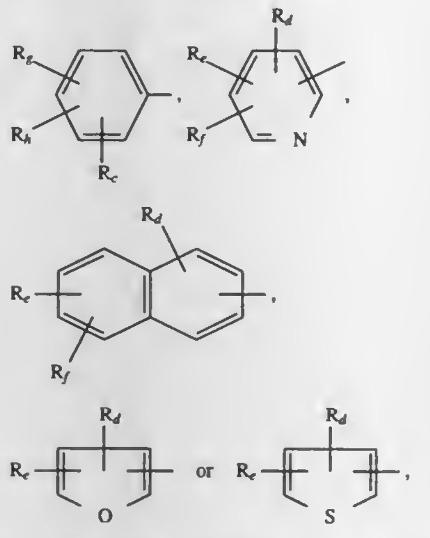
wherein R is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy or C_1–C_4alkylthio, or is C_1–C_4alkyl mono- or poly-substituted by halogen; R_1 is hydrogen or methyl; R_2 is methyl or methoxy; A is —X—R_3 or —N—(R_4)R_5; R_3 is C_1–C_6alkyl, or C_1–C_6alkyl that is mono- or poly-substituted by halogen, C_1–C_6alkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy or by C_3–C_6cycloalkyl, which may for its part be interrupted by oxygen; or is C_3–C_6alkenyl, or C_3–C_6alkenyl that is mono- or poly-substituted by halogen, C_1–C_6alkoxy, C_3–C_6alkenyloxy or by C_3–C_6alkynyloxy; or is C_4–C_6cycloalkyl, or C_4–C_6cycloalkyl that is mono- or poly-substituted by halogen or by C_1–C_6alkoxy; or is C_3–C_6cycloalkyl that is interrupted by oxygen; or is C_3–C_6alkynyl; X is oxygen or S(O)$_n$; n is 0, 1 or 2; R_4 is hydrogen, C_1–C_6alkyl, or C_1–C_6alkyl that is mono- or poly-substituted by halogen, C_1–C_6alkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy or by C_1–C_6alkylthio; R_5 is hydrogen, C_1–C_6alkyl, or C_1–C_6alkyl that is mono- or poly-substituted by halogen, C_1–C_6alkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy or by C_1–C_6alkylthio, or is C(O)R_6; and R_6 is hydrogen, C_1–C_6alkyl, C_3–C_6cycloalkyl or C_2–C_6alkynyl; or is C_1–C_6alkyl or C_3–C_6cycloalkyl each substituted by halogen or by C_1–C_4alkoxy; or is C_2–C_6alkenyl, or C_2–C_6alkenyl substituted by halogen; or is phenyl, benzyl, naphthyl or OR_{12}, or phenyl, benzyl or naphthyl each substituted by halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy, nitro, cyano, COOR_{13}, N$R_{15}R_{16}$, C(O)N$R_{17}R_{18}$, X_1R_{20}, $SO_2NR_{21}R_{22}$ or by X_2R_{23}; R_{12} is C_1–C_6alkyl, C_1–C_6haloalkyl, oxetan-3-yl, or C_4–C_6cycloalkyl, which may for its part be substituted by halogen, C_1–C_4alkyl or by C_1–C_4alkoxy; or is phenyl, benzyl or naphthyl, or phenyl, benzyl or naphthyl each substituted by C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkylthio, C_1–C_4haloalkylthio, C_1–C_4alkylsulfonyl, C_1–C_4alkylsulfinyl, nitro, cyano, COOR_{27}, N$R_{25}R_{26}$, CON$R_{28}R_{29}$ or by $SO_2NR_{30}R_{14}$; or is C_1–C_6alkyl substituted by C_1–C_4alkoxy, C_3–C_6cycloalkyl, cyano, COOR_{24} or by CON$R_{32}R_{33}$; or is C_3–C_6alkenyl, C_3–C_6haloalkenyl, C_3–C_6alkynyl, C_3–C_6haloalkynyl, X_3R_{35} or X_4R_{36}; R_{13} is hydrogen, C_1–C_6alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl or oxetan-3-yl; R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{21}, R_{22}, R_{25}, R_{26}, R_{28}, R_{29}, R_{30}, R_{32} and R_{33} are each independently of the others hydrogen, C_1–C_4alkyl, C_3–C_6alkenyl or C_3–C_6alkynyl; or R_{15} and R25 are each independently of the other the groups —C(O)—X_5—C_1–C_4alkyl or —C(O)—C_1–C_4alkyl, which may for their part be substituted by halogen; or R_{15} and R_{16} or R_{17} and R_{18} or R_{21} and R_{22} or R_{25} and R_{26} or R_{28} and R_{29} or R_{30} and R_{14} or R_{32} and R_{33} together form a C_4–C_5alkylene chain, which may for its part be interrupted by oxygen or by NR_{19}, R_{19} is hydrogen, C_1–C_4alkyl, C_3–C_6alkenyl or C_3–C_6alkynyl; R_{20} and R_{35} are each independently of the other C_1–C_4alkyl or C_1–C_4haloalkyl; R_{23} and R_{36} are each independently of the other C_1–C_4alkyl substituted by COOR_{34}; R_{24}, R_{27} and R_{34} are each independently of the other hydrogen or C_1–C_4alkyl; X_1 and X_3 are each independently of the other sulfur, SO or SO_2; X_2 and X_4 are each independently of the other oxygen or sulfur; X_5 is oxygen or NR_{37}; and R_{37} is hydrogen, C_1–C_4alkyl, C_3–C_6alkenyl or C_3–C_6alkynyl; or an N-oxide or a salt of a compound of formula I, and

b) a herbicide-antagonistically effective amount of a sulfamoylphenylurea of formula II

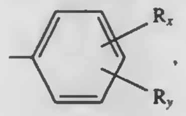
(II)



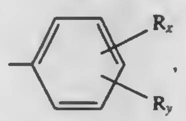
wherein A_2 is a radical from the group



R_7 and R_8 are each independently of the other hydrogen, C_1–C_8alkyl, C_3–C_8cycloalkyl, C_3–C_6alkenyl, C_3–C_6alkynyl or



or are C_1–C_4alkyl substituted by C_1–C_4alkoxy or by



R_7 and R_8 together form a C_4–C_6alkylene bridge, or a C_4–C_6alkylene bridge interrupted by oxygen, sulfur, SO, SO_2, NH or by —N(C_1–C_4alkyl)—; R_9 is hydrogen or C_1–C_4alkyl; R_{10} and R_{11} are each independently of the other hydrogen, halogen, cyano, nitro, trifluoromethyl, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl, —COOR_j, CONR_kR_m, —COR_n, —$SO_2NR_kR_m$ or —OSO_2— C_1–C_4alkyl; or R_{10} and R_{11} together form a C_3–C_4alkylene bridge, which may be substituted by halogen or by C_1–C_4alkyl, or a C_3–C_4alkenylene bridge, which may be substituted by halogen or by C_3- or C_4-alkyl, or a butadienylene bridge, which may be substituted by halogen or by C_1–C_4alkyl, and R_g and R_h are each independently of the other hydrogen, halogen, C_1–C_4alkyl, trifluoromethyl, methoxy, methylthio or —COOR_j; R_c is hydrogen, halogen, C_1–C_4alkyl or methoxy; R_d is hydrogen, halogen, nitro, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl, —COOR_j or —CONR_kR_m; and R_e is hydrogen, halogen, halo-C_1–C_4alkyl, C_1–C_4alkyl, —COOR_j, trifluoromethyl or methoxy; or R_d and R_e together form a C_3–C_4alkylene bridge; R_f is hydrogen, halogen or C_1–C_4alkyl; R_x and R_y are each independently of the other hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, —COOR_{17}, trifluoromethyl, nitro or cyano; R_{17} is hydrogen, C_1–C_{10}alkyl, C_1–C_4alkoxy-C_1–C_4alkyl, C_1–C_4alkylthio-C_1–C_4alkyl, di-C $_1$–C_4alkylamino-C_1–C_4alkyl, halo-C_1–C_8alkyl, C_2–C_8alkenyl, halo-C_2–C_8alkenyl, C_3–C_8alkynyl, C_3–C_7cycloalkyl, halo-C_3–C_7cycloalkyl, C_1–C_8alkylcarbonyl, allylcarbonyl, C_3–C_7cycloalkylcarbonyl, benzoyl that is unsubstituted or mono- to tri-substituted in the phenyl ring by the same or different substituents selected from halogen, C_1–C_4alkyl, halo-C_1–C_4alkyl, halo-C_1–C_4alkoxy and C_1–C_4alkoxy; or is furoyl or thienyl; or is C_1–C_4alkyl substituted by phenyl, halophenyl, C_1–C_4alkylphenyl, C_1–C_4alkoxyphenyl, halo-C_1–C_4alkylphenyl, halo-C_1–C_4alkoxyphenyl, C_1–C_6alkoxycarbonyl, C_1–C_4 alkoxy-C_1–C_8alkoxycarbonyl, C_3–C_8alkenyloxycarbonyl, C_3–C_8alkynyloxycarbonyl, C_1–C_8alkylthiocarbonyl, C_3–C_8alkenylthiocarbonyl, C_3–C_8alkynylthiocarbonyl, carbamoyl, mono-C_1–C_4alkylaminocarbonyl or by di-C_1–C_4alkylaminocarbonyl; or is phenylaminocarbonyl that is unsubstituted or mono- to tri-substituted in the phenyl ring by the same or different substituents selected from halogen, C_1–C_4alkyl, halo-C_1–C_4alkyl, halo-C_1–C_4alkoxy and C_1–C_4alkoxy or that is mono-substituted in the phenyl ring by cyano or by nitro; or is dioxolan-2-yl that is unsubstituted or substituted by one or two C_1–C_4alkyl radicals; or is dioxan-2-yl that is unsubstituted or substituted by one or two C_1–C_4alkyl radicals; or is C_1–C_4alkyl that is substituted by cyano, nitro, carboxy or by C_1–C_8 alkylthio-C_1–C_8alkoxycarbonyl; R_j, R_k and R_m are each independently of the others hydrogen or C_1–C_4alkyl; or R_k and R_m together form a C_4–C_6alkylene bridge, or a C_4–C_6alkylene bridge interrupted by oxygen, NH or by —N(C_1–C_4alkyl)—; and R_n is C_1–C_4alkyl, phenyl, or phenyl substituted by halogen, C_1–C_4alkyl, methoxy, nitro or by trifluoromethyl; or a salt of a compound of formula II.

5,532,204

FOLIAR-APPLIED METHANOL AND NITROGEN FOR INCREASED PRODUCTIVITY ON LEGUMINOUS PLANTS

Jagmohan Joshi, Salisbury, Md., assignor to University of Maryland Eastern Shore, Princess Anne, Md.

Filed Nov. 2, 1994, Ser. No. 334,020

Int. Cl.^{6} A01N *31/02;* **C05C** *9/00*

U.S. Cl. 504—118 **9 Claims**

1. A method for increasing seed yield from a leguminous plant consisting of the steps of:

applying to leguminous plant foliage at a seed growth stage within a developed seed pod of the leguminous plant an aqueous solution consisting essentially of methanol that is up to 50% by volume in a water based solution, and

applying a corresponding unreacted urea fertilizer to the leguminous plant that is in a range of about 25–50 pounds/acre,

whereby the seed yield at maturity has i) increased weight per seed, ii) more seeds per pod of the plant and iii) a greater protein content per seed.

5,532,205

HERBICIDAL COMPOSITION CONTAINING GLYPHOSATE OR A SALT THEREOF

Alan D. Baylis, Binfield, United Kingdom, assignor to Zeneca Limited, London, England

Filed Feb. 25, 1994, Ser. No. 201,830

Claims priority, application United Kingdom, Mar. 3, 1993, 9304294

Int. Cl.^{6} A01N *57/12;57/20*

U.S. Cl. 504—128 **11 Claims**

1. A herbicidal composition comprising (i) N-phosphonomethylglycine or an agriculturally acceptable salt thereof in combination with (ii) paraquat or diquat or a mixture thereof and (iii) a herbicide which functions as a photosystem II inhibitor.

5,532,206

METHOD OF TREATING PLANTS OR PLANT TISSUES WITH C-16,17-DIHYDRO GIBBERELLINS

Lloyd T. Evans, 3 Elliot Street, Campbell, Australian Capital Territory, 2600; Roderick W. King, 33 Norman Street, Deakin, Australian Capital Territory, 2600; Lewis N. Mander, 15 Juwin Street, Aranda, Australian Capital Territory, 2614, all of, Australia; David W. Pearce, 1325 17th Avenue South, Lethbridge, Alberta, T1K 1A3, and Richard P. Pharis, RR2, Box 609, Cochrane, Alberta, T0L 0W0, both of, Canada

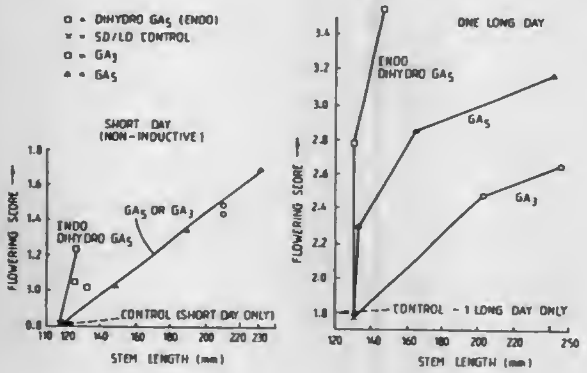
PCT No. PCT/AU92/00426, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO93/03616, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 14, 1992, Ser. No. 196,251

Claims priority, application United Kingdom, Aug. 15, 1991, 9117634

Int. Cl.^{6} A01N *37/08;43/08;45/00*

U.S. Cl. 504—176 **59 Claims**



1. A method for promoting a desired tissue morphology and/or physiological state in a higher plant, wherein said desired tissue morphology or physiological state is selected from at least one of

(i) dwarfing
(ii) stem and shoot and/or root (radicle) growth retardation
(iii) flowering
(iv) improved fruit quality
(v) inhibiting fruit ripening
(vi) improving fruit set
(vii) controlling weed growth
(viii) inducing male sterility
(ix) retarded bud break
(x) tillering

which comprises applying to the plant an amount of a C-16,17-dihydro gibberellin or C-16,17-dihydro gibberellin precursor effective to promote the desired tissue morphology and/or physiological state in the plant.

5,532,207

(2-IMIDAZOLIN-2-YL) FUSED HETEROPYRIDINE COMPOUNDS, INTERMEDIATES FOR THE PREPARATION OF AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

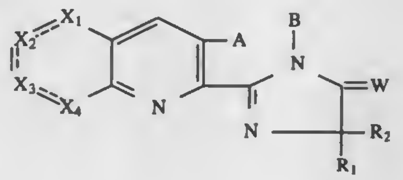
Barrington Cross, Rocky Hill; Marinus Los, Pennington; Robert F. Doehner, Jr., East Windsor; David W. Ladner, Hamilton Square, and Jerry L. Johnson, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 123,827, Sep. 20, 1993, which is a division of Ser. No. 465,569, Jan. 16, 1990, Pat. No. 5,252,538, which is a continuation of Ser. No. 178,408, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 876,599, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,578, Dec. 13, 1985, abandoned, and a continuation-in-part of Ser. No. 612,531, May 21, 1984, Pat. No. 5,129,454. This application Jun. 2, 1995, Ser. No. 460,163

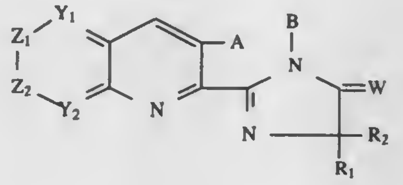
Int. Cl.^{6} A01N *43/90;* C07D *487/06*

U.S. Cl. 504—228 **10 Claims**

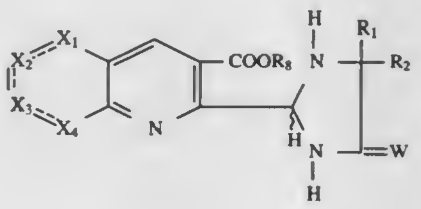
1. (2-Imidazolin-2-yl) fused heteropyridine compounds having the structure



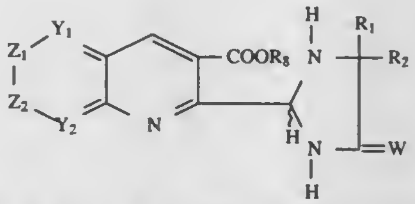
(I)



(III)

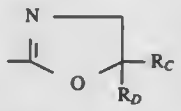


(XVII)



(XIX)

wherein A is COOR$_a$, CHO, CH$_2$OH, COCH$_2$OH, CONH$_2$, CH$_2$CH$_2$OH, CONHOH or



R$_C$ and R$_D$ are each hydrogen or C$_1$–C$_4$ alkyl;

R$_B$ is hydrogen, C$_1$–C$_4$ alkyl which may be interrupted by O or S, or is optionally substituted with C$_1$–C$_4$ alkoxy, halogen, hydroxy, C$_3$–C$_6$ cycloalkyl, benzyloxy, furyl, phenyl, furfuryl, halophenyl, C$_1$–C$_4$ alkylphenyl, C$_1$–C$_4$ alkoxyphenyl, nitrophenyl, carboxyl, C$_1$–C$_4$ alkoxy carbonyl, cyano or C$_1$–C$_4$ trialkylammonium; C$_3$–C$_6$ alkenyl, optionally substituted with one or two C$_1$–C$_3$ alkoxy, phenyl or halogen groups; C$_3$–C$_6$ cycloalkyl, optionally substituted with one or two C$_1$–C$_3$ alkyl groups; C$_3$–C$_{10}$ alkynyl, optionally substituted with phenyl, halogen, C$_1$–C$_4$ alkoxy; or a cation selected from the group consisting of alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and organic ammonium;

B is H, COR$_9$ or SO$_2$R$_{10}$, R$_9$ is C$_1$–C$_{11}$ alkyl, chloromethyl, C$_1$–C$_4$ alkoxyl or phenyl optionally substituted with one chloro, one nitro, one methyl, or one methoxy group; R$_{10}$ is C$_1$–C$_3$ alkyl, phenyl, or phenyl substituted with one methyl, halogen, nitro or C$_1$–C$_4$ alkoxy;

R$_1$ is C$_1$–C$_4$ alkyl;

R$_2$ is C$_1$–C$_4$ alkyl or C$_3$–C$_6$ cycloalkyl;

and when taken together with the carbon to which they are attached, R$_1$ and R$_2$ may represent C$_1$–C$_6$ cycloalkyl, optionally substituted with methyl;

$\underline{- - -}$ represents a single or double bond;

W is O or S;

X$_1$, X$_2$, X$_3$ and X$_4$ are any combination of CR$_4$, CR$_5$R$_6$, N or NR$_3$ and are the same or different, with the proviso that at least two of X$_1$, X$_2$, X$_3$ and X$_4$ must be N or NR$_3$;

Y$_1$ and Y$_2$ are N or CR$_4$;

Z$_1$ and Z$_2$ are NR$_3$ or CR$_5$R$_6$ with the proviso that at least two of Y$_1$, Y$_2$, Z$_1$ and Z$_2$ must be N or NR$_3$:

R$_3$ is C$_1$–C$_4$ alkyl, which may be optionally substituted with phenyl or one or more halogens; C$_3$–C$_6$ alkenyl, optionally substituted with phenyl or one or more halogens; C$_3$–C$_6$ alkynyl, optionally substituted with phenyl or halogen; C$_1$–C$_4$ alkoxy, optionally substituted with phenyl or one or more halogens; C$_3$–C$_6$ alkenyloxy optionally substituted with phenyl or one or more halogens; C$_3$–C$_6$ alkynyloxy optionally substituted with halogen or phenyl; or C$_2$–C$_6$ alkanoyloxy, optionally substituted with halogen or phenyl;

R$_4$ is hydrogen, halogen, C$_1$–C$_6$ alkyl; C$_1$–C$_4$ alkoxy; C$_2$–C$_6$ alkanoyloxy; C$_1$–C$_4$ alkylthio; phenoxy; C$_1$–C$_4$ haloalkyl, C$_1$–C$_4$ haloalkoxy; nitro, C$_1$–C$_4$ alkoxycarbonyl; C$_1$–C$_4$ dialkylamino; C$_1$–C$_4$ alkylsulfonyl or phenyl, optionally substituted with, one or two C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, halogen or C$_1$–C$_4$ haloalkyl;

R$_5$ and R$_6$ are each hydrogen, C$_1$–C$_4$ alkyl; C$_1$–C$_4$ alkoxy, C$_1$–C$_4$ haloalkoxy; nitro, C$_1$–C$_4$ alkylsulfonyl or phenyl optionally substituted with one or two C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, halogen or C$_1$–C$_4$ haloalkyl; or any combination of these groups except when R$_5$ and R$_6$ are the same group, they are either both hydrogen or both C$_1$–C$_4$ alkyl; and when taken together, R$_5$ and R$_6$ may form a ring in which R$_5$R$_6$ are represented by the structure —(CH$_2$)$_n$— where n is an integer of 4 or 5, or when taken together, R$_5$ and R$_6$ may form a group =O or =NR$_7$ wherein R$_7$ is phenyl, C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, C$_1$–C$_4$ alkylamino;

R$_3$, R$_4$, R$_5$ and R$_6$, when present on adjacent positions may, along with the atoms to which they are attached, form a ring and such R$_3$–R$_6$ pairs can be represented by the structure —(CH$_2$)$_m$— or —(CH)$_m$— where m is an integer of 3 or 4;

with the provisos that

$\underline{- - -}$ represents a single bond between:

X$_1$ and X$_2$ when either X$_1$ or X$_2$ is NR$_3$ or CR$_5$R$_6$;

X$_2$ and X$_3$ when either X$_2$ or X$_3$ is NR$_3$ or CR$_5$R$_6$;

X$_3$ and X$_4$ when either X$_3$ or X$_4$ is NR$_3$ or CR$_5$R$_6$; and

when B is COR$_9$ or SO$_2$R$_{10}$ and R$_8$ is hydrogen, then $\underline{- - -}$ represents an aromatic bond, R$_3$ is C$_1$–C$_4$ alkyl, and R$_4$ may not be halogen.

5,532,208

PYRIMIDONE DERIVATIVES AND THEIR USE

Eiki Nagano, Raleigh, N.C.; Susumu Takemura, Takarazuka, Japan; Masayuki Enomoto, Nishinomiya, Japan; Masaharu Sakaki, Toyonaka, Japan, and Satoru Kizawa, Takarazuka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-fu, Japan

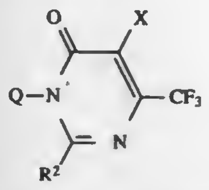
Division of Ser. No. 53,399, Apr. 28, 1993, Pat. No. 5,366,955. This application Aug. 17, 1994, Ser. No. 291,866

Claims priority, application Japan, Apr. 28, 1992, 4-109860

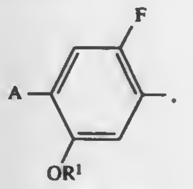
Int. Cl.^{6} C07D *239/32;* A01N *43/54*

U.S. Cl. 504—239 **16 Claims**

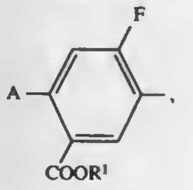
1. A compound of the formula:



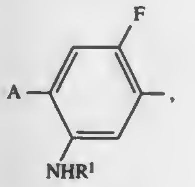
wherein R^2 is hydrogen or methyl; X is hydrogen, chlorine, methyl or ethyl; Q is of the formula:



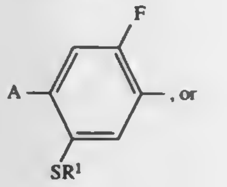
(Q-1)



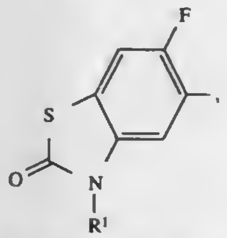
(Q-2)



(Q-3)



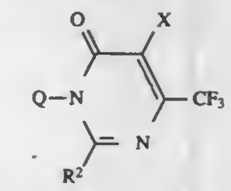
(Q-4)



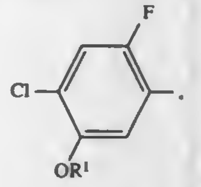
(Q-5)

A is fluorine, chlorine or bromine; and R^1 is alkyl, alkenyl, alkynyl, alkoxyalkyl or haloalkyl.

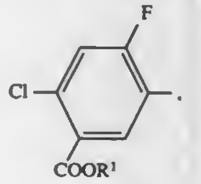
2. A compound of the formula:



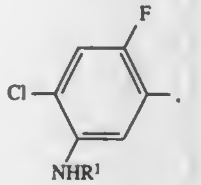
wherein R^2 is hydrogen or methyl; X is hydrogen, chlorine, methyl or ethyl; Q is of the formula:



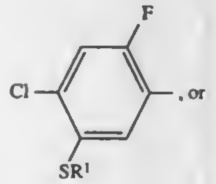
(Q-1)



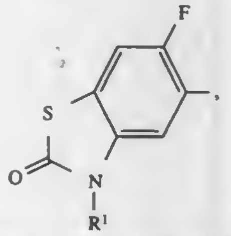
(Q-2)



(Q-3)



(Q-4)



(Q-5)

and R^1 is alkyl, alkenyl, alkynyl, alkoxyalkyl or haloalkyl.

5,532,209

PROPANIL DISPERSIBLE GRANULE FORMULATION

Richard D. Houghton, Harleysville; Linda L. Graham, Flourtown, and David P. Krutsch, Betharyes, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 887,422, May 21, 1992, abandoned, which is a continuation of Ser. No. 606,642, Oct. 31, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 465,066

Int. Cl.^{6} A01N *37/22*

U.S. Cl. 504—339 **18 Claims**

1. A propanil dispersible granule prepared by a process comprising the steps of:
   a. milling a mixture comprising propanil and one or more surfactants to a mean particle size of less than 20 microns;
   b. forming a paste comprising the milled mixture and less than 25% water;
   c. extruding the paste to produce granules; and
   d. drying the granules to a moisture content of less than 2% at a temperature of less than 60° C.;

wherein the dispersible granule:
   a. comprises at least 60 percent by weight propanil;
   b. has a mean granule size of at least 1 millimeter;
   c. has a suspensibility of at least 70 percent;
   d. has dispersibility in fewer than 15 cylinder inversions; and
   e. produces less than 0.3% by weight of particles less than 45 microns in diameter after 10 minutes of attrition.

5,532,210

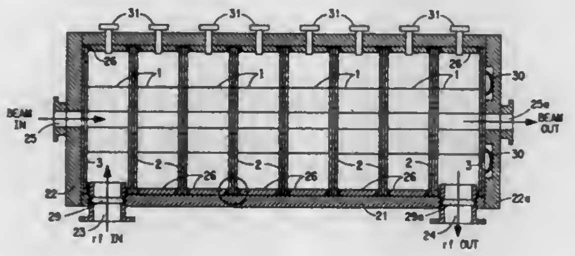
HIGH TEMPERATURE SUPERCONDUCTOR DIELECTRIC SLOW WAVE STRUCTURES FOR ACCELERATORS AND TRAVELING WAVE TUBES

Zhi-Yuan Shen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1994, Ser. No. 255,516

Int. Cl.^{6} H01J *23/24;25/34;* **H05H** *9/02;* **H01B** *12/06*

U.S. Cl. 505—200 **17 Claims**



14. A traveling wave tube comprising a slow wave structure operating in a mode having a longitudinal energy field and thus suitable for use in for changing velocity of a beam of charged particles, wherein said slow wave structure comprises:
   (a) an enclosure having a particle beam entry port, a particle beam exit port, and distinct radio frequency entry and exit ports;
   (b) a plurality of spaced-apart disks disposed within said enclosure, said disks each having a respective central aperture in a center thereof and comprising a respective high temperature superconducting film;
   (c) a respective cylindrical shaped dielectric ring disposed between and in contact with a pair of adjacent disks, said respective ring having a respective aperture in a center thereof and being of reduced size as compared to said corresponding disks, said respective ring being positioned relative to said corresponding disks to align the aperture in the center of the respective ring with the central apertures in the corresponding disks;
   (d) a central longitudinal bore traversing said structure defined by the aligned apertures of said respective ring and said corresponding disks, said bore further being aligned with said particle beam entry port and said particle beam exit port on the enclosure;
   (e) coupling means operatively associated with said respective disks for propagating a wave through said central bore of the structure; and
   (f) tuning means operatively associated with said enclosure for tuning phase velocity of a slow wave when a slow wave is propagating in said structure.

5,532,211

AQUEOUS DRILLING MUDS FLUIDIFIED BY MEANS OF ZIRCONIUM AND ALUMINUM COMPLEXES

Giovanni Burrafato, Tavazzano, and Stefano Carminati, Seriate, both of, Italy, assignors to Eniricerche S.p.A., and AGIP S.p.A., both of Milan, Italy

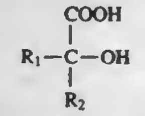
Filed Aug. 16, 1993, Ser. No. 106,634

Claims priority, application Italy, May 7, 1993, MI93A0918

Int. Cl.^{6} C09K *7/02*

U.S. Cl. 507—103 **5 Claims**

1. A composition of aqueous drilling muds on clay basis containing, as the fluidifier agent, one or more complexes, which can be either pre-formed or formed in situ, between multivalent metal ions and ligands, said complexes being selected from:
   (a) complexes of tetravalent zirconium and one or more ligands selected from among organic acids having the formula (I)



$$R_1-\overset{\displaystyle COOH}{\underset{\displaystyle R_2}{C}}-OH \qquad (1)$$

wherein R_1 and R_2, which may be the same or different from each other, represent —H, —COOH, —CH_3, —CH_2COOH, —CH(OH)COOH; or their salts, in an amount from 0.005 to 0.2 grams of zirconium per each 100 grams of mud;
   (b) a complex of aluminum and citric acid; or salts thereof, in an amount from 0.001 to 0.08 grams of aluminum per each 100 g of mud;

with the molar ratio of metal ion to ligand being within the range of from 1:0.5 to 1:4.

5,532,212

COMPOSITION COMPRISING A VISCOSITY PROMOTER AND A MAGNESIUM COMPOUND AND PROCESS USING THE COMPOSITION

Bharat B. Patel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 61,639, May 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 34,966, Mar. 22, 1993, abandoned. This application Sep. 27, 1995, Ser. No. 534,812

Int. Cl.^{6} C09K *7/02*

U.S. Cl. 507—140 **29 Claims**

1. A composition for viscosifying a clay-containing, water-based fluid comprising a clay, a viscosity promoter, and a magnesium compound wherein
   said viscosity promoter is selected from the group consisting of alkali metal aluminate, alkaline earth metal aluminate, aluminum halide, aluminum carboxylate, aluminum sulfate, aluminum phosphate, aluminum nitrate, iron halide, iron carboxylate, iron sulfate, iron phosphate, iron nitrate, manganese halide, manganese carboxylate, manganese sulfate, manganese phosphate, manganese nitrate, and mixtures of any two or more thereof;
   said magnesium compound is selected from the group consisting of magnesium oxide, magnesium hydroxide, magnesium chloride, magnesium acetate, magnesium formate, magnesium propionate, magnesium butyrate, magnesium citrate, magnesium lactate, and mixtures of any two or more thereof; and
   said clay is selected from the group consisting of kaolinite, halloysite, vermiculite, chlorite, attapulgite, smectite, montmorillonite, illite, saconite, sepiolite, palygorskite, Fuller's earth, and mixtures of any two or more thereof.

5,532,213

Patent Not Issued For This Number

5,532,214

ANTI-HIV PROTEIN, TAP 29, FROM TRICOSANTHES, DNA CODING THEREFOR AND THERAPEUTIC USES THEREOF

Sylvia Lee-Huang, New York, N.Y.; Philip L. Huang, Boston, Mass.; Hao-chia Chen, Potomac; Hsiang-fu Kung, Middletown, both of Md.; Peter Huang; Henry I. Huang, both of New York, N.Y., and Paul L. Huang, Boston, Md., assignors to New York University, New York, N.Y.; American Biosciences, Inc., Boston, Mass., and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 966,600, Oct. 26, 1992, abandoned, which is a continuation of Ser. No. 685,126, Apr. 15, 1991. This application Jul. 14, 1994, Ser. No. 275,327

Int. Cl.^{6} A61K *38/02*

U.S. Cl. 214—2 **1 Claim**

1. An isolated TAP 29 protein, obtainable from the root tuber of a plant of the genus Trichosanthes, wherein said protein; (a) includes the amino acid sequence SEQ ID NO:1; (b) has anti-HIV activity in vitro at concentrations above about 0.3 nanomolar; (c) lacks non-specific cytotoxicity in vitro at concentrations of about 1.5 to 30 nanomolar; and (d) has a molecular weight of about 29 kDa as determined by sodium dodecyl sulfate-polyacrylamide electrophoresis.

5,532,215

ANTIVIRAL COMPOSITIONS AND METHOD OF USE

John Lezdey, 976 Kingston Dr., Cherry Hill, N.J. 08034, and Allan Wachter, 9822 S. Grandview, Tempe, Ariz. 85284

Continuation-in-part of Ser. No. 953,234, Sep. 30, 1992, abandoned, and a continuation of Ser. No. 122,204, Sep. 15, 1993, Pat. No. 5,376,633. This application Oct. 3, 1994, Ser. No. 322,293

Int. Cl.^{6} A61K *38/16;38/48*

U.S. Cl. 514—8 **5 Claims**

1. A method for the inhibition of viral proliferation which comprises treating a patient with a composition containing an antiviral effective amount of a human-type serine protease inhibitor selected from the group consisting of alpha 1-antitrypsin, secretory leucocyte protease inhibitor and alpha 1-antichymotrypsin.

5,532,216

NEUTRALIZATION OF NON-LIPOPOLYSACCHARIDE COMPOUNDS BY BACTERICIDAL/PERMEABILITY-INCREASING PROTEIN

Terje Espevik, Trondheim, Norway, and Marian N. Marra, San Mateo, Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 265,088, Jun. 24, 1994, abandoned. This application Jun. 28, 1994, Ser. No. 267,139

Int. Cl.^{6} A61K *38/00;* **C07K** *17/00*

U.S. Cl. 514—21 **13 Claims**

1. A method of inhibiting mannuronic acid polymer-mediated stimulation of host inflammatory cells in the presence of a cell-stimulating amount of a mannuronic acid polymer, said method comprising administering to the host bactericidal/permeability-increasing protein (BPI) in an amount effective to inhibit inflammatory cell stimulation.

5,532,217

PROCESS FOR THE MINERALIZATION OF COLLAGEN FIBERS, PRODUCT PRODUCED THEREBY AND USE THEREOF TO REPAIR BONE

Frederick H. Silver, 103 Springbrook Dr., Bangor, Pa. 18013, and David Christiansen, 270 Altamont Pl., Somerville, N.J. 08876

Continuation-in-part of Ser. No. 873,366, Apr. 24, 1992, abandoned. This application Sep. 7, 1995, Ser. No. 524,752

Int. Cl.^{6} A61K *37/12;* **C07K** *14/00;* **C08H** *1/06;* **C08L** *89/00*

U.S. Cl. 514—21 **10 Claims**

1. A process for mineralizing collagen fibers, which comprises:

contacting collagen fibers with a solution of calcium and phosphate ions at a pH of from 5 to 10 under conditions to precipitate crystalline calcium phosphate onto the surface of said collagen fibers; and

recovering mineralized intact collagen fibers with subfibrillar substructure.

5,532,218

3'-AZIRIDINO-ANTHRACYCLINE DERIVATIVES

Alberto Bargiotti; Michele Caruso; Maria Grandi; Marina Ripamonti, and Antonino Suarato, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy

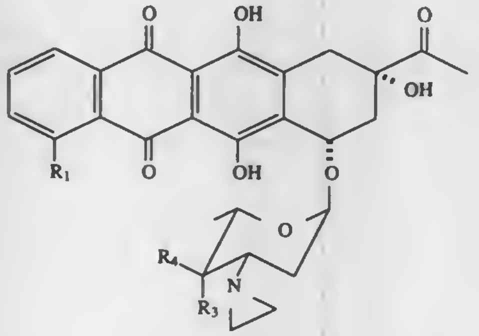
Filed Nov. 21, 1994, Ser. No. 345,450

Claims priority, application United Kingdom, Dec. 13, 1993, 9325417

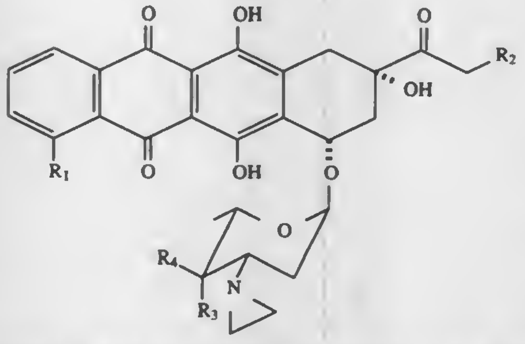
Int. Cl.^{6} A61K *31/70;* **C07H** *15/24*

U.S. Cl. 514—34 **10 Claims**

1. A compound which is an anthracycline glycoside of formula (1) or (2):



(1)



(2)

wherein R_1 is hydrogen or methoxy; R_2 is hydrogen, hydroxy or represents an acyloxy residue of formula 3:

$$\text{—O—COR}_5 \qquad (3)$$

wherein R_5 is a linear or branched C_1–C_8 alkyl, a mono- or bicyclic aryl group of 6 to 10 carbon atoms or a 5- or 6-membered saturated or unsaturated heterocyclic ring containing at least one heteratom selected from the group consisting of O, S and N, and which is optionally fused to a second 5- or 6 -membered, saturated or unsaturated heterocyclic group as defined above; said mono- or bicyclic aryl group or said heterocyclyl ring or rings each being unsubstituted or substituted with:

(a) an amino group —NR_6R_7, in which R_6 and R_7 are each independently hydrogen or C_1–C_4 alkyl, or,

(b) a carboxy group;

R_3 and R_4 both represent hydrogen or one of R_3 and R_4 is hydrogen and the other is a hydroxy group or a group of the formula —OSO_2R_8, in which R_8 is a linear or branched alkyl group containing from 1 to 6 carbon atoms or an aryl group which is unsubstituted or substituted by one to three substituents each of which is independently a linear or branched alkyl or alkoxy group of from 1 to 6 carbon atoms, halogen or nitro; or a pharmaceutically acceptable salt thereof.

10. A method for treating a tumor in a human or animal body, which comprises administering to a human or animal in need thereof an effective amount of one or more anthracycline glycosides or a pharmaceutically acceptable salt thereof as defined in claim 1.

5,532,219

DAPSONE AND PROMIN FOR THE TREATMENT OF DEMENTIA

Patrick L. McGeer, Vancouver, Canada; Nobua Harada, Okugnn; Horoshi Kimura, Otsu, both of, Japan; Edith G. McGeer, and Michael Schulzer, both of Vancouver, Canada, assignors to The University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 689,498, Apr. 23, 1991, abandoned. This application Apr. 5, 1993, Ser. No. 42,658

Int. Cl.^{6} A61K *31/13*

U.S. Cl. 514—42 **11 Claims**

1. A method of treating Alzheimer's disease in a patient, in need of such treatment, which comprises:

administering to the human being a therapeutically effective amount of a substance selected from the group consisting of 4,4'-diaminodiphenylsulfone, the didextrose sulfonate derivative of 4,4'diaminodiphenylsulfone (glucosulfone), sulfoxone, sulfetrone and thiazolsulfone, and therapeutically and pharmaceutically acceptable salts thereof;

the human having no clinical symptoms of leprosy, dermatitis herpetiformis, temporal arteritis, giant cell arteritis, rheumatoid arthritis, Behcet's disease, polymyalgia rheumatica, polychondritis or cutaneous lupus erythematosus.

5,532,220

GENETIC MECHANISMS OF TUMOR SUPPRESSION

Wen-Hwa Lee, and Phang-Lang Chen, both of San Diego, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 947,359, Sep. 18, 1992, abandoned, which is a division of Ser. No. 573,405, Aug. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 91,547, Aug. 31, 1987, Pat. No. 5,011,773, and a continuation-in-part of Ser. No. 108,748, Oct. 15, 1987, abandoned, and a continuation-in-part of Ser. No. 265,829, Oct. 31, 1988, abandoned, and a continuation-in-part of Ser. No. 533,892, Jul. 16, 1990, Pat. No. 5,104,571, and a continuation-in-part of Ser. No. 553,905, Jul. 16, 1990, abandoned. This application Nov. 14, 1994, Ser. No. 337,851

Int. Cl.^{6} A61K *31/70;48/00;* **C12N** *15/00;5/00*

U.S. Cl. 514—44 **6 Claims**

1. A method of treating mammalian cancer cells lacking endogenous wild-type p53 protein, comprising introducing a wild-type p53 tumor suppressor gene encoding said endogenous wild-type p53 protein into said mammalian cancer cells, whereby said mammalian cancer cells' neoplastic phenotype is suppressed.

5,532,221

IONICALLY CROSSLINKED CARBOXYL-CONTAINING POLYSACCHARIDES FOR ADHESION PREVENTION

W. James Huang, Somerville; Douglas B. Johns, Milford, and Richard L. Kronenthal, Fair Lawn, all of N.J., assignors to Lifecore Biomedical, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 680,955, Apr. 5, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 192,336

Int. Cl.^{6} A61K *31/715;* **C07H** *13/02*

U.S. Cl. 514—53 **15 Claims**

1. A method of reducing the incidence of post-operative adhesion formation in any animal that is susceptible to unwanted adhesion formation following surgery, comprising the step of topically applying as an adhesion preventative an effective amount of a carboxyl-containing polysaccharide, selected from the group consisting of hyaluronic acid and pharmacologically acceptable salts thereof having a weight average molecular weight of in the range of from about 550,000 to about 8,000,000 which has been ionically crosslinked with a trivalent cation provided in an amount sufficient to crosslink in the range of from about 60 to about 100 percent of the carboxyl groups of the carboxyl-containing polysaccharide, to a site of surgical trauma.

5,532,222

METHOD OF ENHANCING VISCOSITY USING HETEROPOLYSACCHARIDE 105-4

Bruce L. Dasinger, Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017

Division of Ser. No. 944,144, Sep. 11, 1992, Pat. No. 5,371,012, which is a continuation of Ser. No. 384,939, Jul. 25, 1989, Pat. No. 5,153,320. This application Dec. 2, 1994, Ser. No. 349,178

Int. Cl.^{6} A61K *31/715;* **C12P** *19/04*

U.S. Cl. 514—54 **3 Claims**

1. A process for increasing the viscosity of an aqueous medium comprising adding in an amount effective to increase the viscosity of said medium heteropolysaccharide 105-4, said heteropolysaccharide containing mannose, galactose, and glucose in the approximate molar ratio of 1.3:1:3.6, said heteropolysaccharide also containing, based on the weight of the heteropolysaccharide, from about 10 to about 25% by weight uronic acid and from about 10 to about 15% by weight acetate groups.

5,532,223

USE OF AQUEOUS SOLUBLE GLUCAN PREPARATIONS TO STIMULATE PLATELET PRODUCTION

Spiros Jamas, Boston; D. Davidson Easson, Jr., Shrewsbury, and Gary R. Ostroff, Worcester, all of Mass., assignors to Alpha-Beta Technology, Inc., Worcester, Mass.

Continuation of Ser. No. 60,418, May 11, 1993, Pat. No. 5,488,040, which is a continuation-in-part of Ser. No. 934,015, Aug. 21, 1992, and Ser. No. 855,578, Mar. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 838,288, May 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 404,738, Sep. 8, 1989, abandoned. This application May 30, 1995, Ser. No. 452,971

Int. Cl.^{6} A61K *31/715*

U.S. Cl. 514—54 **32 Claims**

1. A method for stimulating platelet proliferation comprising administering to an animal or human a platelet stimulating amount of an underivatized, aqueous soluble β(1–3) glucan in a triple helix conformation.

5,532,224

CONTACT LENS CLEANING COMPOSITION CONTAINING POLYALKLENE OXIDE MODIFIED SILOXANES

Nayan N. Desai, Freehold, N.J.; Ronald P. Quintana, and Masood A. Chowhan, both of Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 22, 1993, Ser. No. 172,625

Int. Cl.^{6} A01N *55/00;55/08;* **A61K** *31/69*

U.S. Cl. 514—63 **21 Claims**

1. A method of cleaning a contact lens, which comprises applying to the lens a composition comprising a polyalkylene oxide modified siloxane having an average molecular weight of less than 700 daltons and a non-siloxane weight percent of from about 65 to about 80 percent, in an amount effective to clean and wet the lens.

5,532,225

ACYCLIC PURINE PHOSPHONATE NUCLEOTIDE ANALOGS AS ANTIVIRAL AGENTS, AND RELATED SYNTHETIC METHODS

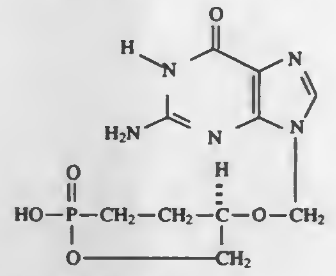
Elmer J. Reist, Menlo Park; Beatrice Ruhland-Fritsch, and Pricilla A. Sturm, both of Mountain View, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 31, 1992, Ser. No. 922,937

Int. Cl.^{6} A61K *31/675;* **C07F** *9/6512*

U.S. Cl. 514—81 **3 Claims**

1. A compound having the structural formula (VIIIb)



(VIIIb)

in enantiomerically pure form.

5,532,226

TRIFLUOROMETHYBENZYLPHOSPHONATES USEFUL IN TREATING OSTEOPOROSIS

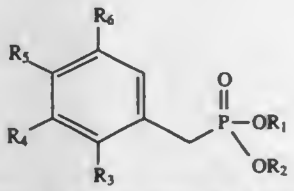
Keith Demarest, Flemington; Charles Schwender, Califon, both of N.J., and David Wustrow, Ann Arbor, Mich., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 732,267, Jul. 18, 1991, Pat. No. 5,300,687. This application Dec. 9, 1993, Ser. No. 164,602

Int. Cl.^{6} C07F *9/02;9/28;* **C07D** *279/12;* **A61K** *31/66*

U.S. Cl. 514—134 **12 Claims**

1. A compound of formula I:



I

wherein R_1 and R_2 are the same or different and are selected from any of hydrogen, alkyl, alkenyl or aralkyl;

wherein R_3 and R_5 may each be either H or CF_3, with the proviso that only one of R_3 or R_5 may be CF_3 at the same time;

wherein R_4 and R_6 may each be H or CF_3, with the proviso that if either or both of R_4 and R_6 are CF_3, neither R_3 nor R_5 may be CF_3, with the further proviso that R_3–R_6 may not each be H at the same time, and with the further proviso that R_1 and

R_2 can both be ethyl only when R_4 and R_6 are each CF_3; or the pharmaceutically acceptable salts thereof.

5,532,227

TETRACYCLINES INCLUDING NON-ANTIMICROBIAL CHEMICALLY-MODIFIED TETRACYCLINES INHIBIT EXCESSIVE GLYCOSYLATION OF DIFFERENT TYPES OF COLLAGEN AND OTHER PROTEINS DURING DIABETES

Lorne M. Golub; Nungavarum S. Ramamurthy, both of Smithtown; Thomas F. McNamara, Port Jefferson, and Maria E. Ryan, Port Jefferson Station, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 977,549, Nov. 17, 1992, abandoned. This application Dec. 21, 1994, Ser. No. 361,116

Int. Cl.^{6} A61K *31/65*

U.S. Cl. 514—152 **11 Claims**

1. A method of treating a mammal suffering from conditions associated with a pathologically excessive amount of protein glycosylation comprising administering to the mammal an effective amount of a tetracycline sufficient to inhibit said pathologically excessive amount of protein glycosylation.

5,532,228

SIDE-CHAIN HOMOLOGOUS VITAMIN D DERIVATIVES, PROCESS FOR THEIR PRODUCTION, PHARMACEUTICAL PREPARATIONS CONTAINING THESE DERIVATIVES AND THEIR USE AS PHARMACEUTICAL AGENTS

Gunter Neef; Gerald Kirsch; Andreas Stein-Eyer; Katica Schwarz; Matthias Bräutigam; Ruth Thieroff-Ekerdt, and Petra Rach, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

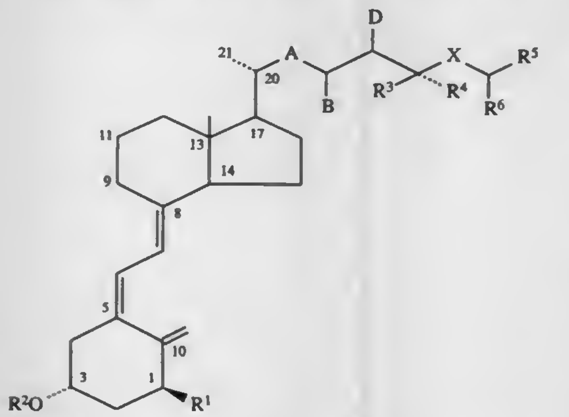
Continuation of Ser. No. 777,519, Dec. 6, 1991, abandoned. This application Jun. 1, 1993, Ser. No. 69,805

Claims priority, application Germany, Feb. 6, 1990, 40 03 854.8; Oct. 30, 1990, 40 34 730.3

Int. Cl.^{6} A61K *31/59;* **C07C** *401/00*

U.S. Cl. 514—167 **10 Claims**

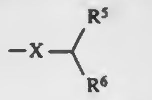
1. Side-chain homologous vitamin D derivatives of formula I



(I)

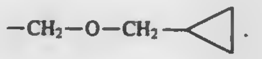
in which

- R^1 means a hydrogen atom, a hydroxy or an acyloxy group with 1 to 9 carbon atoms,
- R^2 means a hydrogen atom or an acyl group with 1 to 9 carbon atoms,
- R^3 or R^4 means a hydroxy or acyloxy group with 1 to 9 carbon atoms, and the respective other substituent is a hydrogen atom or R^3 or R^4 together mean an oxygen atom,
- R^5 and R^6, independently of one another, each mean a linear or branched alkyl radical with up to 5 carbon atoms, a trifluoromethyl group or together a saturated, unsaturated or aromatic carbocyclic 3-, 4-, 5- or 6-member ring formed with the tertiary carbon atom or with the inclusion of 1 or 2 N, O or S atoms a heterocyclic 3, 4, 5 or 6-member ring,
- B and D either mean a hydrogen atom each or together a second bond (E-configured double bond) and either
- A means a direct bond between carbon atoms 20 and 22 and
- X means an oxy alkylene radical —$(CH_2)_n$O— with n=1 to 3 or
- A means a methylene bridge (—CH_2—) between carbon atoms 20 and 22 and
- X means an alkylene radical —$(CH_2)_n$— or an oxy alkylene radical —$(CH_2)_n$O— with n=1 to 3, or if A stands for a direct bond and B and D together stand for a second bond,



$$-X-\underset{R^6}{\overset{R^5}{C}}$$

means



5,532,229

TOPICAL ADMINISTRATION OF VITAMIN D TO MAMMALS

Reinhold W. Vieth, 27 Chester Hill Road, Toronto, Ontario, Canada

Filed May 3, 1994, Ser. No. 237,170

Int. Cl.^{6} A61K *31/595*

U.S. Cl. 514—168 **7 Claims**

1. A method of delivering a nutritional or therapeutic amount of vitamin D to the blood of a mammal, which method comprises topically administering to the skin of the mammal a vitamin D nutritionally or therapeutically-effective amount of a composition comprising a nutritional or therapeutically effective amount of vitamin D in a suitable pharmaceutically-acceptable carrier, diluent or adjuvant therefor.

5,532,230

METHODS FOR PREVENTING PROGRESSIVE TISSUE NECROSIS, REPERFUSION INJURY, BACTERIAL TRANSLOCATION AND ADULT RESPIRATORY DISTRESS SYNDROME

Raymond A. Daynes, Park City, and Barbara A. Araneo, Salt Lake City, both of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

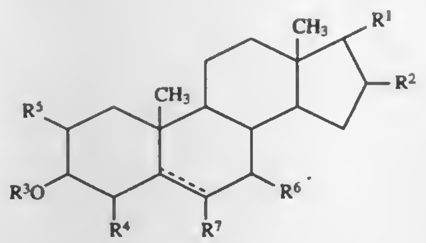
PCT No. PCT/US94/02558, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO94/20111, PCT Pub. Date Sep. 15, 1994

Continuation-in-part of Ser. No. 29,422, Mar. 9, 1993, abandoned. This PCT application Mar. 8, 1994, Ser. No. 284,688

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—178 **17 Claims**

1. A method for reducing loss of tissue viability caused by adhesion of neutrophils to endothelial cells which comprises administering to a patient having a tissue injury a therapeutically effective amount of a compound of the formula



wherein

- R^1 is =O or OH;
- R^2 is H, CH_3, OH or halogen when R^1 is =O and R^2 is H when R^1 is OH;
- R^3 is H, fatty acid, C_{1-10} alkyl, C_{1-10} alkenyl, C_{1-10} acetylenic, $(X)_n$-phenyl-C_{1-5}-alkyl, $(X)_n$-phenyl-C_{1-5}-alkenyl or —CO—R^8;
- R^4 and/or R^5 is H, OH, halogen or a group which does not affect the anti-ischemic activity but which inhibits the conversion of R^3 is H to R^3 is SO_3;
- R^6 is H, OH or a group which does not affect the anti-ischemic activity but which inhibits the conversion of R^3 is H to R^3 is SO_3;
- R^7 is H when the dashed line is a double bond, =O or H and halogen when the dashed line is a single bond or a group which does not affect the anti-ischemic activity but which inhibits the conversion of R^3 is H to R^3 is SO_3;
- R^8 is H, fatty acid, C_{1-10}-alkyl, C_{1-10}-alkenyl, C_{1-10}-acetylenic, $(X)_n$-phenyl-C_{1-5}-alkyl or $(X)_n$-phenyl-C_{1-5}-alkenyl;
- X is the same or different, and is halogen, C_{1-4}alkyl, C_{1-4}alkenyl, C_{1-4}alkoxy, carboxy, nitro, sulfate, sulfonyl, C_{1-6}carboxylesters or C_{1-6}sulfate esters; and
- n is O, 1,2 or 3,

and wherein the administration of said compound occurs simultaneously with or within six hours following said tissue injury.

5,532,231

ANTIBACTERIAL AGENT

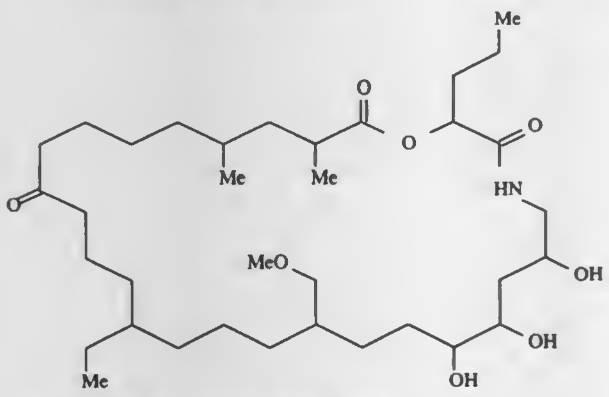
Eugene Rosenberg, Givat-Shmuel, Israel, assignor to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Filed Nov. 1, 1994, Ser. No. 332,964

Int. Cl.^{6} A61K *31/395;* **C07D** *267/00*

U.S. Cl. 514—183 **2 Claims**

1. A compound having the formula I



I

wherein Me represents a methyl group.

5,532,232

GUANIDINE DERIVATIVES

Jean Ackermann; David Banner, both of Basel, Switzerland; Klaus Gubernator, Freiburg, Germany; Paul Hadvary, Biel-Benken, Switzerland; Kurt Hilpert, Hofstetten; Klaus Müller, Münchenstein, Switzerland; Ludvik Labler, Bottmingen, Switzerland; Gérard Schmid, Kienberg, Switzerland; Thomas B. Tschopp, Ettingen, Switzerland; Hans P. Wessel, Heitersheim, Germany, and Beat Wirz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

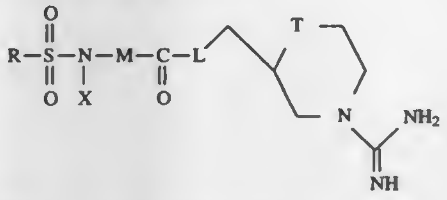
Division of Ser. No. 77,476, Jun. 15, 1993, Pat. No. 5,393,760, which is a division of Ser. No. 719,429, Jun. 24, 1991, Pat. No. 5,260,307. This application Nov. 22, 1994, Ser. No. 343,168

Claims priority, application Switzerland, Jul. 5, 1990, 2250/90; May 2, 1991, 1315/91

Int. Cl.^{6} A61K *31/445;* **C07D** *211/22;211/26*

U.S. Cl. 514—183 **45 Claims**

1. A compound of the formula

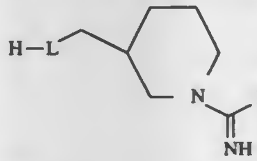


I

wherein

- R is aryl, heterorary1 or heterocyclcyl;
- L is NH or O;
- X is H, —CH_2COOH, —CH_2COO—C_{1-4}-alkyl, —CH_2CO—(tetra- to heptamethyleneimino) or optionally N- mono- or N- di-C $_{1-4}$-alkylated —CH_2CONH_2;
- M is a substituted ethylene group of the formula —CH_2[R'—$(CO)_{1-2}$NH]CH—, —CH_2(benzyl-OCONH)CH—OR—CH(CO— Q)CH_2—; and
- R' is aryl, heteroaryl, cycloalkyl or heterocyclyl;
- Q is benzylamino or a tetra- to heptamethyleneimino group optionally substituted by up to 2 substituents from the group C_{1-4}-alkyl, COOH, —COO—C_{1-4}-alkyl, —CH_2OH and —CH_2O-benzyl, a hydrate or solvate, or physiologically usable salt thereof.

43. A compound of the formula

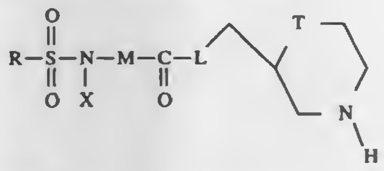


III

wherein

- L is NH or O.

44. A compound of the formula



IV

wherein

- R is aryl, heterorary1 or heterocyclyl;
- L is NH or O;
- X is H, —CH_2COOH, —CH_2COO—C_{1-4}-alkyl, —CH_2CO—(tetra- to heptamethyleneimino) or optionally N- mono- or N-di-C_{1-4}-alkylated —CH_2CONH_2;
- M is a —CH_2[R'$(CO)_{1-2}$NH]CH—, —CH_2(benzyl-OCONH)CH— or —CH(CO—Q)CH_2— group;
- R' is aryl, heteroaryl, cycloalkyl or heterocyclyl; and
- Q is benzylamino or a tetra- to heptamethyleneimino group optionally substituted by up to 2 substituents from the

group C_{1-4}-alkyl, COOH, —COO—C_{1-4} alkyl, —CH_2OH and —CH_2O-benzyl.

5,532,233
HETRAZEPINE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL UTILITY

Karl H. Weber, Gau-Algesheim; Albrecht Harreus, Ingelheim am Rhein; Werner Stransky, Gau-Algesheim; Gerhard Walther, Bingen; Jorge Casals-Stenzel, Munich; Gojko Muacevic, Ingelheim am Rhein; Hubert Heuer, Mainz, and Wolf-Dietrich Bechtel, Appenheim, all of, Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

Continuation of Ser. No. 61,392, May 13, 1993, abandoned, which is a continuation of Ser. No. 942,556, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 724,654, Jul. 2, 1991, abandoned, which is a continuation of Ser. No. 538,582, Jun. 14, 1990, abandoned, which is a continuation of Ser. No. 352,527, May 16, 1989, abandoned, which is a continuation of Ser. No. 88,758, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 76,515, Jul. 22, 1987, abandoned.

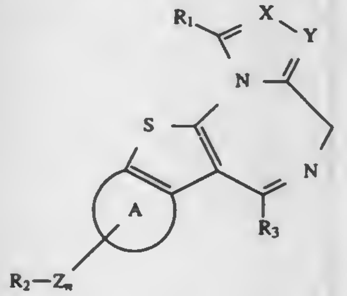
This application Sep. 8, 1994, Ser. No. 302,578

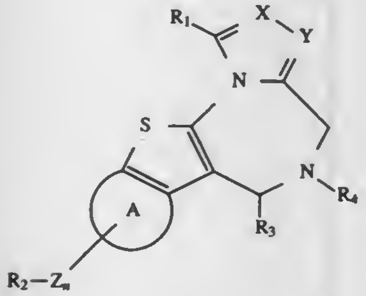
Claims priority, application Germany, Jul. 22, 1986, 36 24 647.62

Int. Cl.⁶ C07D *495/14;* A61K *31/55*

U.S. Cl. 514—219 **12 Claims**

1. A compound of the formula Ia or Ib


Ia


Ib

wherein

A is a fused mono-unsaturated 5-, 6- or 7-membered carbocyclic ring;

Z is a branched or unbranched alkyl or alkenyl group with n carbon atoms;

R_1 is hydrogen, lower alkyl, substituted lower alkyl, cycloalkyl, lower alkoxy, substituted lower alkoxy, or halogen;

R_2 is hydroxy, halogen, cyano, formyl, carboxy, alkyloxycarbonyl, aryloxycarbonyl, alkyl- or aryloxycarbonylalkyloxy, alkylsulphonyloxy, arylsulphonyloxy, alkyl- or arylsulphonylamino, amino, aminocarbonyl, aminocarbonylamino, alkoxycarbonylamino, aryloxycarbonylamino, aminocarbonyloxy, an amidine, an imido group, a C-linked Δ^2-imidazoline, -thiazoline, -oxazoline, or tetrahydropyrimidine group which may optionally be mono- or polysubstituted by methyl, ethyl or isopropyl, a tetrahydropyrimidine ring, optionally mono or polysubstituted by methyl, a benzimidazole group, an indole group, hydrogen where n is greater than 0, an alkyl ether, a phenyl ether, or an alkylthio ether,

R_3 is phenyl wherein the phenyl ring may be mono- or polysubstituted by methyl, halogen, nitro or trifluoromethyl; or pyrirdyl;

R_4 is hydrogen, alkyl or alkylcarbonyl;

X and Y independently of each other are N; and

n is 0,1,2,3,4,5, or 6,

or a pharmaceutically acceptable salt thereof.

5,532,234
USE OF 1-[4-[4-ARYL (OR HETEROARYL)-1-PIPERAZINYL]-BUTYL)-1H-AZOLE DERIVATIVES FOR THE PREPARATION OF MEDICAMENTS INTENDED FOR THE TREATMENT OF DISORDERS OF GASTRIC SECRETION

Jordi Frigola-Constansa, and Ramon Merce-Vidal, both of Barcelona, Spain, assignors to Laboratories Del Dr. Esteve, S.A., Barcelona, Spain

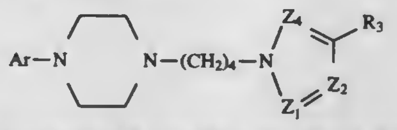
Filed Nov. 23, 1994, Ser. No. 344,377

Claims priority, application France, Nov. 25, 1993, 93 14102

Int. Cl.⁶ A61K *31/54;31/535;31/495*

U.S. Cl. 514—224.2 **5 Claims**

1. A method of treating gastrointestinal diseases characterized by gastric acid hypersecret that comprises administering a therapeutically effective amount to a patient in need of such treatment of a derivative of general formula I:


(I)

in which Ar represents an optionally nitrogenous aromatic radical chosen from the 2-pyrimidine and 3-(1,2-benzisothiazole),Z_1 represents a nitrogen atom or an optionally substituted carbon atom which can be represented by: C-R_1, Z_2 represents a nitrogen atom or an optionally substituted carbon atom which can be represented C-R_2, Z_4 represents a nitrogen atom or an optionally substituted by: carbon atom which can be represented by: C-R_4, and R_1, R_2, R_3 and R_4, which are identical or different and which can also form part of another, optionally aromatic ring, represent a hydrogen atom, a halogen, a lower alkyl radical, a nitro radical, a hydroxyl radical, an alkoxy radical, a cyano radical, a carboxyl radical, a carboxamido radical, an alkyl carboxylate radical, an aryl or substituted aryl radical, a sulfo radical, a sulfonamido radical which is optionally substituted on the amino group, or an amino radical, and its therapeutically acceptable salts.

5,532,235
TRICYCLIC BENZAZEPINE VASOPRESSIN ANTAGONISTS

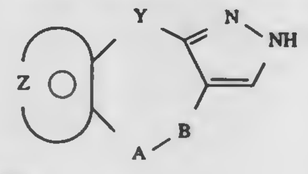
Jay D. Albright; Efren G. Delos Santos, both of Nanuet; Xuemei Du, Valley Cottage; Marvin E. Reich, Rockland, and Aranapakam M. Venkatesan, Elmhurst, all of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Filed Jan. 17, 1995, Ser. No. 373,139

Int. Cl.⁶ C07D *491/147;495/14;* A61K *31/55*

U.S. Cl. 514—215 **20 Claims**

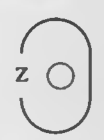
1. A compound selected from Formula I:


Formula I

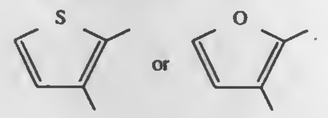
wherein:

Y is a bond;

the moiety

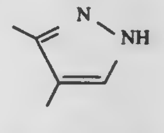


represents an optionally substituted fused thiophene or furan ring selected from the structures:



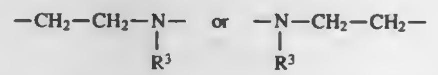
the fused thiophene or furan ring being optionally substituted by one or two substituents selected from the group of (C_1–C_3) lower alkyl, halogen, amino, (C_1–C_3) lower alkoxy, or (C_1–C_3) lower alkyl amino;

the moiety



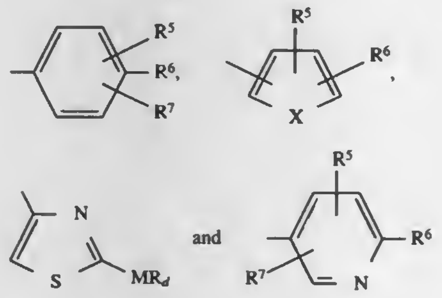
being optionally substituted by one or two substituents selected from the group of (C_1–C_3) lower alkyl, halogen, amino, (C_1–C_3) lower alkoxy, or (C_1–C_3) lower alkyl amino;

A—B is a moiety selected from



$$-CH_2-CH_2-\underset{\displaystyle R^3}{\underset{|}{N}}- \quad \text{or} \quad -\underset{\displaystyle R^3}{\underset{|}{N}}-CH_2-CH_2-$$

R^3 is —COAr, wherein Ar is a moiety selected from the group consisting of:



wherein

X is selected from O, S, —NH, —NCH_3 and —$NCOCH_3$;

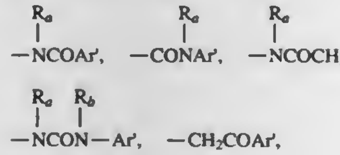
R^1 and R^2 are selected from H, lower alkyl (C_1–C_3), lower alkoxy (C_1– C_3) and halogen;

R^4 is selected from H, lower alkyl (C_1–C_3), —CO-lower alkyl (C_1–C_3);

R^5 is selected from H, (C_1–C_3) lower alkyl, (C_1–C_3)lower alkoxy, and halogen;

R^6 is selected from;

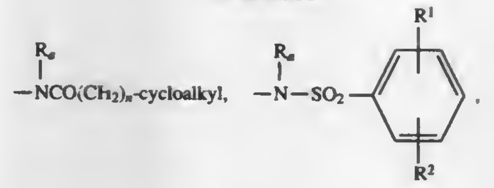
(a) the moieties of the formulae:

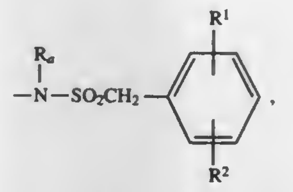


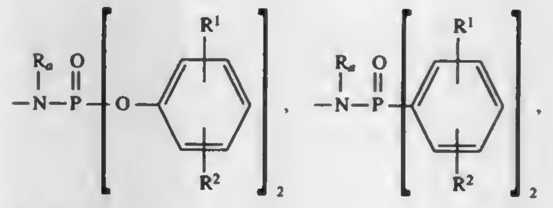
$$-\overset{\displaystyle R_a}{\overset{|}{N}}COAr', \quad -CO\overset{\displaystyle R_a}{\overset{|}{N}}Ar', \quad -\overset{\displaystyle R_a}{\overset{|}{N}}COCH_2Ar',$$

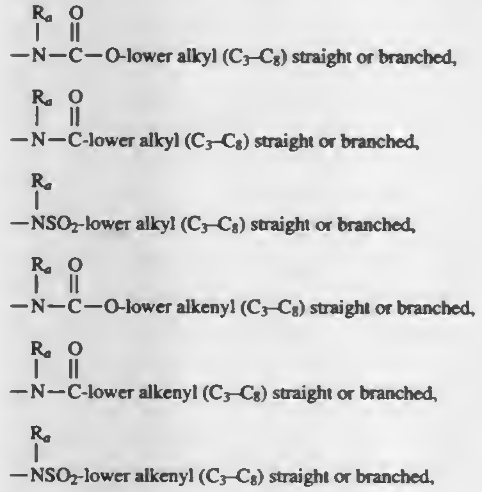
$$-\overset{\displaystyle R_a}{\overset{|}{N}}CO\overset{\displaystyle R_b}{\overset{|}{N}}-Ar', \quad -CH_2COAr',$$

-continued









$$-\overset{\displaystyle R_a}{\overset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}-\text{O-lower alkyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

$$-\overset{\displaystyle R_a}{\overset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}\text{-lower alkyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

$$-\overset{\displaystyle R_a}{\overset{|}{N}}SO_2\text{-lower alkyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

$$-\overset{\displaystyle R_a}{\overset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}-\text{O-lower alkenyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

$$-\overset{\displaystyle R_a}{\overset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}\text{-lower alkenyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

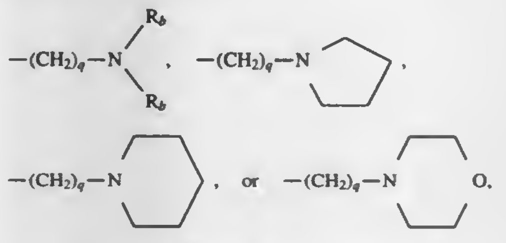
$$-\overset{\displaystyle R_a}{\overset{|}{N}}SO_2\text{-lower alkenyl } (C_3\text{–}C_8) \text{ straight or branched,}$$

wherein

n is 1 or 2;

cycloalkyl is defined as C_3–C_6 cycloalkyl, cyclohexenyl or cyclopentenyl;

R_a is independently selected from hydrogen, —CH_3, —C_2H_5, moieties of the formulae:

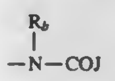


$-(CH_2)_q-$O-lower alkyl (C_1–C_3) or $-CH_2CH_2OH$;

q is one or two;

R_b is independently selected from H, —CH_3, or —C_2H_5;

(b) a moiety of the formula:

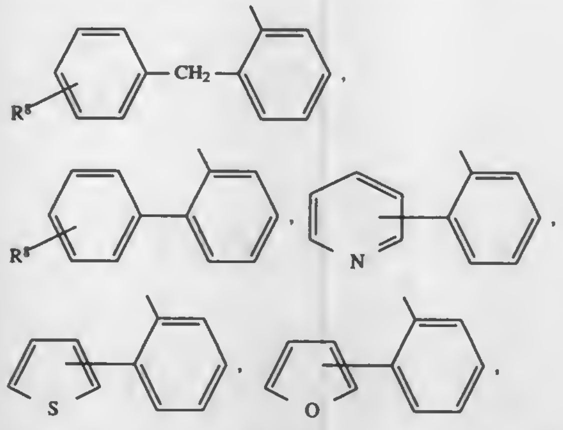


$$-\overset{\displaystyle R_b}{\overset{|}{N}}-COJ$$

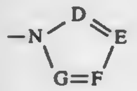
wherein

J is R_a, lower alkyl (C_3–C_8) branched or unbranched, lower alkenyl (C_3–C_8) branched or unbranched, —O-lower alkyl (C_3–C_8) branched or unbranched, —O-lower alkenyl (C_3-

C_8) branched or unbranched, tetrahydrofuran, tetrahydrothiophene, the moieties:

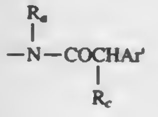


or —CH_2—K' wherein K' is (C_1–C_3) lower alkoxy, halogen, tetrahydrofuran, tetrahydrothiophene or the heterocyclic ring moiety:



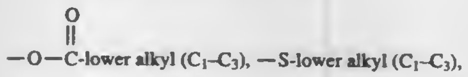
wherein D, E, F and G are selected from carbon or nitrogen and wherein the carbon atoms may be optionally substituted with halogen, (C_1–C_3) lower alkyl, hydroxy, —CO-lower alkyl (C_1–C_3), CHO, (C_1–C_3)lower alkoxy, or —CO-lower alkyl (C_1–C_3), and R_a and R_b are as hereinbefore defined;

(c) a moiety of the formula:

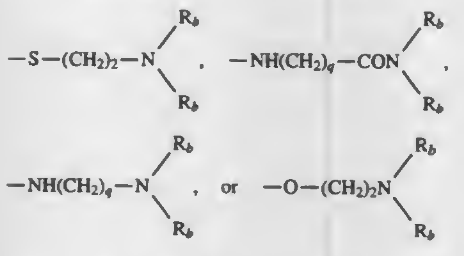


$$-\overset{R_a}{\overset{|}{N}}-CO\underset{\underset{R_c}{|}}{C}HAr'$$

wherein R_c is selected from halogen, (C_1–C_3)lower alkyl, —O-lower alkyl (C_1–C_3), OH,



$$-O-\overset{O}{\overset{\|}{C}}\text{-lower alkyl }(C_1–C_3),\ -S\text{-lower alkyl }(C_1–C_3),$$

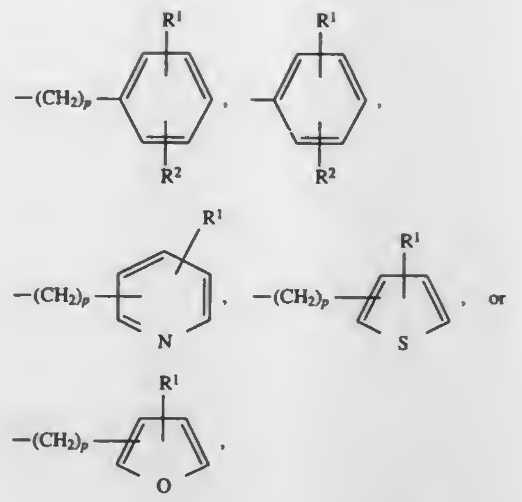


wherein R_a and R_b are as hereinbefore defined;

(d) a moiety of the formula:

—M—R_d

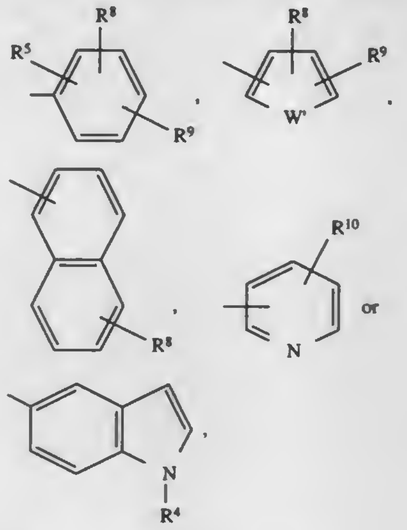
wherein R_d is lower alkyl (C_3–C_8), lower alkenyl (C_3–C_8), or —$(CH_2)_p$-cycloalkyl (C_3–C_6) when M is O, S, NH, NCH_3 or the moiety —M—R_d wherein R_d is selected from the moieties:



wherein

p is 0 to 4 and M is a bond or M is selected from O, S, NH or —$NHCH_3$;

R^1, R^2 and R_a are as hereinbefore defined; wherein Ar' is selected from the moieties of the formula:



W' is selected from O, S, NH, N-lower alkyl (C_1–C_3), —NCO-lower alkyl (C_1– C_3), or NSO_2-lower alkyl(C_1–C_3);

R^7 is selected from H, lower alkyl (C_1–C_3), halogen, O-lower alkyl (C_1–C_3), and CF_3;

R^8 and R^9 are independently selected from H, lower alkyl (C_1–C_3), —S-lower alkyl (C_1–C_3), halogen, —NH-lower alkyl (C_1–C_3), —N-(lower alkyl (C_1– C_3))$_2$, —OCF_3, —OH, —CN, —S-CF_3, —NO_2, —NH_2, —O-lower alkyl (C_1–C_3), NHCO lower alkyl (C_1–C_3), —O—CO-lower alkyl (C_1–C_3), and —CF_3; and

R^{10} is selected from H, halogen, lower alkyl (C_1–C_3), —NH-lower alkyl (C_1–C_3), —N-[lower alkyl (C_1–C_3)]$_2$, —O-lower alkyl (C_1–C_3), —$N(R_b)(CH_2)_1NR_b)_2$;

or a pharmaceutically acceptable salt, ester or prodrug form thereof.

19. A method for treating disease in a mammal characterized by excess renal reabsorption of water, the method comprising administering to a mammal in need thereof an effective amount of a compound of claim 1, or a pharmaceutically acceptable salt, ester or prodrug form thereof, and a suitable pharmaceutical carrier.

5,532,236

[1,2,4]TRIAZOLO[4,3-A]QUINOXALINE COMPOUNDS

Poul Jacobsen, Slangerup; Flemming E. Nielsen, and Lone Jeppesen, both of Virum, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

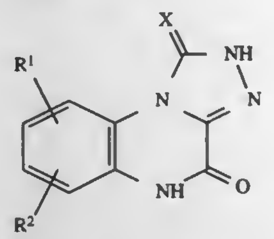
Filed May 3, 1994, Ser. No. 237,518

Claims priority, application Denmark, May 6, 1993, 0535/93; Nov. 12, 1993, 1287/93

Int. Cl.^{6} C07D *487/14;417/14;* **A61K** *31/505;31/54*

U.S. Cl. 514—228.5 **32 Claims**

1. A compound of formula I



(I)

wherein

one of R^1 and R^2 is a 5- or 6-membered nitrogen-containing heterocyclic ring which is optionally substituted with one, two or three substituents, wherein each substituent is independently phenyl or C_{1-6}-alkyl, or one of R^1 and R^2 is a fused ring system comprising a 5- or 6-membered nitrogen-containing heterocyclic ring and a benzene, pyridine, pyrimidine or pyrazine ring, wherein the fused ring system is optionally substituted with phenyl or C_{1-6}-alkyl; and the other of R^1 and R^2 is hydrogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, halogen, NO_2, NH_2, CN, CF_3, COC_{1-6}-alkyl or $SO_2NR'R''$, wherein R' and R" are independently hydrogen or C_{1-6}-alkyl; and

X is O or S; or

a pharmaceutically acceptable salt thereof.

5,532,237

INDOLE DERIVATIVES WITH AFFINITY FOR THE CANNABINOID RECEPTOR

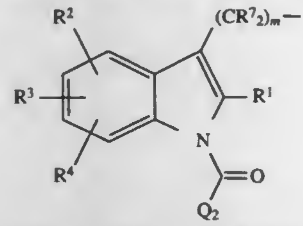
Michel Gallant, Montreal; Yves Gareau, Quebec; Daniel Guay, Quebec; Marc Labelle, Quebec, and Petpiboon Prasit, Quebec, all of, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Feb. 15, 1995, Ser. No. 388,929

Int. Cl.^{6} A61K *31/40;31/535;* **C07D** *209/14;413/06*

U.S. Cl. 514—235.2 **5 Claims**

1. A compound of the structural formula I:



I

pharmaceutically acceptable salts thereof, or diastereomers, or enantiomers or mixtures thereof, wherein:

R^1 is H, lower alkyl, aryl, benzyl, or lower flourinated alkyl;

R^{2-4} is independently, H, lower alkyl, lower fluorinated alkyl, halogen, NO_2, CN, —$(CR^7{}_2)_m$—OR^1, —$(CR^7{}_2)_m$—$S(O)_nR^6$, or —$(CR^7{}_2)_m$—R^6;

R^5 is H, lower alkyl, aryl, or benzyl;

R^6 is lower alkyl, aryl, benzyl, or $N(R^5)_2$;

R^7 is H, or lower alkyl;

R^8 is R^7, lower fluorinated alkyl, halogen, OR^7, or lower alkyl thio;

Q_1 is $N(R^7)_2$, wherein two R^7 groups may be joined to form a pyrrolidine, piperidine, piperazine, morpholine or thiomorpholine ring and their quaternary methyl ammonium salts;

Q_2 is naphthyl,

Z is a bond,

m is 1–6; and

n is 0,1, or 2.

5,532,238

Patent Not Issued For This Number

5,532,239

THERAPEUTIC APPLICATION OF FLUOROQUINOLONE DERIVATIVES

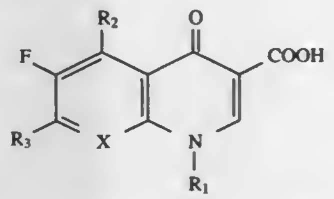
André Pruna, Paris, France, assignor to Assistance Publique - Hopitaux de Paris, Paris, France

Filed Aug. 2, 1993, Ser. No. 100,799

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—254 **4 Claims**

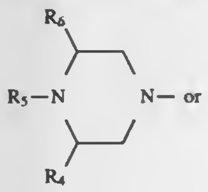
1. A method for the treatment of nephrotic syndromes with minor glomerular lesions comprising administering to a host in need thereof a derivative of the fluoroquinolone class corresponding to the formula:



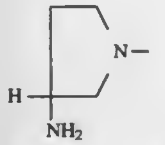
(I)

in which

R_1 is an alkyl, containing 1 to 4 carbon atoms, fluoroethyl, cyclopropyl, methylamino or difluorophenyl radical, X represents a nitrogen atom or a group $=CR_7$— in which R_7 is a hydrogen, chlorine or fluorine atom or alternatively R_7 forms, with the R_1 radical and the atoms to which they are attached, a six-membered heterocycle substituted by a methyl radical and optionally containing an oxygen or sulphur atom, R_2 is a hydrogen atom, or can represent an amino radical, if R_7 is a fluorine atom, and R_3 is a hydrogen atom, a 2,8-diazabicyclo[4.3.0]non-8-yl radical or a radical of structure:



(IIa)



(IIb)

in which R_4, R_5 and R_6 are identical or different and represent hydrogen atoms or methyl radicals, or one of its pharmaceutically acceptable salts.

5,532,240
CONDENSED THIOPHENE COMPOUND AND PHARMACEUTICAL USE THEREOF

Tohru Nakao; Yuji Ono; Masahiro Bougauchi, all of Fukuoka, and Yasuto Morimoto, Osaka, all of, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

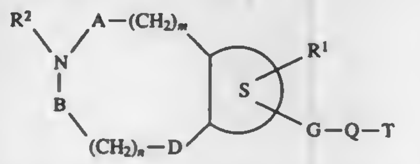
Continuation-in-part of Ser. No. 107,564, Aug. 18, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 272,320

Claims priority, application Japan, Dec. 26, 1991, 3-359547; Oct. 23, 1992, 4-309388

Int. Cl.⁶ A61K *31/435;* **C07D** *495/04*

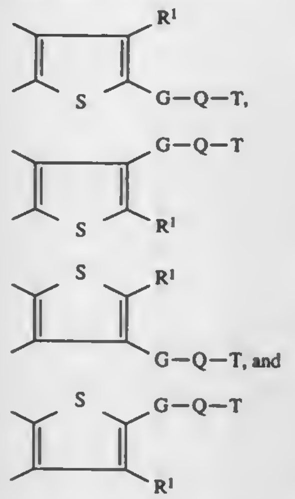
U.S. Cl. 514—254 **8 Claims**

1. A condensed thiophene compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein the ring S is selected from the group consisting of the following fused thiophenes:



wherein R^1 represents a hydrogen atom, a halogen atom, an alkyl group, an acyl group or a hydroxyalkyl group;

R^2 represents a hydrogen atom, an alkyl group, an acyl group, a carbamoyl group, a substituted carbamoyl group, an aryl group or an arylalkyl group;

G represents a $—CH_2—$ group, a $—CH(OR^3)—$ group (wherein R^3 represents a hydrogen atom, an alkyl group or an acyl group), a —CO— group or a $—S(O)_t$ group (t is 0, 1 or 2);

Q represents a straight alkylene group or a branched chain alkylene group;

T represents a tertiary amino group;

D represents a $—CH_2—$ group;

both A and B are absent;

m is 2; and

n is 0.

8. An antipsychotic drug containing a compound of claim 1 as an effective ingredient.

5,532,241
PIPERIDINES AND PIPERAZINES

Henning Böttcher, Darmstadt; Christoph Seyfried, Seeheim-Jugenheim; Gerd Bartoszyk, and Hartmut Greiner, both of Darmstadt, all of, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

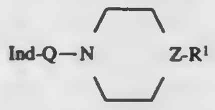
Filed Sep. 29, 1994, Ser. No. 314,734

Claims priority, application Germany, Sep. 30, 1993, 43 33 254.4

Int. Cl.⁶ A61K *31/495;31/445;* **C07D** *405/10*

U.S. Cl. 514—254 **17 Claims**

1. A compound according to formula I



1

wherein

Ind is unsubstituted indol-3-yl, indol-3-yl monosubstituted by OH, OA, CN, Hal, COR^2 or CH_2R^2, or indol-3-yl polysubstituted by OH, OA, CN, Hal, COR^2, CH_2R^2 or combinations thereof;

R^1 is benzofuran-5-yl, chroman-4-on-6-yl, 3-chromen-6-yl or chromen-4-on-6-yl, which in each case is unsubstituted or monosubstituted by CN, CH_2OH, CH_2OA or COR^2;

Q is C_mH_{2m};

Z is N;

A is alkyl having 1–6 C atoms;

Hal is F, Cl, Br or I;

R^2 is OH, OA, NH_2, NHA or NA_2;

$R^3$is H, OH or OA; and

m is 2, 3 or 4; or

a physiologically acceptable salt thereof.

5,532,242
PIPERAZINE DERIVATIVES AS 5-HT RECEPTORS ANTAGONISTS

Ian A. Cliffe, Slough, England, assignor to John Wyeth & Brother, Limited, Maidenhead, England

PCT No. PCT/GB92/02399, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO93/14076, PCT Pub. Date Jul. 22, 1993

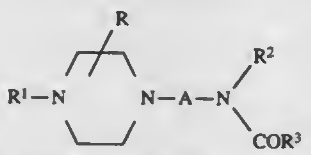
PCT Filed Dec. 24, 1992, Ser. No. 256,330

Claims priority, application United Kingdom, Jan. 8, 1992, 9200293

Int. Cl.⁶ A61K *31/495;31/505;* **C07D** *295/15;401/04*

U.S. Cl. 514—255 **13 Claims**

1. A compound of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein:

A is an alkylene chain of 2 to 5 carbon atoms optionally substituted by one or more lower alkyl groups;

R is hydrogen or one or two same or different lower alkyl groups;

R^1 is a phenyl or a 6-membered, monocyclic heteroaryl radical wherein the heteroatoms are selected from 1 or 2N atoms, which may be optionally substituted by 1 to 3 substituents independently selected from C_1–C_6alkyl, C_1–C_6alkoxy, halogen, haloC_1–C_6alkyl, nitro, nitrile, carbamoyl, C_1–C_6alkoxycarbonyl, amino C_1–C_6alkylamino or di-C_1–C_6alkylamino;

R^2 is phenyl or naphthyl, optionally substituted as for phenyl above; and

R^3 is monocycloalkyl 3 to 7 carbon atoms.

5,532,243
ANTIPSYCHOTIC NITROGEN-CONTAINING BICYCLIC COMPOUNDS

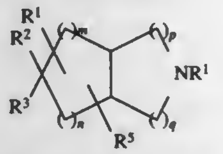
Paul J. Gilligan, Claymont, Del., assignor to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Filed Feb. 14, 1992, Ser. No. 836,230

Int. Cl.⁶ A61K *31/495;31/40;* **C07D** *217/18;239/00*

U.S. Cl. 514—255 **48 Claims**

1. A compound having the formula:



(I)

or a pharmaceutically acceptable salt or pro-drug thereof, wherein:

m is 1 or 2;

n is 1 or 2;

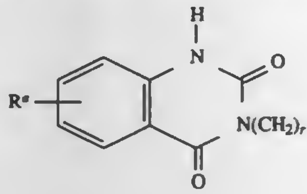
p is 1 or 2;

q is 1 or 2;

provided that m and n cannot both be 2 or p and q cannot both be 2;

R^1 may be H; alkyl of 1 to 6 carbons; cycloalkyl of 3 to 6 carbons; cycloalkyl-alkyl of 4 to 8 carbons; alkenyl of 3 to 6 carbons; phenyl-alkyl (1 to 6 carbons) where the phenyl group is optionally substituted by R^6 and R^7 and where the alkyl group is optionally substituted by oxo, hydroxyl groups or hydrogen; pyridyl; pyrimidinyl; pyrazinyl; quinolinyl; isoquinolinyl; indolyl; quinazolinyl; phthalizinyl; furanyl; thienyl; napthyridinyl; or naphthyl-alkyl (1 to 6 carbons) and where the alkyl group is optionally substituted by oxo, hydroxyl groups or hydrogen;

R^1 may also be drawn from the following groups:

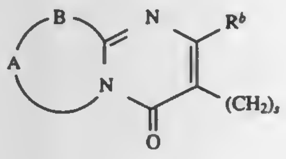


2

where:

r=1 or 2,

R^a=H, alkyl of 1 to 6 carbons, halogen, alkoxy of 1 to 6 carbons or OH, and



where:

S=1 or 2,

B=S, CH_2 or CH═CH,

A=$(CH_2)_2$, $(CH_2)_3$ or CH═CH,

R^b=H or alkyl of 1 to 6 carbons;

R^2 may be H, or OH, provided that when R^2 is OH then R^3=R^{3a} and provided that when R^2 is H then R^3=OR^{3a} or SR^{3a};

R^{2a} may be alkyl of 1 to 10 carbons or phenyl;

R^{3a} may be alkyl of 1 to 6 carbons; phenyl optionally substituted by R^6 and R^7; phenyl-alkyl (1 to 6 carbons) where the phenyl group is optionally substituted by R^6 and R^7; cycloalkyl of 3 to 6 carbons; cycloalkyl-alkyl of 4 to 12 carbons; naphthyl; pyridyl; pyrimidinyl; pyrazinyl; quinolinyl; isoquinolinyl; indolyl; quinazolinyl; phthalizinyl; furanyl; thienyl; or napthyridinyl;

R^4 and R^5 may independently be H or alkyl of 1 to 6 carbons;

R^6 and R^7 independently are selected at each occurrence from the group consisting of H, alkyl of 1 to 6 carbons, alkenyl of 2 to 6 carbons, OH, alkoxy of 1 to 6 carbons, alkythio of 1 to 6 carbons, alkylsulfinyl of 1 of 6 carbons, alkylsulfonyl of 1 to 6 carbons, NH_2, alkylamino of 1 to 6 carbons, dialkylamino of 2 to 12 carbons, NO_2, alkanoylamino of 2 to 6 carbons, CN, CO_2H, carboalkoxy of 2 to 10 carbons, $CONH_2$ or $CONR^8R^9$; and

R^8 and R^9 independently are H or alkyl of 1 to 6 carbons; or R^8 and R^9 taken together may be alkylene of 3 to 6 carbons.

5,532,244
POTENTIATION OF DRUG RESPONSE

David T. Wong, and Juan I. Oguiza, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 277,460, Jul. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 260,857, Jun. 16, 1994, abandoned. This application May 17, 1995, Ser. No. 442,737

Int. Cl.⁶ A61K *31/38;31/495*

U.S. Cl. 514—255 **15 Claims**

1. A method for potentiating the action of a first component chosen from the group consisting of venlafaxine, milnacipran and duloxetine in increasing the availability of serotonin, norepinephrine and dopamine in the brain, comprising administering a first component to a patient in need thereof in combination with a second component chosen from the group consisting of WAY 100135 and spiperone.

12. A pharmaceutical composition which comprises a first component chosen from the group consisting of venlafaxine, milnacipran and duloxetine in combination with a second component chosen from the group consisting of WAY 100135 and spiperone.

5,532,245
SUBSTITUTED N-HETEROARYL-1,2-DIAMINOCYCLOBUTENE-3,4-DIONE COMPOUNDS

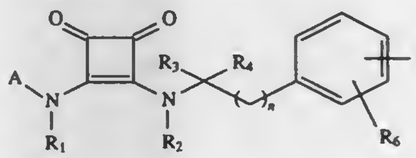
John A. Butera, Clarksburg; Schuyler A. Antane, Lawrenceville, and Bradford H. Hirth, Monmouth Junction, all of N.J., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 334,475, Nov. 4, 1994, Pat. No. 5,466,712. This application Jun. 7, 1995, Ser. No. 477,840

Int. Cl.⁶ C07D *213/02;239/24;* **A61K** *31/44;31/505*

U.S. Cl. 514—272 **7 Claims**

1. A compound of the formula:



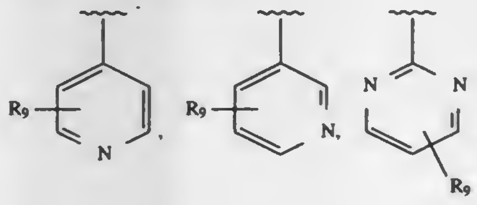
(I)

wherein:

R_1 is hydrogen, C_{1-10} straight or branched chain alkyl, C_{3-10} cyclic or bicyclic alkyl, alkanoyl of 2 to 7 carbon atoms, alkylsulfonyl of 1 to 7 carbon atoms, aroyl of 7 to 12 carbon atoms, arylalkenoyl of 9 to 20 carbon atoms, arylsulfonyl of 6 to 12 carbon atoms, arylalkanoyl of 8 to 12 carbon atoms or arylalkylsulfonyl of 7 to 12 carbon atoms;

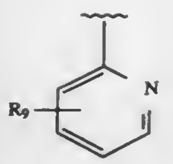
R_2 is hydrogen, C_{1-10} straight or branched chain alkyl or C_{3-10} cyclic or bicyclic alkyl;

A is selected from the following:



or

-continued



wherein:

R_9 is hydrogen, C_{1-6} alkyl, C_{1-6} perfluoroalkyl, C_{1-6} alkoxy, C_{1-6} perfluoroalkoxy, amino, C_{1-12} mono-or dialkylamino, C_{1-6} alkylsulfonamido, C_{1-6} alkylcarboxamido, nitro, cyano, carboxyl, chloro, bromo, fluoro, iodo;

n is an integer from 0 to 6;

R_3 and R_4 are, independent from each other, hydrogen, C_{1-10} straight or branched chain alkyl, or C_{3-10} cyclic or bicyclic alkyl; C_{1-10} perfluoro alkyl, C_{1-10} hydroxyalkyl, C_{1-10} alkoxyalkyl, fluoro; or, when taken together, form a spirocyclic ring containing a total of 3–7 carbon atoms;

R_5 and R_6, independent from each other, are selected from the following: cyano, nitro, C_{1-6} alkyl, C_{1-6} perfluoroalkyl, C_{1-6} alkoxy, C_{1-6} perfluoroalkoxy, amino, C_{1-12} mono- or dialkylamino, sulfonamide, C_{1-6} alkylsulfonamido, C_{6-12} arylsulfonamido, C_{1-6} alkylcarboxamido, C_{6-12} arylcarboxamido, C_{1-6} alkylsulfonyl, C_{1-6} perfluoroalkylsulfonyl, C_{6-12} arylsulfonyl, chloro, bromo, fluoro, iodo, 1-imidazolyl, carboxyl, carboalkoxy, hydroxyl, or hydrogen;

or a pharmaceutically acceptable salt thereof.

5,532,246

USE OF 1,3-OXATHIOLANE NUCLEOSIDE ANALOGUES IN THE TREATMENT OF HEPATITIS B

Bernard Belleau, deceased, late of Westmont, and Nghe Nguyen-Ba, La Prairie, both of, Canada, assignors to Bio-Chem Pharma, Inc., Laval, Canada

PCT No. PCT/CA92/00001, § 371 Date Aug. 9, 1993, § 102(e) Date Aug. 9, 1993, PCT Pub. No. WO92/11852, PCT Pub. Date Jul. 23, 1992

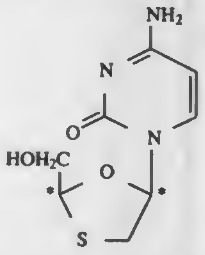
PCT Filed Jan. 3, 1992, Ser. No. 84,222

Claims priority, application United Kingdom, Jan. 3, 1991, 9100039; May 7, 1991, 9109913

Int. Cl.⁶ A61K *31/505*

U.S. Cl. 514—274 **9 Claims**

1. A method for the treatment of a mammal, including a human, suffering from hepatitis B infection, comprising administration of an effective amount of a compound of formula (I)



(I)

or a pharmaceutically acceptable salt, ester, or salt of an ester thereof to said mammal.

5,532,247

NEUROTRANSMITTER RELEASERS USEFUL FOR COGNITION ENHANCEMENT

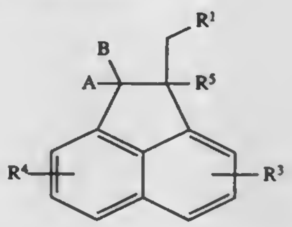
Wendell W. Wilkerson, New Castle; Richard A. Earl, Wilmington, both of Del., and Matthew E. Voss, Lincoln University, Pa., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Division of Ser. No. 124,523, Sep. 20, 1993, Pat. No. 5,414,004. This application Feb. 23, 1995, Ser. No. 392,648

Int. Cl.⁶ A61K *31/44;* C07D *213/16;213/18;213/26*

U.S. Cl. 514—277 **33 Claims**

1. A compound of the formula



wherein A and B are independently selected from the group consisting of H, R^4, —OH and —OCOR^4, or

A and B together form =O, =S, =NOH, =NOR^4, 1,3-dioxane, 1,3-dioxolane, 1,3-dithiane or 1,3-dithiolane;

R^1 is 4-,3-, or 2-pyridyl, 2-, or 3-fluoro-4-pyridyl or 3-fluoro-4-pyridyl;

Phe is a phenyl group;

W is F, Cl, Br, —OH, R^4, —OR^4, —NO$_2$, —NH$_2$, —NHR^4, —NR^{4}R$^{4'}$, —CN, or —S(O)$_m$—R^4;

R^3 is H, F, Cl, Br, —CN, —OH, —NO$_2$, —NH$_2$, —CF$_3$, —NHR^4, —NR^{4}R$^{4'}$, R^4, —OR^4, or —S(O)$_m$—R^4;

R^4 and $R^{4'}$ are H, alkyl of 1 to 4 carbons, CH$_2$Phe or Phe;

R^5 is —(CH$_2$)$_n$—Y or —OCOR^4;

Y is H, OH, NH$_2$, —NHR^4, —NR^{4}R$^{4'}$, —NHCOR^4, —NHCO$_2$R^4, F, Cl, Br, OR^4, —S(O)$_m$R^4, —CO$_2$H, —CO$_2$R^4, —CN, —CONR^{4}R$^{4'}$, —COHNR^4, —CONH$_2$, —COR^4; —CH=CHCO$_2$R^4, OCOR^4, Phe, Phe-W —CH≡CCO$_2$R^4, —CH=CHR^4, or —C≡CR^4;

m is 0, 1 or 2;

n is 1 to 7;

and physiologically suitable salts thereof.

5,532,248

O-ARYL,O-ALKYL, AND O-ALKENYL-MACROLIDES HAVING IMMUNOSUPPRESSIVE ACTIVITY

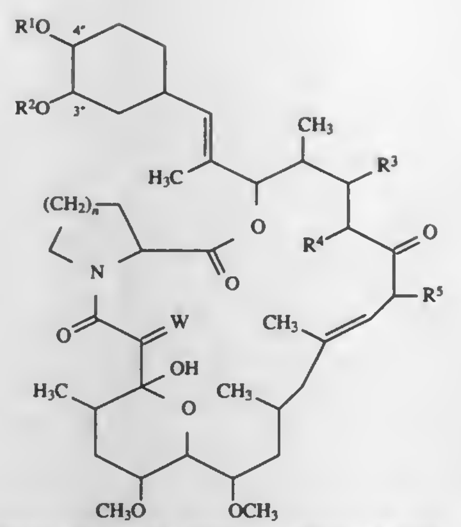
Mark Goulet, Westfield; William H. Parsons, Edison; Helen M. Organ, Fanwood; Peter J. Sinclair, Highland Park; Frederick Wong, Glen Ridge, and Matthew J. Wyvratt, Mountainside, all of N.J., assignors to Merck Co., Inc., Rahway, N.J.

Division of Ser. No. 132,072, Oct. 4, 1993, which is a continuation-in-part of Ser. No. 875,036, May 1, 1992, Pat. No. 5,250,678, which is a continuation-in-part of Ser. No. 809,998, Dec. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 699,407, May 13, 1991, abandoned. This application May 12, 1995, Ser. No. 440,180

Int. Cl.⁶ A61K *31/435;* C07D *491/16*

U.S. Cl. 514—291 **3 Claims**

1. A pharmaceutical composition comprising a pharmaceutical carrier and an immunosuppressive effective amount of a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 are independently selected from:

- (1) hydrogen;
- (2) phenyl;
- (3) substituted phenyl in which the substituents are X, Y and Z;
- (4) 1- or 2-naphthyl;
- (5) substituted 1- or 2-naphthyl in which the substituents are X, Y and Z;
- (6) biphenyl;
- (7) substituted biphenyl in which the substituents are X, Y and Z;
- (8) C_{1-10} alkyl;
- (9) substituted C_{1-10} alkyl in which one or more substituent(s) is(are) selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C_{1-6}-alkoxy,
  - (d) phenyl-C_{1-3}alkoxy,
  - (e) substituted phenyl-C_{1-3}alkoxy, in which the substituents on phenyl are X, Y and Z,
  - (f) —OCO—C_{1-6}alkyl,
  - (g) —NR^{6}R^7, wherein R^6 and R^7 are independently selected from:
    - (i) hydrogen,
    - (ii) C_{1-10}alkyl unsubstituted or substituted with one or more of the substituent(s) selected from:
      - (a') phenyl, which is unsubstituted or substituted with X, Y and Z,
      - (b') —OH,
      - (c') C_{1-6}alkoxy,
      - (d') —CO$_2$H,
      - (e') —CO$_2$—C_{1-6}alkyl,
      - (f') —C_{3-7}cycloalkyl, and
      - (g') —OR^{11},
    - (iii) C_{3-10}alkenyl unsubstituted or substituted with one or more of the substituent(s) selected from:
      - (a') phenyl, which is unsubstituted or substituted with X, Y and Z,
      - (b') —OH,
      - (c') C_{1-6}alkoxy,
      - (d') —CO$_2$H,
      - (e') —CO$_2$—C_{1-6}alkyl,
      - (f') —C_{3-7}cycloalkyl, and
      - (g') —OR^{11},
    - (iv) or where R^6 and R^7 and the N to which they are attached can form a 3–7-membered saturated heterocyclic ring, unsubstituted or substituted with C_{1-6} alkyl or phenyl, the ring being selected from the group consisting of: aziridine, morpholine, thiomorpholine, thiomorpholine-oxide, thiomorpholine-dioxide, piperidine, pyrrolidine, and piperazine,
  - (h) —NR^{6}CO—C_{1-6}alkyl-R^7, wherein R^6 is as defined above,
  - (i) —NR^{6}CO$_2$—C_{1-6}alkyl-R^7,
  - (j) —NR^{6}CONR^{6}R^7,
  - (k) —OCONR^{6}R^7,
  - (l) —COOR^6,
  - (m) —CHO,
  - (n) phenyl,
  - (o) substituted phenyl in which the substituents are X, Y and Z,
  - (p) phenyloxy,
  - (q) substituted phenyloxy in which the substituents are X, Y and Z,
  - (r) 1- or 2-naphthyl,
  - (s) substituted 1- or 2-naphthyl in which the substituents are X, Y and Z,
  - (t) biphenyl,
  - (u) substituted biphenyl in which the substituents are X, Y and Z;
  - (v) —OR^{11}, and
  - (w) —S(O)$_p$—C_{1-6}alkyl;
- (10) C_{3-10} alkenyl;
- (11) substituted C_{3-10} alkenyl in which one or more substituent(s) is(are) selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C_{1-6}alkoxy,
  - (d) phenyl-C_{1-3}alkoxy,
  - (e) substituted phenyl-C_{1-3}alkoxy, in which the substituents on phenyl are X, Y and Z,
  - (f) —OCO—C_{1-6}alkyl,
  - (g) —NR^{6}R^7, wherein R^6 and R^7 are as defined above
  - (h) —NR^{6}CO—C_{1-6}alkyl, wherein R^6 is as defined above,
  - (i) —COOR^6, wherein R^6 is as defined above,
  - (j) —CHO,
  - (k) phenyl,
  - (l) substituted phenyl in which the substituents are X, Y and Z,
  - (m) 1- or 2-naphthyl,
  - (n) substituted 1- or 2-naphthyl in which the substituents are X, Y and Z,
  - (o) biphenyl,
  - (p) substituted biphenyl in which the substituents are X, Y and Z,
  - (q) —OR^{11}, and
  - (r) —S(O)$_p$—C_{1-6}alkyl;
- (12) C_{3-10}alkynyl;
- (13) substituted C_{3-10}alkynyl in which one or more substituent(s) is(are) selected from:
  - (a) hydroxy,
  - (b) oxo,
  - (c) C_{1-6}alkoxy,
  - (d) phenyl-C_{1-3}alkoxy,
  - (e) substituted phenyl-C_{1-3}alkoxy, in which the substituents on phenyl are X, Y and Z,
  - (f) —OCO—C_{1-6}alkyl,
  - (g) NR^{6}R^7, wherein R^6 and R^7 are as defined above,
  - (h) —NR^{6}CO—C_{1-6}alkyl, wherein R^6 is as defined above,
  - (i) —COOR^6, wherein R^6 is as defined above,
  - (j) —CHO,
  - (k) phenyl,
  - (l) substituted phenyl in which the substituents are X, Y and Z,
  - (m) 1- or 2-naphthyl,
  - (n) substituted 1- or 2-naphthyl in which the substituents are X, Y and Z,
  - (o) biphenyl,
  - (p) substituted biphenyl in which the substituents are X, Y and Z, and
  - (q) —OR^{11};

with the proviso that R^1 and R^2 are not simultaneously hydrogen, methyl or combinations thereof and the further proviso that R^1 is not benzyl;

R^3 is hydrogen, hydroxy, —OR^{11} or C_{1-6} alkoxy;

R^4 is hydrogen, or R^3 and R^4 taken together form a double bond;

R^5 is methyl, ethyl, propyl or allyl;

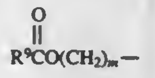
R^{11} is selected from:

- (a) —$PO(OH)O^-M^+$, wherein M^+ is a positively charged inorganic or organic counterion,
- (b) —SO_3-M^+,
- (c) —$CO(CH_2)_qCO_2^-M^+$, wherein q is 1–3, and
- (d) —CO—C_{1-6}alkyl—NR^6R^7, wherein R^6 and R^7 are as defined above and the alkyl is unsubstituted or substituted with one or more substituents selected from:
  - (i) hydroxy,
  - (ii) C_{1-6}alkoxy,
  - (iii) —$NR^{16}R^{17}$, wherein R^{16} and R^{17} are independently selected from:
    - (a') hydrogen, and
    - (b') C_{1-6}alkyl,
  - (iv) —$COOR^6$, wherein R^6 is as defined above,
  - (v) phenyl,
  - (vi) substituted phenyl in which the substituents are X, Y and Z,
  - (vii) —SH, and
  - (viii) —S—C_{1-6}alkyl;

W is 0 or (H, OH);

X, Y and Z independently are selected from:

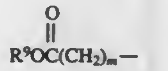
- (a) hydrogen,
- (b) C_{1-7} alkyl,
- (c) C_{2-6} alkenyl,
- (d) halogen,
- (e) —$(CH_2)_m$—NR^6R^7, wherein R^6 and R^7 are as defined above, and m is 0 to 2,
- (f) —CN,
- (g) —CHO,
- (h) —CF_3,
- (i) —SR_8, wherein R^8 is hydrogen, C_{1-6}alkyl, trifluoromethyl, or phenyl,
- (j) —SOR^8, wherein R^8 is as defined above,
- (k) —SO_2R^8, wherein R^8 is as defined above,
- (l) —$CONR^6R^7$, wherein R^6 and R^7 are as defined above,
- (m) $R^9O(CH_2)_m$— wherein R^9 is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, trifluoromethyl, phenyl or naphthyl and m is as defined above,
- (n) —$CH(OR^{12})(OR^{13})$, wherein R^{12} and R^{13} are C_{1-3}alkyl or taken together form an ethyl or propyl bridge,



$$R^9\overset{\displaystyle O}{\overset{\|}{C}}O(CH_2)_m—$$

wherein R^9 and m are as defined above, and

(p)



$$R^9O\overset{\displaystyle O}{\overset{\|}{C}}(CH_2)_m—$$

wherein R^9 and m are as defined above, and

(q) —OR^{11};

or any two of adjacent X, Y and Z can be joined to form a ring selected from the group consisting of: dioxolanyl, dihydrofuranyl, dihydropyranyl, and dioxanyl; and

n is 1 or 2.

5,532,249

DISUBSTITUTED POLYCYCLIC SYSTEMS AS COGNITION ENHANCERS

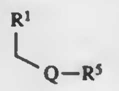
Wendell W. Wilkerson, and Christopher A. Teleha, both of New Castle, both of Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Continuation of Ser. No. 821,570, Jan. 16, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,488

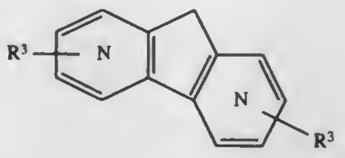
Int. Cl.^{6} A61K *31/44;* **C07D** *471/02;471/04*

U.S. Cl. 514—292 **39 Claims**

1. A compound of the formula



where Q is



R^1 is selected from the group consisting of 4-, 3-, or 2-pyridyl, and fluoro-4-pyridyl;

R^2 and R^3 are independently selected from the group consisting of H, F, Cl, Br, —NO_2, —OH, —R^4, —OR^4, —CO_2R^4, —COR^4, —$CONH_2$, —$CONHR^4$, —$CONR^4R^4$, —$S(O)_m$—R^4, —NH_2, —CF_3, —NHR^4, and —NR^4R^4;

R^4 and $R^{4'}$ are independently selected from the group consisting of H, alkyl of 1 to 4 carbons, —CH_2Phe-W and -Phe-W;

Phe is a phenyl group;

R^5 is selected from the group consisting of —$(CH_2)_n$—Y and —$OCOR^4$;

Y is selected from the group consisting of H, —OH, —NH_2, —NHR^4, —NR^4R^4, —$NHCOR^4$, —$NHCO_2R^4$, —$NHS(O)_2R^4$, F, Cl, Br, —OR^4, —$S(O)_mR^4$, —CO_2H, —CO_2R^4, —CN, —$CONR^4R^4$, —$CONHR^4$, —$CONH_2$, —COR^4, —CH=$CHCO_2R^4$, —$OCOR^4$, —Phe, —Phe-W, —C≡CCO_2R^4, —CH=CHR^4, and —C≡C R^4;

W is selected from the group consisting of F, Cl, Br, —NO_2, —NH_2, and —CN;

m is 0, 1 or 2;

n is 1 to 7;

and hydrates and physiologically suitable salts thereof.

5,532,250

POTENTIATION OF DRUG RESPONSE

David T. Wong, and Juan I. Oguiza, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 277,460, Jul. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 260,857, Jun. 16, 1994, abandoned. This application May 17, 1995, Ser. No. 442,609

Int. Cl.^{6} H61K *31/38;31/40*

U.S. Cl. 514—415 **21 Claims**

1. A method for potentiating the action of a first component chosen from the group consisting of venlafaxine, milnacipran and duloxetine in increasing the availability of serotonin, norepinephrine and dopamine in the brain, comprising administering a first component to a patient in need thereof in combination with a second component chosen from the group consisting of alprenolol, pindolol, propranolol and tertatolol.

5,532,251

METHOD OF TREATING CARDIAC ARRHYTHMIA WITH 3-BENZOYL-3, 7-DIAZABICYCLO[3.3.1]NONANE COMPOUNDS

Uwe Schoen, Burgdorf; Reinhard Brueckner; Joerg Meil, both of Hanover, and Dirk Thormaehlen, Rheden, all of, Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Germany

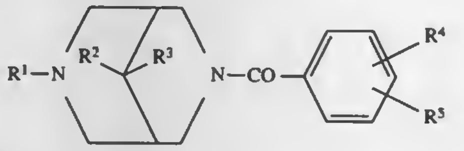
Filed Feb. 1, 1995, Ser. No. 382,265

Claims priority, application Germany, Feb. 1, 1994, 44 02 933.0

Int. Cl.^{6} A61K *31/44*

U.S. Cl. 514—300 **2 Claims**

1. A method of treating cardiac arrhythmia in a mammal comprising administering to said mammal an effective cardiac rhythm affecting amount of a 3-benzoyl-3,7-diazabicyclo[3.3.1]nonane compound corresponding to formula I



I

wherein

R^1 is an alkyl group having 1–6 carbon atoms or a cycloalkylalkyl group having 4–7 carbon atoms,

R^2 and R^3 are each individually lower alkyl or together form an alkylene chain having 3–6 carbon atoms,

R^4 is hydrogen, halogen, cyano, nitro, trifluoromethyl or a R^6—SO_2— group in which R^6 is fluorine or lower alkyl, and

R^5 is hydrogen, halogen, trifluoromethyl or nitro,

or a physiologically acceptable acid addition salt thereof.

5,532,252

CYCLIC NITRONES

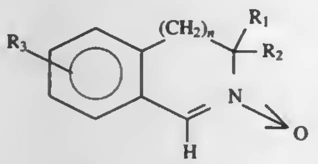
Albert A. Carr, Cincinnati; Craig E. Thomas, West Chester; Ronald C. Bernotas, Cincinnati, and George Ku, West Chester, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 352,470, Dec. 9, 1994, which is a division of Ser. No. 170,543, Dec. 20, 1993, Pat. No. 5,397,789, which is a division of Ser. No. 926,109, Aug. 5, 1992, Pat. No. 5,292,746, which is a continuation-in-part of Ser. No. 828,075, Jan. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 758,063, Sep. 12, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 458,311

Int. Cl.^{6} A61K *31/47*

U.S. Cl. 514—309 **25 Claims**

1. A method for the treatment of tissue damage associated with physical trauma involving excessive bleeding comprising administering to a patient in need thereof, a protective amount of a compound of the formula:



in which R_1 and R_2 are each independently represented by a C_{1-3} alkyl or R_1 and R_2 together form a C_{2-7} alkylene chain; n is represented by an integer from 0–2; and R_3 is represented by a substituent selected from the group consisting of hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, —CF_3, —OCF_3 and —OH.

5,532,253

AGENT FOR TREATING THROMBOSIS AND PHOSPHODIESTERASE INHIBITOR

Takafumi Fujioka; Shuji Teramoto; Michiaki Tominaga, and Yoichi Yabuuchi, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

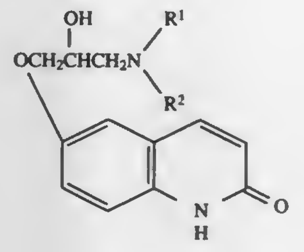
Division of Ser. No. 208,803, Mar. 11, 1994, Pat. No. 5,401,754, which is a continuation of Ser. No. 984,495, Dec. 2, 1992, abandoned. This application Dec. 2, 1994, Ser. No. 352,835

Claims priority, application Japan, Apr. 3, 1991, 3-070223; Feb. 6, 1992, 4-021137

Int. Cl.^{6} A61K *31/47*

U.S. Cl. 514—312 **8 Claims**

1. A method for inhibiting phosphodiesterase in a subject in need thereof comprising administering to said subject a phosphodiesterase inhibitory effective amount of a carbostyril derivative of the formula:



wherein R^1 represents hydrogen or a lower alkyl group optionally having a hydroxy group as a substituent;

R^2 represents a phenyl (lower alkyl) group optionally having 1–3 substituents selected from the group consisting of a lower alkoxy group and a halogen atom on the phenyl ring; a pyridyl (lower alkyl) group; and a group of the formula —A—NR^3R^4, wherein A represents a lower alkylene group, and wherein R^3 and R^4, which are the same or different, represent a lower alkyl group or phenyl group; or a salt of said carbostyril derivative.

5,532,254

MODULATION OF CALCIUM CHANNELS USING BENZOTHIOPHENES

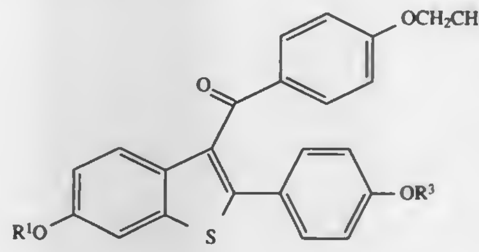
Nancy L. Bowling, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 7, 1995, Ser. No. 485,317

Int. Cl.^{6} A01N *43/40*

U.S. Cl. 514—320 **8 Claims**

1. A method for modulating calcium channels in vascular and cardiac tissue comprising administering to a warm-blooded animal in need thereof a pharmaceutically-effective amount of a compound having the formula



(I)

wherein R^1 and R^3 are independently hydrogen, C_1–C_4 alkyl, —CO—(C_1–C_6 alkyl), or —CH_2Ar, —CO—Ar, wherein Ar is phenyl or substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically-acceptable salt thereof.

5,532,255
ADHESION RECEPTOR ANTAGONISTS

Peter Raddatz, Seeheim-Jugenheim; Joachim Gante, Darmstadt; Horst Juraczyk, Seeheim; Hanns Wurziger, Darmstadt; Helmut Prücher, Heppenheim; Sabine Bernotat-Danielowski, Bad Naumheim, and Guido Melzer, Hofheim/Ts., all of, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Apr. 29, 1994, Ser. No. 234,691

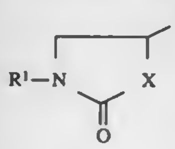
Claims priority, application Germany, May 1, 1993, 43 14 378.4; Feb. 22, 1994, 44 05 633.8

The portion of the term of this patent subsequent to Jul. 21, 2014, has been disclaimed.

Int. Cl.^{6} A61K *31/42;31/445;* **C07D** *413/06*

U.S. Cl. 514—326 **22 Claims**

1. A compound of the formula I



I

wherein

X is O;

Y is aziridino, azetidino, pyrrolidino, piperidino, 1-oxa-8-azaspiro[4.5]dec-8yl, hexahydroazepino or 4-R^4-piperazino which is unsubstituted or substituted once by R^2, OZ, SZ, $N(Z)_2$ or -oxo;

Z is in each case H, A, phenyl-C_kH_{2k} or Ac;

R^1 is phenyl which is substituted once by CN, H_2N—CH_2—, $(A)_2N$—CH_2—, H_2N—C(=NH)—, H_2N—C(=NH)—NH—, H_2N—C(=NH)—NH—CH_2—, HO—NH—C(=NH)— or HO—NH—C(=NH)—NH—;

R^2 is —C_mH_{2m}—$COOR^3$ or —C_nH_{2n}—O—C_pH_{2p}—$COOR^3$;

R^3 is H, A or benzyl;

R^4 is H, A, benzyl or —C_mH_{2m}—$COOR^3$;

A is in each case alkyl having 1–6 C atoms;

Ac is carboxylic acyl having 1–11 C atoms;

k and m are in each case independently 0, 1, 2 or 3;

n is 0, 1 or 2; and

p is 1, 2 or 3; or

a salt thereof.

5,532,256
NEW AZOLIDINEDIONES AND THIADIAZOLIDINEDIONES AS ANTIHYPERGLYCEMIC AGENTS

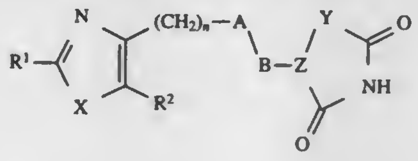
Michael S. Malamas, Jamison, Pa., and Iwan Gunawan, Somerset, N.J., assignors to American Home Products Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 421,167, Apr. 13, 1995, which is a division of Ser. No. 245,734, May 18, 1994, Pat. No. 5,468,762. This application Jun. 1, 1995, Ser. No. 457,948

Int. Cl.^{6} C07D *417/10;417/12;* **A61K** *31/41;31/425*

U.S. Cl. 514—361 **9 Claims**

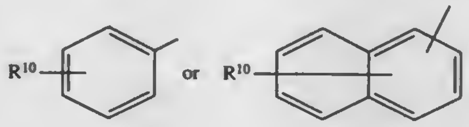
1. A compound according to formula I below



I

wherein:

R^1 is C $_1$–C $_6$ alkyl, C $_3$–C $_8$ cycloalkyl, thienyl, furyl, pyridyl,



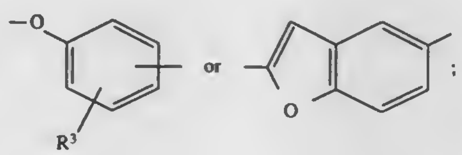
where R^{10} is hydrogen, C $_1$–C $_6$ alkyl, fluorine, chlorine, bromine, iodine, C $_1$–C $_6$ alkyoxy, trifluoroalkyl or trifluoroalkoxy;

R^2 is hydrogen or C $_1$–C $_6$ alkyl;

X is O or S;

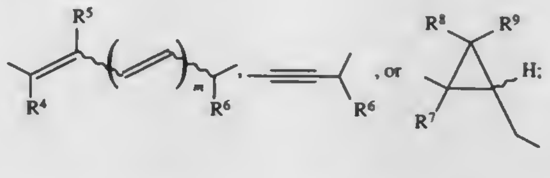
n is 1 or 2;

A is



where R^3 is hydrogen, C $_1$–C $_6$ alkyl, halogen, C $_1$–C $_6$ alkoxy, trifluoroalkyl or trifluoroalkoxy;

B is



where R^4 is hydrogen, C $_1$–C $_6$ alkyl, allyl, C $_6$–C $_{10}$ aryl, C $_6$–C $_{10}$ aryl-(CH $_2$)$_{1-6}$—, fluorine, chlorine, bromine, iodine, trimethylsilyl or C_3– C_8 cycloalkyl;

R^5 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl, or C_6–C_{10} aryl-$(CH_2)_{1-6}$—;

m is 0, 1, or 2;

R^6 is hydrogen or C_1–C_6 alkyl;

R^7 is hydrogen or C_1–C_6 alkyl;

R^8 and R^9 are selected independently from hydrogen, C_1–C_6 alkyl, fluorine, chlorine, bromine, or iodine;

Y is S;

Z is N or CH;

or a pharmaceutically acceptable salt thereof.

5,532,257
BENZOTHIAZOLE COMPOUND, PRODUCTION THEREOF AND USE THEREOF

Takema Hase, Hamuro; Takahiro Kumonaka, Hadano; Chikako Shimizu, Shizuoka; Hiroshi Hosono, Ibaraki; Tomoji Aotsuka, Hamura; Yoshiyuki Nakamura, Shizuoka; Tetsuo Matsui, Tsukuba, and Hiromichi Ishikawa, Kobe, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd, and The Green Cross Corporation, both of Osaka, Japan

PCT No. PCT/JP94/00490, § 371 Date Nov. 25, 1994, § 102(e) Date Nov. 25, 1994, PCT Pub. No. WO94/22845, PCT Pub. Date Oct. 13, 1994

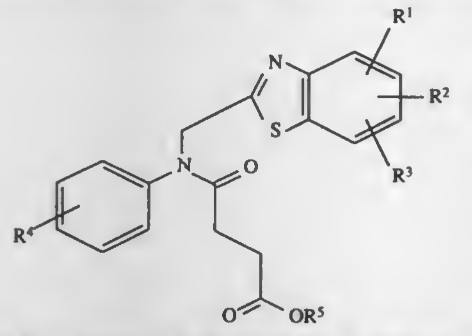
PCT Filed Mar. 25, 1994, Ser. No. 343,489

Claims priority, application Japan, Mar. 26, 1993, 5-90550

Int. Cl.^{6} A61K *31/425;* **C07D** *277/64*

U.S. Cl. 514—367 **12 Claims**

1. A benzothiazole compound of the following formula (I)



(I)

wherein R^1 is a halogen atom, $R^2$and R^3 are the same or different and each is a hydrogen atom or a halogen atom, R^4 is a hydrogen atom, a halogen atom, a lower alkyl, an alkoxy or an alkylthio and R^5 is a hydrogen atom or a lower alkyl, or a pharmaceutically acceptable salt thereof.

5,532,258
H_2-RECEPTOR ANTAGONIST THIAZOLES

Yousuke Katsura, Toyonaka; Tetsuo Tomishi, Minoo; Yoshikazu Inoue, Amagasaki, and Hisashi Takasugi, Sakai, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

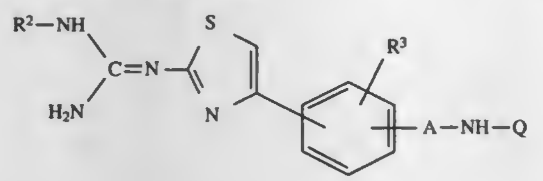
Continuation of Ser. No. 978,477, Nov. 18, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 356,967

Claims priority, application United Kingdom, Dec. 6, 1991, 9125970

Int. Cl.^{6} C07D *277/48;* **A61K** *31/125*

U.S. Cl. 514—370 **5 Claims**

1. A compound of the formula:



wherein R^2 is hydrogen, or lower alkyl which is unsubstituted or substituted by lower alkoxy, hydroxy, acyloxy, di(lower)alkylamino, pyridyl, imidazolyl or lower alkoxyphenyl,

R^3 is hydrogen, lower alkyl, lower alkoxy, or halogen,

A is methylene and

Q is a group of the formula:

—CO—R^1

(in which R^1 is lower alkyl, amino, acylamino, hydroxy(lower-)alkyl, lower alkanoyloxy(lower)alkyl, lower alkoxy, amino(lower-)alkyl, lower alkanoylamino(lower)alkyl, or lower alkoxycarbonylamino(lower)-alkyl), or carbamimidoyl which is substituted by cyano and lower alkyl, with the proviso that

when Q is carbamimidoyl which is substituted by cyano and lower alkyl,

then R^3 is lower alkoxy.

5,532,259
ISOXAZOLE-4-CARBOXAMIDES AND HYDROXYALKYLIDENECYANOACETAMIDES, PHARMACEUTICALS CONTAINING THESE COMPOUNDS AND THEIR USE

Robert R. Bartlett, Darmstadt, and Friedrich-Johannes Kämmerer, Hochheim am Main, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 938,048, Nov. 16, 1992, Pat. No. 5,494,911. This application Jun. 7, 1995, Ser. No. 476,278

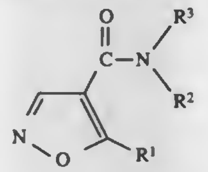
Claims priority, application Germany, May 26, 1990, 40 17 043.8; May 26, 1990, 40 17 020.9; May 18, 1990, 40 16 178.1

The portion of the term of this patent subsequent to Nov. 16, 2012, has been disclaimed.

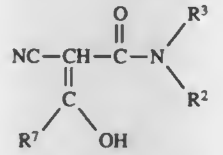
Int. Cl.^{6} A61K *31/41;* **C07D** *261/02*

U.S. Cl. 514—378 **18 Claims**

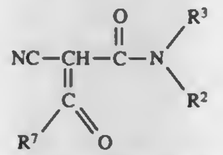
1. A method for the treatment of leukemia, carcinoses, comprising the step of administrating a pharmaceutically effective amount of a compound of formula 1, Ia, or Ib



(I)



(Ia)



(Ib)

stereoisomeric forms thereof, or physiologically tolerable salts thereof, to a patient in need of such treatment, wherein

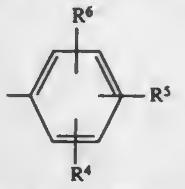
R^1 is
- a) hydrogen,
- b) alkyl having 1 to 6 carbon atoms,
- c) alkyl having 1 to 4 carbon atoms, mono- or polysubstituted by a halogen,
- d) phenyl,

R^2 is
- a) hydrogen,
- b) alkyl having 1 to 4 carbon atoms,
- c) phenyl—(C_1–C_2)—alkyl,
- d) alkenyl having 2 to 3 carbon atoms,

R^3 is
- a) a mono-, di-, or trinuclear, unsaturated heterocyclic radical having 3 to 13 carbon atoms and 1 to 4 heteroatoms from the group comprising oxygen, sulfur, and nitrogen, of which a maximum of 1 is different from nitrogen, in the ring system, unsubstituted or mono- or polysubstituted by
  - 1) halogen
  - 2) alkyl having 1 to 3 carbon atoms,
  - 3) alkyl having 1 to 3 carbon atoms, mono- or polysubstituted by
    - 3.1 halogen,
  - 4) alkoxy having 1 to 3 carbon atoms,

5) alkoxy having 1 to 3 carbon atoms, mono- or polysubstituted by
    5.1 halogen,
6) nitro,
7) hydroxyl,
8) carboxyl,
9) carbamoyl,
10) an oxo group,

b) a radical of the formula II,



(II)

in which R^4, R^5, and R^6 can be identical or different and are
1) hydrogen,
2) alkyl having 1 to 3 carbon atoms,
3) alkyl having 1 to 3 carbon atoms, mono- or polysubstituted by
    3.1 halogen,
4) in which R^4 is hydrogen and R^5 and R^6 together with the phenyl ring of formula II form a naphthalene ring,
5) in which R^4 is hydrogen and R^5 and R^6 form a methylenedioxy radical,
6) alkoxy having 1 to 3 carbon atoms,
7) alkoxy having 1 to 3 carbon atoms, mono- or polysubstituted by
    7.1 halogen,
8) $(C_1–C_3)$-alkylmercapto,
9) $(C_1–C_3)$-alkylmercapto, mono- or polysubstituted by
    9.1 halogen,
10) halogen,
11) nitro,
12) cyano,
13) hydroxyl,
14) carboxyl,
15) $(C_1–C_3)$-alkylsulfonyl,
16) carbalkoxy, having 1 to 3 carbon atoms in the alkyl chain,
17) benzoyl,
18) benzoyl, mono- or polysubstituted by
    18.1 halogen,
    18.2 $(C_1–C_3)$-alkyl
    18.3 $(C_1–C_3)$-alkoxy,
19) phenyl,
20) phenyl, mono- or polysubstituted by
    20.1 $(C_1–C_3)$-alkoxy,
    20.2 halogen,
    20.3 $(C_1–C_3)$-alkyl,
21) phenoxy,
22) phenoxy, mono- or polysubstituted by
    22.1 $(C_1–C_3)$-alkoxy, mono- or polysubstituted by 22.1.1 halogen,
    22.2 halogen,
    22.3 $(C_1–C_3)$-alkyl, mono- or polysubstituted by 22.3.1 halogen,

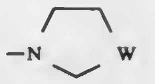
c) radical of the formula III,

$$—(CH_2)_n—COOR^{10} \qquad \text{(III)}$$

in which R^{10} is
1) hydrogen
2) alkyl having 1 to 4 carbon atoms, n is an integer from 1 to 12,

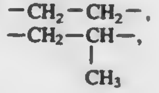
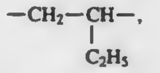
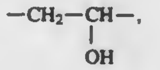
d) R^2 and R^3, together with the nitrogen to which they are bonded, form a 4- to 9-membered ring, substituted by
1) carbonyl on the carbon atom adjacent to the nitrogen atom,

e) R^2 and R^3 together with the nitrogen to which they are bonded, form a 5- to 6-membered ring of the formula IV



(IV)

in which W is

1) $-CH_2-$,
2) $-CH_2-CH_2-$,
3) 
$-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-$,
4) 
$-CH_2-\underset{\displaystyle C_2H_5}{\underset{|}{CH}}-$,
5) 
$-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-$,
6) $-CH_2-O-$ or
7) $-CH_2-S-$

R^7 is
a) hydrogen
b) alkyl having 1 to 17 carbon atoms,
c) alkyl having 1 to 3 carbon atoms, mono- or polysubstituted by halogen,
d) phenyl-$(C_1–C_2)$-alkyl; and

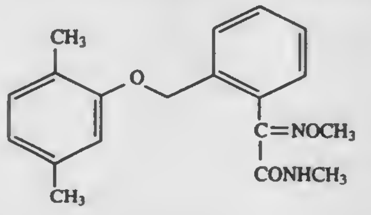
R^8 is
a) hydrogen,
b) methyl,
c) alkenyl having 2 to 3 carbon atoms.

5,532,260
FUNGICIDAL MIXTURES

Horst Wingert; Hubert Sauter, both of Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Schelberger, Gönnheim, and Manfred Hampel, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Division of Ser. No. 311,183, Sep. 23, 1994, Pat. No. 5,476,868.
This application Aug. 11, 1995, Ser. No. 515,051
Claims priority, application Germany, Sep. 24, 1993, 43 32 600.5
Int. Cl.^{6} A01N *37/18;43/64*
U.S. Cl. 514—383 **13 Claims**

1. A fungicidal mixture containing synergistic fungicidally effective amounts of

a) the oxime ether carboxamide of the formula



and

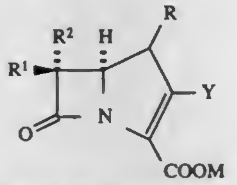
b) an azole compound selected from the group consisting of:
2-(4-chlorophenyl)-3-cyclopropyl-1- (1H-1,2,4-triazol-1-yl)butan-2-ol (cyproconazole);
(E)- (R, S)-1- (2,4-dichlorophenyl)-4,4-dimethyl-2- (1H-1,2,4-triazol- 1-yl) pent-1-en-3-ol (diniconazole);
(R, S)-2- (2,4-dichlorophenyl)-1- (1H-1, 2,4-triazol-1-yl)-hexan-2-ol (hexaconazole);
(1RS, 5RS; 1RS, 5SR)-5- (4-chlorobenzyl)-2,2-dimethyl-1- (1H-1,2,4-triazol-1-ylmethyl) cyclopentanol (metaconazole);
(R,S)-1- (4-chlorophenyl)-4,4-dimethyl-3- (1H-1, 2,4-triazol-1-ylmethyl)pentan- 3-ol (tebuconazole); and
(R,S)-2,4'-difluoro-α-(1H-1,2,4-triazol-1-ylmethyl)benzhydryl alcohol (flutriafol);

wherein a) and b) are in a synergistic weight ratio of 10:1 to 0.1:1.

5,532,261
CARBAPENEM ANTIBIOTICS, COMPOSITIONS CONTAINING SUCH COMPOUNDS AND METHODS OF USE

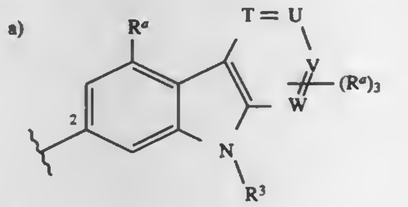
Frank P. DiNinno, Old Bridge; Ravindra N. Guthikonda, Edison, and Laura C. Meurer, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 12, 1994, Ser. No. 353,868
Int. Cl.^{6} C07D *487/04;* **A61K** *31/40*
U.S. Cl. 514—210 **24 Claims**

1. A compound represented by the formula:

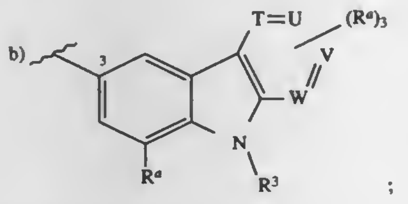


(I)

or a pharmaceutically acceptable salt thereof, wherein:
Y is:

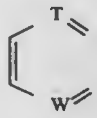


or

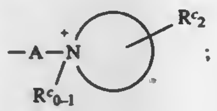


;

R and R^3 represent H or CH_3;
R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$ —, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;
M is selected from:
i) hydrogen;
ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group, or
iii) a negative charge which is balanced by a positively charged group;

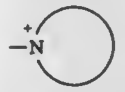


represents an aromatic 6 membered ring;
one of T, U, V and W represents N^+R^y or N, and the others represent C;
R^y is selected from the group consisting of: —H, —O—, —C_{1-4} alkyl, —OC_{1-4} alkyl, —NH_2, —NHC_{1-4} alkyl, —$N(C_{1-4}$ alkyl$)_2$, —C_{1-4} alkyl$(R^q)_{1-3}$, —OC_{1-4} alkyl$(R^q)_{1-3}$, —NHC_{1-4} alkyl$(R^q)_{1-3}$ and —$N[C_{1-4}$ alkyl$(R^q)_{1-3}]_2$ wherein R^q is as defined below;
four R^a groups are present, each independently selected from the group consisting of hydrogen, Type I and Type II set forth below, provided that 0–1 R^a groups are selected from Type I and the remaining R^a groups are selected from H and Type II;
Type I substituents are selected from the group consisting of:
(a)

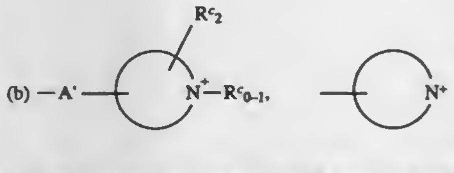


;

wherein A is $(CH_2)_m$—Q—$(CH_2)_n$, in which m is 0–6, n is 1–6 and Q is selected from the group consisting of: a covalent bond, —O—, —S—, —SO—, —SO_2—, —NH—, —SO_2NH—, —$NHSO_2$—, —CONH—, —NHCO—, —$SO_2N(C_{1-4}$ alkyl)—, —$N(C_{1-4}$ alkyl$)SO_2$—, —$CON(C_{1-4}$ alkyl)—, —$N(C_{1-4}$ alkyl)CO—, —CH=CH—, —CO—, —OC(O)—, —C(O)O— and —$N(C_{1-4}$ alkyl);



is a 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicyclic heterocycle, said heterocycle containing a first nitrogen in an aromatic 5- or 6-membered first ring, with attachment of the heterocycle to A by way of said first nitrogen, said first nitrogen being tertiary or quaternary, with the first ring containing 0–1 of either O or S, with the first ring containing 0–3 additional nitrogen atoms, with the first ring optionally fused to a 3- or 4-membered moiety to form an optional second ring, with the moiety containing at least one carbon atom, with the moiety containing 0–1 of either O or S, with the moiety containing 0–2 nitrogen atoms, and with the moiety being saturated or unsaturated and the second ring being aromatic or non-aromatic;
each R^c independently represents H or R^a as defined below under Type II;



is a 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicyclic heterocycle, the heterocycle containing a first nitrogen in an aromatic 5- or 6-membered first ring, 0–1 of either O or S, and 0–2 additional nitrogen atoms, said first nitrogen being quaternary, with the first ring optionally fused to a 3- or 4-membered moiety to form an optional second ring which is aromatic or non-aromatic, said moiety containing at least one carbon atom, 0–1 of O or S, and 0–2 additional nitrogen atoms, said moiety being saturated or unsaturated;
R^c is as defined above;
A' represents $(CH_2)_m$—Q—$(CH_2)_n$', where m is as defined above and n' independently represents 0–6;
Q is as defined above except that when m and n' are both 0, Q is not a covalent bond;

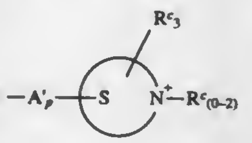
$$—A_p—N^+—R^xR^y_{(0-1)}R^z \qquad \text{(c)}$$

where R^x and R^z are as defined under Type II below, or R^x and R^z together represent a C_{2-4} alkylidene radical which forms a ring, optionally substituted with 1–3 groups selected from R^q as defined below, optionally interrupted by $N(O)R^e$ or $N^+(R^e)_2$, where R^e is hydrogen, C_{1-4} alkyl, or C_{1-4} alkyl substituted with 1–3 groups selected from R^q as defined below,
when present, R^y is as defined above;
or R^x, R^y and R^z are taken together and represent a C_{5-10} tertiary alkylidene radical which with N^+ forms a bicyclic ring,
said tertiary alkylidene radical being optionally substituted with 1–3 groups selected from R^q as defined below, and the tertiary

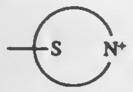
carbon of the tertiary alkylidene radical is optionally replaced with a member selected from the group consisting of: N, N^+-R^e, where R^e is as previously defined, and N^+-O^-;

A is as defined above, and

p is 0 or 1;

(d)


where



represents a 4-, 5- or 6-membered monocyclic heterocycle or an 8-, 9- or 10-membered bicyclic heterocycle, said heterocycle containing a first nitrogen in a first ring, with the first ring being non-aromatic and either saturated or unsaturated, said first nitrogen being a quaternary nitrogen,

said first ring containing in addition to carbon and the first nitrogen, 0 or 1 member selected from the group consisting of N, O, S, S(O), $S(O)_2$ and NR^e, where R^e is as defined above,

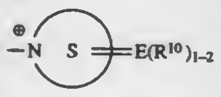
said first non-aromatic ring being optionally fused to a 2-, 3- or 4-membered moiety to form an optional second ring;

A' is defined above;

p is defined above; and

R^q is defined below;

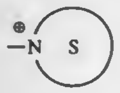
and

(e)


wherein

E represents C, N or N^+ attached to the ring by a double bond;

R^{10} represents H, C_{1-4} alkyl or C_{1-4} alkyl substituted with from 1–3 R^q groups, with R^q as defined below;



represents a 4-, 5- or 6-membered monocyclic unsaturated heterocycle, containing a first nitrogen, said first nitrogen being a quaternary nitrogen,

said ring further containing 0 or 1 member selected from the group consisting of N, O, S, S(O), $S(O)_2$ and NR^e, where R^e is as defined above;

and wherein the Type II substituents are selected from the group consisting of:

a) —CF_3;

b) a halogen atom selected from the group consisting of: —Br, —Cl, —F and —I;

c) —OC_{1-4} alkyl, wherein the alkyl is optionally substituted with 1– 3 groups selected from R^q, wherein

R^q represents a member selected from the group consisting of: —OH, —OCH_3, —CN, —$C(O)NH_2$, —$OC(O)NH_2$, CHO, —$OC(O)N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ where M^a is hydrogen, alkali metal, methyl or phenyl, tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above, and —SO_3M^b, where M^b is hydrogen or an alkali metal;

d) —OH;

e) —O(C═O)R^s, where R^s is C_{1-4} alkyl or phenyl, each of which is optionally substituted by 1–3 R^q groups as defined above;

f) —O(C═O)N(R^x)R^z, where R^x and R^z are independently H, C_{1-4} alkyl, optionally substituted by 1–3 R^q groups as defined above, together a 3- to 5-membered alkylidene radical to form a ring, optionally substituted with 1–3 R^q groups as defined above, or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or —$S(O)_2$— to form a ring, where the ring is optionally substituted with 1–3 R^q groups as defined above;

g) —$S(O)_q$—R^s where q=0–2, and R^s is defined above;

h) —$SO_2N(R^x)R^z$ where R^x and R^z are as defined above;

i) —N_3;

j) —N(R^t)(C═O)H, where R^t is H or C_{1-4} alkyl, and the C_{1-4} alkyl portion thereof is optionally substituted with 1–3 R^q groups, wherein R^q is as defined above;

k) —N(R^t)(C═O)C_{1-4} alkyl, wherein R^t is as defined above, and the alkyl group is optionally substituted by 1-3 R^q groups, with R^q as defined above;

l) —N(R^t)(C═O)OC_{1-4} alkyl, wherein R^t is as defined above, and the alkyl portion thereof is optionally substituted with 1–3 R^q groups, with R^q as defined above;

m) —N(R^t)(C═O)N(R^y)R^z wherein R^t, R^y and R^z are as defined above;

n) —N(R^t)SO_2R^s, wherein R^s and R^t are as defined above;

o) —CN;

p) —(C═O)H or —$CH(OCH_3)_2$;

q) —$C(OCH_3)_2C_{1-4}$ alkyl, wherein the alkyl portion thereof is optionally substituted with 1–3 R^q groups, with R^q as defined above;

r) —(C═O)R^s, wherein R^s is as defined above;

s) —(C═NOR^z)R^y wherein R^y and R^z are as defined above, except they may not be joined together to form a ring;

t) —(C═O)OC_{1-4} alkyl, wherein the alkyl portion thereof is optionally substituted with 1–3 R^q groups, with R^q as defined above;

u) —(C═O)N(R^y)R^z wherein R^y and R^z are as defined above;

v) —(C═O)—N(OR^y)R^z wherein R^y and R^z are as defined above, except they may not be joined together to form a ring;

w) —(C═S)N(R^y)R^z wherein R^y and R^z are as defined above;

x) —$COOM^b$, wherein M^b is as defined above;

y) —SCN;

z) —SCF_3;

aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

ab) an anionic function selected from the group consisting of: phosphono which is P═O$(OM^b)_2$; alkylphosphono which is P═O(OM^b)—[O(C_1–C_4 alkyl)]; alkylphosphinyl which is P═O(OM^b)—(C_1–C_4-alkyl); phosphoramido which is P═O(OM^b)N(R^y)R^z or P═O(OM^b)NHR^w; sulfino which is SO_2M^b; sulfo which is SO_3M^b; acylsulfonamide which is selected from the group consisting of: $CONM^bSO_2R^w$, $CONM^bSO_2N(R^y)R^z$, $SO_2NM^bCON(R^y)R^z$ and SO_2NM^bCN, where

R^w is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally substituted with 1–3 R^q groups, wherein R^q is as defined above; M^b is as defined above; and R^y and R^z are as defined above;

ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N(C_1–C_4 alkyl) and in which one additional carbon may be replaced by NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

ad) C_2–C_4 alkenyl radical, optionally substituted with 1–3 substituents a) to ac) above and phenyl which is optionally substituted by 1–3 R^q groups, with R^q as defined above;

ae) C_2–C_4 alkynyl radical, optionally substituted by one to three of the substituents a) to ac) above;

af) C_1–C_4 alkyl radical;

ag) C_1–C_4 alkyl substituted with 1–3 of the substituents a)–ac) above;

ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from S and NR^t, where R^t is as defined above, and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents a) to ag) above.

5,532,262

FUNGICIDAL ACTIVE COMPOUND COMBINATIONS

Wilhelm Brandes, Leichlingen; Heinz-Wilhelm Dehne, Monheim; Stefan Dutzmann, Hilden; Karl-Heinz Kuck, Langenfeld, and Bernd-Wieland Krüger, Bergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

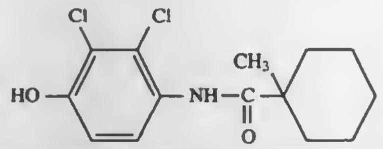
Continuation of Ser. No. 232,923, Apr. 25, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 462,408

Claims priority, application Germany, Apr. 28, 1995, 43 13 867.5

Int. Cl.^{6} A01N *37/18;41/02;43/52*

U.S. Cl. 514—388 **3 Claims**

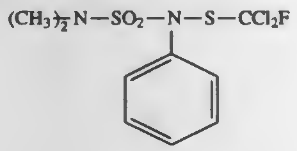
1. A fungicidal composition comprising synergistic fungicidally effective amounts of the combination of a compound of the formula



(I)

and a second compound selected from the group consisting of

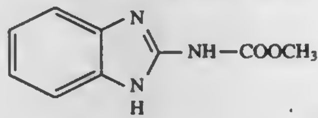
(A) dichlofluanid of the formula



(II)

and

(O) methyl benzimidazole-2-carbamate of the formula



(XIII)

(carbendazim)

where the weight ratio of the active compound of the formula (I)
to active compound (A) 1:0.5 and 1:50 and
to active compound (0) is between 1:01 to 1:10.

5,532,263

BENZOTHIOPYRANOINDAZOLE ANTITUMOR AGENTS

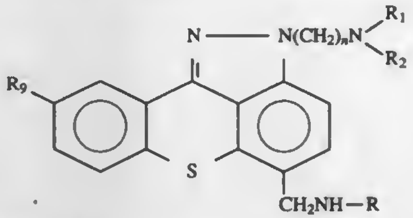
Mark P. Wentland, Audubon, and Robert B. Perni, Birdsboro, both of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Feb. 27, 1995, Ser. No. 391,392

Int. Cl.^{6} A61K *31/415;* **C07D** *495/06*

U.S. Cl. 514—406 **13 Claims**

1. A compound of formula



I

wherein n is 2 or 3;

R is hydrogen, lower-alkyl, C(O)H, $C(O)R_3$, SO_2R_3, and $C(O)OR_3$;

R_1 and R_2 are independently hydrogen or lower-alkyl;

R_3 is lower-alkyl; and

R_9 is hydrogen, lower-alkyl, lower-alkoxy, or hydroxy; or a pharmaceutically acceptable acid-addition salt or solvate thereof.

5,532,264

POTENTIATION OF DRUG RESPONSE

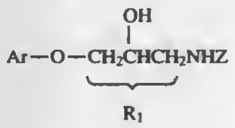
David T. Wong, and Juan I. Oguiza, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 277,460, Jul. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 260,857, Jun. 16, 1994, abandoned. This application May 17, 1995, Ser. No. 442,736

Int. Cl.^{6} H61K *31/135;31/165;31/38;31/395*

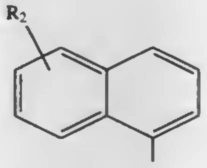
U.S. Cl. 514—415 **20 Claims**

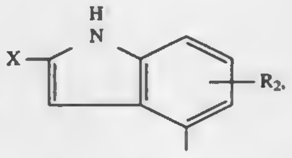
1. A method for potentiating the action of a first component chosen from the group consisting of venlafaxine, milnacipran and duloxetine in increasing the availability of serotonin, norepinephrine and dopamine in the brain, comprising administering a first component to a patient in need thereof in combination with a second component which is a compound of the formula

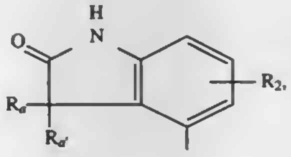


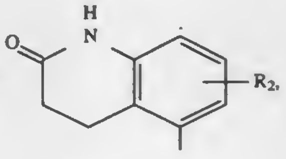
$$Ar-O-\underbrace{CH_2\overset{OH}{\overset{|}{C}}HCH_2}_{R_1}NHZ \qquad \text{I}$$

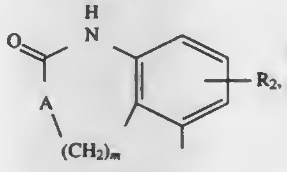
wherein Ar is

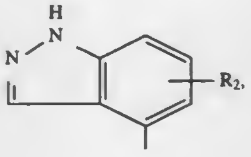












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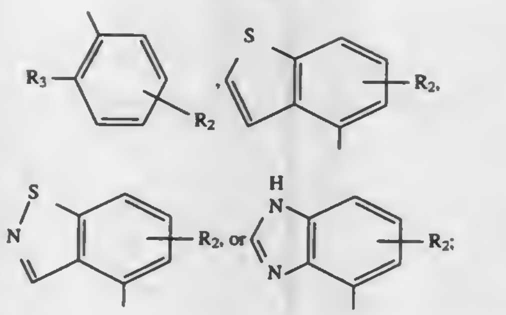
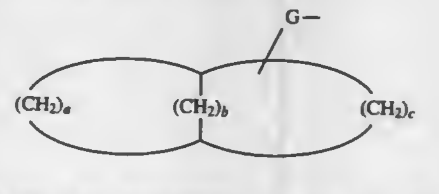


R_1 is an optional methyl group substituted on one of the three connecting carbon atoms;

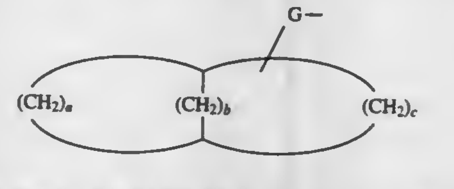
R_2 is hydrogen, C_1–C_4 alkyl, trifluoromethyl, hydroxy, (C_1–C_4 alkyl)—O—, (C_1–C_4 alkyl)—$S(O)_p$—, or halo;

R_3 is a bicycloalkyl group of the formula



where a and c are independently 1–5, b is 0–5, and (a+c) is greater than 2;

Z is a straight or branched C_4–C_{10} alkane, alkene, or alkyne group; (C_4–C_8 cycloalkyl) optionally substituted with C_1–C_4 alkyl or phenyl; a bicycloalkyl group of the formula



wherein a and c are independently 1–5, b is 0–5, and (a+c) is greater than 2; optionally phenyl substituted C_2–C_{10} alkyl where the phenyl group can be optionally substituted with R_2 as previously defined; or (C_1–C_4 alkylidene)-T-(C_1–C_4 alkyl), where T is —O—, —S—, —SO—, or —SO_2—;

where

each G is independently a bond or C_1–C_4 alkylidene;

X is —H, —COY, —CN, or C_1–C_4 alkyl;

Y is —OH, —O—(C_1–C_4 alkyl), or —NH_2;

R_a and $R_{a'}$ are independently hydrogen or C_1–C_3 alkyl, or when taken together with the carbon atom to which they are attached form a C_3–C_8 cycloalkyl ring;

p is 0, 1, or 2;

A is —O—, —S—, —NH—, or —NCH_3—; and

m is 0, 1, 2, or 3; or a pharmaceutically acceptable salt thereof.

5,532,265

TREATMENT OF CENTRAL NERVOUS SYSTEM INFLAMMATORY DISEASE WITH MATRIX METALLOPROTEASE INHIBITORS

Koenraad Gijbels, Menlo Park, and Lawrence Steinman, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 30, 1994, Ser. No. 348,262

Int. Cl.^{6} A61K *31/405*

U.S. Cl. 514—419 **10 Claims**

1. A method for diminishing the adverse effects of an inflammatory central nervous system disease associated with elevated matrix metalloprotease (MMP) activity in the central nervous system of a mammalian host, said method comprising:

administering to said host N-[2R-2-(hydroxamidocarbonylmethyl)- 4-methylpentanoyl)-L-tryptophan methylamide (GM 6001), in an amount effective to diminish said adverse effects.

5,532,266

ACRYLACETAMIDES

Rudolf Gottschlich, Reinheim; Karl-August Ackermann, Ober-Ramstadt; Helmut Prücher, Heppenheim; Christoph Seyfried, Seeheim; Hartmut Greiner; Gerd Bartoszyk, both of Darmstadt; Frank Mauler, Seeheim; Manfred Stohrer, Mainz, and Andrew Barber, Weiterstadt, all of, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

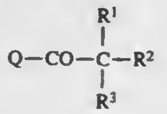
Continuation of Ser. No. 57,801, May 7, 1993, abandoned. This application May 30, 1995, Ser. No. 453,811

Claims priority, application Germany, May 9, 1992, 42 15 213.5

Int. Cl.^{6} C07D *207/36;207/325;* **A61K** *31/40*

U.S. Cl. 514—428 **22 Claims**

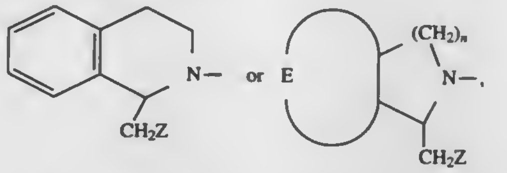
1. An arylacetamide of the formula I



$$Q-CO-\underset{R^3}{\overset{R^1}{C}}-R^2 \qquad I$$

in which

Q is R^4—$CH(CH_2Z)$—NA—,



R^1 is Ar, cycloalkyl with 3–7 C atoms or C_4–C_8-cycloalkyl-C_1–C_7-alkyl,

R^2 is Ar,

R^3 is H, OH, OA or A, R^4 is A or phenyl which can optionally be substituted once or twice by F, Cl, Br, I, OH, OA, CF_3, NO_2, NH_2, NHA, NHCOA, $NHSO_2A$ or NA_2,

R^5 and R^6 are each, independently of one another, H, F, Cl, Br, I, OH, OA, CF_3, NH_2, NHA, NA_2, NHCOA, $NHCONH_2$, NO_2 or taken together are methylenedioxy,

A is alkyl with 1–7 C atoms,

Z is 1-pyrrolidinyl which can optionally be substituted once by OH, OA, O—$COCH_3$ or CH_2OH,

Ar is a mono- or bicyclic aromatic radical which can optionally be substituted once, twice or three times by A, Hal, OH, OA, CF_3, NH_2, NHA, NA_2, NHCOA and/or $NHCONH_2$, and

provided that when R^4 is not phenyl then Ar must be substituted at least once, or physiologically acceptable salts thereof.

5,532,267

AMIDINONAPHTHYL FURANCARBOXYLATE DERIVATIVES AND ACID ADDITION SALTS THEROF

Toyoo Nakayama, Funabashi; Seizo Taira, Chiba; Hiroyuki Kawamura, Ichikawa; Masaoki Shibuya, Chiba, and Masahiro Iwaki, Ichikawa, all of, Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

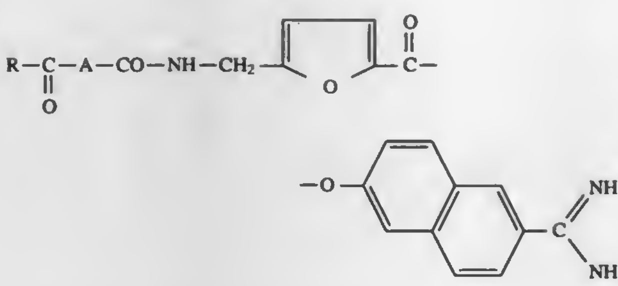
Continuation-in-part of Ser. No. 956,287, Oct. 5, 1992, abandoned. This application Mar. 22, 1994, Ser. No. 215,785

Claims priority, application Japan, Feb. 10, 1992, 4-023848

Int. Cl.^{6} A61K *31/335;31/34;* **C07D** *307/46;317/14*

U.S. Cl. 514—467 **44 Claims**

1. An amidinonaphthyl furancarboxylate derivative of the formula I



I

wherein A is a single bond or A denotes

(a) a phenyl group, cyclopentyl group, or cyclohexyl group,

(b) an alkenylphenyl group, alkylphenyl group, phenylalkenyl group, or phenylalkyl group wherein alkyl is C_1 to C_7 alkyl and alkenyl is C_2 to C_7 alkenyl,

(c) a C_1 to C_{18} alkyl or C_2 to C_7 alkenyl group which may be substituted by one or two substituents selected from C_1 to C_5 alkyl groups and quanidino groups, wherein an alkyl substituent together with the carbon atom to which it is attached may form a cycloalkyl ring having from 3 to 6 carbon atoms, or said C_1 to C_5 alkyl may itself be substituted by a C_3 to C_6 cycloalkyl ring, or

(d) —$(CH_2)_n$—NH—CO—$(CH_2)_{n'}$ wherein n and n' may be the same or different and represent an integer from 1 to 4; and

wherein R denotes

(e) a hydroxyl group,

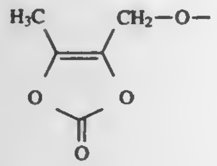
(f) a C_1 to C_7 alkoxy group which may be mono- or disubstituted by C_1 to C_5 alkyl,

(g) a phenyl-C_{1-C4}alkoxy group,

(h) —$OAl(OH)_2$,

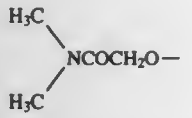
(i) an amino group,

(j)



or

(k)



or a pharmaceutically acceptable addition salt thereof.

5,532,268

POTENTIATION OF DRUG RESPONSE

David T. Wong, and Juan I. Oguiza, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 277,460, Jul. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 260,857, Jun. 16, 1994, abandoned. This application May 17, 1995, Ser. No. 442,735

Int. Cl.^{6} A61K *31/135;31/495;31/38*

U.S. Cl. 514—432 **14 Claims**

1. A method for potentiating the action of a first component which is fluoxetine in increasing the availability of serotonin, norepinephrine and dopamine in the brain, comprising administering a first component to a patient in need thereof in combination with a second component chosen from the group consisting of alprenolol, WAY 100135, spiperone, propranolol and tertatolol.

5,532,269

PREPARATION FOR TREATING CIRCULATORY CHANGES

Peter Koltringer, Graz, Austria, assignor to ASTA Medica Aktiengesellschaft, Dresden, Germany

Filed Oct. 11, 1994, Ser. No. 320,400

Claims priority, application Austria, Oct. 11, 1993, 2045/93; Oct. 18, 1993, 2094/93

Int. Cl.^{6} A01N *43/26*

U.S. Cl. 514—440 **13 Claims**

1. A preparation for the treatment of circulatory changes which comprises essentially alpha-lipoic acid (R,S-thioctic acid) in reduced or oxidized form, its isolated enantiomers and metabolites in the form of the free acid, as salts, esters or amides wherein the alpha-lipoic acid is present in a dosage amount of 20 mg–1800 mg.

5,532,270

COMPOSITION AND PROCESS FOR PREVENTION AND TREATMENT OF CUTANEOUS IMMEDIATE HYPERSENSITIVITY REACTIONS

Emmett Clemente, Manchester; Robert W. Mendes, Dedham; Aloysius O. Anaebonam, Burlington, and Mumtaz Ahmed, Westford, all of Mass., assignors to Ascent Pharmaceuticals, Inc., Billerica, Mass.

Filed Apr. 3, 1995, Ser. No. 415,722

Int. Cl.^{6} A01N *43/16*

U.S. Cl. 514—456 **5 Claims**

1. A process for treatment of cutaneous immediate hypersensitivity reactions caused by insect bites and sting in humans comprising topically administering a therapeutically effective amount of the compound, 1,3-bis(2-carboxychromon-5-yloxy)-2-hydroxypropane, or a pharmacologically acceptable salt, ester or amide thereof, dissolved or dispersed in a pharmacologically acceptable carrier to the reaction site of said human.

5,532,271

FURANONE DERIVATIVES FOR THE SUPPRESSION OR TREATMENT OF AUTOIMMUNE DISEASES

Mitsuru Naiki; Yuichi Takeoka, and Seishi Suehiro, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

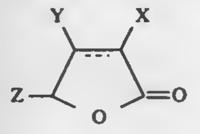
Division of Ser. No. 950,563, Sep. 25, 1992, Pat. No. 5,376,682. This application Sep. 8, 1994, Ser. No. 301,398

Claims priority, application Japan, Sep. 26, 1991, 3-276543

Int. Cl.^{6} A61K *31/34*

U.S. Cl. 514—473 **5 Claims**

1. A method for suppressing or treating autoimmune diseases in a mammal which comprises administering to the mammal an effective amount of at least one furanone compound of the formula



wherein X is hydrogen, hydroxy, a lower alkyl group or a lower alkylene group; Y is hydrogen, hydroxy or a lower alkyl group having 1–3 carbons, Z is hydrogen, a lower alkyl group or a hydroxy lower alkyl group; and the broken line represents the presence or absence of a second bond;

or a pharmaceutically acceptable salt thereof.

5,532,272

3-OXYGERMYLPROPIONIC ACID POLYMER, PHARMACEUTICAL COMPOSITION CONTAINING SAME AND METHOD OF PREVENTING AND/OR CURING SYMPTOMS OF IMMUNE DISEASES USING SAME

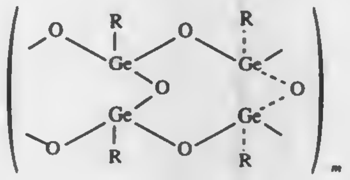
Kiichi Sawai; Takahiko Mitani; Naohisa Ninomiya, and Yoshirou Ishiwata, all of Nagoya, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Filed May 20, 1994, Ser. No. 246,141

Int. Cl.^{6} A61K *31/28;* **C07F** *7/30*

U.S. Cl. 514—492 **4 Claims**

1. An organogermanium compound having an empirical formula of $C_6H_{10}Ge_2O_7$, a minimum constitutional unit of $(O_{1/2})_3GeCH_2CH_2COOH$ and the following stereostructure:



wherein R stands for —CH_2CH_2COOH and m is an integer of 137± 84.

5,532,273

METHOD FOR CONTROLLING PINK BOLLWORM THROUGH DISTURBANCE OF MALE-FEMALE COMMUNICATION THEREOF

Kinya Ogawa; Tetsuo Kitagaki, both of Kanagawa, and Akira Yamamoto, Niigata, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 40,220, Apr. 1, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,792

Claims priority, application Japan, Aug. 19, 1992, 4-219528

Int. Cl.^{6} A01N *25/00;37/00;31/02*

U.S. Cl. 514—546 **7 Claims**

1. A method for controlling pink bollworm in a field through disturbing the male-female communication thereof comprising introducing a mixture of Z,Z/Z,E-7,11-hexadecadienyl acetate wherein the ratio of Z,Z to Z,E acetate is from 3:7 to 7:3 and Z,Z/Z,E-7,11-hexadecadienyl alcohol wherein the ratio of Z,Z to Z,E alcohol is from 3:7 to 7:3 into a polyethylene container; sealing the container having an average thickness ranging from 0.2 mm to 0.8 mm and placing the container in the field to release the mixture, the weight ratio of acetate to alcohol in the mixture being effective to result in a released weight ratio of acetate to alcohol ranging from 99.2:0.8 to 90:10.

5,532,274

ORALLY ADMINISTERABLE DRUGS FOR THE TREATMENT OF CENTRAL DOPAMINE DEFICIENCY CONDITIONS

Udo Wenzel, Halle; Gunther Weber, Zwickau; Jurgen Metzner, Halle; Alfred Darr, Leipzig; Sabine Freitag, Zwickau, all of, Germany; Frank-Ulrich Flother, Schaffhausen-Herblingen, Switzerland; Frank-Michael Albert, Zwickau, Germany; Margit Haase, Gottingen, Germany, and Edith Leistner, Leipzig, Germany, assignors to ISIS PHARMA GmbH, Zwickau, Germany

PCT No. PCT/DE92/00043, § 371 Date Nov. 24, 1993, § 102(e) Date Nov. 24, 1993, PCT Pub. No. WO92/12710, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 23, 1992, Ser. No. 90,163

Claims priority, application Germany, Jan. 23, 1991, 41 01 873.7

Int. Cl.^{6} A61K *31/195;31/045;47/30*

U.S. Cl. 514—565 **5 Claims**

1. Drug formulation administrable by mouth for the treatment of central dopamine deficiency conditions, said formulation comprising

100 to 250 parts by weight of levodopa,

10 to 25 parts by weight of carbidopa,

a polymer mixture in an amount of 10 to 200% based on said drugs, said polymer mixture consisting of:

0 to 100 parts by weight of a completely saponified polyvinyl alcohol having 0 to 3% residual acetyl content, a mean molecular weight of 60,000 to 80,000, and a total surface area of 0.1 m^2/g to 0.18 m^2/g, and

100 to 0 parts per weight of a partially saponified polyvinyl alcohol having 10 to 18% residual acetyl content, a mean molecular weight of 80,000, a total surface area of 0.5 m^2/g to 0.69 m^2/g, and a specific pore volume of 0.2 cm^3/g to 0.36 cm^3/g,

and an effective amount of customary galenic adjuvants.

5,532,275

METHOD OF PROMOTING WOUND HEALING AND SCAR REGRESSION

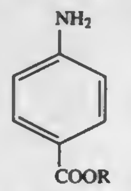
Martin Grumet, New York, N.Y., assignor to Andrx Pharmaceuticals, Inc., Fort Lauderdale, Fla.

Filed Dec. 7, 1994, Ser. No. 351,778

Int. Cl.^{6} A61K *31/195*

U.S. Cl. 514—567 **4 Claims**

1. A method of treating wounds which comprises orally administering an effective amount of a compound of Formula I:



(I)

where R is selected from the group consisting of hydrogen sodium and potassium to a patient who has a wound, said compound being administered in an amount which is sufficient to promote the healing of a wound.

5,532,276

IMIDAZOPYRIDINES

Werner Mederski, Erzhausen; Dieter Dorsch, Ober-Ramstadt; Mathias Osswald, Zwingenberg; Norbert Beier, Reinheim; Pierre Schelling, Muhltal; Klaus-Otto Minck, Ober-Ramstadt, and Ingeborg Lues, Darmstadt, all of, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

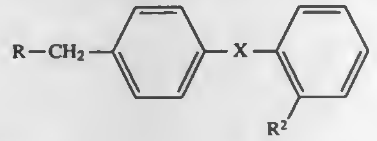
Filed Dec. 5, 1994, Ser. No. 353,309

Claims priority, application Germany, Dec. 6, 1993, 43 41 453.2

Int. Cl.^{6} A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 **10 Claims**

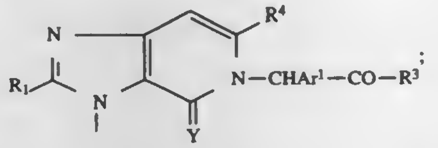
1. An imidazopyridine derivative of formula I



I

wherein

R is



;

R^1 is A, C_{1-6}-alkenyl or -alkynyl, C_{3-7}-cycloalkyl-C_kH_{2k}—, or C_{1-6}-alkyl wherein a CH_2 group is replaced by O or S;

R^2 is H, COOH, COOA, CN, NO_2, NHCOR^5, $NHSO_2R^5$ or 1H-tetrazol-5-yl;

R^3 is NR^{6}R^7, O—C_{3-7}-cycloalkyl, OAr or, when Ar^1 is naphthyl, also OH or OA;

R^4 is H or Hal;

R^5 is C_{1-5}-alkyl wherein, optionally, one or more H atoms is replaced by F;

R^6 and R^7 are each, independently, H, A, C_{1-6}-alkenyl or -alkynyl, C_{3-7}-cycloalkyl-C_kH_{2k}, Ar, ArC_nH_{2n}— or Het,

R^6 is also —CH_2COOA, —SO_2—A or —SO_2—Ar, or

R^6 and R^7 together are C_{2-5}-alkylene optionally mono- or polysubstituted by one or more of carbonyl oxygen, A, Ar, Het, —CO—Ar, —COOA, —CO—N(A)$_2$, —CH_2OH, —SO_2—Ar and —NH—CO—A, and optionally interrupted by O or by —NR^8— and optionally fused with a benzene ring;

R^8 is H, A, Ar, CHO, COOA, Het or SO_2—Ar;

X is absent or is —NH—CO—, —CO—NH—, —O—CH(COOH)—, —NH—CH(COOH)—, —NA—CH(COOH)—, —CH═C(COOH)—, —CH═C(CN)— or —CH═C(1H-tetrazol-5-yl)—;

Y is O or S;

A is C_{1-6}-alkyl;

Ar and Ar^1 are each, independently, phenyl groups or naphthyl groups optionally mono- or disubstituted by R^5, OR^5, COOH, COOA, CN, NO_2, NH_2, NHCOR^5, $NHSO_2R^5$, Hal or 1H-tetrazol-5-yl;

Het is a five- or six-membered heteroaromatic radical having 1 to 3N, O and/or S atoms, optionally fused with a benzene or pyridine ring and optionally can be mono- or poly-substituted by A;

Hal is F, Cl, Br or I;

k is 0, 1, 2, 3 or 4; and

n is 1, 2, 3, 4, 5 or 6,

or a salt thereof.

5,532,277

SPIN TRAP NITRONYL HINDERED PHENOLS

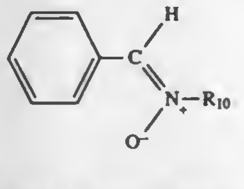
Edward G. Janzen, Oklahoma City, Okla.; Allan L. Wilcox, Campbell, Calif., and Randall D. Hinton, Stillwater, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation of Ser. No. 141,241, Oct. 22, 1993, Pat. No. 5,455,272. This application Apr. 10, 1995, Ser. No. 419,159

Int. Cl.^{6} C07C *251/00;251/32;* **A61K** *31/15*

U.S. Cl. 514—579 **14 Claims**

12. A pharmaceutical composition suitable for internal administration to humans comprising a pharmacologically effective amount of a compound according to the formula below, and a pharmacologically acceptable carrier:



wherein R_{10} is an alkyl of 8 or more carbons.

5,532,278

METHODS AND COMPOSITIONS FOR TREATING URINARY INCONTINENCE USING OPTICALLY PURE (S)-OXYBUTYNIN

Gunnar Aberg, Westborough, and John R. McCullough, Worcester, both of Mass., assignors to Sepracor, Inc., Marlborough, Mass.

Filed Jan. 31, 1995, Ser. No. 381,542

Int. Cl.^{6} A61K *31/165;9/70*

U.S. Cl. 514—617 **9 Claims**

1. A method for treating urinary incontinence while avoiding concomitant liability of adverse effects, which comprises administering to a human in need of such treatment a therapeutically effective amount of (S)-oxybutynin or a pharmaceutically acceptable salt thereof, substantially free of its (R) enantiomer.

5,532,279

ION-EXCHANGE COMPOSITION EMPLOYING RESIN ATTACHMENT TO DISPERSANT AND METHOD FOR FORMING THE SAME

Victor B. Barretto, Santa Clara; Stephen S. Heberling, Mountain View; Vernon E. Summerfelt, and Christopher A. Pohl, both of Union City, all of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 518,293, May 3, 1990, Pat. No. 5,324,752. This application Apr. 1, 1994, Ser. No. 221,752

Int. Cl.^{6} C08J *5/20*

U.S. Cl. 521—28 **13 Claims**

1. An ion-exchange chromatographic composition for the separation of ionic species in a sample solution, comprising suspension polymerized synthetic resin support particles comprising polyvinyl polymer polymerized from vinyl monomers, a polymer dispersant used to suspend said support particles to inhibit or prevent agglomeration in an aqueous medium during suspension polymerization, said dispersant binding to said support particles during suspension polymerization, and fine synthetic ion exchange resin layering particles wherein said dispersant forms a bridge between said synthetic support particles and said fine layering particles to thereby irreversibly attach said support particles and layering particles, said support particles being unsulfonated, said layering particles including cation- or anion-exchanging sites which exchange their ions for the ionic species of the same charge in said sample solution, thereby chromatographically separating said ionic species.

5,532,280

PROCESS FOR THE PRODUCTION OF LIGHTWEIGHT POLYURETHANE MOLDINGS

Marnie M. Allen, Guelph; Aaron W. Beazley, Hamilton, and Daniel J. Hutchinson, Fergus, all of, Canada, assignors to Conix Canada (Polycon Division), Concord, Canada

Filed May 1, 1995, Ser. No. 431,725

Int. Cl.^{6} C08J *9/24;9/32;9/34*

U.S. Cl. 521—51 **11 Claims**

1. A method of preparing a low density rigid article of foamed polyurethane having an outer continuous surface skin, the mixture comprising:

selecting and forming a mixture of polyisocyanate and an isocyanate-reactive component to form a low density rigid foamed molding having a continuous skin; subjecting the mixture to a reactive injection molding process to form a foamed rigid product having a continuous skin; said mixture including from 0.5% to 6% by weight, based upon the weight of the mixture of hollow glass microspheres having a maximum size of 120 microns and a compressive strength of at least 4000 psi.

5,532,281

METHODS AND APPARATUS FOR PRODUCING A COMPOSITION MATERIAL AND PRODUCTS OF THE METHODS AND APPARATUS

Richard T. Vass, 1032 San Carlos Dr., Antioch, Calif. 94509

Filed Sep. 15, 1995, Ser. No. 529,280

Int. Cl.^{6} C08J *9/00;* **B01J** *13/02;* **B32B** *5/22*

U.S. Cl. 521—76 **27 Claims**

1. A method of producing a composition material which embodies both the physical and chemical properties of a physically expanded polymer material and specific structural and/or chemical properties of added solid particles fully encapsulated in membranes in the expanded polymer, said method comprising,

conducting a polymer material in an uncured, liquid form to a mixing chamber,

introducing and intimately blending a pressurized gas into the liquid polymer material in the mixing chamber,

said pressurized gas being chemically inert with respect to the liquid polymer material,

conducting the blend of liquid polymer material and entrained pressurized gas to an enclosing chamber wherein the pressurized gas can expand the liquid polymer material to fill the enclosing chamber,

expanding the liquid polymer by the pressurized gas in the enclosing chamber so that the expanded liquid polymer and gas is compressible and can have solid particle material readily injected and encapsulated within spaces made available by the expansion of the liquid polymer material,

allowing the expanded polymer and gas to take up the available volume of the enclosing chamber,

allowing the polymer to be fully expanded within the enclosing chamber,

conducting a flow stream of added solid particle material to the enclosing chamber,

introducing the particle material into the compressible, expanded liquid polymer and gas in the enclosing chamber in close conjunction with the physical expansion of the liquid polymer material and while the compressible liquid polymer material and gas are in a physical condition to yield readily to the introduction of said solid particles,

said particle material being selected to add particular structural and/or chemical properties to the composition material as finally produced,

controlling the quantity of introduced added particle material, in any amount up to a limit determined by the amount of compressibility of the gas expanded liquid polymer material within the enclosing chamber, to cause all of the added particle material to be intimately and evenly distributed within the polymer material while the polymer material is expanded in a relaxed state in the enclosing chamber wherein substantially every particle of the added particle material is fully encapsulated by a membrane of the polymer material as the mixture of the expanded polymer material, gas and added particle material flows through and out of the enclosing chamber,

conveying the mixture in a relaxed, fluid, flowable state from the outlet of the enclosing chamber to a zone of application, and

completing sufficient curing of the polymer material to hold the added particle material substantially uniformly distributed within and embedded within a matrix of the polymer material at the zone of application whereby said matrix enables the composition material substantially uniformly to incorporate particular structural and/or chemical properties of the added particle material.

5,532,282

POLYOLEFIN-BASED COMPOSITION FOR ROTATIONAL MOLDING

Donald G. Needham, Ramona, Okla., assignor to Neeco, Inc., Ramona, Okla.

Filed Dec. 16, 1994, Ser. No. 357,826

Int. Cl.^{6} C08J *9/08;* **C08K** *5/09;* **C08L** *23/04*

U.S. Cl. 521—93 **10 Claims**

1. A foamable, rotomolding composition comprising a first thermoplastic polymer of ethylene, an effective amount of a suitable foaming agent, which comprises a carbon dioxide-releasing inorganic salt, and an effective amount of a suitable nucleating agent/foaming coagent selected from a mixture of stearic acid and zinc stearate, and a mixture of calcium stearate and stearamide, as particulate matter of a first size; and a second thermoplastic polymer of ethylene as particulate matter of a size significantly smaller than said first size for providing an outer skin to a rotomolded article; wherein said first thermoplastic polymer and said second thermoplastic polymer may be the same or different.

5,532,283

AZEOTROPIC COMPOSITIONS OF 1,1,1,4,4,4-HEXAFLUOROBUTANE AND 2-METHYL BUTANE AND THE USE THEREOF IN THE PRODUCTION OF FOAMS

Joachim Werner, Bethel Park, Pa.; Scott A. Kane, Wellsburg, W. Va.; Eric F. Boonstra, Oakdale, and Herman P. Doerge, Pittsburgh, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1995, Ser. No. 410,458

Int. Cl.^{6} C08J *9/14;* **C11D** *7/50;* **C23G** *5/024;5/028*

U.S. Cl. 521—131 **10 Claims**

1. An azeotropic composition consisting essentially of

a) from about 64 to about 80% by weight of 1,1,1,4,4,4-hexafluorobutane and b) from about 20 to about 36% by weight of 2-methyl butane.

5,532,284

POLYMER FOAMS CONTAINING GAS BARRIER RESINS

Philip L. Bartlett; Joseph A. Creazzo, both of Wilmington, and Howard S. Hammel, Bear, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 882,247, May 8, 1992, abandoned, which is a continuation of Ser. No. 500,050, Mar. 23, 1990, abandoned. This application Feb. 17, 1995, Ser. No. 390,911

Int. Cl.^{6} C08G *18/14*

U.S. Cl. 521—134 **15 Claims**

1. In a closed cell thermoplastic or thermoset polymer foam characterized by a continuous polymeric phase and discontinuous gaseous phase, the improvement comprising: an effective amount of a gas barrier resin substantially uniformly dispersed in the continuous polymeric phase which reduces the permeability of the foam; thereby maintaining a blowing agent in the cells of the foam wherein said blowing agent comprises at least one member from the group consisting of HCFC-22, HCFC-142b, methyl formate, C_3 to C_6 hydrocarbons, HFC-143a, HFC-152, HFC-152a, CO_2, HFC-32, HFC-125, HFC-134, and HFC-134a, wherein said continuous polymeric phase comprises a material selected from the group consisting of polyurethanes, polyisocyanurates, and polystyrene, and; wherein said gas barrier resin comprises a material selected from the group consisting of:

ethylene/vinyl alcohol copolymers;
polyvinyl alcohol;
polyacrylonitrile and copolymers;
polyvinylidene fluoride;
polyamides;
admixtures of ethylene/vinyl alcohol copolymers and mica; and mixtures thereof.

5,532,285

WATER-BLOWN POLYURETHANE SEALING DEVICES AND COMPOSITIONS FOR PRODUCING SAME

Thirumurti Narayan, Grosse Ile, and Steven Hicks, Trenton, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.

Continuation of Ser. No. 461,794, Jun. 5, 1995, abandoned, which is a division of Ser. No. 367,036, Dec. 29, 1994. This application Oct. 23, 1995, Ser. No. 546,748

Int. Cl.^{6} C08G *18/10*

U.S. Cl. 521—159 **15 Claims**

1. A molded polyurethane article, produced by a process comprising:

providing a polyurethane composition comprising:
  (I) an isocyanate prepolymer composition having a % free NCO of between 16 and 20 and a viscosity of from 200 to 600 cPs, the composition comprising the result of reacting:
    (a) an isocyanate blend comprising:
      (i) 0 to 10 pbw 2,4'-diphenylmethane diisocyanate;
      (ii) 30 to 80 pbw 4,4'-diphenylmethane diisocyanate; and
      (iii) 1 to 10 pbw of a mixture of uretonimine containing molecules and carbodiimide containing molecules; and
    (b) from 10 to 70 pbw of an ethoxylated and propoxylated glycerine having a number average molecular weight of between 1,000 and 10,000 and a hydroxyl number of between 20 to 100 wherein all pbw are based on the total weight of (a) and (b);
  (II) an isocyanate-reactive component;
  (III) a chain extender; and
  (IV) a blowing agent consisting essentially of water; and
placing the polyurethane composition inside a mold for a period of time sufficient to produce a molded polyurethane article having improved hardness and compression characteristics.

5,532,286

THIOETHER ACRYLATE CONTAINING PHOTOPOLYMERIZABLE COMPOSITIONS

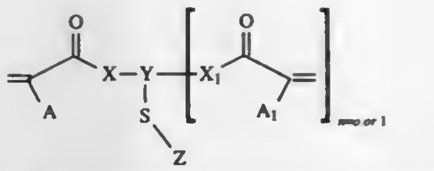
Elizabeth G. Burns; Susan A. Visser, both of Rochester, and Jeffrey F. Taylor, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 243,882, May 17, 1994. This application Mar. 16, 1995, Ser. No. 405,331

Int. Cl.^{6} C08F *2/50;220/38;220/56*

U.S. Cl. 522—37 **9 Claims**

1. A photopolymerizable composition comprising a crosslinking agent, a UV sensitive photopolymerization initiator and a thioether acrylate having the structure:



I

A and A_1, each independently, represent H or branched or straight-chain C_1–C_{10} alkyl;

X and X_1, each independently, represent NH or O;

Y represents a branched or straight-chain C_1–C_{20} alkylene, alkenylene or alkynylene; C_6–C_{30} aromatic groups or heterocyclic having 5 to 30 atoms;

S is a sulfur atom; and

Z represents a branched or straight-chain C_1–C_{20} alkyl, alkenyl or alkynyl; C_6–C_{30} aromatic groups or heterocyclic having 5 to 30 atoms; or

Y, S and Z may be taken together to form a heterocylic group containing from 5 to 8 atoms.

5,532,287

RADIATION CURED DRUG RELEASE CONTROLLING MEMBRANE

Gary V. Savage, Bridgewater, and James M. Clevenger, Glen Gardner, both of N.J., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed May 4, 1994, Ser. No. 238,115

Int. Cl.^{6} C08F *2/46*

U.S. Cl. 522—50 **12 Claims**

1. A method of preparing a pharmaceutically acceptable hydrophilic crosslinked polymer for use as a carrier for biologically active agents which comprises

solubilizing a water-soluble polymer consisting of hydroxyethyl cellulose or hydroxypropyl methyl cellulose containing an effective amount of a photosensitive or light degradable catalyst, and

exposing the solution to an electromagnetic energy source.

5,532,288

PROCESS FOR THE PREPARATION OF A POLYSILANE CROSSLINKED BY IONIZING RADIATION AND PROCESS FOR THE PRODUCTION OF A COMPOSITE MATERIAL HAVING A POLYSILANE MATRIX

Daniel Beziers; Evelyne Chataignier, both of St Nedard En Jalles, and Patrick Noireaux, Le Mans, all of, France, assignors to Aerospatiale Societe Nationale Industrille, France

Continuation of Ser. No. 89,233, Jul. 8, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,611

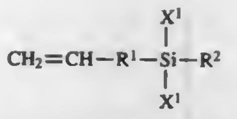
Claims priority, application France, Jul. 10, 1992, 92 08584

Int. Cl.^{6} C08K *3/04;* **C08G** *77/08;* **C08F** *2/48*

U.S. Cl. 522—71 **32 Claims**

6. Process for the production of a composite material incorporating reinforcing fibres embedded in an organic matrix, consisting of impregnating the fibres with a formulation crosslinkable by ionizing radiation containing at least one polysilane having at least one vinyl termination and subjecting the impregnated fibres to an ionizing radiation chosen from among X-rays and an electron bombardment, the polysilane of the formulation being obtained by performing the following stages:

(a) reacting in an inert anhydrous organic solvent a compound RoY^1 in the presence of a melted alkali metal with at least one first monomer having at least one vinyl function of formula (I):



$$CH_2{=}CH{-}R^1{-}\underset{X^1}{\overset{X^1}{Si}}{-}R^2$$

(I)

for forming at least one halogenated polysilane with a vinyl function, which is soluble in the liquid phase, X^1 and Y^1 being the same or different and representing a halogen atom, R^1 is a divalent group, representing a single covalent bond or a substituted or unsubstituted, saturated or unsaturated hydrocarbon radical, Ro representing a methyl group and R^2 representing a hydrogen atom or a substituted or unsubstituted, saturated or unsaturated, hydrocarbon radical characterized in that the substituents on substituted R^1 and R^2 are ether or thioether substituent;

(b) Separating the liquid phase from the solid phases;

(c) carrying out a nucleophilic substitution of the halogen atoms of the polysilane dissolved in a solution containing an organometallic compound; and

(d) extracting the substituted polysilane from the liquid phase.

5,532,289

CONTACT LENS HAVING IMPROVED DIMENSIONAL STABILITY

Patrick H. Benz, and Jose A. Ors, both of Sarasota, Fla., assignors to Benz Research and Development Corp., Sarasota, Fla.

Filed Apr. 14, 1995, Ser. No. 421,887

Int. Cl.^{6} G02C *7/04;* **C08L** *29/02*

U.S. Cl. 523—106 **33 Claims**

1. A soft contact lens having increased dimensional stability, consisting essentially of a copolymer of 2,3-dihydroxypropyl methacrylate and 2-hydroxyethyl methacrylate.

5,532,290

ANTIMICROBIAL POLYMERS AND COMPOSITIONS CONTAINING THEM

Ian M. Newington, High Wycombe; Kevin J. Parr, Harrow Weald, both of, Great Britain; Patricia I. Bowman, Upper Saddle River, and Karen A. McCue, Tenafly, both of N.J., assignors to Reckitt & Colman Inc., Montvale, N.J.

Filed Oct. 12, 1993, Ser. No. 134,713

Claims priority, application United Kingdom, Sep. 2, 1993, 9318170

Int. Cl.^{6} C08K *5/20;* **C08F** *16/00;18/22;* **C09D** *5/14*

U.S. Cl. 523—122 **11 Claims**

1. A polymer having antimicrobial properties containing a phenolic antimicrobial agent covalently bound through a quaternary nitrogen atom to one or more polymerised ethylenically unsaturated monomer units selected from the group consisting of ethylenically unsaturated carboxylic acids, ethylenically unsaturated carboxylic anhydrides, aminoalkyl esters of ethylenically unsaturated carboxylic acids, hydroxyalkyl esters of ethylenically unsaturated carboxylic acids, glycidyl esters of ethylenically unsaturated carboxylic acids, ethylenically unsaturated nitrogen containing heterocycles, and ethylenically unsaturated monomers comprising a haloalkyl group.

5,532,291

COATING COMPOSITION AND PROCESSES THEREFOR

Timothy J. Wright, Temperance, Mich.; Gary G. Hartman, Toledo, and Jeffrey A. Culver, Sylvania, both of Ohio, assignors to Betco Corporation, Toledo, Ohio

Filed May 16, 1995, Ser. No. 442,019

Int. Cl.^{6} C08K *3/18;3/22;5/52;5/06*

U.S. Cl. 523—122 **15 Claims**

1. A coating composition consisting essentially of:

Ingredients	Weight by Percent
Water	to 100
Acrylate Vinyl Copolymer Emulsion	30–50
Polyalkylene Wax Emulsion	5–10
Carboxylic Acid-Vinyl Resin Solution	3–6
Dialkylene Glycol Alkyl Ether	4–7
Tributoxy Ethyl Phosphate	1–2
Tributoxy Pentanediol Diisobutyrate	0–1
2,2,4-Trimethyl-1,3-Pentanediol Monoisobutyrate	0–1
Anti-Microbial Agent	0.1–1.0.

5,532,292

INTUMESCENT COMPOSITIONS

Robin Wainwright, Berkshire, and Kenneth A. Evans, Buckinghamshire, both of, Great Britain, assignors to Alcan International Limited, Montreal, Canada

PCT No. PCT/GB93/01511, § 371 Date Mar. 10, 1995, § 102(e) Date Mar. 10, 1995, PCT Pub. No. WO94/02545, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 16, 1993, Ser. No. 373,313

Claims priority, application United Kingdom, Jul. 17, 1992, 9215184

Int. Cl.^{6} C09K *21/14;21/00;* **C08K** *3/18;3/22*

U.S. Cl. 523—179 **15 Claims**

1. An intumescent composition including saline soluble inorganic silicate fibrous material containing CaO, MgO and no more than 4% by weight of Al_2O_3.

5,532,293

MICROCAPSULE-CONTAINING COHESIVE COATING

Robert A. Landis, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 7, 1994, Ser. No. 301,610

Int. Cl.^{6} C08K *9/10;9/12*

U.S. Cl. 523—210 **12 Claims**

1. An adhesive system comprising:

an activatable, non-tacky cohesive material dispersed in a non-adherent material, said nonadherent material reducing the coefficient of friction of said cohesive material and rendering said cohesive material non-coherent; and

a plurality of microcapsules dispersed in said nonadherent material and said cohesive material, said microcapsules encapsulating a solvent for said cohesive and being rupturable upon the application of pressure, wherein upon the application of pressure, the microcapsules rupture and release said solvent and said solvent dissolves said cohesive material such that said cohesive material becomes coherent.

5,532,294

THIXOTROPIC FLUOROSILICONE GEL COMPOSITION

Masayuki Ikeno, Maebashi, and Hiroyasu Hara, Annaka, both of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1994, Ser. No. 261,961

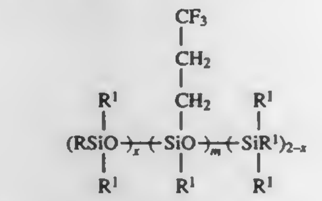
Claims priority, application Japan, Jun. 17, 1993, 5-171050

Int. Cl.^{6} C08K *9/06*

U.S. Cl. 523—212 **7 Claims**

1. A thixotropic fluorosilicone gel composition, comprising:

(A) an alkenyl group-containing organopolysiloxane having the following average formula (1):



$$(R\underset{R^1}{\overset{R^1}{Si}}O)_x(\underset{R^1}{\overset{CH_2CH_2CF_3}{Si}}O)_m(\underset{R^1}{\overset{R^1}{Si}}R^1)_{2-x} \qquad (1)$$

wherein

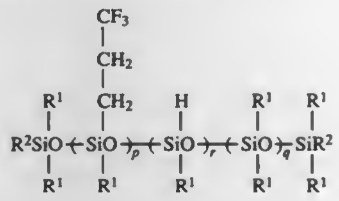
R is an alkenyl group,

(R^1)'s may be the same or different and are each an alkyl group having 1 to 8 carbon atoms, phenyl group or 3,3,3-trifluoropropyl group,

x is a number in the range of 0.3 to 2, and

m is an integer of not less than 1, and a viscosity of 100 to 10,000 cP at 25° C., which has been prepared by subjecting a-cyclic trimer of methyl-3,3,3-trifluoropropylsiloxane to ring-opening polymerization in the presence of a pentacoordinate silicon catalyst at a temperature of 50° C. or below;

(B) an organohydrogenpolysiloxane having at least least 3 silicon-bonded hydrogen atoms in its molecule which has the following general formula (2):



$$R^2\underset{R^1}{\overset{R^1}{Si}}O(\underset{R^1}{\overset{CH_2CH_2CF_3}{Si}}O)_p(\underset{R^1}{\overset{H}{Si}}O)_r(\underset{R^1}{\overset{R^1}{Si}}O)_q\underset{R^1}{\overset{R^1}{Si}}R^2 \qquad (2)$$

wherein

(R^1)'s are each the same as above,

(R^2)'s may be the same or different and are each a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, phenyl group or 3,3,3-trifluoropropyl group,

p and q are each an integer of not less than 0, and

r is an integer of not less than 1, and a viscosity of 5 to 100 cP at 25° C.;

(C) a platinum catalyst; and

(D) a finely powdered silica having a specific surface area of not less than 50 m^2/g which has been rendered hydrophobic by treatment with a silazane, chlorosilane, alkoxysilane or polysiloxane having only methyl groups as substituent groups.

5,532,295

THERMOPLASTIC SYNTACTIC FOAMS AND THEIR PREPARATION

Edward S. Harrison, Encinitas; Edward J. Ruskowski, Carlsbad, and James Melquist, San Diego, all of Calif., assignors to McDonnell Douglas Technologies Inc., San Diego, Calif.

Filed Nov. 1, 1993, Ser. No. 146,517

Int. Cl.^{6} C08J *9/32*

U.S. Cl. 523—218 **9 Claims**

1. A method for preparing a structural, low-density article, comprising the steps of:

furnishing a microballoon first component;

furnishing a second component of a lower molecular weight oligomeric precursor which is polymerizable to a higher molecular weight polyetherimide polymer, the oligomeric precursor having an initial viscosity at a processing temperature of about 330° C. sufficient to flow and to wet the microballoons prior to polymerization;

mixing the first component and the second component together; and

heating the mixture to the processing temperature of about 330° C. for a time sufficient for the oligomeric precursor to flow and to wet the microballoons, and thereafter to polymerize.

5,532,296

BISMALEIMIDE RESIN SYSTEMS TOUGHENED BY ADDITION OF PREFORMED FUNCTIONALIZED LOW T_G ELASTOMER PARTICLES

Hans G. Recker, Irvine, Calif.; Helmut Tesch, Roedersheim/Gronau, Germany; Thomas Weber, Ludwigshafen, Germany; Volker Altstaedt, Gernsheim, Germany, and Jack D. Boyd, Westminster, Calif., assignors to Cytec Technology Corp., Wilmington, Del.

Continuation of Ser. No. 756,001, Sep. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 738,006, Jul. 30, 1991, abandoned. This application Sep. 24, 1993, Ser. No. 126,012

Int. Cl.^{6} C08G *73/10;* **C08J** *5/24*

U.S. Cl. 523—400 **20 Claims**

1. A toughened thermosetting bismaleimide resin system, comprising:

A. A base resin system comprising
  (i) one or more bismaleimide functional monomers;
  (ii) a comonomer which is an alkenylphenol; and
  (iii) optionally, a dissolved thermoplastic having a T_g greater than 150° C.;

B. from about 1 percent to about 10 percent by weight relative to the total system weight of a functionalized, lightly crosslinked elastomer having a T_g of less than 10° C., and a particle size of from about 2 μm to about 70 μm; and

C. optionally, particulate engineering thermoplastics in an amount of from 10 to 30 weight percent based on the total resin system weight.

5,532,297

DIVINYL BENZENE MODIFIED, AQUEOUS DISPERSED, ACRYLIC GRAFT COATINGS

James T. K. Woo, Medina; Gary C. Pompignano, North Royalton; Donston E. Awarski, Medina, and Kevan A. Packard, North Olmsted, all of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed May 26, 1995, Ser. No. 451,147

Int. Cl.^{6} C08K *3/20;* **C08L** *63/02*

U.S. Cl. 523—408 **8 Claims**

1. A process for producing a protective coating composition containing an aqueous dispersed microgel polymeric binder for coating interior substrates of beer and beverage containers, the process for producing the polymeric binder comprising:

copolymerizing ethylenically unsaturated monomer in the presence of epoxy resin having a number average molecular weight between 350 and 20,000 in a non-aqueous polymerization process to produce an epoxy-acrylic graft copolymer;

dispersing the epoxy-acrylic graft copolymer into water to produce an aqueous dispersed epoxy-acrylic copolymer;

emulsion copolymerizing monoethylenically unsaturated monomer and divinyl benzene in the presence of the aqueous dispersed epoxy-acrylic graft copolymer to produce a stable, aqueous dispersed, film forming polymeric binder of crosslinked microgel polymer particles containing by weight between 10% and 88% epoxy resin, between 10% and 70% non-aqueous copolymerized ethylenic monomer, between 1% and 79% emulsion copolymerized monoethylenic benzene and between a 0.1% and 10% emulsion polymerized divinyl benzene.

5,532,298

DEGRADABLE AGRICULTURAL MAT

Stephen H. Monroe, Memphis, Tenn.; James A. Goettmann, and Gerald A. Funk, both of North East, Pa., assignors to International Paper, Tuxedo Park, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,487

Int. Cl.⁶ C08L *1/00;* **B32B** *5/10*

U.S. Cl. 524—13 **8 Claims**

1. A degradable agricultural mat comprised of an aqueous mixture of 20 to 80 percent polymer fibers, 80 to 20 percent cellulose pulp and a water holdout material selected from the group consisting of an alkene ketene dimer, an epichlorohydrin and an alkenyl succinic anhydride.

5,532,299

PROCESS FOR IMPROVING THE MECHANICAL AND SEALING PROPERTIES OF ELASTOMER GASKETS, JOINTS AND SEALS AND THE SEAL OBTAINED WITH THIS PROCESS

Jean-Paul Dubois, Coutras, France, assignor to KSB S.A., Courbevoie, France

Division of Ser. No. 197,586, Feb. 17, 1994, Pat. No. 5,489,631, which is a continuation-in-part of Ser. No. 49,982, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 777,330, Dec. 2, 1991, abandoned. This application May 16, 1995, Ser. No. 441,806

Claims priority, application France, Apr. 6, 1990, 90 04419

Int. Cl.⁶ C08L *1/02;23/02;* **C08K** *3/47;3/04*

U.S. Cl. 524—13 **1 Claim**

1. A sealing gasket of elastomer for providing dynamic sealing in a butterfly valve provided with a closure means comprising:

a plurality of fibers embedded in the elastomer, said fibers having an orientation that is parallel to a surface against which a ridge of the closure means comes into contact and perpendicular to the closure means when the butterfly valve is shut.

5,532,300

WATER-BORNE, WATER REDISPERSIBLE, LAMINATING ADHESIVES FOR NONWOVEN APPLICATIONS

Timothy C. Koubek, Clinton; Paul P. Puletti, Pittstown, and Joseph Wieczorek, Jr., Flemington, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Aug. 12, 1994, Ser. No. 289,601

Int. Cl.⁶ C09J *11/06;103/02*

U.S. Cl. 524—47 **13 Claims**

1. A water-borne, water redispersible laminating adhesive comprising,

an aqueous polymer dispersion prepared by radical-initiated emulsion polymerization of a mixture of unsaturated monomers in the presence of starch degradation products having a weight average molecular weight range of from 2500 to 25,000 and which are obtainable by hydrolysis in an aqueous phase; and

2 to 30 weight percent of a plasticizer, wherein the adhesive exhibits water redispersibility of greater than about 90 percent at a water-temperature of greater than about 15° C.

5,532,301

PROTECTIVELY COATED POSITION SENSOR, THE COATING, AND PROCESS FOR COATING

Kurtis C. Kelley, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 12, 1994, Ser. No. 353,790

Int. Cl.⁶ C08K *5/15*

U.S. Cl. 524—112 **2 Claims**

1. A coating composition, comprising:

(A) a reacted resin mixture;

said resin mixture consisting of:

(a) a reacted and solidified gel of diglycidyl ether of bisphenol A; and

(b) a reacted and solidified gel of polysebacic polyanhydride; said diglycidyl ether and said polyanhydride being present in a weight ratio in the range of about 100:65 to about 100:90, diglycidyl ether:polyanhydride;

(B) polytetrafluoroethylene powder; said powder and said reacted resin mixture being present in a weight ratio in the range of about 5:95 to about 20:80, powder:resin mixture respectively; and

(C) acetone in an amount sufficient to dissolve said resin mixture.

5,532,302

FLAME RETARDANT COMPOSITION AND METHOD FOR USE IN SYNTHETIC THERMOPLASTIC RESINS

Tetsuo Nakanishi; Mitsuo Asai, both of Gunma-ken; Hiroyuki Ohata, and Keiichi Uchida, both of Fukui-ken, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, and Nissin Chemical Industry Co., Ltd., Fukui-ken, both of, Japan

Filed Feb. 28, 1994, Ser. No. 202,630

Claims priority, application Japan, Mar. 1, 1993, 5-039685

Int. Cl.⁶ C08J *5/10;* **C08K** *5/52;* **C08L** *25/02*

U.S. Cl. 524—143 **6 Claims**

1. A method for imparting flame retardancy to a synthetic resin to give a flame-retardant resin composition, which comprises uniformly blending:

(a) 100 parts by weight of the synthetic resin; with

(b) from 1 to 50 parts by weight of a flame retardant agent; and

(c) from 0.5 to 20 parts by weight of an organosilicone group-containing acrylic resin, which is a graft copolymer of (A) an organopolysiloxane having an average degree of polymerization in the range from 500–8,000 represented by the average unit formula

$$R^1_aR^2_bSiO_{(4-a-b)/2},$$

in which R^1 is a monovalent organic group having a radical-reactive group or a mercpato group, R^2 is a hydrogen atom or a monovalent hydrocarbon group having 1 to 20 carbon atoms free from a radical-reactive group or a mercpato group, the subscript a is a positive number in the range from 0.001 to 1.0 and the subscript b is a positive number with the proviso that a+b is in the range from 1.95 to 3.00; and (B)an ester of (meth)acrylic acid represented by the general formula

$$CH_2{=}CR^3{-}CO{-}O{-}R^4,$$

in which R^3 is a hydrogen atom or a methyl group and R^4 is an alkyl group or alkoxy-substituted alkyl group having 1 to 18 carbon atoms, in a weight ratio of (A):(B) in the range from 5:95 to 95:5.

5,532,303

AMMONIUM CHLORIDE AS A PVC CO-STABILIZER

George F. Beekman, West Chester; Gary M. Conroy, Cincinnati, both of Ohio; Jeffrey R. Hyde, Savannah, Ga., and Gene K. Norris, Cincinnati, Ohio, assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 254,460, Jun. 6, 1994, Pat. No. 5,444,111. This application Apr. 27, 1995, Ser. No. 429,752

Int. Cl.⁶ C08K *5/58*

U.S. Cl. 524—180 **8 Claims**

1. A method for the disposal of an ammonium halide having the formula:

$$R_4N^+X^-$$

wherein R is hydrogen, alkyl, aryl, alkaryl, aralkyl, or hydroxyalkyl; and X is a chloride or bromide ion formed as a by-product of the preparation of an organotin mercaptide, said method comprising mixing the by-product ammonium halide and a heat-stabilizing amount of the mercaptide with a halogen-containing polymer, and forming the mixture into an article of manufacture.

5,532,304

RESIN COMPOSITION FOR COATING

Nobuyuki Miyazaki; Shun-ichi Kodama; Takashi Takayanagi, and Bunji Uchino, all of Kawasaki, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

PCT No. PCT/JP94/01155, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO95/02645, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 14, 1994, Ser. No. 397,054

Claims priority, application Japan, Jul. 14, 1993, 5-197017; Aug. 25, 1993, 5-232516; Mar. 30, 1994, 6-061412; Apr. 18, 1994, 6-078732; Apr. 26, 1994, 6-088939; Apr. 26, 1994, 6-088940; Apr. 28, 1994, 6-092206

Int. Cl.⁶ C08K *5/54*

U.S. Cl. 524—261 **9 Claims**

1. A resin composition for coating, comprising a functional group-containing fluoropolymer (a), a curing agent (b) capable of crosslinking the functional group-containing fluoropolymer (a), and an oligomer (c) of a tetrafunctional hydrolyzable silane compound, wherein the curing agent (b) is of a type which prevents the oligomer (c) from reacting with the fluoropolymer (a) and wherein the functional group in fluoropolymer (a) is selected from the group consisting of hydroxyl, amino, amide, carboxyl, epoxy, halogen, and a double bond.

5,532,305

CONTROLLED RELEASE PREPARATION FOR BIOACTIVE SUBSTANCES

Fumiaki Matsuzaki; Toshio Yanaki, both of Yokohama, and Michihiro Yamaguchi, Sagamihara, all of, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

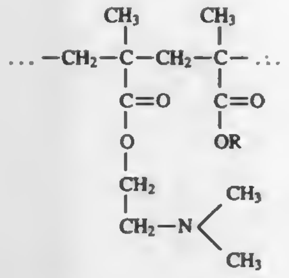
Filed Jul. 26, 1994, Ser. No. 280,736

Claims priority, application Japan, Jul. 26, 1993, 5-224920

Int. Cl.⁶ A61K *47/00*

U.S. Cl. 525—54.2 **18 Claims**

1. A composition comprising a poly-ion complex of hyaluronic acid and a cationic polyacrylic acid copolymer having the formula:



wherein R=CH_3 or C_4H_9.

5,532,306

WATER-SENSITIVE RUBBER-BASED HOT MELT ADHESIVES

Thomas F. Kauffman, Easton, Pa.; Matthew L. Sharak, Franklin Park, and Robert C. Schmidt, Jr., Green Meadows, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Aug. 31, 1994, Ser. No. 298,736

Int. Cl.⁶ C08J *5/10;* **C08L** *53/00;* **C08K** *5/06*

U.S. Cl. 524—274 **8 Claims**

1. A water sensitive hot melt adhesive composition consisting essentially of 5 to 80% by weight of a A-B-A linear or radial rubbery block; 10 to 50% by weight of a water soluble or water dispersible plasticizer containing a hydrophilic portion consisting of a polyalkylene oxide and a hydrophobic portion consisting of a hydrocarbon radical selected from the group consisting of phenyl, phenyl alkyl, phenyl dialkyl or a linear or branched aliphatic radical and having an HLB value within the range of 8 and 18; 0 to 85% by weight of a compatible tackifying resin; 0 to 30% by weight of a compatible thermoplastic polymer selected from the group consisting of ethylene vinyl acetate copolymers containing 12 to 50% vinyl acetate, ethylene acrylic acid, ethylene methyl acrylate, ethylene n-butyl acrylate, caprolactone polymers and poly(hydroxy-butyrate/hydroxyvalerate); 0 to 35% by weight polar wax; and 0 to 3% by weight stabilizer.

5,532,307

METHOD FOR FORMING AN AQUEOUS DISPERSION OF CERAMIC MATERIAL

Leonard E. Bogan, Jr., Hatfield, Pa., assignor to Rohm and Haas Company, Independence Mall, Pa.

Filed Apr. 13, 1995, Ser. No. 421,100

Int. Cl.⁶ C08K *3/10*

U.S. Cl. 524—407 **6 Claims**

1. A method for dispersing one or more ceramic materials in an aqueous medium, comprising utilizing a polymeric dispersant consisting of, as polymerized units, one or more hydroxy functional monomers and one or more acid-containing monomers, wherein the one or more ceramic materials is selected from the group consisting of: barium titanate, silicon nitride, silica, steatite, chromic oxide, zirconia, and mixtures thereof with the proviso that said polymeric dispersant is not a graft polymer.

5,532,308

METHOD FOR IMPROVING RETENTION AND DRAINAGE CHARACTERISTICS IN ALKALINE PAPERMAKING

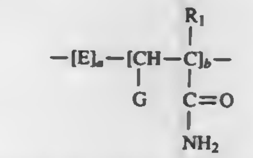
Michael A. Schuster; John C. Harrington, IV, both of Jacksonville, Fla.; Wen P. Liao, Warminster, and Fu Chen, Newtown, both of Pa., assignors to Betz PaperChem, Inc., Jacksonville, Fla.

Division of Ser. No. 217,037, Mar. 24, 1994, Pat. No. 5,415,740, which is a continuation-in-part of Ser. No. 773, Jan. 5, 1993, Pat. No. 5,298,566, which is a division of Ser. No. 691,206, Apr. 25, 1991, Pat. No. 5,211,854. This application Jan. 17, 1995, Ser. No. 373,706

Int. Cl.⁶ C08L *51/06;* **D21H** *17/37*

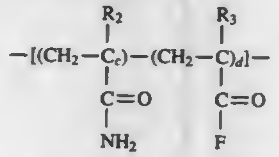
U.S. Cl. 524—447 **10 Claims**

1. A composition comprising a water soluble graft copolymer having the structure



$$-[E]_a-[\underset{G}{CH}-\overset{R_1}{\underset{\underset{NH_2}{C=O}}{C}}]_b-$$

wherein E is the repeat unit obtained after polymerization of an α, β ethylenically unsaturated compound, the molar percentage of a:b is from about 95:5 to 5:95 with the proviso that the sum of a and b equals 100%; G comprises the structure:



$$-[(CH_2-\overset{R_2}{\underset{\underset{NH_2}{C=O}}{C_c}})-(CH_2-\overset{R_3}{\underset{\underset{F}{C=O}}{C}})_d]-$$

wherein R_1, R_2 and R_3 are the same or different and are hydrogen or a lower alkyl group having C_1 to C_3, F is the salt of an ammonium cation, d is a cationic monomer and the molar percentage c:d is from 95:5 to 5:95, with the proviso that the sum of c and d equals 100% and bentonite clay.

5,532,309

RESIN COMPOSITION FOR AUTOMOBILE BUMPER

Osamu Fukui, Kamakura; Kouhei Ueno, Tokyo; Yoshifumi Nakano, Kisiwada; Yukimasa Hamada, Sakai; Takeyoshi Nishio, Okazaki; Takao Nomura, and Nobuya Kawamura, both of Toyota, all of, Japan, assignors to Ube Industries, Ltd., Ube, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 858,139, Mar. 27, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,365

Claims priority, application Japan, Mar. 28, 1991, 3-089854

Int. Cl.⁶ C08K *3/34;* **C08L** *23/00;53/02*

U.S. Cl. 524—451 **7 Claims**

1. A resin composition for an automobile bumper comprising components (A), (B) and (C) described below:

(A) 45 to 74% by weight of a crystalline ethylene-propylene block copolymer having
  (a) a flexural modulus of 15,000 kg/cm² or more,
  (b) an ethylene content of 5 to 20% by weight,
  (c) an intrinsic viscosity (decalin, 135° C.) of a portion soluble in p-xylene at room temperature of 3 or more,
  (d) a melt flow index (MI) of 21 to 70 g/10 min., and
  (e) a content of a portion insoluble in boiling n-heptane of 97% by weight or more;
(B) 21 to 35% by weight of elastomer consisting essentially of:
  (i) component (I);
  (ii) components (I) and (II), having a weight ratio of (I) to {(I)+(II)} of from 0.5 to 1.0;
  (iii) components (I) and (III), having a weight ratio of (I) to {(I)+(III)} of from 0.5 to 1.0; or
  (iv) components (I), (II) and (III), having a weight ratio of (I) to {(I)+(II)+(III)} of from 0.5 to 1.0,
  (a) said component (I) being an amorphous ethylene-butene copolymer having a butene content of 10 to 25% by weight and a Mooney viscosity value ($ML_{1+}4$, 100° C.) of 5 to 20,
  (b) said component (II) being an amorphous ethylene-propylene copolymer having an ethylene content of 70 to 90% by weight and a Mooney viscosity value (ML_{1+4}, 100° C.) of 5 to 40, and
  (c) said component (III) being a hydrogenated block copolymer consisting of 10 to 40% by weight of an aromatic vinyl polymer block X and 60 to 90% by weight of a conjugate diene polymer block Y, having a structure of said block components being X–Y or X–(X–Y)$_n$, wherein n is 1 or 2, 90 mol% or more of said block Y being hydrogenated and the melt flow index (MI) of the hydrogenated block copolymer being 5 g/10 min. (230° C., 2.16 kg) or more, and;
(C) 5 to 20% by weight of talc having a combustion loss of 7% by weight or less, containing no particles having a diameter of 20 μm or more and having an average particle diameter D_{50} of 1.0 to 3.0 μm; wherein said resin composition has a melt flow index (MI) of 15 g/10 min. (230° C.; 2.16 kg) or more and a surface hardness of 55 (Rockwell, R scale) or more.

5,532,310

SURFACTANTS TO CREATE FLUOROPOLYMER DISPERSIONS IN FLUORINATED LIQUIDS

Mark W. Grenfell, Woodbury; Richard M. Flynn, Mahtomedi, and Patricia M. Savu, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

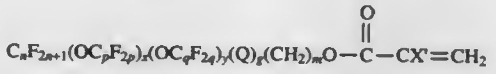
Filed Apr. 28, 1995, Ser. No. 430,556

Int. Cl.⁶ C08K *5/02;5/16;* **C08L** *27/18;27/12*

U.S. Cl. 524—463 **12 Claims**

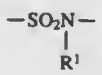
1. A homogeneous and non-ozone depleting dispersion comprising a lubricious fluoropolymer, an inert perfluorinated liquid, a polar solvent, and an effective amount of a surface active agent selected from the group consisting of:

a. perfluoroaliphatic amidoalkanols;
b. polymerized products formed from the reaction of a mixture comprising a hydrophilic monomer and a monomer of the general formula:



$$C_nF_{2n+1}(OC_pF_{2p})_x(OC_qF_{2q})_y(Q)_g(CH_2)_mO-\overset{O}{\overset{\|}{C}}-CX'=CH_2$$

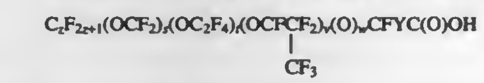
wherein p and q are integers between 1 and 4 inclusive, x and y are integers between 0 and 4 inclusive, m is 1 or 2, n is an integer between 3 and 10 inclusive, X' is either a methyl group or a single hydrogen atom, g is 0 or 1, and Q is a sulfonamido constituent group according to the formula:



$$-SO_2\underset{R^1}{N}-$$

wherein R^1 is a hydrogen or a lower alkyl group having from 1 to 6 carbon atoms and wherein the hydrophilic monomer is present in an amount constituting inclusively between five and twenty-five weight percent of the reactant mixture when the polar solvent employed is a polar organic solvent and wherein the hydrophilic monomer is present in an amount constituting inclusively between one and twenty-five weight percent of the reactant mixture when the polar solvent employed is water; and

c. Perfluorinated ether acids according to the general formula:



$$C_zF_{2z+1}(OCF_2)_s(OC_2F_4)_t(O\underset{CF_3}{CF}CF_2)_v(O)_wCFYC(O)OH$$

wherein z is between 1 and 10 inclusive, s is between 0 to 4, t is between 0 to 4, v between 0 to 5, w is 0 or 1, and Y is either F or CF_3.

5,532,311

PROCESS FOR MODIFYING SURFACES

Larry M. Sirvio, Cottage Grove, and Barbara C. Swenson, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1995, Ser. No. 381,754

Int. Cl.⁶ C08G *63/48;63/91*

U.S. Cl. 525—54.2 **7 Claims**

1. A process for modifying a surface of an article comprising treating said surface with (a) a first water-soluble polyalkylene amine, (b) a water-soluble polymeric anionic compound, and (c) a second water-soluble polyalkylene amine in the absence of crosslinking agents to create a modified surface.

5,532,312

TIRE SIDEWALL COMPOSITION

Leonard J. Gursky, East Brunswick; James V. Fusco, Red Bank, and Douglas D. Flowers, Woodbridge, all of N.J., assignors to Exxon Chemical Patents, Inc., Wilmington, Del.

Continuation of Ser. No. 206,915, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 913,262, Jul. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 638,713, Jan. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 567,965, Aug. 15, 1990, abandoned. This application May 12, 1995, Ser. No. 439,639

Int. Cl.⁶ B60C *13/00;* **C08L** *7/00;25/16*

U.S. Cl. 525—232 **22 Claims**

1. A sidewall composition for a vulcanized tire consisting essentially of from about 10 to about 90 weight parts per hundred parts of total rubber of at least one unsaturated rubber selected from the group consisting of natural rubber, polyisoprene, styrene-butadiene rubber, polybutadiene rubber, and mixtures thereof, and from about 10 to about 90 weight parts per hundred parts of total rubber of a halogen-containing random copolymer of a C_4 to C_7 isomonoolefin and a para-alkylstyrene, said halogen being selected from the group consisting of chlorine, bromine and mixtures thereof, and crosslinking agents.

5,532,313

HEAT CURABLE COATING COMPOSITIONS AND THEIR USE AS TOP COATS

Eberhard König, Leverkusen; Theodor Engbert, and Josef Pedain, both of Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1995, Ser. No. 436,938

Claims priority, application Germany, May 18, 1994, 44 17 355.5

Int. Cl.⁶ C08F *8/30;283/04;* **C08L** *75/00;* **C08G** *18/81*

U.S. Cl. 524—590 **1 Claim**

1. A heat curable coating composition containing a binder consisting essentially of

A) a prepolymer which has butanone oxime-blocked isocyanate groups and an average molecular weight, calculated from the NCO content and NCO functionality, of 1000 to 10,000, and is prepared from
  A1) a (cyclo)aliphatic polyisocyanate and
  A2) an organic polyhydroxyl component in which
    A2.1) 50 to 90% of the hydroxyl equivalents of component A2) are from a polyester polyol,
    A2.2) 10 to 50% of the hydroxyl equivalents of component A2) are from a polyacrylate polyol and/or an alkoxylation product of bisphenol A that contains 2 to 4 alkylene oxide units per molecule and
    A2.3) 0 to 30 of the hydroxyl equivalents of component A2) are from an organic polyhydroxyl compound other than those set forth in A2.1) and A2.2), and
B) a cycloaliphatic polyamine having at least two primary amino groups,

wherein components A) and B) are present in an equivalent ratio of blocked isocyanate groups to amino groups of 1:0.8 to 1:1.2.

5,532,314

AQUEOUS SILANE-PHENOLIC ADHESIVE COMPOSITIONS, THEIR PREPARATION AND USE

Frederick H. Sexsmith, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed May 3, 1995, Ser. No. 434,015

Int. Cl.⁶ C08L *69/00*

U.S. Cl. 524—611 **16 Claims**

1. The method of preparing an aqueous adhesive composition in the form of a colloidal oil-in-water type emulsion which comprises mixing a water-immiscible organo-functional silane with a stable dispersion of a substantially water-insoluble phenolic resole in water.

5,532,315

THERMOFORMABLE, CHEMICAL RESISTANT POLYMER BLENDS

Jeffrey E. Bonekamp, Midland, Mich.; Steven B. Swartzmiller, Newark, Ohio; Robert J. Donald, Midland, Mich., and Andre J. Uzee, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 275,568, Jul. 15, 1994, which is a continuation-in-part of Ser. No. 971,921, Dec. 18, 1992, Pat. No. 5,334,657, which is a continuation-in-part of Ser. No. 859,207, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 811,350, Dec. 20, 1991, abandoned. This application Apr. 26, 1995, Ser. No. 429,398

Int. Cl.⁶ C08L *23/06;23/14;25/06;53/02*

U.S. Cl. 525—71 **18 Claims**

1. A process for thermoformed article which comprises:

A) contacting a virgin polymer blend with a recycled polymer blend to form a homogeneous blend wherein the polymer blends independently comprise (1) from 9 to 90 parts by weight of (a) a monovinylidene aromatic polymer having a molecular weight (M_w) from 50,000 to 400,000 or (b) an impact modified monovinylidene aromatic polymer comprising from 1 to 25 weight percent of a rubber and 75 to 99 weight. percent of a monovinylidene aromatic polymer matrix having a weight average molecular weight (M_w) from 50,000 to 400,000, said weight percents being based on the total weight of said impact modified, monovinylidene aromatic polymer; (2) from 9 to 90 parts by weight of an olefin polymer, selected from the group consisting of homopolymers of ethylene and copolymers of ethylene with one or more C_{4-8} α-olefins; and (3) from 1 to 25 parts by weight of a compatibilizing polymer comprising a styrene-isoprene-styrene triblock copolymer having a weight average molecular weight of from about 50,000 to about 150,000, wherein the styrene contained in the styrene blocks is from about 25 to 50 weight percent of the total polymer; and the sum of A), B) and C) is 100 parts;
B) forming an article from the combined composition; and
C) recycling scrap material generated during the step of forming an article or subsequent processing steps;

wherein the recycled composition contains polymer which has been recycled at least five times; and the melt flow rate of the combined composition is within 2.5 grams per 10 minutes, as determined pursuant to ASTM D1238 at 200° C. under a load of 5 kg, of the virgin polymer blend.

5,532,316
METHOD FOR PRODUCING A MOLDED HEAT-RESISTANT RESIN PRODUCT

Tetsuya Shinmura, and Kunihiko Konishi, both of Ichihara, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1995, Ser. No. 433,018

Claims priority, application Japan, May 24, 1994, 6-110012

Int. Cl.^{6} C08L *51/04*

U.S. Cl. 525—71 **4 Claims**

1. A method for producing a molded beat-resistant resin product, which comprises injection-molding without prior kneading of a thermoplastic resin (A) and a rubber-reinforced heat-resistant resin (B) wherein the highest glass transition temperature component of said rubber-reinforced heat-resistant resin (B) has a glass transition temperature within 60° C. above the glass transition temperature of the highest glass transition temperature component of said thermoplastic resin (A), and wherein said thermoplastic resin (A) is a resin comprising (1) a graft copolymer obtained by graft copolymerizing to a rubber polymer, a monomer mixture (i) comprising an aromatic vinyl monomer, a vinyl cyanide monomer and optionally other copolymerizable vinyl monomers, and (2) a copolymer made from said monomer mixture (i); and the rubber-reinforced heat-resistant resin (B) is a preformed resin comprising (1) a copolymer composed of aromatic vinyl units, unsaturated dicarboxylic acid imide derivative units and/or other copolymerizable vinyl monomer units, (2) a graft copolymer obtained by graft copolymerizing to a rubber polymer, a monomer mixture comprising an aromatic vinyl monomer, a vinyl cyanide monomer and optionally other copolymerizable vinyl monomers, and optionally (3) a vinyl copolymer made of an aromatic vinyl monomer, a vinyl cyanide monomer and optionally other copolymerizable vinyl monomers.

5,532,317
PROCESS FOR PRODUCING A MALEIMIDE-MODIFIED HEAT-RESISTANT ABS RESIN

Tetsuya Shinmura, and Kunihiko Konishi, both of Ichihara, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1995, Ser. No. 433,020

Claims priority, application Japan, May 27, 1994, 6-115206

Int. Cl.^{6} C08L *51/04*

U.S. Cl. 525—73 **14 Claims**

1. A process for producing a maleimide-modified heat resistant ABS resin comprising a maleimide copolymer, an ABS graft copolymer component consisting of one or more ABS graft copolymers, and an AS copolymer component consisting of one or more AS copolymers, which comprises kneading the maleimide copolymer, part of the ABS graft copolymer component and none or part of the AS copolymer component to obtain a heat-resistant master batch resin, and further (2*a*) kneading the remaining ABS graft copolymer component and all or the remaining AS copolymer component to the heat-resistant master batch resin or (2*b*) kneading a resin composed of the remaining ABS graft copolymer component and all or the remaining AS copolymer component, to the heat-resistant master batch resin.

5,532,318
IMPACT MODIFIER FOR HIGH NITRILE RESINS AND IMPACT MODIFIED NITRILE RESIN COMPOSITIONS

Seldon L. Dotson, Parkersburg, W. Va., assignor to General Electric Company, Pittsfield, Mass.

Filed Sep. 26, 1994, Ser. No. 312,376

Int. Cl.^{6} C08L *51/04*

U.S. Cl. 525—83 **2 Claims**

1. A high nitrile resin composition having a impact strength greater than 6.0 ft. lb. per inch and consisting essentially of:

(a) a high nitrile resin comprising 55 to 95 percent by weight of vinyl cyanide monomer based on the total weight of the high nitrile resin and 5 to 45 percent by weight of a monomer selected from the group consisting of alkylmethacrylates, vinyl aromatic monomers and mixtures thereof based on the total weight of the high nitrile resin, said high nitrile resin formulation being a substantially brittle formulation; and

(b) a high nitrile graft copolymer for enhancing the impact resistance of said brittle formulation and comprising 25 to 75 percent by weight of a rubbery substrate based on the total weight of the graft copolymer, and 25 to 75 percent by weight of a polymeric graft portion based on the total weight of the graft copolymer, said rubbery substrate comprising 60 to 85 percent by weight of a diene monomer, 10 to 30 percent by weight of a vinyl cyanide monomer, and 4 to 6 percent by weight of an alkylmethacrylate monomer, based on the total weight of the substrate, said alkylmethacrylate forming said high nitrile graft portion in a sufficient amount for imparting enhanced notched Izod impact strength of greater than 6.0 ftlb per inch, said polymeric graft portion comprising 53 to 70 percent by weight of a vinyl cyanide monomer based on the total weight of the polymeric graft portion, and said polymeric graft portion containing 30 to 47 percent by weight of a vinyl aromatic monomer based on the total weight of the polymeric graft portion, said graft copolymer being present in said composition at a level of from 20 to 35 weight percent and said high nitrile resin being present in said composition at a level of from 65 to 80 weight percent based on the total weight of the composition.

5,532,319
BLOCK COPOLYMER COMPOSITION AND PRESSURE SENSITIVE ADHESIVE COMPOSITION

Itsuo Asahara, and Minoru Takematsu, both of Kanagawa-ken, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 395,006

Claims priority, application Japan, Feb. 28, 1994, 6-055310; Feb. 28, 1994, 6-055312

Int. Cl.^{6} C08F *297/04*

U.S. Cl. 525—89 **10 Claims**

1. A block copolymer composition comprising (1) 20–90 wt. % of a block copolymer represented by the formula (a):

$$(S—B—I)_n—X \qquad (a)$$

and (2) 80–10 wt. % of a block copolymer represented by the formula (c):

$$S—B—I \qquad (c)$$

wherein in all the above formulae, S is a polymer block of an aromatic vinyl compound, B is a polymer block of butadiene, I is a polymer block of isoprene, X is a residue of a bi-, tri- or tetrafunctional coupling agent, and n is an integer of 2–4.

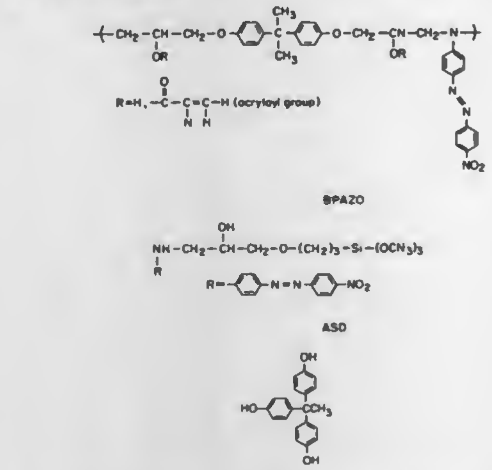
5,532,320
SECOND ORDER NONLINEAR OPTICAL INTERPENETRATING POLYMER NETWORKS

Sukant K. Tripathy, Acton, Mass.; Ru-Jong Jeng, Hsinchu, Taiwan; Jayant Kumar, Lowell, Mass.; Sutiyao Marturunkakul, and Jeng-I Chen, both of Tyngsboro, Mass., assignors to University of Massachusetts Lowell, Lowell, Mass.

Continuation of Ser. No. 159,679, Nov. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 881,609, May 12, 1992, Pat. No. 5,290,824, which is a division of Ser. No. 573,253, Aug. 24, 1990, Pat. No. 5,112,881. This application Dec. 21, 1994, Ser. No. 361,278

Int. Cl.^{6} C08L *63/00;83/08;* **C08F** *20/34*

U.S. Cl. 525—100 **25 Claims**



1. An interpenetrating polymer network which can exhibit nonlinear optical properties, comprising:

a) a first polymer; and

b) a second polymer interpenetrating said first polymer, wherein at least one of said polymers includes a nonlinear optical component.

5,532,321
COPOLYMERS AND BLENDS WHICH ARE SELF-CURABLE UNDER THE ACTION OF ATMOSPHERIC HUMIDITY

Juergen Barwich, Neustadt; Heinz Plaumann, Limburgerhof, and Eckehardt Wistuba, Bad Durkheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed May 6, 1994, Ser. No. 238,901

Claims priority, application Germany, May 12, 1993, 43 15 880.3

Int. Cl.^{6} C08F *220/12;222/06*

U.S. Cl. 525—103 **8 Claims**

1. An essentially isocyanate-free, ketimine-free and aldimine-free, one-component sealing, adhesive or coating material which is self-curable under atmospheric humidity, comprising a copolymer A formed by copolymerizing a monomer mixture, comprising:

(a) 50–99.8% by weight of a C_{1-16}-alkyl (meth)acrylate or a vinyl ester of a C_{1-20} carboxylic acid;

(b) 0.1–20% by weight of an unsaturated carboxylic anhydride;

(c) 0.1–10% by weight of a Si-containing compound capable of undergoing hydrolysis; and

(d) 0–40% by weight of a further, copolymerizable unsaturated compound, or

comprising a mixture of copolymers comprising:

5–95% by weight, based on the mixture, of a copolymer B formed by copolymerizing a monomer mixture, comprising:

(a) 50–99.9% by weight of a C_{1-16}-alkyl (meth)acrylate or a vinyl ester of a C_{1-20} carboxylic acid;

(b) 0–20% by weight of an unsaturated carboxylic anhydride;

(c) 0.1–10% by weight of a Si-containing compound capable of undergoing hydrolysis; and

(d) 0–40% by weight of a further, copolymerizable unsaturated compound, and

5–95% by weight, based on the mixture, of a copolymer C formed by copolymerizing a monomer mixture, comprising:

(a) 50–99.9% by weight of a C_{1-16}-alkyl (meth)acrylate or a vinyl ester of a C_{1-20} carboxylic acid;

(b) 0.1–20% by weight of an unsaturated carboxylic anhydride;

(c) 0–10% by weight of a Si-containing compound capable of undergoing hydrolysis; and

(d) 0–40% by weight of a further, copolymerizable unsaturated compound,

wherein the K value of one of the copolymers B or C is from 12 to 40 and that of the other copolymer is from 30 to 70, and wherein the K values of the two copolymers differ by at least 5K value units, where the K value is measured according to DIN 53,726.

5,532,322
PROCESS FOR PREPARING BROMINATED POLYSTYRENE

Shinichi Kadono; Kiyoshi Mishima; Akihisa Takahasi, all of Fukuyama, and Akira Taniuchi, Kyoto, all of, Japan, assignors to MANAC Inc., Fukuyama, Japan

Filed Sep. 26, 1995, Ser. No. 534,181

Int. Cl.^{6} C08F *8/22*

U.S. Cl. 525—357 **12 Claims**

1. A process for preparing a brominated polystyrene, which comprises reacting a polystyrene dissolved or dispersed in a halogenated hydrocarbon type solvent, with a brominating agent in the presence of an antimony oxide catalyst.

5,532,323
METHOD FOR PRODUCTION OF ABSORBENT RESIN

Kazutaka Yano; Katsuhiro Kajikawa; Kinya Nagasuna, and Yoshio Irie, all of Himeji, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

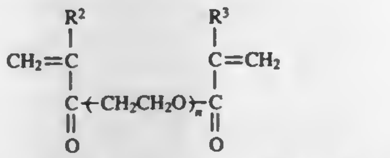
Filed Mar. 4, 1993, Ser. No. 26,407

Claims priority, application Japan, Mar. 5, 1992, 4-048321

Int. Cl.^{6} C08F *8/14;* **C08J** *3/24*

U.S. Cl. 525—384 **6 Claims**

1. A method for producing an absorbent resin comprising polymerizing a water-soluble monoethylenically unsaturated monomer in the presence of a cross-linking agent, said cross-linking agent possessing at least two polymerizable unsaturated groups and between said two polymerizable unsaturated groups at least one unit represented by the formula V:



$$CH_2{=}C(R^2)—C(=O)—(CH_2CH_2O)_n—C(=O)—C(R^3){=}CH_2 \qquad (V)$$

wherein R^2 and R^3 are independently a hydrogen atom or a methyl group and n is a number in the range of from 2 to 100, said cross-linking agent is used in a proportion in the range of from 0.01 to 0.3 mol % based on the amount of said water-soluble monoethylenically unsaturated monomer, and heat-treating the resultant polymer at a temperature in the range of from 160° to 230° C. in the presence of another cross-linking agent having at least two reacting groups capable of reacting with functional groups of said polymer.

5,532,324

COPOLYMERIC POLYCARBONATES, A METHOD FOR THEIR PREPARATION, AND COMPOSITIONS THEREOF

Takeshi Sakashita, 1-40, Ohgicho 3 chome, Iwakuni City, Yamaguchi Prefecture; Tomoaki Shimoda, 4-9, Waki 2-chome, Waki-cho, Kuga-gun, Yamaguchi Prefecture, and Kotaro Kishimura, 2-3-302, Muronokicho 1-chome, Kwakuni City, Yamaguchi Prefecture, all of, Japan

Division of Ser. No. 382,728, Feb. 2, 1995, Pat. No. 5,470,938, which is a division of Ser. No. 171,088, Dec. 21, 1993, Pat. No. 5,401,826, which is a division of Ser. No. 944,377, Sep. 14, 1992, Pat. No. 5,286,834. This application Oct. 12, 1995, Ser. No. 542,294

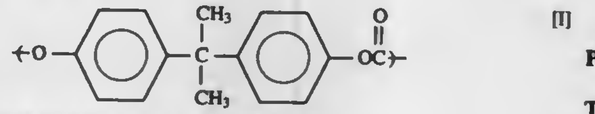
Claims priority, application Japan, Oct. 29, 1991, 3-283347

Int. Cl.^{6} C08G *64/00*

U.S. Cl. 525—462 **11 Claims**

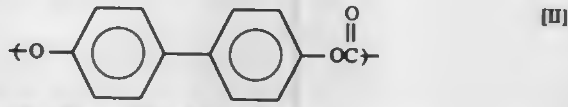
1. A copolymeric polycarbonate composition consisting of:

a copolymeric polycarbonate containing repeating constituent units having



[I]

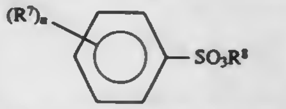
repeating constituent units having formula



[II]

in a molar ratio of from 98:2 to 40:60;

0.05–10 ppm, based on copolymeric polycarbonate, of a sulfonic acid compound having formula



[V]

where R^7 is a hydrocarbon group having 1–6 carbons in which the hydrogens may be substituted with halogens; R^8 is a hydrocarbon group having 1–8 carbons in which the hydrogens may be substituted with 1–8 carbons; and n is an integer from 0 to 3; and

1–2000 ppm, based on copolymeric polycarbonate, of an epoxy compound.

5,532,325

PROCESS FOR PRODUCING HIGH STIFFNESS POLYPROPYLENE

Takahiro Oka, and Hiromasa Chiba, both of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 679,834, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 331,368, Mar. 31, 1989, abandoned. This application Oct. 19, 1995, Ser. No. 545,232

Claims priority, application Japan, Apr. 4, 1988, 63-82597

Int. Cl.^{6} C08F *4/655;10/06*

U.S. Cl. 526—79 **6 Claims**

1. A process for producing polypropylene which comprises polymerizing propylene in multiple stages, in the presence of a catalyst which is prepared by reacting a first organoaluminum compound (i), or a reaction product (vi) formed between the first organoaluminum compound (i) and an electron donor (a), with titanium tetrachloride (c) to obtain a first solid product (ii), reacting the resulting first solid product (ii) with said electron donor (a) and an electron acceptor (b) to obtain a second solid product (iii), and combining the resulting second solid product (iii) with a second organoaluminum compound (iv) and an aromatic carboxylic acid ester (v) at a molar ratio of the aromatic carboxylic acid ester to the second solid product (v/iii molar ratio) of from 0.1 to 10.0, in such a manner that from 10 to 90% by weight of the total polymer is produced in a first stage and the balance of the total polymer is produced in a second and any subsequent stages with the v/iii molar ratio of said catalyst being made higher in the second and any subsequent stages than that in the catalyst used in the first stage by adding the aromatic carboxylic acid ester (v) to the polymerization system so as to give $0.1 \leqq v/iii$ molar ratio$\leqq 10$, while controlling the melt flow rate (MFR) of a polymer portion produced in each of the first and any subsequent stages so as to satisfy the relationships:

$$0.5 < \log (MFR_H/MFR_L) < 5.0 \tag{1}$$

and

$$0.0028 \leqq MFR_L \leqq 0.4 \tag{2}$$

wherein MFR_H is the MFR of a polymer portion having the highest MFR and MFR_L is the MFR of a polymer portion having the lowest MFR.

5,532,326

PROCESS FOR PREPARING ELASTOMERIC ETHYLENE COPOLYMERS

Tiziano Dall'Occo; Floriano Guglielmi, both of Ferrara, and Umberto Zucchini, deceased, late of Ferrara, all of, Italy, assignors to Montell Technology Company bv, Milan, Italy

Continuation of Ser. No. 23,601, Feb. 26, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 341,441

Claims priority, application Italy, Feb. 28, 1992, MI92A0441

Int. Cl.^{6} C08F *4/634*

U.S. Cl. 526—125.7 **16 Claims**

1. In a process for preparing elastomeric copolymers of ethylene with α-olefins $CH_2{=}CHR$, wherein R is an alkyl radical having 1–10 carbon atoms, containing from 20 to 80% by mol of ethylene, by polymerization of a mixture of ethylene with one or more of said α-olefins in the presence of a catalyst, in gas phase or in liquid phase, the improvement wherein said catalyst is the product of the reaction of: (I) a solid component comprising vanadium trichloride supported on a magnesium dihalide having a spherical or spheroidal morphology in active form with a major to minor axis of equal to or less than 1.5 in which said vanadium trichloride, present in Mg/V ratios lower than 6, is precipitated on the magnesium dihalide by heating a solution of VCl_4 in an inert hydrocarbon solvent at a temperature of from 60° to 110° C. with; (II) an alkylaluminum compound.

5,532,327

RANDOM COPOLYMERS MADE BY ANIONIC POLYMERIZATION, TONERS INCORPORATING THESE COPOLYMERS AND METHOD FOR THE MANUFACTURE THEREOF

Robert D. Bayley, Fairport; Thomas R. Hoffend, Webster; Timothy J. Fuller, West Henrietta, and Suresh K. Ahuja, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 76,364, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 814,653, Dec. 30, 1991, abandoned. This application Feb. 27, 1995, Ser. No. 394,580

Int. Cl.^{6} C08F *4/48*

U.S. Cl. 526—180 **8 Claims**

1. A solution polymerization process for producing an organic polymer from styrene and at least one polymerizable diene monomer, said process comprising:

a) providing a liquid reaction medium suitable for conducting said polymerization, said reaction medium containing styrene and a polymerizable diene monomer; and,

b) anionically polymerizing said styrene and said diene monomer, thereby forming random copolymer chains, wherein the total quantity of said styrene used in said polymerization is at least 50% by weight based on the total weight of styrene and polymerizable diene monomer used in said polymerization and wherein a randomizing agent is added to said reaction medium prior to and/or during said polymerization in an amount sufficient to direct insertion of said diene monomer in the polymer to more than 50% 1,2-vinyl regio-stereoisomer.

5,532,328

PROCESS FOR THE PREPARATION OF A POLYMER

Ivan A. L. Hoogmartens, Wilrijk; Joannes M. J. V. Gelan, Genk; Dirk J. M. Vanderzande, Nieuwerkerken, all of, Belgium, and Peter E. Froehling, Sittard, Netherlands, assignors to DSM N.V., Heerlen, Netherlands

PCT No. PCT/NL94/00016, § 371 Date Dec. 15, 1994, § 102(e) Date Dec. 15, 1994, PCT Pub. No. WO94/17120, PCT Pub. Date Aug. 4, 1994

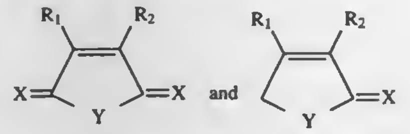
PCT Filed Jan. 25, 1994, Ser. No. 307,837

Claims priority, application Netherlands, Jan. 29, 1993, 9300094

Int. Cl.^{6} C08F *4/00;28/06;26/06;24/00;34/00*

U.S. Cl. 526—193 **18 Claims**

1. A process for the preparation of a polymer which consists essentially of heterocyclic monomer units by polymerizing at least one heterocyclic monomer in the presence of an effective amount of a sulphur-containing reagent whereby said polymer is obtained, wherein said heterocyclic monomer is selected from the group consisting of



wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, alkyl groups having 1–20 carbon atoms, aryl groups having 6–20 carbon atoms, alkaryl groups having 7–40 carbons atoms, aralkyl groups having 7–40 carbon atoms, alkoxy groups having 1–18 carbon atoms, $—O(CH_2CH_2O)_nCH_3$ wherein n is 1–4, and a halogen; or where R_1 and R_2 both form part of a closed ring structure; X is O or S; and Y is O, S, or NH.

5,532,329

COPOLYMERS AND MIXTURES WHICH ARE SELF-CURABLE WITH ATMOSPHERIC HUMIDITY

Ulrich Filges, Limburgerhof; Oral Aydin, Mannheim; Gerhard Auchter, Bad Duerkheim; Juergen Barwich, Neustadt; Hermann Anders, Meckenheim; Werner Langer, and Klaus Vorspohl, both of Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 201,054, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 800,251, Nov. 29, 1991, abandoned. This application Dec. 28, 1994, Ser. No. 365,316

Claims priority, application Germany, Dec. 6, 1990, 40 38 939.1

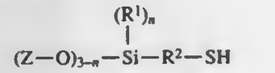
Int. Cl.^{6} C08F *230/08;220/08;220/52;226/02;220/10;218/04*

U.S. Cl. 526—279 **15 Claims**

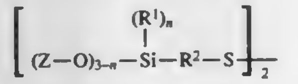
1. A copolymer which is self-curable with atmospheric humidity and is based on acrylic, methacrylic and/or vinyl esters and mixtures of such copolymers with cross-linkers of the following composition:

B) curable mixtures of
  1) from 50 to 99.9% by weight of a copolymer B1 (=100% by weight) composed of
    a) from 30 to 99.9% by weight of the compounds I,
    b) from 0.1 to 50% by weight of the compounds III,
    c) from 0 to 50% by weight of the compounds IV and
    d) from 0 to 5% by weight of the compounds Va or Vb, and
  2) from 0.1 to 50% by weight of a di- or polyisocyanate (compounds VI);
C) curable mixtures of
  1) from 9 to 70% by weight of a copolymer C1 (=100% by weight) composed of
    a) from 50 to 99.9% by weight of the compounds I,
    b) from 0.1 to 20% by weight of compounds III and
    c) from 0 to 30% by weight of the compounds IV, and
  2) from 29 to 90% by weight of a copolymer C2 (=100% by weight) composed of
    a) from 60 to 99.5% by weight of the compounds I,
    b) from 0.5 to 10% by weight of a comonomer with one or more hydroxyls (compounds VII) and
    c) from 0 to 30% by weight of the compounds IV, and
  3) from 1 to 30% by weight of the compounds VI, with the proviso that one hydroxyl in compounds VII corresponds to from 1.7 to 2.3 isocyanates in compounds VI;
E) curable mixtures of
  1) from 40 to 98% by weight of a copolymer E1 (=100% by weight) composed of
    a) from 60 to 99.5% by weight of the compounds I,
    b) from 0.5 to 10% by weight of the compounds VII and
    c) from 0 to 30% by weight of the compounds IV, and
  2) from 1 to 30% by weight of the compounds VI and
  3) from 1 to 30% by weight of a di- or polyaldinime and/or ketimine (compounds VIII), with the proviso that one hydroxyl in the compounds VII corresponds to from 1.7 to 2.3 isocyanates in the compounds VI

where compounds I are one or more C_1–C_{24}-alkyl esters of acrylic and/or methacrylic acid and/or C_1–C_{20} vinyl esters,
compounds III is a carboxylic anhydride which can undergo free radical polymerization,
compounds IV are other monomers and
compounds Va and Vb are

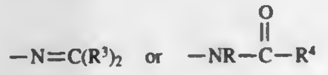


$$(Z-O)_{3-n}-\overset{\overset{\displaystyle (R^1)_n}{|}}{Si}-R^2-SH \qquad V_a$$



$$\left[(Z-O)_{3-n}-\overset{\overset{\displaystyle (R^1)_n}{|}}{Si}-R^2-S-\right]_2 \qquad V_b$$

where
n is from 0 to 2,
R^1 is C_1–C_6-alkyl or phenyl,
R^2 is C_1–C_{18}-alkyl, cyclohexyl or phenyl,
Z is C_1–C_{18}-alkyl, C_2–C_{18}-alkenyl or C_2–C_{18} alkynyl, whose carbons can be replaced by non-adjacent oxygens or halogens, or



$$-N{=}C(R^3)_2 \quad \text{or} \quad -NR-\overset{\overset{\displaystyle O}{\|}}{C}-R^4$$

where
R^3 is C_1–C_{12}-alkyl and
R^4 is C_1–C_{18}-alkyl.

5,532,330

HEAT-CURABLE TANNIN-BASED BINDING AGENTS

Antonio Pizzi, Epinal, France; Willi Roll, Altenberge, and Berthold Dombo, Mönchengladbach, both of, Germany, assignors to Rutgerswerke Aktiengesellschaft, Germany

Filed Oct. 4, 1994, Ser. No. 317,918

Claims priority, application Germany, Oct. 2, 1993, 44 06 825.5; Oct. 13, 1993, 43 34 962.5

Int. Cl.^{6} C08G *67/00*

U.S. Cl. 528—125 **9 Claims**

1. A heat-curable, formaldehyde-free binding agent comprising at least one polyflavonoid tannin selected from the group consisting of tannins of pecan nut, pinus radiata, acacia mearnsii (mimosa), schinopsis and balansae (quebracho) and as a curing catalyst, a compound having a weak acid reaction.

5,532,331

THIODIPHENOL COPOLYCARBONATES AND THEIR USE AS COMPONENTS OF MULTILAYERED POLYMERIC REFLECTIVE BODIES

Stephen E. Bales; Charles A. Langhoff, and John A. Wheatley, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US93/06074, § 371 Date Dec. 15, 1994, § 102(e) Date Dec. 15, 1994, PCT Pub. No. WO94/02533, PCT Pub. Date Feb. 3, 1994

PCT Filed Jun. 24, 1993, Ser. No. 351,436

Int. Cl.^{6} C08G *64/00*

U.S. Cl. 528—196 **5 Claims**

1. A copolycarbonate of 4,4'-thiodiphenol and 9,9-bis (4-hydroxyphenyl) fluorene.

5,532,332

LIGHT-ABSORBING POLYMERS

Max A. Weaver, 125 Hill Rd., Kingsport, Tenn. 37664; James J. Krutak, 6305 Booth Ct., Kingsport, Tenn. 37663; Clarence A. Coates, Rte. 13, Kingsport, Tenn. 37664; Wayne P. Pruett, 101 Walton Ct., Kingsport, Tenn. 37663, and Samuel D. Hilbert, Rte. 7, Jonesborough, Tenn. 37659

Continuation of Ser. No. 206,108, Mar. 3, 1994, Pat. No. 5,376,650, which is a continuation of Ser. No. 11,044, Jan. 29, 1993, abandoned, which is a continuation of Ser. No. 712,384, Jun. 10, 1991, abandoned. This application Sep. 19, 1994, Ser. No. 308,524

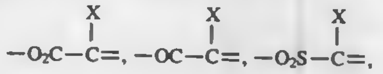
Int. Cl.^{6} C08G *16/00*

U.S. Cl. 528—230 **5 Claims**

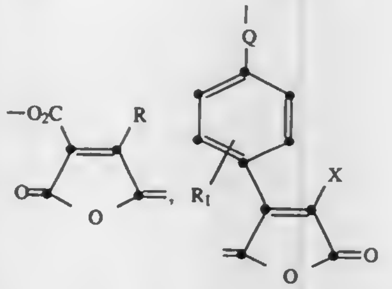
1. A non-protonated polymer represented by Formula (I)

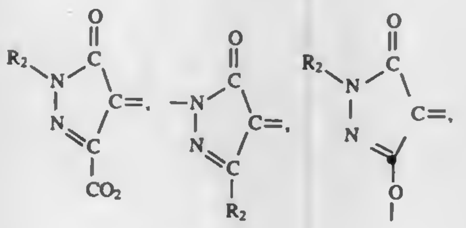
$$\left(\!-\mathrm{CH{=}A{-}L_1{-}A{=}HC{-}B{-}L_2{-}B}-\!\right)_n \qquad \text{(I)}$$

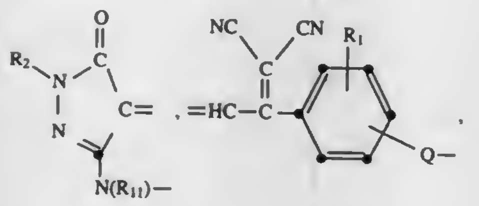
wherein A is independently selected from the group consisting of



$$-\mathrm{O_2C}-\overset{\displaystyle X}{\overset{|}{C}}=,\ -\mathrm{OC}-\overset{\displaystyle X}{\overset{|}{C}}=,\ -\mathrm{O_2S}-\overset{\displaystyle X}{\overset{|}{C}}=,$$







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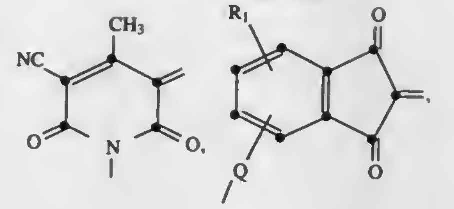

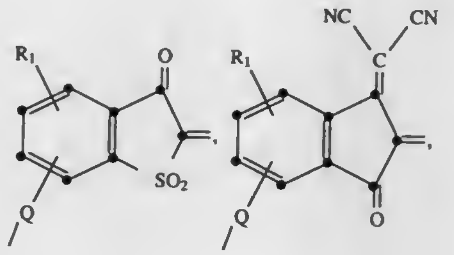

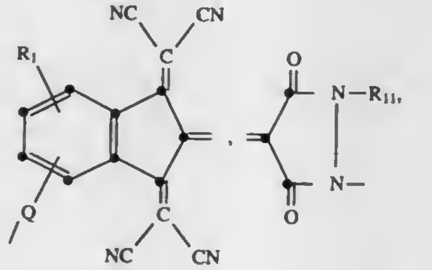

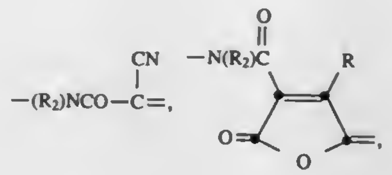

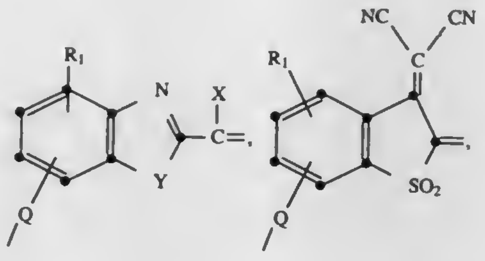

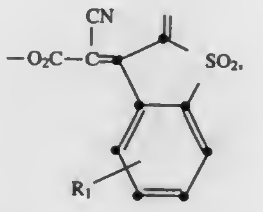

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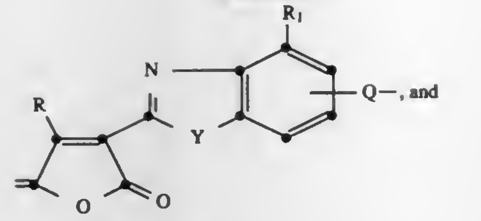
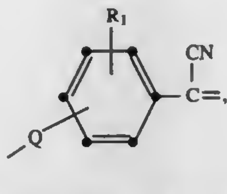




wherein Q is selected from the group consisting of a covalent bond, —CO_2, —CO—, —S—, —O—, —CON(R_2)—, —N(SO_2R_3)—, SO_2 and —$SO_2N(R_2)$—;

X is selected from the group consisting of cyano; a C_1–C_8 alkyl, C_3–C_8 cycloalkyl or aryl..oxycarbonyl group, containing from 2 to 10 carbon atoms and optionally substituted with halogen, C_1–C_6 alkoxy, C_3–C_8 cycloalkyl, aryl, aryloxy, C_1–C_6 alkyl, cyano, C_1–C_6 alkanoyloxy, hydroxy or C_1–C_6 alkoxycarbonyl; a carbamoyl group containing from 2 to 10 carbon atoms, optionally substituted with one or more halogen, phenyl, C_1–C_4 alkanoyloxy, phenoxy, hydroxy, amino, C_1–C_6 alkoxycarbonyl, cyclohexyl, carbamoyl, cyano, C_1–C_6 alkylsulfonylamino or C_1–C_6 alkoxy; C_1–C_{12} alkylsulfonyl, optionally substituted with one or more halogen, phenyl, C_1–C_4 alkanoyloxy, phenoxy, hydroxy, amino, C_1–C_6 alkoxycarbonyl, cyclohexyl, carbamoyl, cyano C_1–C_6 alkylsulfonylamino or C_1–C_6 alkoxy; C_3–C_8 cycloalkylsulfonyl; arylsulfonyl and a carbocylic or heterocyclic aryl selected from the group consisting of phenyl, naphthyl, phenanthryl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, tetrazolyl, thiatriazolyl, oxatriazolyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, thiazinyl, oxazinyl, triazinyl, thiadiazinyl, oxadiazinyl, dithiazinyl, dioxazinyl, oxathiazinyl, tetrazinyl, thiatriazinyl, oxatriazinyl, dithiadiazinyl, imidazolinyl, dihydropyrimidyl, tetrahydropyrimidyl, tetrazolo-(1,5-b)pyridazinyl, purinyl, benzoxazolyl, benzothiazolyl, benzimidazolyl, and indolyl, optionally substituted by one or more halogen, C_1–C_6 alkyl, phenoxy, phenyl, hydroxy, amino, C_1–C_6 alkoxycarbonyl, nitro, C_1–C_6 alkylsulfonyl, carboxy, cyclohexyl, carbamoyl, cyano, C_1–C_4 alkylsulfonylamino or C_1–C_6 alkoxy;

Y is selected from the group consisting of —O—, —S—, —NH— and an imino group substituted with a group selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_3–C_8 cycloalkyl and aryl;

R is hydrogen, C_1–C_6 alkyl or a carbocyclic or heterocyclic aryl selected from the group consisting of phenol, naphthyl, phenanthryl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, tetrazolyl, thiatriazolyl, oxatriazolyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, thiazinyl, oxazinyl, triazinyl, thiadiazinyl, oxadiazinyl, dithiazinyl, dioxazinyl, oxathiazinyl, tetrazinyl, thiatriazinyl, oxatriazinyl, dithiadiazinyl, imidazolinyl, dihydropyrimidyl, tetrahydropyrimidyl, tetrazolo-(1,5-b)pyridazinyl, purinyl, benzoxazolyl, benzothiazolyl, benzimidazolyl, and indolyl, optionally substituted by one or more halogen, C_1–C_6 alkyl, phenoxy, phenyl, hydroxy, amino C_1–C_6 alkoxycarbonyl, nitro, C_1–C_6 alkylsulfonyl, carboxy, cyclohexyl, carbamoyl, cyano, C_1–C_4 alkylsulfonylamino or C_1–C_6 alkoxy;

R_1 is hydrogen or 1–2 groups selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkoxy and halogen;

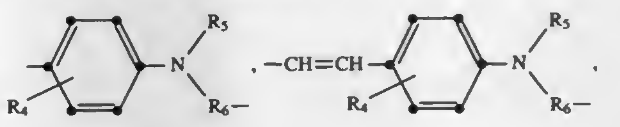
R_2 is selected from the group consisting of hydrogen, C_1–C_6 alkyl, optionally substituted by one or more halogen, phenyl, C_1–C_4 alkanoyloxy, phenoxy, hydroxy, amino, C_1–C_4 alkoxycarbonyl, carboxy, C_1–C_6 alkylsulfonyl, cyclohexyl, carbamoyl, cyano, C_1–C_6 alkylsulfonylamino or C_1–C_6 alkoxy; C_3–C_8 cycloalkyl and a carbocyclic or heterocyclic aryl selected from the group consisting of phenyl, naphthyl, phenanthryl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, tetrazolyl, thiatriazolyl, oxatriazolyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, thiazinyl, oxazinyl, triazinyl, thiadiazinyl, oxadiazinyl, dithiazinyl, dioxazinyl, oxathiazinyl, tetrazinyl, thiatriazinyl, oxatriazinyl, dithiadiazinyl, imidazolinyl, dihydropyrimidyl, tetrahydropyrimidyl, tetrazolo-(1,5-b)pyridazinyl, purinyl, benzoxazolyl, benzothiazolyl, benzimidazolyl, and indolyl, optionally substituted by one or more halogen, C_1–C_6 alkyl, phenoxy, phenyl, hydroxy, amino, C_1–C_6 alkoxycarbonyl, nitro, C_1–C_6 alkylsulfonyl, carboxy, cyclohexyl, carbamoyl, cyano, C_1–C_4 alkylsulfonylamino or C_1–C_6 alkoxy;

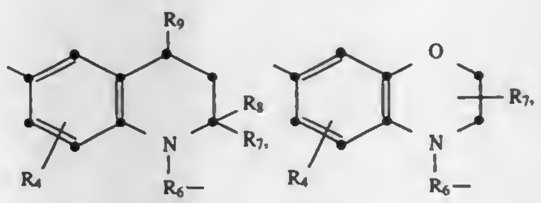
R_2' is —OR_3, —NHR_3, or one of the groups listed for R_2;

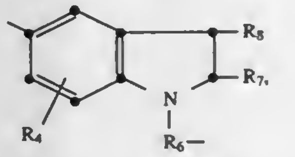
R_3 is selected from the group consisting of C_1–C_{12} alkyl; C_1–C_{12} alkyl substituted by one group selected from the group consisting of halogen, phenyl, C_1–C_4 alkanoyloxy, phenoxy, hydroxy, amino, C_1–C_6 alkoxycarbonyl, carboxy, C_1–C_6 alkylsulfonyl, cyclohexyl, carbamoyl, cyano, C_1–C_6 alkylsulfonylamino and C_1–C_6 alkoxy; C_3–C_8 cycloalkyl and a carbocyclic or heterocyclic aryl selected from the group consisting of phenyl, naphthyl, phenanthryl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, tetrazolyl, thiatriazolyl, oxatriazolyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, thiazinyl, oxazinyl, triazinyl, thiadiazinyl, oxadiazinyl, dithiazinyl, dioxazinyl, oxathiazinyl, tetrazinyl, thiatriazinyl, oxatriazinyl, dithiadiazinyl, imidazolinyl, dihydropyrimidyl, tetrahydropryrimidyl, tetrazolo-(1,5-b)pyridazinyl, purinyl, benzoxazolyl, benzothiazolyl, benzimidazolyl and indolyl, optionally substituted by one or more halogen, C_1–C_6 alkyl, phenoxy, phenyl, hydroxy, amino, C_1–C_6 alkoxycarbonyl, nitro, C_1–C_6 alkylsulfonyl, carboxy, cyclohexyl, carbamoyl, cyano, C_1–C_4 alkylsulfonylamino or C_1–C_6 alkoxy;

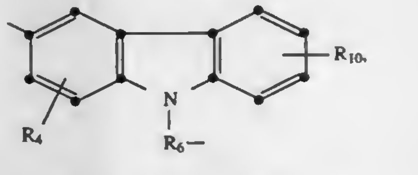
or wherein =A—L_1—A= in combination has the structure =C(CN)—arylene—C(CN)=;

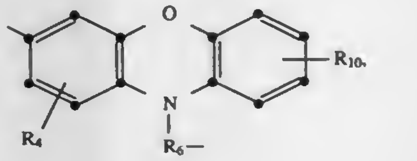
and wherein the divalent moiety B is independently selected from the group consisting of











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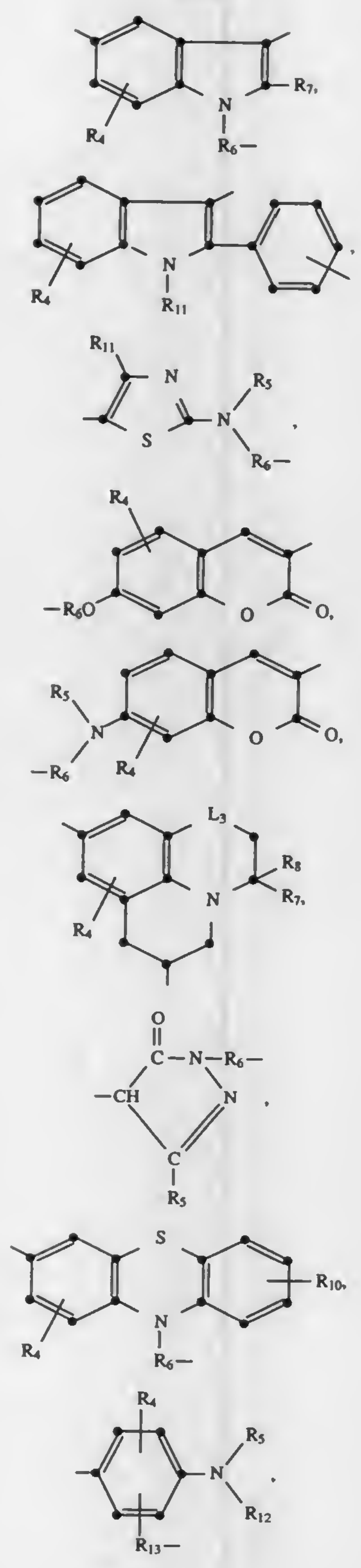

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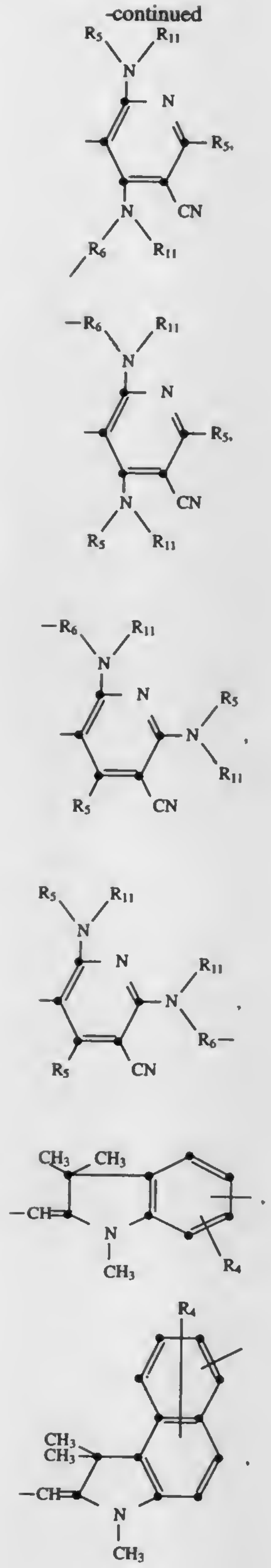

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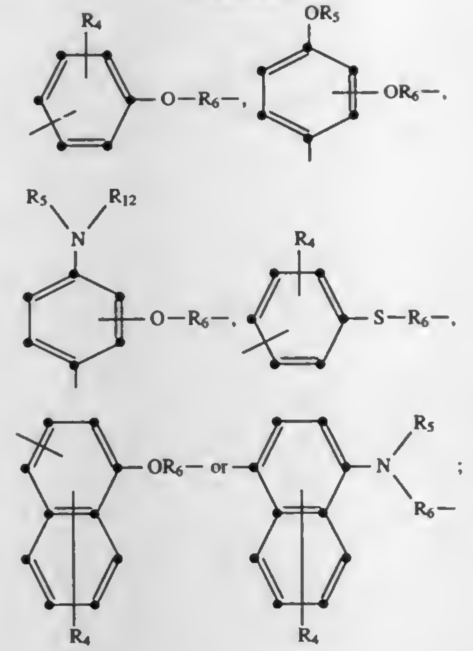


wherein R_4 and R_{10} are hydrogen or 1–2 substituents selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkoxy and halogen;

R_5 and R_{12} are selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, C_3–C_8 cycloalkyl, C_1–C_6 alkyl, optionally substituted by one or more halogen, phenyl, C_1–C_4 alkanoyloxy, phenoxy, hydroxy, amino, C_1–C_4 alkoxycarbonyl, carboxy, C_1–C_6 alkylsulfonyl, cyclohexyl, carbamoyl, cyano, C_1–C_6 alkylsulfonylamino or C_1–C_6 alkoxy; and phenyl;

R_6 is selected from the group consisting of C_1–C_{12} alkylene, C_3–C_8 cycloalkylene, arylene, C_1–C_{12} alkylene—arylene—C_1–C_{12}alkylene, C_1–C_{12} alkylene—(C_3–C_8)cycloalkylene—C_1–C_{12} alkylene, C_1–C_{12} alkylene—O—C_1–C_{12} alkylene, C_1–C_{12} alkylene—S—C_1–C_{12} alkylene, C_1–C_{12} alkylene—SO_2—C_1–C_{12} alkylene, C_1–C_{12} alkylene—O—arylene—O—C_1–C_{12} alkylene, C_{12} alkylene—$N(SO_2R_3)C_1$–C_{12} alkylene and C_1–C_{12} alkylene—arylene;

R_7, R_8, R_9 are hydrogen or C_1–C_{12} alkyl;

R_{11} is hydrogen, C_1–C_6 alkyl or aryl;

R_{13} is —O—R_6— or —$N(SO_2R_3)$—R_6—;

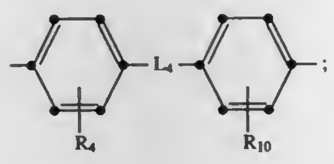
L_1 is a divalent linking group as listed above for R_6;

L_2 is selected from the group consisting of a covalent bond; phenylene optionally substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy, or halogen; C_3–C_8 cycloalkylene; —O—; —S—; —SO_2—; —CO—; —CO_2—; —OCO_2—; —O_2 C—C_1–C_{12} alkylene—CO_2—; —O_2C—arylene—CO_2—; —O_2C—(C_3–C_8)cycloalkylene—CO_2—; —O_2CNH—C_1–C_{12} alkylene—$NHCO_2$—; —O_2CNH—arylene—$NHCO_2$—; —CO_2—C_1–C_{12} alkylene—O_2C—; —SO_2N (R_2)—; —$N(R_3)$—; —SO_2—C_1—C_{12} alkylene—SO_2—; —SO_2—arylene—SO_2—; —$SO_2N(R_2)$—C_1–C_{12} alkylene—$N(R_2)SO_2$—; —$SO_2N(R_2)SO_2$—; —O—C_1–C_{12} alkylene—O— and —O—arylene—O—;

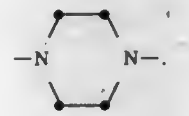
L_3 is selected from the group consisting of a covalent bond, —O—, —CH_2— and —$CH(CH_3)$—; and

n is an integer from 2 to about 50;

or wherein —B—L_2—B— in combination represents the formula:



wherein L_4 is selected from the group consisting of —$N(R_5)$—, —O—, —S—, —CH═CH— and



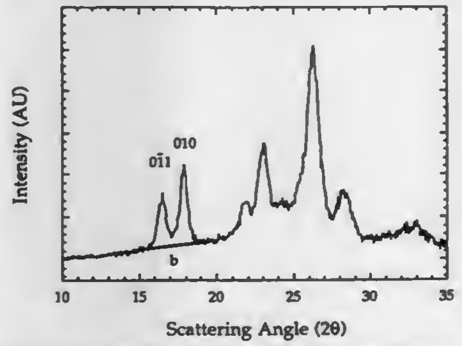
5,532,333
PRODUCTION OF POLY(ETHYLENE TEREPHTHALATE)

Jan M. Stouffer, Hockessin; Elwood N. Blanchard, Wilmington, both of Del., and Kenneth W. Leffew, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 376,600, Jan. 20, 1995. This application Sep. 8, 1995, Ser. No. 525,241

Int. Cl.^{6} C08G *63/88*

U.S. Cl. 528—308.2 **17 Claims**



1. A process for crystallizing poly(ethylene terephthalate), comprising, cooling at a rate sufficient to cool a molten poly(ethylene terephthalate), or heating at a sufficient rate to heat a glassy poly(ethylene terephthalate), to a temperature of about 120° C. to about 210° C., to produce a crystalline poly(ethylene terephthalate) having an average crystallite size of 9 nm or more and a melting point of 270° C. or less, provided that said poly(ethylene terephthalate) has a degree of polymerization of about 5 to about 35.

5,532,334
PROCESS FOR PREPARING POLYAMIDEIMIDE RESINS HAVING HIGH MOLECULAR WEIGHT

Kil-Yeong Chol; Dong-Hack Suh; Mi-Hie Yi; Young-Taik Hong, and Jong-Chan Won, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

Filed Nov. 14, 1994, Ser. No. 339,391

Claims priority, application Rep. of Korea, Nov. 12, 1993, 1993-24151

Int. Cl.^{6} C08G *73/14;69/26*

U.S. Cl. 528—350 **8 Claims**

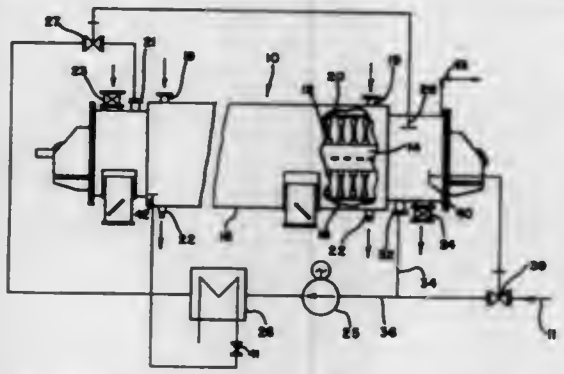
1. A process for preparing polyamideimide resins having an intrinsic viscosity of 0.4 to 1.50 dl/g as measured on a solution of dimethylacetamide as a solvent at a concentration of 0.5g/dl at 30° C., which comprises reacting an aromatic tricarboxylic acid anhydride with an aromatic diamine in N-methyl pyrrolidone solvent in the presence of a first catalyst selected from the group consisting of thionyl chloride, p-toluenesulphonyl chloride, sulfuryl chloride, cyanuric chloride and phosphorus trichloride at a temperature of 50° C. to 130° C. over a period of 1 to 5 hours and further reacting the resultant reaction mixture in the presence of a second catalyst which is a compound of the formula $(RO)_3P$ wherein R is an aliphatic or aromatic substituent, or a compound which is phosphoric acid, pyrophosphoric acid, phosphorous pentaoxide or phosphorous pentachloride as a second catalyst at a temperature of 50° C. to 130° C. over a period of 1 to 5 hours.

5,532,335

METHOD FOR THERMALLY PROCESSING POLYESTER PELLETS

Gregory J. Kimball, Blaine, and Ilya Pikus, Plymouth, both of Minn., assignors to Hosokawa Bepex Corporation, Minneapolis, Minn.

Filed Apr. 26, 1995, Ser. No. 427,801
Int. Cl.^{6} C08F *6/00*
U.S. Cl. 528—495 **12 Claims**



1. A method for thermally processing polyester pellets by crystallization and polymerization in the solid state which comprises providing a confined processing unit, introducing said pellets into said unit, introducing a liquid medium into said unit, agitating said pellets and liquid medium to achieve mixing thereof, controlling the temperature of the agitated mixture to achieve treating of the polyester pellets in agitated heating liquid medium at a temperature slightly below the sticking temperature of said polyester, and continuing such treatment for a period sufficient to substantially increase the crystallinity and molecular weight of said polyester.

5,532,336

ANTI-OBESITY PROTEINS

Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 31, 1995, Ser. No. 381,034
Int. Cl.^{6} A16K *38/00;* C07K *7/10*
U.S. Cl. 530—324 **17 Claims**

1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,532,337

PROTEINS COMPRISING CALMODULIN- AND ACTIN-BINDING HUMAN CALDESMON POLYPEPTIDE FRAGMENTS

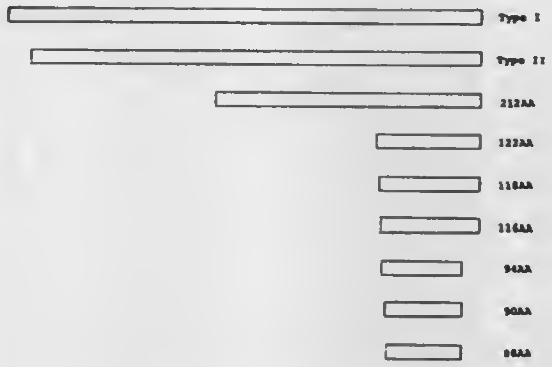
Ken'ichiro Hayashi, Takatsuki; Takashi Hashida, Otsu; Kiyozo Asada, Koga-gun; Hirokazu Kotani, Moriyama; Ikunoshin Kato, Uji, and Kenji Sobue, 3-5, Higashinakajyo-cho, Ibaraki-shi, Osaka-fu, all of, Japan, assignors to Kenji Sobue, Osaka-Fu, and Takara Shuzo Co., Ltd., Kyoto, both of, Japan

Continuation of Ser. No. 858,947, Mar. 27, 1992, abandoned. This application Ang. 4, 1994, Ser. No. 285,440

Claims priority, application Japan, Mar. 29, 1991, 3-089106; Dec. 27, 1991, 3-358040

Int. Cl.^{6} C07K *14/46;19/00*
U.S. Cl. 530—350 **4 Claims**

1. An actin- or calmodulin-binding polypeptide fragment of a human caldesmon protein, said polypeptide fragment comprising at least the amino acid sequence shown in SEQ ID NO: 1, wherein said caldesmon protein has the amino acid sequence shown in SEQ ID NO: 5 or SEQ ID NO: 6.



3. A chimeric protein comprising an actin- or calmodulin-binding polypeptide fragment according to claim 1.

5,532,338

Patent Not Issued For This Number

5,532,339

FUSION PROTEIN BETWEEN HUMAN MACIF AND A HETEROLOGOUS PI ANCHOR DOMAIN

Motowo Tomita, Kanagawa; Yuji Sugita, Saitama; Toshiyuki Takemoto, Saitama; Kiyoshi Furuichi, Saitama; Makoto Takayama; Ko Yasukawa, both of Tokyo; Katsuhisa Ito, Saitama; Noboru Yamaji, and Shinya Yano, both of Tokyo, all of, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 21,724, Feb. 22, 1993, abandoned, which is a continuation of Ser. No. 510,610, Apr. 18, 1990, abandoned. This application Aug. 17, 1994, Ser. No. 291,339

Claims priority, application Japan, Apr. 21, 1989, 1-103088; Jul. 12, 1989, 1-179933; Sep. 6, 1989, 1-230983; Sep. 13, 1989, 1-238246; Sep. 21, 1989, 1-247818; Oct. 27, 1989, 1-281197

Int. Cl.^{6} C07K *14/47;19/00*
U.S. Cl. 530—350 **1 Claim**

1. A fusion protein consisting of

an N-terminal MACIF (Membrane Attack Complex Inhibition Factor) moiety having the following sequence:

1	2	3	4	5	6	7	8	9	10
X—Leu	Gln	Cys	Tyr	Asn	Cys	Pro	Asn	Pro	Thr
11	12	13	14	15	16	17	18	19	20
Ala	Asp	Cys	Lys	Thr	Ala	Val	Asn	Cys	Ser
21	22	23	24	25	26	27	28	29	30
Ser	Asp	Phe	Asp	Ala	Cys	Leu	Ile	Thr	Lys
31	32	33	34	35	36	37	38	39	40
Ala	Gly	Leu	Gln	Val	Tyr	Asn	Lys	Cys	Trp
41	42	43	44	45	46	47	48	49	50
Lys	Phe	Glu	His	Cys	Asn	Phe	Asn	Asp	Val
51	52	53	54	55	56	57	58	59	60
Thr	Thr	Arg	Leu	Arg	Glu	Asn	Glu	Leu	Thr
61	62	63	64	65	66	67	68	69	70
Tyr	Tyr	Cys	Cys	Lys	Lys	Asp	Leu	Cys	Asn
71	72	73	74	75	76				
Phe	Asn	Glu	Gln	Leu	Glu				

wherein X is H or Met and a C-terminal moiety consisting of a heterologous phosphatidylinosirol (PI) anchor domain, wherein a PI membrane anchor is attached to said domain.

5,532,340

TUMOR SUPPRESSOR PROTEIN PRB2, RELATED GENE PRODUCTS, AND DNA ENCODING THEREFOR

Antonio Giordano, Willow Grove, Pa., assignor to Temple University of The Commonwealth System of Higher Education, Philadelphia, Pa.

Division of Ser. No. 106,493, Aug. 12, 1993, Pat. No. 5,457,049. This application Apr. 25, 1995, Ser. No. 429,264

Int. Cl.^{6} C07K *14/47*
U.S. Cl. 530—350 **2 Claims**

1. An isolated and substantially purified protein comprising the amino acid sequence SEQ ID No: 2.

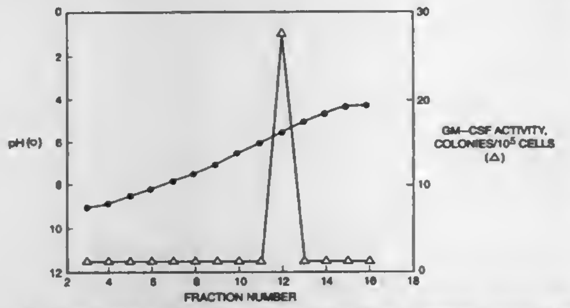
5,532,341

HUMAN PLURIPOTENT HEMATOPOIETIC COLONY STIMULATING FACTOR

Karl Welte, New York, N.Y.; Erich Platzer, Spardorf, Germany; Janice L. Gabrilove, New York, N.Y.; Roland Mertelsmann, Chappaqua, N.Y., and Malcolm A. S. Moore, Larchmont, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 132,240, Oct. 6, 1993, abandoned, which is a continuation of Ser. No. 835,270, Mar. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 716,844, Mar. 28, 1985, abandoned. This application Jul. 26, 1994, Ser. No. 280,582

Int. Cl.^{6} C07K *14/52;14/535*
U.S. Cl. 530—351 **1 Claim**



1. A preparation of isolated and purified human pluripotent colony stimulating factor comprising the following characteristics:

a) a molecular weight of about 19,600 daltons under reducing and non-reducing conditions as determined by SDS-PAGE;
b) a molecular weight of about 32,000 daltons as determined by gel filtration;
c) an isoelectric point of about 5.5;
d) the ability to induce differentiation of the leukemia cell line WEHI-3B (D+);
e) the amino-terminal amino acid sequence Thr-Pro-Leu-Gly-Pro-Ala-Ser-Ser-Leu-Pro-Gln-Ser-Phe-Leu-Leu-Lys-Cys-Leu-Glu-Gln-Val-Arg-Lys-Ile-Gln-Gly-Asp-Gly-Ala-Ala-Leu-Gln-; and
f) the ability to stimulate growth of both human and mouse bone marrow cells.

5,532,342

AZO METAL CHELATE COMPOUND

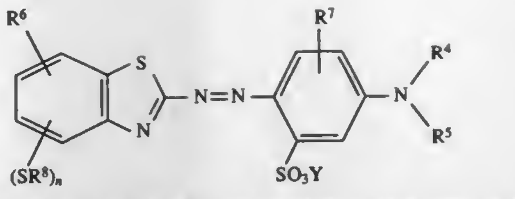
Tameichi Ochiai, Sagamihara; Yutaka Kurose, Kawasaki; Takumi Nagao, Yokohama; Takako Tsukahara, Sagamihara, and Satoru Imamura, Machida, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 70,664, Jun. 2, 1993, Pat. No. 5,447,823. This application Apr. 17, 1995, Ser. No. 422,948

Claims priority, application Japan, Jun. 2, 1992, 4-141812; Oct. 7, 1992, 4-268857

Int. Cl.^{6} C09B *29/042;29/045;29/09;* B41M *5/26*
U.S. Cl. 534—693 **4 Claims**

1. An azo metal chelate compound of an azo compound and a metal, wherein the azo compound is a compound of the following formula (V):



(V)

wherein each of R^4 and R^5, independent of each other, is a C_{1-6} alkyl group or a C_{2-7} alkoxyalkyl group, each of R^6 and R^7 which are independent of each other, is a hydrogen atom, a C_{1-6} alkyl group, a C_{1-6} alkoxy group or a halogen atom, R^8 is a C_{1-6} alkyl group which is substituted by at least one fluorine atom, Y is a hydrogen atom or a cation, and n is an integer of from 1 to 3.

5,532,343

PURIFICATION AND CHARACTERIZATION OF A GLIOMA-DERIVED GROWTH FACTOR HAVING VASCULAR ENDOTHELIAL CELL GROWTH PROMOTING ACTIVITY

Marvin L. Bayne, Westfield; Kenneth A. Thomas, Jr., Chatham Borough, both of N.J., and Gregory L. Conn, Bedfords Hills, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 889,547, May 27, 1992, Pat. No. 5,338,840, which is a continuation of Ser. No. 500,421, Mar. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 356,477, May 24, 1989, abandoned. This application Mar. 2, 1994, Ser. No. 204,850

Int. Cl.^{6} C07K *14/475;14/515*
U.S. Cl. 530—399 **2 Claims**

2. An isolated and purified glioma derived growth factor which is mitogenic for mammalian endothelial cells, wherein said growth factor is characterized by the amino acid sequence set forth in the Figure.

5,532,344

PROCESS FOR PRODUCING A MONOAZODYE BY DIAZO-COUPLING OF A P-NITROANALINE DERIVATIVE WITH A N,N-SUBSTITUTED ANALINE DERIVATIVE

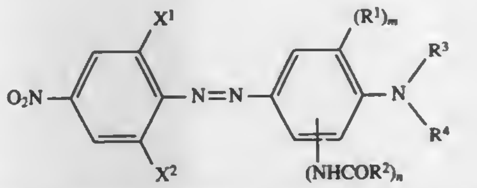
Kiyoshi Himeno, Munakata; Toshio Hihara; Yoshiharu Hamano, both of Kitakyushu, and Shinji Kubo, Nakama, all of, Japan, assignors to Dystar Japan Ltd., Osaka, Japan

Filed Mar. 29, 1993, Ser. No. 38,813

Claims priority, application Japan, Apr. 2, 1992, 4-108428; Apr. 16, 1992, 4-096823; Apr. 20, 1992, 4-099953

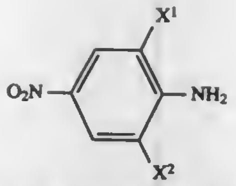
Int. Cl.^{6} C09B *41/00;29/085;67/10*
U.S. Cl. 534—581 **15 Claims**

1. A process for producing a monoazo dye of the following formula (III):



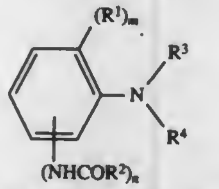
(III)

wherein X^1 is nitro or halogen, X^2 is halogen, R^1 is lower alkoxy, R^2 is lower alkyl, each of R^3 and R^4, which are independent of each other, is alkyl, cyanoalkyl or alkyicarbonyloxyalkyl, and each of m and n, which are independent of each other, is 0 or 1, which comprises diazotizing an aniline derivative of the following formula (I):



(I)

wherein X^1 and X^2 are as defined above, followed by coupling, in an aqueous medium under acidic conditions and in the presence of a polyoxyethylene higher fatty acid ester nonionic surfactant, with an aniline derivative of the following formula (II):



(II)

wherein R^1, R^2, R^3, R^4, m and n are as defined above, wherein a reaction mixture obtained by the coupling reaction is heat-treated in the presence of said polyoxyethylene higher fatty acid ester nonionic surfactant, followed by filtration to obtain said monoazodye in the form of a cake, and wherein the nonionic surfactant is of the formula:

$$R{-}COO{-}(C_2H_4O)_nH$$

where R is a C_{10}–C_{20} saturated or unsaturated aliphatic hydrocarbon group and n is a positive integer.

5,532,345

FIBER REACTIVE PHTHALIMIDYLAZO DYES AND USE THEREOF

Paul Herzig, Basel, and Anton Andreoli, Riehen, both of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

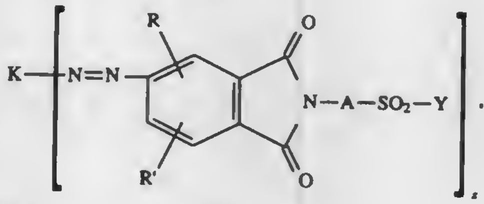
Filed May 26, 1995, Ser. No. 451,354

Claims priority, application Switzerland, May 30, 1994, 1679/94

Int. Cl.^{6} C09B *62/006;62/08;62/507;* **D06P** *1/38*

U.S. Cl. 534—612 **16 Claims**

1. A compound of the formula



(1)

in which

K is the radical of a coupling component,

s is the number 1 or 2,

R and R' independently of one another are each hydrogen, sulfo, hydroxyl, C_1–C_4alkoxy, halogen or cyano,

A is C_1–C_6alkylene which is unsubstituted or substituted by halogen, hydroxyl, sulfato, carboxyl, cyano, C_2–C_4alkanoyloxy, C_1–C_4alkoxycarbonyl or carbamoyl or interrupted by a group —O— or —NR"—, or is C_1–C_6alkylenephenylene which is unsubstituted or substituted in the phenyl part by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or sulfo,

R" is hydrogen or C_1–C_4alkyl,

Y is vinyl or a radical $—CH_2—CH_2—$U, and

U is a leaving group which can be split off under alkaline conditions.

5,532,346

HYDROXYNAPHTHALENECARBOXYLIC ACID COMPOUNDS AND AZO COLORANTS MADE THEREFROM

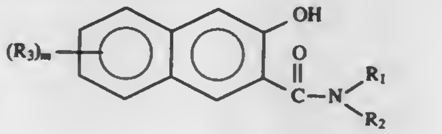
Patrick D. Moore, Pacolet; Michael A. Valenti, Taylors, and Richard A. VanDahm, Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 21, 1994, Ser. No. 327,375

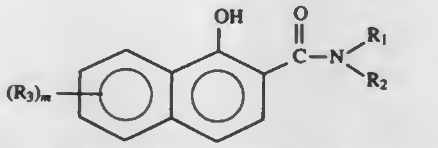
Int. Cl.^{6} C09B *29/20;67/22*

U.S. Cl. 534—729 **14 Claims**

1. A coupling component selected from the group consisting of compounds having the formula:



I



II

wherein R_1 is Y or arylene-$(Y)_n$, where n is an integer from 1–4; R_2 is H, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, aryl, or Y; provided that if R_1 is arylene-$(Y)_n$, then R_2 is not aryl; R_3 is C_1– C_4 alkyl, C_1–C_4 alkoxy, SO_3H, Br, Cl, OH, or NO_2 and m is an integer from 0–3; and Y is a poly(oxyalkylene) substituent having from 4–200 oxyalkylene units which are the addition products of compounds selected from the group consisting of ethylene oxide and propylene oxide.

5,532,347

DNA ENCODING α MELANOCYTE STIMULATING HORMONE RECEPTOR

Roger D. Cone, Oregon City, and Kathleen G. Mountjoy, Portland, both of Oreg., assignors to State of Oregon, Acting by and Through the Oregon State Board of Higher Education on behalf of the Oregon Health Sciences University, a non-profit organization, Potland, Oreg.

Filed Apr. 10, 1992, Ser. No. 866,979

Int. Cl.^{6} C07H *21/04;* **C07K** *14/72;* **C12N** *5/10;15/12;15/63*

U.S. Cl. 536—23.5 **8 Claims**

1. An isolated DNA molecule encoding a mammalian melanocyte stimulating hormone receptor, wherein the encoded melanocyte stimulating hormone receptor has a predicted isoelectric point of about 8 to about 9, a predicted molecular weight of about 34 kilodaltons, and which activates cAMP production in response to a melanotropic peptide selected from the group consisting of NDP-MSH, αMSH and ACTH.

5,532,348

E6 ASSOCIATED PROTEIN AND METHODS OF USE THEREOF

Jon M. Huibregtse, Brighton, Mass.; Martin Scheffner, Walldorf, Germany, and Peter M. Howley, Wellesley, Mass., assignors to United States of America, Washington, D.C.

Filed Jul. 30, 1993, Ser. No. 100,692

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.5 **5 Claims**

1. A DNA construct encoding E6 Associated Protein which comprises the following operably linked elements:

a transcriptional promoter;

a DNA sequence encoding E6 Associated Protein; and

a transcriptional terminator;

wherein said E6 Associated Protein is a polypeptide which comprises an amino acid subsequence of at least six contiguous amino acids of SEQ ID NO:3 and has at least one of the following properties: (1) stably associates with wild-type p53 in the presence of HPV16 E6, (2) stimulates the association of HPV16 E6 with p53, and (3) stably associates with a high risk HPV E6 protein in the absence of p53.

5,532,349

PROCESS FOR PRODUCING 1-(2'-DEOXY-β-D-ERYTHRO-PENTOFURANOSYL)-5-TRIFLUOROMETHYLURACIL DERIVATIVES

Nobuya Kawauchi, Yokohama; Nobuyuki Fukazawa, Mobara; Hiroki Ishibashi, Mobara, and Kengo Otsuka, Mobara, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

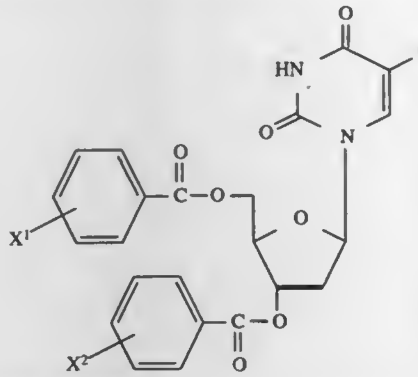
Filed Jul. 15, 1994, Ser. No. 275,455

Claims priority, application Japan, Jul. 20, 1993, 5-179415; Jul. 20, 1993, 5-179416

Int. Cl.^{6} C09H *19/073;* **A01K** *31/70*

U.S. Cl. 536—55.3 **8 Claims**

1. A process for producing 1-(2'-deoxy-β-D-erythro-pentofuranosyl)-5-trifluoromethyluracil derivative of the formula (3)

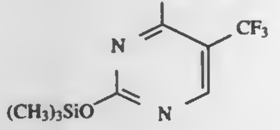


(3)

comprising the steps of:

(a) reacting 5-trifluoromethyl-5,6-dihydrouracil with alkylsulfoxide in the presence of a halogen and an acid catalyst to obtain 5-trifluoromethyluracil;

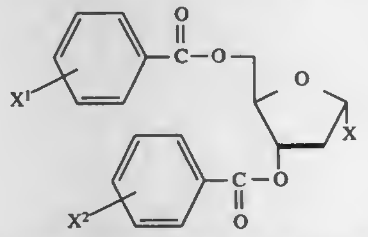
(b) reacting the obtained 5-trifluoromethyluracil with a silylating agent to obtain 5-trifluoromethyl-2,4-bis(trimethylsilyloxy)pyrimidine of the formula (1)



(1)

and

(c) reacting the obtained 5-trifluoromethyl-2,4-bis(trimethylsilyloxy)pyrimidine with 2-deoxy-α-D-erythro-pentofuranosyl halide derivative of the formula (2)



(2)

(wherein X represents a halogen atom, and X^1 and X^2, the same or different, represent hydrogen or a halogen atom) in chloroform solvent in the presence of fluoride ion and in the presence of a copper compound as a catalyst.

5,532,350

CROSSLINKED POLYSACCHARIDES USEFUL AS ABSORBENT MATERIALS

Ian W. Cottrell, Yardley, Pa.; Animesh Goswami, Plainsboro, and Manjit S. Chowdhary, New City, both of N.J., assignors to Rhone-Poulenc Inc., Cranbury, N.J.

Filed Feb. 15, 1994, Ser. No. 196,357

Int. Cl.^{6} C08B *3/06;3/22*

U.S. Cl. 536—76 **25 Claims**

1. A solid composition of matter comprising one or more water-insoluble polygalactomannans which has been cross-linked with either titanium or zirconium cross-linking agents or mixtures thereof.

5,532,351

NUCLEIC ACID SEQUENCES ENCODING OMGP

Kari Stefansson, Chicago, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Continuation of Ser. No. 551,267, Jul. 12, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 183,588

Int. Cl.^{6} C07H *17/00;* **C12P** *21/06;* **C12N** *15/00*

U.S. Cl. 536—23.5 **2 Claims**

1. An isolated nucleic acid that encodes the amino acid sequence set forth in FIG. 1A, FIG. 1B, and FIG. 1C and degenerate variants of said nucleic acid sequence.

5,532,352

SELECTIVE CROSSLINKING OF HEMOGLOBIN BY OXIDIZED, RING-OPENED SACCHARIDES

Diana Pliura, Mississauga; Lawrence T. Wong, North York, and Song S. Er, Scarborough, all of, Canada, assignors to Hemosol Inc., Toronto, Canada

Continuation-in-part of Ser. No. 31,830, Mar. 16, 1993, abandoned. This application Apr. 21, 1994, Ser. No. 231,945

Int. Cl.^{6} C07D *487/22;* **C07K** *15/22*

U.S. Cl. 540—145 **14 Claims**

1. A process of chemically modifying hemoglobin to obtain an oxygen transporting modified hemoglobin which is free from hemoglobin aggregates of molecular weight higher than 600,000 daltons and which is suitable for use as the oxygen transporter in a blood substitute in aqueous solution, which comprises:

(a) subjecting a di/tri-saccharide to an oxidative ring opening process to produce a polyaldehyde therefrom;

(b) adjusting and maintaining the pH of the resulting product solutions to a value in the range from about 5.0–7.0, so as to prevent any substantial hydrolytic degradation of the polyaldehyde so formed;

(c) reacting the product of process step (b) with hemoglobin in solution, at a stoichiometric ratio based upon di/tri-saccharide and hemoglobin tetramers, of from about 1:1–4:1;

(d) reducing the Schiff base linkages so formed to secondary amine linkages; and

(e) recovering the modified hemoglobin so formed.

5,532,353

PROCESS FOR THE PREPARATION OF HALOGENATED β-LACTAM COMPOUNDS

Marco Da Col, Bologna; Leone Dall'Asta, Pavia; Irene Resta, Milan; Gianfranco Cainelli, Bologna; Michele Contento, Bologna; Mauro Panunzio, Bologna, and Achille Umani Ronchi, Bologna, all of, Italy, assignors to Biochimica Opos SpA, Milan, Italy

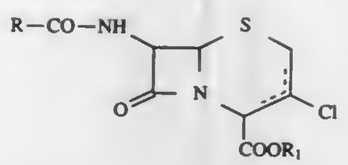
Filed May 10, 1993, Ser. No. 58,714

Claims priority, application Italy, May 11, 1992, MI92A1125

Int. Cl.^{6} C07D *501/02*

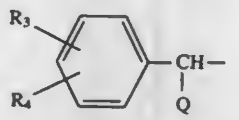
U.S. Cl. 540—215 **22 Claims**

1. Process for the preparation of a 3-chlorocephem, as a mixture of Δ^2 and Δ^3 isomers, of formula (I)



wherein

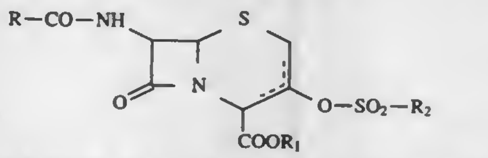
—R is an alkyl group of from 1 to 6 carbon atoms, a haloalkyl of from 1 to 3 carbon atoms, a cyanoalkyl of from 1 to 3 carbon atoms, a phenyl, methylphenyl, nitrophenyl, methoxyphenyl, phenylthiomethyl, benzyl, or a substituted benzyl group having the structure (i)



wherein R_3 and R_4, independently, represent hydrogen, alkyl of from 1 to 4 carbon atoms, alcoxy of from 1 to 4 carbon atoms, halogen, hydroxy or a nitro group and Q is a hydroxy or a protected carboxyl group or an amino group protected by an urethane-like protecting group selected from the group consisting of t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, benzyloxycarbonyl and p-nitrobenzyloxycarbonyl, by an enamine affording compound selected from the group consisting of ethylacetoacetate and acetylacetone or by a trityl group; and

—R_1 represents benzyl, 4-methoxybenzyl, 4-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl or t-butyl,

which comprises treating a 3-sulfonyloxy-3-cephem or a mixture of Δ^2 and Δ^3 isomers of formula (II)



(II)

wherein R and R_1 are as defined above and R_2 is an alkyl group containing from 1 to 6 carbon atoms, a phenyl, halophenyl group or a phenyl group substituted with an alkyl containing from 1 to 3 carbon atoms or a nitrophenyl, 2-pyridyl, 3-pyridyl or 4-pyridyl group, with a chlorine ions donor in an aprotic solvent and in the presence of a base.

5,532,354
INTERMEDIATES FOR CEPHEM COMPOUNDS

Hideaki Yamanaka, Hirakata; Yoshiki Yoshida, Suita; Jiro Goto, Suita; Takeshi Terasawa; Shinya Okuda, both of Ikeda, and Kazuo Sakane, Kawanishi, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

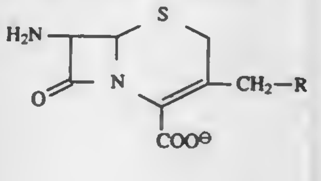
Division of Ser. No. 63,982, May 20, 1993, Pat. No. 5,401,734, which is a division of Ser. No. 885,252, May 20, 1992, Pat. No. 5,244,890, which is a continuation of Ser. No. 354,228, May 19, 1989, abandoned. This application Nov. 29, 1994, Ser. No. 350,065

Claims priority, application United Kingdom, Jun. 6, 1988, 8813308; Jun. 15, 1988, 8814196; Nov. 1, 1988, 8825518

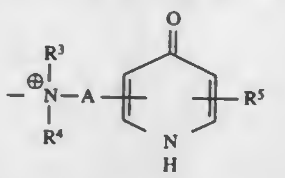
Int. Cl.⁶ C07D *501/18*

U.S. Cl. 540—225 **8 Claims**

1. A compound of the formula:



wherein R is a group of the formula:



(in which R^3 and R^4 are each lower alkyl, or

R^3 and R^4 are linked together to form C_3–C_6 alkylene,

A is lower alkylene, and

R^5 is hydroxy or a protected hydroxy group), or a salt thereof.

5,532,355
CARBAMATES OF RAPAMYCIN

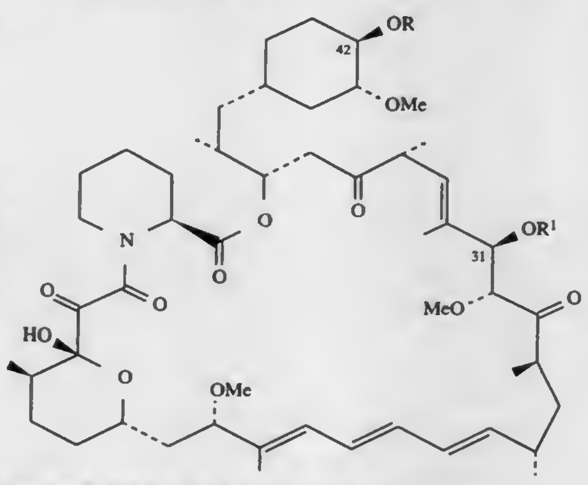
Jerauld S. Skotnicki, Allentown, N.J.; Yvette L. Palmer, Newtown, Pa.; Wenling Koa, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 259,701, Jun. 14, 1994, Pat. No. 5,434,260, which is a continuation of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,012

Int. Cl.⁶ C07D *498/16;* A61K *31/395*

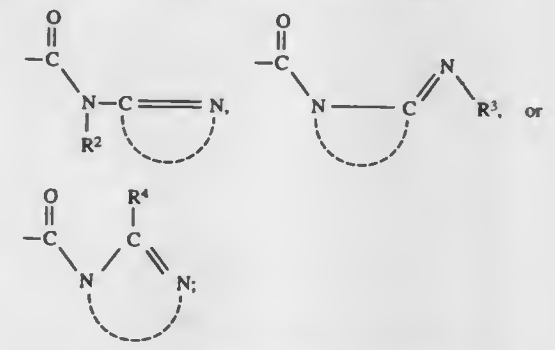
U.S. Cl. 540—456 **8 Claims**

1. A compound of the structure



II

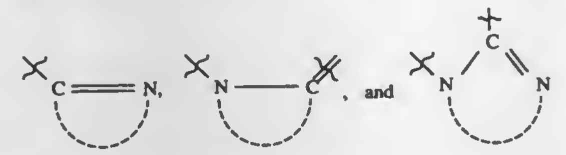
wherein R and R^1 are each, independently, hydrogen,



R^2 and R^3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CO_2R^5$, $—COR^5$, —CN, $—NO_2$, $—SO_2R^5$, $—SO_3R^5$, $—OR^5$, $—SR^5$, or Ar;

R^4 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2-7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CF_3$, $—NR^5R^6$, $—CO_2R^5$, $—COR^5$, $CONR^5R^6$, $—NO_2$, halogen, $—OR^5$, $—SR^5$, —CN, $—SO_2R^5$, $—SO_3R^5$, $—SO_2NR^5R^6$, or Ar;

R^5 and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, or Ar;



are each, independently, a heterocyclic radical selected from the group consisting of pyrrolyl, 3,4-dihydropyrrolyl, pyrrolidinyl, pyrazolyl, imidazolyl, 4,5-dihydroimidazolyl, 2-pyrazolinyl, 1,2,4-triazolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, pyridinyl, 1,2,3,6-tetrahydropyridinyl, piperidinyl, pyridazinyl, pyrimidinyl, 1,4,5,6-tetrahydropyrimidinyl, pyrazinyl, piperazinyl, 1,3,5-triazinyl, hexahydro-1,3,5-triazinyl, 1,2,4-triazinyl, 1,3,2-oxazinyl, 1,4-oxazinyl, morpholinyl, azepinyl, indolyl, indolinyl, indolenyl, benzoxazolyl, quinolinyl, 1,2,3,4-tetrahydroquinolinyl, 5,6,7,8-tetrahydroquinolinyl, isoquinolinyl, 3,4-dihydroisoquinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, and 5,6,7,8-tetrahydroisoquinolinyl, wherein the heterocyclic radical may be optionally substituted by R^7;

R^7 is alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CF_3$, $—NR^5R^6$, $—CO_2R^5$, $—COR^5$, $CONR^5R^6$, $—NO_2$, halogen, $—OR^5$, $—SR^5$, —CN, $—SO_2R^5$, $—SO_3R^5$, $—SO_2NR^5R^6$, or Ar;

Ar is phenyl, naphthyl, or hetaryl, wherein the foregoing may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoromethoxy, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, $—SO_3H$, and $—CO_2H$;

hetaryl is a heterocyclic radical selected from the group consisting of furanyl, thiophenyl, pyrrolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2-dithiolyl, 1,3-dithiolyl, 1,2,3-oxathiolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, 1,2,3-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3,4-oxatriazolyl, 1,2,3,5-oxatriazolyl, 1,2,3-dioxazolyl, 1,2,4-dioxazolyl, 1,3,2-dioxazolyl, 1,3,4-dioxazolyl, 1,2,5-oxathiazolyl, 1,3-oxathiolyl, 1,2-pyranyl, 1,4-pyranyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,4-triazinyl, 1,2,3-triazinyl, 1,2,4-oxazinyl, 1,3,2-oxazinyl, 1,2,6-oxazinyl, 1,4-oxazinyl, isoxazinyl, 1,2,5-oxathiazinyl, 1,4-oxazinyl, o-isoxazinyl, p-isoxazinyl, 1,2,5-oxathiazinyl, 1,2,6-oxathiazinyl, 1,3,5,2-oxadiazinyl, azepinyl, oxepinyl, thiepinyl, 1,2,4-diazepinyl, benzofuranyl, isobenzofuranyl, thionaphthenyl, indolyl, indolenyl, 2-isobenzazolyl, 1,5-pyrindinyl, pyrano[3,4-b]pyrrolyl, benzpyrazolyl, benzisoxazolyl, benzoxazolyl, anthranilyl, 1,2-benzopyranyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazolinyl, naphthyridinyl, pyrido[3,4-b]pyridinyl, pyrido[4,3-b]pyridinyl, pyrido[2,3-b]pyridinyl, 1,3,2-benzozazinyl, 1,4,2-benzoxazinyl, 2,3,1-benzoxazinyl, 3,1,4-benzoxazinyl, 1,2-benzisoxazinyl, 1,4-benzisoxazinyl, carbazolyl, purinyl, and a partially saturated heterocyclic radical selected from the foregoing; wherein the partially saturated heterocyclic radical contains at least one double bond:

with the proviso that R and R^1 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,532,356
METHOD FOR PREPARING N,N'-DISUBSTITUTED CYCLIC UREAS

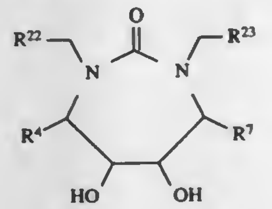
Thomas E. Smyser, and Pasquale N. Confalone, both of Wilmington, Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Filed Jun. 6, 1995, Ser. No. 469,409

Int. Cl.⁶ C07D *243/08;* A61K *31/55*

U.S. Cl. 540—492 **8 Claims**

1. A process for the preparation of a compound of formula (IV):



(IV)

wherein:

R^4 and R^7 are independently selected from the following groups:

C_1–C_8 alkyl substituted with 0–3 R^{11};

C_2–C_8 alkenyl substituted with 0–3 R^{11};

C_2–C_8 alkynyl substituted with 0–3 R^{11};

R^{11} is selected from one or more of the following:

H, keto, halogen, cyano, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, $—CO_2R^{13}$, $—OC({=}O)R^{13}$, $—OR^{13}$, $—S(O)_mR^{13}$, $—NHC({=}NH)NHR^{13}$, $—C({=}NH)NHR^{13}$, $—C({=}O)NR^{13}R^{14}$, $—NR^{14}C({=}O)R^{13}$, $={NOR^{14}}$, $—NR^{14}C({=}O)OR^{14}$, $—OC({=}O)NR^{13}R^{14}$, $—NR^{13}C({=}O)NR^{13}R^{14}$, $—NR^{14}SO_2NR^{13}R^{14}$, $—NR^{14}SO_2R^{13}$, $—SO_2NR^{13}R^{14}$, $—OP(O)(OR^{13})_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_6 cycloalkylmethyl, phenyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, C_1–C_4 bydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, pyridylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, $—OCH_2CO_2H$, 2-(1-morpholino) ethoxy, azido, $—C(R^{14}){=}N(OR^{14})$; or

C_3–C_{10} cycloalkyl substituted with 0–2 R^{12};

C_1–C_4 alkyl substitued with 0–2 R^{12};

aryl(C_1–C_3 alkyl)-, substituted with 0–2 R^{12};

C_2–C_6 alkoxyalkyl-, substituted with 0–2 R^{12};

C_1–C_4 alkylcarbonyloxy substituted with 0–2 R^{12};

C_6–C_{10} arylcarbonyloxy substituted with 0–2 R^{12};

a C_5–C_{14} carbocyclic residue substituted with 0–3 R^{12};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–3 R^{12};

R^{11A} is selected from one or more of the following:

H, keto, halogen, cyano, $—CH_2N(R^{13A})R(^{14A})$, $—OR^{13A}$ $—N(R^{13A})R(^{14A})$, $—CO_2H$, $—OC({=}O)$ (C_1–C_3 alkyl), —OH, C_2–C_6 alkoxyalkyl, $—C({=}O)NH_2$, $—OC({=}O)NH_2$, $-NHC({=}O)NH_2$, $—SO_2NH_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, C_3–C_6 cycloalkoxy, C_1—C_4 alkyl substituted with $—NH_2$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, $—OCH_2CO_2H$, 2-(1-morpholino)ethoxy, azido, aryl(C_1–C_3 alkyl); or

C_3–C_{10} cycloalkyl substituted with 0–2 R^{12A}, C_1–C_4 alkyl substituted with 0–2 R^{12A}, aryl(C_1–C_3 alkyl)- substituted with 0–2 R^{12A};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system substituted with 0–3 R^{12A}; or

$—SO_mR^{13A}$, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxy, C_2–C_4 alkynyl, phenyl, said phenyl being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH; or alternately, R^{11A} and R^{16}, when substituents on adjacent carbons, can be taken together with the carbon atoms to which they are attached to form a 5–6 membered carbocyclic or heterocyclic ring system, said carbocyclic or heterocyclic ring system being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH;

R^{12}, when a substituent on carbon, is selected from one or more of the following:

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, —CO_2H, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, —OR^{13}, —$NR^{13}R^{14}$, C_1–C_4 alkyl substituted with —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl optionally substituted with —$Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$S(O)_mR^{13}$, —$SO_2NR^{13}R^{14}$, —$NHSO_2R^{14}$, —$OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, —$C(R^{14})$═$N(OR^{14})$; or

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;

or R^{12} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —$NR^{13}R^{14}$; or

when R^{12} is attached to a saturated carbon atom, it may be ═O or ═S; or when R^{12} is attached to sulfur it may be ═O.

R^{12}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, —$C(R^{14})$═$N(OR^{14})$;

R^{12A}, when a substituent on carbon, is selected from one or more of the following:

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, —CO_2H, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, —OR^{13A}, C_2–C_6 alkoxyalkyl optionally substituted with —$Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$S(O)_mMe$, —SO_2NH_2, —$NHSO_2Me$, —$OCH_2CO_2R^{13A}$, 2-(1-morpholino) ethoxy; or

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur; or

R^{12A} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —NH_2; or,

when R^{12A} is attached to a saturated carbon atom, it may be ═O or ═S; or when R^{12A} is attached to sulfur it may be ═O.

R^{12A}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl;

R^{13} is independently selected from:

H;
heterocycle substituted with 0–3 R^{11A} and 0–1 R^{16};
phenyl substituted with 0–3 R^{11A};
benzyl substituted with 0–3 R^{11A};
C_1–C_6 alkyl substituted with 0–3 R^{11A};
C_2–C_4 alkenyl substituted with 0–3 R^{11}A;
C_1–C6 alkylcarbonyl substituted with 0–3 R^{11A};
C_1–C6 alkoxycarbonyl substituted with 0–3 R^{11A};
C_1–C6 alkylaminocarbonyl substituted with 0–3 R^{11}A;
C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11A};
an amine protecting group when R^{13} is bonded to N;
a hydroxyl or carboxyl protecting group when R^{13} is bonded to O;

R^{14} is independently selected from:

hydrogen, C_1–C_6 alkoxy, C_2–C_6 alkenyl, phenyl, benzyl, an amine protecting group when R^{14} is bonded to N, a hydroxyl or carboxyl protecting group when R^{14} is bonded to O; and C_1–C_6 alkyl substituted with 0–3 groups selected from OH, C_1–C_4 alkoxy, halogen,

R^{13} and R^{14} can alternatively join to form —$(CH_2)_4$—, —$(CH_2)_5$, —$CH_2CH_2N(R^{15})CH_2CH_2$—, or —$CH_2CH_2OCH_2CH_2$—;

R^{13A} and R^{14A} are independently selected from: H, C_1–C_6 alkyl;

R^{13A} and R^{14A} can alternatively join to form —$(CH_2)_4$—, —$(CH_2)_5$, —$CH_2CH_2N(R^{15})CH_2CH_2$—, or —$CH_2CH_2OCH_2CH_2$—;

R^{15} is H or CH_3;

R16 is independently selected from:

halogen, —CN, —NO_2, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxy, C_1–C_6 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, phenethyl, phenoxy, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_2–C_6 alkoxyalkyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, benzyloxy, C_3–C_6 cycloalkoxy, or phenyl, said phenyl being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH, or

alternately, R^{11A} and R^{16}, when substituents on adjacent carbons, can be taken together with the carbon atoms to which they are attached to form a 5–6 membered carbocyclic or heterocyclic ring system, said carbocyclic or heterocyclic ring system being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH;

R^{20} and R^{21} are independently selected from:

C_1–C_6 alkyl substituted with 0–3 R^{11};
C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11};
C_1–C_6 alkylcarbonyl substituted with 0–3 R^{11};
C_1–C_6 alkoxycarbonyl substituted with 0–3 R^{11};
C_1–C_6 alkylaminocarbonyl substituted with 0–3 R^{11};
benzoyl substituted with 0–3 R^{12};
phenoxycarbonyl substituted with 0–3 R^{12};
phenylaminocarbonyl substituted with 0–3 R^{12};
a hydroxyl protecting; or
any group that, when administered to a mammalian subject, cleaves to form a free hydroxyl group;

R^{20} and R^{21} may also be taken together along with the oxygen atoms to which they are attached to form a group selected from the group consisting of:

—O—(—$CH_2CH_2CH_2CH_2CH_2$—)—O—, —O—$C(CH_2CH_3)_2$—O—, —O—$C(CH_3)$ (CH_2CH_3)—O—, —O—$C(CH_2CH_2CH_2CH_3)_2$—O—, —O—$C(CH_3)$ $(CH_2CH(CH_3)CH_3)$—O—, —O—CH (phenyl)—O—, —OCH_2SCH_2O—, —OCH_2OCH_2O—, —OS (═O)O—, —OC(═O)O—, —OCH_2O—, —OC(═S)O—, —$OS(═O)_2O$—, —OC(═O)C(═O)O—, —$OC(CH_3)_2O$—, and —$OC(OCH_3)$ $(CH_2CH_2CH_3)O$—;

m is 0, 1 or 2;

R^{22} is selected from the following:

C_1–C_8 alkyl substituted with 0–3 R^{31};
C_2–C_8 alkenyl substituted with 0–3 R^{31};
C_2–C_8 alkynyl substituted with 0–3 R^{31};
a C_3–C_{14} carbocyclic ring system substituted with 0–5 R^{31} and 0–5 R^{32};
a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{32};

R^{23}=R^{22};

R^{31} is selected from one or more of the following:

—OH, C_1–C_4 alkoxy, —CO_2R^{15}, —COR^{15}, keto, halogen, cyano, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, —CO_2R^{13}, —$C(═O)R^{11}$, —$OC(═O)R^{13}$, —OR^{13}, C_2–C_6 alkoxyalkyl, —$S(O)_mR^{13}$, —$NHC(═NH)NHR^{13}$, —$C(═NH)NHR^{13}$, —$C(═O)NR^{13}R^{14}$, —$NR^{14}C(═O)R^{13}$, ═NOR^{14}, —$NR^{14}C(═O)OR^{14}$, —OC (═O) $NR^{13}R^{14}$, —$NR^{13}C(═O)NR^{13}R^{14}$, —$NR^{13}C(═S)$ $NR^{13}R^{14}$, —$NR^{14}SO_2NR^{13}R^{14}$, —$NR^{14}SO_2R^{13}$, —$SO_{2NR}{}^{13}R^{14}$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, oxime, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with —$NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$OCH_2CO_2R^{13}$, 2-(1-morpholino) ethoxy, azido, —$C(R^{14})$═$N(OR^{14})$; or

a C_5–C_{14} carbocyclic residue substituted with 0–5 R^{32}; or

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{32};

R^{32}, when a substituent on carbon, is selected from one or more of the following:

phenethyl, phenoxy, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, hydrazide, oxime, boronic acid, C_2–C_6 alkoxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 alkylcarbonyloxy, —$NHSO_2R^{14}$, benzyloxy, halogen, 2-(1-morpholino)ethoxy, —CO_2R^{13}, hydroxamic acid, —$CONR^{13}NR^{13}R^{14}$, cyano, sulfonamide, —CHO, C_3–C_6 cycloalkoxy, —$NR^{13}R^{14}$, —$C(R^{14})$═$N(OR^{14})$, —NO_2, —OR^{13}, —$NR^{40}R^{41}$, SO_mR^{13}, —$SO_mNR^{13}R^{14}$, —$C(═O)NR^{13}R^{14}$, —$OC(═O)NR^{13}R^{14}$, —$C(═O)R^{11}$, —$OC(═O)R^{11}$, —$B(OH)_2$, OCO_2R^{13}, phenyl, —$C(═O)NR^{13}$—(C_1–C_4 alkyl)—$NR^{13}R^{14}$, —$C(═O)NR^{40}R^{41}$, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_2–C_4 haloalkenyl, C_1–C_4 haloalkynyl; or

—$C(═O)NR^{13}C(R^{11})_2NR^{13}R^{14}$, —$C(═O)NR^{13}C(R^{11})_2NR^{13}CO_2R^{13}$, —$C(═O)NR^{13}$—($C_1$–$C_4$ alkyl)—$NR^{13}CO_2R^{13}$, —$C(═O)N(R^{13})$—(C_1–C_4 alkyl)—R^{11}, —$C(═O)C(R^{11})_2NR^{13}R^{14}$, —$C(═O)C(R^{11})_2NR^{13}CO_2R^{13}$, —C(═O)—($C_1$–$C_4$ alkyl) —$NR^{13}R^{14}$, —C(═O)—(C_1–C_4 alkyl) —$NR^{13}CO_2R^{13}$; or

—$(CH_2)_pOR^{13}$, —$(CH_2)_pNHR^{13}$, —$(CH_2)_pCONHR^{13}$, —$(CH_2)_pSO_2NHR^{13}$, —$(CH_2)_nNHCOR^{13}$, —$(CH_2)_pNHCO_2R^{13}$, —$(CH_2)_nOCONHR^{13}$, —$(CH_2)_pNHCONHR^{13}$, —$(CH_2)_pC(═NH)NHR^{13}$; or

C_1–C_4 alkoxy substituted with 0–4 groups selected from: R^{11} , C_3–C_6 cycloalkyl, —CO_2R^{13}, —$C(═O)NR^{13}R^{14}$, —$NR^{13}R^{14}$ or OH; or

C_1–C_4 alkyl substituted with 0–4 groups selected from: R^{11}, ═NR^{14}, ═$NNR^{13}C(═O)NR^{13}R^{14}$, ═$NNR^{13}C(═O)OR^{13}$, or —$NR^{13}R^{14}$: or

C_2–C_4 alkenyl substituted with 0–4 R^{11}, C_2–C_4 alkynyl substituted with 0–4 R^{11}; or

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, substituted with 0–2 R^{12}; or

or R^{32} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —$NR^{13}R^{14}$;

or, when R^{32} is attached to a saturated carbon , it may be ═O, ═S, ═NOH;

or when R^{32} attached to sulfur it may be ═O;

p is 0, 1, or 2

n is 1 or2;

R^{32}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, —$C(R^{14})$═$N(OR^{14})$;

R^{40} is selected from: H, C_1–C3 alkyl; and

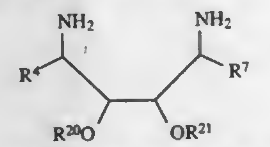
R^{41} is selected from:

—$C(═O)NR^{13}R^{14}$;
—C(═O) $NR^{13}NR^{13}R^{14}$;
—$C(═O)C(R^{11})_2NR^{13}R^{14}$;
—$C(═O)C(R^{11})_2NR^{13}NR^{13}R^{14}$;
—$C(═O)C(R^{11})_2NR^{13}CO_2R^{13}$;
—C(═O)H;
—$C(═O)R^{11}$;
—C(═O)—(C_1–C_4 alkyl)—$NR^{13}R^{14}$;
—C(═O)—(C_1–C_4 alkyl) —$NR^{13}CO_2R^{13}$;
1–3 amino acids linked together via amide bonds, and linked to the N atom via the carboxylate terminus;

provided that functional groups in R^4, R^7, R^{22} and R^{23} that are reactive in steps (1) and (2) below are protected with protecting groups which are removed or converted to the desired functional group in accordance with step (3) below;

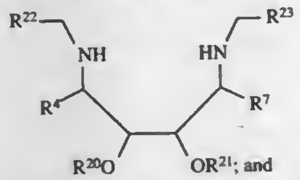
said process comprising one or more of the steps of:

step (1): contacting an amine of formula (I):



(I)

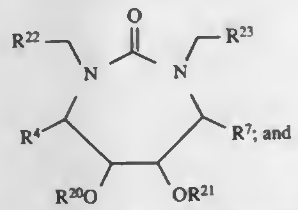
in a suitable solvent with at least two molar equivalents of an aldehyde R^{22}—CHO or R^{23}—CHO, in the presence of at least one molar equivalent of an acid and at least two molar equivalents of a suitable imine reducing agent for a period of time sufficient to form a compound of formula (II):



(II)

; and

step (2): contacting the secondary amine of formula (II) in a suitable aprotic solvent at a suitable temperature in the presence of at least one molar equivalent of a hindered amine base with at least 0.3 molar equivalents of a suitable cyclizing agent at a suitable rate and for a suitable period of time to form a compound of formula (III):



(III)

; and

step (3): contacting the cyclic urea of formula (III) in a suitable solvent with one or more reagents or conditions or a combination or reagents or conditions for a period of time sufficient to effect the conversion of R^{20} and R^{21} to H and the deprotection or conversion of functional groups in R^4, R^7, R^{22} and R^{23} to the desired functional group in R^4, R^7, R^{22} and R^{23} to form the desired compound of formula (IV).

5,532,357

METHOD FOR PREPARING N-MONOSUBSTITUTED AND N,N'-DISUBSTITUTED UNSYMMETRICAL CYCLIC UREAS

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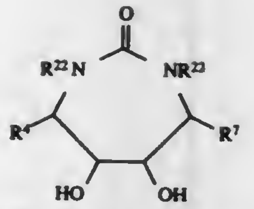
Filed Jun. 7, 1995, Ser. No. 481,683

Int. Cl.^{6} C07D *243/08;* **A61K** *31/55*

U.S. Cl. 540—492 **11 Claims**

1. A process for the preparation of a compound of the formula (VIb):



(VIb)

or pharmaceutically acceptable salts or prodrug forms thereof wherein:

R^4 and R^7 are the same and are selected from the group consisting of:

C_1–C_8 alkyl substituted with 0–3 R^{11}; C_2–C_8 alkenyl substituted with 0–3 R^{11}; and C_2–C_8 alkynyl substituted with 0–3 R^{11};

R^{11} is independently selected at each occurrence from the group consisting of;

H, keto, halogen, cyano, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, —CO_2R^{13}, —$OC(=O)R^{13}$, —OR^{13}, —$S(O)_mR^{13}$, —$NHC(=NH)NHR^{13}$, —$C(=NH)NHR^{13}$, —$C(=O)NR^{13}R^{14}$, —$NR^{14}C(=O)R^{13}$, —NOR^{14}, —$NR^{14}C(=O)OR^{14}$, —$OC(=O)NR^{13}R^{14}$, —$NR^{13}C(=O)NR^{13}R^{14}$, —$NR^{14}SO_2NR^{13}R^{14}$, —$NR^{14}SO_2R^{13}$, —$SO_2NR^{13}R^{14}$, —$OP(O)(OR^{13})_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_6 cycloalkylmethyl, phenyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with —$NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, pyridylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —OCH_2CO_2H, 2-(1-morpholino)ethoxy, azido, —$C(R^{14})=N(OR^{14})$;

C_3–C_{10} cycloalkyl substituted with 0–2 R^{12};

C_1–C_4 alkyl substitued with 0–2 R^{12};

aryl(C_1–C_3 alkyl)-, substituted with 0–2 R^{12};

C_2–C_6 alkoxyalkyl-, substituted with 0–2 R^{12};

C_1–C_4 alkylcarbonyloxy substituted with 0–2 R^{12};

C_6–C_{10} arylcarbonyloxy substituted with 0–2 R^{12};

a C_5–C_{14} carbocyclic residue substituted with 0–3 R^{12}; and

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–3 R^{12};

R^{11A} is independently selected at each occurrence from the group consisting of;

H, keto, halogen, cyano, —$CH_2N(R^{13A})R(^{14A})$, —OR^{13A} —$N(R^{13A})R(^{14A})$, —CO_2H, —$OC(=O)$ (C_1–C_3 alkyl) , —OH, C_2–C_6 alkoxyalkyl, —$C(=O)NH_2$, —$OC(=O)NH_2$, —$NHC(=O)NH_2$, —SO_2NH_2, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with —NH_2, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —OCH_2CO_2H, 2-(1-morpholino)ethoxy, azido, aryl(C_1–C_3 alkyl);

C_3–C_{10} cycloalkyl substituted with 0–2 R^{12A}, C_1–C_4 alkyl substituted with 0–2 R^{12A}, aryl(C_1–C_3 alkyl)- substituted with 0–2 R^{12A};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system substituted with 0–3 R^{12A};

—SO_mR^{13A}, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxy, C_2–C_4 alkynyl, phenyl, said phenyl being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH; and

R^{11A} and R^{16}, when substituents on adjacent carbons, can be taken together with the carbon atoms to which they are attached to form a 5–6 membered carbocyclic or heterocyclic ring system, said carbocyclic or heterocyclic ring system being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, NH_2 or OH;

R^{12}, when a substituent on carbon, is independently selected at each occurrence from the group consisting of;

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, —CO_2H, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, —OR^{13}, —$NR^{13}R^{14}$, C_1–C_4 alkyl substituted with —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl optionally substituted with —$Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$S(O)_mR^{13}$, —$SO_2NR^{13}R^{14}$, —$NHSO_2R^{14}$, —$OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, —$C(R^{14})=N(OR^{14})$;

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;

or R^{12} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —$NR^{13}R^{14}$; and

when R^{12} is attached to a saturated carbon atom, it may be $=O$ or $=S$; or when R^{12} is attached to sulfur it may be $=O$.

R^{12}, when a substituent on nitrogen, is independently selected at each occurrence from the group consisting of;

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, and —$C(R^{14})=N(OR^{14})$;

R^{12A}, when a substituent on carbon, is independently selected at each occurrence from the group consisting of;

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, —CO_2H, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, —OR^{13A}, C_1–C_4 alkyl substituted with —NH_2, —NH_2, —NHMe, C_2–C_6 alkoxyalkyl optionally substituted with —$Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$S(O)_mMe$, —SO_2NH_2, —$NHSO_2Me$, —$OCH_2CO_2R^{13A}$, 2-(1-morpholino)ethoxy;

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;

R^{12A} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —NH_2; and

when R^{12A} is attached to a saturated carbon atom, it may be $=O$ or $=S$; or when R^{12A} is attached to sulfur it may be $=O$.

R^{12A}, when a substituent on nitrogen, is independently selected at each occurrence from the group consisting of;

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, —CO_2H, C_1–C_4 alkylcarbonyloxy, and C_1–C_4 alkylcarbonyl;

R^{13} is independently selected at each occurrence from the group consisting of;

H; heterocycle substituted with 0–3 R^{11A} and 0–1 R^{16}; phenyl substituted with 0–3 R^{11A}; benzyl substituted with 0–3 R^{11A}; C_1–C_6 alkyl substituted with 0–3 R^{11A}; C_2–C_4 alkenyl substituted with 0–3 R^{11A}; C_1–C_6 alkylcarbonyl substituted with 0–3 R^{11A}; C_1–C_6 alkoxycarbonyl substituted with 0–3 R^{11A}; C_1–C_6 alkylaminocarbonyl substituted with 0–3 R^{11A}; C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11A}; an amine protecting group when R^{13} is bonded to N; and

a hydroxyl protecting group when R^{13} is bonded to O;

R^{14} is independently selected at each occurrence from the group consisting of;

hydrogen, C_1–C_6 alkoxy, C_2–C_6 alkenyl, phenyl, benzyl, an amine protecting group when R^{14} is bonded to N, a hydroxyl or carboxyl protecting group when R^{14} is bonded to O; and C_1–C_6 alkyl substituted with 0–3 groups selected from OH, C_1–C_4 alkoxy, halogen,

R^{13} and R^{14} can alternatively join to form —$(CH_2)_4$—, —$(CH_2)_5$—, —$CH_2CH_2N(R^{15})CH_2CH_2$—, or —$CH_2CH_2OCH_2CH_2$—;

R^{13A} and R^{14} are independently selected at each occurrence from the group consisting of:

H and C_1–C_6 alkyl;

R^{13A} and R^{14A} can alternatively join to form —$(CH_2)_4$—, —$(CH_2)_5$—, —$CH_2CH_2N(R^{15})CH_2CH_2$—, or —$CH_2CH_2OCH_2CH_2$—;

R^{15} is H or CH_3;

R^{16} is independently selected from:

halogen, —CN, —NO_2, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxy, C_1–C_6 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, phenethyl, phenoxy, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_2–C_6 alkoxyalkyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, benzyloxy, C_3–C_6 cycloalkoxy, or phenyl, said phenyl being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH; or

R^{11A} and R^{16}, when substituents on adjacent carbons, can be taken together with the carbon atoms to which they are attached to form a 5–6 membered carbocyclic or heterocyclic ring system, said carbocyclic or heterocyclic ring system being optionally substituted with Cl, F, Br, CN, NO_2, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy or OH;

m is 0, 1 or 2;

R^{22} and R^{23} are independently selected at each occurrence from the group consisting of;

C_1–C_8 alkyl substituted with 0–3 R^{31}; C_2–C_8 alkenyl substituted with 0–3 R^{31}; C_2–C_8 alkynyl substituted with 0–3 R^{31}; a C_3–C_{14} carbocyclic ring system substituted with 0–5 R^{31} and 0–5 R^{32}; and

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{32};

R^{31} is independently selected at each occurrence from the group consisting of;

—OH, C_1–C_4 alkoxy, —CO_2R^{15}, —COR^{15}, keto, halogen, cyano, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, —CO_2R^{13}, —$C(=O)R^{11}$, —$OC(=O)R^{13}$, —OR^{13}, C_2–C_6 alkoxyalkyl, —$S(O)_mR^{13}$, —$NHC(=NH)NHR^{13}$, —$C(=NH)NHR^{13}$, —$C(=O)NR^{13}R^{14}$, —$NR^{14}C(=O)R^{13}$, $=NOR^{14}$, —$NR^{14}C(=O)OR^{14}$, —$OC(=O)NR^{13}R^{14}$, —$NR^{13}C(=O)NR^{13}R^{14}$, —$NR^{13}C(=S)NR^{13}R^{14}$, —$NR^{14}SO_2NR^{13}R^{14}$, —$NR^{14}SO_2R^{13}$, —$SO_2NR^{13}R^{14}$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, oxime, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with —$NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, —$OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, azido, —$C(R^{14})=N(OR^{14})$;

a C_5–C_{14} carbocyclic residue substituted with 0–5 R^{32}; and

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{32};

R^{32}, when a substituent on carbon, is independently selected at each occurrence from the group consisting of;

phenethyl, phenoxy, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, hydrazide, oxime, boronic acid, C_2–C_6 alkoxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 alkylcarbonyloxy, —$NHSO_2R^{14}$, benzyloxy, halogen, 2-(1-morpholino)ethoxy, —CO_2R^{13}, hydroxamic acid, —$CONR^{13}NR^{13}R^{14}$, cyano, sulfonamide, —CHO, C_3–C_6 cycloalkoxy, —$NR^{13}R^{14}$, —$C(R^{14})=N(OR^{14})$, —NO_2, —OR^{13}, —$NR^{40}R^{41}$, —SO_mR^{13}, —$SO_mNR^{13}R^{14}$, —$C(=O)NR^{13}R^{14}$, —$OC(=O)NR^{13}R^{14}$, —$C(=O)R^{11}$, —$OC(=O)R^{11}$, —$B(OH)_2$, —OCO_2R^{13}, phenyl, —$C(=O)NR^{13}$—(C_1–C_4 alkyl)—$NR^{13}R^{14}$, —$C(=O)NR^{40}R^{41}$, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_2–C_4 haloalkenyl, C_1–C_4 haloalkynyl;

—$C(=O)NR^{13}C(R^{11})_2NR^{13}R^{14}$, —$C(=O)NR^{13}C(R^{11})_2NR^{13}CO_2R^{13}$, —$C(=O)NR^{13}$—($C_1$–$C_4$ alkyl)—$NR^{13}CO_2R^{13}$, —$C(=O)N(R^{13})$—(C_1–C_4 alkyl)—R^{11}, —$C(=O)C(R^{11})_2NR^{13}R^{14}$, —$C(=O)C(R^{11})_2NR^{13}CO_2R^{13}$, —$C(=O)$—($C_1$–$C_4$ alkyl)—$NR^{13}R^{14}$, —$C(=O)$—(C_1–C_4 alkyl)—$NR^{13}CO_2R^{13}$;

—$(CH_2)_pOR^{13}$, —$(CH_2)_pNHR^{13}$, —$(CH_2)_pCONHR^{13}$, —$(CH_2)_pSO_2NHR^{13}$, —$(CH_2)_nNHCOR^{13}$, —$(CH_2)_pNHCO_2R^{13}$, —$(CH_2)_nOCONHR^{13}$, —$(CH_2)_pNHCONHR^{13}$, —$(CH_2)_pC(=NH)NHR^{13}$;

C_1–C_4 alkoxy substituted with 0–4 groups selected from: R^{11}, C_3–C_6 cycloalkyl, —CO_2R^{13}, —$C(=O)NR^{13}R^{14}$, —$NR^{13}R^{14}$ or OH;

C_1–C_4 alkyl substituted with 0–4 groups selected from: R^{11}, $=NR^{14}$, $=NNR^{13}C(=O)NR^{13}R^{14}$, $=NNR^{13}C(=O)OR^{13}$, or —$NR^{13}R^{14}$;

C_2–C_4 alkenyl substinted with 0–4 R^{11}, C_2–C_4 alkynyl substituted with 0–4 R^{11};

a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, substituted with 0–2 R^{12};

R^{32} may be a 3- or 4- carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6- membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or —$NR^{13}R^{14}$;

when R^{32} is attached to a saturated carbon, it may be $=O$, $=S$, $=NOH$; and

when R^{32} is attached to sulfur it may be $=O$;

p is 0, 1, or 2

n is 1 or 2;

R^{32}, when a substituent on nitrogen, is independently selected at each occurrence from the group consisting of;

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, —$CH_2NR^{13}R^{14}$, —$NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, and —$C(R^{14})=N(OR^{14})$;

R^{40} is selected from: H or C_1–C_3 alkyl; and

R^{41} is selected from:

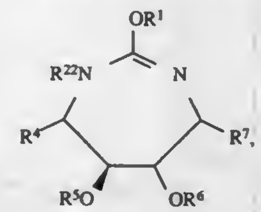
—$C(=O)NR^{13}R^{14}$; —$C(=O)NR^{13}NR^{13}R^{14}$; —$C(=O)C(R^{11})_2NR^{13}R^{14}$; —$C(=O)C(R^{11})_2NR^{13}NR^{13}R^{14}$; —$C(=O)C(R^{11})_2NR^{13}CO_2R^{13}$; —$C(=O)H$; —$C(=O)R^{11}$; —$C(=O)$—($C_1$–$C_4$ alkyl)—$NR^{13}R^{14}$; —$C(=O)$—(C_1–C_4 alkyl)—$NR^{13}CO_2R^{13}$; or

1–3 amino acids linked together via amide bonds, and linked to the N atom via the carboxylate terminus; and

all functional groups, such as amines, carboxyls, ketones, aldehydes, hydrazines, guanidines, hydroxaminc acids, alcohols, oximes, and thiols, that are reactive with the chemistry of this process are protected in such a form that the protecting groups may be kept or removed;

said process comprising the steps of:

step (3a): contacting a compound of the formula (II)



(III)

wherein:

R^1 is methyl or ethyl;

R^5 and R^6 are the same and are selected from the group consisting of:

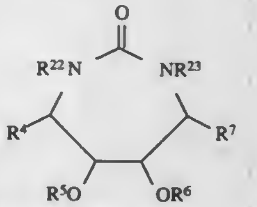
C_1–C_6 alkyl substituted with 0–3 R^{11}; C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11}; C_1–C_6 alkylcarbonyl substituted with 0–3 R^{11}; C_1–C_6 alkoxycarbonyl substituted with 0–3 R^{11}; C_1–C_6 alkylaminocarbonyl substituted with 0–3 R^{11}; benzoyl substituted with 0–3 R_{12}; phenoxycarbonyl substituted with 0–3 R^{12}; phenylaminocarbonyl substituted with 0–3 R^{12}; a hydroxyl protecting; and

any group that, when administered to a mammalian subject, cleaves to form a free hydroxyl group; or

R^5 and R^6 may alternatively be taken together, along with the oxygen atoms to which they are attached, to form a group selected from the group consisting of:

$—O—C—(CH_2CH_2CH_2CH_2CH_2—)—O—$, $—O—C(CH_2CH_3)_2—O—$, $—O—C(CH_3)(CH_2CH_3)—O—$, $—O—C(CH_2CH_2CH_2CH_3)_2—O—$, $—O—C(CH_3)(CH_2CH(CH_3)CH_3)—O—$, $—O—CH(phenyl)—O—$, $—OCH_2SCH_2O—$, $—OCH_2OCH_2O—$, $—OS({=}O)O—$, $—OC({=}O)O—$, $—OCH_2O—$, $—OC({=}S)O—$, $—OS({=}O)_2O—$, $—OC({=}O)C({=}O)O—$, $—OC(CH_3)_2O—$, and $—OC(OCH_3)\ (CH_2CH_2CH_3)_2O—$; and

all other substituents are as defined above; in an aprotic solvent with at least one molar equivalent of a nitrogen alkylating agent R^{23}-Z, wherein Z is leaving group such as halide or sulfonate and R^{23} is as defined above, for a period of time sufficient to form a compound of the formula (IV)



(IV)

which is optionally isolated; and

step (5): contacting a compound of the formula (IV) with a reagent or condition or combination of reagents and/or conditions for a period of time sufficient to effect the removal of R^5, R^6 and any protecting groups and/or to convert functional groups to their desired form to form a compound of the formula (VIb) which is isolated.

5,532,358

METHOD FOR PREPARING ALKYL-5,11-DIHYDRO-6H-DIPYRIDO[3,2-B:2',3'-E] [1,4] DIAZEPIN-6-ONES

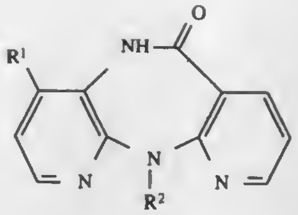
Terence A. Kelly, Ridgefield, Conn., assignor to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Filed Oct. 12, 1994, Ser. No. 321,710

Int. Cl.⁶ C07D *471/14;* A61K *31/55*

U.S. Cl. 540—495 **6 Claims**

1. A method for preparing 4-alkyl-5,11-dihydro-6H-dipyrido[3,2-b:2',3'-e] [1,4]diazepin- 6-ones of the formula I



(I)

wherein

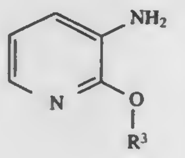
R^1 is alkyl of 1 to 6 carbon atoms, trihalomethyl, alkyloxyalkyl or alkylthioalkyl of 2 to 5 carbon atoms, alkylthio of 1 to 5 carbon atoms, or arylalkyl (wherein the aryl moiety is phenyl,thienyl, furanyl, or pyridyl, which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, or halogen, and the alkyl moiety contains 1 to 2 carbon atoms which may be unsubstituted or substituted with a methyl group);

and,

R^2 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms,

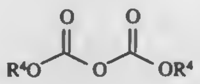
which comprises the steps of:

a) reacting a compound having the formula II



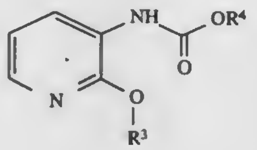
(II)

wherein R^3 is alkyl of from one to 3 carbon atoms, with a compound of the formula III



(III)

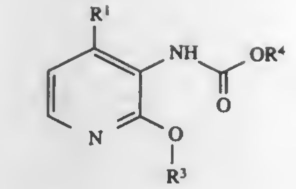
wherein R^4 is an alkyl group of from one to 5 carbon atoms, in an aprotic, organic solvent, and in the presence of two equivalents of a base, to produce a compound of the formula IV



(IV)

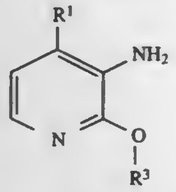
wherein R^3 and R^4 are as hereinbefore defined;

b) reacting the compound of formula IV with two equivalents of a strong base, in a polar, aprotic, organic solvent containing a strongly polar, aprotic cosolvent, to generate an intermediate dianionic species, and further reacting the intermediate dianionic species, which is not isolated from the reaction mixture, with an electrophile of the formula R^1—X, wherein R^1 is as described above, and X is a leaving group, to generate a compound of the formula V;



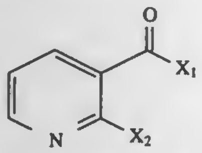
(V)

c) removing the protecting group (—COOR⁴) from the compound of the formula V by cleavage of the carbamate, to yield a compound of the formula VI



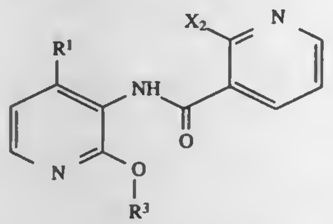
(VI)

d) reacting the compound of formula VI with a compound of the formula VII



(VII)

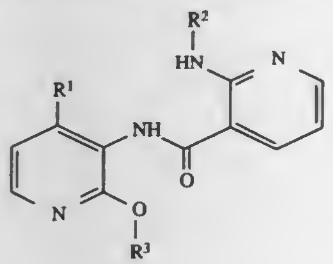
wherein X1 and X2 may be the same or different and are each a halogen atom, in an aprotic, organic solvent in the presence of a hydrogen halide scavenger, to produce a compound of the formula VIII



(VIII)

wherein R^1, R^3 and X_2 are as hereinbeforedefined;

e) reacting the compound of formula VIII with an amine of the formula R^2—NH_2, wherein R^2 is as hereinbefore defined, in the presence of a hydrogen chloride scavenger, to produce a compound of the formula IX



(IX)

and,

f) reacting the compound of formula IX with 2 equivalents of a base, in a polar, aprotic, organic solvent, to produce the compound of formula I.

5,532,359

RAS FARNESYL TRANSFERASE INHIBITORS

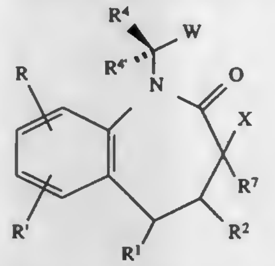
James C. Marsters, Jr., Oakland, Calif.; Michael S. Brown, Dallas, Tex.; Craig W. Crowley, Portola Valley, Calif.; Joseph L. Goldstein; Guy L. James, both of Dallas, Tex.; Robert S. McDowell, San Francisco, Calif.; David Oare, Belmont, Calif.; Thomas E. Rawson, Mountain View, Calif.; Mark Reynolds, So. San Francisco, Calif., and Todd C. Somers, Montara, Calif., assignors to Genentech, Inc., South San Francisco, Calif., and Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 82,202, Jun. 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 61,961, May 14, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,595

Int. Cl.⁶ A61K *31/55;* C07D *223/16;223/18*

U.S. Cl. 540—522 **10 Claims**

1. A compound represented by structural formula (II):

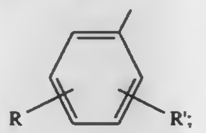


(II)

where

R and R' are independently selected from the group
  hydrogen,
  halo(F, Cl, Br, I),
  C_1–C_6 alkyl,
  halo(F, Cl, Br, I)C_1–C_6 alkyl,
  C_1–C_6 alkoxy,
  hydroxy,
  hydroxy-C_1–C_6 alkyl,
  C_1–C_6 alkylcarbonyl, and
  C_1–C_6 alkyloxycarbonyl;

R^1 and R^2 are independently selected from the group
  hydrogen,
  C_1–C_6 alkyl,
  halo(F, Cl, Br, I)-C_1–C_6 alkyl, and



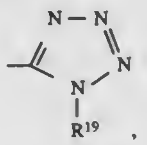
R^1 and R^2 taken together may form a covalent bond or fused benzene substituted with R and R';

R^4 and $R^{4'}$ are independently selected from the group
  hydrogen,
  halo(F, Cl, Br, I),
  C_1–C_6 alkyl,
  halo(F, Cl, Br, I)C_1–C_6 alkyl,
  phenyl, and
  benzyl;

R^7 selected from the group
  hydrogen,
  halo(F, Cl, Br, I),
  C_1–C_6 alkyl, and
  halo(F, Cl, Br, I)C_1–C_6 alkyl;

W is selected from the group
  $C({=}O)—NR^{7'}R^8$,
  $CH_2—C({=}O)—NR^{7'}R^8$,
  $CR^{8'}(OH)—CHR^7R^8$,
  $CHR^{8'}—CHR^7R^8$,
  $CHR^{8'}—CHR^7R^8$,
  $CR^{8'}CR^7R^8$ (E or Z),
  $C({=}O)—CHR^7R^8$,
  $CHR^{8'}—NR^7R^8$,

CHR$^{8'}$—O—R^{8},
CHR$^{8'}$—S(O)$_{u}$—R^{8} where u is 0, 1, or 2,
CR$^{8'}$═N—R^{8},
CHR$^{8'}$—R^{8},
W',
C_1–C_3alkyl-W',
C_6–C_{12}aryl-W',
C_6–C_{12}aryl-C_1–C_3alkyl-W',
heterocycle-W',
heterocycle-C_1–C_3alkyl-W',
C_1–C_2alkyl-C_6–C_{10}aryl-W', and
C_1–C_2alkyl-heterocycle-W',
where any heterocycle is a 5- or 6-member saturated or unsaturated ring containing 1 to 3 heteroatoms selected from O, N, and S;
W' is selected from one to three substituents selected from the group
hydrogen,
SR^{9},
SSR^{9},
SC(═O)—R^{9},
OR^{9},
C(═NH)—NH_2,
N═CH—NH_2,
NH—CH═NH,
R^{8}, and
V;
R^{7} is selected from the group
hydrogen,
benzyl,
C_1–C_4alkyl, and
halo(F, Cl, Br, I)C_1–C_4alkyl;
R$^{8'}$ is selected from the group
hydrogen,
C_1–C_4alkyl, and
halo(F, Cl, Br, I)C_1–C_4alkyl;
R^{7} and R^{8} together with the nitrogen to which they are bonded may form a pyrrolidinyl or piperidyl ring optionally substituted with one or two groups selected from
SR^{9},
SSR^{9},
SC(═O)—R^{9},
OR^{9},
C(═O)NHOH,
NHR^{9},
C(═O)NR^{27}R^{28}, and
V;
R^{8} is selected from the group unsubstituted and substituted
C_1–C_8alkyl,
C_1–C_4alkyl-Z-C_1–C_4alkyl, where Z is S or O,
C_2–C_4alkyl-NR-C_2–C_4alkyl,
C_2–C_8alkenyl,
C_6–C_{12}arylC_1–C_3alkyl,
indol-3-yl-C_1–C_3alkyl, and
imidazol-4-yl-C_1–C_3alkyl,
where any aryl moiety is optionally substituted with —OR^{9} and V, and
where any alkyl or alkenyl group is optionally substituted with one to three groups selected from
SR^{9},
SSR^{9},
SC(═O)—R^{9},
OR^{9},
C(═NH)—NH_2,
N═CH—NH_2,
NH—CH═NH,
NH—C(═NH)—NH_2,
C(═O)NHOH,
NHR^{9},
C(═O)NR^{27}R^{28}, and
V;
V is selected from the group
COR^{10},
SO_3R^{13},
$NHSO_2CF_3$,
PO(OR^{13})$_2$,
SO_2NHR^{10},
CONHOR^{13},
C(OH)R^{10}PO(OR^{13})$_2$,
CN,
SO_2NH-heteroaryl where the heteroaryl is a 5- or 6-member aromatic ring containing 1 to 3 heteroatoms selected from O, N, and S and where the heteroaryl is unsubstituted or substituted with one or two substituents selected from the group
OH,
SH,
C_1–C_4alkyl,
C_1–C_4alkoxy,
CF_3,
halo(F, Cl, Br, I),
NO_2,
COOH,
COO—(C_1–C_4alkyl),
NH_2,
NH(C_1–C_4alkyl), and
N(C_1–C_4alkyl)$_2$,
$CONHSO_2$R^{15},
SO_2NHCOR^{15},
$CONHSO_2$R^{13},
$CH_2CONHSO_2$R^{15},
$NHCONHSO_2$R^{15},
$NHSO_2$NHCOR^{15},
$CONHNHSO_2CF_3$,
CON(OH)R^{13},
$CONHCOCF_3$,
$CONHSO_2$R^{10},
$CONHSO_2$R^{11},
$CONHSO_2$R^{13},



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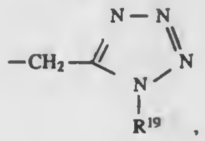

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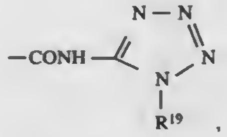

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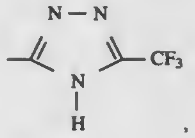

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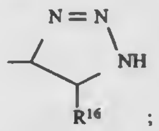
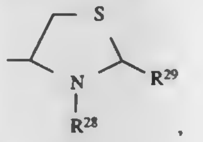
and



;

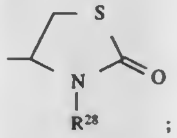
R^{9} is selected from the group
hydrogen,
methyl,
ethyl,
isopropyl,
phenyl, and
benzyl;
R^{10} is selected from the group
hydroxy,
C_1–C_8-alkoxy,

C_3–C_{12}-alkenoxy,
C_6–C_{12}-aryloxy,
C_1–C_6-alkyl-C_6–C_{12}-aryloxy,
di-C_1–C_8-alkylamino-C_1–C_8-alkoxy,
alkanoylamino-C_1–C_8-alkoxy selected from the group
acetylaminoethoxy,
nicotinoylaminoethoxy, and
succinamidoethoxy, and
C_1–C_8-alkanoyloxy-C_1–C_8-alkoxy,
C_6–C_{12}-aryl-C_1–C_8-alkoxy where the aryl group is unsubstituted or substituted with one to three of the groups
nitro,
halo(F, Cl, Br, I),
C_1–C_4-alkoxy, and
amino,
hydroxy-C_2–C_8-alkoxy,
dihydroxy-C_3–C_8-alkoxy, and
NR^{11}R^{12};
R^{11} and R^{12} are independently selected from the group
hydrogen,
C_1–C_6 alkyl,
C_2–C_6 alkanoyl,
C_1–C_6 alkanoyl substituted with from one to three groups selected from
nitro,
halo(F, Cl, Br, I),
C_1–C_4-alkoxy, and
amino, and
C_6–C_{12}-aryl-C_1–C_8-alkyl where the aryl group is unsubstituted or substituted with one to three of the groups selected from
nitro,
halo(F, Cl, Br, I), and
C_1–C_4-alkoxy;
R^{13} is selected from the group
hydrogen,
C_1–C_6 alkyl,
halo(F, Cl, Br, I)-C_1–C_6 alkyl,
phenyl,
benzyl, and
CH_2—O—$COCH_3$;
R^{15} is selected from the group
C_6–C_{14}aryl, heteroaryl, where the heteroaryl is a 5- or 6-member aromatic ring containing 1 to 3 heteroatoms selected from O, N, and S and where the heteroaryl is unsubstituted or substituted with one or two substituents selected from the group
OH,
SH,
C_1–C_4alkyl,
C_1–C_4alkoxy,
CF_3,
halo(F, Cl, Br, I),
NO_2,
COOH,
COO—(C_1–C_4alkyl),
NH_2,
NH(C_1–C_4alkyl), and
N(C_1–C_4alkyl)$_2$,
C_3–C_7-cycloalkyl,
C_1–C_4-alkyl, unsubstituted or substituted with a substituent selected from the group
C_6–C_{14}aryl,
heteroaryl as defined above,
OH,
SH,
C_1–C_4-alkyl,
C_1–C_4-alkoxy,
C_1–C_4-alkylthio,
CF_3,
halo(F, Cl, Br, I),
NO_2,
CO_2H,
CO_2—(C_1–C_4)-alkyl,
NH_2,
N[(C_1–C_4)-alkyl]$_2$,
NH[(C_1–C_4)-alkyl],
PO_3H, and
PO(OH)(C_1–C_4)-alkoxy, and
(C_1–C_4)-perfluoroalkyl;
R^{16} is selected from the group
CN,
NO_2,
COOR^{13},
C_1–C_6-perfluoroalkyl, and
CF_3;
R^{19} is selected from the group
hydrogen,
C_1–C_6alkyl,
C_2–C_6alkenyl,
C_1–C_6alkoxy,
C_2–C_6alkoxyalkyl,
CH_2—O—$COCH_3$, and
benzyl, where the phenyl moiety is unsubstituted or substituted with a group selected from
NO_2,
NH_2,
OH, and
OCH_3;
X is selected from the group
NR^{24}—C(═O)—R^{25},
NR^{24}—CH(OH)—R^{25}, and
NR^{24}—S(O)$_{u}$—R^{25} where u is 0, 1, or 2,
R^{24} is selected from the group
C_1–C_6alkyl, and
halo(F, Cl, Br, I)C_1–C_6alkyl;
R^{25} is selected from R$^{25'}$,



,

and

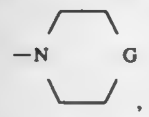


;

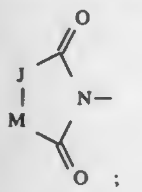
R$^{25'}$ is selected from the group
C_1–C_6alkyl,
C_2–C_6alkenyl,
C_1–C_6alkylamine,
C_2–C_6alkenylamine, and
halo(F, Cl, Br, I)C_1–C_6alkyl
where any alkyl or alkenyl moiety is substituted with NR^{27}R^{28} and one or more groups selected from
SH and
SSR^{26};
R^{26} is selected from
hydrogen,
C_1–C_6alkyl,
halo(F, Cl, Br, I)C_1–C_6alkyl, and
C_1–C_6alkanoyl;
R^{27} and R^{28} are independently selected from the group
hydrogen,
C_1–C_6alkyl,
phenyl,
napthyl,
benzyl,
CH_2napthyl (a or b),
C_1–C_6alkanoyl,
C_1–C_6cycloalkanoyl.
C_6–C_{10}aroyl,
C_6–C_{10}arylC_1–C_6alkanoyl,
C_1–C_6alkylsulfonyl,
C_6–C_{10}arylsulfonyl,
C_6–C_{10}arylC_1–C_6alkylcarbamoyl,

cinnamoyl,
heterocyclecarbonyl,
C_1–C_6alkoxycarbonyl,
C_6–C_{10}aryloxycarbonyl,
C_6–C_{10}arylC_1–C_6alkoxycarbonyl, and
pyroglutamyl;

R^{27} and R^{28} together with the nitrogen atom to which they are bonded may form a cyclic amine represented by



or a cyclic imide represented by



G is selected from —CH_2—, O, $S(O)_u$ where u is 0, 1, or 2, and NR^{28};
J-M is selected from C_2–C_4alkylene and C_2–C_4alkenylene;
R^{29} is selected from hydrogen and C_1–C_3alkyl; and
pharmaceutically acceptable salts thereof.

5,532,360

METHOD FOR HANDLING (2-ALKYL)ACRYLOYL ISOCYANATE, METHOD FOR STABILIZING (2-ALKYL)ACRYLOYL ISOCYANATE, METHOD FOR PRODUCING (2-ALKYL)ACRYLOYL ISOCYANATE, HETEROCYCLIC COMPOUND, AND METHOD FOR PRODUCING HETEROCYCLIC COMPOUND

Noriyuki Tsuboniwa, Osaka; Satoshi Urano, Kyoto; Otohiko Tsuge, Fukuoka, and Taizo Hatta, Kumamoto, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

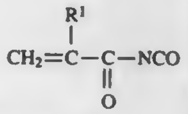
Filed Mar. 8, 1995, Ser. No. 400,588

Claims priority, application Japan, Mar. 11, 1994, 6-067867

Int. Cl.^{6} C07D *273/04*

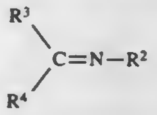
U.S. Cl. 544—68 **10 Claims**

1. A method for handling a (2-alkyl)acryloyl isocyanate represented by formula (1)



$$CH_2=\overset{\overset{\large R^1}{|}}{C}-\underset{\underset{\large O}{\|}}{C}-NCO \qquad (1)$$

which comprises the steps of:
reacting an azomethine compound represented by formula (2)



$$\genfrac{}{}{0pt}{}{R^3}{R^4}\!\!>\!C=N-R^2 \qquad (2)$$

with the (2-alkyl)acryloyl isocyanate to obtain a reaction product and
dissolving the reaction product into a solvent to regenerate the (2-alkyl)acryloyl isocyanate;
wherein R^1 represents a hydrogen atom or a lower alkyl group,
wherein
R^2 represents an alkyl group, a cycloalkyl group, an aralkyl group, an alkenyl group, or an alkynyl group, and
R^3 and R^4 each represents a hydrogen atom or a group which does not cause tautomerism with C═N in the formula, provided that at least one of R^3 and R^4 is not a hydrogen atom.

5,532,361

SPIRO-PYRANIC COMPOUNDS ENDOWED WITH PHOTOCHROMIC CHARACTERISTICS

Pietro Allegrini, San Donato Milanese; Nereo Nodari, Mairago; Vincenzo Malatesta, S. Maurizio Al Lambro, and Luciana Crisci, Graffignana, all of, Italy, assignors to Ministero Deli 'Universita' E Della Ricerca Scientifica E Technologica, Rome, Italy

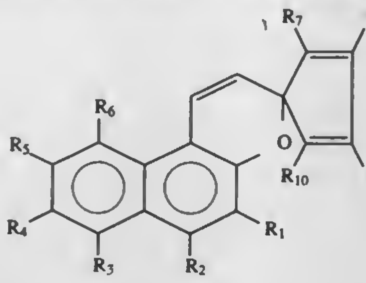
Filed May 12, 1994, Ser. No. 241,759

Claims priority, application Italy, May 18, 1993, MI93A1012

Int. Cl.^{6} C07D *413/08;491/107;405/08;311/96*

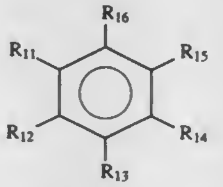
U.S. Cl. 544—70 **7 Claims**

1. A photochromic compound having the general formula (I):

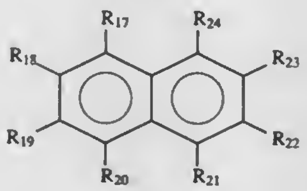


(I)

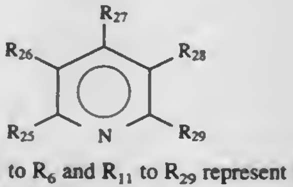
wherein:
(a) the substituents from R_1 to R_{10} represent the following, each independently: a hydrogen atom; a linear or branched C_1–C_5 alkyl group, optionally having 1–5 halogen atoms (selected from fluorine, chlorine, bromine and iodine), hydroxy groups, C_1–C_5 alkoxy groups, C_1–C_5 aciloxy groups, carboxy-C_1–C_5 alkyl groups, and cyano groups; a C_2–C_5 alkenyl group; a benzyl group; a halogen atom selected from fluorine, chlorine, bromine and iodine; a hydroxy group; a C_1–C_5 alkoxy group; an amino group; a mono-(C_1–C_5) alkyl amino group; a di-(C_1–C_5) alkyl amino group; a (C_3–C_{10})-cycloalkyl amino group; a piperidino, piperazino or morpholino group; a carboxy group; a carboxy-C_1–C_5 alkyl group; a C_2–C_5 alkenyl carboxy group; a aminocarbonyl group; an N-(C_1–C_5)-alkyl-substituted aminocarbonyl group; an N,N-di-(C_1–C_5)-alkyl-substituted aminocarbonyl group; a cyano group; a nitro group; a sulfonic group; a (C_1–C_5)-alkyl sulfonate group; an aryl-sulfonate group; an aryl group selected from a phenyl, biphenyl, and naphthyl group; and a carbonyl group selected from an alkyl carbonyl, phenyl carbonyl, naphthyl carbonyl and benzyl carbonyl group; or
(b) each of the substituents from R_7 to R_{10} alternatively represents, jointly with the group adjacent thereto, a ring structure having a formula selected from the following formulas (II), (III) and (IV):



(II)



(III)



(IV)

and substituents R_1 to R_6 and R_{11} to R_{29} represent the same groups represented by R_1 to R10 in part (a).

5,532,362

FIBER-REACTIVE TRIPHENODIOXAZINE DYES

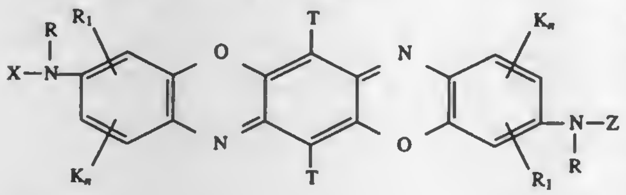
Walter Helmling, Niedemhausen, Germany; David Brunetti, Harrisville, R.I., and Uwe Reiher, Hofheim, Germany, assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 25, 1995, Ser. No. 450,965

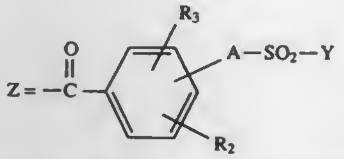
Int. Cl.^{6} C07D *498/04*

U.S. Cl. 544—77 **6 Claims**

1. A dye of the following formula:



wherein:



A is a covalent bond or a substituted or unsubstituted arylene, alkylene or arylene-alkylene group where the alkylene moiety may be optionally interrupted by a hereto atom;
Y is the vinyl group or the β-chloroethyl group and;
X is selected from H or Z;
K is independently selected from SO_3H and COOH;
R and R_1 are independently selected from hydrogen and substituted or unsubstituted alkyl of 1 to 6 carbons;
R_2 and R_3 are independently selected from hydrogen and substituted or unsubstituted alkyl or alkoxy of 1 to 6 carbons;
T is independently selected from hydrogen, Cl, Br, a substituted or unsubstituted C_1 to C_6 alkyl, C_1 to C_6 alkoxy, phenyl or phenoxy; and
n is independently selected from 0, 1 or 2.

5,532,363

HETEROARYL SUBSTITUTED OXAZINONE COMPOUNDS FOR THE PREPARATION OF TAXOL

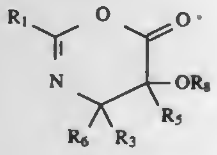
Robert A. Holton, Tallahassee, Fla., assignor to Florida State University, Tallahassee, Fla.

Continuation of Ser. No. 898,438, Jun. 15, 1992, Pat. No. 5,384,399, which is a division of Ser. No. 603,041, Oct. 30, 1990, Pat. No. 5,136,060, which is a continuation-in-part of Ser. No. 436,235, Nov. 14, 1989, Pat. No. 5,015,744. This application Nov. 7, 1994, Ser. No. 335,495

Int. Cl.^{6} C07D *305/00;413/12*

U.S. Cl. 544—97 **26 Claims**

1. An oxazinone of the formula



wherein
R_1 is heteroaryl or —OR_7 wherein R_7 is heteroaryl;
R_3 and R_6 are independently selected from hydrogen, alkyl, alkenyl, alkynyl, aryl and heteroaryl;
R_5 is hydrogen, alkyl, alkenyl, alkynyl, or aryl; and
R_8 is a hydroxyl protecting group.

5,532,364

ENANTIOMERICALLY PURE 2-OXA-5,8-DIAZABICYCLO[4.3.0]NONANES AND PROCESS FOR THEIR PREPARATION

Thomas Schenke, Bergisch Gladbach; Andreas Krebs, Odenthal, and Uwe Petersen, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

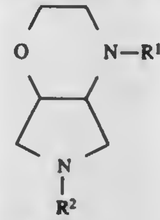
Division of Ser. No. 998,284, Dec. 30, 1992, Pat. No. 5,436,334. This application Aug. 18, 1994, Ser. No. 292,643

Claims priority, application Germany, Jan. 10, 1992, 42 00 415.2

Int. Cl.^{6} C07D *498/04*

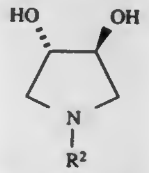
U.S. Cl. 544—105 **2 Claims**

1. A process for the preparation of an enantiomerically pure compound of the formula (I)

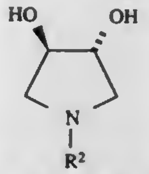


(I)

in which
R^1 represents H, C_1–C_3-alkyl, phenyl, benzyl, 1-phenylethyl, C_1–C_3-alkanoyl, or C_1–C_4-alkoxycarbonyl,
and
R^2 represents H, benzyl, C_1–C_5-alkanoyl, benzoyl which is optionally mono- or disubstituted by halogen or C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl, methanesulphonyl, benzenesulphonyl or toluenesulphonyl,
which comprises
reacting a S,S- or R,R-dihydropyrrolidine derivative of the formula (VIIIa) or (VIIIb)

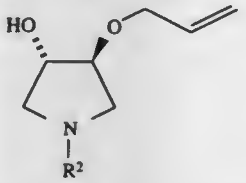


(VIIIa)

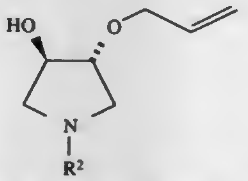


(VIIIb)

in which R^2 is defined above except that it is not hydrogen, with allyl bromide or allyl chloride in the presence of a base to give a compound of the formula (IXa) or (IXb)

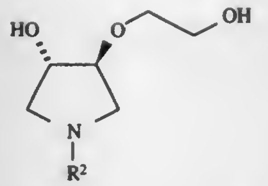


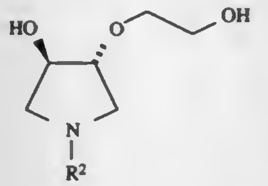
(IXa)



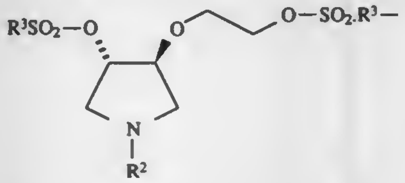
(IXb)

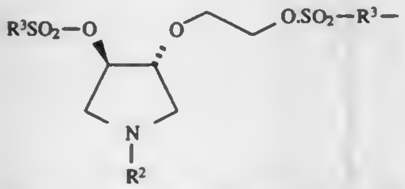
breaking down the compound (IXa) or (IXb) by ozonolysis and subsequent reduction, into a compound of the formula (Xa) or (Xb) respectively,


(Xa)


(Xb)

which, compounds (Xa) or (Xb) are reacted with a sulphonyl chloride, R^3—SO_2Cl, to give a sulphonic acid ester of the formula (XIa) or (XIb) respectively,

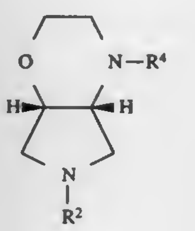

(XIa)

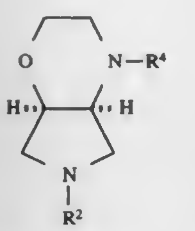

(XIb)

R^3 is methyl, phenyl or methylphenyl, and compounds (XIa) or (XIb) are reacted with a amine of the formula (IV),

R^4—NH_2 (IV)

wherein R^4 is hydrogen, C_1–C_3-alkyl, phenyl, benzyl or 1-phenylethyl to give a compound of the formula (Va) or (Vb) respectively


(Va)


(Vb)

optionally removing the protective radicals R^2 and/or R^4, and reacting the secondary nitrogen atoms of the compound thus obtained again with compounds R^1—X and R^2—X, wherein X is a leaving group, and isolating one enantiomerically pure compound of formula I.

5,532,365

INTERMEDIATE FOR FURANYL INSECTICIDE

Kenji Kodaka; Katsutoshi Kinoshita; Takeo Wakita; Shirou Shiraishi; Kazutomi Ohnuma; Eiichi Yamada; Naoko Yasui; Michihiko Nakaya; Hirozumi Matsuno; Nobuyuki Kawahara, all of Chiba-ken, and Koichi Ebihara, Fukuoka-ken, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

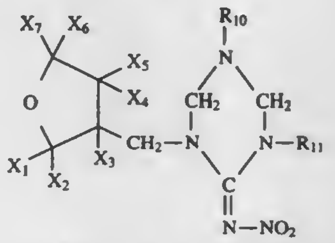
Division of Ser. No. 326,260, Oct. 20, 1994, Pat. No. 5,434,181. This application Apr. 5, 1995, Ser. No. 417,111

Claims priority, application Japan, Oct. 26, 1993, 5-266799

Int. Cl.^{6} C07D *251/08*

U.S. Cl. 544—212 **3 Claims**

1. A compound of a formula (2):


(2)

where X_1, X_2, X_3, X_4, X_5, X_6 and X_7 represent each a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; R_{10} represents an alkyl group having from 1 to 5 carbon atoms or a benzyl group; and R_{11} represents an alkyl group having from 1 to 5 carbon atoms or a benzyl group.

5,532,366

HETEROCYCLIC AMIDES

Philip D. Edwards, Kennett Square, Pa.; Peter Warner, Macclesfield, United Kingdom, and Donald J. Wolanin, Orange, Conn., assignors to Zeneca Limited, London, England

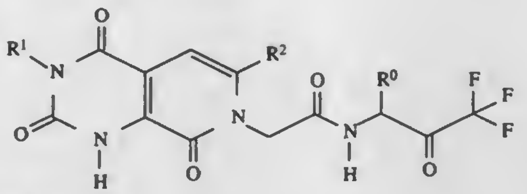
Continuation of Ser. No. 86,780, Jul. 1, 1993, abandoned. This application Jan. 19, 1995, Ser. No. 375,201

Claims priority, application United Kingdom, Jul. 2, 1992, 9214053

Int. Cl.^{6} A61K *31/505;* **C07D** *471/04*

U.S. Cl. 514—234.2 **11 Claims**

1. A compound of formula I:


I

wherein:

R^0 is (1–5C) alkyl;

R^1 is hydrogen, NReRf; or

R^1 is (1–6C)alkyl, (3–6C)cycloalkyl, phenacyl, aryl, acetonyl or heteroaryl (or, where applicable, an N-oxide thereof,) any of which may bear one or more substituents selected from a group consisting of hydroxy, (1–6C)alkyl, (1–4C) alkoxy, (1–4C) acyloxy, COORa, CONRbRc, $COO(CH_2)_2NReRf$, cyano, SO_2R^5, $CONRdSO_2R^5$, NReRf, $NRgCOR^6$, NRg-COOR6, NRhCONRiRj, $NRkSO_2R^3$, SO_2NRlRm, $SO_2NRnCOR^4$, P(O) $(ORa)_2$, aryl and heteroaryl (or, where applicable, an N-oxide thereof,); and wherein an aryl or heteroaryl moiety of R^1 or a substituent thereof may bear one or more halogeno, nitro, (1–4C)alkyl, (1–4C) alkoxy or trifluoromethyl groups; wherein

Ra—Rn are independently hydrogen, benzyl or (1–4C) alkyl; or, independently, a group NRbRc, NReRf, NRiRj or NRlRm is a cyclic radical selected from a group consisting of 1-pyrrolidinyl, piperidino, morpholino or 1-piperazinyl which may bear a (1–4C)alkyl or a halogeno substituent at the 4-position; or, independently, a group NReRf is a cyclic radical selected from a group consisting of 2-pyrrolidinon-1-yl, succinimido, oxazolidin-2-on-3-yl, 2-benzoxazolinon-3-yl, phthalimido and cis-hexahydrophthalimido; and

R^3–R^6 are independently trifluoromethyl, (1–6C)alkyl, (3–6C)cycloalkyl, aryl or heteroaryl (or, where applicable, an N-oxide thereof,) in which the aryl or heteroaryl may bear one or more substituents selected from a group consisting of (1–4C)alkyl, hydroxy, (1–4C)alkoxy, halogeno or trifluoromethyl;

R^2 is hydrogen, (1–6C)alkyl, (3–6C)cycloalkyl or a radical of formula BY- in which B is aryl or heteroaryl (or, where applicable, an N-oxide thereof,) and may bear an aryl, or heteroaryl substituent and in which B or an aryl or heteroaryl substituent on B may independently bear one or more substituents selected from the group consisting of halogeno, nitro, (1–6C)alkyl, (3–6C)cycloalkyl, trifluoromethyl, cyano, hydroxy, (1–4C)alkoxy, acetoxy, SO_2Ro, COORq, CONRrRs; wherein

Rq—Rs are independently hydrogen or (1–4C)alkyl;

Ro is (1–4C)alkyl; and

Y is a direct bond, methylene, ethylene, or trans-vinylene; and

provided that no aliphatic carbon is bonded to more than one nitrogen or oxygen, except as part of a cyclic ketal, or as part of an ester qroup, or where the nitrogen bears a carbonyl group; or

for a compound of formula I which is acidic or basic, a pharmaceutically acceptable salt thereof.

5,532,367

INSECTICIDAL PTERIDINES AND 8-DEAZAPTERIDINES

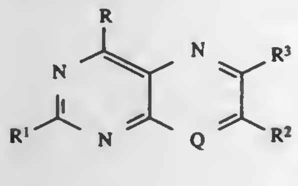
Robert N. Henrie, II, East Windsor; Clinton J. Peake, Trenton; Thomas G. Cullen, Milltown; Albert C. Lew, Princeton Junction, and Ian R. Silverman, Maple Shade, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 67,897, May 27, 1993. This application Mar. 31, 1995, Ser. No. 416,017

Int. Cl.^{6} C07D *475/08;487/04*

U.S. Cl. 544—260 **6 Claims**

1. A compound of the formula


(I)

wherein

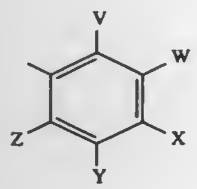
R and R^1 are amino;

R^2 is hydrogen or lower alkyl;

Q is N or CH;

R^3 is —$(n)_m$—R^4, where m is 0 or 1, and when m is 1, n is lower haloalkenylene,

R^4 is



wherein

V, W, X, Y, and Z are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, lower haloalkyl, cyano, lower alkoxycarbonyl, aminocarbonyl, phenyl optionally substituted with chloro, fluoro, or trifluoromethyl; or phenoxy optionally substituted with chloro, fluoro, or trifluoromethyl; wherein optionally V and W taken together form a fused ring and are —$OC(CH_3)_2CH_2$—, —$CH_2C(CH_3)_2O$—, —$OC(CH_3)_2C({=}O)$—, —$C({=}O)C(CH_3)_2O$—, —OCF_2CF_2—, or —CF_2CF_2O—, to provide, respectively, the corresponding 2,3-dihydro- 2,2-dimethylbenzofuran-7-yl, 2,3-dihydro-2,2-dimethylbenzofuran-4-yl, 2,3-dihydro- 2,2-dimethyl-3-benzofuranon-7-yl, 2,3-dihydro-2,2-dimethyl-3-benzofuranon-4-yl, 2,2,3,3-tetrafluorobenzofuran-7-yl, and 2,2,3,3-tetrafluorobenzofuran-4-yl moieties; or, optionally, V and W or W and X taken together are —CH=CHCH=CH—, forming the corresponding naphth-1-yl and naphth-2-yl rings.

5,532,368

XANTHINE DERIVATIVES WITH ADENOSINE-ANTAGONISTIC ACTIVITY

Ulrike Kufner-Muhl, Mainz; Karl-Heinz Weber, Gau-Algesheim; Gerhard Walther, Bingen; Werner Stransky, Gau-Algesheim; Helmut Ensinger, Ingelheim Am Rhein; Gunter Schingnitz, Bad Kreuznach; Franz J. Kuhn, Gau-Algesheim, and Erich Lehr, Waldalgesheim, all of, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

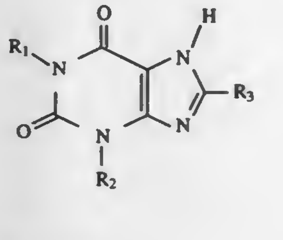
Continuation of Ser. No. 942,871, Sep. 10, 1992, abandoned, which is a division of Ser. No. 691,193, Apr. 25, 1991, Pat. No. 5,175,291, which is a continuation of Ser. No. 452,643, Dec. 18, 1989, abandoned. This application Jul. 27, 1993, Ser. No. 97,478

Claims priority, application Germany, Dec. 22, 1988, 38 43 117.3

Int. Cl.^{6} C07D *473/04*

U.S. Cl. 544—267 **2 Claims**

1. A xanthine of the formula I


I

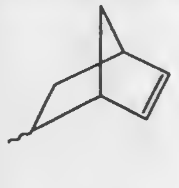
wherein

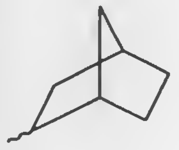
R_1 is a C_1–C_4 alkyl group;

R_2 is a C_1–C_4 alkyl group;

R_3 tetrahydropyran-4-yl or 1,3-dithiolan or;

R_3 represents one of the groups of formula





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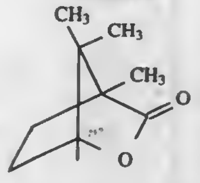


or a pharmaceutically acceptable acid addition salt thereof.

5,532,369

INTERMEDIATES FOR GRISEOLIC ACID DERIVATIVES

Masakatsu Kaneko; Yoshinobu Murofushi; Misako Kimura; Mitsuo Yamazaki, and Yasuteru Iijima, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Division of Ser. No. 130,154, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 916,794, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 742,287, Aug. 8, 1991, abandoned, which is a continuation of Ser. No. 616,763, Nov. 19, 1990, abandoned, which is a continuation of Ser. No. 361,806, May 30, 1989, abandoned, which is a continnation of Ser. No. 157,112, Feb. 10, 1988, abandoned, which is a continuation of Ser. No. 854,418, Apr. 21, 1986, abandoned. This application May 9, 1995, Ser. No. 437,632

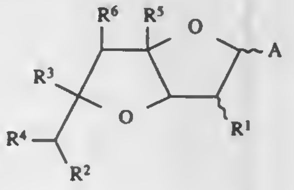
Claims priority, application Japan, Apr. 19, 1985, 60-82132; Apr. 27, 1985, 60-91987; Apr. 27, 1985, 60-91989

The portion of the term of this patent subsequent to Oct. 6, 2014, has been disclaimed.

Int. Cl.^{6} C07D *473/00;* **A61K** *31/52*

U.S. Cl. 544—276 **9 Claims**

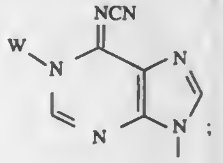
1. A compound of formula (1):



(I)

wherein

A represents a group of formula:



(d)

- R^1 and R^2 are independently selected from the group consisting of hydrogen atoms, halogen atoms and groups of formula —OR^9;
- R^3 and R^4 are independently selected from the group consisting of carbamoyl groups and carboxy groups;
- R^5 and R^6 both represent hydrogen atoms or together they represent an extra carbon-carbon bond between the carbon atoms to which they are attached;
- R^9 represents a hydrogen atom, a C_1–C_6 alkyl group, an alkylsulfonyl group, a haloalkylsulfonyl group, an arylsulfonyl group or a hydroxy-protecting group; and
- W represents an alkoxy group or an aralkoxy group;

or a pharmaceutically acceptable salt or ester thereof.

5,532,370

2,4-DIAMINO-5,6-DISUBSTITUTED- AND 5,6,7-TRISUBSTITUTED 5-DEAZAPTERIDINES AS INSECTICIDES

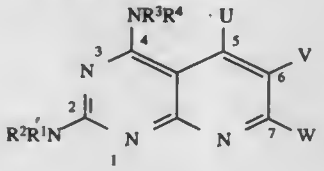
Robert N. Henrie, II, East Windsor; Clinton J. Peake, Trenton; Thomas G. Cullen, Milltown; Munirathnam K. Chaguturu, Lawrenceville, all of N.J.; Partha S. Ray, Memphis, Tenn., and Brian D. Bennett, Lake Hopatcong, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 249,586, May 26, 1994. This application Apr. 20, 1995, Ser. No. 425,524

Int. Cl.^{6} C07D *487/04*

U.S. Cl. 544—279 **2 Claims**

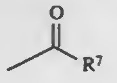
1. Compounds having the formula:



(I)

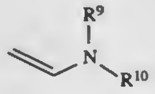
wherein

- R^1 is hydrogen, lower alkyl, or arylalkyl;
- R^3 is hydrogen, lower alkyl, or arylalkyl;
- R^2 and R^4 are independently hydrogen, lower alkyl, arylalkyl, or



wherein R^7 is straight or branched chain alkyl, cycloalkyl, lower haloalkyl, lower alkynyl, straight or branched chain alkoxy, alkylsulfonylalkyl, aryl, arylalkyloxy, or ethers, or polyethers of two to twelve carbon atoms in length containing one to four ether linkages; or

R^1 and R^2 taken together, and R^3 and R^4 taken together, each form the group —R^8—O—R^8, wherein R^8 is lower alkylene; or form the group



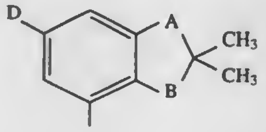
wherein R^9 and R^{10} are independently straight or branched chain lower alkyl, or

R^9 and R^{10} taken together with two to five methylene groups form an alkylene ring;

W is hydrogen, halogen, lower alkyl, or hydroxy;

U is hydrogen, halogen, lower haloalkyl, lower alkoxy, lower haloalkoxy, lower dialkylamino, arylalkyl, substituted arylthio, substituted arylsulfinyl, or substituted arylalkylthio; and

V is thienyl, substituted aryl, arylsulfinyl or substituted arylsulfinyl, arylsulfonyl or substituted arylsulfonyl, (aryl)(halo)alkenyl or substituted (aryl)(halo) alkenyl, aroyl or substituted aroyl, or a benzo-fused oxygen-containing heterocycle of the formula:



A and B are independently selected from methylene, carbonyl, and oxygen, and wherein at least one of A and B is oxygen; wherein D is hydrogen, halogen, lower alkyl, or lower haloalkyl; to form, the heterocycle 2,3-dihydro-2,2-dimethylbenzofuran-4-yl, 2,3-dihydro-2,2-dimethylbenzofuranan- 7-yl, 6-halo-2,3-dihydro-2,2-dimethylbenzofuran-4-yl, 5-halo-2,3-dihydro-2,2-dimethylbenzofuranan- 7-yl, 2,3-dihydro-2,2-dimethyl-3-benzofuranon-4-yl, or 2,2-dimethyl-5-halobenzodioxole-7-yl.

5,532,371

PIPERAZINE SUBSTITUTED CARBOXYLIC ACID DERIVATIVES FOR TREATING HYPERLIPIMIA

Teruo Komoto, Chiba; Hiroyuki Hirota; Susumu Sato, both of Shisui-machi; Mari Ohtsuka, Narashino; Hidehiko Koya, Narita; Hiroyuki Mizuno, Tomisato-machi, and Tadayuki Kuraishi, Narashino, all of, Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

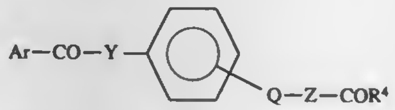
Division of Ser. No. 158,398, Nov. 29, 1993, Pat. No. 5,411,972. This application Jan. 25, 1995, Ser. No. 377,965

Claims priority, application Japan, Dec. 8, 1992, 4-328164; Jun. 7, 1993, 5-136119

Int. Cl.^{6} C07D *401/10*

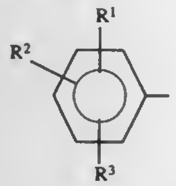
U.S. Cl. 544—360 **2 Claims**

1. An arylamide derivative represented by the formula (1) or a salt thereof:

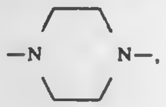


(1)

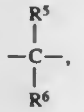
wherein Ar represents a group



in which R^1, R^2 and R^3 are the same or different from each other and each independently represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group which may be substituted by a halogen atom, an alkoxy group, an alkenyl group, an acylamino group or a carboxyalkyloxy group, a naphthyl group, a pyridinyl group, a furyl group, a thienyl group, a quinolyl group or an indolyl group; Y represents a group



and Q represents —O—, Z represents a C1 to C3 alkylene group or a group



$$-\overset{R^5}{\underset{R^6}{\overset{|}{\underset{|}{C}}}}-,$$

in which R^5 and R^6 each independently represents an alkyl group; R^4 represents a hydroxyl group, an alkoxy group or a group —$NH(CH_2)_mCOOH$, in which m is a number of 1 to 3.

5,532,372

IMIDE DERIVATIVES, AND THEIR PRODUCTION AND USE

Ikutaro Saji; Masayuki Muto; Norihiko Tanno, and Mayumi Yoshigi, all of Osaka, Japan, assignors to Sumitomo Pharmaceuticals Company, Ltd., Osaka, Japan

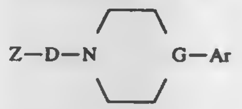
Continuation of Ser. No. 726,172, Jul. 5, 1991, abandoned. This application Aug. 30, 1993, Ser. No. 113,320

Claims priority, application Japan, Jul. 6, 1990, 2-180271

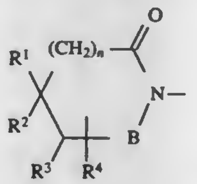
Int. Cl.^{6} C07D *417/14;* **A61K** *31/495*

U.S. Cl. 544—368 **20 Claims**

1. An imide compound of the formula:



wherein Z is a group of the formula:



in which B is a carbonyl group or a sulfonyl group, R^1, R^2, R^3 and R^4 are each a hydrogen atom or an alkyl group having 1–4 carbon atoms with a proviso that R^1 and R^2 or R^1 and R^3 are combined together to make a non-aromatic hydrocarbon ring having at most 7 carbon atoms and being un-substituted or substituted with at least one alkyl group having 1–4 carbon atoms, and n is an integer of 0 or 1;

D is a group of the formula:

$$—(CH_2)_p—A—(CH_2)_q—$$

in which A is a non-aromatic hydrocarbon ring having at most 7 carbon atoms or a non-aromatic hydrocarbon ring having at most 7 carbon atoms which is bridged with an alkylene group having not more than 3 carbon atoms or an oxygen atom, and p and q are each an integer of 0, 1 or 2;

Ar is a benzisothiazolyl group being unsubstituted or substituted with at least one of an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms and a halogen atom; and G is >N—; or an acid addition salt thereof.

5,532,373

ALUMINATE COMPLEX AND USE THEREOF IN PHOTOPOLYMERIZABLE COMPOSITION AND IMAGE-FORMING MATERIAL

Hirotaka Matsumoto; Jun Yamaguchi; Naoto Yanagihara, all of Shizuoka, and Hisashi Yamamoto, Aichi, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

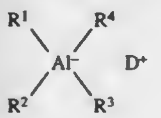
Continuation of Ser. No. 22,432, Feb. 16, 1993, abandoned, which is a continuation of Ser. No. 597,244, Oct. 15, 1990, abandoned. This application Sep. 22, 1994, Ser. No. 311,003

Claims priority, application Japan, Oct. 13, 1989, 1-266601; Dec. 26, 1989, 1-337688; Dec. 26, 1989, 1-337690

Int. Cl.^{6} C07F *5/06*

U.S. Cl. 546—4 **3 Claims**

1. An aluminate complex capable of radical generation upon photoexcitation, wherein said aluminate complex comprises an aluminum compound anion moiety and a cationic compound moiety D^+ and is represented by formula (I):

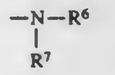


(I)

wherein D^+ is a cationic dye;

R^1 is a group represented by the following formulae (II) or (III); and R^2, R^3, and R^4 may be the same or different, and each is independently selected from the group consisting of an alkyl group, an aryl group, an aralkyl group, an alkaryl group, an alkenyl group, an alkynyl group, an alicyclic group, a group represented by formula (II) and a group represented by formula (III):

$$-X-R^5 \qquad \text{(II)}$$



$$-\underset{\substack{| \\ R^7}}{N}-R^6 \qquad \text{(III)}$$

wherein X is an oxygen, sulfur or selenium atom, R^5 and R^6 are each an aryl group and R^7 is selected from the group consisting of an alkyl group and an aryl group; and

wherein the aryl group represented by R^5 or R^6 may be substituted with an alkyl group having 1 to 16 carbon atoms, an aryl group, a halogen atom, a $—COOCH_3$ group and a methoxy group.

5,532,374
METHOD OF PREPARATION OF BIS-QUINOLINES

Virgil J. Lee, La Verne; Ying Wang, Diamond Bar; Carmen Taran, Glendora, and Matthew L. Marocco, III, Santa Ana, all of Calif., assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 467,462

Int. Cl.^{6} C07D *401/04*

U.S. Cl. 546—167 **10 Claims**

1. A method for forming a bis-quinoline, the method comprising the steps of:

condensing an aromatic 2-amino carbonyl compound and a methylene ketone compound to form a substituted quinoline intermediate having one substituent selected from the group consisting of chloro, bromo, and iodo; and, without isolating or purifying the substituted quinoline intermediate,

reductive coupling said quinoline intermediate using a transition metal catalyst to thereby form the bis-quinoline.

5,532,375
PROCESS FOR PREPARING 1,2,5,6-TETRAHYDROPYRIDIN-3-CARBOXALDEHYDE OXIMES

Giulio Galliani; Fernando Barzashi, both of Monza; Alina Butti, Milan; Carla Bonetti, Fontanella, and Emilio Toja, Milan, all of, Italy, assignors to Roussel-UCLAF, Romainville Cedex, France

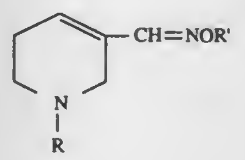
Division of Ser. No. 39,826, Mar. 30, 1993, Pat. No. 5,391,754, which is a division of Ser. No. 19,256, Feb. 26, 1987, Pat. No. 5,219,872. This application Sep. 30, 1994, Ser. No. 313,616

Claims priority, application Italy, Feb. 27, 1986, 19565/86; Jul. 17, 1986, 21157/86

Int. Cl.^{6} C07D *211/70;211/82*

U.S. Cl. 546—334 **1 Claim**

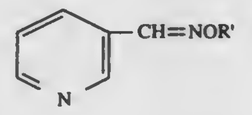
1. Process for the preparation of a compound of the formula (I)



(I)

wherein R represents a hydrogen atom, a linear branched or cyclic alkyl, alkenyl, alkynyl radical, containing up to 8 carbon atoms, unsubstituted or substituted by a free or esterified carboxy radical being alkoxycarbonyl in which the alkoxy radical includes up to 8 carbon atoms, or R represents an aralkyl radical containing up to 10 carbon atoms and R' represents a linear or branched alkyl, alkenyl or alkynyl radical, containing up to 8 carbon atoms, a radical —COalk, or a radical $—(CH_2)_2N(alk_2)_2$, alk, and alk_2 representing an alkyl radical containing up to 8 carbon atoms, as well as their addition salts with acids,

wherein a compound of the formula V:

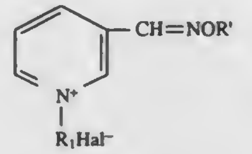


(V)

in which R', as defined above, is reacted and heated in the presence of a compound of the formula (VI)

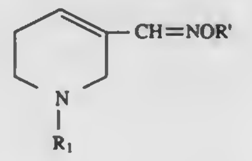
$$R_1HAL \qquad \text{(VI)}$$

wherein HAL represents a halogen atom and R_1 represents a linear, branched or cyclic, saturated or unsaturated alkyl radical, containing up to 8 carbon atoms, optionally substituted by an esterified carboxyl radical being alkoxy carbonyl in which the alkoxy radical includes up to 8 carbon atoms, or R_1 represents an aralkyl radical containing up to 10 carbon atoms, in order to obtain the compound with the formula VII



(VII)

which is submitted to the action of a hydrogenation agent, in order to obtain the corresponding compound with the formula (I_c)



(I_c)

in which R_1 and R' are as defined above, which, if required, is salified or is submitted, if R_1 represents an alkyl radical substituted by an esterified carboxy radical as defined above, to the action of a hydrolyzing agent in order to obtain the corresponding compound carrying a free carboxy radical, which compound if required is salified.

5,532,376
TRIAZOLE COMPOUNDS, THEIR INTERMEDIATES, AND METHOD FOR PRODUCTION OF THE SAME

Otohiko Tsuge, Fukuoka; Taizo Hatta, Kumamoto; Satoshi Urano, Tsuzuki-gun; Noriyuki Tsuboniwa, Osaka, and Ryuzo Mizuguchi, Tokyo-to, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

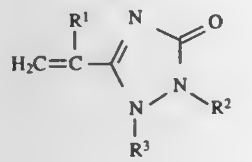
Filed Mar. 24, 1994, Ser. No. 217,106

Claims priority, application Japan, Mar. 24, 1993, 5-065040

Int. Cl.^{6} C07D *249/12*

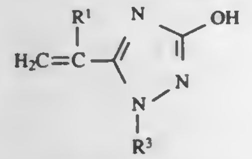
U.S. Cl. 548—263.2 **1 Claim**

1. A triazole compound represented by the formula (1)



(1)

wherein R^1 represents a lower alkyl group which may have a substituent selected from the group consisting of an alkyl group having 1–6 carbon atoms; R^2 and R^3 respectively hydrogen, an aryl group, having 6–20 carbon atoms, a benzoyl group, a tosyl group, a lower alkoxy carbonyl group, or an aryl group having 6–20 carbon atoms and substituted with sulfonyl guoup, each of which except for hydrogen may have a substituent selected from the group consisting of methyl, ethyl, propylbutyl, 2-ethyl hexyl, methoxyethyl, ethoxyethyl, butoxyethyl, hexyloxyethyl, methoxy nitro, chloro and bromo provided that when R^2 is hydrogen, the triazole compound is represented by the formula (2):



(2)

wherein R^1 and R^3 have the same as defined above.

5,532,377
PHOTOGRAPHIC COUPLER AND SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yuki Mizukawa; Masuji Motoki; Tadahisa Sato, and Osamu Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

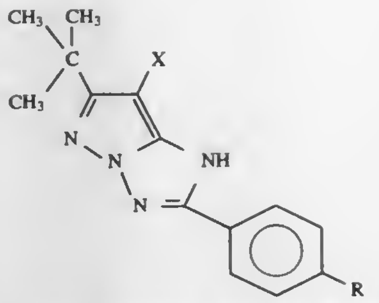
Division of Ser. No. 67,111, May 26, 1993, Pat. No. 5,451,501. This application Jun. 6, 1995, Ser. No. 467,833

Claims priority, application Japan, May 26, 1992, 4-157405; Aug. 11, 1992, 4-234120

Int. Cl.^{6} C07D *487/04*

U.S. Cl. 548—262.4 **1 Claim**

1. A 1H-pyrazolo-[1,5-b][1,2,4]-triazole derivative represented by formula (I):



(I)

wherein X represents a hydrogen atom or a chlorine atom, and R represents NO_2 or NH_2.

5,532,378
SULPHONYLAMINOCARBONYLTRIAZOLINONES

Werner Daum, Krefeld; Klaus-Helmut Muller, Duesseldorf; Michael Schwamborn, Cologne; Peter Babczinski, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

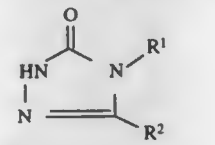
Division of Ser. No. 31,426, Mar. 15, 1993, Pat. No. 5,405,970, which is a division of Ser. No. 816,365, Dec. 30, 1991, Pat. No. 5,241,074, which is a division of Ser. No. 692,439, Apr. 29, 1991, Pat. No. 5,094,683, which is a division of Ser. No. 556,052, Jul. 20, 1990, Pat. No. 5,057,144, which is a continuation-in-part of Ser. No. 337,775, Apr. 13, 1989, abandoned. This application Dec. 15, 1994, Ser. No. 356,933

Claims priority, application Germany, May 9, 1988, 38 15 765.9; Oct. 12, 1989, 39 34 081.3

Int. Cl.^{6} C07D *249/14;249/12*

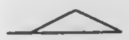
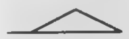
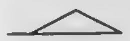
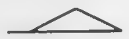
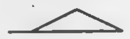
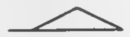
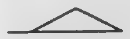
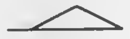
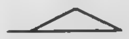
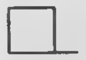
U.S. Cl. 548—263.8 **16 Claims**

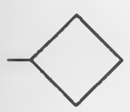
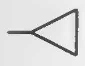
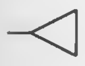
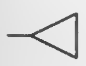
1. A triazolinone of the formula (II*a*)



(IIa)

wherein

R^1 represents	and	R^2 represents
		C_3H_7
		$CH(CH_3)_2$
		C_4H_9
CH_3		
C_2H_5		
C_3H_7		
		
		H
		C_2H_5

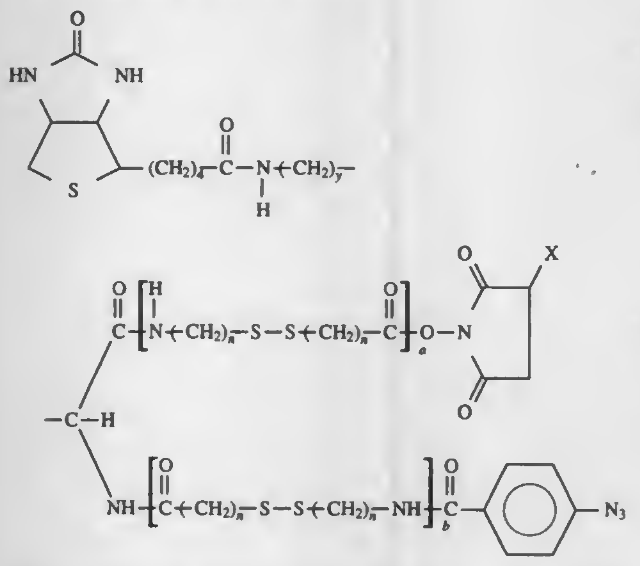
	-continued
$CH_2CH{=}CH_2$	CH_3
	CH_3
CH_3	$—CH_2OCH_3$
	$—CH_2OCH_3$
	$—CH_2OC_2H_5$
	$—N(CH_3)_2$.

5,532,379
BIOTIN CONTAINING HETEROBIFUNCTIONAL CLEAVABLE COMPOUNDS

Edward K. Fujimoto, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed May 5, 1995, Ser. No. 435,206
Int. Cl.^{6} C07D *235/02*
U.S. Cl. 548—304.1 **12 Claims**

1. A compound having the structure



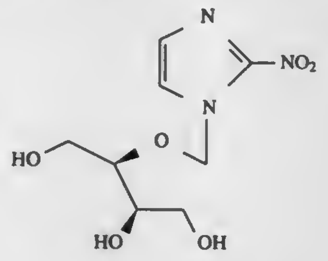
wherein a and b are zero or one, but are different, x is H or SO_3Na, n is an integer of 1 to 10, each n being the same or different and y is an integer of 1 to 10.

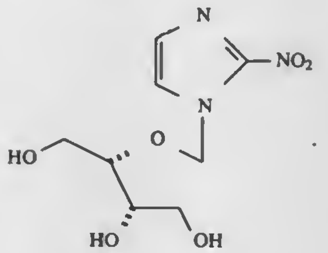
5,532,380
R,R,S,S-2-NITROIMIDAZOLE DERIVATIVES

Toshimitsu Suzuki, and Azuma Nishio, both of Yokohama, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

PCT No. PCT/JP93/01519, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO94/14778, PCT Pub. Date Jul. 7, 1994
PCT Filed Oct. 21, 1993, Ser. No. 256,354
Claims priority, application Japan, Dec. 18, 1992, 4-339035; Feb. 3, 1993, 5-016530
Int. Cl.^{6} C07D *233/91;233/94;* **C07C** *69/63;69/76;* **A61K** *31/415*
U.S. Cl. 548—327.5 **9 Claims**

1. A 2-nitroimidazole derivative represented by any one of the following formulas (1) or (2),


(1)

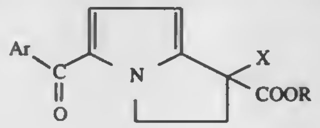

(2)

5,532,381
PROCESS FOR PREPARING PYRROLIZINE DERIVATIVES

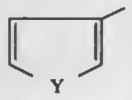
Yong H. Kim, Seoul; Hee S. Park, and Dong H. Lee, both of Taejeon, all of, Rep. of Korea, assignors to Dong Kook Pharmaceutical Co., Ltd., Seoul, Rep. of Korea

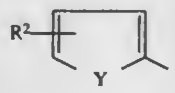
Filed Nov. 30, 1994, Ser. No. 352,085
Claims priority, application Rep. of Korea, Nov. 16, 1994, 94-29968
Int. Cl.^{6} C07D *451/00;487/04*
U.S. Cl. 548—453 **9 Claims**

1. A process for preparing compounds of formula (I)


(I)

wherein
R is lower alkyl,
X is hydrogen or alkoxycarbonyl,
Ar is a moiety selected from the group consisting of





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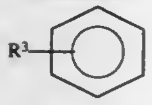
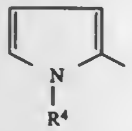
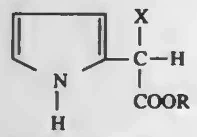


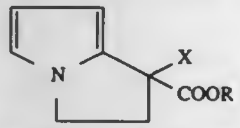
and



in which
R^2 is hydrogen, methyl, chloro or bromo, the R^2 substitution being at the 3-, 4- or 5-position of the ring,
R^3 is hydrogen, lower alkyl, lower alkoxycarbonyl, lower alkylcarbonyl, fluoro, chloro or bromo, the R^3 substitution being at any available position in the ring,
R^4 is hydrogen or lower alkyl,
Y is oxygen or sulfur, comprising the steps of:
i) preparing compounds of formula (III)


(III)

by the reaction between pyrrole and dialkyl diazomalonate or alkyl diazoacetate in the presence of a transition metal or an organometallic transition metal compound as a promoting agent;
ii) preparing compounds of formula (IV)


(IV)

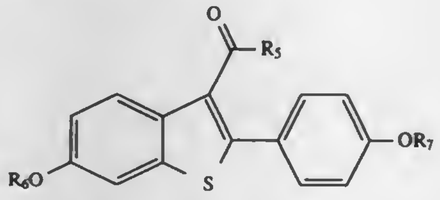
by the reaction between the compounds of formula (III) and dihaloethane in the presence of potassium carbonate as a base in an aprotic polar solvent; and
iii) preparing the compounds of formula (I) according to Vilsmeir-Haak aroylation using arylmorpholide-acid chloride complexes or dialkyl amine-acid chloride complexes.

5,532,382
BENZOTHIOPHENES SUBSTITUTED AT THE 3-CARBONYL

Donald G. Carlson, Indianapolis; George J. Cullinan, Trafalgar; Kennan J. Fahey; William T. Jackson, both of Indianapolis; Neal W. Roehm, Zionsville, and Stephen M. Spaethe, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 13, 1995, Ser. No. 402,683
Int. Cl.^{6} C07D *333/56;333/64*
U.S. Cl. 549—57 **4 Claims**

1. A compound of the of formula II



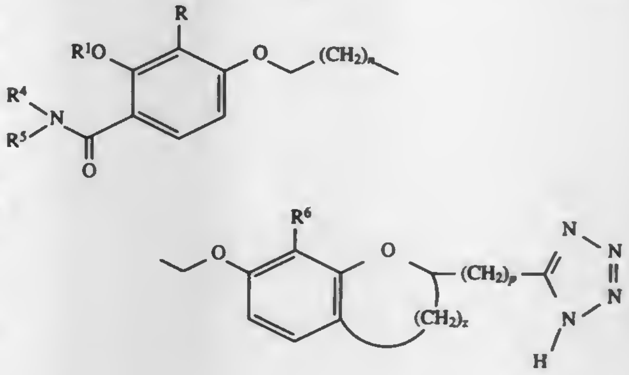
wherein R_6 and R_7 are hydrogen or C_1–C_6 alkyl,
R_5 is naphthyl, substituted naphhyl, or phenyl substituted one to three times with C_1–C_6 alkoxy, C_1–C_6 alkyl, phenyl, or hydroxy; with the proviso that if R_5 is phenyl monosubstituted with hydroxy or C_1–C_6 alkoxy, then the phenyl must be further substituted once or twice with C_1–C_6 alkoxy, C_1–C_6 alkyl, phenyl, or hydroxy, and pharmaceutically acceptable salts thereof.

5,532,383
LEUKOTRIENE B$_4$ ANTAGONISTS

Stevan W. Djuric, Glenview; Stephen H. Docter, Mount Prospect, and Stella S. Yu, Morton Grove, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 205,909, Mar. 3, 1994, Pat. No. 5,439,937, which is a division of Ser. No. 995,859, Dec. 23, 1992, Pat. No. 5,310,951, which is a continuation-in-part of Ser. No. 545,430, Jun. 28, 1990, Pat. No. 5,124,350. This application May 19, 1995, Ser. No. 445,059
Int. Cl.^{6} C07D *405/06;403/10;401/10;257/04*
U.S. Cl. 546—196 **1 Claim**

1. A compound of the formula:



wherein
R represents alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, alkynyl having 2 to 6 carbon atoms, or $—(CH_2)_m$-R^3 wherein R^3 represents cycloalkyl of 3 to 5 carbons atoms and m is 1 or 2;
R^1 represents alkyl having 1 to 4 carbon atoms;
R^6 represents alkyl having 1 to 6 carbon atoms;
n is an integer from 1 to 5;
p is an integer from 0 to 6;
x is 0 or 2; and
R^4 and R^5 are independently hydrogen or alkyl having 1 to 4 carbon atoms, or R^4 and R^5 together with N form a cycloalkylamine having 4 to 5 carbon atoms; and the stereoisomers and pharmaceutically acceptable salts thereof.

5,532,384
PROCESS FOR PRODUCING HYDROCARBON PARTIAL OXIDATION PRODUCTS

Arthur Shirley, Piscataway, and Ramakrishnan Ramachandran, Allendale, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 934,049, Aug. 21, 1992, abandoned. This application May 9, 1994, Ser. No. 239,636
Int. Cl.^{6} C07D *307/30*
U.S. Cl. 549—257 **8 Claims**

1. In a process for the production of a hydrocarbon derivative selected from cyclic anhydrides, alkylene oxides, halogenated hydrocarbons, aldehydes, unsaturated carboxylic acids, unsaturated nitriles and mixtures of these comprising:
(a) contacting in the vapor phase in a reaction zone at a temperature in the range of about 200° to about 600° C. a hydrocarbon containing 2 to 12 carbon atoms and oxygen in the presence of a catalyst which catalyzes the partial oxidation of said hydrocarbon to the selected hydrocarbon derivative,

thereby producing a gaseous product stream containing said hydrocarbon derivative;

(b) removing said hydrocarbon derivative from said gaseous product stream;

(c) flowing substantially all of the hydrocarbon derivative-free gaseous product stream from step (b) at superatmospheric pressure through an adsorption bed containing an adsorbent which is selective for said hydrocarbon, thereby removing unreacted hydrocarbon from said hydrocarbon derivative-free gaseous product stream; and

(d) terminating the flow of hydrocarbon derivative-free gaseous product stream through said adsorption bed when the unreacted hydrocarbon front reaches a predetermined point in said adsorption bed, and depressurizing said adsorption bed, thereby desorbing unreacted hydrocarbon from said adsorption bed; the improvement comprising:

(e) passing nitrogen-rich product through said adsorption bed, thereby further desorbing unreacted hydrocarbon from said adsorption bed; and

(f) recycling desorbed unreacted hydrocarbon and nitrogen-rich product to said reaction zone.

5,532,385

CATALYTIC PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

Jay B. Benziger, Lawrenceville; V. Vance Guliants, Princeton, and Sankaran Sundaresan, Mercerville, all of N.J., assignors to Trustees of Princeton University, Princeton, N.J.

Filed Nov. 14, 1994, Ser. No. 338,237

Int. Cl.^{6} C07D *307/60*

U.S. Cl. 549—259 **5 Claims**

1. The process for the partial oxidation of hydrocarbons containing four (4) carbon atoms to maleic anhydride comprising the steps of:

a) heating said C_4 hydrocarbon in the presence of oxygen to form maleic anhydride;

b) catalyzing the process of step a with the presence of vanadyl pyrophosphate;

wherein said catalyst is produced by the incorporation of the composition having the formula:

$$VOC_nH_{2n+1}PO_3.1.5H_2O,$$

where n is equal to 0, in the reaction vessel with the hydrocarbon and the oxygen.

5,532,386

CATALYTIC PROCESS FOR ELIMINATING CARBOXYLIC ESTER AND ACYL GROUPS FROM ORGANIC COMPOUNDS

Rolf Fischer, Heidelberg, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

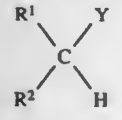
Filed Mar. 1, 1995, Ser. No. 396,606

Claims priority, application Germany, Mar. 7, 1994, 44 07 494.8

Int. Cl.^{6} C07D *307/32*

U.S. Cl. 549—322 **11 Claims**

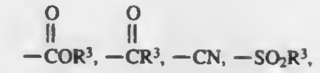
1. A process for preparing compounds of the formula I



(I)

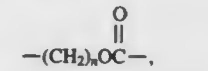
where:

Y is



$$-\overset{O}{\overset{\|}{C}}OR^3,\ -\overset{O}{\overset{\|}{C}}R^3,\ -CN,\ -SO_2R^3,$$

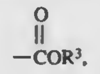
where R^3 is hydrogen or a C_1–C_{10} hydrocarbon radical, phenyl, which carries inert substituents if desired, or together with R^1 is



$$-(CH_2)_nO\overset{O}{\overset{\|}{C}}-,$$

whereon n is an integer from 2 to 4,

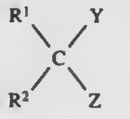
R^1 and R^2 are each, independently of one another, hydrogen, a C_1–C_{20} hydrocarbon radical which carries inert substituents if desired, or heteroaryl, furthermore C_1–C_6-acyl, when Y is



$$-\overset{O}{\overset{\|}{C}}OR^3,$$

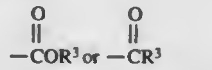
or together are a C_1–C_{12}-alkylene bridge which may contain as bridge member oxygen, sulfur or NR^4 where R^4 is hydrogen or C_1–C_4-alkyl,

which process comprises reacting a compound of the formula II



(II)

where Z is



$$-\overset{O}{\overset{\|}{C}}OR^3 \text{ or } -\overset{O}{\overset{\|}{C}}R^3$$

in the presence of catalytic amounts of a carbonic ester and of a nitrogenous base.

5,532,387

PROCESS FOR THE PREPARATION OF α-TOCOPHEROL DERIVATIVES

Makoto Matsui, and Hisashi Yamamoto, both of Aichi Prefecture, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

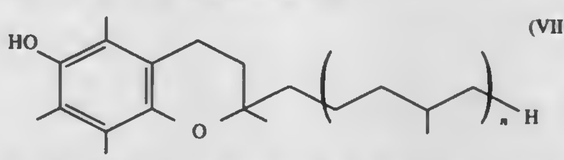
Filed Dec. 9, 1994, Ser. No. 352,519

Claims priority, application Japan, Dec. 14, 1993, 5-342074; Oct. 31, 1994, 6-267288

Int. Cl.^{6} C07D *311/72*

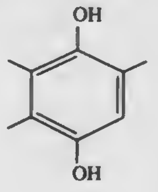
U.S. Cl. 549—411 **7 Claims**

1. A process for the preparation of an α-tocopherol derivative represented by the following formula (VII):



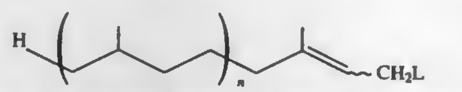
(VII)

wherein n stands for 0 or an integer of from 1 to 5, which comprises subjecting trimethylhydroquinone represented by the following formula (I):



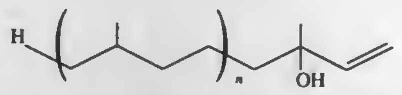
(I)

and an allyl alcohol derivative represented by the following formula (II):



(II)

wherein n has the same meaning as defined above and L represents a hydroxyl group, a halogen atom, acetoxy, methanesulfonyloxy, ethanesulfonyloxy, benzenesulfonyloxy or toluenesulfonyloxy group; or an alkenyl alcohol represented by the following formula (III):



(III)

wherein n has the same meaning as defined above to a condensation reaction in the presence of a fluorosulfonate represented by the following formula (IV):

$$M(RSO_3)_3 \qquad (IV)$$

wherein M represents a scandium, yttrium or lanthanide atom, R represents a fluorine atom, a fluorinated lower alkyl group, or an aryl group which may be substituted by one or more fluorine atoms, and the lanthanide atom means a lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium or lutetium atom; a nitrate represented by the following formula (V):

$$M(NO_3)_3 \qquad (V)$$

wherein M has the same meaning as defined above; or a sulfate represented by the following formula (VI):

$$M_2(SO_4)_3 \qquad (VI)$$

wherein M has the same meaning as defined above.

5,532,388

TAXOIDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hervé Bouchard, Ivry sur Seine; Jean-Dominique Bourzat, Vincennes, and Alain Commercon, Vitry-sur-Seine, all of, France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

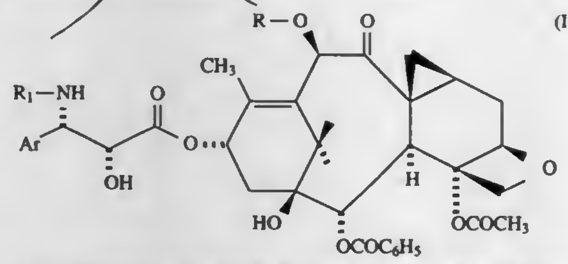
Division of Ser. No. 162,984, Dec. 8, 1993. This application Jun. 7, 1995, Ser. No. 475,621

Claims priority, application France, Dec. 9, 1992, 92 14813

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **20 Claims**

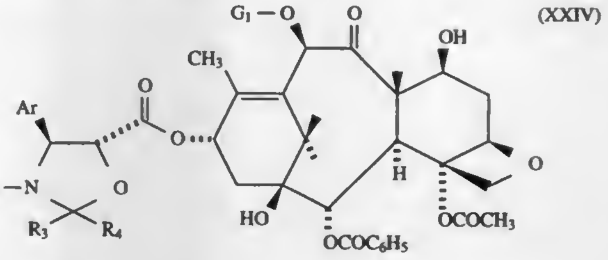
16. A method for preparing a taxoid of formula I:



(I)

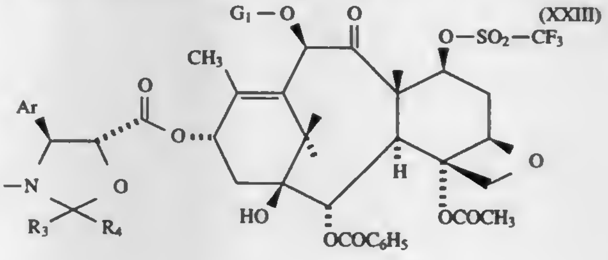
in which R represents a hydrogen atom or an acetyl, alkoxyacetyl or alkyl radical, R_1 represents a benzoyl radical or a radical R_2—O—CO— in which R_2 represents alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, bicycloalkyl, phenyl or heterocyclyl radical, and Ar represents an aryl radical, comprising the steps of

reacting a compound of the formula XXIV:



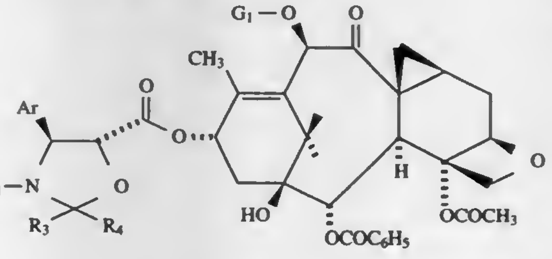
(XXIV)

in which G_1 represents a hydrogen atom or an acetyl, alkoxyacetyl or alkyl radical or a hydroxy-protecting group, R_3 and R_4, which are identical or different, represent an alkyl radical containing 1 to 4 carbon atoms or an aralkyl radical whose alkyl portion contains 1 to 4 carbon atoms or an aryl radical, or R_3 represents a hydrogen atom, or R_3 and R_4 form, together with the carbon atom to which they are attached, a 4–7-membered ring, with trifluoromethanesulfonic acid or a derivative thereof, to give a compound of the formula XXIII:



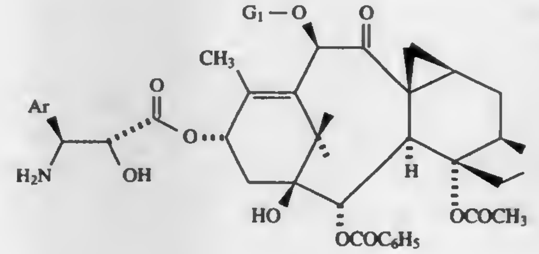
(XXIII)

treating the compound of the formula XXIII with an alkali metal halide, an alkali metal azide, a quaternary ammonium salt, or an alkali metal phosphate in an organic solvent to give a a compound of the formula II:



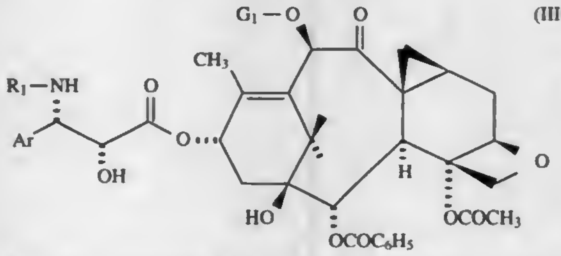
(II)

isolating the treating the compound of formula II with an inorganic or organic acid in an organic solvent at a temperature ranging from 0° to 50° C. to give a compound of formula IV:



(IV)

acylating the compound of formula IV using benzoyl chloride or a reactive derivative of the formula R_2—O—CO—X in which R_2 is as defined above and X represents a halogen atom or a residue —O—R_2 or —O—CO—O—R_2, to give a taxoid of formula I or a compound of formula III


(III)

wherein G_1 represents a protecting group that is removed to form a taxoid of formula I.

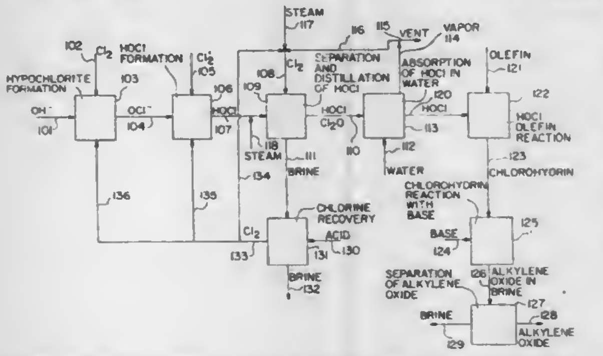
5,532,389
PROCESS FOR PREPARING ALKYLENE OXIDES

David L. Trent, Lake Jackson, Tex.; George J. Quarderer, Midland, Mich.; Kim G. Bargeron, Midland, Mich.; Douglas C. Greminger, Midland, Mich.; David J. Koranek, Lake Jackson, Tex.; Erik J. Stewart, Brazoria, Tex.; Curtis N. Swisher, Lake Jackson, Tex.; Cheryl A. Tirtowidjojo, Lake Jackson, Tex., and Danil Tirtowidjojo, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 156,507, Nov. 23, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,852

Int. Cl.^{6} C07D *301/26;303/04;303/08;* **C07C** *29/66*

U.S. Cl. 549—522 **54 Claims**



1. A continuous process for preparing an olefin chlorohydrin comprising steps of:

(a) contacting chlorine with a solution of a metal hypochlorite at a temperature below about 60° C., and a pH of less than about 5.5, with sufficient micromixing to achieve a product hypochlorous acid in a yield of at least about 80 mole percent based on hypochlorite in an aqueous metal chloride solution;

(b) separating at least a portion of the hypochlorous acid from the aqueous metal chloride solution thereof wherein the solution is sprayed as droplets having a volume mean diameter of less than about 500 micrometers into a vapor stream such that at least about 30 mole percent of the hypochlorous acid is desorbed from a liquid phase into a vapor phase where hypochlorous acid and dichlorine monoxide are in equilibrium;

(c) distilling the remaining liquid phase to obtain additional hypochlorous acid and dichlorine monoxide vapor;

(d) absorbing the hypochlorous acid and dichlorine monoxide in low-chlorides water to produce a low-chlorides aqueous hypochlorous acid solution; and

(e) contacting the low-chlorides aqueous hypochlorous acid solution with an olefin in a continuous process using a continuous stirred tank reactor with backmix stirring sufficient to maintain the HOCl concentration in the reactor of 0.2 weight percent or less to form a corresponding olefin chlorohydrin.

2. The process of claim 1 additionally comprising steps:

(f) contacting the olefin chlorohydrin with a base to form a corresponding alkylene oxide and a salt solution; and

(g) separating the alkylene oxide from the salt solution.

5,532,390
ENERGETIC AZIDE PLASTICIZER

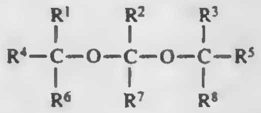
Renato R. Rindone, Fair Oaks; Der-Shing Huang, Carmichael, and Edward E. Hamel, Roseville, all of Calif., assignors to Aerojet General Corporation, Sacramento, Calif.

Division of Ser. No. 320,142, Mar. 17, 1989, Pat. No. 5,220,039. This application Jun. 27, 1990, Ser. No. 563,918

Int. Cl.^{6} C07C *247/00*

U.S. Cl. 552—11 **18 Claims**

1. A method for preparing a compound having the formula



$$R^4-\underset{R^6}{\overset{R^1}{C}}-O-\underset{R^7}{\overset{R^2}{C}}-O-\underset{R^8}{\overset{R^3}{C}}-R^5$$

in which R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 are independently selected from the group consisting of H, CH_3, and CH_2N_3 such that the total number of azide groups is at least one, said method comprising:

(a) reacting a halogen-substituted alcohol in the presence of a catalyst with a compound having a functionality selected from aldehyde and ketone functionalities; and

(b) reacting the product of step (a) with metal azide to obtain said compound.

5,532,391
HOMOLOGATED VITAMIN D_2 COMPOUNDS AND THE CORRESPONDING 1α-HYDROXYLATED DERIVATIVES

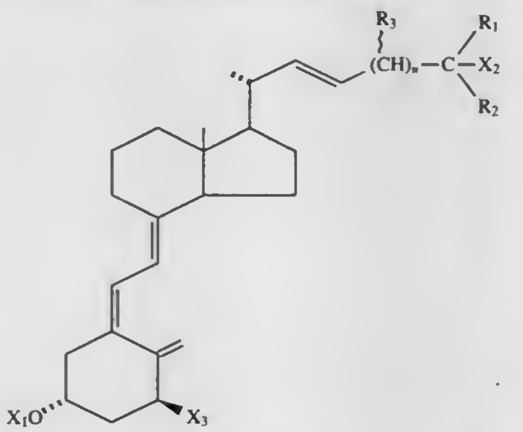
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Kato L. Perlman, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 985,432, Dec. 3, 1992, Pat. No. 5,414,098, which is a continuation of Ser. No. 732,008, Jul. 22, 1991, abandoned, which is a division of Ser. No. 654,746, Feb. 13, 1991, Pat. No. 5,260,290, which is a continuation-in-part of Ser. No. 481,990, Feb. 14, 1990, Pat. No. 5,030,772. This application Feb. 27, 1995, Ser. No. 394,579

Int. Cl.^{6} C07C *401/00*

U.S. Cl. 552—653 **5 Claims**

1. A Vitamin D compound having the formula:



where the configuration about carbon 24 may be R or S and wherein n is an integer having a value of 4, X_1 is selected from hydrogen or a hydroxy protecting group, X_2 is selected from hydrogen, hydroxy, and protected hydroxy, X_3 is selected from hydrogen, hydroxy and protected hydroxy, each R_3 is independently selected from alkyl, hydroxy, protected hydroxy, hydrogen or fluorine, with the proviso that at least one R_3 must be alkyl, and wherein R_1 and R_2, which may be the same or different, are each selected from an alkyl or aryl group.

5,532,392
PROCESS FOR THE PREPARATION OF METHYL FATTY ACID ESTERS STARTING FROM NATURAL OIL OR FAT, METHYL ESTERS OBTAINED IN THIS WAY AND USE THEREOF

Mihail Gheorghiu, Lt L. Emmerechtsplein 4, Box 8, 1853 Strombeek-Bever, Belgium

Filed Jan. 13, 1994, Ser. No. 181,307

Int. Cl.^{6} C11C *1/00*

U.S. Cl. 554—169 **19 Claims**

1. A process, which comprises:

transesterifying natural oil or fat with methanol in the presence of an organotitanate based catalyst to form methyl fatty acid esters;

wherein said catalyst further comprises zinc acetylacetonate.

5,532,393
PROCESS OF PREPARING WAX ESTER

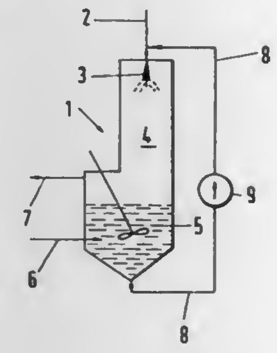
Eberhard Schlichting, Wehrheim; Henning Buchold; Gerd Mallok, both of Hanau; Fritz-Jürgen Gärtner, Bickenbach, and Hans-Martin Stönner, Eschborn, all of, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 16, 1994, Ser. No. 358,447

Claims priority, application Germany, Dec. 18, 1993, 43 43 320.0

Int. Cl.^{6} C11C *3/00*

U.S. Cl. 554—170 **7 Claims**



1. A process of preparing wax ester from a liquid mixture which consists essentially of at least one fatty acid and at least one fatty alcohol, wherein the fatty acid and the fatty alcohol contain 6 to 30 carbon atoms per molecule, which comprises agitating the mixture at temperatures in the range from about 105° to 300° C., spraying said mixture into a spraying zone thereby forming water vapor in the spraying zone, and withdrawing the water vapor from said zone at least in part.

5,532,394
ADDITION POLYMERIZATION CATALYSTS COMPRISING REDUCED OXIDATION STATE METAL COMPLEXES

Robert K. Rosen, Sugar Land, Tex.; Peter N. Nickias, Midland, Mich.; David D. Devore, Midland, Mich.; James C. Stevens, Midland, Mich., and Francis J. Timmers, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

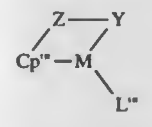
PCT No. PCT/US93/02584, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/19104, PCT Pub. Date Sep. 30, 1993

Division of Ser. No. 8,003, Jan. 21, 1993, Pat. No. 5,374,696, which is a continuation-in-part of Ser. No. 941,014, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 857,886, Mar. 26, 1992, abandoned. This PCT application Mar. 19, 1993, Ser. No. 295,768

Int. Cl.^{6} C07F *17/00*

U.S. Cl. 556—11 **5 Claims**

1. A metal complex corresponding to the formula:



wherein:

M is titanium in the +3 oxidation state;

Cp*' is a cyclopentadienyl group, or a hydrocarbyl, silyl, halo, halohydrocarbyl, or hydrocarbylmetalloid substituted derivative thereof, said Cp*' containing up to 50 nonhydrogen atoms;

Z is a divalent moiety comprising oxygen, nitrogen, phosphorous, boron, or a member of Group 14 of the Periodic Table of the Elements, said moiety having up to 30 nonhydrogen atoms;

Y is a linking group comprising nitrogen, phosphorus, oxygen or sulfur covalently bonded to M and Z through said nitrogen, phosphorus, oxygen or sulfur atom, the ligand moiety consisting of -Cp*'-Z-Y- being dianionic and having the ionic charges residing formally on Cp*' and Y; and

L*' is 2-di(C_1–C_4 alkyl)aminobenzyl, 2-(di(C_1–C_4 alkyl)aminomethyl)phenyl, allyl, 1-methylallyl, 2-methylallyl, 1,1-dimethylallyl, 1,2,3-trimethylallyl, 1-phenyl-3-benzylallyl or 1,1-diphenyl-3-(diphenylmethyl)allyl.

5,532,395
CHIRAL PHOSPHOLANES VIA CHIRAL 1,4-DIOL CYCLIC SULFATES

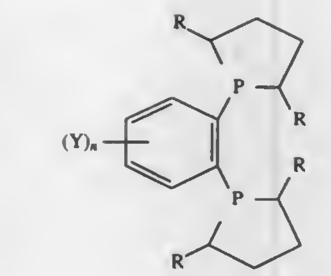
Mark J. Burk, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 324,329, Oct. 17, 1994, which is a division of Ser. No. 222,750, Apr. 4, 1994, Pat. No. 5,386,061, which is a division of Ser. No. 978,215, Jul. 27, 1992, Pat. No. 5,329,015, which is a division of Ser. No. 725,121, Jul. 2, 1991, Pat. No. 5,171,892. This application May 24, 1995, Ser. No. 449,861

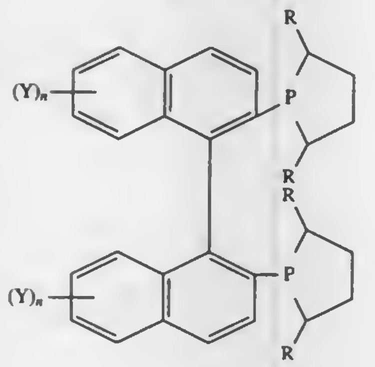
Int. Cl.^{6} C07F *15/00;9/02*

U.S. Cl. 556—18 **9 Claims**

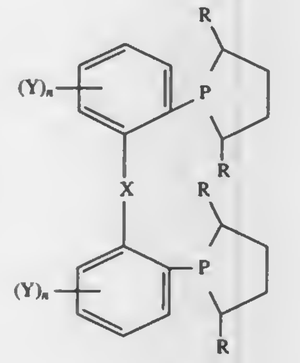
1. A complex consisting of one or more transition metals selected from Groups 8, 9 and 10 boned to both phosphorus atoms of one or more ligands of formulae II, IIIc, IVc, Vc, or VIc:



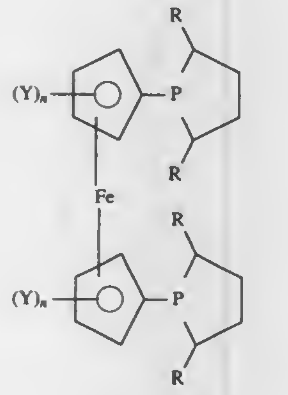
II



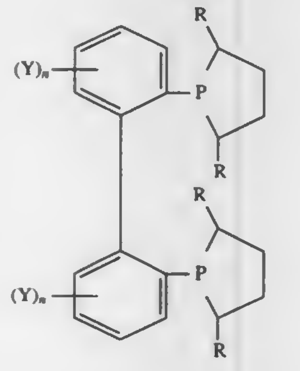
IIIc



IVc



Vc



VIc

wherein

R is a radical selected from the group consisting alkyl, fluoroalkyl, perfluroalkyl, each containing up to about 8 carbons atoms; aryl; aralkyl; and $—CR'_2(CR'_2)_qX(CR'_2)_pR'$;

q and p are each integers, the same or different, ranging from 1 to about 8;

X is as defined below; and

R'is H; F; aryl; or alkyl, fluoroalkyl, or perfluoroalkyl, each containing up to about 8 carbon atoms;

or where together R' and R" form a ring

X is O, S, NR", PR", AsR", SbR", divalent aryl, divalent fused aryl, divalent 6-membered ring heterocyclic group, divalent 5-membered ring heterocyclic group, or divalent fused heterocyclic group;

R" is hydrogen; alkyl, fluoroalkyl or perfluoroalkyl, each containing up to about 8 carbon atoms; aryl; aralkyl; or $—CR'_2(CR'_2)_qZ(CR'_2)_pR'$;

Z is O, S, NR', PR', AsR', or SbR', and R', p, and q are as defined above;

or together R' and R" from a ring; and

each Y is independently hydrogen, halogen, alkyl, alkoxy, aryl, aryloxy, nitro, amino, vinyl, alkynyl or sulfonic acid, and n is an integer from 1 to 6 equal to the number of unsubstituted aromatic ring carbons.

5,532,396
METALLOCENE COMPOUND

Andreas Winter, Glashütten; Frank Küber, Oberursel; Michael Aulbach, Hofheim; Bernd Bachmann, Eppstein; Robert Klein, Frankfurt am Main; Klaus Kühlein, Kelkheim; Walter Spaleck, Liederbach, and Christian Kohlpaintner, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

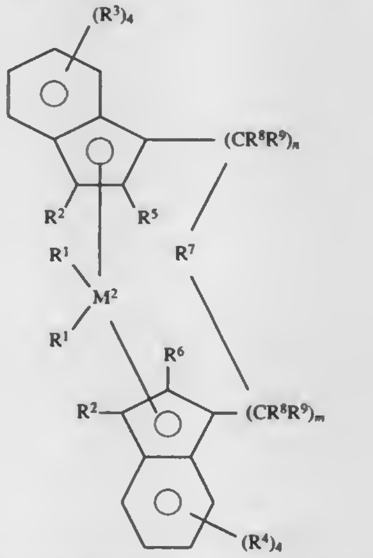
Filed Dec. 22, 1994, Ser. No. 361,762

Claims priority, application Germany, Dec. 27, 1993, 43 44 689.2

Int. Cl.^{6} C08F *4/642;* **C07F** *17/00*

U.S. Cl. 556—11 **11 Claims**

1. A metallocene of the formula I



(I)

where

M^2 is a metal of group IVb, Vb or VIb of the Periodic Table,

the radicals R^1 are identical or different and are a hydrogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-alkoxy group, a C_6–C_{10}-aryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group or a halogen atom,

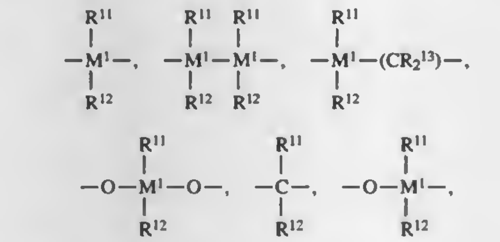
the radicals R^2 are identical or different and are hydrogen, a halogen atom, a C_1–C_{10}-alkyl group which can be halogenated, a C_6–C_{10}-aryl group, a C_1–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group, a $-NR^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3{}^{10}$, $—SiR_3{}^{10}$ or $—PR_2{}^{10}$ radical, where R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

the radicals R^3 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{20}-alkyl group, a C_1–C_{20}-fluoroalkyl group, a C_6–C_{30}-aryl group, a C_6–C_{30}-fluoroaryl group, a C_1–C_{20}-alkoxy group, a C_2–C_{20}-alkenyl group, a C_7C_{40}-arylalkyl group, a C_8–C_{40}-arylalkenyl group, a C_7–C_{40}-alkylaryl group, a $—NR_2{}^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3{}^{10}$, $—SiR_3{}^{10}$ or $—PR_2{}^{10}$ radical, where R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group, or two or more radicals R^3 together with the atoms connecting them form a ring system, but radicals R^3 are not hydrogen when all radicals R^4 are hydrogen,

the radicals R^4 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{20}-alkyl group, a C_1C_{20}-fluoroalkyl group, a C_6C_{30}-aryl group, a C_6–C_{30}-fluoroaryl group, a C_1–C_{20}-alkoxy group, a C_2–C_{20}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_8C_{40}-arylalkenyl group, a C_7–C_{40}-alkylaryl group, a $—NR_2{}^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3{}^{10}$, $—SiR_3{}^{10}$ or $—PR_2{}^{10}$ radical where R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group, or two or more radicals R^4 together with the atoms connecting them form a ring system, but all radicals R^4 are not hydrogen when all radicals R^3 are hydrogen, R^5 a halogen atom, a C_1–C_{10}-alkyl group, which can be halogenated, a C_6–C_{10}-aryl group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group, a $—NR_2{}^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3{}^{10}$, $—SIR_3{}^{10}$ or $—PR_2{}^{10}$ radical, where R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

R^6 is a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, which can be halogenated, a C_6–C_{10}-aryl group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkyloxy group, a C_8–C_{40}-arylakenyl group, a $—NR_2{}^{10}$, $—OR^{10}$, $—SR^{10}$, $—OSiR_3{}^{10}$, $—SIR_3{}^{10}$ or $—PR_2{}^{10}$ radical, where R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

R^7 is



$$-\underset{R^{12}}{\overset{R^{11}}{M^1}}-,\quad -\underset{R^{12}}{\overset{R^{11}}{M^1}}-\underset{R^{12}}{\overset{R^{11}}{M^1}}-,\quad -\underset{R^{12}}{\overset{R^{11}}{M^1}}-(CR_2{}^{13})-,$$

$$-O-\underset{R^{12}}{\overset{R^{11}}{M^1}}-O-,\quad -\underset{R^{12}}{\overset{R^{11}}{C}}-,\quad -O-\underset{R^{12}}{\overset{R^{11}}{M^1}}-,$$

$=BR^{11}$, $=AlR^{11}$, —Ge—, —Sn—, —0—, —S—, =SO, $=SO_2$,$=NR^{11}$, =CO, $=PR^{11}$ or $=P(O)\,R^{11}$,

where

R^{11}, R^{12} and R^{13} are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{20}-alkyl group, a C_1–C_{20}-fluoroalkyl group, a C_6–C_{30}-aryl group, a C_6–C_{30}-fluoroaryl group, a C_1–C_{20}-alkoxy group, a C_2–C_{20}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_5–C_{40}-arylalkenyl group, a C_7–C_{40}-alkylaryl group, or R^{11} and R^{12} or R^{11} and R^{13} together with the atoms connecting them form a ring,

M^1 is silicon, germanium or tin,

R^8 and R^9 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{20}-alkyl group, a C_1–C_{20}-fluoroalkyl group, a C_6–C_{30}-aryl group, a C_6–C_{30}-fluoroaryl group, a C_1–C_{20}-alkoxy group, a C_2–C_{20}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_8–C_{40}-arylalkenyl group, a C_7–C_{40}-alkylaryl group, or R^8 and R^9 together with the atoms connecting them form a ring,

m and n are identical or different and are zero, 1 or 2, where m plus n is zero, 1 or 2, wherein the two indenyl ligands have substitution patterns different from one another on the six-membered ring.

7. The metallocene as claimed in claim 1, wherein the metallocene is dimethylsilanediyl(2-methyl-1-indenyl) (2-methyl-4-phenyl-1-indenyl)zirconium dichloride.

5,532,397
SUBSTITUTED SILYL ALKYLENE AMINES

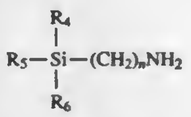
Daniel G. Schirlin, Lampertheim; Jean-Noël Collard, Balbronn, and Charles Danzin, Strasbourg, all of, France, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 875,938, Apr. 30, 1992, which is a continuation-in-part of Ser. No. 690,431, Apr. 24, 1991, abandoned, which is a continuation of Ser. No. 500,446, Mar. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 463,850, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 178,113, Apr. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,847, May 8, 1987, abandoned. This application Sep. 21, 1994, Ser. No. 310,188

Int. Cl.^{6} C07F *7/10*

U.S. Cl. 556—413 **17 Claims**

1. A compound of the formula:



$$R_5-\underset{R_6}{\overset{R_4}{Si}}-(CH_2)_nNH_2$$

or the pharmaceutically acceptable salts thereof, wherein

n is an integer 1 or 2,

R_4 is C_{1-6} alkyl,

R_5 is C_{1-6} alkyl,

R_6 is cyclohexylmethyl or $—(CH_2)_m—$X,Y-substituted aryl, with each of X and Y being H, OH, halogeno, C_{1-4} alkoxy with the proviso X and Y are not simultaneously H.

5,532,398
SILANES, PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION TO PREPARE POLYMERS AND POLYCONDENSATES

Herbert Wolter, Gerchsheim; Klaus Rose, Kitzingen, and Christian Egger, Höchberg, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Germany

Continuation of Ser. No. 680,928, Apr. 5, 1991, Pat. No. 5,399,738. This application Dec. 29, 1994, Ser. No. 366,055

Claims priority, application Germany, Apr. 5, 1990, 40 11 044.3

Int. Cl.^{6} C07F *7/08;7/10*

U.S. Cl. 556—420 **22 Claims**

1. A silane of the formula (I):

$$(X_aR_bSi(R'(A)_c)_{(4-a-b)})_xB \qquad (I)$$

wherein the groups and indices have the following meanings:

X: hydrogen, halogen, hydroxy, alkoxy, acyloxy, alkyl carbonyl, alkoxycarbonyl or $—NR''_2$;

R: alkyl, alkenyl, aryl, alkaryl, or aralkyl;

R': alkylene, arylene or alkylene arylene;

R": hydrogen, alkyl or aryl;

A: O, S, PR", POR", NHC(O)O or NHC(O)NR";

B: straight chain or branched organic group, which is derived from a B' compound with at least one C═C double bond, where c=1 and A=NHC(O)) or NHC(O)NR", or at least two C═C double bonds, and 5 to 50 carbon atoms, said B' compound not having two or more acrylate groups, methacrylate groups or a combination thereof;

a: 1, 2 or 3;

b: 0, 1 or 2;

c: 0 or 1;

x: whole number, whose maximum value corresponds to the number of double bonds in compound B' minus 1, or is equal to the number of double bonds in compound B', when c=1 and A is NHC(O)O or NHC(O)NR".

5,532,399

PROCESS FOR THE PREPARATION OR ORGANOSILICON COMPOUNDS CARRYING SULFUR-CONTAINING ORGANIC RADICALS

Rudolf Hager; Josef Wolferseder, both of Altoetting, and Bernward Deubzer, Burghausen, all of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

PCT No. PCT/EP92/02215, § 371 Date Feb. 3, 1994, § 102(e) Date Feb. 3, 1994, PCT Pub. No. WO93/08228, PCT Pub. Date Apr. 29, 1993

PCT Filed Sep. 24, 1992, Ser. No. 190,132

Claims priority, application Germany, Oct. 24, 1991, 41 35 170.3

Int. Cl.^{6} C07F *7/08*

U.S. Cl. 556—428 **10 Claims**

1. A process for the preparation of organosilicon compounds carrying sulfur-containing organic radicals, wherein organosilicon compounds made up of units of the general formula

$$R_a(R^1O)_bR^2_cSiO_{(4-a-b-c)/2} \qquad (I)$$

in which

R can be identical or different and is a monovalent organic radical,

R^1 can be identical or different and is a hydrogen atom or a monovalent organic radical,

R^2 can be identical or different and is a radical —QX, where Q is a divalent aliphatic or cycloaliphatic hydrocarbon radical having 2 to 10 carbons atoms and X is a halogen atom,

a is 0, 1, 2 or 3,

b is 0, 1, 2 or 3 and

c is 0, 1, 2 or 3,

with the proviso that the organosilicon compound has at least one radical R^2 per molecule and the sum of a, b and c is less than or equal to 4, are reacted with sulfite in the presence of water.

5,532,400

2,6-DI-ALKYL-4-SILYL-PHENOLS AS ANTIATHEROSCELEROTIC AGENTS

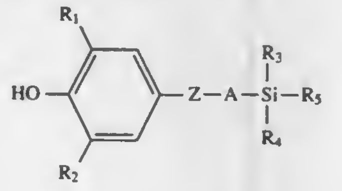
Roger A. Parker, Cincinnati, and Simon J. T. Mao, Loveland, both of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 219,230, Mar. 29, 1994, abandoned, which is a continuation of Ser. No. 72,347, Jun. 4, 1993, abandoned, which is a continuation of Ser. No. 940,774, Sep. 1, 1992, abandoned, which is a continuation of Ser. No. 881,395, Dec. 20, 1991, abandoned, which is a division of Ser. No. 548,052, Jul. 5, 1990, Pat. No. 5,155,250. This application Dec. 12, 1994, Ser. No. 353,736

Int. Cl.^{6} C07F *7/08;7/18*

U.S. Cl. 556—449 **7 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3 and R_4 are each independently a C_1–C_6 alkyl group;

Z is a methylene group;

A is a C_1–C_4 alkylene group;

R_5 is a C_1–C_6 alkyl or —$(CH_2)_n$—(Ar) wherein n is an integer 0 or 1; and Ar is phenyl, or napthyl unsubstituted or substituted with one to three substituents selected from the group consisting of hydroxy, methoxy, ethoxy, chloro, fluoro or C_1–C_6 alkyl.

5,532,401

PROCESS FOR PRODUCTION OF TRIS(NONYLPHENYL) PHOSPHITE

Donald R. Stevenson; Daniel L. Clark; John C. Debevec, all of Dover, Ohio; Charles N. Slater, Houston, Tex., and Carroll W. Larke, Zoar, Ohio, assignors to Dover Chemical Corporation, Dover, Ohio

Filed Jan. 19, 1995, Ser. No. 375,557

Int. Cl.^{6} C07F *9/08*

U.S. Cl. 558—95 **14 Claims**

1. An improved process for the preparation of tris(nonylphenyl) phosphite comprising the steps of:

(a) combining at least a 2 weight percent excess of nonylphenol with PCl_3 with agitation and heating sufficient to liberate HCl formed during the synthetic reaction as a by-product; and

(b) removing the excess nonylphenol from the tris(nonylphenyl) phosphite by thin film distillation to reduce the residual chloride level to 20 ppm or less, an acid number of 0.1 or less and a nonylphenol content after stripping of 0.5 weight percent or less.

5,532,402

PROCESS FOR PRODUCING OPTICALLY ACTIVE HYDROXYALKYLPHOSPHONATES

Ryoji Noyori, Aichi; Masato Kitamura, Nagoya, and Makoto Tokunaga, Chiba, all of, Japan, assignors to Takasago International Corporation, Tokyo, Japan

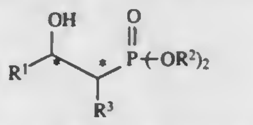
Filed Mar. 13, 1995, Ser. No. 402,654

Claims priority, application Japan, Jul. 1, 1994, 6-150837

Int. Cl.^{6} C07F *9/40*

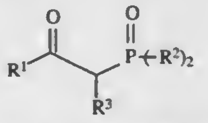
U.S. Cl. 558—178 **4 Claims**

1. A process for producing an optically active hydroxyalkylphosphonate represented by the following general formula (4):



(4)

wherein R^1 and R^2 are identical with or different from each other and mean individually an alkyl group, R^3 denotes a halogen atom, and * stands for an asymmetric carbon atom, which comprises asymmetrically hydrogenating an oxoalkylphosphonate having an asymmetric carbon atom as represented by the following general formula (1):

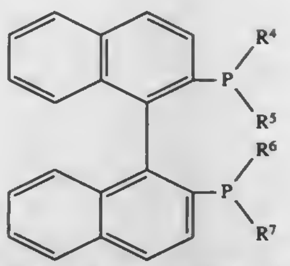


(1)

wherein R^1, R^2 and R^3 have the same meaning as defined above, using, as a catalyst, a ruthenium-optically active phosphine complex represented by the following general formula (2):

$$RuCl_2(binap)(DMF)_n \qquad (2)$$

wherein binap means an optically active bisphosphine represented by the following general formula (3):



(3)

in which R^4, R^5, R^6 and R^7 are identical with or different from one another and denote individually a phenyl group which may be substituted by an alkyl or alkoxy, DMF means N,N-dimethylformamide, and n stands for a natural number.

5,532,403

WATER-BLOWN POLYURETHANE SEALING DEVICES AND COMPOSITIONS FOR PRODUCING SAME

Thirumurti Narayan, Grosse Ile, and Steven Hicks, Trenton, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.

Continuation of Ser. No. 367,036, Dec. 29, 1994, abandoned. This application Oct. 25, 1995, Ser. No. 548,077

Int. Cl.^{6} C07C *261/00*

U.S. Cl. 560—26 **15 Claims**

1. An isocyanate prepolymer composition suitable for preparing a molded polyurethane article, the composition comprising the results of reacting:

(a) an isocyanate blend comprising:

  (i) 0 to 10 pbw 2,4'-diphenylmethane diisocyanate;

  (ii) 30 to 80 pbw 4,4'-diphenylmethane diisocyanate; and

  (iii) 1 to 10 pbw of a mixture of uretonimine containing molecules and carbodiimide containing molecules; and

(b) from 10 to 70 pbw of an ethoxylated and propoxylated glycerine having a number average molecular weight of between 1000 and 10,000 and a hydroxyl number of between 20 to 100;

wherein the resulting prepolymer has a % free NCO of less than 20% and a viscosity of from 200 to 600 cPs and all pbw are based on the total weight of (a) and (b).

5,532,404

MONOMER RECOVERY PROCESS FOR CONTAMINATED POLYMERS

Francis G. Gallagher, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1994, Ser. No. 250,391

Int. Cl.^{6} C07C *67/48*

U.S. Cl. 560—78 **20 Claims**

20. A process for recovering reaction products from a reaction mass that comprises a starting polymer, wherein said polymer is a polyester or polyamide having about 2% to 70% by weight nonpolymer contaminants, which process comprises:

(a) depolymerizing the polymer by means of a depolymerizing agent to yield volatile reaction products;

(b) vapor-phase stripping the volatile reaction products to yield a stripping-agent/product distillate;

wherein said depolymerization and vapor-phase stripping is carried out in the presence of a support material selected from the group consisting of glass, carbon fiber, mineral, metal, ceramic, wood, aramid, and non-depolymerized residual polymer, which support material comprises from about 5% to 99% by weight of the reaction mass, which support material is solid under the conditions of steps (a) and (b), such that a suspended bed is formed in which the support material provides porosity for gas passage and surface area for gas/polymer and gas/oligomer contacting, thereby enhancing the quantity and rate of recovery of reaction products over that obtained in the absence of said support material; and

(c) recovering the reaction products from the stripping-agent/product distillate while leaving non-volatile residue material with the support material.

5,532,405

PREPARATION OF PLASTICIZER OR POLYOL ESTERS BY THE STAGED ADDITION OF THE LOWER BOILING POINT REACTANT

John Lyford, IV, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Apr. 29, 1994, Ser. No. 235,821

Int. Cl.^{6} C07C *67/08*

U.S. Cl. 560—99 **21 Claims**

1. A process for the esterification of an acid with at least one alcohol which comprises the following steps:

a. adding said acid and at least one alcohol to a reaction vessel to form a reaction mixture, said alcohol having a lower boiling point than said acid and being added in an amount of about 5% to 60% of the stoichiometric requirements of the total alcohol required to react with the said acid;

b. heating said reaction mixture to a temperature at about or above the boiling point of said alcohol and maintaining a pressure sufficient to obtain boiling of said reaction mixture, thereby converting said acid and at least one alcohol to an ester and removing water and a portion of said alcohol from said reaction vessel;

c. monitoring the concentration of said alcohol in step (b); and

d. adding additional alcohol to the reaction mixture if said alcohol contained therein as monitored in step (c) falls below a certain predetermined concentration of said alcohol.

5,532,406

PROCESS FOR PREPARING AROMATIC HYDROXYCARBOXYLIC ACIDS

Siegbert Rittner, Mörfelden; Hans-Martin Rüffer, Hofheim; Jörg Schmid, Eppstein, and Thomas Wisser, Limburg, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 19, 1994, Ser. No. 245,962

Claims priority, application Germany, May 21, 1993, 43 16 933.3

Int. Cl.^{6} C07C *51/15*

U.S. Cl. 562—424 **20 Claims**

1. A process for preparing aromatic hydroxy carboxylic acids or di-salts thereof by reaction of solid alkali metal phenolate or naphtholate starting materials with carbon dioxide, which comprises introducing the solid phenolate or naphtholate starting materials into a reaction mixture batchwise or continuously, separately or together, in the form of a dispersion in an inert organic liquid.

5,532,407

PROCESS FOR RECOVERING L-PHENYLALANINE

Tadashi Takemoto, and Takehiko Kataoka, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 330,185

Claims priority, application Japan, Dec. 13, 1993, 5-311675

Int. Cl.^{6} C07C *211/00*

U.S. Cl. 562—443 **6 Claims**

1. A process for recovering L-phenylalanine from production of α-APM, comprising: adding L-aspartic acid or an aqueous solution thereof directly to a side stream obtained from production of α-APM either before or after hydrolysis of the side stream in the presence of a mineral acid, adjusting the pH of the reaction mixture obtained by hydrolysis to 5–6 and recovering precipitated L-phenylalanine.

5,532,408

α-CHAIN-MODIFIED ISOCARBACYCLINS AND PROCESS FOR THE PRODUCTION THEREOF

Masahiro Koga; Toshio Tanaka, both of Iwakuni; Takao Fujii, Koganei, and Tsukio Masegi, Hino, all of, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. pct/jp93/01407, § 371 Date Apr. 5, 1995, § 102(e) Date Apr. 5, 1995, PCT Pub. No. wo94/07838, PCT Pub. Date Apr. 14, 1995

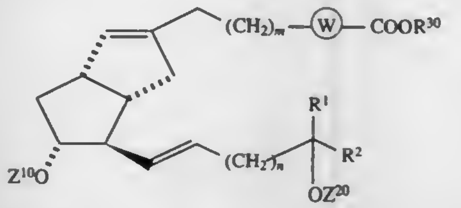
PCT Filed Oct. 1, 1993, Ser. No. 411,649

Claims priority, application Japan, Oct. 5, 1992, 4-266084

Int. Cl.^{6} C07C ***62/06;69/74;177/00;*** **C07F** ***7/04***

U.S. Cl. 562—466 **4 Claims**

1. α-Chain-modified isocarbacyclins of the following formula (1),



(1)

wherein

- (W) is a phenylene group, a C_3–C_7 cycloalkylene group or a thiophendiyl group
- R^1 is a hydrogen atom, a methyl group, an ethyl group or a vinyl group;
- R^2 is a linear or branched C_3–C_8 alkyl group, alkenyl group or alkynyl group or a C_3–C_7 cycloalkyl group;
- R^{30} is a hydrogen atom, a C_1–C_{10} alkyl group, a phenyl group, a benzyl group, a naphthyl group or one equivalent of a cation;
- each of Z^{10} and Z^{20} is independently a hydrogen atom, tri(C_1–C_7 hydrocarbon)silyl group or a group which forms an acetal bond or an ester bond together with an oxygen atom to which it bonds;
- n is 0 or 1; and
- m is an integer of 0 to 4.

5,532,409

PROCESS FOR PRODUCING R-AMINOCARNITINE AND S-AMINOCARNITINE

Fabio Giannessi, Rome; Roberto Castagnani, Recanati; Francesco De Angelis, Rome; Maria O. Tinti, Rome, and Domenico Misiti, Rome, all of, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Continuation of Ser. No. 281,354, Jul. 27, 1994, abandoned.

This application Sep. 30, 1994, Ser. No. 317,658

Claims priority, application Italy, Jul. 29, 1993, RM93A0502

Int. Cl.^{6} C07C ***229/00***

U.S. Cl. 562—561 **4 Claims**

1. A process for producing aminocarnitine inner salt which comprises the steps of:

(1) converting methanesulfonylcarnitine to a lactone by treating methanesulfonylcarnitine in a basic environment;

(2) converting the lactone to azidocarnitine inner salt by treating the lactone with an azide for 2–6 hours, at 20°–30° C.; and

(3) converting the azidocarnitine to aminocarnitine inner salt via catalytic hydrogenation in the presence of 10% Pd/C, at 2–4 hydrogen atmospheres, for 8–18 hours.

5,532,410

PROCESS FOR MANUFACTURING L(-)-CARNITINE FROM A WASTE PRODUCT HAVING OPPOSITE CONFIGURATION

Fabio Giannessi, Rome; Nazareno Scafetta, Pavona di Albano; Ida Bernabei, Nettuno; Maria O. Tinti, and Francesco De Angelis, both of Rome, all of, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Ruinite S.p.A., Rome, Italy

Filed Apr. 4, 1994, Ser. No. 224,513

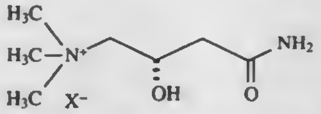
Claims priority, application Italy, Apr. 8, 1993, 93A000227

Int. Cl.^{6} C07C ***229/00***

U.S. Cl. 562—567 **6 Claims**

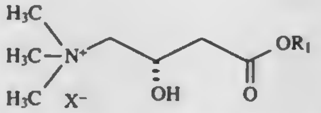
1. A process for producing L-(−)-carnitine from D-(+)-carnitinamide, which comprises:

(a) reacting D-(+)-carnitinamide 1 of the formula:



1

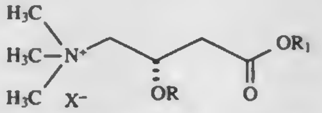
wherein X$^-$ is an anion, in an acid medium with a straight or branched chain aliphatic alcohol, thereby forming ester 2 of the formula:



2

wherein R$_1$ is a straight or branched alkyl group having 1–11 carbon atoms;

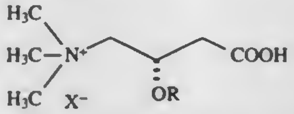
(b) acylating ester 2 to an acyl derivative 3 of the formula:



3

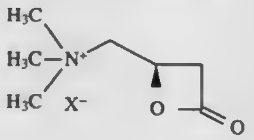
wherein R is an alkylsulfonyl having 1–12 carbon atoms, formyl or trifluoroacetyl group, by reacting ester 2 with an anhydride R$_2$O, wherein R has the above defined meaning;

(c) acid hydrolyzing the COOR$_1$ group of said acyl derivative 3 to a carboxylic acid group, thereby obtaining an acyl D-(+)-carnitine 4 of the formula:



4

(d) reacting said acyl D-(+)-carnitine 4 with a base thereby preparing lactone 5 of L-(−)-carnitine of the formula:



5

and

(e) reacting said lactone 1 with a base and solution thereby forming L-(−)-carnitine and isolating L-(−)-carnitine inner salt by contacting the L-(−)-carnitine containing solution with an ion exchange resin.

5,532,411

PRODUCTION OF CARBOXYLIC ACID HALIDES AND CARBOXYLATE SALTS

Max Braun, Wedemark; Werner Rudolph, Hanover; Stefan Palsherm, Barsinghausen, and Kerstin Eichholz, Langenhagen, all of, Germany, assignors to Solvay Fluor und Derivate GmbH, Hanover, Germany

Filed Apr. 26, 1994, Ser. No. 233,624

Claims priority, application Germany, Apr. 27, 1993, 43 13 793.8

Int. Cl.^{6} C07C ***51/58;69/02***

U.S. Cl. 562—861 **27 Claims**

1. A process for simultaneously preparing a carboxylic acid halide and a carboxylate salt formed from a carboxylate anion and 1/n "onium" cations of nitrogen M^{n+}, wherein n+ represents the positive charge of the cation, said process comprising reacting a carboxylic anhydride with a compound corresponding to the formula M^{n+}(Hal$^-$)$_n$, wherein Hal$^-$ represents chloride, bromide or iodide.

5,532,412

ULTRAVIOLET RAY-ABSORBING AROMATIC COMPOUND AND POLYMERIC COMPOSITION CONTAINING THE SAME

Toshitsugu Matsuki, and Toshihiro Santa, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

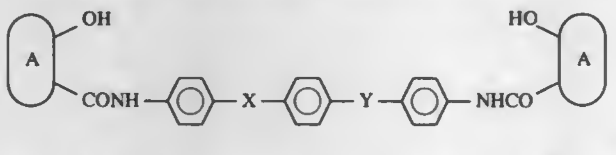
Filed Sep. 13, 1994, Ser. No. 304,866

Claims priority, application Japan, Sep. 14, 1993, 5-228865

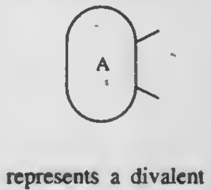
Int. Cl.^{6} C07C ***233/65***

U.S. Cl. 564—158 **1 Claim**

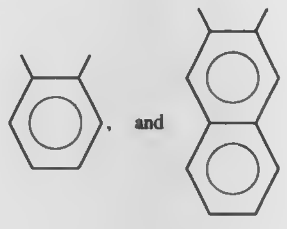
1. An aromatic o-hydroxyamide compound of the formula (I):



wherein X and Y respectively and independently from each other represent a member selected from the group consisting of oxygen and sulfur atoms, and



represents a divalent aromatic group selected from those of the formula:



5,532,413

STORAGE STABLE BIOCIDE COMPOSITION AND PROCESS FOR MAKING THE SAME

Gary F. Matz, Rosslyn Farms, and Paul F. Richardson, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1995, Ser. No. 369,612

Int. Cl.^{6} C07C ***277/02***

U.S. Cl. 564—240 **6 Claims**

1. A process of preparing an antimicrobial composition having a storage stability below about 5° C. comprising:

(a) mixing a technical grade alkyl amine wherein said alkyl group has a carbon chain length distribution from about eight to eighteen carbon atoms such that from about 40 to 60 weight % of the alkyl group has a twelve carbon chain, with a solvent in a reactor to form a mixture of said alkyl amine and said solvent;

(b) adding hydrochloric acid to said alkyl amine solvent mixture and allowing heat of neutralization to warm the reactor from about 22° C. to 95° C.;

(c) adding hydrogen cyanamide to said reactor at a rate sufficient for maintaining the temperature of said alkyl amine, solvent, hydrochloric acid and hydrogen cyanamide mixture from about 75° C. to 95° C.;

(d) maintaining the temperature of said mixture of step (c) from about 75° C. to 95° C. for about four hours;

(e) cooling the mixture of step (d) to below about 30° C.;

(f) adding a sufficient amount of said solvent to dilute said mixture of step (e); and

(g) adjusting the pH of said mixture of step (f) to less than 1.0.

5,532,414

4-SUBSTITUTED BIS(2,6-DIISOPROPYLPHENYL)-CARBODIIMIDES, THEIR PREPARATION, THEIR USE, AND 4-SUBSTITUTED 2,6-DIISOPROPYLPHENYL ISOCYANATES WHICH CAN BE USED FOR THEIR PREPARATION

Friedhelm Lehrich, Lemfoerde; Siegmund Pohl; Bernd Bruchmann, both of Ludwigshafen; Helmut Tesch, Roedersheim-Gronau; Roland Minges, Gruenstadt; Johann Swoboda, Ludwigshafen; Manfred Genz, Damme; Guenter Scholz, Lemfoerde, and Joachim Streu, Dachau, all of, Germany, assignors to BASF Aktiengesellschaft, Germany

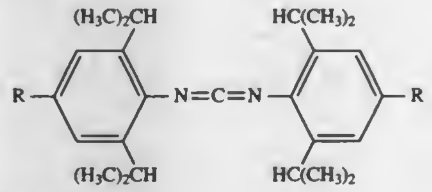
Filed Sep. 24, 1993, Ser. No. 126,292

Claims priority, application Germany, Nov. 11, 1992, 42 38 046.4

Int. Cl.^{6} C07C ***251/24***

U.S. Cl. 564—252 **2 Claims**

1. A 4,4'-disubstituted bis(2,6-diisopropylphenyl)carbodiimide of the formula



(I)

where R is phenoxy.

5,532,415

R-ENANTIOMER OF N-PROPARGYL-1-AMINOINDAN, SALTS, COMPOSITIONS AND USES THEREOF

Moussa B. H. Youdim, Haifa; John P. M. Finberg, Tivon; Ruth Levy, Tel-Aviv; Jeffrey Sterling, Jerusalem; David Lerner, Jerusalem; Tirtsah Berger-Paskin, Raanana; Haim Yellin, Ramat-Gan, and Alex Veinberg, Rehovot, all of, Israel, assignors to Teva Pharmaceutical Industries Ltd., Jerusalem, and Technion Research and Development Foundation Ltd., Haifa, both of, Israel

Continuation of Ser. No. 139,517, Oct. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 63,455, May 18, 1993, Pat. No. 5,387,612, which is a continuation of Ser. No. 632,184, Dec. 21, 1990, abandoned. This application Mar. 28, 1995, Ser. No. 411,398

Claims priority, application Israel, Jan. 3, 1990, 92952

Int. Cl.^{6} C07C *211/38*

U.S. Cl. 564—308 **1 Claim**

1. Mesylate salt of R(+)-N-propargyl-1-aminoindan.

5,532,416

BENZOYL DERIVATIVES AND SYNTHESIS THEREOF

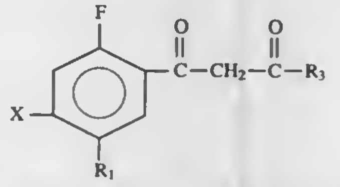
Bruce C. Hamper, Kirkwood, and Kindrick L. Leschinsky, Ellisville, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 20, 1994, Ser. No. 277,725

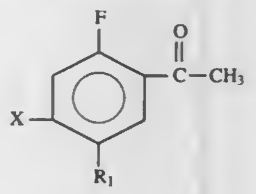
Int. Cl.^{6} C07C *45/45*

U.S. Cl. 568—314 **6 Claims**

1. Process for preparing compounds according to Formula ID


ID

Which comprises acylating a compound according to Formula IB


IB

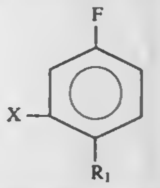
wherein

X is H or halogen;

R_1 is C_{1-6} alkyl and R_3 is C_{1-6} haloalkyl,

with an ester, ketene or acetyl halide or anhydride in an inert solvent in the presence of a strong base and after workup recovering said compound according to Formula ID and

wherein said compounds according to Formula IB are prepared by reacting a compound according to Formula II


II

wherein X and R_1 are a previously defined, with an acylation agent in the presence of an acylation catalyst in an inert solvent.

5,532,417

MANUFACTURE OF NEOPENTYL GLYCOL (IV)

Jeffrey S. Salek, Oakdale Boro; Joseph Pugach, Monroeville Boro; Carole L. Elias, Allegheny County, and Leonard A. Cullo, Greensburg, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 894,961, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 723,097, Jun. 28, 1991, Pat. No. 5,146,012, which is a continuation-in-part of Ser. No. 691,927, Apr. 26, 1991, Pat. No. 5,144,088, and a continuation-in-part of Ser. No. 716,177, Jun. 17, 1991, abandoned. This application Aug. 2, 1993, Ser. No. 100,356

The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.

Int. Cl.^{6} C07C *29/14;45/45;31/20*

U.S. Cl. 568—853 **13 Claims**

1. Method of making neopentyl glycol comprising hydrogenating the aldol reaction product of formaldehyde and isobutyraldehyde in the liquid phase at a pressure of about 500–3000 psig, and in the presence of a hydrogenation catalyst and at least about 20 wt % based on the mixture of alcohol and the reaction product, of an alcohol of the formula RR'CHOH wherein R and R' are independently selected from hydrogen and alkyl groups having from one to five carbon atoms and have a total of no more than five carbon atoms, said hydrogenation including the hydrogenolysis of 3-hydroxy-2,2-dimethylpropyl hydroxypivalate and the hydrogenation of hydroxypivaldehyde present in said reaction product.

5,532,418

METHOD OF PRODUCING 1,1,1,2,3,3,-HEXAFLUOROPROPANE AND TETRAFLUOROCHLOROPROPENE

Tatsuo Nakada, and Hirokazu Aoyama, both of Settsu, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP93/01117, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/05611, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 9, 1993, Ser. No. 392,906

Claims priority, application Japan, Sep. 4, 1992, 4-262863

Int. Cl.^{6} C07C *17/08;17/25*

U.S. Cl. 570—166 **4 Claims**

1. A method of producing 1,1,1,2,3,3-hexafluoropropane which comprises reacting 1,1,1,2,2-pentafluoro-3,3-dichloropropane, 1,1,2,2,3-pentafluoro-1,3-dichloropropane or a mixture thereof with hydrogen in the presence of a catalyst comprising at least one oxide of iron, chromium or copper to form tetrachlorofluoropropene; and then reacting the tetrachlorofluoropropene with hydrogen fluoride in the presence of a catalyst comprising a fluoride or oxyfluoride of chromium or aluminum.

5,532,419

PROCESSES FOR THE PREPARATION OF FLUORINATED OLEFINS AND HYDROFLUOROCARBONS USING FLUORINATED OLEFIN

Michael Van Der Puy, Cheektowaga; G. V. Bindu Madhavan, Amherst; Alagappan Thenappan, Cheektowaga, and Hsueh S. Tung, Getzville, all of N.Y., assignors to AlliedSignal Inc., Morris County, N.J.

Division of Ser. No. 412,476, Mar. 28, 1995, Pat. No. 5,481,050, which is a division of Ser. No. 242,899, May 16, 1994, Pat. No. 5,446,217. This application Sep. 15, 1995, Ser. No. 528,846

Int. Cl.^{6} C07C *17/097;19/01;19/08;19/10*

U.S. Cl. 570—167 **10 Claims**

1. A process for preparing a hydrofluorocarbon comprising:

a) reacting a compound of the formula $RCF_2CH{=}CH_2$ where R is $C_xCl_yF_z$ and y+z=2x+1 with hydrogen fluoride in the presence of an antimony (V) halide catalyst under conditions sufficient to produce a compound of the formula $RCF_2CH_2CH_2F$ where R is $C_xCl_yF_z$ and y+z= 2x+1; and

b) recovering a compound of the formula $RCF_2CH_2CH_2F$ where R is $C_xCl_yF_z$ and; y+z=2x+1.

5,532,420

MANUFACTURE OF SOLID PERFLUOROALKYL BROMIDES

Gilles Drivon, Saint Martin en Haut, and Dominique Bindi, Sainte-Foy-les-Lyon, both of, France, assignors to Elf Atochem S.A., Paris, France

Filed Sep. 12, 1994, Ser. No. 304,457

Claims priority, application France, Sep. 16, 1993, 93 11045

Int. Cl.^{6} C07C *19/08*

U.S. Cl. 570—170 **21 Claims**

1. Process for the manufacture of a normally solid perfluoroalkyl bromide comprising:

thermalbromination in the gas phase of a perfluoroalkyl iodide containing 10 or more than 10 carbon atoms to make said normally solid perfluoroalkyl bromide, said thermalbromination being in the presence of a normally liquid perfluoroalkyl bromide containing from 4 to 8 carbon atoms in a quantity sufficient for a mixture of said normally liquid perfluoroalkyl bromide and said normally solid perfluoroalkyl bromide to be liquid at room temperature; and

recovering the liquid perfluoroalkyl bromide mixture.

5,532,421

METHOD FOR THE ISOMERIZATION OF CIS-ALKENYL COMPOUNDS

Takanobu Terauchi; Toyohisa Sakurada; Takehiko Fukumoto, and Hiroshi Suzuki, all of Jyoetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 275,753

Claims priority, application Japan, Jul. 21, 1993, 5-179528

Int. Cl.^{6} C07C *5/27*

U.S. Cl. 585—671 **5 Claims**

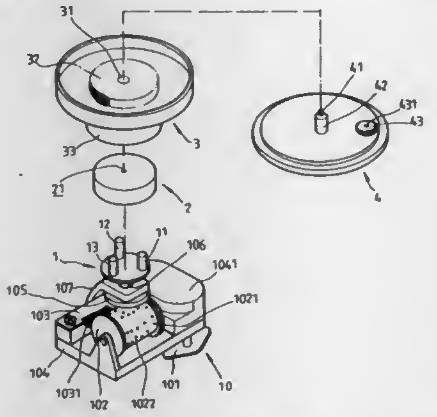
1. A method for the isomerization of a cis-alkenyl compound to their trans-isomers which comprises: a) reacting, under isomerization conditions the cis-alkenyl compound selected from the group consisting of alkenes, alkenols, alkenyl halides, alkenoic acids and alkenyl esters in the presence of a catalyst consisting essentially of nitric acid- has been inserted; and b) recovering the trans-isomer compound.

5,532,422

ROTATION-DRIVEN STRUCTURE FOR MUSIC BOX

Chih-Ping Chang, No. 112, Lane 1008, Ming-Hu Road, Hsinchu, Taiwan

Filed Feb. 25, 1994, Ser. No. 202,288
Int. Cl.⁶ G10F *1/06*
U.S. Cl. 84—95.1 **3 Claims**



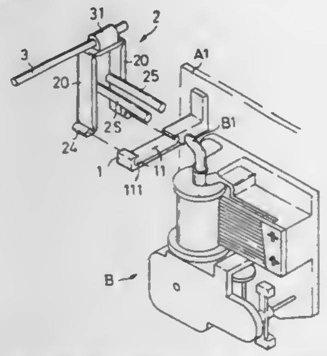
1. A rotation-driven structure for a music box comprising a music generator having a seat; a gear, which is rotatably supported by a shaft on a mount secured to the seat and drivingly engaged with said music generator; a driving disc having a plurality of posts extending therefrom, wherein said driving disc is secured to said shaft to be rotatable in unison with said gear; a transmission cap having a first hole formed thereon and a plurality of plates arranged therein and radially extending therebetween to define a plurality of interior spaces to correspondingly receive therein said posts respectively; a housing having a circumferential side wall formed therebelow rotatably receiving said transmission cap, at least a sun gear being formed on said housing with a second hole formed in center thereof; a cover including a first axle mounted thereto being rotatably received within said second hole of said housing and having an end shaft extending therefrom being drivingly engaged with the first hole of said transmission cap, at least a planetary gear, which is arranged engaging said sun gear of the housing, said planetary gear having a corresponding axle rotatably mounted on said cover to support a corresponding planetary disc at one end thereof.

5,532,423

DYNAMIC DRIVING STRUCTURE FOR THE ORNAMENTAL MUSIC BOX

Jian H. Liu, No. 2, Alley 202, Kao Fen Road, Hsin-chu City, Taiwan

Filed Dec. 7, 1994, Ser. No. 350,895
Int. Cl.⁶ G10F *1/06*
U.S. Cl. 84—95.2 **13 Claims**



1. A dynamic driving structure for an ornamental box that has a music box, the driving structure comprising an eccentric shaft driven by the music box, an elongate link rack driven by said eccentric shaft, and a bracing pedestal used for supporting said link rack

said link rack is a tabulate member having two spaced grooves located therein thereby defining a middle portion of said link rack therebetween and two end portions, each said end portion having a terminal section that extends outwardly from a further groove in said link rack, said spaced grooves making said link rack flexible;

said terminal sections of said link rack are engaged with said bracing pedestal so as to form three sections of a parallelogram shape with said end portions forming the side walls thereof; and

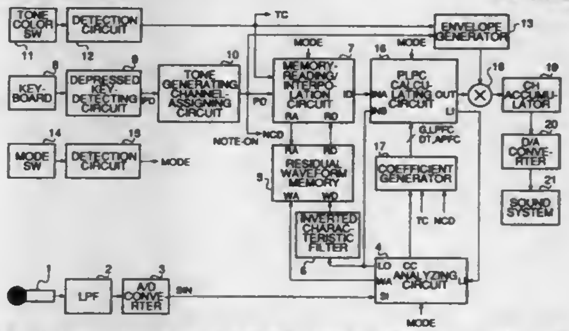
a portion of said eccentric shaft on said music bell is rotated between said end portions of said link rack, so that said link rack is driven to swing.

5,532,424

TONE GENERATING APPARATUS INCORPORATING TONE UTLIIZING COMPRESSION AND EXPANSION

Suzuki Hideo, Hamamatsu, Japan, assignor to Yamaha Corporaion, Japan

Filed May 23, 1994, Ser. No. 247,869
Claims priority, application Japan, May 25, 1993, 5-145530; Apr. 27, 1994, 6-112218
Int. Cl.⁶ G10H *1/12;7/12*
U.S. Cl. 84—607 **10 Claims**



10. A tone generating apparatus which generates a tone signal based on waveform data, comprising:

a waveform memory for storing said waveform data;

waveform input means for inputting an original waveform signal;

analyzing filter means for analyzing said original waveform signal input by said waveform input means, and for generating a waveform signal representative of results of said analysis;

correcting means for correcting said waveform signal from said analyzing filter means by adjusting a level of higher frequency components thereof, and for delivering the corrected waveform signal; and

writing means for writing the corrected waveform signal into said waveform memory.

5,532,425

AUTOMATIC PERFORMANCE DEVICE HAVING A FUNCTION TO OPTIONALLY ADD A PHRASE PERFORMANCE DURING AN AUTOMATIC PERFORMANCE

Takuya Nakata; Hiroyuki Iwase, and Hiromu Miyamoto, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

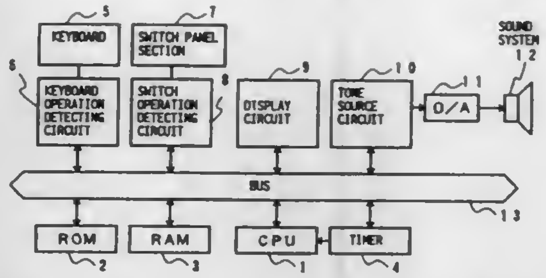
Filed Mar. 1, 1994, Ser. No. 203,892
Claims priority, application Japan, Mar. 2, 1993, 5-066131; Apr. 23, 1993, 5-098166
Int. Cl.⁶ G10H *1/00;5/00;7/00*
U.S. Cl. 84—609 **18 Claims**

17. An automatic performance device comprising:

first storage means for storing first performance data;

second storage means for storing second performance data;

first performance means for executing a first automatic performance based on the first performance data;



second performance means for executing a second automatic performance during the first performance based upon the second performance data; and

delay means for initiating the second automatic performance in delayed synchronization with the first automatic performance.

5,532,426
SWITCH CABINET WITH SEALING ELEMENTS FOR SEALING A DOOR WHEN CLOSED

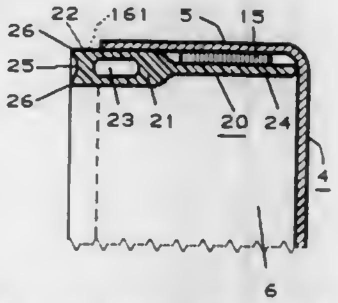
Richard Blum, Dietzenbach; Hans-Michael Groh, Hainburg; Willi Kuester, Gelnhausen, and Klaus-Jürgen Herr, Linsengericht, all of, Germany, assignors to Siemens Aktiengesellschaft, Stuttgart, Germany

Filed Aug. 26, 1993, Ser. No. 112,743

Claims priority, application Germany, Aug. 26, 1992, 42 28 427.9

Int. Cl.⁶ H05K *9/00*

U.S. Cl. 174—356 C **11 Claims**



1. A sealing arrangement for a switch cabinet having a door, wherein the switch cabinet has a front surface and is formed by frame parts and wherein the door has rim flanges bent in the direction of the front surface of the switch cabinet and the door is attached on one side to the switch cabinet by at least one hinge, the sealing arrangement comprising:

at least one sealing element made of elastic rubber material for sealing when the door is closed, said at least one sealing element having a hollow top bead intended to rest against the front surface, the top bead having an end surface and, adjoining said top bead, a fastening strip intended for application onto one of the rim flanges of the door; and

a self-adhesive adhesion layer adapted to fasten the fastening strip to one of the rim flanges, wherein said fastening strip is recessed with respect to one side surface of the top bead by approximately the thickness of the adhesion layer.

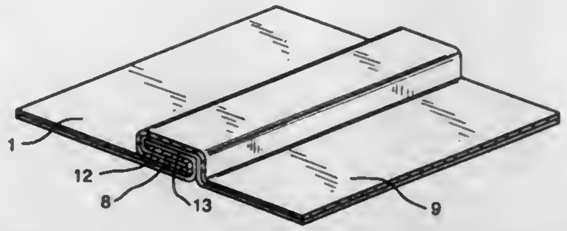
5,532,427
ELECTRICALLY CONDUCTIVE JOINT

Michael T. Stoyko, Newberg, Oreg., assignor to Gerome Manufacturing Company, Inc., Uniontown, Pa.

Filed Oct. 24, 1994, Ser. No. 328,141

Int. Cl.⁶ H05K *9/00*

U.S. Cl. 174—35 R **9 Claims**



1. A method of forming an electrically conductive joint in a sheet of material having top and bottom surfaces wherein one surface is formed of an electrically conductive layer and the other surface is formed of a layer of electrically insulative material overlying and bonded to the electrically conductive layer, comprising off-setting a portion of a first end of said sheet material, said off-set portion extending parallel to the top and bottom surfaces of said sheet material and spaced from the remainder of said one end of said sheet material, bending an edge part of the off-set portion into the form of a first dependent leg forming an angle with the remainder of the off-set portion and having said insulative layer on the outside of the bend, bending an edge portion of a second end of said sheet material into the form of a second dependent leg forming an angle with the remainder of said second end of said sheet material and having said insulative layer on the inside of the bend, assembling the first and second ends of the sheet material with the first and second dependent legs juxtaposed to each other, and compressing the assembly to collapse said first and second legs into a position parallel to the top and bottom surfaces of the sheet material whereby conductive surfaces of the first and second legs are in face-to-face relationship forming a continuous electrically conductive contact.

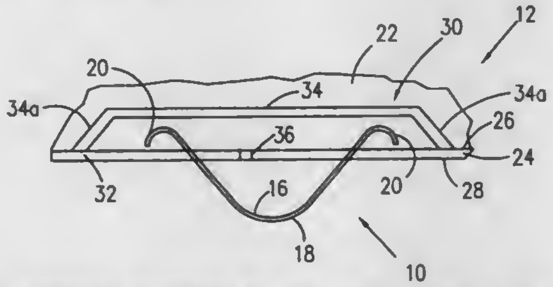
5,532,428
SNAP-IN RESILIENT EMI GROUNDING CLIP APPARATUS FOR COMPUTER STRUCTURES

Timothy Radloff, and Robert Garrett, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Mar. 23, 1994, Ser. No. 216,910

Int. Cl.⁶ H05K *9/00*

U.S. Cl. 174—35 GC **11 Claims**



5. Apparatus for creating an electrically conductive grounding path between a first structure having a wall portion with first and second opposite sides, and a second structure positionable against said first wall portion side, said apparatus comprising:

a lance structure formed on said wall portion and including an opening extending through said wall portion and a lance strip section of said wall portion outwardly offset from said second side thereof over said opening therein, said lance strip section having an edge periphery configuration substantially identical to that of said opening; and

a resiliently deflectable, electrically conductive grounding strip longitudinally curved along its length and having opposite end portions captively retained between said Second wall portion side and said lance strip section for movement toward and away from opposite ends of said lance strip section, and a curved longitudinally intermediate portion extending through said wall portion opening and projecting outwardly beyond said first wall portion side,

said grounding strip being longitudinally curved about a first axis transverse to the length of said grounding strip, and concavely facing said lance strip section, and

said opposite end portions of said grounding strip being transversely enlarged, relative to the balance of said grounding strip, in directions parallel to said first axis.

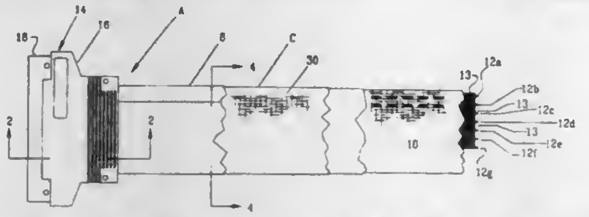
5,532,429
COMPOSITE SHIELD JACKET FOR ELECTRICAL TRANSMISSION CABLE

Marvella Dickerson, Simpsonville, and Douglas E. Piper, Greenville, both of S.C., assignors to Woven Electronics Corp., Simpsonville, S.C.

Division of Ser. No. 949,987, Sep. 24, 1992, Pat. No. 5,387,113. This application Dec. 22, 1994, Ser. No. 361,938

Int. Cl.⁶ H01B *7/34*

U.S. Cl. 174—36 **18 Claims**



1. A composite shield jacket which is flexible and durable for shielding and protecting an electrical transmission cable comprising:

an outer elastomeric cover;

an inner electrically conductive shield cloth for conducting unwanted electrical noises comprising a flexible fibrous web formed from metallic coated fibers providing a highly flexible electrical shield; and

means for securing said elastomeric cover and shield cloth together to form a composite shield jacket having increased structural integrity and flexibility for encasing said electrical transmission cable.

12. A method for producing a composite shield jacket for electrically shielding and protecting a flat electrical transmission cable comprising:

providing elastomeric material to form an outer cover;

providing a conductive shield cloth to form an inner layer for conducting unwanted electrical noises comprising a flexible fibrous web formed from metallic coated fibers providing a highly flexible shield; and

securing said elastomeric material and shield cloth together to form a composite tubular jacket having increased structural integrity.

5,532,430
RECEIVING HOUSING FOR DISSIPATOR ELECTRONIC COMPONENTS

Thierry Lanoe, Cergy, France, assignor to Societe d'Applications Generales d'Electricate et de Mecahique SAGEM, France

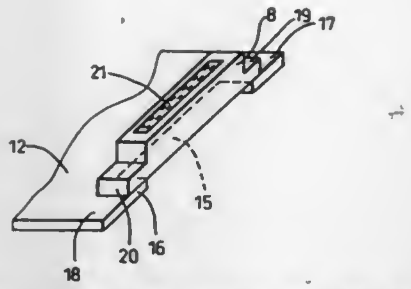
PCT No. PCT/FR93/00037, § 371 Date Dec. 28, 1993, § 102(e) Date Dec. 28, 1993, PCT Pub. No. WO93/14614, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 117,171

Claims priority, application France, Jan. 14, 1992, 92 00297

Int. Cl.⁶ H05K *5/06*

U.S. Cl. 174—52.3 **4 Claims**



1. A housing and circuit board assembly for energy-dissipating electronic components (13, 14) mounted on a double-faced printed circuit (22), where the printed circuit (22) is fastened on one face thereof to a first side of a metal heat-conductive substrate (12) where said substrate (12) is integrated with the housing assembly, said housing assembly comprising:

a connector (**8**) which is also integrated with the housing assembly and is arranged on the same first side of the substrate (12) as the printed circuit (22); and a cutout (15) in the metal heat-conductive substrate (12), where the connector (**8**) is supported by the substrate proximate to said cutout (15) and is soldered to the face of the printed circuit (22) facing the substrate (12) above the cutout (15).

5,532,431
SEALING CONSTRUCTION FOR ELECTRICAL CONNECTION BOX AND METHOD FOR FORMING PACKING USED THEREFOR

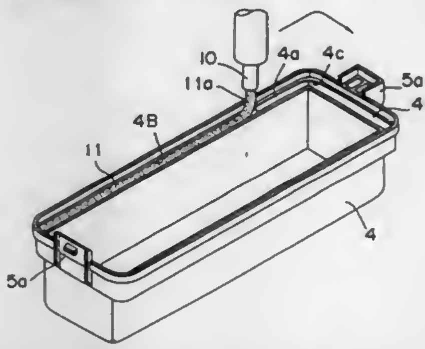
Yuuji Saka, and Hideki Goto, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed May 31, 1994, Ser. No. 251,258

Claims priority, application Japan, Jul. 23, 1993, 5-182828

Int. Cl.⁶ H05C *5/06*

U.S. Cl. 174—52.3 **2 Claims**



1. A sealing construction for an electrical connection box, in which a waterproof cover is mounted on a main body, comprising:

a packing which is fitted into a packing groove of the waterproof cover so as to be brought into pressing contact with a contact portion of the main body;

the packing being formed by hardening liquid packing compound injected directly into a packing groove of the waterproof cover; and

a width of a corner portion of the packing groove being larger than a width of the remaining portion of the packing groove.

5,532,432
CONTROL UNIT, PLUG-IN UNIT, TRANSFORMER, ZERO-PHASE CURRENT TRANSFORMER, AND FREQUENCY MEASURING CIRCUIT APPLIED TO CONTROL CENTER

Masahiro Ishikawa, Kagawa, Japan, assignor to Mitsubishi Denki Kabushiki, Tokyo, Japan

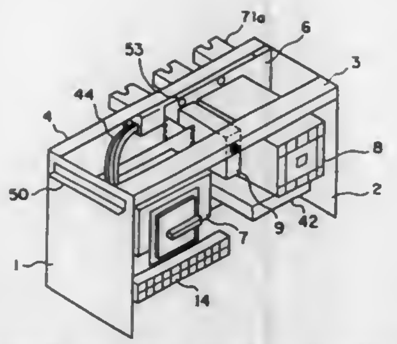
Division of Ser. No. 265,795, Jun. 27, 1994. This application Mar. 15, 1995, Ser. No. 404,580

Claims priority, application Japan, Sep. 29, 1993, 5-242815; Mar. 15, 1994, 6-44109

Int. Cl.⁶ H02G *3/08;* **H02B** *1/08*

U.S. Cl. 174—60 **4 Claims**

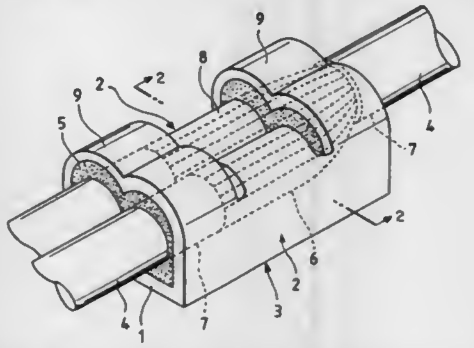
1. A plug-in unit serving as a connecting unit for feeding electric power to a control unit, including an insulating case containing a plurality of contacts respectively connected to lead wires, and said plug-in unit comprising:



a first insulating case having a plurality of contact chambers containing said contact;
a second insulating case fitted with said first insulating case so as to form a wiring chamber between said first and said second insulating cases which wiring chamber extends in a direction perpendicular to a direction of extension of said contact chambers containing said contacts so as to extend across one end of said plurality of contact chambers; and
one lead wire exit provided in a side formed by said two insulating cases through which said lead wires from each of said contact chambers exit.

5,532,433
WATERPROOF-TYPE TERMINAL CONNECTION STRUCTURE AND METHOD OF PRODUCING SAME

Takayoshi Endo, and Hiroki Kondo, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 969,059, Oct. 30, 1992, abandoned. This application May 19, 1994, Ser. No. 245,904
Claims priority, application Japan, Jun. 2, 1993, 5-154592
Int. Cl.^{6} H01R *4/18;43/00*
U.S. Cl. 174—84 C **14 Claims**

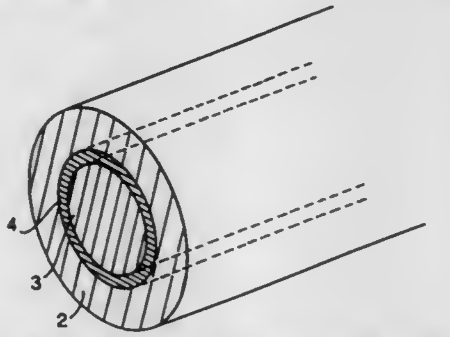


1. A structure for holding at least one electric wire on a connector for electrical connection, comprising:
a base plate portion;
a pair of pressing pieces formed respectively on opposite sides of said base plate portion for holding and clamping at least one electric wire; and
a sealing material;
each of said pressing pieces including a first section for holding and clamping an exposed conductor of said electric wire through said sealing material and a second section for holding and clamping a sheath portion of said electric wire adjacent to said exposed conductor through said sealing material, wherein a height defined between said first section and said base plate portion is less than that defined between said second section and said base plate portion so that when said pressing pieces are clamped, at least some of said sealing material is forced from said first section toward said second section such that said sealing material is filled around said exposed conductor and said sheath portion in a continuous manner.

14. A method of crimping an electric wire to a terminal including a base plate portion and a pair of pressing pieces formed respectively on opposite sides of said base plate portion and defining a wire receiving portion therebetween, each of said pressing pieces including a first section and a second section, comprising the following steps:
stripping a portion of a sheath of said wire from an end portion of said wire to expose a conductor of said wire;
placing said end portion of said wire into said wire receiving portion of said terminal;
applying a sealing material to said exposed conductor and an adjacent sheath portion of said wire;
crimping said first and second sections of said pressing pieces such that said first section clamps said exposed conductor and said second section clamps said adjacent sheath portion of said wire in such a manner that a height between said first section and said base plate portion is smaller than a height between said second section and said base plate portion, whereby at least some of said sealing material is force from said first section toward said second section such that said sealing material is filled around said exposed conductor and said adjacent sheath portion in a continuous manner.

5,532,434
INSULATED WIRE

Shozui Takeno; Masaharu Moriyasu; Kazumichi Machida, and Seiji Yasunaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 21, 1994, Ser. No. 278,167
Claims priority, application Japan, Jul. 26, 1993, 5-183893
Int. Cl.^{6} H01B *7/00*
U.S. Cl. 174—110 R **17 Claims**

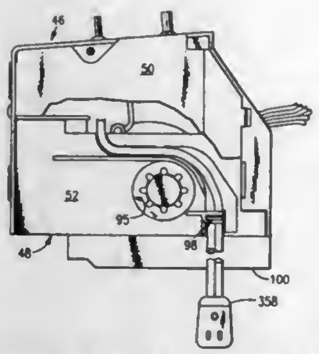


1. An insulated wire adapted to be stripped by energy emitted from an irradiating laser comprising:
a conductor coated with an insulating material;
a light absorbing layer provided between said conductor and the insulating material wherein the light absorbing layer is adapted to absorb the energy emitted from the irradiating laser and increase the temperature of the insulating material so that the insulating material is removed from the conductor.

5,532,435
POWER CORD STRAIN RELIEF FOR ROOM AIR CONDITIONER

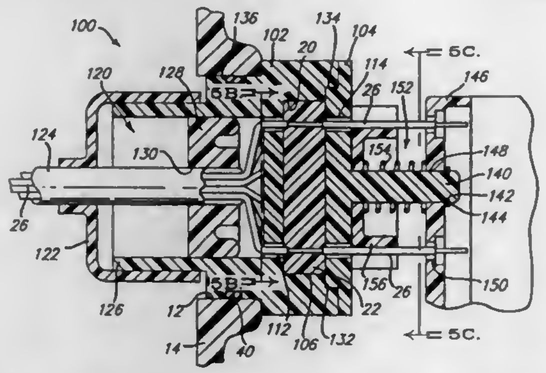
Theodore S. Bolton, Liverpool, and Stephen Stopyra, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 9, 1994, Ser. No. 208,400
Int. Cl.^{6} H05K *5/03;* **H01R** *13/58*
U.S. Cl. 174—135 **2 Claims**

1. A one-piece molded strain relief structure for a flat electrical conductor having a thickner and a width comprising:
a body portion having a tortuous path molded directly therein, for receiving and guiding the conductor, said tortuous path including, an entrance and an exit, and, said path further including at least two changes in direction therealong, wherein said body portion comprises a cover for an electrical control box of an electrical appliance, wherein said body portion includes spaced apart curved walls defining an S-shaped first portion of said tortuous path extending from said entrance toward said exit for confining a first portion of said dimension the flat conductor in a first plane within said S-shaped portion, said curved walls further defining, adjacent said exit, a second portion of said tortuous path following said S-shaped portion oriented in a second plane perpendicular to said first plane for confining a second portion of said dimension the flat conductor in said second plane, and wherein the distance between said curved walls transitions from a width near said entrance substantially the same as the thickness of the conductor to a width wider than the conductor width at the second portion of said tortuous path.



5,532,436
METHOD OF INSTALLING AND HOLDING CABLE SEALING COMPONENTS INTO AN OUTLET

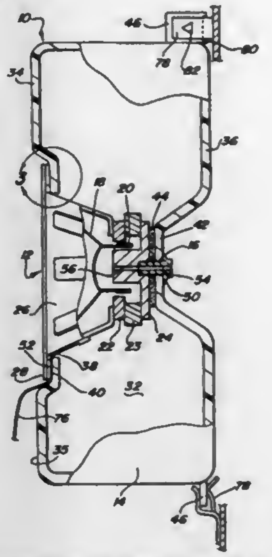
Chester E. Moyers, and Robert L. Lenz, both of Sterling, Ill., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Continuation-in-part of Ser. No. 178,711, Jan. 10, 1994, Pat. No. 5,500,490. This application Apr. 8, 1994, Ser. No. 224,964
Int. Cl.^{6} H01B *17/30*
U.S. Cl. 174—151 **25 Claims**



4. An apparatus for holding a cable sealing component in an aperture within a bulkhead, said apparatus comprising:
a board adapted to be secured to the bulkhead, the cable sealing component being secured to said board and having an outer surface of a predetermined shape and adapted to conform to the shape of a predetermined aperture in said bulkhead; and
a biasing member disposed between said board and said cable sealing component, said biasing member operable to urge said sealing component away from said board.

5,532,437
SPEAKER ASSEMBLY

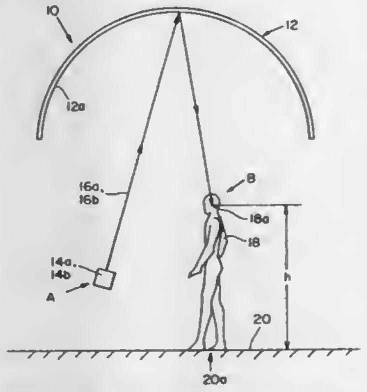
Ionel E. Simplicean, Dearborn Hgts., and Sorin Stancu, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jun. 6, 1995, Ser. No. 466,508
Int. Cl.^{6} H05K *5/00*
U.S. Cl. 181—150 **18 Claims**



1. A speaker assembly for a motor vehicle, comprising:
a speaker having a frame and a back plate, said frame having a peripheral flange;
a blow molded speaker enclosure, having front and rear wall portions, said front wall portion defining an opening for receiving said speaker and having a planar sealing surface adjacent said opening for supporting said flange;
a gasket intermediate said flange and said sealing surface; and
a fastener extending through said rear wall portion and engaging said back plate, said fastener drawing said flange towards said sealing surface such that said gasket is compressed and said speaker spaces said rear wall portion a fixed distance from said front wall portion.

5,532,438
ACOUSTIC IMAGING SOUND DOME

Kevin Brown, 341 Marlboro St., #2, Boston, Mass. 02115
Filed Nov. 4, 1993, Ser. No. 147,026
Int. Cl.^{6} E04B *1/99*
U.S. Cl. 181—155 **20 Claims**



1. An apparatus for focusing sound waves to a listener comprising:
an acoustically reflective dome having an interior surface for focusing sound waves, the interior surface of the dome being spherical in shape with a constant radius; and

a sound wave generator positioned in a first location with respect to the dome for producing sound waves, the sound waves reflecting off the interior surface of the dome and focusing at a predetermined second location with respect to the dome for listening, whereby the location at which the sound waves are focused can be varied by varying the location at which the sound waves are produced.

5,532,439

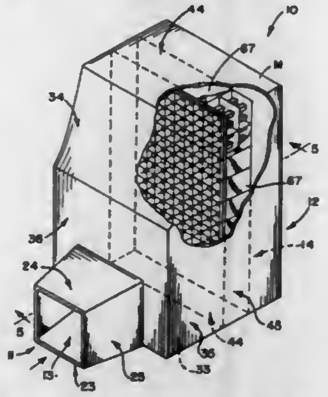
SILENCER ASSEMBLY WITH ACOUSTICAL MODULES THEREIN

Yuriy Minkin, Buffalo Grove, Ill., assignor to Transco Products Inc., Chicago, Ill.

Filed Jun. 23, 1994, Ser. No. 264,854

Int. Cl.⁶ E04F *17/04*

U.S. Cl. 181—224 **16 Claims**



1. A silencer assembly interposed between the outlet of a first component and the inlet of a second component comprising:

external side walls with an inlet with a first cross sectional area connected to the outlet of the first component and an outlet connected to the inlet of the second component;

a first section adjacent said inlet having an expanding cross sectional area along the length thereof;

a second section adjacent said first section also having an expanding cross sectional area along the length thereof; and,

a third section adjacent at one end to said second section and adjacent at another end to said outlet,

said third section including at least one transversing bank of a plurality of parallel acoustical modules disposed therein between said two ends,

each said acoustical module having a front end and a rear end and at least one internal channel member therein,

said internal channel member having a plurality of perforations therein and a front opening at said front end of said module and a rear opening at said rear end of said module and said internal channel member being surrounded by an acoustical media.

5,532,440

LIGHT TRANSMISSIVE SOUND ABSORBING MEMBER

Kyoji Fujiwara, Fukuoka, Japan, assignor to Nitto Boseki Co., Ltd., Japan

Filed Dec. 7, 1994, Ser. No. 351,645

Claims priority, application Japan, Dec. 10, 1993, 5-341598

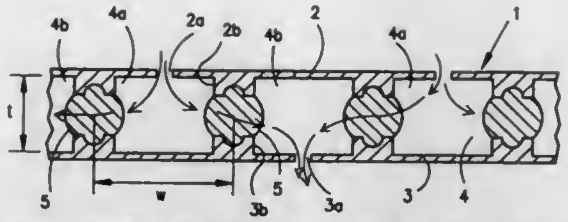
Int. Cl.⁶ E04B *9/00*

U.S. Cl. 181—289 **5 Claims**

1. A light transmissive sound absorbing member, comprising:

a first sheet member having a light transmissive property and including a plurality of through holes;

a second sheet member so disposed as to form a space between said first sheet member and said second sheet member, said second sheet member having a light transmissive property and including a plurality of through holes; and



partition members interposed between said first and second sheet members to divide said space into a plurality of mutually adjoining small spaces, some of said small spaces being in communication with the through holes of the first sheet member and other of said small places being in communication with the through holes of the second sheet member; and

wherein each of said partition members includes a sound absorbing material of a type which enables the mutually adjoining small spaces to communicate with each other.

5,532,441

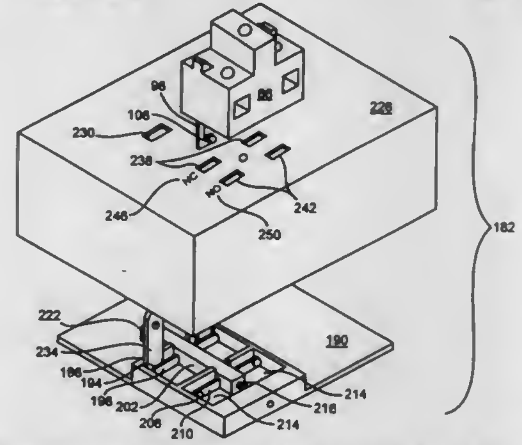
CONTACT BLOCK HAVING CONVERTIBLE NORMALLY OPEN OR NORMALLY CLOSED ELECTRICAL CONTACT

Stanley H. Edwards, Jr.; Richard Marshall, and Tony R. Robbins, all of Raleigh, N.C., assignors to Square D Company, Palatine, Ill.

Filed Oct. 13, 1994, Ser. No. 322,631

Int. Cl.⁶ H01H *1/34;15/02*

U.S. Cl. 200—16 A **35 Claims**



17. An electrical control device having a set of auxiliary electrical contacts convertible between a normally open and normally closed state, said control device comprising:

a housing having a generally hollow interior and defining a pair of terminal apertures, a first pair of access apertures and a second pair of access apertures, each of said apertures providing access to said generally hollow interior;

a base enclosed by said housing;

an actuator being supported by said base such that said actuator is slidably movable between a first position and a second position;

means for biasing said actuator to said first position;

at least one pair of contact cavities being defined by said base, each said contact cavity being immediately adjacent said actuator such that said pair of contact cavities is separated by said actuator, said base being positioned within said housing such that said access apertures provide an external access to said contact cavities;

a pair of stationary contacts supported by said base;

a first pair of movable contacts being attached to said actuator such that said first movable contacts are movable between a first position and a second position relative to said pair of stationary contacts;

means for attaching said first pair of movable contacts to said actuator;

two second pairs of movable contacts, said movable contacts being attached to said actuator such that said second movable contacts are movable between a first position and a second position within said contact cavities;

means for attaching said second pairs of movable contacts to said actuator; and

a stationary contact module having at least one pair of stationary contacts which can be received through either said first or second pairs of access apertures for being selectively engaged by one of said second pairs of movable contacts in one of said first or second positions.

5,532,442

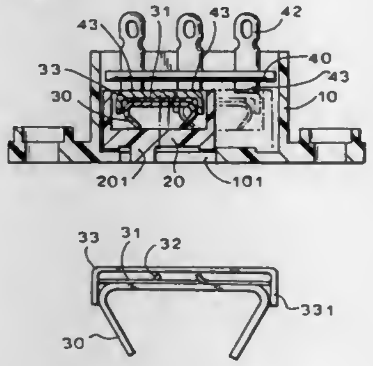
SLIDING TYPE SWITCH ASSEMBLY

Chao-Chi Lin, No. 2, Jin-Chein 4th Street, West Dictnict, Taichung Taiwan, Taiwan

Filed Feb. 7, 1995, Ser. No. 384,739

Int. Cl.⁶ H01H *15/02*

U.S. Cl. 200—16 C **1 Claim**



1. A sliding type switch comprising:

a non-conductive housing enclosing a chamber and including an upper portion and a lower portion, with a slot formed in the lower portion;

a non-conductive board in the chamber and secured to the upper portion;

at least three conductive prongs secured to the board with the bottom of each of the prongs forming a conductive shoe;

a non-conductive slide member in the chamber and defining an elongated trough, the slide member connected to a knob movable slidably in the slot for selectively positioning the slide member within the chamber;

the conductive shoes aligned along the trough;

a spring element in the trough and having two projecting legs engaging with the slide member;

a conductor mounted on the spring element for conjoined movement therewith so as to engage electrically with two of the three conductive shoes;

an S-shaped spring mounted between the spring element and the conductor, the s-shaped spring having two ends each provided With a curved tip for biasing the conductor to engage with said conductive shoes.

5,532,443

PRESSURE CONTACT TERMINAL

Masanori Tsuji; Kimihiro Abe; Osamu Sugiyama; Hiroshi Yamamoto, and Sakai Yagi, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

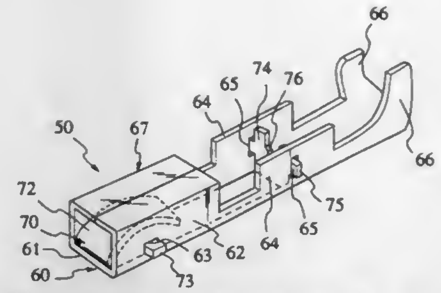
Filed Dec. 28, 1994, Ser. No. 365,082

Claims priority, application Japan, Dec. 29, 1993, 5-353835

Int. Cl.⁶ H01H *1/06*

U.S. Cl. 200—275.000 **19 Claims**

1. A pressure contact terminal, comprising:



a main body having an elongate main base plate, two front side plates, two middle side plates, and two rear side plates, said side plates being formed by bending sides of the main base plate; and

a spring member formed separately from said main body and having a spring base plate, a spring piece formed by turning down a front end of the spring base plate, and at least one pressure contact plate formed by bending a rear end of the spring base plate at a right angle and thereby adapted to be connected to a wire conductor after said spring member has been assembled with said main body, the two front side plates being further bent into a box shape to form, in cooperation with the spring piece of said spring member, a male terminal pressure contact portion.

5,532,444

PUSH BUTTON SWITCH

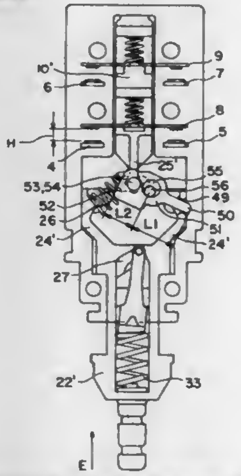
Herbert Bonrath, Bevern; Gerhard Hochgesang, Bad Neustadt; Ulrich Brüggemann, Heustreu, and Hans-Karl Heil, Wildflecken, all of, Germany, assignors to Preh-Werke GmbH & Co., KG, Bad Neustadt, Germany

Filed Aug. 7, 1995, Ser. No. 511,867

Claims priority, application Germany, Aug. 10, 1994, 44 28 285.0

Int. Cl.⁶ H01H *3/42*

U.S. Cl. 200—524.000 **4 Claims**



1. A push button switch having a housing, fixed contacts affixed to the housing, a movable contact bridge, a spring plunger for moving through a contact stroke to move the contact bridge into and out of contact with said fixed contacts, a manually-actuated switch actuator, a spring switching mechanism that transmits force between the spring plunger and the manually-manipulated switch actuator, a locking linkage attached to the switch actuator for alternately holding the switch actuator in a switched-on position and a switched-off position when the switch actuator is pushed, wherein:

a switching rocker is provided between the switch actuator and the spring plunger, with the switching rocker engaging the switch actuator on one side and the spring plunger on the other side, said switching rocker being mounted on the housing by a mounting means for causing the switching rocker, at the beginning of a switching operation of the switch actuator, to forcibly carry with it the spring plunger, in a switching direction, through a portion of the contact stroke, and wherein the spring switching mechanism moves the spring plunger without active enforcement by said switching rocker through the rest of its switching stroke to its switched position after this portion of the contact stroke.

5,532,445

APPARATUS AND PROCESS FOR THE LONGITUDINAL–SIDE WELDING OF TUBES TO FLAT STEEL BARS

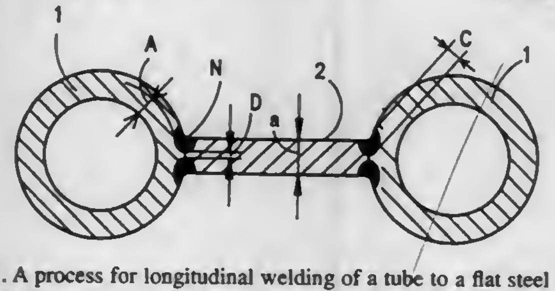
Peter Junker, Oberembrach, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Feb. 14, 1995, Ser. No. 388,513

Claims priority, application European Pat. Off., Feb. 14, 1994, 94102208.9

Int. Cl.^{6} B23K *9/18*

U.S. Cl. 219—61 **15 Claims**



1. A process for longitudinal welding of a tube to a flat steel bar comprising:
positioning submerged-arc welding torches in a fixed position;
connecting a gas metal-arc welding torch to an oscillator;
pressing the tube and the flat steel bar to be joined against one another and passing the tube and the flat steel bar between the submerged-arc welding torches and the gas metal-arc welding torch;
welding a top side of the tube and flat steel bar together by submerged-arc welding;
welding an underside of the tube and flat steel bar together by combined pulse oscillation gas metal-arc welding while welding the top side; and
moving the tube and the flat steel bar in a longitudinal direction during welding by a transport device.

5,532,446

MAGNETIC DEFLECTION SYSTEM FOR A HIGH-POWER ELECTRON BEAM

Matthias Blum, Alzenau; Josef Helmerl, Linsengericht; Martin Bahr, Nidderau, and Volker Bauer, Neuberg, all of, Germany, assignors to Leybold Durferrit, Cologne, Germany

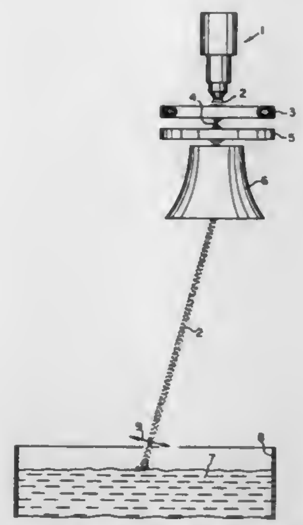
Filed Mar. 15, 1993, Ser. No. 31,370

Claims priority, application Germany, Mar. 14, 1992, 42 08 484.9

Int. Cl.^{6} B23K *15/00*

U.S. Cl. 219—121.25 **12 Claims**

1. A system for controlled magnetic deflection of an electron beam having an expanding cross-sectional area for melting or vaporizing of material in a crucible, comprising:
a rotationally symmetrical yoke of predetermined shape with an inner jacket surface and an outer jacket surface, wherein a distance from an axis of symmetry of the yoke to the inner jacket surface, d(z)/2, increases in a predetermined direction; and
a saddle coil wound on the yoke having a shape corresponding to the shape of the rotationally symmetrical yoke for deflecting said electron beam within said crucible,



whereby said electron beam is deflected by a magnetic field generated in said saddle coil to traverse a surface of said material.

5,532,447

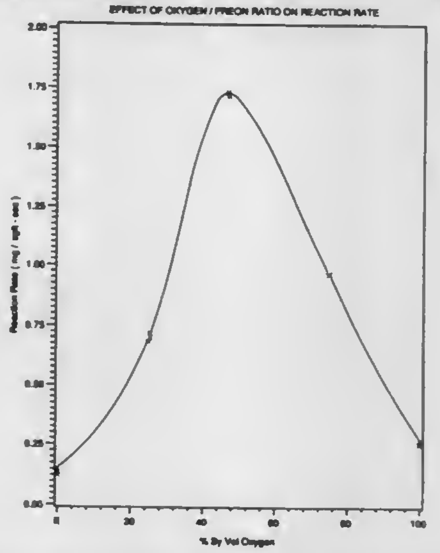
METHOD OF CLEANING AN ALUMINUM SURFACE BY PLASMA TREATMENT

John H. Powers, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1993, Ser. No. 162,564

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.43 **11 Claims**



1. A method of cleaning an aluminum sheet surface comprising:
treating said surface by a cold plasma process, said process removing lubricant from said surface of said aluminum sheet,
employing in said cold plasma process in creating the plasma a mixture consisting essentially of about 40 to 60 percent oxygen by volume and about 40 to 60 percent fluorocarbon by volume, and
employing a wattage of about 400 to 50,000 watts per square foot in said cold plasma process.

5,532,448

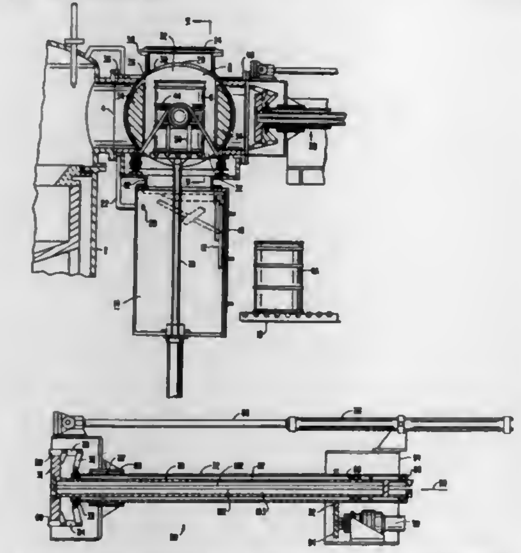
SYSTEM FOR FEEDING TOXIC WASTE DRUMS INTO A TREATMENT CHAMBER

Max P. Schlienger, Ukiah, Calif., assignor to Lockheed Environmental Systems & Technologies Co., Houston, Tex.

Division of Ser. No. 208,159, Mar. 9, 1994, Pat. No. 5,410,121. This application Mar. 6, 1995, Ser. No. 398,610

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.43 **11 Claims**



1. A drum manipulator for grasping a drum, comprising:
an outer member defining a longitudinal axis;
an inner member having proximal and distal ends and at least partially disposed within the outer member, the inner and outer members being movable relative one another in the longitudinal direction between a first position and a second position;
first and second jaws for grasping the drum, the jaws being coupled to the outer and inner members and movable between an open position and a closed position;
a contact plate attached to the distal end of the inner member and disposed to contact a portion of the drum when the jaws are in the closed position;
a fluid conduit having an inlet adapted for receiving a coolant fluid and an outlet communicating with the contact plate for convective cooling of the contact plate;
means for displacing the grasping means; and
means for coupling movement of the grasping means between the open and closed positions and movement of the inner member between the first and second positions.

5,532,449

USING PLASMA ARC AND THERMITE TO DEMOLISH CONCRETE

Taku Murakami, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

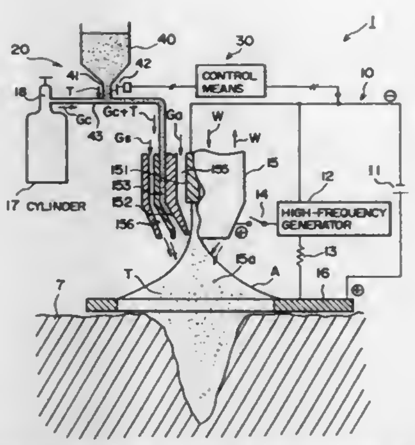
Filed Aug. 29, 1994, Ser. No. 297,610

Claims priority, application Japan, Aug. 30, 1993, 5-238920

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.59 **15 Claims**

1. A method of demolishing a concrete structure, comprising the steps of:
generating a plasma arc from a plasma torch of a plasma arc generator,
mixing thermite powder with a supply gas for said plasma torch,
passing the resulting mixture into the thus generated plasma arc,
directing the plasma arc containing said mixture toward a surface of the concrete structure, and



controlling the supplying of said thermite powder to the plasma arc responsive to the operation of the plasma torch, thereby melting at least a portion of the surface of the concrete structure.

5,532,450

APPARATUS AND METHOD CAPABLE OF MANUFACTURING TWO OR MORE DIFFERENT TYPES OF WELDED PANELS

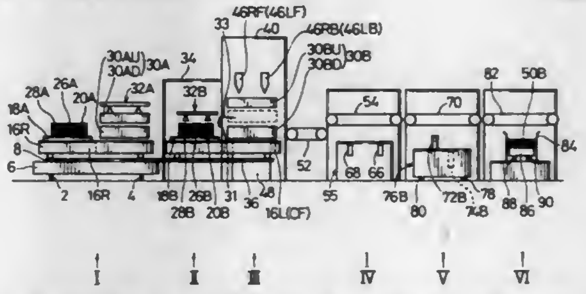
Takao Iwai; Kimikazu Ikemoto; Taminori Yanagisawa, all of Toyota; Fumiaki Natsumi, Okazaki, and Toshiro Shiraki, Toyota, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 8, 1993, Ser. No. 46,868

Claims priority, application Japan, Apr. 9, 1992, 4-118099

Int. Cl.^{6} B23K *26/00*

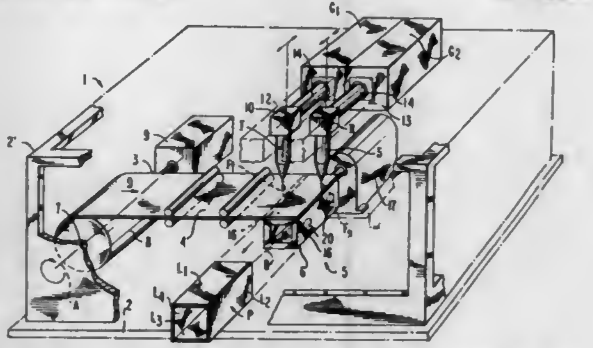
U.S. Cl. 219—121.63 **1 Claim**



1. An apparatus for manufacturing a welded panel from a set of panel pieces by abutting edges of said panel pieces against each other, and irradiating said abutted edges with a welding beam, said apparatus being adapted to manufacture a plurality of types of welded panels, said apparatus comprising:
a plurality of base members, said plurality being equal in number to said plurality of types of welded panels being manufactured, wherein each base member supports a plurality of sets of panel pieces of one of said plurality of types; and
a welding fixture for holding one set of said panel pieces during welding, said welding fixture being supported by said base member;
feeding means for feeding said set of panel pieces to said welding fixture;
wherein said apparatus includes a welding section where welding is performed;
wherein said base member is movable between a first position outside of said welding section and a second position inside said welding section, said base member physically supplanting a prior base member in said welding section after said panel pieces supported on said prior base member have been welded to form a welded panel.

5,532,451
COMBINED CUTTING AND WELDING PROCESS FOR MANUFACTURING STRUCTURAL PRODUCTS, AND APPARATUS IMPLEMENTING SUCH A PROCESS

Aldo V. La Rocca, Moncalieri, Italy, assignor to Lara Consultants, S.r.l., Moncalieri, Italy
Filed Nov. 3, 1994, Ser. No. 295,769
Claims priority, application Italy, Mar. 4, 1992, TO92A0178
Int. Cl.^{6} B23K *26/08;78/02*
U.S. Cl. 219—121.64 **18 Claims**



1. A process for manufacturing structural sheet metal products (P), characterized by the fact that it comprises at least the following stages, consisting in:

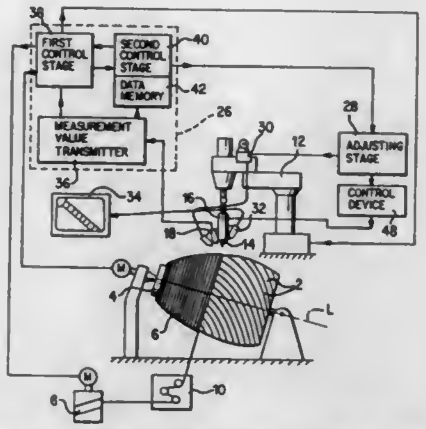
- a) feeding a continuous strip of sheet metal (**4**) onto a supporting surface (**16**) of a work holder (**6**; **26**, **27**) defining at least two supporting surfaces (**16**) forming, a common edge and successively positioned coincident with the plane (α) along which said sheet metal strip (**4**) is fed;
- b) clamping said strip (**4**) on to said supporting surface (**16**);
- c) cutting a first sheet (L1) off said strip (**4**);
- d) resetting said work holder (**6**; **26**, **27**) so as to position a further supporting surface (**16**) coincident with said plane (α);
- e) feeding said strip (**4**) on to said further supporting surface (**16**) of said work holder (**6**; **26**, **27**);
- f) clamping said strip (**4**) on to said further supporting surface (**16**);
- g) cutting a further sheet (L2) off said strip (**4**);
- h) welding said sheets (L1, L2, . . .) substantially along said common edge of said supporting surfaces (**16**).

5,532,452
WELDING ROBOT

Manfred Lechner, Silvanastr. 12/2, 81927 Muenchen; Dietbert Klein, Ludwig-Thoma-Str. 4, 85405 Nandlstadt, both of, Germany, and Wolfgang Koelbl, 8 Pendil Close, Wellington, Telford, TF1 2PQ, Great Britain
Filed Aug. 5, 1994, Ser. No. 286,229
Claims priority, application Germany, Aug. 5, 1993, 43 26 338.0
Int. Cl.^{6} B23K *9/12*
U.S. Cl. 219—124.34 **11 Claims**

1. A welding robot for automatic welding of components, comprising:

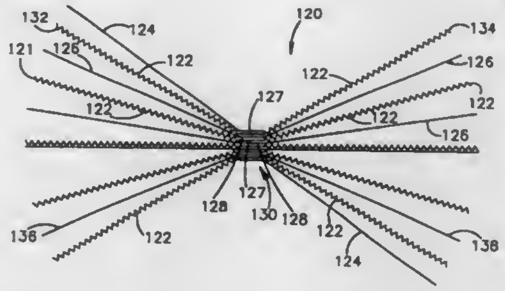
- a welding head;
- a sensor arrangement which scans a course and a cross-sectional geometry including a gap width of a joint gap between components to be welded together;
- an evaluation arrangement coupled to the sensor unit and which generates setting signals;
- a setting device coupled to the evaluation unit and the welding head, which setting device is controlled by the setting signals and adjustably sets welding parameters and guides the welding head along the joint gap in a multi-axially adjustable manner;



- wherein the evaluation unit includes a data memory with a plurality of welding parameter data sets respectively predetermined for different joint gap cross section geometries, and a control stage which selects a respective welding parameter data set in accordance with the detected joint gap geometry for controlling the setting device during the welding process.

5,532,453
PROCESS FOR WELDING A STACK OF THIN METAL SHEETS

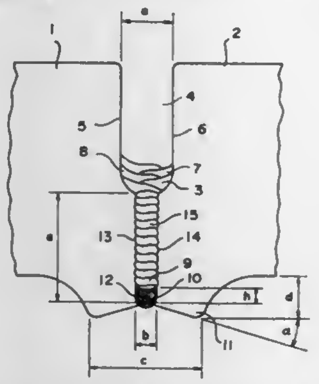
David T. Sheller, Garrettsville, Ohio, assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Apr. 7, 1995, Ser. No. 418,370
Int. Cl.^{6} B23K *9/007*
U.S. Cl. 219—127 **17 Claims**



1. A method for welding a stack of thin metal pieces together without adding any metal which comprises (a) providing a stack of at least 3 thin metal sheets or strips said thin metal sheets or strips having a thickness of at least 0.0005" to 0.0037"; (b) placing said stack between the jaws of a press having an upper jaw and a lower jaw, at least one of said jaws having at least one receptacle for and dimensioned and configured to receive the end of a non-depositing welder gun; (c) applying to said stack a load of at least about 1 ton per square inch sufficient to compress the stack and bring the confronting surfaces of the thin metal strips into contact; (d) inserting the end of said welder gun into said at least one hole and into close proximity of from 0.01" to 0.1" with said stack of thin metal sheets; (e) applying power at a level sufficient to fire said gun; (f) raising the power level to a level sufficient to melt the thin metal; (g) holding the power at such level; and (h) turning the power off, the period of time for the application of power in steps (e) to (h) being from 1 to 15 seconds.

5,532,454
METHOD OF JOINING METAL PARTS BY FUSION WELDING

Gottfried Kuhnen, Oberrohrdorf, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland
Filed Jan. 10, 1995, Ser. No. 370,786
Claims priority, application European Pat. Off., Jan. 29, 1994, 94101332
Int. Cl.^{6} B23K *9/18*
U.S. Cl. 219—137 R **9 Claims**

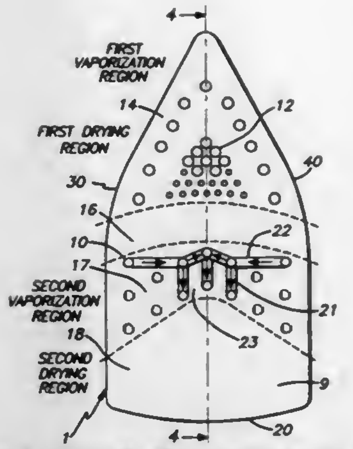


1. A method of joining metal parts by fusion arc welding in a weld of small volume, comprising the steps of:

- providing metal parts to be joined having a first side to be accessible to a welding operation and a second side opposite the first side, the parts having welding surfaces shaped so that each surface has a first flank adjacent the first side and a second flank adjacent the second side, the flanks joined by a step, and each part having a relief bulge formed in said second side adjacent said second flank, and a centering offset at said second flank to position the metal parts, wherein each relief bulge is of sufficient size so that a predetermined melt-through point develops for melting of the centering offset during welding;
- positioning the metal parts for welding by abutting the second flanks at the centering offset, the parts being positioned so that the first flanks define therebetween a first gap and the second flanks define therebetween a second gap, the second gap being narrower than the first gap;
- joining the metal parts at the second flanks by one of a fully automatic tungsten inert-gas welding process (GTAW) or gas metal-arc welding process (GMAW) to form multi-pass welding beads which extend over the entire width of the second gap; and,
- joining the metal parts at the first flanks with a submerged-arc welding process by forming a plurality of welding beads bearing alternately against one and an opposite flank.

5,532,455
SOLE FOR AN ELECTRIC STEAM IRON WITH ALTERNATING VAPORIZATION AND HEATING REGIONS

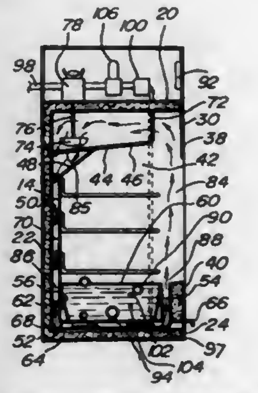
Jean-Paul A. Bouleau, Champfleur, and Gerard L. Guillot, Radon, both of, France, assignors to Moulinex (Societe Anonyme), Bagnolet, France
Continuation of Ser. No. 231,302, Apr. 22, 1994, abandoned.
This application Aug. 17, 1995, Ser. No. 516,253
Claims priority, application France, Apr. 23, 1993, 93 04850
Int. Cl.^{6} D06F *75/38*
U.S. Cl. 219—245 **6 Claims**



1. In an electric steam iron comprising a sole (**1**) extending longitudinally from a point (**3**) toward a heel (**20**) of the iron, and comprising a heating element (**4**) and two vaporization chambers (**5**, **6**) closed by a cover (**2**) separated by a partition (**7**), said chambers comprising a first principal vaporization chamber (**5**) supplied with water by means of a first water injection device through a first opening (**8**) provided in the cover (**2**) and communicating with steam outlet openings (**10**) provided in the sole adjacent to lateral edges (**30**, **40**) of said sole (**1**), and a second vaporization chamber (**6**) disposed in the forward region of the sole (**1**), supplied with water by means of a second water injection device through a second opening (**11**) provided in the cover (**2**) and communicating with other steam outlet openings (**12**) provided in the forward central portion of the sole, the openings (**10**) provided adjacent to lateral edges of the sole and the openings (**12**) provided in the forward central portion of the sole forming on said sole a first steaming region (**14**); the improvement wherein the sole (**1**) further comprises on its lower surface (**9**), from the point (**3**) toward the heel (**20**), after the first steaming region (**14**), a first drying region (**16**), free from steam outlet openings, and extending transversely between the lateral edges (**30** and **40**) of the sole (**1**), said first drying region (**16**) being followed by a second steaming region (**17**) extending transversely between the lateral edges (**30** and **40**) of the sole (**1**) and into which open transversely spaced apart steam outlet openings (**10**), said first drying region being bordered forwardly by said steam outlet openings (**12**) of said first steaming region (**14**) and rearwardly by said steam outlet openings (**10**) of said second steaming region (**17**), said first drying region having an extent between said lateral edges (**30** and **40**) that is substantially greater than its width between said steaming regions (**14** and **17**) and that is substantially greater than the spacing in any direction between said steam outlet openings (**12**) of said first steaming region (**14**), said second steaming region (**17**) being followed by a second drying region (**18**) free from steam outlet openings and extending over all remaining rear surface of the sole.

5,532,456
TEMPERATURE AND HUMIDITY CONTROLLABLE DOORLESS OVEN

Wayne W. Smith, Mt. Pleasant; Thomas J. Frick, Rosebush, and Earl H. Moore, Blancharel, all of Mich., assignors to The Delfield Company, Mt. Pleasant, Mich.
Filed Mar. 2, 1995, Ser. No. 397,852
Int. Cl.^{6} F27D *7/02*
U.S. Cl. 219—400 **20 Claims**



1. A temperature and humidity controllable doorless oven comprising:

a cabinet having exterior walls and interior walls defining an air duct therebetween, said interior walls also defining an interior oven chamber, said cabinet having an access opening into said interior oven chamber;

controllable heating means for heating said interior oven chamber to generate a controlled warm environment inside said interior oven chamber;

controllable humidifying means for humidifying said interior oven chamber to generate a controlled moist environment inside said interior oven chamber which combines with said controlled warm environment to form a controlled combination of said controlled warm and moist environments; and

air circulating means for moving an air stream having an uncontrolled combination of a warm and a moist environment through said air duct and across said access opening to minimize the flow of said controlled combination of said controlled warm and moist environments from said interior oven chamber through said access opening while permitting relatively uninhibited physical access into said interior oven chamber.

5,532,457

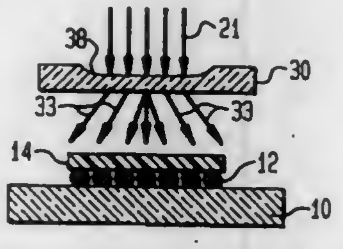
MODIFIED QUARTZ PLATE TO PROVIDE NON-UNIFORM LIGHT SOURCE

Joshua M. Cobb, Millbrook, N.Y., and Peter K. Parker, Urbana, Ill., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 263,977, Jun. 22, 1994. This application Jun. 7, 1995, Ser. No. 477,065

Int. Cl.^{6} B23K ***1/005***

U.S. Cl. 219—411 **9 Claims**



1. An apparatus transmitting non-uniform IR radiation onto a surface of at least one electronic component, generating therein uniformly distributed thermal energy which is transmitted through said electronic component, comprising:

(a) an IR source to provide said non-uniform IR radiation to at least one IR radiation receiving surface of said electronic component,

(b) a quartz plate, wherein at least a portion of at least one surface of said quartz plate has a concave surface, and wherein said IR radiation is transmitted to said IR radiation receiving surface only through said concave portion of said quartz plate,

(c) wherein said non-uniform IR radiation from said IR source is passed to said at least one IR radiation receiving surface of said electronic component in a non-uniform manner through at least a portion of said concave surface and wherein said IR radiation receiving surface of said electronic component transmits said non-uniform IR radiation as uniform thermal energy through a second surface of said electronic component and wherein said second surface is opposite said IR radiation receiving surface.

5,532,458

RADIANT HEATER, IN PARTICULAR, FOR HEATING A GLASS-CERAMIC HOT PLATE

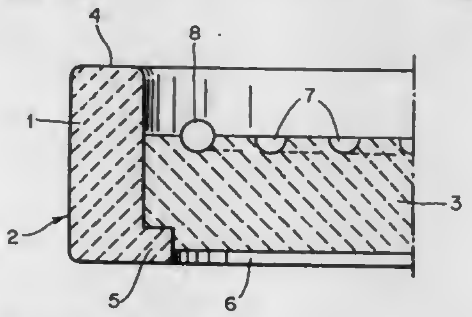
Günter Kratel, Durach; Thomas Eyhorn, Altusried; Günter Stohr, Durach, and Andreas Rell, Waltenhofen, all of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Sep. 16, 1994, Ser. No. 308,740

Claims priority, application Germany, Sep. 17, 1993, 43 31 702.2

Int. Cl.^{6} H05B ***3/68***

U.S. Cl. 219—464 **18 Claims**



1. A radiant heater, comprising

an insulator having a surface for mounting an electrical heating element onto said surface;

said insulator comprising a thermally insulating microporous insulation layer;

a dish-shaped enclosure which forms an annulus surrounding of the insulator, said enclosure having a bottom; and

a circular opening in said bottom, wherein the insulator is shaped so that it fills the opening in the bottom and wherein at least one member selected from the group consisting of the enclosure and the microporous insulation layer comprises a highly porous, fibre-free inorganic material.

5,532,459

WELDING SLEEVE OF THERMOPLASTIC MATERIAL

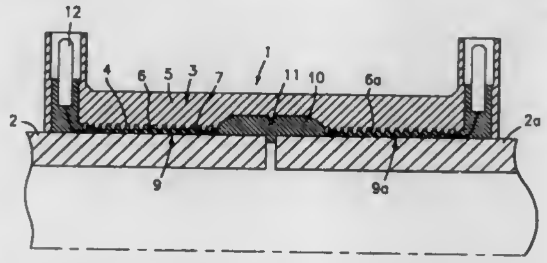
Hans W. Steinmetz, Schaffhausen, and Dirk A. Petry, Feuerthalen, both of, Switzerland, assignors to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland

Filed Sep. 21, 1994, Ser. No. 309,772

Claims priority, application Germany, Sep. 22, 1993, 43 32 196.8

Int. Cl.^{6} H05B ***3/58;*** **F16L** ***13/02***

U.S. Cl. 219—535 **7 Claims**



1. A welding sleeve comprising: a sleeve body formed of a thermoplastic material, the sleeve body having a surface; a resistance wire coiled on the surface of the sleeve body, separation means on the sleeve body for separating said resistance wire so as to define two heating zones of length L_2, each of the heating zones having a center region of length L_3 flanked by two side regions of length L_1 wherein the length L_1 is less than the length L_3, each of said two side regions of length L_1 has a resistance wire pitch and said center region of length L_3 has a resistance wire pitch wherein the pitch of the resistance wire between adjacent coils in the two side regions is smaller than the pitch of the resistance wire in the center region.

5,532,460

INDUCTION COOKWARE FORMED OF TITANIUM ALLOY AND METHOD OF MAKING SAME

Nobuyoshi Okato; Tatsuo Katagiri, both of Kawasaki; Kuniaki Osada, Yokohama, and Keiji Shirakawa, Kanazawa, all of, Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00959, § 371 Date Feb. 14, 1995, § 102(e) Date Feb. 14, 1995, PCT Pub. No. WO94/30031, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 14, 1994, Ser. No. 381,963

Claims priority, application Japan, Jun. 16, 1993, 5-145235; Jun. 17, 1993, 5-146539; May 31, 1994, 6-119040

Int. Cl.^{6} H05B ***6/12***

U.S. Cl. 219—621 **17 Claims**

1. A container of an electromagnetic cooking device comprising a non-magnetic titanium alloy plate which has a resistivity which is not less than $80\times10^{-6}\ \Omega\cdot\text{cm}$ and is not more than $200\times10^{-6}\ \Omega\cdot\text{cm}$ and has a desired shape formed by a superplastic blow forming method in which the titanium alloy plate is forced on a surface of a mold or die by a gas pressure at a forming temperature not less than 500° C.

5,532,461

BOTTOM-HEATED UTENSIL FOR CONDUCTIVE OR INDUCTION HEATING

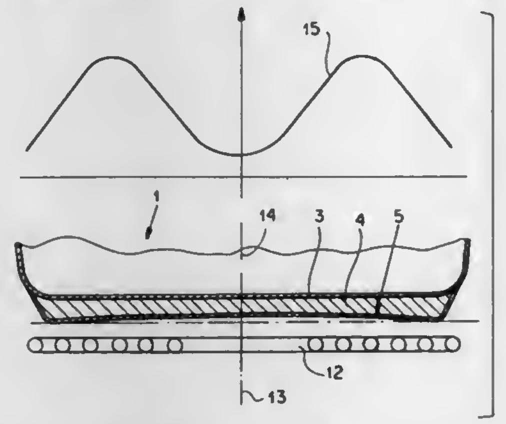
Michael Crummenauer, Oberworesbach; Uwe Dietrich, Schwollen, and Alfred Galle, Idar-Oberstein, all of, Germany, assignors to Fissler GmbH, Idar-Oberstein, Germany

Filed Apr. 10, 1995, Ser. No. 419,675

Claims priority, application Germany, Apr. 15, 1994, 44 12 943.2

Int. Cl.^{6} H05B ***6/12;*** **A47J** ***27/00***

U.S. Cl. 219—621 **10 Claims**



1. A bottom-heated utensil comprising:

a container having a container base of circular configuration composed of austenitic sheet steel, and a container casing extending upwardly from said base;

a circular thermal distribution plate separate from but coextensive with said base and affixed to an external surface thereof continuously over all of said surface said thermal distribution plate terminating at a transitional area of said container between said base and said casing;

a ferromagnetic plate cover of sheet steel overlying said plate and having a collar extending over a periphery of said plate to be substantially flush with said casing in said transitional area of said container between said base and said casing, said plate cover being affixed to an outer surface of said plate over substantially an entire area of said plate cover juxtaposed with said plate;

said plate cover in a cold state having a configuration ranging from level to concave;

said plate cover being formed with a plurality of radial cover recesses extending from a center region of said plate cover and terminating inwardly of said collar, at least some of said recesses being in the form of radial slots; and

said base, said plate and said cover forming a sandwich structure with thicknesses of the base and cover and lengths and widths of said recesses and a diameter of said center region selected to resist deformation during thermal energy application to said container by thermal conduction through said sandwich structure.

5,532,462

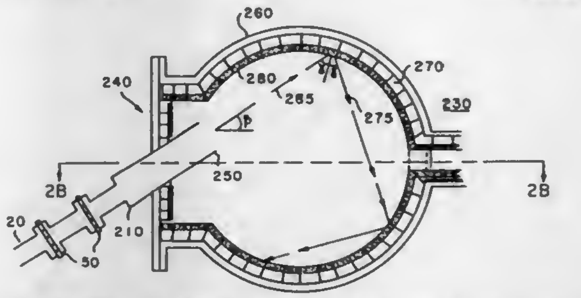
METHOD OF AND APPARATUS FOR HEATING A REACTION VESSEL WITH MICROWAVE ENERGY

Robert J. Butwell, Redwood City; Earl McCune, San Jose; Michael Green, Palo Alto; Hugo Huey, Cupertino; James R. Legarra, Redwood City, and Ross Wilcox, Palo Alto, all of Calif., assignors to Communications & Power Industries, Palo Alto, Calif.

Filed Apr. 29, 1994, Ser. No. 236,759

Int. Cl.^{6} H05B ***6/70***

U.S. Cl. 219—695 **52 Claims**



1. An apparatus for heating material comprising a closed vessel for receiving the material and

means for generating microwave energy,

a waveguide operably coupled to said microwave generating means at a first end and having a means for exciting multiple microwave propagation modes in a second end, said second end integrally coupled to the closed vessel in an angled configuration with respect to the lateral axis of said vessel to induce a helical-type reflection of microwave energy which propagates throughout the closed vessel in a whispering gallery-type mode; and

a microwave transparent isolation means operably interposed between said microwave generating means and said closed vessel, said isolation means comprising a housing and a microwave transparent barrier fixedly attached to said housing by a thermal expansion compensating seal.

5,532,463

PROCESS FOR MAKING SECURE THE WRITING OF SENSITIVE DATA INTO THE EEPROM DATA STORAGE MEMORY OF A MEMORY CARD AND A MEMORY CARD FOR USE IN THE PROCESS

Olivier M. Debelleix, and Fabien P. Thiriet, both of Orleans, France, assignors to Solaic (Societe Anonyme), Puteaux, France

Filed May 25, 1994, Ser. No. 249,239

Claims priority, application France, May 26, 1993, 93 06287

Int. Cl.^{6} G06K ***05/00***

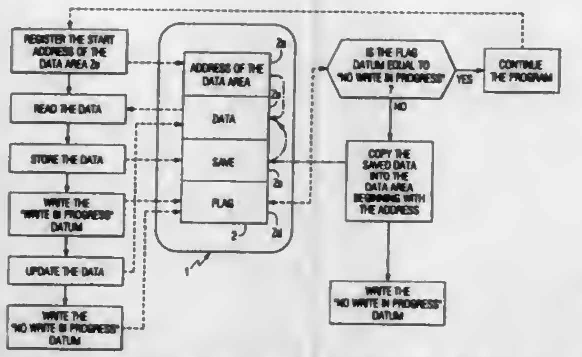
U.S. Cl. 235—380 **4 Claims**

1. A process for making secure the writing of sensitive data into an EEPROM data storage memory of a memory card having a data area, an address field, a save area, and a flag area, comprising, performing, during each write operation, in succession the steps of:

a) registering a start address of the data area of the card to which writing is to be performed, into the address field of the memory;

b) reading the data present in the data area of the memory;

c) storing the read data in the save area of the memory;


REGISTER THE START ADDRESS OF THE DATA AREA 2a
READ THE DATA
STORE THE DATA
WRITE THE "WRITE IN PROGRESS" DATUM
UPDATE THE DATA
WRITE THE "NO WRITE IN PROGRESS" DATUM
ADDRESS OF THE DATA AREA
DATA
SAVE
FLAG
2a
2b
2c
2d
2
1
IS THE FLAG DATUM EQUAL TO "NO WRITE IN PROGRESS" ?
YES
NO
CONTINUE THE PROGRAM
COPY THE SAVED DATA INTO THE DATA AREA BEGINNING WITH THE ADDRESS
WRITE THE "NO WRITE IN PROGRESS" DATUM

d) writing "WRITE IN PROGRESS" datum into the flag area of the memory;
e) writing to the data area of the memory; and
(f) writing "NO WRITE IN PROGRESS" datum into the flag area of the memory, and wherein the contents of the flag area Zd is being overwritten by the "WRITE IN PROGRESS" datum or the "NO WRITE IN PROGRESS" datum.

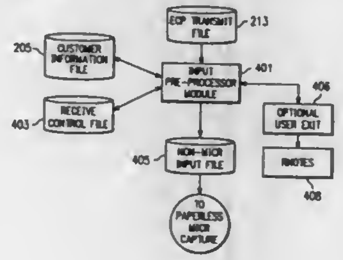
5,532,464
ELECTRONIC CHECK PRESENTMENT SYSTEM HAVING A RETURN ITEM NOTIFICATION SYSTEM INCORPORATED THEREIN

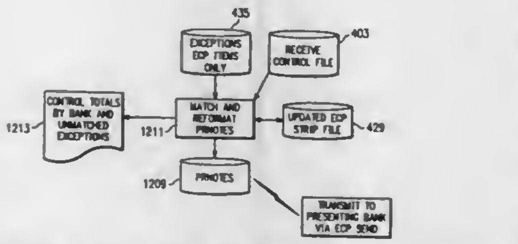
Stanley M. Josephson, Dallas; Michael F. Kopesec, Grapevine; P. Darrell Royal, Dallas; Thomas S. Stephens, Addison, and Mitchell D. Thompson, Dallas, all of Tex., assignors to J. D. Carreker & Associates, Inc., Dallas, Tex.

Continuation of Ser. No. 23,364, Feb. 26, 1993, Pat. No. 5,412,190, which is a continuation-in-part of Ser. No. 731,529, Jul. 17, 1991, Pat. No. 5,237,159. This application Apr. 25, 1995, Ser. No. 428,690

Int. Cl.^{6} G06F *15/30*

U.S. Cl. 235—379 **4 Claims**




435
EXCEPTIONS ECP ITEMS ONLY
RECEIVE CONTROL FILE
403
CONTROL TOTALS BY BANK AND UNMATCHED EXCEPTIONS
1213
MATCH AND REFORMAT PANOTES
1211
UPDATED ECP STRIP FILE
429
PANOTES
1209
TRANSMIT TO PRESENTING BANK VIA ECP SEND

1. A processing system network for transmitting data between a presenting bank and a payor bank, comprising:
a presenting bank processing system including a memory for storing a transmitting program and a processor, associated with said memory, for executing said transmitting program, said executed transmitting program directing said presenting bank processing system to transmit check information, including at least one return instruction code, in the form of a check record for each check received and processed by said presenting bank; and
a payor bank processing system, associated with said presenting bank processing system, including a memory for storing an evaluation program and a processor, associated with said memory, for executing said evaluation program, said executed evaluation program directing said payor bank processing system to receive and evaluate said instruction code for each said check record identified as an exception by said payor bank processing system, and to generate and transmit a return notification for each said exception from said payor bank processing system to said presenting bank processing system.

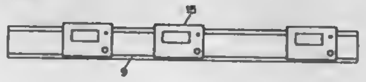
5,532,465
TECHNIQUE FOR LOCATING ELECTRONIC LABELS IN AN ELECTRONIC PRICE DISPLAY SYSTEM

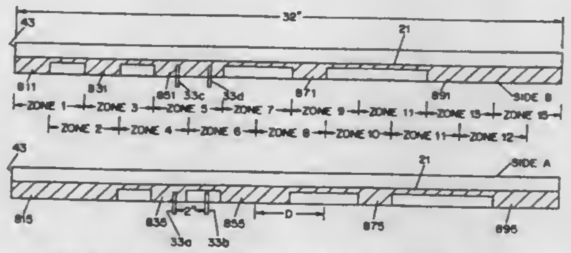
Paul Waterhouse, Copetown; John Stevens, Streetsville, both of, Canada, and George Leibman, Mount Kisco, N.Y., assignors to Electronic Retailing Systems International, Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 31,580, Mar. 15, 1993, Pat. No. 5,374,815. This application Mar. 8, 1994, Ser. No. 207,956

Int. Cl.^{6} G06K *15/00;* **G06F** *15/24*

U.S. Cl. 235—383 **95 Claims**





1. Apparatus for detecting location of a display device having means for generating different signals, said apparatus comprising:
a rail comprising:
mechanical means for mounting said device on said rail;
interface means for causing the generating means of said device to generate a signal indicative of a region within said rail where said device is mounted, the interface means causing the generating means to generate a different signal than said signal when said device displaces by more than a predetermined distance along said rail; and
means for transporting a signal generated by the generating means.

5,532,466
PORTABLE ELECTRONIC EQUIPMENT

Masaki Konno; Kazuhiko Inobe, both of Yokohama; Kenichi Yoshiura, Sagamihara, and Shuji Itoh, Yokohama, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

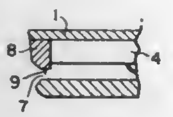
Continuation of Ser. No. 135,472, Oct. 13, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 425,707

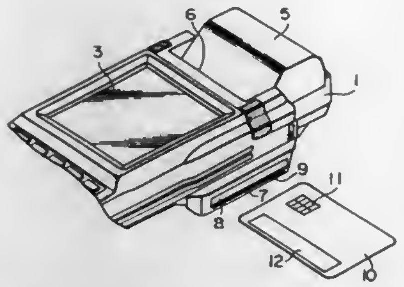
Claims priority, application Japan, Oct. 20, 1992, 4-281480

Int. Cl.^{6} G06K *7/06*

U.S. Cl. 235—441 **19 Claims**

1. A portable electronic device comprising:
a body section;
an IC card accessing part provided in said body section and adapted to receive an IC card and to access data on said IC card, said IC card having a first surface and a second surface and having a contact part and an embossed part on said first surface, said IC card having a thickness h as measured between a top of said embossed part and said second surface;
an IC card insertion slot formed in said body section and positioned to allow said IC card to be inserted into said IC card accessing part, said IC card insertion slot having an upper side and a second lower side which is opposite to said first upper side, said first Upper side and said second lower side being adapted to face said first surface and said second surface of said IC card, respectively, when said IC card is inserted into said IC card accessing part, said first upper side and said second lower side being spaced apart by a distance H which is greater than said thickness h of said IC card, and said second lower side having a flat surface formed thereon; and
an elastic wiper extending from said first upper side of said IC card insertion slot and adapted to make contact with said contact part of said IC card when said IC card is inserted into said IC card accessing part through said IC card insertion slot and said second surface of said IC card is guided by said flat surface of said second lower side of said IC card insertion slot; wherein:
when said IC card is inserted into said IC card accessing part through said IC card insertion slot, said elastic wiper presses on said first surface of said IC card so as to wipe said contact part of said IC card while said second surface of said IC card is guided smoothly by said second lower side of said IC card insertion slot.





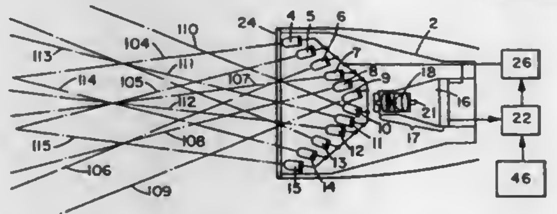
5,532,467
OPTICAL SCANNING HEAD

Alex Roustaei, 1696 Via Inspirar, San Marcos, Calif. 92069

Continuation of Ser. No. 956,646, Oct. 2, 1992, Pat. No. 5,349,172, which is a continuation-in-part of Ser. No. 843,266, Feb. 27, 1992, Pat. No. 5,291,009. This application Sep. 16, 1994, Ser. No. 307,911

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **26 Claims**



1. An optical scanner for reading and decoding information encoded in a bar code comprising alternating lines of light and dark, said optical scanner comprising:
a printed circuit board having a front, a center and a rear;
an array of light emitting diodes comprising at least one combination of light emitting diodes disposed at said front of said printed circuit board in an arrangement wherein each light emitting diode of said at least one combination emits light at a non-zero angle with respect to a centerline bisecting said printed circuit board from said front to said rear so that a fan of light is projected from said array toward a reference plane within a field of view containing said bar code so that light is reflected therefrom;
an optical assembly disposed at a center of said printed circuit board for receiving, concentrating and directing reflected light toward said rear of said board;
a CCD array disposed at said rear of said printed circuit board for detecting a portion of said reflected light directed thereon by said optical assembly and generating an electrical signal in response thereto wherein said electrical signal is an analog representation of said bar code;
a conversion assembly for receiving and converting said electrical signal into a digital signal corresponding to said bar code; and
a voltage source for providing a driving voltage to said array of light emitting diodes, said CCD array and said conversion assembly.

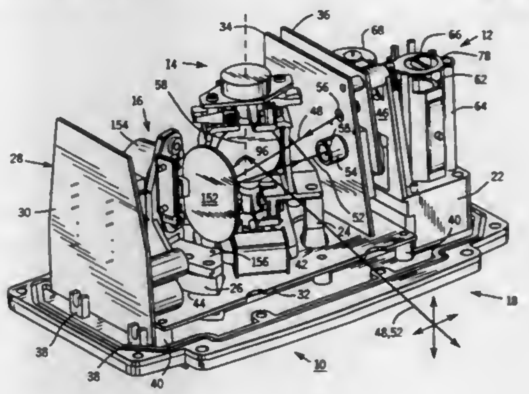
5,532,468
BAR CODE READER FOR SCANNING AN AREA AT VARIABLE SWEEP ANGLES

Robert E. Scofield, Pewaukee, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 26, 1994, Ser. No. 312,249

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **20 Claims**



1. An optical code reader of the type for reading codes within a scan area defined by first and second generally parallel sides, and a third and fourth generally parallel sides, the reader comprising:
a light source configured to produce a light beam;
a first mirror oscillating assembly including a first mirror defining the light path of the light beam and configured to oscillate the first mirror cyclically about a first axis to sweep the light beam between the first and second sides in response to first control signals applied thereto;
a second mirror oscillating assembly including a second mirror further defining the light path and configured to rotate the second mirror between first and second angles of rotation about a second axis skewed from the first axis, the light beam being swept between the first and second sides along the third side when the second mirror is at the first angle and swept between the first and second sides along the fourth side when the second mirror is at the second angle, where the second mirror oscillating assembly rotates the mirror at varying rates defined by second control signals applied thereto; and
a control circuit coupled to the first and second mirror oscillating assembly, and configured to apply the first control signals to the first mirror oscillating assembly and apply the second control signals to the second mirror oscillating assembly which cause the second mirror to rotate from the first angle to the second angle at a first constant rate to produce a first number of sweeps between the first and second sides of the area and further cause the second mirror to rotate from the second angle to the first angle at a second constant rate to produce a second number of sweeps between the first and second sides of the area greater than the first number.

5,532,469

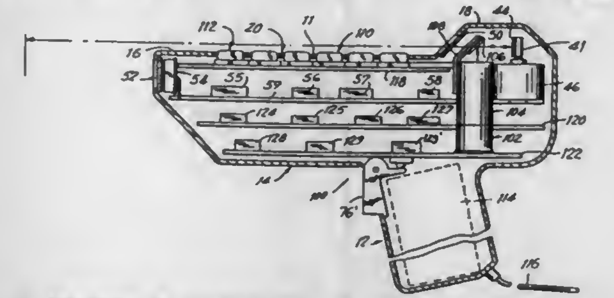
HAND HELD BAR CODE READER WITH INPUT AND DISPLAY DEVICE AND PROCESSOR

Howard M. Shepard, Great River; Edward D. Barkan, South Setauket, and Jerome Swartz, Stonybrook, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation of Ser. No. 93,967, Jul. 21, 1993, Pat. No. 5,396,055, which is a division of Ser. No. 895,277, Jun. 8, 1992, Pat. No. 5,262,628, which is a division of Ser. No. 272,545, Nov. 17, 1988, Pat. No. 5,130,520, which is a division of Ser. No. 148,555, Jan. 26, 1988, Pat. No. 4,845,350, which is a division of Ser. No. 883,923, Jul. 10, 1986, Pat. No. 4,758,717, which is a division of Ser. No. 519,523, Aug. 1, 1983, Pat. No. 4,673,805, which is a division of Ser. No. 342,231, Jan. 25, 1982, Pat. No. 4,409,470. This application Jan. 25, 1995, Ser. No. 377,998

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **29 Claims**



1. Apparatus for reading bar code symbols or the like and processing data associated therewith employing a portable unit supported by the user comprising:
  - (a) a light beam generator in said unit including a laser producing a light beam directed onto a symbol being read;
  - (b) a light detector in said unit receiving reflected light from said symbol being read and producing electrical signals related thereto and a scanner in said unit for automatically scanning at least one of said light beams and a field of view across said symbol being read while said symbol is spaced from said unit and visible to a user supporting said unit, the automatic scanning operation of the scanner being initiated by said user;
  - (c) processor circuitry including decoder circuitry in said unit for receiving said electrical signals and generating a digitized signal to generate therefrom data descriptive of said bar code symbol;
  - (d) said processor circuitry including at least one integrated circuit in said unit for data processing;
  - (e) an integrated circuit storage chip in said unit;
  - (f) a manually activated data input and data display device on said unit; and
  - (g) a portable housing containing said light beam generator, said light detector, said processor circuitry, said integrated circuit storage chip, and said manually activated data input and data display device.

5,532,470

OPTICAL ENCODING AND READOUT SYSTEM USING A LIQUID CRYSTAL MODULATOR TO ENCODE LIGHT WITH AN OBJECT'S IDENTIFICATION CODE AND RELATED SENSOR DATA

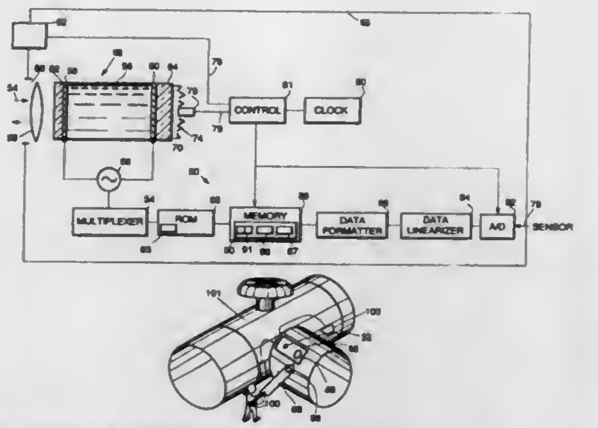
David A. Frank, Tuczon, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 18, 1994, Ser. No. 325,000

Int. Cl.^{6} G06K *19/06*

U.S. Cl. 235—491 **14 Claims**

6. An optical data encoding system for use with a bar code wand reader to identify an object, wherein the wand reader projects a readout beam which is modulated by the system, and decodes the intensity modulated beam, comprising:
  - a memory for storing a unique object identification code in a format that corresponds to a multi-bit binary bar code;
  - a liquid crystal cell for receiving the readout light beam;



  - a polarizer for polarizing the readout beam; and
  - a control circuit for reading out the identification code stored in said memory and modulating the liquid crystals in said cell between binary orientations in accordance with the state of each successive bit in the identification code, said liquid crystal cell in turn modulating the polarization of said readout beam with said code, and said polarizer modulating the beam's intensity in accordance with the beam's modulated polarization.

5,532,471

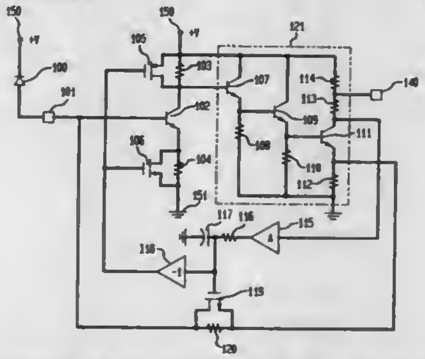
OPTICAL TRANSIMPEDANCE AMPLIFIER WITH HIGH DYNAMIC RANGE

Haideh Khorramabadi, Chatham Township, Morris County; Maurice J. Tarsia, Colonia, both of N.J., and Liang D. Tzeng, Fogelsville, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 21, 1994, Ser. No. 360,895

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 A **6 Claims**



3. A preamplifier for use with currents developed by a photodetecting diode, said preamplifier comprising a first bipolar junction transistor having an emitter, base and collector electrodes, means for coupling the currents developed by said photodetecting diode to said base electrode, means for connecting said emitter electrode to a ground potential, collector load means for connecting a source of potential to said collector electrode, buffer amplifier means responsive to voltage signals at said collector electrode for providing an output of said preamplifier, for coupling a negative feedback signal to said base electrode, and for developing a potential whose value represents the average signal level of said voltage signals, the value of said feedback signal being dependent on said average signal level, characterized in that said collector load means includes a collector resistor and a first field effect transistor of one channel type having a gate, source and drain electrodes, said source and drain electrodes being connected to opposite ends of said collector resistor, and means responsive to said potential whose value represents the average signal level for coupling a potential to said gate electrode, said means for connecting said emitter electrode to said ground potential includes an emitter resistor and a second field effect transistor having a gate, source

and drain electrodes, said source and drain electrodes of said second field effect transistor being connected to opposite ends of said emitter resistor, and said gate electrode of said second field effect transistor is directly connected to the gate electrode of said first field effect transistor, said second field effect transistor being of opposite channel type to said first field effect transistor, whereby said first field effect transistor decreases the effective collector load resistance for increased values of said average signal level, and said second field effect transistor increases the effective resistance between said emitter and ground potential for increased values of said average signal level.

5,532,472

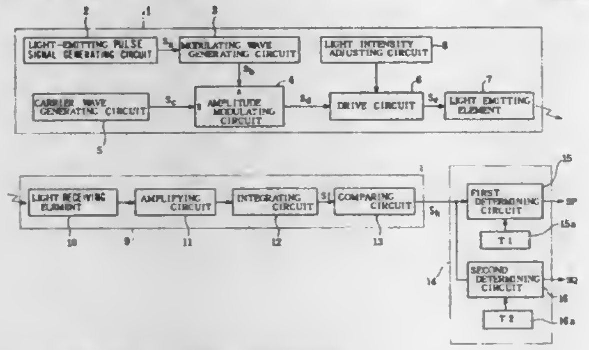
PHOTOELECTRIC SWITCH MONITORING THE DURATION OF PULSED LIGHT TO PREVENT FALSE SIGNALS DUE TO AMBIENT CONDITIONS

Naofumi Furuta, Konan, Japan, assignor to Sunx Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1994, Ser. No. 340,385

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 B **8 Claims**


LIGHT-EMITTING PULSE SIGNAL GENERATING CIRCUIT
MODULATING WAVE GENERATING CIRCUIT
LIGHT INTENSITY ADJUSTING CIRCUIT
CARRIER WAVE GENERATING CIRCUIT
AMPLITUDE MODULATING CIRCUIT
DRIVE CIRCUIT
LIGHT EMITTING ELEMENT
LIGHT RECEIVING ELEMENT
AMPLIFYING CIRCUIT
INTEGRATING CIRCUIT
COMPARING CIRCUIT
FIRST DETERMINING CIRCUIT
T1
SECOND DETERMINING CIRCUIT
T2
SP
SQ

1. A photoelectric switch comprising:
- a) light emitting means comprising:
  - light-emitting pulse signal generating means comprising a first circuit delivering a main pulse having a predetermined duration and an amplitude which is gradually increased, a second circuit delivering a carrier pulse signal having a predetermined amplitude, and a third circuit delivering a light-emitting pulse signal having a waveform approximately the same as that of a signal obtained by amplitude-modulating the carrier pulse signal by means of the main pulse; and
  - means for converting the light-emitting pulse signal to a light signal;
- b) light detecting means comprising:
  - converting means for detecting the light signal delivered from the light emitting means and converting the received light signal to an electric signal;
  - integrating means for integrating the electric signal delivered from the converting means, thereby delivering a signal having an integral value; and
  - comparing means for comparing the signal delivered from the integrating means with a reference value, thereby obtaining a light detection pulse having a duration corresponding to a period of a signal component exceeding the reference value; and
- c) a determination section for determining a duration of the light detection pulse delivered from the light detecting means, thereby generating first and second light-quantity indicative signals in accordance with the determined duration of the light detection pulse, the determination section comprising first determining means having a first determining value and second determining means having a second determining value which is longer than the first determining value, the first determining means comparing the light detection pulse with the first determining value, thereby delivering the first light-quantity indicative signal when the duration of the light detection pulse is equal to or longer than the first determining value, the second determining means comparing the light detection pulse with the second determining value, thereby delivering the second light-quantity indicative signal when the duration of the light detection pulse is equal to or longer than the second determining value.

5,532,473

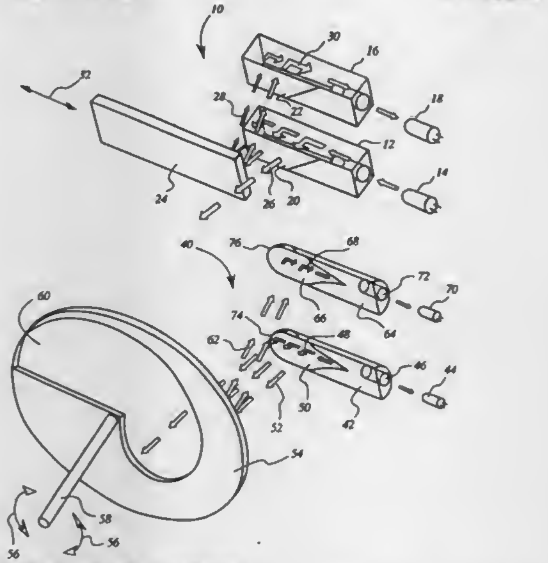
REFLECTION SHADOW SENSOR WITH LIGHT DIRECTING DIFFUSIVE SURFACE

Philip K. Chin, 813 W. William David Pkwy., Metairie, La. 70005

Continuation-in-part of Ser. No. 100,488, Jul. 30, 1993, Pat. No. 5,389,777, which is a continuation-in-part of Ser. No. 955,932, Oct. 2, 1992, Pat. No. 5,376,785. This application Oct. 20, 1994, Ser. No. 326,652

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—214 PR **29 Claims**



1. An optical sensor, comprising:
  - a light emitting means for emitting a light flow, said light emitting means having a diffusive surface through which the light flow travels, said diffusive surface directing the light flow towards a light impermeable object;
  - a light receiving means for receiving the light flow emitted by the light emitting means and reflected by the light impermeable object mounted opposite said light emitting means and said light receiving means, said light receiving means being provided with a diffusive surface for directing the light flow received by said light receiving means.

5,532,474

ACTIVE QUENCH CIRCUIT AND RESET CIRCUIT FOR AVALANCHE PHOTODIODE

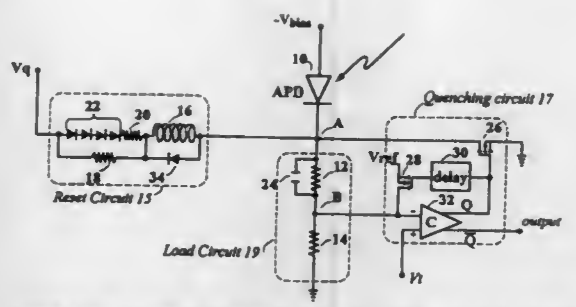
Henri P. E. G. Dautet, and Joseph D. P. DesChamps, both of Québec, Canada, assignors to EG&G Limited, Vaudreail, Quebec, Canada

Continuation of Ser. No. 169,295, Dec. 17, 1993, abandoned. This application Sep. 22, 1995, Ser. No. 532,259

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 R **14 Claims**

1. A circuit for operating an avalanche photodiode (APD) in Geiger mode, including:
  - bias means for applying a first voltage to a first terminal of the APD, the first voltage being less than the breakdown voltage of the APD with respect to a reference voltage and having a polarity to reverse bias the APD;
  - reset means for applying a second voltage to a second terminal of the APD during a first phase of operation, the second voltage being such that the APD is reverse biased above its



breakdown voltage when the second voltage is applied to the APD second terminal, the reset means presenting a first impedance to the second terminal of the APD;

means, responsive to a quench signal, for connecting a second impedance between the APD second terminal and the reference voltage during a second phase of operation, the second impedance being less than the first impedance, and for disconnecting the second impedance from the second terminal in the absence of the quench signal; and

means for detecting an increase in the current flowing through the APD and for producing the quench signal in response thereto to initiate the second phase of operation, the detecting means being further operative for removing the quench signal after a predetermined delay to terminate the second phase of operation; and

wherein the reset means further includes an inductance having a fixed value connected in series between the second voltage and the second terminal of the APD for injecting a current pulse into the APD second terminal immediately following the end of the second phase.

5,532,475

METHOD AND APPARATUS FOR TWO-DIMENSIONAL RADIATION DETECTION

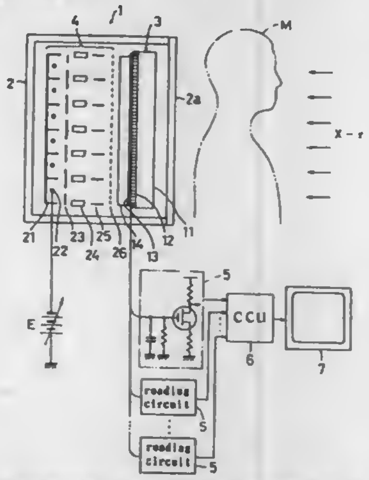
Hiromichi Tonami, Otokuni-gun, and Sirou Oikawa, Shiga-gun, both of, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Apr. 19, 1995, Ser. No. 424,878

Claims priority, application Japan, Apr. 25, 1994, 6-110399

Int. Cl.⁶ H01J *31/50*

U.S. Cl. 250—214 VT **9 Claims**



1. A two-dimensional radiation detecting method for converting incident radiation in a two-dimensional distribution into electric signals, said method comprising the steps of:

causing the radiation in a two-dimensional distribution to strike upon a converting film to convert the radiation into electric charges in a two-dimensional distribution;

selecting, in succession, one of a plurality of linear cathodes juxtaposed and opposed to said converting film to generate electron beams from a selected linear cathode;

converging said electron beams at least vertically, and projecting said electron beams to one horizontal line on said converting film;

reading a charge (potential) distribution on said one horizontal line by detecting variations in current flowing through a plurality of stripe electrodes juxtaposed on said converting film to cross said electron beams projected;

deflecting said electron beams vertically each time the potential distribution on said one horizontal line has been read, to read a potential distribution on an adjacent horizontal line; and

switching said linear cathodes after reading potential distributions on a predetermined number of horizontal lines, to read potential distributions on said predetermined number of horizontal lines with electron beams generated from a newly selected linear cathode, as above, and subsequently reading the potential distribution on said converting film by switching said linear cathodes successively.

5,532,476

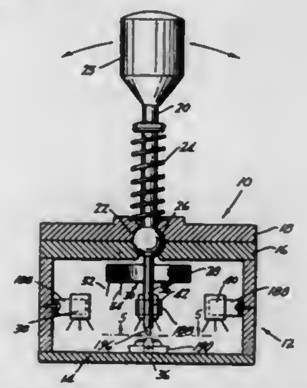
REDUNDANT INDICATOR FOR DETECTING NEUTRAL POSITION OF JOYSTICK MEMBER

Peter J. Mikan, 31 Greenfield Rd., Milford, Conn. 06460

Filed Dec. 21, 1994, Ser. No. 360,285

Int. Cl.⁶ G01D *5/34*

U.S. Cl. 250—221 **19 Claims**



1. An electronic joystick-type controller, comprising in combination:

a) a base,

b) a manually-operable control member, and means pivotally mounting said control member on the base for solely pivotal, non-translational movement between a central neutral position and other non-central control positions in X-axis and Y-axis directions,

c) said control member having a light-reflecting area thereon which traverses a predetermined field of travel as the member is moved between its various positions, and

d) emitter-sensor means disposed at a predetermined, fixed distance from the light-reflecting area of the control member when the latter is in its neutral position, for producing an electrical signal in response to receiving light reflected from the reflecting area of the control member, said emitter-sensor means comprising a light source and a light sensor both fixedly located adjacent the field of travel of the light-reflecting area of the control member, said light sensor being responsive to light reflected thereto from the light-reflecting area of the control member solely when the control member is disposed in its central neutral position,

e) said light being no longer reflected onto said light sensor from the light-reflecting area when the control member is moved out of said neutral position and in any of said other non-central control positions in X-axis and Y-axis directions, thereby to extinguish said produced electrical signal.

5,532,477

OPTICAL PICKUP APPARATUS HAVING LENS GROUP FOR DETERMINING PATHS OF AN INCIDENT BEAM AND A REFLECTED & BEAM

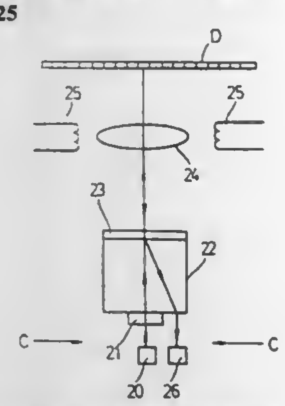
Seong-Min Kim, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed May 30, 1995, Ser. No. 452,513

Claims priority, application Rep. of Korea, May 30, 1994, 94-11851

Int. Cl.⁶ G01J *1/20;* **G02F** *1/01*

U.S. Cl. 250—225 **14 Claims**



1. An optical pickup apparatus comprising:

a laser source for generating a laser beam;

a lens group for determining paths of an incident beam to an information recording medium and a reflected beam from the information recording medium to read information recorded on the information recording medium, said lens group having a polarization converting means for polarizing a beam transmitted through the polarization converting means, a birefringent means for refracting the beam depending on a polarized state of the beam, and an objective lens through which the beam is transmitted to be focused on the information recording medium; and

a receiving means for receiving the reflected beam which is polarized and refracted by the lens group.

5,532,478

UNDERWATER BRANCHING DEVICE

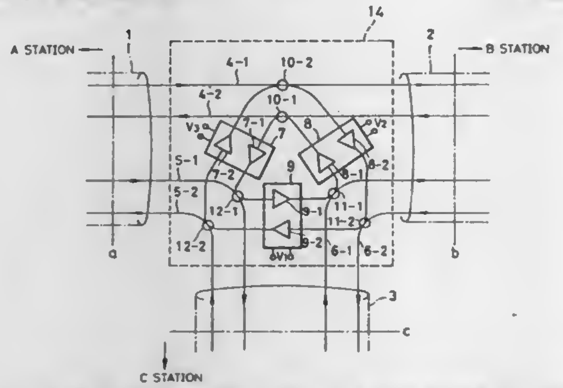
Yoshikazu Kogure, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1994, Ser. No. 345,691

Claims priority, application Japan, Nov. 25, 1993, 5-318964

Int. Cl.⁶ H01J *5/16*

U.S. Cl. 250—227.24 **7 Claims**



1. An underwater branching device for branching first, second and third submarine communication cables respectively provided for communication between first and second stations, between second and third stations and between third and first stations respectively located across an ocean, comprising:

first, second and third distributing and coupling means for branching and coupling transmission signals of said first, second and third submarine communication cables, respectively;

first, second and third amplifier means provided between said first and second distributing and coupling means, between said second and third distributing and coupling means and between said third and first distributing and coupling means for amplifying signals between respective ones of said distributing and coupling means; and

control means for selectively activating said first, second and third amplifier means.

5,532,479

TEMPERATURE, PRESSURE, VIBRATION OR HUMIDITY SENSOR BASED ON REFLECTED LIGHT FROM A BIMETALLIC, PLASTIC OR DEHUMIDIFYING MATERIAL

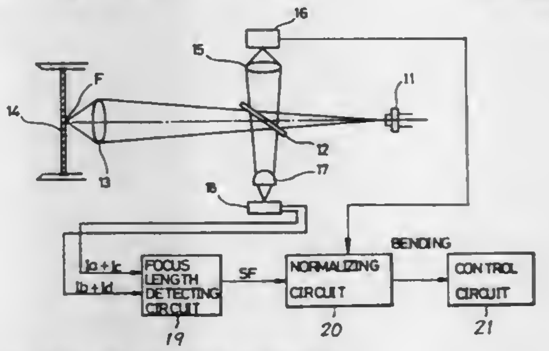
Kwang G. Jung, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Nov. 10, 1994, Ser. No. 337,547

Claims priority, application Rep. of Korea, Nov. 11, 1993, 1993-23964

Int. Cl.⁶ G01D *5/34*

U.S. Cl. 250—231.11 **4 Claims**



1. A multi-function sensor comprising:

a laser for emitting laser beams;

a beam splitter for transmitting a part of the laser beams and reflecting the remaining part of the laser beams;

a measurement object medium for responding to a variation in measurement object to be measured;

a first lens for focusing the laser beams reflected by the beam splitter as a reference light;

a second lens for focusing the laser beams transmitted through the beam splitter on the measurement object medium;

a cylindrical lens for focusing the laser beams sequentially reflected by the measurement object medium and the beam splitter as a reflected light;

a reference light measuring photo detector for measuring a quantity of the reference light;

a reflected light measuring photo detector for measuring a quantity of the reflected light;

a focus length detecting circuit for converting an output signal from the reflected light measuring photo detector into a distance detection signal;

a normalizing circuit for calculating a ratio of an output signal of the focus length detecting circuit to an output signal of the reference light measuring photo detector and thereby measuring a relative quantity of the reflected light; and

a control circuit for receiving an output signal from the normalizing circuit and thereby generating a control signal meeting a desired function.

5,532,480

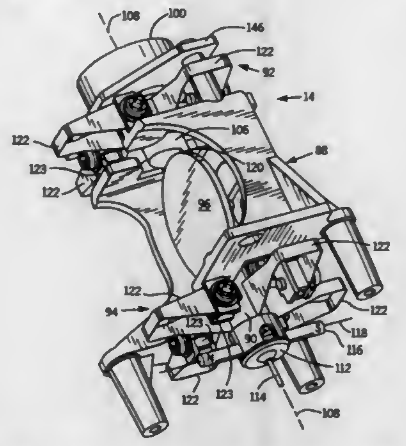
DYNAMIC DAMPER FOR AN OSCILLATING MIRROR IN A CODE READER

Robert E. Scofield, Pewaukee, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 26, 1994, Ser. No. 312,262

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—235 **21 Claims**



1. In a code reader of the type including a light source for producing scanning light and a transducer for sensing scanning light reflected from a code, a light directing assembly comprising:
- a mirror support defining a rotational axis;
- a mirror fastened to the mirror support;
- a frame;
- a rotational axis support spring assembly fastened to the mirror support and the frame to allow the mirror support to oscillate only about the rotational axis; and
- a damper fastened to the frame and slidably engageable with the mirror support to dampen oscillation of the mirror support perpendicular to the rotational axis.

5,532,481

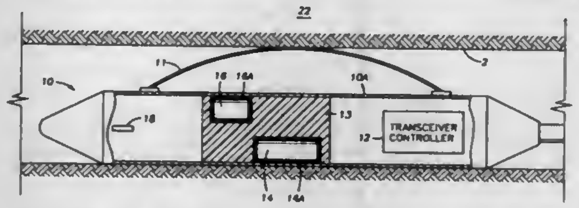
SYSTEM FOR MEASURING EPITHERMAL NEUTRON POROSITY HAVING REDUCED BOREHOLE EFFECT

Medhat W. Mickael, Sugar Land, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 23, 1995, Ser. No. 409,268

Int. Cl.^{6} G01V *5/10*

U.S. Cl. 250—269.4 **11 Claims**



1. A method of determining an epithermal neutron decay rate of an earth formation penetrated by a wellbore, comprising the steps of:
- irradiating said earth formation with a burst of high energy neutrons from a neutron source disposed in a logging tool inserted into said wellbore;
- detecting neutrons at a first detector adapted to be primarily sensitive to epithermal neutrons emanating from said earth formation;
- detecting neutrons at a second detector adapted to be primarily sensitive to epithermal neutrons emanating from said wellbore;
- determining a first time after said burst of high energy neutrons wherein a counting rate of said first detector reaches a maximum;
- scaling a counting rate of said second detector to match said counting rate of said first detector at said first time at which said counting rate of said first detector reaches a maximum after said bursts of high energy neutrons;
- determining a second time after said burst of neutrons at which said first detector and said second detector measure thermal neutrons at substantially the same rate; and
- determining said epithermal neutron decay rate of said earth formation by generating a linear least-squares fit of a difference in counting rates between said first detector and said second detector between said first time at which said counting rate of said first detector reaches a maximum and a predetermined portion of a time span from said burst to said second time at which said first detector and said second detector measure thermal neutrons at substantially the same rate.

5,532,482

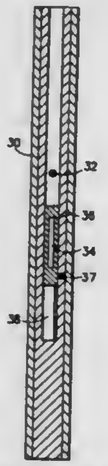
METHOD AND APPARATUS FOR WELL LOGGING USING AN ACCELERATOR NEUTRON SOURCE

Kenneth E. Stephenson, Newtown, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.

Continuation of Ser. No. 226,737, Apr. 12, 1994, abandoned. This application Jun. 26, 1995, Ser. No. 494,497

Int. Cl.^{6} G01V *5/10*

U.S. Cl. 250—269.4 **34 Claims**



1. A method of determining a characteristic of an underground formation through which a borehole passes comprising using a tool comprising a high-energy neutron source and a neutron detector, the method comprising irradiating the underground formation with neutrons from the neutron source, detecting neutrons which have passed from the source to the detector via the formation and having energies of about 1 MeV with the neutron detector which comprises a high pressure ^{4}He proportional counter so as to produce a signal, and using the signal to determine the characteristic of the underground formation.

5,532,483

MASS SPECTROMETER AND ION SOURCE

Yoichi Ose, Mito; Kiyomi Yoshinari, Hitachi; Masayoshi Yano, and Tadao Mimura, both of Hitachinaka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

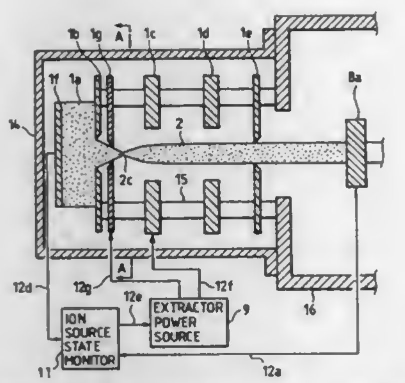
Filed Mar. 15, 1995, Ser. No. 403,980

Claims priority, application Japan, Mar. 17, 1994, 6-047090

Int. Cl.^{6} H01J *49/10*

U.S. Cl. 250—288 **11 Claims**

1. An ion source in which generated ions are extracted from a slit of an acceleration electrode to form an ion beam, said ion beam being focussed with a focussing electrode to be extracted from an extracting slit, wherein:
- an extracted electrode is provided in between said acceleration electrode and said focussing electrode in vicinity of said acceleration electrode to locate a cross-over point of said ion beam at a position distanced from the acceleration electrode by a desired distance.



5,532,484

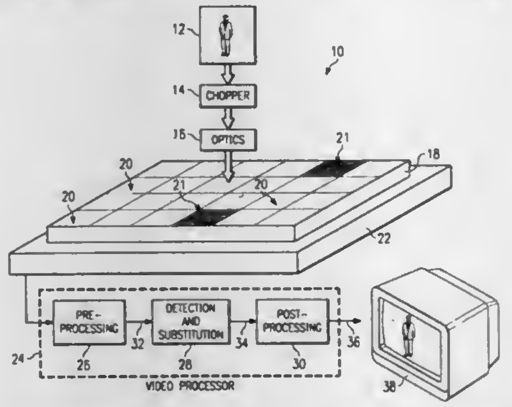
DEFECTIVE PIXEL SIGNAL SUBSTITUTION IN THERMAL IMAGING SYSTEMS

Kevin N. Sweetser, Garland; Howard R. Beratan, Richardson, and Robert A. Owen, Rowlett, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1994, Ser. No. 304,001

Int. Cl.^{6} H04N *5/33;7/18*

U.S. Cl. 250—332 **20 Claims**



1. An apparatus for defective pixel signal substitution in a thermal imaging system, the thermal imaging system having a focal plane array with at least three pixels, the apparatus comprising:
- addressing circuitry operable to address a signal produced by at least one of the pixels;
- a reference generator operable to generate a reference value for the pixel;
- a subtractor having a first input coupled to the addressing circuitry and a second input coupled to the reference generator, the subtractor operable to output an error value representing a comparison of the produced signal and the reference value;
- a comparator coupled to the subtractor and operable to compare the error value to a predetermined threshold and to generate a substitution flag if the error value exceeds the predetermined threshold; and
- a substitutor coupled to the comparator and operable to substitute the produced signal of the pixel with a selected signal in response to the substitution flag.

5,532,485

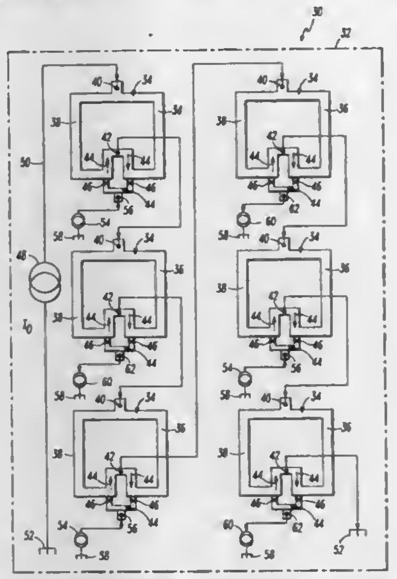
MULTISPECTRAL SUPERCONDUCTIVE QUANTUM DETECTOR

Nathan Bluzer, Rockville, Md., and Martin G. Forrester, Pittsburgh, Pa., assignors to Northrop Grumman Corp., Linthicum, Md.

Filed Oct. 14, 1994, Ser. No. 323,228

Int. Cl.^{6} H01L *39/22*

U.S. Cl. 250—336.2 **34 Claims**



1. An array of superconductive quantum detectors, comprising
- a substrate;
- a plurality of spaced adjacent patterns of superconductive materials deposited on the substrate, each said pattern being endless and having at least one pair of spaced legs, each said pattern being a quantum detector;
- an input and output current biasing node on each pattern between the legs of said at least one pair;
- a read-out superconductive quantum interference device including a pair of spaced Josephson junctions coupled to each pattern;
- conductive material connecting each output node to the input node of an adjacent pattern, a first DC current source connected to the input node of a first pattern; and
- a second DC current source having positive and negative terminals, one-half of the negative terminals being connected to one-half of the read-out superconductive quantum interference devices of the array, one-half of the positive terminals being connected to the remaining superconductive quantum interference devices of the array, the remaining positive and negative terminals of the second source being connected to grounds.

5,532,486

HETEROJUNCTION DIODE WITH LOW TURN-ON VOLTAGE

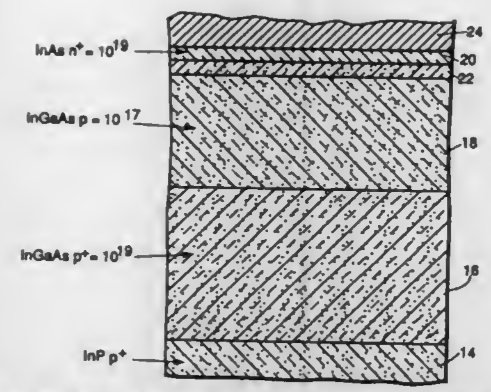
William E. Stanchina, Thousand Oaks, Calif.; Robert A. Metzger, Atlanta, Ga., and David B. Rensch, Thousand Oaks, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 13, 1995, Ser. No. 387,507

Int. Cl.^{6} H01L *31/0328*

U.S. Cl. 257—201 **21 Claims**

1. A diode with a low forward-bias turn-on voltage, comprising:
- a layer of n-doped semiconductor material having a narrow bandgap energy of not more than about 0.4 eV,
- a layer of p-doped semiconductor material having a substantially wider bandgap energy than said narrow bandgap material and forming a pn heterojunction therewith, said n-doped material having a valence band energy and a conduction band energy



that are less than the valence band and conduction band energies, respectively, of said p-doped material by respective valence band and conduction band discontinuities when said heterojunction is unbiased, the unbiased valence band discontinuity being substantially less than the unbiased conduction band discontinuity, said materials responding to a forward bias across said beterojunction by reducing said valence band discontinuity to enable a substantial valence band hole flow across said heterojunction, and by maintaining said conduction band discontinuity at a level that is high enough to substantially block conduction band electron flow across said beterojunction, and

respective electrical contacts to said narrow and wider bandgap materials for establishing a diode action by applying a bias across said pn beterojunction.

5,532,487

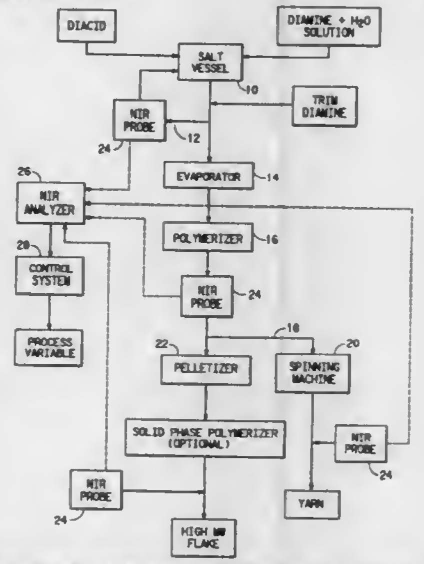
NEAR-INFRARED MEASUREMENT AND CONTROL OF POLYAMIDE PROCESSES

Ann M. Brearley, West Chester, Pa., and Harvey S. Gold, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 23, 1994, Ser. No. 344,426

Int. Cl.⁶ G01J *5/02;* **G01N** *30/28;33/00;23/00*

U.S. Cl. 250—339.12 **13 Claims**



1. A method for measuring and controlling at least one characteristic of a dimonomeric polyamide, copolyamide, or polyamide precursor mixture in a polymerization process stream, comprising the steps of:

(a) creating a predictive model for the value of the characteristic;

(b) acquiring spectra by measuring the near-infrared absorbance of the polyamide, copolyamide or polyamide precursor mixture in-line at least one selected point in the polymerization process stream at wavelengths within the near-infrared range;

(c) applying spectral pretreatment to the measurements of step (b) to obtain a pretreated spectrum;

(d) applying the predictive model to the spectrum to calculate a predicted value of the characteristic;

(e) comparing the predicted value of the characteristic to a preselected desired value of the characteristic; and

(f) controlling the characteristic by making an adjustment to at least one process variable of the polymerization process stream.

5,532,488

APPARATUS AND METHOD FOR EVALUATING ORIENTATION FILM

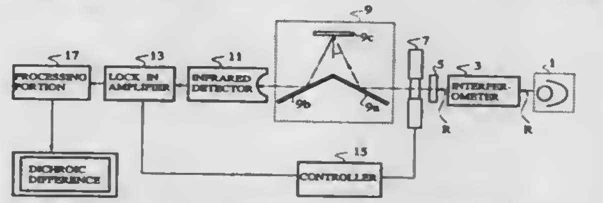
Mitsuru Ishibashi, Chiba-ken; Hideyuki Sasaki, Kanagawa-ken; Tatsuo Nomaki, Kanagawa-ken; Akira Tanaka, Kanagawa-ken, and Rei Hasegawa, Kanagawa-ken, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1994, Ser. No. 305,905

Claims priority, application Japan, Sep. 13, 1993, 5-227072; Sep. 14, 1993, 5-228465; Dec. 29, 1993, 5-353763

Int. Cl.⁶ G01J *4/00*

U.S. Cl. 250—341.3 **11 Claims**



1. An orientation film evaluating apparatus comprising:

means for radiating infrared light;

polarizing means for polarizing the radiated infrared light at varied angles to an orientation film formed on an electrode on a substrate, and for irradiating the polarized infrared light to the orientation film;

detection means for detecting infrared light passing through the orientation film and reflected by the electrode; and

evaluating means for obtaining a difference of intensity of infrared light detected by the detection means with respect to the infrared light polarized in different directions, and for evaluating an orientation capability of the orientation film.

5,532,489

POSITRON IMAGING APPARATUS

Takaji Yamashita, and Eiichi Tanaka, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jun. 8, 1994, Ser. No. 257,677

Claims priority, application Japan, Jun. 10, 1993, 5-138740

Int. Cl.⁶ G01T *1/17*

U.S. Cl. 250—363.03 **18 Claims**

1. A positron imaging apparatus comprising:

a first detector array comprising a first number of γ-ray detectors with a first detector size;

a second detector array arranged as opposed to said first detector array interposing an object to be measured therebetween, comprising a second number of γ-ray detectors with a second detector size;

annihilation presuming means for receiving a signal reflecting energy of incident γ-ray, output from said first detector array and a signal reflecting energy of incident γ-ray, output from said second detector array, to obtain a presumable γ-ray pair emitted with positron annihilation; and

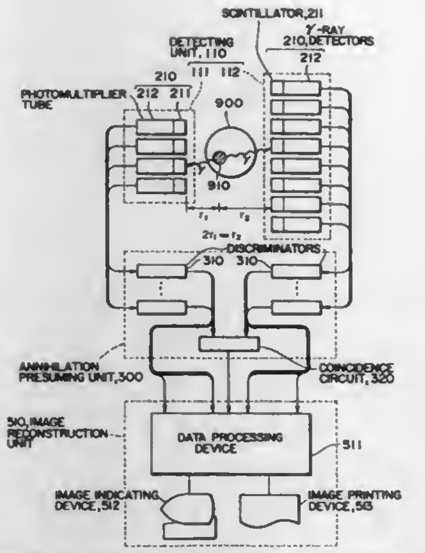


image reconstructing means for, in synchronization with annihilation occurrence notification output from said annihilation presuming means, collecting and storing receiving detector information on said first detector array and receiving detector information on said second detector array for the presumed γ-ray pair emitted with positron annihilation and performing an arithmetic operation according to a predetermined image reconstruction algorithm based on information of a line passing through a position of annihilation occurrence calculated from the stored detector information;

wherein in operation, a specific portion of the object is located close to said first detector array, the first number is smaller than the second number and coincidence counting is carried out for every opposing γ-ray detector pair.

5,532,490

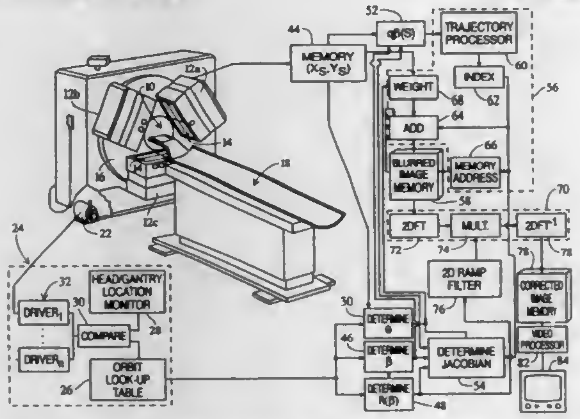
DISPLACED CENTER-OF-ROTATION FAN-BEAM TOMOGRAPHY FOR CARDIAC IMAGING

Grant T. Gullberg, and Gengsheng L. Zeng, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Dec. 27, 1994, Ser. No. 364,605

Int. Cl.⁶ G06F *159/00;* **G01T** *1/166*

U.S. Cl. 250—363.04 **16 Claims**



12. A method for generating an image representation of an interior portion of a subject, the method comprising:

rotating a radiation detector about a selected point in the subject, which selected point is offset from an axis of rotation and canting the radiation detector such that a central normal ray from the radiation detector is constrained to pass through the selected point;

with the radiation detector, converting radiation received along radiation rays into electronic data;

collimating the received radiation such that the detector is limited to receiving radiation travelling along fan-shaped array of radiation rays which converge at a focal spot;

backprojecting the electronic data received along each of the radiation rays into an image memory;

weighting each backprojected electronic data with a weighting value that changes with location in image space into which the electronic data is backprojected.

5,532,491

X-RAY IMAGE SENSOR

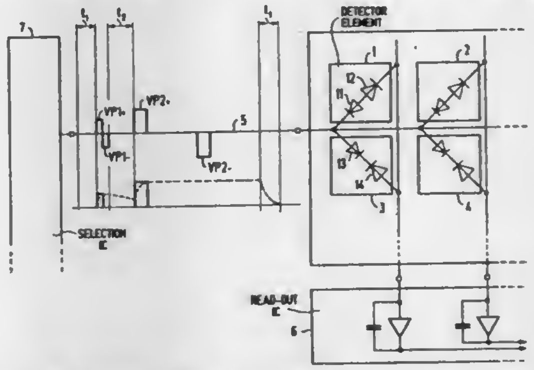
Dietrich Hassler, Uttenreuth, and Martin Hoheisel, Erlangen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 21, 1995, Ser. No. 505,662

Claims priority, application Germany, Aug. 19, 1994, 44 29 434.4

Int. Cl.⁶ G01T *1/24*

U.S. Cl. 250—370.09 **8 Claims**



1. An arrangement for converting an X-ray image into corresponding electrical signals, comprising:

an X-ray image sensor having a matrix composed of a plurality of radiation-sensitive detector elements, said detector elements comprising two respective groups of detector elements; and

means for reading out said detector elements, connected to said detector elements by a common read out line which is shared by said two groups of detector elements, for generating bipolar read-out signals on said read out line for causing read-out of the detector elements of one of said groups with a read-out signal of one polarity and for causing read-out of the detector elements of the other of said groups with a read-out signal of an opposite polarity.

5,532,492

NUCLEAR GAUGE WITH COMPENSATION FOR SAMPLE IRREGULARITIES

Tianqing He, and Ali Regimand, both of Raleigh, N.C., assignors to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Oct. 12, 1994, Ser. No. 321,546

Int. Cl.⁶ G01N *23/09*

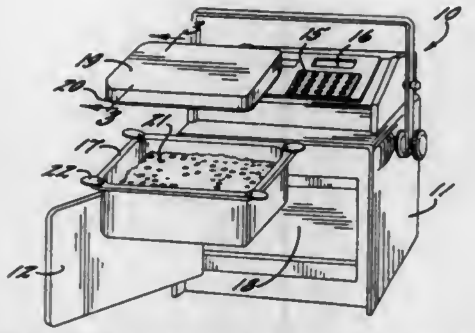
U.S. Cl. 250—390.05 **33 Claims**

1. Apparatus for determining the hydrogen content of a hydrogen-containing material comprising, in combination:

a gauge housing having a sample chamber therein adapted for receiving a sample so that the hydrogen content thereof can be measured,

a sample positioned in said sample chamber,

a fast neutron source provided in the housing on one side of said chamber for subjecting said sample to neutrons,



- a neutron moderator positioned between said source and said sample, said neutron moderator being so positioned relative to said sample as substantially to preclude fast neutrons from reaching said sample from said source while permitting moderated neutrons to reach said sample,
- a detector for detecting thermalized neutrons, said detector provided in the housing opposite the neutron moderator from said neutron source, and
- means cooperating with said detector for calculating from the thus detected thermalized neutrons the hydrogen content of said sample.

5,532,493
OPTICAL WAVEGUIDE CHEMICAL AND BIOLOGICAL SENSOR

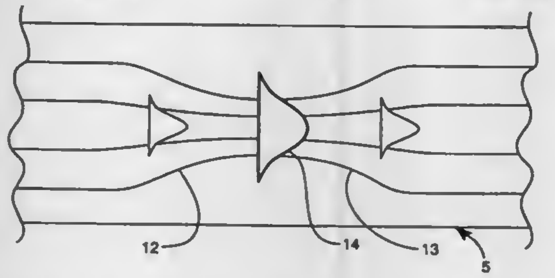
Zoë M. Hale, Monument, Colo., and Robert Marks, Cambridge, England, assignors to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio

Filed Oct. 7, 1994, Ser. No. 319,710

Claims priority, application United Kingdom, Jan. 21, 1994, 9401170

Int. Cl.^{6} G01N *21/64;* **G02B** *6/16*

U.S. Cl. 250—458.1 **10 Claims**



1. An optical waveguide sensor comprising:

(a) a single mode fiber optic waveguide having a first end and a second end and including a core surrounded by a cladding and having intermediate said first end and said second end a tapered portion which tapers adiabatically inwardly to a waist and then adiabatically outwardly by variation of said cladding whereby under operating conditions the evanescent electromagnetic field associated with the guided mode of said waveguide is externally accessible in the region of said tapered portion;

(b) an optical source optically coupled to said first end of said waveguide; and

(c) a detector coupled to said second end of said waveguide for detecting optical radiation modulated or coupled into said waveguide at said tapered portion.

5,532,494
TREATMENT AND OBSERVATION APPARATUS USING SCANNING PROBE

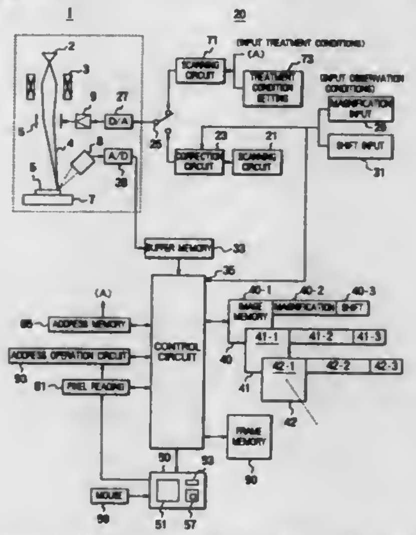
Yoshimi Kawanami, Kokubunji, and Tsuyoshi Ohnishi, Katsuta, both of, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 5, 1994, Ser. No. 222,945

Claims priority, application Japan, Apr. 7, 1993, 5-080444

Int. Cl.^{6} G01N *23/225;* **H01J** *37/252*

U.S. Cl. 250—491.1 **32 Claims**



1. A treatment and observation apparatus using a scanning probe, comprising:
- means for holding a sample;
- means for positioning a probe at a point on said sample designated by a two-dimensional address with respect to a predetermined reference point;
- means for stepwise moving the position of said probe in response to a change of the address on said sample to thereby scan said probe on said sample;
- means for displaying an image of said sample on a display screen, wherein addresses for pixels on said display screen correspond to addresses on said sample to which said probe is positioned;
- detecting means for detecting signals received from said probe, said signal being produced in accordance with positioning of said sample with respect to said probe;
- first designating means for designating, on said display screen, an area to be observed, and for scanning, with said probe, a first area on said sample corresponding to said area to be observed to produce an image signal to be detected by said detecting means, said designation of an area to be observed comprising a first magnification and first shift data;
- first image forming means for forming an image based on said image signal thus produced;
- means including a memory for storing at least two images formed by said first image forming means along with said designation of an area to be observed;
- second designating means for designating, on said display screen, an area to be treated, and for scanning, with said probe, a second area on said sample corresponding to said area to be treated under given conditions to treat said second area on said sample;
- means for combining said at least two images stored in said memory and having the same magnification to form a combined image by referencing said designation of an area to be observed;
- means for displaying scrollably said combined image on said display screen; and
- third designating means for designating, on said display screen, an area to be displayed in said combined image, said designation of an area to be displayed comprising a second magnification and second shift data.

5,532,495
METHODS AND APPARATUS FOR ALTERING MATERIAL USING ION BEAMS

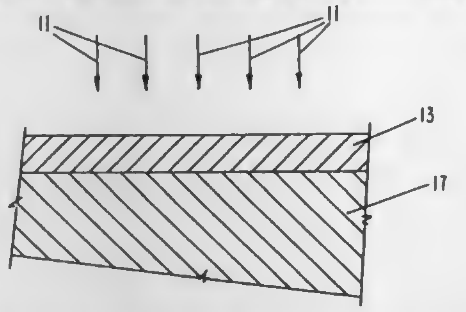
Douglas D. Bloomquist; Rudy Buchheit, both of Albuquerque, N.M.; John B. Greenly, Lansing, N.Y.; Dale C. McIntyre, Albuquerque, N.M.; Eugene L. Neau, Albuquerque, N.M., and Regan W. Stinnett, Albuquerque, N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Continuation-in-part of Ser. No. 153,248, Nov. 16, 1993. This application Oct. 4, 1994, Ser. No. 317,948

Int. Cl.^{6} G21K *5/04*

U.S. Cl. 250—492.21 **32 Claims**

1. A process for uniformly altering a characteristic of a surface



of a material to a depth of<several hundred microns comprising the step of irradiating a surface of the material with a repetitively pulsed ion beam from an ion beam source, wherein each pulse of the pulsed ion beam has a duration of ≦1000 ns at (an accelerating gap) between an anode electrode means and a cathode electrode means in the ion beam source, a total beam energy delivered to the material of >1 Joule/pulse, an impedance of <100Ω, a repetition rate of >1 Hz, an ion kinetic energy of >50 keV, and an ion penetration depth of <50 microns.

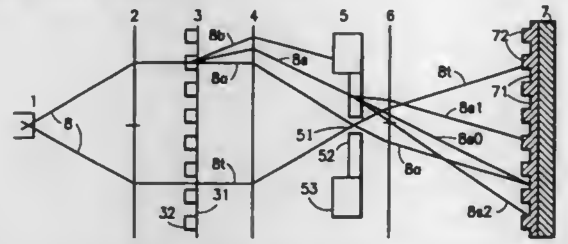
5,532,496
PROXIMITY EFFECT COMPENSATION IN SCATTERING-MASK LITHOGRAPHIC PROJECTION SYSTEMS AND APPARATUS THEREFORE

Charles A. Gaston, Lancaster, Pa., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1994, Ser. No. 355,887

Int. Cl.^{6} H01J *37/317*

U.S. Cl. 250—492.22 **15 Claims**



1. An improved lithographic projection method which comprises projecting radiation along a transmission path and through a lens system to produce a patterned image and an amount of undesired backscattered radiation on a target, said transmission path including:
- a pattern-defining mask that contains two types of mask regions that produce different degrees of scattering in said radiation, and
- a back focal plane filter that contains at least three types of filter regions that produce different degrees of scattering or blocking of said radiation dependent on the degree of scattering produced by said mask, whereby the sum of the intensity distribution of said projected radiation which produces the patterned image on said target, combined with the intensity distribution of said undesired backscattered radiation resulting from the impact of said projected radiation at said target, produces a net effective exposure pattern at the target which is the sum of an idealized exposure reproducing the pattern of said mask and a background exposure substantially constant across said target.

5,532,497
OPTICAL ALIGNER EQUIPPED WITH LUMINANCE SENSOR ON MOVABLE STAGE

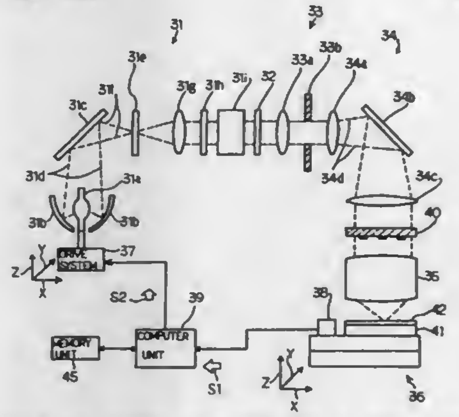
Tadao Yasuzato; Hiroshi Nozue, and Seiichi Shiraki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,115

Claims priority, application Japan, Dec. 27, 1993, 5-350112

Int. Cl.^{6} G01N *21/86;* **G01V** *9/04*

U.S. Cl. 250—548 **8 Claims**



1. A projection aligner for transferring a pattern image of a reticle to an image-forming plane, comprising:
- an illuminating system for radiating light from a light source to said reticle so that said reticle transfers the light carrying said pattern image to said photo-sensing layer;
- an illuminance measuring system having a plurality of sampling points on said image-forming plane for concurrently generating pieces of illuminance data each indicative of an illuminance of one of said sampling points, and a plurality of photo-sensors respectively associated with said plurality of sampling points and each operative to measure said illuminance of the associated sampling point, one of said plurality of sampling points being provided at a center of said image-forming plane, the others of said plurality of sampling points being provided in a peripheral sub-area of said image-forming plane; and
- a regulating system responsive to said pieces of illuminance data for changing a position of said light source, thereby causing values of said pieces of illuminance data to fall within an admitted range.

5,532,498
HIGH SENSITIVITY CONTROL CIRCUIT FOR OPTICAL SOLID-STATE RELAYS

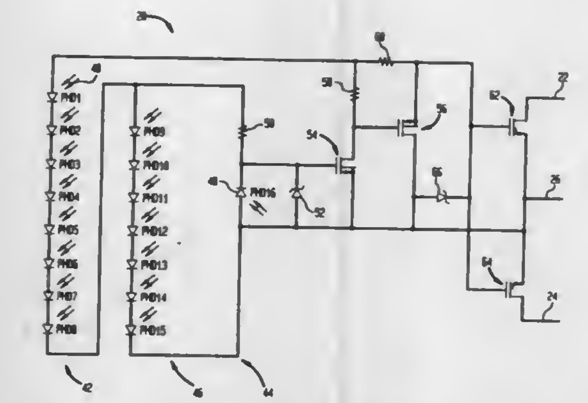
Dean M. Umberger, Stouchsburg, and Craig B. Ziemer, New Holland, both of Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 6, 1994, Ser. No. 350,342

Int. Cl.^{6} G02B *27/00*

U.S. Cl. 250—551 **12 Claims**

1. A high sensitivity control circuit for a solid-state relay having a light emitting diode for generating optical energy when activated, the control circuit comprising:
- a photodiode array operatively optically coupled to the light emitting diode for generating an operating signal;
- a sense photodiode operatively optically coupled to the light emitting diode and operating in a voltage generating mode in response to the optical energy from the activated light emitting diode;
- a switching transistor for receiving an input signal; and



a two stage transistor circuit having a first and second transistor in first and second stages, respectively, wherein the first transistor is activated when the sense photodiode is operating in the voltage generating mode and wherein the first transistor is deactivated when the sense photodiode is operating in a reverse bias mode, wherein the second transistor is activated or deactivated in response to the activation or deactivation, respectively, of the first transistor, and wherein the deactivation of the first and second transistors of the transistor circuit reduces a loading effect of the transistor circuit on the photodiode array for facilitating operation of the switching transistor using the operating signal to switch the input signal to a switching contact.

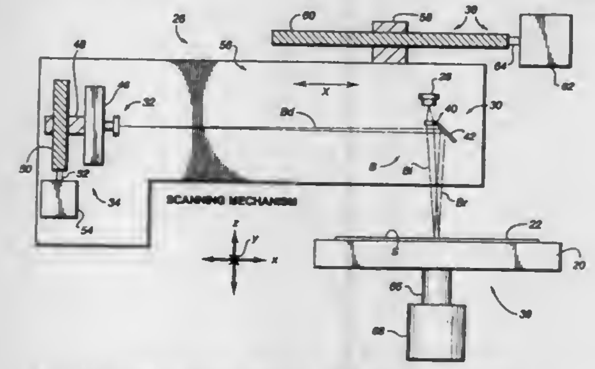
5,532,499
BEAM SPOT POSITION DETECTOR HAVING A DETECTOR MOVING MECHANISM

David Cheng, Sunnyvale, Calif., assignor to Ann F. Koo, Los Altos, Calif.

Division of Ser. No. 225,425, Apr. 8, 1994, Pat. No. 5,369,286, which is a continuation of Ser. No. 144,141, Oct. 27, 1993, abandoned, which is a division of Ser. No. 876,576, Apr. 30, 1992, Pat. No. 5,270,560, which is a continuation-in-part of Ser. No. 822,910, Jan. 21, 1992, Pat. No. 5,233,201, which is a continuation-in-part of Ser. No. 357,403, May 26, 1989, Pat. No. 5,118,955. This application Oct. 3, 1994, Ser. No. 317,115

Int. Cl.^{6} G01N *21/86*

U.S. Cl. 250—559.22 **18 Claims**



1. A beam spot position detector assembly comprising:

a first photodetector having a first substantially planar photosensitive surface and operative to develop a first signal in response to a spot from a beam of radiant energy which impinges upon at least part of said first photosensitive surface;

a second photo detector having a second substantially planar photosensitive surface and operative to develop a second signal in response to said spot which impinges upon at least part of said second photosensitive surface, said first photosensitive surface and said second photosensitive surface being substantially coplanar and abutting along an elongated, linear interface;

processing means coupled to said first photodetector and said second photodetector and responsive to said first signal and said second signal and operative to develop a beam spot position signal representative of the position of said beam spot relative to said linear interface;

means for moving said first photodetector and said second photodetector in a direction parallel to their planar surfaces and perpendicular to said linear interface; and

means for maintaining a beam spot within a linear region of said first photodetector and said second photodetector by controlling said moving means to maintain said beam spot within a linear region distance of said linear interface, said linear region distance being a distance from said linear interface wherein said beam spot position signal changes generally linearly with changes in displacement of said beam spot in said direction perpendicular to said linear interface.

5,532,500
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING CLOCK SIGNAL WIRING CONSTRUCTION FOR SUPPRESSING CLOCK SKEW

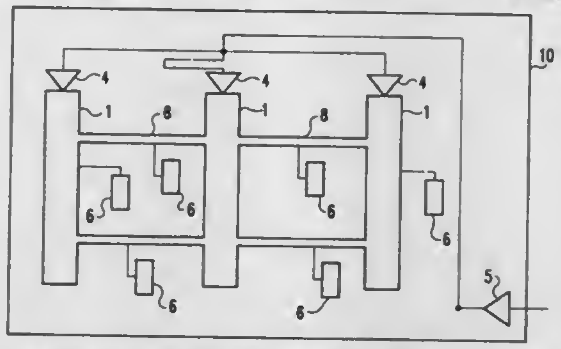
Hitoshi Okamura, and Shin-Ichi Ohkawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 294,826

Claims priority, application Japan, Sep. 1, 1993, 5-217126

Int. Cl.^{6} H01L *23/482*

U.S. Cl. 257—207 **8 Claims**



1. A semiconductor integrated circuit device, comprising:

a plurality of trunk clock signal lines formed in at least one wiring layer of a plurality of wiring layers on a semiconductor substrate;

a plurality of clock signal branch lines connected to said trunk clock signal lines, formed in one of a same layer and another layer with said trunk clock signal lines and having a line width and a line film thickness smaller than those of said trunk clock signal lines; and

a plurality of circuit elements each having a clock input terminal connecting one of directly to said trunk clock signal line and indirectly by way of said clock signal branch line to said trunk clock signal line,

wherein one of a pair of terminals of each trunk clock signal line is connected to a clock driver including an emitter-coupled logic (ECL), while the other terminal of said trunk clock signal line is open-ended so that the signal reflection coefficient at the open-ended terminal of said trunk clock signal line is substantially sufficiently high and a reflected clock signal is in a same phase with the clock signal inputted thereto while a reflected clock signal at the clock driver side terminal is in a phase opposite that of the reflected clock signal inputted thereto, and

wherein each trunk clock signal line has a length such that a respective rising and falling time of the clock voltage waveform is longer compared to a value represented by an integer multiplied by a value obtained by dividing four multiplied by the length of said trunk clock signal line by a propagation speed of the clock voltage waveform which advances in said trunk clock signal line.

5,532,501
SEMICONDUCTOR DEVICE HAVING WIRING TAKEK-OUT CELLS

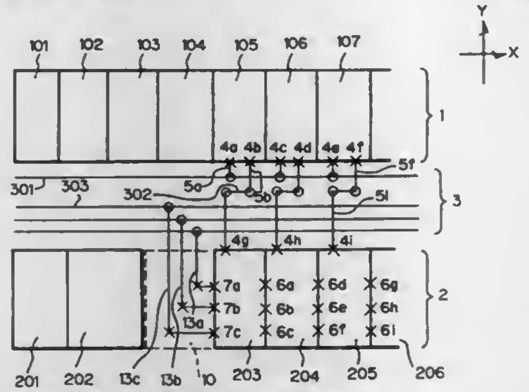
Takeshi Nakamura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 23, 1994, Ser. No. 247,541

Claims priority, application Japan, May 25, 1993, 5-122237

Int. Cl.^{6} H01L *27/10;23/58*

U.S. Cl. 257—208 **8 Claims**



5. A semiconductor device comprising:

a plurality of logic cell areas, each including logic cells arranged along a first direction, said logic cell areas being arranged along a second direction perpendicular to said first direction, at least adjacent first and second logic cells of said logic cells having different wiring arrangements from each other at opposing edges of said first and second logic cells;

a plurality of wiring channel areas arranged along said second direction, each being adjacent to at least one of said logic cell areas and including first wiring arranged along said first direction;

at least one wiring take-out cell arranged between said first and second logic cells, said wiring take-out cell including second wiring only from at least one of said first and second logic cells to said first wiring.

5,532,502
CONDUCTIVITY-MODULATED-TYPE MOSFET

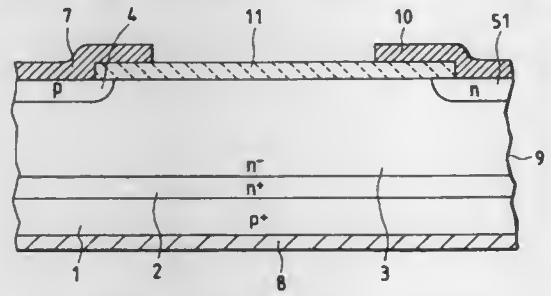
Yasukazu Seki, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 178,630, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 965,701, Oct. 23, 1992, abandoned. This application Mar. 2, 1995, Ser. No. 397,558

Claims priority, application Japan, Oct. 24, 1991, 3-275841

Int. Cl.^{6} H01L *29/76;29/80;29/94*

U.S. Cl. 257—213 **2 Claims**



1. A conductivity modulated MOSFET with a periphery, comprising:

a first semiconductor layer as a drain layer having a first conductivity type;

a second semiconductor layer as a buffer layer having a second conductivity type on a first surface of the first semiconductor layer;

a third semiconductor layer as a base layer having the second conductivity type on the second semiconductor layer;

a first semiconductor region selectively formed in a surface layer of the third semiconductor layer;

a second semiconductor region as a source selectively formed in a surface layer of the first semiconductor region;

a gate electrode over a surface region of the third semiconductor layer forming a channel in the first semiconductor region between the second semiconductor region and the third semiconductor layer through an insulating layer;

a drain electrode contacting a second surface of the first semiconductor layer;

a source electrode contacting surfaces of the first semiconductor region and the second semiconductor region;

a third semiconductor region having the first conductivity type reaching the periphery of the MOSFET separated from the first semiconductor region in a surface layer of the third semiconductor layer; and

an electrode as a stopper contacting a surface of the third semiconductor region.

5,532,503
CHARGE TRANSFER DEVICE WITH MULTI-LINE READ STRUCTURE

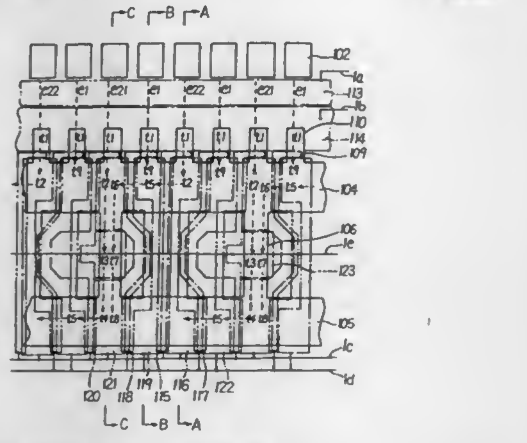
Makoto Monoi, Tokyo-To, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation of Ser. No. 118,857, Sep. 10, 1993, abandoned. This application May 24, 1995, Ser. No. 449,341

Claims priority, application Japan, Sep. 11, 1992, 4-243422

Int. Cl.^{6} H01L *27/148;29/768*

U.S. Cl. 257—233 **5 Claims**



1. A charge transfer device, comprising:

a shift gate portion for outputting, in parallel, charges of pixels of a first group and charges of a predetermined number of pixels of a second group arranged in a line, every outputted pixel charge of the second group being interposed between two outputted pixel charges of the first group;

a first charge transfer path provided in parallel to the shift gate portion, to which the outputted charges of the first-group and second-group pixels are separately supplied and through which the supplied charges of the first-group and second-group pixels are separately transferred;

a second charge transfer path provided in parallel to the first charge transfer path, through which the charges of the second-group pixels are transferred;

a transfer gate portion provided between the first and second charge transfer paths and having a predetermined number of gate electrodes by which the charges of the second-group pixels are transferred from the first charge transfer path to the second charge transfer path, the number of the gate electrodes being less than the number of the second-group pixels; and

control means for controlling transfer of charges of at least two pixels are the second-group pixels such that the two charges are separately transferred from the first charge transfer path to the second charge transfer path by one of the gate electrodes at different times.

5,532,504
PROCESS FOR THE PRODUCTION OF DIELECTRIC THIN FILMS

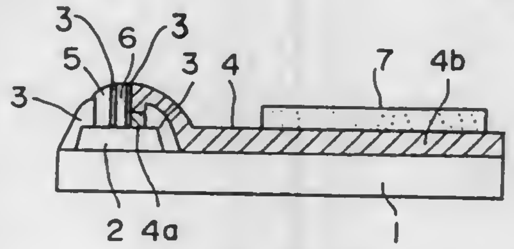
Hitoshi Tabata, Akashi; Osamu Murata, Kobe; Junzo Fujioka, and Shunichi Minakata, both of Akashi, all of, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo-ken, Japan

Division of Ser. No. 51,817, Apr. 26, 1993, Pat. No. 5,395,663, which is a continuation of Ser. No. 749,726, Aug. 26, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 353,293

Claims priority, application Japan, Aug. 24, 1990, 2-222884; Jun. 18, 1991, 3-077242 U; Jun. 18, 1991, 3-245292; Jul. 12, 1991, 3-266786

Int. Cl.^{6} H01L *27/14*

U.S. Cl. 257—252 **15 Claims**



1. A pyroelectric type of sensor comprising:
a MOS element including a drain electrode, a source electrode, a gate electrode and an Si semiconductor and
a film of a ferroelectric or pyroelectric material that is situated entirely on the drain electrode,
wherein said drain electrode exhibits good ohmic contact with Si or SiO_2 and has a lattice constant close to that of said ferroelectric or pyroelectric material.

5,532,505
FIELD EFFECT TRANSISTOR INCLUDING A CAP WITH A DOPED LAYER FORMED THEREIN

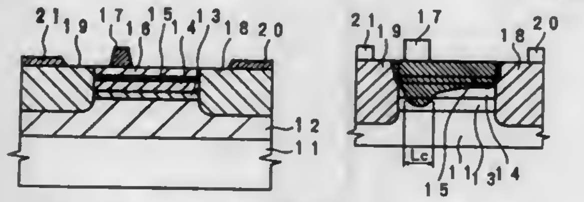
Nobuhiro Kuwata, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 810,406, Dec. 23, 1991, abandoned. This application Nov. 10, 1993, Ser. No. 150,349

Claims priority, application Japan, Dec. 27, 1990, 2-407762

Int. Cl.^{6} H01L *29/812*

U.S. Cl. 257—269 **32 Claims**



1. A field effect transistor comprising:
a semi-insulating, compound semiconductor substrate layer;
an un-doped buffer layer formed on the substrate layer and made of a first compound semiconductor;
a thin channel layer made of a second compound semiconductor and formed on the buffer layer, the channel layer being heavily doped with a dopant;
a cap layer formed on the heavily doped thin channel layer, the cap layer having
a lower layer made of the second compound semiconductor which is substantially lattice-matched with the channel layer and which has the same conductivity type as the channel layer, and
a doped layer made of the second compound semiconductor, the doped layer being formed by doping with a dopant having a conductivity type which is the same as the dopant in the channel layer;
a source and a drain electrode, each formed on the cap layer with ohmic contact therebetween; and
a gate electrode formed between the source and drain electrodes on the cap layer in Schottky contact therewith.

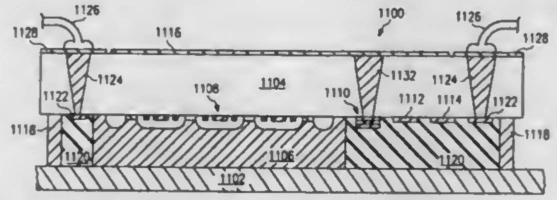
5,532,506
INTEGRATED CIRCUIT ADAPTED FOR IMPROVED THERMAL IMPEDANCE

Hua Q. Tserng, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 298,822, Aug. 31, 1994. This application Nov. 14, 1994, Ser. No. 339,429

Int. Cl.^{6} H01L *23/52;23/535;* **H01Q** *1/40*

U.S. Cl. 257—276 **13 Claims**



1. An integrated circuit, comprising:
(a) at least one transistor formed at a frontside surface of a substrate;
(b) at least one transmission line at said frontside surface;
(c) an airbridge formed over portions of said at least one transistor wherein a top surface of said airbridge is spaced from said frontside surface by a distance approximately equal to, or greater than, the thickness of said substrate;
(d) a heatsink coupled to said airbridge; and
(e) a conducting via through said substrate coupling said at least one transistor to a bond pad at a backside surface.

5,532,507
MES FIELD EFFECT TRANSISTOR POSSESSING LIGHTLY DOPED DRAIN

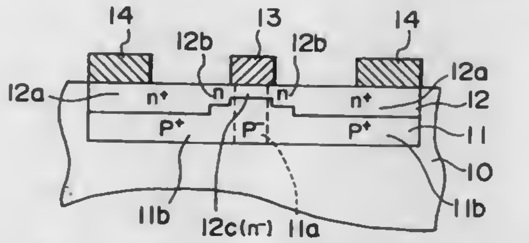
Jun Wada, Yamanashi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1994, Ser. No. 362,124

Claims priority, application Japan, Dec. 28, 1993, 5-336432

Int. Cl.^{6} H01L *29/80;31/112;29/76*

U.S. Cl. 257—280 **10 Claims**



1. A MES field effect transistor (MESFET) having a lightly doped drain region, comprising:
a semi-insulating compound semiconductor substrate;
a first semiconductor layer of a first conductivity type formed in said semiconductor substrate and along a surface of the semiconductor substrate;
a second semiconductor layer of a second conductivity type formed in said semiconductor substrate and under said first semiconductor layer;
a gate electrode formed on said first semiconductor layer in Schottky contact with the first semiconductor layer;
a source electrode and a drain electrode formed on said first semiconductor layer and electrically connected with the first semiconductor layer;
wherein said first semiconductor layer includes first regions formed under said source and drain electrodes and having a

first impurity concentration, a second region formed under said gate electrode and having a second impurity concentration lower than said first impurity concentration, and third regions formed between each of said first regions and said second region and having a third impurity concentration lower than said first impurity concentration and higher than said second impurity concentration;
said second semiconductor layer includes fourth regions formed under said first and third regions and having a fourth impurity concentration, and a fifth region formed under said second region and having a fifth impurity concentration lower than said fourth impurity concentration; and
said fourth regions extend into the fifth region so as to physically separate the third regions from the fifth region.

5,532,508
SEMICONDUCTOR DEVICE WITH LDD STRUCTURE

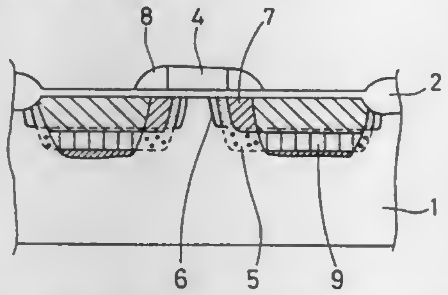
Seiji Kaneko, Joyo, and Tomoya Baba, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 215,604, Mar. 22, 1994, Pat. No. 5,426,063. This application May 22, 1995, Ser. No. 445,018

Claims priority, application Japan, Mar. 24, 1993, 5-65285

Int. Cl.^{6} H01L *29/76;29/94*

U.S. Cl. 257—336 **3 Claims**



1. A semiconductor device comprising an MOS type field effect transistor comprising:
a semiconductor substrate having a gate oxide film and a gate electrode thereon;
source and drain regions formed of ion implanted regions of opposite conductivity type to the substrate on opposite sides of a channel region; and
plural pairs of impurity ion implanted regions having a same conductivity type as the substrate, which comprise:
a first shallow pair of impurity ion implanted regions located in the channel region under the gate electrode, and having a higher impurity concentration than that of the channel region; and
a second pair of impurity ion implanted regions provided in a position deeper than the first shallow pair of impurity ion implanted regions and equal in depth or shallower than a depth of said source/drain regions.

5,532,509
SEMICONDUCTOR INVERTER LAYOUT HAVING IMPROVED ELECTROMIGRATION CHARACTERISTICS IN THE OUTPUT NODE

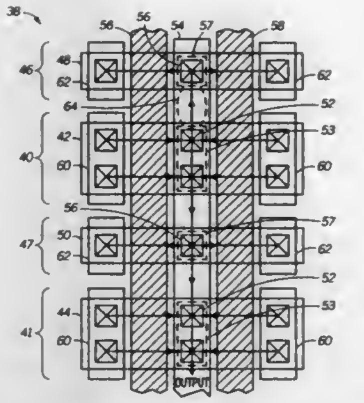
Michael L. D'Addeo, Austin, Tex., assignor to Motorola, Inc., Schumburg, Ill.

Filed Dec. 16, 1994, Ser. No. 357,469

Int. Cl.^{6} H01L *29/06*

U.S. Cl. 257—618 **15 Claims**

1. A layout for a semiconductor device comprising:
at least two first-type transistors, each having a first output terminal;



a second-type transistor having a second output terminal, wherein the at least two first-type transistor and the second-type transistor are connected to an input line voltage; and
a continuous conductor line, having an output end, serially connecting the first and second output terminals;
wherein the second output terminal of the second-type transistor is disposed between the first output terminals of the at least two first-type transistor along the continuous conductor line to separate the first output terminals which enables a bidirectional current flow along a major portion of the continuous conductor line because when the input line voltage is at a first level, current flows in a first direction toward the output end, and when the input line voltage is at a second level, currently flows in an opposing second direction away from the output end, which reduces electromigration along the continuous conductor line by reducing a proportion of the continuous conductor line having only unidirectional current.

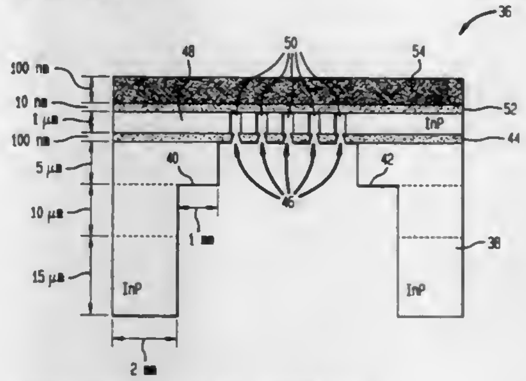
5,532,510
REVERSE SIDE ETCHING FOR PRODUCING LAYERS WITH STRAIN VARIATION

Netzer Amoral-Moriya, Maplewood; Igal M. Brener, Westfield, and Leonard C. Feldman, Berkeley Heights, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 366,515

Int. Cl.^{6} H01L *29/06;31/0328;31/0336;31/072*

U.S. Cl. 257—618 **15 Claims**



1. A semiconductor structure comprising:
a substrate having a front-side and a reverse side;
a strained layer disposed on the front-side of the substrate and having first and second layers of strain; and
the reverse side of the substrate etched to form the second layer of strain in the strained layer, wherein the first and second layers of strain form a pattern of strain into the strained layer to determine the bandgap characteristics of the semiconductor structure.

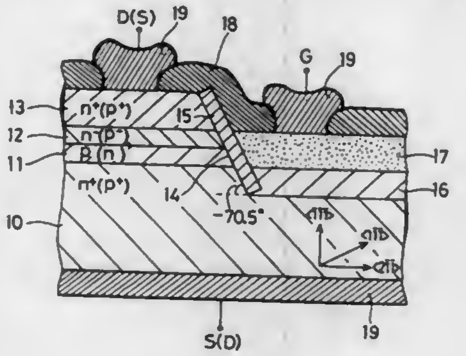
5,532,511
SEMICONDUCTOR DEVICE COMPRISING A HIGHSPEED STATIC INDUCTION TRANSISTOR

Jun-Ichi Nishizawa, and Toru Kurabayashi, both of Sendai, Japan, assignors to Research Development Corp. of Japan, Tokyo; Japan AND Jun-Ichi Nishzawa, and Japan AND Zaidan Hojin Handotai Kenkyu Shinokai, both of Sendai, all of, Japan

Continuation of Ser. No. 162,300, Dec. 7, 1993, abandoned, which is a division of Ser. No. 965,722, Oct. 23, 1992, Pat. No. 5,296,403. This application Mar. 23, 1995, Ser. No. 409,684

Int. Cl.^{6} H01L *29/04;29/80;31/112;31/036*

U.S. Cl. 257—627 **8 Claims**



1. A semiconductor device comprising:
a substrate crystal of a type for epitaxial growth thereon, said substrate crystal comprising a (111)A face and a (111)B face;
at least two semiconductor regions of different conductivity types deposited by way of epitaxial growth on the (111)B face of said substrate crystal according to molecular layer epitaxy, thereby providing a structure having a source and a drain;
a gate side comprising the (111)A face of said substrate crystal; and
a gate insulating layer deposited by way of epitaxial growth on said gate side according to metal organic chemical vapor deposition.

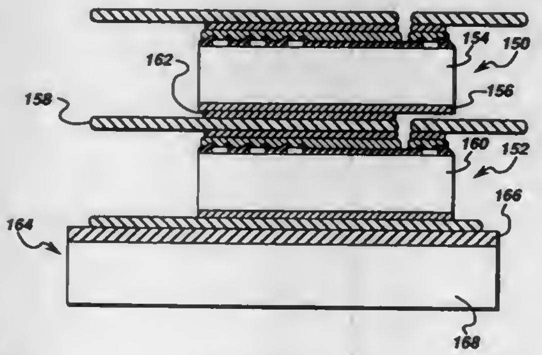
5,532,512
DIRECT STACKED AND FLIP CHIP POWER SEMICONDUCTOR DEVICE STRUCTURES

Raymond A. Fillion; Eric J. Wildi, both of Niskayuna; Charles S. Korman; Sayed-Amr El-Hamamasy, both of Schenectady; Steven M. Gasworth, Glenville; Michael W. DeVre, Scotia, and James F. Burgess, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1994, Ser. No. 316,996

Int. Cl.^{6} H01L *23/02;23/48;* **H05K** *7/20*

U.S. Cl. 257—686 **22 Claims**



10. A stacked power semiconductor device configuration comprising:
first and second power semiconductor device structures, each of said power semiconductor device structures comprising:
a semiconductor chip having an active major surface and an opposite major surface, contact pads on the active major surface comprising one main terminal of the chip and a control terminal, and the opposite major surface comprising another main terminal of the chip;
a thermally-conductive dielectric layer overlying at least portions of the active major surface, with vias formed in said dielectric layer in alignment with said contact pads,
a patterned metallization layer over said thermally-conductive dielectric layer, portions of said patterned metallization layer extending through said vias into electrical contact with said contact pads, and
a metal electrode structure bonded to selected areas of said patterned metallization so as to be electrically and thermally coupled thereto; and
the opposite major surface of said semiconductor chip of said first power semiconductor device structure being bonded to the metal electrode structure of said second power semiconductor device structure so as to be electrically and thermally coupled thereto.

5,532,513
METAL-CERAMIC COMPOSITE LID

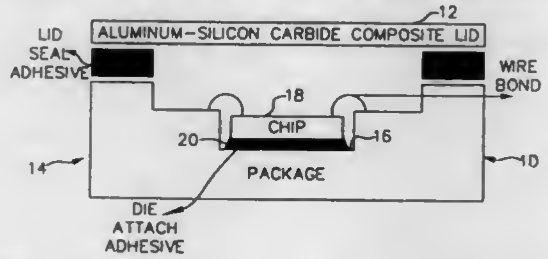
Charles Smith, Ramona; Masyood Akhtar, San Diego; Michael M. Chau, San Diego, and David Savage, San Diego, all of Calif., assignors to Johnson Matthey Electronics, Inc., Spokane, Wash.

Filed Jul. 8, 1994, Ser. No. 272,354

Int. Cl.^{6} H01L *23/053;23/06*

U.S. Cl. 257—703 **5 Claims**

1. An enclosure for a semiconductor device, the enclosure comprising:



a package having a cavity with a substrate base to which the semiconductor device may be attached, the package being formed of a ceramic; and
a lightweight lid secured to the package over the cavity to form the enclosure, the lid having a porous ceramic body with a material having a thermal conductivity greater than air dispersed within the porous body to form a composite having a thermal conductivity substantially greater than that of the package, and having a coefficient of thermal expansion sufficiently close to that of the package so as to avoid damage to the lid and package due to temperature change during normal operation of the semiconductor device.

5,532,514
HIGH FREQUENCY SEMICONDUCTOR DEVICE

Hiroyuki Kozono, Omiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

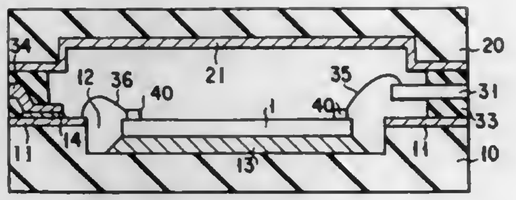
Filed May 18, 1995, Ser. No. 443,449

Claims priority, application Japan, May 19, 1994, 6-129641

Int. Cl.^{6} H01L *23/053;23/34;23/12;* **H01P** *1/00*

U.S. Cl. 257—728 **4 Claims**

1. A semiconductor device comprising:
a semiconductor substrate having a surface on which a connection electrode is formed;
a polygonal shaped substrate mounting portion having a cavity portion containing said semiconductor substrate such that said semiconductor substrate is located at a central portion of a main surface of said substrate mounting portion;



a first conductive metal layer formed on a portion of said main surface of said substrate mounting portion located outside said cavity portion;
a plurality of leads arranged along a periphery of said cavity portion, said leads being located above the first conductive metal layer so that respective ends of said plurality of leads oppose each other, at least some of said plurality of leads being arranged between corner portions of said substrate mounting portion and said cavity portion and forming power source lines for said semiconductor device;
bonding wires for connecting at least some of the respective ends of said plurality of leads to the connection electrode formed on the surface of said semiconductor substrate; and
cap means for covering at least said semiconductor substrate, said bonding wires, and said respective ends of said plurality of leads, said cap means having a main surface opposed to said semiconductor substrate and a second conductive metal layer formed on said main surface so that said second conductive metal layer covers said plurality of leads,
said plurality of leads being bonded to said first conductive metal layer and said second conductive metal layer.

5,532,515
SEMICONDUCTOR CONNECTING DEVICE

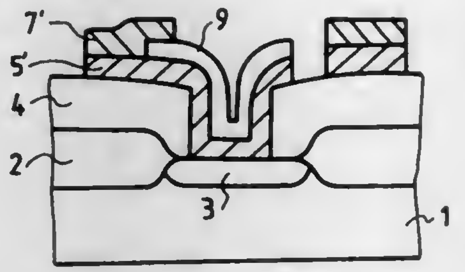
Jae K. Kim, Ichonkun, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Continuation of Ser. No. 148,839, Nov. 5, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 551,540

Claims priority, application Rep. of Korea, Nov. 6, 1992, 1992-20789

Int. Cl.^{6} H01L *23/48;23/52;29/40;23/28*

U.S. Cl. 257—751 **2 Claims**



1. A semiconductor connecting device comprising
a first conductive layer;
an insulating film covering the first conductive layer, said insulating film having a contact hole through to said first conductive layer;
a conductive material pad formed in the contact hole so as to be connected with the first conductive layer, said conductive material pad forming an extended region over the insulating film, said conductive material pad having a first edge;
an etching barrier material formed on said conductive material pad over said contact hole and a part of the extended region, said etching barrier material having a second edge, said first and second edges meeting in a common contour with one another since said etching barrier material functions as a mask on said conductive material pad when said first and second edges are formed; and
a second conductive layer formed on a surface region of said conductive material pad including a first area which is covered by said etching barrier material and a second area which is not covered by said etching barrier material.

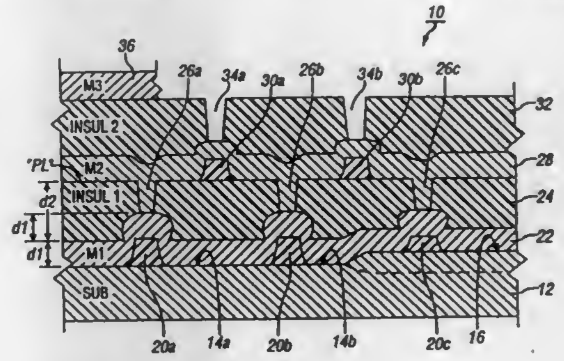
5,532,516
TECHNIQUES FOR VIA FORMATION AND FILLING

Nicholas F. Pasch, Pacifico, and Roger Patrick, Santa Clara, both of Calif., assignors to LSI Logic Corportion, Milpitas, Calif.

Continuation of Ser. No. 750,832, Aug. 26, 1991, Pat. No. 5,471,091. This application Mar. 28, 1995, Ser. No. 411,496

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—752 **4 Claims**



1. A semiconductor device, comprising:
a substrate having a non-planar surface;
a plurality of first insulated pillars formed on portions of the substrate surface;
a plurality of second insulated pillars formed on other portions of the substrate surface;
the plurality of first insulated pillars having a first height;
the plurality of second insulated pillars having a second height;
a first metalization layer deposited over the substrate non-planar surface, the plurality of first insulated pillars and the plurality of second insulated pillars, wherein the plurality of first and second insulated pillars push up portions of the metalization layer to a third height;
a first insulation layer deposited over the first metalization layer and planarized; and
a plurality of first vias formed in the first insulation layer over the locations of the plurality of first and second insulated pillars, wherein the first vias extend through the planarized first insulating layer to the first metalization layer at the third height and have substantially the same depths.

5,532,517
HYBRID INTEGRATED CIRCUIT DEVICE WITH HEAT SUPPRESSION MEANS PROVIDED IN THE VICINITY OF SOLDER BONDING AREAS

Atunobu Kawamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

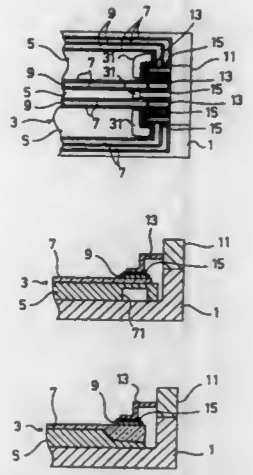
Filed May 26, 1994, Ser. No. 249,737

Claims priority, application Japan, Jun. 30, 1993, 5-162829

Int. Cl.^{6} H01L *23/48;29/41*

U.S. Cl. 257—773 **6 Claims**

1. An integrated electrical device including:
a first electrically conductive member;
a thermally conductive second member having an electrically conducting portion soldered to said first electrically conductive member; and
at least one empty through hole extending through said second member proximate and spaced from said electrically conduct-



ing portion for decreasing dissipation of heat into said second member upon soldering of said first member to said electrically conducting portion of said second member.

5,532,518

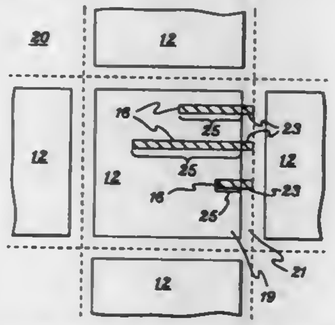
ELECTRICAL CONNECT AND METHOD OF FABRICATION FOR SEMICONDUCTOR CUBE TECHNOLOGY

Mark C. Hakey, Milton; Steven J. Holmes, Burlington, and John M. Wursthorn, Underhill Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 22, 1994, Ser. No. 344,315

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—774 **23 Claims**



1. Electrical connect for an integrated circuit, said electrical connect comprising:

a unitary, elongate conductor, said unitary, elongate conductor being formed of a same material and including
  (i) a flat conductor portion disposed above an active region of the integrated circuit, and
  (ii) a vertically-enhanced conductor portion, said vertically-enhanced conductor portion having a transverse cross-sectional configuration with a vertical width greater than a vertical width of a transverse cross-sectional configuration of the flat conductor portion, wherein said flat conductor portion and said vertically-enhanced conductor portion are electrically connected together to form said unitary, elongate conductor formed of the same material, said vertically-enhanced conductor portion being disposed above a kerf region of the integrated circuit and facilitating electrical connection to said flat conductor portion disposed above the active region of the integrated circuit.

5,532,519

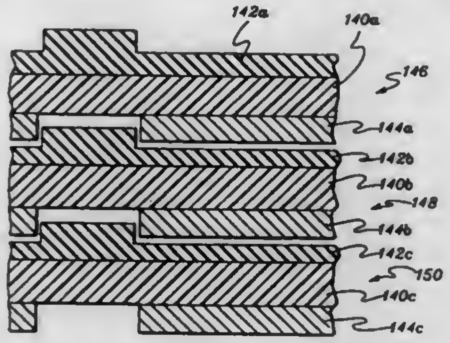
CUBE WIREABILITY ENHANCEMENT WITH CHIP-TO-CHIP ALIGNMENT AND THICKNESS CONTROL

Claude L. Bertin, South Burlington; John E. Cronin, Milton, both of Vt., and David J. Perlman, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 306,042, Sep. 14, 1994. This application Jan. 20, 1995, Ser. No. 375,770

Int. Cl.^{6} H01L *25/65;23/538*

U.S. Cl. 257—777 **17 Claims**



1. An electronic module comprising:

two integrated circuit chips, said two integrated circuit chips being stacked in said electronic module;

a first of the two integrated circuit chips having a first thickness control layer formed integrally therein, a thickness of said first thickness control layer determined as a function of the thickness of at least a portion of the first integrated circuit chip.

5,532,520

SEMICONDUCTOR WAFER WITH ALIGNMENT MARKS

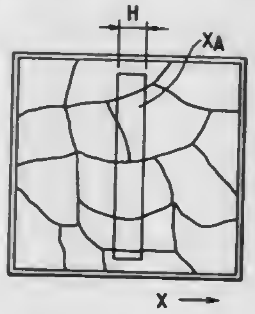
Hiroshi Haraguchi, Tokyo; Masahiro Abe, Yokohama, and Wataru Nomura, Ichikawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 21, 1994, Ser. No. 263,333

Claims priority, application Japan, Jun. 22, 1993, 5-150431; Jun. 14, 1994, 6-132020

Int. Cl.^{6} H01L *23/544;23/58*

U.S. Cl. 257—797 **31 Claims**



1. A semiconductor device comprising:

a semiconductor wafer having a plurality of device areas;

at least one alignment mark comprising a recess formed on said semiconductor wafer; and

a metal film formed on said alignment mark, said recess of said alignment mark having a width smaller than an average size of gains of said metal film.

5,532,521

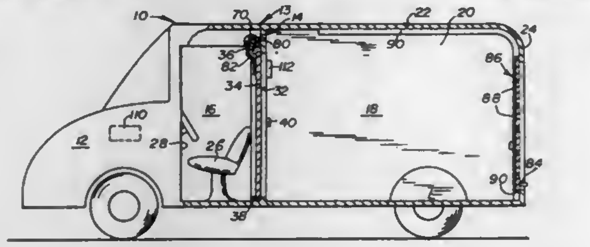
SECURITY CONTROL SYSTEM FOR THE STORAGE AREA OF A DELIVERY TRUCK

Robert L. Leininger, 1711 Ave. L, Fort Madison, Iowa 52627

Filed Dec. 3, 1993, Ser. No. 161,067

Int. Cl.^{6} B60R *25/00*

U.S. Cl. 307—10.2 **8 Claims**



1. A security system for a delivery truck having a bulkhead dividing the interior of the truck into storage and cab areas, a doorway located in the bulkhead, a door mounted for horizontal movement transversely of the doorway between a first position closing the doorway ("closed position") and a second position spaced from and opening the doorway ("open position"), and a power source, the security system comprising

(A) guide means positioned on the bulkhead to slidingly support said door during movement thereof between its said open and closed positions,

(B) operating means comprising
  (i) motor means and
  (ii) drive means operatively engaging said motor means and said door, said drive means being movable by said motor means in a first direction to move said door to its open position and in a second direction to move said door to its closed position,

(C) latch means for automatically locking said door upon movement of said door to its closed position, said latch means being isolated from and not accessible to said cab area,

(D) actuating means for disabling said latch means to permit movement of said door away from its closed position,

(E) control means communicating with said power source, said control means being operable in response to the reception of
  (i) a first control signal to connect said power source (a) to said actuating means to disable said latch means and (b) to said motor means in a first polarity to move said drive means in said first direction and said door from its closed position to its open position to provide access to the storage area and
  (ii) a second control signal to connect said power source to said motor means in said second polarity to move said drive means in said second direction and said door from its open position to its closed position wherein said latch means automatically locks said door to prevent access to the storage area,

(F) first limiting means operatively interposed between said power source and said control means and isolating said power source from said motor means upon movement of said door to its closed position,

(G) second limiting means operatively interposed between said power source and said control means and isolating said power source from said motor means upon movement of said door to its open position,

(H) a first manually operable remote control switch for selectively generating said first control signal, and

(I) a second manually operable switch disposed within the cab area for selectively generating said second control signal.

5,532,522

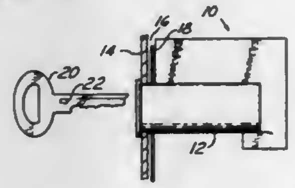
PRINTED CIRCUIT READER/EXCITER COIL FOR VEHICLE SECURITY SYSTEM

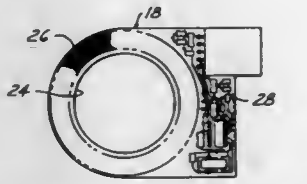
George J. Dietz, Greenfield; Randall E. Hammer, Greendale, both of Wis.; Stephen M. Basche, Lindenhurst, Ill., and Kevin J. Hawes, Greentown, Ind., assignors to Delco Electronics Corp., Kokomo, Ind.

Filed Jun. 6, 1994, Ser. No. 254,717

Int. Cl.^{6} B60R *25/00*

U.S. Cl. 307—10.5 **6 Claims**





1. A security system for controlling access to vehicle operation including a lock cylinder adapted to control access, a key for insertion into the lock cylinder, the key containing a transponder carrying an identification code, a reader/exciter coil, and an electronic control circuit for communicating with the transponder via the reader/exciter coil for verifying the identification code, the improvement wherein:

the electronic control circuit and reader/exciter coil are formed on a single printed circuit board, the electronic control circuit having components mounted on the printed circuit board and electrically interconnected by conductor traces formed on at least one planar surface of said printed circuit board, and the reader/exciter coil being defined by extensions of said conductor traces disposed in a spiral pattern surrounding the lock cylinder, thereby eliminating a connector interface between said reader/exciter coil and said electronic control circuit.

5,532,523

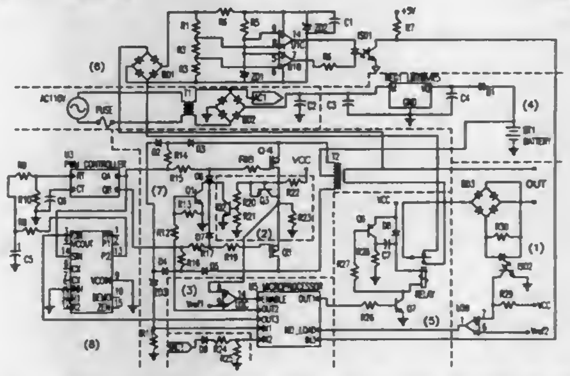
UNINTERRUPTIBLE POWER SYSTEM

Yu-Chang Tang, Taipei, Taiwan, assignor to Sysgration Ltd., Taipei, Taiwan

Filed May 4, 1994, Ser. No. 237,935

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 307—64 **1 Claim**



1. An uninterruptible power supply of the type having an input connected to a primary power supply which in turn is connected to output terminals to which a load is to be connected, said power supply also including means for detecting cut-off of the primary power supply, and causing a battery to supply power to an output transformer via a transistor driver circuit, comprising:

means including an auto off circuit for detecting whether the uninterruptible power supply is connected to a load and for supplying a signal to a microprocessor which controls a transistor driver circuit to automatically shut off the power supply when no load is present, said auto off circuit being connected between the output terminals of the power supply by a relay upon detection of power failure at the power supply input;

means including a current limiting circuit for protecting the transistor driver circuit;

means including a power on overload protecting circuit connected between the transistor driver circuit and the microprocessor for detecting whether the load at the output terminals is too large and, if the load is too large, disabling the power supply to protect a fuse at the power supply input from permanent damage due to excessive load;

means including a charging circuit for insuring that the battery is charged within a safe range so as to prolong battery life;

means including a relay driver circuit for driving said relay, said relay driver circuit including means for increasing a relay driving voltage in order to increase the switching speed of the relay, said speed increasing means including a relay driving voltage supply and a capacitor for storing addition relay driving voltage prior to activation of the relay;

means including an external power voltage detecting for detecting whether the external power voltage is too low or too high in order to protect said microprocessor; and

means including a synchronizing circuit for synchronizing, using a phase locked loop, the primary power supply with an output of said transistor driver circuit.

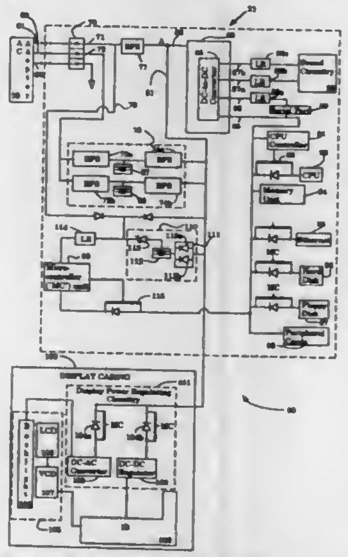
5,532,524
DISTRIBUTED POWER REGULATION IN A PORTABLE COMPUTER TO OPTIMIZE HEAT DISSIPATION AND MAXIMIZE BATTERY RUN-TIME FOR VARIOUS POWER MODES

David B. Townsley, and Shaoan Chin, both of Cupertino, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 11, 1994, Ser. No. 240,991

Int. Cl.^{6} H02J *3/14*

U.S. Cl. 307—64 **34 Claims**



1. A system for distributing power within a computer system including a display element implemented within a display casing and a central processing unit ("CPU") implemented within a main computer casing of said computer system, the system comprising:

a micro-controller unit controlling a distribution of power supplied by a selected power source;

a switching regulator coupled to a plurality of regulator power lines, said switching regulator receiving power from said selected power source through a first power input line and generating a plurality of regulated power outputs via said plurality of regulator power lines, wherein at least a first regulated power output is transmitted through a first regulator power line of said plurality of regulator power lines in order to provide power to at least said micro-controller unit;

a battery switching circuit coupled to an auxiliary power line which is coupled to said first power input line., said battery switching circuit including at least one battery pack supplying power to said switching regulator when said micro-controller unit selects said battery pack to be said selected power source; and

an auxiliary power source including a charging regulator and a battery, wherein said charging regulator is coupled to said auxiliary power line and charges said battery upon receipt of power through said auxiliary power line, and said battery is coupled to said micro-controller unit and supplies power to at least said micro-controller unit when said micro-controller unit selects said battery to be said selected power source.

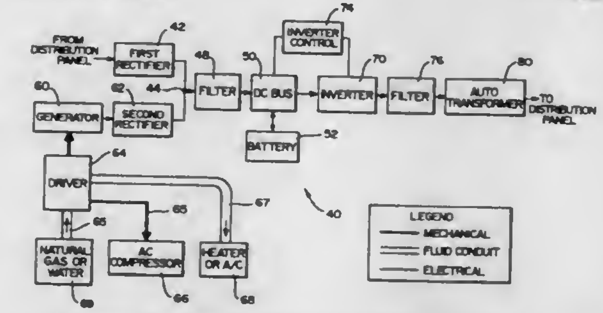
5,532,525
CONGENERATION POWER SYSTEM

Frederick Kaiser, Bellingham, and Howard H. Bobry, Lynnwood, both of Wash., assignors to Albar, Inc., Lynnwood, Wash.

Filed Jun. 2, 1994, Ser. No. 252,749

Int. Cl.^{6} H02J *9/04*

U.S. Cl. 307—64 **17 Claims**



1. A power distribution panel connectable between a primary power supply and electrical load circuits for facilitating installation of a secondary power system comprising:

an alternating current bus connectable to the load circuits;

first means to selectively connect the primary power supply to the alternating current bus;

second means to selectively connect the primary power supply to terminals for connection to an input of the secondary power supply; and

third means to selectively connect the alternating current bus to terminals for connection to an alternating current output from the secondary power supply.

5,532,526
CONTROL CIRCUIT FOR PREDOMINANTLY INDUCTIVE LOADS IN PARTICULAR ELECTROINJECTORS

Mario Ricco, Bari; Nicola Pacucci, Carbonara; Maurizio Abate, Orbassano, and Eugenio Faggioli, Turin, all of, Italy, assignors to Elasis Sistema Ricerca Fiat Nel Mezzogiorno Societa Consortile per Azioni, Pomigliano D'Arco, Italy

Continuation of Ser. No. 994,894, Dec. 22, 1992, abandoned.

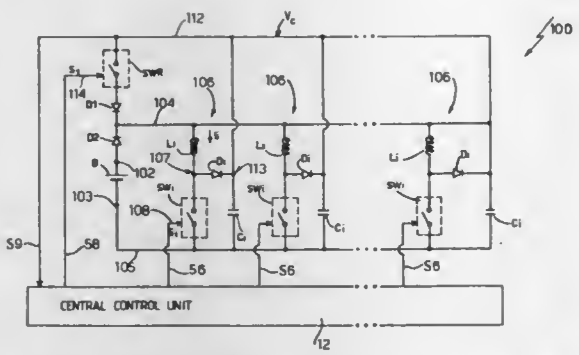
This application Apr. 28, 1995, Ser. No. 430,869

Claims priority, application Italy, Dec. 23, 1991, TO91A1023

Int. Cl.^{6} H01H *47/00*

U.S. Cl. 307—104 **12 Claims**

1. In a combination of a control circuit (**100**) and a predominantly inductive load said control circuit being for supplying said load with current (Ii) having a high-amplitude portion with a rapid leading edge and a lower-amplitude portion said circuit (**100**), the improved combination comprising:



first and second input terminals (**102**, **103**) for connection to a voltage source (B);

an energy storage circuit (**106**) connected between said first and second input terminals and comprising an inductive element (Li) of said load and a capacitive element (Ci);

a first controlled switch element (SWi) connected between said inductive element and a reference line (**105**) for enabling selective charging of said inductive element;

a second controlled switch element (SWR) connected for enabling rapid discharge of said capacitive element into said load;

a control unit (**12**) for generating control signals (s_i, s_1) respectively for said first and second switch elements (SWi, SWR);

means (**12**) for closing said first and second switch elements (SWi, SWR) when said capacitive element (Ci) is charged, and rapidly discharging said capacitive element into said load (Li);

means for consecutively opening and closing said first switch element (SWi) when said second switch element (SWR) is closed, and producing small current pulses in said load with no energy transfer between said load and said capacitive element; and

means for consecutively opening and closing said first switch element (SWi) when said second switch element (SWR) is open, for producing small current pulses in said load and subsequently transferring energy from said load to said capacitive element.

5,532,527
LEVEL SWITCH

Andrej Zatler, Aškerčeva 24, 62000, Maribor, and Franc Eferl, Pri šli 45, 62351, Kamnica, both of, Slovenia

Filed Jan. 13, 1993, Ser. No. 3,768

Claims priority, application Slovenia, May 6, 1992, 9200073

Int. Cl.^{6} G01F *23/00;* H01H *35/00*

U.S. Cl. 307—118 **13 Claims**

1. A level switch comprising:

a dielectric body;

a first electrode terminating a first end of the dielectric body;

a second, grounded, opposite electrode surrounding a second end of the dielectric body;

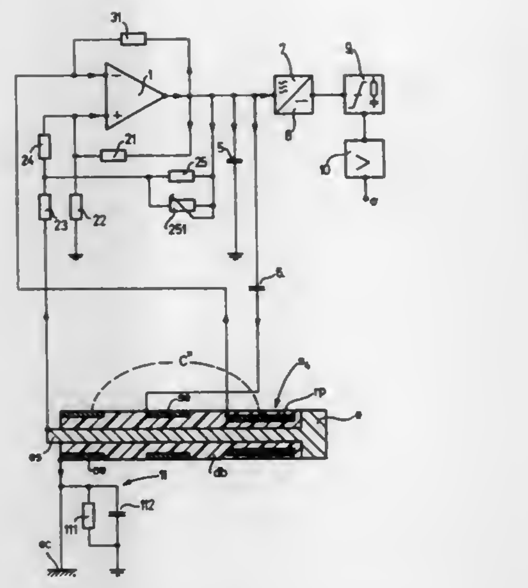
said dielectric body, said first electrode and said second, grounded, opposite electrode together forming a sensor;

an operational amplifier having an inverting input, a non-inverting input and an output;

a first resistor connected to said non-inverting input and a second connected to said inverting input, resistor providing positive and negative feedback, respectively, to said operational amplifier;

a first capacitor through which the inverting input of the operational amplifier is grounded; and

a third resistor through which the non-inverting input of the operational amplifier is connected to the first electrode.



5,532,528
CONVERTER INCLUDING DIRECT CURRENT DETECTION

Franciscus H. T. Lammers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

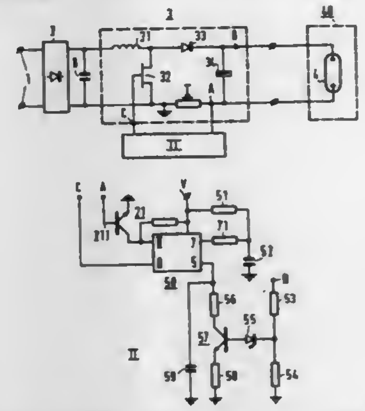
Continuation of Ser. No. 861,683, Apr. 1, 1992, abandoned.

This application May 17, 1995, Ser. No. 442,601

Claims priority, application European Pat. Off., Apr. 4, 1991, 91200779

Int. Cl.^{6} H02M *7/217;* G05F *1/70;1/613*

U.S. Cl. 307—125 **33 Claims**



1. A circuit arrangement which extracts a sinusoidal load current from a sinusoidal supply source, comprising:

an input for receiving the sinusoidal supply source;

inductive means for exhibiting inductive characteristics;

capacitive means for being charged by a charging current and coupled to said inductive means;

switching means coupled to said capacitive means and switchable between a non-conducting and a conducting state for controlling, respectively, charging and discharging of the capacitive means;

drive means for controlling the switching of said switching means; and

detection means coupled to said capacitive means for detecting the charging current through said capacitive means via a voltage drop across said detection means which voltage drop is caused by the charging current flowing from said capacitive means across said detection means, said drive means switching said switching means in dependence on the detection of the charging current through said capacitive means by said detection means.

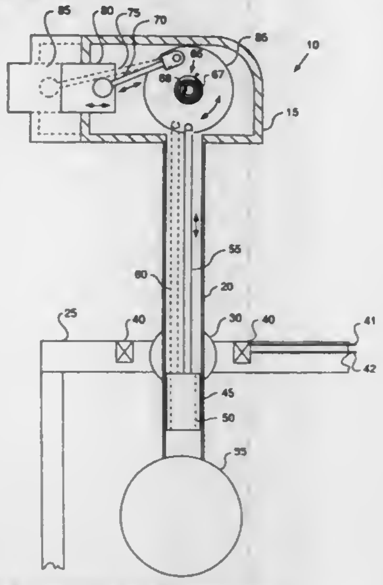
5,532,529
CONTACTLESS INDUCTANCE JOYSTICK SWITCH

George Codina, North Hollywood, Calif.; Donald L. Copple, Dunlap, and Kevin G. Yakes, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 14, 1994, Ser. No. 338,925

Int. Cl.^{6} H01H *35/38*

U.S. Cl. 307—129 **8 Claims**



1. A joystick control switch, comprising:
a base;
a hollow shaft attached to a swivel mounting, and pivotally mounted to said base;
a handle attached to an end of the shaft and having a control switch mechanically attached to a mass installed within said shaft;
electrical conductor windings installed in said base adjacent said pivotal mounting;
sensing circuitry electrically connected to said electrical conductor windings; and
a bell crank rotatably mounted within said handle, said control switch and said mass being pivotally connected to said bell crank;
wherein said control switch and said mass are normally biased to a first position, said mass is moved to a second position adjacent to said electrical conductor winding in response to said control switch being moved to a second position, and said sensing circuitry responsively produces a control signal.

5,532,530

Patent Not Issued For This Number

5,532,531
PERMANENT MAGNET TYPE BRUSHLESS MOTOR

Masafumi Sakamoto, Gunma, Japan, assignor to Japan Servo Co., Ltd., Tokyo, Japan

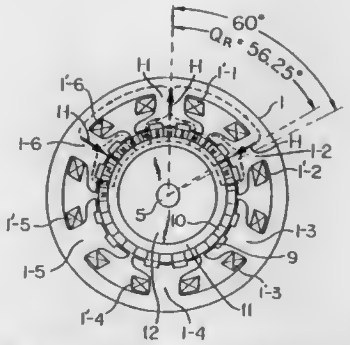
Filed Oct. 24, 1994, Ser. No. 327,857

Claims priority, application Japan, Nov. 1, 1993, 5-293796

Int. Cl.^{6} H02K *37/14;37/08*

U.S. Cl. 310—49 R **11 Claims**

1. A permanent magnet type brushless motor comprising
a cylindrical stator,
3 m pieces of stator magnetic pole extending inwardly in the radial direction from the inner peripheral surface of said stator, m being an integer not less than 2, and each of said stator magnetic poles having a plurality of pole teeth on the tip thereof,



stator exciting windings each wound around on each of the stator magnetic poles,
a cylindrical permanent magnet facing the inner peripheral surfaces of said pole teeth of the stator magnetic poles with a gap therebetween, said permanent magnet having
Z pieces of N pole and Z pieces of S pole magnetized alternately around the circumference thereof with the same pitch, where Z=m(3n±1), and n is an integer not less than 2, and
an angle formed between
the center of an N pole of said permanent magnet, said N pole corresponding to a first pole tooth, said first pole tooth being at the center of a first one of said stator magnetic poles, and
the center of an S pole of said permanent magnet, said S pole corresponding to a second pole tooth, the second pole tooth being at the center of a second one of said stator magnetic poles, said second one of said stator magnetic poles being adjacent to said first one of said stator magnetic poles,
such that magnetic flux from said N pole of said permanent magnet is passed through said first one of said stator magnetic poles and returned to said S pole through said second one of said stator magnetic poles, said magnetic flux having a radial orientation as it passes through said N pole and said S pole of said permanent magnet,
and such that the radial orientation of said magnetic flux through said stator magnetic poles alternates with each successive stator magnetic pole,
a back yoke of magnetic material intimately attached on the inner peripheral surface of said permanent magnet, and
a rotary shaft for supporting said back yoke.

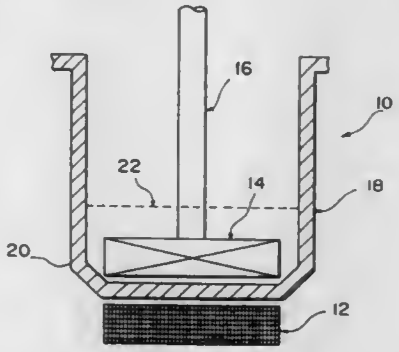
5,532,532
HERMETICALLY SEALED SUPERCONDUCTING MAGNET MOTOR

Robert C. DeVault, and Benjamin W. McConnell, both of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Sep. 17, 1993, Ser. No. 122,626

Int. Cl.^{6} H02K *9/00*

U.S. Cl. 310—52 **15 Claims**



1. A superconducting magnet machine comprising:
a stator;
an armature in spaced relation to the stator; and
a hermetic seal between the stator and armature, one of the stator and armature including a superconducting material which, when placed at a superconducting temperature, and when at least one of the armature and stator is coupled to a source of electrical energy, applies a repulsive force between the stator and armature.

5,532,533
SERVO MOTOR INTEGRAL WITH CONTROL APPARATUS

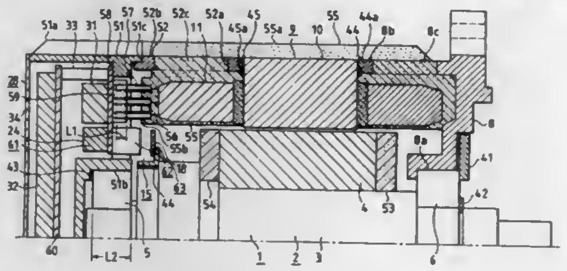
Takao Mizutani, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1994, Ser. No. 223,100

Claims priority, application Japan, Apr. 2, 1993, 5-077020

Int. Cl.^{6} H02K *11/00*

U.S. Cl. 310—68 B **10 Claims**



1. An integral servo motor and control unit, comprising:
an amplifier section,
a partition body, and
a servo motor section;
wherein said servo motor section comprises:
a frame,
a rotor having a rotor core with a permanent magnet defining a plurality of poles,
a rotary shaft to which said rotor is affixed, said shaft being supported by an opposite-to-load side bearing and a load side bearing, said bearings being fitted to and supported by said partition body and a first bracket, respectively, and
a stator having a core and a coil wound around said core and being affixed to said frame;
wherein said partition body comprises:
a first portion between said amplifier section and said servo motor section,
a housing for supporting said opposite-to-load side bearing of said servo motor section, and
a second portion extending in the radial direction of said opposite-to-load side bearing from said housing, said housing and said second portion being formed on said partition body; and
wherein said amplifier section comprises:
a printed circuit board fitted to said second portion, and
a detector, comprising:
a stationary portion (1) for detecting at least one of the velocity and the rotary position of said servo motor section and (2) being fitted to said printed circuit board, and
a rotary portion disposed between said opposite-to-load side bearing of said servo motor section and said rotor core.

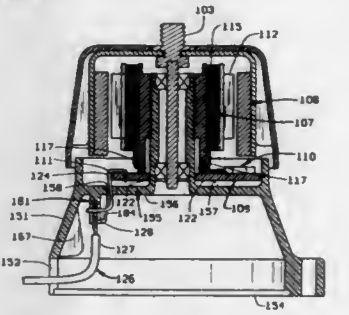
5,532,534
BRUSHLESS PERMANENT MAGNET CONDENSER MOTOR FOR REFRIGERATION

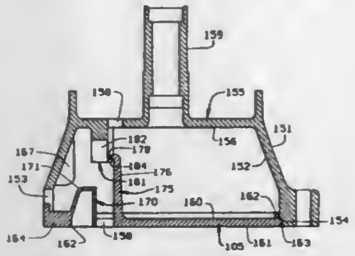
Gerald N. Baker, and Alan D. Crapo, both of Florissant, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 11, 1994, Ser. No. 240,633

Int. Cl.^{6} H02K *11/00;5/00;5/04;5/22*

U.S. Cl. 310—89 **12 Claims**





1. A motor with a base-enclosure, said enclosure being cup shaped and open-bottomed, said enclosure having a side wall and a top wall defining an interior space, said side wall having a port interrupting a bottom edge; an electrical circuit associated with said motor; electrical conductors electrically connected to said motor circuit, said electrical conductors extending into said interior space; current supply conductors extending through said side wall port and electrically connected to said electrical conductors, said current supply conductors being surrounded by insulating sheaths at the portion extending through said port, and an enclosure cover member, said cover member having an inside surface having projecting upwardly therefrom deflectable prong means with an overhanging lip, and strain relief means positioned between said prong means and said side wall port, said cover having at least one tool-receiving aperture to permit engagement of a tool with said prong means, and ledge means carried by an inner surface of said enclosure and positioned complementarily to said prong means lip to permit said lip to engage a surface of said ledge means remote from said cover inner surface to hold said cover in enclosure closing position, but to permit the deflection of said prong means by a tool inserted through said cover aperture to move said lip from off said ledge, hence to release said cover.

5,532,535
ELECTRIC DRIVE FOR AN AUTOMOTIVE VEHICLE

Karl-Heinz Oltmanns, Oldenburg, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

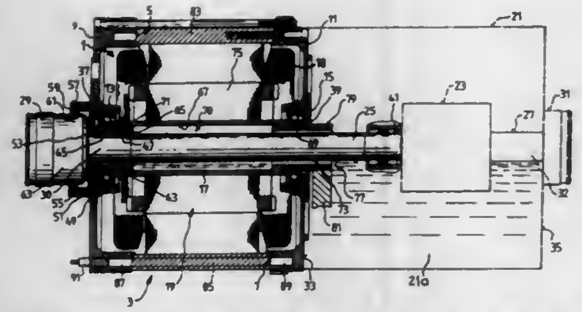
Filed Jun. 27, 1994, Ser. No. 266,534

Claims priority, application Germany, Jun. 25, 1993, 43 21 172.0

Int. Cl.^{6} H02K *5/16*

U.S. Cl. 310—90 **10 Claims**

1. An electric drive for a vehicle, comprising
(a) a motor housing having opposite first and second ends;
(b) first and second bearing plates secured to said motor housing and closing said first and second ends, respectively; said first and second bearing plates having first and second bearing openings;



(c) first and second roller bearings held in said first and second bearing openings of said first and second bearing plates, respectively;

(d) an electric motor accommodated in said motor housing and including
  (1) a stator disposed in said motor housing;
  (2) a rotor surrounded by said stator;
  (3) an axially hollow rotor shaft affixed to said rotor and having opposite first and second axial end portions journalling in said first and second roller bearings, respectively;

(e) a gear housing adjoining said motor housing and having opposite first and second end walls; said first end wall adjoining face-to-face said second bearing plate and being oriented toward said motor housing;

(f) a gearing accommodated in said gear housing;

(g) torque-transmitting means for torque-transmittingly coupling said rotor shaft with an input of said gearing;

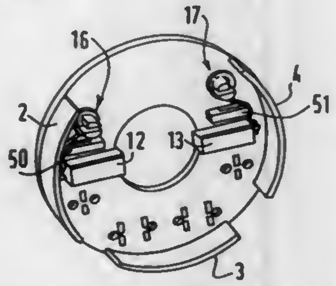
(h) a first output shaft coupled to an output of said gearing; said first output shaft extending through said first end wall of said gear housing and passing axially through said rotor shaft and through said first and second bearing plates; said first output shaft having an end situated at said first bearing plate externally of said motor housing;

(i) a second output shaft coupled to an output of said gearing; said second output shaft extending through said second end wall of said gear housing and having an end situated at said second bearing plate externally of said gear housing; and

(j) first and second coupling members mounted on the ends of said first and second output shafts, respectively; said first and second coupling members being adapted to transmit a driving torque to front and rear wheels of the vehicle.

5,532,536
BRUSH HOLDER PLATE FOR A DIRECT CURRENT ELECTRIC COMMUTATING MOTOR AND AN ELECTRIC MOTOR EQUIPPED THEREWITH

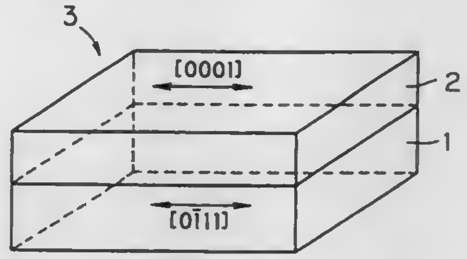
Arsène Gaspar, Morangis, France, assignor to Valeo Systems D'Essuyage, Montigny-le-Bretonneux, France
Filed Jun. 27, 1994, Ser. No. 267,801
Claims priority, application France, Jun. 30, 1993, 93 07985
Int. Cl.^{6} H01F *39/38*
U.S. Cl. 310—239 **5 Claims**



1. A brush holder plate of the kind having at least two brushes disposed along an axis and in which the brushes are urged towards a commutator by elastic means comprising spiral springs disposed on the same side in relation to the axis, wherein the springs are formed by identical turns having the same winding direction and are located on either side of the plane surface of the disc of the brush holder plate so that the ends of the spiral springs each rest on the brushes in the direction of the support of the two sides on the commutator.

5,532,537
ZINC OXIDE PIEZOELECTRIC CRYSTAL FILM ON SAPPHIRE PLANE

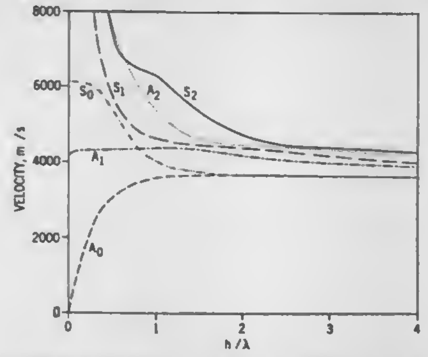
Jun Koike, and Hideharu Ieki, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Division of Ser. No. 284,889, Aug. 2, 1994. This application Mar. 22, 1995, Ser. No. 408,952
Claims priority, application Japan, Aug. 5, 1993, 5-215091
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—313 A **5 Claims**



1. A surface acoustic wave substrate, for a surface acoustic wave device, comprising:
  a $(01\bar{1}2)$-plane cut sapphire substrate having a surface being substantially parallel to its $(01\bar{1}2)$-plane; and
  a $(11\bar{2}0)$-plane zinc oxide piezoelectric crystal film being epitaxially grown on said surface of said sapphire substrate,
  said zinc oxide piezoelectric crystal film containing at least 0.4 to not more than 4.5 percent by weight of Cu with respect to the total content of Zn and Cu.

5,532,538
SENSING AND SIGNAL PROCESSING DEVICES USING QUASI-SH (SHEAR HORIZONTAL) ACOUSTIC WAVES

Yu Jin, 1015 W. 31st St., Chicago, Ill. 60608, and Shrinivas G. Joshi, 20340 Downing Ct., Brookfield, Wis. 53045
Filed Oct. 28, 1994, Ser. No. 331,182
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—313 R **25 Claims**



1. A solid-state acoustic wave sensor device, comprising:

(a) an anisotropic elastic substrate having a pair of opposed surfaces, said substrate having a thickness h which lies between 0 and 3λ, where λ is the wavelength of the quasi-shear horizontal acoustic wave to be propagated through the substrate;

(b) input transducer means affixed to said substrate for propagating quasi-shear horizontal acoustic waves through said substrate;

(c) output transducer means affixed to said substrate for receiving quasi-shear horizontal acoustic waves propagated through said substrate from said input transducer means;

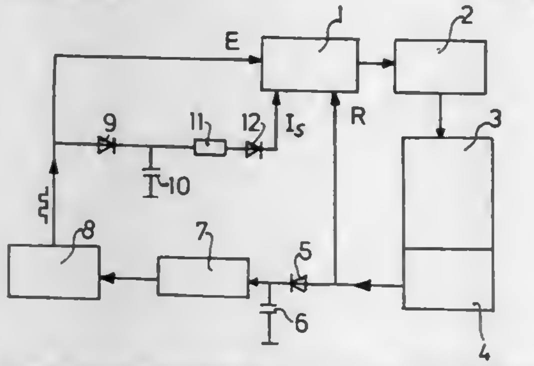
(d) means for applying an input r.f. signal to said input transducer to generate said quasi-shear horizontal wave;

(e) means for receiving an output r.f. signal from said output transducer representative of a propagation characteristic of said quasi-shear horizontal acoustic wave; and

(f) measuring means for measuring a selected propagation characteristic of said output signal from said output transducer.

5,532,539
METHOD AND CIRCUITRY FOR THE SAFE OSCILLATION BUILD-UP OF ULTRASONIC DISINTEGRATORS

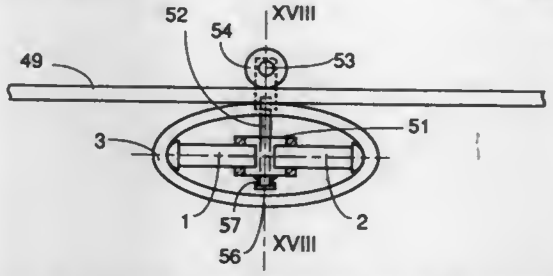
Harald Hielscher, Potsdam, Germany, assignor to Dr. Hielscher GmbH, Stahnsdorf, Germany
Filed Jun. 28, 1994, Ser. No. 267,414
Claims priority, application Germany, Jun. 30, 1993, 43 22 388.5
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—316 **1 Claim**



1. A circuit for safely building up the frequency of ultrasonic disintegrator, the circuit comprising:
  high frequency generator means for generating a range of high frequency signals;
  ultrasonic transducer means connected to said high frequency generator means and for converting said high frequency signals into mechanical oscillations, said ultrasonic transducer means has an operating frequency;
  measuring means for measuring and comparing an amplitude of said mechanical oscillations with a predetermined value, said measuring means includes a piezo-disc connected to said ultrasonic transducer means and also connected to a first side of a diode, a second side of said diode is connected to a side of a capacitor and connected to an input of a comparator;
  start/stop means for cycling said high frequency generator on and off periodically when said amplitude of said mechanical oscillations is below said predetermined value, said start/stop means varies a frequency of said high frequency signals during said on cycles of said high frequency generator, said start/stop means starting said frequency of said high frequency signals at an initial frequency spaced from said operating frequency and then varying said frequency toward said operating frequency, said start/stop means includes means for generating and sending start/stop pulses to said high frequency generating means, said start/stop means also including a first diode having a first side receiving said start/stop pulses, a second side of said first diode being connected to a capacitor and a first side of a resistor, a second side of said resistor being connected to a first side of a second diode, and a second side of said first diode being connected to said high frequency generator means.

5,532,540
ELECTRIC MOTOR WITH VIBRATING ELEMENTS AND ELASTIC COUPLING

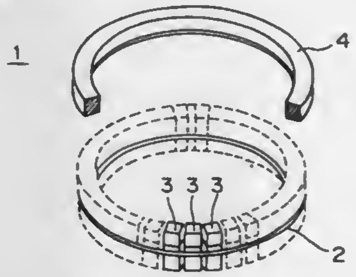
Frank Claeyssen, Meylan; Ronan Le Letty, Combrit, and Nicolas Lhermet, Meylan, all of, France, assignors to Figest B.V., Netherlands
Continuation-in-part of Ser. No. 287,234, Aug. 8, 1994, abandoned. This application Jul. 17, 1995, Ser. No. 503,018
Claims priority, application France, Aug. 18, 1993, 93 10085
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—323 **15 Claims**



1. An electric motor comprising at least one pair of transducers each comprising a vibrating element, these transducers being located colinearly in permanent contact with a support structure and excited so that their vibrating elements vibrate at one and the same frequency, depending on the alignment of the transducers, but with a phase shift of 90°, an elastic coupling shell presenting an axis of symmetry on which the transducers are aligned and able to produce, from symmetrical displacements due to the transducers, displacements on points of the shell belonging to the symmetry plane perpendicular to the axis of symmetry, both perpendicular to the previous one and amplified by a factor α and at least one element frictionally driven by the coupling shell whose zone of contact with the driven element is given a circular elliptical movement, wherein said transducers are supported at a vibration node by said support structure and wherein the motional mass m_C of the ensemble of coupling shell and transducers in translation motion, the motional mass m^*_C of the ensemble of coupling shell and transducers in flexion mode, the stiffness k_A of the transducers from the transducers and the stiffness k_C of the coupling shell considered from the transducers meet at least approximately the relation $\alpha=((m_C/m^*_C).(2k_A+k_C)/2k_A)^{1/2}$, in order to match the flexion mode and the translation mode.

5,532,541
ULTRASONIC MOTOR

Satoru Fujishima, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan
Filed Sep. 29, 1994, Ser. No. 315,144
Claims priority, application Japan, Sep. 30, 1993, 5-244066
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—325 **19 Claims**



1. An ultrasonic motor comprising:
  a plurality of Langevin vibrators, each of which comprises a piezoelectric ceramic plate and at least one metal terminal joined together, the Langevin vibrators being adapted and arranged to vibrate in a length mode and in a flexural mode thereby producing an elliptical vibration of edge portions of

the metal terminals when the Langevin vibrators are supplied with an alternating voltage;

a rotor being arranged to be driven by vibration of the Langevin vibrators via friction with the Langevin vibrators; and

a ring stator having at least one supporting surface for supporting the Langevin vibrators; wherein

each of the piezoelectric ceramic plates has a first polarized region and a second polarized region which are polarized in mutually opposite directions;

the plurality of Langevin vibrators being arranged adjacent to each other on the at least one supporting surface of the stator so as to form a ring and so that the first polarized region of each of the Langevin vibrators is disposed adjacent to the second polarized region of an adjacent one of the Langevin vibrators.

5,532,542

ENERGY-TRAP CHIP-TYPE PIEZOELECTRIC RESONANCE COMPONENT

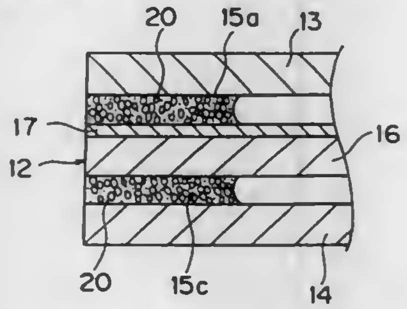
Ryuhei Yoshida, and Masaya Wajima, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 13, 1995, Ser. No. 387,200

Claims priority, application Japan, Feb. 16, 1994, 6-019648

Int. Cl.^{6} H03H *9/02;* **H01L** *41/08*

U.S. Cl. 310—348 **30 Claims**



1. An energy-trap chip-type piezoelectric resonance component comprising:

an energy-trap piezoelectric resonance element having a piezoelectric body and first and second resonance electrodes being partially formed on a pair of opposite surfaces of said piezoelectric body;

first and second holding plates each being arranged to hold said piezoelectric resonance element from both said pair of opposite surfaces of said piezoelectric body, wherein at least one of said first and second holding plates comprises a substantially flat plate having no recesses formed therein; and

adhesive layers bonding said piezoelectric resonance element and said first and second holding plates with each other in regions other than a resonance part for allowing vibration of said resonance part and integrating said piezoelectric resonance element with said first and second holding plates;

said adhesive layers containing granular solids, each of said adhesive layers having a thickness defining a vibration space between said first holding plate and said resonance part or between said second holding plate and said resonance part so as to allow said resonance part to vibrate uninhibited, the thickness of each adhesive layer being substantially equal to a distance between said first holding plate and said resonance plate or between said second holding plate and said resonance plate, said granular solids being arranged to extend along the thickness of each of the adhesive layers.

5,532,543

HIGH DENSITY DISCHARGE LAMP WITH PINCHED-ON CONTAINMENT SHIELD

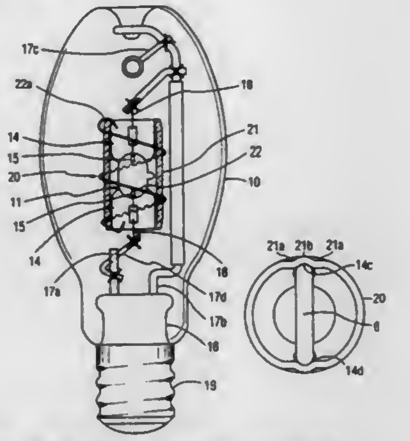
Bart Van Der Leeuw, Hammondsport; Albert E. Kowal, Savona, both of N.Y.; Henrikus J. H. Pragt, Eindhoven, Netherlands, and Joseph E. Canale, Painted Post, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 994,572, Dec. 22, 1992. This application Sep. 24, 1993, Ser. No. 126,820

Claims priority, application European Pat. Off., Dec. 23, 1991, 91203379

Int. Cl.^{6} H01J *17/28*

U.S. Cl. 313—25 **22 Claims**



20. A metal halide discharge lamp, comprising:

a) an outer envelope sealed in a gas-tight manner;

b) a discharge vessel arranged within said outer envelope, said discharge vessel including a pair of opposing discharge electrodes between which a discharge arc is maintained during lamp operation, conductive feed-throughs extending from said discharge electrodes to the exterior of said discharge vessel, a pair of opposing press seals sealing said discharge vessel in a gas-tight manner, a discharge sustaining fill including mercury, a metal halide, and a rare gas, each of said press seals having a pair of opposing major faces and a pair of opposing minor, side faces extending between said major faces, each of said minor faces including an end portion remote from said discharge electrodes;

c) a lamp frame including first and second conductive support rods each connected to a respective one of said discharge vessel feed-throughs; and

d) a containment shield disposed about said discharge vessel, said containment shield including a light-transmissive sleeve having opposing ends each adjacent a respective said press seal and a length of helically coiled wire coiled about said sleeve, said ends of said sleeve being pinched to said end portions of each of said minor, side faces, said sleeve not being pinched to said discharge vessel between the end portions at opposing ends of said discharge vessel,

said discharge vessel and sleeve being supported within said outer envelope solely by said connection of said discharge vessel feed-throughs to said conductive support rods, and said sleeve and said helically coiled wire being free of contact with said lamp frame and being electrically isolated therefrom.

5,532,544

ELECTRON-EMITTING DEVICE WITH ELECTRON-EMITTING REGION INSULATED FROM ELECTRODES

Seishiro Yoshioka, Hiratsuka; Ichiro Nomura, Yamato; Hidetoshi Suzuki, Atsugi; Toshihiko Takeda, Tokyo; Tetsuya Kaneko, Yokohama; Yoshikazu Banno, Atsugi, and Kojiro Yokono, Yokohama, all of, Japan, assignors to Ganon Kabushiki Kaisha, Tokyo, Japan

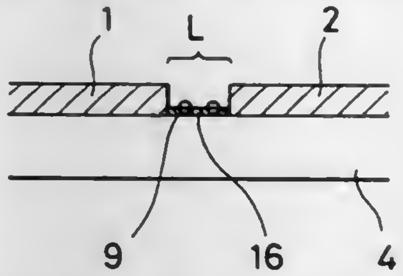
Continuation of Ser. No. 58,801, May 10, 1993, abandoned, which is a continuation of Ser. No. 694,014, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 218,203, Jul. 13, 1988, Pat. No. 5,066,883. This application Dec. 30, 1994, Ser. No. 366,430

Claims priority, application Japan, Jul. 15, 1987, 62-174837; Oct. 2, 1987, 62-250448; Oct. 9, 1987, 62-255063; Oct. 9, 1987, 62-255068; Apr. 27, 1988, 63-102485; Apr. 27, 1988, 63-102486; Apr. 27, 1988, 63-102487; Apr. 27, 1988, 63-102488; Jun. 21, 1988, 63-154516

Int. Cl.^{6} H04N *3/14*

U.S. Cl. 313—310 **22 Claims**

1. An electron-emitting device comprising a device structure that includes a semiconductor layer formed between opposing electrodes on a planar substrate, said semiconductor layer having fine particles dispersed inside said semiconductor layer, or on said semiconductor layer, said fine particles ranging in particle diameter from the order of tens of angstroms to the order of microns.



5,532,545

COLOR CATHODE RAY TUBE

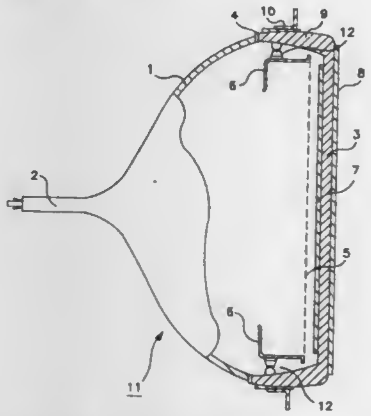
Takami Okamoto, Muko; Hideaki Maki, Sakai, and Osamu Konosu, Nagaokakyo, all of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed May 16, 1994, Ser. No. 243,579

Claims priority, application Japan, May 19, 1993, 5-116983

Int. Cl.^{6} H01J *29/80*

U.S. Cl. 313—407 **19 Claims**



1. A color cathode ray tube comprising:

a bulb having a flat glass panel, the flat glass panel having a predetermined thickness which is substantially uniform in the range from 5 mm to 20 mm and including a glass wall formed integrally as a part of the flat glass panel, the glass wall extending in a substantially vertical direction from the flat glass panel;

a flat shadow mask provided inside the bulb, the flat shadow mask facing the flat glass panel; and

a frame attached to the glass wall and provided inside the bulb, the frame supporting the flat shadow mask and giving the flat shadow mask tensile stress in a range from 49 newtons/mm^2 to 490 newtons/mm^2 at least at room temperature,

wherein a resin film comprising at least one layer is attached to the outer surface of the flat glass panel for preventing implosion of the color cathode ray tube.

5,532,546

COLOR SELECTING ELECTRODE MOUNTING FRAME FOR CRT AND PROCESS FOR PRODUCTION OF SAME

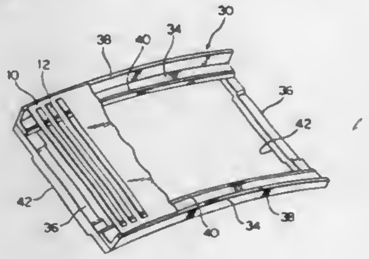
Yoshiro Horiuchi, Tokyo, Japan, assignor to Sony Corporation, Japan

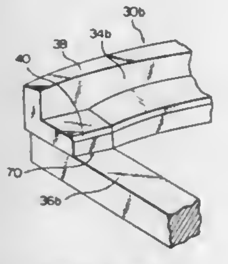
Filed Sep. 16, 1994, Ser. No. 307,005

Claims priority, application Japan, Sep. 27, 1993, 5-240177

Int. Cl.^{6} H01J *29/81*

U.S. Cl. 313—407 **6 Claims**





PERSPECTIVE VIEW OF FOURTH EMBODIMENT

1. A color selecting electrode mounting frame for a CRT comprising:

a pair of long curved members each having an L-shape cross-section, each of said L-shaped cross-sectioned long curved members having an upright portion and a horizontally extending leg portion, the upright portions having curved top edge portions to which two opposing sides of a color selecting electrode are attached, said horizontally extending leg portions being arranged to extend toward each other and to each have a taper portion formed along an upper edge of each free end thereof; and

a pair of short members which are arranged to extend between said pair of long members, said short members each being each formed from a straight piece of rod material so as to have aligned end portions which extend laterally outward in a direction essentially parallel to the central portion, said laterally outward extending end portions being joined to two ends of said long members,

each of said L-shaped cross-sectioned long curved members being obtained by blanking a plate of a fixed predetermined width into an arc shape having a predetermined curvature, and subsequently forming it to have the L-shaped cross-sectional shape and curvature which matches a panel glass surface of the CRT.

5,532,547
ELECTRON GUN FOR A COLOR CATHODE-RAY TUBE

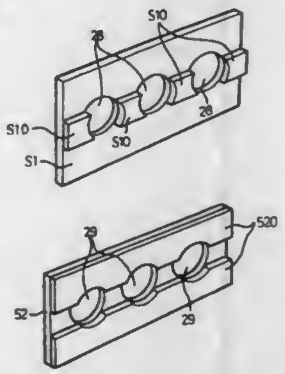
Sang W. Park, Gumi, and Hyun C. Kim, Kyungsangbuk-do, both of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 998,782, Dec. 28, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,506

Claims priority, application Rep. of Korea, Dec. 30, 1991, 91-24988; Dec. 30, 1991, 91-25242

Int. Cl.^{6} H01J *29/58*

U.S. Cl. 313—414 4 Claims



1. An electron gun for a color cathode-ray tube, comprising:
a plurality of electron emission means for emitting electron beams;
a beam-forming region composed of a control electrode for controlling a quantity of said electron beams emitted from said plurality of electron emission means, and an accelerator electrode for accelerating said controlled electron beams;
a plurality of focus electrodes for forming a main static focus lens for focusing said electron beams on a screen of said cathode-ray tube, one of said plurality of focus electrodes forming a static voltage focus electrode by applying thereto a static voltage, and one of the remaining focus electrodes forming a dynamic voltage focus electrode by applying thereto a dynamic voltage;
an anode for accelerating said focused electron beams onto said screen; and
quadrupole electrode means, provided between said static voltage focus electrode and said dynamic voltage focus electrode, for forming a quadrupole lens, said quadrupole electrode means comprising a first quadrupole electrode composed of a plurality of vertical partitions connected to one surface of said static voltage focus electrode and arranged on left and right sides of beam-passing apertures formed on said static voltage focus electrode, and a second quadrupole electrode composed of a flat plate connected to said dynamic voltage focus electrode and having a horizontally-elongated opening therein in alignment with said beam-passing apertures; upper and lower portions of said opening having arcs having a radius at least as large as that of said beam-passing apertures;
wherein said static voltage focus electrode and said dynamic voltage focus electrode are arranged at predetermined intervals, and said vertical partitions connected to said static voltage focus electrode are inserted inside of said horizontally-elongated opening formed on said second quadrupole electrode.

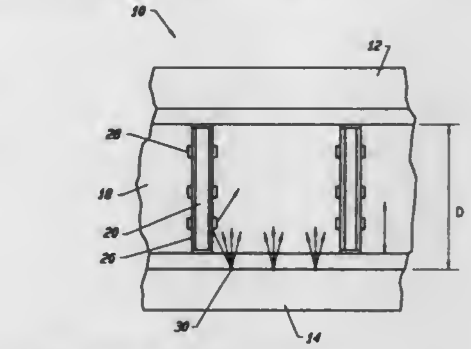
5,532,548
FIELD FORMING ELECTRODES ON HIGH VOLTAGE SPACERS

Christopher J. Spindt, Menlo Park; John E. Field, Redwood City; David L. Morris, San Jose, and Christopher J. Curtin, Los Altos Hills, all of Calif., assignors to Silicon Video Corporation, Campbell, Calif.

Continuation-in-part of Ser. No. 188,857, Jan. 29, 1994, which is a continuation-in-part of Ser. No. 12,542, Feb. 1, 1993, which is a continuation-in-part of Ser. No. 867,044, Apr. 10, 1992, Pat. No. 5,424,605. This application Oct. 3, 1994, Ser. No. 317,205

Int. Cl.^{6} H01J *19/42*

U.S. Cl. 313—422 30 Claims



15. A flat panel apparatus, comprising:
a faceplate;
a backplate positioned in an opposing relationship to the faceplate;
an enclosure member positioned between the backplate and the faceplate to form a sealed envelope therebetween, the sealed envelope including a phosphor coated emissive area of length L_1;
a spacer in the envelope supporting the backplate and the faceplate against forces acting in a direction toward the envelope, the spacer having a selectable potential drop across an exterior surface of the spacer; and
at least one electrode disposed on the spacer extending a length L_2 along a side of the spacer that is at least equal to L_1, the voltage of the electrode being controlled to achieve a desired voltage distribution between the backplate and the faceplate.

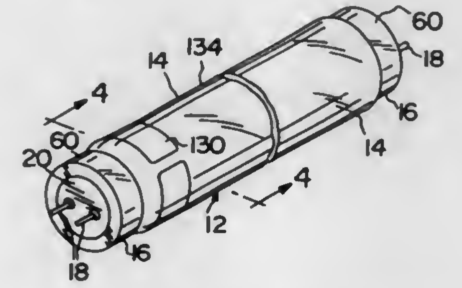
5,532,549
COATED, LABELED FLUORESCENT LAMP

Edward F. Duzyk, Meadville, Pa., and Wallace E. Fizer, Lexington, Ky., assignors to Trojan, Inc., Mt. Sterling, Ky.

Filed Mar. 2, 1993, Ser. No. 24,518

Int. Cl.^{6} H01J *61/35*

U.S. Cl. 313—489 11 Claims



1. A tamper-resistant coated and labeled fluorescent lamp comprising a light-transmitting envelope defining an enclosed interior;

means for conducting electrical energy to said enclosed interior from outside of said enclosed interior;
means disposed within said enclosed interior to emit light when stimulated by said electrical energy;
a tough, smooth, uninterrupted, substantially transparent coating covering said envelope to contain said envelope and contents thereof in the event of failure of said envelope; and
a label adhered to said envelope and entirely covered by said coating, said label being bonded to said coating to be non-peelable and non-separable from the coating to prevent removal and misuse at the end of the useful life of the lamp;
said coating functions in a dual role of providing resistance to tampering with said non-separable label in addition to said containment of said envelope and thereof contents in the event of failure of said envelope.

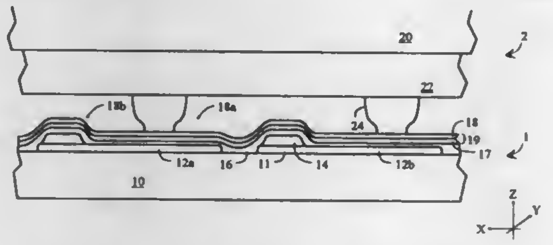
5,532,550
ORGANIC BASED LED DISPLAY MATRIX

Robert Adler, 327 Latrobe, Northfield, Ill. 60093

Filed Dec. 30, 1993, Ser. No. 175,844

Int. Cl.^{6} H01J *1/62*

U.S. Cl. 313—500 7 Claims



1. An electroluminescent display panel, comprising:
I. a thin film light emitting diode matrix comprising row conductors and column conductors
  A) a transparent substrate;
  B) a series of thin film, transparent anode strips affixed to the transparent substrate and oriented in a first longitudinal direction;
  C) a series of thin film, low resistance conductor strips, the conductor strips oriented in the first longitudinal direction and in electrical contact with the anode strips;
  D) a luminescent film overlying the anodes and the conductors;
  E) a series of thin film cathode strips overlying and in electrical contact with the luminescent film, the cathode strips being oriented in a second longitudinal direction orthogonal to the first longitudinal direction; and
II. a high amperage, low resistance, current device having:
  a nonconductive backing plate having attached thereto a series of low resistance, high amperage conductors, each conductor of sufficient length and cross section to carry an amount of current necessary to supply an entire cathode strip without incurring a brightness depleting voltage drop with a spacing equal to that of the cathode strips and oriented in the second longitudinal direction; and
III. means for electrically connecting each of the high amperage conductors to one of the cathode strips at a plurality of points along the high amperage conductors without mechanically stressing the light emitting diode matrix so as to pair a plurality of the high amperage conductors to a plurality of the cathode strips without causing a disruption of the light emitting diode matrix.

5,532,551
PHOTOMULTIPLIER FOR CASCADE-MULTIPLYING PHOTOELECTRONS

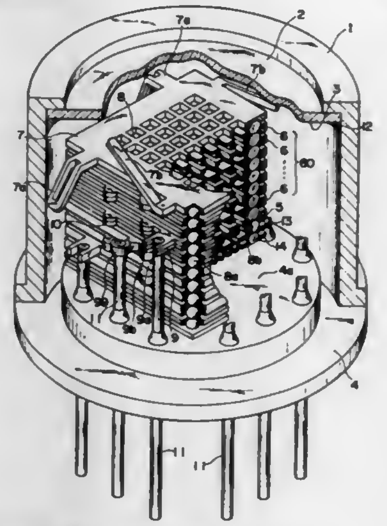
Hiroyuki Kyushima; Koji Nagura; Yutaka Hasegawa; Eiichiro Kawano; Tomihiko Kuroyanagi; Akira Atsumi, and Masuya Mizuide, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Apr. 28, 1994, Ser. No. 234,020

Claims priority, application Japan, Apr. 28, 1993, 5-102910

Int. Cl.^{6} H01J *43/06*

U.S. Cl. 313—533 48 Claims



1. A photomultiplier comprising:
a housing for fabricating a vacuum container;
a photocathode provided in said housing;
an anode provided in said housing;
an electron multiplier for cascade-multiplying photoelectrons emitted from said photocathode, said electron multiplier provided between said photocathode and said anodes in said housing; and
a focusing electrode plate provided between said photocathode and said electron multiplier and fixed on said electron multiplier through insulating members, said focusing electrode plate having holding springs pressed against an inner wall of said housing to hold an arrangement position of said electron multiplier.

5,532,552
METAL-HALIDE DISCHARGE LAMP WITH CERAMIC DISCHARGE VESSEL, AND METHOD OF ITS MANUFACTURE

Juergen Heider, Munich; Stefan Juengst, Zorneding, and Peter Wahrendorff, Munich, all of, Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

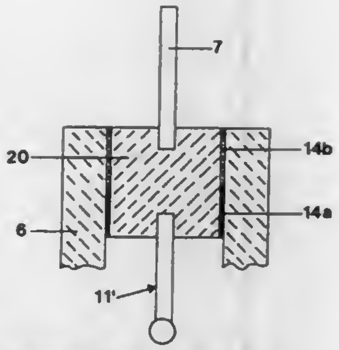
Filed Oct. 25, 1994, Ser. No. 328,492

Claims priority, application Germany, Nov. 10, 1993, 43 38 377.7

Int. Cl.^{6} H01J *17/04;17/18*

U.S. Cl. 313—623 18 Claims

1. A metal-halide discharge lamp having
a discharge vessel (**4**) of ceramic material, said vessel being formed with two open ends (**6**);
two electrodes (**11**) located within the discharge vessel;
external current supply means (**7**);
current leadthroughs (**9**) connected to the current supply means (**7**) and to one each of the electrodes, passing through the open ends of the discharge vessel;
a vacuum-tight sealing structure or system, including a sealing composition (**14**) vacuum-tightly sealing the leadthroughs (**9**) in the open ends of the vessel; and
a fill within the discharge vessel (**4**) which includes metal halides,



wherein, in accordance with the invention,

the sealing structure or sealing system comprises

a multi-part sealing composition located in a gap, which is formed, at least in part of the said open end, between at least a part of a first means providing, at least as a part thereof, a feedthrough and a second means located at the open end,

in which a first part of the multi-part sealing composition essentially consists of a material highly resistant to attack from said metal halides of the fill, is located in a first zone of said gap and faces the interior of the discharge vessel, and

in which another part of the multi-part sealing composition essentially consists of a material forming a vacuum-tight vitreous seal devoid of pores, voids, or fissures, is located in another zone of said gap remote from the interior of the sealing vessel; and

wherein the first part of the multi-part sealing composition has a melting point higher than that of the other part to define a high melting point composition, and the other part of the sealing composition defines a lower melting point composition;

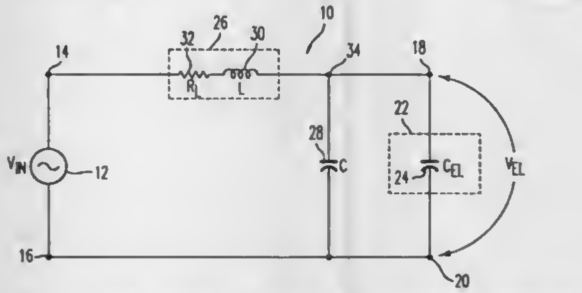
wherein both the first part and the other part of the composition contain Al_2O_3 and at least one further component M_xO_y which are oxides of the metals La, Sc, Y, rare earth metals, Mg, Zr, Ti; and

wherein the first part of the composition contains between 0 to 12% SiO_2, and the other part of the composition contains between 20–40% SiO_2,

all percentages by weight.

5,532,553
OPERATING CIRCUIT FOR ELECTROLUMINESCENT PANEL

Isaac L. Flory, IV, Blacksburg, Va., assignor to Hubbell Incorporated, Orange, Conn.
Filed Oct. 19, 1994, Ser. No. 325,901
Int. Cl.^{6} G09G *3/10*
U.S. Cl. 315—169.3 **15 Claims**



1. An operating circuit for increasing the voltage across an electroluminescent panel, comprising:

first and second input terminals adapted to be connected to an AC voltage source;

a series resonant circuit including an inductor and a capacitor connected in series with each other, said series resonant circuit being connected across said first and second input terminals; and

first and second output terminals adapted to be connected to an electroluminescent panel, said first output terminal being connected to the node between said inductor and one terminal of said capacitor and said second output terminal being connected to a second terminal of said capacitor, whereby said electroluminescent panel is connected in parallel with said capacitor;

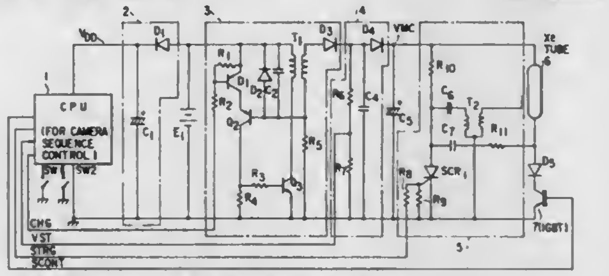
wherein the values of said inductor and said capacitor are selected to produce an AC voltage across said output terminals that is greater than the AC voltage of said source when an electroluminescent panel is connected to said output terminals.

5,532,554

Patent Not Issued For This Number

5,532,555
ELECTRONIC FLASH APPARATUS USING GATE CONTROLLED SWITCHING DEVICE DIRECTLY DRIVEN BY CPU

Hiroshi Yamada, Hachloji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 21, 1995, Ser. No. 391,730
Claims priority, application Japan, Mar. 7, 1994, 6-035563
Int. Cl.^{6} H05B *37/00*
U.S. Cl. 315—241 P **15 Claims**



1. An electronic flash apparatus comprising:

a main capacitor for storing charges;

a discharge light emitting tube for emitting light in accordance with the charges stored in said main capacitor;

a CPU (Central Processing Unit) for performing camera sequence control, said CPU including a light emission control terminal for controlling a light emission timing of said discharge light emitting tube and said CPU being supplied with a CPU operation voltage; and

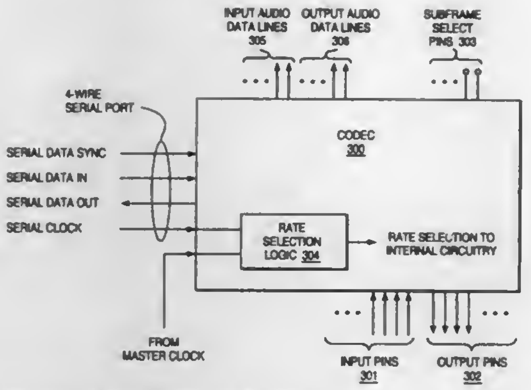
an IGBT (Insulated Gate Bipolar Transistor) coupled to each of said discharge light emitting tube and said CPU, said IGBT having a gate terminal connected to said light emission control terminal of said CPU, a collector terminal, and an emitter terminal, wherein, responsive to said light emission control terminal inputting to said gate terminal a control voltage substantially equivalent in amplitude to said CPU operation voltage, a channel is formed between said collector terminal and said emitter terminal and the charges of said main capacitor are discharged through said discharge light emitting tube.

5,532,556
MULTIPLEXED DIGITAL AUDIO AND CONTROL/ STATUS SERIAL PROTOCOL

Eric C. Anderson, San Jose; David F. Wilson, Los Altos, and William V. Oxford, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Continuation of Ser. No. 881,842, May 12, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 314,538
Int. Cl.^{6} H04L *7/00;* H04J *3/12*
U.S. Cl. 375—356 **11 Claims**

8. A system comprising:

a first unit;



a plurality of audio functional units;

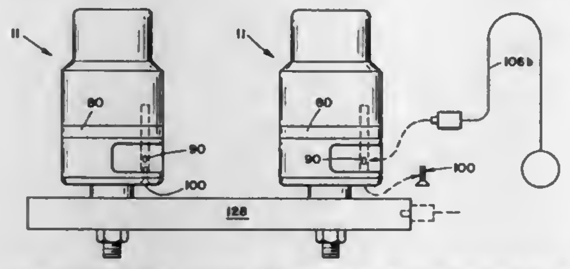
an interface connecting the first unit to the plurality of audio functional units, wherein the interface comprises a first conductor, a second conductor, a third conductor and a fourth conductor, wherein the first conductor transfers combined audio and auxiliary data from the first unit to the plurality of audio functional units and the second conductor transfers combined audio and auxiliary data from the plurality of audio functional units to the first unit, and wherein data transfers occur according to a clock signal on the third conductor generated by the first unit;

and further wherein data is transferred in frames comprising a plurality of subframes, each of said plurality of audio functional units tuned to one of the plurality of subframes, such that data transfers between the first unit and each of a plurality of audio functional units are made using the subframe associated with each audio functional unit, wherein inputs and outputs of each of said plurality of audio functional units are tri-stated during all other subframes, and

wherein variable length synchronization pulses on the fourth conductor indicate a start of each frame and each of the plurality of subframes to enable the first unit and the plurality of audio functional units to identify the subframe associated with said each audio functional unit.

5,532,557
ELECTRIC LIGHT SOCKET CONSTRUCTIONS

Jacob Saidian, 440 El Rio Rd., Danville, Calif. 94526
Continuation-in-part of Ser. No. 719,355, Jun. 24, 1991, Pat. No. 5,208,516. This application Apr. 5, 1993, Ser. No. 42,529
The portion of the term of this patent subsequent to May 4, 2010, has been disclaimed.
Int. Cl.^{6} H05B *37/00;* H01J *7/44*
U.S. Cl. 315—362 **20 Claims**

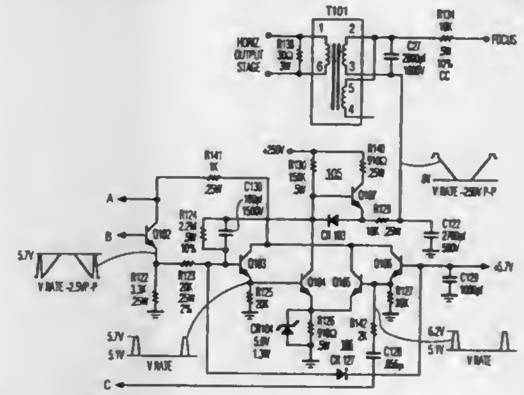


1. An electric light socket for engaging and energizing a light bulb comprising:

a housing adapted for attachment to a support and having a receptacle for receiving the base of said light bulb which receptacle has contacts for supplying electrical voltage to said light bulb, said housing having an interior power terminal chamber with power thermal access and at least a pair of spaced apart power terminals therein for receiving said voltage from an external source, further including access means for selectively opening and closing a passage which communicates with said interior power terminal chamber, wherein said housing has a sidewall and said passage is an access opening therein that communicates with said interior power terminal chamber, and wherein said access means for selectively opening and closing a passage which communicates with said interior power terminal chamber includes a movable closure at said sidewall which movable closure is shiftable from a first position at which said access opening is exposed and a second position at which said access opening is covered.

5,532,558
PROTECTION CIRCUIT FOR DYNAMIC FOCUS AMPLIFIER

John B. George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Continuation of Ser. No. 285,580, Aug. 3, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 413,046
Int. Cl.^{6} H01J *29/58*
U.S. Cl. 315—382.1 **17 Claims**



1. An apparatus, comprising:

means for generating a dynamic focus modulating signal for an electrode of a cathode ray tube;

an active pull up arrangement generating an operating voltage;

a voltage supply return;

an amplifier for said modulating signal, coupled to said generating means and having a plurality of transistors coupled in a push pull configuration between said pull up arrangement and said supply return and biased by said operating voltage, said transistors being subject to damage in the event of a fault condition in said push pull configuration;

at least one of said transistors being coupled in series between an element of said pull up arrangement and said supply return; and,

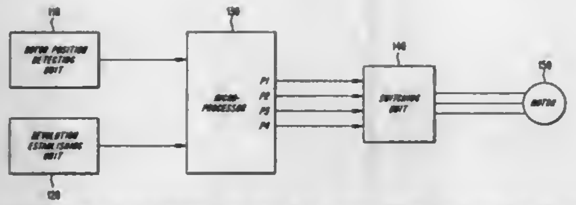
switch means coupled between said at least one transistor and said supply return for switching current flow therebetween as a function of a voltage threshold value, said switch means having a voltage threshold value below the level at which said transistors will be damaged by said fault condition.

5,532,559
APPARATUS FOR AND METHOD OF PROVIDING CONTINUOUS DRIVING CURRENT TO A COMMUTATORLESS MOTOR

Han-Ju Yoo, Kwangmyung, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Dec. 8, 1994, Ser. No. 355,195
Claims priority, application Rep. of Korea, Dec. 8, 1993, 93-26913
Int. Cl.^{6} H02P *7/00*
U.S. Cl. 318—254 **3 Claims**

1. An operation control apparatus for a commutatorless motor, the apparatus comprising:

rotor position detecting means for detecting a rotor position of the commutatorless motor;



revolution establishing means for controlling revolution of the commutatorless motor;

a microprocessor, responsive to the rotor position detecting means,

for determining whether the commutatorless motor is being driven and for outputting a predetermined initial driving signal according to a position of the rotor when the commutatorless motor is in an initial driving state to thereafter drive the commutatorless motor,

for outputting a driving signal having a predetermined delay time for controlling motor speed to thereafter drive the commutatorless motor,

for controlling the delay time to enable current to flow in a first winding of the commutatorless motor before current ceases to flow in a second winding of the commutatorless motor;

for determining whether the delay time has elapsed for controlling the revolutions per minute of the commutatorless motor;

said delay time is established within a period in a case where there is no change of waveform for detecting the rotor position of the commutatorless motor; and

switching means activated by the driving signals output from the microprocessor for controlling the flow of current in the windings.

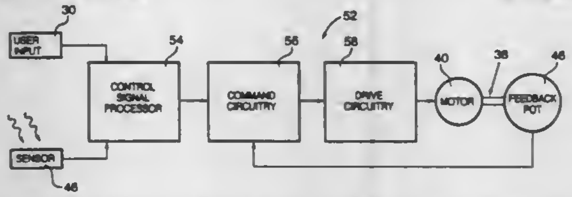
5,532,560
PHOTOSENSITIVE AUTOMATIC BLIND CONTROLLER

Richard G. Element, Tottenham, and Roger A. Morris, Oshawa, both of, Canada, assignors to Sun Dial Industries, Inc., Tottenham, Canada

Filed Nov. 8, 1994, Ser. No. 337,468

Int. Cl.^{6} E05F *15/20;* H02P *1/22;1/54*

U.S. Cl. 318—266 **18 Claims**



1. A photosensitive automatic controller connected to a power supply for use with a window covering having an opening and closing device, comprising:

a reversible motor operably connected to the opening and closing device having a predetermined range from open to closed corresponding to the window covering being fully opened and fully closed;

a drive circuit operably connected to the reversible motor for generating a drive signal which drives the motor in a predetermined range from fully opened to fully closed;

a photosensitive sensor for generating a sensor signal;

user input means for generating an input signal;

a control signal processor operably connected to the photosensitive sensor and the user input means wherein the sensor signal is combined with the input signal to produce a control signal;

a feedback sensor operably connected to the opening and closing device for generating a feedback signal which corresponds to the position of the opening and closing device;

a command circuit operably connected to the drive circuit, the control signal processor and the feedback sensor for comparing the feedback signal to the control signal and producing a command signal and transmitting the command signal to the drive circuit.

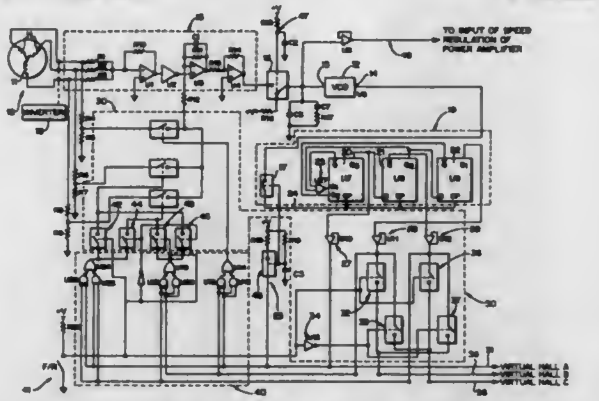
5,532,561
VIRTUAL HALL-EFFECT SIGNAL GENERATING FOR A BRUSHLESS SENSORLESS ELECTRICAL ROTARY MACHINE

Hao Huang, Montevideo, Minn., assignor to SL Montevideo Technology, Inc., Montevideo, Minn.

Division of Ser. No. 246,859, May 20, 1994, Pat. No. 5,469,033. This application May 31, 1995, Ser. No. 456,076

Int. Cl.^{6} H02P *6/18*

U.S. Cl. 318—439 **8 Claims**



1. In combination in association with an electrical rotary machine:

a voltage controlled oscillator having an input, and having an output; and

a plurality of D flip flops, each having a CP input;

a NAND gate;

said voltage controlled oscillator output connected to said CP inputs of said D flip flops through a switch, and said NAND gate connected to a current carrying line extending from each of first and second of said D flip flops; and

a commutation error detector circuit connected to the input of said voltage controlled oscillator.

5,532,562
APPARATUS FOR CONTROLLING DC MOTOR WITH H-BRIDGE SWITCHING CIRCUIT

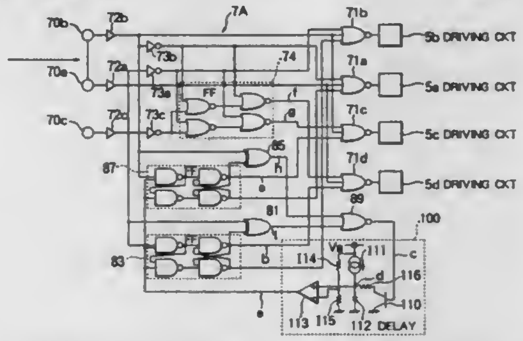
Yukio Yasuda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 267,378

Claims priority, application Japan, Jun. 30, 1993, 5-162834

Int. Cl.^{6} H01R *39/46*

U.S. Cl. 318—439 **10 Claims**



1. An apparatus for controlling operation of a DC motor with a plurality of switching elements, wherein the DC motor and the switching elements are connected in an H-bridge circuit configuration between a power supply source and the ground, comprising:

control signal generating means for generating a plurality of control signals for controlling on/off operations of the switching elements, respectively, in accordance with a predetermined sequence in response to a control command signal inputted from a control unit; and

means for regulating the control signal so that a time gap of a predetermined duration intervenes between preceding and succeeding ones of the control signals, said means for regulating including:

a single capacitor inserted between a power supply source and the ground,

charge/discharge circuit means for charging the capacitor in response to a change in level of the control command signal and for discharging the single capacitor when a terminal voltage appearing across the single capacitor coincides with a predetermined reference level,

detecting circuit means for detecting coincidence between said terminal voltage and said predetermined reference level to thereby generate a detection signal,

hold circuit means for holding the control signals in response to a change in level of said control command signal until generation of said detection signal,

output circuit means for outputting said control signals for controlling said switching elements in response to said detection signal, and ·

circuit means for determining the duration of the time gap on the basis of time taken for charging the single capacitor.

5,532,563
DISK DEVICE WITH AUXILIARY BATTERY AND START METHOD THEREOF

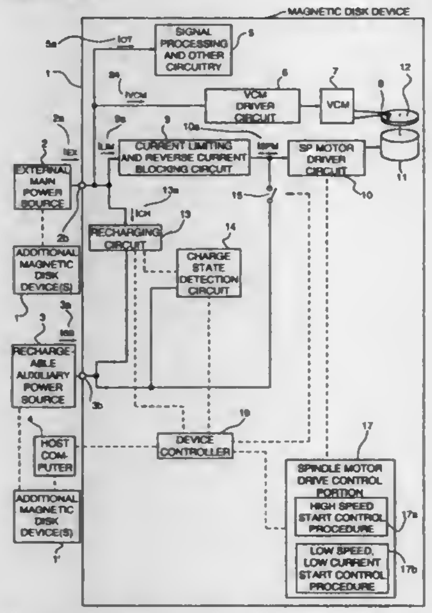
Kouji Kodama, Odawara; Hiroshi Nishida, Naka-gun; Hideaki Amano, Odawara, and Toshio Matsushita, Ashigarakami-gun, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,234

Claims priority, application Japan, Jun. 10, 1993, 5-138672

Int. Cl.^{6} H02P *1/00*

U.S. Cl. 318—440 **16 Claims**


MAGNETIC DISK DEVICE
SIGNAL PROCESSING AND OTHER CIRCUITRY
VCM DRIVER CIRCUIT
VCM
CURRENT LIMITING AND REVERSE CURRENT BLOCKING CIRCUIT
SP MOTOR DRIVER CIRCUIT
EXTERNAL MAIN POWER SOURCE
RECHARGING CIRCUIT
CHARGE STATE DETECTION CIRCUIT
ADDITIONAL MAGNETIC DISK DEVICE(S)
RECHARGEABLE AUXILIARY POWER SOURCE
HOST COMPUTER
DEVICE CONTROLLER
SPINDLE MOTOR DRIVE CONTROL PORTION
HIGH SPEED START CONTROL PROCEDURE
LOW SPEED, LOW CURRENT START CONTROL PROCEDURE
ADDITIONAL MAGNETIC DISK DEVICE(S)

1. A disk device for use with a computer having an external power source, comprising:

at least one disk and head assembly, said disk being driven in rotation by a DC spindle motor, and means for driving said DC spindle motor;

means for electrically connecting the external power source to said disk device including means for providing a first current from said external power source to the spindle motor drive means;

means for connecting the disk device to an auxiliary power source;

means electrically connected with said external power source and said auxiliary power source for recharging said auxiliary power source;

current adding means connected to said spindle motor drive means and receiving a second current from said auxiliary power source for selectively adding said second current to said first current during an initial period of driving said DC spindle motor with said spindle motor drive means to an operational speed of rotation that is required for read and write access of the disk; and

means for controlling said current adding means to selectively add said second current to said first current during said initial period and to charge said auxiliary power source with said external power source after said initial period while rotating said DC spindle motor.

5,532,564
CONTROL UNIT FOR AN ELECTRIC DRIVE MOTOR OF INDUSTRIAL PROCESSING MACHINERY

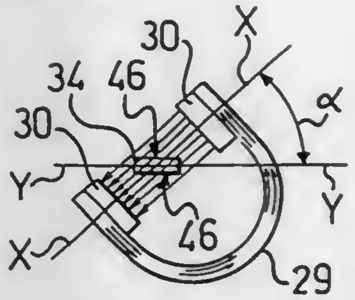
Alessandro Zorzolo, Pavia, Italy, assignor to Comelz S.p.A., Pavia, Italy

Continuation of Ser. No. 187,423, Jan. 25, 1994, abandoned, which is a continuation of Ser. No. 853,932, Mar. 19, 1992, Pat. No. 5,336,981. This application Jan. 24, 1995, Ser. No. 377,673

Claims priority, application European Pat. Off., Mar. 27, 1991, 91830119

Int. Cl.^{6} D05B *69/06*

U.S. Cl. 318—551.000 **4 Claims**



1. A control unit for an electric drive motor of industrial processing machinery comprising:

magnetic flux generating means and Hall effect sensor means, the magnetic flux generating means and the Hall effect sensor means disposed adjacent to each other at a fixed distance relative to each other, the magnetic flux generating means and Hall effect sensor means being rotatably movable relative to each other, such that the Hall effect sensor means are swept rotatably by a magnetic flux generated by the magnetic flux generating means, an electric signal generated by the Hall effect sensor means being variable linearly with the amount of relative rotation for linearly controlling the electric drive motor, said magnetic flux generating means comprising a pair of oppositely located magnets, having opposite poles facing each other, where between the Hall effect sensor is disposed.

5,532,565
CONTROLLER

Michaël J. Vervoordeldonk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

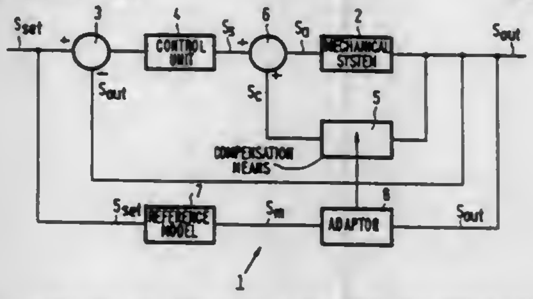
Continuation of Ser. No. 164,226, Dec. 7, 1993, abandoned.

This application Apr. 11, 1995, Ser. No. 420,895

Claims priority, application European Pat. Off., Dec. 7, 1992, 92203795

Int. Cl.^{6} G05B *13/00;13/04*

U.S. Cl. 318—610 **7 Claims**



1. A controller for controlling a non-linear mechanical system having a plurality of degrees of freedom in accordance with a setpoint signal representing a desired position of the mechanical system with respect to at least one of said plurality of degrees of freedom, the mechanical system being representable as a combination of a linear part and a non-linear part and producing an output signal representing a current position of the mechanical system with respect to said at least one degree of freedom, the controller comprising:

a subtracter for subtracting the output signal of the mechanical system from the setpoint signal to produce an error signal;

a control unit for receiving the error signal and producing a control signal;

compensation means to compensate the non-linear behavior of the mechanical system, the compensation means producing an output signal;

an adder for adding the output signal of the compensation means to the control signal to produce an input signal to the mechanical system;

a reference model of the control unit in series with the linear part of the mechanical system, the reference model receiving the setpoint signal as an input signal and producing an output signal; and

adaptation means for adapting the compensation means in dependence on a difference between the output signal of the mechanical system and the output signal of the reference model.

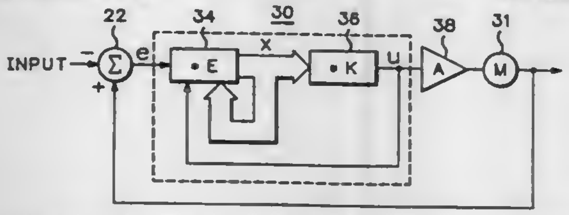
5,532,566
VOLTAGE MODE DRIVE OF SERVO SYSTEM

Edward F. Burke, Lake Oswego, and David L. Knierim, Wilsonville, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Feb. 1, 1995, Ser. No. 382,348

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 318—650 **9 Claims**



1. A method of voltage mode driving a servo system comprising the steps of:

measuring an instantaneous parameter for the servo system;

estimating a set of parameters for the servo system, one of the parameters being current, as a function of a prior estimated set of parameters, a voltage control signal, the instantaneous parameter, and a reference signal;

generating from the estimated set of parameters for the servo system the voltage control signal for driving the servo system;

voltage amplifying the voltage control signal before application for driving the servo system.

5,532,567
CONTROLLER FOR SWITCHED RELUCTANCE MOTOR

Shinichiro Iwasaki, Anjou; Masanori Sugiyama, Nishio; Chiaki Umemura, Toyohashi; Akemi Ookawa, Chita gun, and Hisayoshi Takahashi, Kariya, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

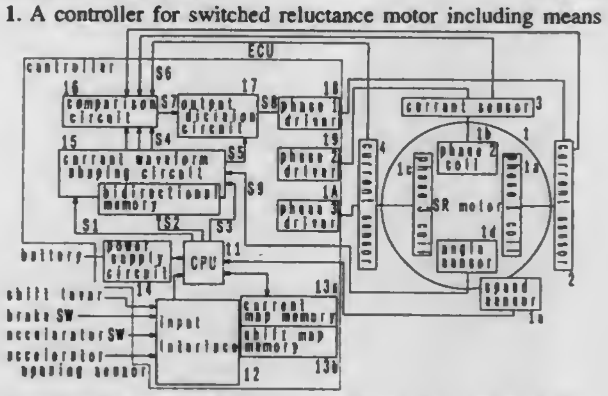
Filed Mar. 28, 1995, Ser. No. 411,974

Claims priority, application Japan, Mar. 31, 1994, 6-062280

Int. Cl.^{6} H02P *7/05*

U.S. Cl. 318—701.000 **7 Claims**

1. A controller for switched reluctance motor including means



for detecting a rotational position of a rotor and in which the energization of an electrical coil which is used to drive the rotor is switched at a particular rotational position of a respective pole on the rotor; characterized by position modifying means for providing an offset between the particular rotational position and an actual position where the energization of the coil is switched and for periodically modifying the magnitude of such offset.

5,532,568
METHOD FOR BRAKING AN ALTERNATING-CURRENT MOTOR

Ari Huttunen, Espoo, Finland, assignor to ABB Industry Oy, Helsinki, Finland

Filed Mar. 6, 1995, Ser. No. 399,372

Claims priority, application Finland, Mar. 24, 1994, 941404

Int. Cl.^{6} H02P *3/18*

U.S. Cl. 318—757 **2 Claims**

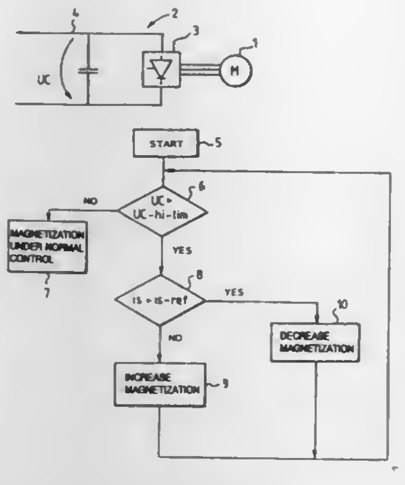
1. Method for braking an alternating-current motor when the alternating-current motor is supplied by a frequency converter comprising an intermediate circuit, the method comprising the steps of

monitoring the voltage of the intermediate circuit;

increasing magnetization of the motor when the voltage of the intermediate circuit reaches a predetermined value in order to increase the thermal losses of the motor; and

removing said increased magnetization of the motor when the voltage of the intermediate circuit drops below said predetermined value.

2. Method according to claim 1, wherein the increase of the magnetization of the motor is effected by increasing the magnetization current at the most up to a predetermined limit.



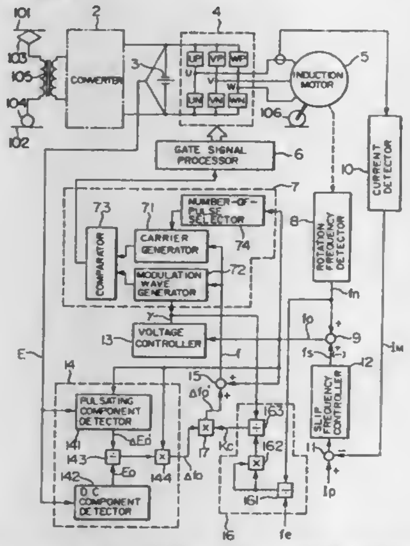
5,532,569
INVERTER CONTROL APPARATUS

Tokunosuke Tanamachi; Kiyoshi Nakamura, both of Katsuta; Kiyoshi Nakata, Ibaraki-ken; Yoshio Tsutsui; Wataru Miyake, both of Katsuta, and Katsuaki Suzuki, Kitaibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 201,449, Jun. 2, 1988, Pat. No. 5,250,890. This application Oct. 4, 1993, Ser. No. 131,308

Int. Cl.^{6} H02P *5/34*

U.S. Cl. 318—802 **21 Claims**



1. An electric railway vehicle control system comprising:

means for receiving a single-phase a.c. voltage;

a convertor for converting said single-phase a.c. voltage to a d.c. voltage;

a PWM inverter for inverting the d.c. output of said convertor to a variable frequency a.c. voltage;

a three-phase induction motor supplied with the a.c. output of said inverter to drive electric railway vehicles;

means for commanding an output frequency of said inverter;

means for controlling the output frequency of said inverter in accordance with a frequency command of said commanding means;

means for controlling the output voltage of said inverter in both of:

a) a variable voltage, variable frequency (VVVF) control mode for changing the output voltage of said inverter substantially relative to a change in the output frequency of said inverter; and

b) a constant voltage, variable frequency (CVVF) control mode for fixing the output voltage of said inverter to a substantially constant value;

means for detecting a rectification ripple in a frequency band including a frequency double the frequency of said single-phase a.c. voltage, included in the d.c. input voltage to said inverter; and

means for adjusting the output frequency of said inverter in accordance with an output of said rectification ripple detecting means.

5,532,570
VARIABLE SPEED CONTROL APPARATUS FOR INDUCTION MOTOR

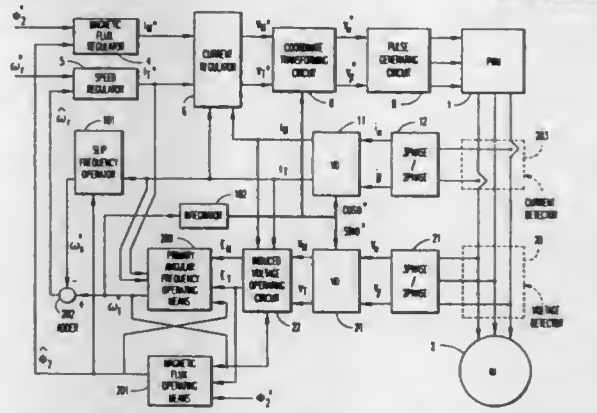
Hirokazu Tajima, and Hidetoshi Umida, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 20, 1995, Ser. No. 407,312

Claims priority, application Japan, Mar. 18, 1994, 6-074401

Int. Cl.^{6} H02P *5/40*

U.S. Cl. 318—809 **18 Claims**



1. A variable speed control apparatus for an induction motor comprising:

power converting means, capable of controlling magnitude, frequency and phase of a voltage supply generated by said power converting means, for powering said induction motor;

means for detecting a primary current of said output voltage supply and resolving said primary current into a magnetizing current component and a torque current component;

means for generating an angular position of a magnetic flux, used for independently controlling said magnetizing current component and said torque current component, whereby at least a torque of said induction motor is controlled;

means for generating an induced voltage vector of said induction motor;

means for generating a magnetic flux axis component of said induced voltage vector and a torque axis component of said induced voltage vector responsively to said angular position of a magnetic flux;

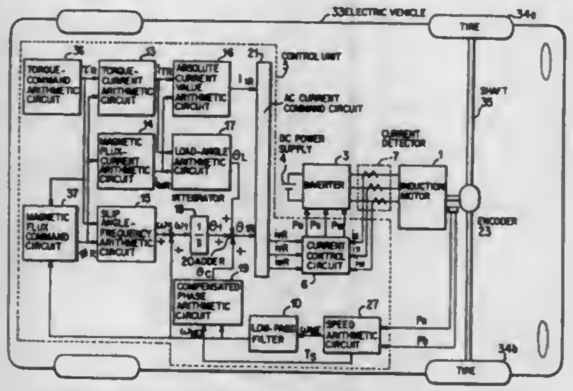
first regulating means for regulating said magnetic flux axis component at zero by generating a first control signal to which said magnetic flux axis is responsive;

means for adjusting a gain of said first control signal in a field weakening operating range of said induction motor to produce a gain-adjusted control signal;

means for generating an absolute value of said torque axis component and dividing said absolute value by an equivalent of a magnetic flux of said induction motor; and

means for subtracting said gain-adjusted control signal from a result of said dividing and making a polarity of a result of said subtracting equal to a polarity of said magnetic flux axis component to generate a primary angular frequency command signal.

5,532,571
CONTROL APPARATUS FOR INDUCTION MOTOR
Ryoso Masaki, Hitachi, and Nobuyoshi Mutob, Hitachinaka, both of, Japan, assignors to Hitachi, Ltd., Japan
Filed Apr. 21, 1995, Ser. No. 426,913
Claims priority, application Japan, Apr. 21, 1994, 6-082840
Int. Cl.^{6} H02P ***5/40***
U.S. Cl. 318—809 **8 Claims**


33 ELECTRIC VEHICLE
TIRE
34a
34b
SHAFT 35
ENCODER 23
CONTROL UNIT
AC CURRENT COMMAND CIRCUIT
DC POWER SUPPLY
CURRENT DETECTOR
INVERTER
INDUCTION MOTOR
TORQUE-COMMAND ARITHMETIC CIRCUIT
TORQUE-CURRENT ARITHMETIC CIRCUIT
ABSOLUTE CURRENT VALUE ARITHMETIC CIRCUIT
MAGNETIC FLUX-CURRENT ARITHMETIC CIRCUIT
LOAD-ANGLE ARITHMETIC CIRCUIT
INTEGRATOR
MAGNETIC FLUX COMMAND CIRCUIT
SLIP ANGLE-FREQUENCY ARITHMETIC CIRCUIT
20 ADDER
CURRENT CONTROL CIRCUIT
COMPENSATED PHASE ARITHMETIC CIRCUIT
LOW-PASS FILTER
SPEED ARITHMETIC CIRCUIT

1. A control apparatus for an induction motor, comprising:

a speed detection arrangement for detecting speed of the induction motor, said speed detection arrangement having a speed detection characteristic associated therewith;

a torque command circuit which generates a torque command;

a magnetic flux phase arithmetic unit which computes a magnetic flux phase of the induction motor based on at least the speed of the motor detected by said speed detection arrangement, and the torque command;

a vector arithmetic unit for computing vector control parameters based on the magnetic flux phase; and

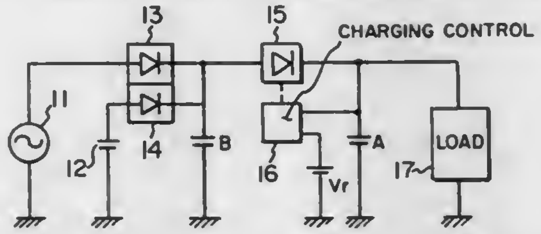
a torque control unit for controlling the output torque of the induction motor in accordance with the torque command; wherein

said torque control unit has a compensation arithmetic unit for computing a phase compensation value which corrects said magnetic flux phase computed by said magnetic flux phase arithmetic unit to compensate for the speed detection characteristic of said speed detection arrangement, said phase compensation value being based on the speed detection characteristic of the speed detection arrangement, and the motor speed; and

a phase correction unit for correcting the magnetic flux phase by adding the phase compensation value to the magnetic flux phase computed by said magnetic flux phase arithmetic unit.

5,532,572
STORAGE CAPACITOR POWER SUPPLY
Michio Okamura, Kanagawa, Japan, assignor to JEOL Ltd., Japan
Continuation of Ser. No. 41,543, Apr. 2, 1993. This application May 31, 1995, Ser. No. 454,841
Claims priority, application Japan, Apr. 3, 1992, 4-82173; Apr. 3, 1992, 4-82174; Mar. 4, 1993, 5-43467
Int. Cl.^{6} H02J ***7/00***
U.S. Cl. 320—1 **4 Claims**

1. A storage capacitor power supply for supplying electric power



to a load from charged capacitors, said power supply comprising:

a first capacitor block connected with the load and supplying electric power directly to the load;

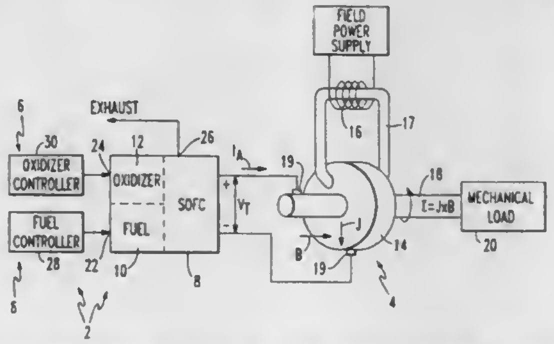
a charging circuit for electrically charging the first capacitor block;

a second capacitor block connected with the first capacitor block via the charging circuit and acting as a power supply that electrically charges the first capacitor block; and

a charging control circuit which detects the terminal voltage of the first capacitor block and controls the charging circuit in such a way that the first capacitor block is charged by the second capacitor block until the detected voltage reaches a given voltage;

wherein the internal resistance of the first capacitor block is smaller than that of the second capacitor block, and wherein the second capacitor block is larger than the first block in capacity.

5,532,573
RECONFIGURABLE HYBRID POWER GENERATION SYSTEM
Donald W. Brown, Gibsonia; William F. Hannan, III, Monroeville, and Dennis Pavlik, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sep. 7, 1994, Ser. No. 301,768
Int. Cl.^{6} H02P ***9/00;*** **H01M** ***8/10***
U.S. Cl. 322—22 **12 Claims**



5. An apparatus for powering a load, said apparatus comprising:

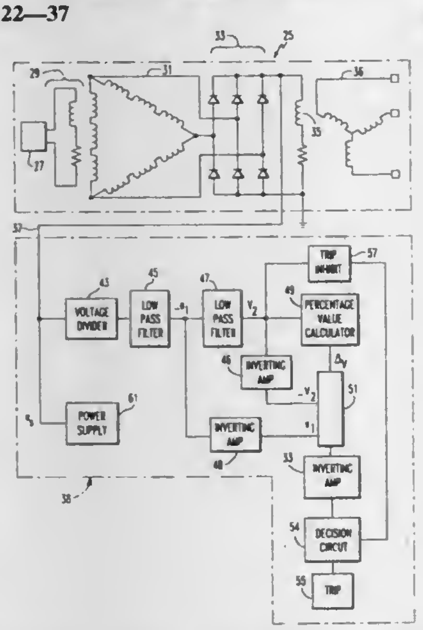
fuel cell means including a fuel input, an oxidizer input, a thermal exhaust output, and a plurality of sub-modules, each of the plurality of sub-modules for producing fuel cell electric power at a plurality of terminals;

turbine-generator means including generator means and turbine means for driving said generator means, said turbine means having a thermal exhaust input interconnected with the thermal exhaust output of said fuel cell means, said generator means having a plurality of armature turns, each of the plurality of armature turns for producing generator electric power at a plurality of terminals;

a plurality of connection means for interconnecting the plurality of terminals of said fuel cell means with the plurality of terminals of said generator means in order to provide a configurable voltage-current profile for said load; and

control means for controlling at least one of the fuel input and the oxidizer input of said fuel cell means.

5,532,574
BRUSHLESS EXCITER PROTECTION CIRCUIT
William R. Wolfe, Penn Hills, and Raymond M. Calfo, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 28, 1994, Ser. No. 219,125
Int. Cl.^{6} H02H ***1/00;7/06***
U.S. Cl. 322—37 **16 Claims**

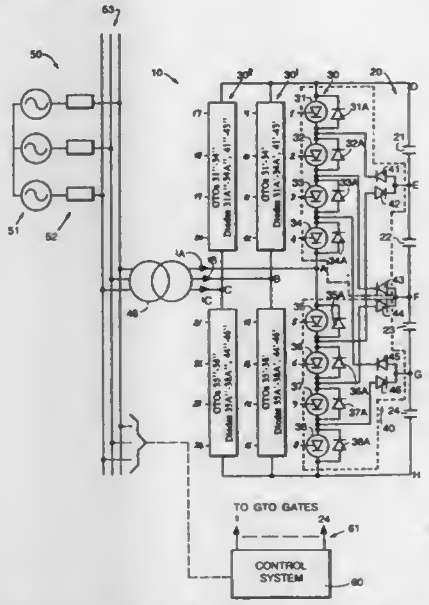


1. In a brushless excitation system containing a multiphase ac exciter and a diode bridge rectifier assembly having an output voltage, an exciter protection assembly comprising:

means generating a reference signal which tracks a dc value of said output voltage of said diode bridge rectifier assembly, said means generating said reference signal including voltage divider means for scaling down said output voltage from said diode bridge by a preselected factor and said means generating said reference signal also including at least one low pass filter means for removing a high frequency ripple from said output voltage; and

means generating from said reference signal a tolerance band associated with said reference signal and including comparison means generating an output signal when said output voltage of said diode bridge rectifier assembly is outside said tolerance band, said means generating said tolerance band including means for obtaining a predetermined percentage of an average dc value of said reference signal and said tolerance band being associated with said percentage.

5,532,575
MULTILEVEL CONVERTER WITH CAPACITOR VOLTAGE BALANCING
John D. Ainsworth, and David R. Trainer, both of Stafford, United Kingdom, assignors to GEC Alsthom Limited, United Kingdom
Filed Jan. 6, 1995, Ser. No. 369,474
Claims priority, application United Kingdom, Jan. 8, 1994, 9400285
Int. Cl.^{6} H02M ***1/12***
U.S. Cl. 323—211 **22 Claims**



1. A multilevel convertor for connection to a single-phase or multiphase AC system, the convertor comprising:

a plurality of series-connected capacitors, the capacitors being arranged, when the convertor is switched on, to be charged to an initial DC voltage,

a plurality of switch means for each phase for connecting each node of the plurality of capacitors in turn onto the AC system, said switch means having respective control inputs,

a main control loop arrangement for controlling the timing of the coupling of each node of the plurality of capacitors in turn onto the AC system, the main control loop arrangement including, for each phase:

a switching control means for performing switching operations on said switch means, said switching control means having a control input and a plurality of outputs connected to respective control inputs of said switch means,

an error signal producing means for producing an error signal representative of a difference between an actual value of an electrical quantity to be controlled and a reference value of said quantity, an output of said error signal producing means being connected to said control input of said switching control means,

a plurality of subsidiary control loops for each phase, said plurality of subsidiary control loops being one fewer in number than said plurality of capacitors and being associated with respective pairs of said capacitors, each subsidiary control loop including a first combining means having a first input for receiving a first signal proportional to a difference between mean DC voltage levels on a pair of capacitors associated with that subsidiary control loop, and a second input for receiving a second signal proportional to tap currents entering a pair of nodes associated with said pair of capacitors, the first combining means having an output which is taken to an input of said error signal producing means such that said output signal of said first combining means is additively combined with said error signal, said subsidiary control loops serving to maintain a predetermined relationship between the mean DC voltage levels on said plurality of capacitors.

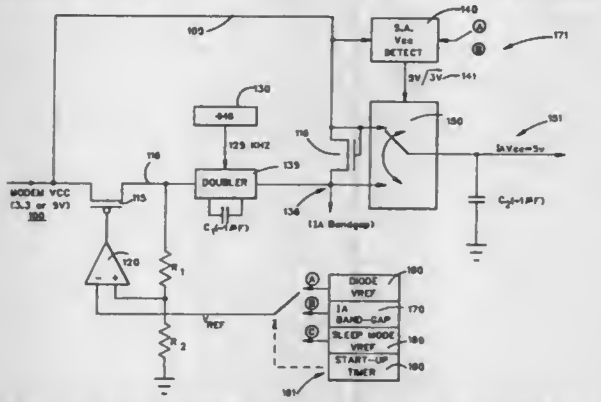
5,532,576
EFFICIENT, WELL REGULATED, DC-DC POWER SUPPLY UP-CONVERTER FOR CMOS INTEGRATED CIRCUITS

Edward MacRobbie, Lake Forest; Daryush Shamlou, Laguna Niguel; Rajiv Gupta, Brea, and Raouf Halim, Laguna Niguel, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Apr. 11, 1994, Ser. No. 226,197

Int. Cl.^{6} G05F *1/575*

U.S. Cl. 323—274 **4 Claims**



1. An on-board regulated voltage up-converter for converting a first DC voltage at a first node from an electronic system to a second DC voltage for an integrated device at a second node, comprising:

reference generator means for generating a predetermined reference voltage at start-up;

voltage regulator means coupled to said first node for regulating said first voltage at substantially a third voltage at a third node;

feedback means coupled to said third node for feeding said third voltage back to said voltage regulator means to adjust the level of said third voltage at said third node according to how said third voltage is relative to said predetermined reference voltage;

voltage multiplier means coupled to said third node and to said second node for multiplying said third voltage to generate an output voltage, wherein said output voltage is substantially equal to said second voltage, and

bypass means coupled between said first and second nodes for directly coupling said first node to said second node if said first voltage is already substantially equal to said second voltage upon power-up.

5,532,577
METHOD AND APPARATUS FOR MULTIPLE OUTPUT REGULATION IN A STEP-DOWN SWITCHING REGULATOR

Tunc Doluca, Saratoga, Calif., assignor to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Filed Apr. 1, 1994, Ser. No. 222,461

Int. Cl.^{6} G05F *1/56*

U.S. Cl. 323—282 **30 Claims**

18. In a switching regulator having a magnetic storage device including a first output and a second output, a first switching device coupled to a primary winding of said magnetic storage device, a second switch device coupled to said primary winding of said magnetic storage device, a control circuitry coupled to said first output, to said second output, to said first switching device and to said second switching device, a current sensing device measuring a current through said primary winding of said magnetic storage device, said current sensing device coupled to said primary winding and to said control circuitry, a method of regulating output voltages of said switching regulator comprising the steps of:

detecting a voltage of said first output being in regulation;

detecting a voltage of said second output being out of regulation by comparing the voltage of said second output to a first reference voltage;

turning on said first switching device;

turning off said first switching device;

turning on said second switching device;

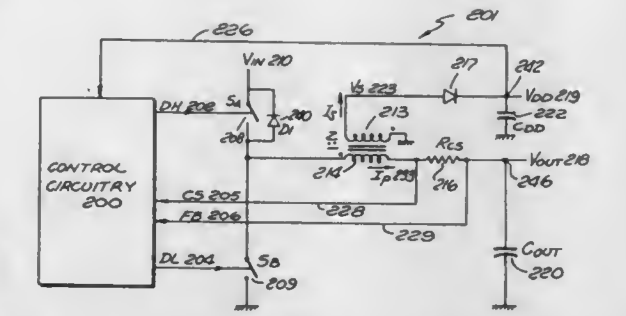
turning off said second switching device when one of a first event, a second event, a third event and a fourth event occurs;

wherein said first event is said current becoming substantially zero;

wherein said second event is said current exceeding a predetermined limit value;

wherein said third event is an end of a clock cycle;

wherein said fourth event is an end of a pre-determined time period.



5,532,578
REFERENCE VOLTAGE GENERATOR UTILIZING CMOS TRANSISTOR

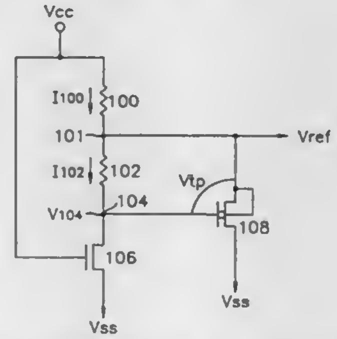
Seung-Hun Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 28, 1993, Ser. No. 68,546

Claims priority, application Rep. of Korea, May 30, 1992, 9411/1992

Int. Cl.^{6} G05F *3/16*

U.S. Cl. 323—313 **17 Claims**



1. A reference voltage generating circuit, comprising:

a source voltage terminal connected to an external source voltage;

a ground terminal;

a reference voltage terminal at which a reference voltage is apparent;

a first resistor connected between said source voltage terminal and said reference voltage terminal;

a second resistor connected between said reference voltage terminal and a node;

a first MOS transistor of first conductivity type having a channel, said channel having a predetermined resistance and being connected between said node and said ground voltage terminal, and a gate connected to said source voltage terminal; and,

a second MOS transistor of second conductivity type having a predetermined threshold voltage, a channel connected between said reference voltage terminal and said ground voltage terminal, and a gate connected to said node.

5,532,579
TEMPERATURE STABILIZED LOW REFERENCE VOLTAGE GENERATOR

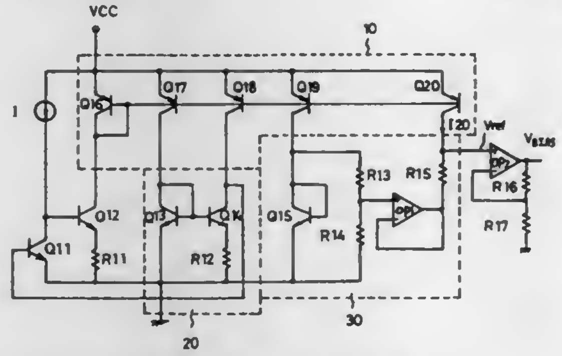
Seung K. Park, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 271,816

Claims priority, application Rep. of Korea, Feb. 7, 1994, 2235/1994

Int. Cl.^{6} G05F *3/16*

U.S. Cl. 323—314 **5 Claims**



1. A reference voltage generator comprising:

a current mirror circuit for being connected to a power supply voltage and having a plurality of transistors which are coupled in parallel to said power supply voltage;

a reference current circuit, connected between said current mirror circuit and a ground, for generating a reference current in accordance with a differential operation;

feedback means for applying said reference current to said current mirror circuit; and

a constant voltage circuit having a first operational amplifier, with an input terminal of said first operational amplifier being connected to said current mirror circuit for generating said reference voltage.

5,532,580
CIRCUIT FOR WEIGHTED ADDITION

Guoliang Shu; Weikang Yang; Wiwat Wongwarawipat, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan, Inc., Tokyo, and Sharp Corporation, Osaka, both of, Japan

Continuation of Ser. No. 964,144, Oct. 21, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 259,168

Claims priority, application Japan, Oct. 20, 1992, 4-306467

Int. Cl.^{6} G05B *24/02*

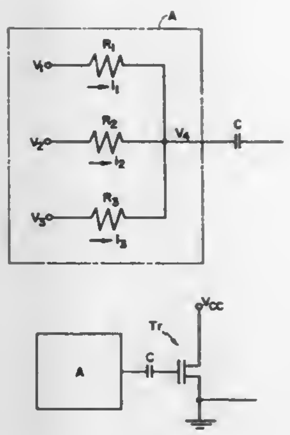
U.S. Cl. 323—354 **28 Claims**

20. A circuit for weighted addition comprising:

a field effect transistor having a first terminal and a second terminal, said first terminal being a gate and said second terminal providing an output signal representative of a weighted addition sum;

a plurality of resistance elements, each resistance element having a first and second end, the first end of each resistance element impressed with a voltage representative of an addend of said weighted addition, the resistance of each resistance element being indicative of a weight to be applied to its respective voltage, and the second end of each resistance element connected to the gate of the transistor for providing a signal representative of the resistance element's respective addend after weighting; and

a capacitor connected between the gate of the transistor and the second end of each resistance element.



5,532,581
CONNECTOR FOR MEASURING APPARATUS

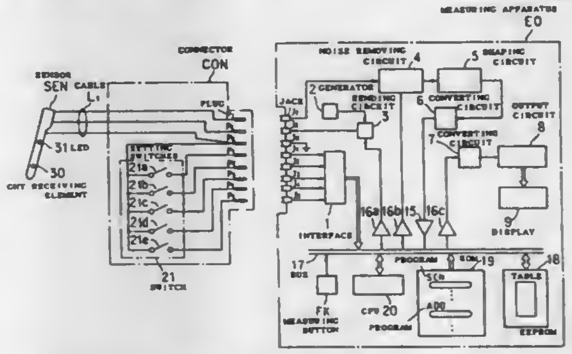
Tadahiro Ohkura; Toshiyuki Yoshida; Mitsuru Kainuma, and Kazuo Aoki, all of Yokohama, Japan, assignors to Otax Co., Ltd., Japan

Filed May 10, 1994, Ser. No. 240,422

Claims priority, application Japan, May 13, 1993, 5-111754

Int. Cl.^{6} G01R *15/08*

U.S. Cl. 324—115 **2 Claims**



1. A connector apparatus for use in a measuring apparatus comprising:

a measuring unit containing a stored setting line scanning program,

a connector containing a plurality of setting switches set in ON/OFF states indicating one of a plurality of measurements and which are scanned by the setting line scanning program,

a sensor connected to the connector for performing the indicated measurement,

jacks in the measuring unit for being releasably engaged with the connector,

a sensor pulse transmitting circuit in the measuring unit for transmitting a sensor pulse via the jacks and the connector to the sensor,

a background noise eliminating circuit in the measuring unit for eliminating background noise in a signal input from the sensor via the jacks,

a sensing data shaping circuit in the measuring unit for shaping sensing data output from the background noise eliminating circuit,

a correction table in the measuring unit used in accordance with the setting line scanning program,

a correction calculation program in the measuring unit for correcting data read out from the sensor in accordance with the setting line scanning program, and

a corrected data outputting circuit in the measuring unit for outputting the corrected data which has been corrected in accordance with the correction calculation program.

5,532,582
ANALOG INPUT APPARATUS

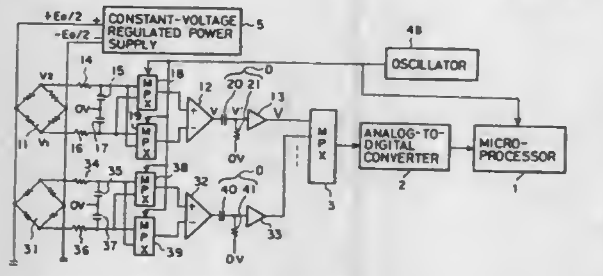
Noritaka Egami, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 957,032, Oct. 6, 1992, Pat. No. 5,357,189. This application Sep. 8, 1994, Ser. No. 302,340

Claims priority, application Japan, Oct. 7, 1991, 3-285454; Apr. 13, 1992, 4-118541

Int. Cl.^{6} G01R *1/02;* **G01B** *7/18*

U.S. Cl. 324—130 **10 Claims**



1. An analog input apparatus comprising:

a bridge measuring device connected to a bipolar voltage power supply;

at least two analog multiplexers each receiving at least two analog output voltages from said bridge measuring device and selectably outputting only one of said two analog output voltages as a multiplexer output signal;

a differential amplifier amplifying said multiplexer output signals from said analog multiplexers; and

an analog-to-digital converter receiving an analog signal from said amplifier and converting said analog signal into digital form for output.

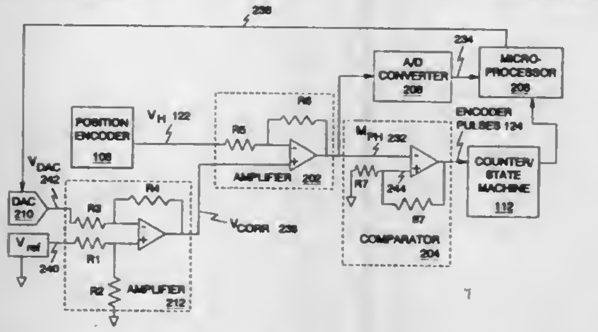
5,532,583
SYSTEM AND METHOD FOR CALIBRATING A POSITION SENSING SYSTEM

Bruce M. Davis, Longmont; Steven S. Stetler, Firestone, and Chester L. Rebman, Longmont, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed May 4, 1993, Ser. No. 56,625

Int. Cl.^{6} G01R *35/00;* **G01B** *7/00;7/14;* **H01L** *43/06*

U.S. Cl. 324—202 **14 Claims**



1. A system for positioning an object at a desired position, comprising:

a position sensor providing a first signal having a first DC offset level and an AC component, wherein said AC component varies as a function of the position of the object;

an amplifier, coupled to said position sensor, configured to receive the first signal and a second signal and to produce an amplified signal at an output thereof, wherein said amplified signal is substantially proportional to a difference between said first and second signals;

calibration means, coupled to said amplifier, for receiving said amplified signal, for determining a magnitude of said DC offset level as manifested in said amplified signal, and for producing said second signal, wherein said second signal is chosen such that the DC level manifested in said amplified signal is set to a predetermined level;

a comparator, coupled to said amplifier, configured to receive said amplified signal and to produce pulses representing a difference between said amplified signal and a reference voltage level; and

controller means, coupled to said comparator, for using said pulses to determine the position of the object, and to produce a control signal to a motor to adjust the position of the object.

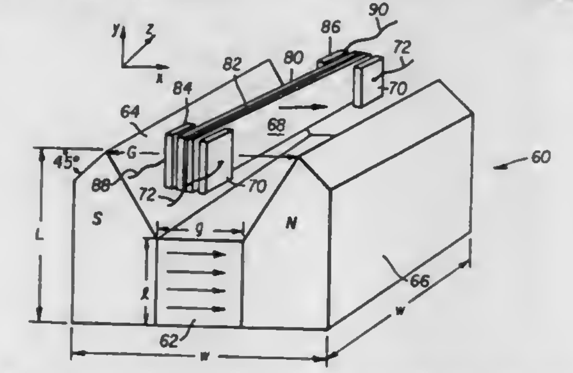
5,532,584
MR SENSOR INCLUDING CALIBRATION CIRCUIT WHEREIN SIGNALS ARE AVERAGED FOR DETERMINING A CORRECTION FACTOR AND POLE PIECES ARE SHAPED TO REDUCE FIELD IN GAP THEREBETWEEN

Frederick J. Jeffers, Escondido; Neil Smith, San Diego; Jay D. Freeman, Leucadia; Kent R. Gandola, Poway, and Peter V. Koeppe, San Diego, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 114,720, Aug. 31, 1993, Pat. No. 5,418,458. This application Oct. 28, 1994, Ser. No. 330,639

Int. Cl.^{6} G01R *35/02;33/02;* **G01D** *18/00*

U.S. Cl. 324—202 **5 Claims**



4. A magnetic assembly for both magnetizing and detecting magnetic documents comprising:

a permanent magnet;

first and second magnetically soft, high permeability pole pieces shaped to form a tapered variable gap-size magnetic circuit with said permanent magnet, wherein said permanent magnet is located at a first gap between said first and second pole pieces;

a magnetoresistive (MR) sensing element which is located at or near the center of a second gap between said first and second pole pieces, wherein said second gap and said MR sensing element are proximate to a magnetic document to be sensed by said MR sensing element; and wherein said magnetic field at said MR sensing element maintains said MR element in a proper magnetic bias state for achieving adequate sensitivity for detecting magnetic fields emanating from a magnetic document to be sensed, said magnetic field also magnetizes said object to be detected;

an electrical conductor which is adjacent to but electrically insulated from said MR element;

a signal processing circuit for processing said sensing signal produced by said MR sensing element; and

a calibration circuit for periodically passing a predetermined calibration current through said electrically conductive layer to produce a calibration magnetic field which is sensed by said MR sensing element to produce a calibration signal which is used to control a parameter of said signal processing circuit; wherein said first and second pole pieces have inner and outer corners and wherein at least one outer corner of said first and second pole pieces over which a sensed magnetic document passes last in time, is tapered so as to significantly reduce, at that location, the strength of the component of magnetic field that is substantially opposite in direction to that produced at or near the center of said second gap between said first and second pole pieces.

5,532,585
POSITION SENSOR INCORPORATING A PERMANENT MAGNET AND A MAGNETISM-SENSITIVE PROBE AND INCLUDING PRIMARY AND SECONDARY AIR GAPS

Claude Oudet, Besancon, and Daniel Prudham, Thise, both of, France, assignors to Moving Magnet Technologies S.A., Besancon, France

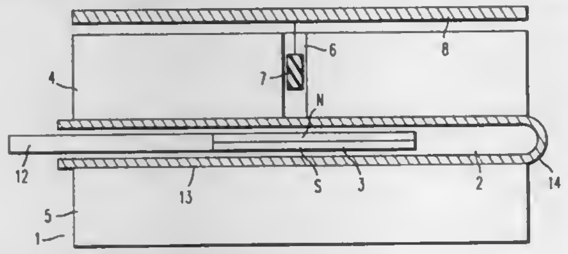
PCT No. PCT/FR93/00495, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/23720, PCT Pub. Date Nov. 25, 1993

PCT Filed May 19, 1993, Ser. No. 182,039

Claims priority, application France, May 19, 1992, 92 06052

Int. Cl.^{6} G01B *7/14;* **G01D** *5/14*

U.S. Cl. 324—207.22 **9 Claims**



1. A position sensor comprising:

first and second ferromagnetic components connected by at least one non-magnetic connection element, the first and second ferromagnetic components defining a principal air gap;

a permanent magnet formed to travel in the principal air gap;

a secondary air gap formed perpendicular to the principal air gap;

an induction measurement device including a magnetism sensitive probe formed in the secondary air gap; and

wherein a length of the principal air gap as measured in a direction of the travel of the permanent magnet is at least equal to 2(C+E), where C is a course of travel of the permanent magnet and E is a width of the principal air gap, and a length of the permanent magnet is at least equal to (C+E) and the course of travel of the permanent magnet is equal to (+C/2)+(−C/2) relative to the secondary air gap.

5,532,586
METHOD AND APPARATUS FOR DETECTING MAGNETIC DISK DEFECTS USING A COMPLETE DISK ERASURE MAGNET

Tetsuro Ishikawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 16, 1993, Ser. No. 17,861

Claims priority, application Japan, Feb. 18, 1992, 4-030257

Int. Cl.^{6} G01R *33/12;* **G11B** *27/36*

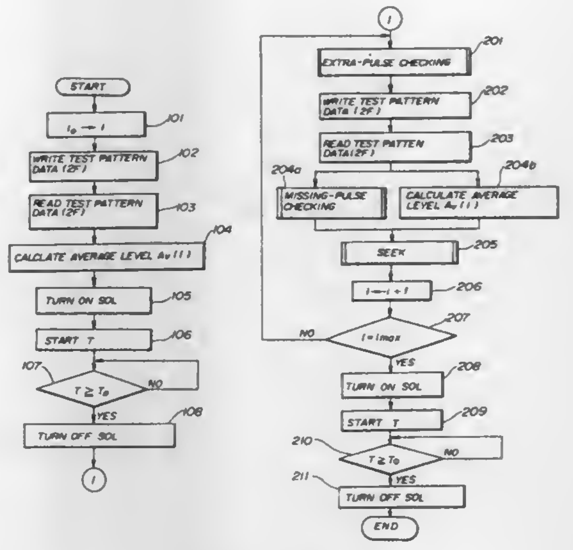
U.S. Cl. 324—212 **14 Claims**

1. A method for detecting defects of a revolving magnetic disk comprising the steps of:

(aa) obtaining, through initializing processing, reference data from said magnetic disk;

(a) erasing, during a single revolution of said magnetic disk, all the information from said whole magnetic disk; and

(b) testing, using said reference data, for every track, whether or not a defect is present on said magnetic disk, after said step (a).



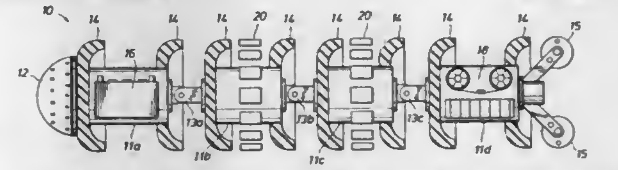
5,532,587
MAGNETIC FIELD ANALYSIS METHOD AND APPARATUS FOR DETERMINING STRESS CHARACTERISTICS IN A PIPELINE

Robert W. Downs, Houston, and James C. Simek, Richmond, both of Tex., assignors to Vetco Pipeline Services, Inc., Houston, Tex.

Filed Dec. 16, 1991, Ser. No. 808,425

Int. Cl.^{6} G01N *27/72;27/82;* **G01R** *33/12*

U.S. Cl. 324—220 **6 Claims**



1. An apparatus for use in detecting and locating occurrences of stress in the wall of a pipeline constructed of ferromagnetic metal, comprising:

means forming a pig body to be passed through the pipeline;

a plurality of means for magnetically coupling to the wall and for generating an electrical signal proportional to the density of the magnetic flux induced in each of the coupling means by the coupling, each of the coupling means being affixed to the body means;

means for generating correlating data;

means for recording the electric signal generated by each magnetic coupling means and for recording the correlating data generated by the data generating means; and

means for powering each magnetic coupling means, the data generating means, and the recording means.

5,532,588
CABLE ECCENTRICITY GAUGE INCLUDING AN E-SHAPED CORE AND A SENSOR COIL DISPOSED BETWEEN AN OUTER TIP OF THE CENTRAL LIMB AND THE CABLE

John Kyriakis, London, England, assignor to Beta Instrument Co., Ltd., Bucks, England

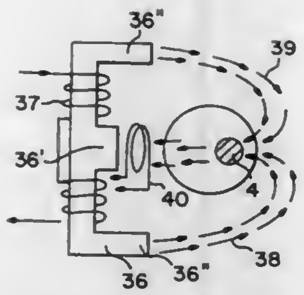
Continuation-in-part of Ser. No. 202,659, Feb. 28, 1994. This application Jul. 21, 1994, Ser. No. 278,227

Claims priority, application United Kingdom, Feb. 26, 1993, 9303978

Int. Cl.^{6} G01N *27/72;21/84*

U.S. Cl. 324—226 **12 Claims**

1. Apparatus for determining the position of the conductor core of an electrical cable being formed in an extrusion process com-



prising optical means for transmitting a beam of light across the cable, detector means for receiving the beam reflected from the cable and providing output signals representative of the position of the outer surface of the cable in relation to the optical means, electrical inductive means comprising an E-shaped core, with outer limbs and a central limb attached to a common yoke, wound with a current carrying induction coil for inducing magnetic fields in the vicinity of the cable, means for detecting variation in the field strength of said magnetic fields as a result of movement of the conductor core through said fields corresponding to a change in position of the conductor core from a desired-location within the cable thereby to provide a measure of the position of the conductor core in relation to the inductive means, and means for relating the position of said conductor core to the position of the outer surface of the cable whereby to determine the eccentricity or off-set position of the conductor core with respect to said desired location within the cable,

wherein said cable is placed at an outer tip of said central limb, whereby lines of force of said induced magnetic fields are set up respectively between the outer limbs and the central limb of the E-shaped core to provide a convergent magnetic flux through said cable from both of said outer limbs leading to the central limb, said detecting means being a search coil placed between an outer tip of the central limb of the E-shaped core and the cable so that the convergent magnetic flux engendered by said induced magnetic fields threads the search coil.

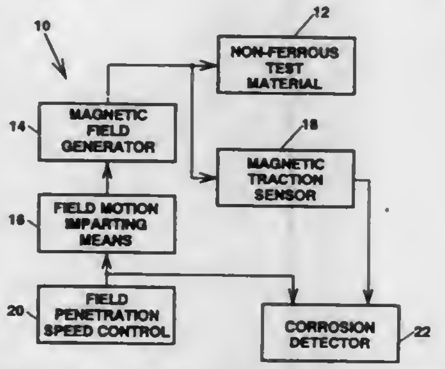
5,532,589
SUBSURFACE EXAMINATION OF NON-FERROUS MATERIAL FOR DETECTING CORROSION BY MEASURING MAGNETIC TRACTION

Paul M. Gammell, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1995, Ser. No. 450,774

Int. Cl.⁶ G01N *27/82;17/00;27/72*

U.S. Cl. 324—228 **9 Claims**


10
12
NON-FERROUS TEST MATERIAL
14
MAGNETIC FIELD GENERATOR
18
MAGNETIC TRACTION SENSOR
16
FIELD MOTION IMPARTING MEANS
20
FIELD PENETRATION SPEED CONTROL
CORROSION DETECTOR
22

7. A method of assessing subsurface corrosion of a non-ferrous metal comprising the steps of generating a magnetic field externally of the metal for penetration underlying a continuous surface portion thereof; imparting rotation to the magnetic field about an axis intersecting said continuous surface portion of the metal; sensing magnetic traction resulting from the rotation imparted to the magnetic field during said penetration of the metal and detecting said subsurface corrosion underlying said continuous surface portion of the metal as a function of the magnetic traction sensed.

5,532,590
APPARATUS FOR MEASURING CIRCUIT PARAMETERS WHEREIN ERRORS DUE TO TRANSMISSION LINES ARE PREVENTED

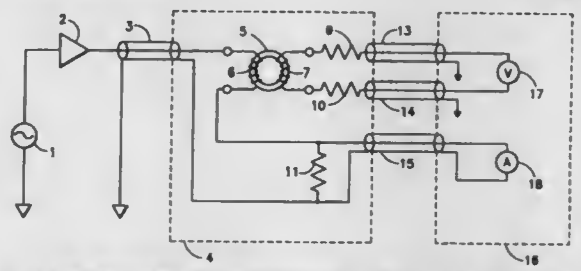
Haruhiko Yamanaka, Hyogo, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 17, 1994, Ser. No. 261,154

Claims priority, application Japan, Jun. 30, 1993, 5-187109

Int. Cl.⁶ G01R *27/00;33/12;33/14*

U.S. Cl. 324—239 **4 Claims**



1. A test apparatus for measuring a voltage or a current at a device under test (DUT), said test apparatus comprising:

means for applying an excitation frequency signal to said DUT; transmission line means, having an input and an output, for connecting said DUT to measurement meter means so as to enable measurement of electrical characteristics of said DUT, said transmission line means exhibiting a characteristic impedance, said output directly connected to said measurement meter means without intervening impedance matching means to enable said measurement meter means to accurately measure signals at said output; and

a resistor connecting said DUT to said input of said transmission line means, said resistor having a resistance equal to said characteristic impedance of said transmission line means, whereby measurement errors due to transmission characteristics of said transmission line means are prevented.

5,532,591
APPARATUS FOR DETECTING SURFACE FLAWS IN CYLINDRICAL ARTICLES BY MEANS OF ASYMMETRIC MAGNETIC DETECTION

Delmar L. Logue, R.R. #1, Box 60, Herrick, Ill. 62431

Continuation-in-part of Ser. No. 108,880, Aug. 13, 1993, abandoned, and a continuation-in-part of Ser. No. 842,244, Feb. 27, 1992, Pat. No. 5,404,101. This application Oct. 29, 1993, Ser. No. 142,933

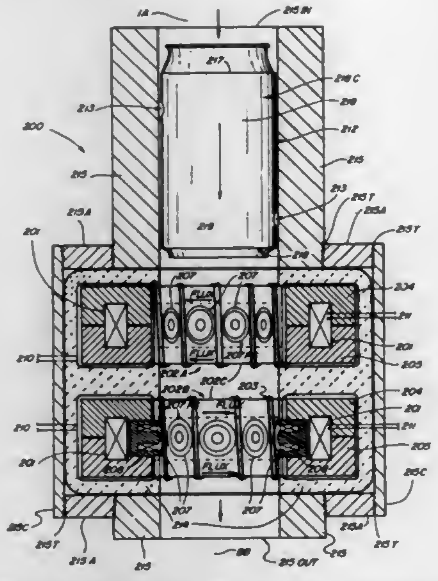
Int. Cl.⁶ G01N *27/82;27/90;* **G01R** *33/12;* **B07C** *5/344*

U.S. Cl. 324—242 **18 Claims**

1. Apparatus for detecting surface flaws in ferrous or non-ferrous cylindrical articles having central longitudinal axes, comprising:

a) guide means for guiding said cylindrical articles along a displacement path having a central longitudinal axis extending coaxially of said central longitudinal axes of said articles: and a pair of first and second multiple polar sensor assemblies, each disposed coaxially with said displacement path providing first and second inspection zones displaced axially in said displacement path, also each multiple polar sensor assembly generating a plurality of phase-amplitude modulated signals representive of the surface geometry of said article, each multiple polar sensor assembly comprising:

i) a hollow toroid core formed of ferromagnetic material having a plurality of bores in the lesser circumference wall of the hollow toroid core, the axes of said bores being disposed on a plurality of radial lines perpendicular to the central axis of the hollow toroid core, the central axis of the hollow toroid core being disposed coaxially with the central longitudinal axis of the said displacement path;



ii) a plurality of polar sensors mounted partially within the bores so as to provide an extending portion outside the surface of the hollow toroid core, each mounted polar sensor coupling a rotating magnetic field to the cylindrical article sidewall to induce eddy currents therein;

iii) each polar sensor generating a phase-amplitude modulated signal representative of a specimen flaw;

iv) a first excitation winding wound within the hollow toroid core for inducing a first magnetic field throughout the hollow toroid core, said first excitation winding having connecting leads;

iv) a second excitation winding wound around the outside of the hollow toroid core, being subdivided and wound between the extending portion of the mounted polar sensors, for flux symmetry, said second excitation winding for inducing a second magnetic field throughout the hollow toroid core;

v) sine-cosine excitation being applied to said first and second excitation windings to induce a rotating magnetic field throughout the hollow toroid core, the said rotating magnetic field having distributive axes perpendicular to the surface of the hollow toroid core everywhere;

vi) the hollow toroid core being separable for assembly;

vii) Faraday shielding surrounding a portion of the hollow toroid core, said shielding being grounded;

viii) signal processing means for receiving said plurality of signals to extract flaw components.

5,532,592
SQUID CONTROL APPARATUS WITH NON-CRYOGENIC FLUX-LOCKED LOOP DISPOSED IN CLOSE PROXIMITY TO THE SQUID

Mark S. Colclough, Sunnyvale, Calif., assignor to Conductus, Inc., Sunnyvale, Calif.

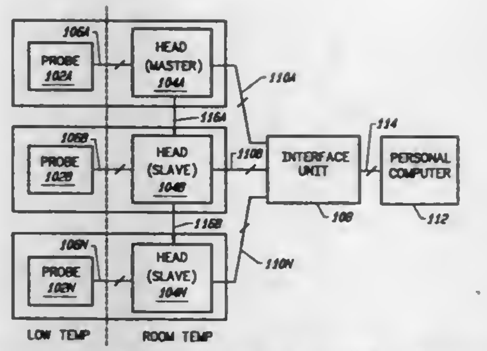
Filed Feb. 2, 1993, Ser. No. 12,500

Int. Cl.⁶ G01R *33/02;33/035*

U.S. Cl. 324—248 **26 Claims**

1. SQUID control apparatus, for use with a SQUID probe having a voltage output, comprising:

a head unit having electrical conductors to receive said voltage output of said probe, said head unit having, in conjunction with said probe, a non-cryogenic flux-locked loop having an analog output indicative of the magnetic flux applied externally to said probe;



a base unit having means for converting said analog output to a digital signal; and

cable means for carrying said analog output from said head unit to said base unit, said cable means distancing said base unit from said head unit.

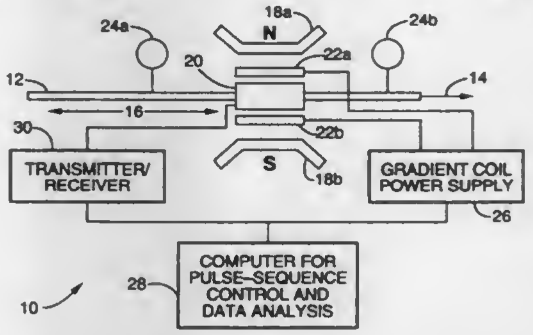
5,532,593
NUCLEAR MAGNETIC RESONANCE IMAGING RHEOMETER

James E. Maneval, Lewisburg, Pa.; Kathryn L. McCarthy; Michael J. McCarthy, both of Davis, Calif., and Robert L. Powell, Sacramento, Calif., assignors to The Regents of The University of California, Oakland, Calif.

Filed Nov. 1, 1993, Ser. No. 146,497

Int. Cl.⁶ G01V *3/00*

U.S. Cl. 324—306 **18 Claims**


18a
N
24a
24b
20
22a
12
14
16
22b
30
TRANSMITTER/ RECEIVER
S
18b
GRADIENT COIL POWER SUPPLY
26
28
COMPUTER FOR PULSE-SEQUENCE CONTROL AND DATA ANALYSIS
10

1. An apparatus for measuring rheological characteristics of a fluid, comprising:

(a) tube means for conducting the flow of a fluid, said fluid having an applied pressure gradient;

(b) imaging means for subjecting said fluid to nuclear magnetic resonance imaging and determining a velocity profile of said fluid as a function of radial position across said tube;

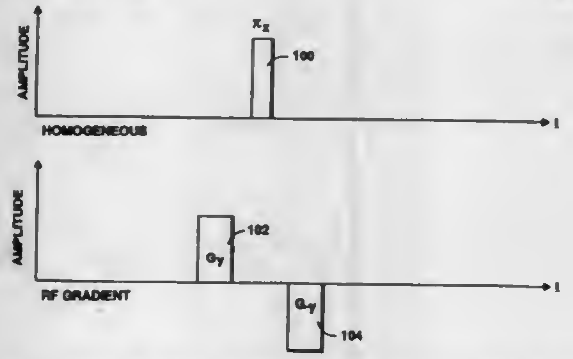
(c) pressure transducer means for measuring pressure of said fluid at a plurality of points along said tube and determining a pressure gradient between said points; and

(d) processing means for converting said velocity profile to shear rate values for said fluid, for converting said pressure gradient to shear stress values for said fluid, and for determining a shear stress-shear rate curve for said fluid at said applied pressure gradient, wherein rheological properties of the fluid can be determined from said shear stress-shear rate curve.

5,532,594
METHOD FOR SUPPRESSING SOLVENT RESONANCE SIGNALS IN NMR EXPERIMENTS

David G. Cory, Winchester, and Werner E. Maas, Lincoln, both of Mass., assignors to Bruker Instruments, Inc., Billerica, Mass.

Filed Apr. 6, 1994, Ser. No. 223,699
Int. Cl.^{6} G01R *33/20*
U.S. Cl. 324—307 **11 Claims**



7. A composite radio-frequency (RF) pulse sequence for use in an NMR experiment having a main static magnetic field applied parallel to the z-axis, the pulse sequence destroying coherences of resonance signals which fall into a predetermined frequency range, the pulse sequence comprising:

a first B_1, RF gradient pulse having a first phase;

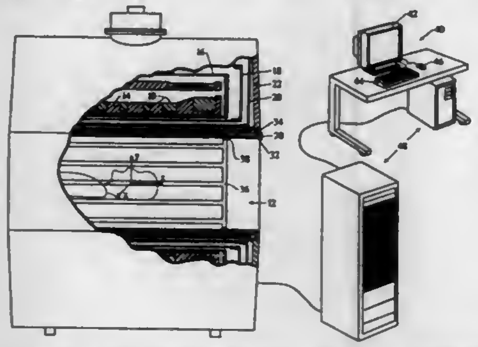
an inversion pulse sequence comprising at least one homogeneous frequency-selective pulse selected to invert spins with regard to whether their spin resonance signals fall within said predetermined frequency range; and

a second B_1, RF gradient pulse having a second phase relative to the first phase.

5,532,595
THREE-DIMENSIONAL SPIRAL ECHO VOLUME IMAGING

David A. Lampman, Eastlake, and Haiying Liu, Euclid, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Apr. 18, 1994, Ser. No. 228,661
Int. Cl.^{6} G01R *33/44*
U.S. Cl. 324—309 **19 Claims**



1. In an echo volume magnetic resonance imaging method in which selected dipoles in a volume of interest are induced to resonate by an RF pulse and in which a series of gradients are applied after the RF pulse and in the absence of any additional RF pulses such that resonance signal data is simultaneously detected and spatially encoded along a preselected data collection trajectory in three dimensions in k-space, the improvement comprising:

applying the magnetic field gradients such that the trajectory in k-space follows a three-dimensionally curving spiral trajectory through the three-dimensions.

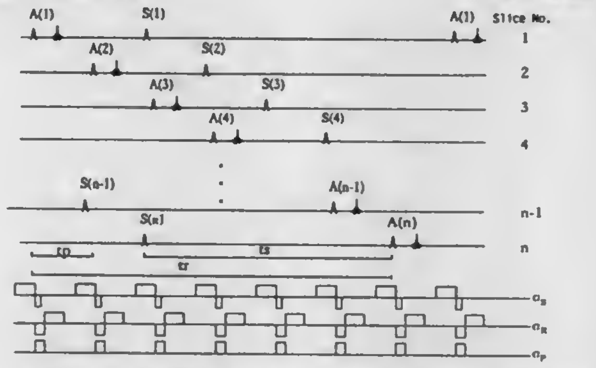
5,532,596
METHOD FOR THE MEASURMENT OF MAGNETIC RESONANCE ("CONTINUOUS SATURATION")

Jürgen Henning, Freiburg, Germany, assignor to Klinikum der Albert-Ludwigs Universitat Freiburg, Freiburg, Germany

Filed Feb. 23, 1995, Ser. No. 393,206

Claims priority, application Germany, Feb. 24, 1994, 44 05 979.5

Int. Cl.^{6} G01V *3/00*
U.S. Cl. 324—309 **6 Claims**



1. A multislice magnetic resonance imaging method comprising the steps of:

a) switching on a first slice selection gradient;

b) radiating a first radio frequency pulse in the presence of the first slice selection gradient to coherently excite a transverse magnetization in a first slice of a measured object;

c) switching on a first read gradient to dephase the coherent transverse magnetization;

d) switching on a second slice selection gradient having a gradient bandwidth and gradient steepness to rephase the dephased transverse magnetization;

e) radiating a second radio frequency pulse in the presence of the second slice selection gradient to rephase the dephased transverse magnetization;

f) switching on a second read gradient to generate a spin echo;

g) switching on a phase encoding gradient at a phase encoding time between the first radio frequency pulse and a read-out time of the transverse magnetization;

h) radiating, in the presence of a slice selection gradient, one of a saturation and an inversion radio frequency pulse displaced relative to the read-out time by a constant time interval to one of saturate and invert a read-out signal in dependence on a relaxation of the read-out signal during a time interval between the one of the saturation and the inversion pulse and the first radio frequency pulse;

i) repeating steps a) through h) on additional slices; and

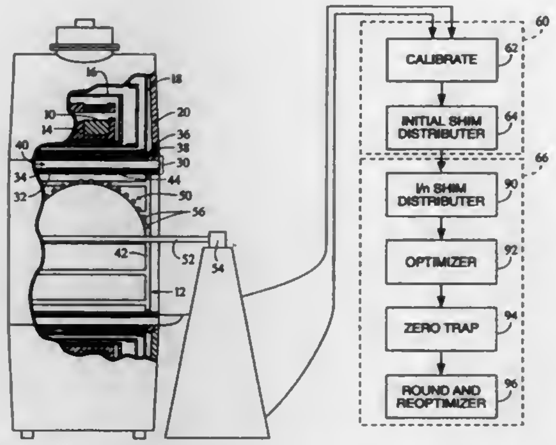
j) repeating steps a) through i) under variance of the phase encoding gradient to generate signals needed for two-dimensional Fourier transformation image reconstruction of the first and the additional slices.

5,532,597
PASSIVE SHIMMING TECHNIQUE FOR MRI MAGNETS

John V. M. McGinley, London, England; Vishnu C. Srivastava, Highland Heights, and Gordon D. DeMeester, Wickliffe, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Nov. 4, 1994, Ser. No. 334,813
Int. Cl.^{6} G01V *3/00*
U.S. Cl. 324—319 **12 Claims**

1. A magnetic resonance imaging apparatus comprising:



a bore for receiving a subject to be imaged, the bore having a diameter and an axial length with an axial length to diameter ratio of less than 2:1;

an annular magnet surrounding the bore to generate a temporally constant inhomogeneous magnetic field axially through the bore;

a radio frequency coil disposed around the bore and positioned to broadcast radio frequency signals into the bore and receive radio frequency signals from the bore;

a self-shielded gradient coil assembly disposed adjacent the radio frequency coil, the self-shielded gradient coil assembly including a primary gradient coil assembly having a smaller diameter and disposed adjacent the radio frequency coil and a secondary gradient coil assembly having a larger diameter, the primary and secondary gradient coil assemblies defining a shim receiving annular region therebetween;

an array of ferrous shim pockets disposed along an around the bore within the shim receiving annular region for receiving ferrous shims to shim magnet fields within the bore; and

an optimizing system including: a means for determining a residual magnetic field, the residual magnetic field being equal to a difference between (i) the inhomogeneous magnetic field and (ii) a predetermined target magnetic field, and a means for determining in each of R optimizations adjustments to a placement of the shims in 1/n of the shim pockets to generate a negative of the residual magnetic field, the determining means including:

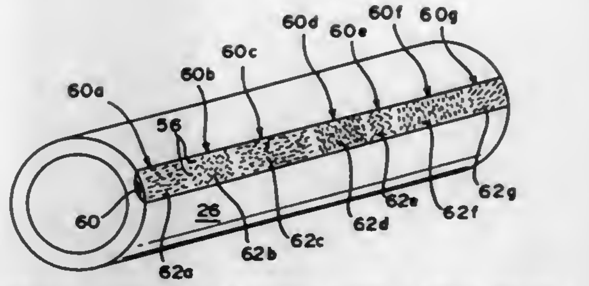
a distributor means for determining a group of 1/n shim pockets of the plurality of shim pockets, and

an optimizer for calculating for each of the 1/n shim pockets an optimal amount of the shimming material required to produce the negative residual magnetic field.

5,532,598
AMORPHOUS METAL TAGGING SYSTEM FOR UNDERGROUND STRUCTURES INCLUDING ELONGATED PARTICLES OF AMORPHOUS METAL EMBEDDED IN NONMAGNETIC AND NONCONDUCTIVE MATERIAL

William G. Clark, Jr., Murrysville Boro; Warren R. Junker, Monroeville; William A. Byers, Penn Hills Township; John J. Herald, Monroeville, and Rajender K. Sadhir, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1994, Ser. No. 248,905
Int. Cl.^{6} G01R *19/00;* G01V *3/08*
U.S. Cl. 324—326 **17 Claims**



1. An electromagnetic tagging system for remotely detecting and locating a structure formed from a non-electrically conductive, non-magnetic material that is situated behind a barrier having a control surface by a means for generating a fluctuating magnetic field, comprising:

at least one tag means integrated into said structure and including an amorphous metal target for generating a signal containing a response characteristic of amorphous metal when exposed to said fluctuating magnetic field, said target being formed from a plurality of elongated particles of a single alloy of amorphous magnetic metal embedded in the same electrically non-conductive and non-magnetic material forming the structure and having length to diameter aspect ratios of at least three to one, and being aligned substantially parallel and along their longitudinal axes with respect to one another and being sufficiently close end-to-end to be magnetically linked to one another to enhance the strength of said signal, and

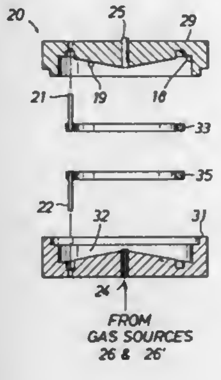
portable circuit means movable relative to said control surface for remotely detecting said characteristic response in said generated signal.

5,532,599
HIGH VOLTAGE SPARK EXCITATION AND IONIZATION SYSTEM INCLUDING DISC DETECTOR

Stanley D. Stearns, 1201 Archley Dr., Houston, Tex. 77055, and Wayne E. Wentworth, 614 E. Larkspur Cir., Pearland, Tex. 77584

Continuation-in-part of Ser. No. 662,149, Feb. 28, 1991, Pat. No. 5,153,519, and a continuation-in-part of Ser. No. 956,632, Oct. 5, 1992, Pat. No. 5,317,271, and a continuation-in-part of Ser. No. 176,968, Jan. 3, 1994, Pat. No. 5,394,092, and a continuation-in-part of Ser. No. 201,467, Feb. 25, 1994, Pat. No. 5,394,090, and a continuation-in-part of Ser. No. 201,469, Feb. 25, 1994, Pat. No. 5,394,091. This application Dec. 2, 1994, Ser. No. 349,495

Int. Cl.^{6} G01N *27/62;27/68*
U.S. Cl. 324—464 **16 Claims**



1. A charged particle detector comprising:
- (a) a circular closed chamber having a gas flow inlet and spaced outlet positioned to direct gas flow through said chamber and said chamber directs the gas flow in a circle therein;
- (b) spaced electrodes provided with a current sufficient to enable an electrical spark to be formed in a gap between said electrodes locating the spark thereacross, said electrodes being positioned to form a spark in gas in said chamber to create charged particles; and
- (c) a spaced detector electrode in said chamber for collection of charged particles wherein the charged particles move to said detector electrode to form a current indicative of a sample gas concentration in said chamber.

5,532,600
METHOD OF AND APPARATUS FOR EVALUATING RELIABILITY OF METAL INTERCONNECT

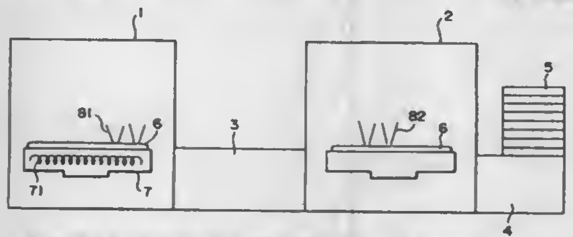
Kazuhiro Hoshino, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 329,401

Claims priority, application Japan, Oct. 19, 1993, 5-293899

Int. Cl.^{6} G01R *31/26;27/08*

U.S. Cl. 324—537 **18 Claims**



1. A method of evaluating the reliability of a metal interconnect of a semiconductor device, comprising:
- a step of measuring the start-up resistance of said metal interconnect of a test piece of semiconductor device;
- a step of performing a constant-temperature storage test for said test piece of semiconductor device for a time period made by measuring a resistance of said metal interconnect after being left at a temperature higher than 25° C. for a specified time and comparing said resistance of said metal interconnect with the start-up resistance of said metal interconnect; and
- a step of applying a current to said metal interconnect of said test piece of semiconductor device subjected to said constant-temperature storage test, and simultaneously performing a test of measuring the resistance of said metal interconnect, and comparing said resistance of said metal interconnect with said start-up resistance of said metal interconnect.

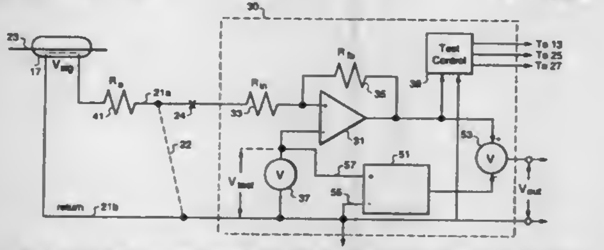
5,532,601
CIRCUIT INTEGRITY TEST SYSTEM

Michael P. Weir, Ballston Lake, and Hunt A. Sutherland, SaratogaSprings, both of N.Y., assignors to General Electirc Company, Schenectady, N.Y.

Filed Feb. 15, 1995, Ser. No. 388,917

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—539 **6 Claims**



1. A device for testing integrity of a signal wire carrying a signal V_{sig} and return wire serially connected with a resistance R_s comprising:
- a) a first amplifier (1st amp) having an input resistance R_{in}, a feedback loop having a resistance R_{fb}, an inverting input connected to said signal wire, a noninverting input, and an output, the amplifier providing an output voltage V_{out} at its output being linearly related to voltage provided to its inputs;
- b) a test voltage unit having first and second connections, capable of providing two distinct test signals V_{test1}, V_{test2} across its connections with its first connection coupled to the 1st amp's noninverting input, and the second coupled to the return wire; and
- c) a test control unit for activating the test voltage unit to inject test signals V_{test1}, V_{test2} into the 1st amp causing the 1st amp to create output signals V_{out1}, V_{out2}, respectively, for determining if the signal wire and return wire are shorted, if the signal wire and return wire are discontinuous from the test signals and output signals, and for indicating when the wires are shorted or discontinuous.

5,532,602
DIAGNOSTIC CIRCUIT AND METHOD FOR AMPEROMETRICALLY DETERMINING THE CURRENT PASSING THROUGH A SENSOR

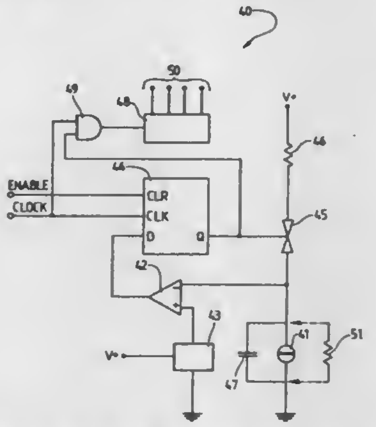
Fridolin Wiget, Neuchâtel, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Jun. 21, 1994, Ser. No. 263,070

Claims priority, application France, Jun. 22, 1993, 93 07674

Int. Cl.^{6} G01R *27/02*

U.S. Cl. 324—605 **13 Claims**



1. Diagnostic circuit for amperometrically determining the current passing through a sensor (**41**), comprising
- a current source (V+, **46**) for passing a constant DC current through said sensor (**41**),
- switching means (**45**) for selectively operating said current source,
- comparing means (**42**) for comparing the potential difference (V_{BS}) across said sensor to a reference voltage (V_{ref}), and producing a control signal (D) having a first logic level when said potential difference is less than said reference voltage (V_{ref}) and a second logic level when said potential difference is greater than said reference voltage (V_{ref}),
- control means (**44**) for providing a switching signal (Q) having said first logic level in response to said control signal (D) having said first logic level and said second logic level in response to said control signal (D) having said second logic level, said switching means (**45**) being caused to operate when said switching signal (Q) is in said first logic level, and
- timing means (**48,49**) for measuring the cumulative time during which said switching signal (Q) has said first logic level during a selected time interval, so as to provide an output signal (**50**) indicative of a mean value of current (I_{bs}ave) passing through said sensor (**41**).

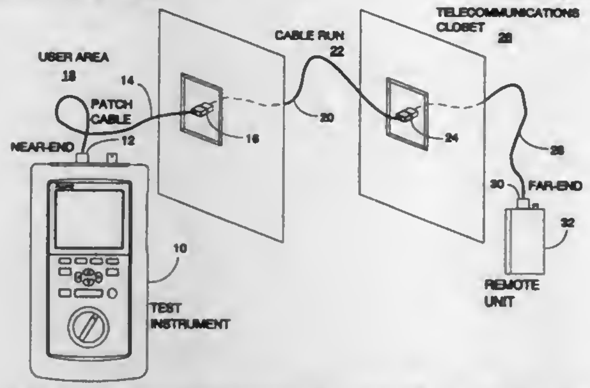
5,532,603
CROSS-TALK MEASUREMENT APPARATUS WITH NEAR-END COMPENSATION

Jeffrey S. Bottman, Seattle, Wash., assignor to Fluke Corporation, Everett, Wash.

Filed Jan. 27, 1995, Ser. No. 379,230

Int. Cl.^{6} G01R *27/04*

U.S. Cl. 324—628 **25 Claims**



1. In an instrument for measuring a cross-talk response in a pair of transmission lines, a method for removing undesired cross-talk effects from at least one selected location along said pair of transmission lines, comprising:
- (a) generating stimulus signals to one of said pair of transmission lines;
- (b) receiving cross-talk signals from another of said pair of transmission lines and digitizing said cross-talk signals as a pulse-response time record wherein said cross-talk signals are produced in response to said stimulus signals;
- (c) constructing an undesired-response time record from said pulse-response time record containing only said undesired cross-talk effects corresponding to said selected location;
- (d) calculating a first frequency domain representation of said pulse-response time record and a second frequency domain representation of said undesired-response time record; and
- (e) calculating said cross-talk response by subtracting said second frequency domain representation from said first frequency domain representation.

5,532,604
DIELECTRIC CONSTANT MEASURING METHOD AND APPARATUS

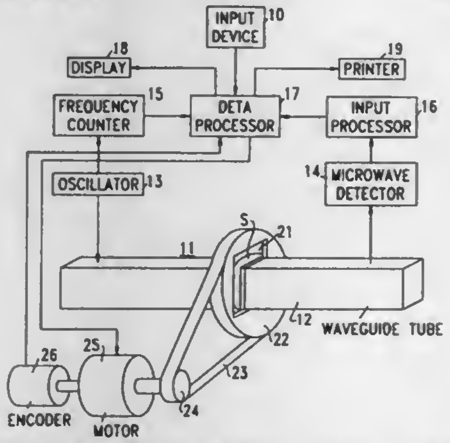
Shinichi Nagata, Matsubara, Japan, assignor to New Oji Paper Co. Ltd., Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 297,619

Claims priority, application Japan, Aug. 31, 1993, 5-216751

Int. Cl.^{6} G01N *22/00*

U.S. Cl. 324—636 **10 Claims**



1. A method of measuring a dielectric constant of a sheet-like material using a cavity resonator having two ends, one of which is adapted to receive microwaves and the other of which is adapted to detect the intensity of the microwaves, and said cavity resonator also having a transverse slit formed in the intermediate region between the two ends for disposing a sample consisting of the sheet-like material perpendicularly to the longitudinal axis of the cavity resonator extending therebetween, wherein the dielectric constant is calculated as a function of f_{1r}–f_{2r}, the difference between the microwave resonance frequency f_{1r}, of the cavity resonator obtained when the sample is not inserted in the transverse slit and the microwave resonance frequency f_{2r} of the cavity resonator obtained when the sample is inserted in the transverse slit, said method comprising the steps of:
- a) determining and storing the resonance frequency f_{1r} when the sample is not inserted in the transverse slit;
- b) determining and storing the resonance frequency f_{2r} (0), the peak level I_0 of the sample-transmitted microwave energy in the frequency f_{2r} (0) as a parameter in the resonance curve of the resonance frequency f_{2r} (0), and at least one of the other parameters in the resonance curve of the resonance frequency f_{2r} (0) providing the peak level I_0 of the sample-transmitted microwave energy for acquiring an approximated resonance curve to be selected from Lorentz's function, L-C-R resonance function and Gaussian distribution function or the like approximating the resonance curve of the sample by changing the frequency of the microwaves while the sample is inserted in the transverse slit and maintained at a predetermined angular position to be assumed as zero degrees in angle of rotation about the longitudinal axis of the cavity resonator;
- c) determining and storing the sample-transmitted microwave energy level I {f (β)} taken out of the cavity resonator by the frequency f upon the sample in said transverse slit having been rotated through a certain angle β about said longitudinal axis from said predetermined angular position;
- d) calculating the resonance frequency f_{2r} (β) at the angle β of the sample in said transverse slit by approximating another resonance curve shifted in frequency by substituting the form-approximated resonance curve of the resonance frequency f_{2r} (0) with the sample-transmitted microwave energy level I {f (β)}; and
- e) calculating the dielectric constant of the sample as a function of f_{1r}–f_{2r} (β).

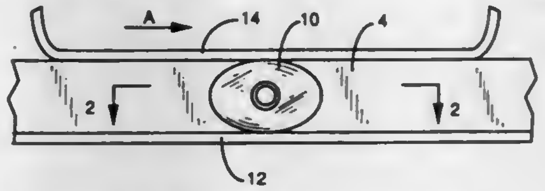
5,532,605
CONTAINER INSPECTION APPARATUS HAVING DIAMETER MEASURING MEANS AND ASSOCIATED METHOD

Henry M. Dimmick, Butler; Mark F. Zanella, Sr., Cranberry Township, and Thomas F. Melnik, Butler, all of Pa., assignors to AGR International, Inc., Butler, Pa.

Filed Oct. 27, 1994, Ser. No. 330,323

Int. Cl.^{6} G01R *35/00*

U.S. Cl. 324—671 **42 Claims**



28. Apparatus for inspecting containers comprising
- elongated container contacting means,
- means for urging said containers into intimate contact with said container contacting means,
- means for effecting translational movement of said containers along said container contacting means,
- electronic processor means having means for receiving signals related to container diameter and converting the same into a container diameter measurement, and
- displaceable means operatively associated with said container contacting means for being displaced responsive to variations in container diameter and emitting a responsive displacement electrical signal to said electronic processor means corre-

sponding to the diameter of the portion of said container in contact with said container contacting means.

5,532,606
ELECTRICAL TESTING PROCESS

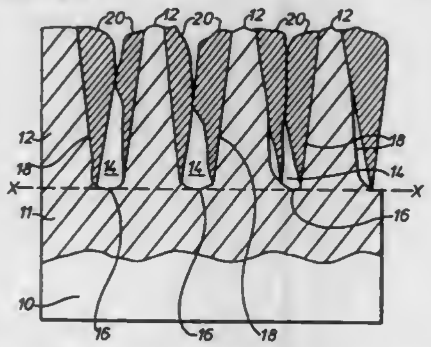
Pierre Descamps, Rixensart, Belgium, assignor to Dow Corning S. A., Seneffe, Belgium

Filed Oct. 17, 1994, Ser. No. 323,641

Claims priority, application United Kingdom, Oct. 19, 1993, 9321502

Int. Cl.^{6} G01N *27/02*

U.S. Cl. 324—674 **6 Claims**



1. Apparatus for determining characteristics of a substrate comprising two or more layers of different electrical capacitance which comprises means for passing alternating current at several frequencies across the substrate, means for measuring the electrical impedance at each frequency and means for using the information to solve equations

$$Re\,(y) = \frac{a + b\,w^2 + c\,w^4}{1 + d\,w^2 + e\,w^4} \qquad (1)$$

and

$$Im\,(y) = \frac{s + u\,w^2 + v\,w^4}{1 + d\,w^2 + e\,w^4} \qquad (2)$$

where y is the complex admittance of the substrate, w is the frequency of the measured frequency, a, b, c, d are non-linear combinations of electrical resistances analogous to each of four layers of the substrate and s, e, u, v are non-linear combinations of electrical capacitances analogous to the said four layers of the substrate.

5,532,607
SEMICONDUCTOR DEVICE INSPECTION SYSTEM INVOLVING SUPERIMPOSITION OF IMAGE DATA FOR DETECTING FLAWS IN THE SEMICONDUCTOR DEVICE

Eiji Inuzuka; Shigehisa Oguri; Kouji Suzuki; Wataru Nagata, and Yasushi Hiruma, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jul. 18, 1994, Ser. No. 274,716

Claims priority, application Japan, Jul. 19, 1993, 5-177957

Int. Cl.^{6} G01R *31/26*

U.S. Cl. 324—750 **2 Claims**

1. A semiconductor device inspection system comprising:

infrared-ray epi-illumination means for illuminating a polished surface of a substrate of a semiconductor chip with infrared light;

image pickup means for picking up at least a pattern image on the semiconductor chip;

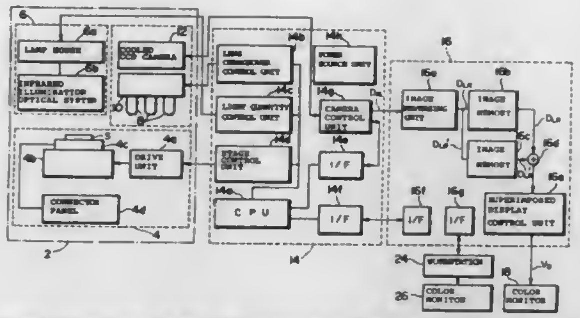


image reversing means for producing first left-to-right-reversed image data by left-to-right-reversing an array of pixels in image data output when said image pickup means picks up the pattern image on the semiconductor chip under illumination by said infrared-ray epi-illumination means and for producing second left-to-right-reversed image data by left-to-right-reversing an array of pixels in image data output when said image pickup means picks up an image of very weak light emitted from an anomalous portion in the semiconductor chip through the substrate of the semiconductor chip, said semiconductor chip having an operating voltage applied thereto;

adding means for superimposedly adding said first left-to-right-reversed image data and said second left-to-right-reversed image data produced by said image reversing means with pixel arrays of said first and second left-to-right-reversed image data corresponding to one another and for outputting superimposedly added data; and

superimposed display control means for controlling a display means so that a restored image is displayed thereon, said display being based on the superimposedly-added data output from said adding means.

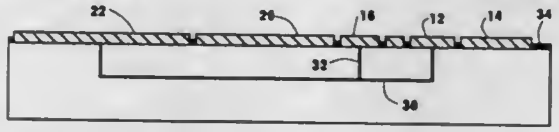
5,532,608
CERAMIC PROBE CARD AND METHOD FOR REDUCING LEAKAGE CURRENT

Abbas Behfar-Rad, Poughquag; Charles H. Perry, Poughkeepsie, and Krishna G. Sachdev, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1995, Ser. No. 417,623

Int. Cl.^{6} G01R *15/12*

U.S. Cl. 324—754 **21 Claims**



10. An electrical probe card comprising:

a ceramic substrate having a ceramic surface;

a plurality of electrical conductors mounted on the ceramic surface; and

a coating of a hydrophobic material extending over the entire ceramic surface between the electrical conductors, the hydrophobic material being silicone based and solvent resistant and having a thickness of less than 0.1 micrometer;

the coating of the hydrophobic material being adhered to the ceramic surface after the first plurality of electrical conductors has been mounted on the ceramic surface.

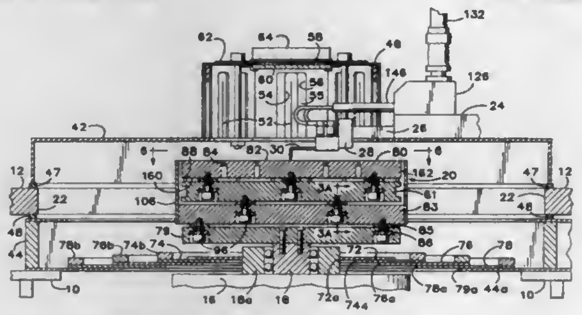
5,532,609
WAFER PROBE STATION HAVING ENVIRONMENT CONTROL ENCLOSURE

Warren K. Harwood; Paul A. Tervo, both of Vancouver, Wash., and Martin J. Koxxy, Hillsboro, Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Division of Ser. No. 245,581, May 18, 1994, Pat. No. 5,434,512, which is a division of Ser. No. 896,853, Jun. 11, 1992, Pat. No. 5,345,170. This application Apr. 6, 1995, Ser. No. 417,982

Int. Cl.^{6} G01R *31/02;1/073*

U.S. Cl. 324—754 **10 Claims**



1. A probe station comprising:

(a) a surface for holding a test device on said surface;

(b) a holder for an electrical probe for contacting said test device;

(c) a pair of positioning mechanisms each for selectively moving a corresponding one of said surface and said holder, independently of each other, toward or away from the other along an axis of approach; and

(d) an environment control enclosure substantially surrounding said surface for limiting fluid communication between the interior and exterior of said enclosure to a substantially constant degree despite movement by said positioning mechanisms of either one of said surface and holder, respectively, toward or away from the other along said axis of approach, said pair of positioning mechanisms each having a portion located at least partially outside of said enclosure for transferring movement mechanically to the corresponding one of said surface and said holder.

5,532,610
APPARATUS FOR TESTING SEMICONDCTOR WAFER

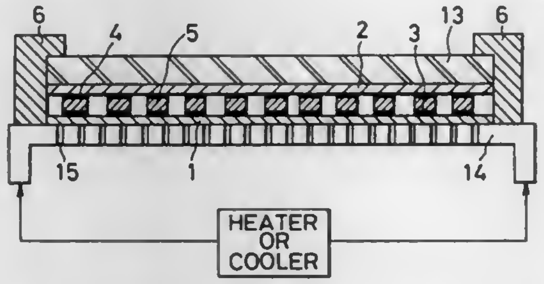
Tohru Tsujide; Toshiyasu Hishii, and Kazuo Nakaizumi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 295,030

Claims priority, application Japan, Aug. 25, 1993, 5-232386; Aug. 9, 1994, 6-206133

Int. Cl.^{6} G01R *1/073;31/02*

U.S. Cl. 324—757 **12 Claims**



1. An apparatus for testing or burning-in a plurality of semiconductor chips disposed on a wafer, said apparatus comprising:

a testing substrate;

an active circuit disposed on said testing substrate for activating chips disposed on a wafer to be tested;

a plurality of pads disposed on said testing substrate and positioned so that said pads are disposed in alignment with bonding pads of said chips disposed on said wafer when said testing substrate is engaged to said wafer;

an anisotropic conductive layer disposed on said pads; and

means electrically connected to said testing substrate for testing said wafer, and including a circuit integrated on said testing substrate for rapidly testing a plurality of chips formed on said wafer at the same time and a memory integrated on said testing substrate for storing the results of the test.

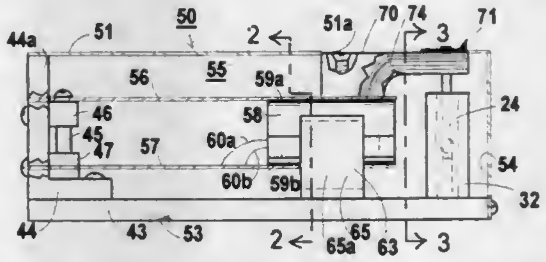
5,532,611
MINIATURE PROBE POSITIONING ACTUATOR

Jiann-Chang Lo; Michael Servedio; James M. Hammond, all of Boca Raton; James E. Boyette, Jr., Delray Beach, all of Fla., and Hans-George H. Kolan, Bowling Green, Ohio, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1995, Ser. No. 451,635

Int. Cl.^{6} G01R *31/22*

U.S. Cl. 324—758 **16 Claims**



16. An actuator for accurately and selectively positioning a probe into contact with a surface of a device for electrically testing the same, said device being adapted for receipt into an X-Y positioning apparatus, and said actuator being adapted for precise location in a plane parallel to the plane of the device being tested so that said actuator is positioned in superimposed, overlapping relation to the device being tested, comprising in combination:

a frame,

at least one pair of spaced apart, laterally extending, flexible beams attached to said frame, at least one of said beams carrying flexible conductors;

an armature attached adjacent the extended terminal ends of said beams thereby being cantilever supported by said beams, said armature being composed of a non-magnetic material;

a probe including a probe tip attached to said armature, said probe tip adapted for contacting selected points on the surface of said device being tested and being electrically connected to conductors in one of said beams carrying flexible conductors;

a coil wound on said armature and arranged so that its axis is in parallel relation to said probe tip;

spaced apart magnet means, carried by said frame, creating a magnetic field across at least part of said coil, whereby upon energization of said coil, deflection of said beams and said armature occurs, effecting movement of said probe tip into contact with selected portions of the surface of the device being tested, and;

wherein said armature is substantially U-shaped including a base portion and upstanding leg portions, said coil being wound upon said leg portions with its' axis being substantially parallel to said probe tip.

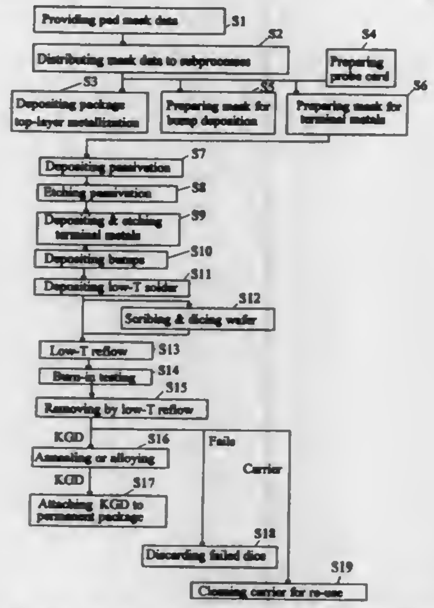
5,532,612
METHODS AND APPARATUS FOR TEST AND BURN-IN OF INTEGRATED CIRCUIT DEVICES

Louis H. Liang, 10601 Creston Dr., Los Altos, Calif. 94024-7420

Filed Jul. 19, 1994, Ser. No. 277,223

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—760 **42 Claims**



1. A burn-in and test process for integrated circuit chips prior to final packaging, comprising the steps of:

- a) providing integrated circuit chips having metallic interconnection bumps before any reflow or annealing of said bumps, said bumps having a melting point above a predetermined temperature and each of said bumps having a characteristic bump volume,
- b) depositing a limited amount of solder having a melting point below said predetermined temperature to each of said bumps, while controlling said limited amount to be less than one-tenth of said characteristic bump volume,
- c) providing test carriers to temporarily carry and interconnect said chips by flip-chip mounting, and
- d) mounting said integrated circuit chips to said test carriers for burn-in and test by reflowing said solder at a temperature below said predetermined temperature.

5,532,613
PROBE NEEDLE

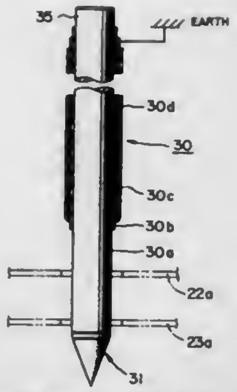
Yasushi Nagasawa, Yamanashi-Ken; Satoru Yamashita, and Masahiko Matsudo, both of Kofu, all of, Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo-To, and Tokyo Electron Yamanashi Kabushiki Kaisha, Yamanashi-ken, both of, Japan

Filed Apr. 14, 1994, Ser. No. 227,638

Claims priority, application Japan, Apr. 16, 1993, 5-113690; Apr. 27, 1993, 5-123335

Int. Cl.^{6} G01R *1/067*

U.S. Cl. 324—761 **26 Claims**



22. A probe needle used in a prober that performs a test on a semiconductor element and has conductive characteristics to enable an electrical connection in contact with a contact portion of said semiconductor element, wherein said probe needle has a rod-like shaped main body which is formed of a conductive polymer.

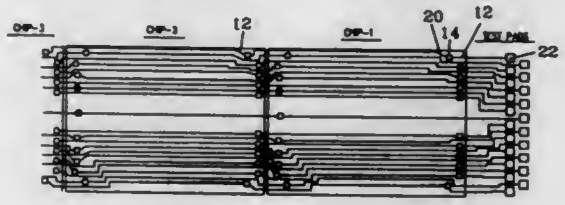
5,532,614
WAFER BURN-IN AND TEST SYSTEM

Anthony M. Chiu, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 191,847, Feb. 4, 1994, Pat. No. 5,444,366, which is a division of Ser. No. 954,592, Sep. 30, 1992, Pat. No. 5,307,010, which is a continuation of Ser. No. 640,198, Jan. 11, 1991, abandoned. This application Apr. 28, 1995, Ser. No. 431,204

Int. Cl.^{6} G01R *31/28;* **H01L** *21/66*

U.S. Cl. 324—763 **5 Claims**



1. A method of forming an interconnection system to semiconductor devices formed on a wafer for burn-in and testing of the semiconductor devices prior to separation from the semiconductor wafer, comprising the steps of:

forming an insulating layer over the semiconductor wafer and the semiconductor devices formed thereon, the semiconductor devices arranged in rows, each semiconductor device having a plurality of bond pads and first and second edges extending in a row direction, and the insulating layer having openings over each of the bond pads;

forming a plurality of conductors, each of said conductors overlaying the semiconductor devices in a row without extending over the first and second edges of the semiconductor devices in the row, each of said conductors connected to a bond pad of each semiconductor device in the row;

forming test point contacts on the semiconductor wafer at locations not containing semiconductor devices; and

connecting each of the test point contacts to one of the plurality of conductors.

5,532,615
INSPECTING METHOD, INSPECTING APPARATUS, AND DEFECT CORRECTING METHOD

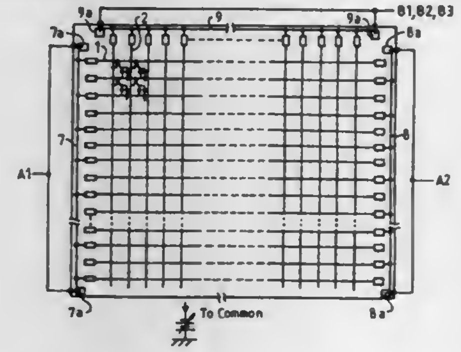
Naofumi Kondo, Nara; Mikio Katayama, Ikoma; Masaya Okamoto, Soraku-gun; Makoto Miyago, Higashiosaka; Kiyoshi Nakazawa, Fujiidera; Yuzuru Kanemori, and Makoto Tachibana, both of Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1993, Ser. No. 158,843

Claims priority, application Japan, Nov. 25, 1992, 4-315417

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—770 **12 Claims**



9. An inspecting apparatus for an active matrix substrate, including

an insulating substrate;

a plurality of first lines formed on said insulating substrate;

a plurality of second lines crossing said first lines;

a respective pixel electrode provided in an area enclosed by each first line, an adjacent first line thereto, each second line, and an adjacent second line thereto;

a respective switching element, for driving said respective pixel electrode, connected to said pixel electrode and to said first line; and

a respective pair of electrodes constituting an auxiliary capacitance, one of said pair of electrodes being connected to said respective pixel electrode, the other one being connected to said adjacent first line, said apparatus comprising:

a counter substrate, having a face on which a counter electrode is formed, said counter substrate being disposed so that said face faces said active matrix substrate;

a liquid crystal layer formed on said face of said counter substrate, and, in use, interposed between said counter substrate and said active matrix substrate;

ON/OFF signal generating means for generating at least one alternating sequence of an ON signal and an OFF signal, applied to said first lines and to said adjacent first lines, said ON signal turning on each switching element to which it is applied, said OFF signal turning off each switching element to which it is applied, said OFF signal following in sequence said ON signal;

first signal generating means for generating a first detecting signal applied to said second line, said first detecting signal having a voltage which changes before said ON signal is applied to said first lines;

second signal generating means for generating a second detecting signal applied to said second line, said second detecting signal having a voltage which changes before and after said ON signal is applied to said first lines; and

third signal generating means for generating a third detecting signal applied to said second line, said third detecting signal having a voltage which changes after said ON signal is applied to said first lines.

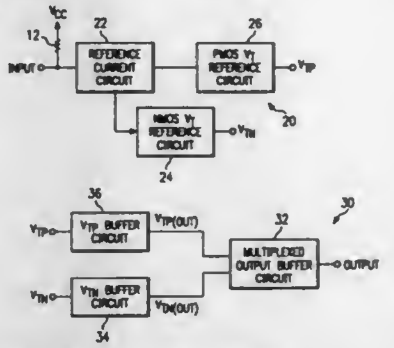
5,532,616
ON-CHIP SERIES TERMINATED CMOS(BI-CMOS) DRIVER

Stanley C. Keeney, Grand Saline, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 1, 1994, Ser. No. 283,436

Int. Cl.^{6} H03K *17/16*

U.S. Cl. 326—30 **11 Claims**


VCC
12
22
26
INPUT
REFERENCE CURRENT CIRCUIT
PMOS VT REFERENCE CIRCUIT
VTP
NMOS VT REFERENCE CIRCUIT
VTN
20
24
36
30
VTP
VTP BUFFER CIRCUIT
VTP(OUT)
32
MULTIPLEXED OUTPUT BUFFER CIRCUIT
OUTPUT
VTN
VTN BUFFER CIRCUIT
VTN(OUT)
34

1. A terminated driver circuit, comprising:

an external impedance;

a bias generator circuit connected to the external impedance, said bias generator circuit generating a plurality of bias voltages in response to a reference current, said reference current being a function of the external impedance magnitude; and

an output driver circuit connected to said bias generator circuit, said output driver circuit having a plurality of output devices connected to a transmission line, said driver circuit receiving said plurality of bias voltages from said bias generator circuit and selectively coupling them to the plurality of output devices such that only a single bias voltage is driving a single output device at a time, wherein said plurality of bias voltages causes the plurality of output devices to have a specific output impedance that is matched with the characteristic impedance of said transmission line thereby reducing waveform reflections.

5,532,617
CMOS INPUT WITH TEMPERATURE AND V_{CC} COMPENSATED THRESHOLD

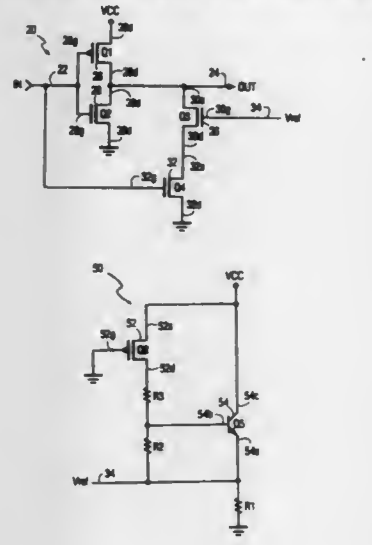
Thomas D. Parkinson, and Brian C. Martin, both of Albuquerque, N.M., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Mar. 25, 1994, Ser. No. 218,487

Int. Cl.^{6} H03K *17/16;19/003*

U.S. Cl. 326—32 **10 Claims**

1. A logic circuit operable between a first voltage supply and a



second voltage supply and having an input terminal for receiving an input signal and an output terminal for outputting an output signal, comprising:

inverting means for receiving the input signal, inverting the input signal and outputting the inverted input signal, said inverting means having a predetermined switching threshold;

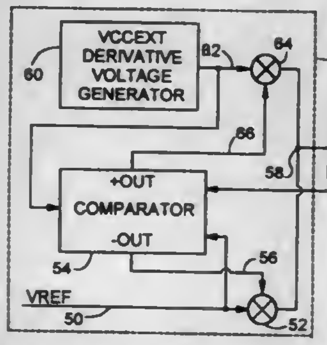
current boosting means for changing the predetermined switching threshold of the inverting means during operation responsive to a predetermined reference signal; and

reference signal generating means responsive to changes in the first voltage supply for generating the predetermined reference signal, said reference signal generating means including a bipolar transistor, said bipolar transistor having a base, emitter and collector and multiplying means for generating the reference signal equal to a multiple of a voltage potential between the base and the emitter of the bipolar transistor.

5,532,618
STRESS MODE CIRCUIT FOR AN INTEGRATED CIRCUIT WITH ON-CHIP VOLTAGE DOWN CONVERTER

Kim C. Hardee, and Michael V. Cordoba, both of Colorado Springs, Colo., assignors to United Memories, Inc., Colorado Springs, Colo., and Nippon Steel Semiconductor Corporation, Japan

Filed Nov. 30, 1992, Ser. No. 983,328
Int. Cl.^{6} H03K *17/00*
U.S. Cl. 326—63 **17 Claims**



1. A stress mode circuit comprising:

a comparison circuit having a plurality of outputs and coupled to receive and compare a reference voltage with a first voltage derived from a supply voltage;

a plurality of switches each respectively coupling said reference voltage and said first voltage to a common output terminal and each respectively controlled by one of said plurality of outputs; and

a voltage converter coupled between said common output terminal and an output terminal of said stress mode circuit for providing an internal voltage to said output terminal and said comparison circuit,

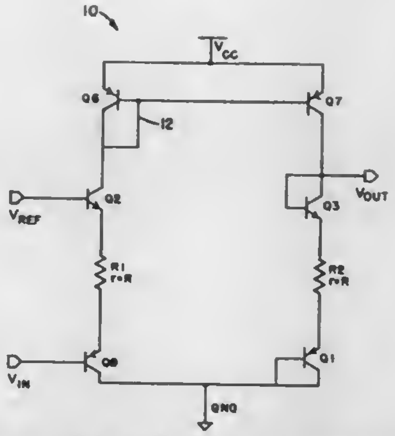
wherein said reference voltage and said first voltage are selectively coupled to said common output terminal via said plurality of switches in response to the comparison of the reference voltage and said first voltage, and wherein said comparison circuit is powered by said supply voltage.

5,532,619
PRECISION LEVEL SHIFTER W/CURRENT MIRROR

Anthony R. Bonaccio, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1994, Ser. No. 356,816
Int. Cl.^{6} H03K *19/20*
U.S. Cl. 326—75 **13 Claims**

1. A level shifter circuit comprising:



a first current path including a series arrangement of a first bipolar transistor having a base input voltage V_{ref}, and a second bipolar transistor having a base input voltage V_{in};

a second current path including a first and a second bipolar transistor arranged in series and each arranged in a diode configuration; and

a current arrangement for producing substantially identical currents through said first and second current paths, the current in said second current path producing an output voltage $V_{OUT}=V_{ref}-V_{in}$ across said second current path.

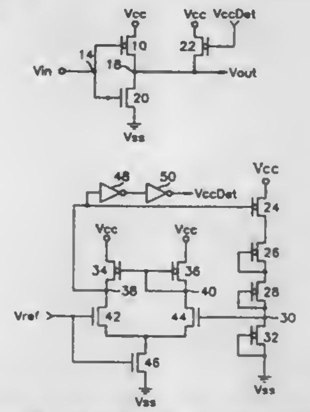
5,532,620
INPUT BUFFER CIRCUIT CAPABLE OF CORRESPONDING TO VARIATION OF OPERATING VOLTAGE IN SEMICONDUCTOR INTEGRATED CIRCUIT

Bo-Sung Seo, Suwon, and Jong-Young Kim, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 359,458

Claims priority, application Rep. of Korea, Dec. 18, 1993, 28378

Int. Cl.^{6} H03K *19/0175;19/01*
U.S. Cl. 326—81 **17 Claims**



1. A semiconductor integrated circuit connectable to an external power source having two power voltage levels comprising:

a power voltage terminal connectable to said external power source,

a power voltage sensing signal generator coupled to said power voltage terminal, said signal generator detecting one of said power voltage levels of said external power source and generating a power voltage sensing signal having a "high" and "low" state corresponding to said detected level,

and an input buffer circuit coupled to said power voltage sensing signal generator, said input buffer circuit performing an input operation of converting an external signal into an internal signal, said input buffer circuit using said power voltage sensing signal to accelerate said input operation in dependence upon said power voltage level.

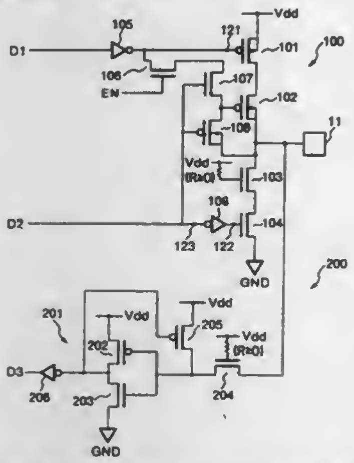
5,532,621
OUTPUT BUFFER CIRCUIT, INPUT BUFFER CIRCUIT AND BI-DIRECTIONAL BUFFER CIRCUIT FOR PLURAL VOLTAGE SYSTEMS

Kenichiro Kobayashi, and Hisaya Keida, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Dec. 20, 1994, Ser. No. 360,056

Claims priority, application Japan, Dec. 24, 1993, 5-327156

Int. Cl.^{6} H03K *19/094;17/06*
U.S. Cl. 326—86 **18 Claims**



1. An output buffer circuit for outputting a signal to a pad via which the signal is transferred to an external circuit, comprising:

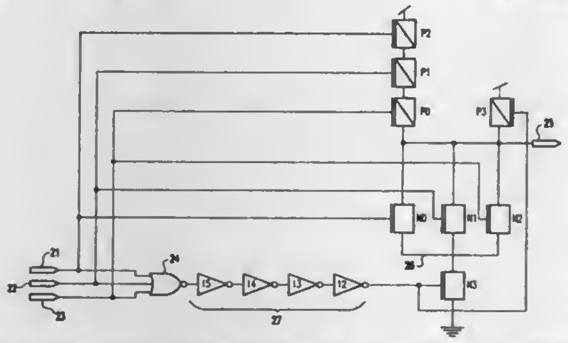
first and second pull-up transistors connected in series between a power source and said pad, wherein a first signal is inputted to a gate of the first pull-up transistor disposed proximate to said power source, and a back gate of the second pull-up transistor disposed proximate to said pad is connected to said pad; and

a gate pull-up transistor for pulling up a gate of said second pull-up transistor.

5,532,622
MULTI-INPUT TRANSITION DETECTOR WITH A SINGLE DELAY

Mark A. Belley, Burlington, and John A. Fifield, Underhill, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1995, Ser. No. 427,396
Int. Cl.^{6} H03K *19/096*
U.S. Cl. 326—95 **6 Claims**



1. A circuit for producing a pulse on an output node from any one of a plurality of transitioning inputs, comprising:

precharging means, coupled between the plurality of transitioning inputs and the output node, for charging the output node to a first voltage level;

a first charging device for charging the output node to said first voltage level and coupled to the output node;

a second charging device for discharging the output node to a second voltage level different from said first voltage level;

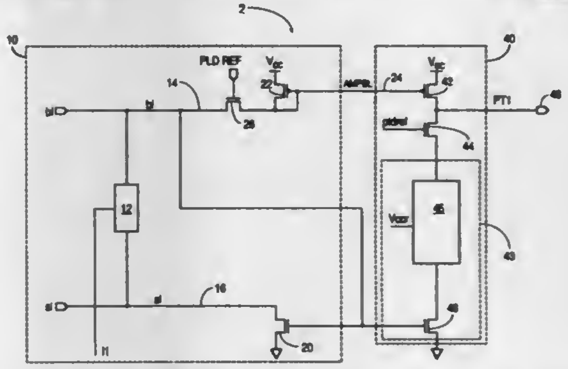
a single delay means, coupled between the plurality of transitioning inputs and both the first and second charging devices, for both turning off the first charging device and turning on the second charging device; and

switching means, controlled by said plurality of transitioning inputs and coupled between the output node and the second charging device, for disconnecting the second charging device from the output node.

5,532,623
SENSE AMPLIFIER WITH READ CURRENT TRACKING AND ZERO STANDBY POWER CONSUMPTION

Manik Advani, Fremont, and Cuong Trinh, Milpitas, both of Calif., assignors to WaferScale Integration, Inc., Fremont, Calif.

Filed Oct. 21, 1994, Ser. No. 330,211
Int. Cl.^{6} G01R *19/00*
U.S. Cl. 327—51 **21 Claims**



1. A circuit for reading a state of a memory cell, the circuit comprising:

a first transistor having a drain and a gate coupled together;

means for connecting the first transistor to the memory cell, wherein the first transistor is connected between a power supply terminal and the memory cell;

a second transistor connected between the power supply terminal and an output node, wherein the second transistor has a gate coupled to the gate of the first transistor and a channel width-to-length ration which is greater than that of the first transistor; and

a pull-down device coupled between the output node and a ground terminal, the pull-down device comprising a reference cell which is structurally identical to the memory cell.

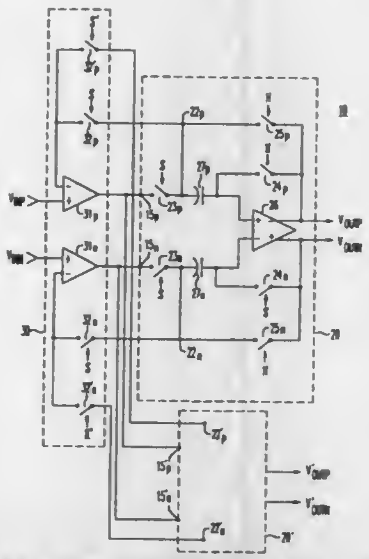
5,532,624
HIGH-SPEED AND ACCURATE SAMPLE AND HOLD CIRCUITS

John M. Khoury, New Providence, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jan. 31, 1995, Ser. No. 381,627
Int. Cl.^{6} H03K *5/159*
U.S. Cl. 327—95 **7 Claims**

1. A sample and hold circuit having a sampling node therein, an input node, and an input switch for selectively coupling the input node to the sampling node during sampling and decoupling the input node from the sampling node when holding, CHARACTERIZED BY:

a differential amplifier having an inverting input, a non-inverting



input and an output, disposed between the input node and the input switch such that the output connects to the input switch, the non-inverting input couples to the input node, and the inverting input is coupled to the sampling node during sampling and is decoupled from the sampling node during holding by a pass switch.

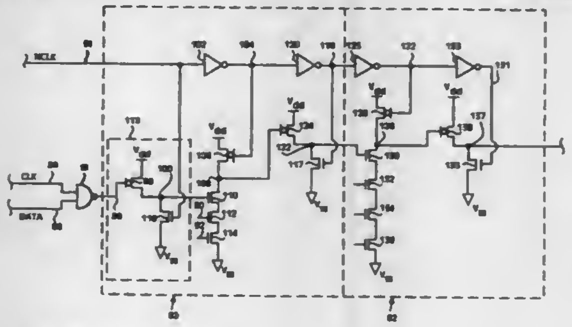
5,532,625
WAVE PROPAGATION LOGIC

Sathyanandan Rajivan, San Jose, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 1, 1995, Ser. No. 397,419

Int. Cl.^{6} H03K *19/017*

U.S. Cl. 326—98 **23 Claims**



1. A circuit, comprising:

a first clock terminal; and

a first circuit stage for evaluating a first plurality of logic inputs, comprising,

a pulse generation circuit coupled to said first clock terminal, an output terminal,

an evaluation device coupled to said output terminal and said pulse generation circuit, said evaluation device being part of a first circuit stage evaluation device chain coupled in series between said output terminal and a second logic level, said first circuit stage evaluation device chain having as many evaluation devices as the number of logic inputs in said first plurality of logic inputs, and

a precharge device coupled to said output terminal and a first logic level.

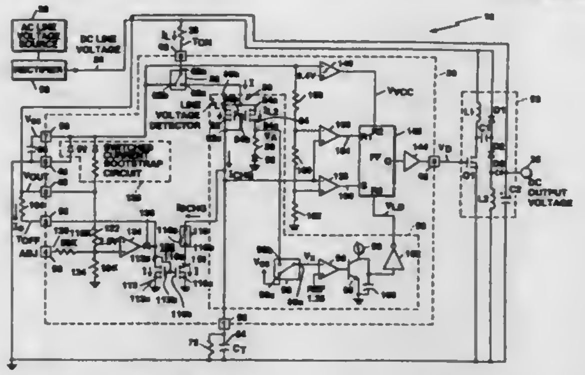
5,532,626
OFF-LINE CONTROLLER HAVING A LINE VOLTAGE DETECTOR AND A SWITCHED CURRENT BOOTSTRAP CIRCUIT

Joseph M. Khayat, Bedford, N.H., assignor to Unitrode Corporation, Billerica, Mass.

Filed Feb. 6, 1995, Ser. No. 384,769

Int. Cl.^{6} G01R *19/00*

U.S. Cl. 327—53 **12 Claims**



1. In an integrated off-line controller circuit for providing a drive signal for controlling a switching device of a switching converter which converts a line voltage having an associated line current into a regulated DC output voltage, a circuit comprising:

a control circuit responsive to a first portion of said line current for generating said drive signal;

a sense resistor responsive to a second portion of said line current for establishing a voltage proportional to said line voltage; and

a comparator having a first input terminal receiving said proportional voltage and a second input terminal receiving a reference voltage, said comparator having an output terminal at which an output signal is provided, said output signal being in a first logic state when said line voltage is greater than a predetermined level and being in a second logic state when said line voltage is less than said predetermined level, wherein said output signal is coupled to said control circuit for inhibiting said drive signal when said output signal is in said second logic state.

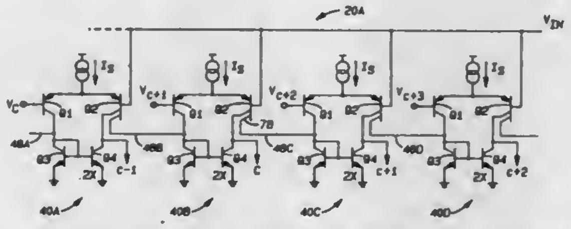
5,532,627
STACKABLE VOLTAGE COMPARATOR CIRCUIT FOR A MULTIPLE VOLTAGE WINDOW DETECTOR

Mark B. Kearney, Kokomo, and Dennis M. Koglin, Carmel, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 14, 1995, Ser. No. 422,433

Int. Cl.^{6} H03K *5/153*

U.S. Cl. 327—74 **11 Claims**



1. A voltage comparator network for comparing an input voltage with voltage windows, the comparator network comprising:

a first comparator circuit comparing an input voltage with a first threshold voltage, said first comparator circuit including a first differential input pair of transistors for receiving and comparing the input voltage with the first threshold voltage, the first differential input pair of transistors having one transistor with a first and a second collector, the second collector being coupled to an output line; and

a second comparator circuit comparing the input voltage with a second threshold voltage, the second comparator circuit including a second differential input pair of transistors for comparing the input voltage with the second threshold voltage, said second comparator circuit having an input coupled to the output line of the first comparator circuit for receiving current when the input voltage is less than the first threshold voltage, said second comparator circuit further including an output for providing an output indicative or whether the input voltage is within a voltage window bounded by the first and second threshold voltages.

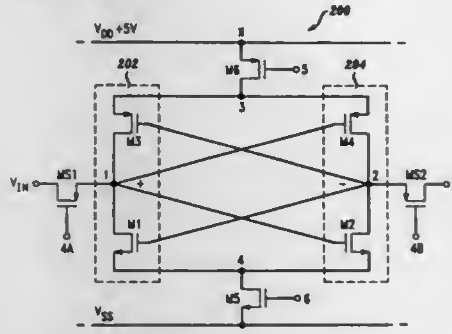
5,532,628
FAST COMPARATOR CIRCUIT

Thayamkulangara R. Viswanathan, Albany Township, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 163,957, Dec. 8, 1993, abandoned. This application Sep. 13, 1995, Ser. No. 527,989

Int. Cl.^{6} H03K *5/153;3/356;* **G01R** *19/00*

U.S. Cl. 327—77 **3 Claims**



1. A method for comparing an input signal having a first voltage to a reference signal having a second voltage to determine whether said first voltage is greater than or less than said second voltage in a circuit which includes:

a first inverter comprising a first pair of complementary transistors coupled in series forming a first node therebetween;

a second inverter comprising a second pair of complementary transistors coupled in series forming a second node therebetween;

wherein said first pair of complementary transistors have gates coupled to said second node and said second pair of complementary transistors having gates coupled to said first node;

wherein said first and second inverters are coupled in parallel between third and fourth nodes;

a first transistor interposed between a first power supply voltage and said third node;

a second transistor interposed between a second power supply voltage and said fourth node;

a third transistor interposed between the input signal and said first node;

a fourth transistor interposed between the reference signal and said second node;

the method comprising the steps of:

simultaneously applying the input signal to said first node and the reference signal to said second node for a first discrete time period;

during a second discrete time period, ramping a gate voltage of said first transistor and a gate voltage of said second transistor, said first and second transistors operating as current sources, said first and second pair of complementary transistors acting as differential amplifiers, said first and second pair of complementary transistors charging capacitances at said first and second nodes with currents which are proportional to a voltage difference between said first voltage and said reference voltage;

during a third discrete time period, latching a voltage of said first node to one of a logical 0 and a logical 1 and latching a voltage of said second node to an other one of said logical 0 and said logical 1 by setting said gate voltage of said first transistor to one of said logical 0 and said logical 1 and setting said gate voltage of said second transistor to an other one of said logical 0 and logical 1, said first and second transistors being ON and fully conductive; and

during a fourth discrete time period, measuring said voltage of said first node and said voltage of said second node and outputting one of said logical 0 and said logical 1 based on a difference between said voltage of said first node and said voltage of said second node, wherein each of the first through the fourth discrete time periods is approximately 2.5 nanoseconds.

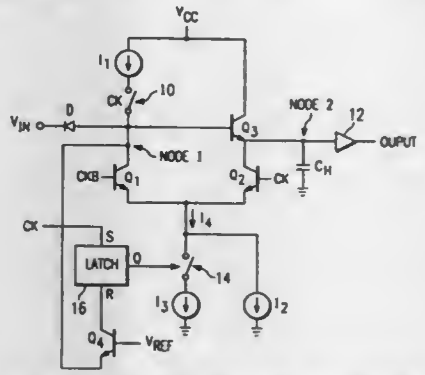
5,532,629
BIPOLAR TRACK AND HOLD CIRCUIT

Krishnasawamy Nagaraj, Wescosville, Pa., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1994, Ser. No. 286,047

Int. Cl.^{6} G11C *27/02*

U.S. Cl. 327—94 **19 Claims**



11. A track and hold circuit comprising, in combination:

an input terminal for receiving an externally generated analog signal that is to be tracked and held;

a first and a second node;

a clock input terminal for receiving a periodic clock signal for periodically defining a time during which said track and hold circuit operates in track mode and a time during which said track and hold circuit operates in hold mode;

a selectively actuated coupling means for providing a connection between said first node and said input terminal to selectively couple said analog signal to said first node during said tracking mode of operation of said track and hold circuit and to isolate said input terminal from said first node during said hold mode of operation of said track and hold circuit;

a first transistor connected in series at a connection node with a first current source, said first transistor and said first current source being connected between said first node and ground, said first transistor being conductive only during said hold mode;

a second transistor connected between said second node and said connection node between said first transistor and said first current source, said second transistor being conductive only during said track mode;

a third transistor the emitter and collector of said third transistor being connected between said second node and a voltage source and the base of said third transistor being connected to said first node;

a capacitor connected between said second node and ground;

a latch circuit which is set by the transition of the clock at said clock input terminal from a level indicating said hold mode to a level indicating said track mode, said latch circuit including a reset input for receiving a reset signal for resetting said latch;

a switch series connected with a second current source between said connection node and ground, said switch being closed whenever said latch is set; and a level sensing circuit coupled between said first node and said reset input of said latch to reset said latch whenever the voltage at said first node falls to a preselected level to thereby disconnect said second current source from said track and hold circuit.

5,532,630

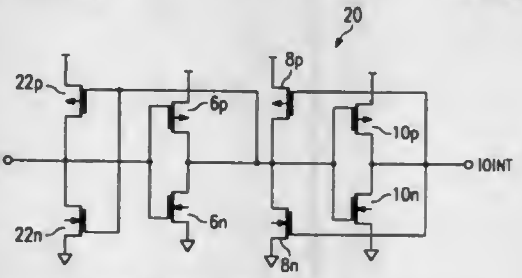
RECEIVER CIRCUIT WITH A BUS-KEEPER FEATURE

Charles D. Waggoner, Richardson; Richard J. Blumberg, Plano, and Gary B. Kotzur, Spring, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 879,191, May 6, 1992, abandoned. This application Jul. 27, 1994, Ser. No. 281,509

Int. Cl.⁶ H03K *3/00;17/16*

U.S. Cl. 327—108 **20 Claims**



1. A receiver circuit, comprising:
- an input node, for direct connecting to a tristate bus line;
- an output node;
- an inverter, having an input directly connected to said input node and having an output coupled to said output node:
- a first transistor, having a conduction path directly connected on one side to said input node and coupled on another side to a first bias voltage, and having a control terminal; and
- a second transistor, having a conduction path directly connected on one, side to said input node and coupled on another side to a second bias voltage, and having a control terminal;
- wherein the control terminals of said first and second transistors are coupled to the output of said inverter in such a manner that said first transistor is on and said second transistor is off responsive to the logic level at said input node corresponding to said first bias voltage and in such a manner that said second transistor is on and said first transistor is off responsive to the logic level at said input node corresponding to said second bias voltage;
- and wherein said first and second transistors have drive characteristics which are significantly weaker than said inverter.

5,532,631

ACTIVE PULL-DOWN WRITE DRIVER FOR THREE-TERMINAL INDUCTIVE LOAD

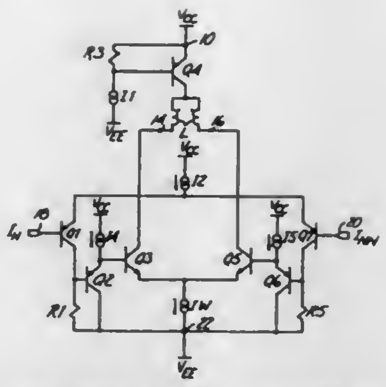
Tuan V. Ngo, Eden Prairie, and Raymond E. Barnett, Burnsville, both of Minn., assignors to VTC Inc., Bloomington, Minn.

Filed Nov. 17, 1994, Ser. No. 341,495

Int. Cl.⁶ H03K *3/00;1/04*

U.S. Cl. 327—110 **15 Claims**

1. In a write driver circuit for driving a magnetic transducer having an inductive winding having a tap, the driver circuit having a load terminal for coupling to the tap, a supply terminal for coupling to a voltage source, and a switching transistor connected between the load terminal and the supply terminal, the switching transistor having a control region responsive to a write signal for coupling the load terminal to the supply terminal, the improvement comprising:
- an active subcircuit coupled between the control region and the supply terminal and responsive to the write signal for selectively varying conduction between the control region and the supply terminal; and



- a bias subcircuit coupled to the active subcircuit for maintaining conduction of the active subcircuit.

5,532,632

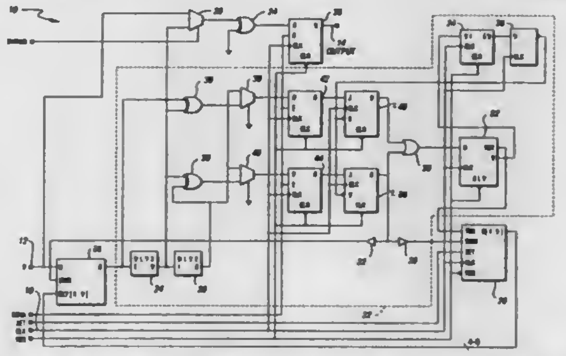
METHOD AND CIRCUIT FOR SYNCHRONIZING AN INPUT DATA STREAM WITH A SAMPLE CLOCK

Bruce C. Kent, Long Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 1, 1994, Ser. No. 189,826

Int. Cl.⁶ H03L *7/00*

U.S. Cl. 327—141 **7 Claims**



1. A synchronizing circuit comprising a data input means for receiving an input data stream, sample clock input means for receiving a sample clock signal of predetermined frequency establishing a predetermined sample clock period, and a data output means providing a synchronized output data stream, said circuit comprising:
- variable time delay means responsive to said input data stream for providing a delayed data stream having data transitions which are adjustable relative to the data transitions occurring in said input data stream;
- means responsive to said delayed data stream for providing said synchronized output data stream;
- logic means for detecting the occurrence of data transitions within a predetermined time interval on either side of the active edge of said clock signal;
- means for adjusting the delay interval of said variable time delay means, in response to data transitions within said predetermined time interval, to either increase or decrease said delay interval to thereby return the data transitions of said output data stream to a neutral zone outside said predetermined time interval; and
- wherein said logic means includes means for defining said neutral zone comprising first and second fixed delay means serially connected with said variable time delay means and first and second exclusive OR gates connected across said first and second fixed delay means.

5,532,633

CLOCK GENERATING CIRCUIT GENERATING A PLURALITY OF NON-OVERLAPPING CLOCK SIGNALS

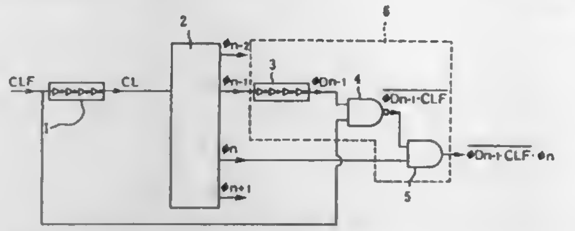
Shuichi Kawai, Tokyo, Japan, assignor to NEC Corporaton, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 352,086

Claims priority, application Japan, Dec. 3, 1993, 5-338975

Int. Cl.⁶ H03K *3/017*

U.S. Cl. 327—174 **7 Claims**



1. A clock generating circuit comprising:
- a first delay circuit for receiving a reference clock signal and for producing a delayed reference clock signal;
- first circuit means responsive to said delayed reference clock signal for generating a set of intermediate clock signals, each of said intermediate clock signals having a clock active width corresponding to an integer number multiple of one cycle period of said delayed reference clock signal, and said intermediate clock signals having respective clock active widths which are delayed in sequence by a value corresponding to said integer number multiple of the clock width of said delayed reference clock signal; and
- at least one delay generating circuit for receiving an (n−1)th intermediate clock signal, where n is an integer greater than zero, and an n-th intermediate clock signal of said intermediate clock signals adjacent each other in a phase sequence and said reference clock signal,
- said at least one delay generating circuit including a second delay circuit for receiving said (n−1)th intermediate clock signal and for producing a delayed intermediate clock signal and a circuit arrangement responding to said delayed intermediate clock signal, said n-th intermediate clock signal and said reference clock signal and for generating an output clock signal having a delay time relative to said n-th intermediate clock signal,
- said delay time being defined by a delay time having a smaller value between a clock active width of the reference clock signal minus a delay time of the first delay circuit and a delay time of said second delay circuit.

5,532,634

HIGH-INTEGRATION J-K FLIP-FLOP CIRCUIT

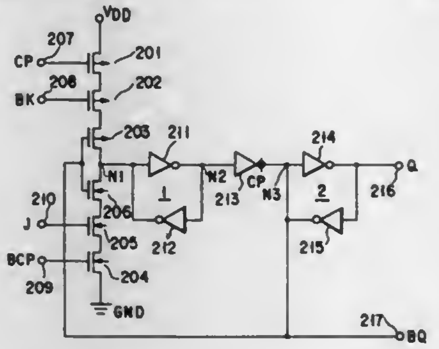
Yasushi Sato, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 10, 1994, Ser. No. 339,240

Claims priority, application Japan, Nov. 10, 1993, 5-281276; Sep. 12, 1994, 6-217652

Int. Cl.⁶ H03K *3/356*

U.S. Cl. 327—216 **14 Claims**



1. A J-K flip-flop circuit comprising:
- at least three MOS transistors of a first conductivity type which have current paths connected in series with each other between a first power supply terminal and a signal node, gates of said MOS transistors of the first conductivity type respectively receiving a clock signal, an inverted signal of a K signal, and an inverted signal BQ of an output Q associated with a data output; and
- at least three MOS transistors of a second conductivity type which have current paths connected in series with each other between a second power supply terminal and the signal node, gates of said MOS transistors of the second conductivity type respectively receiving an inverted signal of the clock signal, a J signal, and the inverted signal BQ.

5,532,635

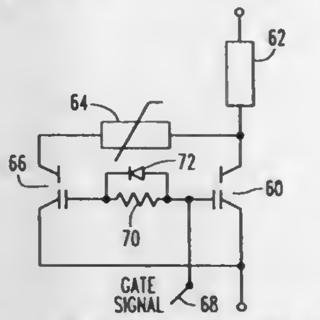
VOLTAGE CLAMP CIRCUIT AND METHOD

Donald L. Watrous, and Victor A. K. Temple, both of Clifton Prak, N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 12, 1994, Ser. No. 304,554

Int. Cl.⁶ H03K *5/08;17/687;3/00;* **H02H** *3/22*

U.S. Cl. 327—310 **24 Claims**



1. In an electrical circuit in which a power source supplies electrical power to a load, a circuit for reducing the transmission of surge voltage to the load comprising:
- a switch electrically connected in series with a varistor, said series being electrically connected across said load; and
- a switch drive circuit controlling said switch so that said switch is off when no surge is present and said switch is on when surge is present to thereby permit said varistor to absorb the energy of the surge during the surge.

5,532,636

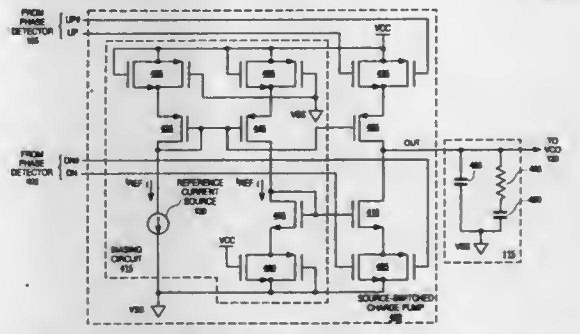
SOURCE-SWITCHED CHARGE PUMP CIRCUIT

Monte F. Mar, and Paul D. Madland, both of Beverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 10, 1995, Ser. No. 402,343

Int. Cl.⁶ H03L *7/06*

U.S. Cl. 327—543 **2 Claims**



1. A charge pump circuit comprising:
- a charging transistor having a gate coupled to receive a first biasing voltage, the charging transistor being a p-channel field effect transistor (FET);

a discharging transistor having a gate coupled to receive a second biasing voltage, wherein a drain of the discharging transistor is coupled to a drain of the charging transistor, the discharging transistor being an n-channel FET wherein the charging transistor and the discharging transistor are matched devices;

a first complementary switch coupled in series between a source of the charging transistor and a first supply voltage, the first complementary switch being switched on and off in response to a first pair of complementary signals;

a second complementary switch coupled in series between a source of the discharging transistor and a second supply voltage, the second complementary switch being switched on and off in response to a second pair of complementary signals;

a biasing circuit, providing the first and second biasing voltages, comprising:

a current source outputting a reference current;

a current mirror circuit coupled to the current source and the charging and discharging transistors such that the reference current is mirrored to the charging and discharging transistors;

the current mirror circuit comprising:

a first field effect transistor (FET), having matched characteristics to the charging transistor, having a source, a drain, and a gate, wherein the drain of the first FET is coupled to the gate of the first FET, the current source being coupled between the drain of the first FET and the second supply voltage;

a first impedance coupled between the first supply voltage and the source of the first FET, the first impedance being a complementary switch that matches the characteristics of the first complementary switch and being equivalent to a first switch impedance of the first complementary switch when the first complementary switch is switched on;

a second FET, having matched characteristics to the charging transistor, having a source, a drain, and a gate, wherein the gate of the second FET are coupled to the gate of the first FET and a gate of the charging transistor;

a second impedance coupled between the first supply voltage and the source of the second FET, the second impedance being a complementary switch that matches the characteristics of the first complementary switch and being equivalent to the first switch impedance of the first complementary switch when the first complementary switch is switched on;

a third FET having matched characteristics to the discharging transistor, having a source, a drain, and a gate, wherein the drain of the third FET is coupled to the gate of the third FET, a gate of the discharging transistor, and the drain of the second FET; and

a third impedance coupled between the second supply voltage and the source of the third FET, the third impedance being a complementary switch that matches the characteristics of the second complementary switch and being equivalent to a second switch impedance of the second complementary switch when the second complementary switch is switched on.

5,532,637

LINEAR LOW-NOISE MIXER

George Khoury; Ronald D. Beards, both of Ottawa, and John J. Nisbet, Nepean, all of, Canada, assignors to Northern Telecom Limited, Montreal, Canada

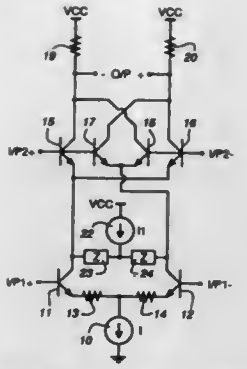
Filed Jun. 29, 1995, Ser. No. 496,648

Int. Cl.^{6} H03B *19/00*

U.S. Cl. 327—359 **17 Claims**

1. A tree mixer comprising:

a first differential pair of bipolar transistors having a current source coupled to their emitters and first input terminals coupled to their bases for supplying a first differential input signal thereto;



two second differential pairs of bipolar transistors having second input terminals coupled to their bases for supplying a second differential input signal to each pair of the two second differential pairs of transistors, the transistors of each pair of the two second differential pairs of transistors having emitters coupled to the collector of a respective transistor of the first differential pair of transistors, and the transistors of the two second differential pairs of transistors having collectors for providing an output signal representing a product of the input signals; and

at least one further current source coupled to the collectors of the first differential pair of transistors for conducting current so that total collector-emitter current passed by the first differential pair of transistors is greater than total collector-emitter current passed by the two second differential pairs of transistors.

5,532,638

SUPERCONDUCTING ENERGY STORAGE APPARATUS

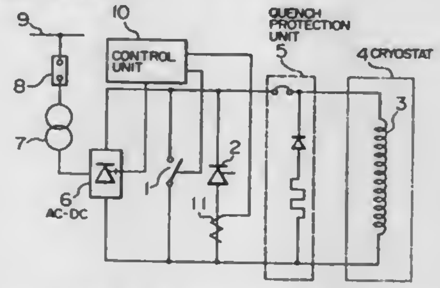
Morihiro Kubo; Yukio Ishigaki, both of Hitachi; Takeshi Itoh, and Hirokazu Misawa, both of Nagoya, all of, Japan, assignors to Hitachi, Ltd., and Chubu Electric Power Co., Inc., both of, Japan

Filed Sep. 20, 1993, Ser. No. 123,477

Claims priority, application Japan, Sep. 21, 1992, 4-251381

Int. Cl.^{6} H02H *7/20*

U.S. Cl. 327—368 **4 Claims**



1. A superconducting energy storage apparatus improved in generating a persistent current mode operation in response to a possible fault generated in an electric power system, said apparatus comprising:

an AC-DC converter having a power receiving side connected to an electric power system;

a quench protection unit connected in parallel with said AC-DC converter;

a superconductive coil connected in parallel with said quench protection unit;

a mechanical type persistent current switch connected in parallel with said AC-DC converter;

a self-firing type thyristor switch Connected to be in parallel with said mechanical type persistent current switch and to self-fire in response to a voltage applied thereto due to said fault and which is higher than a predetermined voltage; and

control means for closing said mechanical type persistent current switch in response to the self-firing of said self-firing type thyristor switch, such that a closed circuit is formed consisting essentially of said coil and the mechanical type persistent current switch to enable a persistent current mode operation in the closed loop.

5,532,639

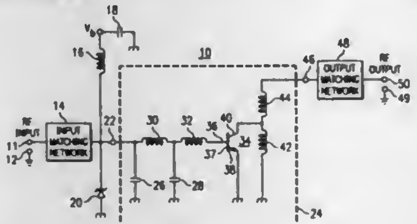
METHOD AND STRUCTURE FOR IMPROVING RF AMPLIFIER GAIN, LINEARITY, AND SWITCHING SPEED UTILIZING SCHOTTKY DIODE TECHNOLOGY

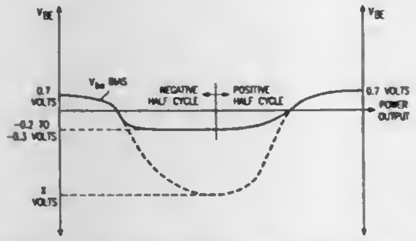
Craig J. Rotay, Lansdale, and Christopher Zielke, E. Greenville, both of Pa., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 31, 1994, Ser. No. 221,089

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 327—376 **25 Claims**





1. RF transistor circuitry which limits the amount of stored charge which must be overcome by a RF transistor when it attempts to turn on, comprising:

a RF transistor, having a base, a collector, and an emitter, which is located on a RF transistor die contained within a RF transistor package having a plurality of matching elements connecting to the base of said RF transistor;

a schottky diode circuit connected to the base of the RF transistor and located physically close to the RF transistor;

an input matching network connected between a RF input signal and the schottky diode circuit;

an output matching network connected to an output signal of the RF transistor; and

said RF input signal, representative of an RF cycle, is applied to the base of the transistor through the input matching network, wherein during a first portion of the RF cycle when the RF transistor is off, the schottky diode circuit limits the amount of charge which is stored by a base-emitter junction of the RF transistor, to a predetermined level of reactively stored charge, such that when the RF transistor attempts to turn on during a second portion of the RF cycle the RF transistor must only overcome the predetermined level of reactively stored charge.

5,532,640

VOLTAGE GENERATOR CIRCUIT GENERATING STABLE NEGATIVE POTENTIAL

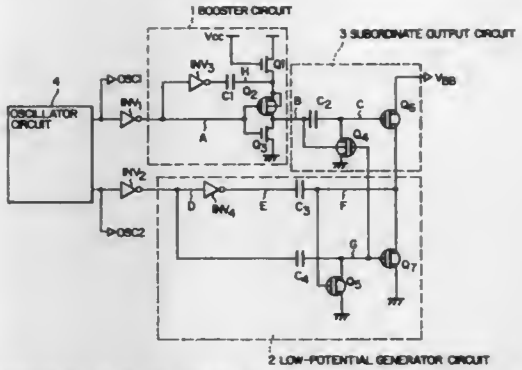
Kazuo Okunaga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 268,450

Claims priority, application Japan, Jun. 30, 1993, 5-159805

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 327—537 **6 Claims**



1. A voltage generator circuit comprising a first clock generator responding to a first clock signal oscillating with a first polarity and generating at a first output node a second clock signal with a second polarity opposite to said first polarity, a second clock generator responding to a third clock signal oscillating with said first polarity and generating at a second output node a fourth clock signal oscillating with said first polarity, and an output circuit responding to said second and fourth clock signals and generating at an output terminal thereof a bias voltage with said second polarity, said output circuit including an MOS transistor having a source-drain path connected between said output terminal and said first output node and a gate and a capacitance having a first electrode connected to said second output node to receive said fourth clock signal and a second electrode connected to the gate of said MOS transistor, the gate of said MOS transistor receives such a clock signal that is the same in phase and polarity with said second clock signal and has a voltage amplitude greater in absolute value than a voltage amplitude of said second clock signal.

5,532,641

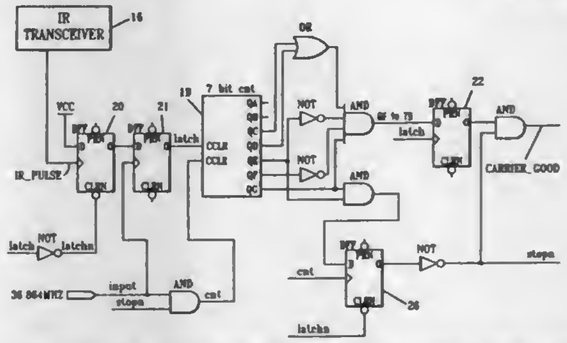
ASK DEMODULATOR IMPLEMENTED WITH DIGITAL BANDPASS FILTER

Peruvemba S. Balasubramanian, Chappaqua; Nathan J. Lee, New City, and Scott D. Lekuch, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,331

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 329—311 **20 Claims**



1. Apparatus for demodulating an ASK modulated signal, comprising:

means for reconditioning and digitizing an incoming ASK modulated signal and producing first output signal pulses in accordance therewith;

means for synchronizing said first output signal pulses with a system clock signal;

means for qualifying said first synchronized signal pulses and producing a CARRIER_GOOD (C_G) output signal in accordance therewith when the carrier frequency of said signal pulses is within a predefined bandpass frequency;

means for prolonging said C_G output signal for a predefined amount of time while said C_G output signal is active; and

means for outputting said prolonged C_G signal pulses as said demodulated ASK signal.

5,532,642
FEEDFORWARD-TYPE DISTORTION COMPENSATION CIRCUIT

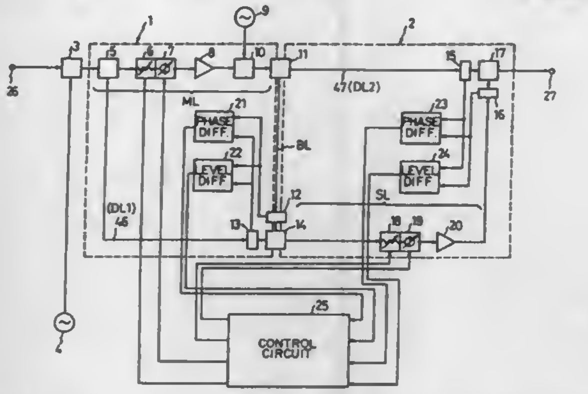
Kenichi Takai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,878

Claims priority, application Japan, Mar. 10, 1994, 6-065484

Int. Cl.^{6} H03F *1/32*

U.S. Cl. 330—15 **15 Claims**



1. A feedforward-type distortion compensation circuit which includes a main amplifier, and which detects and compensates for a non-linear distortion component generated by the main amplifier, comprising:

oscillation means for generating first and second pilot signals;
first coupling means for coupling the first pilot signal to an input signal;
a main amplifier path;
a first delay line path;
a second delay line path;
an auxiliary amplifier path;
a signal transmission path;
first signal distribution means for distributing a signal from the first coupling means to an end of the main amplifier path and an end of the first delay line path;
a main amplifier interposed in the main amplifier path;
second coupling means interposed in the main amplifier path for coupling the second pilot signal to a signal propagating in the main amplifier path;
a first variable attenuation means interposed in one of the main amplifier path and the first delay line path and having a controllable attenuation amount;
first variable phase shifting means interposed in one of the main amplifier path and the first delay line path and having a controllable phase shift amount;
second signal distribution means having an input terminal connected to the other end of the main amplifier path and having a pair of output terminals connected to an end of the second delay line path and an end of the signal transmission path;
first signal combination means having a pair of input terminals connected to the other end of the first delay line path and the other end of the signal transmission path and having an output terminal connected to an end of the auxiliary amplifier path;
an auxiliary amplifier interposed in the auxiliary amplifier path;
second variable attenuation means interposed in one of the auxiliary amplifier path and the second delay line path and having a controllable attenuation amount;
second variable phase shifting means interposed in one of the auxiliary amplifier path and the second delay line path and having a controllable shift amount;
second signal combination means having a pair of input terminals connected to the other end of the second delay line path and the other end of the auxiliary amplifier path for outputting an output signal;
phase difference detection means for detecting a difference in phase between the input terminals of the first signal combination means and for detecting a difference in phase between the input terminals of the second signal combination means;
level difference detection means for detecting a difference in level between the input terminals of the first signal combination means and for detecting a difference in level between the input terminals of the second signal combination means; and
control means for controlling the first and second variable attenuation means and the first and second phase shifting means in response to results of detection of the phase difference detection means and the level difference detection means so that components of the first pilot signal from the input terminals of the first signal combination means are combined with equal delay amounts, in opposite phases and with equal amplitudes by the first signal combination means and components of the second pilot signal from the input terminals of the second signal combination means are combined with equal delay amounts, in opposite phases and with equal amplitudes by the second signal combination means.

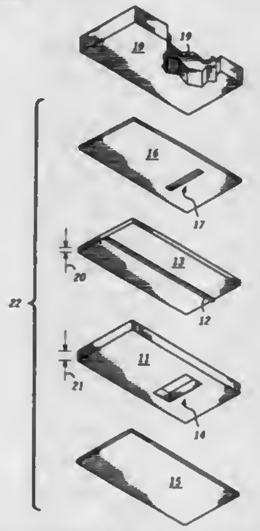
5,532,643
MANUFACTURABLY IMPROVED ASYMMETRIC STRIPLINE ENHANCED APERTURE COUPLER

Stephen L. Kuffner, Algonquin, and Eric L. Krenz, Crystal Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1995, Ser. No. 494,205

Int. Cl.^{6} H01P *5/02*

U.S. Cl. 333—246 **13 Claims**



1. An asymmetric stripline aperture coupler comprising:

a stripline conductor;
a first ground plane having a first aperture;
a first dielectric disposed between the stripline conductor and the first ground plane;
a second ground plane;
a second dielectric disposed between the stripline conductor and the second ground plane having a second aperture;
a third dielectric; and
a coupling conductor separated from the first ground plane by the third dielectric.

5,532,644
VARIABLE GAIN AMPLIFYING CIRCUIT

Chikashi Nakagawara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Feb. 23, 1995, Ser. No. 393,278

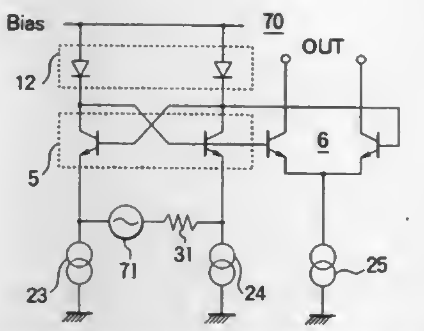
Claims priority, application Japan, Feb. 24, 1994, 6-026771

Int. Cl.^{6} H03F *3/45*

U.S. Cl. 330—254 **14 Claims**

3. A variable gain amplifying circuit, comprising:

a first transistor pair whose bases and collectors are cross-connected and whose emitters are connected to respective first current sources for supplying bias currents;



a PN junction pair for conducting bias currents that are collector currents of said first transistor pair;
a second transistor pair with a common emitter connection and bases connected to receive a voltage difference of said PN junction pair, the common emitter connection connected to a second current source;
input voltage means,
a resistor connected in series with said input voltage means between the emitters of said first transistor pair; and
output terminals connected to collectors of said second transistor pair.

5,532,645
CIRCUIT FOR CONTROLLING THE RISE OF THE OUTPUT VOLTAGE OF AN AMPLIFIER AT START UP

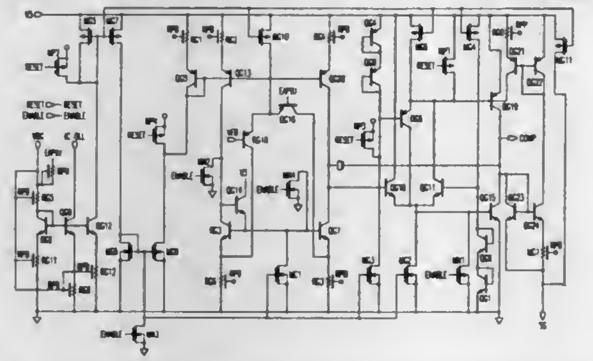
Mauro Fagnani, Nerviano; Bruno Ferrario, Mornasco, and Paolo Sandri, Milan, all of, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Oct. 24, 1994, Ser. No. 328,233

Claims priority, application Italy, Oct. 22, 1993, VA93A0023

Int. Cl.^{6} H03P *3/26*

U.S. Cl. 330—265 **22 Claims**



6. A circuit for regulating the charge of the output node of an amplifier at start up, comprising

an external capacitor that is chargeable by a charging current delivered by a pull-up transistor of a push-pull output stage of the amplifier, through a diode functionally connected between the output node of the amplifier and a terminal of said external capacitor, and
means for mirroring a current, which is a function of said charging current, onto a control terminal of said pull-up transistor of the output stage of the amplifier, to thereby limit the current provided by said pull-up transistor when said capacitor is discharged.

5,532,646
HIGH FREQUENCY POWER AMPLIFIER

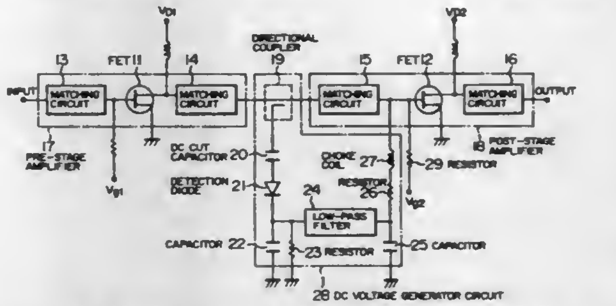
Yukichi Aihara, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 14, 1994, Ser. No. 339,698

Claims priority, application Japan, Nov. 30, 1993, 5-299778

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 330—279 **20 Claims**



1. A high frequency power amplifier comprising a plurality of amplifiers connected in cascade, each of said amplifiers including an amplifying element, and first DC voltage generator means including means for detecting an input power level to one of said plurality of amplifiers and means for generating and applying a DC voltage having a level corresponding to said input power level to an input terminal of said amplifying element of said one of said plurality of amplifiers, said first DC voltage generator means including an input coupler means for extracting a part of an input signal to said one of said plurality of amplifiers and means for converting said part of said input signal extracted by said input coupler means to said DC voltage applied to said one of said plurality of amplifiers.

5,532,647
RECEIVER HAVING ACG CIRCUIT

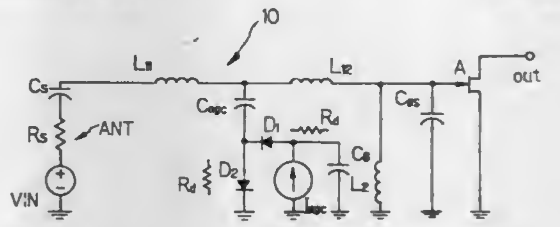
Yasuo Kawakami, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan

Filed Oct. 12, 1994, Ser. No. 321,981

Claims priority, application Japan, Oct. 12, 1993, 5-254064

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 330—284 **8 Claims**



1. A receiver, to which a high frequency signal is inputted from an antenna for receiving the high frequency signal, said receiver comprising:

an amplifier element for amplifying the inputted high frequency signal;
n (n: natural number not less than 2) pieces of coil elements, which are serially connected between said antenna and an input side of said amplifier element and construct a low pass filter for the inputted high frequency signal; and
an AGC circuit including an impedance variable means, which is connected at one end thereof to an intermediate connection point of two coil elements adjacently disposed in said n pieces of coil elements and is connected at the other end thereof to a ground, and which impedance between said one end and said the other end is varied in accordance with a level of the

inputted high frequency signal, for controlling an input level of the inputted high frequency signal for said amplifier element by changing an attenuation characteristic thereof in accordance with the change in the impedance of said impedance variable means.

5,532,648

RADIO FREQUENCY AMPLIFIERS WITH COMPENSATION SIGNAL TO ACCOMODATE CHANGES IN THE CONDUCTION POINT DUE TO TEMPERATURE CHANGES

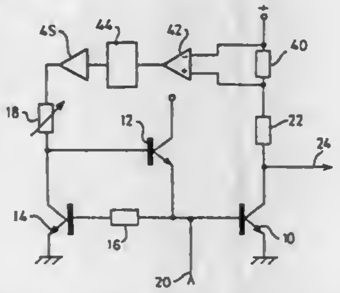
Dennis A. Culling, Cambridge, Great Britain, assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 22, 1994, Ser. No. 256,221

Claims priority, application United Kingdom, Dec. 30, 1991, 9127469; Feb. 4, 1992, 9202302

Int. Cl.^{6} **H03F** *1/30*

U.S. Cl. 330—289 **8 Claims**



1. A radio-frequency amplifier incorporating at least one amplifying device having an input bias circuit and an output circuit comprising means for continuously applying to the input bias circuit of the device a compensation signal having a magnitude continuously related to changes in the radio frequency power handled by the device to compensate for changes in the conduction point of the device due to temperature changes within the device resulting from changes in the radio frequency power handled by the device in which the compensation signal related to the changes in the radio frequency power handled by the device is derived from a sensing element in the output circuit of the device.

5,532,649

SPEAKER RESISTANCE SENSING AND POWER LIMIT SETTING CIRCUIT

Youssef Y. Sahyoun, 4367 Lanyard Ave., Redwood City, Calif. 94065

Filed Jan. 3, 1995, Ser. No. 368,772

Int. Cl.^{6} **H03F** *21/00;* **H02M** *3/335*

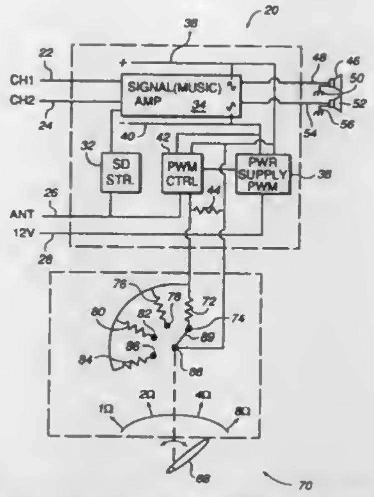
U.S. Cl. 330—297 **16 Claims**

1. An amplifier comprising:

a pulse width modulating controller whose pulse control controls a rail voltage of the amplifier based on a resistance value of a feedback loop connected between two terminals of the controller; and

a multi-position switch connected to said feedback loop such that varying the position of the multi-position switch changes the resistance value of the feedback loop to change the voltage level at which the rail voltage is controlled,

wherein one or more positions of the multi-position switch change the resistance value of the feedback loop to control the rail voltage of the amplifier to one or more pre-set values, wherein said one or more pre-set values are set to correlate to drive speakers having one or more impedance values, wherein setting the position of the multi-position switch to a first position identified with a first speaker impedance value provides a first resistance value of the feedback loop and a corresponding pre-set rail voltage value, while moving the multi-position selector switch to a second position identified with a second speaker impedance value having higher impedance value than the first impedance value provides a second resistance value of the feedback loop and a corresponding second pre-set rail voltage value which is higher than said rail voltage value at said first position.



5,532,650

HIGH-FREQUENCY AMPLIFIER

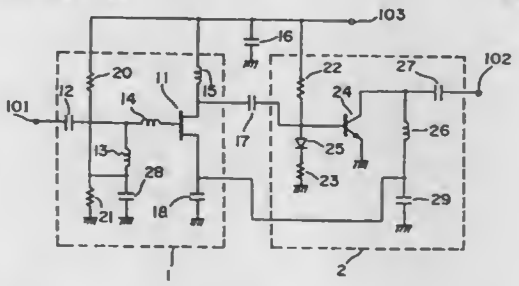
Sadao Igarashi, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 375,452

Claims priority, application Japan, Jan. 20, 1994, 6-021966

Int. Cl.^{6} **H03F** *3/16*

U.S. Cl. 330—300 **7 Claims**



6. A high-frequency amplifier, comprising:

a first signal amplifier including a field effect transistor having a first terminal connected to a first voltage source through an impedance element, the field effect transistor also having a second terminal; and

a constant-current circuit cascade-connected to the first signal amplifier, the constant-current source including a bipolar transistor having a base connected to the first terminal of the field effect transistor, a collector connected to the second terminal of the field effect transistor, and an emitter connected to a second voltage source;

wherein a drain current through the field effect transistor is equal to a collector current through the bipolar transistor.

5,532,651

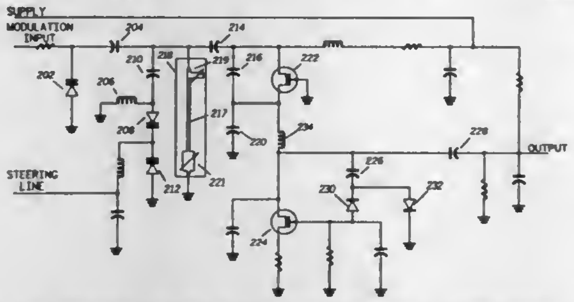
TUNABLE VOLTAGE CONTROLLED OSCILLATOR HAVING MICROSTRIP RESONATOR WITH CUTS FOR BETTER TUNING

Rene I. Jager, North York; Peter Vizmuller, Richmond Hill, and Mathias M. Gimpelj, Markham, all of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1995, Ser. No. 417,557

Int. Cl.^{6} **H03B** *5/18;* **H01P** *7/08*

U.S. Cl. 331—96 **12 Claims**



1. An oscillator having an operating frequency, comprising:

a resonator having a quality factor (Q) and disposed on a circuit carrying substrate, the resonator comprising:

a micro-strip having a width and disposed on the substrate;

an inductive component having a metalized portion disposed on the substrate;

a plurality of cuts made on the metalized portion in order to tune the operating frequency of the oscillator, the plurality of cuts are made in such a way to produce a continuous runner having a width not smaller that the width of the micro-strip in order to minimize degradation in the Q of the resonator;

an amplifier coupled to the resonator; and

an output.

5,532,652

OSCILLATION CIRCUIT WITH ENABLE/DISABLE FREQUENCY STABILIZATION

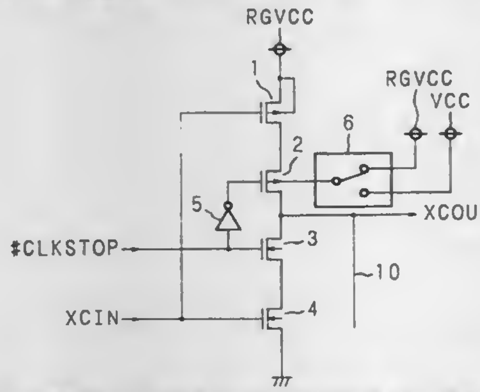
Toshiaki Koyama; Shinichi Hirose, and Hisashi Harada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 398,237

Claims priority, application Japan, Apr. 1, 1994, 6-065219

Int. Cl.^{6} **H03B** *5/06;5/36;* **H03L** *3/00*

U.S. Cl. 331—116 FE **15 Claims**



1. An oscillation circuit formed in an N-well type CMOS semiconductor integrated circuit for outputting an oscillation signal based on an oscillation input signal and inputting an input signal and outputting an output signal, comprising:

a first P-channel transistor and a first N-channel transistor connected in series to each other for allowing said oscillation circuit to be in one of an enable state where said oscillation circuit can output said oscillation signal and a disable state where said oscillation circuit can input said input signal and output said output signal;

a second P-channel transistor through which a first voltage is supplied to said first P-channel transistor and which is turned on or off in accordance with said oscillation input signal;

a second N-channel transistor through which a ground voltage is supplied to said first N-channel transistor and which is turned on or off in accordance with said oscillation input signal; and

switching means for switching a voltage to be supplied to the back gate of said first P-channel transistor between said first voltage and a second voltage higher than said first voltage.

5,532,653

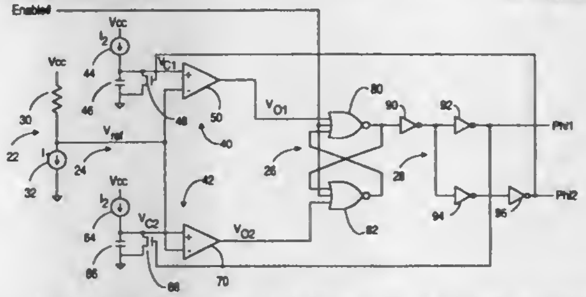
SUPPLY VOLTAGE COMPENSATED CHARGE PUMP OSCILLATOR

Kenneth C. Adkins, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 7, 1995, Ser. No. 384,980

Int. Cl.^{6} **H03B** *5/04;5/06;5/24;* **H03K** *3/011*

U.S. Cl. 331—143 **18 Claims**



1. A charge pump oscillator apparatus for providing a charge pump clock signal having a charge pump clock signal frequency, the charge pump oscillator being provided with a supply voltage, the apparatus comprising

a reference circuit, the reference circuit providing a reference signal when provided with the supply voltage, the reference signal being related to the supply voltage of the charge pump oscillator, and

a signal generation circuit, the signal generation circuit receiving the reference signal and providing the charge pump clock signal, the charge pump clock signal frequency being inversely related to the reference signal, the signal generation circuit including

a timing circuit coupled to the reference circuit, the timing circuit providing first and second timing signals based upon the reference signal, and

a latch circuit coupled to the timing circuit, the latch circuit receiving the first and second timing signals and providing the charge pump clock signal based upon the first and second timing signals.

5,532,654

FSK MODULATOR USING SAW RESONATOR WITH SWITCHABLE CAPACITORS

Tsutomu Ieki, and Yasuhiko Hirano, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 1, 1995, Ser. No. 457,284

Claims priority, application Japan, Jun. 28, 1994, 6-146670

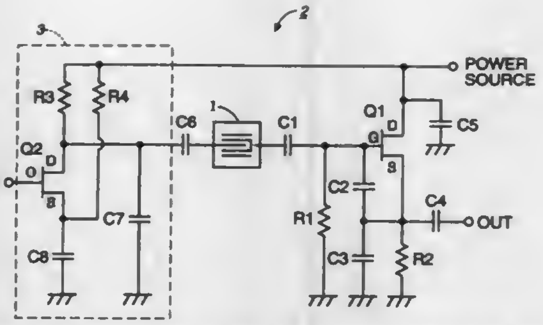
Int. Cl.^{6} **H04L** *27/12*

U.S. Cl. 332—102 **19 Claims**

1. In combination with an amplifier for oscillation, an FSK modulator comprising:

a surface acoustic wave resonator connected to said amplifier;

a switching circuit connected in series with said surface acoustic wave resonator, said switching circuit including one or more fixed-capacity capacitors and a semiconductor switch having first and second terminals and being capable of being set in an ON condition or an OFF condition wherein said semiconductor switch is respectively conductive or non-conductive between said first and second terminals and thereby causing



one or a combination of said fixed-capacity capacitors to be connected in series with said surface acoustic wave resonator; and

an input terminal connected to said semiconductor switch for receiving input signals for setting said semiconductor switch selectably in said ON or OFF condition.

5,532,655

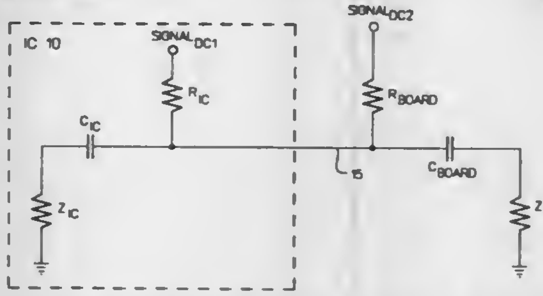
METHOD AND APPARATUS FOR AC/DC SIGNAL MULTIPLEXING

Nhat M. Nguyen, San Jose, and Kevin J. Negus, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1995, Ser. No. 393,634

Int. Cl.^{6} H03H *1/02*

U.S. Cl. 333—1 **7 Claims**



1. In an integrated circuit having a plurality of input/output leads, a method for transmitting a first AC signal and a first DC signal over the same input/output lead simultaneously, the method comprising the steps of:

coupling an input/output lead to a first integrated circuit capacitance and to a first integrated circuit resistance;

coupling the input/output lead to a first printed circuit board capacitance and to a first printed circuit board resistance;

applying the first AC signal to one of the first integrated circuit capacitance and the first printed circuit board capacitance, the AC signal traveling through the input/output lead to the other capacitance; and

applying the first DC signal to one of the first integrated circuit resistance and the first printed circuit resistance, the DC signal traveling through the input/output lead to the other resistance, the printed circuit board and the integrated circuit capacitances appearing as open circuits to the DC signal and the printed circuit board and the integrated circuit resistances appearing as open circuits to the AC signal.

5,532,656

PLANAR T-TYPE LC FILTER WITH RECESSES BETWEEN TERMINAL ELECTRODES

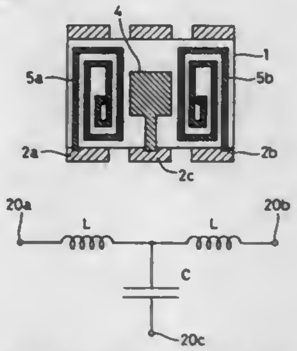
Tamotsu Yoshimura, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 28, 1994, Ser. No. 365,406

Claims priority, application Japan, Dec. 28, 1993, 5-336022

Int. Cl.^{6} H03H *7/01*

U.S. Cl. 333—185 **5 Claims**



1. A chip filter for high frequency comprising:

a capacitor and two substantially winding coils formed on a top surface of an insulating substrate said insulating substrate having a plurality of recesses at an end, thereof three terminal electrodes are provided on the top surface of the insulating substrate at portions adjacent to the recesses, said terminal electrodes extending to a bottom surface of the insulating substrate along a side surface thereof, one end of each of the two coils and a first electrode of the capacitor are connected to different terminal electrodes, and the other end of each of the two coils is connected to a second electrode of the capacitor.

5,532,657

HIGH SPEED COAXIAL CONTACT AND SIGNAL TRANSMISSION ELEMENT

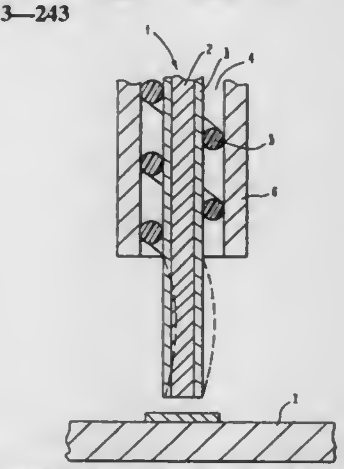
Roland Stoehr, Nufringen, and Rudolf Kratt, Rottenburg, both of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1995, Ser. No. 448,221

Claims priority, application Germany, Jun. 1, 1994, 94108593

Int. Cl.^{6} H01P *3/06*

U.S. Cl. 333—243 **2 Claims**



1. A high speed coaxial contact and signal transmission element comprising:

a. an inner conductor element;

b. an outer conductor element comprising a metal shield;

c. a dielectric area between said inner conductor element and said outer conductor element, where said inner conductor element is a continuous element with a core of hardened conductive material exhibiting good elastic properties surrounded by a metal shell, said core having a hardness in the range of approximately 1400 N/MM^2 to approximately 1600 N/MM^2, and said core material being $CuBe_2$; and

d. a filament of low dielectric constant material wrapped around said inner conductor element and fixed on the surface of said inner conductor element.

5,532,658

MOUNTING STRUCTURE FOR ELECTRONIC COMPONENT

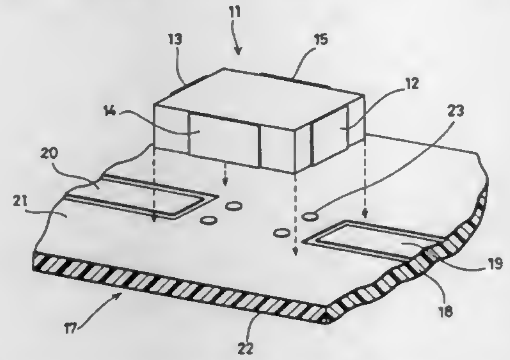
Ken Tonegawa; Harufumi Mandai; Teruhisa Tsuru; Mitsuhide Katou, and Koji Furutani, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 22, 1994, Ser. No. 362,805

Claims priority, application Japan, Dec. 22, 1993, 5-324311; Dec. 28, 1993, 5-336404; Dec. 28, 1993, 5-336406

Int. Cl.^{6} H01P *5/00;* H01L *23/48*

U.S. Cl. 333—246 **28 Claims**



1. A mounting structure for mounting an electronic component, for being employed in the frequency range in the microwave band or above, on a circuit board;

said circuit board comprising a transmission line member, a ground electrode being electrically insulated from said transmission line member, and an electric insulating substrate having a major surface and holding said transmission line member and said ground electrode;

said electronic component comprising a plurality of external terminals;

said electronic component being fixed to said circuit board with said external terminals being capacitively coupled with said transmission line member and said ground electrode respectively; and

said electronic component having opposite upper and lower surfaces and a plurality of side surfaces connecting said upper and lower surfaces with each other, said external terminals comprising external electrodes being formed on said side surfaces.

5,532,659

CONNECTION DEVICE TO PROVIDE A CONNECTION, BY COAXIAL CABLE, TO A PRINTED CIRCUIT

André Dodart, Eragny S/oise, France, assignor to Thomson-CSF, Paris, France

Filed May 15, 1995, Ser. No. 441,408

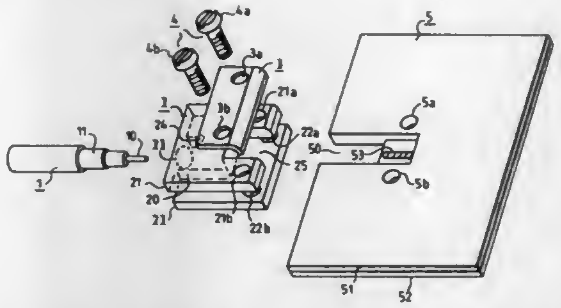
Claims priority, application France, May 19, 1994, 94 06123

Int. Cl.^{6} H01P *5/08;* H01R *9/09*

U.S. Cl. 333—260 **8 Claims**

1. A connection device providing a coaxial cable connection to a printed circuit, comprising:

coaxial cable with an internal conductor, an external conductor and an end bared to reveal the internal and external conductors,



a U-shaped fixed metal part which includes a bottom plate and a first and second plate respectively positioned on either side of the bottom plate so as to form vertical arms of the U-shaped metal part, said U-shaped metal part fitting into the printed circuit with the first and second plates being respectively positioned on either side of the printed circuit, the bottom plate including a hole formed therein which has a wall, the hole receiving the bared end of the cable with the internal conductor wherein the internal conductor is located within the U-shaped metal part and the external conductor is in contact with the wall of the hole, and wherein the first plate has an aperture located therein which is located in proximity with a location where the internal conductor emerges within the U-shaped metal part,

at least one fastening member fixing the U-shaped metal part to the printed circuit; and

a substantially flat metal cap covering the aperture and overlapping at least one of the vertical arms of the U-shaped metal part.

5,532,660

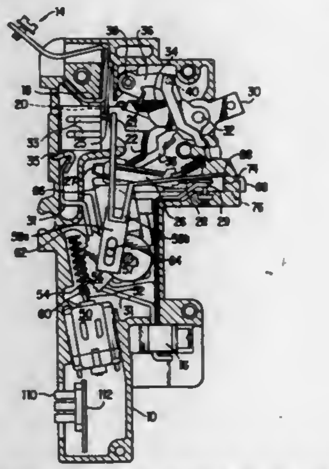
MANUAL OVERRIDE MECHANISM FOR A REMOTE CONTROLLED CIRCUIT BREAKER

Lowell D. Smith, Cedar Rapids, Iowa, and Robert G. Cook, West Chester, Ohio, assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 901,365, Jun. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 722,050, Jun. 28, 1991, Pat. No. 5,180,051. This application Feb. 28, 1995, Ser. No. 397,025

Int. Cl.^{6} H01H *75/00*

U.S. Cl. 335—14 **21 Claims**



1. A remotely controllable circuit breaker device for interrupting power in a circuit path between a source and a load, comprising:

a housing;

a first contact and a second contact within said housing and cooperatively arranged in the circuit path so as to provide current from the source to the load and at least one of the contacts being secured to a contact carrier which is movable for interrupting the power provided to the load;

a motor having a rotatable shaft, said motor being responsive to remote control signals generated from a remote location;

gear driving means, rotatably responsive to the rotatable shaft, for moving the contact carrier so that the circuit path may be interrupted or established in response to the remote control signals;

a coupling arrangement, having a first part coupled to said contact carrier and a second part coupled to said gear driving means, operating in a normal mode which is responsive to said gear driving means so that the circuit path is interrupted or established in response to the remote control signals;

a slide mechanism, coupled to said gear driving means, which is movable between a fixed position, which renders said coupling arrangement responsive to the remote control signals, and a non-fixed position, which allows free movement thereof and renders said coupling arrangement nonresponsive to the remote control signals; and

a manually operated member supported in said housing and movable between (i) a first position wherein said manually operated member engages and activates said slide mechanism to said fixed position thereby rendering the coupling arrangement responsive to the remote control signals, and (ii) a second position wherein said manually operated member is disengaged from and activates said slide mechanism to said non-fixed position, thereby rendering the coupling arrangement non-responsive to the remote control signals.

5,532,661

DEVICE FOR DISTRIBUTION OF MICROWAVE SIGNALS

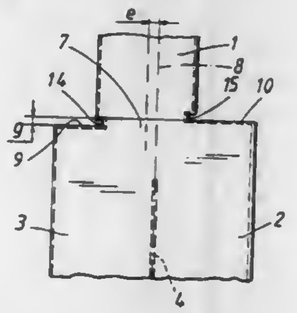
Rolf Lagerlöf, Mölnlycke, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 14, 1995, Ser. No. 421,973

Claims priority, application Sweden, Apr. 15, 1994, 9401280

Int. Cl.^{6} H01P *5/12*

U.S. Cl. 333—125 **3 Claims**



1. A waveguide device for non-uniformly distributing in a magnetic plane a microwave signal, the waveguide device comprising:

a first waveguide, a second waveguide, and a third waveguide, wherein the microwave signal from the first waveguide is distributed between the second waveguide and the third waveguide; the second and third waveguides are placed parallel to each other, are separated by a partition wall, and are terminated at one end by shoulder walls in which an opening is arranged to which the first waveguide is connected; the opening and the first waveguide are displaced sideways in relation to a longitudinal direction of the partition wall; and the shoulder walls in relation to each other are displaced sideways in relation to the longitudinal direction of the waveguides.

5,532,662

INDUCTIVE COMPONENT HAVING AN OPENING IN THE EXTERIOR MOLD

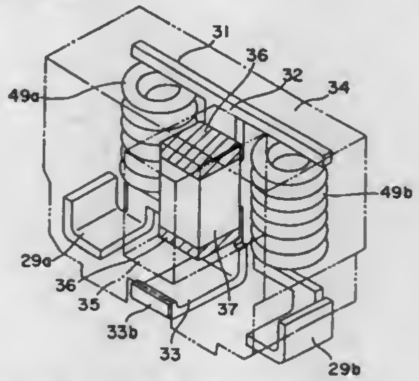
Yasushi Kumeji, Kadoma; Seiichi Nishimura, Hirakata; Yoshinobu Nakajima, Ka‘ano, and Makoto Itou, Toyooka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 135,291, Oct. 12, 1993, Pat. No. 5,446,428. This application Mar. 28, 1995, Ser. No. 412,163

Claims priority, application Japan, Oct. 12, 1992, 4-272699; Mar. 26, 1993, 5-067833; Jun. 30, 1993, 5-162131

Int. Cl.^{6} H03H *7/01*

U.S. Cl. 333—185 **3 Claims**



1. An electronic component comprising:

an inductive element including a pair of conductive wire coil windings which are covered with an insulated film,

a pair of first terminal parts connected to one side of the pair of windings,

a connecting part connected to another side of the pair of windings,

an electrode coupled to the connecting part,

a second terminal positioned adjacent to said electrode,

and an exterior mold including an opening which exposes portions of said electrode and said second terminal.

5,532,663

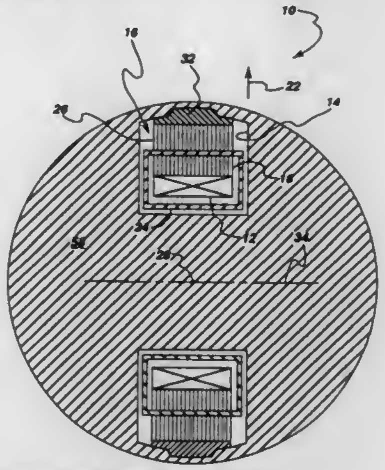
SUPPORT STRUCTURE FOR A SUPERCONDUCTING COIL

Kenneth G. Herd, Niskayuna, and Evangelos T. Laskaris, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 13, 1995, Ser. No. 402,439

Int. Cl.^{6} H02K *55/00;9/00;* **H01F** *7/00*

U.S. Cl. 335—216 **7 Claims**



1. A superconducting device comprising:

a) a superconductive coil;

b) a vacuum enclosure surrounding and spaced apart from said superconductive coil; and

c) means for supporting said superconductive coil in said vacuum enclosure during operation of said superconducting device, said means including a first thermally insulative honeycomb assemblage disposed between said superconductive coil and said vacuum enclosure, and

wherein said first thermally insulative honeycomb assemblage includes a plurality of generally identical cells having a common open direction aligned to extend from said superconductive coil to said vacuum enclosure.

5,532,664

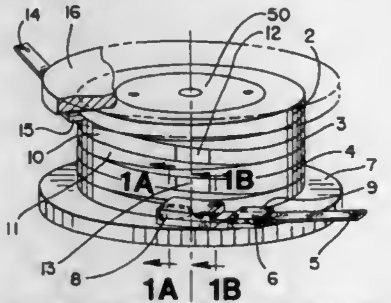
MODULAR SUPERCONDUCTING ENERGY STORAGE DEVICE

Warren E. Buckles, Madison, Wis., and Richard A. Lundy, White Salmon, Wash., assignors to Superconductivy, Inc., Middleton, Wis.

Filed Jul. 18, 1989, Ser. No. 381,309

Int. Cl.^{6} H01F 7/22

U.S. Cl. 335—216 **27 Claims**



1. A superconducting magnet for energy storage comprising a plurality of modules connected in series such that in operation the magnetic field produced by each of said modules acts in the same direction, each module comprising:

a core member;

a superconducting coil member wound around said core member, said coil member having an input end and an output end;

a tensioning member adapted to retain the tension in the turns of said coil member; and

attachment means adapted to secure said unit to another of said units;

said input and output ends being adapted for attachment to another of said modules.

5,532,665

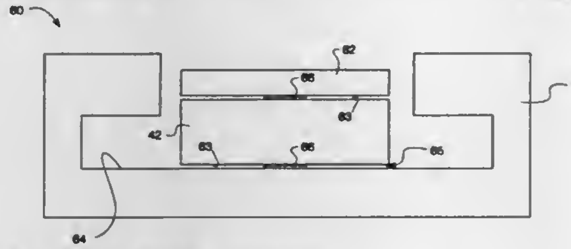
LOW STRESS MAGNET INTERFACE

Steven A. Foote, Issaquah, and Damon R. Stoddard, Seattle, both of Wash., assignors to AlliedSignal, Inc., Morristown, N.J.

Filed Jan. 21, 1994, Ser. No. 184,527

Int. Cl.^{6} G01P *15/08;* **H01F** *1/00*

U.S. Cl. 335—296 **8 Claims**



6. A magnet assembly comprising:

an excitation ring;

a magnet defining opposing bonding surfaces; and

an adhesive bond forming a pedestal bonding a portion of a first bonding surfaces to the excitation ring, and an air gap between said excitation ring and said first bonding surface.

5,532,666

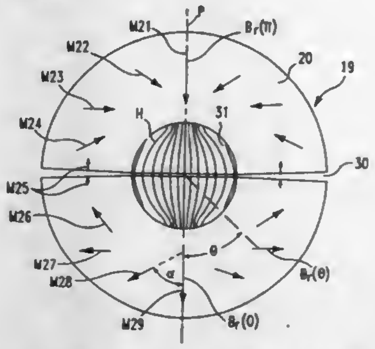
MAGNETOSTATIC CHARGED PARTICLE TRAP

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1995, Ser. No. 454,965

Int. Cl.^{6} H01F *7/02*

U.S. Cl. 335—306 **4 Claims**



2. A charged particle ion trap comprising a spherical shell of magnetic material having a spherical hollow cavity positioned concentrically within said shell and having a polar axis that passes through a center of said shell and cavity, said shell being permanently magnetized to produce a double-tapered magnetic field in said cavity, wherein said magnetic material has a remanence that varies in direction and magnitude such that the angular orientation α of said remanence with respect to said polar axis varies as a function of a polar angle θ of the material's average location in accordance with with equation $\alpha=2\theta$; wherein the remanence $B_r(\theta)$ varies according to the following expression:

$B_r(\theta)=B_r(0)\ [B_r(\pi/2)-B_r\ (0)]\ 2\theta/\pi$, for average polar angles between $\theta=0$ radians and $\theta=\pi/2$ radians; and

$B_r(\theta)=B_r(\pi/2)\ [B_r(\pi/2)-B_r(0)]\ (2\theta\ -\pi)/\pi$, for average polar angles between $\theta=\pi/2$ radians and $\theta=\pi$ radians.

5,532,667

LOW-TEMPERATURE-COFIRED-CERAMIC (LTCC) TAPE STRUCTURES INCLUDING COFIRED FERROMAGNETIC ELEMENTS, DROP-IN COMPONENTS AND MULTI-LAYER TRANSFORMER

Carol Haertling, Santa Ana; Andrew A. Shapiro, Orange; Charles A. Goodman, Garden Grove; Ramona G. Pond, Downey; Robert D. Washburn, Malibu; Robert F. McClanahan, Valencia; Carlos H. Gonzalez, La Mirada, and David M. Lusher, Gardena, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 190,955, Feb. 3, 1994, abandoned, which is a division of Ser. No. 923,409, Jul. 31, 1992, Pat. No. 5,312,674. This application Oct. 11, 1995, Ser. No. 541,170

Int. Cl.^{6} H01F *17/04;27/30*

U.S. Cl. 336—177 **8 Claims**

1. A cofired ceramic tape transformer structure comprising:

a plurality of sandwiched sheets of low-temperature-cofired-ceramic (LTCC) tape;

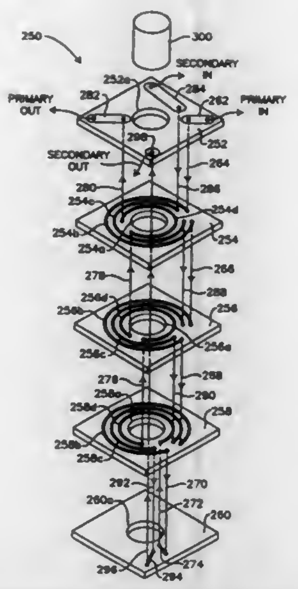
a primary coil comprising a first section and a second section and including:

  a plurality of vertically aligned, arcuate primary electrical conductors formed on surfaces of the sheets wherein said electrical conductors for said first section are located on the same surface as and laterally spaced apart from said electrical conductors for said second section; and

  a plurality of primary vertical interconnects (vias) which extend through said sheets and interconnect ends of said primary conductors on adjacent sheets respectively to form a continuous electrical path through said primary conductors wherein said vias comprise ferromagnetic material;

a secondary coil including:

  a plurality of vertically aligned arcuate secondary electrical conductors formed on surfaces of the sheets wherein said



secondary electrical conductors are located on the same surface as and laterally in the space between said first section and said second section of said primary coil; and

a plurality of secondary vertical interconnects (vias) which extend through said sheets and interconnect ends of said secondary conductors on adjacent sheets respectively to form a continuous electrical path through said secondary conductors wherein said vias comprise ferromagnetic material; and

a central core comprising ferromagnetic material, said central core extending through a plurality of central openings in said sheets.

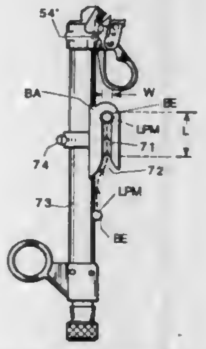
5,532,668
UNIVERSAL FUSE HOLDER AND CUT-OUT WITH BUILT-IN SAFETY FEATURES AND METHOD

Robert B. Fennell, 978 Shawnee Egypt Rd., Springfield, Ga. 31329

Continuation-in-part of Ser. No. 299,622, Sep. 2, 1994. This application Feb. 15, 1995, Ser. No. 388,925

Int. Cl.⁶ H01H *71/10;71/20*

U.S. Cl. 337—168 **2 Claims**



1. A safety device for aiding a lineman to mount and demount a fuse cut-out switch element to a distribution switch using a hot/switch stick having a longitudinal axis and a member projecting laterally of said axis and an enlargement on the end of said member, said element having a tubular body and a pair of spaced contact assemblies at the ends thereof, said safety device having means forming a slot having a width W and length L, said width W of said slot being smaller than said enlargement, said member having an intermediate portion which is narrower than W, said slot having a member engaging base at the opposite end, said slot having a length such that, in conjunction with the weight of said fuse cut-out, jiggling and wind and rain forces are insufficient to displace said projection member from said slot while said hot/switch stick is being raised to fit said fuse cutout switch element to said distribution switch, means mounting said safety device on said tubular body and adjacent one of said pair of spaced contact assemblies such that when said member is at the base of said slot, said device is guidingly moved parallel to said tubular body to engage said one of said pair of spaced contact assemblies and preclude rotation thereof relative to said tubular body.

5,532,669
TERMINAL FOR HIGH-VOLTAGE VARIABLE RESISTOR

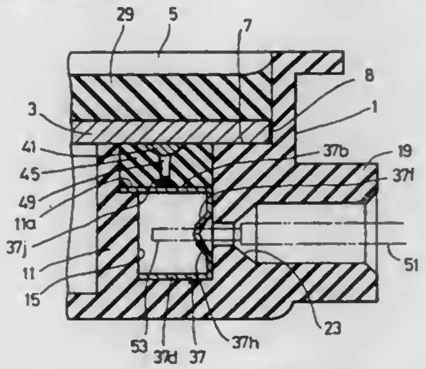
Ichiro Tsunezawa, Toyama; Hiromasa Saikatsu, Himi, and Tsuyoshi Ohta, Toyama, all of, Japan, assignors to Hokuriku Electric Industry Co., Ltd., Kami-Niikawagun, Japan

Filed Nov. 29, 1993, Ser. No. 158,943

Claims priority, application Japan, Nov. 27, 1992, 4-087639 U

Int. Cl.⁶ H01C *1/02;13/00*

U.S. Cl. 338—184 **13 Claims**



1. A high-voltage variable resistor comprising:

a circuit substrate having a circuit pattern formed on a front surface thereof;

an insulating casing made of an insulating resin material and provided therein with a circuit substrate receiving section open at one end thereof;

said circuit substrate being received in said circuit substrate receiving section of said insulating casing and arranged so as to define a space between an inner surface of said insulating casing and said front surface of said circuit substrate;

at least one sliding element arranged in said space in a manner to be operable from an outside of said insulating casing; and

at least one terminal fitment to which a core of a lead wire is connected without soldering and which is electrically connected to an electrode incorporated in said circuit pattern;

said terminal fitment including a core holding section provided with four edge elements each having a pointed distal end adapted to bite into a periphery of the core of the lead wire inserted;

said edge elements each being formed between each adjacent two of four slits formed at a plate-like section of said terminal fitment so as to radially extend from a center of said plate-like section;

said plate-like section being formed into a substantially rectangular configuration;

said four slits being formed so as to extend toward corners of said plate-like section, respectively;

said edge elements each being constructed so as to be forced by the core of the lead wire when the core is inserted through said center of said plate-like section into said terminal fitment, to thereby be inclined in a direction of insertion of the core into said terminal fitment and bite into the periphery of the core of the lead wire when drawing force is applied to the lead wire.

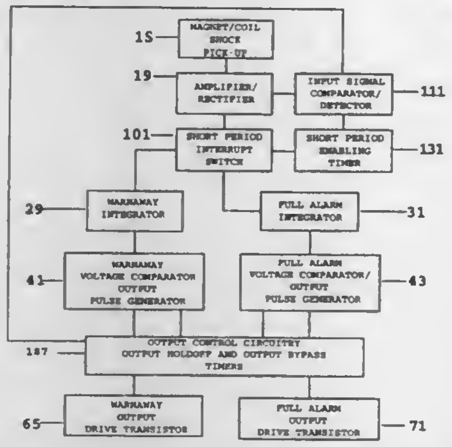
5,532,670
METHOD OF INDICATING THE THREAT LEVEL OF AN INCOMING SHOCK TO AN ELECTRONICALLY SECURED VEHICLE AND APPARATUS THEREFORE

Darrell E. Issa, Vista, and Jerry W. Birchfield, Escondido, both of Calif., assignors to Directed Electronics, Inc., Vista, Calif.

Continuation-in-part of Ser. No. 886,871, May 22, 1992, abandoned, and a continuation-in-part of Ser. No. 945,667, Sep. 16, 1992. This application Aug. 30, 1993, Ser. No. 112,940

Int. Cl.⁶ G08B *13/02*

U.S. Cl. 340—429 **40 Claims**


15
MAGNET/COIL SHOCK PICK-UP
19
AMPLIFIER/ RECTIFIER
INPUT SIGNAL COMPARATOR/ DETECTOR
111
101
SHORT PERIOD INTERRUPT SWITCH
SHORT PERIOD ENABLING TIMER
131
29
WARNAWAY INTEGRATOR
FULL ALARM INTEGRATOR
31
41
WARNAWAY VOLTAGE COMPARATOR OUTPUT PULSE GENERATOR
FULL ALARM VOLTAGE COMPARATOR/ OUTPUT PULSE GENERATOR
43
187
OUTPUT CONTROL CIRCUITRY OUTPUT HOLDOFF AND OUTPUT BYPASS TIMERS
65
WARNAWAY OUTPUT DRIVE TRANSISTOR
FULL ALARM OUTPUT DRIVE TRANSISTOR
71

1. A method of indicating a threat level of an incoming shock to an electronically secured vehicle comprising the steps of:

a) sensing a shock delivered to the vehicle;

b) generating a signal having strength proportional to the intensity of said shock;

c) analyzing said signal to determine if it has a low, generally non-threatening intensity or a higher, generally security-threatening intensity; and

d) producing either a first pulse, representing that said signal has only said low intensity, or separately producing said first pulse and a second pulse, representing that said signal has both said low intensity and said higher intensity.

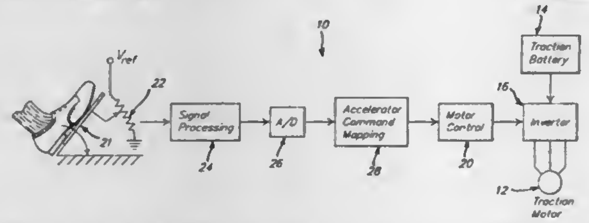
5,532,671
METHOD AND APPARATUS FOR INFORMING A DRIVER OF THE PROPULSIVE CAPABILITY OF A VEHICLE POWERTRAIN

Michael S. Bachman, 23087 Evan Ct. North, New Boston, Mich. 48264, and Marc R. Davis, 5201 Heather Dr., #211, Dearborn, Mich. 48126

Filed Sep. 2, 1994, Ser. No. 300,249

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—438 **17 Claims**



14. An apparatus for informing a driver of a propulsive capability of a vehicle powertrain, said apparatus comprising:

an accelerator command device;

an accelerator position sensor mechanically coupled to said accelerator command device, said sensor providing a first signal representing a position of said accelerator command device;

input circuitry electrically coupled to said accelerator position sensor;

a processor electrically coupled to said input circuitry and programmed to map said first signal into a second signal in view of a reduced propulsive capability of said powertrain, wherein said second signal has a value less than or equal to said first signal for all values of said first signal and less than said first signal for some values of said first signal; and

a powertrain controller coupled to said processor to receive said second signal;

wherein said first signal has a range with a first endpoint having a first magnitude and a second endpoint having a second magnitude;

wherein said second signal has a range with a third endpoint having a third magnitude and a fourth endpoint having a fourth magnitude;

wherein said first magnitude and said third magnitude are equal; and

wherein said second magnitude and said fourth magnitude are equal.

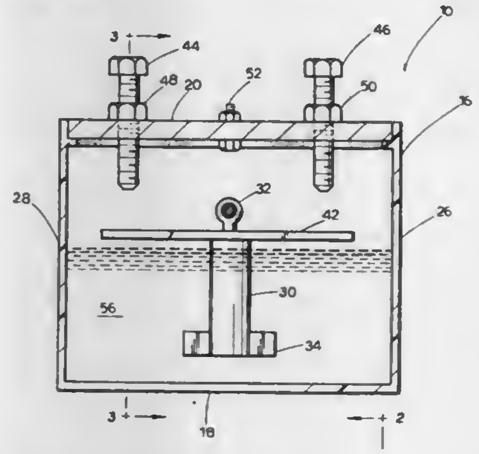
5,532,672
VEHICLE LEVEL ALARM

James J. Plazarin, 209 First St., Yatesboro, Pa. 16263

Filed Nov. 28, 1994, Ser. No. 348,814

Int. Cl.⁶ B60Q *1/00;* **G08B** *21/00*

U.S. Cl. 340—440 **10 Claims**



1. A tilt responsive switch comprising:

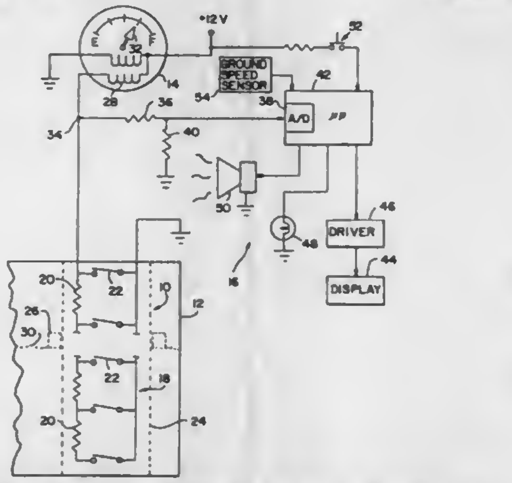
a housing including a bottom, a conductive top, a first pair of parallel sides being spaced from each other by a first dimension, and a second pair of parallel sides being spaced from each other by a second dimension;

a pendulum having a weighted end and a pivot end, said pendulum having a conductive bar disposed between said weighted end and said pivot end, and said pendulum being pivotally mounted within said housing, whereby said pendulum is free to pivot about a pivot axis passing through said pivot end; and

first and second conductive bolts symmetrically disposed on either side of the pivot axis of said pendulum, said conductive bolts matingly engaging respective threaded openings provided in said conductive top, whereby an amount of a protrusion of said first and second conductive bolts into said housing can be set by a user, and tilting said housing, relative to a vertical direction, to a user defined angle will cause an electrically conductive contact between said conductive bar and one of said first and second conductive bolts.

5,532,673
FUEL FILL MONITORING SYSTEM AND METHOD

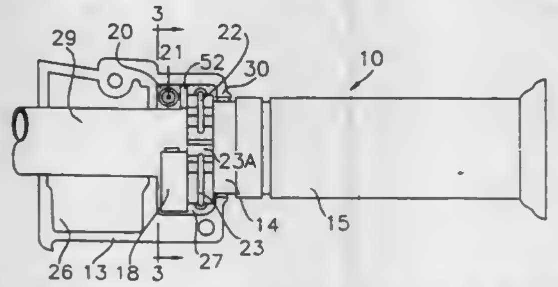
Daniel E. Olson, Manitoba, Canada; David G. Sokol, New Holland, Pa., and Kevin Walker, Manitoba, Canada, assignors to New Holland North America, Inc., New Holland, Pa.
Continuation of Ser. No. 209,711, Mar. 14, 1994, abandoned.
This application May 10, 1995, Ser. No. 437,973
Int. Cl.^{6} B60Q *1/00*
U.S. Cl. 340—450.2 **10 Claims**



1. A fuel fill monitoring system for monitoring the filling of a vehicle tank of a vehicle with fuel, said system comprising:
- first means for repeatedly sensing the level of fuel in said tank;
- means for determining a base low fuel level;
- second means responsive to said first means for determining when the level of fuel in said tank has increased from said base low fuel level by a given fraction of the total capacity of said tank;
- third means responsive to said first and second means for setting a first indicator when the level of fuel reaches a first level less than a second level but substantially greater than said given fraction of the total capacity of said tank;
- fourth means responsive to said first and second means for resetting said first indicator and setting a second indicator when the level of fuel reaches said second level; and
- alarm means responsive to said first indicator for giving a first warning and responsive to said second indicator for giving a second warning different from said first warning.

5,532,674
IDLE BRAKE LIGHT SYSTEM

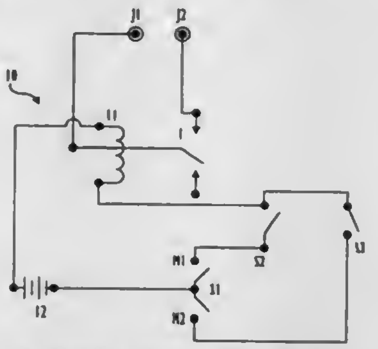
Paul J. Michaud, 852 N. Roy St., Melrose Park, Ill. 60164
Filed May 28, 1993, Ser. No. 69,345
Int. Cl.^{6} B60Q *1/26*
U.S. Cl. 340—479 **5 Claims**



1. In a motorcycle having a wheel brake and a brake light illuminated responsive to the wheel brake being applied, and a throttle handle oriented in an idle position for powering the motorcycle when stopping or stopped and oriented in other positions for powering the motorcycle for moving, an improved brake light control comprising the combination of switch means connected in a power circuit with the brake light, operable to illuminate the brake light when shifted, and means to shift the switch means responsive to the motorcycle stopping or being stopped to provide for illumination of the brake light even should the wheel brake not be applied;
- said means to shift the switch means comprising linkage operated by the throttle handle only when oriented in the idle position, providing that the brake light is illuminated when the throttle handle is oriented in the idle position,
- said motorcycle having a handelbar which supports said throttle handle to rotate about its axis and also holds said switch means adjacent said throttle handle, and said linkage comprising a stop formed on the throttle handle suited to shift said switch means only when the throttle handle is oriented in the idle position.

5,532,675
ALARM TESTER

Doug White, Griffin, Ga., assignor to Linda Johnson, Boca Raton, Fla.
Filed Dec. 29, 1994, Ser. No. 366,114
Int. Cl.^{6} G08B *29/00*
U.S. Cl. 340—515 **7 Claims**

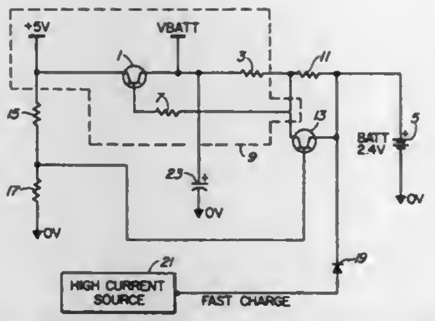


1. A device for testing a circuit comprising:
- a first and a second jack for connecting the device to the circuit, wherein the first and second jacks are connectable by a relay switch;
- a control circuit, having a power supply, a relay coil, and a mode switch for switching between two operational modes, wherein: the first operational mode causes the control circuit to be normally-open with a normally-open control switch capable of shorting the control circuit, connecting the power supply to the relay coil, energizing the relay coil which causes the relay switch to connect the first and second jacks; and the second operational mode causes the control circuit to be normally-closed with a normally-closed control switch capable of breaking the control circuit, disconnecting the power supply from the relay coil, deenergizing the relay coil which causes the relay switch to disconnect the first and second jacks.

5,532,676
BATTERY SWITCH FOR RAM BACKUP

Harry W. Moore, III, Watkins Glen, N.Y., assignor to Mitel, Inc., Reston, Va.
Filed Apr. 29, 1994, Ser. No. 235,257
Int. Cl.^{6} H02J *9/00*
U.S. Cl. 327—545 **7 Claims**

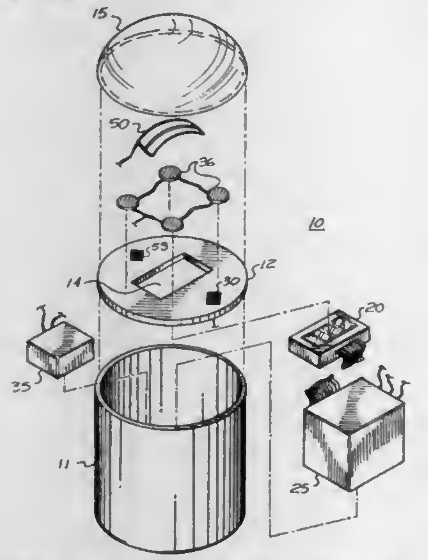
1. A charging circuit for a random access memory (RAM) backup battery connected to a RAM, for supplying a first charge current from a voltage supply to the battery and to the RAM for as long as the voltage supply is at a nominal voltage, comprising:
- (a) a first resistance means connected in series between the battery and the RAM for limiting said first charge current to a low predetermined value,
- (b) a bypass conducting switch connected in parallel with the first resistance means,



- (c) means for detecting a low voltage condition of the voltage supply which is lower than the nominal voltage and for enabling operation of the bypass conducting switch thereby bypassing the first resistance means and allowing discharge current to flow from the battery to the RAM, and
- (d) a diode connected from a high current drive source to the battery, and
- (e) means for applying a voltage level to the diode sufficient to cause it to conduct a high charging current from the high current drive source to the battery.

5,532,677
VARIABLE DISTANCE MARKER

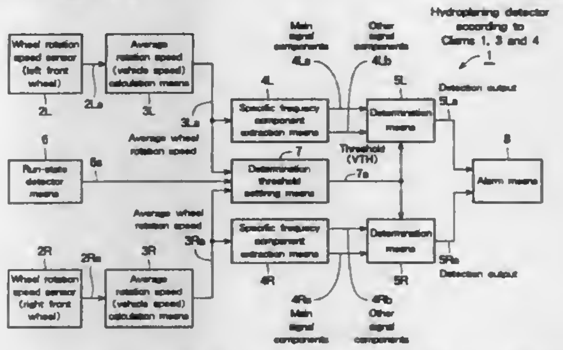
John E. Miller, 7408 E. Corrine Dr., Scottsdale, Ariz. 85260
Filed Jul. 1, 1994, Ser. No. 269,882
Int. Cl.^{6} G08C *21/00*
U.S. Cl. 340—286.01 **19 Claims**



11. A variable distance marker system comprising:
- a housing;
- an electrically actuable, visual display including a plurality of variable digits and an input for receiving signals to actuate the display and change the digits, the visual display being mounted in the housing and viewable externally;
- electronics circuits mounted in the housing and electrically connected to the visual display input, the electronics circuits being controllable to actuate the visual display to display selected digits;
- a light detector mounted in the housing and electrically connected to the electronics circuits for receiving externally generated light signals, converting the received light signals into control signals and applying the control signals to the electronics circuits;
- an antenna mounted in the housing and connected to the electronics circuits for receiving RF signals including an actuating signal at a predetermined frequency and applying the activating signal to the electronics circuits;
- a rechargeable battery and a solar cell array connected to the battery for supplying power thereto, the rechargeable battery being connected to the visual display and the electronics circuits for supplying power thereto;
- a remote portable light generator controllable to generate control signals in the form of a beam of light directable at the light detector; and
- a remote RF transmitter controllable to transmit RF signals to the antenna at the predetermined frequency.

5,532,678
HYDROPLANING DETECTOR APPARATUS

Keiyu Kin; Yoshimitsu Akuta, and Yuji Sakaki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 28, 1995, Ser. No. 395,694
Claims priority, application Japan, Mar. 22, 1994, 6-050864
Int. Cl.^{6} B60Q *1/00*
U.S. Cl. 340—438 **4 Claims**

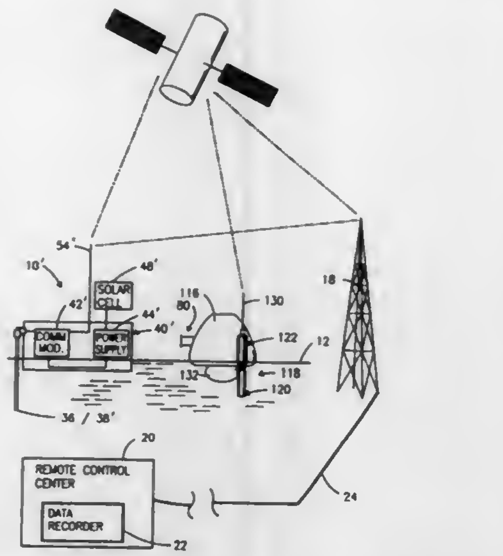

Hydroplaning detector according to Claims 1, 3 and 4
1
Wheel rotation speed sensor (left front wheel)
Average rotation speed (vehicle speed) calculation means
2L
2La
3L
3La
Average wheel rotation speed
Main signal components
4La
Other signal components
4Lb
4L
Specific frequency component extraction means
5L
Determination means
Detection output
5La
6
Run-state detector means
6a
7
Determination threshold setting means
Threshold (VTH)
7a
8
Alarm means
Average wheel rotation speed
3Ra
Specific frequency component extraction means
Determination means
5Ra
Detection output
4R
5R
2R
2Ra
3R
Wheel rotation speed sensor (right front wheel)
Average rotation speed (vehicle speed) calculation means
4Ra
Main signal components
4Rb
Other signal components

1. A hydroplaning detector apparatus detecting the occurrence of hydroplaning on a wheel based on wheel rotation speed signals output from a wheel rotation speed sensor, said sensor detecting the wheel rotation speed of a vehicle, comprising:
- a specific frequency component extraction means for respectively extracting signal components of a main frequency or signal components in a main frequency band in a predetermined frequency band centering on the main frequency corresponding to said wheel rotation speed or said vehicle speed, and the signal components in other frequency bands near the main frequency from said wheel rotation speed signals, and
- a determination means for determining the occurrence of hydroplaning based on the signal components of said main frequency or the signal components in the main frequency band in the predetermined frequency band centering on the main frequency, and the signal components in said other frequency bands.

5,532,679
OIL SPILL DETECTION SYSTEM

John F. Baxter, Jr., 930 Heron Ct., Marco Island, Fla. 33937
Continuation of Ser. No. 124,347, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 102,271, Aug. 5, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 391,424
Int. Cl.^{6} G08B *1/08;* **E02B** *15/04*
U.S. Cl. 340—539 **11 Claims**

1. An oil spill detection system to detect and track oil spills and transmit data to a remote monitoring site comprising a stationary buoyant detection platform including a sensing means to detect the presence of hydrocarbons in the water adjacent said stationary buoyant detection platform and to generate a detection signal in response thereto and a communication means operatively coupled to said sensing means to receive said detection signal and to generate a data signal in response to said detection signal and to transmit said data signal to the remote monitoring site, and a deployable free floating tracking buoy detachably attached to said stationary buoyant detection platform by a tracking buoy retainer



device movable between an open position to release said deployable free floating tracking buoy and a closed position to retain said deployable free floating tracking buoy, said tracking buoy retainer device operatively coupled to said communications means and further including control means to generate an enable signal in response to said detection signal and to transmit said enable signal to said tracking buoy retainer device to move said tracking buoy retainer device from said closed position to said open position to release said deployable free floating tracking buoy from said stationary buoyant detection platform into the oil such that said deployable free floating tracking buoy floats with the oil slick created by the oil spill whereby the location of said deployable free floating tracking buoy relative to said stationary buoyant detection platform indicates the direction and speed of travel of the oil slick.

5,532,680

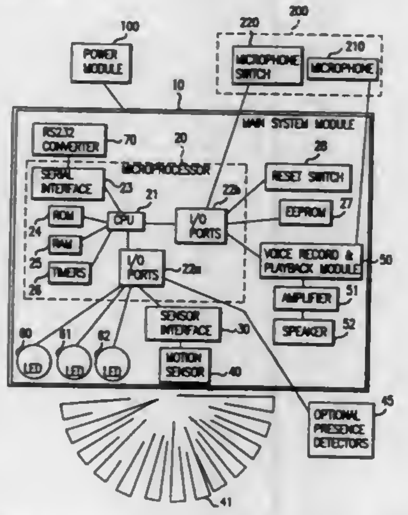
AUTOMATIC MESSAGE PLAYBACK SYSTEM

Jeffrey Ousborne, 5606 Foxview Ct., Clarksville, Md. 21029

Filed Mar. 27, 1995, Ser. No. 411,332

Int. Cl.⁶ G08B *13/18*

U.S. Cl. 340—567 **18 Claims**



1. An automatic message playback system having a system operation of transmitting audio messages responsive to detection of an enclosed area occupant comprising:

a) one or more occupant sensors for monitoring at least a portion of said enclosed area to parametrically detect the position of the enclosed area occupant, each of said one or more occupant sensors transducing an occupant detection parameter thereby sensed to a respective electrical signal representative thereof, at least one of said one or more occupant sensors having a plurality of discrete sensing fields of view and being actuated to generate a respective electrical signal for each of said plurality of sensing fields of view detecting the occupant therein;

b) system processor means having a control data storage medium coupled to said one or more occupant sensors for controlling said message playback system operation, said system processor means receiving from each of said one or more occupant sensors said respective electrical signals for automatically actuating audible transmission of one or more respective audio messages to said occupant responsive to said respective electrical signals, whereby said system processor means determines a migration of the occupant within said enclosed area from said respective electrical signals and generating message transmission signals for actuating transmission of respective one or more of said audio messages to the occupant responsive to said respective electrical signals generated by migration of the occupant within said enclosed area, said system processor means including means for prioritizing said audio messages stored in said control data storage medium and means for selecting a predetermined number of prioritized ones of said audio messages to respectively generate therefor said message transmission signals when the rate of said migration of the occupant within said enclosed area detected by said one or more occupant sensors exceeds a predetermined rate;

c) an erasable solid state message storage medium coupled to said system processor for storing in digital form said audio messages; and,

d) a message transducing unit coupled to both said system processor means and said solid state storage medium, said message transducing unit having first audio transducing means for converting a message generated by a user in audio form to said digital form, said message transducing unit further having second audio transducing means for converting to said audio form said message retrieved in said digital form from said solid state message storage medium for said audible transmission thereof responsive to said message transmission signals from said system processor means.

5,532,681

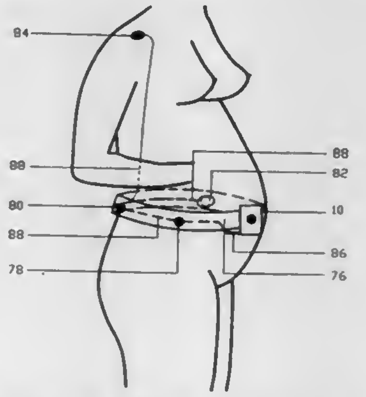
PROTECTION DEVICE FOR POWER FREQUENCY MAGNETIC FIELDS

Aemil J. M. Peters, Houston, Tex.; Byron J. Masterson, and Robert M. Abrams, both of Gainesville, Fla., assignors to Bodysonics, Inc., Houston, Tex.

Continuation of Ser. No. 139,434, Oct. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 66,573, May 26, 1993, Pat. No. 5,420,581. This application Feb. 13, 1995, Ser. No. 387,631

Int. Cl.⁶ G08B *23/00*

U.S. Cl. 340—573 **6 Claims**



1. A portable magnetic field detection device to alert a person when an ambient low-frequency magnetic field of arbitrary orientation has a magnitude exceeding a predetermined value, said value being adjustable, the portable magnetic field detection device comprising:

(a) magnetic field detection means responsive to the ambient low-frequency magnetic field irrespective of the magnetic field's orientation for generating a first electrical signal representative of the magnitude of the magnetic field, said magnetic field detection means comprising:

(i) three orthogonally placed coils, fitted inside the magnetic field detection device, for simultaneously detecting orthogonal components of the ambient low-frequency magnetic field and for producing outputs indicative of the magnitude of the orthogonal components of said magnetic field, and (ii) means for combining the outputs indicative of the magnitude of such orthogonal components of said magnetic field to generate the first electrical signal;

(b) comparator means responsive to the first electrical signal for comparing the first electrical signal with a second electrical signal representative of the predetermined value, and for generating a third electrical signal when the first electrical signal exceeds the second electrical signal; and

(c) alarm means, comprising visual and acoustical alarm means, responsive to the third electrical signal for alerting the person when the magnitude of the ambient low-frequency magnetic field exceeds the predetermined value;

(d) means for placing the device at the level of and in proximity to the person's abdomen to accurately detect the exposure of a fetus and abdominal organs of the person to the low-frequency magnetic field;

(e) a switch means for controllably switching the alarm means on and off;

wherein the detection device protects the person's fetus and abdominal organs from over-exposure to the low-frequency magnetic field while isolating vibrational effects of the acoustical alarm means from the person's fetus and organs, the alarm means comprising:

A. means for generating an audible alarm;

B. an enclosure for the alarm means having a frontal audible alarm emission point; and

C. means for minimizing acoustical coupling of vibrations and sounds placed between the means for generating the audible alarm and said enclosure, to reduce coupling of vibrations and sounds from the alarm means to the person's fetus and organs through said enclosure at said frontal audible alarm emission point; wherein the enclosure for the alarm means is worn in a pocket or is used in conjunction with a clothing material comprising one of a drape, a belt, and pairs of slacks such that said clothing material is placed between the enclosure and the person's skin and thus does not contact the person's skin, therefore additionally reducing exposure of the person's fetus and organs to the sounds and vibrations generated by the portable magnetic field detection device.

5,532,682

CONTROL DATA TRANSMISSION SYSTEM

Masami Murayama, Yokohama; Shuji Yoshimura; Tetsuo Kawamata, both of Kawasaki, and Atsushi Yoshioka, Yokohama, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 743,887, Aug. 12, 1991, abandoned. This application Aug. 23, 1993, Ser. No. 110,209

Claims priority, application Japan, Aug. 10, 1990, 2-210398

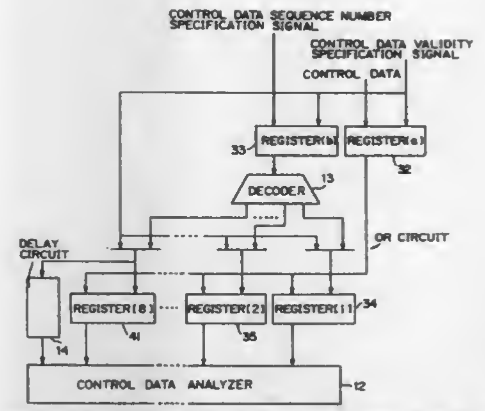
Int. Cl.⁶ G05B *23/02*

U.S. Cl. 340—825.06 **4 Claims**

1. A control data transmission method for transmitting control data from a main system to an electronic switching sub-system for control thereof, comprising the steps of:

(a) splitting a unit of the control data into a plurality of fixed-length bit blocks;

(b) generating control data sequence number specification signals respectively identifying the fixed-length bit blocks;



(c) emitting the control data sequence number specification signals, each paired with a corresponding block of control data and a control data validity specification signal for validating receipt of control data;

(d) storing each of the control data sequence number specification signals with the corresponding block of control data upon receipt of the control data validity specification signal in the electronic switching sub-system;

(e) sorting the fixed-length bit blocks of the control data according to the control data sequence number specification signals stored therewith in the electronic switching sub-system; and

(f) analyzing the unit of the control data upon completion of steps (a)–(e).

5,532,683

PAGING RECEIVER AND RADIO FREQUENCY CHANNEL SEARCHING METHOD FOR THE SAME

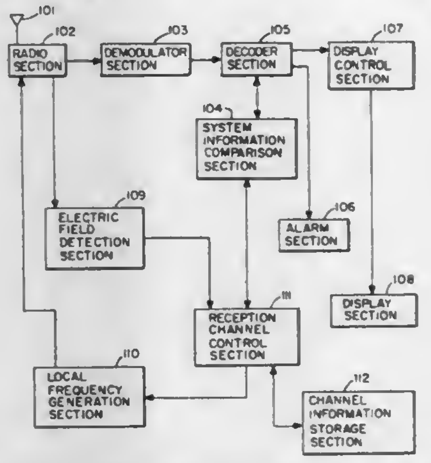
Hisashi Kondo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 14, 1993, Ser. No. 135,560

Claims priority, application Japan, Oct. 14, 1992, 4-276126

Int. Cl.⁶ H04B *1/16*

U.S. Cl. 340—825.03 **5 Claims**


101
102
RADIO SECTION
103
DEMODULATOR SECTION
105
DECODER SECTION
107
DISPLAY CONTROL SECTION
104
SYSTEM INFORMATION COMPARISON SECTION
109
ELECTRIC FIELD DETECTION SECTION
106
ALARM SECTION
108
DISPLAY SECTION
111
RECEPTION CHANNEL CONTROL SECTION
110
LOCAL FREQUENCY GENERATION SECTION
112
CHANNEL INFORMATION STORAGE SECTION

1. A battery-operated paging receiver, which searches for radio frequency channels of a plurality of paging systems, said radio frequency channels having system information for identification of said paging systems, which receives the radio frequency channels in a certain order by incrementally switching among the radio frequency channels in said certain order, and which determines that a radio frequency channel being received is an object radio frequency channel whose reception should be continued if the system information included in the radio frequency channel being received coincides with system information held by said paging receiver, said paging receiver comprising:

a battery saving means for preventing the degradation of useful battery life, said battery saving means comprising an electric field detection means for detecting received electric field strength of a radio frequency channel being received;

storage means for storing information regarding a received electric field of a radio frequency channel received from said electric field detection means;

system information comparison means for determining whether or not said system information included in said radio frequency channel being received coincides with said system information held by said paging receiver; and

reception channel control means for controlling the searching for radio frequency channels and determining the object radio frequency channel,

wherein said reception channel control means immediately switches the radio frequency channel being received to a next radio frequency channel when the received electric field strength is not greater than a prescribed value,

wherein said reception channel control means confirms from said system information comparison means if the system information exhibits coincidence when said electric field strength is greater than said prescribed value, and

wherein said reception channel control means switches the radio frequency channel being received to said next radio frequency channel when said system information does not exhibit coincidence and determines that the radio frequency channel being received is the object radio frequency channel when the system information exhibits coincidence, and

wherein said reception channel control means rearranges the certain order of searching the radio frequency channels for a next searching cycle to be executed by using the received electric field information stored in said storage means.

5,532,684
BIDIRECTIONAL COMMUNICATION SYSTEM IN A REMOTE CONTROL SYSTEM FOR AN AUDIO/VIDEO SYSTEM

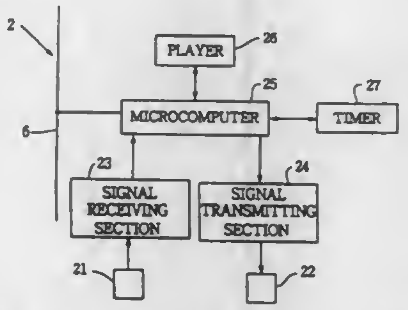
Toshiyuki Katsu, deceased, late of Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 189,300

Claims priority, application Japan, Feb. 12, 1993, 5-024326

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.25 **2 Claims**



1. A bidirectional communication system in a remote control system for an audio/video system including a remote controller and a plurality of controlled units controlled by the remote controller, comprising:

communication lines connecting the controlled units with each other for bidirectional communication;

each of the controlled units having a signal receiving section for receiving a command from the remote controller, a signal transmitting section for transmitting a wireless response to the remote controller, computer means for controlling the signal receiving operation and the signal transmitting operation and the bidirectional communication between the controlled units through the communication lines, and being given a precedence for responding to the command;

the computer means having,

transmitting means responsive to the command for applying a response preparing data, including a unit identification code, to other controlled units through the communication line,

receiving means for receiving the response preparing data from other controlled units through the communication line,

determining means for determining whether the precedence of the unit itself is higher than those of the other controlled units and for producing a precedent signal when the precedence of the unit is higher,

responding means responsive to the precedent signal for generating the wireless responses, and

abandon means for applying a response abandon data to the other controlled units at a time when it is determined that the precedence of the unit is lower than those of the other controlled units after applying the response preparing data to the other controlled units.

5,532,685
CALL ALARMING APPARATUS FOR PAGING SYSTEM

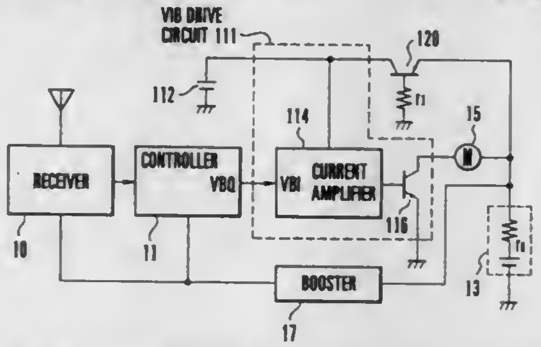
Satoshi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,970

Claims priority, application Japan, Apr. 28, 1993, 5-101691

Int. Cl.^{6} G08B *5/22*

U.S. Cl. 340—825.46 **8 Claims**



1. A call alarming apparatus for a paging system, comprising:

receiving means for receiving a call number as a radio signal;

alarming means driven to alarm a call when said receiving means receives a self call number;

driving means for driving said alarming means by inputting a control signal to said driving means;

control means for outputting a control signal to said driving means on the basis of an output from said receiving means;

first power supply means for supplying power to said alarming and driving means;

second power supply means automatically switched to supply power to said driving means, when a power supply voltage-of said first power supply means decreases; and

rectifying means for preventing a current flowing from said second power supply means into said first power supply means.

5,532,686
PROGRAMMABLE TRANSPONDER

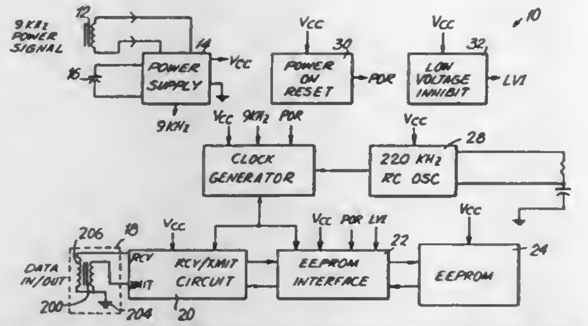
Donald J. Urbas, Evergreen; David Ellwood, Golden, and John Burne, Kittridge, all of Colo., assignors to Bio Medic Data Systems, Inc., Maywood, N.J.

Continuation of Ser. No. 8,057, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 737,082, Jul. 29, 1991, abandoned. This application Oct. 4, 1993, Ser. No. 131,275

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 340—825.54 **25 Claims**

1. A passive transponder for inductively receiving a power signal and a first communication signal and transmitting a second communication signal in response thereto comprising communication antenna means for receiving said first communication signal; power antenna means for receiving said power signal; information generating means for creating said second communication signal in response to said first communication signal, power supply means for directly providing said power signal to said information generating means, said information generating means utilizing said power signal as a clock to generate said second communication signal and said communication antenna means outputting said second communication signal synchronous with said power signal.



18. A passive transponder comprising communication antenna means for inductively receiving a first communication signal and inductively transmitting a second communication signal in response thereto, said first and second communication signals each including data and instructions, reprogrammable memory means for storing data received by said transponder, said reprogram table memory means having a plurality of memory addresses; information generating means for creating said second communication signal in response to said first communication signal, said information generating means including memory interface means for selectively addressing an address of said reprogrammable memory in response to said first communication signal and operating on said selectively addressed memory address in response to said first communication signal.

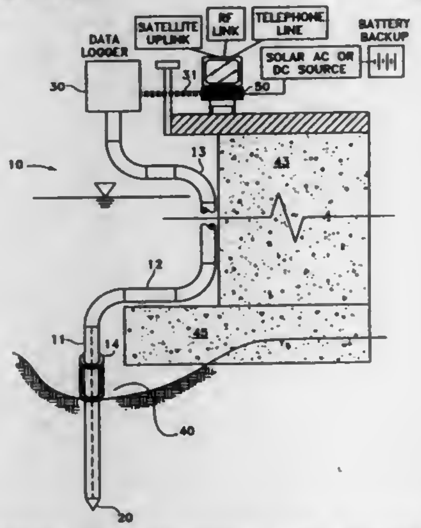
5,532,687
MODULAR MAGNETIC SCOUR MONITORING DEVICE AND METHOD FOR USING THE SAME

Jerry R. Richardson, 2912 Cortez St., Fort Collins, Colo. 80525; Gerald R. Price, 300 Flicker St., Fort Collins, Colo. 80526; Everett V. Richardson, 824 Gregory Rd., Fort Collins, Colo. 80524, and Peter F. Lagasse, 3412 Shore Rd., Fort Collins, Colo. 80524

Filed Dec. 31, 1992, Ser. No. 999,616

Int. Cl.^{6} G08C *17/04*

U.S. Cl. 340—870.33 **88 Claims**



1. An apparatus for the monitoring of scour in a stream bed, said apparatus comprising:

a. a length of hollow tubing to be positioned such that said tubing extends vertically into and from a stream bed;

b. a collar which fits around said length of tubing and rests upon said stream bed and wherein said collar moves downward with the event of scour, said collar comprising:

  (1) a top section and a bottom section;

  (2) a plurality of vertical spacers located between said top and bottom sections; and

  (3) at least one bar magnet attached to at least one of said vertical spacers; and

c. a means for determining the vertical position of said collar along said tubing, wherein said means for determining comprises:

  (1) a plurality of magnetic switches; and

(2) a plurality of electrical components, at least one component linked to one said magnetic switch.

5,532,688
SELECTIVE CALLING RECEIVER CAPABLE OF PROVIDING A MESSAGE BY A SPEECH SOUND

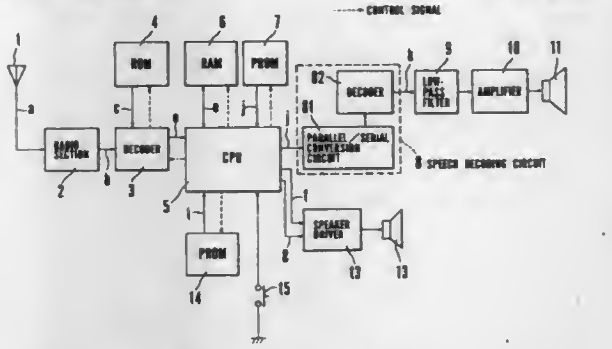
Kazuhiro Kudoh, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 20, 1994, Ser. No. 263,121

Claims priority, application Japan, Jun. 21, 1993, 5-173746

Int. Cl.^{6} H04Q *7/14*

U.S. Cl. 340—825.44 **15 Claims**



1. A selective calling receiver comprising:

speech data storage means storing speech data corresponding to a predetermined message,

speech output means outputting a speech sound on the basis of the speech data stored in said speech data storage means,

first speech output control means reading out speech data corresponding to a message contained in a received selective calling signal from said speech data storage means and causing said speech output means to output a speech sound on the basis of the speech data, and

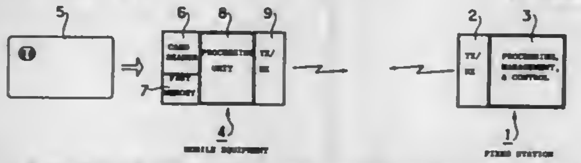
second speech output control means sectioning the message contained in the received selective call signal into a predetermined number of unit informations, reading out speech data corresponding to a predetermined unit information of all the unit informations from said speech data storage means, and causing said speech output means to output a speech sound on the basis of the speech data, said second speech output control means performs a predetermined number of repetition of a speech sound corresponding to the predetermined unit information.

5,532,689
METHOD OF TRANSMITTING DATA QUICKLY AND SECURELY FROM A SMART CARD DURING A REMOTE TRANSACTION

Serge Bueno, Bretigny Sur Orge, France, assignor to Compagnie Generale D'Automatisme CGA-HBS, Bretigny Sur Orge, France

Filed Jul. 7, 1994, Ser. No. 271,664
Claims priority, application France, Jul. 9, 1993, 93 08482
Int. Cl.⁶ G08G *1/00*

U.S. Cl. 340—928 **4 Claims**



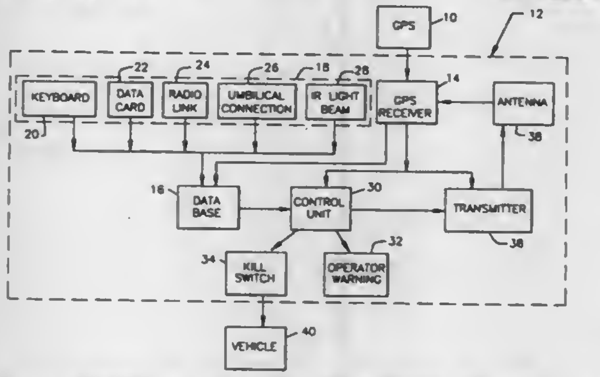
1. A method of transmitting data quickly and securely from a smart card during a remote transaction between a fixed station and a mobile item of equipment containing a smart-card reader, said card reader having a fast memory, the method comprising the steps of: inserting said card in said reader; storing data from the card in the fast memory of said reader, said data comprising a pair of data items including a first data item and a second data item, said first data item identifying the number of the card, and said second data item corresponding to an access count indicating the number of accesses to the card; incrementing the access count in the card by unity upon each access by the reader, said step of incrementing being performed internally by the card; comparing said pair of data items stored in said fast memory of said reader with the pair of data items from the card that is currently provided in the mobile item of equipment, said step of comparing being performed by the mobile item of equipment during the remote transaction; and transmitting the result of the comparison and the data stored in the fast memory to the fixed station.

5,532,690
APPARATUS AND METHOD FOR MONITORING AND BOUNDING THE PATH OF A GROUND VEHICLE

Richard J. Hertel, Fort Wayne, Ind., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 4, 1995, Ser. No. 416,186
Int. Cl.⁶ G08G *1/123*

U.S. Cl. 340—989 **20 Claims**



1. An apparatus for monitoring and bounding the path of a ground vehicle, comprising:

GPS receiver means for receiving radio signals from a Global Positioning System which are indicative of the current ground position of said GPS receiver means, whereby said current ground position is also the ground vehicle's current ground position when said GPS receiver means is coupled thereto;

data base means for storing data which is indicative of at least one bounded area of permitted operation for the ground vehicle;

computing means responsive to said GPS receiver means and said data base means, for determining if the current ground position is outside of said at least one bounded area of permitted operation; and

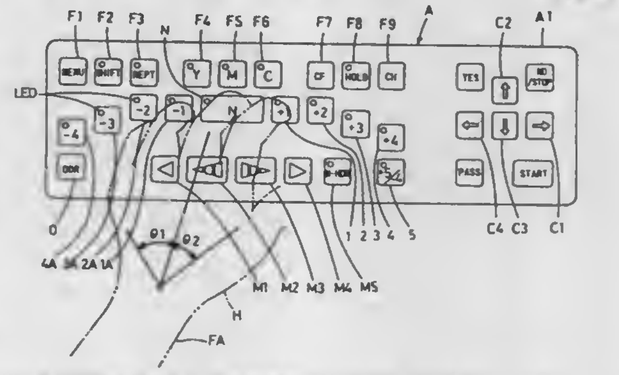
kill switch means responsive to said computing means for disabling the ground vehicle when the current ground position is outside of said at least one bounded area of permitted operation.

5,532,691
KEYBOARD FOR PHOTOGRAPHIC PRINTING APPARATUS

Seiji Honomizo, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed May 27, 1994, Ser. No. 249,983
Claims priority, application Japan, Jun. 7, 1993, 5-030345
Int. Cl.⁶ H03M *11/00*

U.S. Cl. 341—22 **3 Claims**



1. A keyboard for a photographic printing apparatus, said keyboard comprising:

a single board base;

a set of entry keys arranged on said single board base for entering corresponding data to correct exposure or color tone;

a primary group of said entry keys being arranged in a substantially rectilinear alignment at a home position;

remaining of said entry keys being disposed at opposite ends of said substantially rectilinear alignment in respective curved alignments curving away from said substantially rectilinear alignment along paths of fingers of an operator defined by inward and outward movements of a wrist of the operator about said home position, whereby the overall arrangement of said primary group and said remaining of said entry keys is an arc;

each said curved alignment being a mirror image of the other said curved alignment;

each said curved alignment at each respective said opposite end of said substantially rectilinear alignment being curved away from said substantially rectilinear alignment at increasing rates of curvature at increasing distances from said respective opposite end; and

a plurality of control keys arranged on said single board base at a location within the curvature of said arc of said overall arrangement of said entry keys.

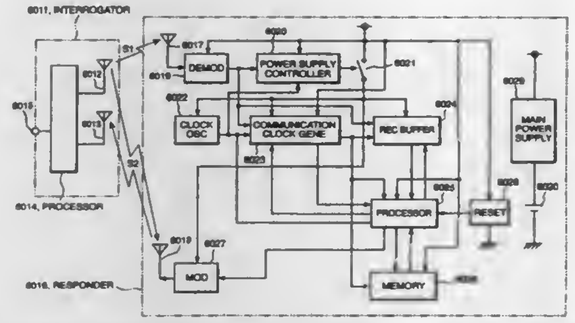
5,532,692
COMMUNICATION SYSTEM

Hirata Tatsuya, Ichinomiya, and Kazuaki Wakahara, Tsushima, all of, Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Sep. 7, 1993, Ser. No. 116,991
Claims priority, application Japan, Sep. 7, 1992, 4-238517; Sep. 28, 1992, 4-258624; Sep. 30, 1992, 4-261398; Oct. 5, 1992, 4-266124; Oct. 27, 1992, 4-288764; Nov. 6, 1992, 4-297291; Nov. 25, 1992, 4-315064; Jul. 30, 1993, 5-189628
Int. Cl.⁶ H04Q *9/00*

U.S. Cl. 340—825.540 **7 Claims**

1. A communication system comprising:



an interrogator for transmitting an interrogation signal representing a communication reference time length, and communication serial data that is generated based on the communication reference time length; and

a responder for receiving the interrogating signal from the interrogator and for responding to the interrogation signal, the responder including:

a clock oscillator for outputting clock pulses;

measuring means for measuring the communication reference time length represented by the interrogation signal, the measuring means comprising first counting means for counting the clock pulses output from the clock oscillator during the communication reference time length represented by the received interrogation signal;

setting means for setting a time length based on the communication reference time length measured by the measuring means, the setting means comprising pulse number setting means for setting a pulse number based on a number of clock pulses counted by the first counting means;

generating means for generating a plurality of timing signals based on the time length set by the setting means, the generating means comprising second counting means for counting clock pulses output by the clock oscillator, and for generating one of the timing signals when a number of clock pulses counted by the second counting means reach the pulses number set by the pulse number setting means; and

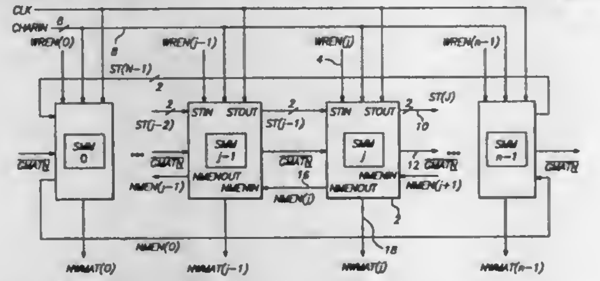
demodulating means for receiving the interrogating signal from the interrogator and for demodulating the communication serial data represented by the received interrogation signal in response to the timing signals generated by the generating means.

5,532,693
ADAPTIVE DATA COMPRESSION SYSTEM WITH SYSTOLIC STRING MATCHING LOGIC

Kel D. Winters; Patrick A. Owsley; Catherine A. French; Robert M. Bode, and Peter S. Freeley, all of Moscow, Id., assignors to Advanced Hardware Architectures, Pullman, Wash.

Filed Jun. 13, 1994, Ser. No. 259,760
Int. Cl.⁶ H03M *7/30*

U.S. Cl. 341—51 **31 Claims**



14. A data compression system comprising:

a. means for receiving data from an input source a byte at a time, each byte representing eight bits of information;

b. means for simultaneously storing a present data byte into one of a plurality of content addressable memory cells and comparing the present data byte to a plurality of previously received data bytes to determine if the present data byte matches the previously received data bytes wherein state information indicative of a match is transferred between the memory cells and data bytes are not transferred between the memory cells;

c. means for grouping data bytes into uncoded bytes and strings, where each string consists of a longest matching string stored in the content addressable memory from the previously received data;

d. means for determining which longest matching string stored in the content addressable memory is nearest to a last byte received, if there is more than one longest matching string stored in the content addressable memory; and

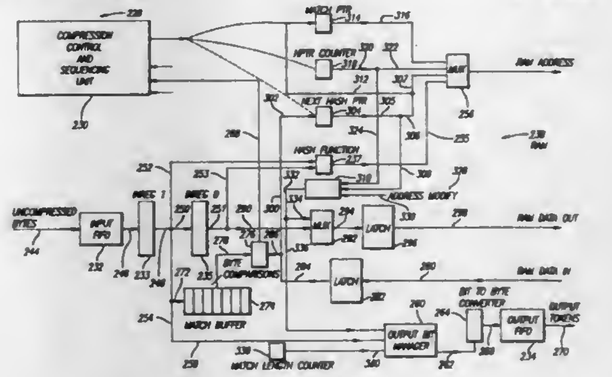
e. means for outputting a string code representative of each string or a previously written byte if no matching string occurs.

5,532,694
DATA COMPRESSION APPARATUS AND METHOD USING MATCHING STRING SEARCHING AND HUFFMAN ENCODING

Clay Mayers, San Diego, and Douglas L. Whiting, Carlsbad, both of Calif., assignors to Stac Electronics, Inc., San Diego, Calif.

Continuation of Ser. No. 927,343, Aug. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,554, Apr. 17, 1992, abandoned, which is a continuation of Ser. No. 619,291, Nov. 27, 1990, Pat. No. 5,146,221, which is a division of Ser. No. 297,152, Jan. 13, 1989, Pat. No. 5,016,009. This application Jul. 7, 1995, Ser. No. 499,230
Int. Cl.⁶ H03M *7/40*

U.S. Cl. 341—67 **26 Claims**



1. A data compression method comprising:

performing a search for matching strings in a window of input bytes, said search producing a stream of tokens, said tokens representing either a raw byte or a matching string of a certain length and a certain offset back into said window;

assigning said tokens to predefined bins, some of said bins containing matching strings of a predetermined length and within a certain offset range;

assigning variable length codes to each bin based on the frequency of occurrence of tokens assigned to each bin;

outputting for each token generated said variable length codes for said bin to which each token is assigned to the output data stream; and

after each said variable length code is output, outputting extra bits, if required, to specify exactly said token within said bin.

5,532,695
POWER OF TWO LENGTH PSEUDORANDOM NOISE SEQUENCE GENERATOR

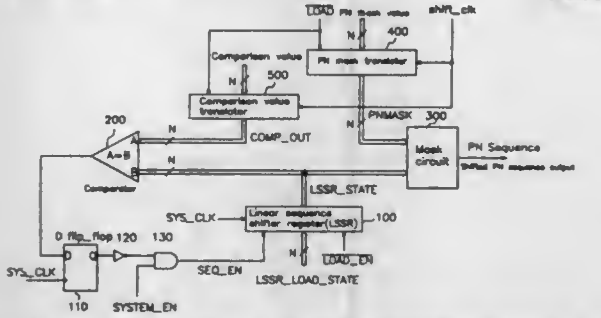
Gyeong-Lyong Park; Chung-Wook Suh, and Ik-Soo Eo, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea

Filed Dec. 20, 1994, Ser. No. 360,136

Claims priority, application Rep. of Korea, Apr. 13, 1994, 94-7767

Int. Cl.^{6} G08C *19/12*

U.S. Cl. 341—173 **1 Claim**



1. A power of two length PN sequence generator comprising:
a linear sequence shifter register (LSSR) that is operated in synchronization with signals from a system clock, that receives an initial LSSR state input in accordance with a load enable signal, and that carries out a shift operation in accordance with a sequence enable signal, so as to generate and output a PN sequence;
a comparator having input terminals for receiving said output PN sequence of said LSSR into an input terminal and for receiving a comparison value signal into another input terminal, said comparator comparing the two inputs and providing a resultant output based on the comparison;
a mask circuit for receiving said output PN sequence from said LSSR and PN mask data to carry out a masking operation and to output the resulting shifted PN sequence; and
a bit adding means operated in response to said system clock signals and to a system enable signal for delaying said PN sequence by one cycle when said comparator finds an identical match between said PN sequence and said comparison value signal, and so as to add one bit into a proper position in the PN sequence;
said bit adding means comprising:
  a flip flop means for receiving the output of said comparator in synchronization with said system clock signals for providing a resulting logic signal output; and
  gate means having input terminals and receiving the output of said flip flop means into one of its input terminals, and receiving said system enable signals into another input terminal, said gate means for carrying out a logic arithmetic operation and for providing sequence enable signals to said LSSR; and
said PN sequence generator further comprising:
  a PN mask translating means operated in synchronization with shift clock signals for receiving an initial PN mask value in accordance with load signals and for translating them into PN mask data before outputting them;
  a comparison value translating means operated in synchronization with the shift clock signals for receiving an initial comparison value of N bits in accordance with the load signals for translating them into a value corresponding to the PN mask data to supply them to said comparator; and
relevant N×N translating matrices;
whereby said PN mask translating means and said comparison value translating means calculate said PN mask data and said shifted comparison value by utilizing the relevant N×N translating matrices.

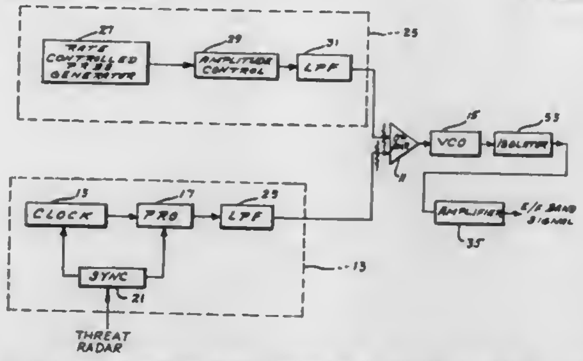
5,532,696
PSEUDO RANDOM JAMMER WITH FALSE TARGET SCINTILLATION CAPABILITY

Richard J. Cyrulik, Williamsville, and Elmer H. Eckert, Buffalo, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 25, 1974, Ser. No. 508,936

Int. Cl.^{6} G01S *7/38*

U.S. Cl. 342—14 **3 Claims**



1. A pseudo random noise system for jamming a threat radar comprising:
  a. a pseudo random generator;
  b. clock feeding the pseudo random generator;
  c. means for synchronizing the clock and the pseudo random generator to the threat radar;
  d. a first low pass filter fed by the pseudo random generator;
  e. a scintillation generator; and
  f. an operational amplifier resistively coupled to the scintillation generator and the first low pass filter.

5,532,697
NON-CONTACT SPEED MEASURING APPARATUS FOR RAILROAD VEHICLE

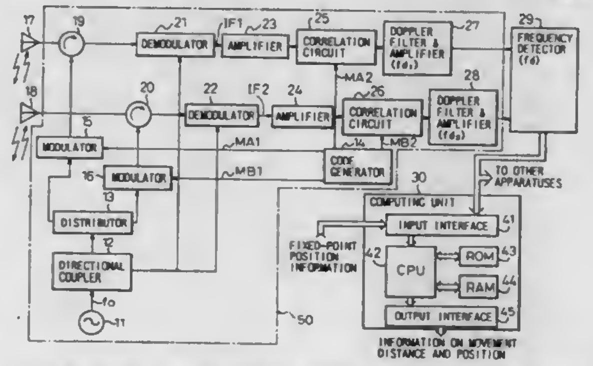
Keiki Hidaka, Kamakura, and Shigekatsu Uehara, Tokyo, both of, Japan, assignors to Mitsubishi Precision Co., Ltd., and East Japan Railway Company, both of, Japan

Filed Jun. 7, 1995, Ser. No. 478,821

Claims priority, application Japan, Jun. 9, 1994, 6-127526; Mar. 8, 1995, 7-069540

Int. Cl.^{6} G01S *13/58*

U.S. Cl. 342—104 **11 Claims**



1. An apparatus for measuring a speed of a railroad vehicle, the apparatus being provided on the railroad vehicle and comprising:
an oscillator for generating a carrier signal for transmission;
a code generator for generating a coded two-phase random signal for modulation;
a modulation circuit for carrying out a direct spread modulation with respect to said transmission carrier signal using said generated coded two-phase random signal;
antenna means for transmitting said modulated transmission carrier signal as a radio-wave toward an object and for receiving a reflected wave from the object;

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a demodulation circuit for demodulating a signal corresponding to said received reflected wave using said transmission carrier signal, to thereby generate an intermediate frequency signal;
a correlation circuit for making correlation between said intermediate frequency signal generated by said demodulation circuit and a signal having the same code as that of said coded two-phase random signal for modulation and having a phase delayed by a predetermined time compared with said coded two-phase random signal for modulation;
a Doppler detecting means for extracting from an output signal of said correlation circuit a Doppler frequency component contained in a signal which has been propagated by way of a propagation path existing in a specified distance range, and for generating speed information based on the extracted Doppler frequency component; and
a computing means for computing a movement distance and a position of said railroad vehicle over the whole track, on a real-time basis, using said generated speed information and fixed-point position information input from an outside of said apparatus.

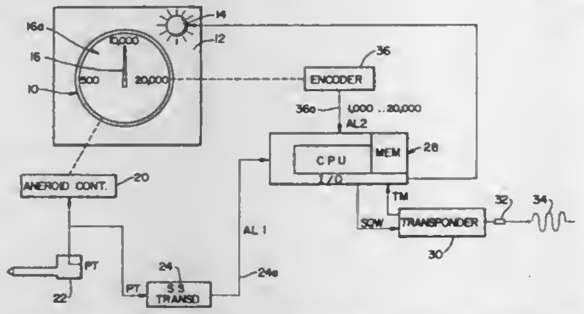
5,532,698
TRANSPONDER SQUAWK CALIBRATION

Brian T. K. Nielsen, Seminole, and Ronald M. Miller, Sr., Clearwater, both of Fla., assignors to Aerosonic Corporation, Clearwater, Fla.

Filed Mar. 30, 1995, Ser. No. 413,716

Int. Cl.^{6} G01S *13/08;7/40*

U.S. Cl. 342—120 **5 Claims**



1. An altimeter system comprising an aneroid altimeter having a rotating needle to point to one of a plurality of altitude graduations on a instrument card and an altitude transponder for transmitting an altitude signal, characterized by:
first means for providing a first signal indicating that the pointer is aligned with a preselected graduation;
second means for providing a pressure signal indicative of altitude; and
signal processing means comprising means for receiving the pressure signal and the first signal; for storing a code for different values of said pressure signal and supplying said code to the transponder to transmit said altitude signal to indicate a first altitude; for storing an acceptable altitude variation for the first signal; for providing an error signal that represents the difference in altitude associated with the first signal and said first altitude signal; for providing a warning signal if said error signal exceeds said acceptable altitude variation; for providing said warning signal to said transponder to transmit a transponder fault signal; for determining an offset value when said error signal is less than said acceptable altitude variation; for providing a second signal to the transponder to transmit an altitude signal that represents the sum of said first altitude and said offset.

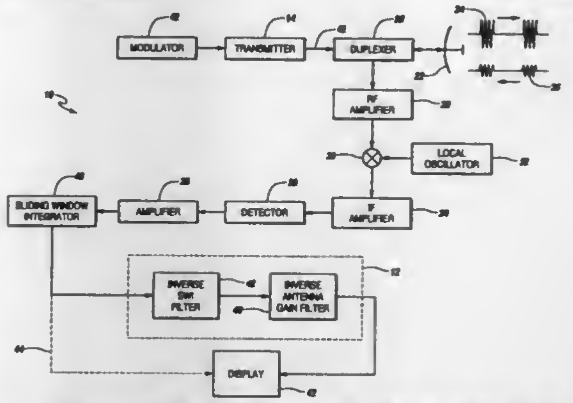
5,532,699
NON-COHERENT RADAR SYSTEM HAVING IMPROVED RESOLUTION CAPABILITIES

Winthrop W. Smith, Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 307,469, Sep. 19, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,616

Int. Cl.^{6} G01S *7/44*

U.S. Cl. 342—195 **8 Claims**



1. A filter circuit for the receiver of a radar system having an antenna with a known gain pattern, the receiver processing a radar return signal, comprising:
an inverse filter receiving the radar return signal, said filter having a filter response substantially the inverse of a response for the antenna due to its known gain pattern.

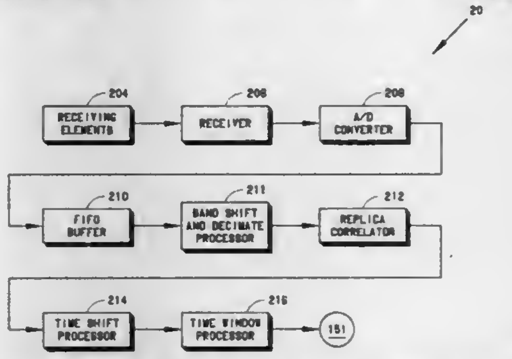
5,532,700
PREPROCESSOR AND ADAPTIVE BEAMFORMER FOR ACTIVE SIGNALS OF ARBITRARY WAVEFORM

James C. Lockwood, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1995, Ser. No. 405,487

Int. Cl.^{6} G01S *3/16;15/00*

U.S. Cl. 342—378 **27 Claims**



1. A signal processor for processing an echo signal received by an array of receiving elements from a distant target ensonified or irradiated by a transmitted signal, comprising:
a receiver operably coupled to said array of receiving elements for receiving element outputs;
a digitizer operably coupled to said receiver for generating a digitized time series from each of said element outputs;
a block generator operably coupled to said digitizer for forming a series of uncompressed time blocks from said digitized time series within a total receiving time of said element outputs, wherein said uncompressed time blocks contain sufficient data to correlate and synchronize time segments from said digitized time series with a replica of said transmitted signal;
a replica correlator operably coupled to said block generator for correlating each of said uncompressed time blocks with said replica of said transmitted signal to form a series of correlated time blocks;

a time shifter operably coupled to said replica correlator for forming a series of synchronized groups from said series of correlated time blocks, wherein said synchronized groups are synchronized to within one sample period for each of a plurality of steering directions; and

a time window generator operably coupled to said time shifter for forming a contiguous series of time windows from said series of synchronized groups, wherein each of said time windows extends from an initial time to a final time appropriate to an arrival time and a duration of said echo signal.

5,532,701

ARRANGEMENT FOR COMPARING TWO TEMPORALLY SEPARATED BURSTS OF SIGNAL AT TWO DIFFERENT FREQUENCIES

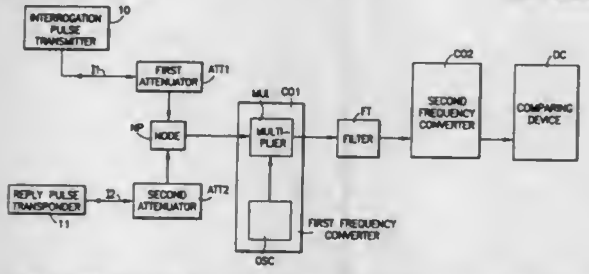
Daniele Biella, Milan, Italy, assignor to Alcatel Italia S.p.A., Milan, Italy

Filed May 21, 1993, Ser. No. 65,591

Claims priority, application Italy, May 21, 1992, MI92A1230

Int. Cl.^{6} G01S *1/04*

U.S. Cl. 342—387 **18 Claims**



1. An arrangement for comparing two timewise separated input bursts of signals that occur at two different frequencies, for use in navigation systems, comprising:

a first frequency converter, connected to receive at an input thereof, both of said two separated input bursts of signals, for converting said two separated input bursts of signals into two new bursts of signals that have a common frequency; and

a comparator connected to receive said two new bursts of signals from said first frequency converter, for comparing a characteristic of said two new bursts of signals with each other, whereby measurement errors in the arrangement are reduced by said comparator comparing said two new bursts of signals at said common frequency.

5,532,702

METHOD AND SYSTEM FOR OBTAINING INFORMATION FROM A PLURALITY OF REMOTE STATIONS

Yosef Mintz, 14 Savyon Street, Petach Tikva 49542, Israel

Filed Apr. 25, 1994, Ser. No. 232,776

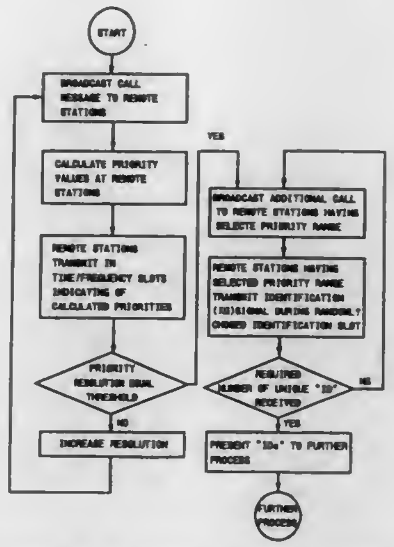
Claims priority, application Israel, Dec. 4, 1992, 103976

Int. Cl.^{6} G01S *3/02*

U.S. Cl. 342—463 **40 Claims**

1. A method for receiving information from a plurality of remote stations, the stations having varying attributes related to the information, comprising the steps of:

(a) determining, at each of a plurality of stations, of a characteristic value based on at least one of the attributes, according to a predetermined protocol for the respective station; and


START
BROADCAST CALL MESSAGE TO REMOTE STATIONS
CALCULATE PRIORITY VALUES AT REMOTE STATIONS
REMOTE STATIONS TRANSMIT IN TIME/FREQUENCY SLOTS INDICATING OF CALCULATED PRIORITIES
PRIORITY RESOLUTION EQUAL THRESHOLD
NO
YES
INCREASE RESOLUTION
BROADCAST ADDITIONAL CALL TO REMOTE STATIONS HAVING SELECTE PRIORITY RANGE
REMOTE STATIONS HAVING SELECTED PRIORITY RANGE TRANSMIT IDENTIFICATION (ID)SIGNAL DURING RANDOMLY CHOSED IDENTIFICATION SLOT
REQUIRED NUMBER OF UNIQUE "ID" RECEIVED
NO
YES
PRESENT "IDs" TO FURTHER PROCESS
FURTHER PROCESS

(b) transmitting, by the stations, of a non-information bearing signal in a transmission slot, wherein said slot is indicative of the determined characteristic value.

5,532,703

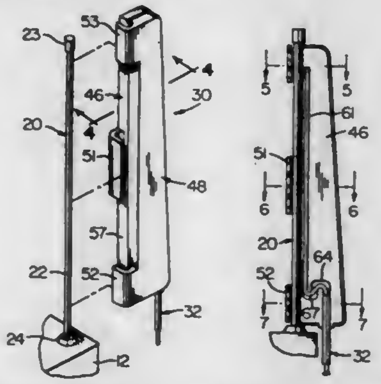
ANTENNA COUPLER FOR PORTABLE CELLULAR TELEPHONES

Gerald D. Stephens, Vandalia, and Duixian Liu, Dayton, both of Ohio, assignors to Valor Enterprises, Inc., Piqua, Ohio

Continuation-in-part of Ser. No. 50,588, Apr. 22, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,546

Int. Cl.^{6} H01Q *1/24*

U.S. Cl. 343—702 **9 Claims**



1. A coupler adapted for inductively connecting a flexible coaxial cable extending from a remote external antenna on a motor vehicle to an elongated flexible wire-like retractable antenna of a portable cellular telephone, said coupler comprising an elongated body of substantially rigid plastics material and including two opposing and mating elongated body sections secured together, said body sections including a plurality of longitudinally spaced and substantially rigid hook-shaped tabs projecting in opposite directions for releasably and positively attaching said body laterally to the retractable antenna in response to flexing of the retractable antenna for engaging said tabs, an elongated electrical conductor connected to the coaxial cable, and said conductor is confined between said opposing body sections and extends generally parallel and adjacent the retractable antenna to obtain an effective inductive connection between said conductor and the retractable antenna.

5,532,704

DEVICE FOR POSITIONING ANTENNAS INSIDE A MEASURMENT CHAMBER OF THE ANECHOIC OR OF THE SEMI-ANECHOIC TYPE

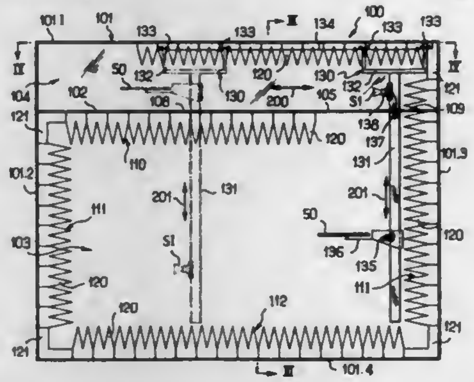
Phillipe Ruelle, Pluneret, France, assignor to SIEPEL-Societe Industrielle d'Etudes et Protection Electroique, La Trinite-Sur-Mer, France

Filed Jun. 14, 1994, Ser. No. 260,378

Claims priority, application France, Jun. 15, 1993, 93 07178

Int. Cl.^{6} H01Q *1/12;* **G01R** *29/08*

U.S. Cl. 343—703 **10 Claims**



1. A device for positioning antennas inside an anechoic or semi-anechoic measurement chamber, the chamber being constituted by an envelope inside which electromagnetically absorbent blocks are disposed forming absorbent walls for said measurement chamber, wherein a reserve is formed between a particular absorbent wall of the measurement chamber and the adjacent wall of the envelope of said chamber, and wherein an assembly is movably mounted in said reserve, said movable assembly including an antenna carder mast which passes through said particular wall via an associated opening therein to extend into the measurement chamber, each antenna being mounted to slide along said mast without mechanically interfering with any other antenna carried by said mast, thereby enabling the desired antenna to be positioned in the desired location within the measurement chamber while retracting the other antenna(s) into said reserve, behind said particular wall.

5,532,705

WRIST-MOUNTED-TYPE ANTENNA DEVICE AND APPARATUS HAVING THE ANTENNA DEVICE

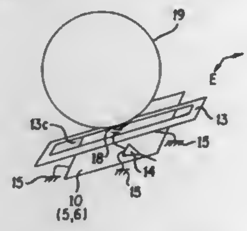
Norio Hama, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

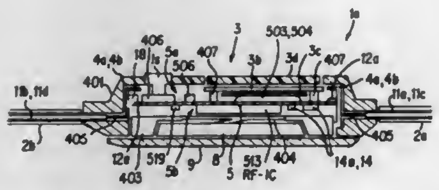
Filed Mar. 17, 1994, Ser. No. 214,412

Claims priority, application Japan, Mar. 17, 1993, 5-057428; Mar. 17, 1993, 5-057432; Mar. 29, 1993, 5-070384

Int. Cl.^{6} H01Q *1/18*

U.S. Cl. 343—718 **46 Claims**





7. A wrist-mounted-type antenna device comprising:

a main body having an outer frame that defines a cavity and an outer peripheral surface of said main body, and a circuit board located inside said cavity, a circuit arranged on said circuit board; and

a slot antenna assembly attached to said outer peripheral surface of said main body and coupled to said circuit board, said antenna assembly including a slot extending along a length of said antenna assembly and having a reactance element connected across sides of said slot near a center of a length of said slot, whereby an electric field is produced across said slot when said antenna device is operated.

5,532,706

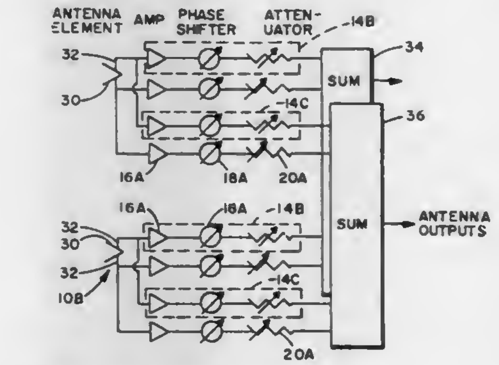
ANTENNA ARRAY OF RADIATORS WITH PLURAL ORTHOGONAL PORTS

Victor S. Reinhardt, Rancho Palos Verdes, and Steven O. Lane, Torrance, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Dec. 5, 1994, Ser. No. 349,637

Int. Cl.^{6} H01Q *13/00*

U.S. Cl. 343—778 **2 Claims**



1. A phased array antenna comprising:

a plurality of radiators arranged in an array, each of said radiators comprising a first port and a second port and a radiating aperture electromagnetically coupled to said first port and to said second port, said first port introducing a first radiation with a first polarization, said second port introducing a second radiation with a second polarization orthogonal to said first polarization;

first signal means having a first set of branches operatively coupling energy of said first radiation with the respective first ports of said radiators;

second signal means having a second set of branches operatively coupling energy of said second radiation with the respective second ports of said radiators, said second signal means being operative independently of said first signal means; and

beamformer means coupled to said first and said second signal means for forming at least one beam of electromagnetic power from said array of radiators, wherein said beamformer means comprises a first beamformer coupled to the first ports of respective ones of said radiators and a second beamformer coupled to the second ports of respective ones of said radiators, said first beamformer providing a first set of beams and said second beamformer providing a second set of beams independently of said first set of beams, wherein each set of beams comprises at least one beam, and

wherein each of said beamformers comprises a plurality of branches, an individual one of said branches is coupled via a respective one of said signal means to a port of an individual one of said radiators, each of said branches of respective ones of said beamformers is bifurcated into two signal carrying paths to enable operation of said antenna in a mode of frequency reuse, each of said paths of each of said branches having a phase shifter and an attenuator.

5,532,707

DIRECTIONAL ANTENNA, IN PARTICULAR DIPOLE ANTENNA

Georg Klinger, Saaldorf, and Max Gottl, Grobkarollnenfeld, both of, Germany, assignors to Kathrein-Werke KG, Rosenheim, Germany

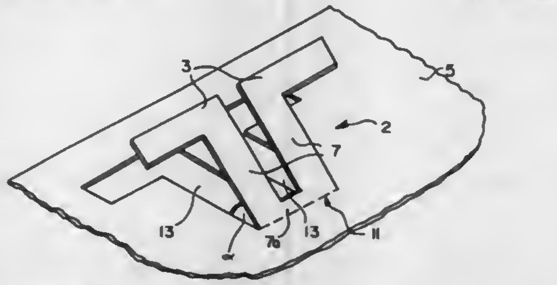
PCT No. PCT/EP94/00285, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO94/18719, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 1, 1994, Ser. No. 302,834

Claims priority, application Germany, Feb. 2, 1993, 43 02 905.1

Int. Cl.^{6} H01Q *9/16*

U.S. Cl. 343—793 **16 Claims**



1. A direction antenna having at least one radiator in the form of a dipole including an associated symmetrizer that carries the dipole above which the at least one dipole is mounted on a reflector, wherein a respective dipole half is embodied in one piece with the associated part of the symmetrizer, characterized in that the dipole, including its symmetrizer, is produced from the material of the reflector, in that the dipole and the symmetrizer are cut out from the remaining material of the reflector except for a connecting segment by means of a cutting operation and that the symmetrizer is bent out at an angle α relative to the reflector.

5,532,708

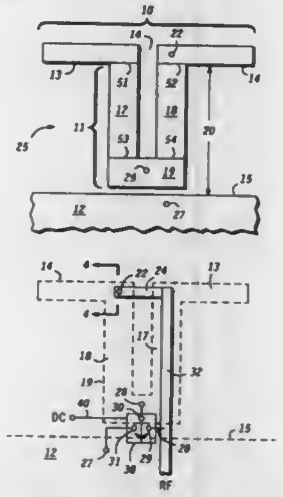
SINGLE COMPACT DUAL MODE ANTENNA

Eric L. Krenz, Crystal Lake, and David J. Tammen, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1995, Ser. No. 398,278

Int. Cl.^{6} H01Q *9/28*

U.S. Cl. 343—795 **7 Claims**



1. A single compact dual mode antenna, fabricated using double-sided printed circuit board techniques or multilayered circuit board techniques to form a single "T" shaped radiation structure providing electronically switched orthogonal polarizations and pattern diversity as in a dipole mode of operation and in a monopole mode of operation comprising:

an antenna element having a half wavelength dimension used as a split dipole antenna in a dipole mode of operation, and as a load in a monopole mode of operation;

a balun structure which is integral to, and situated coplanarly with and orthogonally to, the antenna element, used as a balun structure for the antenna element in the dipole mode of operation and as a monopole antenna in the monopole mode of operation;

a ground plane area which selectably connects to the balun structure in the dipole mode of operation and provides image response for the balun structure in the monopole mode of operation;

a transmission line antenna feed situated on an opposite side of a conventional double-sided printed circuit board which provides connection to or from the antenna element in both the dipole and monopole modes of operation, and selectably provides connection to the balun structure in the monopole mode of operation; and

an electronic switch which electronically selects ground from the ground plane area to the balun structure in the dipole mode of operation, or connects the transmission line antenna feed to the balun structure in the monopole mode of operation.

5,532,709

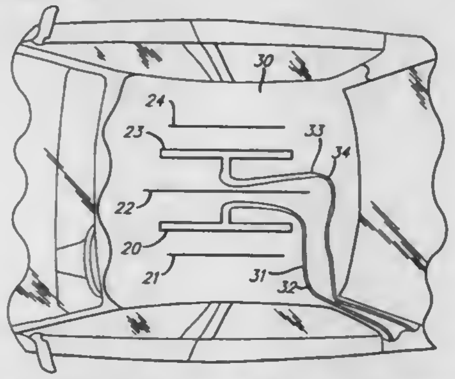
DIRECTIONAL ANTENNA FOR VEHICLE ENTRY SYSTEM

Timothy J. Talty, Trenton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1994, Ser. No. 333,191

Int. Cl.^{6} H01Q *19/30*

U.S. Cl. 343—819 **3 Claims**



1. A pair of directional antennas for concealed mounting on a transportation vehicle to receive radio-frequency (RF) signals from first and second predetermined zones on opposite sides of said transportation vehicle, comprising:

a shared reflector element substantially bisecting said first and second predetermined zones;

a first elongated active antenna element positioned between said shared reflector and said first predetermined zone;

a first elongated director element disposed between said first elongated active antenna element and said first predetermined zone and resonantly directing said RF signals from said first predetermined zone to said first elongated active antenna element;

a second elongated active antenna element positioned between said shared reflector and said second predetermined zone; and

a second elongated director element disposed between said second elongated active antenna element and said second predetermined zone and resonantly directing said RF signals from said second predetermined zone to said second elongated active antenna element.

5,532,710

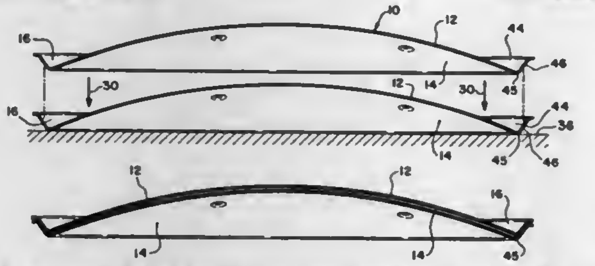
SATELLITE DISH STACKING SYSTEM

Mark A. Rodeffer, Burlington, Iowa, assignor to Winegard Company, Burlington, Iowa

Filed Jun. 21, 1994, Ser. No. 262,941

Int. Cl.^{6} H01Q *15/14*

U.S. Cl. 434—912 **23 Claims**



1. A system for stacking a plurality of satellite dishes, each of said satellite dishes having a reflector surface and a surface opposing said reflector surface, said system comprising in combination:

a first supporting region formed on said opposing surface of each of said plurality of satellite dishes;

a second supporting region formed on said reflector surface of each of said plurality of satellite dishes opposite said first supporting region;

said first supporting region of a given satellite dish abutting against said second supporting region of an adjacent satellite dish when said reflector surface of said adjacent satellite dish nests in said opposing surface of said given satellite dish, the abutment of said first and second supporting regions separating said reflector surface of said adjacent satellite dish a predetermined space apart from said opposing surface of said given satellite dish.

5,532,711

LIGHTWEIGHT DISPLAY SYSTEMS AND METHODS FOR MAKING AND EMPLOYING SAME

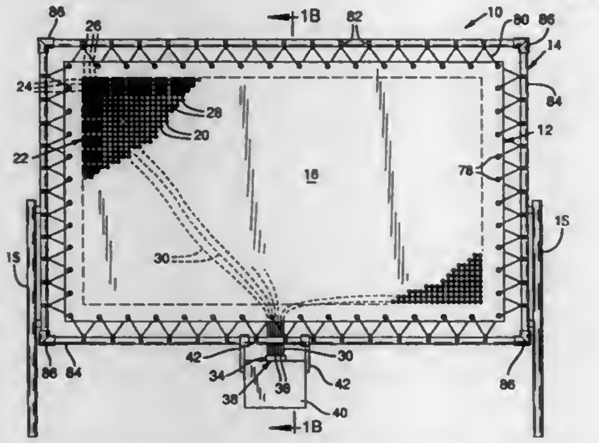
Laura L. Harris, Eugene, Oreg., assignor to Inwave Corporation, Eugene, Oreg.

PCT No. PCT/US91/07329, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO93/06584, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 27, 1991, Ser. No. 211,235

Int. Cl.^{6} G09G *3/34*

U.S. Cl. 345—55 **24 Claims**



1. A display system for generating an image preferably for viewing at a distance, comprising:

plural elongate optical conductors each of which includes at opposite ends thereof an input terminal and an output terminal;

an input matrix of closely packed input terminals;

a display matrix of spaced apart output terminals whose relative positioning within the display matrix corresponds to relative positioning of the input terminals in the input matrix;

a foldable display screen including terminal housings affixed to a flexible substrate for supporting the display matrix, the terminal housings having protruding portions from a surface of the substrate to receive the optical conductors; and

image projection means for providing a source image to the input matrix such that the display matrix generates a display image that corresponds to the source image but is much greater in size.

5,532,712

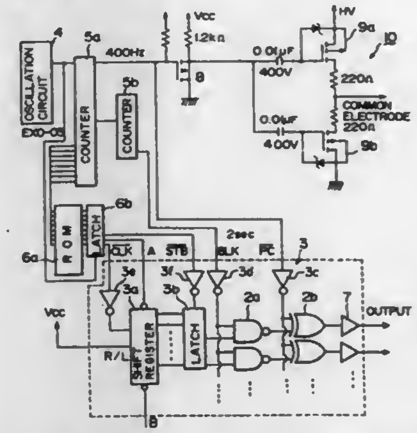
DRIVE CIRCUIT FOR USE WITH TRANSMISSIVE SCATTERED LIQUID CRYSTAL DISPLAY DEVICE

Yukihiro Tsuda, and Akira Mori, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 47,654, Apr. 13, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 290,600

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—87 **7 Claims**



1. A circuit for operating a transmissive scattered liquid crystal display device, said circuit comprising:

a transmissive scattered liquid crystal display device having a plurality of pixels, each of said pixels having a common terminal and a data terminal, a first common electrode connected to the common terminal of each of a first group of said plurality of pixels, a second common electrode connected to the common terminal of each of a second group of said plurality of pixels, and a plurality of data electrodes, each of said data electrodes being connected to the data terminal of a respective one of the pixels in each of said first and second groups of pixels;

a shift register;

a display signal circuit for serially sending a display signal with a logic signal level to said shift register;

a plurality of gates, each of said gates functioning as an exclusive OR circuit, each of said gates having an input adapted to receive a signal from said shift register;

a plurality of switching devices, each of said switching devices having a withstand voltage which is higher than said logic signal level, each said switching device having an input connected to an output of a respective one of said plurality of gates, each said switching device having a data output, the data output of each switching device being connected to a respective data electrode of said transmissive scattered liquid crystal display device;

wherein each gate and the switching device to which it is connected constitute, along with said shift register, a drive path, each drive path being formed as part of an IC;

a logic signal circuit for applying to a first input of each of said plurality of gates a logic signal for designating the plus and minus of a voltage applied to said liquid crystal display device;

a switching circuit connected to said first and second common electrodes of said transmissive scattered liquid crystal display device, thereby multiplex-driving said transmissive scattered liquid crystal display device.

5,532,713
DRIVING METHOD FOR LIQUID CRYSTAL DEVICE

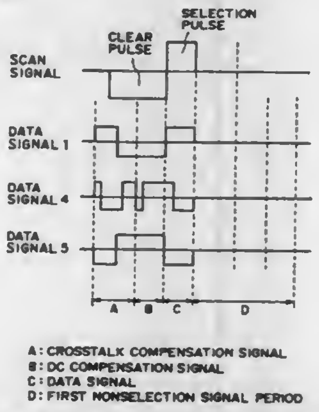
Shinjiro Okada, Isehara; Yutaka Inaba, Kawaguchi, and Kazunori Katakura, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1994, Ser. No. 229,220

Claims priority, application Japan, Apr. 20, 1993, 5-093185

Int. Cl.^{6} G09G ***3/36***

U.S. Cl. 345—97 **5 Claims**



1. A driving method for a liquid crystal device of the type comprising a pair of oppositely disposed electrode plates having thereon a group of scanning lines and a group of data lines, respectively, and a liquid crystal disposed between the pair of electrode plates so as to form a pixel at each intersection of the scanning lines and data lines, said driving method comprising:

selecting a scanning line from among the scanning lines and applying a scanning selection signal to the selected scanning line at a scanning selection period (C) in one scanning period; and

applying a data signal to a data line for an associated pixel on the selected scanning line,

said data signal including a first signal in a data signal period (C) synchronized with the scanning selection period (C), a second signal, for compensating for the first signal, in a period (B), and an AC signal in an AC period (A), so that the first signal and the second signal provide a time-integrated voltage of zero to the associate pixel, and the AC signal also provides a time-integrated voltage of zero applied to the associated pixel; and

said first signal having a waveform varying depending on gradation data for the associated pixel, and said AC signal having a waveform varying depending on the first signal applied subsequent to the AC signal.

5,532,714
METHOD AND APPARATUS FOR COMBINING VIDEO IMAGES ON A PIXEL BASIS

Benjamin P. Knapp, Byron Center, Mich., and Clifford H. Kraft, Naperville, Ill., assignors to SPX Corporation, Muskegon, Mich.

Continuation of Ser. No. 918,286, Jul. 22, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 287,467

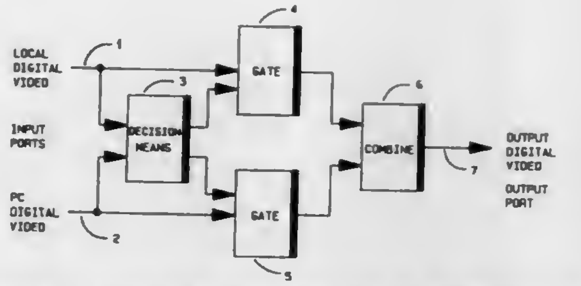
Int. Cl.^{6} G09G ***1/28;*** **H04N** ***5/272***

U.S. Cl. 345—114 **3 Claims**

1. An apparatus for combining digital words from clocked digital video sources comprising:

a plurality of input ports for receiving digital words with binary values, said binary values determining the color of a pixel to be displayed, each port coupled to a source of digital words;

a gate associated with each input port for passing or inhibiting a digital word;



means for transmitting digital words from said input ports to the gates;

decision means comprising a plurality of decision rules for reading the binary values of the words at each input port at each pixel clock time and deciding which gate should pass its corresponding word, a decision rule being chosen from said plurality of decision rules at each pixel clock time, the decision rules making decisions at said pixel clock time based on the binary values of the digital words;

an output port for passing digital words to a video display or palette;

means for transmitting the digital words from the gates to said output port.

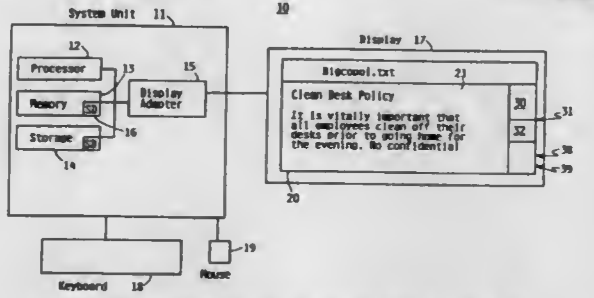
5,532,715
VISUALLY AGING SCROLL BAR

Cary L. Bates; Jerry A. Blades; Harvey G. Kiel, all of Rochester; Raymond F. Romon, Oronoco, and Jeffrey M. Ryan, Byron, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 777,867, Oct. 16, 1991. This application Oct. 9, 1992, Ser. No. 959,315

Int. Cl.^{6} G09G ***5/34***

U.S. Cl. 345—123 **13 Claims**



1. A computer system having a display and a scroll bar, comprising:

means for determining that a slider is located at a first position, said slider being located within said scroll bar;

means for retrieving a first clock time from said computer system;

means for storing said first clock time;

means for detecting that said slider has moved to a second position;

means for retrieving a second clock time from said computer system;

means for creating a first region in said scroll bar, said first region having an upper boundary and a lower boundary and including said first position; and

first means for changing the visual appearance of said first region in said scroll bar based on the length of time between said second clock time and said first clock time;

means for storing said second clock time; and

means for displaying said slider at said second location.

5,532,716
RESOLUTION CONVERSION SYSTEM

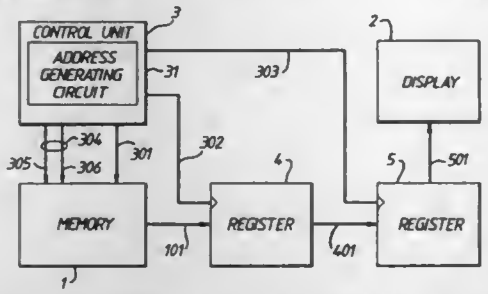
Yoshinobu Sano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 9, 1992, Ser. No. 988,314

Claims priority, application Japan, Dec. 9, 1991, 3-324156

Int. Cl.^{6} G09G ***5/00***

U.S. Cl. 345—132 **9 Claims**



1. A resolution conversion system having a memory for storing data at a first predetermined resolution and a display device for displaying data at a second predetermined resolution different from the first predetermined resolution, said conversion system comprising:

address generating means connected to said memory and generating an address for reading out the stored data in the memory;

a first storage device connected to said memory and storing therein the data read out in response to the address from the address generating means, said first storage device outputting said stored data in response to a first clock signal having a frequency f_1; and

a second storage device connected to said first storage device and said display device, and second storage device operating in response to a second clock signal having a frequency f_2, different from the frequency f_1 of said first clock signal, for storing therein only selected data from the first storage device, said second storage device outputting the selected data stored therein to the display device, said first storage device having an output and said second storage device having an input connected to the output of said first storage device, and said second storage device selecting for storage therein only the data appearing on said input which is in synchronism with a rising edge of said second clock signal at said frequency f_2,

wherein the first predetermined resolution corresponds to a storage size within said memory of n1×m1, and said second predetermined resolution corresponds to a display size of said display device of n2×m2, and wherein f_1 and f_2 are related according to the formula:

$$f_2=(m2/m1).f_1.$$

5,532,717
METHOD OF DISPLAYING TIME SERIES DATA ON FINITE RESOLUTION DISPLAY DEVICE

Gregory B. Jones, Tiverton, R.I.; Joseph B. Lopes, Seekonk, Mass., and Gerald R. Martel, Middletown, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

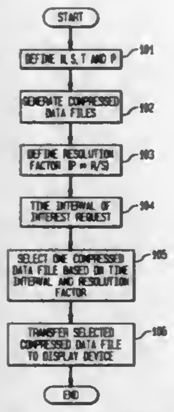
Filed May 19, 1994, Ser. No. 246,901

Int. Cl.^{6} G09G ***5/00***

U.S. Cl. 345—202 **10 Claims**

1. In a computer system, a method of minimizing display time for a data file, comprising the steps of:

generating a plurality of compressed data files based on said data file, said data file consisting of N data points sampled at sampling rate S over time period T, each of said plurality of compressed data files being defined by a corresponding unique compression ratio R and each of said plurality of compressed data files containing N/R data points that characterize said N data points;


START
DEFINE N, S, T AND P
101
GENERATE COMPRESSED DATA FILES
102
DEFINE RESOLUTION FACTOR (P = R/S)
103
TIME INTERVAL OF INTEREST REQUEST
104
SELECT ONE COMPRESSED DATA FILE BASED ON TIME INTERVAL AND RESOLUTION FACTOR
105
TRANSFER SELECTED COMPRESSED DATA FILE TO DISPLAY DEVICE
106
END

storing said plurality of compressed data files in a data storage device;

defining a resolution factor (PR/S) for each of said plurality of compressed data files, wherein P is the number of indivisible units of display of a finite resolution display device and wherein N>P;

selecting one of said plurality of compressed data files whose corresponding one of said resolution factors is closest to and less than or equal to a selected portion of time t from said time period T; and

transferring said one of said plurality of compressed data files from said data storage device to said display device.

5,532,718
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

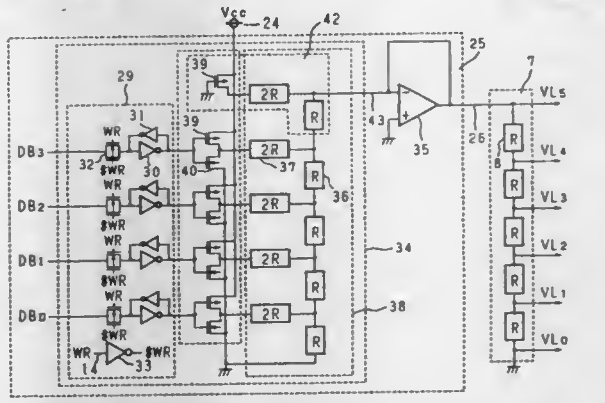
Yoshiyuki Ishimaru, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 205,223, Mar. 3, 1994, abandoned. This application Apr. 14, 1995, Ser. No. 422,661

Claims priority, application Japan, Mar. 3, 1993, 5-42553

Int. Cl.^{6} G09G ***5/00***

U.S. Cl. 345—211 **32 Claims**



1. A semiconductor integrated circuit device connected to a power supply providing a power-supply voltage and provided with a circuit for driving a liquid-crystal display panel on the basis of a control signal output from a CPU via an address bus and a data bus, comprising:

a liquid-crystal control circuit for generating a driving signal for driving the liquid-crystal display panel;

a driving voltage generating circuit connected to said liquid-crystal control circuit, receiving a reference voltage and generating a voltage for driving said liquid-crystal control circuit responsive to the reference signal; and

a reference voltage generating circuit connected to said driving voltage generating circuit for transforming the power-supply voltage responsive to the control signal received from said CPU into the reference voltage and for transmitting the reference voltage to said driving voltage generating circuit, wherein said reference voltage driving circuit comprises brightness level circuits, each of said brightness level circuits including

a register receiving the control signal from the CPU, the control signal including data signals to control illumination of the liquid crystal display panel via the data bus and a write signal and an address signal via the address bus;

a transistor connected to said register, wherein the write signal controls activation of said transistor and transmission of the data signals, and the write signal and the data signals which are input to said register by the write signal control the reference voltage output from said reference voltage generating circuit;

a resistance ladder connected to said transistor including first and second resistances, the first resistances connected in series and each of the second resistances connected between and in parallel with the first resistances and said transistor forming a ladder shape; and

an operational amplifier connected to said resistance ladder.

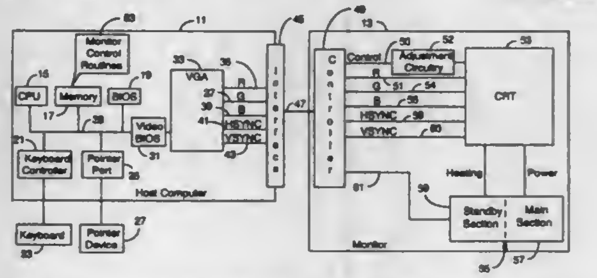
5,532,719
REMOTE CONTROL OF DISPLAY FUNCTIONS

Dan Kikinis, Saratoga, Calif., assignor to Cordata, Inc., Tortola, Virgin Islands (Br.)

Continuation of Ser. No. 181,884, Jan. 14, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 515,384

Int. Cl.⁶ G09G *1/00;1/28;1/06*

U.S. Cl. 345—211 **14 Claims**



1. In a computer system having a central processing unit (CPU), a memory, a monitor, and a video adapter providing signals to the monitor, a monitor control adjustment system comprising:

a dedicated vertical synchronization (VSYNC) line carrying timed VSYNC pulses and carrying no pixel data;

an input interface for a user to input information relative to desired monitor adjustments;

encoding circuitry controllable by the CPU; and

an adjustment controller in the monitor;

wherein the encoding circuitry converts the input information into digital commands and data and encodes the commands and data as serial data packets on the dedicated VSYNC line between instances of the VSYNC pulse without regard to blanking time, and wherein the adjustment controller in the monitor receives and decodes the serial data packets and adjusts display characteristics of the monitor according to the commands and data received.

5,532,720
SOLVENT RECOVERY SYSTEM FOR INK JET PRINTER

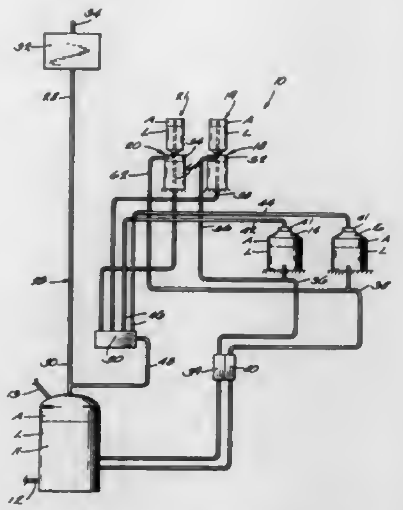
William J. Krueger, Saratoga Spring, and Victor G. Eckstein, Galway, both of N.Y., assignors to Quad/Tech, Inc., Sussex, Wis.

Filed Sep. 15, 1993, Ser. No. 121,930

Int. Cl.⁶ B41J *2/18*

U.S. Cl. 347—7 **40 Claims**

1. An ink supply system for ink jet printers, the ink supply system comprising



an ink supply tank for containing ink and solvent, the tank being connectable to an ink jet printer, the tank being a closed container and including an airspace having evaporated solvent therein;

a condenser positioned above said ink supply tank and including a low temperature cooler;

a tube connected to the airspace of said ink supply tank and to the condenser such that air containing evaporated solvent from the airspace is cooled by the low temperature cooler of the condenser and such that solvent in the air will condense and the condensed solvent is caused to flow by gravity back into said ink supply tank;

a solvent make up container connected to the ink supply tank for supplying solvent to the ink supply tank, said solvent make up container including an airspace; and

an equalizing conduit connecting the solvent make up container airspace to one of the ink supply tank airspace and the tube to provide for equalization of pressure between the solvent make up container and the ink supply tank.

5,532,721
DIELECTRIC DRUM AND ELECTROSTATIC RECORDING DEVICE USING THE SAME

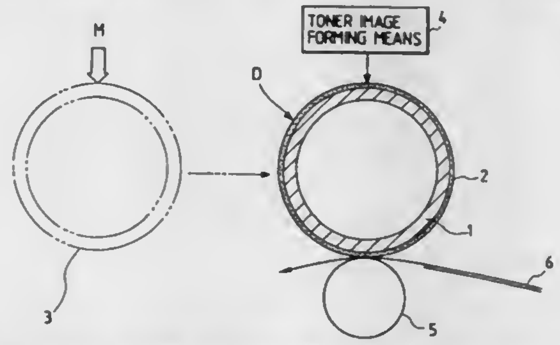
Kazuo Asano; Koji Masuda, both of Kanagawa; Takuo Kusano, Tokyo, and Ken Ebihara, Shizuoka, all of, Japan, assignors to Fuji Xerox Co., Ltd.; Nippon Light Metal Company, Ltd., and Nikkel Techno-Research Co., Ltd., all of Tokyo, Japan

Continuation of Ser. No. 960,831, Oct. 14, 1992, abandoned. This application Mar. 22, 1995, Ser. No. 408,177

Claims priority, application Japan, Oct. 16, 1991, 3-294788

Int. Cl.⁶ G01O *15/06*

U.S. Cl. 347—112 **4 Claims**



1. A dielectric drum for transferring a toner image to a recording paper used in electrostatic recording comprising:

a substrate having an outer surface;

a dielectric layer formed of an anodic oxidized film on said outer surface of said substrate, wherein said substrate is formed by drawing and hardening an aluminum alloy pipe of the 5000 series alloys of the Aluminum Association; and

said outer surface of said substrate having a surface hardness not less than 100 in terms of the Vicker's hardness.

5,532,722
IMAGE FORMING DEVICE AND METHOD FOR TRANSFERRING INK USING A HEATED PNEUMATIC DRUM

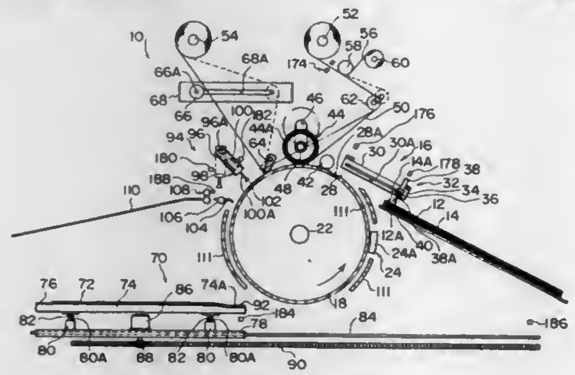
Tomizo Namiki; Tamotsu Suzuki, both of Shizuoka, and Yukihide Miyata, Kanagawa, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1994, Ser. No. 205,094

Claims priority, application Japan, Mar. 3, 1993, 5-42946

Int. Cl.⁶ G01D *15/10*

U.S. Cl. 347—153 **19 Claims**



1. An image forming device comprising:

a rotating drum having a peripheral surface around which an image forming material is trained, ink receiving portions and ink non-receiving portions being formed on said image forming material by at least one of exposure of a color separated original by active light and developing processing effected after said exposure, said ink receiving portions and said ink non-receiving portions corresponding to said color separated original;

an ink sheet conveying mechanism which conveys an ink sheet, said ink sheet comprising a supporting body having ink provided on a surface of said body, synchronously with rotation of said rotating drum;

ink transfer means for fitting together said image forming material, said image forming material being trained around said rotating drum, and said ink sheet, said ink sheet being conveyed by said ink sheet conveying mechanism, and transferring ink from said ink sheet to said ink receiving portions of said image forming material and said ink sheet in a state in which said image forming material and said ink sheet are fit together; and

conveying means, having an image receiving material loading surface, for reciprocally moving an image receiving material provided on the loading surface in a direction tangent to the peripheral surface of said rotating drum synchronously with the rotation of said rotating drum, and fitting together said image receiving material with said image forming material to which the ink has been transferred by said ink transfer means, and for applying at least one of a predetermined pressure and a predetermined temperature to said image receiving material and said image forming material so that the ink is transferred from said image forming material to said image receiving material.

5,532,723
DRIVE IC FOR A PRINTING HEAD

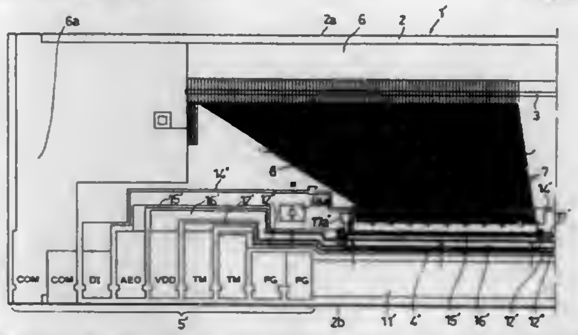
Takaya Nagahata; Toshiyuki Shirasaki; Tokihiko Kishimoto, and Yoshinobu Kishimoto, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 950,651, Sep. 23, 1992, Pat. No. 5,335,002. This application Mar. 11, 1994, Ser. No. 208,594

Claims priority, application Japan, Sep. 30, 1991, 3-252060; Sep. 30, 1991, 3-252061; Jan. 31, 1992, 4-16547; Feb. 14, 1992, 4-27623

Int. Cl.⁶ B41J *2/34*

U.S. Cl. 347—209 **4 Claims**



4. In a printing head comprising an elongate head substrate having first and second longitudinal edges, a line of printing dots provided on the head substrate along the first longitudinal edge, an array of drive ICs provided on the head substrate along the second longitudinal edge, a plurality of connection terminals formed on the head substrate adjacent to the second longitudinal edge, and a pattern of wiring conductor paths formed on the head substrate for electrically connecting between the connection terminals and the drive ICs, the conductor paths including a power grounding conductor path located between the drive ICs and the second longitudinal edge, the power grounding conductor path being at least as wide than the drive ICs, the drive ICs being rectangular with first and second longer sides as well as first and second shorter sides, the drive ICs having a multiplicity of drive output pads arranged adjacent to and along the first longer side, the drive ICs also having control signal pads which include at least a data-in pad, a data-out pad, a strobe pad, and a clock pad,

the improvement wherein all of the data-in pad, data-out pad, strobe pad and clock pad are arranged adjacent to the respective shorter sides of the drive ICs.

5,532,724
IMAGE TRANSFER DEVICE

Minoru Inagaki; Shigeru Fukai; Michio Shinozaki; Tomoyuki Marugame; Hiroyuki Kuroki; Tatsuya Morimitsu, and Tomio Andoh, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1993, Ser. No. 111,069

Claims priority, application Japan, Aug. 31, 1992, 4-231900; Feb. 24, 1993, 5-061028; Feb. 24, 1993, 5-061029; Feb. 25, 1993, 5-061069; Feb. 25, 1993, 5-061070

Int. Cl.⁶ B41J *2/325*

U.S. Cl. 347—213 **28 Claims**

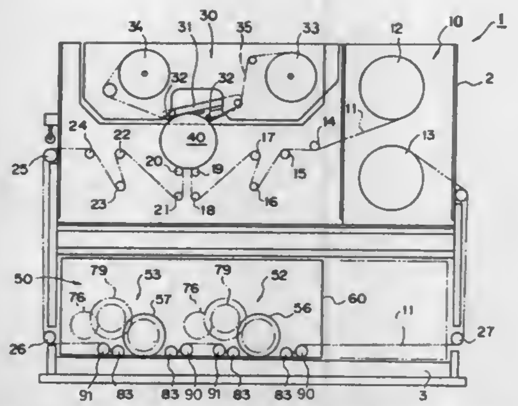
1. An image transfer device comprising:

transport means for transporting a film having at least a first transfer layer on a support,

image writing means for bringing a transfer ribbon into contact with said first transfer layer of said film, and transferring transfer ink on said ribbon to said first transfer layer by a thermal head so as to form an image on said first transfer layer,

a stage for fixing a transfer object,

transfer means for guiding said film whereon said image has been formed on said first transfer layer by said ribbon onto said object on said stage, and transferring said image on said first transfer layer to said object by heating and applying pressure to said object by way of said film by a transfer roller,



a peel roller for peeling said support of said film adhering to said transfer object from said object downline from where said film passes over said transfer roller, said peel roller being disposed in the vicinity of said transfer roller, and

a pressure roller which is free to rotate and which presses said film onto said stage, said pressure roller being provided between said transfer roller and said peel roller.

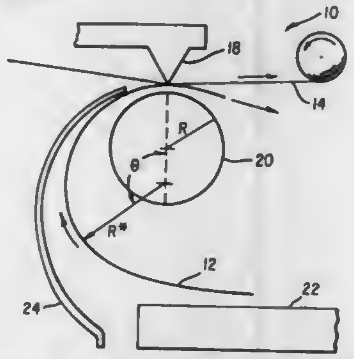
5,532,725
TRANSPARENT MEDIA FOR MINIMIZING CURL DURING PRINTING OF HIGH DENISTY THERMAL DYE TRANSFER IMAGES

Thomas W. Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1993, Ser. No. 146,270

Int. Cl.^{6} B41M *5/40*

U.S. Cl. 347—221 **6 Claims**



1. Transparency dye receiver media for minimizing curl during receipt of dye transfer images in a thermal printing process in which the receiver media is passed through a nip formed between a thermal printhead and a platen while heat is selectively applied to the media by image-wise energization of heater elements that make up the thermal printhead, said receiver media comprising:

a transparent support having a thickness in inches approximately equal to the cube root of

$$C^*F_HR^{*2}\theta^3/4Eb(57.3)^3(1-\text{Cos}\,\theta/2).$$

where:

C^* is a constant for a given dye receiver support thickness,

F_H is the load on the receiver media from the printhead in pounds,

R^* is the radius of the bend during printing in inches,

θ is the arc of bending of the receiver media during printing in degrees,

E is Young's Modulus in psi, and

b is the width of printhead in inches; and

a dye receiver layer on one surface of said support.

5,532,726
THERMAL RECORDING APPARATUS FOR RECORDING AN IMAGE OF STABLE DENSITY WITHOUT AN INCREASE IN LASER OUTPUT POWER

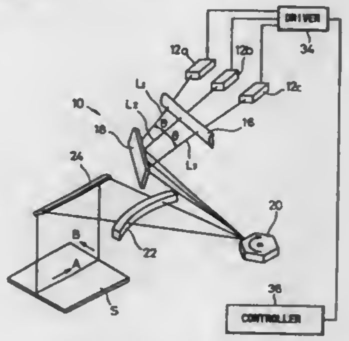
Yasuhiko Goto; Toshitaka Agano, and Shinji Imai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

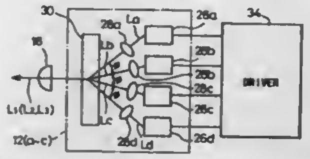
Filed Feb. 25, 1993, Ser. No. 22,274

Claims priority, application Japan, Feb. 27, 1992, 4-041702

Int. Cl.^{6} B41J *2/47;* G01D *15/14;* G02B *26/00;27/00*

U.S. Cl. 347—243 **17 Claims**





1. A thermal recording apparatus for recording information on a thermosensitive recording medium having a support coated with a coloring agent, a color developer, and light-absorbing dyes, and producing a color having a density depending on an amount of thermal energy that is applied to the thermosensitive recording medium, said thermal recording apparatus comprising:

a plurality of laser beam generating means, each for generating a separate, single laser beam; and

an optical scanning means for scanning the thermosensitive recording medium with said separate, single laser beams at respective different positions on the thermosensitive recording medium;

wherein one of said separate, single laser beam scans the thermosensitive recording medium earlier than the other separate, single laser beams and has a thermal energy which is high enough to enable the thermosensitive recording medium to produce the color.

5,532,727
APPARATUS AND METHOD OF THERMALLY RECORDING INFORMATION WITH SHADING CORRECTION

Toshitaka Agano, and Takashi Shoji, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1994, Ser. No. 186,473

Claims priority, application Japan, Jan. 28, 1993, 5-012526

Int. Cl.^{6} B41J *2/47;2/435;* H01S *3/00;* G01D *15/14*

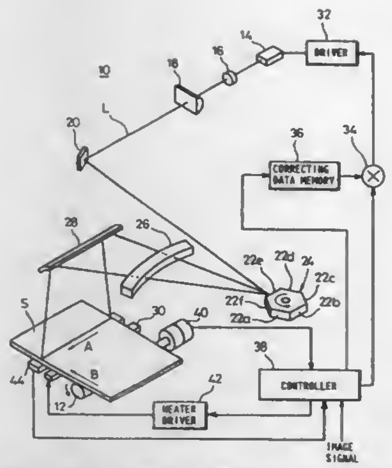
U.S. Cl. 347—253 **9 Claims**

2. A thermal recording apparatus comprising:

preheating means for preheating a thermosensitive recording medium, which has a support coated with a coloring agent, a color developer, and light-absorbing dyes, and can be colored to a density depending on thermal energy imparted thereto at a coloring temperature, along a main scanning direction to a temperature below the coloring temperature;

auxiliary scanning means for moving said thermosensitive recording medium in an auxiliary scanning direction substantially perpendicular to said main scanning direction;

recording means for recording information based on an image signal;



said recording means including heating means energizable based on said image signal for applying a light beam to said thermosensitive recording medium along said main scanning direction to heat the thermosensitive recording medium to said coloring temperature to color the thermosensitive recording medium to thereby record the information based on said image signal;

speed variation detecting means for detecting variations in a speed at which said thermosensitive recording medium is moved by said auxiliary scanning means; and

shading correcting means for compensating for the variations in the speed at which said thermosensitive recording medium is moved by said auxiliary scanning means by controlling the light beam generated by said heating means based on a speed variation signal from said speed variation detecting means.

5,532,728
LASER SCANNING APPARATUS

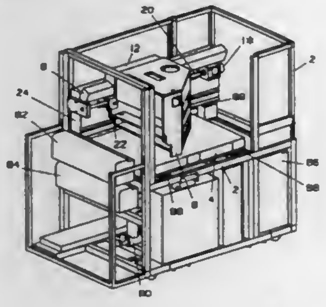
Zvi Krams, Raanana; Dov Berman, Hofit; Avigdor Bieber, Raanana, and Avinoam Livni, Haifa, all of, Israel, assignors to Scitex Corporation Ltd., Herzlia Bet, Israel

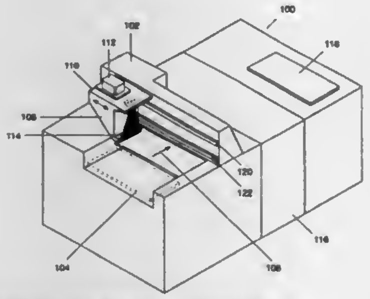
Filed Jul. 8, 1993, Ser. No. 87,303

Claims priority, application Israel, Jul. 10, 1992, 102463

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—257 **18 Claims**





1. Laser scanning apparatus, comprising:

a machine frame;

a first supporting member for supporting a working medium; and a second supporting member for supporting at least the delivery end of a laser beam delivery system;

one of said supporting members being a movable carriage mounted in cantilever fashion from one side of the machine frame for effecting relative movement between said working medium and said laser beam delivery system to cause the laser beam to scan the working medium;

said machine frame including an upper rail for slidably supporting one end of said carriage in cantilever fashion,

and a linear bearing surface below and parallel to said rail;

said linear bearing surface being engageable with a lower part of the carriage to prevent pivoting of the carriage on said upper rail and to permit only linear movement of the carriage along said rail.

5,532,729
SCANNER MOTOR WITH CERAMIC SLEEVE BEARING

Mikio Nakasugi, Chofu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

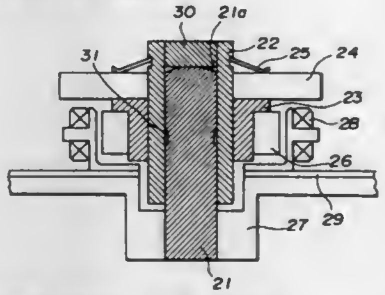
Filed Jul. 19, 1993, Ser. No. 92,991

Claims priority, application Japan, Jul. 31, 1992, 4-224602

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—257 **16 Claims**

1. A scanner motor comprising:



a fixed shaft made of a ceramic material;

a rotary sleeve made of a ceramic material, said rotary sleeve being rotatably fitted onto said fixed shaft so as to be rotatable around said fixed shaft;

a thrust plate fixed to one end portion of said rotary sleeve, wherein an abutting surface of said thrust plate faces an end surface of said fixed shaft and is made of a ceramic material; and

driving means for rotating said rotary sleeve,

wherein at least one of said end surface of said fixed shaft and said abutting surface of said thrust plate has the shape of at least part of the surface of a sphere.

5,532,730
LIGHT BEAM SCANNING APPARATUS

Yuichi Akanabe, Hino, Japan, assignor to Konica Corporation, Japan

Filed Sep. 19, 1994, Ser. No. 308,383

Claims priority, application Japan, Oct. 6, 1993, 5-250773

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—259 **5 Claims**

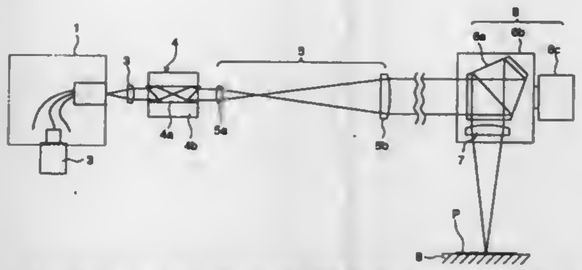
1. An apparatus for recording an image on a photosensitive material by scanning with a light beam having image information of said image, comprising:

a cylinder for holding said photosensitive material, wherein said photosensitive material faces an interior of said cylinder and is adapted to be scanned in a circumferential direction thereof;

means for projecting said light beam;

first optical means for transmitting said light beam projected from said projecting means in a direction substantially parallel to a central axis of said cylinder;

means for rotating said first optical means about said central axis, wherein said first optical means rotates said light beam



projected from said projecting means about a rotating axis of said first optical means at a rotating speed twice said rotating speed of said first optical means;

second optical means for transmitting said light beam rotated by said first optical means and magnifying said light beam so as to expand a diameter of said light beam;

third optical means for transmitting said light beam magnified by said second optical means and changing a direction of said light beam to a direction which is substantially perpendicular to said central axis so as to direct said light beam onto said photosensitive material; and

means for rotating said third optical means about said central axis synchronized with a rotation of said light beam rotated by said first optical means whereby said image is recorded on said photosensitive material by scanning with said light beam transmitted from said third optical means.

5,532,731

METHOD AND APPARATUS FOR ADJUSTING IMAGE FORMING POSITIONS TO ALLOW PLURAL IMAGES TO BE FORMED ON PLURAL RECORDING SHEETS

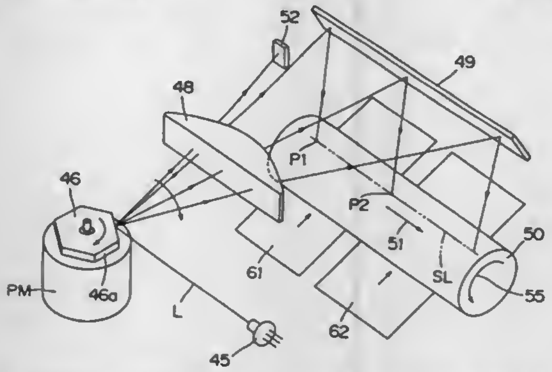
Takashi Mihara; Masaki Tsuchiya; Junichiro Higuma; Seiji Kikuchi, and Hiromi Okada, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 24, 1993, Ser. No. 156,896

Claims priority, application Japan, Nov. 30, 1992, 4-321017

Int. Cl.⁶ H04N ***1/21***

U.S. Cl. 347—250 **8 Claims**



1. A method of adjusting image forming positions in an apparatus in which laser light, which is modulated suitable to images to be formed, scans a photoconductor at an approximately constant velocity to write a plurality of images arranged in parallel along a scanning direction of the laser light, such that a plurality of toner images may be formed on a plurality of recording sheets fed in parallel, said method comprising:

adjusting a timing of modulating the laser light suitable to a first image to be written by the laser among the plurality of images so that a writing position of the first image to be written lies at a first specified position, and

varying a scanning velocity of the laser light on the photoconductor to adjust image forming positions so that a writing position of a last image to be written by the laser light among the plurality of images lies at a second specified position.

5,532,732

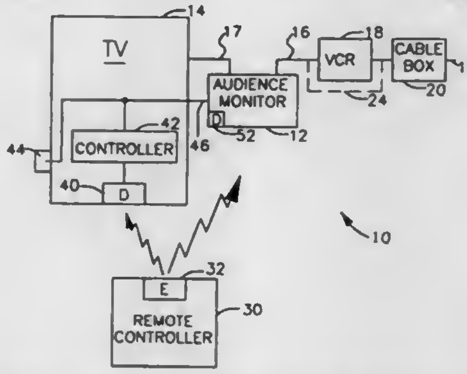
APPARATUS AND METHODS FOR USING COMPRESSED CODES FOR MONITORING TELEVISION PROGRAM VIEWING

Henry C. Yuen, Redondo Beach, and Daniel S. Kwoh, La Canada, both of Calif., assignors to Gemstar Development Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 934, Jan. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 965,075, Oct. 22, 1992, abandoned, which is a continuation of Ser. No. 877,687, May 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,412, Feb. 3, 1992, Pat. No. 5,307,173, which is a continuation-in-part of Ser. No. 767,323, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 676,934, Mar. 27, 1991, Pat. No. 5,335,079, which is a continuation-in-part of Ser. No. 371,054, Jun. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 289,369, Dec. 23, 1988, abandoned. This application Sep. 16, 1993, Ser. No. 122,146

Int. Cl.⁶ H04N ***7/00;7/10***

U.S. Cl. 348—1 **20 Claims**



1. An apparatus for television audience monitoring comprising:

means for sensing that a television is on;

means for retrieving compressed codes from a received television signal, each compressed code having at least one digit, each compressed code representative of, and compressed in length from, the combination of channel, time-of-day, and date for a program, and each compressed code embedded in the received television signal containing the program;

means for determining a time duration that a first program is displayed by the television by measuring the time duration between a time of first retrieving a first compressed code representing the first program from the television signal and a time of first retrieving a second compressed code representing a second program from the television signal, if the means for sensing senses that the television is on, each compressed code having at least one digit and each compressed code representative of, and compressed in length from, the combination of channel, time-of-day, and date for a program;

means for decoding and expanding the retrieved compressed code for the first program into a channel, time-of-day, and date for the first program; and

means for storing the decoded channel, time-of-day, and date for the first program and for storing the measured time duration that the first program is displayed by the television.

5,532,733

REMODULATION OF A CABLE BOX OUTPUT SIGNAL TO A UHF CHANNEL

Leroy S. Wignot, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

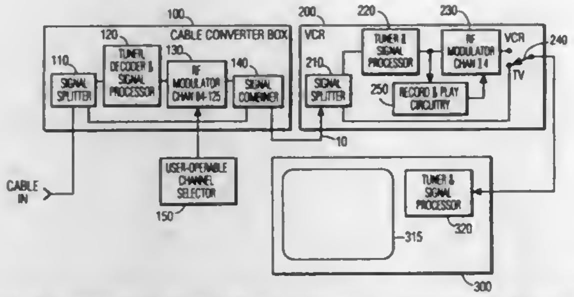
Continuation of Ser. No. 22,119, Mar. 10, 1993, abandoned.

This application Jan. 4, 1995, Ser. No. 379,758

Int. Cl.⁶ H04N ***7/10***

U.S. Cl. 348—6 **3 Claims**

1. A cable converter, comprising:



an RF television signal input terminal for receiving RF cable television signals in a first range of frequencies corresponding to cable television channels from 2 to 83 inclusive;

a first signal path from said RF television signal input terminal to an RF television signal output terminal;

said first signal path including at least a tuner for selecting a particular cable television channel from said cable television channels, and a remodulator portion for remodulating said selected channel to an unoccupied cable television channel in a second range of frequencies corresponding to cable television channels from cable television channel 84 to cable television channel 125 inclusive; and

a second signal path from said RF television signal input terminal to said RF television signal output terminal;

said second signal path having a bandwidth sufficient to pass all of the cable television channels received at said RF television signal input terminal to said RF television signal output terminal at a substantially uniform amplitude;

said remodulator portion being controllable by a user to select said unoccupied cable television channel only from said second range of frequencies corresponding to cable television channels from cable television channel 84 to cable television channel 125 inclusive.

5,532,734

METHOD OF TRANSMITTING PICTURE DATA FROM A TRANSMITTER TO A SELECTED RECEIVER

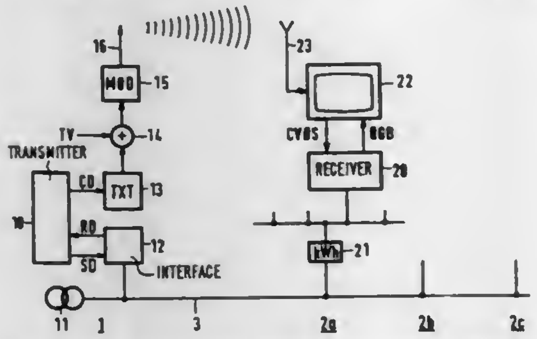
Hendrik M. H. G. Goertz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,914

Claims priority, application European Pat. Off., Feb. 22, 1994, 94200435

Int. Cl.⁶ H04N ***7/10***

U.S. Cl. 348—8 **6 Claims**



1. A method of transmitting power consumption information in the form of picture data from a power station to a selected receiver in a plurality of receivers, comprising the steps of:

splitting up the picture data into common picture data for transmission and storage in the plurality of receivers, and specific data for transmission to the selected receiver;

transmitting, at least when modified, the common picture data to the plurality of receivers via a first transmission medium;

storing the common picture data in the plurality of receivers;

transmitting the specific picture data from the transmitter to the selected receiver via a second transmission medium different from said first transmission medium;

combining the received specific picture data with the stored common picture data in the selected receiver to form a combined picture for display on a display screen.

5,532,735

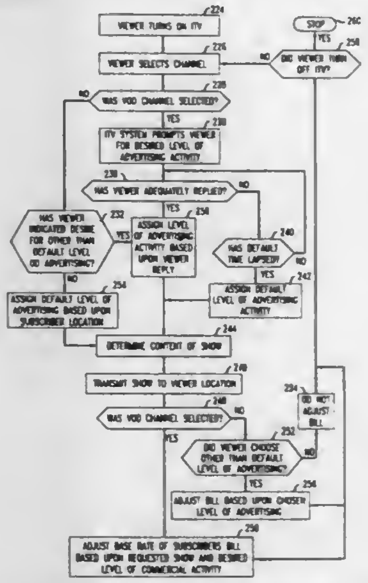
METHOD OF ADVERTISEMENT SELECTION FOR INTERACTIVE SERVICE

Donald E. Blahut, Holmdel; William M. Schell, Watchung, both of N.J.; Guy A. Story, New York, N.Y., and Edward S. Szurkowski, Maplewood, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Apr. 29, 1994, Ser. No. 236,286

Int. Cl.⁶ H04N ***7/14***

U.S. Cl. 348—13 **1 Claim**



224
VIEWER TURNS ON ITV
226
VIEWER SELECTS CHANNEL
228
WAS VOD CHANNEL SELECTED?
NO
YES
230
ITV SYSTEM PROMPTS VIEWER FOR DESIRED LEVEL OF ADVERTISING ACTIVITY
238
WAS VIEWER ADEQUATELY REPLIED?
NO
YES
HAS VIEWER INDICATED DESIRE FOR OTHER THAN DEFAULT LEVEL OF ADVERTISING?
232
YES
NO
ASSIGN LEVEL OF ADVERTISING ACTIVITY BASED UPON VIEWER REPLY
240
HAS DEFAULT TIME LAPSED?
NO
YES
242
ASSIGN DEFAULT LEVEL OF ADVERTISING ACTIVITY
254
ASSIGN DEFAULT LEVEL OF ADVERTISING BASED UPON SUBSCRIBER LOCATION
244
DETERMINE CONTENT OF SHOW
TRANSMIT SHOW TO VIEWER LOCATION
WAS VOD CHANNEL SELECTED?
NO
YES
DO NOT ADJUST BILL
252
DID VIEWER CHOOSE OTHER THAN DEFAULT LEVEL OF ADVERTISING?
NO
YES
ADJUST BILL BASED UPON CHOSEN LEVEL OF ADVERTISING
ADJUST BASE RATE OF SUBSCRIBERS BILL BASED UPON REQUESTED SHOW AND DESIRED LEVEL OF COMMERCIAL ACTIVITY
STOP
YES
NO
DID VIEWER TURN OFF ITV?

1. A method of sending a set of signals to an interactive service subscriber location, the method comprising:

(a) prompting a user at the interactive service subscriber location to enter a desired level of advertising activity;

(b) waiting a predetermined amount of time for a response from the user; and

(c) after the predetermined amount of time has elapsed, assigning a default entry to the desired level of advertising activity;

(d) based upon the desired level of advertising activity, selecting a set of advertisements; and

(e) sending to the interactive service subscriber location, the set of signals representing a program and the set of advertisements.

5,532,736

DISPLAY AND IMAGE CAPTURE APPARATUS

Makoto Kuriki, Tokyo; Kazutake Uehira, Tokorozawa; Yukio Takahashi, Tokyo, and Shigenobu Sakai, Tama, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 94,963, Jul. 22, 1993, abandoned.

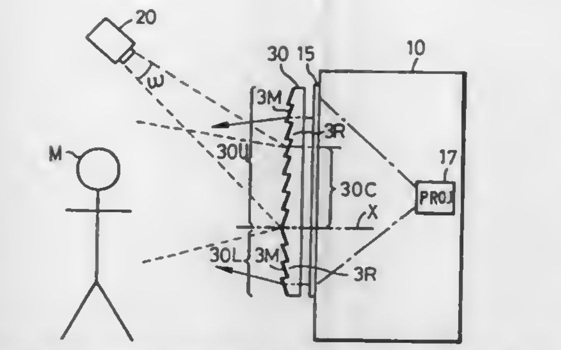
This application Mar. 9, 1995, Ser. No. 401,303

Claims priority, application Japan, Jul. 31, 1992, 4-204949; Jan. 6, 1993, 5-000395

Int. Cl.⁶ H04N ***5/30;7/14***

U.S. Cl. 348—20 **9 Claims**

1. A display and image capture apparatus comprising:



display means having a large-sized display screen for displaying an image thereon;

a half-transparent mirror, disposed in front of and substantially parallel to said large-sized display screen substantially over the entire area thereof, for reflecting a portion of light from a subject located in front of said large-sized display screen and for transmitting therethrough a portion of light from said image on said display screen, said half-transparent mirror comprising a multiplicity of strip-like micro half-transparent mirror segments disposed on the front surface of said half-transparent mirror substantially in parallel to one another, each of which segments extends horizontally of said large-sized display screen and has a micro width vertically thereof, the front surface of each of said strip-like micro half-transparent mirror segments being inclined forward in vertical section thereof and having a reflecting surface formed on the inclined surface for reflecting a portion of light from said subject;

at least one image capturing means disposed diagonally to said large-sized display screen so as to have at least a central area of the display screen surface within the angle of field of image capture of said image capturing means, said image capturing means receiving light reflected from said half-transparent mirror and capturing the image of said subject;

said strip-like micro half-transparent mirror segments of said half-transparent mirror being continuously disposed in vertical direction, the inclined front surfaces of the half-transparent mirror segments at least positioned at said central area of said display screen surface which is within said angle of field of image capture of said image capturing means protruding in the same direction and being oriented at a predetermined fixed angle, and having half-transparent reflecting surfaces formed thereon for reflecting a portion of light from said subject and for transmitting therethrough a portion of light from said image on said large-sized display screen, respectively; and

said half-transparent mirror further comprising a multiplicity of strip-like micro recesses formed in a central region of the back of said half-transparent mirror in opposing relation to said central area of said display screen surface, said strip-like micro recesses being formed in opposing relation to said half-transparent mirror segments positioned at said central area of said display screen surface and having substantially the same widths as those of said strip-like micro half-transparent mirror segments opposed thereto, respectively, said strip-like micro recesses having inclined surfaces oriented in the same direction as that of said strip-like micro half-transparent mirror segments, respectively, the number of said strip-like micro recesses being substantially the same as that of said half-transparent mirror segments positioned at said central area of said display screen surface, angles of said inclined surfaces of said strip-like micro recesses being changed to become larger or smaller on a stepwise basis in the vertical direction.

5,532,737

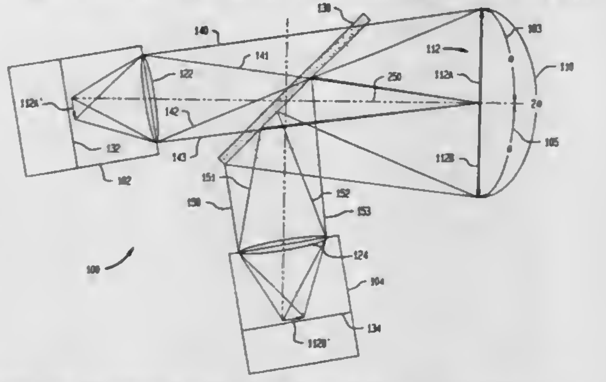
CAMERA ARRANGEMENT WITH WIDE FIELD OF VIEW

David A. Braun, Denville, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Continuation of Ser. No. 56,972, May 3, 1993, abandoned. This application Jun. 7, 1994, Ser. No. 255,839

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—36 **15 Claims**



1. A video camera arrangement comprising a plurality of individual video cameras having individual fields of view which merge contiguously to form a single aggregate field of view, said arrangement comprising,

a mirror for receiving incident light, for allowing a portion of said incident light to pass through without reflection, and for reflecting a portion of said incident light,

a first set of one or more video cameras having individual fields of view for receiving at least some of the light passed through said mirror,

a second set of one or more video cameras having individual fields of view for receiving at last some of the light reflected by said mirror,

the cameras in said first and second sets being positioned so that the aggregate field of view is formed by alternating the individual fields of view of the individual cameras of the first and second sets, the field of view of each camera of each set merging continuously along a boundary with a field of view of a camera of the other set.

5,532,738

SYSTEM FOR DETECTING ICE OR SNOW ON SURFACE WHICH SPECULARLY REFLECTS LIGHT

Howard Stern, Greenlawn, N.Y., assignor to Robotic Vision Systems, Inc., Hauppage, N.Y.

Continuation of Ser. No. 963,840, Oct. 20, 1992, Pat. No. 5,475,370. This application Jul. 11, 1995, Ser. No. 500,542

Int. Cl.^{6} H04N *7/18;* **G08B** *19/02*

U.S. Cl. 348—61 **11 Claims**

1. Apparatus for canceling background light reflected from an object comprising:

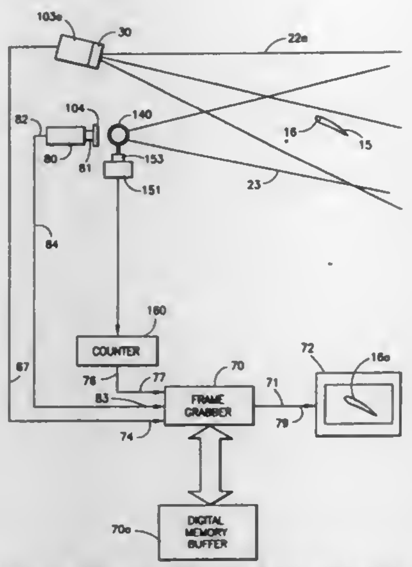
means for producing an image using ambient light reflected from said object;

means for storing light amplitude data of a plurality of pixels of said image;

means for projecting artificial illumination onto said object;

means for producing an illuminated image produced by said artificial illumination plus said ambient light; and

means for subtracting said light amplitude data from corresponding pixels of said illuminated image to compensate for ambient light contribution to said illuminated image.



5,532,739

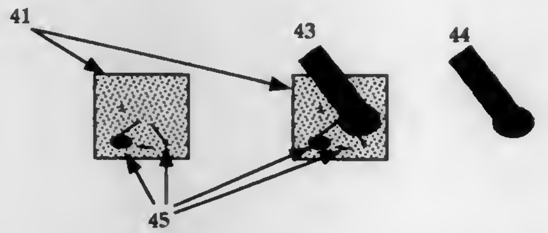
AUTOMATED OPTICAL INSPECTION APPARATUS

Arman M. Garakani, Cambridge, and Juha Koljonen, Needham, both of Mass., assignors to Cognex Corporation, Natick, Mass.

Continuation of Ser. No. 132,532, Oct. 6, 1993, abandoned. This application Feb. 15, 1995, Ser. No. 389,437

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—87 **14 Claims**



1. A machine vision apparatus for automating in-process inspection of device bonding, comprising:

an image processing means for generating digital image signals corresponding to an optically sensed pre-bond view of a device which is to be bonded to a supporting member,

a bonding means, coupled to said image processing means, for placing a bond between said device and said supporting member,

a means for activating said image processing means, coupled to said bonding means and said image processing means, for generating digital image signals corresponding to a an optically sensed post-bond view of said device located in said supporting member,

a registration means, coupled to said activating means, for subtracting said post-bond view from said pre-bond view to identify a bond, and

an inspection means, coupled to said registration means, for verifying said bond.

5,532,740

IMAGE-DATA RECORDING DEVICE AND IMAGE-REPRODUCTION DEVICE FOR AN ELECTRONIC STILL CAMERA

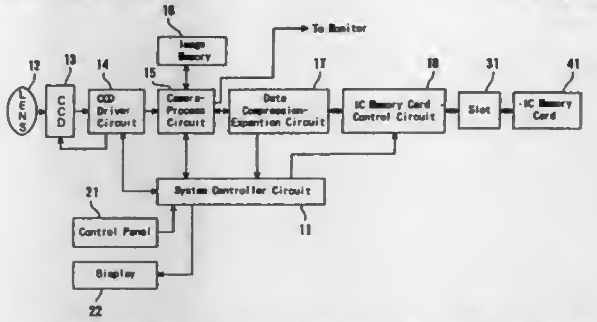
Yoshio Wakui, Itabashi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,116

Claims priority, application Japan, Mar. 10, 1994, 6-066598

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 348—231 **18 Claims**



1. A recording device, used in an electronic still camera, for recording image data derived from objects to be photographed in an over-writable memory means at regular predetermined time intervals, comprising:

release switch means for performing photographing operations;

means for setting a series of recording areas in said over-writable memory means, a plurality of said image data being recordable in said recording areas;

means for initiating a recording of said image data in said recording areas of said over-writable memory means by switching said release switch means ON, in such a manner that said image data are successively stored in said recording areas of said memory means; and

means for repeating the recording of said image data in said memory means in an endless manner until said release switch means is switched OFF.

5,532,741

VIDEO IMAGE DISPLAY AND VIDEO CAMERA FOR PRODUCING A MIRROR IMAGE

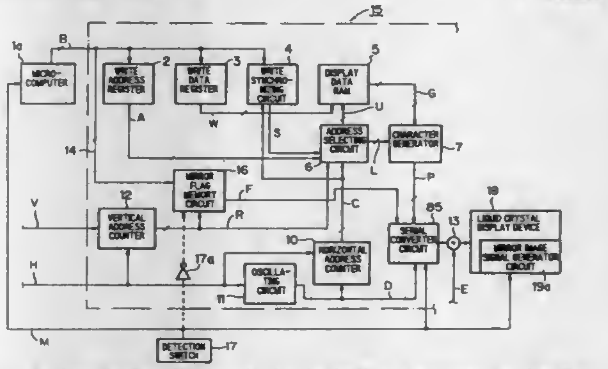
Kunihiro Tsutsumi, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed May 17, 1994, Ser. No. 243,859

Claims priority, application Japan, May 19, 1993, 5-140106

Int. Cl.^{6} H04N *5/262;5/225*

U.S. Cl. 348—239 **4 Claims**



1. A video image display device including a memory, a character generator and a write circuit adapted to output a character pattern while superimposing it on a displayed video image, comprising: a serial pattern generator circuit for outputting a serial bit pattern with normal bit sequence corresponding to one line received in parallel from said character generator and, in response to a control signal, generating serial bit pattern with inverted bit sequence; a combining circuit for combining an output of said serial pattern generator circuit with a video signal of said display device; and a

mirror image signal generator circuit responsive to an output signal of said combining circuit and said control signal to generate a mirror image signal such that said serial bit pattern has a normal bit sequence;

wherein said serial pattern generator circuit comprises a mirror pattern generator circuit for generating, from said parallel bit pattern received from said character generator, a bit pattern having bit sequence reversed to bit significances of said parallel bit pattern; and a parallel/serial conversion circuit responsive to said parallel bit pattern from said character generator as a first bit pattern and said bit sequence reversed bit pattern from said mirror pattern generator circuit as a second bit pattern to output said second bit pattern after conversion thereof into a second serial bit pattern when said control signal is received and output said first bit pattern after conversion thereof into a first serial bit pattern when said control signal is not received;

wherein said mirror pattern generator circuit comprises a set of wirings for reversing the significances of bits of said parallel bit pattern from said character generator and said parallel/serial conversion circuit includes a selector for receiving said first and second bit patterns in significance correspondence relation, respectively, and selecting either of said first or second bit pattern, to convert said selected parallel bit pattern into either said first or second serial bit pattern;

the video image display device further comprising a video camera, a liquid crystal display device for monitoring said video image obtained by said video camera, and a detector for detecting whether or not a shooting direction of said video camera coincides with a direction of a display screen of said liquid crystal display device; wherein said control signal is generated from said detector when a coincidence is detected thereby; and

a microprocessor and a mirror flag memory circuit; wherein said liquid crystal display device includes said mirror image signal generator circuit, said mirror image signal generator circuit generates said mirror image signal by inverting a scan direction of a signal corresponding to one horizontal line according to said control signal, said write circuit includes an address register for holding address data received from said microprocessor and outputting it to said memory and a data register for holding a character code received from said microprocessor and outputting it to said memory, said control signal output from said detector when the coincidence is detected is input to said microprocessor and said microprocessor sets a flag in said mirror flag memory circuit when a predetermined switch is not operated, and a selecting control signal for said selector is generated upon a logical product condition between said set flag and said control signal from said detector.

5,532,742

IMAGE PICKUP APPARATUS WITH HORIZONTAL LINE INTERPOLATION FUNCTION HAVING THREE IMAGE PICKUP UNITS SHIFTED IN VERTICAL PHASE FROM ONE ANOTHER

Hiroya Kusaka, Kawanishi; Takashi Sakaguchi, Yamatotakada, and Masaaki Nakayama, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP93/01002, § 371 Date Mar. 22, 1994, § 102(e) Date Mar. 22, 1994, PCT Pub. No. WO94/03015, PCT Pub. Date Feb. 3, 1994

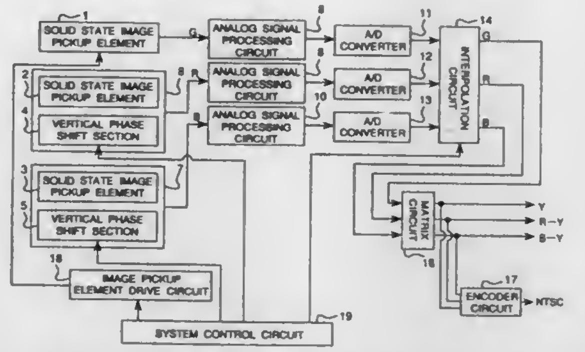
PCT Filed Jul. 19, 1993, Ser. No. 211,151

Claims priority, application Japan, Jul. 22, 1992, 4-195095; Jul. 22, 1992, 4-195096; Jul. 22, 1992, 4-195097; Jul. 22, 1992, 4-195099; Feb. 2, 1993, 5-015171

Int. Cl.^{6} H04N *9/09*

U.S. Cl. 348—264 **20 Claims**

1. An image pickup apparatus with a horizontal interpolation function comprising:


1
SOLID STATE IMAGE PICKUP ELEMENT
G
ANALOG SIGNAL PROCESSING CIRCUIT
8
A/D CONVERTER
11
14
G
2
SOLID STATE IMAGE PICKUP ELEMENT
8
R
ANALOG SIGNAL PROCESSING CIRCUIT
8
A/D CONVERTER
12
INTERPOLATION CIRCUIT
R
4
VERTICAL PHASE SHIFT SECTION
B
ANALOG SIGNAL PROCESSING CIRCUIT
10
A/D CONVERTER
13
B
3
SOLID STATE IMAGE PICKUP ELEMENT
5
VERTICAL PHASE SHIFT SECTION
MATRIX CIRCUIT
Y
R−Y
B−Y
16
18
IMAGE PICKUP ELEMENT DRIVE CIRCUIT
17
ENCODER CIRCUIT
NTSC
SYSTEM CONTROL CIRCUIT
19

a plurality of solid state image pickup elements for obtaining three chrominance signals C1, C2, and C3 which are different from each other;

a first vertical phase shift section for shifting a vertical phase of the chrominance signal C2 with respect to the chrominance signal C1 by a specified pitch p1;

a second vertical phase shift section for shifting a vertical phase of the chrominance signal C3 by a specified pitch p2;

coefficient generator means for generating:

(1) a first interpolation coefficient w for interpolating the chrominance signal C1 where $0 \leqq w < 1$;

(2) a second coefficient for interpolating the chrominance signal C2 from the first interpolation coefficient w and the specified pitch p1;

(3) a third coefficient for interpolating the chrominance signal C3 from the interpolation coefficient w and the specified pitch p2;

an interpolation circuit for producing an interpolation horizontal line signal by interpolating the chrominance signal C1 using the first interpolation coefficient w, the chrominance signal C2 using the second coefficient and, the chrominance signal C3 using the third coefficient.

5,532,743

SOLID-STATE IMAGE PICKUP DEVICE

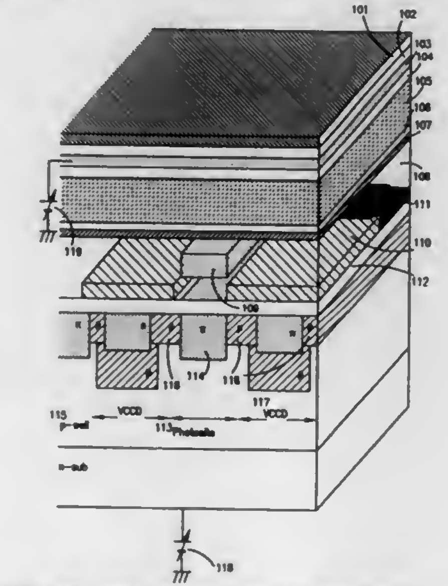
Hiroyoshi Komobuchi, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 871,707, Apr. 21, 1992, abandoned. This application Nov. 17, 1994, Ser. No. 344,681

Claims priority, application Japan, May 1, 1991, 3-100039

Int. Cl.^{6} H04N *5/232*

U.S. Cl. 348—297 **29 Claims**



1. A solid-state image pickup device comprising:

a photosite disposed on a substrate, for converting incident light to electrons and for storing a photo-electrically converted signal charge produced by said electrons, and

an incident light control layer disposed over a light incident side of said photosite, for modulating light transmitted through said incident light control layer in response to variation in quantity of a stored signal charge produced by

variation in quantity of incident light received by said photosite, and

a first transparent electrode located on a light incident Side of said incident light control layer and electrically connected to said photosite through said incident light control layer.

5,532,744

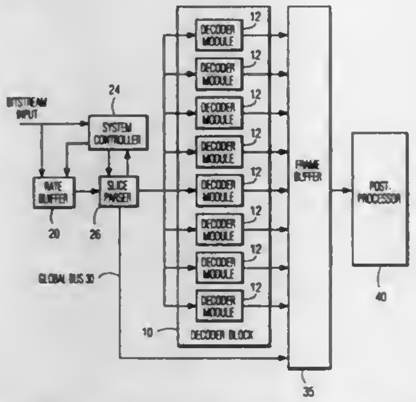
METHOD AND APPARATUS FOR DECODING DIGITAL VIDEO USING PARALLEL PROCESSING

Olu Akiwumi-Assani, Beacon; Carlo Basile, Ossining; Alan Cavallerano, Ossining; Kiran Challapali, Ossining, all of N.Y.; Richard Shen, Leonia, N.J., and Karl Wittig, New York, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Aug. 22, 1994, Ser. No. 294,124

Int. Cl.^{6} H04N *7/26*

U.S. Cl. 348—390 **3 Claims**



1. A video decoder for decoding a coded bitstream representing a video signal coded to comprise a slice layer indicating slice information, wherein the real time decoding of a frame of the video signal requires a first quantity of real time processing capability, said video decoder comprising:

a system controller for deriving from the frame of the video signal received by said system controller a bit average and an initial number of slices;

a plurality of decoder modules, each decoder module of said plurality of decoder modules providing a respective quantity of real time processing capability, each respective quantity being individually less than the first quantity, but when added totaling at least the first quantity; and

a slice parser for directing the coded bitstream on a per slice basis to a first decoder module of said plurality of decoder modules as long as the number of slices directed to said first decoder module is less than or equal to the initial number of slices and the number of bits directed to said first decoder module is less than or equal to the bit average, and for subsequently directing the coded bitstream on a per slice basis to a second decoder module of said plurality of decoder modules.

5,532,745

MOTION PICTURE ADAPTIVE PREDICTION ENCODER WITH A QUANTIZATION PARAMETER DECIDED IN ACCORDANCE WITH BLOCK CLASSIFICATION

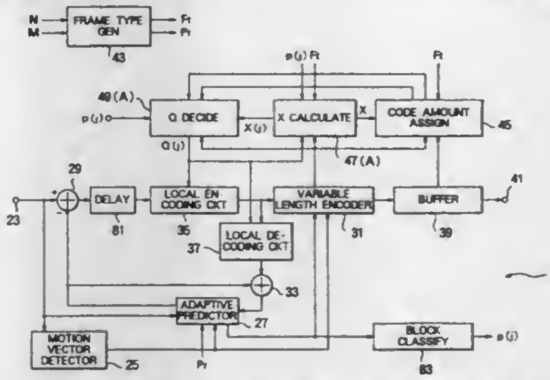
Yuzo Senda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 13, 1993, Ser. No. 120,079

Claims priority, application Japan, Sep. 11, 1992, 4-242448

Int. Cl.^{6} H04N *7/36*

U.S. Cl. 348—405 **3 Claims**



1. A motion picture encoding device for encoding a motion picture signal composed of successive frames, each of said successive frames composed of a predetermined number of unclassified blocks, and in which selected schemes are selected from a plurality of encoding schemes, said motion picture encoding device comprising:

classifying means for classifying the unclassified blocks of each of said successive frames into classified blocks based on a prediction type restriction information for restricting said selected schemes;

calculating means for calculating a code amount characteristic value by using a product of a multiplication factor and an amount of codes actually produced from each of said classified blocks as an actually produced code amount;

assigning means for producing assigned code amounts for each of said classified blocks based on respective code amount characteristic values calculated in connection with each of said classified blocks;

deciding means for deciding a quantization parameter for use as said multiplication factor based on said actually produced code amount and one of said assigned code amounts that is produced by using said actually produced code amount; and

encoding means for encoding the classified blocks of said successive frames in accordance with said selected schemes and said quantization parameter.

5,532,746

BIT ALLOCATION METHOD FOR CONTROLLING TRANSMISSION RATE OF VIDEO ENCODER

Sung H. Chang, Seoul, Rep. of Korea, assignor to Korea Telecommunication Authority, Seoul, Rep. of Korea

Filed Nov. 9, 1994, Ser. No. 336,807

Claims priority, application Rep. of Korea, Nov. 9, 1993, 93-23851

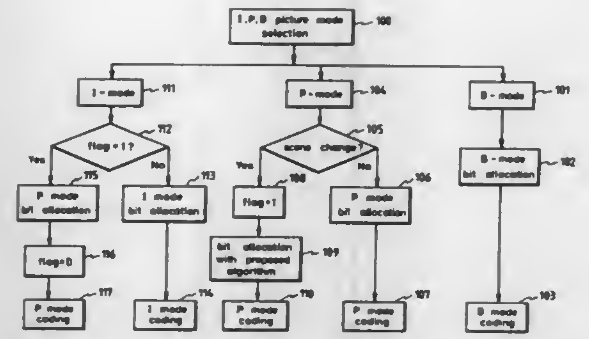
Int. Cl.^{6} H04N *7/32*

U.S. Cl. 348—415 **2 Claims**

1. A bit allocation method for controlling a transmission rate of a video encoder having an intra mode, a predicted mode and a bidirectionally predicted mode, comprising the steps of:

selecting one of the intra mode, the predicted mode and the bidirectionally predicted mode;

checking whether a scene change is present, if the predicted mode is selected, allocating a bit amount corresponding to the predicted mode to the video data if it is checked that the scene change is not present, coding the video data in the predicted mode, outputting a scene change indicating signal if it is checked that the scene change is present, allocating a bit



amount approximate to that corresponding to the intra mode to the video data and coding the video data in the predicted mode;

checking whether a scene change indicating signal is outputted, if the intra mode is selected, allocating a bit amount corresponding to the intra mode to video data if it is checked that the scene change indicating signal is not outputted, coding the video data in the intra mode, allocating a bit amount corresponding to the predicted mode to the video data if it is checked that the scene change indicating signal is outputted, initializing the scene change indicating signal and coding the video data in the predicted mode; and

allocating a bit amount corresponding to the bidirectionally predicted mode 1o the video data if the bidirectionally predicted mode is selected and coding the video data in the bidirectionally predicted mode.

5,532,747

METHOD FOR EFFECTUATING HALF-PIXEL MOTION COMPENSATION IN DECODING AN IMAGE SIGNAL

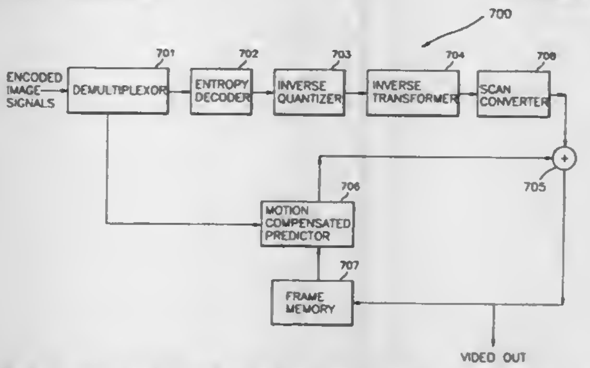
Sang-Ho Yoon, and Oh-Sang Kwon, both of Seoul, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 19, 1994, Ser. No. 308,237

Claims priority, application Rep. of Korea, Sep. 17, 1993, 93-18874

Int. Cl.^{6} H04N *7/50*

U.S. Cl. 348—416 **2 Claims**



1. A method for decoding an encoded image signal supplied in the form of a series of encoded image frames, each of the encoded image frames being divided into a multiplicity of macroblocks of pixels, each of the macroblocks having an associated half-pixel resolution motion vector which represents a translatory motion of the macroblock between a present and its preceding frames of the encoded image signal to a half-pixel accuracy, said method comprising the steps of:

providing differential pixels of a differential macroblock in a first predetermined scanning order by performing entropy decoding, inverse quantization and inverse transformation on the pixels in each macroblock of the present frame;

scanning the differential pixels so as to provide scan converted differential pixels of a scan converted differential macroblock in a second predetermined scanning order;

providing half-pixel resolution pixels of a half-pixel resolution macroblock in the second predetermined scanning order by accessing, under a control of the half-pixel resolution motion vector, the pixels in the previous frame in an order corresponding to the second predetermined scanning order and, depending on the half-pixel resolution motion vector, performing a spatial interpolation on the pixels in the previous frame; and

adding, on a pixel-by-pixel basis, the scan converted differential macroblock to the half-pixel resolution macroblock, to thereby form a reconstructed macroblock of the present frame.

5,532,748

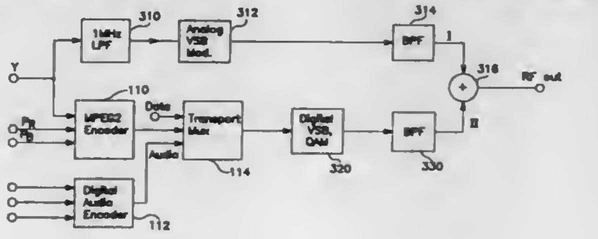
HYBRID ANALOG/DIGITAL TELEVISION TRANSMISSION SYSTEM

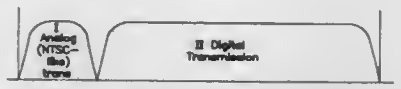
Saiprasad V. Naimpally, Langhorne, Pa., assignor to Matsushita Electric Corporation of America, Secaucus, N.J.

Filed Mar. 31, 1995, Ser. No. 414,334

Int. Cl.^{6} H04N *7/015;7/06;7/08*

U.S. Cl. 348—432 **20 Claims**





1. An encoding/transmission system for providing a video signal to occupy a delay time defined from when a user selects a new channel to when a digital video signal is decoded, acquired and displayed comprising:

means for receiving a signal representative of a video signal and for Converting said signal representative of a video signal into a digital video signal occupying a first predetermined band of frequencies;

means for receiving the signal representative of the video signal and for providing an analog video signal therefrom, said analog video signal occupying a second predetermined band of frequencies exclusive of the first band of frequencies; and

means for combining the analog video signal with the digital video signal, wherein the analog and digital video are spectrally separate, to produce a hybrid video signal suitable for transmission within a conventional single channel frequency spectrum allocation.

5,532,749

SAMPLE RATE CONVERSION DEVICE FOR PROCESSING NON-STANDARD TELEVISION SIGNAL

Sung H. Hong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 5, 1994, Ser. No. 318,159

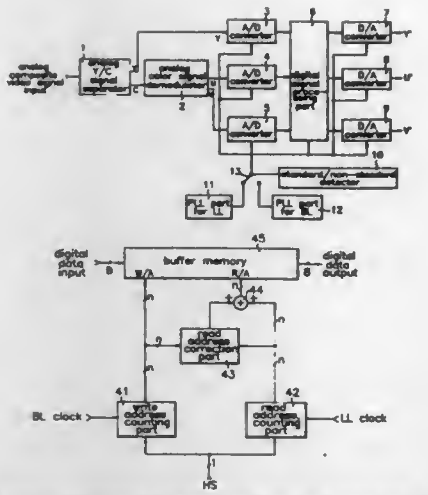
Claims priority, application Rep. of Korea, Oct. 5, 1993, 20465/1993

Int. Cl.^{6} H04N *7/01*

U.S. Cl. 348—449 **10 Claims**

1. A sample rate conversion device for processing a non-standard television signal comprising:

a write address counting means reset to a horizontal synchronization signal for counting a BL (Burst Locked) clock for n bits repeatedly to generate a write address signal;



a read address counting means reset to a horizontal synchronization signal for counting a LL (Line Locked) clock for n bits repeatedly to generate a read address signal;

a read address correction signal generation means for comparing the write address signal received from the write address counting means and the read address signal received from the read address counting means and generating a correction signal according to a difference of the comparison;

an adder for adding the correction signal from the read address correction signal generation means to the signal received from the read address counting means to generate a corrected read address signal; and

a buffer memory for storing digital data applied thereto in response to the write address signal received from the write address counting means, and reading in and transmitting the stored digital data in response to the corrected read address signal received from the adder.

5,532,750

INTERLACED-TO-SEQUENTIAL SCAN CONVERSION

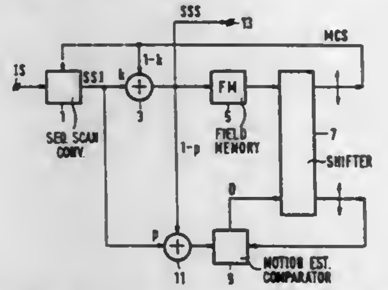
Gerard De Haan; Paul W. A. C. Biezen, and Olukayode A. Ojo, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1995, Ser. No. 417,718

Claims priority, application European Pat. Off., Apr. 5, 1994, 94200920

Int. Cl.^{6} H04N *7/01*

U.S. Cl. 348—452 **8 Claims**



1. A method of converting an interlaced video signal into an output sequentially scanned video signal, comprising the steps of:

furnishing a first sequentially scanned video signal (SS1) in dependence upon said interlaced video signal (IS);

furnishing a motion-compensated sequentially scanned signal (MCS) in dependence upon said first sequentially scanned video signal (SS1); and

generating all video lines of said output sequentially scanned video signal (SSS) in dependence upon both said first sequentially scanned video signal (SS1) and said motion-compensated sequentially scanned signal (MCS).

5,532,751

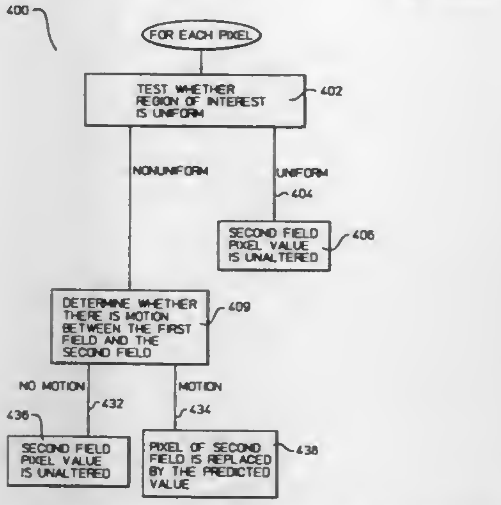
EDGE-BASED INTERLACED TO PROGRESSIVE VIDEO CONVERSION SYSTEM

Sam Lui, 2680 Fayette Dr., Apt. 617, Mountain View, Calif. 94040

Filed Jul. 31, 1995, Ser. No. 509,075

Int. Cl.^{6} H04N *7/01*

U.S. Cl. 348—452 **20 Claims**


400
FOR EACH PIXEL
TEST WHETHER REGION OF INTEREST IS UNIFORM
402
NONUNIFORM
UNIFORM
404
SECOND FIELD PIXEL VALUE IS UNALTERED
406
DETERMINE WHETHER THERE IS MOTION BETWEEN THE FIRST FIELD AND THE SECOND FIELD
409
NO MOTION
MOTION
432
434
436
SECOND FIELD PIXEL VALUE IS UNALTERED
PIXEL OF SECOND FIELD IS REPLACED BY THE PREDICTED VALUE
438

1. A method of testing for a pixel of interest in a second field whether motion has occurred between a first field and the second field of an image represented by a plurality of pixels, the method including the steps of:

finding the edge orientation of a pixel of interest in the second field from a pixel cross pair in the first field;

based on the edge orientation of the pixel cross pair in first field, predicting the value of the pixel of interest in the second field; and

comparing the predicted value of the pixel of interest in the second field to our actual value of the pixel of interest in the second field.

5,532,752

CHARACTER IMAGE ENCODING/DECODING SYSTEM

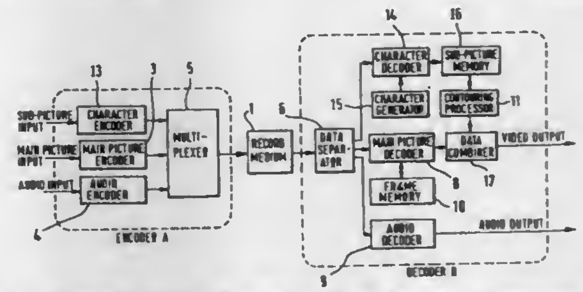
Yuichi Miyano, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 26, 1994, Ser. No. 233,879

Claims priority, application Japan, Apr. 28, 1993, 5-102042

Int. Cl.^{6} H04N *5/445;7/08*

U.S. Cl. 348—468 **2 Claims**



1. A character image encoding/decoding apparatus comprising:

an encoding portion comprising:

means for encoding character data to a sub-picture with a bit-mapped shape of monochromic character data, separately from an encoding of a main picture; and

a decoding portion producing decoded character data and decoded image data comprising:

means for detecting bit changing positions in a two-dimensional manner from the bit-mapped shape of monochromic character data, and processing means for extracting a contour from the character data and developing the character data, the contour and a background of the character data in three domains, respectively, such that the decoded character data and the decoded image data do not require synchronization to be displayed.

5,532,753

REMOTE-CONTROLLED ON-SCREEN AUDIO/VIDEO RECEIVER CONTROL APPARATUS

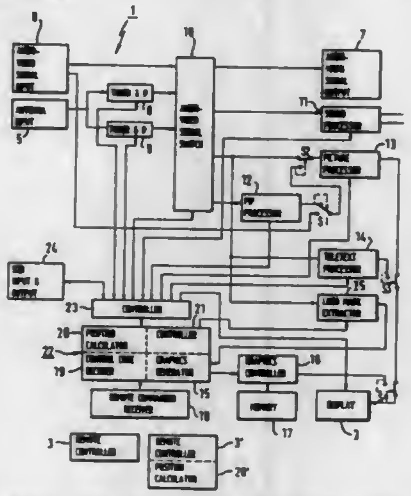
Peter Buchner, Leonberg, and Gerd Spalink, Stuttgart, both of, Germany, assignors to Sony Deutschland GmbH, Köln, Germany

Filed Mar. 18, 1994, Ser. No. 214,569

Claims priority, application European Pat. Off., Mar. 22, 1993, 93104696

Int. Cl.⁶ H04N *5/50*

U.S. Cl. 348—569 **16 Claims**



1. Audio and/or video reproducing apparatus comprising:

input means supplied with a first plurality of audio and/or video input signals, said input means includes a first input circuit for receiving broadcast signals from broadcasting stations and a second input circuit for receiving a second plurality of audio and/or video input signals from an external device;

processing means connected to said input means for processing the first plurality of audio and/or video input signals in accordance with multiple processing functions, said processing means includes selecting means for selecting audio and/or video input signals from said first plurality for reproduction;

reproducing means connected to said processing means for reproducing a sound and/or a video picture corresponding to the selected audio and/or video input signals;

pointing means for transmitting a control signal;

control means connected to said processing means and coupled to receive the control signal from said pointing means for decoding the control signal, generating a control picture signal in response to the decoded control signal and controlling said processing means;

display means connected to said control means for displaying a control picture corresponding to the control picture signal, the control picture including a plurality of control areas and a pointer movable within the control picture in response to operation of said pointing means, and for displaying identifications of said broadcasting stations and said external device in one or more of the control areas;

wherein said control means selectively modifies the control picture or one of the control areas or controls the processing means in accordance with one of the control areas pointed by the pointer; and

wherein said selecting means selects for reproduction one of the audio and/or video input signals from said first plurality corresponding to a control area which displays one of the identifications pointed by the pointer.

5,532,754

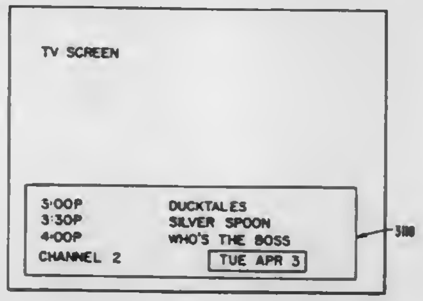
BACKGROUND TELEVISION SCHEDULE SYSTEM

Patrick Young, San Mateo; John H. Roop, Palo Alto, and Michael W. Faber, Pleasanton, all of Calif., assignors to Starsight Telecast Inc., Fremont, Calif.

Continuation of Ser. No. 33,773, Mar. 19, 1993, Pat. No. 5,353,121, which is a continuation-in-part of Ser. No. 579,555, Sep. 10, 1990, abandoned, and a continuation-in-part of Ser. No. 916,043, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 778,404, Oct. 17, 1991, Pat. No. 5,151,789, which is a continuation-in-part of Ser. No. 428,620, Oct. 30, 1989, abandoned. This application Apr. 11, 1994, Ser. No. 226,209

Int. Cl.⁶ H04N *5/44*

U.S. Cl. 348—569 **7 Claims**



1. A background television schedule system for displaying television schedule information on a television including a television screen on which is displayed a primary display, the background television schedule system comprising:

set-up display controller, coupled to said television, for assisting a user in selecting a television program listing arrangement, and for displaying on said television user selections of said television program listing arrangement;

a memory, coupled to said television, for storing said user selections;

activation controller, coupled to said memory, for activating and suspending operation of said background television schedule system; and

background display controller, coupled to said television and to said memory, for displaying background schedule information over a portion of said television screen in response to an activation of operation of said background television schedule system, said primary television display being displayed on said television screen in conjunction with said background schedule information, said displayed background schedule information being determined according to said user selections.

5,532,755

APPARATUS FOR SUPPRESSING GHOSTS IN SIGNALS MODULATING A CARRIER IN QUADRATURE PHASING WITH A VIDEO CARRIER

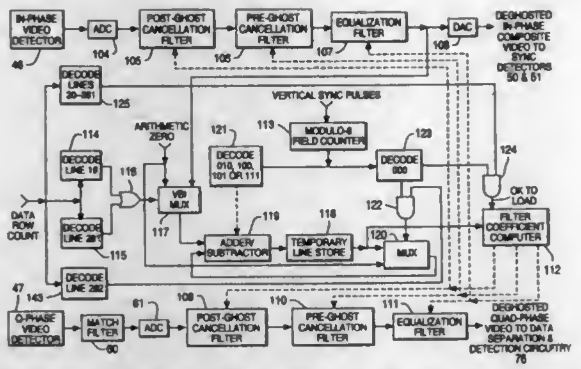
Chandrakant B. Patel, Hopewell, N.J., and Jian Yang, Bensalem, Pa., assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jan. 5, 1994, Ser. No. 179,616

Int. Cl.⁶ H04N *5/21*

U.S. Cl. 348—614 **15 Claims**

1. A receiver for an auxiliary signal transmitted in a combined signal together with a composite video signal having consecutive fields of horizontal scanning lines, a prescribed one of said horizontal scanning lines in each of said fields containing a prescribed one of an eight-field cycle of ghost cancellation reference signals, said composite video signal modulating the amplitude of a video carrier and said auxiliary signal modulating the amplitude of a quadrature carrier in quadrature phasing with said video carrier in said combined signal, which said combined signal is vestigial-sideband filtered prior to its transmission, said receiver comprising:



an in-phase synchronous video detector, responsive to said combined signal as received over at least one transmission path, for detecting modulation of the amplitude of said video carrier to regenerate said composite video signal, accompanied by upper-frequency remnants of said auxiliary signal owing to said vestigial-sideband filtering, as an in-phase detected signal that at times includes undesirable ghosts owing to multipaths;

first deghosting circuitry for providing a response to said in-phase detected signal in which ghosts are to be suppressed, said first deghosting circuitry including respective ghost-suppression filtering having adjustable filtering parameters;

circuitry for accumulating the response of said first deghosting circuitry as occurs only during said prescribed ones of said horizontal scanning lines, each of successive accumulations being done over at least one eight-field cycle of said ghost cancellation reference signals for generating a received ghost cancellation reference signal, said received ghost cancellation reference signal subject to including undesirable ghosts owing to multipaths;

a computer for computing, based upon comparison of said received ghost cancellation reference signal with a ghost-free ghost cancellation reference signal available a priori within said computer, the values of said adjustable filtering parameters required for substantial matching of said received ghost cancellation reference signal with said ghost-free ghost cancellation reference signal;

a quadrature-phase synchronous video detector, responsive to the same received combined signal as said in-phase synchronous video detector, for detecting modulation of the amplitude of said quadrature carrier to regenerate said auxiliary signal, accompanied by upper-frequency remnants of said composite video signal owing to said vestigial-sideband filtering, as a quadrature-phase detected signal that at times includes undesirable ghosts owing to multipaths; and

second deghosting circuitry for providing a response to said quadrature-phase detected signal in which ghosts are to be suppressed, said second deghosting circuitry including respective ghost-suppression filtering having adjustable filtering parameters that are adjusted similarly to said adjustable filtering parameters in the respective ghost-suppression filtering included in said first deghosting circuitry.

5,532,756

COLOR VIDEO SIGNAL DETECTOR AND COLOR VIDEO SIGNAL DETECTING METHOD

Katuhiko Nishikawa; Hiroya Ikeda; Hidenori Hirai, and Yoshio Ogawa, all of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1995, Ser. No. 381,712

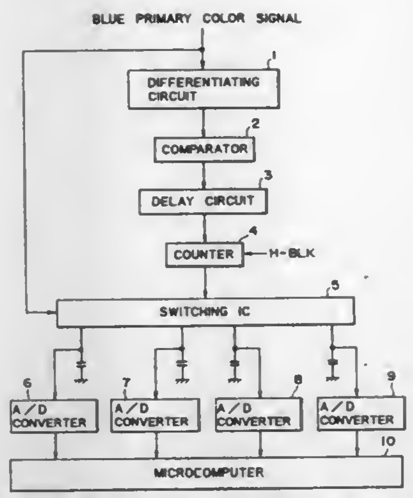
Claims priority, application Japan, Feb. 1, 1994, 6-010305; Jul. 21, 1994, 6-169153

Int. Cl.⁶ H04N *9/68;5/208*

U.S. Cl. 348—630 **5 Claims**

1. A color video signal detector for detecting color level and color phase of a color video signal, comprising:

edge detection means for detecting edges in the color video signal;



extraction means for holding values of the color video signal at times after a given time interval from the edges, counting an order of the edges and extracting a value of the color video signal at every count; and

measurement means for measuring the values of the color video signal extracted by the extraction means.

5,532,757

APC AND ACC PROCESSING USING COMMON CIRCUITRY

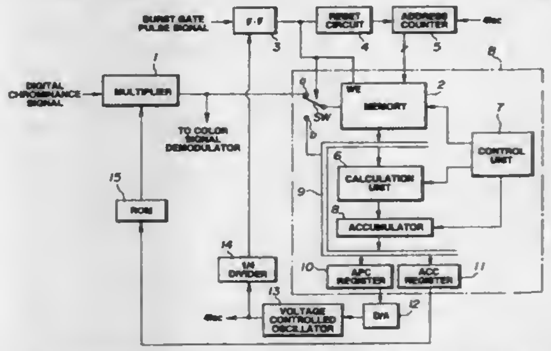
Shinichirou Miyazaki, Kanagawa, and Kazuo Watanabe, Chiba, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 267,677

Claims priority, application Japan, Jul. 1, 1993, 5-163432

Int. Cl.⁶ H04N *9/455;9/68*

U.S. Cl. 348—646 **13 Claims**



1. A chrominance signal processing apparatus including common circuitry for providing APC and ACC processing of a digitized chrominance signal containing a burst synchronization signal, comprising:

a source of reference clock signals;

address generating means for generating a sequence of addresses in response to said reference clock signals;

memory means for storing successive samples of said burst synchronization signal at respective ones of said sequence of addresses;

common calculating means for calculating differences between predetermined non-adjacent ones of said stored samples corresponding to zero crossings of the burst synchronization signal to derive phase error data indicative of a phase difference between said reference clock signals and said burst synchronization signal and for calculating differences between adjacent ones of said stored samples to derive burst level data;

adjustable phase oscillator means included in said source of reference clock signals for generating said reference clock signals in response to said phase error data such that said phase error data is minimized and said reference clock signals coincide with said burst synchronization signal;

a ROM for storing coefficient data in a table;

means for accessing said table with said burst level data to read out from said ROM coefficient data corresponding to said burst level data; and

multiplying means supplied with said read out coefficient data for multiplying said digitized chrominance signal, including said burst synchronization signal, by said coefficient data to form a constant level chrominance signal and for supplying the multiplied signal to be stored in said memory means.

5,532,758
FEEDBACK CLAMP CIRCUIT FOR ANALOG-TO-DIGITAL CONVERSION

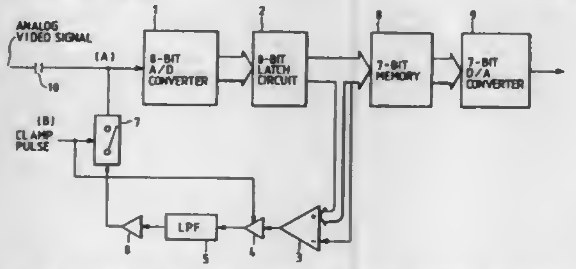
Yoshihiro Honma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 764,771, Sep. 24, 1991, abandoned. This application Dec. 14, 1993, Ser. No. 165,865

Claims priority, application Japan, Sep. 25, 1990, 2-254640

Int. Cl.^{6} H04N *5/18*

U.S. Cl. 348—694 **15 Claims**



1. An apparatus for processing an image signal including a synchronizing signal comprising:

means for inputting plural kinds of input image signals;

means for removing the synchronizing signal from the input image signal;

means for clamping the input image signal with the synchronizing signal removed;

an A/D converter for converting said input image signal with the synchronizing signal removed into an m bit digital signal;

means for controlling said clamping means in accordance with an m bit digital image signal portion of the m bit digital signal converted by said A/D converter and for controlling a pulse width of a clamp pulse according to the kind of input image signal;

means for extracting an upper n-bit digital image signal (n<m) of said m bit digital signal; and

processing means for processing said n bit digital image signal extracted by said extracting means.

5,532,759

Patent Not Issued For This Number

5,532,760
RECEIVER CAPABLE OF SELECTIVELY RECEIVING SATELLITE BROADCAST TV SIGNALS AND AUDIO SCPC SIGNALS

Atsushi Inoue, Tokyo, Japan, assignor to Uniden Corporation, Chiba, Japan

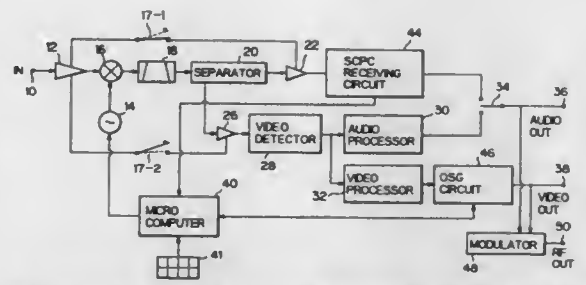
Filed Apr. 8, 1994, Ser. No. 224,717

Claims priority, application Japan, Sep. 29, 1993, 5-242466

Int. Cl.^{6} H04N *5/46;* **H04H** *1/00*

U.S. Cl. 348—729 **12 Claims**

1. A receiver capable of selectively receiving satellite broadcast television signals of audio SCPC signals, comprising:



RF reception means for receiving television signals and audio SCPC signals broadcast from a satellite;

frequency conversion means for converting an RF output from said RF reception means into an IF signal;

separation means for separating the output of said frequency conversion means into a television signal and an audio SCPC signal, and for producing a first output including the television signal and a second output including the audio SCPC signal;

a TV signal processing unit for receiving and processing the first output from said separation means;

an SCPC signal processing unit for receiving and processing the second output from said separation means; and

selection means for selecting any one of the outputs from said TV signal processing unit and said SCPC signal processing unit, thereby enabling selective reception of TV signals and audio SCPC signals broadcast from a satellite.

5,532,761
METHOD FOR AUTOMATIC RESERVATION TUNING FOR BROADCASTING RECEIVERS AND DEVICE THEREFOR

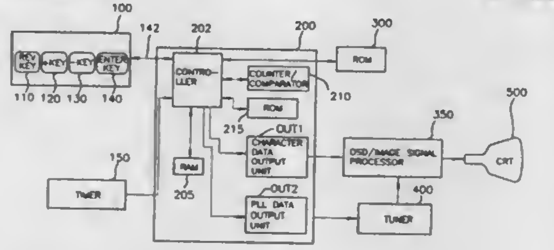
Changho Lee, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Japan

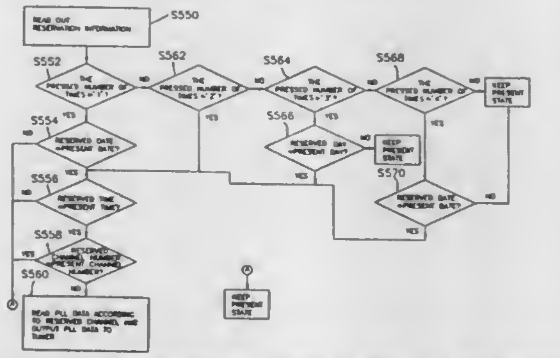
Filed Dec. 27, 1994, Ser. No. 363,909

Claims priority, application Rep. of Korea, Dec. 28, 1993, 93-30445

Int. Cl.^{6} H04N *5/50*

U.S. Cl. 348—731 **6 Claims**




READ OUT RESERVATION INFORMATION
S550
S552
S562
S564
S568
NO
YES
KEEP PRESENT STATE
S554
S566
S556
S570
S558
S560
READ PLL DATA ACCORDING TO RESERVED CHANNEL AND OUTPUT PLL DATA TO TUNER
A
KEEP PRESENT STATE

1. A method for automatically tuning a tuner of a broadcasting receiver by PLL data in accordance with reservation information while displaying on a CRT screen present and reservation information inputting to the receiver wherein said reservation information includes a date, time, a day, and a channel number reserved through a reservation input means and said present information includes a present date, time, and a channel number outputting from a timer, comprising the steps of:

scanning a keypad for checking whether a reservation key of said reservation input means is pressed for inputting said reservation information;

counting a pressed number of times whenever said reservation key is pressed to a memory unit;

checking whether an enter key of said reservation input means is pressed;

storing the pressed number of times of said reservation key and said reservation information to said memory unit when said enter key is pressed;

rescanning said reservation input means after setting the value of pressed number of times to a first value when the pressed number of times is smaller than a second value or larger than a fifth value or when said enter key is twice pressed;

inputting said present information from said timer to said memory unit;

displaying on said CRT screen characters about said watching mode and characters about said reservation input items in accordance with said watching mode;

comparing said reservation information and said present information in accordance with said watching mode; and

outputting phase locked loop (PLL) data corresponding to said reserved channel number for tuning said tuner when said reserved channel number and a present channel number are different.

4. An automatic reservation tuning device for a broadcasting receiver for automatically tuning a tuner of a broadcasting receiver by PLL data in accordance with reservation information while displaying on a CRT screen present and reservation information inputting to the receiver wherein said reservation information includes a date, time, a day, and a channel number, and said present information includes a present date, time, and a channel number outputting from a timer, comprising:

an input unit for inputting to a memory unit information on a plurality of watching modes and said reservation information on a desired program in accordance with a watching mode, wherein said watching mode is a mode for watching a desired program to be broadcasted today, everyday, every week or on a given date and said reservation information includes a date, time, a day of the week;

a character data storing unit for storing character data to be displayed on the CRT screen in accordance with said reservation information on said watching mode when said watching mode is inputted through said input unit, wherein said character data include "date", "time", "day", "today", "everyday", "every week", "channel" and "given date";

a character data output unit for reading out said character data indicating input items from said character data storing unit in accordance with said watching mode selected by said input unit and for outputting character data signals based on said character data to an OSD/image signal processor for displaying said character data on the CRT screen; and

PLL data output unit for outputting to said tuner, said PLL data corresponding to a reserved channel number when said present information and reservation information are different.

5,532,762
DIGITAL BROADCAST RECEIVER THAT SWITCHES BETWEEN NICAM AUDIO AND ANALOG AUDIO

Yuji Sakai, and Yasuhisa Nakajima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 16, 1995, Ser. No. 389,659

Claims priority, application Japan, Feb. 28, 1994, 6-055166

Int. Cl.^{6} H04N *5/60*

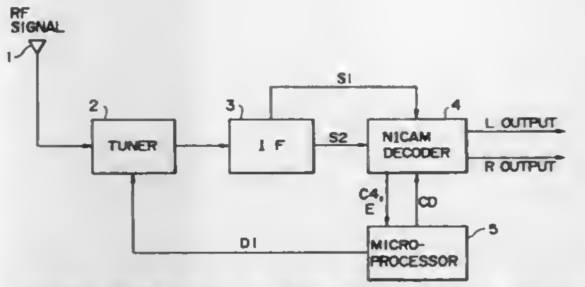
U.S. Cl. 348—738 **5 Claims**

1. A television receiving apparatus comprising:

a tuner for receiving a broadcast signal;

an intermediate frequency amplifier for extracting a frequency-modulated audio signal and a digital audio signal from an output signal of said tuner;

a decoder for receiving said frequency-modulated audio signal and said digital audio signal from said intermediate frequency amplifier and producing an output therefrom and for detecting a control bit in said digital audio signal; and



control means connected to said decoder for changing a point in the broadcast signal at which said decoder selects one of said frequency-modulated audio signal and said digital audio signal as said output according to the contents of said control bit, wherein said control means includes error rate changing means for changing an error rate that provides a reference for determining the point at which said frequency-modulated audio signal and said digital audio signal are selected according to the contents of said control bit.

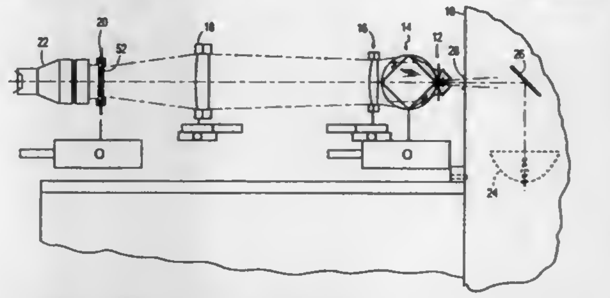
5,532,763
SINGLE PANEL COLOR PROJECTION VIDEO DISPLAY

Peter J. Janssen, Scarborough, N.Y.; Ralph H. Bradley, Kingsport, Tenn.; Joseph P. Bingham, Knoxville, Tenn.; William F. Guerinot, Knoxville, Tenn., and Detlev Otto, Knoxville, Tenn., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 218,882, Mar. 25, 1994, abandoned, which is a continuation of Ser. No. 927,782, Aug. 10, 1992, abandoned, which is a continuation of Ser. No. 634,366, Dec. 27, 1990, abandoned. This application Feb. 10, 1995, Ser. No. 386,606

Int. Cl.^{6} H04N *5/64;5/74*

U.S. Cl. 348—744 **18 Claims**



1. A color display system comprising:

(a) a light valve having an array of rows of addressable pixels for modulating light impinging on the light valve in accordance with display signals applied to the pixels;

(b) means for providing at least two light beams, each beam having a different color, and each beam being wider in the direction of the width of the pixel rows to be addressed and narrower in the direction of the height of the pixel rows to be addressed;

(c) means for repeatedly sweeping the beams sequentially across a surface of the light valve in the height direction in a manner that each of the at least two different color beams illuminates only a portion of the pixel rows to be addressed at any one time, whereby each addressable pixel row of the light valve is repeatedly impinged by the at least two different color beams in sequence; and

(d) means for repeatedly addressing the rows of pixels of the light valve in sequence with display signals corresponding to the color of the beam to impinge on the pixels being addressed, so as to form a color display image.

5,532,764

CONVERGENCE ERROR DETECTING APPARATUS CAPABLE OF BEING APPLIED TO PROJECTION-TYPE DISPLAYS HAVING DIFFERENT SCANNING FREQUENCIES

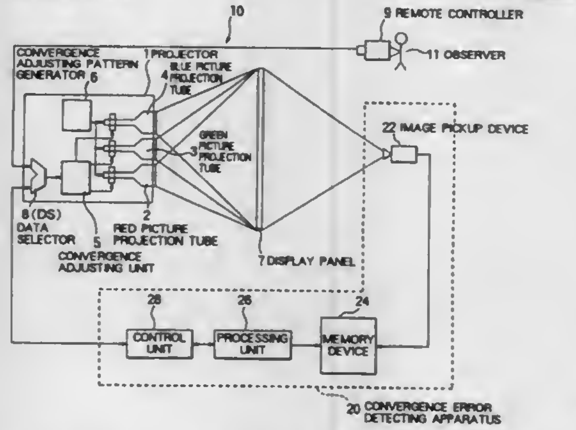
Yohichi Itaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 15, 1994, Ser. No. 213,910

Claims priority, application Japan, Mar. 16, 1993, 5-055298

Int. Cl.^{6} H04N *9/28;3/227*

U.S. Cl. 348—745 **16 Claims**


10
9 REMOTE CONTROLLER
11 OBSERVER
CONVERGENCE ADJUSTING PATTERN GENERATOR 6
1 PROJECTOR
4 BLUE PICTURE PROJECTION TUBE
3 GREEN PICTURE PROJECTION TUBE
22 IMAGE PICKUP DEVICE
8 (DS) DATA SELECTOR
5 CONVERGENCE ADJUSTING UNIT
2 RED PICTURE PROJECTION TUBE
7 DISPLAY PANEL
28
26
24
CONTROL UNIT
PROCESSING UNIT
MEMORY DEVICE
20 CONVERGENCE ERROR DETECTING APPARATUS

1. A convergence error detecting apparatus for use with a projection type display system which displays, onto a display panel, a projected image signal which has a first synchronization signal of a predetermined frequency, said apparatus for detecting a convergence error signal representative of a convergence error appearing on said projected image signal, said apparatus comprising:

image pickup means operated by a second synchronization signal of a frequency different from said predetermined frequency, for picking up said projected image signal to produce a pickup image signal by the use of said second synchronization signal;

processing means for processing said pickup image signal to detect said convergence error and to produce a convergence error signal representative of said convergence error; and

means for providing said convergence error signal to said display system to correct said convergence error in said display system.

5,532,765

IMAGE CORRECTION APPARATUS USING A DISPLAYED TEST SIGNAL

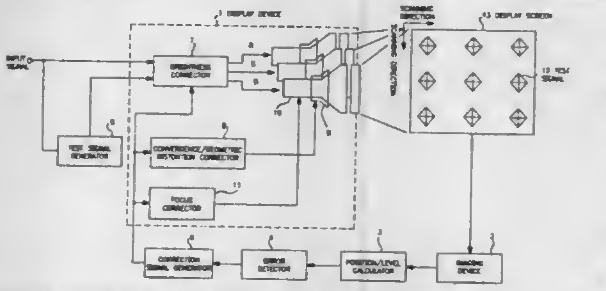
Ikunori Inoue, Takatsuki, and Susumu Tsujihara, Neyagawa, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 17, 1994, Ser. No. 210,306

Claims priority, application Japan, Mar. 17, 1993, 5-056688; Mar. 17, 1993, 5-056690; Mar. 17, 1993, 5-056691; Mar. 19, 1993, 5-059864; May 18, 1993, 5-115717; Jun. 2, 1993, 5-131806

Int. Cl.^{6} H04N *17/00;17/02*

U.S. Cl. 348—807 **9 Claims**



1. An apparatus for correcting images, comprising:

test signal generating means for generating a test signal;

display means for displaying said test signal in a region on a display screen;

imaging means for imaging said test signal displayed on said display screen in a scanning direction so as to produce an image signal having a rising linear portion and a falling portion along said scanning direction, said image signal having a tetrahedron shaped waveform, where said tetrahedron has a base plane which is parallel to said display screen and a height in a level direction of said image signal;

position calculating means for calculating a position of a centroid of said image signal for each of R, G and B colors, based on said rising linear portion and said falling linear portion;

error detecting means for detecting an amount of error between said calculated positions of said centroids for R, G and B colors;

correction signal generating means for generating a correction signal for correcting a convergence and a geometric distortion for said region, based on said amount of said error; and

correcting means for correcting said convergence and said geometric distortion for said region, based on said correction signal.

5,532,766

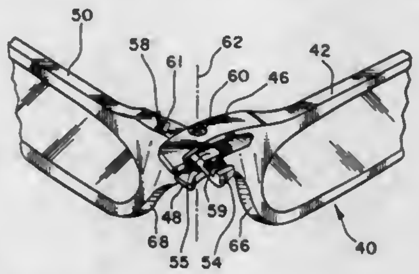
FOLDABLE EYEGLASSES HAVING LOCKING MEANS

David G. Mateer, Niwot, Colo., and D. Michael Pogue, Reston, Va., assignors to Al W. Paulsen, Gillette, Wyo.

Filed Sep. 27, 1995, Ser. No. 534,644

Int. Cl.^{6} G02C *7/10;5/00*

U.S. Cl. 351—63 **20 Claims**



1. Foldable eyeglasses comprising:

a first frame holding a lens, said first frame having a first leaf and a second leaf with a predetermined space therebetween, at least one of said first leaf and said second leaf having locking means;

a second frame holding a lens and having a third leaf, said third leaf having complimentary locking means for engaging said locking means of said first frame; and

hinge means for allowing rotation of said frames about an axis extending through said first, second, and third leaves from a folded position wherein said frames are folded together to an open position wherein said third leaf rotates into said space between said first leaf and said second leaf and said locking means of said first frame engages said locking means of said second frame.

5,532,767

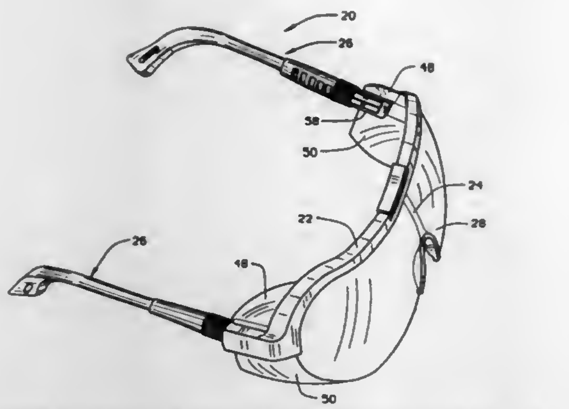
PANTOSCOPIC AND LENGTH ADJUSTABLE SAFETY SPECTACLE

Daniel A. Pleune, Rockford, and William E. Roe, Wayland, both of Mich., assignors to Jackson Products, Inc., Belmont, Mich.

Filed Jul. 19, 1995, Ser. No. 504,371

Int. Cl.^{6} G02C *5/20;5/14*

U.S. Cl. 351—118 **14 Claims**



8. A temple length and lens adjustable safety spectacle comprising:

a) a one-piece lens having a front face with integral upper and lower transverse shields on each side thereof with an inset portion between each said upper and lower shields, and a nose notch on said front face;

b) a one-piece unitary frame defined by an upper rim and left and right side members, said upper rim having a groove disposed along a bottom edge thereof for receipt of an upper edge of said front face, said left and right side members each having a channel therein and adapted to be received in said inset portions wherein an end of said inset portion is maintained in said channel, each said side member further including a bracket defined by an opening having upwardly and outwardly tapering upper and lower walls transverse to said front face, and an upper and lower socket respectively disposed in said upper and lower walls;

c) a detachable nose bridge extending from said nose notch of said lens to said upper rim, said nose bridge releasably retaining said lens to said upper rim; and

d) a left and right temple arm assembly, each temple arm assembly having an earpiece member with a pair of prongs extending from one end, one of said prongs having a tab, each said temple arm assembly further including an earpiece member attachment assembly having an earpiece receptacle including a base end and an open end leading to a channel in communication with a plurality of slots for insertion of said tab of said earpiece member and adjusting the length of said temple arm assembly by rotating and extending or retracting said earpiece member within said earpiece receptacle and positioning said tab in alternate slots, said attachment assembly further having an upper arm plate member extending from said base of said earpiece receptacle having a knob at the top end for insertion into said socket on the upper side of said bracket, said upper arm plate member further including a protruding rail extending along a back surface of said upper arm plate member, and a lower arm plate member having a threaded base extending around the front and sides of said lower arm plate member and further including a channel on the back surface of said lower arm plate member that receives said rail for slidably mounting said rail of said upper arm plate member onto said lower arm plate member, said lower arm plate member further including a knob at the top end for insertion into said socket on the lower side of said bracket, thereby along with said knob of said upper arm plate member and said socket on said upper side of said bracket hinging said temple arm assembly with respect to said frame.

5,532,768

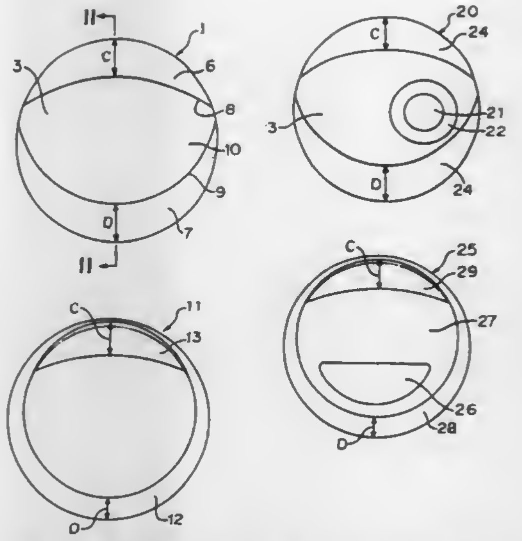
CONTACT LENS

Takayuki Onogi, Nagoya; Keiji Yamashita, and Kazuya Miyamura, both of Seki, all of, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Oct. 4, 1993, Ser. No. 130,728

Int. Cl.^{6} G02C *7/04*

U.S. Cl. 351—160 R **6 Claims**



1. A contact lens for preventing a rotation of the lens on an eye during use, the contact lens comprising:

an inner surface formed so as to meet a shape of a cornea of a wearer; and

an outer optical surface which has a predetermined degree of lens power and is formed in asymmetrical rotation with respect to a geometrical center of the lens;

a center axis of the outer surface being deviated downwardly with respect to a center axis of the inner surface so that a gravity center of the lens is shifted downwardly with respect to the geometrical center of the lens;

spherical thin wall regions are formed in at least upper and lower peripheral portions of the lens so as to define a smooth outer periphery of the lens;

smooth borders are defined between said spherical thin wall regions and the outer optical surface; and

a deviation rate of the gravity center from the geometrical center is from 2.5 to 7.5%.

5,532,769

OPHTHALMOLOGIC ALIGNMENT DEVICE WITH AUTOMATIC ALIGNMENT MEANS

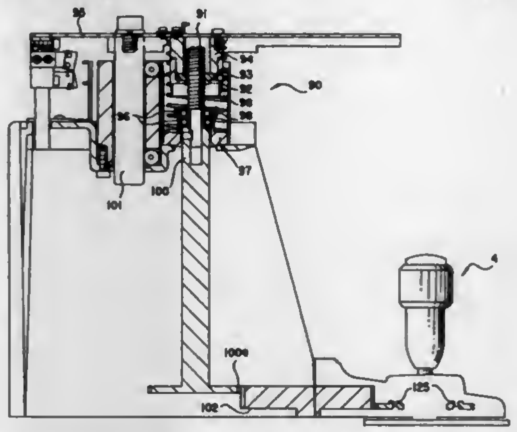
Tetsuyuki Miwa, Aichi-ken; Munehiro Nakao, Toyokawa; Nobuo Suzuki, Aichi-ken, and Koki Kato, Anjo, all of, Japan, assignors to Nidek Co., Ltd., Aichi-ken, Japan

Filed Mar. 20, 1995, Ser. No. 406,403

Claims priority, application Japan, Mar. 31, 1994, 6-087589; Jun. 30, 1994, 6-173579; Jun. 30, 1994, 6-173580

Int. Cl.^{6} A61B *3/10*

U.S. Cl. 351—205 **10 Claims**



1. An ophthalmologic alignment device for aligning a measuring system at a predetermined position for an eye to be examined, comprising:

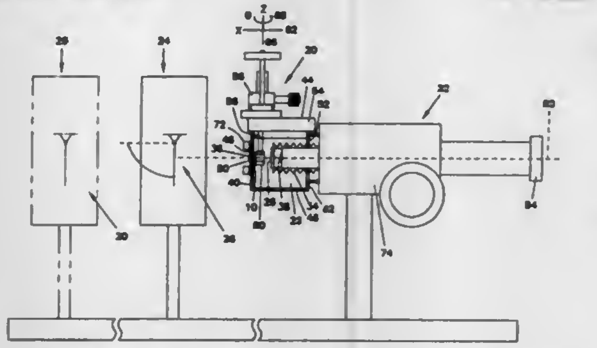
observation means for observing the front of the eye;

first moving means for moving the measuring system with a joystick for aligning purposes while observing the eye with said observation means;

second moving means for further moving the measuring system moved by said first moving means;
index projection/detection means for projection an index onto the cornea of the eye and detecting index light reflected by the cornal surface;
drive/control means for driving/controlling said second moving means on the basis of a detection result of said index projection/detection means;
mode switching means for switching an alignment mode in which the measuring system is moved from a one in which the measuring system is moved by said first moving means to a one in which the measuring system is moved by said second moving means; and
informing means for informing an operator of that an operation of the second moving means has started after detecting as to whether the index is located within a predetermined region based on the detection result due to the index projection/detection means.

5,532,770
APPARATUS AND METHODS FOR EVALUATING VISION THROUGH AN INTRAOCULAR LENS

Richard T. Schneider, 17 Alachua Highlands, Alachua, Fla. 32615, and Richard H. Keates, 71 Whitman Ct., Irvine, Calif. 92715
Filed Apr. 18, 1995, Ser. No. 423,104
Int. Cl.^{6} A61B *3/10;3/00*
U.S. Cl. 351—205 **14 Claims**

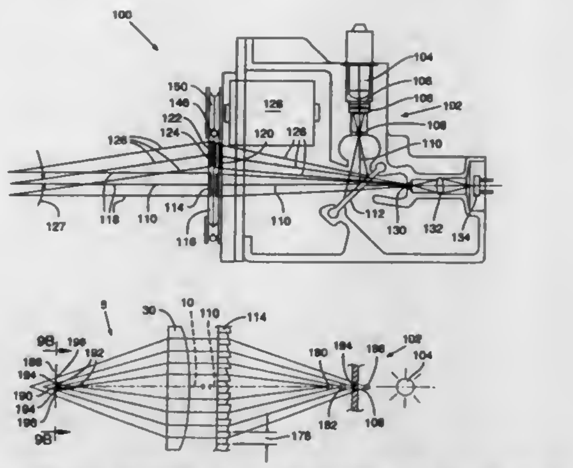


1. An apparatus for evaluating vision through an intraocular lens comprising:
a basin with a chamber for holding liquid;
a cornea allowing light to enter the basin;
an intraocular lens holder positioned in the chamber; and
a fovea window allowing light to exit the basin wherein the cornea, the intraocular lens holder and the fovea window are in a collinear array with the intraocular lens holder positioned between the fovea window and the cornea.

5,532,771
EYE FUNDUS OPTICAL SCANNER SYSTEM AND METHOD

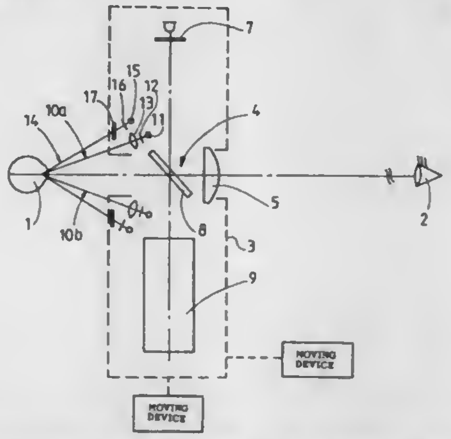
Joel C. Johnson, Lake Oswego, and Robert B. Hill, Portland, both of Oreg., assignors to EDI of Louisiana, Inc., Baton Rouge, La.
Filed Dec. 17, 1993, Ser. No. 169,494
Int. Cl.^{6} A61B *3/10;* **G02B** *26/08*
U.S. Cl. 351—211 **59 Claims**

1. Apparatus for scanning a fundus of an eye and for detecting an ocular light pattern reflected by the fundus, comprising:
a source providing beams of visible and IR radiation directed substantially along a system optical axis;
a scanner disk positioned to rotate about the optical axis, the scanner disk including an optical scanner mounted at a location spaced apart from the optical axis and oriented to receive the IR radiation and direct a scanning beam into the eye from a plurality of angularly divergent positions onto the fundus at scanned points centered around the visual axis of the eye; and
an angular encoder integral to the scanner disk, the plurality of angular divergent positions being determined by data received from the angular encoder.



5,532,772
OPHTHALMIC APPARATUS WITH POSITIONING CONTROL

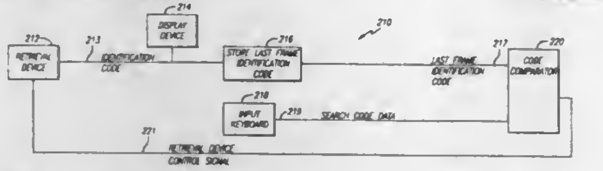
Masanao Fujieda, Toyohashi; Nobuyuki Yano, Okazaki; Yoshiaki Mimura, Gamagori, and Naoki Isogai, Nishio, all of, Japan, assignors to Nidek Co., Ltd., Japan
Filed Mar. 30, 1994, Ser. No. 219,881
Claims priority, application Japan, Mar. 31, 1993, 5-098938
Int. Cl.^{6} A61B *3/10*
U.S. Cl. 351—211 **14 Claims**



1. An ophthalmic apparatus for use by an examiner in examining an examinee's eye where the examinee's eye is positioned at a determined position, the ophthalmic apparatus comprising:
measuring means including an optical system for examining the examinee's eye;
an observing optical path for observing the examinee's eye directly in binocular vision by the examiner;
a beam splitter disposed in the observing optical path; and
mark forming means for forming an aiming mark at a position substantially conjugate to a predetermined portion of the anterior part of the eye, and introducing the aiming mark reflected by said beam splitter into the eyes of the examiner,
wherein the positional relationship along the observing optical path between the anterior part of the examinee's eye and the aiming mark is perceived by the examiner's eyes and the suitability of a working distance can be judged.

5,532,773
METHOD AND APPARATUS FOR INDEXING AND RETRIEVAL OF A CONTINUOUS VISUAL IMAGE MEDIUM

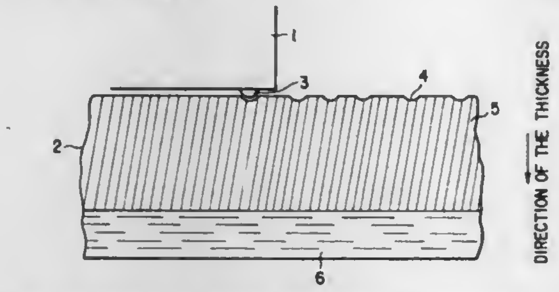
Ronald Shaw, 140 The Village, No. 402, Redondo Beach, Calif. 90277, assignor to Ronald Shaw, Redondo Beach, Calif.
Filed Oct. 27, 1993, Ser. No. 144,733
Int. Cl.^{6} G03D *17/24;* **G03B** *21/32*
U.S. Cl. 353—26 A **12 Claims**


RETRIEVAL DEVICE
IDENTIFICATION CODE
DISPLAY DEVICE
STORE LAST FRAME IDENTIFICATION CODE
LAST FRAME IDENTIFICATION CODE
CODE COMPARATOR
INPUT KEYBOARD
SEARCH CODE DATA
RETRIEVAL DEVICE CONTROL SIGNAL

10. A motion picture index retriever for retrieving index code imprinted on each frame of a motion picture film, comprising:
a. a motion picture projector for projecting said motion picture film;
b. a frame reader mounted on a gate of said motion picture projector for detecting each frame of said motion picture film to trigger a code reader also mounted on the gate of said motion picture projector for retrieving said index code of each frame of said motion picture film;
c. a keyboard for inputing a search code of a desired frame on said motion picture film;
d. a code comparator for comparing said input search code and said retrieved index code until they match;
e. a monitor for monitoring said index code retrieved from said motion picture film; and
f. means for controlling said motion picture projector to retrieve said desired frame on said motion picture film upon a matching of said input search code and said retrieved index code.

5,532,774
FILM DATA RECORDING/REPRODUCING APPARATUS FOR A CAMERA BY WRITING/READING PITS RECORDED ON A FILM

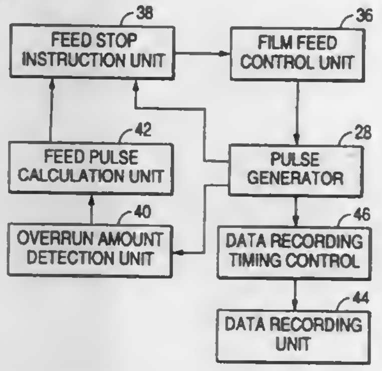
Yasunobu Ootsuka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 25,642, Mar. 2, 1993, abandoned.
This application Jan. 20, 1995, Ser. No. 376,641
Claims priority, application Japan, Mar. 5, 1992, 4-048771
Int. Cl.^{6} G03B *17/24*
U.S. Cl. 354—106 **33 Claims**



24. A camera for recording data on a film, comprising:
a shooting mechanism for exposing said film to an object image;
film feeding means for feeding said film;
detecting means for detecting a feeding state of the film;
encoding means for encoding data to be recorded on said film;
pit-forming means for forming shallow pits on said film, said pit-forming means abutting said film; and
control means for controlling said pit-forming means to thereby control recording of encoded data onto said film according to an output of said detecting means and to an output of said encoding means while said film feeding means feeds said film.

5,532,775
CAMERA WITH FILM FEED CORRECTION

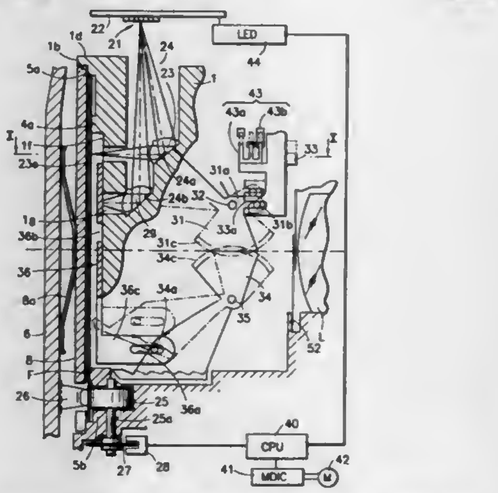
Isao Soshi, Hatsudai; Hidenori Miyamoto, Urayasu, and Toshiyuki Nakamura, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 124,773, Sep. 22, 1993, abandoned.
This application Apr. 10, 1995, Ser. No. 418,135
Claims priority, application Japan, Sep. 22, 1992, 4-253236
Int. Cl.^{6} G03B *17/36*
U.S. Cl. 354—106 **18 Claims**


FEED STOP INSTRUCTION UNIT
FILM FEED CONTROL UNIT
FEED PULSE CALCULATION UNIT
PULSE GENERATOR
OVERRUN AMOUNT DETECTION UNIT
DATA RECORDING TIMING CONTROL
DATA RECORDING UNIT

1. A camera comprising:
(a) film feeding means for performing a film feed operation;
(b) pulse generating means for generating a pulse train signal synchronously with the film feed operation; and
(c) control means, responsive to said pulse train signal, for controlling said film feeding means to stop the film feed operation, and for detecting an overrun amount in the film feed operation, and for controlling the feeding of the film during a next film feed operation such that the film is fed by an amount which is different from a normal feed amount by the detected overrun amount.

5,532,776
CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397.
This application Jun. 7, 1995, Ser. No. 474,265
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.^{6} G03B *17/24*
U.S. Cl. 354—106 **1 Claim**



1. A data imprinting device for use in a camera, comprising:
a light source for emitting imprinting light;
a first part of said device for focusing said imprinting light upon a photosensitive surface at at least two positions;

- a second part of said device for selectively occluding said imprinting light from focusing upon at least one position of said at least two positions;
- said first part including a first reflecting unit for reflecting incident light of said imprinting light upon a first position of said at least two positions;
- said first part including a second reflecting unit for reflecting incident light of said imprinting light upon a second position of said at least two positions;
- said first position being further from a center of said photosensitive surface than said second position; and
- said first and second reflecting units comprise first and second prisms respectively, each having lenses incorporated therein.

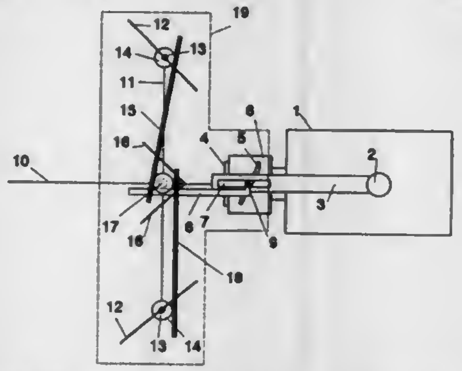
5,532,777
SINGLE LENS APPARATUS FOR THREE-DIMENSIONAL IMAGING HAVING FOCUS-RELATED CONVERGENCE COMPENSATION

Pieter O. Zanen, 107 Cayuga Heights Rd., Ithaca, N.Y. 14850

Filed Jun. 6, 1995, Ser. No. 470,130

Int. Cl.^{6} G03B *35/08*

U.S. Cl. 354—114 **21 Claims**



1. A lens attachment for creation of three-dimensional images using a single lens, for use with lenses having a field of view symmetrical about an optical axis and a focusing means for focusing the lens to a selected distance, comprising:

- a) a right and a left inner mirror, both inner mirrors being located in front of the lens facing inwardly along the optical axis of the lens toward the lens, covering substantially all of the field of view of the lens, the inner mirrors being connected together at one edge at the optical axis of the lens, such that the two inner mirrors form an acute angle symmetrical about the optical axis of the lens;
- b) a right and a left outer mirror, both being larger than the inner mirrors and located outward of the inner mirrors, facing outward toward the subject, such that the substantially all of the field of view of the inner mirrors is covered by the outer mirrors, the outer mirrors being pivotable about a vertical axis;
- c) ganging means for simultaneously pivoting the outer mirrors about their vertical axes in opposite senses, having a control input for actuating the ganging means, such that a movement of the control input causes the right and left outer mirrors to pivot equally, oppositely and simultaneously, such that a movement of the control input in one direction causes the fields of view of the outer mirrors to converge, and a movement of the control input in the opposite direction causes the fields of view of the outer mirrors to diverge; and
- d) adapter means for moving the control input of the ganging means in response to actuation of the focusing means of the lens, connected to the control input of the ganging means and the focusing means of the lens, such that when the lens is focused at a selected distance, the field of view of the outer mirrors converges at the selected distance.

5,532,778
CAMERA WITH ADJUSTABLE VIEWFINDER

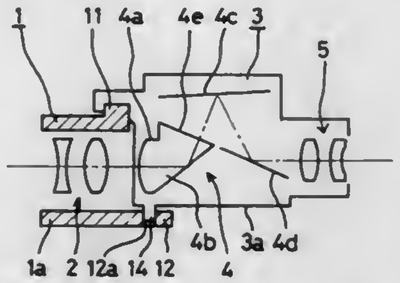
Yukio Noguchi, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, and Fuji Photo Film Co., Ltd., Kanagawa-ken, both of, Japan

Filed Mar. 28, 1994, Ser. No. 218,377

Claims priority, application Japan, Mar. 26, 1993, 5-092333; Mar. 26, 1993, 5-092334

Int. Cl.^{6} G03B *13/14*

U.S. Cl. 354—221 **2 Claims**



1. A camera having a finder which allows observation of an object by an optical system different from the taking optical system of the camera to determine the composition of a scene to be photographed, wherein said finder is divided into an objective block and an eyepiece block; said objective block including at least an objective lens; said eyepiece block including at least an eyepiece; said objective block and said eyepiece being removable from each other; with one of said blocks when assembled being movable relative to each other in a direction transverse to an optical axis of the finder, said blocks together defining a closed finder housing to exclude dust from the inside of the finder;

- wherein interengaging means on said objective block and said eyepiece block; said interengaging means comprising slots and engaging pins which allow said objective block and said eyepiece block to engage with each other while moving relative to each other transversely of said optical axis of said finder;
- wherein a removable spacer adapted to be sandwiched between an engaging projecting portion and a recess on respective ones of said blocks, so that by changing the thickness of said spacer said objective block and said eyepiece block may be adjusted in a direction transversely of the optical axis of the finder.

5,532,779
PHOTOGRAPHIC PROCESSOR

Nobuo Matsumoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1994, Ser. No. 318,342

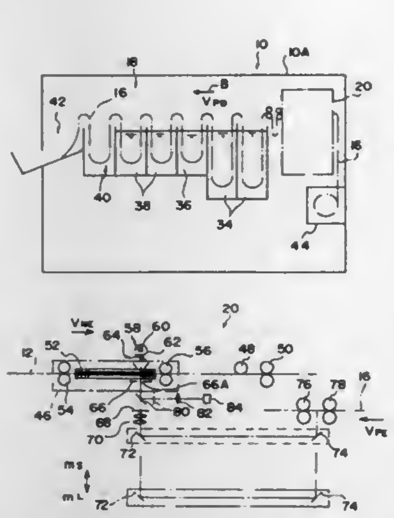
Claims priority, application Japan, Nov. 1, 1993, 5-273663

Int. Cl.^{6} G03D *3/08*

U.S. Cl. 354—319 **12 Claims**

1. A photographic processor in which a first processor for subjecting a photographic film to development processing while transporting the photographic film, an exposure device for subjecting a photosensitive material to exposure processing with an image recorded on the photographic film processed by the first processor, and a second processor for subjecting the photosensitive material, which has been subjected to exposure processing, to development processing while transporting the photosensitive material are accommodated integrally, said photographic processor comprising:

- a first transporting device provided in said exposure device and adapted to transport the photographic film subjected to development processing by said first processor at a predetermined speed;
- a second transporting device provided in said exposure device and adapted to transport an unexposed photosensitive material at a predetermined speed; and



- an exposing optical system provided in said exposure device and adapted to effect exposure by causing the image on the photographic film to be formed on the photosensitive material in a case where the photographic film is being transported by said first transporting device and the photosensitive material is being transported by said second transporting device;

wherein the transporting speed of the photographic film transported by said first transporting device is set such that if the transporting speed of the photosensitive material transported by said second transporting device is fixed, a transporting speed V_{ND} of the photographic film in said first processor and a maximum transporting speed V_{NEmax} of the photographic film transported by said first transporting device satisfy the following formula:

$$V_{ND} \leqq V_{NEmax.}$$

5,532,780
PHOTOGRAPHIC PROCESSING METHOD USING A CARTRIDGE

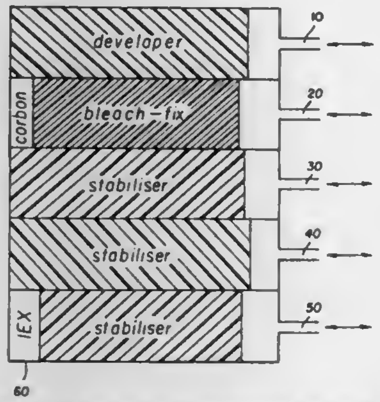
John R. Fyson, Hackney, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1995, Ser. No. 463,328

Claims priority, application United Kingdom, Sep. 10, 1994, 9418281; Apr. 5, 1995, 9507055

Int. Cl.^{6} G03D *3/02*

U.S. Cl. 354—324 **17 Claims**



1. In a method of processing imagewise exposed photographic materials, said method comprising treating said materials in a washing or stabilizing step in a processing machine comprising at least two processing tanks including a final stabilizing and washing tank, and a removable container containing at least one working strength solution and a final stabilizing and washing solution in separate sub-containers from which the processing tanks are fed,

the improvement wherein the sub-container that contains the last stabilizing and washing solution comprises (a) an ion exchange resin and (b) an indicator means capable of undergoing a color change when the ion exchange resin is exhausted.

5,532,781
FOCUS DETECTION DEVICE FOR AN OPTICAL SYSTEM

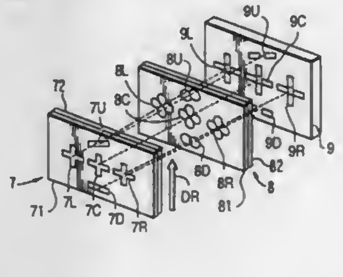
Ken Utagawa, and Yosuke Kusaka, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,514

Claims priority, application Japan, Apr. 27, 1993, 5-101196

Int. Cl.^{6} G03B *13/36*

U.S. Cl. 354—402 **8 Claims**



1. A focus detection device for a camera provided with an objective lens having a predetermined image plane, the focus detection device comprising:

- a light shielding mask disposed near the predetermined image plane, said light shielding mask provided with a center aperture substantially near the center of said light shielding mask, said light shielding mask provided with an upper aperture above said center aperture, said light shielding device provided with a bottom aperture below said center aperture;
- an image sensor device, said image sensor device provided with two sensor arrays disposed orthogonally to each other, said image sensor device provided with a first and second rectilinear sensor array, said first rectilinear sensor array being disposed above said orthogonally disposed sensor arrays, said second rectilinear sensor array being disposed directly below said orthogonally disposed sensor arrays opposite said first rectilinear sensor array at least one of said rectilinear arrays being non-parallel with each of said orthogonally disposed sensor arrays; and
- a re-imaging optical system adapted to form distributions of intensity of light from the light passed through said center aperture on said orthogonally disposed sensor arrays, said re-imaging optical system adapted to form distributions of intensity of light from the light passed through said upper aperture on said first rectilinear sensor array, said re-imaging optical system adapted to form distributions of intensity of light from the light passed through said bottom aperture on said second rectilinear sensor array.

5,532,782
CAMERA HAVING A DEPTH PRIORITY OPERATION MODE

Ryuichi Mori, Kanagawa-ken; Tetsuo Goto, Chiba-ken, and Sunao Nishioka, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

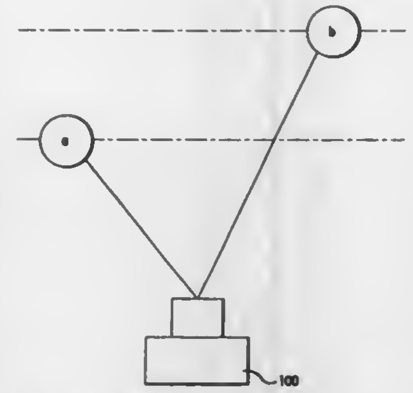
Filed Jan. 23, 1995, Ser. No. 376,411

Claims priority, application Japan, Feb. 17, 1994, 6-020189

Int. Cl.^{6} G03B *9/02*

U.S. Cl. 354—402 **19 Claims**

1. A camera having a depth priority operation mode for simultaneously photographing a plurality of objects and a focal surface having a lens side and a rear cover side, the camera comprising:

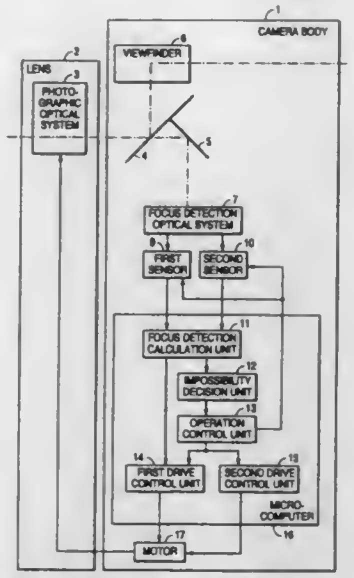


lens means attached to the camera;
lens information means for storing lens information in the lens means, the lens information including a smallest stop value obtainable with the lens means;
drive means for moving the lens means to a desired position relative to the focal surface of the camera;
focus detection means for determining focus information for each one of the plurality of objects;
memory means for storing the focus information for the plurality of objects;
stop value determining means for determining a determined stop value for the lens means based on the focus information for the plurality of objects;
stop value selecting means for selecting a larger one of the smallest stop value and the determined stop value as the actual stop value;
focal depth determining means for determining a focal depth of field of the lens means based on the selected stop value; and
control means for controlling the drive means, wherein, when the smallest stop value is selected, the control means moves the lens means to focus a closest one of the plurality of objects within the focal depth and on the lens side of the focal surface of the camera.

5,532,783
APPARATUS AND METHOD FOR ADJUSTING THE FOCUS OF A CAMERA DURING SCANNING DRIVE AND NON-SCANNING DRIVE OF A PHOTOGRAPHIC LENS

Yosuke Kusaka, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Nov. 23, 1994, Ser. No. 348,145
Claims priority, application Japan, Nov. 24, 1993, 5-293315; Dec. 22, 1993, 5-324394
Int. Cl.^{6} G03B *13/36*
U.S. Cl. 354—402 **16 Claims**

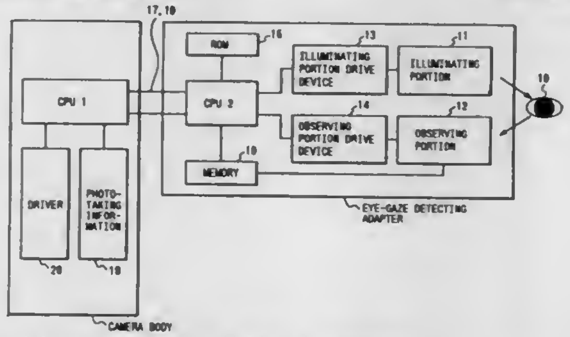
1. A camera which performs focus detection to detect a focus position, the camera comprising:
a photographic lens which is adjustable from a close end position to an infinity end position to obtain a respective focus position corresponding to a subject to be photographed;
first and second image sensors, each image sensor receiving light from the subject which passes through the photographic lens, forming a respective image of the subject, and producing a sensor output which corresponds to the luminous intensity distribution of the received light, each image sensor having a specific sensitivity and the sensitivity of the second image sensor being higher than the sensitivity of the first image sensor; and
a control unit which
determines, based on the sensor output of one of the first and second image sensors, whether focus detection is possible,


1
CAMERA BODY
2
LENS
3
PHOTO-GRAPHIC OPTICAL SYSTEM
6
VIEWFINDER
4
5
7
FOCUS DETECTION OPTICAL SYSTEM
8
FIRST SENSOR
10
SECOND SENSOR
11
FOCUS DETECTION CALCULATION UNIT
12
IMPOSSIBILITY DECISION UNIT
13
OPERATION CONTROL UNIT
14
FIRST DRIVE CONTROL UNIT
15
SECOND DRIVE CONTROL UNIT
MICRO-COMPUTER
16
17
MOTOR

causes the photographic lens to scan from the close end position to the infinity end position when focus detection is not possible, and
performs focus detection based on the output of the second image sensor when the photographic lens is scanning.

5,532,784
EYE-GAZE DETECTING ADAPTER

Hitoshi Nishimura, Komae, and Masao Owashi, Kawasaki, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 116,697, Sep. 7, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 354,155
Claims priority, application Japan, Sep. 14, 1992, 4-245199
Int. Cl.^{6} G03B *29/00;17/02;13/02;* **A61B** *3/14*
U.S. Cl. 354—410 **23 Claims**

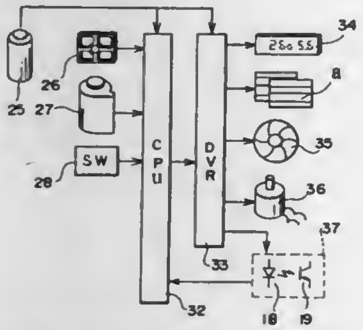

17, 18
ROM
16
13
ILLUMINATING PORTION DRIVE DEVICE
11
ILLUMINATING PORTION
10
CPU 1
CPU 2
14
OBSERVING PORTION DRIVE DEVICE
12
OBSERVING PORTION
15
MEMORY
DRIVER
PHOTO-TAKING INFOR-MATION
20
19
EYE-GAZE DETECTING ADAPTER
CAMERA BODY

1. An eye-gaze detecting adapter comprising:
an illuminating portion for illuminating an eyeball of an observer;
an illumination drive portion for driving said illuminating portion;
an observing portion for observing an eyeball of an observer illuminated by said illuminating portion and outputting eye-gaze direction information;
an observation drive portion for driving said observing portion;
a first storage portion for storing information output from said observing portion;
a second storage portion having information necessary for eye-gaze detection;
a calculating portion for calculating an eye-gaze direction of an observer, based on information stored in said first storage portion and the information from said second storage portion;
a control portion for controlling said illumination drive portion and said observation drive portion;

a mounting portion for mounting the adapter onto an imaging apparatus body; and
a communication portion for transmitting information of eye-gaze direction obtained by said calculating portion to said imaging apparatus body.

5,532,785
CAMERA HAVING MEANS FOR CORRECTING SHUTTER TIME BY MEASURING THE ACTUAL EXPOSURE TIME

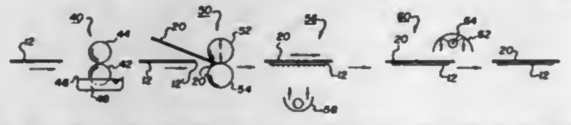
Tetsuro Goto, Funabashi; Akira Katayama, Koganei, and Masanori Hasuda, Yokohama, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Mar. 10, 1994, Ser. No. 208,471
Claims priority, application Japan, Mar. 12, 1993, 5-052631; Mar. 12, 1993, 5-052634
Int. Cl.^{6} G03B *7/08*
U.S. Cl. 354—430 **32 Claims**



1. A camera with a shutter time measuring system, comprising:
calculating means for calculating a control exposure time to be controlled;
a shutter drive control device that drive-controls the shutter for a calculated exposure time;
a measuring device that measuring device that measures the actual exposure time achieved by drive-controlling said shutter with said drive control means; and
correction means for calculating the difference between said control exposure time and said actual exposure time and correcting said control exposure time based upon said difference, wherein the amount of correction applied in a direction in which said control exposure time is reduced is smaller than the amount of correction in a direction in which said control exposure time is increased.

5,532,786
METHODS FOR ASSEMBLING DEPTH IMAGE SYSTEMS

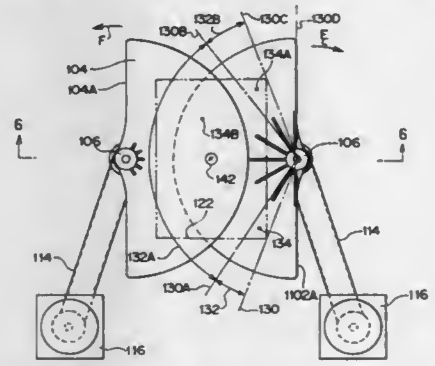
Stephen J. Hassall, Churchville; Daniel R. May, West Henrietta, and Martin E. Oehlbeck, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 278,436, Jul. 21, 1994, Pat. No. 5,473,406. This application May 24, 1995, Ser. No. 449,149
Int. Cl.^{6} G03B *27/32;35/14*
U.S. Cl. 355—22 **3 Claims**



1. A method for laminating a depth image system of the type including an image sheet bearing a lineiform image and having a first, leading edge; a lenticular array sheet, the array sheet having lenticules parallel to the lineiform image and the array sheet having a second, leading edge; and. a layer of adhesive between the image and array sheets, the method comprising the steps of:
applying a layer of the adhesive to a surface of either the image sheet or the array sheet;
providing a laminatot comprising a pair of laminating rolls having a nip between the rolls;
placing the second leading edge between the rolls;
inserting the first leading edge into the nip behind the second leading edge;
rotating the laminating rolls to draw the array and image sheets between the rolls; and
simultaneously with the rotating step, flexing the array sheet away from the image sheet at the nip into contact with the roll on a same side of the nip as the array sheet, so that the surface of the array sheet facing the image sheet deforms to ensure full contact between the sheets and to prevent entrapment of air between the sheets as the sheets are drawn into the nip.

5,532,787
PHOTOGRAPHIC PRINTING SHUTTER

Tatsuya Konagaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 30, 1994, Ser. No. 315,482
Claims priority, application Japan, Oct. 14, 1993, 5-257325; Oct. 14, 1993, 5-257326
Int. Cl.^{6} G03B *7/08*
U.S. Cl. 355—71 **17 Claims**

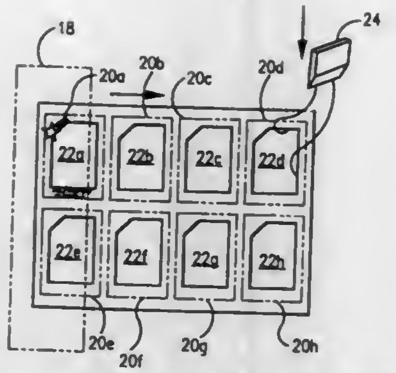


1. A photographic printing shutter comprising:
a pair of shutter bodies each shaped in the form of a sector, for cutting off printing light and allowing the printing light to pass;
a pair of rotatable shafts disposed on opposite sides of a light transmissive window and respectively fixed to said pair of sectorial shutter bodies, the printing light passing through the light transmissive window; and
driving means for respectively rotatably shifting said pair of sectorial shutter bodies between a closing position where said pair of sectorial shutter bodies cuts off the printing light passing through the window and an opening position where said pair of sectorial shutter bodies allows the printing light to pass through the window.

5,532,788
METHOD FOR MAKING SPORTSCARDS

Kenneth H. Monroe, 32758 Birchwood, Westland, Mich. 48185
Continuation-in-part of Ser. No. 133,884, Oct. 12, 1993, Pat. No. 5,369,467. This application Nov. 23, 1994, Ser. No. 344,078
Int. Cl.^{6} G03B *27/32;27/44*
U.S. Cl. 355—77 **2 Claims**

1. A method for making a plurality of individual cards, such as sportscards, each card having printed indicia material common to



all of the plurality of cards, and each card bearing a colored photographed image exclusive to the individual card, comprising the steps of:

making a master panel having a front side and a rear side;

printing on the front side of the master panel borders for a plurality of window areas;

cutting the master panel around each window area to form a plurality of window openings;

locating a photograph adjacent the rear side of the master panel behind each window opening such that the subject matter of the photograph is visible through the window opening;

disposing each photograph on the rear side of the master panel;

photocopying the front of the master panel and that portion of each photograph visible through each window to form a photocopied panel;

laminating the photocopied panel between two sheets of clear plastic, and adhesively attaching the sheets of clear plastic to the photocopied panel to form a laminated panel; and

cutting the laminated panel into as many sub panels as there are photographed images thereon.

5,532,789

ELECTROSTATIC COPIER HAVING A MARKING UNIT FOR INDICATING UNNECESSARY PRINT MATTER ON ONCE-USED PAPER

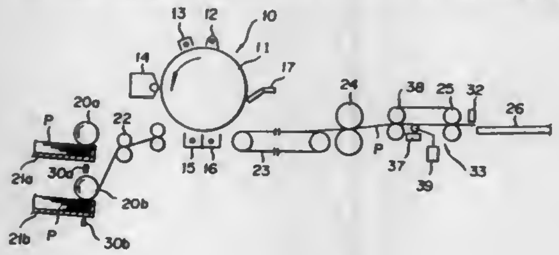
Shigeru Yaginuma, Machida, and Junichi Yamamoto, Hadano, both of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1991, Ser. No. 702,881

Claims priority, application Japan, May 25, 1990, 2-133734; Apr. 15, 1991, 3-081081

Int. Cl.^{6} G03G ***15/00***

U.S. Cl. 355—202 **18 Claims**



1. An image apparatus comprising a cassette for placing a sheet therein, a sheet feed means for feeding the sheet placed in the cassette into an apparatus body, an image forming means for forming an image on the sheet fed into the apparatus body and a sheet discharge means for discharging the sheet having an image thereon out of the apparatus body, which comprises:

a marking means for marking one surface of the sheet, the sheet having a surface on which an image is formed and a reverse surface;

a used surface detection means for detecting if the reverse surface of the sheet is a surface which has been used; and

a marking control means for controlling the marking means so that a surface of the sheet is marked when the reverse surface of the sheet is detected by the used surface detection means as having already been used.

5,532,790

DEVICE FOR OPTICALLY DETECTING AN AMOUNT OF REMAINING DEVELOPER IN AN IMAGE FORMING APPARATUS

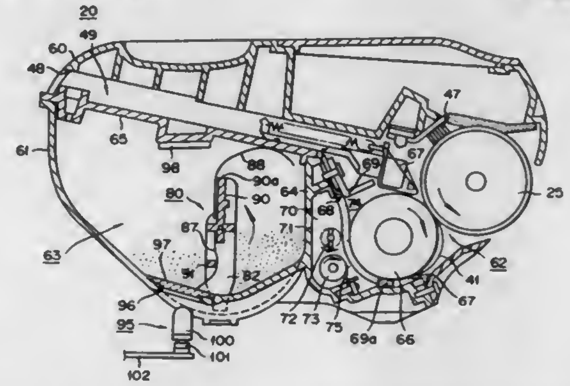
Takashi Akazawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1993, Ser. No. 149,992

Claims priority, application Japan, Nov. 13, 1992, 4-078318 U; Nov. 13, 1992, 4-078319 U; Nov. 13, 1992, 4-304201; Nov. 13, 1992, 4-304202

Int. Cl.^{6} G03G ***21/00***

U.S. Cl. 355—203 **14 Claims**



1. A device for detecting an amount of remaining developer comprising:

developer storing means for storing developer therein;

light emitting means for emitting light from an outside to an inside of said developer storing means;

light receiving means provided outside said developer storing means for receiving the light emitted to the inside of said developer storing means by said light emitting means and outputting signals corresponding to the received light;

first detecting means for detecting a condition that a time interval during which the signal outputted by said light receiving means exceeds a predetermined threshold value is longer than a first time; and

second detecting means for detecting that said condition detected by said first detecting means occurs a predetermined number of times during a second time that is longer than said first time.

5,532,791

ERROR DETECTION APPARATUS FOR DETECTING ERRORS OF TONER SENSING IN AN IMAGE FORMING APPARATUS

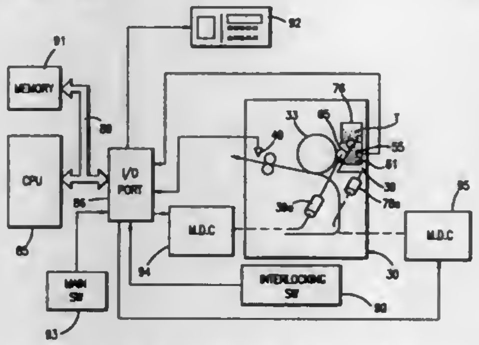
Yasuhito Takahashi; Tsutomu Kimura, both of Ebina, and Toru Isosu, Iwatsuki, all of, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1994, Ser. No. 320,261

Claims priority, application Japan, Dec. 20, 1993, 5-319749

Int. Cl.^{6} G03G ***21/00***

U.S. Cl. 355—206 **3 Claims**



1. An error detection apparatus that detects a toner sensor error in an image forming apparatus, the image forming apparatus comprising:

a developer housing positioned opposite to a photosensitive body;

a toner box for supplying monocomponent toner to said developer housing;

a developing roller for developing an electrostatic latent image on said photosensitive body in said developer housing; and

a toner transport and supply member for transporting and supplying said monocomponent toner to said developing roller;

said toner sensor being arranged for detecting either the presence or the absence of said monocomponent toner in at least one of said developer housing and said toner box;

said error detection apparatus that detects toner sensor error comprising:

first counting means for counting the number of at least one of prints and image signals while a toner-present signal is being detected continuously from said toner sensor;

second counting means for counting the number of at least one of prints and image signals while a toner-absent signal is being detected continuously from said toner sensor; and

display and stopping means for stopping the operation of said image forming apparatus and displaying an error indication concurrently when a toner sensor error occurs if the sum of the values counted by said first and said second counting means has exceeded a predetermined value.

5,532,792

PRINTING APPARATUS WITH IMMEDIATE INTERRUPT

Yuji Hattori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nahoya, Japan

Filed Apr. 18, 1995, Ser. No. 423,870

Claims priority, application Japan, Apr. 20, 1994, 6-106105

Int. Cl.^{6} G03G ***15/00***

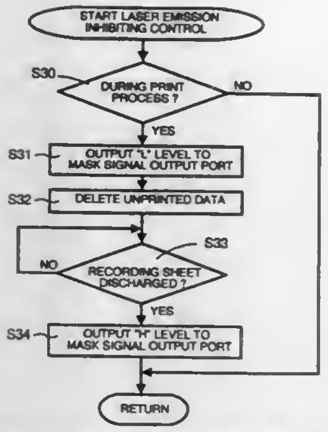
U.S. Cl. 355—206 **20 Claims**

1. A printing device that prints an image on a substrate comprising;

a feeding mechanism that feeds a substrate through the printing device along a feed path;

a memory that stores print data corresponding to the image to be printed;

a charged image recording surface disposed in the feed path and a charging device coupled to the image recording surface to charge the image recording surface;


START LASER EMISSION INHIBITING CONTROL
S30
DURING PRINT PROCESS ?
NO
YES
S31
OUTPUT "L" LEVEL TO MASK SIGNAL OUTPUT PORT
S32
DELETE UNPRINTED DATA
S33
NO
RECORDING SHEET DISCHARGED ?
YES
S34
OUTPUT "H" LEVEL TO MASK SIGNAL OUTPUT PORT
RETURN

an image forming device coupled to the memory that forms a latent image based on the stored print data on the charged image recording surface;

a developing device disposed in the feed path adjacent to the image recording surface that develops the latent image with toner;

a controller coupled to the feeding mechanism, the memory, the charging device, the image forming device, and the developing device, wherein the controller controls driving signals that drive the feeding mechanism, the charging device, the image forming device, and the developing device during printing; and

a stop printing signal controller coupled to the controller for selectively outputting a stop printing signal to the controller during printing to stop the driving signal to at least one of the charging device, the image forming device, and the developing device to immediately interrupt printing.

5,532,793

PAPER TRANSPORT APPARATUS CAPABLE OF REMOVING LESS JAMMED PAPER IN IMAGE FORMING APPARATUS

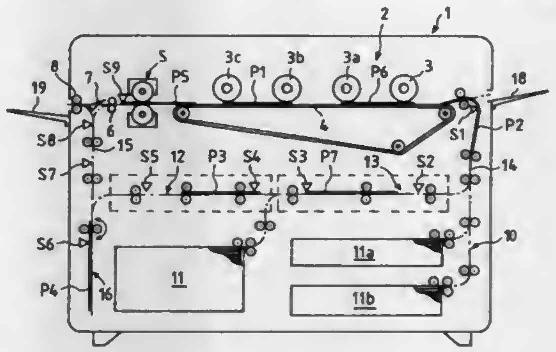
Yoshio Kogure, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 325,933

Claims priority, application Japan, Oct. 21, 1993, 5-285628

Int. Cl.^{6} G03G ***21/00;15/00***

U.S. Cl. 355—207 **8 Claims**



1. An image forming apparatus comprising:

image transfer means for forming images on one or both of first and second faces of copy paper sheets;

a paper supply tray;

a first transport path leading to the image transfer means for alternately transporting blank copy paper sheets having no images formed on the first and second faces thereof and

single-face copy paper sheets having an image formed on the first faces thereof;
a paper sheet inversion path connected to the first transport path beyond the image transfer means;
a copy sheet invertor apparatus connected to the paper sheet inversion path;
a second transport path connecting the copy sheet invertor apparatus to the first transport path to convey single-face copy paper sheets into the first transport path in alternation with blank copy paper sheets conveyed from the paper supply tray; and
control means for controlling the image forming apparatus by performing a first operation and a second operation, the first operation being carried out in a manner such that, when a paper jam occurs, a single-face copy paper sheet located at the image transfer means is formed as a double face copy paper sheet by transferring an image from the image transfer means to the second face thereof and is then directed to the ejection tray, and the second operation being carried out in a manner such that a blank copy paper sheet to which an image has been transferred to the first face thereof by the image transfer means is sequentially advanced to a waiting position.

5,532,794
ELECTROPHOTOGRAPHIC IMAGE STABILIZATION CONTROL APPARATUS

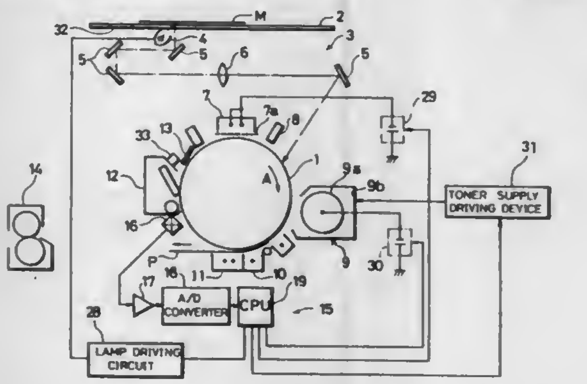
Mitsuru Tokuyama, Nara; Toshiaki Ino; Motoyuki Itoyama, both of Yamatokoriyama; Kunio Ohashi, and Haruo Nishiyama, both of Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1993, Ser. No. 175,636

Claims priority, application Japan, Jan. 7, 1993, 5-001384

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—208 **20 Claims**



1. A process control apparatus of electrophotographic apparatus comprising:
density detecting means for optically detecting density of a reference toner image on a photoreceptor;
means for judging whether or not said density detecting means has detected the density by a predetermined number of times; and
information processing means for forming a reference toner image between every two toner images for a picture image formation, and for controlling each section of an electrophotographic process in response to said judging means so as to stabilize picture quality of a formed picture image.

5,532,795
METHOD OF AND SYSTEM FOR CLEANING ROLLER MEMBERS

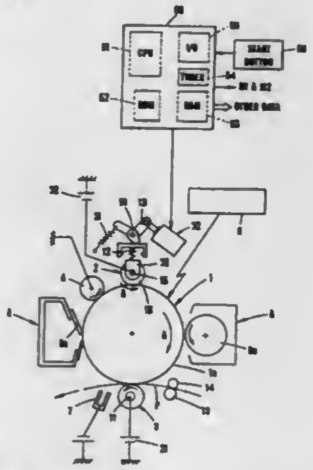
Kenzo Tatsumi; Masaru Tanaka, both of Yokohama, and Takeo Suda, Tokyo-To, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,644

Claims priority, application Japan, Dec. 28, 1993, 5-334485

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—210 **54 Claims**



12. An apparatus comprising:
a photoconductive element;
a roller member maintained in contact with said photoconductive element; and
transfer means for transferring toner and other contaminants from said roller member to said photoconductive element, wherein said transfer means comprises speed varying means for changing the rotational speed of said roller.

5,532,796
IMAGE FORMING APPARATUS

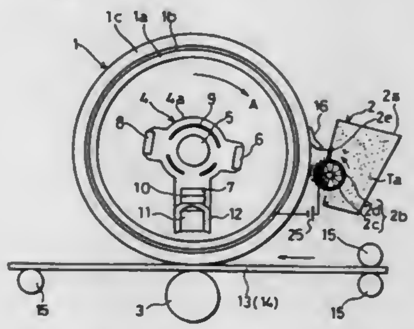
Shiro Narikawa, Kashihara; Hirokazu Tanaka, Osaka; Iwakazu Honda, Kitakatsuragi-gun; Tomohiro Oikawa, and Hiroe Ando, both of Chiba, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 3, 1995, Ser. No. 433,604

Claims priority, application Japan, May 11, 1994, 6-97410

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 355—210 **19 Claims**



1. An image forming apparatus carrying out simultaneous charge-expose-development process, which exposes a transparent image carrier from an inside of said image carrier on an opposite side to a developing side so as to form a visible image on a surface of said image carrier, comprising:
said image carrier formed such that at least a transparent conductive layer is formed on a transparent base;
developing means for supplying a developer to a surface of a transparent conductive layer side of said image carrier, said developing means being provided on the transparent conductive layer side of said image carrier;

an optical head unit provided on a transparent base side of said image carrier; and
control means for controlling an operation of said optical head unit,
wherein said optical head unit includes:
exposing means for irradiating a light around the developer supplied position from the transparent base side of said image carrier, said exposing means being provided oppositely to said developing means across said image carrier; and
information reading means for irradiating a light on a document positioned on the transparent conductive layer side so as to read a document image using a reflected light from the document,
said exposing means being integral with said information reading means,
wherein said optical head unit further includes:
a common light source which is commonly used as a light source to the above two means which are integral with each other;
a first liquid crystal shutter array for opening and closing an optical path of said common light source in direction of said image carrier so that a light of said common light source is used as a light of said exposing means; and
a second liquid crystal shutter array for opening and closing the optical path of said common light source in the direction of said image carrier so that the light of said common light source is used as a light of said information reading means,
wherein said control means controls open/close operation of said first liquid crystal shutter array of said exposing means according to an image signal, and controls said first and second liquid crystal shutter arrays so that said second liquid crystal shutter array of said information reading means is closed when said exposing means operates and that said first liquid crystal shutter array of said exposing means is closed when said information reading means operates.

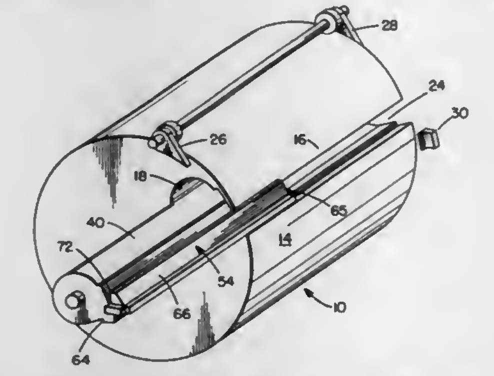
5,532,797
REPLACEABLE PHOTOCONDUCTOR-CONTAINING CANISTER FOR AN ELECTROPHOTOGRAPHIC PRINTER

David J. Arcaro, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 29, 1994, Ser. No. 346,977

Int. Cl.^{6} G03G *5/00*

U.S. Cl. 355—213 **9 Claims**



1. A canister, including an organic photoconductor web, for an electrophotographic (EP) apparatus that includes a drum with a canister-receiving receptacle and a slot which communicates between said receptacle and an exterior cylindrical surface of said drum, said canister comprising:
an elongated casing including an elongated slot communicating between an outer surface of said casing and a chamber within said casing;
a spring loaded mandrel positioned within said chamber;
a flexible OPC web wound around said mandrel and including a distal end that extends through said elongated slot;
an end attachment coupled to said distal end of said flexible OPC web and spring biased against an outer surface of said casing by action of said spring loaded mandrel, said end attachment, upon insertion of said elongated casing into said canister-receiving receptacle, positioned to engage stop means in said EP apparatus, whereby rotation of said drum causes said end attachment to bear against said stop means and to cause an unrolling of said OPC web during continued rotation of said drum, said end attachment and elongated casing including means for preventing withdrawal of said OPC web back into said casing by said spring loaded mandrel when said OPC web surrounds said exterior cylindrical surface of said drum.

5,532,798
CHARGING DEVICE HAVING A PLATE ELECTRODE AND A CLEANING DEVICE FOR CLEANING EDGES OF THE PLATE ELECTRODE

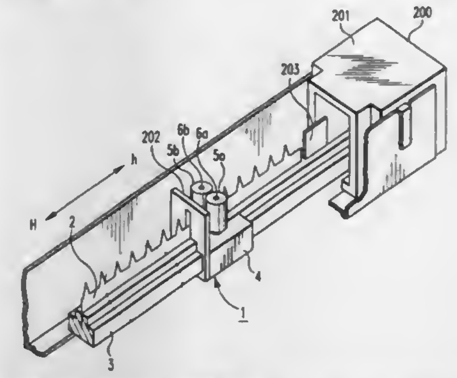
Yasuhiro Nakagami; Kouji Matsushita; Noboru Yonekawa, all of Toyokawa; Noboru Ito, Kawanishi; Yoshihiro Shojo, and Katsuhiko Takeda, both of Itami, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1994, Ser. No. 247,862

Claims priority, application Japan, May 26, 1993, 5-124352; Jun. 22, 1993, 5-174987; May 16, 1994, 6-101241

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 355—221 **19 Claims**



1. A charging device comprising:
a plate-like electrode provided with a plurality of protrusions;
a cleaning device including rotatable cleaning members provided bilaterally to said electrode and gripping said electrode therebetween to clean said electrode; and
a guide member provided along said electrode so as to slidably guide said cleaning device thereon.

5,532,799
IMAGE FORMING APPARATUS HAVING CONTACT MEMBER CAPABLE OF CONTACTING WITH IMAGE BEARING MEMBER

Tsuyoshi Watanabe, Ebina; Hisaaki Senba, Yokohama; Hiroshi Matsumoto, and Makoto Yanagida, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 91,035, Jul. 14, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 266,305

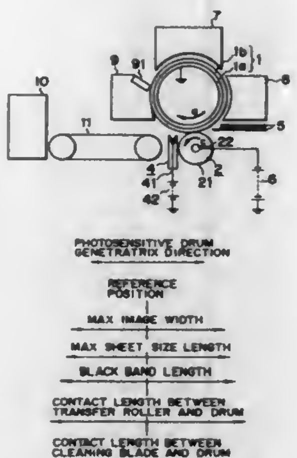
Claims priority, application Japan, Jul. 16, 1992, 4-189492

Int. Cl.^{6} G03G *15/06;21/00*

U.S. Cl. 355—245 **20 Claims**

1. An image forming apparatus, comprising:
image forming means for forming an image on a recording material, said image forming means having an image bearing member for bearing a developer image thereon and a contact member contactable with said image bearing member for image formation;
application means for applying developer to the image bearing member to form a developer bearing area thereon, the devel-

oper bearing area being formed in an area not contacting the recording material and extending in a generatrix direction of the image bearing member; and
a cleaning member contacting with the developer bearing area of the image bearing member for cleaning the developer thereon,
wherein a width of said developer bearing area on said image bearing member is wider than a maximum image width on said image bearing member in the generatrix direction thereof.


7
9
91
1b
1a
1
8
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11
5
22
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42
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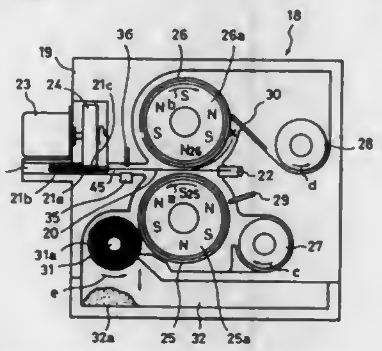
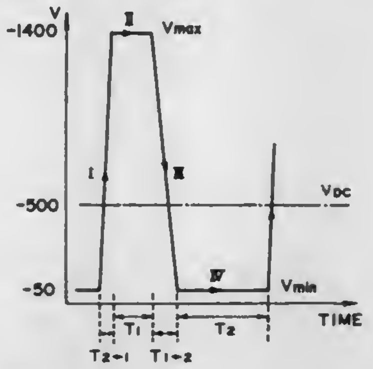
2
6
PHOTOSENSITIVE DRUM GENETRATRIX DIRECTION
REFERENCE POSITION
MAX IMAGE WIDTH
MAX SHEET SIZE LENGTH
BLACK BAND LENGTH
CONTACT LENGTH BETWEEN TRANSFER ROLLER AND DRUM
CONTACT LENGTH BETWEEN CLEANING BLADE AND DRUM

5,532,800
SEPARATING APPARATUS AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS USING THE SAME
Hironobu Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 14, 1995, Ser. No. 490,132
Claims priority, application Japan, Jun. 16, 1994, 6-156420; May 23, 1995, 7-123909
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 355—245 **38 Claims**



1. A separating apparatus for removing foreign matter from magnetic toner, said separating apparatus being used in an electrophotographic image forming apparatus, comprising:
a filter having openings for allowing passage of the magnetic toner:
a magnetic field generating means for generating magnetic field for attracting the magnetic toner and causing it to pass through said filter; and
magnetic force decreasing means for decreasing a magnetic force generated by said magnetic field generating means to lessen the magnetic field for attracting the magnetic toner and causing it to pass through said filter.

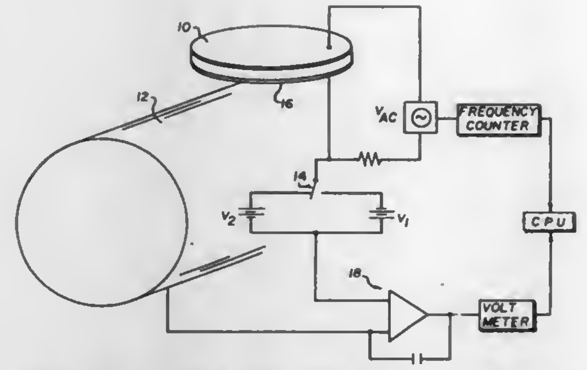
5,532,801
IMAGE FORMING METHOD SUPERPOSING FIRST AND SECOND DEVELOPING OPERATIONS ON AN IMAGE BEARING MEMBER
Yoshito Mizoguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1994, Ser. No. 363,885
Claims priority, application Japan, Dec. 27, 1993, 5-348362
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 355—246 **5 Claims**



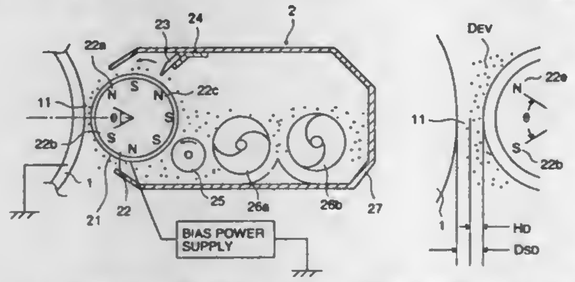
1. An image forming method comprises steps of:
forming a first electrostatic image on an image bearing member;
developing with developer carried on a developer carrying member the first image formed in the first image forming step;
forming a second electrostatic image on the image bearing member carrying the first developed image formed in the first developing step; and
developing with developer carried on a developer carrying member, the electrostatic image formed in the second electrostatic image forming step;
wherein during the second developing step, an alternating electric field is generated between the developer carrying member and the image bearing member,
wherein the electric field has a peak value V1 at a transfer portion, which transfers developer to the image bearing member and is maintained for a predetermined time T1, a peak value V2 at a back-transfer portion, which transfers developer back from the image bearing member to the developer carrying member and is maintained for a predetermined time T2,
wherein a time period T(1-2) necessary for the electric field to shift from a peak value V1 to a peak value V2 is larger than a time period T(2-1) necessary for the electric field to shift from a peak value V2 to a peak value V1; and
wherein $|V1-V2|/T(2\text{-}1)<50$ V/μsec.

5,532,802
PIEZOELECTRIC SENSOR FOR IN-SITU MONITORING OF ELECTROSTATOGRAPHIC DEVELOPERS
Sven Sonnenberg, Rochester; Donald S. Rimai, Webster; David D. Almeter, and Martin Potucek, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 13, 1995, Ser. No. 372,639
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 355—246 **22 Claims**

1. A toner mass sensor comprising:
a piezoelectric crystal having a resonant frequency;
a first electrode on a first face of the crystal;
a second electrode on a second face of the crystal;
an electrically conductive lead connecting the first electrode to an electrical contact point in the vicinity of the second face of the crystal, said electrical contact point being electrically insulated from the second electrode; and
a casing closed at one end by the crystal with the first face of the crystal allowed to contact developer outside of the closed casing through the opening of the casing, said casing and crystal defining an interior which is sealed from developer in a development station, within which sealed interior the second face of the crystal is protected from contamination by developer.



5,532,803
DEVELOPING APPARATUS WITH IMPROVED TONER CONVEYANCE
Kazuo Yasuda, and Satoshi Takahashi, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Mar. 15, 1994, Ser. No. 212,921
Claims priority, application Japan, Mar. 18, 1993, 5-058872
Int. Cl.^{6} G03G *15/09*
U.S. Cl. 355—251 **3 Claims**

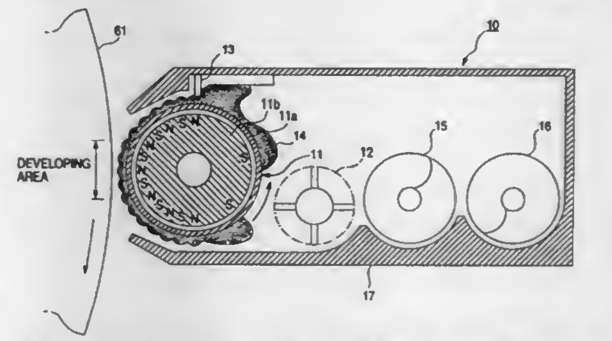


1. A developing apparatus for use with a multi-color image forming apparatus, comprising:
image forming body means having a surface, for holding a toner image;
means for containing a plurality of two-component developers, each consisting of toner having a respective color and magnetic carrier; and
a plurality of developing sleeve means, located in the vicinity of said image forming body means without contacting said image forming body means, each of said plurality of developing sleeve means for supplying said toner having a respective color to said surface of said image forming body means to form a respective toner image on said surface of said image forming body means,
wherein a respective toner image formed by a first of said plurality of developing sleeve means is superimposed on a respective toner image formed by a second of said plurality of developing sleeve means,
each respective developing sleeve means of said plurality of developing sleeve means including;
a rotatable surface member for conveying each of said two-component developers,
a plurality of magnetic poles each of which is fixed at a respective predetermined location in said rotatable surface member,
wherein said plurality of magnetic poles include a north pole and a south pole, located in the vicinity of said surface of said image forming body means and having a predetermined angle therebetween with respect to an axis of said respective developing sleeve means, so that said north pole and said south pole create a horizontal magnetic field from said respective developing sleeve means toward said surface of said image forming body means at a location where said rotatable surface member is closest to said surface of said image forming body means, said predetermined angle between said north pole and said south pole being between 25° and 80°, and wherein the middle between said north pole and said south pole is substantially at said location where said rotatable surface member is closest to said surface of said image forming body means,
developer layer thickness regulating means for regulating a layer thickness of one of said two-component developers provided on said rotatable surface member, and
developing bias generating means for applying a developing bias voltage, including an AC component, onto said respective developing sleeve means,
wherein a frequency of said developing bias voltage is between 5 KHz and 10 KHz, and at said location where said rotatable surface member is closest to said surface of said image forming body means, a layer thickness H_D (mm) of said two-component developer on said rotatable surface member and a gap D_{SD} (mm) between said surface of said image forming body means and said rotatable surface member satisfies:

$$0.02 \leqq D_{SD}-H_D \leqq 0.3,$$

and
wherein said toner of said two-component developer conveyed to said surface of said image forming body means is in an amount of between 5 and 40 mg/cm^2 at said location where said rotatable surface member is closest to said surface of said image forming body means.

5,532,804
DEVICE FOR DEVELOPING AN ELECTROSTATIC IMAGE ON AN IMAGE MEMBER
Kei Hirata; Tomoyoshi Chihara; Nobumasa Furuya, and Takeshi Sumikawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Jul. 15, 1994, Ser. No. 275,440
Claims priority, application Japan, Jul. 16, 1993, 5-197725
Int. Cl.^{6} G03G *15/09*
U.S. Cl. 355—251 **18 Claims**



1. A developing device for developing a latent image formed on an electrostatic latent image retaining member, comprising:
a developer carrying member having a circumferential surface portion for transporting a magnetically attracted two-component developer containing magnetic carriers and nonmagnetic toner disposed facing said electrostatic latent image retaining member, wherein an alternating electric field is formed in a developing area where said electrostatic latent image retaining member faces said developer carrying member, the nonmagnetic toner of the two-component developer, which is kept in noncontact with said developer carrying member, is transferred to said electrostatic latent image retaining member in the alternating electric field, thereby visualizing an electrostatic latent image formed thereon;
a magnet concentrically disposed within said developer carrying member and having an array of magnetic poles of different polarities alternately and circumferentially arrayed at the sur-

face thereof at such a pitch that a plural number of the magnetic polarities are contained in the developing area, and wherein said magnetic pole pitch is established to be longer than a distance between said magnet surface and said developer carrying member surface.

5,532,805
METHOD AND APPARATUS FOR DIRECT PRINTING OF IMAGES

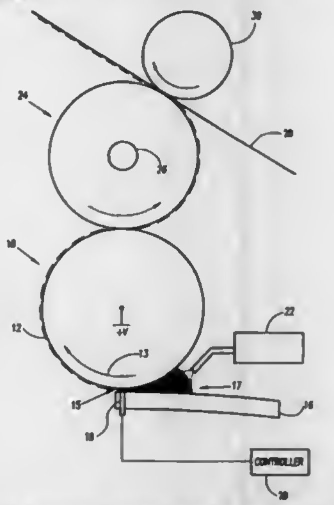
Benzion Landa, Edmonton, Canada, assignor to Indigo N.V., Netherlands

PCT No. PCT/NL91/00181, § 371 Date Aug. 2, 1994, § 102(e) Date Aug. 2, 1994, PCT Pub. No. WO93/06532, PCT Pub. Date Jan. 4, 1993

PCT Filed Sep. 20, 1991, Ser. No. 204,392

Int. Cl.^{6} G03G ***15/10***

U.S. Cl. 355—256 **47 Claims**



1. A method of forming images on a member comprising:

supplying a layer of material comprising charged toner particles and carrier liquid to a space between a first, moving member having a direction of motion and a second, stationary member closely spaced therefrom; and

selectively applying an electric field between the first and second members and transverse to the direction of motion of the moving member across selected segments of the layer of material, causing certain segments of the layer to adhere to the moving member in image configuration thereon for a first value of the electric field and other segments of the layer to adhere to the second member for a second value of the electric field.

5,532,806
IMAGE FIXING APPARATUS HAVING MEANS FOR PREVENTING TEMPERATURE UNEVENNESS

Takeshi Sugita; Nobukazu Adachi; Akira Kuroda, all of Yokohama, and Manabu Takano, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,970

Claims priority, application Japan, Apr. 28, 1993, 5-102045; Apr. 28, 1993, 5-102732

Int. Cl.^{6} G03G ***15/20***

U.S. Cl. 355—285 **16 Claims**

1. An image fixing apparatus, comprising:

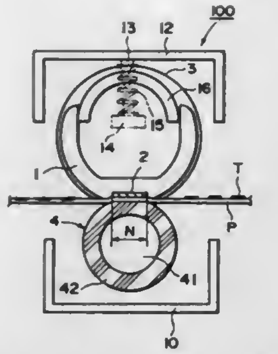
a heating member;

a film in slidable contact with said heating member;

a pressing roller cooperable with said heating member to form a nip with said film therebetween;

wherein said pressing roller comprises a core metal of aluminum and has a rubber layer outside said core metal and a ratio of cross-sectional area of said core metal to that of said pressing roller is not less than 25%; and

a metal member for transferring heat from said heating member.



5,532,807
HEATING ROLLER HAVING ELECTRODES FOR SUPPLYING POWER TO A HEATING ELEMENT

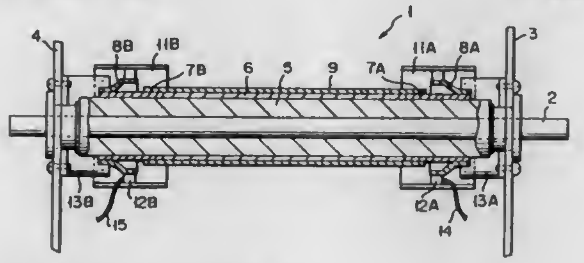
Takeshi Takemoto, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,789

Claims priority, application Japan, Dec. 27, 1993, 5-329163

Int. Cl.^{6} G03G ***15/20***

U.S. Cl. 355—289 **5 Claims**



1. A heating roller comprising:

a heating element;

an electrode member which comes in contact with a power supplying member for supplying power to said heating element and resiliently fitted to said heating element;

a bearing for rotatably supporting the heating roller having the heating element; and

a structural member for supporting said bearing;

power being supplied to said heating element by the electrode member and the power supplying member, a movement of said heating roller in a thrust direction is restricted by making the electrode member resiliently fitted to said heating element come in contact with said bearing or said structural member.

5,532,808
ELASTIC FIXING ROLLER FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

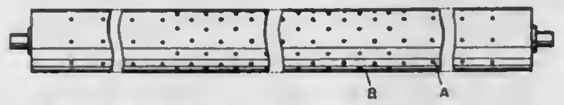
Shinji Saito, Suntoh-gun, and Akihiko Sugizaki, Numazu, both of, Japan, assignors to Nitto Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1995, Ser. No. 412,484

Claims priority, application Japan, Sep. 2, 1994, 6-209653

Int. Cl.^{6} G03G ***15/20***

U.S. Cl. 355—290 **7 Claims**



1. An image fixing elastic roller comprising:

a metal core;

a sponge layer provided around said metal core; and

a fluoroplastic layer provided around said sponge layer and formed with a plurality of holes in a predetermined distribution, wherein a distribution density of said holes of the fluoroplastic layer is larger at the central portion of the roller than at end portions thereof.

5,532,809
COPYING MACHINE HAVING AUTOMATIC DOCUMENT FEEDING DEVICE

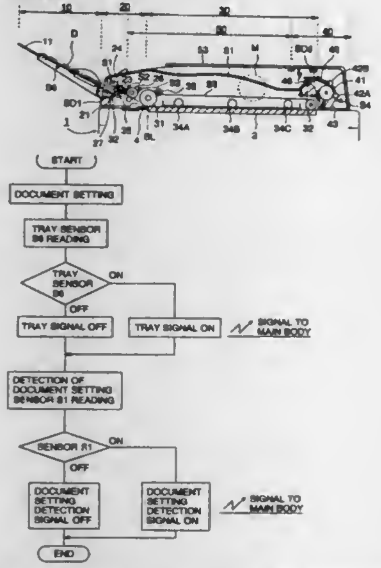
Izumi Hamanaka; Mitsuru Nagoshi, both of Hachioji; Toshio Yokoyama, Kiyose; Toshitaka Matsumoto, Asaka; Hiroshi Gomi, Urawa; Masaru Goto, Tokyo, and Masaaki Sekiguchi, Asaka, all of, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 4, 1994, Ser. No. 206,539

Claims priority, application Japan, Mar. 8, 1993, 5-046757; Mar. 8, 1993, 5-046758; Mar. 11, 1993, 5-050824

Int. Cl.^{6} G03G ***21/00***

U.S. Cl. 355—308 **4 Claims**



1. A copying apparatus provided with an automatic document feeding apparatus, comprising:

(a) a document stacker on which a plurality of documents are positioned and stacked;

(b) a document feeding section for separating a sheet of document from the plurality of documents stacked on said document stacker and then for feeding;

(c) an image reading section for reading an image of the document fed by said document feeding section;

(d) a conveyance section for conveying the document fed by said document feeding section and for stopping at a predetermined position at which image reading operation is conducted by said image reading section, and then for conveying;

(e) a sheet ejecting section disposed at a downstream side in a conveying direction from said image reading section, for ejecting the document conveyed by said conveyance section;

(f) an exit tray section for receiving the document ejected by said ejecting section;

(g) a detector provided on said document stacker, for detecting passage of a trailing edge of a last document stacked on said document stacker and for sending a detected signal to a main body of said copying apparatus; and

(h) control means for controlling feeding of recording sheets stored in a sheet feeding section provided in said main body, according to the detected signal.

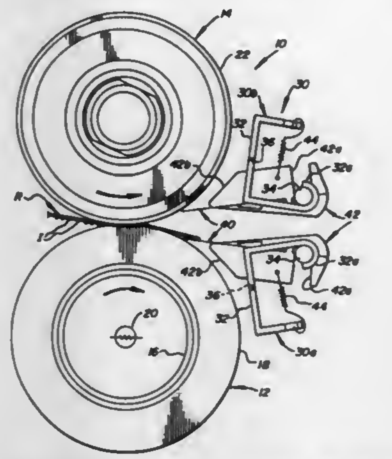
5,532,810
FUSER ROLLER SKIVE MECHANISM HAVING ANTI-GOUGING SKIVE FINGERS

David F. Cahill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1994, Ser. No. 335,933

Int. Cl.^{6} G03G ***21/00***

U.S. Cl. 355—315 **7 Claims**



1. In a fuser assembly having a pair of rollers and in nip relation to transport a receiver member therebetween to permanently fix a marking particle image to such receiver member, at least one skive mechanism for stripping a receiver member adhering to a fuser assembly roller from said roller, said skive mechanism comprising:

at least one elongated, relatively flexible skive finger;

means, associated with said at least one skive finger, having a body portion for supporting a major portion of said skive finger so as to increase the rigidity thereof;

an elongated shaft having a longitudinal axis, said longitudinal axis of said elongated shaft being substantially parallel with the longitudinal axis of a roller of said fuser assembly, said axes spaced apart a predetermined fixed distance less than the sum of the longitudinal dimension of said body portion of said skive finger supporting means and the radius of said fuser assembly roller; and

said skive finger support means mounted on said elongated shaft for movement about said longitudinal axis of said elongated shaft to a first position where said at least one skive finger engages said roller with said skive finger supporting means spaced from said roller, or a second position where said at least one skive finger engages said roller with said skive finger supporting means in engagement with said roller to limit flexing of said skive finger to substantially prevent gouging of the peripheral surface of the fuser assembly roller or damage to said skive finger.

5,532,811
SHEET FEED MECHANISM WITH CONTROL FOR ADVANCEMENT AND RETRACTION OF PAPER

Tomoyuki Nishikawa, and Yoshimi Saito, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 267,245

Claims priority, application Japan, Jun. 30, 1993, 5-186810

Int. Cl.^{6} G03G ***21/00***

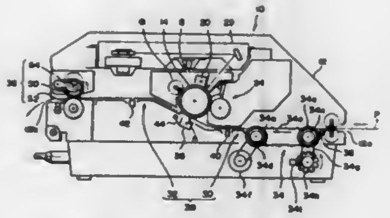
U.S. Cl. 355—316 **11 Claims**

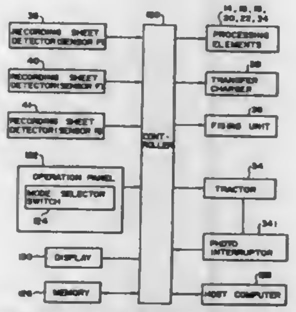
1. In an electrophotographic printer for printing an image onto a continuous sheet, a sheet feed mechanism comprising:

means for defining a sheet path;

a feeding device for advancing a printed portion of said continuous sheet to discharge said printed portion of said continuous sheet from said printer and for retracting said continuous sheet into said printer along said sheet path;

means for checking if a successive page of image data to be printed, after said printed portion, is available to be printed;





means for controlling said feeding device to advance said printed portion of said continuous sheet to discharge from said printer in response to said checking means indicating that said successive page of image data is not available to be printed; and

means for prohibiting said advancing of said printed portion of said continuous sheet to discharge from said printed even when a successive page of image data to be printed is not available,

whereby said prohibiting means prohibits advancement of said printed portion if said checking means indicates that said successive page of image data to be printed is not available due to a pause in transmission of image data.

5,532,812
APPARATUS FOR FORMING A COPY OF AN ORIGINAL IMAGE ON A SHEET OF PAPER

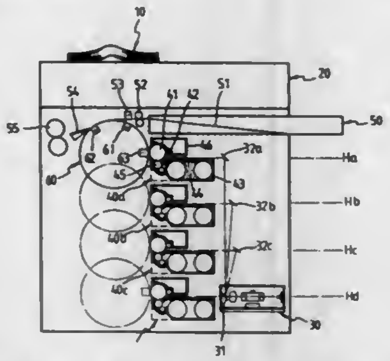
Min-ho Choi; Kyung-hwan Kim; Byeong-sik Cheon, all of Suwon; Young-gi Kim, Euiwang; Hwa-seong Shin, and Yong-kook Kim, both of Suwon, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 7, 1994, Ser. No. 319,811

Claims priority, application Rep. of Korea, Apr. 12, 1994, 94-7658; Apr. 12, 1994, 94-7659; Apr. 30, 1994, 94-9548; Jun. 30, 1994, 94-15690

Int. Cl.^{6} G03G *15/01;15/04*

U.S. Cl. 355—327 **20 Claims**



1. An image forming apparatus for forming an image on a sheet of paper comprising:

a plurality of image forming units, each image-forming unit having photoconductive drum for forming a latent image by exposure and a developing device for containing a respective color developer for developing the latent image, thereby providing different colored developed images;

an exposing device for projecting light according to image information;

optical passage control means for controlling passage of the light projected by said exposing device to expose the photoconductive drum of a selected image forming unit among said plurality of image forming units;

transfer means for transferring an image developed by the selected image forming unit from the photoconductive drum of the selected image forming unit onto a sheet of paper;

paper feeding and ejecting means for feeding the sheet of paper to said transfer means and for ejecting the sheet of paper; and

means for moving said transfer means to respective positions corresponding to each of said image forming units.

5,532,813
OPTICAL DISTANCE METER AND LIGHT SOURCE DEVICE USED FOR THE SAME

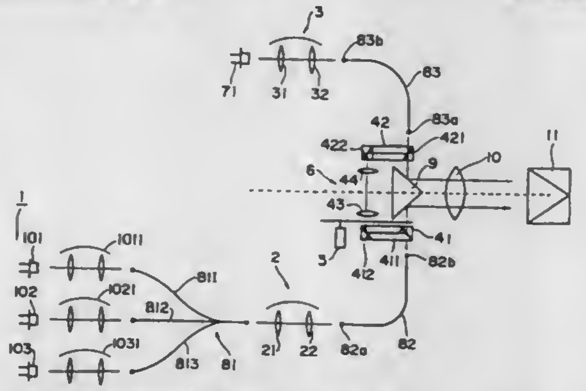
Masahiro Ohishi; Fumio Ohtomo; Kazuaki Kimura; Masaaki Yabe; Yasutaka Katayama; Kazushige Koshikawa, and Takeshige Saito, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 171,277

Claims priority, application Japan, Dec. 21, 1992, 4-356756

Int. Cl.^{6} G01C *3/08;* **H01S** *3/10;* **H01L** *31/14*

U.S. Cl. 356—5.01 **8 Claims**



1. A light-wave distance meter comprising:

a light source device for emitting reference modulated light beams from a plurality of spatially-separated light emitting areas, said light beams having different center wavelengths;

optical guide means for unifying said reference modulated light beams emitted from said light emitting areas;

optical means for radiating a light beam produced from the light beams emitted by said light source device to a target of distance measurement;

light beam reception means for receiving a reflected return light beam from the target and transducing the return light beam into an electrical pulse signal; and

distance measuring means for calculating the distance to the target based on the time difference between the radiation of the reference light beam and the reception of the return light beam.

5,532,814
HOLOGRAPHIC DIFFRACTION IMAGE VELOCIMETRY FOR THREE-DIMENSIONAL THREE-COMPONENT PARTICLE FIELDS OR SOLID OBJECTS

Soyoung S. Cha, 716 Grange Ct., Wheaton, Ill. 60187

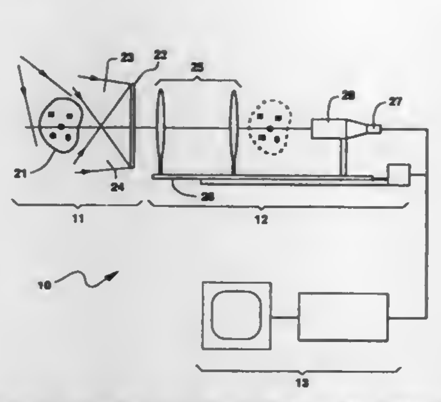
Filed Jun. 20, 1994, Ser. No. 261,775

Int. Cl.^{6} G01P *3/36*

U.S. Cl. 356—28.5 **9 Claims**

1. A system for performing three-dimensional, three-component displacement or velocity field detection from a single observation direction defining an optical axis, said system comprising:

a double-reference beam, off-axis holographic recording system disposed on said optical axis and including means for independently recording two three-dimensional images of a displacing particle or image-element field corresponding to two distinct moments on a single holographic plate, and means for reconstructing said images with separate beams;



an image acquisition system disposed on said optical axis and including a large aperture image relay optics system to re-image said reconstructed images, a magnifying optical element for magnifying said re-imaged images, and a solid state detector for receiving said magnified images and digitizing them; and

a control and processing means for receiving said digitized images and processing them according to an algorithm:

$$C(u,v\backslash w)=\iint I_{w_1}(x-u,y-v,0)I_{w_2}(x,y,w)dxdy$$

$$I_{w_1}(x,y,0)=I_1(x,y,0)W_1(x,y)$$

$$I_{w_2}(x,y,z)=I_2(x,y,z)W_2\ (x-\Delta x_p,y-\Delta y_p,z-\Delta z,$$

where C equals correlation value, I_1 equals initial particle-field image, W_1 equals interrogation plane window centered at an origin, I_2 equals displaced particle-field image, and W_2 equals transplaced search volume window centered at a displacement estimate $(\Delta x_i, \Delta y_i, \Delta z_i)$.

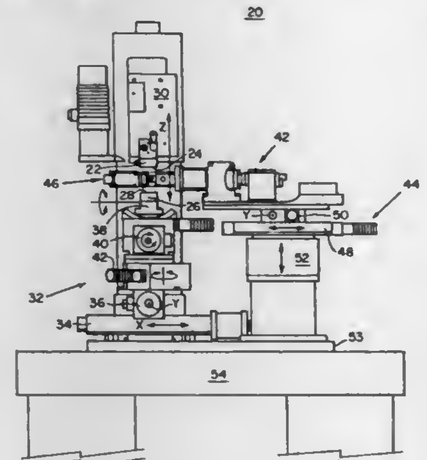
5,532,815
SYSTEM AND METHOD FOR ALIGNING A FIRST SURFACE WITH RESPECT TO A SECORD SURFACE

Yair Y. Kipman, West Newton; Paul A. McDonald, North Billerica, and Robert D. Schuchatowitz, Brighton, all of Mass., assignors to KDY Associates, Inc., Nashua, N.H.

Filed Jun. 17, 1994, Ser. No. 262,551

Int. Cl.^{6} G01B *11/26*

U.S. Cl. 356—139.03 **46 Claims**



1. A system for aligning a first surface with respect to a second surface, comprising:

means for determining the distances between the first and second surfaces at at least three locations on the surfaces;

means, responsive to said means for determining, for detecting differences in the distances between the first and second surfaces at said at least three locations; and

alignment means, responsive to said detecting means, for moving at least one of the surfaces until there is no nominal difference in the distances between the first and second surfaces at said at least three locations.

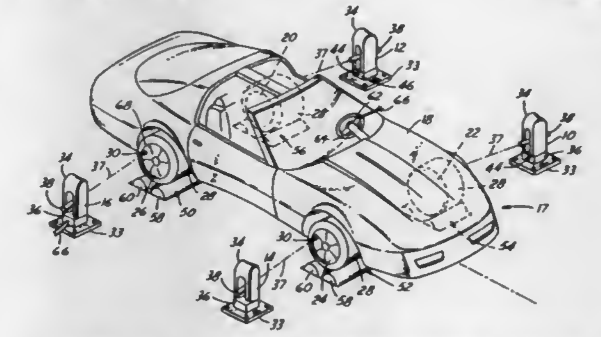
5,532,816
LASER TRACKING WHEEL ALIGNMENT MEASUREMENT APPARATUS AND METHOD

Kyle T. Spann, Sterling Heights, and Peter G. Karcz, Farmington Hills, both of Mich., assignors to Stellar Industries, Inc., Madison Heights, Mich.

Filed Mar. 15, 1994, Ser. No. 213,120

Int. Cl.^{6} G01B *11/26;* **B01C** *1/00*

U.S. Cl. 356—139.09 **27 Claims**



1. A method for determining the actual rotational plane of at least two wheels of a vehicle in a common coordinate system, comprising the steps of:

positioning a first reflective device on a first wheel at any point on said first wheel offset from the central axis of rotation of said first wheel;

positioning a second reflective device on a second wheel at any point on said second wheel offset from the central axis of rotation of said second wheel;

rotating said first wheel about its central axis of rotation while the vehicle is in a natural loaded driving condition;

rotating said second wheel about its central axis of rotation while the vehicle is in a natural loaded driving condition;

tracking the position of said first and second reflective devices respectively in three dimensional space during the rotation of said first and second wheels by directing a light beam at said reflective device capable of accurately following the movement of said reflective device;

generating a first signal directly representative of the actual rotational plane of said first wheel; and

generating a second signal directly representative of the actual rotational plane of said second wheel.

5,532,817
METHOD OF OPTICAL INSPECTION

Robert A. DeVries; Reed A. Shick; G. Thomas Wells, and Joseph N. Carr, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

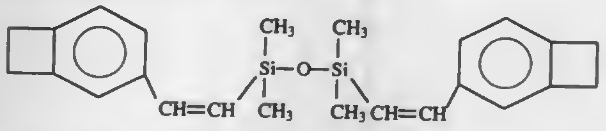
Filed Oct. 3, 1994, Ser. No. 317,089

Int. Cl.^{6} G01B *11/02;15/02*

U.S. Cl. 356—318 **1 Claim**

1. A method for determining a thickness or uniformity of thickness of a resin portion of an article or the presence of cracks, voids,

mounds or contaminants comprising exposing the article to a light source at a first wavelength in the near UV and measuring emission of light at a second, different wavelength; wherein the resin is a homopolymer of a monomer of the formula:



and wherein the sole source of fluorescence is the resin.

5,532,818

DIFFERENCE DISPERSIVE DOUBLE-PATH MONOCHROMATOR HAVING WAVELENGTH-INDEPENDENT IMAGING POINT

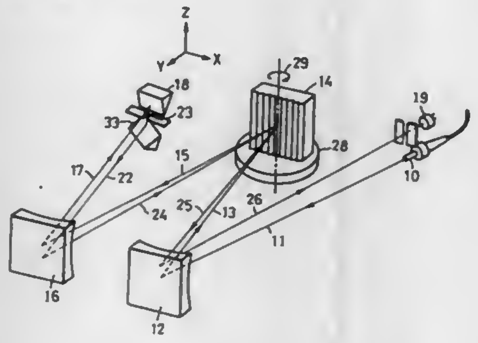
Isao Tokumoto, Gyoda, Japan, assignor to Advantest Corporation, Japan

Filed Dec. 22, 1994, Ser. No. 361,369

Claims priority, application Japan, Dec. 27, 1993, 5-074481 U

Int. Cl.^{6} G01J *3/18*

U.S. Cl. 356—333 **11 Claims**



1. A double-path monochromator comprising:

first parabolic mirror means which reflects incoming light to be measured, as parallel rays of light to a diffraction grating and reflects and converges light reflected from said diffraction grating to a photodetector;

said diffraction grating which is rotatable about a rotation axis parallel to its grating grooves and on which said parallel rays of light from said first parabolic mirror means and parallel rays of light from second parabolic mirror means are incident in a plane perpendicular to said rotation axis;

said second parabolic mirror means which reflects and converges light from said diffraction grating for incidence on a first reflecting mirror and reflects light from a second reflecting mirror for incidence as parallel rays of light on said diffraction grating;

said first reflecting mirror which reflects said light reflected from said second parabolic mirror means in parallel with said rotation axis for incidence on said second reflecting mirror;

said second reflecting mirror which reflects said incident light from said first reflecting mirror back to said second parabolic mirror means; and

said photodetector which receives said reflected and converged light from said first parabolic mirror means and converts said received light into an electric signal;

wherein at least one of said first and second reflecting mirrors bends the incident light thereon by a predetermined angle in said plane perpendicular to said rotation axis of said diffraction grating.

5,532,819

ROTARY DETECTOR HAVING AN OPTICAL SYSTEM FOR GUIDING TWO DIFFRACTED LIGHTS

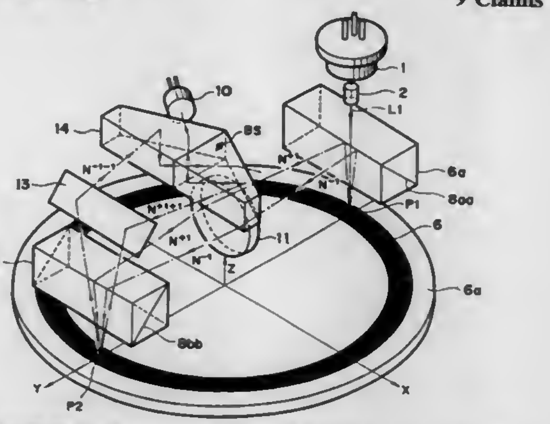
Koh Ishizuka, Urawa, and Tetsuharu Nishimura, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 983,965, Dec. 1, 1992, abandoned. This application Feb. 22, 1995, Ser. No. 392,617

Claims priority, application Japan, Dec. 4, 1991, 3-348069

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—356 **9 Claims**



1. An apparatus for measuring rotational information of a rotating object, comprising:

a rotatable diffraction grating having a center at substantially a center of rotation;

a light source;

an irradiating optical system for irradiating one luminous flux from said light source to a first point on said diffraction grating;

optical means for guiding first and second diffracted luminous fluxes emerging from the first point at respective emerging angles and diffracted to have a same order but different signs to be incident at a second point on said diffraction grating at respective incident angles relative to a rotational direction of said grating, with the second point positioned substantially opposite to the first point on said diffraction grating with respect to the center of rotation, wherein the first diffracted luminous flux is irradiated from the first point to the rotational direction relative to an axis normal to said diffraction grating and is incident on the second point from a direction opposite to the rotational direction relative to the normal axis of said diffraction grating, and the second diffracted luminous flux is irradiated from the first point in the direction opposite to the rotational direction relative to the normal axis of said diffraction grating and is incident on the second point from the rotational direction relative to the normal line of said diffraction grating;

a wave superposing optical system for superposing the two rediffracted fluxes diffracted at the second point with the order of the same signs at the first point, respectively, wherein the two rediffracted fluxes are irradiated from the second point in a direction different from their respective incident angles; and

detectors for detecting said superposed rediffracted lights, whereby the rotational information of the rotating object is measured.

5,532,820

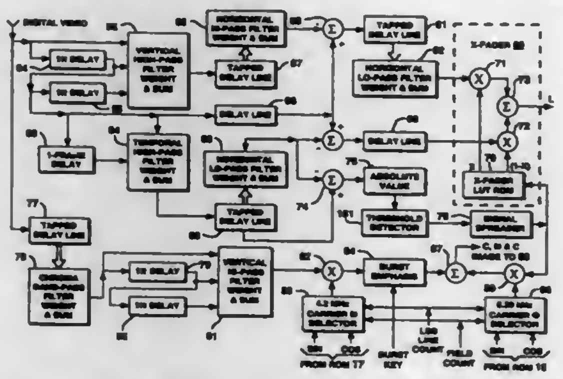
DIGITAL MODULATORS FOR USE WITH SUB-NYQUIST SAMPLING OF RASTER-SCANNED SAMPLES OF IMAGE INTENSITY

Christopher H. Strolle, Glenside, Pa., and Hermann J. Weckenbrock, Bordentown, N.J., assignors to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation-in-part of Ser. No. 787,690, Nov. 4, 1991, which is a continuation-in-part of Ser. No. 635,197, Jan. 2, 1991, which is a continuation-in-part of Ser. No. 569,029, Aug. 17, 1990, Pat. No. 5,113,262. This application Jan. 13, 1992, Ser. No. 819,890

Int. Cl.^{6} H04N *9/79;7/12*

U.S. Cl. 358—310 **52 Claims**



1. Apparatus for processing a video signal that is raster scanned, with successive scan lines occurring at a prescribed scan line rate within image fields and occurring in first and second spatially interleaved sets of scan lines within each image field, said video signal being a baseband video signal of a prescribed bandwidth extending up to a prescribed maximum frequency, said apparatus comprising:

means for generating a digitized video signal by digitizing said video signal;

a band-splitting filter with a crossover frequency of one-half said prescribed maximum frequency, for separating said digitized video signal into samples of a lower-frequency-band component and into samples of a higher-frequency-band component;

a balanced modulator for modulating a carrier wave of said prescribed maximum frequency in accordance with said higher-frequency-band component to generate a digital balanced modulation signal essentially free of remnant of said higher-frequency-band component and said carrier wave; and

means for linearly combining said digital balanced modulation signal with said lower-frequency-band component.

5,532,821

TESTING OF RECESSED SURFACES AT GRAZING INCIDENCE

Mark J. Tronolone, Fairport; Paul G. Dewa, Newark; James E. Platten, Penfield, and John H. Bruning, Pittsford, all of N.Y., assignors to Tropel Corporation, Fairport, N.Y.

Filed Mar. 16, 1995, Ser. No. 404,923

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—359 **43 Claims**

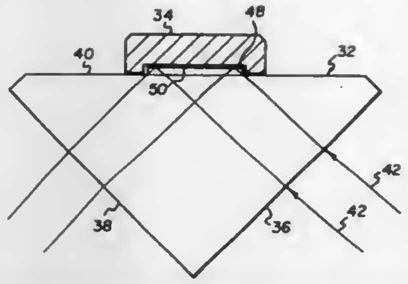
1. An interferometer for measuring recessed surfaces in test pieces comprising:

a light source for producing a primary beam of light;

a prism for projecting the primary beam toward a test piece;

a prism extender sized to fit within a recess of the test piece between the prism and a bottom surface of the recess; and

said prism extender having a reference surface for reflecting a portion of the primary beam as a reference beam and for transmitting another portion of the primary beam as a test beam that reflects from the bottom surface of the recess at grazing incidence and recombines with the reference beam at the reference surface for producing a pattern of interference indicative of differences between the reference and bottom surfaces.



5,532,822

METHOD OF MEASURING ORTHOGONALITY OF STAGE UNIT

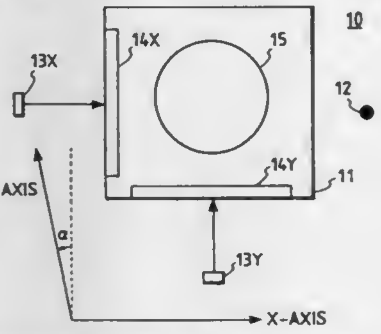
Tadaaki Shinozaki, Kawasaki; Manabu Toguchi, Kawagoe; Kunihiro Kawae, Machida, and Kazuo Murano, Sagamihara, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 406,171

Claims priority, application Japan, Mar. 22, 1994, 6-050557

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—363 **3 Claims**



1. A method of measuring an orthogonality of a movement coordinate system of a stage unit having a stage which two-dimensionally moves along the movement coordinate system determined by first and second axes that cross each other, comprising the steps of:

mounting a measurement substrate having at least three measurement patterns on the stage, the at least three measurement patterns including at least two first patterns arranged on a straight line parallel to a third axis on an array coordinate system determined by the third and fourth axes crossing each other, and at least two second patterns arranged on a straight line parallel to the fourth axis;

aligning the third axis with respect to the first axis of the movement coordinate system;

obtaining a difference in an angle between the fourth axis of the array coordinate system and the second axis of the movement coordinate system as a first deviation by detecting positions of the second patterns on the movement coordinate system in an aligned state of aligning the third axis with respect to the first axis;

rotating the measurement substrate by 90 degrees from the aligned state and mounting the measurement substrate on the stage;

aligning the fourth axis with respect to the first axis of the movement coordinate system;

obtaining a difference in an angle between the third axis of the array coordinate system and the second axis of the movement coordinate system as a second deviation by detecting positions of the first patterns on the movement coordinate system in an aligned state of aligning the fourth axis with respect to the first axis; and

obtaining the orthogonality of the movement coordinate system on the basis of the first and second deviations.

5,532,823
METHOD OF MEASURING OPTICAL CHARACTERISTICS OF LIQUID CRYSTAL CELLS, MEASUREMENT EQUIPMENT THEREFOR AND METHOD FOR MANUFACTURING LIQUID CRYSTAL DEVICES

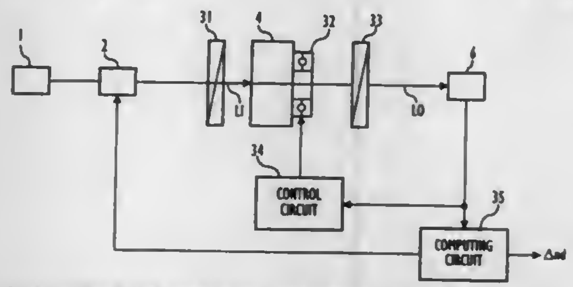
Atsushi Fukui; Kanji Nishii, both of Osaka; Kenji Takamoto, Neyagawa, and Masami Ito, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 206,677, Mar. 7, 1994, abandoned. This application Dec. 22, 1994, Ser. No. 361,546

Claims priority, application Japan, Mar. 8, 1993, 5-046314

Int. Cl.^{6} G01J *4/00*

U.S. Cl. 356—364 **11 Claims**



1. A method for measuring retardation Δnd of a liquid crystal cell having a known twist angle comprising steps:

inputting a linearly polarized light beam, having a wavelength, to said liquid crystal cell;

rotating said liquid crystal cell in a plane normal to an optical axis of a measuring optical system so that the transmission through said liquid crystal cell for a component of an emerging light beam having a polarization parallel to that of said linearly polarized light beam becomes maximal;

scanning the wavelength of said linearly polarized light beam to detect at least one wavelength at which the transmission of said component of said emerging light beam has a maximum or minimum value; and

calculating retardation Δnd of said liquid crystal cell based upon said known twist angle and at least one wavelength detected.

5,532,824
OPTICAL MOTION SENSOR

Dennis N. Harvey, Victoria, and Randal L. Jenniges, Bloomington, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 186,310, Jan. 25, 1994, Pat. No. 5,463,463. This application Apr. 28, 1995, Ser. No. 430,425

Int. Cl.^{6} G01B *11/14*

U.S. Cl. 356—375 **16 Claims**

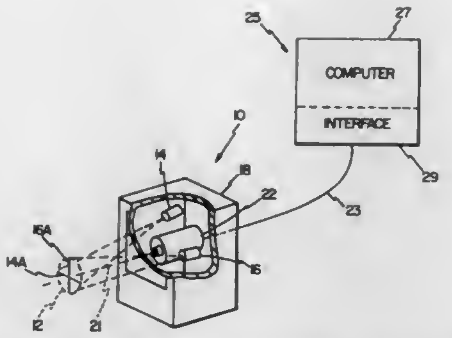
1. A method for determining a position of an object having a first pattern thereon, the object moving within a region with respect to a reference coordinate system, the method comprising the steps of:

projecting a second pattern upon a surface of the object;

sensing an image of the region including an image of the first pattern and an image of the second pattern, said image constituting a fixed defined portion of the region;

providing an image signal representing the image of the fixed defined portion of the region; and

analyzing the image signal to detect positional changes of the image of the first pattern in the image of the fixed defined portion of the region and to detect positional changes of the image of the second pattern in the image of the fixed defined portion of the region and to ascertain the position of the object based on a position of the image of the first pattern in the image of the fixed defined portion of the region and on a position of the image of the second pattern in the image of the fixed defined portion of the region.



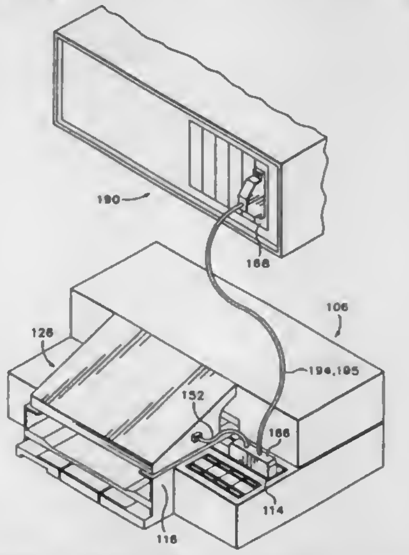
5,532,825
ADD-ON SCANNER FOR EXISTING INK JET PRINTER

Chuin K. Lim, Singapore, Singapore, and Frank L. Cloutier, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1993, Ser. No. 113,878

Int. Cl.^{6} H04N *1/23;1/04;1/034;* **B41J** *29/13*

U.S. Cl. 358—296 **20 Claims**



1. A method for operating an ink-jet printer for scanning images, the printer being of the type having a frame defining a print media path, means for advancing print media along said media path, an output path for receiving print media after passing through said print media path, a carriage mounted on said frame for traversing said media path, an ink-jet print head mountable on said carriage for printing upon media received in said media path, and means for selecting between optically scanning print media received in said media path in a scanning mode and printing upon media received in said media path in a printing mode, said method comprising the steps of:

printing on said print media in the printing mode;

placing said printer in the scanning mode;

inserting print media having an image thereon into a print media input of the printer;

mounting a scanner on the printer output tray;

advancing the print media through the print media path in the printer; and

scanning the image as the print media moves through the print media path.

5,532,826
FACSIMILE APPARATUS

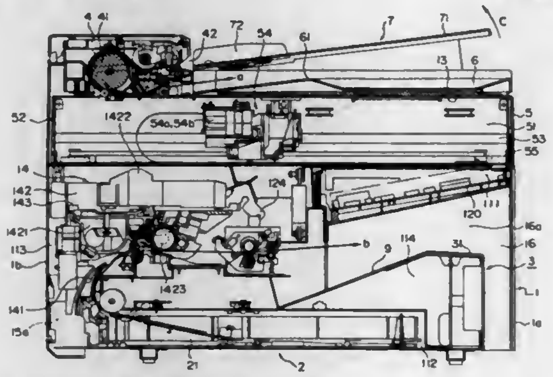
Masumasa Miyao, Fujisawa; Yuji Kawano, and Masaki Sato, both of Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1994, Ser. No. 199,027

Claims priority, application Japan, Feb. 24, 1993, 5-035686

Int. Cl.^{6} H04N *1/21;* **G03G** *15/00*

U.S. Cl. 358—296 **8 Claims**



1. A facsimile apparatus comprising:

an apparatus body having an operation control portion which can be operated from a front side thereof;

a box-like cover disposed on an upper face of said apparatus body and having a document reading surface;

document reading means including an image reading portion within a space of said box-like cover capable of moving laterally in said space as to face said document reading surface, said image reading portion having a line sensor and a mechanism for moving said line sensor, said line sensor being brought to a position below a document U-turn conveyance mechanism to read, at said position, a sheet-shaped document from a document sheet supply tray when said sheet-shaped document from the tray is read to be transmitted, and being moved along said document reading surface to read a document on said document reading surface when said document on said reading surface is read to be transmitted;

cover means including a document cover so mounted to said box-like cover so as to be opened or closed and capable of covering said document reading surface;

document U-turn conveyance means disposed on one side of an upper face of said box-like cover to face said document reading means and adapted to convey a sheet-shaped document downwards and in a U-turn manner, said document U-turn conveyance means including said document U-turn conveyance mechanism which upwards conveys downwards said sheet-shaped document from said document sheet supply tray in the U-turn manner to discharge said sheet-shaped document toward said document cover;

document sheet supply means mounted to said document U-turn conveyance means and including a document sheet supply tray for supplying said sheet-shaped document to said document U-turn conveyance means;

discharged document receiving means disposed on a side opposite to said one side, on the upper face of said box-like cover adjacent to said document reading surface and including a document sheet discharge tray for receiving said sheet-shaped document discharged from said document U-turn conveyance means;

recording sheet-accommodating cassette means including a recording sheet cassette for cut sheets, said recording sheet cassette being disposed in said apparatus body in a manner to be drawn out from the front side of said apparatus body;

image recording means disposed in said apparatus body at a position above said recording sheet-accommodating cassette means, said image recording means including a cut sheet U-turn conveyance portion for conveying said cut sheets from said recording sheet cassette upwards and in the U-turn manner and an image recording portion for recording facsimile-transmitted information on said cut sheet conveyed in the U-turn manner; and

discharged recording sheet receiving means including a recording sheet discharge tray disposed above said recording sheet-accommodating cassette means to face said image recording means and adapted to receive said recording sheet discharged from said cut sheet U-turn conveyance portion of said image recording means.

5,532,827
APPARATUS FOR REPRODUCING IMAGE DENSITIES USING PIXEL PROCESSING AND METHOD OF USE THEREOF

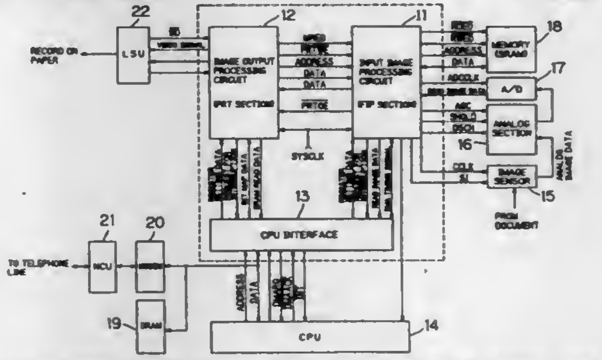
Tetsuji Kajitani; Ariyoshi Hikosaka, both of Osaka; Hideo Azumai, Toyonaka, and Satoshi Iwatsubo, Osaka, all of, Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Jul. 12, 1993, Ser. No. 89,332

Claims priority, application Japan, Jul. 13, 1992, 4-209652

Int. Cl.^{6} H04N *1/40;* **G01D** *15/14*

U.S. Cl. 358—298 **3 Claims**



1. An image density reproducing method in which density data for each pixel obtained by reading a document in a unit of a predetermined pixel using optical image reading means is processed to reproduce the density of the document, comprising the steps of:

detecting, when an image of the read document is divided into image portions each including a predetermined number of pixels constituting a predetermined matrix, a position of a target pixel which is to be processed in said predetermined matrix; and

subjecting, in accordance with gamma correction characteristics predetermined to correspond to each pixel position in said predetermined matrix, the density data corresponding to the target pixel to gamma correction on the basis of the position in said predetermined matrix of said target pixel.

5,532,828
IMAGE FORMING APPARATUS WITH EDGE SMOOTHING

Toshihiko Mitsuse, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 1, 1993, Ser. No. 143,669

Claims priority, application Japan, Nov. 4, 1992, 4-294680

Int. Cl.^{6} H04N *1/21;1/23*

U.S. Cl. 358—298 **8 Claims**

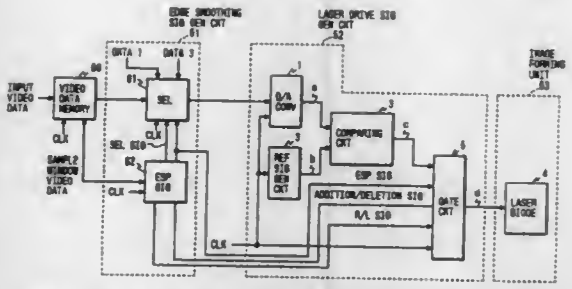
1. An image forming apparatus for forming an image, comprising:

(a) dot forming means responsive to a drive signal for forming a dot on a pixel when said drive signal indicates forming of said dot;

(b) first drive signal generation means for generating a first drive signal, having;

pulse width modulation means including:

a digital to analog converter for converting a video density signal into an analog video density signal;



first signal generation means for generating a reference sawtooth signal in phase with a clock signal which is in phase with said video density signal; and

comparing means for comparing said analog video density signal with said reference sawtooth signal to generate said first drive signal;

(c) second drive signal generation means for generating a second drive signal, having:

first inverting means for inverting said first drive signal;

second inverting means for inverting said clock signal;

second signal generation means for generating first to fourth signals in accordance with said clock signal, said first drive signal, said inverted clock signal, and said inverted first drive signal; and

first selection means for selecting and supplying either of said first to third signals as said second drive signal in accordance with an addition/deletion signal and a directional signal; and

(d) second selection means for selecting and supplying said first drive signal as said drive signal to said dot forming means when an edge smoothing signal indicates a non-smoothing mode and for supplying said second drive signal as said drive signal to said dot forming means when said edge smoothing signal indicates a soothing mode, said edge smoothing signal indicating addition and deletion of said dot, a deletion mode of said addition/deletion signal indicating that said video density signal of said pixel shows a shadow level and there is a first edge adjacent to said pixel in a first image indicated by said video density signal, an addition mode of said addition/deletion signal indicating that said video density signal of said pixel shows a highlight level and there is a second edge adjacent to said pixel in a second image indicated by said video density signal, said directional signal indicating a direction of said first and second edges from said pixel.

5,532,829
AUTOMATIC COLOR CONTROL CIRCUIT HAVING A CONTROL SIGNAL STORING CAPACITOR

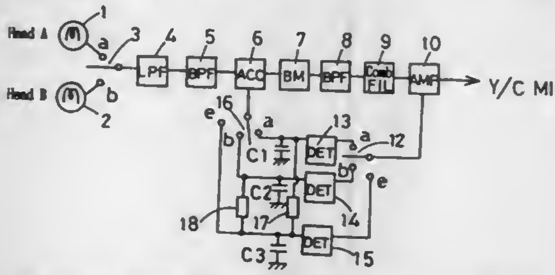
Yasunori Kawamura, Kyoto-Fu, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 860,781, Mar. 19, 1992, abandoned. This application Mar. 29, 1995, Ser. No. 412,855

Claims priority, application Japan, Mar. 20, 1991, 3-081513

Int. Cl.^{6} H04N *9/79;9/68*

U.S. Cl. 358—315 **1 Claim**



1. A control circuit in a video cassette recorder, comprising:

a first capacitor which stores a level detection signal of a color burst signal in a color signal reproduced by a first rotation head for automatic color signal level control at a time of normal reproduction;

a second capacitor which stores a level detection signal of a color burst signal in a color signal reproduced by a second rotation head for automatic color signal level control at the time of normal reproduction;

a third capacitor for special reproduction which stores a level detection signal of a reproduction color burst signal for automatic color signal level control at a time of special reproduction;

a first switch which operates to provide a color burst level detection signal to said first capacitor and said second capacitor alternately every field at the time of normal reproduction, said first switch operating to provide the color burst level detection signal only to said third capacitor at the time of special reproduction;

a second switch which provides to a gain variable amplifier for color signal amplification an output of said first capacitor and an output of said second capacitor alternately every field at the time of normal reproduction, said second switch providing an output of said third capacitor to the gain variable amplifier at the time of special reproduction; and

applying means for applying a voltage of said third capacitor to said first and second capacitors at the time of special reproduction, said applying means being activated/deactivated by a normal/special reproduction change-over signal.

5,532,830
ROUTING APPARATUS AND METHOD FOR VIDEO COMPOSITION

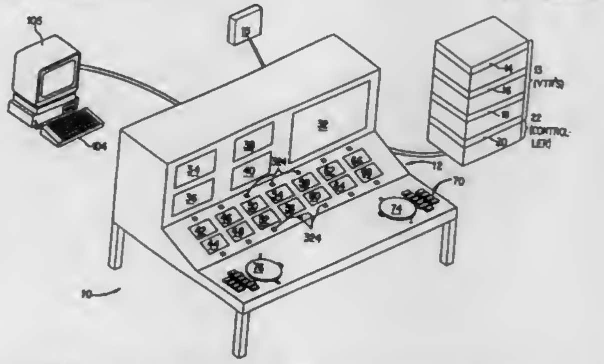
Chester L. Schuler, Sudbury, Mass., assignor to Lex Computer and Management Corporation, Keene, N.H.

Division of Ser. No. 709,985, Jun. 4, 1991, Pat. No. 5,477,337, which is a continuation-in-part of Ser. No. 556,539, Dec. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 452,287, Dec. 22, 1982, Pat. No. 4,538,188. This application Feb. 1, 1994, Ser. No. 190,343

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.^{6} H04N *5/76;* **G11B** *27/02*

U.S. Cl. 358—335 **20 Claims**



1. Apparatus for composing image source material stored on at least one image storage medium, said source material being composed of a sequence of stored frames representing a time sequential visual image, sequences of said frames being associated to form a video segment, said composing apparatus comprising:

means for inputting said source material and for recording said source material in said storage medium;

means for segmenting said source material as it is being input;

means for digitizing each frame of said source material as said source material is being input so that each video segment comprises a number of digitized frames;

a plurality of pictorial display means arranged in an ordered array, each display means providing a visual presentation of a video label selected from a sequence of said digitized frames, said video labels, in sequence, representing a sequence of said video segments,

means for storing said digitized frames,

a composing control means operative with said frame storage medium, said composing control means comprising means for selectively supplying each said pictorial display means, while said source material is being input, with electrical data signals representing a selected one of said sequence of labels,

means for sorting the label sequence displayed by said plural pictorial display means while said source material is being input; and

means for selectively manually controlling said sorting means and said composing control means.

5,532,831
RECORDING APPARATUS AND METHOD FOR A HIGH DEFINITION VIDEO CASSETTE RECORDER

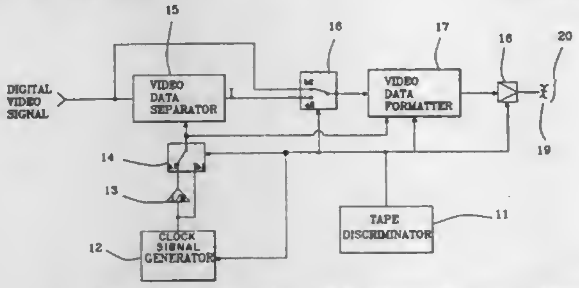
Man C. Choi; Soo K. Kim; Je H. Lee; Tae S. Yang, and Sang J. Woo, all of Seoul, Rep. of Korea, assignors to Goldstar Company, Ltd., Seoul, Rep. of Korea

Filed Mar. 10, 1994, Ser. No. 208,302

Claims priority, application Rep. of Korea, Mar. 19, 1993, 4086/1993; Mar. 19, 1993, 4229/1993; Apr. 3, 1993, 5653/1993

Int. Cl.^{6} H04N *5/76;5/92*

U.S. Cl. 358—335 **22 Claims**



1. A recording apparatus for a high definition video cassette recorder, comprising:

tape discrimination means for discriminating whether a tape is of a normal-VHS type or a super-VHS type;

clock signal generation means for generating a clock Signal of a desired period in response to an output signal from said tape discrimination means;

frequency division means for frequency-dividing the clock signal from said clock signal generation means by an integer;

first switching means for selecting between the clock signal from said clock signal generation means and the frequency-divided clock signal from said frequency division means in response to the output signal from said tape discrimination means;

video data separation means for separating intra-frame data and inter-frame data from an input digital video signal in response to the clock signal selected by said first switching means and outputting the separated intra-frame data;

second switching means for selecting between the input digital video signal and the intra-frame data from said video data separation means in response to the output signal from said tape discrimination means;

video data formatting means for formatting an output signal from said second switching means in response to the clock signal selected by said first switching means and the output signal from said tape discrimination means; and

recording means for recording on the tape an output signal from said data formatting means.

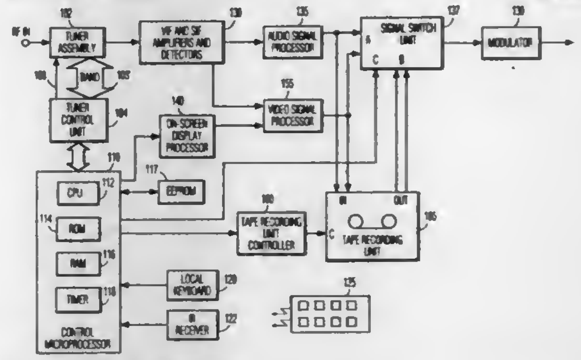
5,532,832
DELETION OF ENTRIES FROM THE CHANNEL MAPPING LIST OF A VIDEOCASSETTE RECORDER

James E. Halley, Indianapolis, and John J. Nigborowicz, Carmel, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 694,310, May 2, 1991, abandoned. This application Apr. 15, 1994, Ser. No. 233,891

Int. Cl.^{6} H04N *5/76;5/50;* **H04B** *1/18*

U.S. Cl. 358—335 **11 Claims**



11. A VCR, comprising:

means for identifying active channels and programming an autoprogramming skip list in a first memory array with autoprogramming data;

means for storing a list of channel guide numbers in a second memory array;

means for entering data;

control means for addressing said first and second memory means, and for producing control signals; and

on-screen display signal generator means for producing a display signal;

said control means using said autoprogramming data to identify elements of said channel guide list which correspond to active channels;

said control means causing said on-screen display signal generator means to generate a signal for causing a display of a list comprising channel numbers of only the active channel and their corresponding modifiable channel guide numbers;

said control means in response to data input by a user modifies a selected one of said modifiable channel guide numbers to associate a particular channel guide number with a particular active channel;

said control means deleting entries of said first and second memory means independently of one another.

5,532,833
METHOD AND SYSTEM FOR DISPLAYING SELECTED PORTIONS OF A MOTION VIDEO IMAGE

Jung-Kook Hong, Tokyo; Toyohisa Kaneko, Yokohama, and Junichi Takahashi, Tokyo, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 959,820, Oct. 13, 1992, abandoned. This application May 11, 1994, Ser. No. 240,803

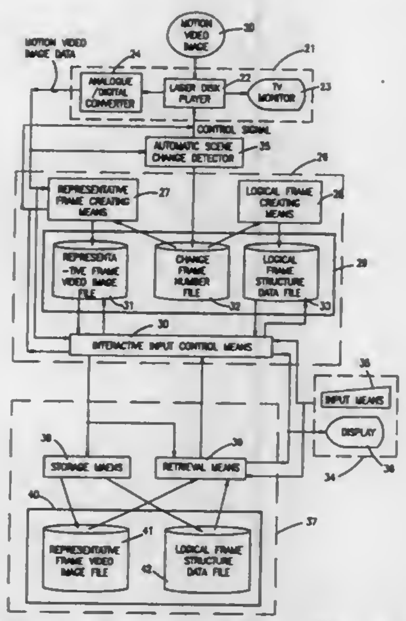
Int. Cl.^{6} H04N *5/76*

U.S. Cl. 358—335 **12 Claims**

1. A motion video image retrieval system for retrieving and displaying a desired portion of a sequence of still video image frames forming a motion video image, said system comprising:

memory means, distinct from said motion video image, comprising: means for storing frame sequence data indicating the organization of said motion video image into a plurality of still video image frame sequences according to physical or semantic changes in scenes of said motion video image, means for storing still video image data frames representative of individual still video image frames of each of said frame sequences,

means for storing logical frame structure data of said frame sequences, and


MOTION VIDEO IMAGE DATA
MOTION VIDEO IMAGE
ANALOGUE /DIGITAL CONVERTER
LASER DISK PLAYER
TV MONITOR
CONTROL SIGNAL
AUTOMATIC SCENE CHANGE DETECTOR
REPRESENTATIVE FRAME CREATING MEANS
LOGICAL FRAME CREATING MEANS
REPRESENTA-TIVE FRAME VIDEO IMAGE FILE
CHANGE FRAME NUMBER FILE
LOGICAL FRAME STRUCTURE DATA FILE
INTERACTIVE INPUT CONTROL MEANS
INPUT MEANS
DISPLAY
STORAGE MEANS
RETRIEVAL MEANS
REPRESENTATIVE FRAME VIDEO IMAGE FILE
LOGICAL FRAME STRUCTURE DATA FILE

means for storing attribute data for each of said frame sequences;

means for retrieving from said memory means a representative frame selected from said still video image data frames, corresponding to said logical frame structure and said attribute data for a selected frame sequence as selected by a user of said system; and

means for displaying said retrieved representative frame of said still video image data frames from said retrieving means, on a video display, said retrieved representative frame being said desired portion of said motion video image.

5,532,834

VIDEO CASSETTE RECORDER CAPABLE OF AUTOMATICALLY REMOVING INTERFERENCES BETWEEN A RECORDING SIGNAL AND A BROADCAST SIGNAL

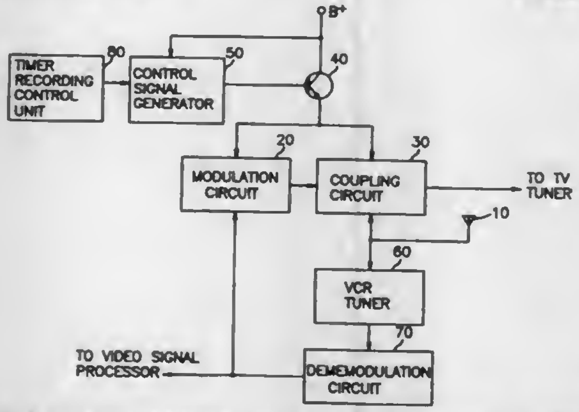
Youn-Seong Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co. Ltd., Seoul, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,145

Claims priority, application Rep. of Korea, Dec. 29, 1993, 93-31092

Int. Cl.^{6} H04N *5/76;5/63*

U.S. Cl. 358—335 **4 Claims**



1. A recording apparatus, for use in a video cassette recorder equipped with a timer recording feature, capable of automatically eliminating an interference between a first broadcast signal selected by a tuner of the video cassette recorder and a second broadcast signal selected by a television tuner, wherein the video cassette recorder has means for demodulating the selected first broadcast signal to a composite video signal, modulation means for modulating the composite video signal to a radio frequency video signal, coupling means for coupling the radio frequency video signal to the television tuner and a power supply for supplying a driving power to the modulation means and the coupling means, said apparatus comprising:

means for controlling a timer recording and generating a detection signal at a recording start time of the timer recording;

means for generating a control signal in response to the detection signal as long as the video cassette recorder is in a turn-on state; and

switching means, in response to the control signal, for decoupling the driving power from the modulation means and the coupling means, thereby preventing the radio frequency video signal from being coupled to the television tuner and allowing a viewer to watch the second broadcast signal selected by the television tuner.

5,532,835

TRACKING CONTROL IN APPARATUS FOR FAST REPRODUCING DIGITAL INFORMATION SIGNAL FROM MAGNETIC TAPE

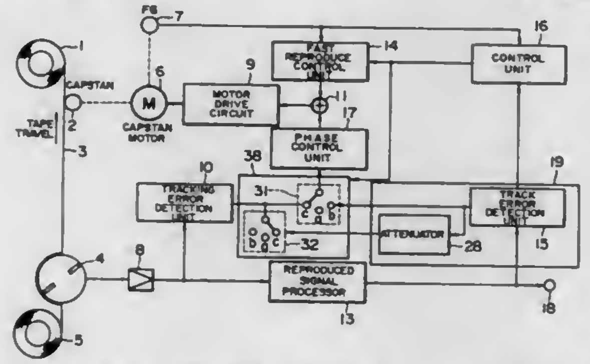
Harushige Nakagaki; Naozumi Sugimura; Takao Arai, and Yasunori Ohara, all of Yokohmama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 15, 1995, Ser. No. 441,703

Claims priority, application Japan, May 13, 1994, 6-099513; May 24, 1994, 6-109303; May 24, 1994, 6-109304

Int. Cl.^{6} H04N *5/76;5/78;* **G11B** *15/46;5/55*

U.S. Cl. 358—335 **14 Claims**



1. In a helical scan digital magnetic reproducing apparatus having a rotary cylinder, magnetic heads mounted on said rotary cylinder, and a magnetic tape wrapped around said rotary cylinder and which has a digital information signal recorded on a plurality of recorded tracks so that said magnetic heads scan said recorded tracks to read said digital information signal, a tracking control for controlling the speed of said magnetic tape in order for said magnetic heads to precisely trace said tracks, wherein said reproducing apparatus has a standard playback mode in which said apparatus makes playback operation at a normal speed and a fast playback mode in which said apparatus makes playback operation at a higher speed than said normal speed, each of said plurality of tracks is divided into a plurality of blocks each of which has recorded thereon said digital information signal, and an identification signal including a track number for indicating the corresponding one of said tracks and a block number for indicating the corresponding one of said blocks, and at least one particular block of said blocks of each track has recorded thereon said digital information signal for said fast playback mode, said particular blocks of said tracks being arranged on said plurality of tracks in such a manner that in said fast playback mode said magnetic heads scan said particular blocks along their scan path on said magnetic tape, said tracking control comprising:

fast reproduce control means for controlling said magnetic tape to be transported at said higher speed than said standard speed;

means for detecting positional error between the track of a reproduced one of said blocks and the track of said particular block on the basis of said identification signal of said reproduced block which said heads have reproduced and generating a track error signal corresponding to said positional error;

tracking error detection means for detecting positional error between said magnetic heads and a target track on the basis of the signal reproduced by said magnetic heads and generating a tracking error signal corresponding to said positional error;

switching means for selectively producing one of said track error signal and said tracking error signal;

phase control means for controlling the speed of said magnetic tape on the basis of the output from said switching means so that said positional error can be reduced to zero; and

control means for controlling said fast reproduce control means and said switching means to operate, wherein said control means, in said fast playback mode, controls said fast reproduce control means to operate, thereby accelerating said magnetic tape to said higher speed, and when said magnetic tape has reached said higher speed, controls said switching means to produce said track error signal, and also when said track error signal has entered in a certain range, controls said switching means to produce said tracking error signal.

5,532,836

APPARATUS FOR GRADUALLY SWITCHING VIDEO PRESENTATION OF STORED PICTURES

Erik Luyckx, and Jozef M. K. Timmermans, both of Hasselt, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

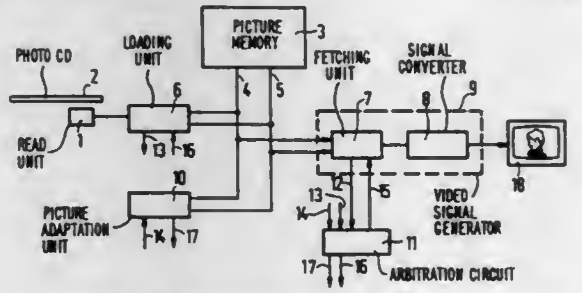
Continuation of Ser. No. 101,323, Aug. 2, 1993, abandoned.

This application Oct. 10, 1995, Ser. No. 541,999

Claims priority, application European Pat. Off., Aug. 3, 1992, 92202393

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 358—335 **18 Claims**



1. An apparatus for generating a video signal representative of still pictures, and providing a smooth shift between one picture and a new picture, wherein said one picture and said new picture are based on respective stored still picture information which requires picture data processing between read-out and video signal generation, comprising:

a picture memory having addressable storage locations for storage of signal values representing the pixels of said one picture,

video signal generating means for continuously generating, at a predetermined picture rate, a video signal defined by the stored signal values, said video signal generating means comprising

means for carrying out a fetching process in which the signal values are periodically fetched from the storage locations of the picture memory in a predetermined sequence, and

means for converting the fetched signal values into the video signal,

a record carrier reader for reading picture information of the new picture recorded on the record carrier, and

first means for carrying out a loading process in which previously stored signal values in respective storage locations are replaced by new signal values based on picture information of said new picture,

characterized in that the apparatus further comprises:

second means for carrying out at least one information adaptation process on new signal values stored in the corresponding storage locations, said information adaptation process changing at least a part of the stored signal values, wherein said second means comprises:

means for fetching signal values from the picture memory, and

means for adapting the fetched values by a predetermined adaptation process, and

control means for alternately giving a selected one of the processes exclusive access to the picture memory during generation of video signals, said control means including arbitration means for determining which of the processes is selected for access to the picture memory, said arbitration means giving lower priority to the information adaptation process than to the fetching and loading processes.

5,532,837

DIGITAL VIDEO SIGNAL PROCESSING APPARATUS

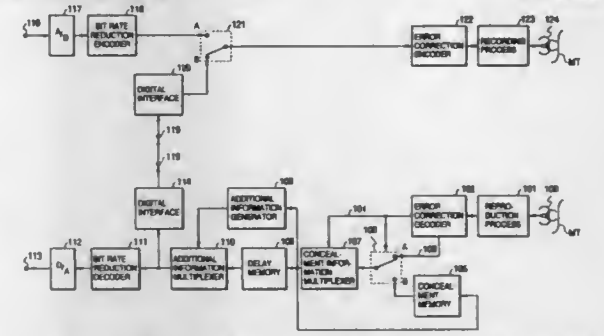
Hideki Ootaka, Neyagawa, and Tatsuro Juri, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 18, 1993, Ser. No. 154,468

Claims priority, application Japan, Dec. 18, 1992, 4-338419

Int. Cl.^{6} H04N *5/94;5/91;5/21*

U.S. Cl. 358—336 **5 Claims**


A/D
BIT RATE REDUCTION ENCODER
ERROR CORRECTION ENCODER
RECORDING PROCESS
DIGITAL INTERFACE
ADDITIONAL INFORMATION GENERATOR
ERROR CORRECTION DECODER
REPRO-DUCTION PROCESS
D/A
BIT RATE REDUCTION DECODER
ADDITIONAL INFORMATION MULTIPLEXER
DELAY MEMORY
CONCEAL-MENT INFOR-MATION MULTIPLEXER
CONCEAL-MENT MEMORY

1. A digital video signal processing apparatus for reproducing a digital video signal from bit rate reduction coded data recorded on a recording medium in the form of record blocks which have been produced by dividing a digital video signal into small blocks, forming macro blocks each being composed of a specified number of small blocks, bit rate reduction encoding each of said macro blocks, forming said record blocks from the encoded macro blocks, respectively, and recording said record blocks on the recording medium, said apparatus comprising:

a reproducing means for reproducing said record blocks from the recording medium;

an error correction means coupled to said reproducing means for correcting errors contained in the reproduced record blocks;

an error concealment means coupled to said error correction means for performing error concealment of each of the reproduced record blocks having an error which cannot be corrected by said error correction means;

a multiplexing means coupled to said error concealment means for multiplexing, among the reproduced record blocks, each record block which has been concealed by said error concealment means with a concealment information data concerning the error concealment and a decoding information data concerning a decoding of said record block which has been concealed by said error concealment means, and for multiplexing, among the reproduced record blocks, each record block which has not been concealed by said error concealment means with a concealment information data concerning the error concealment and an error flag indicating whether or not an error exists in said record block which has not been concealed by said error concealment means, to obtain multiplexed record blocks each being multiplexed with said concealment information data and one of said decoding information data and said error flag;

a first output means coupled to said multiplexing means for outputting said multiplexed record blocks;

a decoding means coupled to said multiplexing means for decoding bit rate reduction encoded data in each of said multiplexed record blocks according to said decoding information data multiplexed to each said multiplexed record block to obtain a decoded digital video signal; and

a second output means coupled to said decoding means for outputting the decoded digital video signal.

5,532,838

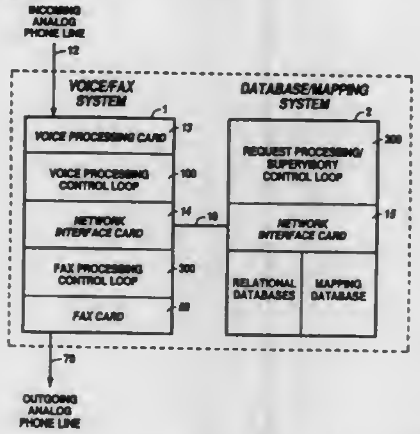
METHOD & APPARATUS FOR DYNAMICALLY CREATING AND TRANSMITTING DOCUMENTS VIA FACSIMILE EQUIPMENT

Edward P. Barbari, 2941 Belmont Woods Way, Belmont, Calif. 94002

Continuation of Ser. No. 175,212, Dec. 27, 1993. This application Apr. 14, 1995, Ser. No. 422,630

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 358—400 **11 Claims**



1. Programmable computer-based apparatus for dynamically creating a map responsive to a remote user's request received on a telephone receiving and transmitting means, said map including at least one map page, and for transmitting said map to said user via said telephone transmitting means, the apparatus comprising:

a programmed computer having memory;

data storage and retrieval means operatively associated with said computer;

format conversion means for converting document data presented in a page description format into a format suitable for facsimile transmission;

a mapping database, containing alphanumeric map data which define map features in terms of geographic coordinates, stored in said data storage and retrieval means;

a plurality of listings stored in said data storage and retrieval means, each of said listings being defined in terms of geographic coordinates;

display means operatively associated with said computer; voice processing means operatively associated with said computer; and

a computer implemented process for receiving said user's request as a first DTMF telephonic signal via said telephone receiving means, said request being formed in response to prerecorded voice message prompts from said voice processing means, comparing said request with said listings stored in said data storage and retrieval means, selecting ones of said listings which most closely approximate said user's request, dynamically creating a map page in a page description format using alphanumeric map data from said mapping database, said map page containing map information specific to said selected ones of said listings, converting the dynamically created map page into a format suitable for facsimile transmission using said format conversion means, storing said converted map page in said data storage and retrieval means, and transmitting, as a second telephonic signal via said telephone transmitting means, said map page from said data storage and retrieval means to said user.

5,532,839

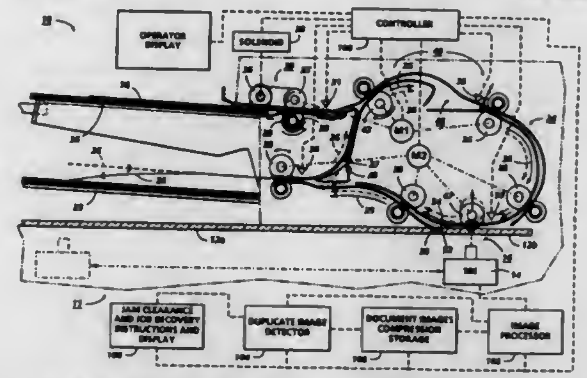
SIMPLIFIED DOCUMENT HANDLER JOB RECOVERY SYSTEM WITH REDUCED MEMORY DUPLICATE SCANNED IMAGE DETECTION

Thomas R. Belkirch, Webster, and Margaret C. Plain, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1994, Ser. No. 334,994

Int. Cl.^{6} H04N *1/00;1/04*

U.S. Cl. 358—401 **6 Claims**


OPERATOR DISPLAY
SOLENOIDS
CONTROLLER
JAM CLEARANCE AND JOB RECOVERY INSTRUCTIONS AND DISPLAY
DUPLICATE IMAGE DETECTOR
DOCUMENT IMAGES COMPRESSION STORAGE
IMAGE PROCESSOR

3. In a document handling and digital imaging system for sequentially feeding plural document sheets in a document feeding path from a document input to an electronic imaging station to be digitally electronically imaged in electronic pixels as document page images and fed out from said electronic imaging station after said electronic imaging, with a system for detecting document sheet feeding stoppages in said document feeding path, the improvement comprising a simplified job recovery system including:

a system for generating and storing electronic indicia indicative of said digital electronic page images of said documents which have been fed in said document feeding path to said electronic imaging station and electronically imaged;

an operator display instructing the operator in response to a said detected sheet feeding stoppage in said document feeding path to remove document sheets from said document feeding path and reload said removed document sheets into said document input even if said removed document sheets have been electronically imaged, for refeeding said removed document sheets in said document feeding path from said document input to said electronic imaging station to be electronically imaged;

said system for generating and storing electronic indicia indicative of said digital document page images further electronically generating and storing subsequent electronic indicia indicative of said subsequent digital electronic page images of said removed documents which have been refed in said document feeding path to said electronic imaging station;

and a duplicate electronic document image detection system electronically connecting with said system for generating and storing electronic indicia indicative of said digital electronic images for automatically comparing said previously stored electronic indicia indicative of said previous digital electronically images of said documents prior to said detected sheet feeding stoppage with said subsequent digital electronic images of said removed documents which have been refed in said document feeding path to said electronic imaging station, to detect duplicate digital electronic images and to provide a duplicate electronic images signal for the automatic deletion of duplicate electronic document page images;

wherein said system for generating and storing electronic indicia indicative of said digital electronic images of said documents which have been fed to said electronic imaging station comprises a pixel addition system in which the number of pixels in multiple defined cell areas of a said page image are respectively totaled and the least significant figures are deleted to provide electronic indicia indicative of respective said digital document images without substantial electronic data storage requirements.

5,532,840

FACSIMILE MACHINE

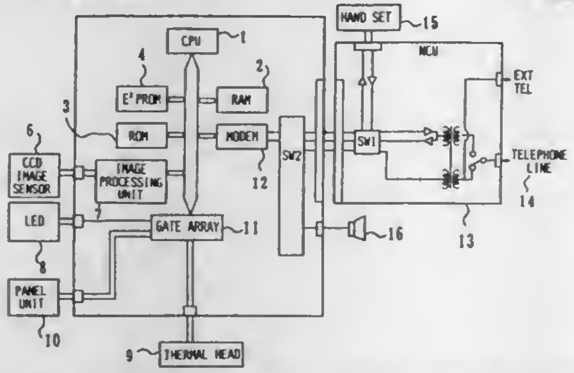
Yuji Asano, and Wataru Tomida, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 22, 1993, Ser. No. 171,420

Claims priority, application Japan, Dec. 29, 1992, 4-360545; Dec. 29, 1992, 4-360546; May 17, 1993, 5-139385

Int. Cl.^{6} H04N *1/21*

U.S. Cl. 358—404 **15 Claims**



1. A data management system in a data receiving and storage assembly comprising:

a semiconductor memory that stores data in clusters of bits;

a bit determiner that determines whether each cluster has a defective bit;

a cluster identifier that identifies any clusters with at least one defective bit as a defective bit cluster and identifies clusters with no defective bits as a normal bit cluster;

a data classifier that classifies data to be stored in said semiconductor memory as data that requires accurate reproduction and as data that does not require accurate reproduction; and

a data controller that allocates data for storage into clusters based on the identification of a cluster and the classification of the data, wherein data that requires accurate reproduction is allocated into a normal bit cluster and data that does not require accurate reproduction is allocated into a defective bit cluster when available.

5,532,841

FACSIMILE APPARATUS COMPRISING A PLURALITY OF IMAGE READING UNITS

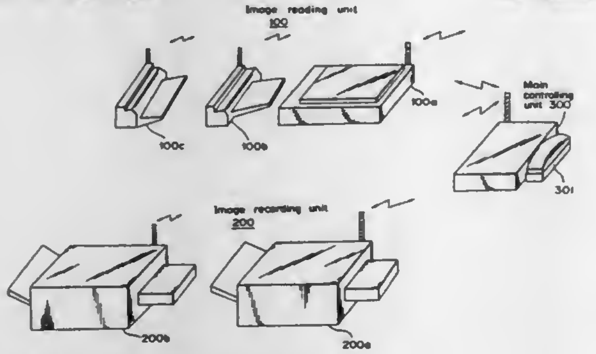
Akio Nakajima, Toyokawa; Hideo Muramatsu, Shinshiro; Hiroyuki Suzuki, Toyokawa, and Kanako Hamano, Hirakata, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 738,588, Jul. 31, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 228,924

Claims priority, application Japan, Jul. 31, 1990, 2-205671; Jul. 31, 1990, 2-205672; Jul. 31, 1990, 2-205673

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 358—408 **10 Claims**



1. A facsimile apparatus comprising:

a plurality of image reading units, each of said image reading units reading an image and converting said read image into image data; and

a main controlling unit for receiving image data through a communication line and transmitting said received image data through another communication line to another facsimile apparatus of a destination,

each of said image reading units including inputting means for inputting, according to a manual operation by an operator, an order of operation of any one of said plurality of image reading units,

said main controlling unit comprising:

communication line connection means for connecting said main controlling unit through said communication line with one of said image reading units;

data reception means for receiving image data from said one of said image reading units connected through said communication line by said communication line connection means; and

control means for controlling said communication line connection means to connect said main controlling unit sequentially with said any ones of said plurality of image reading units in said order inputted by said inputting means.

5,532,842

Patent Not Issued For This Number

5,532,843

PARALLEL PROCESSING APPARATUS BASED ON ARBITRARY DETERMINATION OF PROCESSING AREAS OF IMAGE DATA

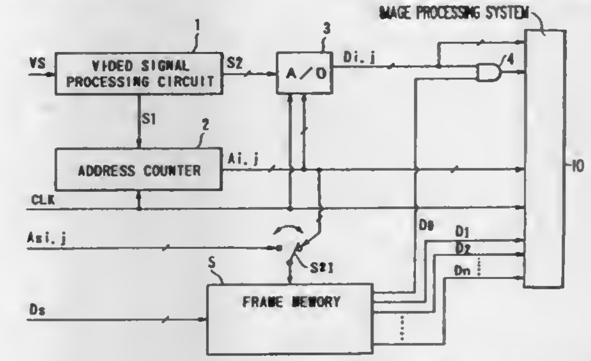
Akira Otsuki, Matsudo, Japan, assignor to Fujikura Ltd., and FMT Ltd., both of Tokyo, Japan

Filed Mar. 31, 1994, Ser. No. 220,701

Claims priority, application Japan, Apr. 8, 1993, 5-082248

Int. Cl.^{6} H04N *1/387;1/40;1/46;* G06K *9/40*

U.S. Cl. 358—453 **3 Claims**



1. A parallel processing apparatus based on arbitrary determination of processing areas consisting of pixels, comprising:

an image data outputting means for outputting image data sequentially for each frame;

an area setting memory which stores a distinction code/data in order to distinguish the areas to be processed from the other areas for each pixel in one frame, and outputs said distinction code/data in synchronization with the output of said image data;

a gate means which is supplied with said image data and said distinction code/data, and outputs said image data only when said distinction code/data shows that the area is to be processed;

wherein the area setting memory stores on a pixel-by-pixel basis a parameter defining image processing to be performed on each respective pixel in one frame of image data as additional information, and outputs said additional information on a pixel-by-pixel basis in synchronization with outputting said distinction code/data to define processing to be performed on each respective pixel as said each respective pixel is output by said image data outputting means; and

a parallel processing means for performing each process indicated by the additional information.

5,532,844

IMAGE DATA TRANSFERRING SYSTEM AND METHOD

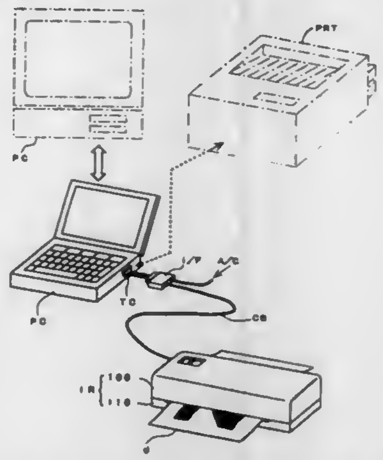
Yuichi Kagami, and Takashi Kanda, both of Kofu, Japan, assignors to Nisca Corporation, Yamanashi-ken, Japan

Filed Jul. 29, 1994, Ser. No. 283,214

Claims priority, application Japan, Jul. 30, 1993, 5-208516

Int. Cl.^{6} H04N *1/32;* **H01J** *3/00*

U.S. Cl. 358—468 **13 Claims**



1. A system for interfacing an image processor having a signal input-output connector with signal input and output ports and an image scanner for scanning a given image to transfer a multiple-bit image data signal issued from said image scanner and a command signal outputted from said image processor between said image processor and image scanner, comprising signal transfer lines for transferring said command signal from said image processor to said image scanner and said image data signal from said image scanner to said image processor bit by bit in parallel,

an interface unit including switching means for selecting either said signal input ports of said image processor when transferring said image data signal from said image scanner to said image processor or said signal output ports when transferring said command signal from said image processor to said image scanner,

a control unit having a status register capable of memorizing a status signal representing conditions of said image scanner and successively feeding said status signal to said image processor, and

an interface control circuit for designation of a transfer mode in which said image data signal of specific bits is permitted to be transferred bit by bit in parallel and switching said switching means in accordance with the designated transfer mode,

said transfer mode designation in said interface control circuit being effected by giving a check signal of specific bits from said image processor to said status register, sending back an echo signal read out from said status register, and comparing said check signal with said echo signal to determine whether said check signal and said echo signal coincide, and

said signal transfer lines being shared by said image processor and said image scanner to transfer said image data and command signals when said check signal and said echo signal coincide.

5,532,845

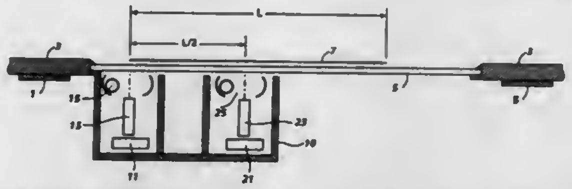
HIGH SPEED HIGH RESOLUTION PLATEN SCANNING SYSTEM USING A PLURALITY OF SCANNING UNITS

Donald J. Gusmano, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1994, Ser. No. 342,540

Int. Cl.^{6} H04N *1/00;1/04;1/387*

U.S. Cl. 358—474 **13 Claims**



1. A digital copier for copying a document having L scanlines of image data, comprising:

M optical scanning systems, M being equal to or greater than 2, each optical scanning system scanning only L/M scanlines of the document, L being a number of document scanlines in a slow scan direction, such that an area of the document scanned by a single optical scanning system does not overlap an area of the document scanned by another single optical scanning system;

a plurality of image processing means, each operatively connected to one of said M optical scanning systems, for producing a plurality of sets of digital image data, each set of image data corresponding to an image scanned by a single optical scanning system;

stitching means, operatively connected to said plurality of image processing means, for stitching together the plurality of sets of digital image data to produce a complete image; and a printing system operatively connected to said stitching means.

5,532,846

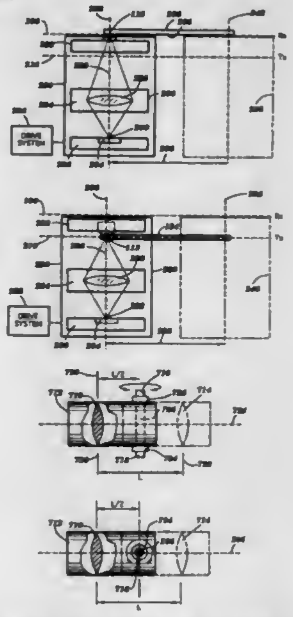
METHOD AND APPARATUS FOR POSITIONING A FOCUSING LENS

Mark G. Brook, Londonderry, N.H., and Mark E. Tellam, Charlestown, Mass., assignors to AGFA Division, Bayer Corporation, Wilmington, Mass.

Filed Jun. 29, 1995, Ser. No. 496,713

Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—497 **17 Claims**



1. A flat-bed scanner for scanning an original document to obtain a digitized representation of said original document, said flat-bed scanner comprising:

(A) An object focal plane;

(B) A scan carriage movably disposed for linear motion along a scanning axis, said scan carriage including an illumination source for illuminating a scan line of an original document located in said object focal plane, said scan carriage further including optical imaging and sensor means for obtaining a digitized representation of said scan line;

(c) Means for moving said scan carriage along said scanning axis to obtain digitized representations of successive scan lines of said original document, said digitized representations of said successive scan lines together comprising said digital representation of said original document; and,

wherein said optical imaging and sensor means further comprises an optical assembly and means for rotatably positioning said optical assembly about an axis of rotation substantially perpendicular to an optic axis of said optical assembly.

5,532,847

DUPLEX DOCUMENT FEEDER FOR A FACSIMILE MACHINE

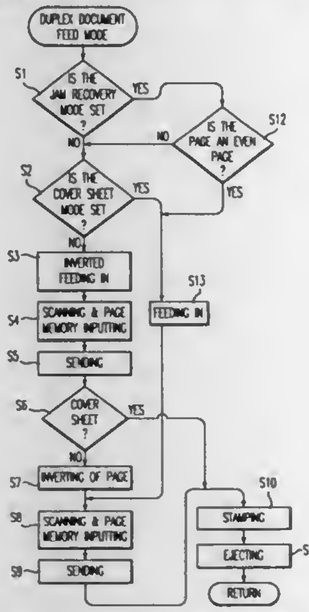
Ohji Maruyama, Shinagawa-ku, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,533

Claims priority, application Japan, Dec. 22, 1993, 5-324424

Int. Cl.^{6} H04N *1/04;* **G03G** *21/00;* **B65H** *29/00*

U.S. Cl. 358—498 **12 Claims**


DUPLEX DOCUMENT FEED MODE
S1
IS THE JAM RECOVERY MODE SET ?
YES
NO
S12
IS THE PAGE AN EVEN PAGE ?
YES
NO
S2
IS THE COVER SHEET MODE SET ?
YES
NO
S3
INVERTED FEEDING IN
S13
FEEDING IN
S4
SCANNING & PAGE MEMORY INPUTTING
S5
SENDING
S6
COVER SHEET ?
YES
NO
S7
INVERTING OF PAGE
S8
SCANNING & PAGE MEMORY INPUTTING
S9
SENDING
S10
STAMPING
EJECTING
S11
RETURN

1. A facsimile device, comprising: an automatic document feeder for feeding pages from a document table to a document ejecting tray in front of a contact glass;

a first inverting means, disposed in a document path between said document table and said contact glass, for inverting a page fed from said document table;

a second inverting means, disposed adjacent to said contact glass for inverting said page ejected from said contact glass and feeding said page to said contact glass again;

a reading means for reading each side of pages fed onto said contact glass;

a sending means for sending image data obtained from each of said pages by said reading means;

a duplex document mode setting means for setting a mode in which two sided documents are read in order of the pages thereof, and disposed on said facsimile device; and

a control means which performs a control process such that each of said pages is inverted by the first and second inverting means before reading one side of said page by said reading means at said contact glass, and is inverted again by said second inverting means and another side therefore is read by said reading means after said reading of one side thereof is completed, and further inverted by said second inverting means after reading said another side thereof when said duplex document mode is set.

5,532,848

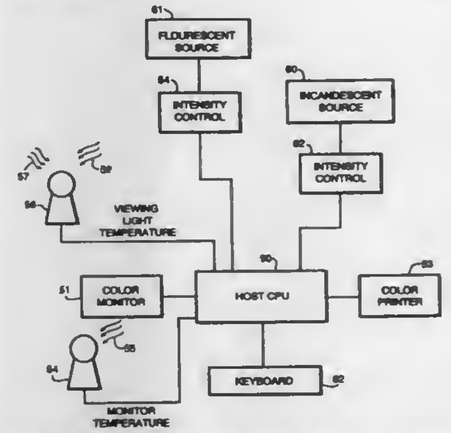
METHOD AND APPARATUS FOR ADJUSTING CORRELATED COLOR TEMPERATURE

Giordano B. Beretta, Palo Alto, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

Filed Nov. 25, 1992, Ser. No. 981,437

Int. Cl.^{6} H04N *1/46;5/58;9/73*

U.S. Cl. 358—504 **21 Claims**



1. Apparatus for adjusting color temperature of viewing light to a white point of a color monitor, said apparatus comprising:

a first light source whose color temperature is adjustable;

means for measuring a color temperature of viewing light, the viewing light including ambient light and light output of said first light source;

means for comparing the color temperature measured by said measuring means with the white point of the color monitor; and

means for adjusting the color temperature of said first light source based on the comparison so that the color temperature of the viewing light is adjusted toward the white point of the color monitor.

5,532,849

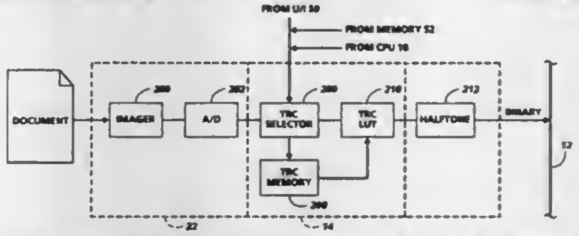
FACSIMILE WITH LOCAL CORRECTION OF TRC BASED ON DESTINATION TRC REQUIREMENTS

Lloyd F. McIntyre, Plano, Tex., and Reiner Eschbach, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 10, 1995, Ser. No. 402,459

Int. Cl.^{6} H04N *1/407*

U.S. Cl. 358—534 **15 Claims**



1. A document processing system including at least scanning and facsimile functions, and comprising:

a scanner producing digital gray signals representing a document scanned thereby;

a facsimile modem, sending and receiving communications from a called facsimile device, said communications:

a) identifying a preferred tone reproduction curve for printing the digital gray signals at the called facsimile device to the calling device, and

- b) transmitting image signals representing the scanned document with preferred tone reproduction curve correction from the calling device to the called device;

an image processing circuit including:
- a tone reproduction curve correction circuit including
  - a first memory storing at least two tone reproduction curve functions,
  - a look up table stored in a second memory, mapping digital gray input values from said scanner to corrected digital gray output values,
  - a tone reproduction curve selector, operative to load stored tone reproduction curve functions from said first memory to said look up table in said second memory responsive to a tone reproduction curve selection command;
- a halftoning circuit, reducing the number of bits defining each digital gray signal to a number suitable for facsimile communication; and

a controller, producing tone reproduction curve selection commands responsive to identified preferred tone reproduction functions.

5,532,850

TFT ACTIVE MATRIX LIQUID CRYSTAL DISPLAY WITH GATE LINES HAVING TWO LAYERS, THE GATE ELECTRODE CONNECTED TO THE WIDER LAYER ONLY

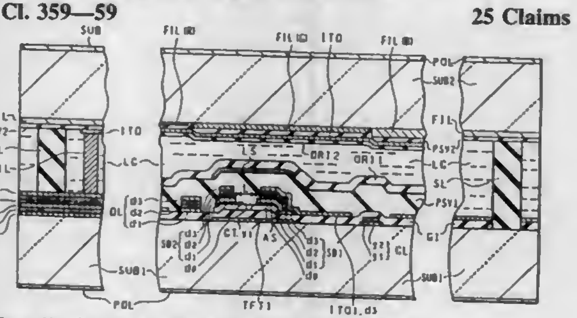
Sakae Someya, Sanwa-machi; Ryuuzoh Nashimoto; Hirofumi Suzuki, both of Mobara; Katsuhiko Yarita, Ichihara; Shinji Matsumoto, Mobara; Akira Sasano, Hinode-machi; Hideaki Taniguchi, Mobara, and Ryouji Oritsuki, Shirako-machi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 277,434, Jul. 18, 1994, which is a division of Ser. No. 910,455, Jul. 8, 1992, Pat. No. 5,331,447, which is a continuation of Ser. No. 205,185, Jun. 10, 1988, Pat. No. 5,132,820. This application Jun. 1, 1995, Ser. No. 457,577

Claims priority, application Japan, Jun. 10, 1987, 62-144913; Sep. 25, 1987, 62-242363; Dec. 9, 1987, 62-309601

Int. Cl.^{6} G02F *1/1343;1/136*

U.S. Cl. 359—59 **25 Claims**



1. In a liquid crystal display device comprising:
- a thin film transistor;
- a pixel electrode; and
- a pixel including said thin film transistor and said pixel electrode and disposed in each of intersecting regions defined by two adjacent scanning signal lines and by two adjacent image signal lines,

the improvement characterized in that:
- said thin film transistor comprises a gate electrode electrically connected to one of said two adjacent scanning signal lines, a gate insulating film disposed on said gate electrode, a semiconductor layer disposed on said gate insulating film, and a source electrode and a drain electrode being electrically connected to said semiconductor layer, respectively,
- one of said source electrode and drain electrode being electrically connected to said pixel electrode,
- the other of said source electrode and drain electrode being electrically connected to one of said two adjacent image signal lines,
- said scanning signal lines including a first conductive film and a second conductive film laminated on said first conductive film,
- said gate electrode being connected to said first conductive film and left uncovered by said second conductive film of one of said two adjacent scanning signal lines, and
- said second conductive film having a smaller width than that of said first conductive film at least in crossover portions of said scanning signal lines and said image signal lines.

5,532,851

OPTICAL SWITCHING ELEMENT

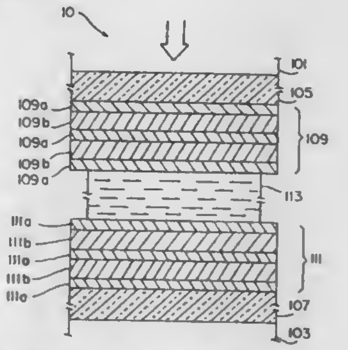
Yoshihisa Usami, Shizuoka-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 8, 1994, Ser. No. 225,303

Claims priority, application Japan, Apr. 9, 1993, 5-106014; Jul. 14, 1993, 5-174399

Int. Cl.^{6} G02F *1/1335;1/137;1/13*

U.S. Cl. 359—73 **22 Claims**



1. An optical switching element comprising:
- a variable optical path length layer whose optical path length is varied and whose refractive index anisotropy is controlled by application of an external field;
- external field application means for applying said external field to said variable optical path length layer;
- at least one layer of a material having a first non-varying optical path length and having a refractive index which is greater than a maximum refractive index of said variable optical path length layer; and
- at least one layer of a material having a second non-varying optical path length, and having a refractive index which is less than a minimum refractive index of said variable optical path length layer,
- wherein a layered body is formed by said variable optical path length layer, said external field application means, said first non-varying optical path length layer and said second non-varying optical path length layer, said layered body varying the optical path length of said variable optical path length layer and controlling interference of light transmitted through said layered body so that the transmitted light becomes a predetermined intensity, and wherein an average refractive index anisotropy with respect to a light incident direction assumes a value substantially equal to zero upon sufficient application of said external field.

5,532,852

HIGH SPEED, HIGH AMBIENT VIEWABILITY LIQUID CRYSTAL DISPLAY ASSEMBLY

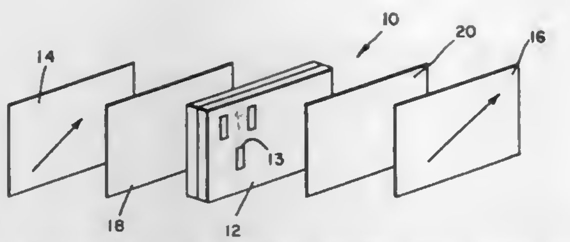
Michael H. Kalmanash, Los Altos, Calif., assignor to Kaiser Aerospace and Electronics Corporation, Foster City, Calif.

Filed Feb. 23, 1994, Ser. No. 200,148

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 359—73 **16 Claims**

12. A liquid crystal display assembly with improved anti-reflective qualities, adapted to be coupled with a variable voltage source, in which light enters said assembly from a rear face and a controllable portion of the entering light is transmitted through a front face of said assembly, said assembly comprising:



- a liquid crystal cell of untwisted nematic liquid crystal molecules, including of a matrix of separately controlled pixel sections, all having a common director axis wherein for each pixel section, light entering polarized parallel to said director axis is phase shifted relative to light entering polarized orthogonally to said director axis, the relative phase shift being a function of the voltage applied to that pixel section;
- a first polarizer adjacent the rear face of the display and arranged to polarize impinging light to an angle of approximately 45°, relative to said director axis;
- a second polarizer located adjacent the front face of the display, oriented with its axis of polarization alternatively parallel and perpendicular to the axis of polarization of said first polarizer and arranged to polarize light transmitted through the display alternatively substantially parallel to and orthogonally to the polarization vector of light transmitted through said first polarizer;
- a first phase shifter, set to cause a relative phase shift of $-(\lambda/4+\phi_o)$, located adjacent the rear face of the liquid crystal display; and
- a second phase shifter, set to introduce a relative phase shift of $\lambda/4$, located adjacent the front face of the liquid crystal display, wherein said first and second phase shifters collectively introduce a phase shift of $-\phi_o$, where $-\phi_o$ is chosen to compensate for the minimum phase shift created by the passage of light through said liquid crystal display, itself, whereby varying the voltage applied to each pixel element controls the amount of light transmitted through that element, with minimum phase shift ϕ_o corresponding to the maximum drive voltage available to be applied to that element, and whereby ambient light entering through the front face of the device and said second polarizer reflecting from said liquid crystal display has its polarization sense rotated to be blocked from further passage through said second polarizer.

5,532,853

REPARABLE DISPLAY DEVICE MATRIX FOR REPAIRING THE ELECTRICAL CONNECTION OF A BONDING PAD TO ITS ASSOCIATED SIGNAL LINE

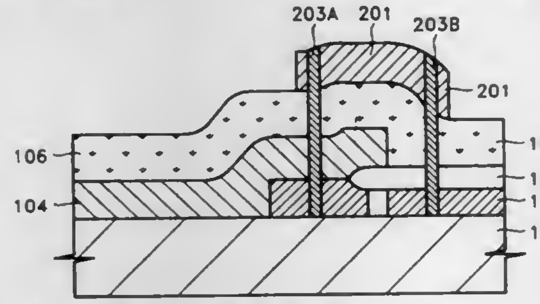
Jun-Ho Song; Yong-Gug Pae, both of Kyungki-do, and Wunyong Park, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 3, 1994, Ser. No. 205,299

Claims priority, application Rep. of Korea, Mar. 4, 1993, 93-3209

Int. Cl.^{6} G02F *1/1333;1/1345;* **H01L** *21/26;21/268*

U.S. Cl. 359—87 **19 Claims**



1. A display device matrix comprising:
- a substrate;
- a plurality of signal lines disposed on the substrate in a matrix pattern;
- a plurality of bonding pads, each one of the plurality of bonding pads having one end electrically connected to a respective one of the plurality of signal lines, such that an electrical junction is formed between each bonding pad and a respective signal line;
- an insulating layer formed over the plurality of signal lines and the plurality of bonding pads; and
- a plurality of repairing conductive layers formed on first the insulating layer, each one of the plurality of repairing conductive layers being formed over a respective electrical junction, such that a first end portion of the repairing conductive layer overlays a portion of an associated signal line, and another end portion of the repairing conductive layer overlays a portion of an associated bonding pad.

5,532,854

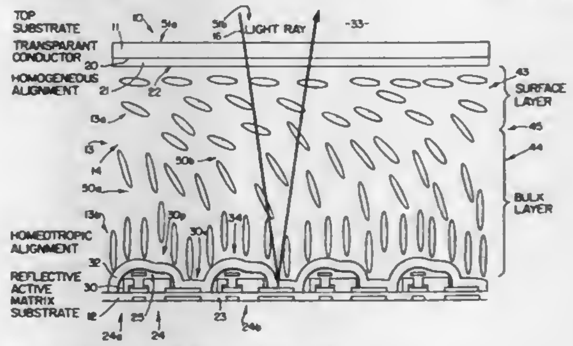
FOLDED VARIABLE BIREFRINGERENCE ZEROTH ORDER HYBRID ALIGNED LIQUID CRYSTAL APPARATUS

James L. Fergason, 92 Adam Way, Atherton, Calif. 94025

Filed Jan. 25, 1994, Ser. No. 187,050

Int. Cl.^{6} G02F *1/133;1/1337*

U.S. Cl. 359—93 **53 Claims**



34. A display apparatus, comprising,
- a source of polarized light,
- a liquid crystal display for selectively modulating light,
- said liquid crystal display comprising a semiconductor substrate and a further substrate with birefringent liquid crystal material in a generally hybrid alignment configuration between said substrates, said liquid crystal cell being configured to operate in a birefringent mode with relatively minimal color dispersion,
- said source being operative to provide light to pass into said liquid crystal material through said further substrate toward said semiconductor substrate, and
- means to reflect light to pass through said liquid crystal material and subsequently through said further substrate,
- the liquid crystal material being operative in response to a field input to change the optical phase retardation characteristics of the liquid crystal material.

5,532,855

OPTICAL SPACE SWITCH DEVICE

Masayuki Kato, and Hiroyasu Ito, both of Kawasaki, Japan, assignors to Fujitsu Limited

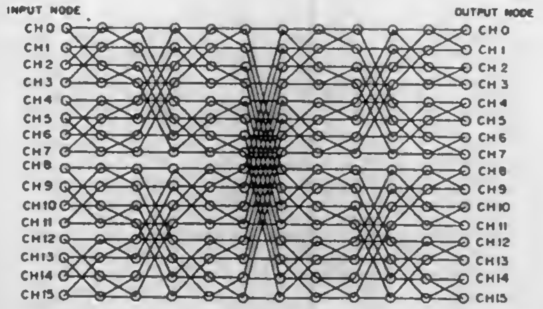
Division of Ser. No. 910,779, Jul. 8, 1992, Pat. No. 5,430,561. This application Mar. 27, 1995, Ser. No. 411,162

Claims priority, application Japan, Jul. 17, 1991, 3-202392; Jul. 17, 1991, 3-202393

Int. Cl.^{6} H04J *14/00*

U.S. Cl. 359—117 **7 Claims**

3. An optical space switch comprising;
- eleven optical space switch stages stacked to form an equivalent structure of an eleven stage cross Banyan network and having



channels **0**, **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11**, **12**, **13**, **14** and **15** extending therethrough, where

the distance between the closest adjacent channels is represented by d and the coordinates of an origin are represented by (**0**, **0**), the channel **0** is disposed at the coordinates (**0**,**0**), the channel **1** is disposed at the coordinates (**0**, −2d), the channel **2** is disposed at the coordinates (2d, **0**), the channel **3** is disposed at the coordinates (2d, −2d), the channel **4** is disposed at the coordinates (d, −d), the channel **5** is disposed at the coordinates (d, −3d), the channel **6** is disposed at the coordinates (3d, −d), the channel **7** is disposed at the coordinates (3d, −3d), the channel **8** is disposed at the coordinates (d, **0**), the channel **9** is disposed at the coordinates (d, −2d), the channel **10** is disposed at the coordinates (3d, **0**), the channel **11** is disposed at the coordinates (3d, −2d), the channel **12** is disposed at the coordinates (**0**, −d), the channel **13** is disposed at the coordinates (**0**, −3d), the channel **14** is disposed at the coordinates (2d, −d), and the channel **15** is disposed at the coordinates (2d, −3d),

a beam can be shifted at the first, fourth, seventh and tenth optical space switch stages between the channel **0** and the channel **2**, between the channel **4** and the channel **6**, between the channel **1** and the channel **3**, between the channel **5** and the channel **7**, between the channel **8** and the channel **10**, between the channel **12** and the channel **14**, between the channel **9** and the channel **11** and between the channel **13** and the channel **15**,

a beam can be shifted at the second, fifth, eighth and eleventh optical space switch stages between the channel **0** and the channel **1**, between the channel **4** and the channel **5**, between the channel **2** and the channel **3**, between the channel **6** and the channel **7**, between the channel **12** and the channel **13**, between the channel **8** and the channel **9**, between the channel **14** and the channel **15** and between the channel **10** and the channel **11**,

a beam can be shifted at the third and ninth optical space switch stages between the channel **0** and the channel **4**, between the channel **1** and the channel **5**, between the channel **2** and the channel **6**, between the channel **3** and the channel **7**, between the channel **8** and the channel **12**, between the channel **9** and the channel **13**, between the channel **10** and the channel **14** and between the channel **11** and the channel **15**,

a beam can be shifted at the sixth optical space switch stage between the channel **0** and the channel **8**, between the channel **12** and the channel **4**, between the channel **1** and the channel **9**, between the channel **13** and the channel **5**, between the channel **2** and the channel **10**, between the channel **14** and the channel **6**, between the channel **3** and the channel **11** and between the channel **15** and the channel **7**,

NB(I) is the Ith bit of a binary represented address of each node at each stage, FB(J) is the Jth bit of the binary represented address of a destination node, PS is the polarization of an input beam of light at each node having the value "0" when the polarization of the input beam to the node is P-polarization but having the value "1" when such polarization is S-polarization, and SC is the state of the polarization controlling switch, polarization switch setting is provided such that,

for the first, fourth, seventh and tenth stages

SC=PS XOR (NB(3) XOR FB(3)),

for the second, fifth, eighth and eleventh stages

SC=PS XOR (NB(4) XOR FB(4)),

for the third and ninth stages

SC=PS XOR (NB(2) XOR FB(2)),

and for the sixth stage

SC=PS XOR (NB(i) XOR FB(1)),

where X XOR Y signifies an exclusive OR operation of X and Y,

each stage includes 2-input 2-output optical switches, each of the 2-input 2-output optical switches defining first and second optical axes extending therethrough in a parallel, spaced relationship, and having respective, first and second light input positions at which first and second lights are received and respective first and second light output positions, the 2-input 2-output optical switches of each stage are arranged in a common plane with the first and second optical axes of each switch being in parallel with the first and second optical axes of the other switches in the respective stage, each 2-input 2-output optical switch comprising

polarization controlling means, disposed transversely to the first and second optical axes and through which extend the first and second optical axes, for switching a polarization plane of light transmitted therethrough from one to another of first and second orthogonal polarization directions, and

optical path shifting means, disposed transversely to the first and second optical axes, and between the polarization controlling means and the first and second light output positions, for receiving first and second lights respectively transmitted through the polarization controlling means along the first and second optical axes, and for selectively outputting the received first and second lights at the first and second light output positions, respectively, when the polarization plane of the first and second lights is in the first orthogonal polarization direction, and for outputting the first and second lights at the second and first light output positions, respectively, when the polarization plane of the first and second lights is in the second orthogonal polarization direction.

5,532,856

PLANAR OPTICAL MESH-CONNECTED TREE INTERCONNECT NETWORK

Yao Li, Monmouth Junction; Richard A. Linke, Princeton; Yuh-Dauh Lyuu, Cranbury, all of N.J.; Kenichi Kasahara, Ibaraki, Japan; Shigeru Kawai, Tokyo, Japan, and Keiichi Kubota, Kanagawa, Japan, assignors to NEC Research Institute, Inc., Princeton, N.J.

Filed Jun. 30, 1994, Ser. No. 269,913

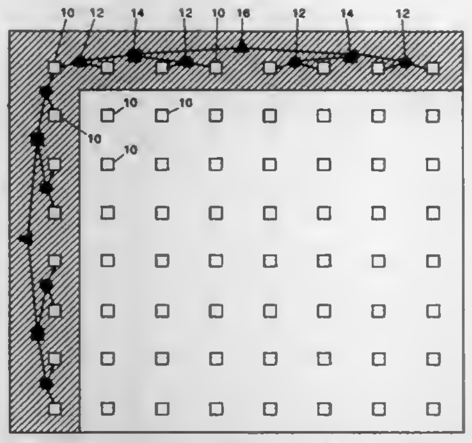
Int. Cl.^{6} H04B *10/20;* **H04J** *14/00*

U.S. Cl. 359—118 **29 Claims**

1. A planar optical mesh-connected tree interconnect network comprising:

a planar array of mesh-connected leaf nodes, each leaf node comprising an optical transmitter means and an optical receiver means;

parent nodes, each parent node being disposed in the plane of said planar array and intermediate an associated pair of leaf nodes, each parent node comprising optical transmitter means and optical receiver means, said parent nodes being associated with leaf nodes in accordance with a mesh-connected tree structure;



means for causing transmitter means of a preselected leaf node or preselected parent node to transmit an optical signal to receiver means at a predetermined leaf node or predetermined parent node after reflection at a reflecting plane for communicating between said preselected node and said predetermined node; and

an array of micro-optical means disposed in the path of said optical signal, where a first layer of material is disposed between said nodes and said array of micro-optical means and a second layer of material is disposed between said array of micro-optical means and said reflecting plane.

5,532,857

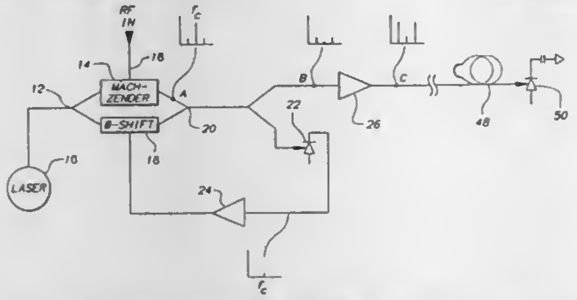
WIDE DYNAMIC RANGE OPTICAL LINK USING DSSC LINEARIZER

Eitan Gertel, Lansdale, Pa., and Donald L. Sipes, Jr., Lisle, Ill., assignors to AEL Industries, Inc., Lansdale, Pa., and Amoco Corporation, Chicago, Ill.

Filed Sep. 7, 1994, Ser. No. 303,104

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—154 **14 Claims**



1. A wide dynamic range optical link comprising

a laser source for producing a lightwave carrier output at a predetermined power level and wavelength;

a double sideband suppressed carrier optical modulator having the lightwave carrier as a first input and an RF information-bearing signal as a second input, said modulator producing a suppressed carrier modulated signal output having a characteristic modulation index, said double sideband suppressed carrier optical modular comprising

a signal divider for dividing the lightwave carrier into primary and secondary carriers,

a Mach-Zehnder optical modulator into which the primary carrier is input and modulated by the RF information bearing signal, producing a modulated signal comprising information sidebands and a primary carrier component,

a feedback controlled phase shifter in which phase of the secondary carrier is shifted 180 degrees from phase of the primary carrier,

a signal combiner into which are input the modulated signal and the phase shifted secondary carrier, the combination of said signals causing the controlled suppression of the carrier component in the output of the signal combiner, and

a feedback loop for controlling the phase shifter comprising an optical detector for detecting the amplitude of the carrier component in the suppressed carrier signal and means for providing a control signal derived from the detected carrier amplitude to the phase shifter;

a linear optical amplifier for increasing the modulation index of the modulated signal output from the suppressed-carrier modulator, the output of said amplifier being input to an input end of an optical fiber medium for transmission of the modulated signal to a desired destination; and

at least one optical signal detector at said destination adjacent an output end of the optical fiber for detecting the modulated signal.

5,532,858

OPTICAL RADIO TRANSMISSION SYSTEM AND A METHOD FOR ADJUSTING OPTICAL AXES THEREOF

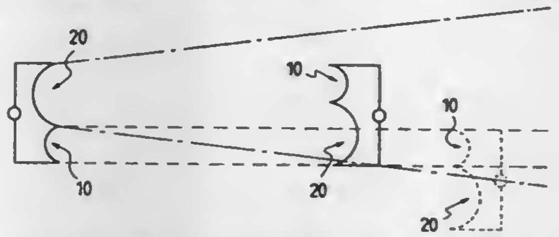
Kazutoshi Hirohashi, Yokohama; Teruhiko Shinomiya; Manabu Sakane, both of Yokosuka; Keishi Ushijima, Fukuoka; Takaaki Takeda, Tokyo; Masamichi Satou, Tokyo; Michio Kikuta, Tokyo, and Motoyasu Nagashima, Kashiwa, all of, Japan, assignors to Nit Data Communications Victor Company of Japan, Yokohama, and Systems Corporation, Tokyo, both of, Japan

Filed Oct. 18, 1993, Ser. No. 136,848

Claims priority, application Japan, Oct. 16, 1992, 4-304638

Int. Cl.^{6} H04B *10/10;10/24*

U.S. Cl. 359—159 **16 Claims**



1. An optical radio communication system comprising:
a first light transmitting system; and
a second light transmitting system;
each of which light transmitting systems comprising:
  a transmitting means comprising:
    a light emitting element positioned in a region including and surrounding a focal point of a first parabolic reflector for emitting light beams;
    said first parabolic reflector having an inner reflective surface for reflecting said light beams emitted from said light emitting element; and
    a means for driving said light emitting element with a signal to be transmitted;
  a receiving means comprising:
    a second parabolic reflector having an inner reflective surface for reflecting incident light beams;
    a light receiving element positioned in a region including and surrounding a focal point of said second parabolic reflector for receiving light beams reflected by said second parabolic reflector to output signals; and
    means for taking out information from said signals outputted from said light receiving element,
said optical radio communication system comprising at least a pair of said first and second light transmitting systems,
wherein said pair of said first and second light transmitting systems are configured for implementing duplex optical radio communication, and wherein, in each of said first and second light transmitting systems, said transmitting means is integrally combined with said receiving means so that, in each of said first and second light transmitting systems an optical axis of said transmitting means is in parallel with an optical axis of

said receiving means integrally combined therewith in duplex optical radio communication,

wherein said first light transmitting system includes a first projector means of a wide directivity provided in the vicinity of said transmitting means thereof to emit first guide beams, and

said second light transmitting system includes a second projector means of a wide directivity provided in the vicinity of said transmitting means thereof to emit second guide beams,

said first guide beams having a carrier frequency different from that of said second guide beams for varying an intensity of the first and second guide beams and for isolating the first and second guide beams while adjusting said optical axes.

5,532,859

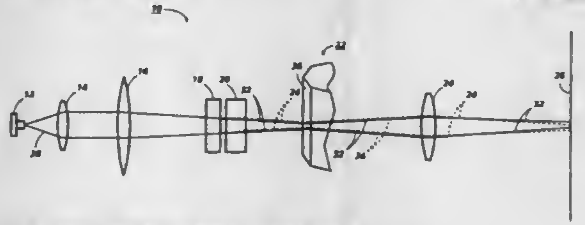
ELECTRO-OPTICAL DEVICE FOR VARIABLE SCAN WIDTH

Jean-Michel Guerin, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1994, Ser. No. 179,180

Int. Cl.^{6} G02F *1/03*

U.S. Cl. 359—249 **6 Claims**



1. A raster output scanner comprising:

a laser light source for emitting a light beam;

polarizing means located in the path of the light beam from said laser light source for receiving the light beam and polarizing the light beam;

a beam splitter located in the path of the polarized light beam from said polarizing means for receiving the polarized light beam;

said polarizing means and said beam splitter being so constructed and arranged relative to each other to generate one single light beam when the degree of polarization of the light beam is 0°, to generate another single light beam when the degree of polarization of the light beam is 90°, and splitting the polarized light beam into two partially overlapping light beams defining a single resulting light beam when the degree of polarization of the light beam is between 0° and 90°;

the intensity of the two partially overlapping light beams varying in accordance with the degree of polarization;

a medium;

a scanning means located in the path of the resulting light beam from said beam splitter and being so constructed and arranged to scan the resulting light beam onto said medium in order to scan one scan line;

means for controlling said polarizing means to change the degree of the polarization in order to change the intensity of the two partially overlapping light beams to change the width of the resulting light beam and thereby the width of the one scan line.

5,532,860

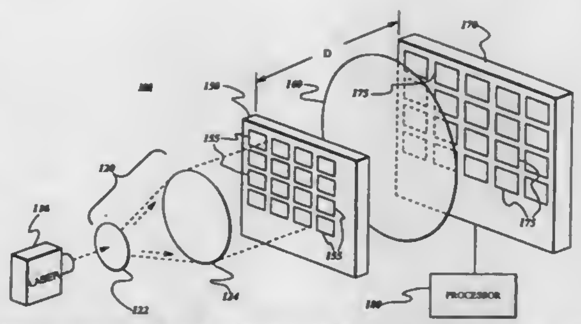
SPATIAL SYNCHRONIZATION FOR OPTICAL COMMUNICATION SYSTEM

John E. Hershey, Ballston Lake, N.Y.; Nabeel A. Riza, Orlando, Fla., and Amer A. Hassan, Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 20, 1995, Ser. No. 406,437

Int. Cl.^{6} H04J *14/00*

U.S. Cl. 359—159 **12 Claims**



1. A spatial synchronization method for an optical communication system having a transmit aperture comprising a plurality of control pixels for signal transmission and a receive aperture comprising a plurality of receive pixels, each user of said communication system having a unique respective identification speckle pattern, the synchronization method comprising:

transmitting a user pyramidal synchronizing profile so as to sequentially spatially register said identification speckle pattern at said receive aperture, the step of transmitting a pyramidal synchronizing speckle pattern comprising:

transmitting a user initialization iteration signal in which the transmit aperture control pixels are set to generate a known initialization speckle pattern;

transmitting at least one user intermediate iteration signal in which a portion of said transmit aperture control pixels are set to generate a known intermediate speckle pattern,

transmitting a user final iteration signal in which said transmit aperture control pixels are set to generate said identification speckle pattern.

5,532,861

OPTICAL FIBER TRANSMISSION SYSTEM WITH COMPENSATION FOR LINE DISTORTIONS

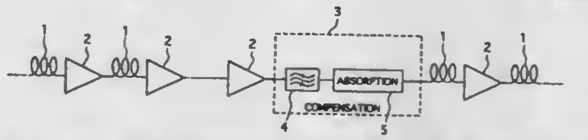
Francis Pirio, and Jean-Baptiste Thomine, both of Paris, France, assignors to France Telecom, Paris, France

Filed Jun. 30, 1994, Ser. No. 268,484

Claims priority, application France, Jul. 16, 1993, 93 08539

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—161 **15 Claims**



1. A system for transmission of a digital signal having a given passband, on a transmission line with optical on-line amplification, said transmission line being formed by a plurality of optical fiber sections and a plurality of optical amplifiers, each of said optical amplifiers being interposed between two adjacent optical fiber sections, said system comprising at least one device for on-line compensation of distortions induced in said digital signal, notably by noise and propagation on said transmission line, said on-line compensation device comprising:

at least one bandpass optical filter having a passband whose value is substantially comparable to the passband of said digital signal, said at least one bandpass optical filter being interposed on-line between one of said optical fiber sections and one of said optical amplifiers; and

at least one saturable absorbent element that is a non-linear passive optical element and having an absorption that depends decreasingly on optical power of said digital signal, time taken for said saturable absorbent element to go from maximum absorption without saturation to minimum absorption with saturation and vice-versa being shorter than duration of each of the pulses forming said digital signal, said at least one saturable absorbent element being interposed on-line between one of said optical fiber sections and one of said optical amplifiers.

5,532,862

LINE SWITCHING SYSTEM

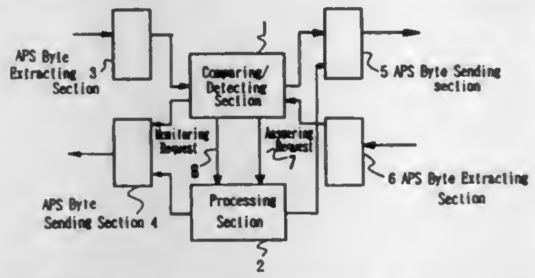
Katsuyuki Tada, and Katsuya Kitamori, both of Nakahara, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 8, 1994, Ser. No. 302,419

Claims priority, application Japan, Mar. 16, 1994, 6-072511

Int. Cl.^{6} H04B *10/08*

U.S. Cl. 359—161 **6 Claims**


APS Byte Extracting 3 Section
Comparing/Detecting Section
5 APS Byte Sending section
Monitoring Request
8
Answering Request
7
6 APS Byte Extracting Section
APS Byte Sending Section 4
Processing Section
2

1. A line switching system for switching an optical transmission line in an optical transmission system for transmitting optical data signals between nodes, in the event of a fault at the nodes or a disconnection on the optical transmission line, comprising:

optical transmission lines of a working line for transmitting optical data signals and a protection line for transmitting APS (Automatic Protection Switch) bytes; and

a plurality of nodes connected via the optical transmission lines in a ring form;

each of the nodes including a comparing and detecting section for receiving the APS bytes sent from an adjacent node and comparing a fault pattern indicated by the APS bytes with a fault pattern data stored in said node in advance, and a processing section for determining a line switching route, based on a result of comparison in the comparing and detecting section.

5,532,863

OPTICAL SIGNAL-REGENERATING UNIT AND TRANSMISSION SYSTEM COMPRISING SUCH A UNIT

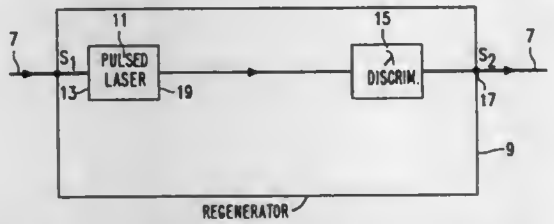
Coen T. H. F. Liedenbaum, and John J. E. Reid, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1995, Ser. No. 407,534

Claims priority, application European Pat. Off., Jul. 27, 1994, 94202187

Int. Cl.^{6} H04B *10/02;10/00*

U.S. Cl. 359—176 **4 Claims**



1. An optical signal-regenerating unit for regenerating a received optical signal pulse series S_1 having a modulation period T and a wavelength λ_d; comprising:

a pulsed laser generating an optical pulse series S_2 having a pulse period equal to said modulation period T, said laser having an input face at which the pulses of the received optical pulse series S_1 are injected at instants at which an injected pulse has a radiation energy which exceeds the radiation energy of a pulse then being built up in said laser, thereby converting a multimode spectrum of said laser into a single mode spectrum having a wavelength equal to the wavelength λ_d of the received optical pulse series;

said laser further having an output face at which said generated pulse series S_2 is produced having said wavelength λ_d, so that said generated pulse series S_2 is a regeneration of the received pulse series S_1.

5,532,864

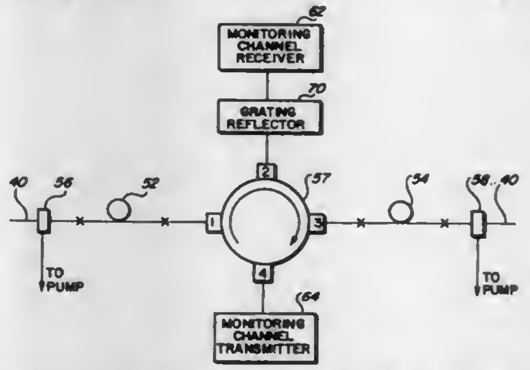
OPTICAL MONITORING CHANNEL FOR WAVELENGTH DIVISION MULTIPLEXED OPTICAL COMMUNICATION SYSTEM

Stephen B. Alexander, Millersville; Steve W. Chaddick, and David R. Huber, both of Annapolis, all of Md., assignors to Ciena Corporation, Columbia, Md.

Filed Jun. 1, 1995, Ser. No. 457,292

Int. Cl.^{6} H04B *10/02;* **H01S** *3/00*

U.S. Cl. 359—177 **10 Claims**



1. A wavelength division multiplexed optical communication system for transmitting a plurality of optical transmission signals over an optical waveguide comprising:

a plurality of optical transmitters, each optical transmitter producing an information-bearing optical signal at a transmission wavelength corresponding to an optical channel within the wavelength division multiplexed optical communication system;

an optical waveguide optically communicating with each of the optical transmitters for carrying a plurality of wavelength division multiplexed optical transmission signals;

at least one multiple-stage optical amplifier having at least first and second stages positioned along said optical waveguide for simultaneously amplifying the plurality of wavelength division multiplexed optical transmission signals carried thereby, the optical amplifier comprising:

a first stage comprising a first doped optical fiber having first and second ends, the doped fiber having a first wavelength band which provides gain to optical signals when the doped fiber is pumped, the first end of the first stage doped optical fiber optically communicating with said optical waveguide;

a second stage comprising a second doped optical fiber having first and second ends, the second end of the second stage doped optical fiber optically communicating with said optical waveguide;

at least one optical pump source optically communicating with the first and second amplifier stages for producing population inversion among the energy levels of the dopant to cause optical amplification of the wavelength division multiplexed optical signals;

an optical connecting element positioned between the first stage and the second stage of the optical amplifier, the optical connecting element including a plurality of ports such that at least one port optically communicates with the first stage of the optical amplifier and at least a second port optically communicates with the second stage of the optical amplifier;

at least one of an optical monitoring signal transmitter and an optical monitoring signal receiver optical communicating with at least one port of the optical connecting element such that the optical monitoring signal passes through at least one of the first and second stages of the optical amplifier, the optical monitoring signal transmitter transmitting an optical monitoring signal having a wavelength greater than the longest wavelength of said first wavelength band of the first doped fiber and the optical monitoring signal receiver being configured to receive an optical monitoring signal having a wavelength greater than the longest wavelength of said first wavelength band of the first doped fiber, said optical monitoring signal wavelength being selected such that the optical monitoring signal is not substantially attenuated by an unpumped optical amplifier; and

a plurality of optical receiving systems optically communicating with the optical waveguide, each optical receiving system including a Bragg grating device for selecting a single optical channel wavelength from the plurality of transmitted wavelength division multiplexed optical signals.

5,532,865

FIBER OPTIC COMMUNICATION TERMINAL, FIBER OPTIC COMMUNICATION SYSTEM, AND ITS WAVELENGTH SETTING METHOD

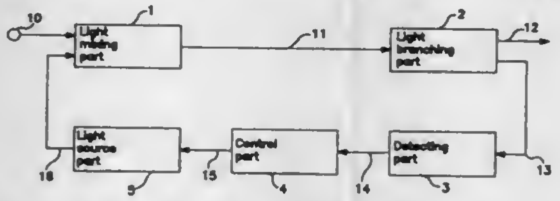
Kuniaki Utsumi, Sanda; Hiroaki Yamamoto, and Katsuyuki Fujito, both of Higashiosaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 135,156, Oct. 12, 1993. This application Sep. 11, 1995, Ser. No. 526,578

Claims priority, application Japan, Oct. 9, 1992, 4-271272

Int. Cl.^{6} H04B *10/06;10/04*

U.S. Cl. 359—189 **15 Claims**



1. A fiber optic communication terminal comprising:

light source means for producing an output light signal having a wavelength and a spectrum distribution of a specified shape,

light mixing means for mixing an input light and the output light signal from the light source means,

light branching means for separating the mixed light signal output from the light mixing means into a first light signal and a second light signal each having respective signal qualities, said second light signal having a noise level and a bit error rate,

detecting means for detecting deterioration of the signal quality of the second light signal from the light branching means by detecting one of the noise level and the bit error rate of the second light signal and producing a detection signal, and

control means for controlling the wavelength of the output light signal of the light source means in response to the detection signal to prevent deterioration of the signal quality of the first light signal regardless of the specified shape of the spectrum distribution of the output light signal emitted by the light source means.

5,532,866

POLYGONAL MIRROR AND MANUFACTURING METHOD THEREOF AND LIGHT BEAM SCANNING OPTICAL APPARATUS USING THE POLYGONAL MIRROR

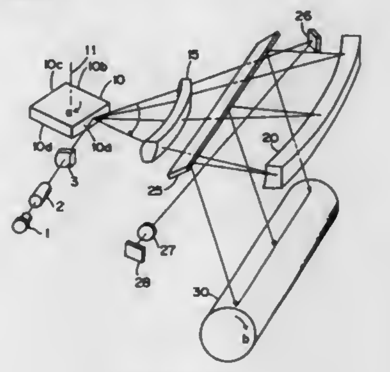
Etsuko Shibata, Toyohashi, and Hiromu Nakamura, Toyokawa, both of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

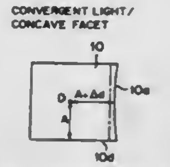
Filed Apr. 7, 1994, Ser. No. 224,507

Claims priority, application Japan, Apr. 8, 1993, 5-082240

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—216 **5 Claims**





1. A light beam scanning optical apparatus, comprising:

a light source; and

a polygonal mirror which deflects a light beam emitted from the light source to scan the light beam on a light receiving surface;

wherein the polygonal mirror has reflecting facets which are at such distances from a rotation axis of the polygonal mirror and have such curvatures that a shift of a beam spot position on the light receiving surface caused by differences among the reflecting facets in curvature can be counterbalanced by a shift of the beam spot position caused by differences among the reflecting facets in distance from the rotation axis.

5,532,867

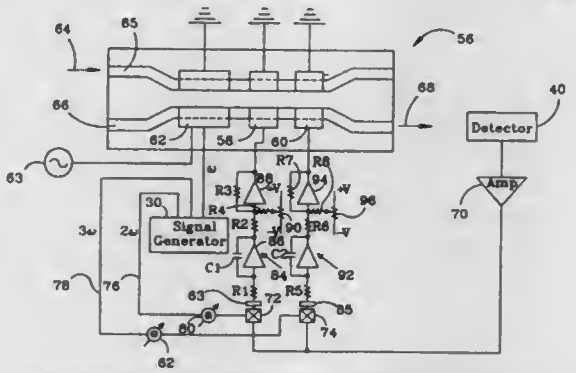
BIAS STABILIZATION CIRCUIT AND METHOD FOR A LINEARIZED DIRECTIONAL COUPLER MODULATOR

Robert R. Hayes, Calabasas, and William B. Bridges, Pasadena, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 6, 1995, Ser. No. 468,578

Int. Cl.^{6} G02F *1/35;2/00*

U.S. Cl. 359—329 **17 Claims**



3. A linearized directional coupler modulator, comprising:

an electro-optic substrate with an index of refraction that can be varied with the application of an electric field,

first and second optical waveguides on said substrate that are parallel and in close lateral proximity to each other, so that an optical beam launched into an input end of the first waveguide couples between said waveguides via evanescent coupling and exits through an output end of one or both of said waveguides,

an active electrode along a first portion of said waveguides for modulating evanescent coupling between said waveguides along said first portion,

at least two passive electrodes along at least two other portions of said waveguides for applying respective bias voltages across said other waveguide portions to control the linearity of said modulator,

a pilot tone generator for generating and applying a reference electrical signal (pilot tone) at frequency ω to said active electrode for modulating the evanescent coupling between said waveguides, thereby modulating said optical beam,

an optical detector that monitors said modulated optical beam, and generates an AC electrical signal with a frequency that corresponds to a modulation frequency of said optical beam, and

at least two negative feedback circuits that generate said respective bias voltages in response to at least two non-zero order harmonic frequency components in said modulated optical beam, each of said feedback circuits applying its respective bias voltage to a respective One Of said at least two passive electrodes to counter said non-zero order harmonic frequency components,

each of said feedback circuits comprising a synchronous detector that selects a respective one of said non-zero order harmonic frequency components of said AC electrical signal, and an integrator that integrates the value of a DC voltage component of the harmonic frequency component selected by said Synchronous detector and applies an integrated DC bias voltage that corresponds to said integrated DC voltage component to its respective passive modulator section,

said integrators having different integration time constants to reduce competitive interactions between said at least two negative feedback circuits.

5,532,868

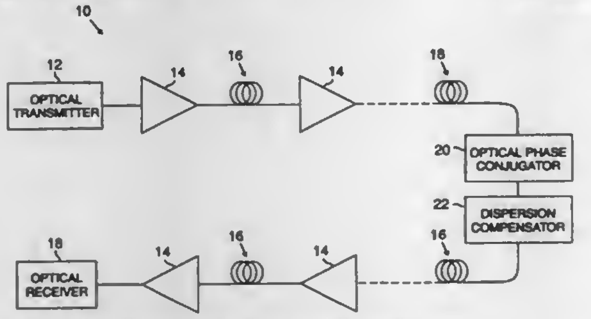
APPARATUS AND METHOD FOR COMPENSATING CHROMATIC DISPERSION PRODUCED IN OPTICAL PHASE CONJUGATION OR OTHER TYPES OF OPTICAL SIGNAL CONVERSION

Alan H. Gnauck, Middletown, and Robert M. Jopson, Rumson, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 23, 1994, Ser. No. 311,481

Int. Cl.^{6} G02F *1/35*

U.S. Cl. 359—332 **34 Claims**



26. An optical communication system comprising:

an optical fiber span including at least one segment having a first portion and a second portion;

an optical signal transmitter at one end of the optical fiber span for supplying an optical signal to the optical fiber span;

an optical signal receiver at an opposite end of the optical fiber span for receiving the optical signal from the optical fiber span;

an optical phase conjugator arranged between the first and the second portions of the at least one segment for phase conjugating the optical signal; and

a dispersion compensator arranged in the fiber span to compensate for an amount of chromatic dispersion introduced in the phase-conjugated optical signal by the optical phase conjugator.

5,532,869

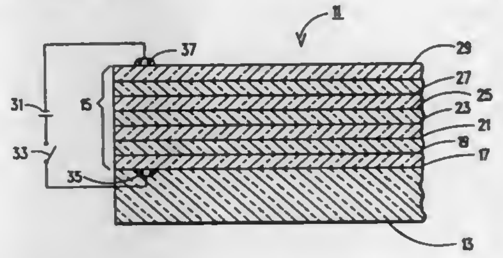
TRANSPARENT, ELECTRICALLY-CONDUCTIVE, ION-BLOCKING LAYER FOR ELECTROCHROMIC WINDOWS

Ronald B. Goldner, Lexington, and Semyon Slaven, Newton, both of Mass., assignors to Tufts University, Medford, Mass.

Filed Apr. 29, 1994, Ser. No. 235,255

Int. Cl.^{6} G02F *1/153*

U.S. Cl. 359—275 **11 Claims**



1. An electrochromic window comprising:

(a) a transparent substrate;

(b) a first transparent, electron-conducting layer on said transparent substrate;

(c) an electrochromic layer on said first transparent, electron-conducting layer;

(d) an ion-conductive, electron-resistive layer on said electrochromic layer;

(e) a counter-electrode layer on said ion-conductive, electron-resistive layer;

(f) a second transparent, electron-conducting layer on said counter-electrode layer; and

(g) a first transparent, electron-conducting, ion-blocking layer interposed between said first transparent, electron-conducting layer and said electrochromic layer or between said counter-electrode layer and said second transparent, electron-conducting layer, said first transparent, electron-conducting, ion-blocking layer being an n-type silicon carbide thin film.

5,532,870

OPTICAL FIBER AMPLIFIER AND OPTICAL AMPLIFIER REPEATER

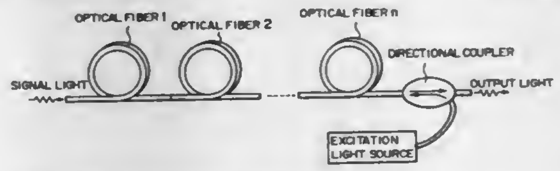
Masayuki Shigematsu; Koji Nakazato; Tomonori Kashiwada, and Masayuki Nishimura, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 23, 1994, Ser. No. 346,256

Claims priority, application Japan, Nov. 24, 1993, 5-293440

Int. Cl.^{6} H01S *3/00;3/30*

U.S. Cl. 359—341 **13 Claims**



1. An optical amplifier comprising:

a first fiber having Er and Al doped therein, with no P being doped therein, said first fiber having a first end and a second end;

a second fiber having Er, Al, and P doped therein, said second fiber having a first end and a second end, said first end of said second fiber being optically coupled to said second end of said first fiber, said second fiber having a different concentration of Al than does said first fiber; and

a light source for emitting an excitation light that can excite Er, said light source being optically coupled to said second end of said second fiber, said Er in said first and second fibers being excited when said excitation light passes therethrough.

5,532,871
TWO-WAVELENGTH ANTIREFLECTION FILM

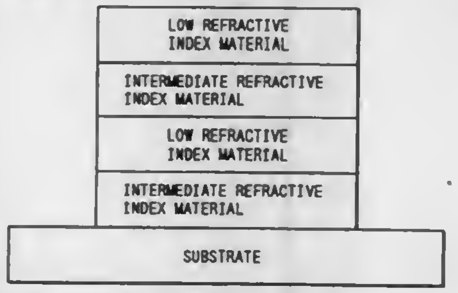
Shigeru Hashimoto, and Akihiko Yokoyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1993, Ser. No. 156,694

Claims priority, application Japan, Nov. 25, 1992, 4-337945; Jun. 2, 1993, 5-156252

Int. Cl.^{6} G02B *5/08;5/28;3/00*

U.S. Cl. 359—359 **13 Claims**


LOW REFRACTIVE INDEX MATERIAL
INTERMEDIATE REFRACTIVE INDEX MATERIAL
LOW REFRACTIVE INDEX MATERIAL
INTERMEDIATE REFRACTIVE INDEX MATERIAL
SUBSTRATE

1. A two-wavelength antireflection film comprising:

a substrate; and

an alternate film consisting of alternately laminated layers of a low refractive index material and an intermediate refractive index material, in an order from a light entrance side to a surface of said substrate;

wherein said low refractive index material and said intermediate refractive index material are alternately laminated in four layers with optical thicknesses, having a design wavelength λ_0, in an order from a light entrance side, of $0.2\lambda_0$ to $0.4\lambda_0$ for the 1st layer, $0.05\lambda_0$ to $0.2\lambda_0$ for the 2nd layer, $0.2\lambda_0$ to $0.4\lambda_0$ for the 3rd layer, and $0.4\lambda_0$ to $0.6\lambda_0$ for the 4th layer.

5,532,872
VIEWING TUBE FOR MICROSCOPE

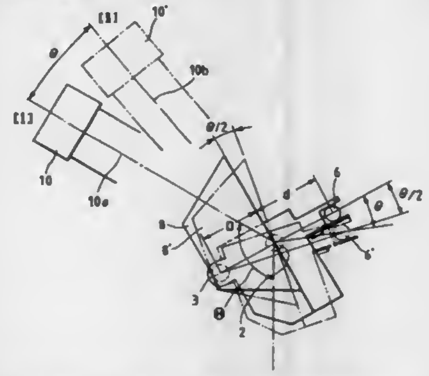
Shinobu Sakamoto, and Takeshi Fujino, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 13, 1994, Ser. No. 274,389

Claims priority, application Japan, Dec. 10, 1992, 4-352152

Int. Cl.^{6} G02B *21/00;23/00*

U.S. Cl. 359—384 **11 Claims**



1. A viewing tube for a microscope, comprising:

an optical deflecting element for deflecting light from an objective;

a supporting member for supporting said optical deflecting element, said supporting member being rotatable around a first shaft;

an eyepiece tube member having an eyepiece tube into which light deflected by said optical deflecting element enters, said eyepiece tube member being rotatable around a second shaft which is parallel to said first shaft and spaced from said first shaft by a predetermined distance in a radial direction of said first shaft; and

a connecting mechanism for connecting said supporting member and said eyepiece tube member at a position whose distance from said second shaft in a radial direction of said second shaft is substantially equal to said predetermined distance, so that said supporting member and said optical deflecting element are rotated around said first shaft in accordance with rotation of said eyepiece tube member around said second shaft.

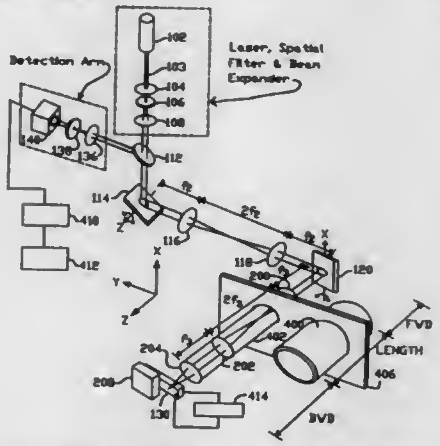
5,532,873
SCANNING BEAM LASER MICROSCOPE WITH WIDE RANGE OF MAGNIFICATION

Arthur E. Dixon, 601 Stonebury Crescent, Waterloo Ontario N2K 3R2, Canada

Filed Sep. 8, 1993, Ser. No. 117,797

Int. Cl.^{6} G02B *21/06*

U.S. Cl. 359—388 **9 Claims**



1. A confocal scanning beam microscope or imaging system with a wide range of magnification comprising:

means for supporting a specimen to be observed and measured;

an illumination source for producing a light beam directed along an optical path toward said specimen;

a microscope objective;

a scan lens;

means for interchanging said :microscope objective and said telecentric scan lens, such that either said microscope objective or said telecentric scan lens can be moved into position to focus the light beam to a diffraction-limited spot in a prescribed specimen plane;

means for scanning the light beam to move the diffraction-limited spot in a predetermined scan pattern on said specimen plane:

a detection arm for receiving light reflected, scattered or emitted from said diffraction-limited spot in said specimen plane comprising

  a pinhole and a focusing lens for obtaining a focal point for confocal detection of the light returning from said specimen,

  a detector placed behind said pinhole,

  whereby confocal image data can be measured,

a first beamsplitter directing light returning from said specimen into said detection arm; and

means for recording and displaying a signal from said detector.

5,532,874
MULTISCANNING CONFOCAL MICROSCOPY

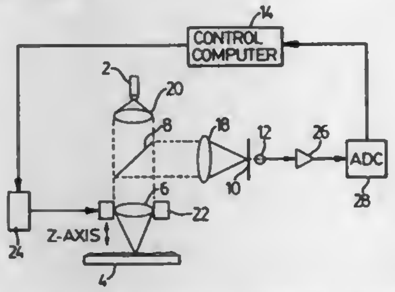
Alfred Stein, Toronto, Canada, assignor to Morphometrix Inc., Toronto, Canada

Filed Dec. 15, 1993, Ser. No. 166,881

Claims priority, application United Kingdom, Dec. 18, 1992, 9226430

Int. Cl.^{6} G02B *21/26;21/00*

U.S. Cl. 359—394 **13 Claims**



1. A confocal microscope system comprising a turntable having locations for mounting multiple objects to be examined in a ring thereon, a motor for rotating the turntable about an axis concentric with the ring, a microscope optical system mounted for radial movement relative to the turntable such that a focus of an objective thereof is scanned over successive objects mounted in said locations, the microscope optical system including a point image detector for providing a signal output, an actuator for effecting radial movement of the optical system, and an actuator for adjusting the focus of the objective in an axial direction relative to the turntable, and a signal processor for receiving said signal output and for separately processing portions of said signal output generated as the objective is scanned over each successive object.

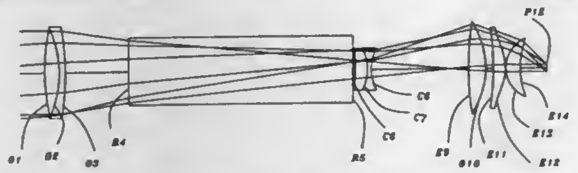
5,532,875
WIDE ANGLE BINOCULAR SYSTEM WITH VARIABLE POWER CAPABILITY

Ellis I. Betensky, Redding, Conn., assignor to BenOpcon, Inc., Cincinnati, Ohio

Division of Ser. No. 28,413, Mar. 9, 1993, Pat. No. 5,371,626. This application Nov. 9, 1994, Ser. No. 336,424

Int. Cl.^{6} G03B *13/02*

U.S. Cl. 359—399 **3 Claims**



1. A variable power eyepiece for viewing a real intermediate image comprising a negative lens unit, a first positive lens unit, a second positive lens unit, and means for moving the second positive lens unit, wherein:

(a) the negative lens unit is positioned before the real intermediate image and provides aberration correction for the eyepiece;

(b) the first positive lens unit is positioned after the real intermediate image and has only positive lens elements; and

(c) the second positive lens unit is positioned between the negative lens unit and the first positive lens unit, in the vicinity of the real intermediate image, variation in the power of the eyepiece being achieved by movement of the second positive lens unit by the means for moving.

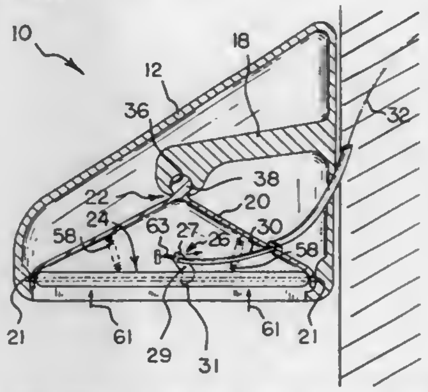
5,532,876
REMOTELY CONTROLLED, DAY/NIGHT MIRROR APPARATUS

Edgar J. Gauer, 3196 Lonesome Dove Cir., El Paso, Tex. 79936, and John B. Doyle, 2381 Gulf to Bay Boulevard #462, Clearwater, Fla. 34625

Filed Feb. 2, 1994, Ser. No. 191,393

Int. Cl.^{6} B60R *1/08*

U.S. Cl. 359—604 **3 Claims**



1. A new and improved remotely controlled, day/night mirror apparatus, comprising:

an outer housing assembly for connection to an exterior portion of a motor vehicle,

an inner housing support assembly contained within said outer housing assembly and supported by said outer housing assembly,

an inner housing assembly,

an adjustable connection assembly, connected between said inner housing assembly and said inner housing support assembly, for adjusting an angular orientation of said inner housing assembly with respect to said outer housing assembly,

a day/night mirror assembly pivotally supported by said inner housing assembly by a mirror pivot,

an incremental tilt assembly, connected between said day/night mirror assembly and said inner housing assembly distal from said mirror pivot, for incrementally tilting said day/night mirror assembly around said mirror pivot from a day position to a night position and vice versa, and

an incremental control assembly, connected to said incremental tilt assembly, for incrementally controlling said incremental tilt assembly, wherein said incremental control assembly includes an exterior portion connected to said incremental tilt assembly, an intermediate portion connected to said exterior portion, and an interior portion connected to said intermediate portion, wherein said interior portion is located inside a passenger compartment of the motor vehicle, and said exterior portion is located within said outer housing assembly which is outside the passenger compartment of the motor vehicle; and

wherein said incremental control assembly includes:

  a bracket supported by the motor vehicle

  a lever arm assembly,

  a first hinge pin supporting said lever arm assembly on said bracket, wherein said first hinge pin serves as a fulcrum for said lever arm assembly and divides said lever arm assembly into a first lever arm and a second lever arm,

a two-position toggle lever assembly which includes a first pressure-receiving surface and a second pressure-receiving surface,

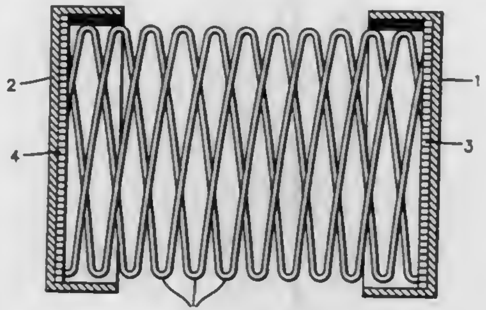
a second hinge pin connecting said two-position toggle lever assembly to said first lever arm, and

a third hinge pin connecting said intermediate portion to said second lever arm.

5,532,877

INFINITE KALEIDOSCOPES

Juan Sandoval, Suchil 137, Mexico City, Mexico
Filed Oct. 28, 1994, Ser. No. 331,105
Int. Cl.^{6} G02B *27/08*
U.S. Cl. 359—616 **12 Claims**

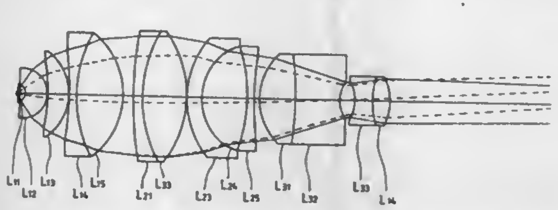


1. An infinite kaleidoscope comprising a pair of opposed mirrors, helical spring means having opposite ends connected with the respective mirrors enabling the mirrors to be relatively moved toward one another, away from one another and tilted, and a peephole formed through one of the mirrors to enable an observer looking through the peephole to view an image in a tunnel defined by the spring means and multiply reflected by said mirrors and which is adjustable by relative movement of the mirrors.

5,532,878

OBJECTIVE LENS SYSTEM FOR MICROSCOPE

Yutaka Suenaga, and Itoe Hayashi, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Feb. 14, 1995, Ser. No. 388,460
Claims priority, application Japan, Feb. 17, 1994, 6-020192
Int. Cl.^{6} G02B *21/02*
U.S. Cl. 359—657 **5 Claims**



1. An objective lens system for a microscope comprising, sequentially from an object side:

a first lens group having positive refracting power;
a second lens group shiftable in an optical-axis direction; and
a third lens group,
wherein said first lens group has a cemented lens component comprising a plano-convex lens element with its plane surface toward the object side and a meniscus lens element with its concave surface toward the object side,
said second lens group has a first sub-group having positive refracting power and a second sub-group having negative refracting power,
said second sub-group has a negative meniscus lens element with its concave surface toward an image side,
said third lens group has a meniscus cemented lens component with its concave surface toward the image side, and
said objective lens system satisfies the following conditions:

$$-4.1\times10^{-3}<\frac{f}{(f_2\times-\beta)}<4.2\times10^{-3}$$

$$2.5\times10^{-3}<\frac{n_1}{n_2}\times\frac{R_1}{f\times\beta}<8.3\times10^{-3}$$

-continued

$$3.3\times10^{-2}<\frac{R_2}{f\times-\beta}<8.3\times10^{-2}$$

$$1.6\times10^{-2}<\frac{R_3}{f\times-\beta}<4.2\times10^{-2}$$

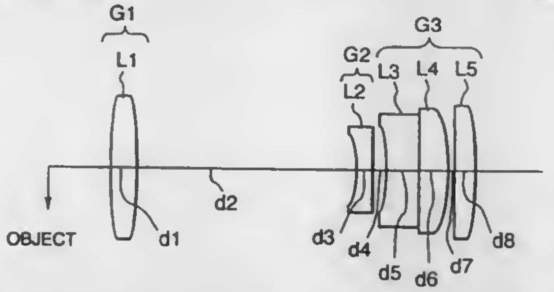
$$8.3\times10^{-3}<\frac{d_1+d_2}{f\times-\beta}<5\times10^{-2}$$

where
f: the focal length of the whole system,
f_2: the focal length of said second lens group,
β: the lateral magnification of said microscope objective lens,
n_1: the refractive index of said plano-convex lens element of said first lens group,
n_2: the refractive index of said meniscus lens element of said first lens group,
R_1: the radius of curvature of an object-side lens surface of said meniscus lens element of said first lens group,
R_2: the radius of curvature of an image-side lens surface of said negative meniscus lens element of said second sub-group,
R_3: the radius of curvature of an image-side lens surface of said cemented lens component of said third lens group,
d_1: the air spacing between said first and second lens groups, and
d_2: the air spacing between said second and third lens groups.

5,532,879

MICROSCOPE OBJECTIVE LENS

Itoe Hayashi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Jul. 15, 1994, Ser. No. 275,416
Claims priority, application Japan, Jul. 23, 1993, 5-202783
Int. Cl.^{6} G02B *21/02;9/34;9/14*
U.S. Cl. 359—661 **7 Claims**



1. A microscope objective lens, sequentially from an object-side, comprising:

a first lens group constructed of a positive lens element;
a second lens group constructed of a negative lens element; and
a third lens group constructed of cemented lens elements consisting of a negative lens element and a positive lens element and exhibiting a positive refracting power on the whole,
wherein said microscope objective lens system satisfies the following conditions:

$$1.5<f/f_1<1.9$$

$$-3.8<f/f_2<-3.1$$

$$2.0<f/f_3<2.7$$

$$0.9<(d_2+d_3+d_4+d_5)/f_1<1.2$$

$$15<n_1\cdot f/d_1$$

$$50<n_2\cdot f/d_3$$

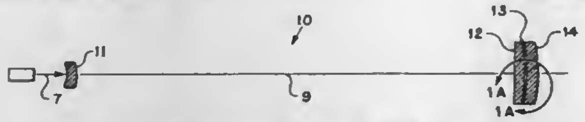
where
f : the focal length of the whole system,
f_1: the focal length of said first lens group,
f_2: the focal length of said second lens group,

f_3: the focal length of said third lens group,
d_1: the central thickness of said positive lens element in said first lens group,
d_2: the on-axis spatial interval between said first lens group and said second lens group,
d_3: the central thickness of said negative lens element in said second lens group,
d_4: the on-axis spatial interval between said second lens group and said third lens group,
d_5: the central thickness of said negative lens element constituting said cemented lens element in said third lens group,
n_1: the refractive index of said positive lens element in said first lens group, and
n_2: the refractive index of said negative lens element in said second lens group.

5,532,880

LASER BEAM EXPANDERS

Paul Robb, Sunnyvale, Calif., assignor to Lockhead Missiles & Space Company, Inc., Sunnyvale, Calif.
Filed Jul. 1, 1994, Ser. No. 269,576
Int. Cl.^{6} G02B *1/06*
U.S. Cl. 359—665 **45 Claims**



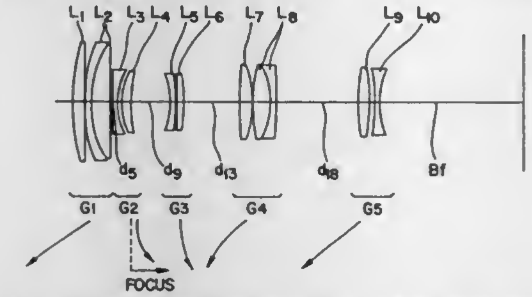
1. A beam expander having substantially diffraction-limited performance over a pre-selected wavelength range within the ultraviolet, visible and near infrared regions of the electromagnetic spectrum, said beam expander system comprising:

a lens set including first, second, and third lens elements disposed along an optical axis;
a fourth lens element spaced a pre-determined distance apart from said lens set along said optical axis;
said first, third, and fourth lens elements each comprising an optical crystal material;
said second lens element comprising a liquid having selected optical properties and being disposed between and in contact with the surfaces of said first and third lens elements; said crystalline material and said liquid being inert with respect to each other.

5,532,881

ZOOM LENS UTILIZING INNER FOCUS SYSTEM

Masahiro Nakatsuji, Kanagawa, and Kenzaburo Suzuki, Tokyo, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 33,034, Mar. 18, 1993, Pat. No. 5,325,233. This application Jun. 27, 1994, Ser. No. 266,272
Claims priority, application Japan, Mar. 25, 1992, 4-067256
Int. Cl.^{6} G02B *15/14*
U.S. Cl. 359—684 **12 Claims**

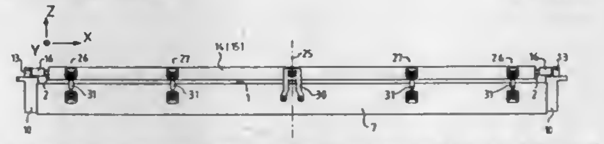


1. A zoom lens utilizing an inner focus system comprising:
a first lens group having a positive refracting power;
a second lens group having a negative refracting power;
a third lens group having a negative refracting power;
a fourth lens group having a positive refracting power; and
a fifth lens group having a negative refracting power;
said first to fifth lens groups being arranged in said order from an object side, whereby during the period of zooming, said first to fifth lens groups are moved relative to one another to mutually vary a lens group spacing therebetween, whereas during the period of focusing said second lens group is moved along an optical axis to vary a lens group spacing between said second lens group and said first and third lens groups, respectively.

5,532,882

ELECTRO-OPTICAL SCANNING UNIT HAVING ADJUSTABLE CONNECTING ELEMENTS BETWEEN LINEAR ARRAYS OF ELECTRO-OPTICAL AND LENS-UNITS

Anthonie H. Lamper, Tegelen, and Hans Reinten, Velden, both of, Netherlands, assignors to OCE-Nederland, B.V., Venlo, Netherlands
Filed Sep. 7, 1994, Ser. No. 301,494
Claims priority, application Netherlands, Sep. 13, 1993, 9301576
Int. Cl.^{6} G02B *7/02*
U.S. Cl. 359—819 **10 Claims**

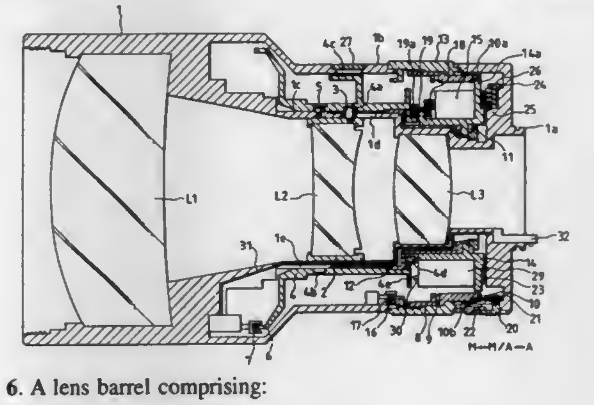


1. An electro-optical scanning unit comprising a linear array of electro-optical elements fixed on an elongate optical holder, a linear array of lens units fixed to a lens holder, which lens array extends substantially parallel to said electro-optical array, and connecting elements which, as considered in a direction (Y-direction) transverse to a longitudinal direction (X-direction) of said arrays, extend on either side thereof and which, at each of their ends, are connected to one of said optical and lens holders, wherein each connecting element is rotatable with respect to each holder connected to one of said ends of said connecting element, about a line which extends in said longitudinal direction of said arrays, to form a parallelogram between said connecting elements and said lens and elongated optical holders.

5,532,883

LENS BARREL HAVING SUPPRESSED LOAD TORQUE AND MOMENT OF INERTIA

Kunihiro Fukino, Fujisawa, Japan, assignor to Nikon Corporation, Japan
Filed Apr. 21, 1995, Ser. No. 426,181
Claims priority, application Japan, Jun. 22, 1994, 6-163031
Int. Cl.^{6} G02B *7/02;15/14*
U.S. Cl. 359—825 **6 Claims**



6. A lens barrel comprising:

a focusing optical system movable in the direction of the optical axis of the lens barrel for performing a focusing operation;

a moving member rotatable about the optical axis for moving said focusing optical system for performing the focusing operation;

an operating mechanism for driving said moving member to perform the focusing operation; and

a connecting device for coupling and decoupling said operating mechanism to said moving member,

said connecting device decoupling said operating mechanism from said moving member for an autofocusing operation, said connecting device coupling said operating mechanism to said moving member for a manual focusing operation, and said connecting device coupling said operating mechanism to said moving member when during the autofocusing operation said operating mechanism is manually operated.

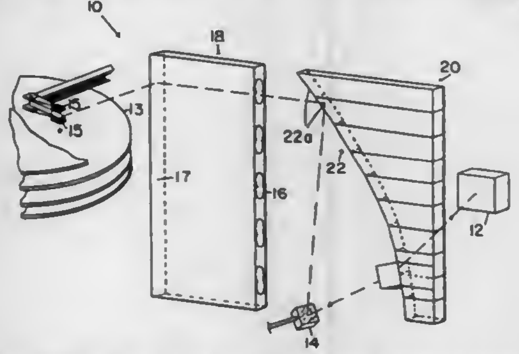
5,532,884
APPARATUS AND METHOD FOR FABRICATING A DEFLECTION MIRROR TOWER

Neville K. Lee, Sherbourn; Amit Jain, Marlboro, and Roy E. Martin, Westminster, all of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 303,895, Aug. 16, 1994, which is a continuation of Ser. No. 847,455, Mar. 6, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,347

Int. Cl.^{6} G02B *5/04;5/08;7/182;* **B29D** *11/00*

U.S. Cl. 359—833 **11 Claims**



1. A method of fabricating a deflection mirror tower arrangement for an optical storage device, said tower arrangement having a multi-faceted arcuate mirror surface configured to deflect an optical beam to one of a plurality of closely-spaced optical disks having recording disk surfaces configured to store data, said method comprising the steps of:

constructing a plurality of positive bars, each having a defined angular orientation at a mirror surface thereof;

constructing a negative master assembly having a plurality of negative bars, each having a surface arranged to provide a facet of a multi-faceted mating surface with a contour similar, but opposite, to said arcuate mirror surface of said deflection mirror tower;

disposing said mirror surface of each positive bar in frictional color contact relation to a respective facet of said mating surface of said negative master, such that said positive bars are aligned adjacent to one another, said respective facet having a similar, but opposite, angular orientation to that of said mirror surface of each of said positive bars; and

creating a plurality of prism assembly segments, each having an arcuate surface contour composed of said mirror surfaces of said positive bars, whereby each of said mirror surfaces provide a facet of said multi-faceted arcuate mirror surface of said tower arrangement to deflect said optical beam to any of said plurality of closely-spaced optical disks.

5,532,885
MAGNETIC RECORDING/REPRODUCING APPARATUS HAVING INTEGRATED CIRCUIT FOR HOLDING LOW FREQUENCY FULL WAVE RECTIFIED SIGNAL

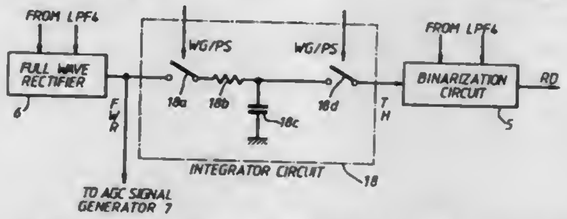
Hiroshi Okamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Oct. 7, 1994, Ser. No. 319,879

Claims priority, application Japan, Oct. 8, 1993, 5-253217

Int. Cl.^{6} G11B *5/09;15/12*

U.S. Cl. 360—46 **11 Claims**



1. A magnetic recording/reproducing apparatus for reproducing data recorded on a recording medium based on a read signal generated by a head, comprising:

filter means for restricting the frequency range of the read signal and for allowing a low frequency read signal to pass through it;

full wave rectifying means for receiving said low frequency read signal and for generating a rectified signal, in response thereto, said rectified signal being a full wave rectification of said low frequency read signal;

integrating means for generating a threshold signal of said low frequency read signal by integrating said rectified signal;

binarization means for generating read data pulses based on said threshold signal said low frequency read signal; and

switch means, interposed between said integrating means and said full wave rectifying means, and between said integrating means and said binarization means, for causing said integrating means to hold said rectified signal.

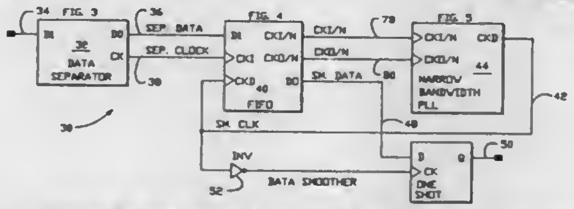
5,532,886
DATA STREAM SMOOTHING METHOD AND CIRCUIT FOR A TAPE DRIVE

William Buchan, Irvine; Edward Patrick, Westminster, both of Calif.; M. Takahashi, Kawauchi Onsengun, Japan, and J. V. Howell, Newport Beach, Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Filed May 28, 1992, Ser. No. 890,029

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—51 **22 Claims**



1. A circuit for smoothing a stream of data pulses, comprising:

an input adaptable for coupling to a tape drive;

an output adaptable for coupling to a computer;

separator means, coupled to said input, for extracting a separate clock signal from said stream of data pulses and for generating a stream of clocked data pulses;

first phase-locked loop (PLL) means for removing frequency modulation and phase modulation from said separate clock signal to form a smoothed clock signal;

First-In-First-Out (FIFO) means, coupled to said separator means and to said first PLL means, for delaying each said clocked data pulses in said stream of data pulses responsive to said smoothed clock signal to form a smoothed stream of clocked data pulses at said output; and

monostable multivibrator means, coupled to said FIFO means and to said output, for generating a smoothed stream of clocked data pulses responsive to said smoothed clocked signal and to said delayed clocked data pulses.

5,532,887
MAGNETIC RECORDING AND REPRODUCTION APPARATUS

Yasushi Higashiyama, Yokohama, and Takanori Furusawa, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

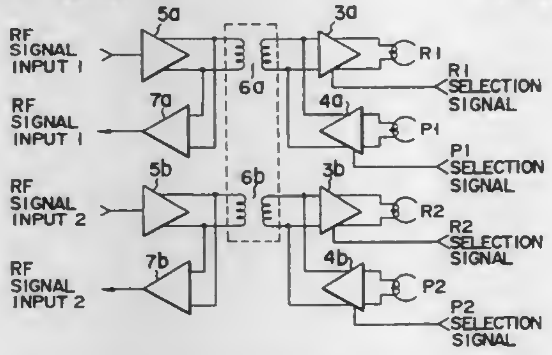
Continuation-in-part of Ser. No. 617,081, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 525,831, May 18, 1990, Pat. No. 5,276,565. This application Mar. 8, 1993, Ser. No. 29,303

Claims priority, application Japan, May 23, 1989, 1-127906; May 23, 1989, 1-127911; Nov. 8, 1989, 1-288754

The portion of the term of this patent subsequent to Jan. 4, 2004, has been disclaimed.

Int. Cl.^{6} G11B *15/12*

U.S. Cl. 360—64 **36 Claims**



1. A magnetic recording/reproduction apparatus comprising:

a rotary drum having a circumferential surface;

tape running means for rotating said rotary drum to run a magnetic tape with the magnetic tape being in contact with, at least, part of the circumferential surface of said rotary drum;

a plurality of magnetic heads installed on said rotary drum so that said magnetic heads are rotated together with said rotary drum, with said magnetic heads being in contact with the magnetic tape;

a plurality of amplifying circuit means respectively connected to said magnetic heads and installed on said rotary drum so that they rotate together with said rotary drum, said amplifying circuit means being selectively active and inactive;

at least one rotary transformer having a core in which a slot having a circular shape is formed, a winding formed of at least one metal plate coil received in said slot and having both coil ends, said metal plate coil having a shape corresponding to the circular shape of said slot, and lead-in metal plate wires formed integral with said metal plate coil by-etching or die-cutting so that they extend from the both coil ends of said metal plate coil, said lead-in-metal plate wires having terminal ends connected to said amplifying circuit means; and

control means for making said magnetic heads perform at least one of data-recording and data-reproduction through said amplifying circuit means, and said rotary transformer.

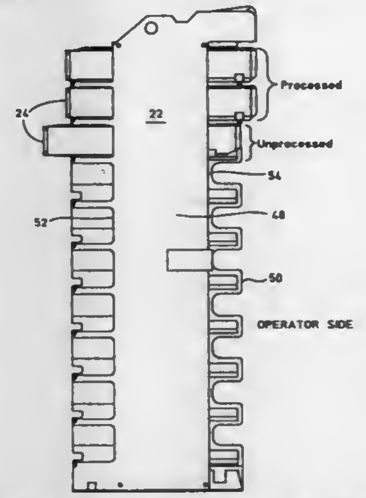
5,532,888
CARTRIDGE MAGAZINE WITH CARTRIDGE PROCESSING STATUS INDICATOR

Donald C. Acosta, San Jose, Calif., and Paul Yu-Fei Hu, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 68,366, May 27, 1993, abandoned. This application Sep. 1, 1994, Ser. No. 300,092

Int. Cl.^{6} C11B *15/68;23/023;33/02;* **B65D** *85/672*

U.S. Cl. 360—92 **19 Claims**



8. A magazine for storing electronic media cartridges for processing, the cartridges being of a type having front and rear ends joined by first and second oppositely located sides which have first and second notches respectively, a distance between the front and rear ends defining the length of the cartridge and a distance between the sides defining the width of the cartridge, the magazine comprising:

a base;

a pair of sidewalls connected to the base in an upstanding, spaced-apart relationship so as to accommodate the widths of the cartridges, each sidewall having front and rear edges, a distance between the front and rear edges defining the width of one of the sidewalls;

a plurality of shelves connected between the magazine sidewalls at spaced intervals therealong, each shelf having front and rear edges, a distance between the front and rear edges defining the length of the shelf;

the sidewalls and shelves forming a plurality of receptacles, each receptacle having front and rear open ends for receiving said cartridges;

each shelf being capable of slidably supporting a respective one of said cartridges for transport into and out of each of the open ends of a respective one of said receptacles;

a pair of detents mounted to each shelf in a spaced apart relationship so as to accommodate the width of a respective one of said cartridges;

a first one of the detents of each pair of detents being receivable by the first notch of the first side of a respective one of said cartridges for releasably engaging the cartridge and stopping the cartridge in a first position along the length of the shelf and the second one of the detents of each pair of detents being receivable by the second notch of the cartridge for releasably engaging the cartridge and stopping the cartridge in a second position along the length of the shelf;

the first detent engaging the first side of the cartridge within the first notch and the second detent substantially engaging said rear end of the cartridge when the cartridge is in the first position, and the second detent engaging the second side of the cartridge within the second notch and the first detent slidably engaging the first side of the cartridge when the cartridge is in the second position;

the rear end of one of said cartridges being substantially flush with the rear edge of at least one of the sidewalls of the magazine and the front end of the cartridge extending forwardly of the front edges of the sidewalls of the magazine for processing when the first detent stops the cartridge at the first position: and

the rear end of one of said cartridges extending rearwardly of the rear edge of one of the sidewalls of the magazine for removal of the cartridge after its processing when the second detent stops the cartridge at the second position,

whereby the flush position indicates that one of said cartridges is ready for processing and the rearwardly extending position of the cartridge indicates that the cartridge has been processed.

5,532,889

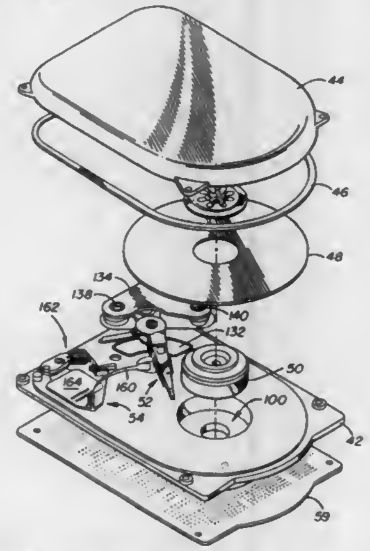
WINCHESTER DRIVE CARD INCLUDING AN ACTUATOR ARM BODY, ACTUATOR ARM PLATES, AND A VCM MAGNET EXTERNAL TO A CONTROLLED ENVIRONMENT

Frederick M. Stefansky, Longmont, Colo.; Louis J. Shrinkle, Leucadia, Calif., and Thomas A. Fiers, Longmont, Colo., assignors to Conner Peripherals, Inc., San Jose, Calif.

Continuation of Ser. No. 757,709, Sep. 11, 1991, abandoned. This application Aug. 5, 1994, Ser. No. 286,403

Int. Cl.^{6} G11B *5/012;5/55*

U.S. Cl. 360—97.01 **1 Claim**



1. A disk drive, comprising:

a disk having first and second opposed surfaces, said disk having an outer diameter;

a housing for maintaining said disk in a controlled environment;

a spin motor, mounting in said housing, for rotating said disk;

first and second transducers for writing information to and reading information from respective ones of said first and second surfaces of said disk;

an actuator assembly for supporting said transducers, said actuator assembly comprising:

an arm body having first and second mounting surfaces, said first and second mounting surfaces being substantially parallel, said arm body being positioned outside of said outer diameter of said disk,

first and second actuator arm plates mounted on respective ones of said first and second mounting surfaces of said arm body,

first and second load beams mounted on respective ones of said first and second actuator arm plates,

first and second flexures for attaching said first and second transducers to respective ones of said load beams,

a magnet mounted in a slot in said housing external to said controlled environment for providing a magnetic field, and

a coil, mounted on said arm body, for passing a current in said magnetic field; and

control means for controlling said spin motor and for providing currents to said coil.

5,532,890

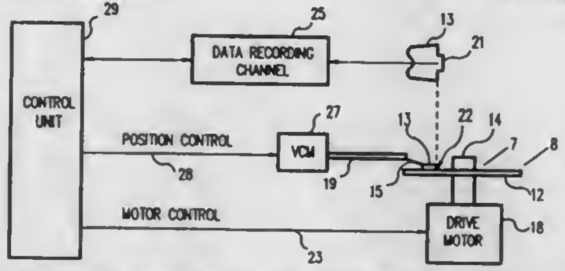
NEGATIVE PRESSURE SLIDER WITH OPTIMIZED LEADING POCKET FOR PROFILE CONTROL

Lee K. Dorius, and Laurence S. Samuelson, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 149,861, Nov. 10, 1993. This application Jun. 7, 1995, Ser. No. 486,539

Int. Cl.^{6} G11B *5/60;21/21*

U.S. Cl. 360—103 **6 Claims**



1. A negative pressure air bearing slider for use in a disk drive, said slider including an air bearing surface, a leading edge at which an airflow of variable velocity enters said air bearing surface, a trailing edge from which said airflow exits said air bearing surface, and first and second side edges, said air bearing surface further comprising;

a TE pocket defined by a first generally U-shaped rail including a first cross rail, and a first pair of side rails extending from said first cross rail in the direction of said trailing edge;

a LE pocket of predetermined width defined by a second generally U-shaped rail including a second unvented cross rail, and a second pair of side rails extending from said second cross rail in the direction of said leading edge; and

a center rail extending from said first cross rail to said trailing edge, said center rail partitioning said TE pocket into first and second negative pressure regions, the amount of said airflow entering each of said first and second negative pressure regions being determined by said predetermined width of said leading edge pocket and the velocity of said airflow.

5,532,891

DISK DRIVE APPARATUS

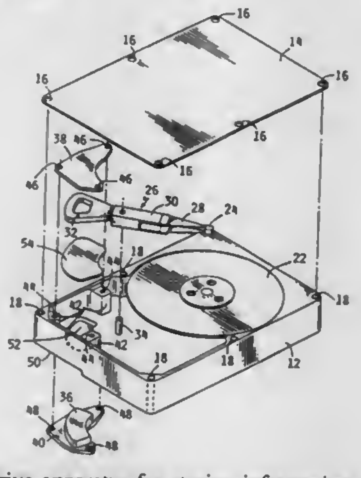
Hitoshi Tsujino, Tokyo-to, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 176,406, Jan. 3, 1994, Pat. No. 5,483,400, which is a division of Ser. No. 731,587, Jul. 17, 1991, Pat. No. 5,315,464. This application Jun. 5, 1995, Ser. No. 461,088

Claims priority, application Japan, Jul. 20, 1990, 2-190878

Int. Cl.^{6} G11B *5/54;33/12*

U.S. Cl. 360—106 **4 Claims**



1. A disk drive apparatus for storing information comprising:

a housing providing a base for mounting components of said disk drive;

at least one disk rotatably mounted on said housing;

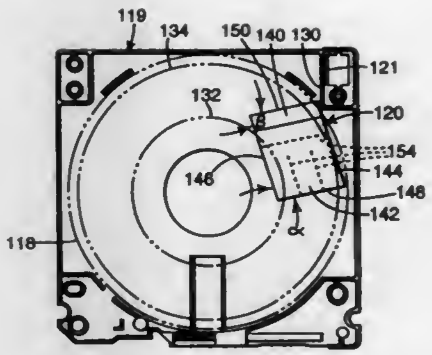
an actuator attached to said housing, said actuator having a first end and a second end, and pivoting about an axis parallel to the axis of rotation of said disk;

a head attached to said first end of said actuator;

a coil attached to the second end of said actuator;

a first permanent magnet for creating a magnetic field surrounding said coil, said field used for positioning said actuator;

wherein said housing has a first through hole opening therein near said coil, said first permanent magnet being positioned within and substantially filling said first through hole opening, said first permanent magnet being attached to said housing.



5,532,892

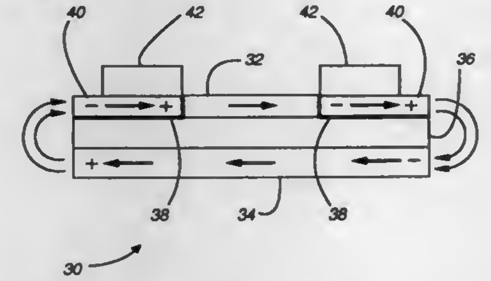
SOFT ADJACENT LAYER BIASED MAGNETORESISTIVE DEVICE INCORPORATING A NATURAL FLUX CLOSURE DESIGN UTILIZING COPLANAR PERMANENT MAGNET THIN FILM STABILIZATION

J. Lamar Nix, and Guy F. Ruse, both of Boulder, Colo., assignors to Quantum Peripherals Colorado, Inc., Louisville, Colo.

Filed Jun. 5, 1995, Ser. No. 461,874

Int. Cl.^{6} G11B *5/39;5/31*

U.S. Cl. 360—113 **51 Claims**



1. A magnetoresistive device comprising:

a magnetoresistive layer presenting first and second oppositely disposed end portions transverse to a major axis thereof, said magnetoresistive layer in an overlying relationship with respect to a soft adjacent layer; and

first and second permanent magnet layer portions in an overlying relationship with respect to said soft adjacent layer and disposed adjacent to, but spaced apart from, said first and second end portions of said magnetoresistive layer in a generally coplanar relationship thereto.

5,532,893

PARALLELOGRAM-SHAPED LIFTER FOR CLEANING A FLEXIBLE MAGNETIC RECORDING DISC

Mark R. Nyberg, Wahpeton, N. Dak.; Gregory A. Laska, Woodbury, Minn., and Daniel J. Stetson, Menomonie, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1994, Ser. No. 341,762

Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—133 **11 Claims**

1. A lifter for supporting a fabric liner of a flexible magnetic recording disc so that the disc is cleaned by rotation of the disc with respect to the liner, wherein the lifter is parallelogram-shaped, wherein none of the four sides of the lifter are at right angles with respect to each other.

5,532,894

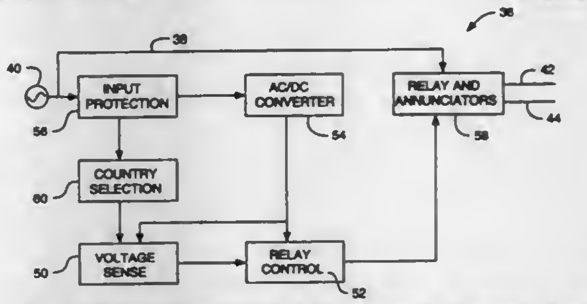
OVERVOLTAGE PROTECTION CIRCUIT

Michael C. Sweaton, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 11, 1994, Ser. No. 273,239

Int. Cl.^{6} H02H *7/04*

U.S. Cl. 361—18 **19 Claims**



1. An apparatus for detecting a high-voltage condition of an alternating-current (ac) voltage source, and adapted for driving a load at two different voltages, the apparatus comprising:

an input line for connection to the ac voltage source;

a first output line;

a second output line;

switch means for selectively connecting either said first output line or said second output line to said input line;

means for generating a direct-current (dc) output whose voltage is based on the ac voltage source;

means for comparing said dc output voltage to a predetermined threshold voltage;

means, connected to said comparing means, for controlling said switch means;

a load line; and

means for coupling said first and second output lines to said load such that the ac voltage source, when applied to said first output line, will produce a lower voltage at said load line than that produced when the ac voltage source is applied to said second output line, said switch means having a first state wherein said input line is connected to said first output line, and a second state wherein said input line is connected to said second output line, said switch means being in said first state when said dc output voltage exceeds said predetermined threshold voltage.

5,532,895

OVERLOAD PROTECTION DEVICE

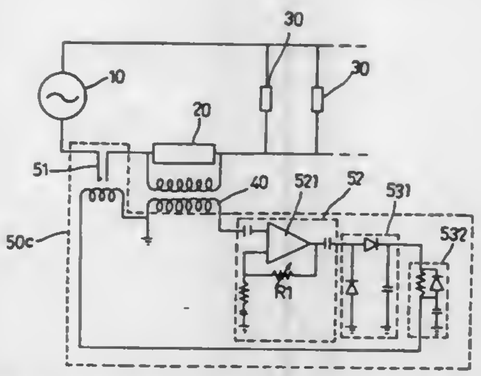
Ming-Hsiang Chiu, Hsin-Chuang No. 8-22, Mei-Yuan Li, Chia-Yi City, Taiwan

Filed Nov. 15, 1994, Ser. No. 339,565

Int. Cl.^{6} H02H *7/04*

U.S. Cl. 361—35 **4 Claims**

1. An overload protection device for use in a current-carrying circuit which includes an AC power source and at least one load, said overload protection device comprising:



a resister to be connected to the AC power source and the load so as to interconnect the AC power source and the load;

a transformer having a primary winding connected across said resistor, and a secondary winding; and

a control circuit connected to said secondary winding of said transformer, said control circuit including a switch unit to be connected to the AC power source and the load so as to interconnect normally the AC power source and the load, said switch unit disconnecting the load from the AC power source when voltage at said secondary winding of said transformer reaches a predetermined overload voltage,

wherein said switch unit comprises:

a DC power source;

a relay unit with a first coil connected to said secondary winding of said transformer, a second coil, and first and second sets of electrical contacts for connecting the AC power source and the load in a first mode and for connecting said DC power source and the load in a second mode;

a charging circuit to be connected serially to the load by one of said first and second sets of electrical contacts when said first and second sets of electrical contacts are in said second mode; and

a comparator having a first input connected to said charging circuit, a second input which receives a reference voltage, and an output terminal connected to said second coil:

whereby, when an overload condition occurs, the voltage at said secondary winding of said transformer becomes sufficient to energize said first coil, thereby actuating said first and second sets of electrical contacts to operate in said second mode, a large voltage drop across said charging circuit due to presence of the overload condition actuating said comparator to energize said second coil to maintain said first and second sets of electrical contacts in said second mode until the overload condition has elapsed.

5,532,896

DISTRIBUTED SILICON CONTROLLED RECTIFIERS FOR ESD PROTECTION

Eugene Coussens, 900 O'Dell Way, Los Altos, Calif. 94024, and Thomas Dungan, 1915 Country Club Rd., Fort Collins, Colo. 80524

Filed Apr. 26, 1994, Ser. No. 234,882

Int. Cl.^{6} H02H *9/04*

U.S. Cl. 361—56 **17 Claims**

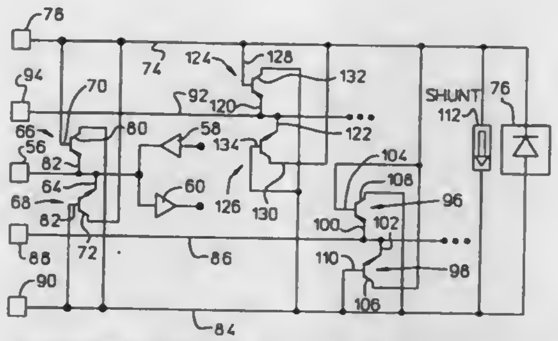
1. An electrostatic discharge (ESD) protection circuit for integrated circuitry having a signal line, a first ground bus and a switching ground bus comprising:

an ESD protection bus;

a first transistor pair having a first PNP transistor and a first NPN transistor, said first PNP transistor having a base connected to said ESD protection bus and to a collector of said first NPN transistor; and

a second transistor pair having a second PNP transistor and a second NPN transistor, said second PNP transistor having a base connected to said ESD protection bus and to a collector of said second NPN transistor;

said first ground bus connected to a collector of each of said PNP transistors and to a base of each of said NPN transistors, said signal line connected to an emitter of each of said first PNP transistor and said second NPN transistor, said switching ground bus connected to an emitter of each of said second PNP transistor and said first NPN transistor.



5,532,897

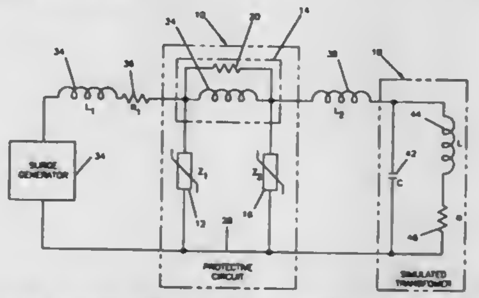
HIGH-VOLTAGE SURGE ELIMINATOR

Roy B. Carpenter, Jr., Boulder, Colo., assignor to Lightning Eliminators & Consultants, Inc., Boulder, Colo.

Filed May 27, 1994, Ser. No. 250,584

Int. Cl.^{6} H02H *9/04*

U.S. Cl. 361—118 **17 Claims**



1. A high-voltage surge suppression system for the protection of a high-voltage electric circuit against the effects of transients and atmospheric discharges, including those caused by lightning and switching transients, which comprises:

a high energy surge arrestor;

a surge interceptor; and

a low energy surge arrestor, wherein:

said high energy surge arrestor is connected between an input to said surge suppression system and ground;

said low energy surge arrestor is connected between an output to said surge suppression system and ground;

said surge interceptor is connected between said high energy surge arrestor and said low energy surge arrestor in said surge suppression system;

said surge interceptor comprises inductor means where said inductor means has minimal capacitance from input to output; and

said inductor means comprises a wire wrapped tube; and resistor means connected in parallel with said inductor means, functioning to dampen high frequency oscillations and to absorb surge energy.

5,532,898

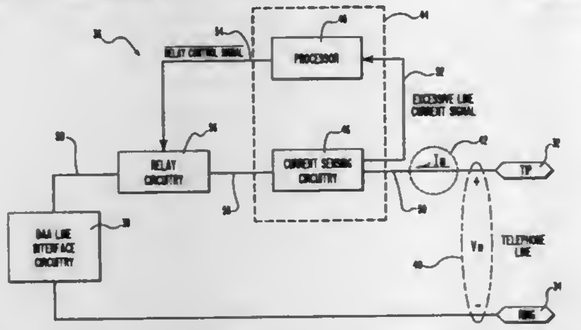
LINE CURRENT PROTECTION CIRCUIT FOR USE WITH A PCMCIA-ARCHITECTURE MODEM CARD

Tim U. Price, Salt Lake City, Utah, assignor to Megahertz Corporation, Salt Lake City, Utah

Filed Apr. 1, 1994, Ser. No. 221,940

Int. Cl.^{6} H02H *3/26;* **H04M** *11/00*

U.S. Cl. 361—119 **23 Claims**


RELAY CONTROL SIGNAL
PROCESSOR
EXCESSIVE LINE CURRENT SIGNAL
RELAY CIRCUITRY
CURRENT SENSING CIRCUITRY
DAA LINE INTERFACE CIRCUITRY
TIP
TELEPHONE LINE
RING

1. A protection circuit intended for use with a line interface circuit that is electrically connectable to a telephone line, the protection circuit comprising:

relay means, connected between the interface circuit and the telephone line, for selectively providing an open or a closed connection between the line interface circuit and the telephone line; and

detection means for detecting the magnitude of a line-current presented to the interface circuit via a supply voltage placed across the telephone line and for causing the relay means to be opened or closed depending on the magnitude of the line-current.

5,532,899

VOLTAGE PROTECTION STRUCTURE FOR SEMICONDUCTOR DEVICES

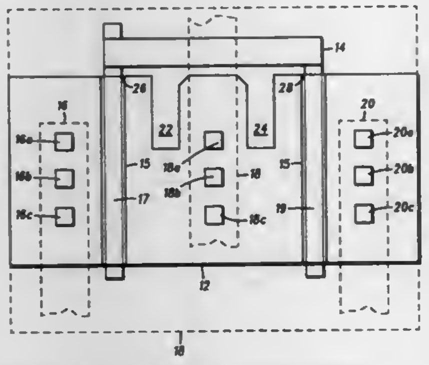
Jean-Claude Tarbouriech, Ville-la-Grand, France, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1994, Ser. No. 210,865

Claims priority, application United Kingdom, Apr. 13, 1993, 9307538

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 361—126 **8 Claims**



1. A voltage protection arrangement comprising:

a semiconductor substrate having at least two discrete electrical conductors adjacent an edge of the substrate, and

an aperture extending from said edge towards a point between the two electrical conductors, whereby the aperture reduces conductance between the two electrical conductors in a region adjacent the edge of the substrate, such that if an excess voltage occurs between the two conductors, a reduced current flows in the region.

5,532,900

SEMICONDUCTOR ARRESTER

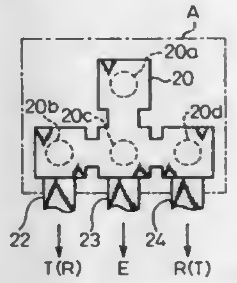
Min-Su Kim, Kyungki-Do, Rep. of Korea, and Itsunari Hamada, Nagano, Japan, assignors to Shinko electric Industries co., Ltd., Nagano, Japan

Filed Feb. 8, 1995, Ser. No. 386,907

Claims priority, application Japan, Feb. 14, 1994, 6-19099

Int. Cl.^{6} H02H *9/06*

U.S. Cl. 361—127 **8 Claims**



1. A diode-bridge thyristor containing semiconductor arrestor, comprising;

a pair of opposed metal plates (**20**, **21**) each having four contacts, wherein the four contacts (**20***a*–**20***d*) of one plate (**20**) are opposite to the four contacts (**21***a*–**21***d*) of the other plate (**21**);

a thyristor (T) connected between one contact (**20***a*) of one plate (**20**) and one opposed contact (**21***a*) of the other plate (**21**);

three pairs of diodes (D1, D2; D3; D4; D5, D6) with each pair respectively connected between the three remaining contacts (**20***b*, **20***c*, **20***d*) of one plate (**20**) and the three remaining contacts (**21***b*, **21***c*, **21***d*) of the other plate (**21**); and

a lead (**22**, **24**, **23**) provided and intervening between each pair of the diodes (D1, D2; D3, D4; D5, D6).

5,532,901

OFFICE ENVIRONMENT LEVEL ELECTROSTATIC DISCHARGE PROTECTION

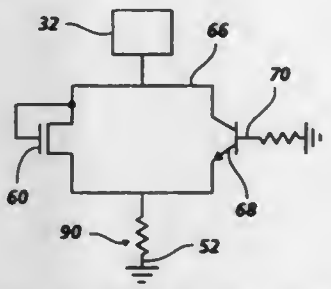
William G. Hawkins, Webster; Cathie J. Burke; Thomas E. Watrobski, both of Rochester; Thomas A. Tellier, Williamson, and Sophie Vandebroek, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 952,015, Sep. 28, 1992, Pat. No. 5,428,498. This application Feb. 13, 1995, Ser. No. 387,516

The portion of the term of this patent subsequent to Sep. 28, 2012, has been disclaimed.

Int. Cl.^{6} H02H *3/22*

U.S. Cl. 361—212 **9 Claims**



1. An electrostatic discharge protection device for a connector associated with an apparatus, comprising:

a MOS device operatively disposed between the connector and ground;

a bipolar transistor, parasitic to the MOS device, having a collector, an emitter, and a base, and adapted to conduct current through the collector and emitter in response to a voltage between the connector and ground in excess of a predetermined threshold;

a direct electrical connection between the connector and the collector of the bipolar transistor; and a zone of a predetermined electrical resistance operatively disposed between the emitter of the bipolar transistor and ground, the zone extending along at least one dimension of the connector.

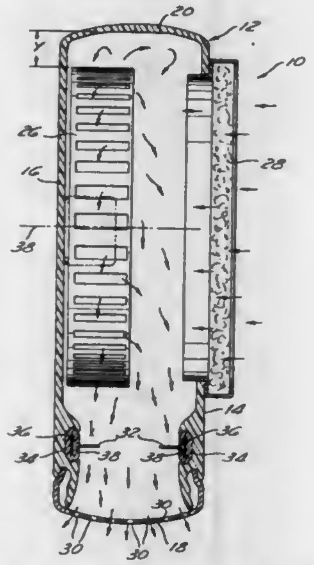
5,532,902
AIR IONIZING DEVICE

Douglas H. Beyer, Cathedral City; Eugene V. Williams, Desert Hot Springs, and Jose A. Alvarez, Palm Springs, all of Calif., assignors to Richmond Technology, Inc., Redlands, Calif.

Filed Feb. 8, 1995, Ser. No. 386,110

Int. Cl.^{6} H05F *3/06*

U.S. Cl. 361—230 **6 Claims**



1. An air ionizing device for providing a flow of ionized air, the device including:

an enclosing housing of insulating material having an intake side and a vent side, the intake side having an opening to allow room-air to enter the housing, the vent side adjoining and approximately perpendicular to the intake side, and the vent side having a plurality of apertures to allow ionized air to exit the housing;

a fan mounted inside the housing and having a plurality of blades that rotate about an axis approximately perpendicular to the intake side, the fan operative to pull room-air axially through the inlet opening and disperse the room-air radially within the enclosed housing away from the axis of rotation of the blades; and

a plurality of electrodes mounted inside the housing adjacent to the vent side and electrically connectable to a high voltage power source, the electrodes protruding inside the housing such that the flow of air within the enclosed housing travels sufficiently near the electrodes that ionized air is created, and the ionized air exits the housing through the vent side;

further including an elongate channel of insulating material having material removed to form a cavity running lengthwise through the channel;

a rail of conductive material disposed inside the channel cavity, and electrically connectable to the high-voltage power supply; and

the channel having a plurality of apertures spaced apart along the length of the channel, the apertures sized to allow attachment of the electrodes and electrical connection of the electrodes to the rail, the channel disposed inside the housing adjacent to the vent side.

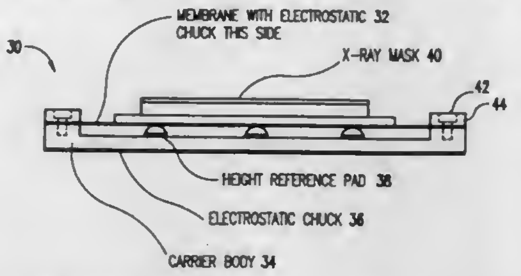
5,532,903
MEMBRANE ELECTROSTATIC CHUCK

Rodney A. Kendall, Fairfield County, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1995, Ser. No. 434,092

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **6 Claims**



1. An electrostatic chuck assembly, comprising:

a housing with an axial opening;

an electrostatic membrane positioned across said axial opening of said housing; and

means for securing said electrostatic membrane to said housing only at perimeter edges of said axial opening of said housing, whereby said electrostatic membrane is translatable in said axial direction relative to said axial opening of said housing during electrostatic chucking of a substrate to an electrostatic membrane.

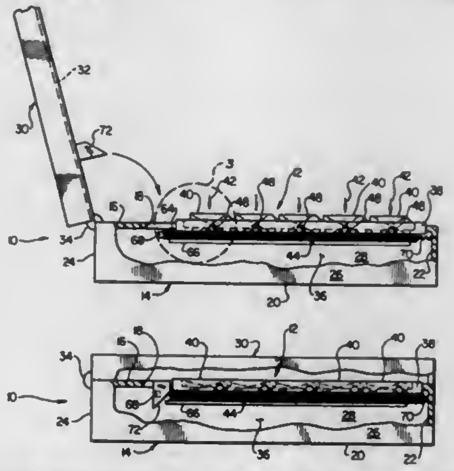
5,532,904
COLLAPSIBLE KEYBOARD STRUCTURE FOR A NOTEBOOK COMPUTER, RESPONSIVE TO OPENING AND CLOSING OF THE COMPUTER'S LID

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 30, 1994, Ser. No. 268,818

Int. Cl.^{6} G06F *1/16;* **B41J** *11/56;* **H05K** *7/04;* **H01H** *13/02*

U.S. Cl. 361—680 **31 Claims**



1. A collapsible keyboard structure for a portable computer, comprising:

a key support structure having top and bottom sides;

a series of keys each carried on said top side of said key support structure for vertical movement relative thereto, through a vertical key stroke distance, between extended and retracted positions;

a base structure carried beneath said key support structure and having a top side facing said bottom side of said key support structure; and

a spaced series of resilient key return members disposed on said top side of said base structure,

said key support structure and said base structure being horizontally shiftable relative to one another between a first position in which said key return members underlie and resiliently hold said keys in said extended positions thereof, each of said key return members being vertically compressed only when said key support structure and said base structure are in said first position and a corresponding one of said keys is moved between said extended and said retracted positions, and a second position in which said key return members permit said keys to be moved from said extended positions thereof to said retracted positions thereof without vertically compressing said resilient key return members.

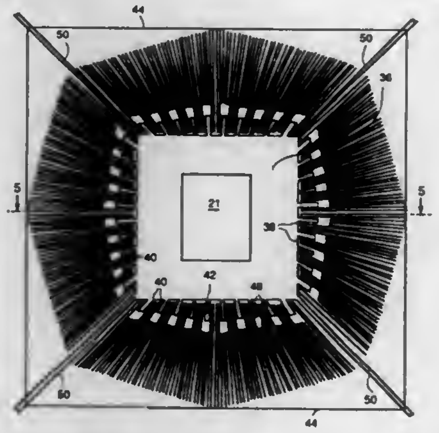
5,532,905
THERMALLY ENHANCED LEADFRAME FOR PACKAGES THAT UTILIZE A LARGE NUMBER OF LEADS

Thomas D. Moore, Limerick, Ireland, assignor to Analog Devices, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 277,324, Jul. 19, 1994, abandoned. This application May 19, 1995, Ser. No. 445,037

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—723 **10 Claims**



1. A thermally enhanced leadframe structure for supporting an integrated circuit (IC), comprising:

a thermally conductive paddle with a plurality of indentations and generally rectangularly shaped protrusions along its perimeter, and

a plurality of electrically and thermally conductive leads arranged to electrically communicate with an IC supported by said paddle, each of said leads having an inner portion that is parallel to at least one of said paddle protrusions, said inner lead portions being positioned so that they lie on a first plane that is in close proximity to a second plane on which said paddle perimeter lies, some of said inner lead portions being longer than the other inner lead portions, the longer inner lead portions substantially extending into respective paddle indentations between paddle protrusions, and the other inner lead portions being generally in-line with respective paddle protrusions and terminating outside said paddle protrusions,

wherein said longer inner lead portions are in thermal transfer communication with said paddle perimeter, and at least some of said other inner lead portions are in thermal transfer communication with an adjacent longer inner lead portion,

wherein the distance between said first and second planes does not exceed approximately 1.5 times the thickness of said inner lead portions.

5,532,906
WIRING SUBSTRATE

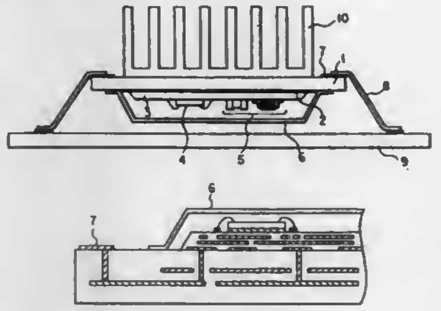
Jun Hanari, Kawasaki; Takeshi Miyagi, Fujisawa; Kazuhiro Matsumoto, Yokohama; Ayako Tohdake, Tokyo, and Yoshitaka Fukuoka, Kawasaki, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 119,576, Sep. 13, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,707

Claims priority, application Japan, Sep. 14, 1992, 4-244872

Int. Cl.^{6} H05K *1/00;* **H01R** *23/68;* **H01L** *23/48*

U.S. Cl. 361—749 **6 Claims**



1. A wiring substrate comprising:

a ceramic substrate having upper and lower surfaces, a first conductive connection pattern on the lower surface and a second conductive connection pattern on one of said upper and lower surfaces;

a multilayered wiring portion having opposite first and second sides, said multilayered wiring portion being formed through said first conductive connection pattern and said first side being arranged on the lower surface of said ceramic substrate, said multilayered wiring portion including an insulating layer made of an organic polymer;

at least one of an integrated circuit and a circuit part mounted on said second side of said multilayered wiring portion;

a flexible wiring substrate, connected to said second conductive connection pattern, for connecting said at least one of an integrated circuit and a circuit part to an external circuit, said flexible wiring substrate including

a multilayered region having a power supply layer on one side of an insulating layer and a ground layer on another side of said insulating layer, and

a single-layered region having a signal wiring layer surrounded by an insulator.

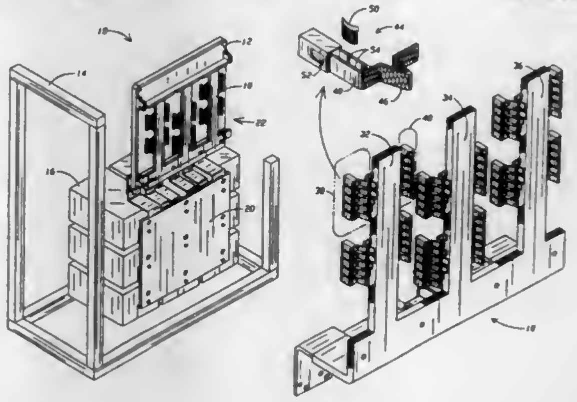
5,532,907
COMPUTER SYSTEM WITH IMPROVED POWER BUS

John A. Asselta, Endicott; Albert L. Balan, Endwell; Stephen Boyko, Conklin, and James E. Myers, Lisle, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1993, Ser. No. 145,815

Int. Cl.^{6} H01R *9/00;* **H02B** *1/20*

U.S. Cl. 361—775 **10 Claims**

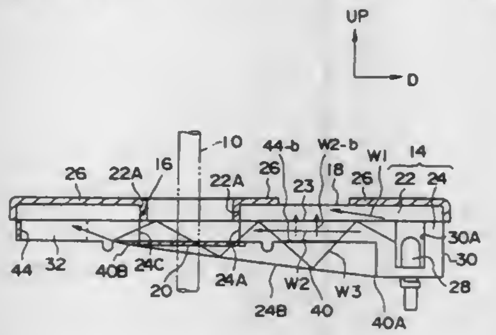


1. A computer system comprising:
- a circuit board;
- at least one power supply for supplying power to said circuit board;
- a power bus comprised of more than one layer of electrically conductive material for connecting said at least one power supply to said circuit board, said power bus being attached to said circuit board so that said power bus and said circuit board are parallel;
- an electronic component connected to said circuit board; and
- said power bus having a bus leg connected to said circuit board adjacent to said electronic component for supplying power in a plurality of voltage or current values directly to said component.

5,532,908
LIGHTING DEVICE FOR ZIGZAG-OPERATED SHIFT LEVER

Yoshinobu Yokoyama; Kenji Suzuki; Yoshiyuki Seki; Shoichi Harada, and Etsuo Shimizu, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-Ken, Japan

Filed May 30, 1995, Ser. No. 454,023
Claims priority, application Japan, May 31, 1994, 6-117992
Int. Cl.^{6} G01D *11/28*
U.S. Cl. 362—30 **9 Claims**

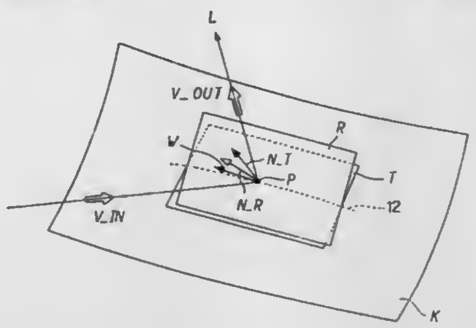


1. A lighting device for a zigzag-operated shift lever in which the shift lever, which is pivotably operated in two orthogonal directions, is shift-operated in accordance with a step-shaped operation groove, comprising:
- a case main body which covers a supporting portion of said shift lever;
- an indicator plate which is assembled to an upper surface open portion of said case main body, said indicator plate including said operation groove and a position indicator which indicates a shift position of said shift lever along the operation groove; and
- lighting means which is disposed within said case main body and discharges light for illumination toward said indicator plate,
- wherein said indicator plate is light-transmissible and has a two-layer structure, said indicator plate has an upper member, in which the upper surface other than the area of said position indicator is shaded and said position indicator is illuminated by said lighting means, and a lower member, in which the light from said lighting means is transmitted to the peripheral portion of the operation groove at said indicator plate so that the peripheral portion of the operation groove is illuminated.

5,532,909
REFLECTOR FOR A VEHICULAR LAMP AND METHOD OF PRODUCING A DIE THEREFOR

Naoto Ban, and Hiroshi Kawashima, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 998,039, Dec. 29, 1992, abandoned.
This application Aug. 3, 1994, Ser. No. 288,388
Claims priority, application Japan, Jan. 6, 1992, 4-018161
Int. Cl.^{6} B60Q *1/30*
U.S. Cl. 362—61 **14 Claims**



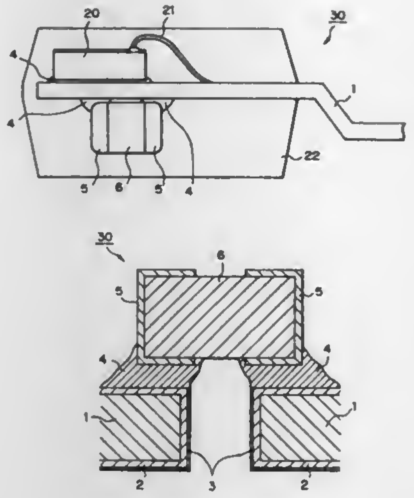
1. A reflector for a vehicle lamp and having an optical axis, comprising:
- a reflecting surface constituted of a plurality of reflecting steps formed around the optical axis of the reflector,
- wherein at least one of said steps is produced from a fundamental surface comprising a free surface adjacent to at least one portion of a vehicle body, said free surface conforming in shape to said at least one portion of a vehicle body adjacent said fundamental surface, and
- wherein said reflecting step is arranged on said fundamental surface so that a tangential vector of a very small reflecting surface at a reflection point on said reflecting step is in a same direction as an outer product of a normal vector of the very small reflecting surface at the reflection point and a normal vector of a tangential plane of said fundamental surface at said reflection point.

5,532,910
HYBRID INTEGRATED CIRCUIT AND PROCESS FOR PRODUCING SAME

Yasutoshi Suzuki, Okazaki; Kenichi Ao, Tokai; Yoshimi Yoshino, Inuyama; Ryoichi Narita, Obu, and Hiroshi Omi, Anjo, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 51,934, Apr. 26, 1993, abandoned.
This application Jul. 14, 1995, Ser. No. 502,580
Claims priority, application Japan, Apr. 28, 1992, 4-137712
Int. Cl.^{6} H05K *5/02*
U.S. Cl. 361—813 **7 Claims**

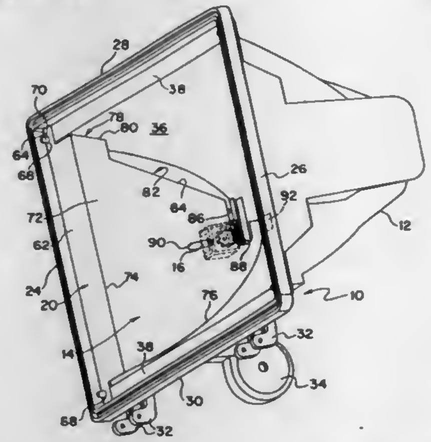
1. A hybrid integrated circuit having a lead frame electrically connected to electronic components by means of a silver (Ag) paste, said hybrid integrated circuit comprising:
- an electroless-plated coating on said lead frame; a copper-plated layer directly formed on said electroless-plated coating;
- a silver-plated area directly formed on said copper-plated layer; and
- a chip condenser mounted on said lead frame by means of at least said silver (Ag) paste, said silver-plated layer having a surface providing an electric connection area.



5,532,911
LIGHTING FIXTURE BARRIER WITH LAMP INSERTION CHANNEL

Ralph W. Sutherland, Blacksburg, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Jun. 7, 1995, Ser. No. 474,170
Int. Cl.^{6} F21S *3/00*
U.S. Cl. 362—220 **12 Claims**

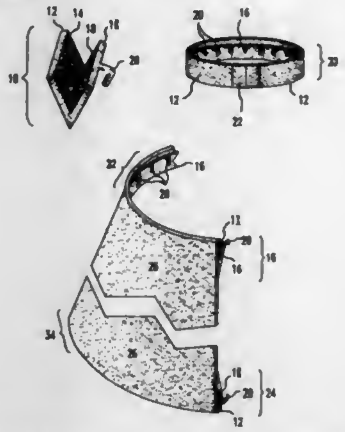


1. A lighting fixture for a double-end lamp, comprising:
- a housing defining a lamp cavity between opposite sides and top and bottom ends thereof;
- first and second electrical sockets adjacent said opposite sides of said housing for receiving and making electrical connection with lamp end connectors, said first socket facing said second socket in said lamp cavity;
- first and second side barriers adjacent said opposite sides and overlying said sockets such that each of said sockets is located between the respective housing side and the respective barrier and is recessed behind the respective barrier by a predetermined distance; and
- first and second openings in said first and second barriers, respectively, coaxially aligned with said sockets along a lamp axis to permit the lamp to extend through said openings and connect the lamp to said sockets; and
- a first channel in said first barrier, said first channel having a first portion extending along a peripheral edge of said first barrier adjacent one of said ends and a second portion extending from said first portion and terminating at said first opening.

5,532,912
CLAMPSHADE

Barbara G. Bendit, One Jared La., Manalapan, N.J. 07726

Filed Mar. 27, 1995, Ser. No. 410,671
Int. Cl.^{6} F21V *1/06*
U.S. Cl. 362—352 **10 Claims**



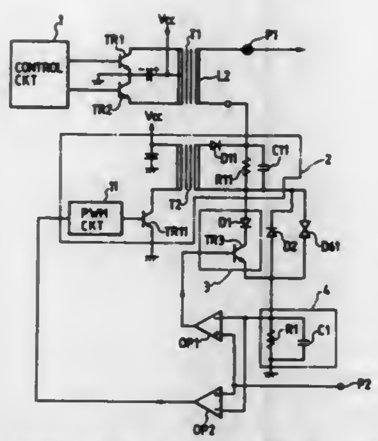
1. A dressing kit for receiving a fabric to cover over the existing shade of a lamp shade frame of the type having an upper rim, a lower rim and a shade extending therebetween, comprising: an upper strip forming a first hoop for clamping to said upper rim of said lamp shade frame, and a lower strip forming a second hoop for clamping to said lower rim of said lamp shade frame; wherein said upper strip is of an upwardly facing Vee cross-section having a first pair of facing walls and a plurality of downwardly extending projections; wherein said lower strip is of a downwardly facing Vee cross-section having a second pair of facing walls and a plurality of upwardly extending projections; wherein said plurality of downwardly extending projections of said upper strip are positionable to clamp to said upper rim of said lamp shade frame; and wherein said plurality of upwardly extending projections of said lower strip are positionable to clamp to said lower rim of said lamp shade frame; a first adhesive means between said first pair of facing walls; a second adhesive means between said second pair of facings walls; wherein said first pair of facing walls are deformable towards one another to adhesively secure a top of said cover fabric to be received; and wherein said second pair of facing walls are deformable towards one another to adhesively secure a bottom of said cover fabric to be received.

5,532,913
ELECTRIC POWER SOURCE

Koji Suzuki; Toshiyuki Sekiya, and Koji Doi, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 816,582, Jan. 3, 1992, abandoned.
This application Mar. 21, 1994, Ser. No. 215,399
Claims priority, application Japan, Jan. 8, 1991, 3-000620; Mar. 7, 1991, 3-041642; Sep. 11, 1991, 3-231251
Int. Cl.^{6} H02M *3/335*
U.S. Cl. 363—25 **20 Claims**

1. An AC high-voltage power supply circuit for use in an image forming apparatus including a load, comprising:
- an AC high-voltage transformer to output AC high-voltage power;
- a DC constant current circuit comprising a transistor, and being connected to said transformer in series;
- a diode which is connected to said DC constant current circuit in parallel such that a current direction of said DC constant current circuit is opposite to that of said diode;
- a constant voltage circuit which is connected in series to said DC constant current circuit and said transformer;
- a load current detection circuit for detecting the DC component of a load current of the load; and
- a supply circuit for supplying composed voltage of an AC output of said AC high-voltage transformer and an output of said



constant voltage circuit to the load without rectifying the AC output of said AC high-voltage transformer,

wherein outputs of said constant voltage circuit and of said DC constant current circuit are controlled by an output of said load current detection circuit.

5,532,914

DC-DC CONVERTER APPARATUS

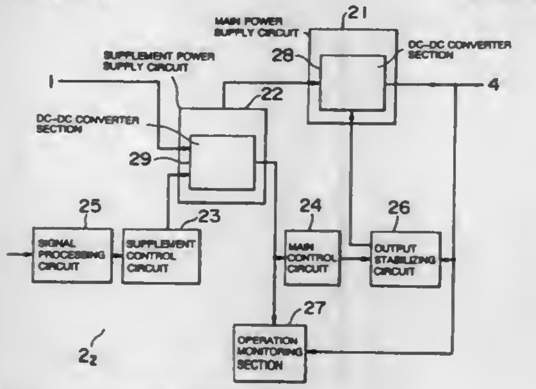
Hironobu Kageyama, and Mitsuo Nakamura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Feb. 28, 1994, Ser. No. 202,578

Claims priority, application Japan, Apr. 30, 1993, 5-104574

Int. Cl.^{6} H02H *7/10*

U.S. Cl. 363—50 **10 Claims**


MAIN POWER SUPPLY CIRCUIT
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SUPPLEMENT POWER SUPPLY CIRCUIT
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DC-DC CONVERTER SECTION
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DC-DC CONVERTER SECTION
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SIGNAL PROCESSING CIRCUIT
SUPPLEMENT CONTROL CIRCUIT
MAIN CONTROL CIRCUIT
OUTPUT STABILIZING CIRCUIT
27
OPERATION MONITORING SECTION
2

1. A DC-DC converter apparatus comprising:

main converter means for converting a D.C. input into a D.C. output which satisfies a preset condition and is supplied to a load;

main control means for controlling the operation of said main converter means;

supplemental power supply means for supplying operating electric power to said main converter means and said main control means;

signal processing means for generating a control signal in response to an external signal indicating an operative or a non-operative state of said DC-DC converter apparatus; and

supplemental control means for receiving said control signal and for controlling the operation of said supplemental power supply means to interrupt the operation of said supplemental power supply means when said main converter means is set in the non-operative state in accordance with said received control signal.

5,532,915

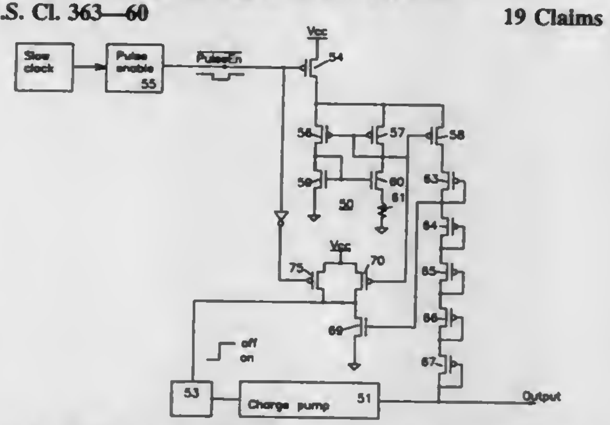
METHOD AND APPARATUS FOR PROVIDING AN ULTRA LOW POWER REGULATED NEGATIVE CHARGE PUMP

Dimitris Pantelakis, Folsom; Kerry Tedrow, Orangevale; Johnny Javanifard, Sacramento, and George Canepa, Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 23, 1994, Ser. No. 217,095

Int. Cl.^{6} H02M *3/18;* G05F *3/16*

U.S. Cl. 363—60 **19 Claims**



1. A circuit for providing a regulated output voltage from a charge pump circuit while utilizing very low amounts of power, the circuit comprising:

a charge pump circuit,

a clock circuit for providing clock pulses to operate the charge pump circuit to produce an output voltage,

a bias circuit for regulating the output voltage by monitoring the output voltage of the charge pump and enabling the clock circuit when insufficient output voltage is detected, and

circuitry for enabling the bias circuit during a fraction of the total operating time available to the charge pump.

5,532,916

VOLTAGE CONVERTING CIRCUIT AND MULTIPHASE CLOCK GENERATING CIRCUIT USED FOR DRIVING THE SAME

Akio Tamagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

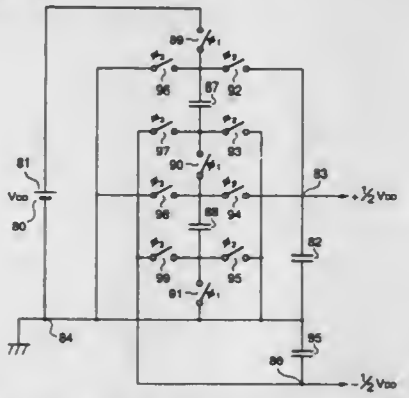
Division of Ser. No. 115,210, Sep. 2, 1993, Pat. No. 5,461,557.

This application May 9, 1995, Ser. No. 438,655

Claims priority, application Japan, Sep. 2, 1992, 4-234387

Int. Cl.^{6} H02M *3/06*

U.S. Cl. 363—62 **4 Claims**



1. A voltage converting circuit including a plurality of capacitive elements, means for connecting said plurality of capacitive elements charging in series with each other and charging the series-connected capacitive elements with a voltage source voltage at a first timing, means for connecting a first predetermined number of capacitive elements of said plurality of capacitive elements in parallel to each other at a second timing so as to generate a positive voltage corresponding to a voltage which is obtained by dividing the voltage source voltage by an integer, and means for connecting a second predetermined number of capacitive elements of said plurality of capacitive elements in parallel to each other at a third timing so as to generate a negative voltage corresponding to a voltage which is obtained by dividing the voltage source voltage by an integer.

5,532,917

POWER FACTOR CORRECTED RECTIFYING CIRCUIT

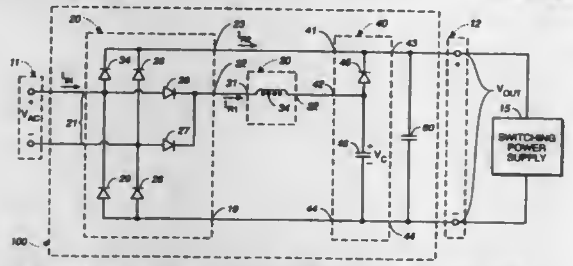
So W. Hung, Chol Wan Est., Hong Kong, assignor to Astec International, Ltd., Hong Kong

Continuation of Ser. No. 18,874, Feb. 17, 1993, abandoned.

This application Aug. 5, 1994, Ser. No. 286,798

Int. Cl.^{6} H02M *7/08;* G05F *1/70*

U.S. Cl. 363—67 **18 Claims**



1. A power factor corrected rectifying circuit comprising:

a power input port for receiving an AC power source having an input voltage and an input current;

a power output port;

a first rectifying means for providing a first rectified current path between said power input port and said power output port;

a second rectifying means for providing a second rectified current path between said power input port and said power output port, said rectified current paths being capable of simultaneously conducting current;

a current delay means in said first rectified current path for delaying the coupling of current through said first rectified current path such that the waveform of the input current at said power input port approximates the waveform of the input voltage at said power input port; and

a current combining means for coupling the first rectified current path and the second rectified current path to said power output port.

5,532,918

HIGH POWER FACTOR SWITCHED DC POWER SUPPLY

James F. Mayrand, Townsend, Mass., and James Gregorich, Merrimack, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

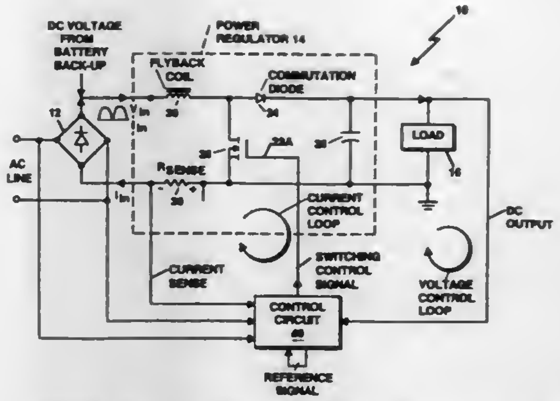
Continuation of Ser. No. 896,256, Jun. 10, 1992, abandoned.

This application Apr. 14, 1994, Ser. No. 227,493

Int. Cl.^{6} H02M *7/155*

U.S. Cl. 363—89 **30 Claims**

1. A high-power-factor switched power supply comprising
a) a full-wave rectifier for rectifying an AC voltage from an AC power line for producing a full-wave rectified voltage, said AC line voltage having a waveform shape and a varying magnitude;
b) a power regulator coupled with the full-wave rectifier for providing a substantially constant DC output voltage to a load, including switch means responsive to a switching control signal for controlling the DC output voltage; and
c) control means coupled with the switch means for supplying the switching control signal thereto, said control means including;
   i) first means for producing a CURRENT DEMAND REFERENCE signal that is directly related to the difference



between the DC output voltage and a predetermined, substantially constant reference signal, and to the waveform shape of the AC line voltage, and inversely related to magnitude changes of the AC line voltage, wherein

said first means further includes first and second detectors that are both responsive to the AC power line and a reference voltage for respectively generating (i) a first signal of substantially constant peak amplitude that is substantially independent of the magnitude of the AC line voltage and has substantially the same waveform as the full-wave rectified voltage, and (ii) a second signal whose magnitude varies with the magnitude of the AC line voltage, and

   ii) second means for producing the switching control signal in response to both the CURRENT DEMAND REFERENCE signal and a current drawn by the power regulator from the AC power line.

5,532,919

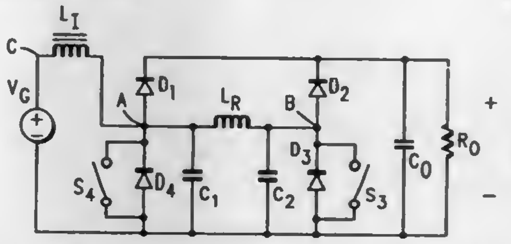
VARIABLE FREQUENCY, ZERO VOLTAGE SWITCHING, QUASI-RESONANT CONVERTERS WITH RESONANT BRIDGE SWITCH

Joel P. Gegner, Oak Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1993, Ser. No. 40,234

Int. Cl.^{6} H02M *3/10*

U.S. Cl. 363—124 **8 Claims**



1. A variable frequency controlled, zero-voltage switched, quasi-resonant converter for receiving power from a DC power source and providing power to a DC load, said converter comprising:

switching bridge means for connecting and disconnecting said power from said DC power source to and from said DC load, said switching bridge comprising:
   (a) a resonant inductor having a first end operatively connected to a first node and a second end operatively connected to a second node;
   (b) a first diode having an anode operatively connected to said first node and a cathode operatively connected to a third node;
   (c) a second diode having an anode operatively connected to said second node and a cathode operatively connected to said third node;
   (d) a third diode having an anode operatively connected to a fourth node and a cathode operatively connected to said second node;

(e) a fourth diode having an anode operatively connected to said fourth node and a cathode operatively connected to said first node;

(f) first and second active switch means for connecting and disconnecting said DC power source to and from said DC load, said first active switch means operatively connected across said third diode, said second switch means operatively connected across said fourth diode;

(g) a first resonant capacitor;

(h) a second resonant capacitor;

wherein said first resonant capacitor is operatively connected to said first node such that any voltage change across said first resonant capacitor necessitates a substantially equal voltage change across said fourth diode as represented by

$$\frac{d}{dt}\,v_{\text{first resonant capacitor}} = \frac{d}{dt}\,v_{\text{fourth diode}}$$

and wherein said second capacitor is operatively connected to said second node such that any voltage change across said second resonant capacitor necessitates a substantially equal voltage change across said third diode as represented by

$$\frac{d}{dt}\,v_{\text{second resonat capacitor}} = \frac{d}{dt}\,v_{\text{third diode}}$$

such that any voltage change across said fourth diode necessitates a substantially equal and opposite voltage change across said first diode;

at least one filtering inductor having first and second ends, said first end operatively connected to said first node, said second end operatively connected to said DC power source;

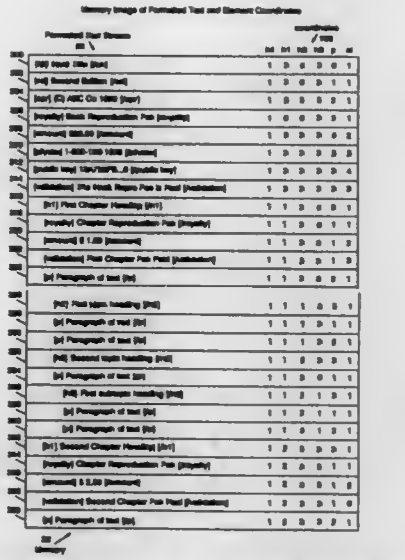
at least one filtering capacitor operatively connected in parallel with said switching bridge;

a timing means for controlling the turning on and turning off of said first active switch means and said second active switch means such that the turn-on and turn-off of said first active switch means is delayed by an amount equal to the switching period T_s relative to the turn-on and turn-off of said second active switch means, and such that said first active switch means and said second active switch means and said first diode and said second diode turn on and turn off with substantially zero volts across them.

5,532,920

DATA PROCESSING SYSTEM AND METHOD TO ENFORCE PAYMENT OF ROYALTIES WHEN COPYING SOFTCOPY BOOKS

Thomas V. Hartrick; Jeffrey N. Stevens, both of Gaithersburg, and Nicholas J. Sabia, Silver Spring, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 875,919, Apr. 29, 1992. This application Dec. 28, 1994, Ser. No. 365,980
Int. Cl.^{6} G06F *3/14;17/21;* **G09C** *3/00;5/00*
U.S. Cl. 364—419.1 **30 Claims**



1. A method for managing the printing of pages of a structured document on a user's printer in a network, so as to comply with royalty payment requirements of the document, comprising the steps of:

loading into memory of a user's data processor in said network, a formatted text stream of a structured document which includes a plurality of portions, at least one portion having an associated document portion royalty payment element including an identification tag and a document portion royalty payment amount tag defining a document portion royalty payment amount:

receiving a print command from a user to print a portion of said document on a printer controlled by said user's data processor;

searching said formatted text stream to identify said document portion royalty payment element associated with the portion to be printed and storing said document portion royalty payment element in a memory in said user's data processor;

transmitting, in response to said print command and to said identified document portion royalty payment element, a request by said user's data processor to a second data processor in said network, for authorization to print said portion of said document, said request for authorization including said document portion royalty payment amount defined by said document portion royalty payment amount tag;

receiving said request at said second data processor and in response thereto, creating a charge of said document portion royalty payment amount to an account of said user;

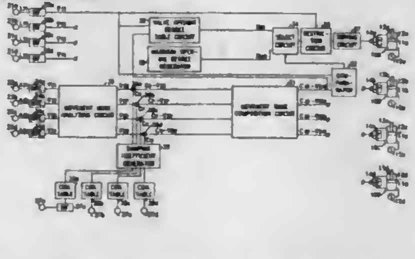
transmitting from said second data processor to said user's data processor an authorization message for printing said portion of said document;

receiving said authorization message at said user's data processor and in response thereto, outputting a print control signal from said user's data processor to a user's printer to print, controlled by said user's data processor, said portion of said document.

5,532,921

ELECTRIC CONTROL APPARATUS FOR SHOCK ABSORBER

Takayuki Katsuda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Sep. 23, 1994, Ser. No. 311,696
Claims priority, application Japan, Sep. 28, 1993, 5-242584
Int. Cl.^{6} B60G *17/00*
U.S. Cl. 364—424.05 **4 Claims**



1. An electric control apparatus for a shock absorber disposed between an unsprung mass and a sprung mass of a suspension mechanism in an automotive vehicle, the shock absorber being provided with an electrically operated control valve an opening degree of which may be electrically controlled for changing damping characteristics of the shock absorber to control vertical displacement of the sprung mass relative to the unsprung mass, comprising:

first detection means for detecting a velocity of the sprung mass relative to a road surface on which the automotive vehicle is supported;

second detection means for detecting a velocity of the sprung mass relative to the unsprung mass;

determination means for determining a target opening degree of the control valve in accordance with the detected velocity of the sprung mass relative to the road surface and the velocity of the sprung mass relative to the unsprung mass;

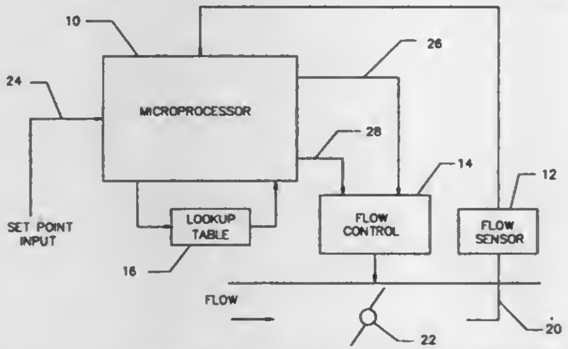
restriction means for controlling the determination means so that the target opening degree is varied within a first predetermined range when the second detection means has detected a direction change condition in the velocity of the sprung mass relative to the unsprung mass and for restricting variation of the target opening degree to a second predetermined range when the second detection means has not detected a direction change condition in the velocity of the sprung mass relative to the unsprung mass, the second predetermined range being smaller than the first predetermined range; and

control means for controlling an opening degree of the control valve so that the opening degree of the control valve approaches the target opening degree.

5,532,922

NON-LINEAR CONTROL SYSTEM FOR A SINGLE INPUT SINGLE OUTPUT PROCESS

Paul C. Wacker, and Gary A. Smith, both of Plymouth, Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 30, 1994, Ser. No. 315,650
Int. Cl.^{6} G05B *13/02*
U.S. Cl. 364—15.2 **12 Claims**



1. A control system for a single input-single output process, said process including i) a controlled variable having an output magnitude and ii) an input receiving an operating signal in which is encoded a value responsive to which a process parameter changes, said parameter change causing the controlled variable's output magnitude to change in a predictable manner dependent on the value encoded in the operating signal, said control system comprising:

sensing means which detects the controlled variable's output magnitude at predetermined intervals and provides a sensor signal encoding the output magnitude;

error signal generating means receiving the sensor signal, for generating an error signal with a magnitude proportional to the difference between the sensor signal output magnitude and a predetermined set point, and a polarity indicative of error direction;

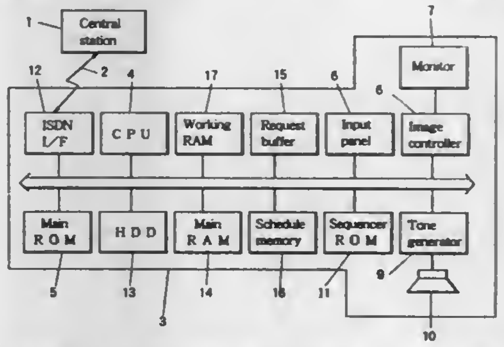
a look up table receiving the error signal, said look up table having a plurality of recorded entries, wherein each of the entries comprises a preselected control value magnitude and an error value specifying a range of error signal magnitudes, wherein the look up table provides a control signal encoding the control value magnitude recorded in the entry in which is also recorded the error value specifying a range of error signal magnitudes within which falls the error signal magnitude in the current error signal from the error signal generating means; and

control means receiving the error signal and the control signal from the look up table and responsive thereto, for providing the operating signal in which is encoded a value proportional to the magnitude of the look up table output and having a polarity dependent on the polarity of the error signal.

5,532,923

KARAOKE NETWORK SYSTEM SERVING SPARE EVENTS DURING IDLING TIME

Takurou Sone, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Continuation of Ser. No. 294,444, Aug. 23, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 528,747
Claims priority, application Japan, Aug. 31, 1993, 5-238836
Int. Cl.^{6} G05B *15/02;* **G10H** *7/00*
U.S. Cl. 364—138 **18 Claims**



1. A karaoke network system comprising a central station for serving a data, and a local terminal connected to the central station through a communication line for presenting an event according to the served data and being switchable between a working state and an idling state in response to a request, wherein

the central station comprises means responsive to a call from the local terminal for serving a song data representative of a karaoke event to the local terminal through the communication line, and means for down-loading a program data which sequentially prescribes spare events into the local terminal through the communication line, and

the local terminal comprises means operative in the working state where a request is present for presenting the karaoke event of a requested song based on the served song data, and means operative in the idling state where a request is absent for sequentially presenting the spare events according to the down-loaded program data so as to fill a blank period of the idling state.

5,532,924

ATTITUDE CONTROL METHOD OF A VISUAL SENSOR UTILIZED FOR AN INDUSTRIAL ROBOT

Ryuichi Hara, Fujiyoshida, and Eiichi Kobayashi, Minamitsuru-gun, both of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

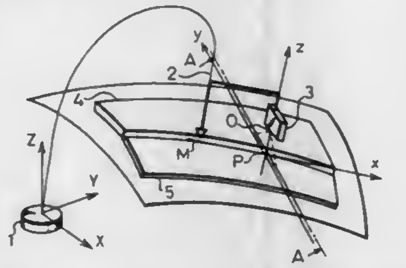
PCT No. PCT/JP94/00808, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/27791, PCT Pub. Date Dec. 8, 1994

PCT Filed May 19, 1994, Ser. No. 360,690

Claims priority, application Japan, May 20, 1993, 5-118662

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—167.01 **1 Claim**



1. An attitude control method of a visual sensor utilized for an industrial robot, wherein said method controls the attitude of the visual sensor so that the sensor may detect an object when a tool (2) attached to a robot (1) moves along with said sensor (3) incorporated into said tool, is characterized in that it comprises:

a first step of teaching positions of a starting point and an end point on a path of said tool through which said tool moves;

a second step of memorizing initial attitude data representing the attitude at said starting point of said visual sensor;

a third step of periodically sampling and memorizing moving attitude data representing the attitude of said visual sensor when said tool moves through said path; and

a fourth step of controlling the attitude of said sensor so that the attitude of said sensor after sampling said moving attitude data at each sampling time matches the attitude represented by said initial attitude data, based on both said initial attitude data and said moving attitude data;

and by achieving said above steps, said attitude of said sensor is controlled so that said visual center of said sensor matches said object to be detected by said sensor when said tool moves.

5,532,925

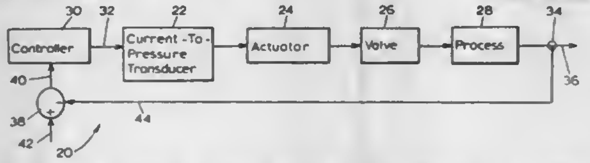
CURRENT-TO-PRESSURE TRANSDUCER WITH SELECTABLE, ADJUSTABLE INPUT FILTER

George W. Gassman, Marshalltown, Iowa, assignor to Fisher Controls International, Inc., Clayton, Mo.

Filed Aug. 12, 1994, Ser. No. 290,015

Int. Cl.^{6} G05B *13/02*

U.S. Cl. 364—177 **18 Claims**



1. Process control system apparatus responsive to a control signal for developing a pressure, the apparatus comprising:

a current-to-pressure transducer including means responsive to an input signal for developing the pressure;

control signal receiving means for receiving a control signal;

a filter integral with the process control system apparatus and electrically coupled intermediate the control signal receiving means and the current-to-pressure transducer, wherein the filter has a dynamic input-to-output characteristic with a time constant which is adjustable to enable variation of the dynamic input-to-output characteristic; and

means for selectively activating the filter so that the filter filters the control signal to develop the input signal to the current-to-pressure transducer and deactivating the filter so that the filter does not filter the control signal to develop the input signal.

5,532,926

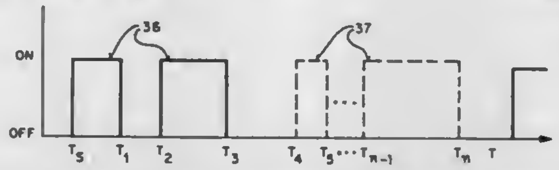
CONTROL SYSTEM FILTER HAVING BOTH EARLY-OFF HOLD AND MULTI-INTERVAL SAMPLING FUNCTIONS

Paul F. Dunn, Longmont, and Randall C. Bauck, Boulder, both of Colo., assignors to Maxtor Corporation, Longmont, Colo.

Continuation of Ser. No. 69,423, Jun. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 722,663, Jun. 28, 1991, abandoned. This application Jan. 11, 1995, Ser. No. 371,923

Int. Cl.^{6} G05B *21/02*

U.S. Cl. 364—178 **23 Claims**



22. A sampled-data control system for generating a generalized filter function comprising:

a pulse filter comprising a control loop means for calculating an error signal representing a difference between an output response of said filter and an input signal coupled to said filter; said control loop means including a sample and hold means for periodically sampling said difference signal at discrete points in time, said sampled signal being held at a sampled value during a first set of time intervals and changed to a reference level during a second set of time intervals, said first and second time intervals being alternated within a sampling period T, wherein a transfer function of said sample and hold means is given in the s-domain by the equation:

$$G(s)=[A_1(\exp^{(-sTs)}-\exp^{(-sT1)})+(A_3(\exp^{(-sT2)}-\exp^{(-sT3)})\ \ldots\ +A_n(\exp^{(-sTn-1)}-\exp^{(-sTn)}))]/(sT)$$

where n is an odd integer greater than 3, A_n is a gain term, and Ts is a start time, and where time intervals Ts to T1, T2 to T3 . . . Tn−1 to Tn comprise said first set of intervals, and time intervals T1 to T2, T3 to T4 . . . Tn to T, comprise said second set of intervals;

memory/computation device means coupled in parallel to said pulse filter for extending said output response of said pulse filter beyond said sampling period.

5,532,927

AUTOMOTIVE DIAGNOSTIC TOOL

David Pink, and Christopher Marley, both of Daventry, Great Britain, assignors to V. L. Churchill, Ltd., United Kingdom

PCT No. PCT/GB91/01246, § 371 Date Sep. 2, 1993, § 102(e) Date Sep. 2, 1993, PCT Pub. No. WO92/02825, PCT Pub. Date Feb. 20, 1992

PCT Filed Jul. 25, 1991, Ser. No. 988,110

Claims priority, application United Kingdom, Jul. 27, 1990, 9016533

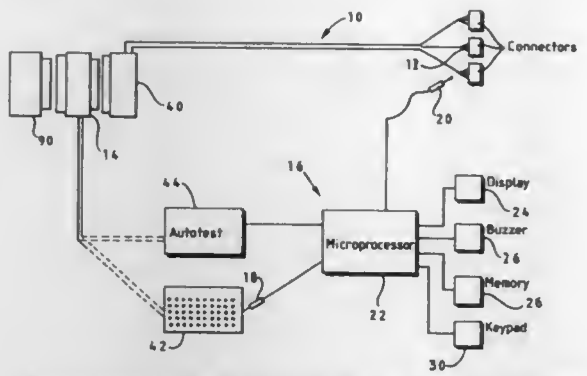
Int. Cl.^{6} G06F *19/00;* G01R *31/00;* G01M *17/00*

U.S. Cl. 364—424.03 **17 Claims**

1. A method of diagnosing fault in an electrical circuit of a motor vehicle having a microprocessor connected to a wiring harness of the vehicle for controlling selected operations of the vehicle, the method using a diagnostic apparatus having:

a diagnostic microprocessor,

connector means for connection between said vehicle microprocessor and said wiring harness for connecting said diagnostic microprocessor to said electrical circuit, said connector means selectively connecting one of an autotest unit and a manual breakout box and with reference probe means for connecting said diagnostic microprocessor to said manual breakout box:



store means for storing data including control data representative of selected parameters specific to said electrical circuit;

test probe means for connecting said diagnostic microprocessor to selected locations in said electrical circuit;

display means for displaying user information; and

keypad means for enabling user input to said diagnostic microprocessor;

the method comprising:

(a) monitoring signals from said vehicle microprocessor to detect fault signals;

(b) selecting control data from said stored data representative of preselected parameters specific to said electrical circuit in response to receipt of a fault signal; and

(c) commencing a preselected diagnostic check of said electrical circuit;

wherein said preselected diagnostic check comprises carrying out one of the following steps in dependence on said control data:

(c1) where said control data is text only, generating a fault diagnostic display on said display means in the form of text and awaiting a user key entry on said keypad; or

(c2) where said control data requires the user to carry out a test measurement, monitoring said connector means for the presence of one of said autotest unit and said manual breakout box and prompting the user by a display on said display means in response to said diagnostic microprocessor detecting the presence of said manual breakout box.

5,532,928

COMPUTER SYSTEM AND METHOD FOR WASTE ACCOUNTING, REDUCTION, AND EVALUATION

Thomas F. Stanczyk, North Tonawanda; Frank K. Milano, Williamsville, and Mary P. Hintermeier, Cheektowaga, all of N.Y., assignors to Recra Environmental, Inc., Amherst, N.Y.

Continuation of Ser. No. 982,185, Nov. 25, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 389,560

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 364—406 **15 Claims**

1. A computer-implemented method of operation on a computer to allocate the cost of treatment, storage, and/or disposal of a specific waste material generated to sites of waste material generation comprising the steps of:

a. providing at least one database containing information including sites of waste material generation and routes of possible flow of waste material after it is generated to disposal thereof;

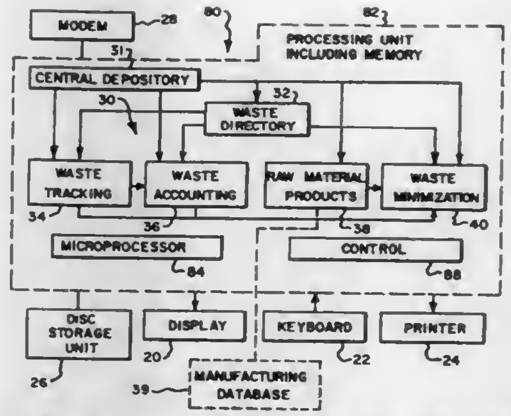
b. inserting said database implemented on said computer;

c. inputting to said computer information containing the date, type, source, cost, and destination for each transaction of waste material generated;

d. inputting to said computer identification of waste generation sites:

e. operating said computer to recursively search said inputted transactions to locate all transactions of waste material having a type and destination which match the type and source of said transaction of said specific waste material and continuing to operate said computer to recursively search back to at least one waste generation site said inputted transactions to respectively locate all transactions of waste material having a type and destination which match the type and source of previously located transactions respectively of waste material wherein the destinations are sources respectively of said previously located matching transactions and having transaction dates which are on or before the respective dates of subsequent transactions of waste material in the flow routes respectively thereof to locate sites of generation of waste material which match the quantity and type of said specific waste material; and

f. operating said computer to allocate the cost of the treatment, storage, and/or disposal of said specific waste material among the located matching sites of waste material generation according to the inputted costs for the respective transactions of waste material located during the search.



5,532,929

APPARATUS FOR CONTROLLING VEHICLE DRIVING POWER

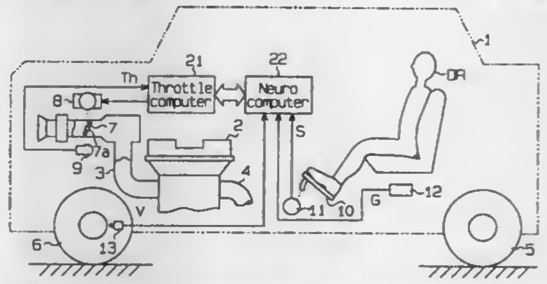
Tatsuya Hattori; Makoto Nishida, both of Susono; Masuji Oshima, Kariya, and Hiroyuki Yoshida, Inazawa, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 14, 1993, Ser. No. 167,601

Claims priority, application Japan, Dec. 16, 1992, 4-336323; Feb. 26, 1993, 5-037772; Feb. 26, 1993, 5-037773; Feb. 26, 1993, 5-037774; Feb. 26, 1993, 5-037775; Feb. 26, 1993, 5-037776; Feb. 26, 1993, 5-037777; Feb. 26, 1993, 5-037778; Feb. 26, 1993, 5-037779; Feb. 26, 1993, 5-037780; Feb. 26, 1993, 5-037781; Feb. 26, 1993, 5-037786; Jul. 30, 1993, 5-190562

Int. Cl.^{6} F02D *41/04*

U.S. Cl. 364—431.07 **52 Claims**



1. An apparatus for controlling the driving power of a motor vehicle having a power adjuster for regulating the power output from said motor vehicle according to control parameters set for said power adjuster, said vehicle further having an accelerator for manipulation by the vehicle's driver to regulate the power output from said motor at various vehicle speeds, the apparatus comprising:

means responsive to the manipulation of said accelerator for detecting the amount by which said accelerator is manipulated (S) and for outputting a signal representative of the detected accelerator manipulation amount;

means responsive to the vehicle speed for detecting the speed of the vehicle and for outputting a signal representative of the detected vehicle speed;

means responsive to the vehicle acceleration for detecting the acceleration of the vehicle (G) and for outputting a signal representative of the detected vehicle acceleration;

a first model learning means for constructing an acceleration model reflective of the driver's changing acceleration needs, and for determining the relationship among the manipulated amount of the accelerator, the vehicle speed, and the vehicle acceleration;

said first learning means including a first learning program for updating said acceleration model, and for generating a first output value (Gx) in response to the amount detected by said acceleration detecting means and said speed detecting means;

said first learning program being designed to calculate a deviation value (ΔG) between said detected vehicle acceleration (G) and said first output (Gx), wherein said acceleration (G) is selected as teaching data, and where said first model learning means modifies said first output (Gx) to decrease said deviation (ΔG) in order to provide an updated acceleration model;

second model learning means for constructing a sensitivity model used to regulate the power adjuster's control parameter, and for determining the relationship among the manipulated amount of the accelerator, the vehicle speed, and the control parameter;

said second model learning means including a second learning program for updating said sensitivity model, and for generating a second output (Thx) in response to the manipulated amount of the accelerator and the detected vehicle speed;

said second learning program being designed to modify said second output (Thx) in order to decrease said deviation (ΔG) calculated by said first model learning means; and

drive control means for controlling said power adjuster and vehicle driving power, said drive control means adjusting the control parameter by referring to a target control parameter determined on the basis of said second output (Thx) transmitted from said second model learning means.

5,532,930

ENGINE-CONTROLLING ATMOSPHERIC PRESSURE DETECTION SYSTEM

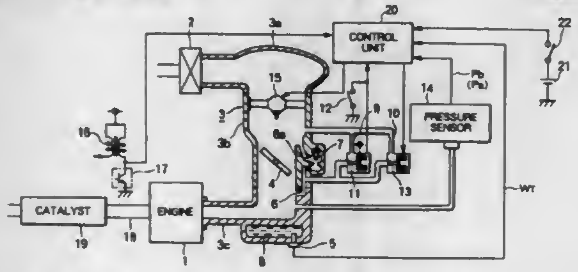
Hajime Kako, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1994, Ser. No. 332,778

Claims priority, application Japan, Nov. 4, 1993, 5-275602

Int. Cl.^{6} F02D ***41/18***

U.S. Cl. 364—431.05 **7 Claims**



1. An engine-controlling atmospheric pressure detection system comprising:

engine speed calculation means for calculating a speed of an engine;

pressure detection means for detecting air-intake tube pressure of said engine;

first pressure calculation means for calculating a first pressure according to at least said engine speed, said first pressure being associated with the air-intake tube pressure when a throttle valve of said engine is closed;

second pressure calculation means for calculating a second pressure according to at least said engine speed, said second pressure being associated with the air-intake tube pressure when said throttle valve of said engine is closed;

parameter calculation means for calculating a parameter which indicates the relationship of said air-intake tube pressure in relation to said first and second pressures;

learn value calculation means for processing said parameter in time sequence by calculation so as to determine a typical value of said parameter and to store said typical value as a learn value; and

atmospheric pressure calculation means for calculating an atmospheric pressure based on said learn value.

5,532,931

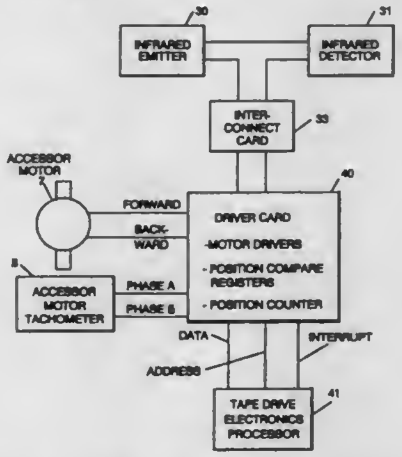
LOW TOLERANCE POSITIONING SYSTEM IN AN AUTOMATED HANDLING SYSTEM

Jack N. Erickson, Jr.; Jack M. Gazza; Victor S. Olivas, and Charles A. Thompson, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1994, Ser. No. 282,868

Int. Cl.^{6} G06F ***17/00;*** **G11B** ***15/68***

U.S. Cl. 364—478.06 **16 Claims**



1. A method for locating objects stationed within a plurality of storage cells for transporting said objects to a predetermined location, said method comprising steps of:

(a) moving a gripper mechanism to a home position;

(b) sensing when said gripper mechanism has arrived at said home position and storing a location indication of said home position, said home position having a known relationship to said plurality of storage cells;

(c) translating said gripper mechanism to a predetermined storage cell of said plurality of storage cells for retrieving an object therefrom;

(d) detecting when said gripper mechanism is located in a position to retrieve said object within said predetermined storage cell and then storing a location indication of said object; and

(e) retrieving said object from said predetermined storage cell and transporting said object to said predetermined location.

5,532,932

NUMERICAL CONTROL UNIT

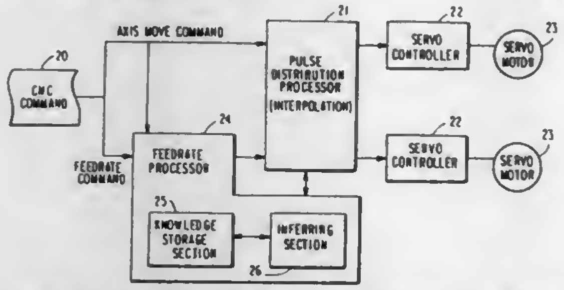
Tomomitsu Niwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 935,876, Aug. 26, 1992. This application Mar. 16, 1995, Ser. No. 405,025

Claims priority, application Japan, Sep. 2, 1991, 3-221587

Int. Cl.^{6} G05B ***19/416;*** **G06F** ***15/18***

U.S. Cl. 364—474.3 **23 Claims**



1. A numerical control unit for changing a cutting condition of a machine tool during machining of a workpiece, comprising:

a knowledge storage section for storing at least two rules for changing the cutting condition, at least one of said rules defining a rate at which movement of the machine tool is changed based on the position of the machine tool with respect to a corner of the workpiece, said section further comprising a rule description part and assessment functions; and

an inferring section for inferring the optimum value of the cutting condition on the basis of a number of said rules, including said at least one of said rules, stored in said knowledge storage section, said numerical control unit causing a workpiece to be machined in accordance with the cutting condition inferred by said inferring section.

5,532,933

CAD/CAM SYSTEM AND METHOD OF GENERATING MACHINING PATHS FOR THE SAME

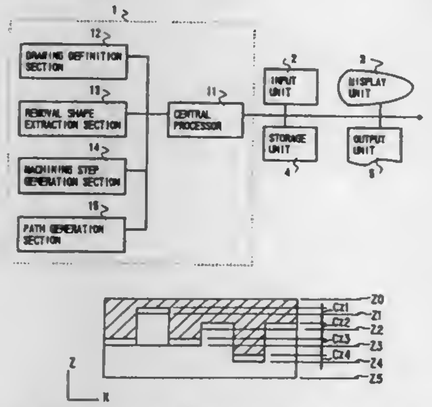
Masafumi Nakata, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 209,748

Claims priority, application Japan, Mar. 12, 1993, 5-052105

Int. Cl.^{6} G06F ***19/00***

U.S. Cl. 364—474.24 **21 Claims**



1. A CAD/CAM system for automatically generating data for machining a workpiece into a finished shape, including the generation of plural machining paths according to predefined finish shape data and workpiece shape data, said data for machining the workpiece being expressed in a coordinate system having an X-axis and a Y-axis lying in a horizontal plane and having a Z-axis extending in a vertical direction, the system comprising:

a removal shape extraction means for determining removal shape data from said predefined finish shape data and workpiece shape data, said removal shape extraction means comprising: Z direction division means for dividing the workpiece shape at points along the Z-axis corresponding to each machining surface Z height of the finished shape between upper and lower Z heights along the Z-axis; and contour curve inclusion judgment means for specifying a removal shape for each machining surface Z height by judging whether a finish shape contour curve is included in the removal shape, wherein the Z direction division means includes an extraction division means for extracting, in the case of a curved finish shape, an X-Y plane portion representing a section of the pertinent removal shape; and

a machining step generation means for generating a machining step, corresponding to a machining surface of each removal shape extracted by said removal shape extraction means, for each of plural Z heights of the workpiece.

5,532,934

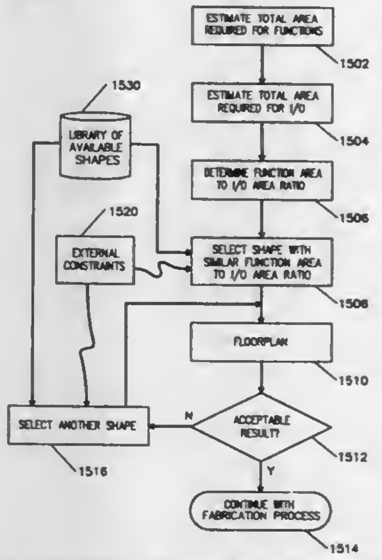
FLOORPLANNING TECHNIQUE USING MULTI-PARTITIONING BASED ON A PARTITION COST FACTOR FOR NON-SQUARE SHAPED PARTITIONS

Michael D. Rostoker, Boulder Creek, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 15,947, Feb. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 916,328, Jul. 17, 1992, Pat. No. 5,340,772. This application Apr. 3, 1995, Ser. No. 416,457

Int. Cl.^{6} H01L ***23/50***

U.S. Cl. 364—488 **20 Claims**


ESTIMATE TOTAL AREA REQUIRED FOR FUNCTIONS
1502
1530
ESTIMATE TOTAL AREA REQUIRED FOR I/O
1504
LIBRARY OF AVAILABLE SHAPES
DETERMINE FUNCTION AREA TO I/O AREA RATIO
1506
1520
EXTERNAL CONSTRAINTS
SELECT SHAPE WITH SIMILAR FUNCTION AREA TO I/O AREA RATIO
1508
FLOORPLAN
1510
N
SELECT ANOTHER SHAPE
ACCEPTABLE RESULT?
1512
1516
Y
CONTINUE WITH FABRICATION PROCESS
1514

1. A method of designing, including floorplanning functions for, an integrated circuit, comprising the steps of:

designing an integrated circuit, including a plurality of interconnected functions, each function requiring a first area and a plurality of interconnected functions, each function requiring a first area and a plurality of I/O points, each I/O point requiring a second area;

selecting a die having a die size, die area and die shape;

performing a floorplanning process whereby portions of the die area are successively partitioned by a partitioning process into progressively smaller groups of two or more sub-partitions, each portion of the die area having a partition area and each sub-partition having a sub-partition area;

assigning functions to the sub-partitions such that each assignment of functions to the sub-partitions results in a number of connections between interconnected functions crossing from one sub-partition area into another sub-partition area, said crossings of connections between the sub-partition areas being "partition boundary crossings"; and

determining a partition cost factor (PCF) according to the equation:

$$PCF = \frac{SF_1 \cdot \left\{ \left| A_{f1} - \left(A_f \frac{A_{p1}}{A_D} \right) \right| + \left| A_{f2} - \left(A_f \frac{A_{p2}}{A_D} \right) \right| + \ldots + \left| A_{fm'} - \left(A_f \frac{A_{p'm'}}{A_D} \right) \right| \right\}}{A_f} + SF_2 \cdot PBC$$

where A_f is a sum of the first areas of all d the functions assigned to all of the sub-partitions in a first group of sub-partitions, A_{f1} is a sum of the first areas of all of the functions assigned to a first sub-partition in the first group, A_{f2} is the sum of the areas of all of the functions assigned to a second sub-partition in the group, 'm' is the number of sub-partitions in the first group, $A_{fm'}$ is the sum of the areas of all of the functions assigned to the 'm'th sub-partition in the first group, A_{p1} is the sub-partition area of the first sub-partition, A_{p2} is the sub-partition area of the second sub-partition, $A_{p'm'}$ is the sub-partition area of the 'm'th sub-partition, A_D is the partition area for the portion of the die areas which has been partitioned into the first group of sub-partitions, PBC is the number of partition boundary crossings, SF_1 is a partition-balance scale factor, and SF_2 is a partition boundary crossing scale factor;

wherein said floorplanning process is based on the PCF resulting in a layout for the die of the integrated circuit.

5,532,935

ELECTRONIC DEVICE CAPABLE OF AUTOMATICALLY CONTROLLING POWER ASSUMPTION OF COMPONENTS EMPLOYED IN ACCORDANCE WITH OPERATING TIME PERIOD BY USER

Ryoji Ninomiya; Hideaki Muraya, and Shizuka Gunji, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

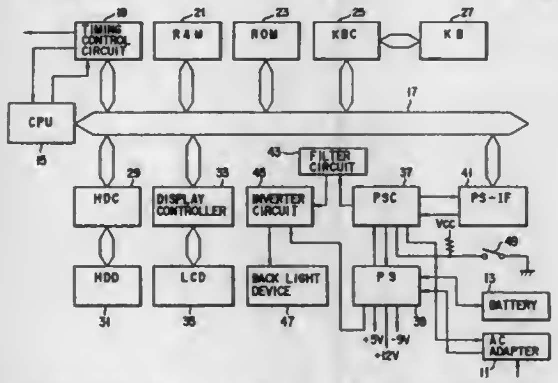
PCT No. PCT/JP92/01274, § 371 Date Oct. 13, 1993, § 102(e) Date Oct. 13, 1993, PCT Pub. No. WO93/07557, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 66,097

Claims priority, application Japan, Oct. 2, 1991, 3-255581

Int. Cl.^{6} H02J *1/00*

U.S. Cl. 364—492 **14 Claims**



1. An electronic device driven by a battery, comprising:

a device component driven by power supplied from the battery;

time period setting means for setting an operating time period during which the electronic device is operated by the battery;

capacity detection means for detecting a remaining capacity of the battery; and

power control means for controlling the amount of power supplied to the device component on the basis of the operating time period set by the time period setting means and the remaining capacity detected by the capacity detection means.

5,532,936

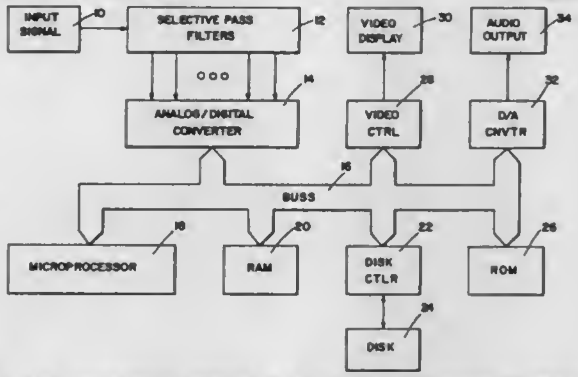
TRANSFORM METHOD AND SPECTROGRAPH FOR DISPLAYING CHARACTERISTICS OF SPEECH

John W. Perry, 7419 Cimmaron Sta. Dr., Columbus, Ohio 43235

Filed Oct. 21, 1992, Ser. No. 964,341

Int. Cl.^{6} G10L *7/10*

U.S. Cl. 364—514 A **3 Claims**



1. An economical method for developing frequency-domain information of audio signals in realtime and displaying said frequency-domain data as a spectogram which allows for the visual recognition of spoken words, said method comprising the steps of:

receiving a time-domain signal, said input signal having an input signal frequency;

filtering said received signal with an array of low pass filters, wherein each successive low pass filter has a cutoff frequency which is approximately twice the cutoff frequency of the low pass filter with the next lower cutoff frequency;

sampling the filtered output signal of each low pass filter, wherein each low pass filter is sampled at a higher rate than the rate of the low pass filter with the next lower cutoff frequency respectively;

mathematically modeling a receiver of said input signal, said mathematical model including a mathematical representation of a damped oscillator, said damped oscillator having a natural frequency;

processing said input signal through said mathematical model to detect the spectral power at said natural frequency of said damped oscillator;

capturing said spectral power in a medium to facilitate usage of said input signal;

representing said spectral power in a medium, said representation being a logarithmic function of said spectral power;

determining the amplitude of said received signal;

displaying an amplitude line offset from said base reference line a distance proportional to said amplitude;

displaying a prerecorded reference spectogram;

displaying a reference pitch indicator;

wherein said higher sampling rate is substantially twice the rate of the low pass filter with the next lower cutoff frequency; and

wherein said power of said spectral components are displayed at an intensity and color which varies according to the respective power of each spectral component.

5,532,937

SWITCHING OF MULTIPLE MULTIMEDIA DATA STREAMS

Michael J. Graziano, Warrenton; Jon F. Hauris, and Daniel L. Stanley, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

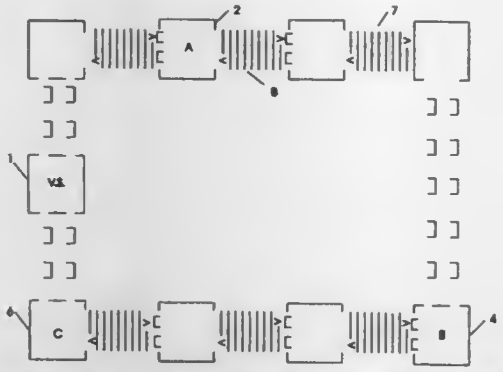
Filed Jan. 31, 1994, Ser. No. 189,533

Int. Cl.^{6} H04J *3/00*

U.S. Cl. 364—514 C **6 Claims**

1. A method of switching multimedia data streams, said method comprised of:

a) sending of data by a master source to a receiver, said data transmitted in the form of master cycles, each of said master cycles being divided into uniform time slots, each slot containing client data to be transmitted to a specific client associated with said slot;



b) receiving of said data in a storage means contained in said receiver, said receiver distributing said client data in each of said slots to said associated client, said receiver having a switching matrix, said switching matrix comprised of an identifier for each slot and an identifier for each client, said matrix showing the correspondence between each of said slots and each of said clients, the slots related to the client data in the order of the client data stored in the storage means;

c) sending a control message from the master source, said first control message containing information indicating that a first client is to be deallocated;

d) placing "place-holder" data by the master source into those portions of the data stream allocated to said first client;

e) creating a new switching matrix said matrix comprised of said identifiers for each slot and a collection of said client identifiers, each client identifier correlated to a different client and to the order of the client data stored in the storage means, said collection not containing an identifier for said first client;

f) sending a response message by said receiver to said master source, said response message containing information indicating that said new switching matrix has been created;

g) ceasing to transfer data at a master cycle boundary by said master source;

h) sending to said receiver an interrupt message when said data has been emptied from the storage means;

i) using said new switching matrix in the receiver to control said sending of data by said receiver following receiving of said interrupt message;

j) sending by said receiver of a second control message indicating that said new switching matrix is being used;

k) sending data by said master source to said associated client in an order corresponding to said new switching matrix; and

l) receiving said new data by said receiver and distributing said new data on said network according to said new switching matrix.

5,532,938

NUMERICAL ARITHMETIC PROCESSING UNIT

Yoshikazu Kondo, and Yutaka Arima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,300

Claims priority, application Japan, Jan. 28, 1994, 6-008777

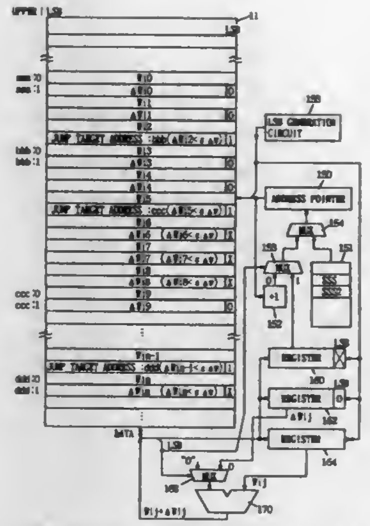
Int. Cl.^{6} G06F *7/38;7/00*

U.S. Cl. 364—736 **36 Claims**

1. A numerical arithmetic processing unit comprising:

storage means for storing numeric data; and

set means for reading a numeric data from said storage means; and setting processing to be executed subsequently to the



reading of the numeric data from said storage means in accordance with a numeric value of said numeric data being read each said numeric data including a numeric part onsisting of a numeral data and a numeric code part including a code specifying whether the numeric data is data to be arithmetically processed or data indicating processing to be executed subsequently, said code including said numeric value.

5,532,939

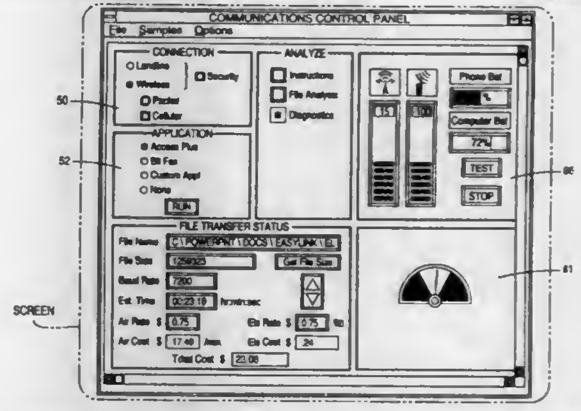
METHOD AND APPARATUS FOR DATA COMMUNICATION EFFICIENCY ANALYSIS

Leas N. Psinakis, Basking Ridge, N.J.; Thomas J. Villani, Bethlehem, Pa., and August C. Etsch, Nanuet, N.Y., assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Jul. 27, 1994, Ser. No. 280,891

Int. Cl.^{6} H04J *15/00*

U.S. Cl. 364—514 C **22 Claims**



File Name C:\POWERPNT\DOCS\EASYLINK\
File Size 1258323
Baud Rate 7200
Est. Time 00:23:19
Air Rate $ 0.75
Air Cost $ 17.40
Total Cost $ 23.08

1. A method for evaluating efficiency of a transmission of a data file through a first transmission device, comprising:

selecting the first transmission device;

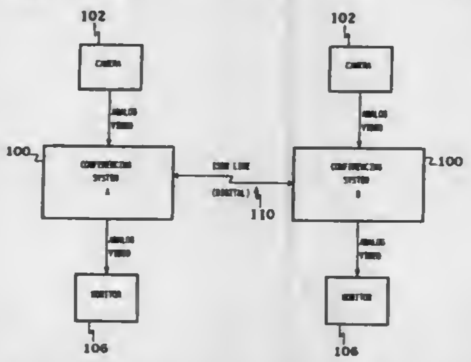
selecting the data file for transmission;

determining information about the transmission of the data file through the first transmission device; and

displaying the information determined in the determining step whereby a user may evaluate whether to transmit the data file through the first transmission device.

5,532,940
PROCESS, APPARATUS AND SYSTEM FOR SELECTING QUANTIZATION LEVELS FOR ENCODING VIDEO SIGNALS

Rohit Agarwal, Hillsboro, and Michael Keith, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Continuation-in-part of Ser. No. 158,855, Nov. 24, 1993. This application Apr. 28, 1994, Ser. No. 234,978
Int. Cl.^{6} G06F *17/00*
U.S. Cl. 364—514 R **22 Claims**

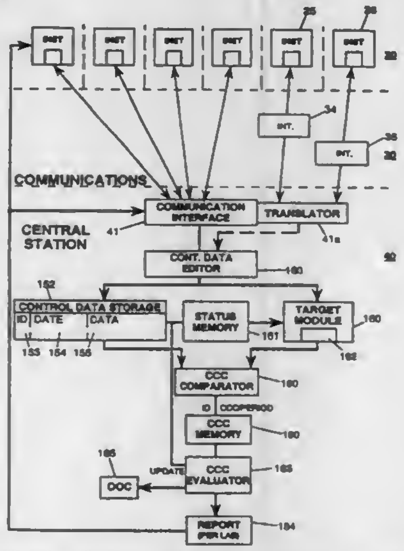


1. A computer-implemented process for encoding video signals, comprising the steps of:

(a) receiving a current video frame;
(b) selecting a quantization level for the current video frame in accordance with a plurality of mappings, wherein each mapping correlates an activity measure with a bits per frame measure and each mapping corresponds to a quantization level of a plurality of quantization levels; and
(c) encoding the current video frame in accordance with the selected quantization level.

5,532,941
INTER-LABORATORY PERFORMANCE MONITORING SYSTEM

Lawrence I.-K. Lin, 2565 Riverwoods Rd., Riverwoods, Ill. 60015
Filed Jul. 8, 1994, Ser. No. 272,239
Int. Cl.^{6} G06F *15/16;* G06G *7/48*
U.S. Cl. 364—552 **43 Claims**



1. A system for quality control monitoring the operating performance of a large plurality of instruments, the system comprising, in combination:

a plurality of geographically distributed instruments comprising a peer group operated to produce control data on a periodic basis and also experimental data whose quality is to be monitored;

a communication medium linking the instruments to a central station for reporting the control data to the central station;

the central station including a communication interface linked to the communication medium, a data storage module for the control data, a target module for setting control targets, a status memory, a correlation comparator for comparing the control data against the targets, and a CCC performance evaluator;

the data storage module comprising means for storing control data in conjunction with instrument identification data received on a periodic basis via the communication interface from the instruments making up the peer group;

the status memory containing indicators identifying a subset of instruments within the peer group which are to serve as the golden peer group;

the target module including means responsive to the status memory for selecting control data from the golden peer group, automatically processing the selected control data horizontally across periods and vertically across instruments to minimize the effect of outliers, and to produce from the so-processed control data a set of periodic moving targets for the control data;

the correlation comparator comprising means for comparing the periodic targets against the control data for each instrument to determine for each instrument a CCC for an interval comprising a number of periods which rates the accuracy and precision of the instrument performance for said interval with respect to the moving targets for the same interval;

the CCC evaluator comprising means for determining the distribution of all of the instruments in the peer group and rating the CCC for each instrument against said distribution; and

means responsive to the CCC evaluator for selecting a subset of good performing instruments near the center of the distribution of the peer group as comprising the golden peer group and operative on the status memory for updating the golden peer group identification.

5,532,942
AUTOMATIC APPARATUS FOR INSPECTING POWDERY PRODUCT

Hajime Kitamura, Ichihara; Masaru Takeuchi; Hideo Yoshikoshi, both of Hazaki-machi; Mikio Kitai, Mito; Takashi Chino, Iruma; Yuji Nogami, Kawaguchi; Hajime Yashiro, Sagara-cho, and Keisuke Kato, Kawasaki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan
Filed Jul. 6, 1993, Ser. No. 983,862
Claims priority, application Japan, Jul. 8, 1991, 3-167101; Aug. 29, 1991, 3-218253; Aug. 29, 1991, 3-218254; Jan. 6, 1993, 5-000797
Int. Cl.^{6} G01N *1/00;35/00*
U.S. Cl. 364—555 **10 Claims**

1. An apparatus for automatically inspecting a plastic powdery sample comprising

means for reading sample data attached to the sample;

means for subdividing the sample into subdivisions;

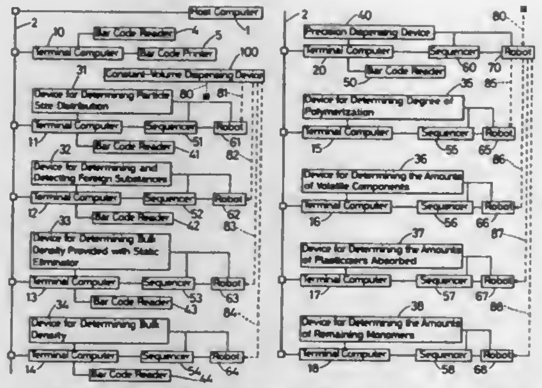
a plurality of automatic inspection means, each of which processes, in parallel, each subdivision of the sample;

a computer for calculating condition data for each inspection from the sample data read by the reading means;

means for recording the condition data of each subdivision of the sample;

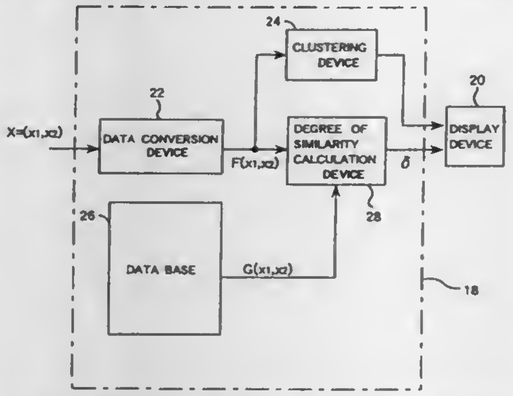
a plurality of means for reading the condition data; and

a plurality of computers each of which controls the operation of each inspection means from the condition data read by the reading means, wherein the plurality of automatic inspection means comprises a means for determining bulk density when the sample is destaticized, a means for determining bulk density when the sample is not destaticized and at least one of a means for determining an amount of a volatile component and a means for determining an amount of a plasticizer absorbed.



5,532,943
PARTICLE ANALYZING APPARATUS AND METHOD THEREFOR

Kaoru Asano, and Yukimi Ikekita, both of Kobe, Japan, assignors to TOA Medical Electronics Co., Ltd., Kobi, Japan
Filed Dec. 28, 1993, Ser. No. 174,249
Claims priority, application Japan, Dec. 28, 1992, 4-359893
Int. Cl.^{6} G01N *33/49*
U.S. Cl. 364—555.000 **25 Claims**



1. A particle analyzing apparatus for analyzing particles in a fluid comprising:

particle detection means for measuring at least one physical characteristic of each of a plurality of particles in a fluid to obtain at least one data representative of each measured physical characteristic for each measured particle;

conversion means for converting the data obtained for the particles into distribution data;

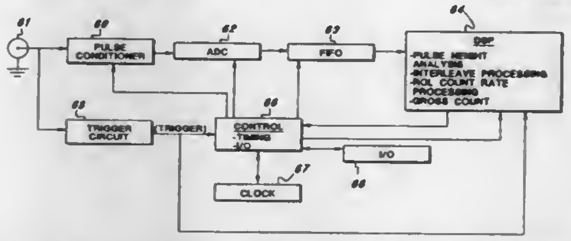
data base storing means for storing reference distribution data;

calculation means for calculating a degree of similarity δ of the distribution data with respect to the reference distribution data; and

display means for displaying the degree of similarity calculated by said calculation means.

5,532,944
MULTI-CHANNEL ANALYSIS SYSTEM AND METHOD USING DIGITAL SIGNAL PROCESSING

Richard M. Battista, San Diego, Calif., assignor to Sorrento Electronics, Inc., San Diego, Calif.
Filed Jul. 28, 1994, Ser. No. 302,191
Int. Cl.^{6} G06J *1/00*
U.S. Cl. 364—602 **20 Claims**



1. A device for performing pulse height analysis on a detector signal in a multi-channel analyzer used in radiation monitoring, said device including:

a pulse conditioner coupled to the detector signal, the pulse conditioner including means for filtering, means for shaping and means for digitizing the detector signal, and further including means for generating a pulse data signal in response to the means for filtering, the means for shaping and the means for digitizing;

a trigger circuit coupled to the detector signal, the trigger circuit including means for detecting pulses in the detector signal and means for generating a trigger signal in response to the means for detecting the pulses;

a signal processor coupled to the pulse conditioner, and the trigger circuit, the signal processor including means for performing the pulse height analysis on the pulse data signal, and for determining a gross number of pulses detected by the trigger circuit in response to the trigger signal;

a control circuit coupled to the signal processor, to the trigger circuit, and to the pulse conditioner, the control circuit including means for controlling the filtering, shaping and digitizing within the pulse conditioner, and further including means for controlling timing within the pulse conditioner and within the signal processor; and

a clock circuit coupled to the control circuit, the clock circuit including means for generating a clock signal, the clock circuit being coupled to the means for controlling timing within the pulse conditioner and within the signal processor.

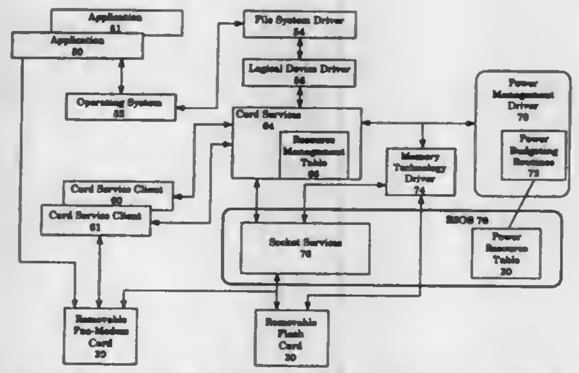
5,532,945
POWER BUDGETTING IN A COMPUTER SYSTEM HAVING REMOVABLE DEVICES

Kurt B. Robinson, Newcastle, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Jun. 17, 1994, Ser. No. 261,447
Int. Cl.^{6} G06F *1/00;* G11C *7/00*
U.S. Cl. 364—707 **14 Claims**

1. A computer system, comprising:

nonvolatile memory coupled to a system bus, the nonvolatile memory containing a power resource table that stores a power consumption indication for at least one resident device for the computer system;

socket controller coupled to the system bus, the socket controller for receiving a removable device, the removable device containing a card information structure that stores a power consumption indication for the removable device;



processor coupled to access the power consumption indication for each of said at least one resident device from the power resource table and the power consumption indication for the removable device from the card information structure, the processor coupled to fetch and execute a power management driver that allocates a power budget to the removable device.

5,532,946

CALCULATOR WITH TABLE GENERATION CAPABILITY

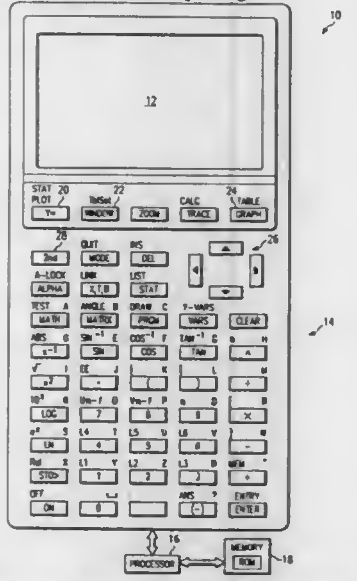
Ann E. Phipps, and David M. Santucci, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 128,941, Sep. 29, 1993, abandoned. This application Sep. 11, 1995, Ser. No. 526,606

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 364—710.14 **18 Claims**

1. An electronic calculator comprising:



an input device for inputting a mathematical function having at least one dependent and one independent variable in response to selective actuation by an operator;

a processor operably connected to said input device for receiving the mathematical function and computing said mathematical function to produce ordered sets of numerical values for each of said dependent and independent variables; and

display means operably connected to said processor and having a predetermined tabular display format into which said computed ordered sets of numerical values are arranged for visual presentation in a table of vertically disposed entries.

5,532,947

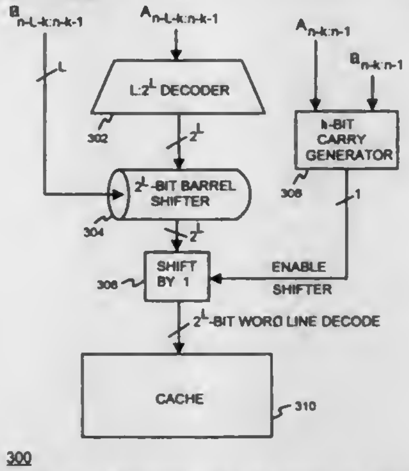
COMBINED DECODER/ADDER CIRCUIT WHICH PROVIDES IMPROVED ACCESS SPEED TO A CACHE

Terence M. Potter, and John S. Muhich, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1995, Ser. No. 377,820

Int. Cl.^{6} G06F *7/00;7/50;* G11C *8/00*

U.S. Cl. 364—715.01 **10 Claims**



1. A combined decoder/adder for operating on a first operand and a second operand, each of the first and second operands being represented by a plurality of bits comprising:

decoder means for decoding upper order bits of the first operand;

first shift means for receiving the decoded upper order bits of the first operand and the upper order bits of the second operand and for rotating the decoded upper order bits of the first operand to an appropriate value based upon the upper bits of the second operand;

a second shifter means for receiving the appropriate value from the first shifter means;

a generator means for receiving the lower order bits of the first and second operand and providing an enable signal to the second shifter means when a carry is to be provided dependent upon state of the lower order bits of the first and second operand.

5,532,948

RANK ORDER FILTER

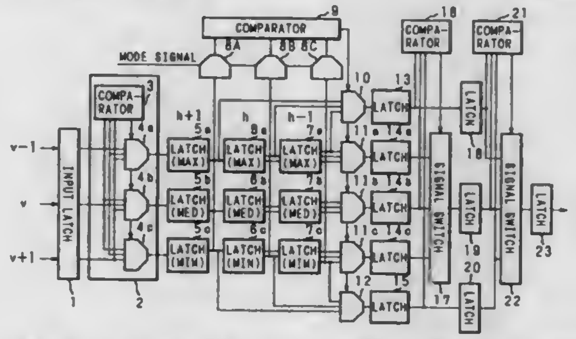
Masahiro Kohno, Kobe; Hiroshi Nittaya, Ikoma, and Masahiro Kato, Kobe, all of, Japan, assignors to Sumitomo Metal Industries, LTD., Osaka, Japan

Filed Jan. 6, 1994, Ser. No. 177,989

Claims priority, application Japan, Jan. 13, 1993, 5-022167

Int. Cl.^{6} G06F *7/00;7/02*

U.S. Cl. 364—715.06 **4 Claims**



1. A rank order filter for a 3×3 local area having three columns and three rows, with three sample values in each column and row, comprising:

(1) first comparing means for comparing in magnitude, for each column or row, three sample values from a column or row of said 3×3 local area to determine three median values;

(2) second comparing means for comparing in magnitude the three median values obtained by said first comparing means to determine which column or row has a minimum median value, which column or row has a maximum median value, and which column or row has a median median value; and

(3) third comparing means for comparing in magnitude a maximum value A in the column or row determined by said second comparing means to have the minimum median value, a minimum value B in the column or row determined by said second comparing means to have the maximum median value, and a median value C in the column or row determined by said second comparing means to have the median median value; and

(4) means for determining a median value of the nine sample values in the 3×3 local area, wherein the median value is selected as:

(i) a minimum of: (a) said maximum value A, (b) said minimum value B and (c) a maximum value in the column or row determined by said second comparing means to have the median median value when said maximum value A and said minimum value B are both larger than said median median value;

(ii) a maximum of: (a) said maximum value A, (b) said minimum value B and (c) the minimum value in the column or row determined by said second comparing means to have the median median value when said maximum value A and said minimum value B are both smaller than said median median value; or

(iii) detecting said median value C as the median value of the nine sample values when said median value C is intermediate said maximum value A and said minimum value B.

5,532,949

BARREL SHIFTER

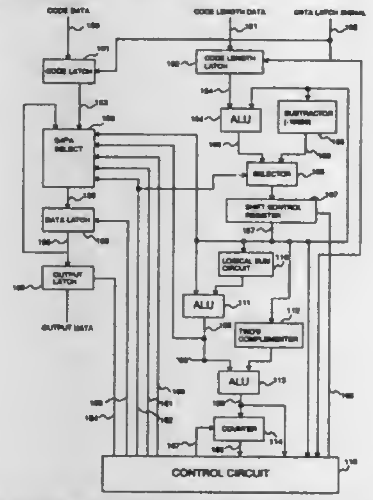
Shiro Fujihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,448

Claims priority, application Japan, Dec. 28, 1993, 5-336204

Int. Cl.^{6} G06F *7/00;15/00;* G11C *19/00*

U.S. Cl. 364—715.08 **6 Claims**



1. A barrel shifter that inputs a variable length code data made of maximum n bit and outputs it as a fixed length data of m bit, the barrel shifter comprising:

a data latch means for latching an (n+m) bit data;

a shift control register for indicating an effective bit length retained in said data latch means;

a data selector for connecting said variable length code data with said data latch means;

a counting means for counting shift amount by each one bit;

a first means for logically dividing said data latch means by k bit, controlling said data selector so as to shift a minimum value that exceeds a value of said shift control register in an integer multiple of the logically divided k as a first stage shifting, and retaining a data in said data latch means;

a second means for controlling said data selector so as to shift by each one bit for differences between a shifted value in said first stage and a value of said shift control register as a second stage shifting and retaining a data in said data latch means; and

a third means for controlling said data selector so as to output m bit of said shift control register when a value of said shift control register exceeds m and shift a data retained in said data latch means m bit and retaining a data.

5,532,950

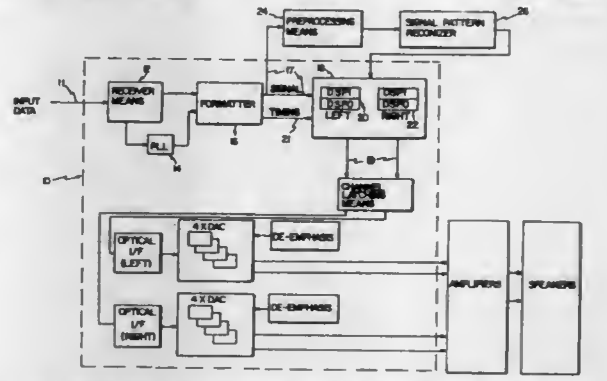
DYNAMIC DIGITAL FILTER USING NEURAL NETWORKS

Donald W. Moses, Eagan, Minn.; Charles H. Hustig, Hudson; James Kinne, River Falls, both of Wis., and Hossein L. Najafi, Minneapolis, Minn., assignors to Wadia Digital Corporation, River Falls, Wis.

Filed Apr. 25, 1994, Ser. No. 232,733

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 364—724.19 **21 Claims**



1. An apparatus for reconstructing an audio input signal, comprising:

means for receiving a plurality of digital audio input signals provided by a digital signal source representing samples of the audio input signal;

a trained neural network, which is a result of a set of training signals with corresponding filter coefficients previously taught to the neural network, responsive to the digital audio input signals to dynamically provide digital filter coefficients wherein the coefficients are produced based on the digital audio input signals received, unaccompanied by any training signals;

a digital filter for producing a digital audio output signal for reconstruction of the audio input signal, said filter receiving the digital audio input signals and the coefficients provided by the neural network, wherein said coefficients dynamically configure the digital filter to produce a filtered digital audio output signal.

5,532,951

DEVICE FOR ELIMINATING RINGING IN FILTERED ECG SIGNALS

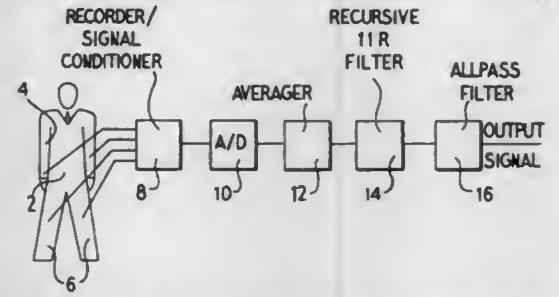
Thomas Ohlsson, Haesselby, and Peter Karlsson, Stockholm, both of, Sweden, assignors to Siemens-Elema AB, Solna, Sweden

Filed Jun. 27, 1994, Ser. No. 266,233

Claims priority, application Sweden, Jul. 16, 1993, 9302433

Int. Cl.^{6} G06F *17/10;* A61B *5/0402*

U.S. Cl. 364—724.17 **5 Claims**



1. A device for eliminating filter-produced ringing in filtered ECG signals comprising:

an analog-to-digital converter to which analog ECG signals are supplied, said converter converting said analog ECG signals into a series of digital values;

a recursive IIR filter to which said digital values are supplied, said recursive IIR filter filtering said digital values and generating an output signal exhibiting a phase shift and simultaneously introducing ringing into said output signal; and

an allpass filter supplied with said output signal of said recursive IIR filter, said allpass filter filtering at least a portion of said output signal from said IR filter time-reversed in comparison to said IIR filter and with a phase shift equal to twice the phase shift exhibited by the output signal from the IIR filter to eliminate said ringing.

5,532,952

SELECTIVELY ALTERABLE OPTICAL DATA MEMORY

Markus Kreuzer, Darmstadt, and Rudolf Eidenschink, Mainz, both of, Germany, assignors to NEMATEL Dr, R. Eidenshink, Mainz, Germany

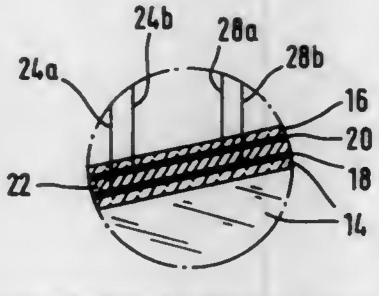
PCT No. PCT/EP93/00864, § 371 Date Dec. 12, 1994, § 102(e) Date Dec. 12, 1994, PCT Pub. No. W093/20554, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 7, 1993, Ser. No. 307,847

Claims priority, application Germany, Apr. 7, 1992, 42 11 502.7

Int. Cl.^{6} G02F *1/13;* C09K *3/34*

U.S. Cl. 365—108 **8 Claims**



1. Selectively alterable optical data memory, having two plates, at least one of which is transparent, and which carry electrodes on internal surfaces thereof, a nematic medium between the plates comprising a nematic phase and a solid body dispersed in it, consisting essentially of highly-dispersed silicic acid, as well as a voltage source with which a voltage can be applied to the electrodes wherein the voltage source, when it is turned on, produces an auxiliary voltage which, by itself, cannot change the predetermined local orientation pattern of the data memory, and wherein a source of intense electromagnetic radiation is provided, which, when auxiliary voltage is applied, converts a predetermined local orientation pattern in the predetermined region of the data memory into another pattern.

5,532,953

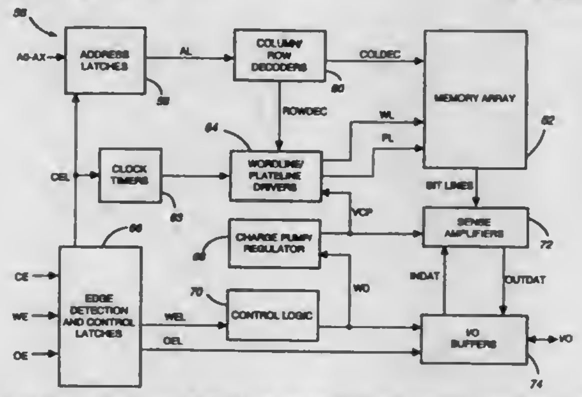
FERROELECTRIC MEMORY SENSING METHOD USING DISTINCT READ AND WRITE VOLTAGES

Rodney A. Ruesch, and Manooch Golabi, both of Colorado Springs, Colo., assignors to Ramtron International Corporation, Colorado Springs, Colo.

Filed Mar. 29, 1995, Ser. No. 413,083

Int. Cl.^{6} G11C *11/22*

U.S. Cl. 365—145 **20 Claims**



1. A method of operating a nonvolatile ferroelectric memory cell including a polarized ferroelectric capacitor, the method comprising the steps of:

during a read operation, reading and restoring a first polarization state of the ferroelectric capacitor at a maximum voltage not sufficient to fully saturate the ferroelectric capacitor, but sufficient to release a detectable amount of charge corresponding to the first polarization state; and

during a write operation, writing a second polarization state in the ferroelectric capacitor at a voltage sufficient to fully saturate the ferroelectric capacitor.

5,532,954

SINGLE IN-LINE MEMORY MODULE

Andreas Bechtolsheim, Stanford; Edward Frank, Portola Valley; James Testa, Mountain View, and Shawn Storm, Mt. View, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 345,477, Nov. 28, 1994, Pat. No. 5,465,229, which is a continuation of Ser. No. 279,824, Jul. 25, 1994, Pat. No. 5,383,148, which is a continuation of Ser. No. 115,438, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 886,413, May 19, 1992, Pat. No. 5,270,964. This application Jun. 7, 1995, Ser. No. 473,073

Int. Cl.^{6} G11C *13/00*

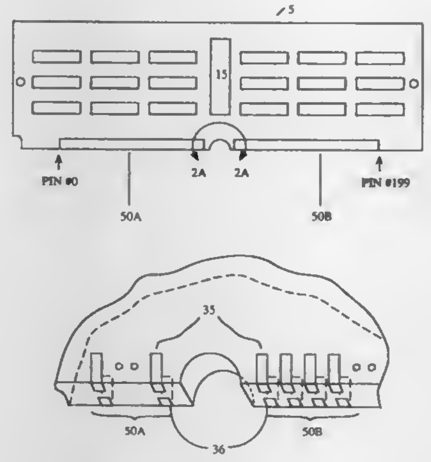
U.S. Cl. 365—52 **25 Claims**

25. A single in-line memory module for memory expansion in a computer system having a memory bus, said single in-line memory module comprising the elements of:

a printed circuit board, said printed circuit board having a first side and a second side, said printed circuit board-having an electrical connector, said electrical connector comprising a first set of electrical contacts on said first side of said printed circuit board and a second set of electrical contacts on said second side of said printed circuit board; and

a first set of memory elements arranged on said printed circuit board;

wherein said first set of electrical contacts and said second set of electrical contacts are electrically distinct.



5,532,955

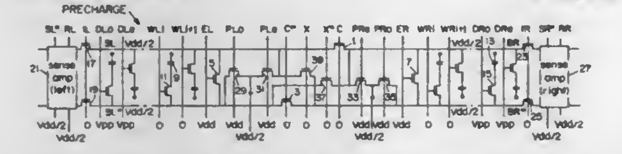
METHOD OF MULTILEVEL DRAM SENSE AND RESTORE

Peter B. Gillingham, Kanata, Canada, assignor to Mosaid Technologies Incorporated, Kanata, Canada

Filed Dec. 30, 1994, Ser. No. 366,921

Int. Cl.^{6} G11C *11/24*

U.S. Cl. 365—149 **9 Claims**



7. A method of restoring a DRAM charge storage cell on one of two bitlines, each bitline divided into two subbitlines, by charge sharing two sub-bitlines with a sign bit and a single sub-bitline with a magnitude bit, to obtain reference levels against which a cell voltage magnitude is sensed, wherein the sign bit S and magnitude bit M define reference levels in accordance with the truth table:

S	M	2S+M
1	1	(2Vdd+Vdd)/3 = Vdd
1	0	(2Vdd+0)/3 = 2Vdd/3
0	1	(0+Vdd)/3 = Vdd/3
0	0	(0+0)/3 = 0

5,532,956

MEMORY CELL STRUCTURE FOR SEMICONDUCTOR DEVICE AND DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Hajime Watanabe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 392,477

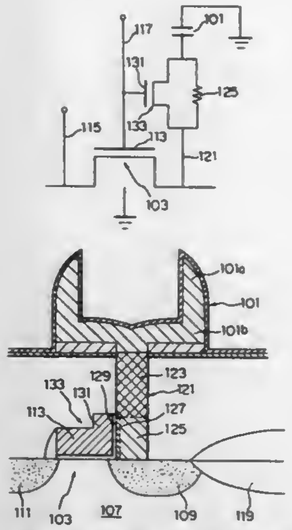
Claims priority, application Japan, Feb. 23, 1994, 6-025550

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—149 **9 Claims**

1. A memory cell structure for a semiconductor device comprising:

a capacitor for storing electrical charge;



a first transistor for controlling storage and release of charge in said capacitor and having a gate for switching said first transistor between electrically opened and electrically closed states; and

a second transistor interposed in an electrically conductive path electrically connecting said capacitor and said first transistor to each other for closing and opening said electrically conductive path, said second transistor having a gate for switching said second transistor between electrically open and electrically closed states, said gates of said first and second transistors being directly connected to each other for simultaneous switching of said first and second transistors between the electrically open and electrically closed states.

5,532,957

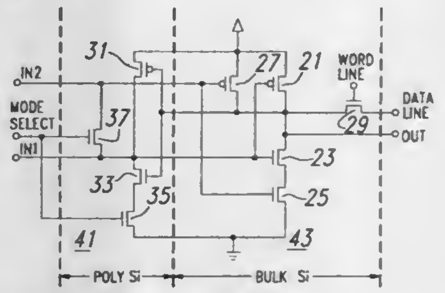
FIELD RECONFIGURABLE LOGIC/MEMORY ARRAY

Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1995, Ser. No. 381,180

Int. Cl.^{6} G11C *11/00*

U.S. Cl. 365—154 **3 Claims**



1. An integrated circuit chip comprising:

a monocrystalline silicon portion on said chip;

a polycrystalline portion on said chip;

a first plurality of of circuit elements on said monocrystalline silicon portion;

a second plurality of circuit elements on said polycrystalline silicon portion; and

circuitry for configuring said first and second plurality of circuit elements in a memory cell configuration and for alteratively configuring said first plurality of circuit elements and disabling said second plurality of circuit elements for a logic gate configuration.

5,532,958

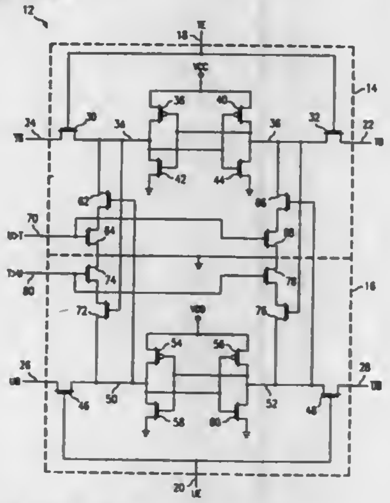
DUAL STORAGE CELL MEMORY

Ching-Lin Jiang, Dallas, and Clark R. Williams, Plano, both of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Division of Ser. No. 542,689, Jun. 25, 1990, Pat. No. 5,299,156. This application Nov. 24, 1993, Ser. No. 135,722

Int. Cl.^{6} G11C *11/40*

U.S. Cl. 365—154 **16 Claims**



1. An integrated circuit memory, comprising:
a first plurality of bitline pairs;
a second plurality of bitline pairs;
an array of dual storage cells;
each dual storage cell of said array of dual storage cells comprising a first latch coupled between a first pair of data nodes and a second latch coupled between a second pair of data nodes;
each dual storage cell of said array of dual storage cells further comprising a first memory cell and a second memory cell, said first memory cell contains data for use by timekeeping circuitry and said second memory cell contains data for use by a user;
each dual storage cell of said array of dual storage cells further comprising a first pair of pass transistors coupled to said first pair of data nodes and a second pair of pass transistors coupled to said second pair of data nodes;
said first pair of pass transistors of each dual storage cell of said array of dual storage cells coupled to at least on pair of said first plurality of bitline pairs,
said second pair of pass transistors of each dual storage cell of said array of dual storage cells coupled to at least one pair of said second plurality of bitline pairs;
each dual storage cell of said array of dual storage cells coupled to receive a first control signal and a second control signal; and
each dual storage cell of said array of dual storage cells further comprising a transfer circuit;
wherein, for each dual storage cell of said array of dual storage cells, the transfer circuit is coupled to said first and second pairs of data nodes and configured to drive at least one data node of said second pair of data nodes when said first control signal is activated, which data node(s) of said second pair of data nodes driven determined in accordance with logic levels of said first pair of data nodes and to drive at least one data node of said first pair of data nodes when said second control signal is activated, which data node(s) of said first pair of data nodes driven determined in accordance with logic levels of said second pair of data nodes.

5,532,959

ELECTRICALLY ERASABLE AND PROGRAMMABLE READ ONLY MEMORY DEVICE EQUIPPED WITH INSPECTION CIRCUIT FOR THRESHOLD LEVELS OF MEMORY CELLS

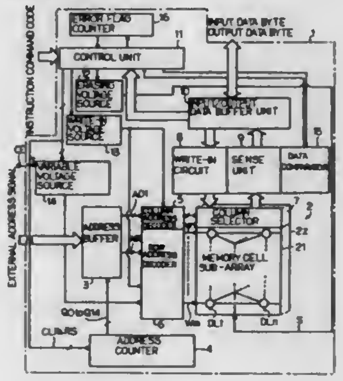
Kazuhisa Ninomiya, and Toshiya Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 266,115, Jun. 27, 1994, abandoned, which is a continuation of Ser. No. 950,013, Sep. 19, 1992, abandoned. This application Apr. 19, 1995, Ser. No. 427,833

Claims priority, application Japan, Sep. 27, 1991, 3-277190

Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—185.3 **8 Claims**



1. An electrically erasable and programmable read only memory device having a write-in mode, a read-out mode and an erasing mode, comprising:
a memory cell array having a plurality of memory cell transistors having different threshold levels between an erased state and a write-in state, each of said plurality of memory cell transistors being connected to one of a plurality of word lines;
a write-in means for supplying a first voltage to one of said word lines in said write-in mode so as to cause the memory cell transistor corresponding to an address to enter into said write-in state;
a read-out means for supplying a second voltage to one of said word lines in said read-out mode so as to determine whether the memory cell transistor corresponding to the address is in one of said erased state and said write-in state;
an erasing means for performing an erasing operation on said plurality of memory cell transistors for a time period shorter than that which allows said plurality of memory cell transistors to be changed from said write-in state to said erased state;
an erased state checking means for successively supplying a third voltage lower than said second voltage to each of said plurality of word lines according to said address so as to check whether or not each of said plurality of memory cell transistors has entered into said erased state;
an excessively erased state checking means for successively supplying a fourth voltage lower than a threshold voltage of said erased state to each of said plurality of word lines according to said address so as to check whether or not there is a memory cell transistor in an excessively erased state among said plurality of memory cell transistors; and
a control means for selectively activating said write-in means, said erasing means, said erased state checking means and said excessively erased state checking means in said erasing mode,

said control means starting a write-in and erasing cycle wherein said write-in means causes said plurality of memory cell transistors to enter into said write-in state and, thereafter, said erasing means performs said erasing operation on said plurality of memory cell transistors and repeats said erasing operation until said erased state checking means confirms that said plurality of memory cell transistors has entered into said erased state,
said control means repeating said write-in and erasing cycle when said excessively erased state checking means detects that said memory cell transistor is in said excessively erased state,
said control means terminating said erasing mode when none of said memory cell transistors is in said excessively erased state.

5,532,960

NEGATIVE VOLTAGE GENERATOR FOR FLASH EPROM DESIGN

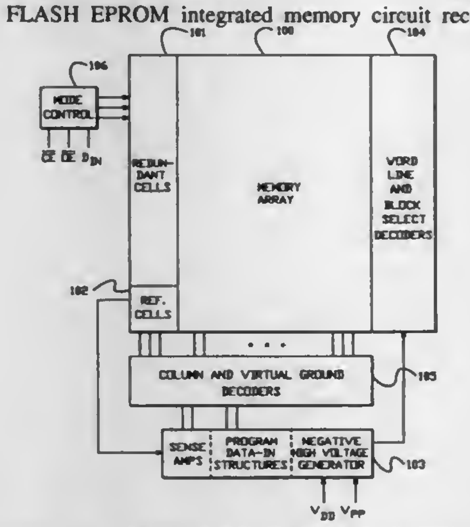
Tien-Ler Lin, Cupertino, Calif., and Liang Chao, Hsinchu, Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Division of Ser. No. 108,647, Aug. 31, 1993, Pat. No. 5,399,928. This application Jan. 11, 1995, Ser. No. 371,361

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—185.29 **13 Claims**

1. A FLASH EPROM integrated memory circuit receiving a supply voltage V_{cc} for read operations and a programming potential V_{PP} for programming operations, comprising:


101
100
104
106
MODE CONTROL
CE OE D$_{IN}$
REDUNDANT CELLS
MEMORY ARRAY
WORD LINE AND BLOCK SELECT DECODERS
102
REF. CELLS
COLUMN AND VIRTUAL GROUND DECODERS
105
SENSE AMPS
PROGRAM DATA-IN STRUCTURES
NEGATIVE HIGH VOLTAGE GENERATOR
103
V$_{DD}$ V$_{PP}$

an array of FLASH EPROM storage transistors, storage transistors in the array having respective floating gates, sources and drains;
addressing means, coupled to the array, for generating address signals to access selected storage transistors;
a plurality of wordlines, coupled to the floating gates of storage cells in respective rows;
a plurality of bitlines, coupled to drains of storage cells in respective columns;
a plurality of local virtual ground lines, each coupled to the sources of storage cells in respective columns;
means for connecting the local virtual ground lines in the array of storage cells with a virtual ground terminal;
means, coupled to the plurality of wordlines and the plurality of virtual ground lines, for supplying a negative gate erasing potential on wordlines and a positive voltage on virtual ground lines, to remove charge in the floating gates of selected storage transistors, said means for Supplying a negative gate erasing potential including a negative voltage generator, responsive to the programming potential V_{PP}, to generate the negative erasing potential on an output node, said negative voltage generator including,
a positive high voltage input to receive V_{PP};
a voltage converter, coupled to the positive high voltage input and the clock driver to convert the clock signal to a positive periodic signal having a particular amplitude different than V_{CC}; and
a charge pump, coupled to voltage converter, for generating negative voltage on the output node in response to the positive periodic signal.

5,532,961

SEMICONDUCTOR MEMORY DEVICE HAVING EXTENDED DATA OUT FUNCTION

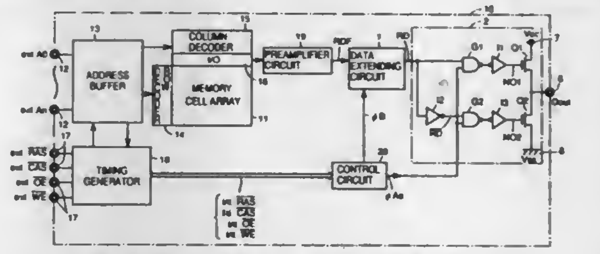
Shigeru Mori; Tomio Suzuki, and Masanori Hayashikoshi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 345,758

Claims priority, application Japan, Dec. 21, 1993, 5-321557

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **7 Claims**



7. The semiconductor memory device comprising:
an output terminal,
a plurality of memory cells, each storing 1 bit of data therein,
read out means for sequentially reading out data stored in said memory cells,
extending means for extending each data read out from said read out means,
providing means responsive to extended data from said extending means for providing output data sequentially to said output terminal, and
deactivating means for deactivating said providing means before each output data is provided by said providing means.

5,532,962

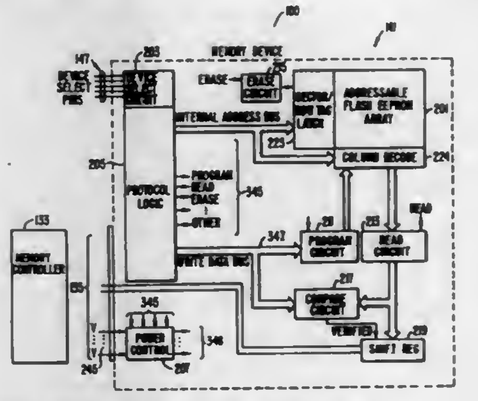
SOFT ERRORS HANDLING IN EEPROM DEVICES

Daniel L. Auclair, Mountain View; Jeffrey Craig, Fremont; John S. Mangan, Santa Cruz; Robert D. Norman, San Jose; Daniel C. Guterman, Fremont, and Sanjay Mehrotra, Milpitas, all of Calif., assignors to SanDisk Corporation, Santa Clara, Calif.

Continuation of Ser. No. 886,030, May 20, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 408,109

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 365—201 **32 Claims**



1. A solid-state memory system comprising:

an array of memory cells that are individually capable of having a threshold voltage programmed or erased to an intended level within a range supported by the memory system;

monitoring means invoked by at least one of the plurality of predefined events of the memory system for identifying one or more cells that individually have a threshold voltage shifted beyond a predetermined margin from said intended level; and

writing means for re-writing said shifted threshold voltage back to said intended level;

wherein said plurality of predefined events of the memory system including memory operations on a portion of the memory array that are liable to preturb cells in other portions of the memory array outside of said portion; and

wherein said monitoring means samples one of a plurality of fractions of the memory array outside of said portion, such that statistically substantially all said plurality of factions of the memory array get monitored after at most a predetermined number of said sampling.

5,532,963
SEMICONDUCTOR MEMORY AND SCREENING TEST METHOD THEREOF

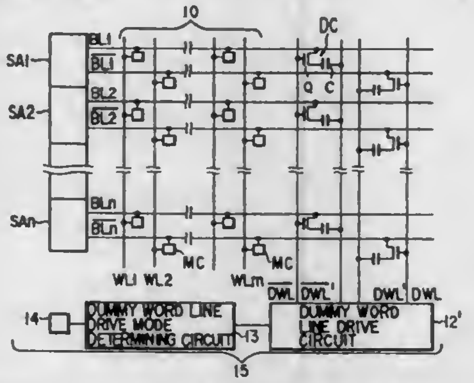
Natsuki Kushiyama, Yokohama; Tohru Furuyama, Tokyo, and Kenji Numata, Yamato, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 311,006, Sep. 23, 1994, abandoned, which is a division of Ser. No. 978,883, Nov. 19, 1992, Pat. No. 5,377,152. This application Sep. 5, 1995, Ser. No. 523,741

Claims priority, application Japan, Nov. 20, 1991, 3-304335; Nov. 20, 1991, 3-304343

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—201 **5 Claims**



1. A method of conducting a screening test on a semiconductor memory device formed on a semiconductor wafer, said semiconductor memory device comprising pairs of bit lines; a plurality of memory cells connected to each pair of bit lines; a plurality of word lines for selecting the memory cells; first and second complementary dummy word lines; first capacitors, each connected between said first dummy word line and one bit line of each of said bit line pairs; second capacitors, each connected between said second dummy word line and the other bit line of each of said bit line pairs; and a dummy word line potential control circuit including a dummy word line drive mode determining circuit for determining a dummy word line drive mode from a plurality of prearranged dummy word line drive modes and a dummy word line drive circuit for driving said dummy word lines in the dummy word line drive mode determined by said dummy word line drive mode determining circuit; said method comprising the steps of:

applying a control signal to a pad formed on said semiconductor wafer so that said dummy word line potential drive circuit changes a potential of a terminal of the first and second capacitors as data are read out of memory cells to forcibly reduce a difference in voltage on said bit line pairs while data are being read out of the memory cells; and

detecting memory cells having a read-out margin too small to produce a sufficient difference in potential on said bit line pairs, such that said detected memory cells may be rejected:

wherein said screening test is carried out while said semiconductor device is in a wafer state, and said potentials of said terminals of said first and second capacitors are independently varied.

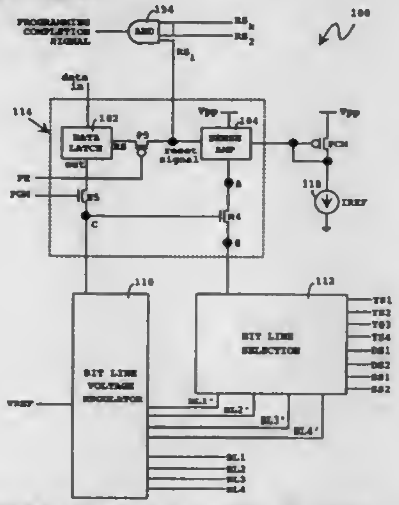
5,532,964
METHOD AND CIRCUIT FOR SIMULTANEOUSLY PROGRAMMING AND VERIFYING THE PROGRAMMING OF SELECTED EEPROM CELLS

Raul-Adrian Cernea, Cupertino; Sanjay Mehrotra, Milpitas, and Douglas J. Lee, San Jose, all of Calif., assignors to SanDisk Corporation, Santa Clara, Calif.

Division of Ser. No. 89,175, Jul. 8, 1993, Pat. No. 5,422,842. This application May 4, 1995, Ser. No. 434,969

Int. Cl.^{6} G11C *11/40*

U.S. Cl. 365—189.09 **5 Claims**



3. An EEPROM having a plurality of memory cells, each memory cell having a control gate, a drain electrode, and a source electrode, wherein a selected one of said plurality of memory cells has its control gate connected to a word line, its source electrode connected to a first bit line, and its drain electrode connected to a second bit line, said selected one memory cell being accessed by providing appropriate voltages to said word line, first bit line, and second bit line, and wherein said selected one memory cell draws through said second bit line, a first current, if said selected one memory cell is in an unprogrammed state, or a second current less than said first current, if said selected one memory cell is in a programmed state, said EEPROM including a voltage regulator circuit comprising:

a first n-mos transistor having a drain electrode connected to a voltage supply, a source electrode connected to said second bit line having a bit line voltage, and a control gate;

a first p-mos transistor having a source electrode connected to said voltage supply, a drain electrode and a control gate, wherein said drain electrode of said first p-mos transistor is connected to said control gate of said first p-mos transitor;

a second p-mos transistor having a source electrode connected to said voltage supply, a drain electrode connected to the control gate of said first n-mos transistor, and a control gate connected to the control gate of said first p-mos transistor;

a second n-mos transistor having a drain electrode connected to the source electrode of said first p-mos transistor, a control gate connected to a voltage reference, and a source connected to a current sink; and

a plurality of n-mos transistors, each having a drain electrode connected to the drain of said second p-mos transistor, a source electrode connected to said current sink, and a control gate connected to one of a plurality of bit lines, wherein each of said plurality of bit lines is connected to a corresponding memory cell.

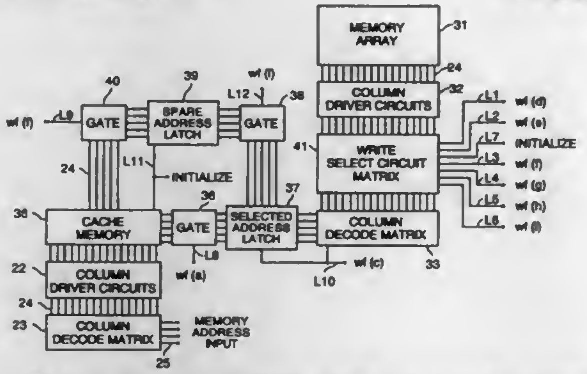
5,532,965
MEMORY PRECHARGE SCHEME USING SPARE COLUMN

Donald M. Kenney, 18 Birch Rd., Shelburne, Vt. 05482

Filed Apr. 13, 1995, Ser. No. 423,922

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **16 Claims**



1. An array of memory elements, arranged in rows and columns having memory addresses, the improvement comprising:

(a) at least one spare column of said memory elements, and

(b) transfer means for writing data directed to a first said memory address associated with a first said column, into a first said spare column during a memory access, and for reassociating said first memory address with said first spare column after beginning said memory access, and

(c) means for operating said first column as a new spare column after said first memory address has been reassociated with said first spare column.

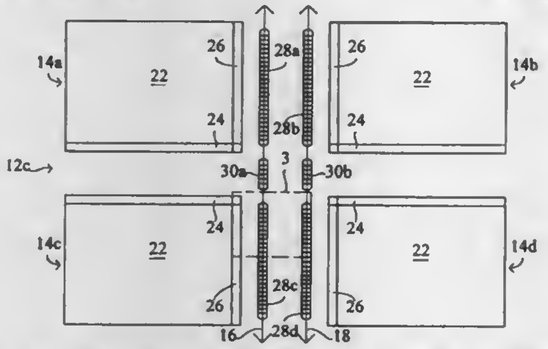
5,532,966
RANDOM ACCESS MEMORY REDUNDANCY CIRCUIT EMPLOYING FUSIBLE LINKS

Kenneth A. Poteet, San Jose, and Chitranjan N. Reddy, Milpitas, both of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.

Filed Jun. 13, 1995, Ser. No. 490,196

Int. Cl.^{6} G11C *7/00;29/00*

U.S. Cl. 365—200 **20 Claims**



1. In a semiconductor memory device having at least one memory array block that includes a plurality of standard rows and at least one redundant row, a redundancy circuit comprising:

a redundant row decoding circuit for activating the redundant row in response to a selected row decode signal; and

a row fuse bank generally perpendicular to the standard rows and proximate a first side of the memory array block, said row fuse bank including

a plurality of disable fuses, each disable fuse disabling at least one standard row, and

a plurality of redundant row decoder fuses interspersed among said disable fuses, the selected row decode signal for said redundant row decoding circuit being determined by opening selected ones of the redundant row decoder fuses.

5,532,967
METHOD FOR SUPPRESSING PEAK CURRENT IN A VIDEO RAM AND IN A SERIAL ACCESS MEMORY BLOCK

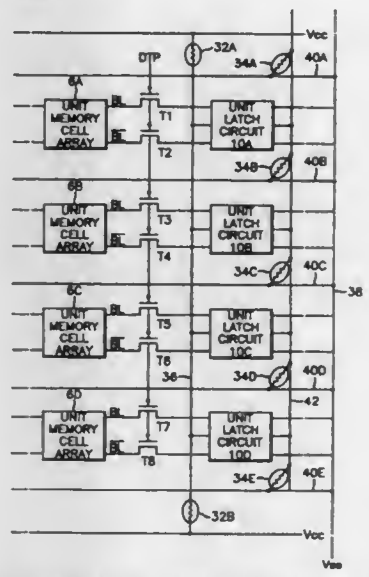
Jung-Hyuck Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 2, 1994, Ser. No. 352,735

Claims priority, application Rep. of Korea, Dec. 2, 1993, 26144/1993

Int. Cl.^{6} G11C *7/02*

U.S. Cl. 365—206 **14 Claims**



1. A video random access memory comprising a first power source, a second power source, a plurality of unit circuits coupled to said first and second power sources, said unit latch circuits arranged in a serial access memory block, and a plurality of peak current suppression circuits connected between said first and second power sources and said unit latch circuits.

5,532,968
SELF REFRESH CONTROL CIRCUIT FOR MEMORY CELL ARRAY

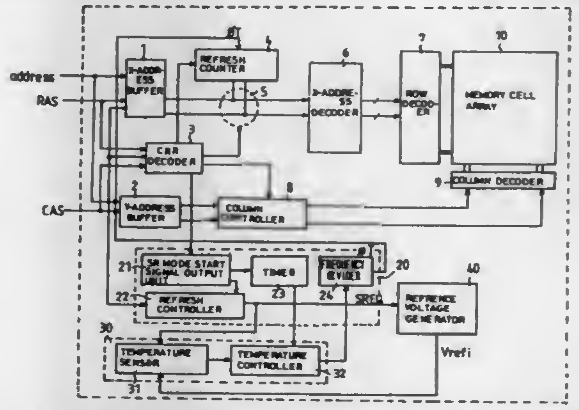
Jae S. Lee, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Feb. 22, 1995, Ser. No. 392,444

Claims priority, application Rep. of Korea, Apr. 21, 1994, 8459/1994

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—222 **17 Claims**



1. A self refresh control circuit for a memory cell array comprising a plurality of address buffers for inputting addresses of said memory cell array and a plurality of decoders for decoding the addresses from said address buffers, wherein the improvement comprises:

self refresh mode control means for controlling a self refresh operation of said memory cell array in response to a row address strobe signal and a column address strobe signal;

reference voltage generation means for generating a plurality of reference voltages, each of said reference voltages being nearly constant in level regardless of a temperature variation in a chip; and

temperature tracing means for generating a voltage variable with the temperature variation in the chip, comparing the generated variable voltage with the reference voltages from said reference voltage generation means, respectively, selecting a desired one of a plurality of self refresh periods from said self refresh mode control means in accordance with the compared results and outputting the selected self refresh period to said self refresh mode control means.

5,532,969

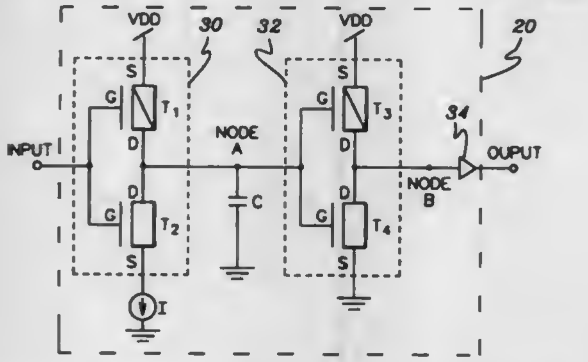
CLOCKING CIRCUIT WITH INCREASING DELAY AS SUPPLY VOLTAGE VDD

Russell J. Houghton, Essex Junction, Vt., and Duane E. Galbi, Marlborough, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1994, Ser. No. 319,898

Int. Cl.⁶ G11C *13/00*

U.S. Cl. 365—226 **45 Claims**



1. A clocking circuit for generating an output signal in response to an input signal, said clocking circuit being powered by a supply voltage VDD and having a delay in generating said output signal relative to the input signal that varies with variation in said supply voltage VDD such that as said supply voltage increases, the delay in generating said output signal increases therewith, said clocking circuit comprising:

a capacitive load for storing an amount of charge, said amount of charge stored by said capacitive load varying with said supply voltage VDD;

discharge means for linearly discharging said amount of charge stored by said capacitive load;

switch means coupled between said capacitive load and said discharge means for controlling linear discharging of said amount of charge stored by said capacitive load by said discharge means, said switch means being responsive to said input signal; and

detection means coupled to said capacitive load for detecting linear discharging of the capacitive load to a trigger level V_0 and for providing said output signal upon detection of said trigger level V_0 at said capacitive load, said trigger level V_0 being predefined and substantially fixed relative to ground potential GND and independent of variation in said supply voltage VDD, wherein said amount of charge stored at said capacitive load varying with said supply voltage VDD, said linear discharging of said amount of charge stored by said capacitive load and said detection means detecting linear discharging of the capacitive load to the trigger level V_0 that is independent of supply voltage VDD results in the delay in providing said output signal relative to said input signal that varies with variation in said supply voltage VDD such that as said supply voltage increases, the delay in providing said output signal increases therewith.

5,532,970

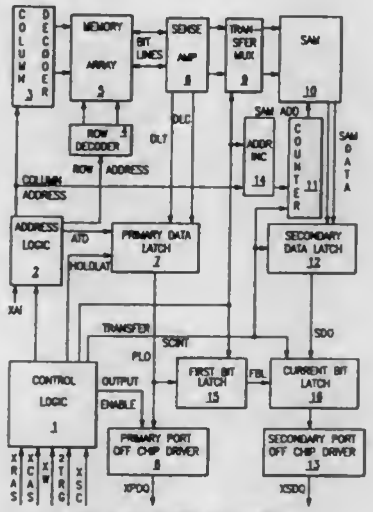
NO LATENCY PIPELINE

Edward Butler, P.O. Box 12, Richmond, Vt. 05477; Martin B. Lundberg, 175 Jackson Rd., Milton, Vt. 05468; Pushkar U. Mokashi, 941 Golden Grove Dr., Lewisville, Tex. 75067; Alfred L. Sartwell, P.O. Box 40, Skyview Dr., Jericho, Vt. 05465; Hemen R. Shah, 35 Thasha La., Apt. A7, Essex Jct., Vt. 05452, and Robert Tamlyn, 10 Starbird Rd., Jerico, Vt. 05465

Filed Mar. 3, 1995, Ser. No. 398,334

Int. Cl.⁶ G11C *8/00*

U.S. Cl. 365—230.05 **8 Claims**



BLOCK DIAGRAM OF READ WITH INVENTION

1. A data storage apparatus comprising:

a storage structure including a plurality of data cells for storing digital data;

control logic for initiating a read operation via data signals including a first access strobe (FAS);

decoder means coupled to the control logic, and to the storage structure for decoding the FAS, and for accessing data in the storage structure addressed by the FAS;

reading means coupled to the storage structure, to a transfer means, and to a primary latch for retrieving the accessed data, and for simultaneously providing the accessed data to the transfer means and to the primary latch, the transfer means for providing the retrieved data to a serial access memory (SAM);

counter increment means for incrementing a SAM counter so that a second bit of the retrieved data is addressed by the SAM counter;

a secondary latch coupled to the SAM for receiving a portion of the retrieved data from the SAM, the SAM providing said portion of the retrieved data beginning with a second bit of the retrieved data in response to the SAM counter;

a first bit latch coupled to the primary latch for receiving a first bit of the retrieved data, and for providing the first bit to a current bit latch, the current bit latch coupled to the secondary latch for receiving said portion of the retrieved data from the secondary latch immediately after receiving tile first bit of tile retrieved data from the first bit latch; and

a secondary off-chip driver coupled to the current bit latch for providing the data received in tile current bit latch to hardware coupled to tile data storage apparatus.

5,532,971

NONVOLATILE SEMICONDUCTOR MEMORY HAVING ENHANCED SPEED FOR ERASING AND PROGRAMMING

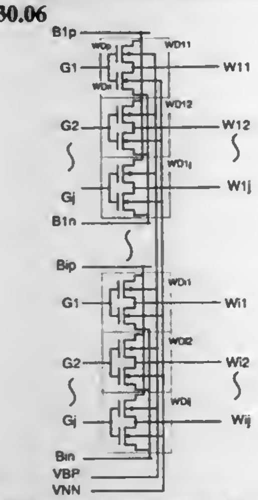
Toshihiro Tanaka, Akigawa; Masataka Kato, Musashino; Keiichi Yoshida, Ome; Hitoshi Kume, Musashino; Yoshinobu Nakagome, Hamura, and Katsutaka Kimura, Akishima, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 354,639

Claims priority, application Japan, Dec. 15, 1993, 5-314712

Int. Cl.⁶ G11C *8/00;11/34*

U.S. Cl. 365—230.06 **3 Claims**



1. A nonvolatile semiconductor memory comprising:

an electrically erasable and programmable nonvolatile memory cell having a control gate, a drain and a source;

a word line connected to the control gate of the nonvolatile memory cell;

a data line connected to the drain of the nonvolatile memory cell; and

a word line drive circuit to drive the word line;

wherein the word line drive circuit is an inverter circuit consisting of an n-channel transistor and a p-channel transistor, and the n- and p-channel transistors each have their source line supplied with a block selection address line generated from a first address line group and their gate line supplied with a gate selection address line generated from a second address line group.

5,532,972

METHOD AND CIRCUIT FOR TIMING THE READING OF NONVOLATILE MEMORIES

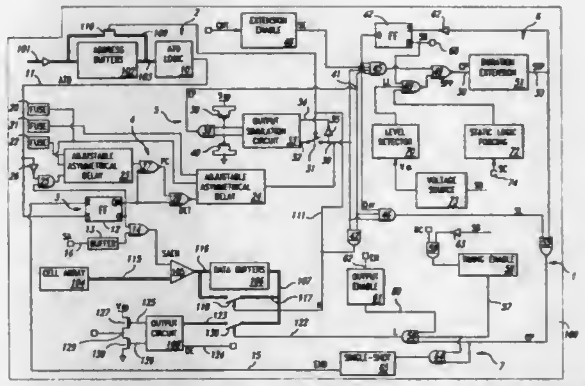
Luigi Pascucci, Sesto San Giovanni; Silvia Padoan, Rimini; Carla M. Golla, Sesto San Giovanni; Marco Maccarrone, Palestro, and Marco Olivo, Bergamo, all of, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Milan, Italy

Filed Feb. 21, 1995, Ser. No. 391,920

Claims priority, application European Pat. Off., Feb. 18, 1994, 94830074

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—233 **13 Claims**



5. A read timing circuit for a nonvolatile memory comprising at least an output element and a data buffer unit; said circuit comprising read enabling means for generating a read enabling signal; precharge enabling means enabled by said read enabling signal; and detection enabling means for generating a detection enabling signal; characterized in that it comprises:

duration modifying means for disabling said precharge enabling means and enabling said detection enabling means a predetermined adjustable time after receiving said read enabling signal;

simulating generator means enabled by said detection enabling means, for generating a data simulating signal a predetermined adjustable time after receiving said detection enabling signal;

an output simulation circuit having the same propagation time as said output element and connected to said simulating generator means;

data blocking means connected to said data buffer unit, for preventing switching of said data buffer unit;

simultaneous enabling means for said output simulation circuit, said output element and said data blocking means, for simultaneously propagating said data simulating signal in said output simulation circuit, loading data from said data buffer unit to said output circuit and disabling said data buffer unit;

propagation detecting means connected to said output simulation circuit, for generating a disabling signal for said simultaneous enabling means;

load extending means for generating an extended load signal for said output circuit;

selective enabling means for selectively enabling said load extending means; and

circuit resetting means.

5,532,973

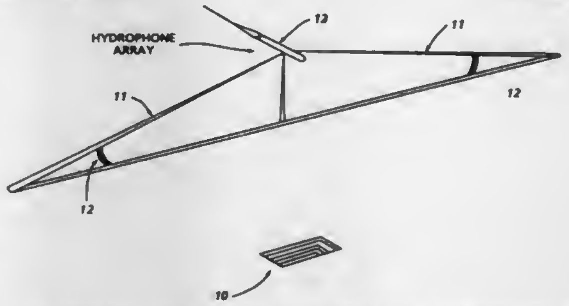
RESOLVING POWER TARGET FOR SIDE-SCANNING SONARS

William J. Zehner, Lynn Haven, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1995, Ser. No. 521,376

Int. Cl.⁶ H04B *17/00*

U.S. Cl. 367—13 **11 Claims**



1. An apparatus for obtaining resolving power measurement as a target for a side-scanning sonar, comprising:

a planar sheet having a first flat and acoustically smooth surface, and

a second flat surface spaced apart from a thickness and in parallel with said first surface; and

a pattern-shaped means for producing side-scanning sonar reflections permitting resolving power measurements, said means affixed to the smooth surface of said sheet by a water insoluble adhesive.

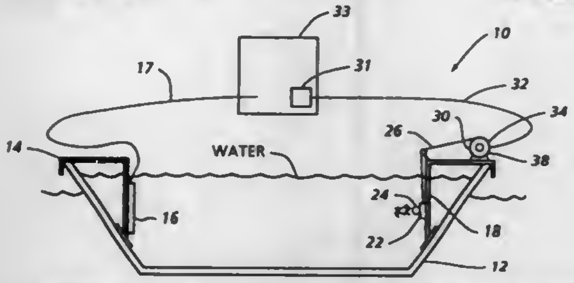
5,532,974

BEAM PATTERN MEASURING APPARATUS FOR SIDE-SCANNING SONARS

William J. Zehner, Lynn Haven, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1995, Ser. No. 521,379
Int. Cl.^{6} H04B *17/00*

U.S. Cl. 367—013 **10 Claims**



1. An apparatus for measuring side-scanning sonar beam pattern in a test pool having a bottom and two opposite end walls extending upward from and normal to said bottom and spaced apart orthogonally from and in parallel with each other, said apparatus comprising:

- a mounting means for securing a sonar array upon one end wall of said pool, said means positioned upon said end-wall in the vertical direction normal to the bottom of said pool;
- a straight, elongated, and rigid guide means attached to the opposite end-wall of said test pool, said means positioned upon said end-wall in the vertical direction normal to the bottom of said pool;
- a means for carrying an affixed test transducer and traveling up and down said guide means;
- a connecting means extending between a takeup reel on a gear motor and said carrying means, said connecting means attached to said reel and said carrying means to move said carrying means upon said guide means;
- a means slaved to said connecting means for indicating the position of said carrying means, and
- a motor control means connecting to said gear motor for controlling the direction of movement and speed of said connecting means and the position and velocity of said carrying means attached to said connecting means.

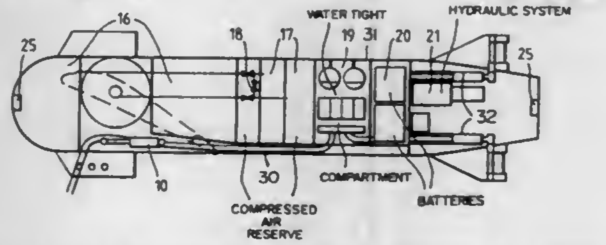
5,532,975

DEVICE AND METHOD FOR POSITIONING OF TOWING SYSTEMS FOR USE IN MARINE SEISMIC SURVEYS

Tor Elholm, Hosle, Norway, assignor to Geco A.S., Stavanger, Norway

Filed Feb. 8, 1994, Ser. No. 194,377
Claims priority, application Norway, Feb. 23, 1993, 930641
Int. Cl.^{6} G01V *1/38;* B63B *21/66*

U.S. Cl. 367—16 **24 Claims**



1. A device for positioning of seismic equipment in a desired underwater position when towed by a seismic vessel, said device including a mechanism for placement underwater and for maintaining said desired underwater position, said mechanism comprising:

- a body part equipped with wings and rudders,
- a control body for controlling the wings and rudders so as to achieve said desired underwater position,
- instruments for use in positioning the device in said desired underwater position,
- a communication system for communicating between the seismic vessel and the device,
- a control unit for processing signals which operate on the basis of information from at least one of two locations, said two locations consisting of the seismic vessel and said instruments
- an attachment device for at least one cable and at least one float, and
- a power supply system.

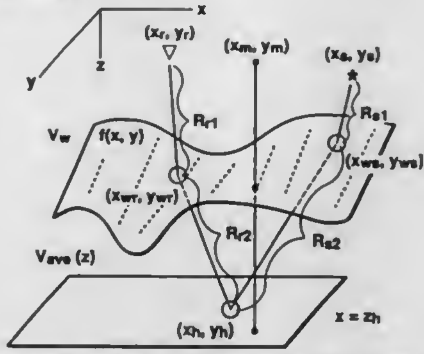
5,532,976

CURVED-RAY REPLACEMENT DYNAMICS

William A. Schneider, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 19, 1994, Ser. No. 277,543
Int. Cl.^{6} G01V *1/28*

U.S. Cl. 367—38 **16 Claims**



1. A computer-implemented method for processing a seismic data trace to reduce nonhyperbolic distortion caused by a contrast between the seismic velocities of adjacent upper and lower layers of the earth having an irregular boundary, said seismic data trace comprising a time series of discrete data samples of the amplitude of seismic energy received by a receiver in response to a seismic signal from a source, said method comprising the steps of:

- (a) determining the seismic velocity in said upper layer and a subsurface seismic velocity function for said lower layer;
- (b) determining a replacement seismic velocity for said upper layer which reduces said seismic velocity contrast;
- (c) selecting a plurality of reflector locations at various depths within said lower layer and for each of said reflector locations,
  - (1) determining, according to Fermat's principle and Snell's law, a raypath from said source downwardly through said irregular boundary to a reflection point at said reflector location and then upwardly through said irregular boundary to said receiver,
  - (2) determining a first seismic traveltime along said raypath using said seismic velocity in said upper layer for portions of said raypath in said upper layer and said subsurface seismic velocity function for portions of said raypath in said lower layer,
  - (3) determining a second seismic traveltime along said raypath using said replacement seismic velocity for portions of said raypath in said upper layer and said subsurface seismic velocity function for portions of said raypath in said lower layer, and
  - (4) determining a traveltime difference between said first and second seismic traveltimes;
- (d) using said traveltime difference for each of said plurality of reflector locations and the process of interpolation to determine a traveltime correction for each data sample on said seismic data trace; and
- (e) shifting each data sample on said seismic data trace by an amount equal to said traveltime correction for said data sample to create a replacement data trace having reduced nonhyperbolic distortion.

5,532,977

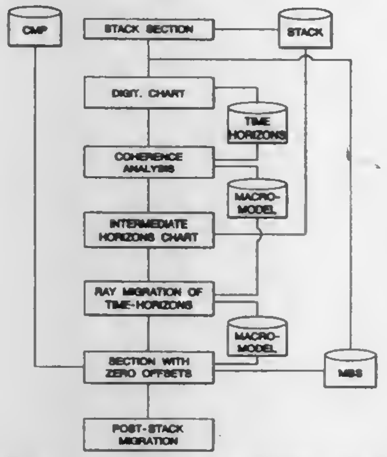
PROCESSING METHOD FOR OBTAINING A STACK SECTION WITH ZERO OFFSETS

Pierre Thore, Pau, France, assignor to Elf Aquitaine Production, Courbevoie, France

PCT No. PCT/FR92/00257, § 371 Date Feb. 16, 1993, § 102(e) Date Feb. 16, 1993, PCT Pub. No. WO92/18883, PCT Pub. Date Oct. 29, 1992

PCT Filed Mar. 20, 1992, Ser. No. 955,731
Claims priority, application France, Apr. 19, 1991, 91 04842
Int. Cl.^{6} G01V *1/36*

U.S. Cl. 367—53 **16 Claims**



1. A method for obtaining a stack seismic section with zero offsets by stacking up CMP gather recordings recorded along a given profile, comprising the steps of:

- (a) determining from a basis tack section, an interval velocity macro-model associated with the profile processed as a function of depth;
- (b) calculating from said macro-mode, travel times for each of the recordings of each of gathers and each of reflectors of the macro-model;
- (c) calculating between indicatrices defined by said travel times calculated in said step (b), as many interpolated indicatrices as there are samples over a stack trace; and
- (d) stacking the recordings for each of the gathers along said indicatrices defined in said step (c).

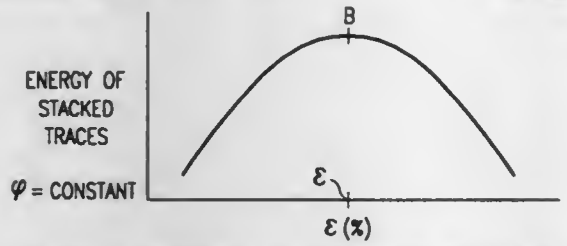
5,532,978

METHOD OF CORRECTION OF SEISMIC DATA FOR THE EFFECTS OF AZIMUTHAL ANISOTROPY

Dennis Corrigan, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1993, Ser. No. 171,727
Int. Cl.^{6} G01V *1/28;1/053*

U.S. Cl. 367—75 **9 Claims**



1. A method for improving the signal to noise ratio of a stacked trace of common midpoint seismic data obtained over a surface area having a plurality of trace azimuths, comprising:

- selecting a first gather of traces along a first one of said plurality of trace azimuths;
- b. selecting a second gather of traces along a second one of said plurality of trace azimuths;
- c. assuming a plurality of degrees of anisotropy;
- d. assuming a plurality of angular directions of the anisotropy;
- e. stacking of said first and second gathers of traces in a manner which accounts for said anisotropy to produce a candidate stacked trace;
- f. measuring the total energy of the candidate stacked trace for each one of said plurality of degrees of anisotropy to determine a degree of anisotropy for which the energy is a maximum; and
- g. measuring the total energy of the candidate stacked trace at the degree of anisotropy for which the total energy of the candidate stacked trace is a maximum for a plurality of angles for direction of anisotropy to determine the angle of anisotropy for which the energy is a maximum

thereby maximizing the signal to noise ratio of the stack and determining the degree of and angular direction of azimuthal anisotropy.

5,532,979

TOWED ARRAY STRAIN-SENSING NOISE CANCELLER

Robert J. Hansen, Clinton, Md.; Chen C. Ni, McLean, Va., and Hugh M. Fitzpatrick, Chevy Chase, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 9, 1981, Ser. No. 304,417
Int. Cl.^{6} G01S *3/80*

U.S. Cl. 367—106 **9 Claims**

1. In an elongate liquid-filled hose housing a plurality of spaced-apart hydrophones defining a towed array which, when towed through water, has induced in its will from boundary layer contact low frequency longitudinally propagating axisymmetric radial deformations known as breathing waves which pressure-pulse radially inward on the liquid filling and interfere with hydrophone reception of acoustic sound waves emanating from a source outside the hose, the improvement comprising:

- means including a part secured annularly about the inside of the hose wall at locations radially opposite respective hydrophones for generating a low frequency signal in response to the propagating breathing-wave-induced deformations in the wall which pressure-pulse the liquid about the hydrophone; and,
- means for processing the low frequency generated signal and substracting its effect from the output signal from respective hydrophones;

whereby noise from low frequency breathing waves is substantially eliminated.

5,532,980

VIBRATIONAL ANTI-FOULING SYSTEM

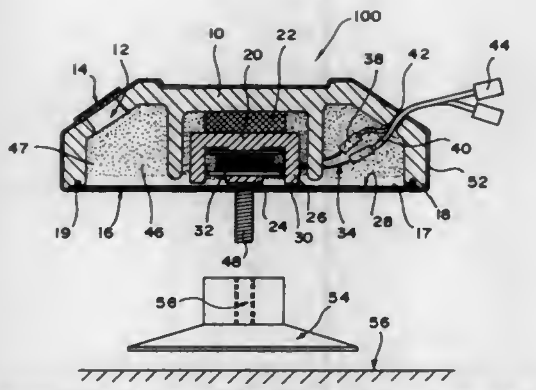
Carlos E. Zarate; H. Graciela Zarate, and Clarence Verge, all of Hamilton, Canada, assignors to Sciencetech Inc., London, Canada

Filed Nov. 14, 1994, Ser. No. 339,693
Int. Cl.^{6} H04B *1/02*

U.S. Cl. 367—139 **14 Claims**

1. A vibrational system for use in inhibiting the attachment of aquatic life forms to underwater structures comprising:

- a plurality of transducers including at least a first and a second transducer adapted-to be mounted upon said underwater structure to impart vibrations thereto, each such transducer including:
- a housing defining a central chamber, said housing having a first opening extending through said housing into said central chamber;
- a resilient diaphragm of magnetic material mounted on said housing and extending across said first opening, said resilient diaphragm having a front face and a rear face;
- an electromagnet mounted in said housing in spaced relation to the rear face of said diaphragm to create a small gap and



responsive to a current pulse to attract and deform said diaphragm into said gap, said electromagnet being closely spaced from the rear face of said resilient diaphragm in an area within the confines of said first opening, and a transducer mount for attaching said transducer to said underwater structure, said transducer mount being secured to the front face of said resilient diaphragm; and

a control circuit means connected to said plurality of transducers to sequentially impart trains of spaced current pulses to said electromagnets during a power cycle, said control circuit means including at least a first output connected to said first transducer and a second output connected to said second transducer, the control circuit means operating during a power cycle to first provide a train of current pulses to said first output and to subsequently provide a train of current pulses to said second output after terminating the provision of power pulses to said first output.

5,532,981

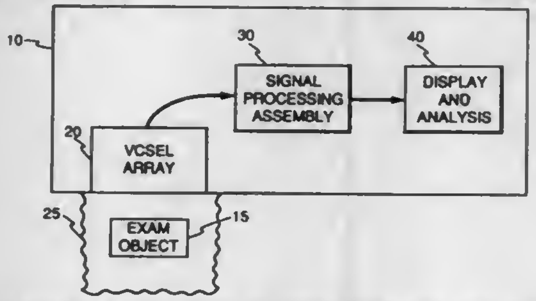
METHOD OF INCORPORATING VERTICAL CAVITY SURFACE EMITTING LASERS IN AN ULTRASOUND DETECTOR

Anil R. Duggal, Schenectady, N.Y., and Christopher P. Yakymyshyn, Raleigh, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,834

Int. Cl.⁶ H04R *23/00*

U.S. Cl. 367—149 **15 Claims**



1. A method of transmitting the output signal from each pixel of an array of vertical cavity surface emitting lasers (VCSEL's) operatively positioned in an acoustic detector which minimizes the size of interconnects to the different pixels, the method comprising the steps of:

fabricating an array of VCSEL's on an acoustic matching layer, the acoustic matching layer being designed for allowing maximum acoustic coupling;

providing maximum acoustic sensitivity and/or frequency bandwidth;

converting the VCSEL array output into amplitude modulation; and

sending the amplitude modulation signal to a signal processing assembly by an array of fiber optic couplers operatively connected to the signal processing assembly.

5,532,982

COUPLING DEVICE BETWEEN A SOURCE OF MECHANICAL ENERGY AND AN ELECTRICAL ENERGY GENERATOR IN A TIMEPIECE

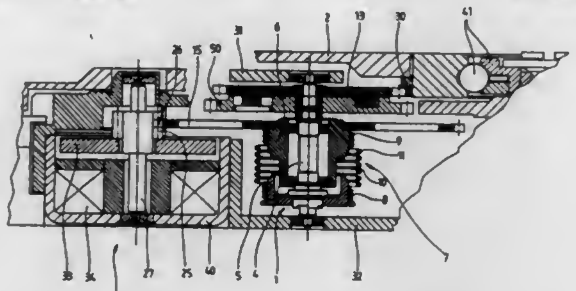
Jean-Luc Béguin, Cormondréche, and Pierre Haefeli, Saules, both of, Switzerland, assignors to Eta SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed Apr. 27, 1995, Ser. No. 429,574

Claims priority, application Switzerland, May 4, 1994, 01398/94

Int. Cl.⁶ G04B *1/00;* H01M *10/46*

U.S. Cl. 368—64 **5 Claims**



1. A device for coupling a source of mechanical energy and a generator of electrical energy in a timepiece, comprising an arbor driveable by said source of mechanical energy and a cylindrical element fixedly and coaxially mounted on said arbor, a tube surmounting said cylindrical element, said tube being mounted for free rotation about said arbor and arranged to drive said generator, and a helical spring mounted with a friction-tight fit on the cylindrical element and on the tube by its first turns and last turns respectively, a space being provided between said tube and cylindrical element and the central turns of said spring.

5,532,983

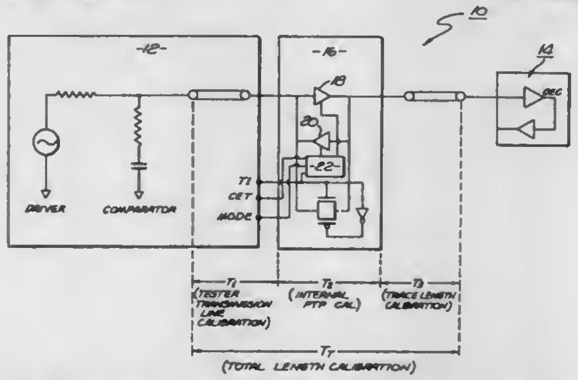
CIRCUIT DESIGN FOR POINT-TO-POINT CHIP FOR HIGH SPEED TESTING

Anna Madrid; Scott Jacobson, both of Phoenix, and Bidyut K. Bhattacharyya, Chandler, all of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1992, Ser. No. 998,427

Int. Cl.⁶ G04F *8/00;* G01R *1/073*

U.S. Cl. 368—113 **8 Claims**


10
12
16
18
14
DEC
20
22
T1
CET
MODE
DRIVER
COMPARATOR
T1 (TESTER TRANSMISSION LINE CALIBRATION)
T2 (INTERNAL PTP CAL)
T3 (TRACE LENGTH CALIBRATION)
TT (TOTAL LENGTH CALIBRATION)

1. A device that is coupled to a tester with an impedance, that test an integrated circuit with an impedance, comprising:

a test chip that is coupled to and located between the tester and the integrated circuit, said test chip having a first driver circuit that is located between the tester and the integrated circuit and which provides an output test signal to the tester in response to an input test signal from the integrated circuit, and a second driver circuit that is located between the tester and the integrated circuit and which provides an output test signal to the integrated circuit in response to an input test signal from the tester.

5,532,984

HIGH RESOLUTION READ-ONLY MAGNETO-OPTICAL DISK AND METHOD AND APPARATUS FOR REPRODUCING INFORMATION THEREFROM

Hiroyuki Matsumoto, Tokyo, and Tatsuo Niwa, Sakura, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

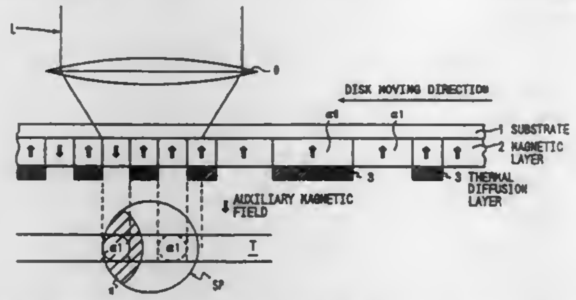
PCT No. PCT/JP93/00647, § 371 Date Dec. 28, 1993, § 102(e) Date Dec. 28, 1993, PCT Pub. No. WO93/23850, PCT Pub. Date Nov. 25, 1993

PCT Filed May 18, 1993, Ser. No. 170,261

Claims priority, application Japan, May 19, 1992, 4-125246; May 19, 1992, 4-125247; Dec. 16, 1992, 4-336102; Apr. 27, 1993, 5-100704

Int. Cl.⁶ G11B *11/00;5/70*

U.S. Cl. 369—13 **31 Claims**



1. A read-only magneto-optical disk comprising at least a substrate and a magnetic layer built up thereon,

wherein a first micro region α_0 and a second micro region α_1 are formed along a track in said magnetic layer, said first and second micro regions have a same direction of magnetization prior to information reproduction from the disk, the direction of magnetization of said second micro region is changed to a predetermined direction under predetermined irradiation of a laser beam for reproduction and the direction of magnetization of the first micro region is not changed to said predetermined direction under said predetermined irradiation and wherein, defining one of said micro regions as an information unit, information is expressed by presence or absence of the information unit or by a length thereof.

5,532,985

DISK PLAYER WITH MAGAZINE

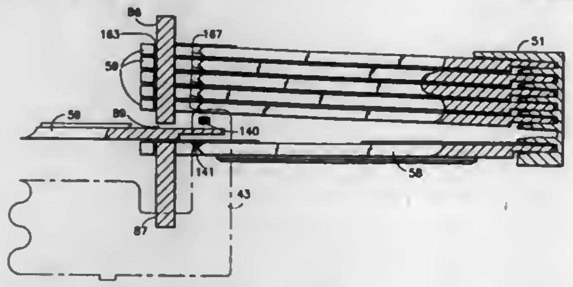
Niro Nakamichi, Rancho Palos Verdes, Calif., assignor to Nakamichi Corporation, Tokyo, Japan

Filed Mar. 1, 1994, Ser. No. 205,020

Claims priority, application Japan, Mar. 5, 1993, 5-071176

Int. Cl.⁶ G11B *17/04*

U.S. Cl. 369—34 **7 Claims**



1. A disk handling device comprising:

a magazine having a plurality of holding means for concentrically holding a plurality of disks;

a disk reader;

means for transporting a disk between an access position, external to said device, said disk reader and said magazine;

means for aligning a selected one of said plurality of disks with said means for transporting;

said disk reader being positioned for reading said selected disk while a recording surface of said selected disk overlaps recording surfaces of others of said plurality of disks, stored within said magazine;

a tray;

a plurality of carriages;

a selected carriage carried by said tray;

said selected carriage supporting said selected disk;

said magazine accepting carriages in said holding means;

said holding means containing said plurality of carriages;

means for separating said carriages to permit said disk reader to read said selected disk while said selected disk overlaps others of said disks within said magazine;

means for supporting rear edges of said carriages at a side of said magazine opposite said disk reader;

said means for supporting rear edges including a plurality of prongs fixedly mounted in said magazine;

each of said rear edges of said carriages demountably fitting between adjacent pairs of said prongs, such that said carriages are removable from said adjacent pairs of said prongs;

each of said adjacent pairs of prongs being spaced to limit pivotal movement of their respective carriages; and

said means for separating being effective to separate a portion of an adjacent carriage, adjacent to said carriage associated with said selected disk, remote from said rear edge of said adjacent carriage whereby said adjacent carriage is pivoted about said rear edge of said adjacent carriage.

5,532,986

AUTOMATIC DISK PLAYING APPARATUS

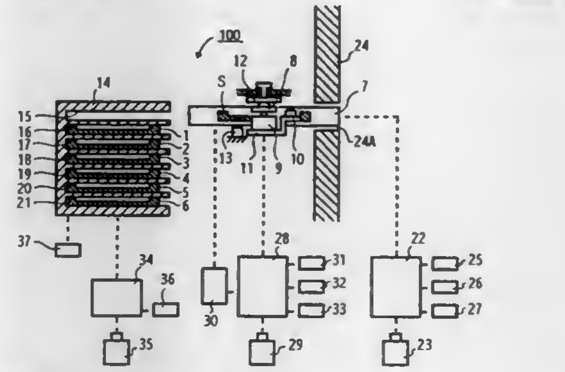
Kazuhiro Sakiyama, Irumi, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Continuation of Ser. No. 198,099, Feb. 17, 1994, Pat. No. 5,438,534, which is a continuation of Ser. No. 58,545, May 5, 1993, Pat. No. 5,299,182, which is a continuation of Ser. No. 707,920, May 30, 1991, Pat. No. 5,216,645. This application Apr. 7, 1995, Ser. No. 418,604

Claims priority, application Japan, May 31, 1990, 2-143226

Int. Cl.⁶ G11B *17/22*

U.S. Cl. 369—36 **36 Claims**



10. A disk player, comprising:

means for moving a disk between a first position and a second position;

disk playing means for playing said disk;

said first position permitting ejection of said disk from said means for moving to a position outside said disk player and insertion of said disk from said position outside into said means for moving;

means for loading said disk at said second position from said means for moving to said disk playing means;

control means for operating said disk player including an eject/load control;

disk sensing means for indicating to said control means whether a disk is present at, and/or moved from, said first position by said means for moving; and

said control means including means for moving a detected disk, detected at or transported from said first position, to said second position and loading to load said detected disk onto said disk playing means.

5,532,987
FOCUS ERROR DETECTING DEVICE

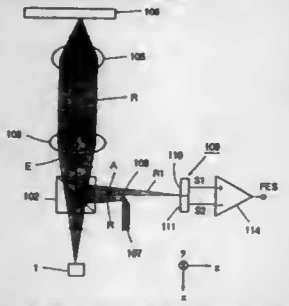
Teruo Fujita; Morihiro Karaki; Mitsuru Irie, all of Nagaokakyo, and Kazuhiko Nakane, Amagasaki, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

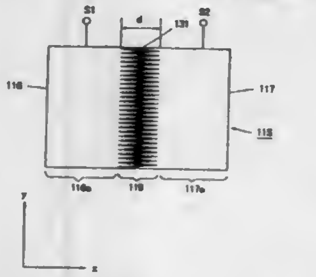
Division of Ser. No. 109,724, Aug. 19, 1993, Pat. No. 5,453,962. This application Apr. 26, 1995, Ser. No. 427,811

Claims priority, application Japan, Aug. 20, 1992, 4-221318; Aug. 24, 1992, 4-223912; Nov. 30, 1992, 4-319885; Apr. 28, 1993, 5-102613; May 31, 1993, 5-128894; May 31, 1993, 5-128895; Aug. 17, 1993, 5-203460

Int. Cl.^{6} G11B *7/09*

U.S. Cl. 369—44.240 **9 Claims**





1. A focus error detecting device for detecting a focus error of light beam from a light source and focused onto an information recording medium, comprising:

an obscuration means for obscuring part of a reflected light beam from the information recording medium;

a two-division photodetector having first and second light receiving sections each producing an output signal responsive to the amount of light which it receives, said light receiving sections being separated from each other at a division band region, and said photodetector being so disposed as to receive the light from the obscuration means at the division band region; and

means for producing a focus error signal in accordance with the output signals from said first and second light receiving sections;

wherein each of said light receiving sections has an array of tapered projections along their edge in said division band region, and the tapered projections of the light receiving sections are interdigitated with each other.

5,532,988
TRACKING APPARATUS FOR SAMPLED SERVO SYSTEM WHICH PERFORMS TRACKING CONTROL USING SIGNALS IDENTIFYING TRACKS AS EVEN OR ODD NUMBERED

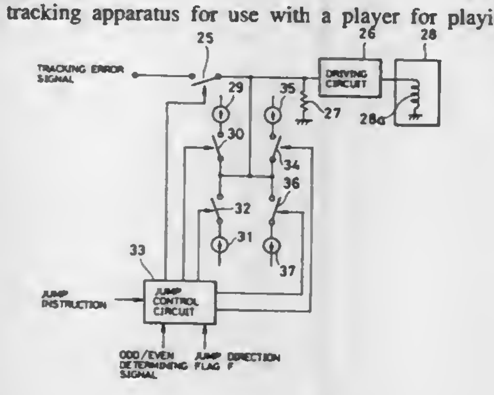
Fumihiko Yokogama, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 24, 1994, Ser. No. 328,000

Claims priority, application Japan, Oct. 29, 1993, 5-272051

Int. Cl.^{6} G11B *7/095*

U.S. Cl. 369—44.28 **8 Claims**



1. A tracking apparatus for use with a player for playing an optical disc having a recording format for a sampled servo system, on which a track identifying pit indicative of an odd-numbered track or an even-numbered track is formed together with wobble pits for tracking servo in a servo field of each of a plurality of preformatted tracks, comprising:

reading means for emitting a light beam for reading information recorded as pits on each track of said optical disc and producing read signals corresponding to said wobble pits;

tracking error signal generating means for generating a tracking error signal in accordance with said read signals produced by said reading means;

means for generating an odd/even determining signal indicative of an odd-numbered track or an even-numbered track in accordance with said read signals produced by said reading means;

tracking control means for controlling movement of an irradiating spot formed by the light beam from said reading means on said optical disc in a radial direction of said optical disc, said tracking control means being controlled by any of (a) said tracking error signal, (b) a kick pulse, and (c) a brake pulse; and

relay means for (a) relaying said tracking error signal to said tracking control means, (b) in response to a jump command input to said relay means, generating said kick pulse for a track jump and outputting said kick pulse instead of said tracking error signal to said tracking control means, (c) detecting a change in value of said odd/even determining signal, and, in response to said detected change, again relaying said tracking error signal to said tracking control means, and (d) generating and outputting said brake pulse for terminating the track jump to said tracking control means.

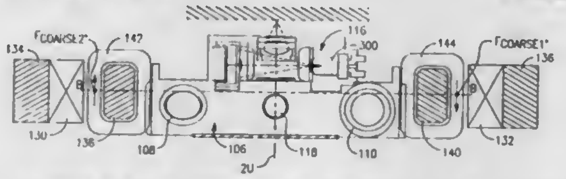
5,532,989
SEEK ACTUATOR FOR OPTICAL RECORDING

Kurt W. Getreuer, Colorado Springs, and Leonardus J. Grassens, Chipita Park, both of Colo., assignors to Discovision Associates, Irvine, Calif.

Continuation of Ser. No. 105,866, Aug. 11, 1993, abandoned, which is a continuation of Ser. No. 657,155, Feb. 15, 1991, Pat. No. 5,265,079. This application Mar. 6, 1995, Ser. No. 399,268

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—44.150 **9 Claims**



1. An apparatus for controlling the position of a lens, comprising:

a suspended body having a center of mass and a lens defining an optical axis, said center of mass being disposed substantially on said optical axis;

a carriage suspending said suspended body for relative motion therewith with at least one degree of freedom, wherein a center of mass of said carriage lies within 0.1 mm of said optical axis proximate said center of mass of said suspended body, and said carriage has an initial attitude with respect to three mutually orthogonal planes of reference defined by an X axis, a Y Axis, and a Z axis, and suspensory forces acting on said suspended body are symmetric about said optical axis;

a first drive means acting on said carriage for producing a first plurality of forces that are balanced and symmetric about said optical axis to accelerate said carriage and said suspended body therewith at different frequencies along said Y axis; wherein moments produced by said first plurality of forces about said center of mass of said carriage are effectively absent; and forces reactive to said first plurality of forces are balanced and symmetric with respect to said optical axis and produce insubstantial moments about said center of mass of said carriage; and inertial forces acting on said carriage are balanced and symmetric about said optical axis;

whereby said carriage maintains its said attitude with respect to said planes of reference during acceleration thereof, and said suspended body maintains an initial position with respect to said carriage.

5,532,990
OPTICAL INFORMATION PROCESSING METHOD AND APPARATUS INCLUDING MEASURING AND CORRECTING THE OFFSET OF A TRACKING ERROR SIGNAL FROM AN OUTPUT OF A PHOTODETECTOR USING A VIBRATING OBJECTIVE LENS

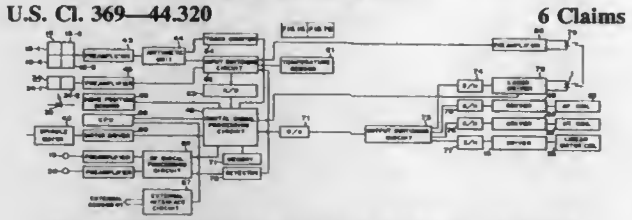
Osamu Koyama; Tadashi Kato, both of Kawasaki; Masayuki Usui, Yokohama; Yoshihiko Watanabe, Yokohama; Hisatoshi Baba, Yokohama; Hirotake Ando, Tokyo; Hideo Nakajima; Shinji Sakai, both of Yokohama, and Kenji Tamaki, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 374,222, Jan. 18, 1995, which is a division of Ser. No. 154,120, Nov. 18, 1993, Pat. No. 5,404,346, which is a division of Ser. No. 562,021, Aug. 2, 1990, Pat. No. 5,347,503. This application May 23, 1995, Ser. No. 447,645

Claims priority, application Japan, Aug. 4, 1989, 1-203069

Int. Cl.^{6} G11B *7/09*

U.S. Cl. 369—44.320 **6 Claims**



1. An optical information processing apparatus comprising:

an optical head for irradiating a light beam onto an optical recording medium provided with a plurality of tracks;

an objective lens, mounted on said optical head, for condensing the light beam onto the recording medium;

a photodetector for receiving one of a light beam reflected by the recording medium and a light beam transmitted through the recording medium and for generating a tracking error signal indicative of a positional deviation between the light beam irradiated position and a track;

a tracking actuator for moving said objective lens in a direction intersecting the tracks and for causing said objective lens to vibrate in the vicinity of the center of the light beam;

tracking control means for driving said tracking actuator in accordance with the tracking error signal so as to correct the positional deviation;

measuring means for measuring an offset of the tracking error signal from an output of said photodetector when said objective lens is caused to vibrate in the vicinity of the center of the light beam; and

correction means for correcting the offset of the tracking error signal on the basis of the offset measured by said measuring means.

5,532,991
RECORDING AND/OR REPRODUCING APPARATUS AND METHOD OF CONTROLLING SAME

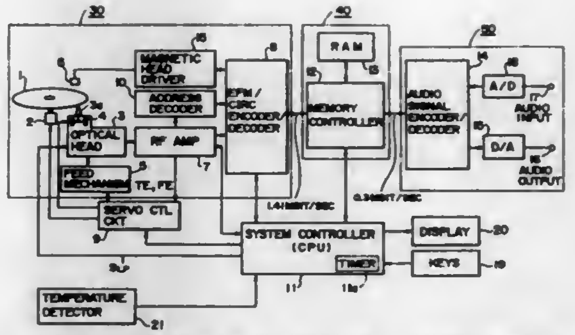
Yoshio Sasaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 223,554, Apr. 6, 1994, Pat. No. 5,491,677. This application Aug. 11, 1995, Ser. No. 513,721

Claims priority, application Japan, Apr. 12, 1993, 5-107266

Int. Cl.^{6} G11B *7/095*

U.S. Cl. 369—44.350 **5 Claims**



1. A recording and/or reproducing apparatus comprising:

recording and/or reproducing means for recording data on a recording medium and/or reproducing recorded data from the recording medium;

memory means for temporarily storing data outputted from said recording and/or reproducing means or input data to be recorded on the recording medium by said recording and/or reproducing means;

memory control means for controlling said memory to write and read data such that data are read from said memory means in a unit of time at a transfer rate lower than the transfer rate at which data are written in said memory means in a unit of time;

servo control means for supplying a servo control signal to said recording and/or reproducing means, said servo control means having an adjustable servo control gain; and

system control means for controlling operation of said recording and/or reproducing means, said memory control means, and said servo control means;

wherein the input data are recorded on the recording medium through said memory means and the data reproduced from the recording medium are outputted through said memory means;

said system control means comprising means for temporarily interrupting the recording of data on the recording medium or the reproducing of data .from the recording medium with said recording and/or reproducing means based on the amount of data stored in said memory means, and controlling said servo control means and said recording and/or reproducing means to automatically adjust the servo control gain while the recording or reproducing of data is temporarily interrupted.

5,532,992
RECORDING AND REPRODUCING METHOD FOR WRITABLE TYPE DISK DRIVING APPARATUS

Kyota Funamoto, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 903,168, Jun. 24, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 302,376

Claims priority, application Japan, Dec. 26, 1991, 3-345210

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 369—47 **4 Claims**

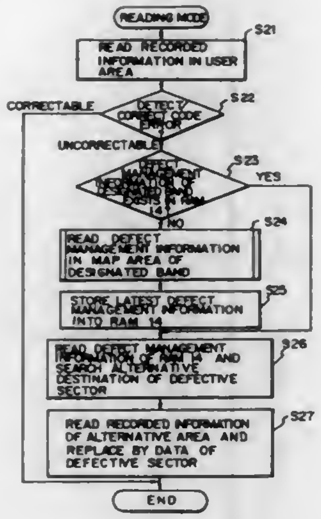
1. A recording and reproducing method for a writable type disk driving apparatus for driving a writable type disk in which an information recording area is divided into a plurality of bands and every band has a defect management information recording area, the method comprising:

recording latest defect management information at a predetermined sector in the defect management information recording area, the latest defect management information being indicative of (i) an address of a defective sector in the disk and (ii) an address of an alternative sector for the defective sector;

recording information by accessing a designated address immediately in response to a write command;

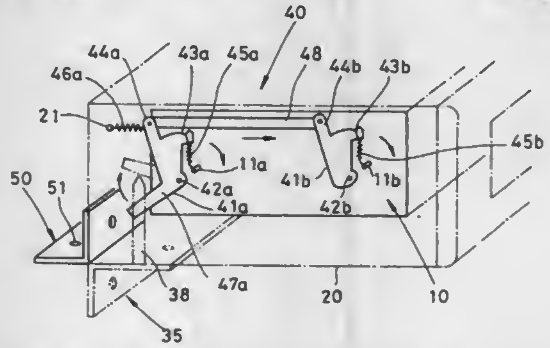
verifying whether the information was accurately recorded at the designated address; and

reading the latest defect management information from the writable type disk only if said verifying determines that the information was not accurately recorded at the designated address.


READING MODE
S21
READ RECORDED INFORMATION IN USER AREA
S22
CORRECTABLE
DETECT/CORRECT CODE ERROR
UNCORRECTABLE
S23
YES
DEFECT MANAGEMENT INFORMATION OF DESIGNATED BAND EXISTS IN RAM 14
NO
S24
READ DEFECT MANAGEMENT INFORMATION IN MAP AREA OF DESIGNATED BAND
S25
STORE LATEST DEFECT MANAGEMENT INFORMATION INTO RAM 14
S26
READ DEFECT MANAGEMENT INFORMATION OF RAM 14 AND SEARCH ALTERNATIVE DESTINATION OF DEFECTIVE SECTOR
S27
READ RECORDED INFORMATION OF ALTERNATIVE AREA AND REPLACE BY DATA OF DEFECTIVE SECTOR
END

5,532,993
VIBRATION DAMPING SUSPENSION MECHANISM FOR RECORDED DATA REPRODUCING APPARATUS

Tatsuya Yanagisawa; Nobuo Nohtomi; Nobutaka Sawada; Fumiya Yamada; Kiyohito Kajihara; Kiyoshi Morikawa; Atsushi Kurosawa; Tomomichi Kimura, and Toshiroh Yamashita, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 12,844, Feb. 4, 1993. This application Nov. 14, 1994, Ser. No. 340,441
Claims priority, application Japan, Feb. 6, 1992, 4-012928 U; Feb. 6, 1992, 4-012929 U
Int. Cl.⁶ G11B *33/08*
U.S. Cl. 369—75.1 4 Claims



1. A vibration damping support mechanism for use in a recorded data reproducing apparatus comprising:

spring loaded arms mounted rotatably on inner surfaces of side panels of an outer casing which contains a main recorded data reproducing unit;

damper springs mounted in one of horizontal and vertical directions between holding portions of said spring loaded arms and the side panels of said main recorded data reproducing unit; and

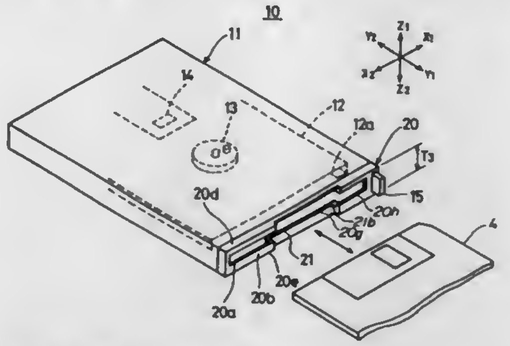
a shift lever extending radialward from a rotating center of at least one of said spring loaded arms for rotation together with said at least one of said spring loaded arms, said shift lever planar with said spring loaded arms;

connecting means for interconnecting said at least one of said spring loaded arms with at least one other of said spring loaded arms so that they turn together; and

shifting means for engaging said shift lever, only after said shifting means is inserted into said outer casing, said shifting means being parallel to said inner surface of said side panel of said outer casing to which said spring loaded arms are mounted, said shifting means mounted to said outer casing to turn both said at least one and said at least one other spring loaded arms together through 90 degrees and change the mounting direction of said damper springs, corresponding to a positional change of said recorded data reproducing apparatus from a horizontal position to the vertical position.

5,532,994
DISK STORAGE HAVING NOTCHED FRONT BEZEL

Kazuhiko Inoue, Houya, and Takashi Watanabe, Ichikawa, both of, Japan, assignors to TEAC Corporation, Japan
Continuation of Ser. No. 842,467, Feb. 27, 1992, abandoned. This application Nov. 2, 1993, Ser. No. 147,003
Claims priority, application Japan, Mar. 29, 1991, 3-20170 U
Int. Cl.⁶ G11B *17/04;33/02*
U.S. Cl. 369—77.2 7 Claims



1. A disk storage comprising:

a housing (11);

disk loading means, accommodated in said housing (11), for translating a disk cartridge (4) accommodating a disk therein from a first position to a second position subadjacent and parallel to the first position in said housing (11), in order to load the disk cartridge (4) at the second position;

recording/reproducing means, accommodated in said housing (11), for recording information on a recording surface of the disk of the disk cartridge (4) loaded at the second position, and for reproducing information therefrom;

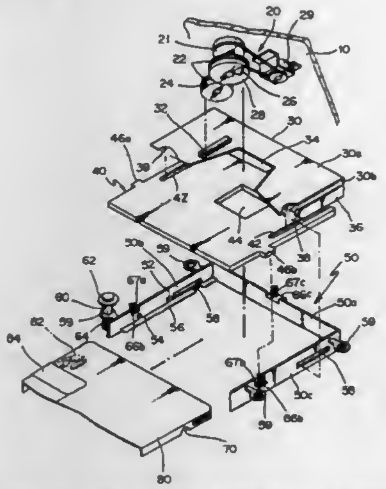
a front bezel (20) having a top surface (20*d*), an opposed bottom surface (20*e*) parallel to said top surface (20*d*), a first surface (20*b*) which comprises a front surface of said disk storage, and a rearward surface (20*i*) having a shoulder therein for retaining the disk cartridge (4) in the second position, the front bezel (20) being attached to said housing and including an opening (20*a*) having a longitudinal direction extending parallel to said top and bottom surfaces via which the disk cartridge (4) is inserted in said housing (11), the bezel (20) further including a concave portion (21) having a concave shape spanning from said top surface to said bottom surface, the concave portion being defined by a second surface (21*a*, 21*c*) in the bezel positioned in the center of said opening (20*a*) along said longitudinal direction of said opening (20*a*) and between said opening (20*a*) and said top surface (20*d*), a third surface (21*d*) in the bezel (20) positioned in the center of said opening (20*a*) along said longitudinal direction of said opening (20*a*) and between said opening (20*a*) and said bottom surface (20*e*), and a fourth surface (20*b*) in the bezel extending at a slant from said third surface (21*d*) inwardly of said housing (11), said second surface (21*a*, 21*c*) and said third surface being situated inwardly of said first surface (20*b*) and outwardly of said shoulder, and said fourth surface (21*b*) having an innermost end situated inwardly of said shoulder whereby said concave portion facilitates complete insertion of the disk cartridge (4) into said opening (20*a*) So as to allow the disk cartridge (4) to translate from the first position to the second position without interference from said shoulder;

a singular, isolated eject button (15) that projects from said front bezel (20) at a position beyond the width of the opening (20*a*) of said front bezel (20) and in alignment with said longitudinal direction of the opening (20*a*) of said front bezel (20); and

an eject mechanism coupled to said eject button that ejects the disk cartridge (4) loaded at the second position from said housing (11) when said eject button (15) is pressed.

5,532,995
DISC-CARTRIDGE FRONT LOADING APPARATUS OF A MINI DISC PLAYER

Young S. Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 27, 1993, Ser. No. 173,108
Claims priority, application Rep. of Korea, Dec. 31, 1992, 92-27169
Int. Cl.⁶ G11B *33/02;17/028*
U.S. Cl. 369—77.2 9 Claims



1. A disc-cartridge front loading apparatus of a mini-disc player comprising:

a turn table;

a disc-cartridge tray for receiving and supporting a disc-cartridge;

a disc-cartridge pushing plate for fixing said disc-cartridge on said turntable by pushing said disc-cartridge inserted in said disc-cartridge tray, said pushing plate being mounted on said disc-cartridge tray, and being formed with protruded portions at both side surfaces and a rear surface thereof and a hole and two predetermined distance guide slots on an upper surface;

a disc-cartridge guide plate for loading or ejecting said disc-cartridge gripped in said disc-cartridge tray, and said disc-cartridge guide plate being mounted between said disc-cartridge pushing plate and a driving means and movable between loading and ejecting positions; and

said driving means for providing power in order to load and eject said disc-cartridge to said disc-cartridge guide plate and for pushing said disc-cartridge pushing plate,

wherein said driving means comprises:

a driving motor mounted on an inside of a housing in a disc player, said driving motor being driven when said disc-cartridge is engaged with said disc-cartridge guide plate in case of loading said disc-cartridge and being reversely rotated in case of ejecting said disc-cartridge;

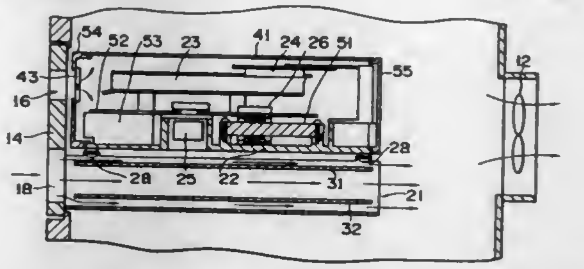
a belt pulley connected with said driving motor by a belt;

a first gear having a protruded portion at the lower part thereof and said first gear being connected and engaged with said belt pulley, said hold is located at the center of said disc-cartridge pushing plate, said first gear protruding portion extending into said hold in said disc-cartridge pushing plate when said first gear is in one position and said first gear protruding portion bearing on said disc-cartridge pushing plate when said first gear is in a second position; and

a second gear gearing into said first gear, said second gear transferring said disc-cartridge guide plate into an inside and outside of said housing according to the rotation of said driving motor, said second gear being released and engaged with said disc-cartridge guide plate by downward and upward movement of said disc-tray according to the position of said first gear protruding portion.

5,532,996
DRIVE UNIT FOR OPTICAL MEMORY DEVICE HAVING A FIRST HOUSING ENVELOPING A SECOND HOUSING

Satoshi Okabe, and Sunao Aoki, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 132,555, Oct. 6, 1993, abandoned, which is a division of Ser. No. 657,690, Feb. 19, 1991, Pat. No. 5,301,178. This application Apr. 17, 1995, Ser. No. 422,775
Claims priority, application Japan, Feb. 22, 1990, 2-41833; Apr. 11, 1990, 2-94106; May 23, 1990, 2-131129
Int. Cl.⁶ G11B *33/14*
U.S. Cl. 369—77.2 4 Claims



1. A drive unit for use in an optical memory device, comprising:

a cartridge containing a disc-shaped recording medium;

a cartridge guiding mechanism for moving said cartridge at least in a direction substantially perpendicular to a medium surface of the recording medium;

a motor shaft for connecting with the recording medium after said cartridge is moved in a direction substantially perpendicular to a surface of the recording medium;

a motor body for rotating the motor shaft after the recording medium connects with the motor shaft;

an optical head for reading out information stored on the recording medium;

an optical head driving mechanism for linearly reciprocating said optical head in a direction which is parallel to the medium surface of the recording medium and which passes across an information track of the recording medium;

a circuit substrate;

an outer first housing for accommodating all of said cartridge guiding mechanism, said motor shaft, said motor body, said optical head, said optical head driving mechanism and said circuit substrate therein; and

an inner second housing which is positioned inside said outer first housing, said inner second housing comprising a bottom surface, a top surface, two side surfaces and a rear surface, all of said bottom, top, side and rear surfaces being interconnected so as to form a substantially sealed enclosure and to enclose in a substantially sealed condition said cartridge guiding mechanism, said optical head, said optical head driving mechanism and at least part of said motor shaft;

wherein said outer first housing and said inner second housing each have a respective opening in respective front surfaces thereof;

said outer first housing and said inner second housing adjacent each other and facing each other at said front surfaces thereof with their respective openings being in alignment so as to form a common opening through which said cartridge passes; and

a shutter arranged at said common opening, said shutter being controlled such that said shutter opens said common opening when said cartridge passes through said common opening.

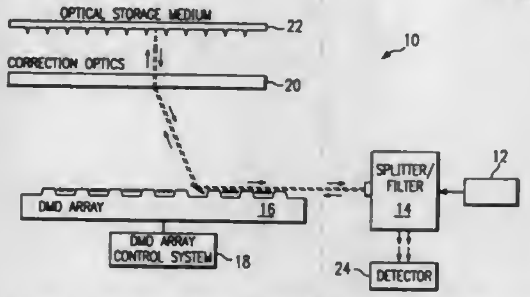
5,532,997
OPTICAL TRACKING SYSTEM

Giles A. Pauli, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 106,027, Mar. 13, 1993, Pat. No. 5,448,546, which is a continuation of Ser. No. 534,103, Jun. 6, 1990, Pat. No. 5,291,473. This application Jun. 7, 1995, Ser. No. 479,027

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—112 **5 Claims**



1. An light beam positioning system for directing a beam of light onto an optical storage medium, said system comprising:

a light beam source for generating a beam of light along a light path;

an array comprising a plurality of mirror elements proximate said light path, each of said mirror elements selectively deflectable into said light path to divert said beam of light to a selected portion of an optical storage medium;

an array control system operable to selectively deflect said mirror elements; and

a detector to receive light reflected by said selected portion of said optical storage medium.

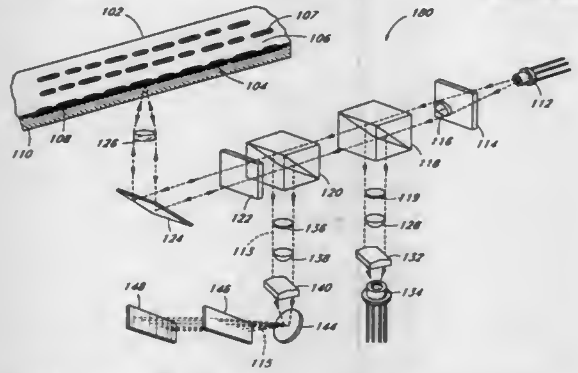
5,532,998
OPTICAL SPECTROSCOPIC INFORMATION STORAGE

Jayson T. Durham, San Diego, Calif., assignor to Serotech, Inc., Irvine, Calif.

Filed Feb. 14, 1995, Ser. No. 389,125

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—116 **23 Claims**



1. An apparatus for optical information storage comprising:

a light source supplying light having a first predetermined wavelength;

a data storage medium emitting light having said first predetermined wavelength and having a second predetermined wavelength, different from said first predetermined wavelength, in response to excitation by said light source;

a processor providing wavelength discrimination of light emission from said data storage medium; and

a light sensor detecting light emission from said data storage medium independently at said first and at said second predetermined wavelengths.

5,532,999
OPTICAL DETECTOR HAVING STRAY CARRIER ABSORPTION REGIONS BETWEEN LIGHT RECEIVING ELEMENTS, AND AN OPTICAL HEAD USING THE SAME

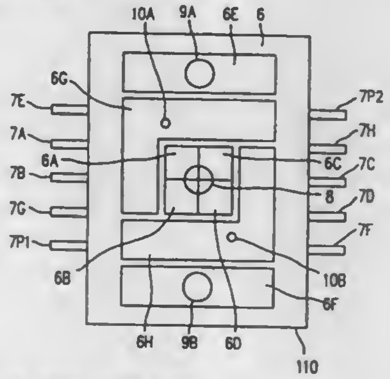
Hideki Aikoh, Higashiosaka; Makoto Takashima, Ikoma; Hiroyuki Nakamura, Kobe, and Tohru Nakamura, Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 22, 1994, Ser. No. 263,549

Claims priority, application Japan, Jun. 25, 1993, 5-154703

Int. Cl.⁶ G11B *7/00*

U.S. Cl. 369—120 **22 Claims**



1. An optical head comprising:

a light source for emitting light;

first means for forming at least three light beams from the light emitted from the light source;

second means for converging said at least three beams on a storage medium; and

a photodetector for receiving said at least three beams reflected by the storage medium so as to generate electrical outputs in accordance with an intensity of the light beams,

the photodetector comprising;

- a semiconductor substrate;
- a light receiving section formed on a surface of the semiconductor substrate for receiving the light beams reflected by the storage medium;
- a plurality of input terminals for receiving a supply of a predetermined potential; and
- a plurality of output terminals for outputting electric signals,
- wherein the light receiving section includes a plurality of light receiving elements for signal detection provided apart from each other on the surface of the semiconductor substrate and a plurality of stray light carrier absorption regions provided so as to substantially fill regions between the plurality of light receiving elements for signal detection,
- the plurality of stray light carrier absorption regions are made of first impurity diffusion regions of a first-conductivity type formed in the semiconductor substrate, the first impurity diffusion regions forming PN junctions and depletion layers in the semiconductor substrate so as to absorb stray light carriers generated in the semiconductor substrate by stray light, and
- the first impurity diffusion regions are electrically connected to the plurality of input terminals for receiving the supply of the predetermined potential, thereby applying a reverse-bias to the PN junctions.

5,533,000
DISK APPARATUS INCLUDING A DISK DRIVING MEMBER ADAPTED TO HOLD TWO DIFFERENT SIZE DISKS

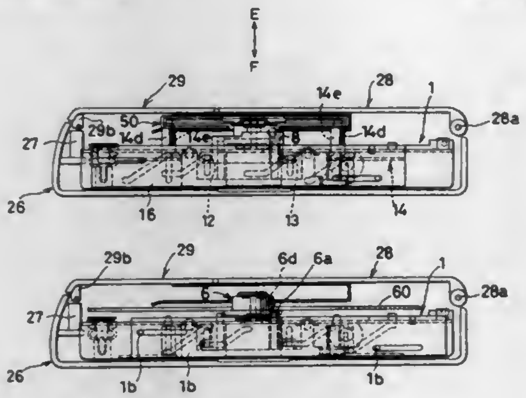
Satoru Koizumi, Higashihiroshima, Japan, assignor to Sharp kabushiki Kaisha, osaka, Japan

Filed Jan. 25, 1994, Ser. No. 186,458

Claims priority, application Japan, Mar. 19, 1993, 5-060590

Int. Cl.⁶ G11B *33/02*

U.S. Cl. 369—270 **60 Claims**



15. An optical disk apparatus comprising:

a driving member for driving a disc-shaped first recording medium with a top portion of the driving member contacting the circumferential edge of a first center hole of the first recording medium as well as for driving a disc-shaped second recording medium while contacting the circumferential edge of a second center hole of the second recording medium, the first center hole being arranged to have a diameter smaller than that of the second center hole, the driving member being provided with a rotation axis, the first and second recording media being simultaneously held by the driving member with the second recording medium being held by the driving member at a station which is different from the top portion of the rotation axis of the driving member during operation of the optical disk apparatus;

reading means for reading information by scanning either a recording surface of the first recording medium or that of the second recording medium;

shifting means for shifting the reading means in parallel with the rotation axis; and

control means for controlling the shifting means so that when only the first recording medium is supported by the driving member, the reading means is shifted to a first reading position where the first recording medium is to be read, and so that except when only the first recording medium is supported by the driving member, the reading means is shifted to a second reading position where the second recording medium is to be read.

5,533,001
MAGNETO-OPTICAL DISK SYSTEM WITH SPECIFIED THICKNESS FOR PROTECTIVE LAYER RELATIVE TO THE NUMERICAL APPERTUREG330302 OBJECTIVE LENS

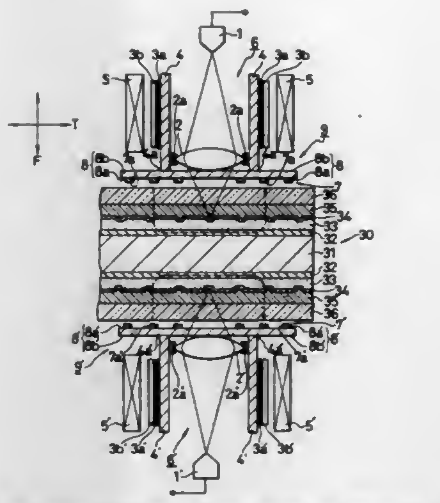
Tetsu Watanabe, and Yoshio Aoki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 277,357, Jul. 19, 1994, Pat. No. 5,392,263, which is a continuation of Ser. No. 761,874, Sep. 13, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 383,351

Claims priority, application Japan, Jan. 31, 1990, 2-21210

Int. Cl.⁶ G11B *11/00*

U.S. Cl. 369—275.2 **3 Claims**



1. An optical recording medium for use in an optical recording and/or reproducing apparatus having at least one light source for generating a light beam and at least one objective lens for converging said light beam on an optical axis thereof, the numerical aperture of said objective lens falling within a range of 0.55 to 0.70, said recording medium comprising:

- a first recording layer;
- a first light-transmitting cover layer provided on one surface of said first recording layer to cover said first recording layer and having a first light incident surface irradiated by said light beam through said objective lens;
- a second recording layer arranged parallel to said first recording layer;
- a second light-transmitting cover layer provided on one surface of said second recording layer to cover said second recording layer and having a second light incident surface irradiated by said light beam through said objective lens; and

interconnecting means provided between said first and second recording layers for connecting said first recording layer to second recording layer,

wherein each thickness of said first and second light-transmitting cover layers falls within a range of 0.6 to 0.1 mm.

5,533,002
OPTICAL DATA STORAGE COMPACT DISC AND METHOD FOR MANUFACTURING THE SAME

Nigel C. Abraham, 14c West Avenue, Gosforth Newcastle-upon-Tyne NE38 4ES, United Kingdom

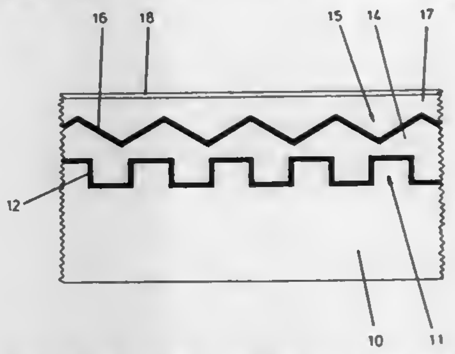
PCT No. PCT/GB92/01920, § 371 Date Apr. 7, 1994, § 102(e) Date Apr. 7, 1994, PCT Pub. No. WO93/08565, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 19, 1992, Ser. No. 211,607

Claims priority, application United Kingdom, Oct. 19, 1991, 9122247

Int. Cl.⁶ G11B *7/24*

U.S. Cl. 369—275.3 **6 Claims**



1. An optical data storage disc having a first side and an opposite, second side, said disc comprising:

- a substrate having a first side;
- a pattern of indentations formed in said first side of said substrate;

a film of reflective material applied over said first side of said substrate, said pattern of indentations defining a digital data recording to be optically read form said second side of said disc;

a coating of embossable material carried on said first side of said substrate, said coating having a surface which is embossed with a relief pattern defining an optically variable image to be viewed from said first side of said disc; and,

a second film of reflective material applied over the embossed surface of said coating.

5,533,003

RECORDING DEVICE CAPABLE OF DETECTING THE CHANGE IN LENGTH AND POSITION OF THE PIT EDGE

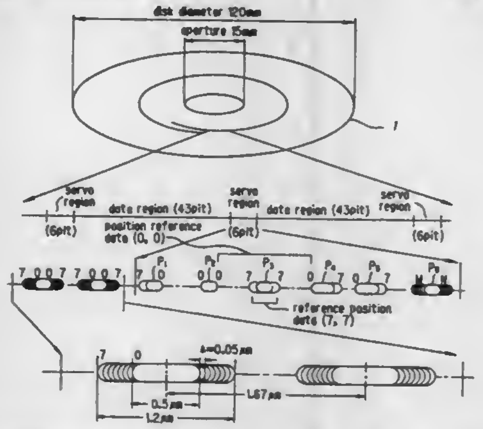
Seiji Kobayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 262,821

Claims priority, application Japan, Jun. 28, 1993, 5-156417

Int. Cl.⁶ G11B *7/24*

U.S. Cl. 369—275.4 **16 Claims**



1. An information recording medium having a plurality of regularly spaced pits that alternate between data pits and servo pits, each pit of the plurality of regularly spaced pits having an edge located in one of a plurality of positions,

wherein the position of the edge of a data pit defines user data recorded on the recording medium, and

wherein an edge position of the plurality of positions available to a servo pit is unavailable to the data pits.

5,533,004

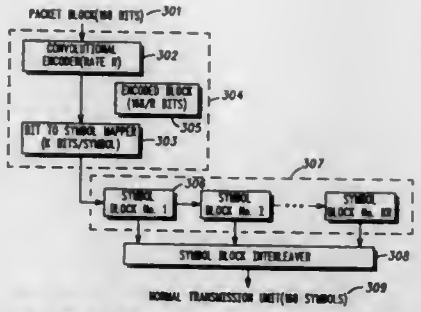
METHOD FOR PROVIDING AND SELECTING AMONGST MULTIPLE DATA RATES IN A TIME DIVISION MULTIPLEXED SYSTEM

Steven C. Jasper, Hoffman Estates, and Kenneth J. Crisler, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 7, 1994, Ser. No. 334,982

Int. Cl.⁶ H04B *7/212*

U.S. Cl. 370—11 **23 Claims**


PACKET BLOCK(168 BITS)
301
CONVOLUTIONAL ENCODER(RATE R)
302
ENCODED BLOCK (168/R BITS)
304
305
BIT TO SYMBOL MAPPER (K BITS/SYMBOL)
303
307
306
SYMBOL BLOCK No. 1
SYMBOL BLOCK No. 2
SYMBOL BLOCK No. KR
SYMBOL BLOCK INTERLEAVER
308
NORMAL TRANSMISSION UNIT(168 SYMBOLS)
309

FORMAT NUMBER	CODE RATE (R)	MODULATION RATE (K)	INTERLEAVE SIZE (BLOCKS/SLOT)	EFFECTIVE DATA RATE(BITS/SYMBOL)
0	1/2	2 (QPSK)	1	1:1
1	1/2	4 (16QAM)	2	2:1
2	2/3	6 (64QAM)	4	4:1
3	3/4	8 (256QAM)	6	6:1

1. A method comprising the steps of:

providing a communication channel having a plurality of time slots, wherein each of the plurality of time slots has a common duration;

providing a quantity of information bits to be transmitted to at least one intended recipient;

providing a plurality of modulation techniques having corresponding effective data transmission rates;

selecting one of the plurality of modulation techniques to produce a selected modulation technique;

regardless of which of the plurality of modulation techniques was selected:

formatting the information bits into at least one block, such that an identical number of information bits are always contained within a single block;

transmitting the at least one block in at least one of the time slots at a predetermined constant symbol rate using the selected modulation technique.

5,533,005

DUAL CONNECTIONS

Stephen P. Ferguson, Coventry, England, assignor to GPT Limited, United Kingdom

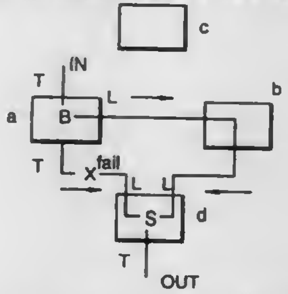
Filed Nov. 29, 1993, Ser. No. 158,912

Claims priority, application United Kingdom, Dec. 1, 1992, 9225081

Int. Cl.⁶ H01L *1/20;1/22*

U.S. Cl. 370—16 **4 Claims**

1. A method of protecting data in a data transmission system having a ring network of parent Add-Drop Multiplexors (ADMs) each connected to one another by means of respective line ports, each parent ADM having a tributary port to allow access to the ting network by a dependent node, at least one dependent node being connected to a tributary port of two parent ADMs such that incoming traffic signals can pass between said dependent node and a first one of said parent ADMs either directly via a tributary port of said first parent ADM or via a second parent ADM and a line port of said first parent ADM, said method comprising the steps of: comparing, within said first parent ADM, quality representative data from the dependent node within the incoming traffic signals on each of the line and tributary ports with each other; and selecting which of the incoming traffic signals to route to a destination as a result of the outcome of that data comparison.



5,533,006

CONTROL SYSTEM FOR A RING TYPE NETWORK SYSTEM

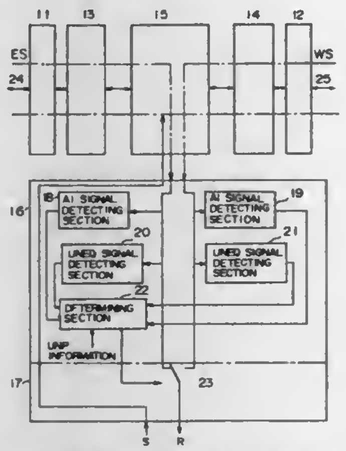
Tetsuya Uchida, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 14, 1994, Ser. No. 196,057

Claims priority, application Japan, Sep. 13, 1993, 5-226780

Int. Cl.⁶ H04L *11/22*

U.S. Cl. 370—16.1 **11 Claims**


4
11
13
15
14
12
ES
WS
24
25
16
18
AI SIGNAL DETECTING SECTION
AI SIGNAL DETECTING SECTION
19
20
21
UNEQ SIGNAL DETECTING SECTION
UNEQ SIGNAL DETECTING SECTION
22
DETERMINING SECTION
UNP INFORMATION
17
23
S
R

1. A node provided in a ring type network having a plurality of nodes coupled to each other via ring type transmission path means having signal receiving paths and signal transmitting paths for respectively receiving and transmitting multiplexed signals in mutually opposite directions between said nodes, the node comprising:

cross connecting means, coupled to said ring type transmission path means, for cross connecting the paths of the ring type transmission path means by dropping signals in time slots of the node and passing through signals in time slots of other nodes of the network;

path switching means, coupled to said cross connecting means, for switching only signal receiving paths of said ring type transmission path means to connect the node to one of two signal receiving paths from which said node is to receive a signal; said two signal receiving paths transmitting signals in two mutually opposite directions; and

controlling means, coupled to said path switching means, for controlling a switching operation of said path switching means to connect the node to one of the two signal receiving paths in response to at least one unequipment code signal received via another of said two signal receiving paths from an arbitrary node coupled to said node and indicating an unused path which is not cross-connected in said arbitrary node.

5,533,007

ISDN LINE CIRCUIT MONITOR SYSTEM

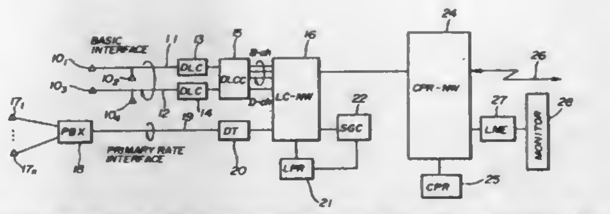
Akira Orita; Takaaki Kawakami, and Tetsuya Sakata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 754,954, Sep. 4, 1991, abandoned. This application Oct. 18, 1994, Ser. No. 324,495

Claims priority, application Japan, Sep. 4, 1990, 2-234025; Feb. 8, 1991, 3-016726

Int. Cl.⁶ H04J *3/14*

U.S. Cl. 370—17.000 **16 Claims**



1. An ISDN line circuit channel monitor system having a digital line circuit controller which separates time slots carried by basic rate interface lines into a D channel and B channels and generates multiplexed time slots of the D channel and multiplexed time slots of the B channels, a first network receiving multiplexed time slots transmitted from said digital line circuit controller and a primary rate interface line, and a second network which switches time slots transmitted from said first network to said second network and which outputs switched multiplexed time slots to an ISDN, said ISDN line circuit channel monitor system, comprising:

monitor means, coupled to the digital line circuit controller via the first network and the second network, for monitoring said B channels and said D channel carried by said basic rate interface lines and said primary rate interface line; and

connection means, coupled to said monitor means, for establishing a communication path to connect a terminal with said monitor means via the first network, the second network and the digital line circuit controller so that at least one of the time slots of the B channels and the D channel to be monitored is transmitted along the communication path.

5,533,008

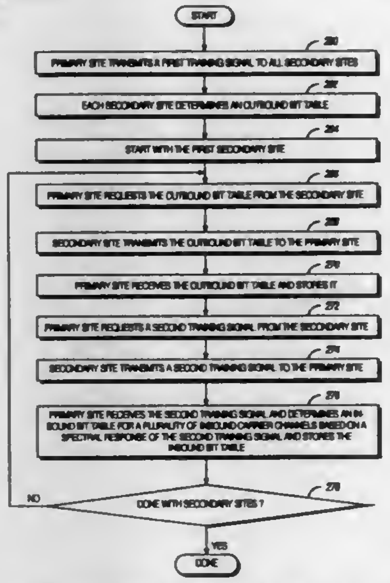
METHOD AND APPARATUS FOR PROVIDING A COMMUNICATION SYSTEM INFRASTRUCTURE

Gary W. Grube, Barrington, Ill.; Timothy W. Markison, Austin, Tex.; Matthew A. Pendleton, Cedar Park, Tex., and Mathew A. Rybicki, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 26, 1995, Ser. No. 381,602

Int. Cl.⁶ H04N *7/14*

U.S. Cl. 370—17 **43 Claims**


START
260
PRIMARY SITE TRANSMITS A FIRST TRAINING SIGNAL TO ALL SECONDARY SITES
262
EACH SECONDARY SITE DETERMINES AN OUTBOUND BIT TABLE
264
START WITH THE FIRST SECONDARY SITE
266
PRIMARY SITE REQUESTS THE OUTBOUND BIT TABLE FROM THE SECONDARY SITE
268
SECONDARY SITE TRANSMITS THE OUTBOUND BIT TABLE TO THE PRIMARY SITE
270
PRIMARY SITE RECEIVES THE OUTBOUND BIT TABLE AND STORES IT
272
PRIMARY SITE REQUESTS A SECOND TRAINING SIGNAL FROM THE SECONDARY SITE
274
SECONDARY SITE TRANSMITS A SECOND TRAINING SIGNAL TO THE PRIMARY SITE
276
PRIMARY SITE RECEIVES THE SECOND TRAINING SIGNAL AND DETERMINES AN INBOUND BIT TABLE FOR A PLURALITY OF INBOUND CARRIER CHANNELS BASED ON A SPECTRAL RESPONSE OF THE SECOND TRAINING SIGNAL AND STORES THE INBOUND BIT TABLE
278
NO
DONE WITH SECONDARY SITES ?
YES
DONE

1. A method for obtaining communication system infrastructure information for a wireless communication system, the method comprising the steps of:

a) transmitting, by a primary site, a first training signal simultaneously to a plurality of secondary sites via an outbound wireline communication path;

b) upon receiving the training signal, determining, by each of the plurality of secondary sites, an outbound bit table based on a spectral response of the outbound wireline communication path;

c) requesting, by the primary site, the outbound bit table from one of the plurality of secondary sites;

d) upon receipt of the outbound bit table, storing, by the primary site, the outbound bit table of the one of the plurality of secondary sites;

e) requesting, by the primary site, a second training signal from the one of the plurality of secondary sites;

f) transmitting, by the one of the plurality of secondary sites, the second training signal to the primary site via an inbound wireline communication path;
g) upon receiving the second training signal, determining, by the primary site, an inbound bit table for the one of the plurality of secondary sites based on a spectral response of the inbound wireline communication path;
h) storing, by the primary site, the inbound bit table for the one of the plurality of secondary sites, and
i) repeating steps (c) through (h) for remaining sites of the plurality of secondary sites to produce a data base of outbound bit tables and inbound bit tables.

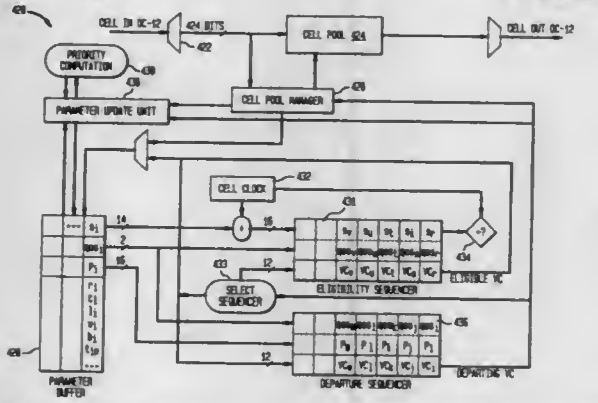
5,533,009
BANDWIDTH MANAGEMENT AND ACCESS CONTROL FOR AN ATM NETWORK

Wai Chen, Randolph, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Filed Feb. 3, 1995, Ser. No. 383,400

Int. Cl.^{6} H04L *12/54*

U.S. Cl. 370—17 **35 Claims**



1. A bandwidth management system, for managing a plurality of virtual data connections within a communications network, comprising:
- an input for receiving data cells, wherein each cell is associated with a particular one of the virtual connections;
- a cell pool, coupled to said input, for storing said cells;
- a first queue containing particular ones of the virtual connections, wherein a relative position of a virtual connection in said first queue is determined by an eligibility value that varies according to an anticipated data rate associated with the particular virtual connection and according to an amount of time that the particular virtual connection has been in said first queue;
- a second queue, coupled to said first queue and containing particular other ones of the virtual connections, wherein a relative position of a virtual connection in said second queue varies according to a predetermined quality of service that is assigned to each of the virtual connections; and
- an output, coupled to said second queue and said cell pool, for transmitting a cell from said cell pool corresponding to a virtual connection at the front of said second queue.

5,533,010
CHANNEL SWITCHING CONTROL METHOD AND A CORDLESS TELEPHONE SYSTEM USING THE SAME

Kiyoshi Tanaka, Chiba, Japan, assignor to Uniden Corporation, Ichikawa, Japan

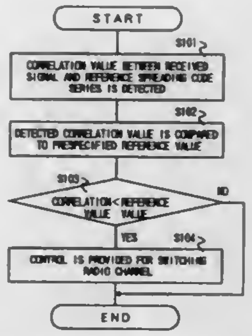
Filed Sep. 19, 1994, Ser. No. 305,926

Claims priority, application Japan, Dec. 14, 1993, 5-342606

Int. Cl.^{6} H04B *1/69;7/216;* H04M *11/00*

U.S. Cl. 370—18 **22 Claims**

1. A channel switching control method between a master phone connected to a telephone line and a slave phone providing spread spectrum communication with said master phone via one of a plurality of radio channels each switchable to said master phone comprising steps of:
- detecting a correlation value between a received signal and a reference spreading code series;
- comparing the detected correlation value to a prespecified reference value; and
- switching said one of the radio channels when it is determined from the result of comparison that said correlation value is lower than said reference value.


START
S101
CORRELATION VALUE BETWEEN RECEIVED SIGNAL AND REFERENCE SPREADING CODE SERIES IS DETECTED
S102
DETECTED CORRELATION VALUE IS COMPARED TO PRESPECIFIED REFERENCE VALUE
S103
CORRELATION < REFERENCE VALUE VALUE
NO
YES
S104
CONTROL IS PROVIDED FOR SWITCHING RADIO CHANNEL
END

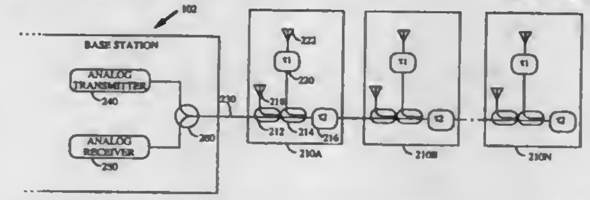
5,533,011
DUAL DISTRIBUTED ANTENNA SYSTEM

Richard F. Dean, Boulder, Colo.; Franklin P. Antonio, Del Mar, Calif.; Klein S. Gihousen, Bozeman, Mont., and Charles E. Wheatley, III, Del Mar, Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 112,392, Aug. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 849,651, Mar. 9, 1992, Pat. No. 5,280,472, which is a continuation of Ser. No. 624,118, Dec. 7, 1990, abandoned. This application Dec. 23, 1994, Ser. No. 370,769

Int. Cl.^{6} H04B *7/04*

U.S. Cl. 370—18 **16 Claims**



1. In a digital communication signal distribution system coupled to a base station, an antenna system comprised of a series of nodes each node comprising:
- a first directional coupler having two pass through ports and a coupling port, a first one of said pass through ports coupled to a first external bi-directional port of said node;
- a first antenna coupled to said coupling port of said directional coupler;
- a second directional coupler having two pass through ports and a coupling port, a first one of said pass through ports coupled to a second one of said pass through ports of said first directional coupler;
- a first delay device having two ports, a first one of said two ports coupled to said coupling port of said second directional coupler;
- a second antenna coupled to a second one of said two ports of said first delay device; and
- a second delay device having two ports, a first one of said two ports coupled to a second one of said two pass through ports of said second directional coupler and a second one of said two ports providing a second external bi-directional port of said node.

5,533,012
CODE-DIVISION MULTIPLE-ACCESS SYSTEM WITH IMPROVED UTILIZATION OF UPSTREAM AND DOWNSTREAM CHANNELS

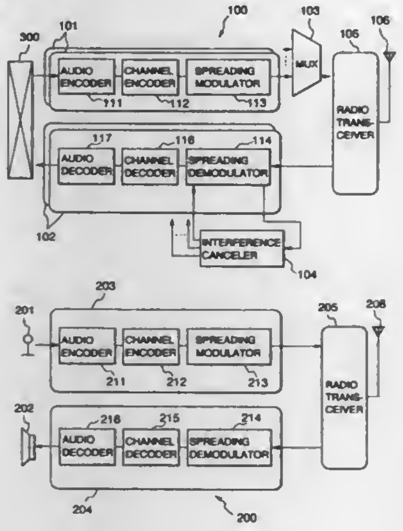
Atsushi Fukasawa; Kenji Horiguchi; Takuro Sato; Hiroki Sugimoto, and Yumi Takizawa, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,451

Claims priority, application Japan, Mar. 10, 1994, 6-040140

Int. Cl.^{6} H04B *1/69*

U.S. Cl. 370—18 **40 Claims**



1. A code-division multiple-access communication system for communication between a base station and a plurality of mobile stations, comprising:
- a base-station apparatus for transmitting to said plurality of mobile stations a downstream signal in which symbols to be transmitted to different mobile stations are spread by different downstream spreading codes, receiving from said plurality of mobile stations an upstream signal in which symbols from different mobile stations are spread by different upstream spreading codes, and despreading said upstream signal by correlation with respective upstream spreading codes to obtain symbols transmitted by respective mobile stations; and
- a mobile-station apparatus at each of said mobile stations, for receiving said downstream signal and despreading said downstream signal with one of said downstream spreading codes, spreading symbols to be transmitted to said base station by one of said upstream spreading codes to create a transmit signal, and transmitting said transmit signal as part of said upstream signal; wherein
- said base-station apparatus transmits said downstream signal on two mutually orthogonal carrier signals, and divides each of said downstream spreading codes into two parts, spreading each symbol by one of said two parts for transmission on one of said two mutually orthogonal carrier signals, and by another one of said two parts for transmission on another one of said two mutually orthogonal carrier signals; and
- upon receiving a symbol from any one of said mobile stations, said base-station apparatus despreads said upstream signal by a corresponding one of said upstream spreading codes, generates an estimated symbol value of said symbol, respreads said estimated symbol value to generate an estimated interference signal, and cancels said estimated interference signal from said upstream signal so that it will not interfere with estimation of symbol values of other mobile stations.

5,533,013
COMMUNICATION METHOD AND SYSTEM

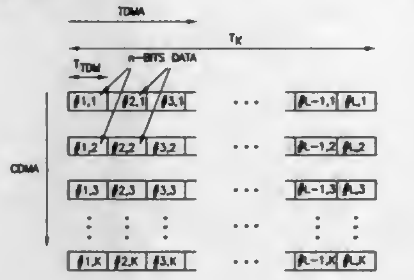
Pentti Leppanen, Oulu, Finland, assignor to Nokia Mobile Phones Limited, Salo, Finland

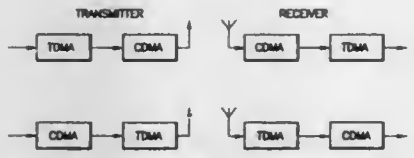
Continuation of Ser. No. 158,707, Nov. 29, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 420,327

Claims priority, application Finland, Dec. 1, 1992, 925472

Int. Cl.^{6} H04B *7/204*

U.S. Cl. 370—18 **10 Claims**





1. A system for radiotelephone communication, said system including at least one base station capable of bidirectional communications with a plurality of radio telephones, said system comprising:
- means for assigning respective groups of radio telephone users to one of a plurality of orthogonal radio telephone communication channels; and
- means for assigning to each user of said groups complete orthogonal spreading codes selected from at least one complementary spreading code set, wherein individual ones of radio telephone users bidirectionally communicate with said at least one base station using said complete orthogonal spreading codes, and wherein individual ones of said radio telephone users transmitting to said at least one base station are enabled to transmit with a power level that is independent of a power level of other ones of the radio telephone users that are transmitting to said at least one base station, and further comprising:
- means for transmitting within a time slot a plurality of transmission data bursts each of which comprises a predetermined number of data bits or data symbols; and
- means for modulating the data bits or data symbols of each transmission data burst with a first complete orthogonal spreading code member (S_k1), and for then modulating the data bits or data symbols with a second complete orthogonal spreading code member (S_k2), and then continuing to modulate the data bits or data symbols with further complete orthogonal spreading code members until (S_kK).

5,533,014
NON-CONTINUOUS TRANSMISSION FOR SEAMLESS HANDOVER IN DS-CDMA SYSTEMS

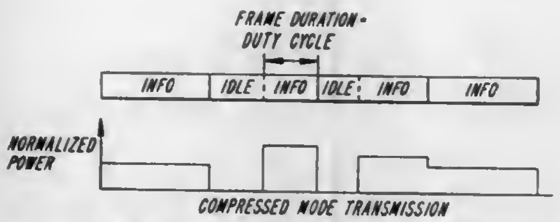
Per H. A. Willars, Stockholm; Olof E. Grimlund, Hasselby, and Lars-Magnus Ewerbring, Stockholm, all of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 75,892, Jun. 14, 1993, abandoned. This application May 1, 1995, Ser. No. 431,458

Int. Cl.^{6} H04J *13/00*

U.S. Cl. 370—18 **37 Claims**

1. A method of code division multiple access in cellular communications, said method comprising steps of:



impressing an informational data stream to be transmitted on a higher rate data signature sequence to produce a coded information signal; and

transmitting said coded information signal on a channel according to a frame structure comprising frames, each frame having a specific time duration,

said transmitting step includes intermittently transmitting said coded information signal in a compressed mode, using a lower spreading ratio, wherein a frame transmitted in said compressed mode includes a first part having a time duration less than said specific time duration and containing a complete coded information signal, and a second part.

5,533,015

TRANSMISSION SYSTEM COMPRISING AT LEAST TWO SUBSCRIBER DEVICES EXCHANGING INFORMATION SIGNALS IN THE SIMPLEX OF HALF-DUPLEX MODE

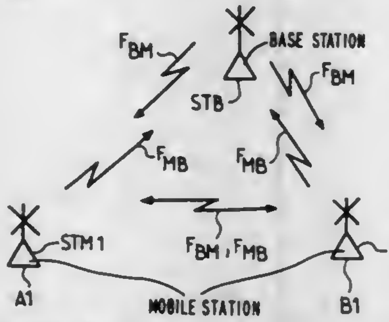
Pierre Makowski, Prunay; Rémi Sfez, Saint Clond, and Yvon Guedes, Lannion, all of, France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 941,339, Sep. 4, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 255,850

Claims priority, application France, Sep. 11, 1991, 91 11211

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—31 **8 Claims**



1. A first subscriber device for communicating over a transmission system comprising a base station and at least a second subscriber device and another subscriber device, wherein said first and second subscriber devices exchange information signals in a simplex mode using time division multiplex signals, said time division multiplex signals including spaced control time intervals, and one of said control time intervals being allocated for a request to transmit by said first subscriber device, characterized in that said first subscriber device comprises

means for detecting said one of said control time intervals,

means for enabling a subscriber using said first subscriber device to obtain transmission priority for transmitting information to said another subscriber device, said means for enabling including means for generating a first request to transmit signal; means, responsive to said means for detecting, for transmitting said first request to transmit signal during said one of said control time intervals; and means, responsive to receipt of a first control signal from said base station, for enabling transmission of said information to said another subscriber device, and

means, responsive to completion of transmission of said information, for transmitting a release signal.

5,533,016

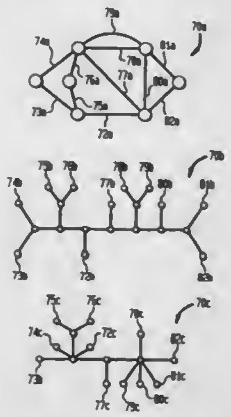
COMMUNICATIONS NETWORK RING ROUTER

William J. Cook, Madison, and Paul D. Seymour, Mountain Lakes, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed May 16, 1994, Ser. No. 242,799

Int. Cl.^{6} H04J *3/02;* H04L *12/42*

U.S. Cl. 370—54 **6 Claims**



1. A method for selecting a communication ring path of lowest cost through a subset of nodes of a communication network, each edge of the network having a particular cost associated therewith, the method comprising the steps of

providing a tree data structure wherein each leaf vertex of the tree represents an edge of the network and each non-leaf vertex of the tree is connected to exactly three edges of the tree, said tree data structure being a branch-decomposition having a pattern of separations of the network, a separation of the network corresponding to each edge of the tree;

in response to each separation of said branch-decomposition having a number of nodes less than or equal to a predetermined constant, determining costs associated with portions of the ring path passing through separations of the branch-decompositions by sequentially examining pairings of nodes of the separations of the branch-decompositions; and

selecting a lowest cost ring path based upon such examinings.

5,533,017

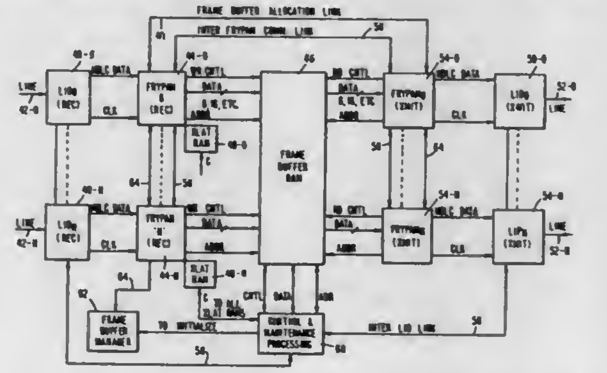
LINE INTERFACE DEVICE FOR FAST-PACKET SWITCHING NETWORK

Ailen Thor, Livingston, N.J., assignor to Advanced Micro Devices, Inc., Parsippany, N.Y.

Filed May 2, 1994, Ser. No. 236,853

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—60 **21 Claims**



1. Apparatus for interfacing a packet switching network to a plurality of transmitting and receiving data terminals, comprising:

a receiving line circuit responsive to said transmitting data terminals for converting transmitted data supplied via receiving lines coupled to said transmitting data terminals into a logic data signal having logic levels compatible with said switching network,

an interface control circuit responsive to a control processor of said network for supplying an address field;

a signal forming circuit responsive to said receiving line circuit and interface control circuit for supplying said switching network with a clock signal and data packet including said data signal and said address field at said logic levels, and

a transmitting line circuit responsive to said data packet from said switching network for removing said address field and converting said data signal into received data supplied via transmitting lines to said receiving data terminals, said interface control circuit including a plurality of control units interconnected by an interface control link coupled to said control processor, each of said control units being provided for a corresponding line of said transmitting and receiving lines to supply said interface control circuit with address information corresponding to said line and to request control and maintenance procedures in response to an instruction from said control processor.

5,533,018

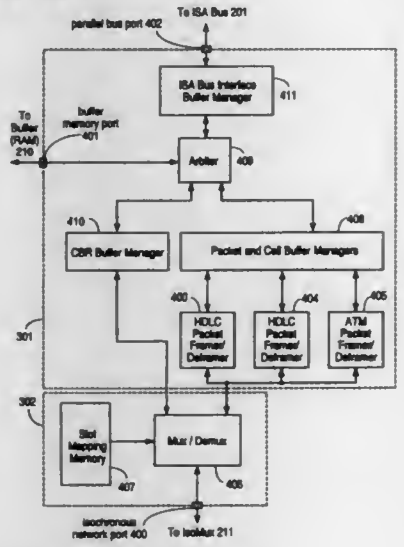
MULTI-PROTOCOL PACKET FRAMING OVER AN ISOCHRONOUS NETWORK

Gregory L. DeJager, and Erik R. Swenson, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 21, 1994, Ser. No. 361,603

Int. Cl.^{6} H04L *12/52*

U.S. Cl. 370—60.1 **44 Claims**



1. An integrated circuit, comprising:

an isochronous network port;

a first protocol packet framer/deframer circuit;

a second protocol packet framer/deframer circuit; and

a circuit switch multiplexer/demultiplexer coupled to said isochronous network port, said first protocol packet framer/deframer circuit, and said second protocol packet framer/deframer circuit, wherein said circuit switch multiplexer/demultiplexer comprises a multiplexer/demultiplexer, and a storage device, said multiplexer/demultiplexer being at least in part controlled based on a value output from said storage device.

5,533,019

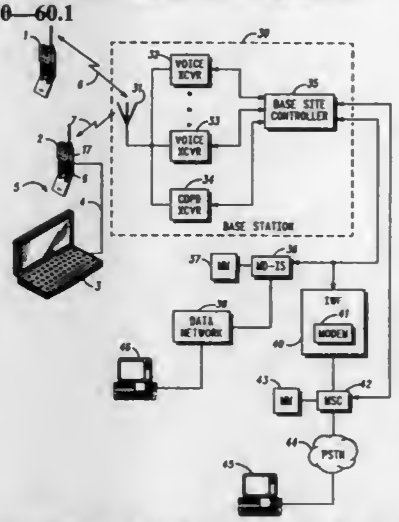
PACKET DATA IN AN ANALOG CELLULAR RADIOTELEPHONE SYSTEM

Jay P. Jayapalan, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1994, Ser. No. 189,522

Int. Cl.^{6} H04Q *11/04;* H04B *7/26*

U.S. Cl. 370—60.1 **22 Claims**



1. An analog cellular radiotelephone system for communicating analog voice messages via radio channels to and from one or more mobile voice units, and additionally communicating user data via one or more of the radio channels, the system comprising:

a mobile data unit operable for communicating user data via said one or more radio channels; and

a base station comprising:

one or more voice transceiver means for transmitting and receiving analog voice communications to and from said one or more mobile voice units;

a data transceiver means for transmitting and receiving a plurality of digital data packets to and from said mobile data unit; and

a base site controller comprising a means for establishing a packet data circuit-switched connection between the mobile data unit and a data end system, a means for establishing a packet-switched data transfer channel between the mobile data unit and the data end system, and means for determining when to establish the packet data circuit-switched connection and when to establish the packet-switched data transfer channel.

5,533,020

ATM CELL SCHEDULER

Jonathan W. Byrn; Gary S. Delp; Philip L. Leichty, all of Rochester, N.Y.; Baiju V. Patel, Mt. Kisco, N.Y.; Kevin G. Plotz, Byron, Minn.; Frank A. Schaffa, Hartsdale, N.Y., and Marc H. Willebeek-LeMair, Millwood, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1994, Ser. No. 332,160

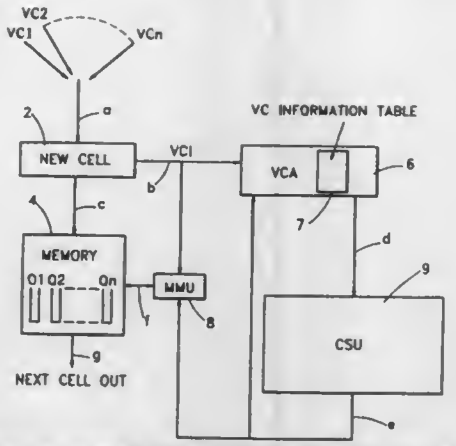
Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—60.1 **7 Claims**

1. A method of scheduling the transmission of a plurality of virtual connections over a common communications link, where only one of said virtual connections can transmit on said link at any given time, where each of said virtual connections must conform to corresponding flow control parameters which control the number of cells that can be transmitted, said method comprising:

a. storing cells from each of said virtual connections in a corresponding queue, where there is one queue corresponding to each of said virtual connections

b. maintaining the status of each of said queues in a memory, said status being at least a time when a cell was last transmitted from said each queue and a credit count indicating a



number of cells that may be transmitted from said each queue in selected time interval;

c. evaluating a target transmission time for said each queue having cells to transmit on said link, each said target transmission time being dependent on said status of said each queue;

d. generating a signal for each corresponding said target transmission time at least after each said target transmission time is reached, where each said signal indicates that a corresponding queue should transmit a cell on said link; and

e. transmitting at least one cell from a corresponding queue upon reception of said signal for said corresponding queue by said corresponding queue.

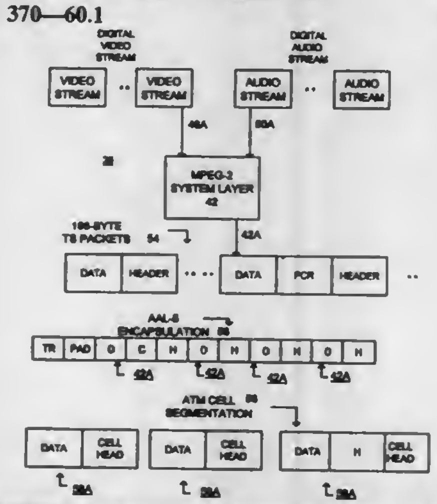
5,533,021
APPARATUS AND METHOD FOR SEGMENTATION AND TIME SYNCHRONIZATION OF THE TRANSMISSION OF MULTIMEDIA DATA

Mark W. Branstad; Jonathan W. Byrn; Gary S. Delp; Philip L. Leichty, all of Rochester, Minn.; Jeffrey J. Lynch, Apex, N.C.; Kevin G. Plotz, Byron, Minn.; Lee A. Sendelbach, Rochester, Minn., and Albert A. Slane, Oronoco, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1995, Ser. No. 382,905

Int. Cl.^{6} H04N *7/62*

U.S. Cl. 370—60.1 **24 Claims**



1. Apparatus for transmitting a stream of multimedia digital data over a distribution communications network comprising:

means for receiving and for segmenting the multimedia digital data stream into data blocks on a first boundary and a second boundary; said first boundary being a set number of transport system data packets and said second boundary being a transport system data packet including a timestamp;

means for scheduling said segmented data blocks for transmission;

means for decoding said segmented data blocks to locate said timestamp; and

means for matching the transmission of said located timestamp data block with a time value indicated by said timestamp.

5,533,022
DIGITAL INTERFACE SYSTEM FOR OFFICES CONNECTED BY PLURAL DIGITAL LINES

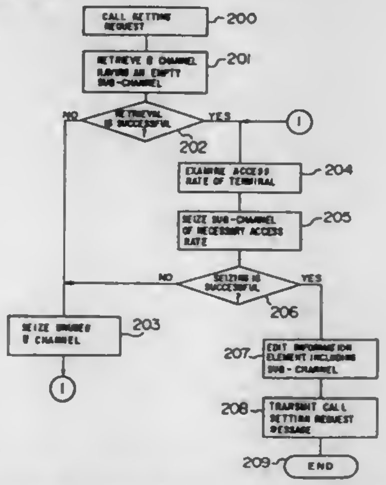
Masashi Hiraiwa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 153,107, Nov. 17, 1993, Pat. No. 5,420,854, which is a continuation of Ser. No. 716,933, Jun. 18, 1991, abandoned. This application Feb. 24, 1995, Ser. No. 393,892

Claims priority, application Japan, Jun. 18, 1990, 2-157522

Int. Cl.^{6} H04J *3/16;* **H04L** *12/52*

U.S. Cl. 370—68.1 **16 Claims**


CALL SETTING REQUEST
200
RETRIEVE B CHANNEL HAVING AN EMPTY SUB-CHANNEL
201
NO
RETRIEVAL IS SUCCESSFUL ?
YES
1
202
EXAMINE ACCESS RATE OF TERMINAL
204
SEIZE SUB-CHANNEL OF NECESSARY ACCESS RATE
205
NO
SEIZING IS SUCCESSFUL ?
YES
206
SEIZE UNUSED B CHANNEL
203
1
207
EDIT INFORMATION ELEMENT INCLUDING SUB-CHANNEL
208
TRANSMIT CALL SETTING REQUEST MESSAGE
209
END

3. In a switching system including in each of two switching offices a time division switch, a multiplexing unit connected to said time division switch for multiplexing low-speed data or audio information received from a low-speed terminal through the time division switch into data at a respective basic bit rate, with a sub-rate intermediate the low-speed rate and the basic bit rate, and a circuit interface unit for a plurality of digital lines, each digital line having a plurality of first channels thereon, each first channel having a corresponding basic bit rate and adapted to multiplex a plurality of sub-rate channels, each sub-rate channel accommodating a sub-rate call at the sub-rate, a sub-rate switching method for use in response to a request for setting a sub-rate call between the two switching offices, said method comprising in sequence the steps of:

(a) determining whether a first channel, having a corresponding basic bit rate, is already set between the two switching offices;

(b) when a first channel is not already set between the two switching offices, setting one of the first channels on one of the digital lines, the set first channel having a corresponding basic bit rate;

(c) when a first channel is set between the two switching offices, determining whether a new multiplex communication can be made on the set first channel at a rate required by a sub-rate call;

(d) when the multiplex communication cannot be made on the set first channel at the required rate, setting another one of the first channels on any one of the digital lines, the newly set first channel having a corresponding basic bit rate, and returning to step (c); and

(e) when the first channel is set between the two switching offices and the multiplex communication can be made at the required rate, making the multiplex communication on the set first channel at the required rate, to set the sub-rate call between the terminals of the two switching offices.

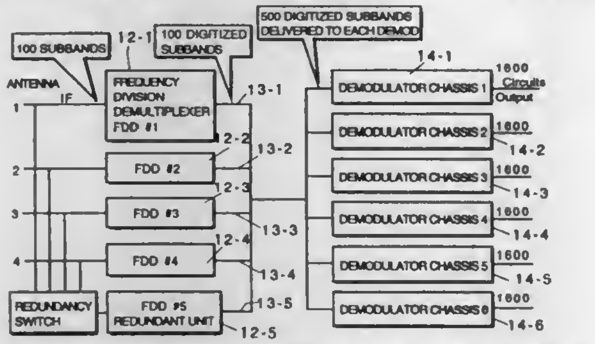
5,533,023
PRACTICAL MEANS FOR DYNAMIC ALLOCATION OF INDIVIDUAL DEMODULATORS TO A MULTIPLICITY OF RECEIVED RF SIGNALS

John Ohlson, Mt. View, and William Slivkoff, Monte Sereno, both of Calif., assignors to Stanford Telecommunications, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1994, Ser. No. 358,157

Int. Cl.^{6} H04J *1/02*

U.S. Cl. 370—69.1 **6 Claims**



1. In a radio communication network having a hub station for receiving a large number of modulated carrier radio signals having similar data modulation formats and on a plurality of different frequency channels, and demodulator means for extracting data from said modulated carrier radio signals, the improvement comprising:

means to divide each frequency channel into a plurality of subband signals and means to translate each subband signal/to baseband signals,

one or more demodulator chassis, each demodulator chassis having a plurality of demodulators, and

means for selectively coupling any selected one of said baseband signals to any selected one of said plurality of demodulators, respectively.

5,533,024
RADIO CHANNEL SELECTION METHOD AND SYSTEM

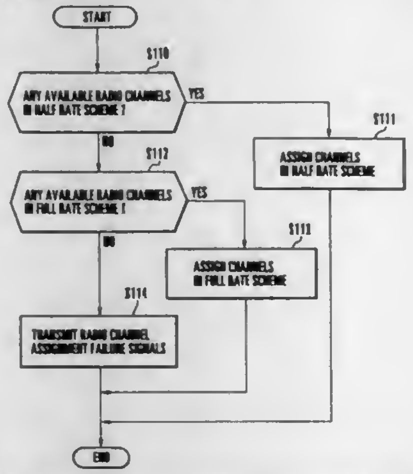
Junichi Owada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,881

Claims priority, application Japan, Mar. 8, 1994, 6-062202

Int. Cl.^{6} H04B *7/212*

U.S. Cl. 370—84 **8 Claims**


START
S110
ANY AVAILABLE RADIO CHANNELS IN HALF RATE SCHEME ?
YES
S111
ASSIGN CHANNELS IN HALF RATE SCHEME
NO
S112
ANY AVAILABLE RADIO CHANNELS IN FULL RATE SCHEME ?
YES
S113
ASSIGN CHANNELS IN FULL RATE SCHEME
NO
S114
TRANSMIT RADIO CHANNEL ASSIGNMENT FAILURE SIGNALS
END

1. A radio channel selection method comprising the steps of:

causing a mobile terminal, in an originating operation, to transmit a call setting signal indicating that communication can be performed by either of first and second communication schemes in different communication forms;

causing a radio base station to receive the call setting signal from said mobile terminal, and checking whether there is any available radio channel in the first communication scheme;

if there is an available radio channel in the first communication scheme, transmitting information on the found available radio channel, as a radio channel designation signal, to said mobile terminal;

if there is no available radio channel in the first communication scheme, searching for an available radio channel in the second communication scheme;

if there is an available radio channel in the second communication scheme, transmitting information on the found available radio channel, as a radio channel designation signal, to said mobile terminal; and

if there is no available radio channel in both the first and second communication schemes, transmitting a clear-forward signal to said mobile terminal.

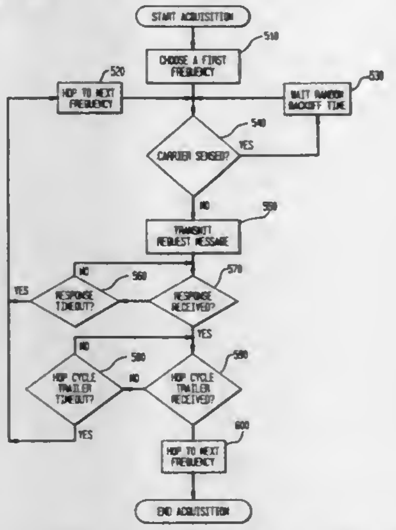
5,533,025
ROBUST FREQUENCY MANAGEMENT AND ACQUISITION IN A WIRELESS LOCAL AREA NETWORK THAT USES FREQUENCY-HOPPING RADIOS

Arthur E. Fleek, Cary, N.C., and Richard O. LaMaire, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1994, Ser. No. 313,516

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 370—85.2 **3 Claims**



1. In a wireless network using frequency-hopping radio communications and having a plurality of remote stations and a leader station which coordinates communications between said remote stations and said leader station, a method of determining a frequency at which each of said remote stations is to initiate communications on a wireless communication link with said leader station and with each other, wherein frequency hopping synchronization is initially established, said method for each one of said remote stations comprising:

a. sensing for a carrier signal at a first frequency by said one remote station;

b. if a carrier signal of said first frequency is sensed, by said one remote station requesting access to said network, transmitting a request message on said first frequency on said wireless communications link, to said leader station after a delay which is determined using a carrier sense protocol, said request message indicating a request to establish communication with said leader station by said one remote station on said wireless communications link;

- c. if a carrier signal of said first frequency is not sensed, transmitting said request message on said first frequency on said wireless communications link to said leader station;
- d. upon said one remote station's receiving a response from said leader station to said request message, listening on said first frequency for a hop cycle trailer signal on said wireless communications link, said response, if received, indicating that said leader station is currently transmitting and receiving on said first frequency;
- e. upon receiving said hop cycle trailer signal by said one remote station, hopping to a second frequency indicated in said hop cycle trailer signal at a time indicated in said hop cycle trailer signal, said second frequency being a frequency on which said one remote station communicates with said leader station and with other of said remote stations; and
- f. if said response is not received by said one remote station, hopping to a third frequency and repeating steps (a) through (e), replacing said first frequency with said third frequency.

5,533,026

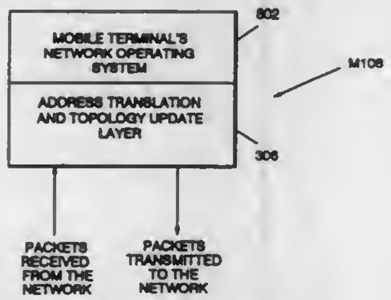
COMMUNICATION SYSTEM INCLUDING METHOD AND APPARATUS FOR MAINTAINING COMMUNICATIONS WITH A MOBILE TERMINAL

Hamid Ahmadi, Somers, N.Y.; Frederic J. Bauchot, Saint-Jeannet; Roselyne Bonnet, Saint Paul, both of, France; Ilan Kessler, Haifa, Israel; Arvind Krishna, Briarcliff Manor, N.Y.; Fabien P. Lanne, Valbonne, France; Mahmoud Naghshineh, Fishkill, N.Y.; Catherine Solar, Saint Laurent du Var, and Michelle M. Wetterwald, Cagnes Sur Mer, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1995, Ser. No. 398,717

Int. Cl.⁶ H04B *7/24;* **H04L** *12/56*

U.S. Cl. 370—94.1 **14 Claims**


802
MOBILE TERMINAL'S NETWORK OPERATING SYSTEM
M108
ADDRESS TRANSLATION AND TOPOLOGY UPDATE LAYER
306
PACKETS RECEIVED FROM THE NETWORK
PACKETS TRANSMITTED TO THE NETWORK

1. A communication network comprising:

a plurality of stations connected together in a first network for transmitting information between users of the network; and

a plurality of terminals each communication with at least one of said stations through at least one of a plurality of second networks, each of said terminals having a unique network address, wherein said terminals are mobile terminal capable of being moved from said at least one of said plurality of second networks to another one of said plurality of second networks, wherein said terminals store a second network address of said at least one of said plurality of second networks, and wherein each of said terminals includes an address translation means for translating said second network address of said at least one of the plurality of second networks to a second network address of said another one of said plurality of second networks when said terminal is moved from said at least one of said plurality of second networks to said another one of said plurality of second networks.

5,533,027

DIGITAL FIXED RADIO ACCESS SYSTEM PROVIDING LOCAL MOBILITY

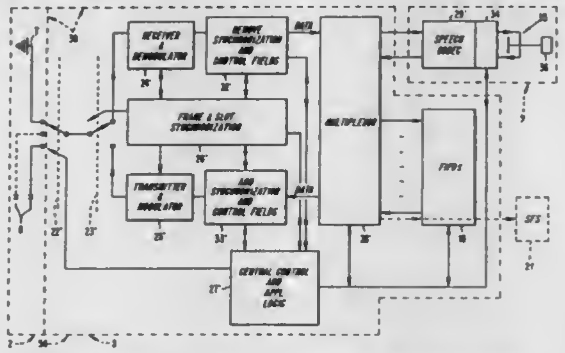
Dag E. Åkerberg, Kungsängen, Sweden, and Petrus van de Berg, Enschede, Netherlands, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 154,549, Nov. 19, 1993, abandoned. This application Aug. 28, 1995, Ser. No. 520,509

Claims priority, application Sweden, Feb. 16, 1993, 9300495

Int. Cl.⁶ H04B *7/204;7/24;* **H04Q** *7/20*

U.S. Cl. 370—195.1 **30 Claims**



1. An arrangement for radio communication comprising:

at least one first radio station;

a plurality of subscriber stations; and

a plurality of second radio stations, each second radio station comprising:

at least one digital radio arrangement, said digital radio arrangement including radio switch means having a common transceiver for providing wireless communication with a first radio station and at least one subscriber station,

first means for communicating with said first radio station, said first means comprising at least one long-range antenna, and

second means for communicating with a subscriber radio station, said second means comprising at least one short-range antenna for local coverage.

5,533,028

COMMUNICATIONS SUBSYSTEM BETWEEN BASE STATIONS AND BASE STATION CONTROLLERS IN BURST COMMUNICATIONS SYSTEMS

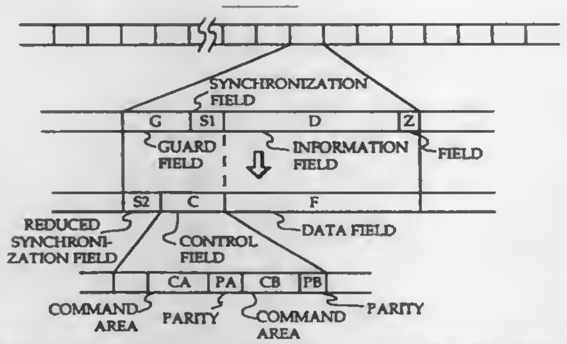
Carlos Hita de la Torre; Francisco J. Escrihuela Langa; Francisco J. Martinez Garcia, and Carlos H. Blanco, all of Madrid, Spain, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Jun. 24, 1994, Ser. No. 264,962

Claims priority, application Spain, Jun. 25, 1993, 9301440

Int. Cl.⁶ H04B *7/212*

U.S. Cl. 370—95.3 **5 Claims**



1. In a burst communications system, a communications subsystem comprising a base station (2) and a base station controller (1) interconnected by a pair of unidirectional transmission lines, one for each direction of communication, wherein the base station (2) communicates by a radio link with a mobile terminal (3) using a time division multiple access protocol at a bit transmission rate, wherein a frame of said protocol includes a series of bursts each of which comprises a guard field (G), a synchronisation field (S1) and a radio link information field (D), and characterised in that the base station (2) and the base station controller (1) each have means by which to communicate, at a bit rate equal to the bit transmission rate for the radio link, in frames each of which is transmitted as a series of bursts that correspond one-for-one to the bursts of the radio link, and wherein each burst comprises an information field (F) that conveys information that is the same as is conveyed by the radio link information field (D), a reduced synchronisation field (S2) and a control field (C) to convey control and signalling information between the base station (2) and its base station controller (1).

5,533,029

CELLULAR DIGITAL PACKET DATA MOBILE DATA BASE STATION

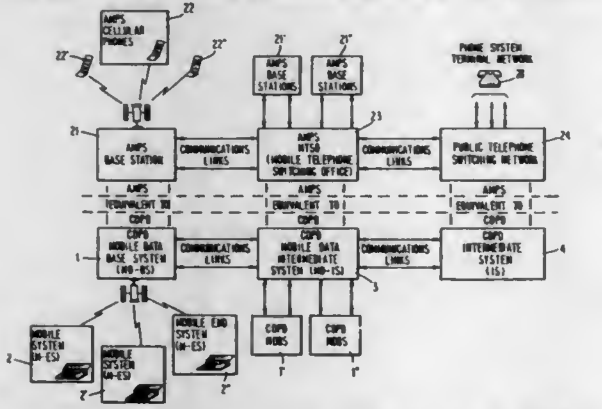
Steven H. Gardner, San Diego, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.

Division of Ser. No. 152,005, Nov. 12, 1993. This application Jun. 5, 1995, Ser. No. 461,618

Int. Cl.⁶ H04B *7/212;7/24;* **H04J** *3/17*

U.S. Cl. 370—94.1 **20 Claims**

1. A method for operating a cellular digital packet data (CDPD)



system having at least one mobile data base station (MDBS) associated with an advance mobile phone system (AMPS) base station and connected via radio frequency link to at least one mobile end station, the method comprising steps of:

- a. detecting full AMPS communications on all radio frequency channels at said MDBS;
- b. deriving a queue of channels based upon AMPS use of said channels;
- c. sending said queue of channels to any mobile end systems within range of said MDBS; and
- d. selecting channels from said queue at said mobile end station for CDPD use.

5,533,030

RADIOTELEPHONE SYSTEM WITH THE CHARACTER OF A LOCAL OR AUXILIARY COMMUNICATIONS APPARATUS

Reinhard Schiffel; Klaus Jäckel; Bruno Stadler, and Holger Vogel, all of Berlin, Germany, assignors to Jenoptik Communications GmbH, Jena, Germany

PCT No. PCT/DE93/00766, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO94/17336, PCT Pub. Date Mar. 31, 1994

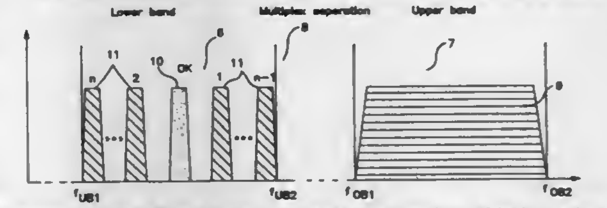
PCT Filed Aug. 17, 1993, Ser. No. 244,007

Claims priority, application Germany, Aug. 21, 1992, 42 27 990.9

Int. Cl.⁶ H04J *1/08*

U.S. Cl. 370—120 **8 Claims**

1. A method of communicating information in a radio transmission system including a base station and a number of independent subscriber stations, comprising:



converting first information signals to be communicated from the base station to the subscriber stations to narrow-band signals using single-side band suppressed carrier modulation;

setting frequency band limits for each of said narrow-band signals to allow said narrow band signals to form a combined, frequency-multiplex signal;

modulating said frequency multiplex signal on a carrier using phase or frequency modulation to produce a wide band radio signal containing the first information signals to be communicated from the base station to said subscriber stations;

accessing, at each subscriber station, no more than one of said first information signals; and

communicating second information signals from each subscriber station to said base station by transmitting the second information signals within corresponding narrow-band channels.

5,533,031

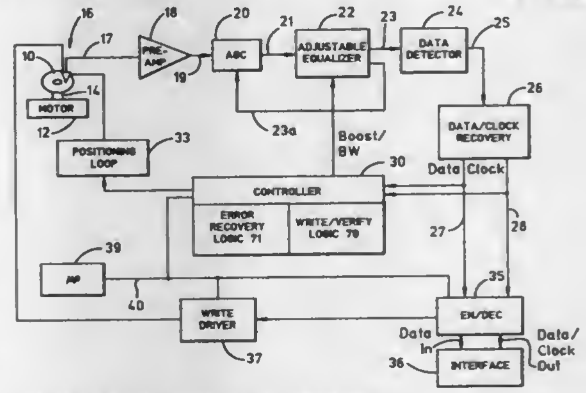
ADJUSTABLE READ CHANNEL EQUALIZATION FOR ERROR PROCESSING IN A RECORDABLE MEDIA DRIVE

Paul J. Dounn; Terry L. Kise, both of Tucson, Ariz.; Richard C. Schneider, Boulder, Colo., and Morovat Tayefeh, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1994, Ser. No. 265,538

Int. Cl.⁶ G11C *29/00*

U.S. Cl. 371—21.1 **12 Claims**



1. A recordable media drive, comprising:

a media drive signal source with a readback signal output;

- a read channel with an input and a read channel signal output for providing a read channel signal, the read channel input connected to the readback signal output;
- a signal error detector coupled to the read channel signal output;
- a controller coupled to the signal error detector, the controller including an equalizer setting output, the controller providing equalizer configuration signals on the equalizer setting output in response to a data detected in the read channel signal;
- an adjustable equalizer in the read channel with an input connected to the equalizer setting output, the adjustable equalizer having signal equalization characteristics set by the equalization configuration signals that compensate for the data error; and
- write/verify logic in the controller, the write/verify logic including means for generating a gain set signal and a bandwidth set signal at the equalizer setting output;
- whereby, a gain of the adjustable equalizer is reduced in response to the gain set output and a bandwidth of the adjustable equalizer is increased in response to the bandwidth set output.

5,533,032

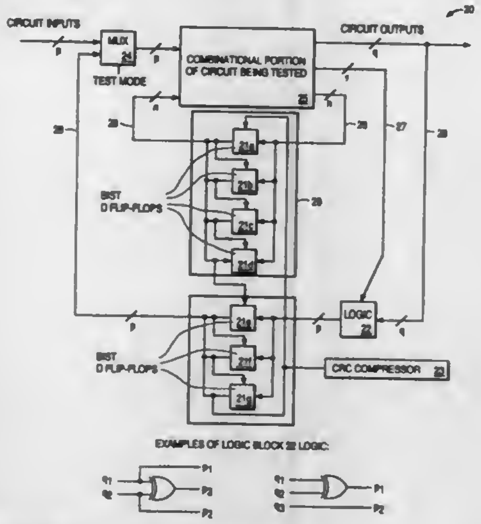
BUILT-IN SELF-TEST GLOBAL CLOCK DRIVE ARCHITECTURE

Peter A. Johnson, San Jose, Calif., assignor to Sequoia Semiconductor, Inc., Scotts Valley, Calif.

Filed Oct. 28, 1991, Ser. No. 783,514

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 371—22.5 **9 Claims**



1. An integrated circuit comprising:

- a logic circuit with memory circuits, wherein a portion of memory circuits have clock inputs supplied by signals generated from random gate logic,
- a built-in self-test (BIST) mechanism coupled to the memory circuits, said BIST mechanism for testing said logic circuit during self-test and allowing said logic circuit to perform its designated logic function during user mode, said BIST mechanism generating mode signals for controlling the mode of operation for said logic circuit;.and
- a clock driver coupled to said memory circuits and providing said memory circuits with clock signals, said clock driver comprising
  - a first logic circuit to provide said memory circuits with a global clock signal during said user mode and a test clock signal during said self-test;
  - a second logic circuit coupled to said first logic circuit, said second logic circuit providing an inverted clock signal to some of said memory circuits derived from said global clock signal during said user mode and providing the test clock signal to said some of said memory circuit during said self-test; and
  - a third logic circuit coupled to said first logic circuit, said third logic circuit providing clock inputs of said random gate logic with a buffered clocking signal derived from said global clock signal.

5,533,033

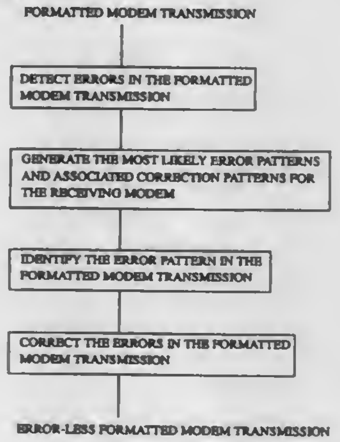
DEVICE FOR AND METHOD OF CORRECTING ERRORS IN FORMATTED MODEM TRANSMISSIONS

Alan S. Ratner, Clarksville, Md., assignor to The United States of America as represented by the Director, National Security Agency, Washingon, D.C.

Filed Dec. 19, 1994, Ser. No. 359,313

Int. Cl.^{6} H04L *1/00*

U.S. Cl. 371—30 **6 Claims**


FORMATTED MODEM TRANSMISSION
DETECT ERRORS IN THE FORMATTED MODEM TRANSMISSION
GENERATE THE MOST LIKELY ERROR PATTERNS AND ASSOCIATED CORRECTION PATTERNS FOR THE RECEIVING MODEM
IDENTIFY THE ERROR PATTERN IN THE FORMATTED MODEM TRANSMISSION
CORRECT THE ERRORS IN THE FORMATTED MODEM TRANSMISSION
ERROR-LESS FORMATTED MODEM TRANSMISSION

1. A method of correcting an error in a formatted modem transmission, comprising the steps of:

- a) receiving a formatted modem transmission into a receiving modem;
- b) identifying the formatting scheme of the transmission;
- c) testing the transmission to determine if a formatting error is contained therein;
- d) generating error patterns and associated correction patterns for the receiving modem based upon the format of the transmission and the type of descrambler used in the receiving modem;
- e) searching the transmission to determine if any of the generated error patterns is found therein; and
- f) replacing any error pattern found in the transmission with its associated correction pattern.

5,533,034

HIGH SPEED DATA TRANSFER DEVICE HAVING IMPROVED EFFICIENCY

Yuri Kuwata, Hyogo; Ichiro Okabayashi, and Tetsuji Kishi, both of Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1993, Ser. No. 79,591

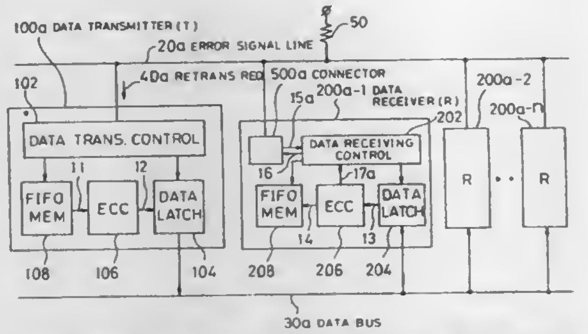
Claims priority, application Japan, Jun. 26, 1992, 4-168846

Int. Cl.^{6} H04L *1/16*

U.S. Cl. 371—32 **12 Claims**

1. A data transfer device comprising:

- one data transmitter for transmitting a broadcast data and for re-transmitting said broadcast data in response to an error judgement signal:
- a plurality of data receivers, each of said data receivers individually receiving said broadcast data from said data transmitter, and individually detecting whether an error is present in the received data, and if an error is present, the data receiver detecting the presence of the error provides an error judgement signal and discards the received broadcast data having an error; and
- a single error line connected in common to said data transmitter and each of said data receivers for providing said error judgement signal concurrently to said data transmitter and each of said data receivers, which do not detect the presence of an error in the received broadcast data,
- wherein each of said data receivers, which do not detect the presence of an error in the received broadcast data, discards the received broadcast data in response to said error judgement signal provided by any of said data receivers via said error line, and
- wherein said data transmitter re-transmits the broadcast data in response to said error judgement signal provided by any of said data receivers via said error line so that the broadcast data is re-received by all of said data receivers.



5,533,035

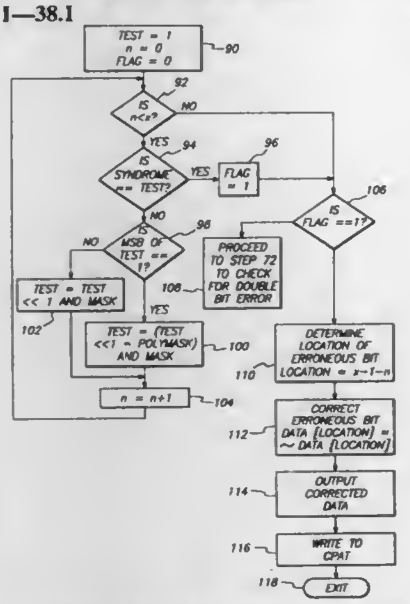
ERROR DETECTION AND CORRECTION METHOD AND APPARATUS

Nirmal Saxena, and Chih-Wei D. Chang, both of San Jose, Calif., assignors to HaL Computer Systems, Inc., Campbell, Calif.

Continuation-in-part of Ser. No. 78,012, Jun. 16, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 465,367

Int. Cl.^{6} H03M *13/00*

U.S. Cl. 371—38.1 **8 Claims**


TEST = 1
n = 0
FLAG = 0
90
92
IS n<x?
NO
YES
94
IS SYNDROME == TEST?
YES
96
FLAG = 1
106
IS FLAG ==1?
NO
98
IS MSB OF TEST == 1?
NO
PROCEED TO STEP 72 TO CHECK FOR DOUBLE BIT ERROR
108
TEST = TEST << 1 AND MASK
102
YES
TEST = (TEST <<1 ^ POLYMASK) AND MASK
100
DETERMINE LOCATION OF ERRONEOUS BIT LOCATION = x-1-n
110
n = n+1
104
CORRECT ERRONEOUS BIT DATA [LOCATION] = ~ DATA [LOCATION]
112
OUTPUT CORRECTED DATA
114
WRITE TO CPAT
116
EXIT
118

1. For a set of data having a first portion representing data and a second portion representing an error code, a computer-implemented method for correcting an error in said set of data, comprising the steps of:

- (a) generating a syndrome code based on the first and second portions of the set of data;
- (b) setting a multiple-bit test code to a value of 1;
- (c) determining whether said syndrome code is equivalent to said test code;
- (d) in response to a determination that said syndrome code is equivalent to said test code:
  - i. determining a location in the set of data at which an erroneous bit is located;
  - ii. complementing said erroneous bit at said location to correct the error in the set of data; and
  - iii. outputting a corrected set of data representing the set of data with said erroneous bit corrected;
- (e) in response to a determination that said syndrome code is not equivalent to said test code, determining whether the most significant bit of said test code is a 1;
- (f) in response to a determination that the most significant bit of said test code is a 1:
  - i. shifting each bit in said test code one position to the left to derive a shifted test code;
  - ii. XORing said shifted test code with a polynomial masking value to derive an updated test code; and
  - iii. setting said test code to be equivalent to said updated test code;
- (g) in response to a determination that the most significant bit of said test code is not a 1:
  - i. shifting each bit in said test code one position to the left to derive a shifted test code; and
  - ii. setting said test code to be equivalent to said shifted test code;
- (h) repeating steps (c) through (g) a selected number of times or until said syndrome code is determined to be equivalent to said test code.

5,533,036

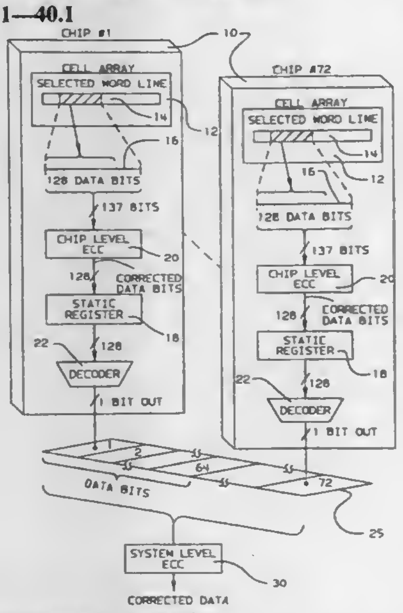
FAULT TOLERANT COMPUTER MEMORY SYSTEMS AND COMPONENTS EMPLOYING DUAL LEVEL ERROR CORRECTION AND DETECTION WITH DISABLEMENT FEATURE

Robert M. Blake, Wappingers Falls; Douglas C. Bossen, Poughkeepsie; Chin-Long Chen, Wappingers Falls, all of N.Y.; John A. Fifield, Underhill, and Howard L. Kalter, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 12,186, Feb. 2, 1993, which is a continuation of Ser. No. 790,797, Nov. 12, 1991, Pat. No. 5,228,046, which is a continuation of Ser. No. 321,827, Mar. 10, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,628

Int. Cl.^{6} G06F *11/10*

U.S. Cl. 371—40.1 **2 Claims**



1. A digital memory comprising:

- a multi-level storage system having at least one lower level which supplies accessed data from a memory location at said lower level to at least one upper level, said storage system having error correction and detection means for at least two distinct ones of said levels, wherein a lower one of said levels is capable of exhibiting both hard and soft errors;

means for disabling a lower level one of said error correction and detection means upon the occurrence of multiple errors as determined at an upper level; and

means at an upper level for correcting hard errors occurring at a lower level by activating said disabling means and by reaccessing, from the same location, data stored at said lower level, whereby the presence and location of otherwise masked hard errors is ascertainable.

5,533,037

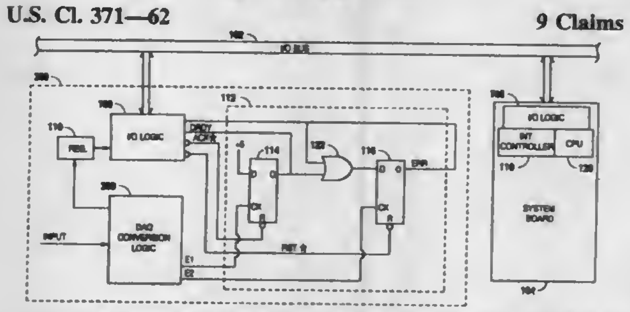
LATENCY ERROR DETECTION CIRCUIT FOR A MEASUREMENT SYSTEM

Jaffar Shah; Kosta Ilic, both of Travis County; Joseph E. Peck, and Zu-Yi Wang, all of Travis County, Tex., assignors to National Instruments Corporation, Austin, Tex.

Filed May 24, 1994, Ser. No. 248,417

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—62 **9 Claims**



1. A measurement system which detects latency errors in received data, comprising:

data acquisition conversion logic which receives input data signals indicating events of physical phenomena, wherein said input data signals occur asynchronously to said data acquisition conversion logic, wherein the data acquisition conversion logic generates one or more event signals in response to receiving an input data signal;

a memory coupled to said data acquisition conversion logic for storing said received input data signals;

processing logic coupled to said memory which performs operations in response to a stored input data signal, wherein said processing logic generates an acknowledge cycle after completing said operations performed in response to said stored input data signal;

acknowledge logic coupled to said processing logic, wherein said acknowledge logic receives said acknowledge cycle from said processing logic, wherein said acknowledge logic asserts an acknowledge signal in response to said processing logic completing said operations performed in response to said stored input data signal;

a first latch coupled to said data acquisition conversion logic and receiving said at least one of said one or more event signals generated by said data acquisition conversion logic, wherein said first latch asserts a data ready signal in response to receiving said at least one of said one or more event signals generated by said data acquisition conversion logic, wherein said asserted data ready signal indicates that an input data signal has been received, wherein said first latch includes a reset input receiving said acknowledge signal from said acknowledge logic for clearing said data ready signal when said acknowledge signal is asserted; and

a second latch coupled to said first latch and receiving said data ready signal and receiving at least one of said one or more event signals generated by said data acquisition conversion logic, wherein said second latch generates an error signal if said data ready signal is asserted while said at least one of said one or more event signals is asserted.

5,533,038

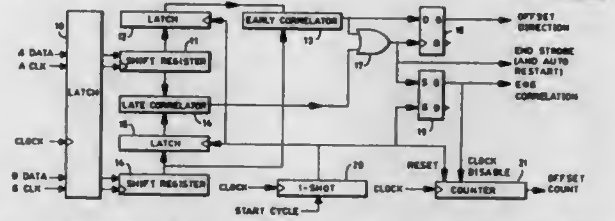
METHOD AND APPARATUS FOR THE RAPID DETECTION AND MEASUREMENT OF DIFFERENTIAL PHASE OFFSET BETWEEN TWO IDENTICAL BINARY CODE SEQUENCES

Ralph W. Andrea, Sunnyvale, Calif., assignor to GTE Government Systems Corporation, Mountain View, Calif.

Filed Dec. 14, 1994, Ser. No. 355,764

Int. Cl.^{6} G06F *7/02*

U.S. Cl. 371—68.2 **8 Claims**



1. An apparatus for rapidly detecting and measuring the phase offset between A and B identical binary code input data sequences, each data sequence having its respective dock, comprising in combination:

input latch means including a master dock for resynchronizing said A and B input data sequences and their respective clocks by said master clock;

A and B code sequence shift register means for serial-to-parallel converting said A and B input code sequences, respectively, from said input latch means;

A and B code sequence latch means for storing states of said A and B code sequence shift register means at the start of a new detection or measurement cycle;

early correlator means for detecting coincidence of said A code sequence latch with said B code sequence shift register;

late correlator means for detecting coincidence of said B code sequence latch with said A code sequence shift register;

combining means for providing an end conversion strobe in response to an output from either said early correlator means or said late correlator means;

offset direction latch means for storing the output of said early correlator means in response to the end conversion strobe;

end correlation latch means for storing a clear state in response to the start of a new detection and measurement cycle, and storing a set state in response to the end conversion strobe;

counter means for providing a count of the number of counter clock pulses occurring while the said end correlation latch is storing a clear state; said counter means being reset to zero count in response to the start of a new detection and measurement cycle; and

start cycle 1-shot means coupled to said A and B code sequence latch means, said end correlation latch means, and said counter means for providing a master clock aligned pulse identifying the start of a new detection and measurement cycle in response to the occurrence of a start cycle command.

5,533,039

FAULT TOLERANT FIBER OPTIC PROTOCOL FOR DETERMINING BEGINNING OF DATA

Keith G. Boyer, Northglenn, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 22, 1993, Ser. No. 125,337

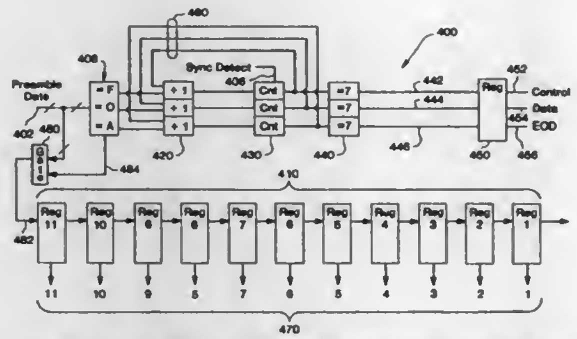
Int. Cl.^{6} G06F *7/02;* **H04L** *1/00*

U.S. Cl. 371—67.1 **16 Claims**

13. A fault tolerant system for determining the beginning of data in a frame of transmitted data in the presence of burst errors, said fault tolerant system comprising:

an information portion in said frame, located before said transmitted data, said information portion having:

(a) a preamble burst field having a plurality of different preamble characters, P, formed in a prearranged order,



(b) a sync burst field having a plurality of identical sync characters, S, said sync burst field located before said preamble burst field,

means for detecting a predetermined number, n, of sequential sync characters in said sync burst field in the presence of said burst errors,

means for issuing a sync signal upon the detection of said predetermined number, n, of sequential sync characters by the aforesaid detecting means,

means for detecting for the majority, m, of preamble characters in said preamble burst field in the presence of said burst errors and in response to the issuing of said sync signal by said issuing means,

means for determining said beginning of data based on said detected majority, m, of preamble characters by the aforesaid means in comparison to said prearranged order of said preamble characters in said preamble burst field.

5,533,040

LASER PROCESSING METHOD

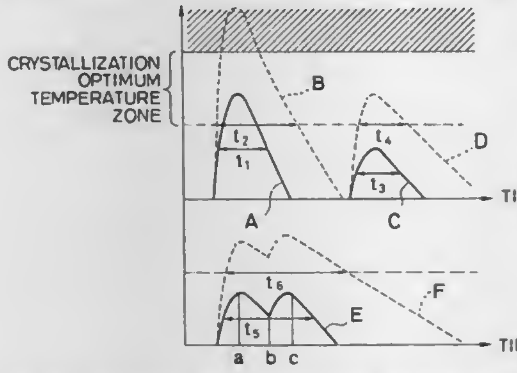
Hongyong Zhang, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Oct. 20, 1993, Ser. No. 138,066

Claims priority, application Japan, Oct. 21, 1992, 4-307797

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—25 **17 Claims**



1. A laser processing method comprising the steps of:

generating a laser pulse from a laser, said laser pulse having a pulse width duration w; and

amplifying said laser pulse by the step of activating a laser amplifier at a time t after said generating step, wherein said time t is between about 0.5 times said pulse width duration w and 5.0 times said pulse width duration w; and

processing an object with said laser pulse emitted from said laser amplifier.

170–384 O.G.–96–24: QL3

5,533,041

OPTICAL TRANSMISSION AND RECEPTION DEVICE

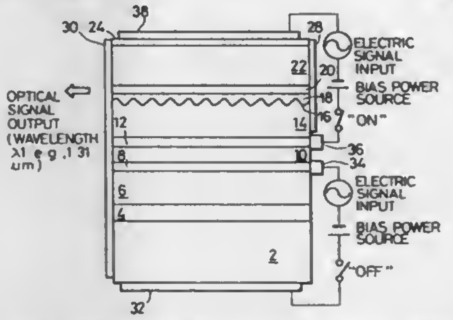
Manabu Matsuda, and Hajime Shoji, both of Kawasaki, Japan, assignors to Fnjitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 105,697, Aug. 13, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 395,530

Claims priority, application Japan, Aug. 18, 1992, 4-219346

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—50 **18 Claims**



1. An optical transmission and reception device comprising:

an optical transmission region including an active layer which oscillates and outputs a laser beam having a wavelength λ1 during a transmission state and guides received light having a wavelength λ2 different from the wavelength λ1 during a reception state, and electrodes which inject current into the active layer for oscillating the laser beam; and

an optical reception region including a light detecting device for detecting the received light of the wavelength λ2 guided by the active layer and converting the received light into electric signals, and electrodes which apply a bias voltage to the light detecting device for detecting the received light, the optical transmission region and the optical reception region being laminated.

5,533,042

SEMICONDUCTOR LASER DEVICE AND DRIVING METHOD FOR THE SAME AS WELL AS TRACKING SERVO SYSTEM EMPLOYING THE SAME

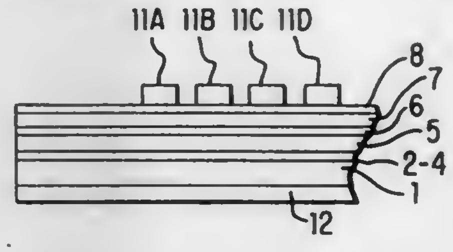
Hideki Fukunaga; Kaoru Yasukawa; Hideo Nakayama; Nobuaki Ueki; Hiromi Otoma, and Mario Fuse, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Oct. 3, 1994, Ser. No. 317,594

Claims priority, application Japan, Oct. 12, 1993, 5-254433

Int. Cl.^{6} H01S *3/18;* **G11B** *7/00*

U.S. Cl. 372—50 **16 Claims**



1. A semiconductor laser device, comprising:

an active layer for oscillating a laser beam when an electric current is supplied thereto;

a plurality of independent electrodes connected to the active layer, with each electrode receiving a corresponding continuously varying electric current; and

means for supplying each said continuously varying electric current from said electrodes to said active layer to vary a density distribution of electric currents in the active layer and to vary an intensity distribution of the laser beam, thereby varying the location of the beam on an emergent face of said semiconductor laser device.

5,533,043

INSTALLATION FOR PRODUCING LIQUID METAL BY MELTING SCRAP IRON

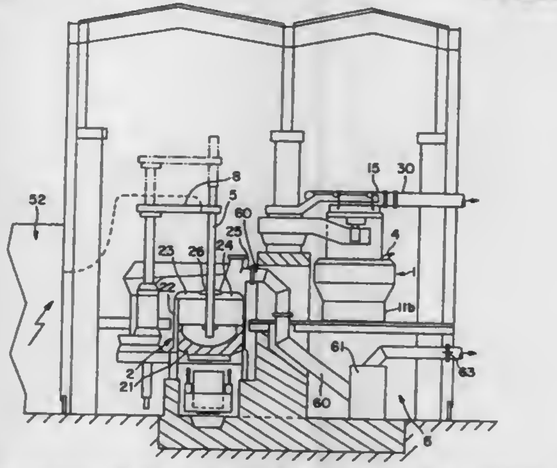
Guy Forestier, Saint-Just-Saint-Rambert, France, assignor to CLECIM, Cergy Pontoise, France

Filed May 13, 1994, Ser. No. 242,108

Claims priority, application France, May 13, 1993, 93 05786

Int. Cl.^{6} F27D *13/00*

U.S. Cl. 373—9 **14 Claims**



1. An installation for the production of liquid metal by melting a charge of ferrous material, said installation comprising:
- (a) at least one electric melting furnace consisting of a chamber having a bottom and a lateral wall and closed by a removable roof;
- (b) means for introducing a charge of ferrous material into said chamber;
- (c) electrical means for melting said charge to produce melting gases with a throughput of a first magnitude, said electrical means comprising at least one consumable electrode removably connected to an electrical power source and means for introducing said at least one consumable electrode into said chamber by passing through at least one central opening provided in said roof;
- (d) at least one cover for removably closing said at least one central opening;
- (e) independent heat input means associated with said furnace for preheating said charge of ferrous material contained in said chamber before introduction of said electrode, said preheating producing preheating gases with a reduced throughput of a second magnitude less than said first magnitude;
- (f) at least one evacuation opening provided in said roof and associated with means for removably connecting said evacuation opening with evacuation means for evacuating gases produced in said chamber by preheating and melting, respectively;
- (g) a main treatment circuit comprising a main blower and purification means adapted to said throughput of melting gases;
- (h) an auxiliary treatment circuit comprising an auxiliary blower and fume treatment means adapted to said reduced throughput of preheating gases;
- (i) said evacuation opening being connected with said auxiliary treatment circuit by said removably connecting means in a first, preheating position of said furnace for which said charge is preheated by said independent heat input means, said consumable electrode being withdrawn and said central opening being closed by said cover; and
- (j) said evacuation opening being connected with said main treatment circuit in a second, melting position of said furnace for which said charge is melted by introduction of said consumable electrode connected to the power source after opening said removable cover, said independent heat input means being shut off.

5,533,044

METHOD OF ELECTRODE REGULATION OF A DC ARC FURNACE AND ELECTRODE REGULATION DEVICE

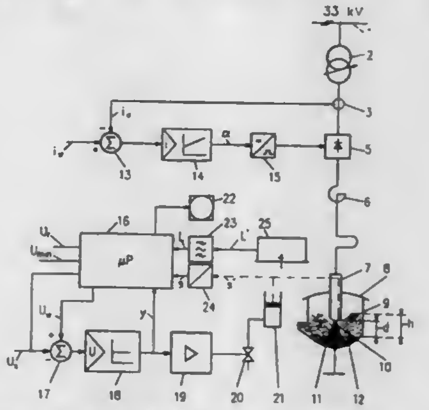
Eduard Strebel, Nussbauman, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Dec. 29, 1994, Ser. No. 365,958

Claims priority, application Germany, Dec. 29, 1993, 43 44 854.2

Int. Cl.^{6} H05B *7/148*

U.S. Cl. 373—104 **13 Claims**



1. A method of electrode regulation of a DC arc furnace, comprising the steps of:
- a. controlling arc current strength of the arc furnace to a predeterminable current set value in response to a variable control signal;
- b. controlling an electrode distance between at least one controllable electrode and a molten bath of the arc furnace as a function of a difference between a predeterminable electrode regulator set value signal and an electrode regulator actual signal; and
- c. forming the electrode regulator set value signal as a function of a slag height in the arc furnace.

5,533,045

AUTOMATIC VEHICLE IDENTIFICATION SYSTEM, INTERROGATOR AND RESPONDER INCLUDED IN THE SAME

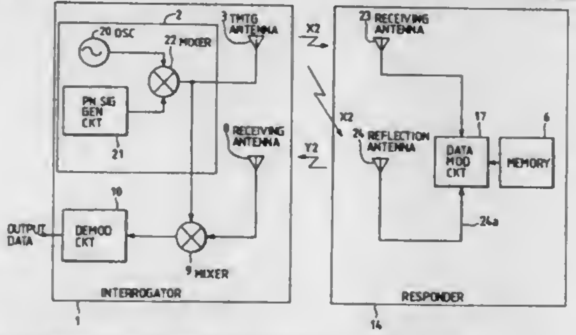
Makoto Hasegawa, Tokyo; Naoki Adachi, Kawasaki; Masahiro Mimura, Tokyo; Hirohide Hirabayashi, and Hideko Sakai, both of Yokohama, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 4, 1994, Ser. No. 191,690

Claims priority, application Japan, Feb. 5, 1993, 5-018377; Apr. 14, 1993, 5-087030

Int. Cl.^{6} H04B *1/69*

U.S. Cl. 375—200 **17 Claims**



1. A mobile unit identifying system comprising:
- (a) an interrogator having:
  - spread spectrum signal generation means for generating a spread spectrum coding signal using a predetermined pseudo noise signal; and
  - a transmitting antenna for transmitting said spread spectrum coding signal; and

- (b) a responder having:
  - storing means for storing data;
  - modulation means for modulating radio signals including said transmitted spread spectrum coding signal with said data; and
  - sending means for sending the modulated radio signals to said interrogator, said interrogator further comprising:
  - a receiving antenna for receiving said sent radio signals; and
  - mixing means for mixing said received radio signals with said spread spectrum signal to detect said data.

5,533,046

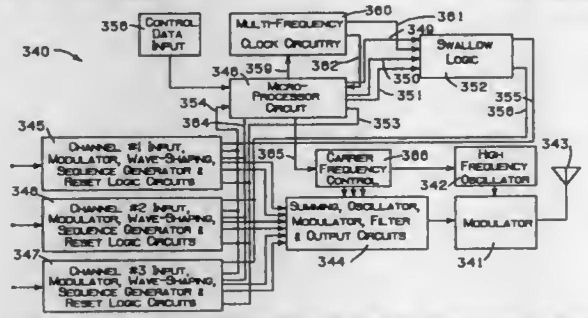
SPREAD SPECTRUM COMMUNICATION SYSTEM

VanMetre Lund, 2294 Elm Ridge Dr., Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 959,025, Oct. 8, 1992, abandoned. This application Dec. 28, 1993, Ser. No. 174,143

Int. Cl.^{6} H04K *1/10*

U.S. Cl. 375—200 **35 Claims**


340
358
CONTROL DATA INPUT
MULTI-FREQUENCY CLOCK CIRCUITRY
360
361
349
SWALLOW LOGIC
348
359
362
350
351
352
355
356
MICRO-PROCESSOR CIRCUIT
354
364
353
345
CHANNEL #1 INPUT, MODULATOR, WAVE-SHAPING, SEQUENCE GENERATOR & RESET LOGIC CIRCUITS
365
CARRIER FREQUENCY CONTROL
366
HIGH FREQUENCY OSCILLATOR
343
342
346
CHANNEL #2 INPUT, MODULATOR, WAVE-SHAPING, SEQUENCE GENERATOR & RESET LOGIC CIRCUITS
SUMMING, OSCILLATOR, MODULATOR, FILTER & OUTPUT CIRCUITS
MODULATOR
347
CHANNEL #3 INPUT, MODULATOR, WAVE-SHAPING, SEQUENCE GENERATOR & RESET LOGIC CIRCUITS
344
341

1. A spread spectrum communication system comprising: at least one intelligence transmitting device including sequence generator means for generating an intelligence wavetrain modulated in accordance with information to be transmitted, and a synchronization transmitting device for generating an unmodulated synchronization wavetrain in timed relation to said intelligence wavetrain, each of said wavetrains including a sequence of variations having predetermined varying durations and in a predetermined distinctive pseudo-random order, further including clock means for supplying a clock signal for operation of said sequence generator means, and means including selectively controlled cycle swallowing means for applying said clock signal to said signal generator means for selective control of the effective frequency of said clock signal.

5,533,047

THRESHOLD DETECTOR FOR DIGITAL RADIO TRANSMISSION SYSTEMS, DEVICES COMPRISING A THRESHOLD DETECTOR OF THIS KIND AND CORRESPONDING UTILIZATION

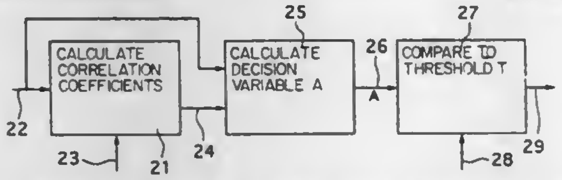
Christophe Mourot, Asnieres; René Olivier, St Germain De La Grange, and Evelyne Le Strat, Paris, all of, France, assignors to Alcatel Mobile Communication France, Paris, France

Filed Sep. 9, 1994, Ser. No. 303,772

Claims priority, application France, Sep. 15, 1993, 93 11007

Int. Cl.^{6} H04B *15/00;* H04K *1/00;* H04L *27/30*

U.S. Cl. 375—208 **8 Claims**


25
27
CALCULATE CORRELATION COEFFICIENTS
CALCULATE DECISION VARIABLE A
26
COMPARE TO THRESHOLD T
A
22
23
21
24
28
29

1. Threshold detector for a digital signal transmission system using a transmission channel, in particular for transmission to mobiles, comprising:
- means for calculating a set of coefficients f_n belonging to a group comprising of a set of coefficient c_n expressing a correlation between a first series of digital samples x_n received by a receiver and a second series of reference digital samples p_n know to said receiver, in order to acquire synchronization of the system, and a set of coefficient $\hat{h}_n$ of an estimate of an impulse response of said transmission channel, when said system is already synchronized; and
- means for calculating a decision variable A such that:

$$A = \frac{\sum_{n=0}^{L-1} |f_n|^2}{\frac{1}{N} \sum_{n=0}^{N-1} |x_n|^2}$$

where L and N are predetermined integers.

5,533,048

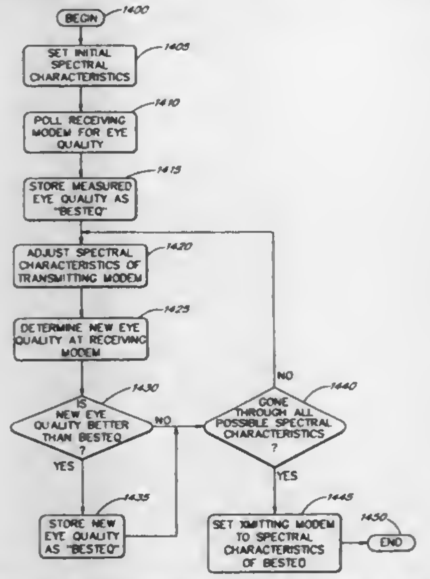
APPARATUS AND METHOD FOR COMPENSATING FOR LIMITER INDUCED NON-LINEAR DISTORTION IN A WIRELESS DATA COMMUNICATION SYSTEM

Michael G. Dolan, Orange, Calif., assignor to Celeritas Technologies, Ltd., Irvine, Calif.

Continuation-in-part of Ser. No. 147,148, Nov. 3, 1993, which is a continuation-in-part of Ser. No. 99,080, Jul. 28, 1993, Pat. No. 5,386,590. This application Feb. 17, 1994, Ser. No. 198,085

Int. Cl.^{6} H04B *1/38;* H04L *27/06*

U.S. Cl. 375—222 **8 Claims**


BEGIN
1400
SET INITIAL SPECTRAL CHARACTERISTICS
1405
POLL RECEIVING MODEM FOR EYE QUALITY
1410
STORE MEASURED EYE QUALITY AS "BESTEQ"
1415
ADJUST SPECTRAL CHARACTERISTICS OF TRANSMITTING MODEM
1420
DETERMINE NEW EYE QUALITY AT RECEIVING MODEM
1425
IS NEW EYE QUALITY BETTER THAN BESTEQ ?
1430
NO
YES
GONE THROUGH ALL POSSIBLE SPECTRAL CHARACTERISTICS ?
1440
NO
YES
STORE NEW EYE QUALITY AS "BESTEQ"
1435
SET XMITTING MODEM TO SPECTRAL CHARACTERISTICS OF BESTEQ
1445
END
1450

1. A method of compensating for varying spectral characteristics of data signals received by a receiving modem from a transmitting modem via an analog communications link wherein said data signals comprise amplitude and phase modulation of at least one carrier signal, said amplitude and phase modulation defining a signal constellation at said receiving modem wherein predetermined points on said signal constellation represent combinations of binary data, said signal constellation including points having varying phases and amplitudes that differ from phases and amplitudes of said predetermined points in the presence of non-ideal spectral characteristics of said communication link between said transmitting modem and said receiving modem, said non-ideal spectral characteristics including non-linear amplitude limiting of portions of said data signals, said method comprising the steps of:
- generating at said receiving modem said data signal constellation to provide a first plurality of data points having respective amplitudes and phases;
- detecting at said receiving modem a second plurality of points included in said first plurality of points having amplitudes that differ sufficiently from said predetermined points to indicate that amplitudes of data signals that generated said second plurality of points have been nonlinearly limited;

calculating in said receiving modem spectral shaping coefficients for use by said receiving modem using amplitude measurements from a third plurality of points that are included in said first plurality of points but not included in said detected second plurality of points; and

modifying in said receiving modem spectral shaping characteristics of said receiving modem using said calculated spectral shaping coefficients so that said third plurality of points have phases and amplitudes that more closely correspond to phases and amplitudes of said predetermined points.

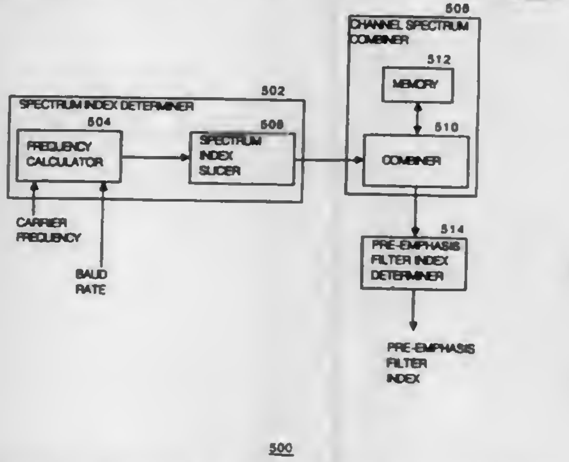
5,533,049
METHOD, DIGITAL SIGNAL PROCESSING MODULE AND SYSTEM FOR EFFICIENTLY SELECTING A PRE-EMPHASIS FILTER DURING LINE PROBING

Jingdong Lin, Norwood, Mass., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1994, Ser. No. 280,919

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 375—222 **15 Claims**


508
CHANNEL SPECTRUM COMBINER
512
MEMORY
510
COMBINER
502
SPECTRUM INDEX DETERMINER
504
FREQUENCY CALCULATOR
506
SPECTRUM INDEX SLICER
CARRIER FREQUENCY
BAUD RATE
514
PRE-EMPHASIS FILTER INDEX DETERMINER
PRE-EMPHASIS FILTER INDEX
500

1. A method for selecting a pre-emphasis filter by a digital signal processing module in a line probing modem having at least a channel spectrum measurement, comprising the steps of:

for each of a plurality of predetermined pairs of carrier frequencies and baud rates,

A) calculating at least three frequencies using a predetermined scheme based on an input carrier frequency and a baud rate,

B) selecting, by a spectrum index determiner, channel spectrum indexes corresponding to the at least three frequencies using a predetermined scheme,

C) combining, by a channel spectrum combiner, each of the channel spectra indicated by the spectrum indexes with at least two nearest neighbors to provide corresponding combined spectrum values,

D) using, by a pre-emphasis filter index determiner, the combined spectrum values for determining a pre-emphasis filter index based on a predetermined logic scheme.

5,533,050
SYSTEM FOR RECEIVING A PHASE AND AMPLITUDE MODULATED DIGITAL SIGNAL

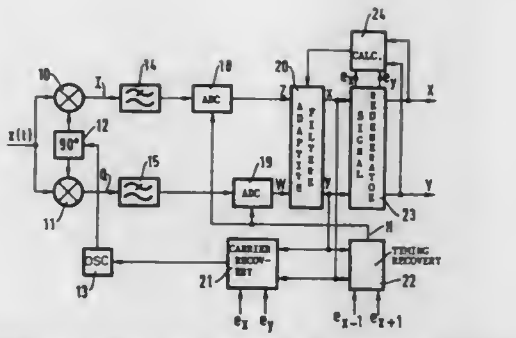
Marc Isard, Saint Germain en Laye, and Thierry Bernier, Maurecourt, both of, France, assignors to Alcatel Telspace, Nanterre Cedex, France

Filed Jun. 16, 1994, Ser. No. 260,824

Claims priority, application France, Jun. 17, 1993, 93 07314

Int. Cl.^{6} H03H *7/30;7/40;* **H03K** *5/159;* **H04L** *27/14*

U.S. Cl. 375—229 **4 Claims**



1. A system for receiving a complex modulation digital signal (x(t)) using a temporal equalizer (**20**, **24**) for receiving said signal and including an estimator (**24**) supplying correction parameters ($C_{\alpha\beta}$), characterized in that it comprises:

at least one peripheral control loop (**21**, **22**), the estimator of which uses at least one of said correction parameters ($C_{\alpha\beta}$) supplied to said temporal equalizer (**20**, **24**), said peripheral control loop (**21**, **22**) having an operating range separate from that of said temporal equalizer (**20**, **24**); and

temporal discriminator means (**40**, **70**) coupled to, and detecting inactive areas of, the estimator of each peripheral control loop (**21**, **22**) to enable operation of said temporal equalizer (**20**, **24**) in such a way as to prevent interaction between said temporal equalizer (**20**, **24**) and said peripheral control loop (**21**, **22**).

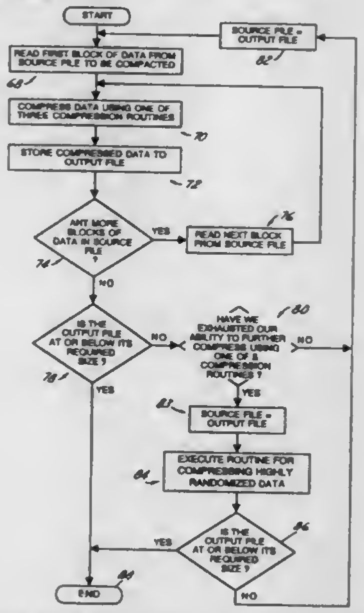
5,533,051
METHOD FOR DATA COMPRESSION

David C. James, Marco Island, Fla., assignor to The James Group, Naples, Fla.

Filed Mar. 12, 1993, Ser. No. 30,741

Int. Cl.^{6} H04B *1/66;* **H03M** *7/40;7/30;7/34*

U.S. Cl. 375—240 **9 Claims**


START
READ FIRST BLOCK OF DATA FROM SOURCE FILE TO BE COMPACTED
68
COMPRESS DATA USING ONE OF THREE COMPRESSION ROUTINES
70
STORE COMPRESSED DATA TO OUTPUT FILE
72
ANY MORE BLOCKS OF DATA IN SOURCE FILE ?
74
YES
NO
READ NEXT BLOCK FROM SOURCE FILE
76
IS THE OUTPUT FILE AT OR BELOW ITS REQUIRED SIZE ?
78
HAVE WE EXHAUSTED OUR ABILITY TO FURTHER COMPRESS USING ONE OF 3 COMPRESSION ROUTINES ?
80
SOURCE FILE = OUTPUT FILE
82
EXECUTE ROUTINE FOR COMPRESSING HIGHLY RANDOMIZED DATA
84
IS THE OUTPUT FILE AT OR BELOW ITS REQUIRED SIZE ?
86
END
88

9. A method of extracting and compressing redundant data from a stream of electrically encoded binary data, comprising the steps of:

A) parsing n-bits from said stream of data;

B) determining the value of said parsed n-bits of data;

C) associating a coded string with the value determined in step B;

D) dividing said coded string into first and second string portions and concatenating said first portion of the coded string of step C to a contents of at least one of a first and third target strings;

E) concatenating said second portion of the coded string of step C to a contents of a second target string;

F) parsing n-bits at a time from the contents of at least one of said first, second, and third target strings;

G) assigning a coded string, from a plurality of coded strings, to each of the parsed n-bits of step F, said assigning of said coded string based in part, upon the value of said parsed n-bits of step F and wherein at least one of said coded strings is not greater than n−1 bits long;

H) dividing said assigned coded string into at least first and second portions, and assigning at least one of said first and second coded string portions to at least one of a first, second, and third output registers.

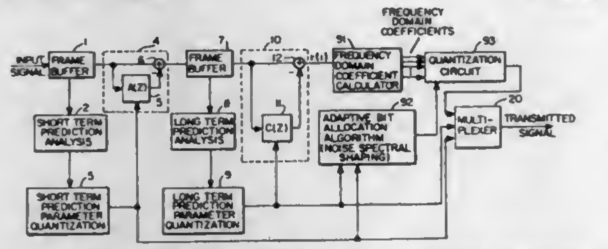
5,533,052
ADAPTIVE PREDICTIVE CODING WITH TRANSFORM DOMAIN QUANTIZATION BASED ON BLOCK SIZE ADAPTATION, BACKWARD ADAPTIVE POWER GAIN CONTROL, SPLIT BIT-ALLOCATION AND ZERO INPUT RESPONSE COMPENSATION

Bangalore R. R. U. Bhaskar, North Potomac, Md., assignor to Comsat Corporation, Bethesda, Md.

Filed Oct. 15, 1993, Ser. No. 136,745

Int. Cl.^{6} H04B *14/06*

U.S. Cl. 375—244 **21 Claims**


INPUT SIGNAL
FRAME BUFFER
1
2
3
4
5
6
7
8
9
10
11
12
20
91
92
93
A(Z)
FRAME BUFFER
C(Z)
FREQUENCY DOMAIN COEFFICIENTS
FREQUENCY DOMAIN COEFFICIENT CALCULATOR
QUANTIZATION CIRCUIT
SHORT TERM PREDICTION ANALYSIS
LONG TERM PREDICTION ANALYSIS
ADAPTIVE BIT ALLOCATION ALGORITHM (NOISE SPECTRAL SHAPING)
MULTI-PLEXER
TRANSMITTED SIGNAL
SHORT TERM PREDICTION PARAMETER QUANTIZATION
LONG TERM PREDICTION PARAMETER QUANTIZATION

1. An adaptive predictive coding method comprising the steps of generating a residual signal by performing short term and long term prediction analysis and filtering on an input signal in accordance with LPC coefficients derived from said input signal, and quantizing said residual signal, said method further comprising the step of reducing the gain of said coefficients and using the reduced gain coefficients for said performing step.

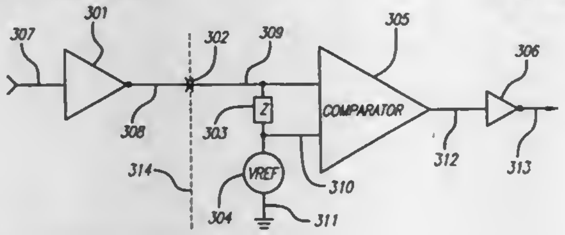
5,533,053
LOW FREQUENCY COMMON MODE REJECTION IN A CLOCK CIRCUIT

Russell A. Hershbarger, Nevada City, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Filed May 16, 1994, Ser. No. 243,563

Int. Cl.^{6} H04B *3/06*

U.S. Cl. 375—257 **6 Claims**



1. Apparatus comprising:

a driver for providing a signal;

a capacitor having a first terminal and a second terminal, said first terminal coupled to said driver, said capacitor for coupling said signal from said first terminal to said second terminal;

an impedance element comprising a transconductance element coupled to said second terminal for filtering said signal, wherein said impedance element has a highpass filter characteristic and wherein said impedance element further comprises a feedback capacitor in a feedback loop around said transconductance element;

a comparator coupled to said impedance element for comparing said signal; and

a reference voltage source coupled to said impedance element and to said comparator, wherein said transconductance element comprises:

an amplifier having a first amplifier input, a second amplifier input, and an amplifier output;

a field effect transistor (FET) having a gate terminal, a first FET terminal, and a second FET terminal, said amplifier output coupled to said gate terminal, said first amplifier input coupled to said first FET terminal, said second FET terminal coupled to a first feedback capacitor terminal of said feedback capacitor, and said second amplifier input coupled to a second feedback capacitor terminal of said feedback capacitor.

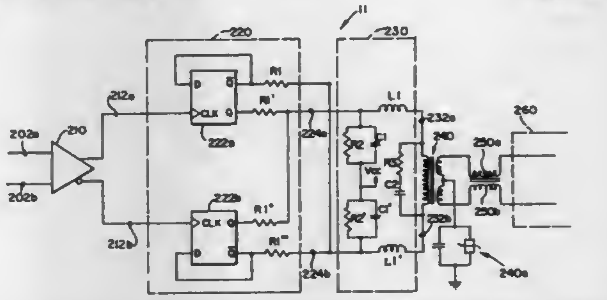
5,533,054
MULTI-LEVEL DATA TRANSMITTER

John J. DeAndrea, Lawrenceville, N.J., and Keith M. Conroy, Philadelphia, Pa., assignors to Technitrol, Inc., Feasterville, Pa.

Filed Jul. 9, 1993, Ser. No. 89,730

Int. Cl.^{6} H04L *25/49*

U.S. Cl. 375—286 **3 Claims**



1. A conversion circuit for converting a differential binary signal to a three-level signal, the differential binary signal including a first binary signal and a complementary of the first binary signal, said conversion circuit comprising:

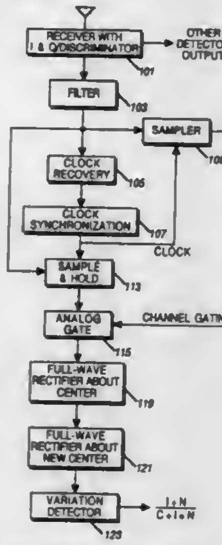
(a) a first latch having a first latching input, a first triggering input, a first non-inverting output, and a first inverting output; said first triggering input connected to receive said first binary signal, and said first latching input connected to receive said first inverting output, whereby said first inverting output is latched at said first latching input in response to a transition in said first binary signal;

(b) a second latch having a second latching input, a second triggering input, a second non-inverting output, and a second inverting output; said second triggering input connected to receive said complementary of the first binary signal, and said second latching input connected to receive said second inverting output, whereby said second inverting output is latched at said second latching input in response to a transition in said complementary of the first binary signal;

(c) a first voltage divider connected between the respective first and second non-inverting outputs for providing a first voltage level when the first and second non-inverting outputs are logical high, a second voltage level when first and second non-inverting outputs are logical low, and a third, intermediate, voltage level when said first and second non-inverting outputs are in opposite logical conditions, whereby said three-level signal is provided.

5,533,055
CARRIER TO INTERFERENCE RATIO MEASUREMENT

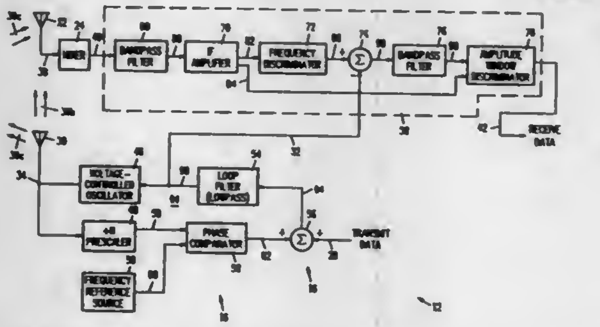
Lester T. Matzek, Lombard, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 7,223, Jan. 22, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 456,329
Int. Cl.^{6} H04L *25/08;* **H04B** *15/00*
U.S. Cl. 375—286 **10 Claims**



1. An apparatus for measuring quality of a digital signal, the apparatus comprising:
a receiver for receiving the digital signal;
a sampler for sampling the received digital signal, thereby producing a sampled digital signal;
a full-wave rectifier, arranged and constructed to full-wave rectify the sampled digital signal, thereby producing a full-wave rectified signal; and
a detector, arranged and constructed to detect variations between the full-wave rectified signal and an expected signal level, thereby producing an interference measurement.

5,533,056
DATA ENCODER/DECODER FOR DATA TRANSCEIVER

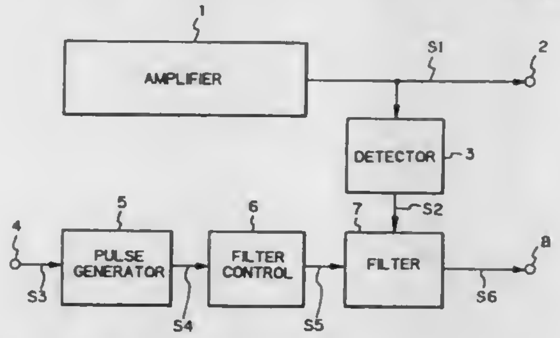
Peter K. Cripps, Redwood City, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Division of Ser. No. 57,621, May 5, 1993, abandoned. This application Aug. 8, 1994, Ser. No. 287,118
Int. Cl.^{6} H04L *25/34*
U.S. Cl. 375—286 **21 Claims**



1. A binary-to-trinary data encoder, comprising:
receiver means for receiving a first plurality of binary data having associated therewith a second plurality of binary data transitions which includes a third plurality of positive binary data transitions and a fourth plurality of negative binary data transitions; and
encoder means coupled to said receiver means for encoding said received first plurality of binary data to a fifth plurality of trinary data having associated therewith a sixth plurality of primary trinary data values, a seventh plurality of secondary trinary data values and an eighth plurality of tertiary trinary data values, wherein each one of said sixth plurality of primary trinary data values corresponds to an absence of one of said second plurality of binary data transitions, each one of said seventh plurality of secondary trinary data values corresponds to one of said third plurality of positive binary data transitions, and each one of said eighth plurality of tertiary trinary data values corresponds to one of said fourth plurality of negative binary data transitions.

5,533,057
HIGH FREQUENCY SIGNAL DETECTING CIRCUIT

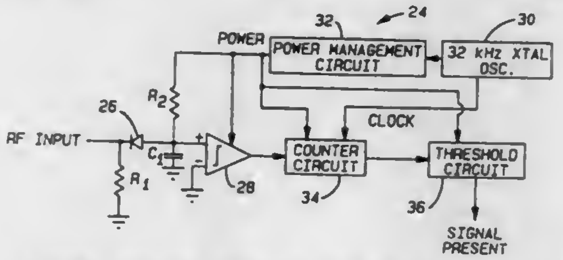
Tsuguo Hori, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Nov. 29, 1993, Ser. No. 158,701
Claims priority, application Japan, Nov. 27, 1992, 4-318716
Int. Cl.^{6} H04L *27/04;25/03;* **H04J** *3/16*
U.S. Cl. 375—295 **4 Claims**



1. A detecting circuit comprising:
means for generating a high frequency signal having an envelope whose mean power level may change depending on a time slot;
detecting means for detecting the envelope of the high frequency signal;
means for generating a control signal; and
low-pass filtering means responsive to the control signal for broadening a pass band for an output of said detecting means only during a transition time of the mean power level of the high frequency signal.

5,533,058
METHOD AND APPARATUS FOR LOW CURRENT RF SIGNAL DETECTION

Mark A. Kady, Greentown, and Vincent M. Wenos, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Filed Mar. 10, 1994, Ser. No. 208,177
Int. Cl.^{6} H04L *25/06*
U.S. Cl. 375—317 **15 Claims**

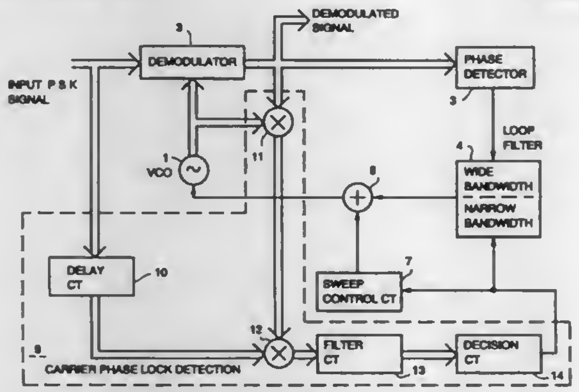


1. A signal detection circuit for indicating whether an radio frequency (RF) input signal is a valid predetermined input signal, said signal detection circuit comprising:
a comparator receiving the RF input signal and generating an output baseband signal;

a counter circuit receiving the baseband signal from the comparator, said counter circuit counting predetermined edges of the baseband signal and providing a counter output signal indicating a number of counted edges;
an oscillator, said oscillator applying a clock signal to the counter circuit, wherein the clock signal is asynchronous with respect to the RF input signal; and
a threshold circuit receiving the counter output signal, said threshold circuit comparing the number of counted edges to a threshold range of counts, and providing a threshold output signal when the number of counted edges is within the threshold range of counts, thereby indicating that the RF input signal is valid.

5,533,059
CARRIER PHASE LOCK DETECTING APPARATUS USED IN PSK-MODULATED SIGNAL RECEIVER FOR SATELLITE COMMUNICATION SYSTEM

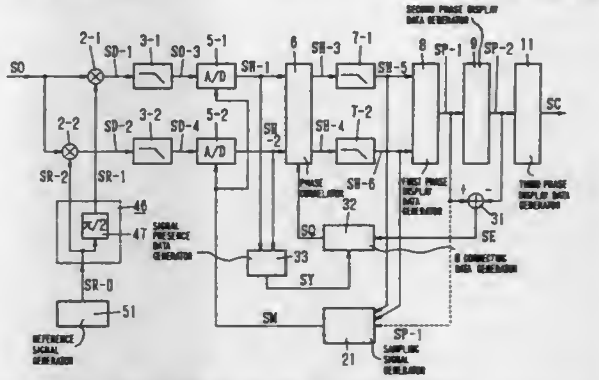
Hiroki Tsuda, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Oct. 12, 1993, Ser. No. 135,065
Claims priority, application Japan, Oct. 13, 1992, 4-273934
Int. Cl.^{6} H03D *3/18;3/24*
U.S. Cl. 375—327 **5 Claims**



1. A carrier phase lock detecting apparatus comprising:
(a) demodulation means for demodulating a received PSK-signal by a PLL circuit arrangement including:
  a voltage-controlled oscillator for generating a reference carrier signal in response to a control signal;
  a demodulator for demodulating said received PSK-modulated signal in response to said reference carrier signal to deliver a demodulated signal;
  a phase detector for detecting a phase difference between said received PSK-modulated signal and said reference carrier signal to deliver a phase difference signal; and
  a loop filter for filtering said phase difference signal to deliver said control signal;
(b) remodulation means for remodulating said demodulated signal by multiplying said demodulated signal by said reference carrier signal;
(c) delay means for delaying said received PSK-modulated signal by a time required for said demodulation means to demodulate said received PSK-modulated signal and said remodulation means to remodulate said demodulated signal;
(d) multiplier means for multiplying the output of said remodulation means by the output of said delay means; and
(e) decision means for determining carrier phase lock by comparing an averaged output of said multiplier means with a preset threshold level.

5,533,060
MULTI-PHASE PSK SIGNAL DECODER INCLUDING PHASE DISPLAY GENERATOR WITH PHASE CORRECTING FEEDBACK

Yobdoh Kameo, Yokohama; Kazuo Matsumoto, Sagamihara, and Jun Suzuki, Sakura, all of, Japan, assignors to Satellite Communication Laboratory Co., Ltd., Japan
Filed Dec. 16, 1994, Ser. No. 358,107
Claims priority, application Japan, Dec. 16, 1993, 5-343541
Int. Cl.^{6} H03D *3/22*
U.S. Cl. 375—332 **6 Claims**



1. A multi-phase PSK signal decoder comprising:
(A) reference signal generating means for generating a reference signal of a frequency or angular frequency corresponding to that of a carrier of a multi-phase PSK signal according to a multi-phase PSK system;
(B) phase detecting reference signal generating means for generating, from said reference signal, first and second phase detecting reference signals which have the same frequency or angular frequency as that of said reference signal and are displaced $\pi/2$ apart in phase;
(C) first and second quasi-synchronous phase detecting means for generating, from said multi-phase PSK signal, first and second quasi-synchronous phase detecting signals quasi-synchronously detected by said first and second phase detecting reference signals of the same phase as that of said multi-phase PSK signal;
(D) first and second digital converting means for generating, from said first and second quasi-synchronous phase detecting signals, first and second digitized quasi-synchronous phase detecting signals by use of a sampling signal;
(E) phase correcting means for generating, from said first and second digitized quasi-synchronous phase detecting signals, third and fourth digitized quasi-synchronous phase shifting signals corrected by phase correcting data of the same phase as those of said first and second digitized quasi-synchronous phase detecting signals;
(F) first and second low-pass filter means for generating, from said third and fourth quasi-synchronous phase detecting signals, fifth and sixth digitized quasi-synchronous phase detecting signals composed of their low-frequency components;
(G) first phase display data generating means for generating, from said fifth and sixth digitized quasi-synchronous phase detecting signals, first phase display data representing the phase of the carrier of said multi-phase PSK signal;
(H) second phase display data generating means for generating, from said first phase display data, second phase display data representing the phase assigned to a code of said multi-phase PSK signal;
(I) decoded digital code generating means for generating, from said second phase display data, a decoded digital code representing the code of said multi-phase PSK signal;
(J) sampling signal generating means for generating, as said sampling signal, a signal of timing synchronized with that of the code of said multi-phase PSK signal, from said first phase display data or either one or both of said fifth and sixth digitized quasi-synchronous phase detecting signals;

(K) phase difference display data generating means for generating phase difference data representing a difference between said first and second phase display data

(L) signal presence display information generating means for generating, from either one or both of said first and second digitized quasi-synchronous phase detecting signals, signal presence display information representing whether the amplitude of said multi-phase PSK signal to be input into said first and second quasi-synchronous phase detecting means is smaller or larger than a predetermined threshold value; and

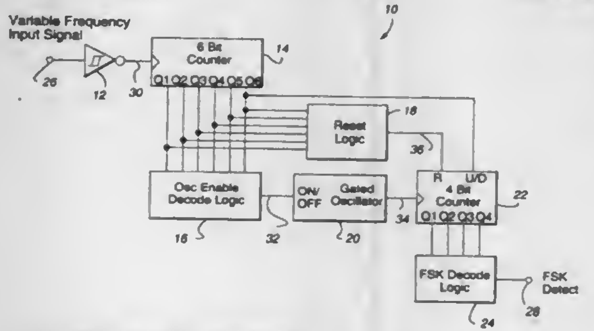
(M) phase correcting data generating means; (i) which, when said signal presence display information is in its state representing that the amplitude of said multi-phase PSK signal is larger than the predetermined threshold value, estimates the frequency or angular frequency and phase of the carrier of said multi-phase PSK signal from said phase difference display data, then predicts the frequency or angular frequency and phase of the carrier of said multi-phase PSK signal from said estimated frequency or angular frequency and phase thereof and generates, as said phase correcting data, data which represents the phase contained in data representing said predicted frequency or angular frequency and phase; and (ii) which, when said signal presence display information changes from its state representing that the amplitude of said multi-phase PSK signal is larger than the threshold value to its state representing that the amplitude of said multi-phase PSK signal is smaller than the predetermined threshold value, predicts the frequency or angular frequency and phase of the carrier of said multi-phase PSK signal from those estimated until then and generates, as said phase correcting data, data which represents the phase contained in data representing said predicted frequency or angular frequency and phase.

5,533,061

METHOD AND APPARATUS FOR DETECTING AN FSK ENCODED CARRIER SIGNAL

Gregory M. Smith; Michael W. Yeager, both of Colorado Springs; J. Donald Pauley, Estes Park, and Gary T. Carroll, Boulder, all of Colo., assignors to Racom Systems, Inc., Englewood, Colo.

Filed Feb. 10, 1994, Ser. No. 194,694
Int. Cl.^{6} H03D *3/00*
U.S. Cl. 375—334 **23 Claims**



1. An FSK detector comprising:

a first counter having an output, and having an input for receiving an FSK modulated carrier signal, said carrier signal having a frequency-shift-keyed frequency that operates to increment said first counter;

an oscillator enable decoder having an input coupled to said output of said first counter, and having an output providing a calibrate pulse upon said first counter reaching a first count state, and thereafter providing a measure pulse upon said first counter reaching a second count state;

a gated oscillator having an output, and having an input coupled to said output of said oscillator enable decoder;

a second counter having an output, having an input coupled to said output of said gated oscillator, and having an up/down control terminal coupled to said output of said first counter, said second counter being selectively enabled to count up, and then count down, in response to said first and second count states of said first counter; and

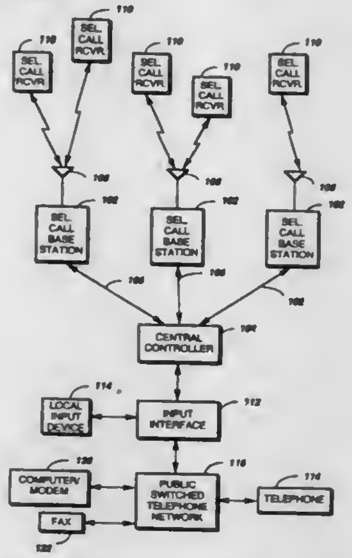
an FSK decoder having an input coupled to said output of said second counter, said FSK decoder having an output providing an FSK detect signal.

5,533,062

METHOD AND APPARATUS FOR CARRIER TRACKING AND DEMODULATION

Joseph C. Liberti, Jr., Blacksburg, Va.; Douglas I. Averst, Delray Beach, Fla.; Tony R. Branch, and Stephen R. Carsello, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 316,956
Int. Cl.^{6} H04L *27/10;27/22;27/14;7/00*
U.S. Cl. 375—334 **24 Claims**



1. A method for estimating a received carrier frequency and for demodulating a symbol value associated with the carrier frequency, the method utilized in a frequency shift keyed (FSK) receiver for receiving a modulated radio signal comprising symbol values corresponding to predetermined frequency offsets from the received carrier frequency, the symbol values received during serially transmitted symbol intervals, the method comprising the steps of:

digitizing the modulated radio signal during a symbol interval to form a plurality of digitized samples corresponding to the modulated radio signal over the symbol interval;

converting the plurality of digitized samples into a frequency domain signal corresponding to the modulated radio signal, the frequency domain signal comprising a first plurality of frequency domain samples corresponding to a plurality of frequencies identified by a plurality of frequency indexes;

storing the first plurality of frequency domain samples in the frequency shift keyed receiver;

repeating the digitizing, converting, and storing steps for a predetermined number of the serially transmitted symbol intervals to obtain a second plurality of frequency domain samples corresponding to the predetermined number of the serially transmitted symbol intervals;

summing squares of magnitudes of the second plurality of frequency domain samples stored for each of the corresponding plurality of frequencies to generate a composite frequency domain signal corresponding to the modulated radio signal received over the predetermined number of the serially transmitted symbol intervals;

generating a frequency domain windowing function that increases sensitivity to frequency domain samples having frequency offsets corresponding to the predetermined frequency offsets;

convolving the composite frequency domain signal generated in the summing step with the frequency domain windowing function to determine a location of a frequency distribution of frequency domain samples, which frequency distribution corresponds to the predetermined frequency offsets;

making an estimate of the received carrier frequency from the location determined in the convolving step; and

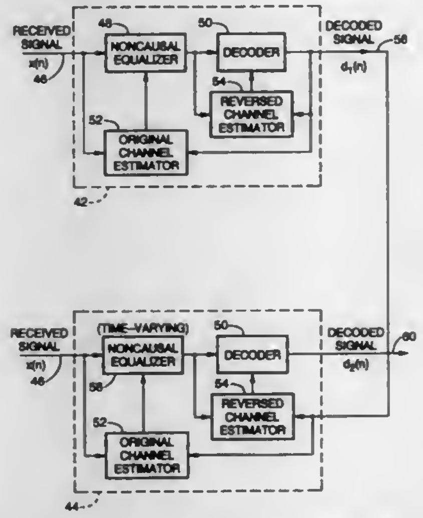
demodulating the symbol value corresponding to one of the serially transmitted symbol intervals, based upon the estimate of the received carrier frequency.

5,533,063

METHOD AND APPARATUS FOR MULTIPATH CHANNEL SHAPING

Sanjit K. Mitra, Santa Barbara; Eduardo Abreu, Goleta, both of Calif., and Rossano Marchesani, Chieti, Italy, assignors to The Regents of the University of California, Oakland, Calif.

Filed Jan. 31, 1994, Ser. No. 189,959
Int. Cl.^{6} H03D *1/00*
U.S. Cl. 375—340 **10 Claims**



1. A method for shaping the channel impulse response of a radio frequency communications channel and extracting digital data transmitted over said communications channel, comprising the steps of:

(a) receiving and sampling a radio frequency signal on an antenna, said radio frequency signal containing digital information, said radio frequency signal being transmitted over a communications channel, said communications channel having a time-varying non-minimum phase channel impulse response, said radio frequency signal including a signal of interest and interference;

(b) estimating said channel impulse response for said radio frequency signal;

(c) filtering said received radio frequency signal using a noncausal digital allpass filter operating in reversed time, said digital allpass filter using filter coefficients determined from the estimated channel impulse response;

(d) estimating a minimum phase desired impulse response for said filtered radio frequency signal, said estimated desired impulse response being the time reversal of said estimated channel impulse response; and

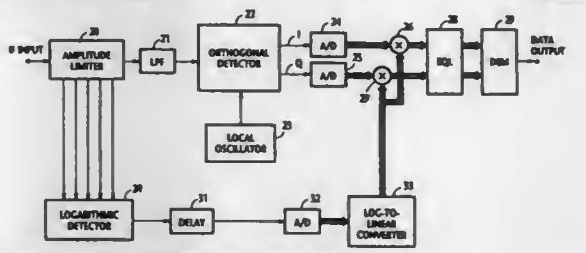
(e) decoding data contained in said signal of interest using the estimated desired impulse response and the filtered radio frequency signal.

5,533,064

DIGITAL RADIO RECEIVER HAVING LIMITER AMPLIFIERS AND LOGARITHMIC DETECTOR

Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 782,666, Oct. 25, 1991, abandoned. This application Feb. 24, 1994, Ser. No. 203,875
Claims priority, application Japan, Oct. 25, 1990, 2-285750
Int. Cl.^{6} H03D *1/00;* H04L *27/06*
U.S. Cl. 375—340 **9 Claims**



1. A digital radio receiver comprising:

an amplitude limiter for receiving an orthogonally modulated signal and producing a constant-amplitude version of the received signal;

an orthogonal detector coupled to said amplitude limiter for orthogonally mixing the constant-amplitude signal with a reference carrier and producing a first baseband signal in phase with said reference carrier and a second baseband signal in quadrature phase with said reference carrier;

an analog-to-digital converter for converting said first and second baseband signals to first and second digital baseband signals, respectively;

a logarithmic detector coupled to said amplitude limiter for generating a signal representative of the amplitude of the orthogonally-modulated signal received by the amplitude limiter;

a logarithmic-to-linear converter for converting the logarithmic scale of said amplitude-representative signal to a linear scale;

a multiplier for multiplying the first and second digital baseband signals with the linear-scale amplitude-representative signal from the logarithmic-to-linear converter;

an equalizer coupled to said multiplier for equalizing the multiplied first and second digital baseband signals to produce first and second equalized digital signals; and

a demodulator coupled to said equalizer for recovering a modulating signal from said first and second equalized digital signals.

5,533,065

DECREASING LENGTH TRACEBACKS

David M. Blaker, Emmaus, Pa.; Gregory S. Ellard, Forest Park, Great Britain, and Mohammad S. Mobin, Whitehall, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 28, 1993, Ser. No. 174,933
Int. Cl.^{6} H04L *27/06*
U.S. Cl. 375—341 **12 Claims**

12. A method of operating a digital communication system comprising a receiver, the receiver for receiving signals, the method for tracing a path through an array of surviving branch data from various symbol instants to determine a decoded symbol, the surviving branch data stored in an array of storage registers, the method comprising the step of:

receiving signals representative of encoded data;

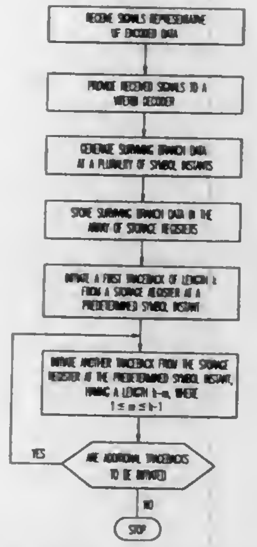
providing the received signals to a Viterbi decoder;

generating the surviving branch data at a plurality of symbol instants based on the received signals;

storing the surviving branch data in the array of storage registers;

initiating a series of tracebacks from a predetermined symbol instant, the traceback length of each traceback in the series of tracebacks defined by

k–m, where: k is the length of an initial traceback;


RECEIVE SIGNALS REPRESENTATIVE OF ENCODED DATA
PROVIDE RECEIVED SIGNALS TO A VITERBI DECODER
GENERATE SURVIVING BRANCH DATA AT A PLURALITY OF SYMBOL INSTANTS
STORE SURVIVING BRANCH DATA IN THE ARRAY OF STORAGE REGISTERS
INITIATE A FIRST TRACEBACK OF LENGTH k FROM A STORAGE REGISTER AT A PREDETERMINED SYMBOL INSTANT
INITIATE ANOTHER TRACEBACK FROM THE STORAGE REGISTER AT THE PREDETERMINED SYMBOL INSTANT, HAVING A LENGTH k-m, WHERE 1≤m≤k-1
YES
ARE ADDITIONAL TRACEBACKS TO BE INITIATED
NO
STOP

and m=1, 2, 3 . . . k−1

each traceback of the series of tracebacks tracing a path back through the array of storage registers of the surviving branch data to obtain a decoded symbol.

5,533,066

APPARATUS AND METHOD FOR ESTIMATING MAXIMUM LIKELIHOOD SEQUENCE USING OPTIMUM SAMPLING PHASE

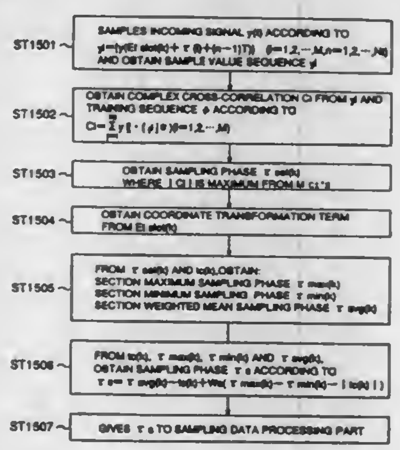
Norio Yamaguchi, and Haruhiro Shiino, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd.

Filed Feb. 2, 1994, Ser. No. 190,107

Claims priority, application Japan, Jun. 18, 1992, 4-159475

Int. Cl.^{6} H03D *1/00*

U.S. Cl. 375—341 **32 Claims**


ST1501
SAMPLES INCOMING SIGNAL y(t) ACCORDING TO
AND OBTAIN SAMPLE VALUE SEQUENCE y
ST1502
OBTAIN COMPLEX CROSS-CORRELATION Ci FROM y AND TRAINING SEQUENCE ϕ ACCORDING TO
ST1503
OBTAIN SAMPLING PHASE τ
WHERE | Ci | IS MAXIMUM FROM M Ci's
ST1504
OBTAIN COORDINATE TRANSFORMATION TERM
ST1505
SECTION MAXIMUM SAMPLING PHASE
SECTION MINIMUM SAMPLING PHASE
SECTION WEIGHTED MEAN SAMPLING PHASE
ST1506
OBTAIN SAMPLING PHASE τ s ACCORDING TO
ST1507
GIVES τ s TO SAMPLING DATA PROCESSING PART

1. A maximum likelihood sequence estimator for estimating, from a reception signal y(t) received from a transmission path during each of a plurality of time segments designatable by an index k (k=1, 2, . . .), a transmission symbol sequence $\mathbf{x}$={xn} containing a predetermined training sequence Φ={ϕn} (n=1, 2, . . . , Nt), comprising:

sampling means for sampling, during each of the time segments k, a training portion of the received reception signal y(t), the training portion corresponding to the predetermined training sequence Φ={ϕn}, said sampling means sampling the training portion at a symbol interval T at each of respective sampling phases of a sampling phase sequence[s] τ={τ(i)} (i=1, 2, . . . , M), to obtain, for each of the sampling phases τ (i) (i=1, 2 . . . . , M) a corresponding sample value sequence[s] $\mathbf{y}^i$ ={yin} (n=1, 2, . . . , Nt) of the reception signal y(t),

correlation value calculating means for obtaining for each time segment k a complex cross-correlation function $\mathbf{c}$={Ci} (i=1, 2, . . . , M) of the sample value sequences $\mathbf{y}$i (i=1, 2, . . . , M) and the training sequence[s] Φ={ϕn} (n=1, 2, . . . , Nt),

selecting means for obtaining for each time segment k from among the sampling phases of the sampling phase sequence τ={τ(i)} a selected sampling phase corresponding to a complex cross-correlation value Ci at which the absolute value of the cross-correlation function $\mathbf{c}$={Ci} is maximum, by comparing the absolute values of the M number of complex cross-correlation values Ci,

sampling phase smoothing means for obtaining for each time segment k a sampling phase τs based on a plurality Of the selected sampling phases obtained by said selecting means,

a sampling processing part for sampling during each time segment k the reception signal y(t) entered at specified timings with respect to a symbol interval T and the sampling phase τs to obtain a sample value sequence $\mathbf{y}$={yn} (n=1, 2, . . . , N),

a transmission path estimating part for obtaining for each time segment k estimated values E$\mathbf{h}$={Ehj}(j=0, 1, . . . , L) of the impulse response of the transmission path based on the sample value sequence $\mathbf{y}$, and

an operation processing part for obtaining for each time segment k estimated values E$\mathbf{x}$={Exn} (n=1, 2, . . . , N) of the transmission symbol sequence $\mathbf{x}$ from the sample value sequence $\mathbf{y}$ based on the estimated values E$\mathbf{h}$.

5,533,067

METHOD AND DEVICE FOR ESTIMATING TRANSMITTED SIGNALS IN A RECEIVER IN DIGITAL SIGNAL TRANSMISSION OPERATIONS

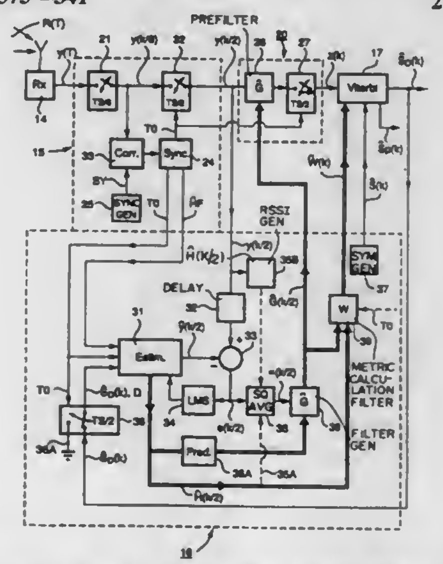
Karim Jamal, Stockholm; Björn Gudmundson, Sollentuna, and Gustav Brismark, Stockholm, all of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 23, 1994, Ser. No. 264,491

Claims priority, application Sweden, Jun. 24, 1993, 9302204

Int. Cl.^{6} H04L *27/06;* H03H *7/30*

U.S. Cl. 375—341 **22 Claims**



1. In a method of receiving successive digital symbols transmitted over a communication channel that uses a viterbi algorithm, a method of estimating transmitted symbols comprising the steps of:

(a) sampling a received signal at a sampling time point during each received symbol;

(b) correlating the samples generated by step (a) with a predetermined sequence to produce at least an initial estimated impulse response of the communication channel;

(c) generating coefficients of a prefilter based on an adapted estimated impulse response and prefiltering the samples;

(d) generating coefficients of a metric calculation filter based on the coefficients of the prefilter and the adapted estimated impulse response;

(e) generating at least preliminary estimated symbols using the viterbi algorithm and the prefiltered samples and the coefficients of the metric calculation filter;

(f) generating estimated signal values based on the estimate impulse response and the at least preliminary estimated symbols;

(g) generating error signal according to differences between the samples generated by step (a) and the estimate signal values; and

(h) generating the adapted estimated impulse response based on the at least preliminary estimated symbols and the error signals.

5,533,068

FREQUENCY ERROR DETECTING DEVICE CAPABLE OF CORRECTLY DETECTING A FREQUENCY ERROR BETWEEN A CARRIER FREQUENCY AND A STANDARD FREQUENCY

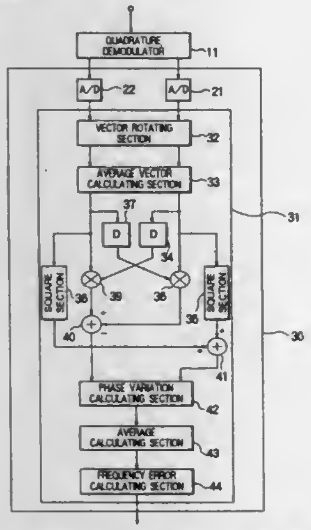
Hiroyasu Muto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 24, 1993, Ser. No. 157,702

Claims priority, application Japan, Nov. 25, 1992, 4-314769

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 375—344 **7 Claims**


QUADRATURE DEMODULATOR
11
A/D
22
A/D
21
VECTOR ROTATING SECTION
32
AVERAGE VECTOR CALCULATING SECTION
33
37
D
D
34
31
SQUARE SECTION
38
39
36
SQUARE SECTION
35
40
30
41
PHASE VARIATION CALCULATING SECTION
42
AVERAGE CALCULATING SECTION
43
FREQUENCY ERROR CALCULATING SECTION
44

1. A frequency error detecting device for use in combination with a demodulating section for receiving a transmitted signal through a transmission path to quadrature demodulate said transmitted signal into a demodulated signal with reference to a standard signal of standard frequency, said transmitted signal having a carrier signal of a carrier frequency and being defined by a signal vector sequence including a set of signal vectors each of which has a phase variation equal to a predetermined phase variation, said signal vectors being defined by a sequence of symbols at a predetermined symbol rate, said demodulated signal being defined by a sequence of demodulated vectors, said frequency error detecting device for detecting a frequency error between said standard frequency and said carrier frequency to produce a frequency error signal, wherein said predetermined sampling rate is equal to said predetermined symbol rate, said frequency error detecting device comprising:

first means for sampling said demodulated vectors at a predetermined sampling rate to quantize said demodulated vectors into quantized vectors;

second means for compounding a composite vector from said quantized vectors within a predetermined number of said quantized vectors, said predetermined number being equal to the number of said demodulated vectors in a phase variation of 2π radian; and

third means for calculating a phase difference between said composite vector and a predetermined vector to produce said frequency error signal.

5,533,069

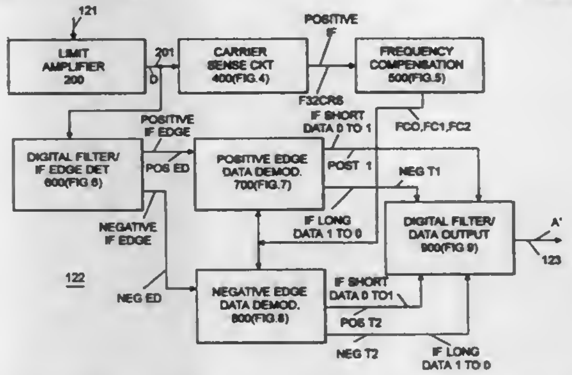
METHOD AND APPARATUS FOR DIGITAL FREQUENCY COMPENSATION OF CARRIER DRIFT IN A PSK DEMODULATOR

Arthur E. Fleek, Cary; William O. Camp, Jr., Chapel Hill, both of N.C.; Gary M. Warchocki, Owego, N.Y., and Michael J. Bracco, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1994, Ser. No. 329,362

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 375—344 **8 Claims**


121
LIMIT AMPLIFIER 200
201
D
CARRIER SENSE CKT 400(FIG.4)
POSITIVE IF
FREQUENCY COMPENSATION 500(FIG.5)
F32CRS
IF SHORT DATA 0 TO 1
FC0,FC1,FC2
POSITIVE IF EDGE
DIGITAL FILTER/ IF EDGE DET 600(FIG.6)
POS ED
POSITIVE EDGE DATA DEMOD. 700(FIG.7)
POST 1
NEG T1
NEGATIVE IF EDGE
IF LONG DATA 1 TO 0
DIGITAL FILTER/ DATA OUTPUT 900(FIG.9)
A'
123
122
NEG ED
NEGATIVE EDGE DATA DEMOD. 800(FIG.8)
IF SHORT DATA 0 TO1
POS T2
NEG T2
IF LONG DATA 1 TO 0

1. An improved method to compensate for carrier drift in a digital radio signal, comprising the steps of:

receiving at a radio receiver, a carrier signal having a carrier frequency that is phase shift modulated with a binary signal;

mixing said carrier signal with a local signal having a local oscillator frequency that is different by an intermediate frequency value, forming an intermediate frequency signal;

forming from said intermediate frequency signal an amplified intermediate frequency signal of square wave pulses having rising and falling edges separated by spacings;

measuring the frequency of said carrier signal by counting a predetermined number of said pulses for a measured interval whose duration is determined by counting a first clock count value;

determining in a demodulator at the receiver when the duration of time defining said spacings changes in response to the phase shift modulation;

measuring first intervals between consecutive rising edges of said amplified intermediate frequency signal of square wave pulses, by counting clock pulses for a second selected interval whose duration is determined by a second selected count value;

measuring second intervals between consecutive falling edges of said received signal by counting clock pulses for a third selected interval whose duration is determined by a third selected count value;

compensating for frequency drift in said carrier signal by adjusting said second selected count value and said third selected count value, using said first clock count value; and

combining results of said measuring first intervals and measuring second intervals to provide a composite representation of the binary signal at the receiver.

5,533,070

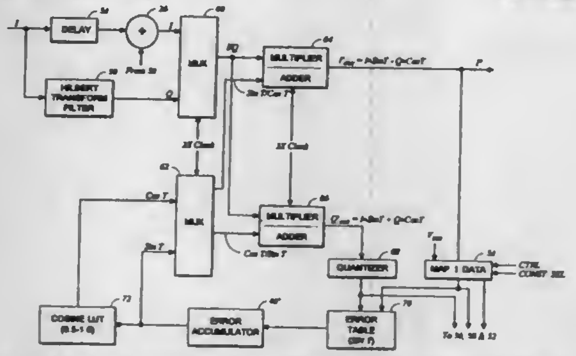
SIMPLIFIED COMPLEX MULTIPLIER IN ERROR TRACKING LOOP

Gopalan Krishnamurthy, Wheeling, and Ronald B. Lee, Northbrook, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 14,889, Feb. 8, 1993, Pat. No. 5,406,587. This application Dec. 30, 1994, Ser. No. 366,656

Int. Cl.^{6} H04L *1/00;25/08*

U.S. Cl. 375—346 **6 Claims**



6. In a phase noise tracking circuit of the type including a complex multiplier supplied with I and Q signals, a phase angle look-up table for indicating a phase error angle and sine and cosine look-up tables for applying sine and cosine correction values of the phase angle to the complex multipliers, the improvement comprising:

a pair of multiplexers and a pair of multiplier/adders respectively coupled thereto operating at a double clock rate and replacing said complex multipliers, said I and Q signals and said sine and cosine values being applied to respective ones of said first and said second multiplexers.

5,533,071

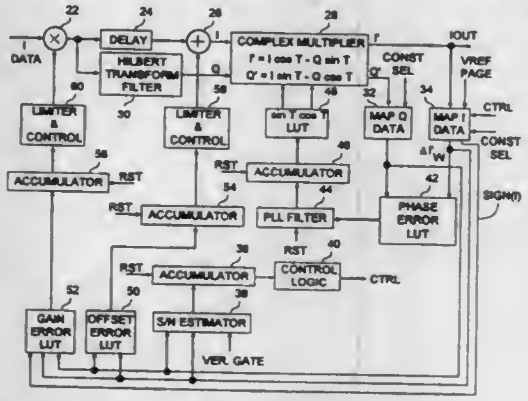
ERROR TRACKING LOOP INCORPORATING SIMPLIFIED COSINE LOOK-UP TABLE

Gopalan Krishnamurthy, Wheeling, and Ronald B. Lee, Northbrook, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 14,889, Feb. 8, 1993, Pat. No. 5,406,587. This application Dec. 30, 1994, Ser. No. 366,844

Int. Cl.^{6} H04L *1/00;25/08*

U.S. Cl. 375—346 **10 Claims**



1. A phase noise tracking circuit comprising:

means for receiving a complex data signal having an in-phase data component and a related quadrature component;

means for recovering said in-phase data component from said received signal;

means for approximating said quadrature component from said recovered in-phase data component; and

means for adjusting the phase angle of a vector defined by said recovered in-phase data component and said approximated quadrature component to reduce phase noise characterizing said recovered in-phase data component;

said adjusting means comprising means for developing an error signal in the form of the sine of the phase angle correction representing the difference between said recovered in-phase data component and a closest valid value thereof, means for accumulating said error signal, means for developing the cosine of said phase angle correction, and means for rotating said vector responsive to said sine and cosine of said phase angle correction.

5,533,072

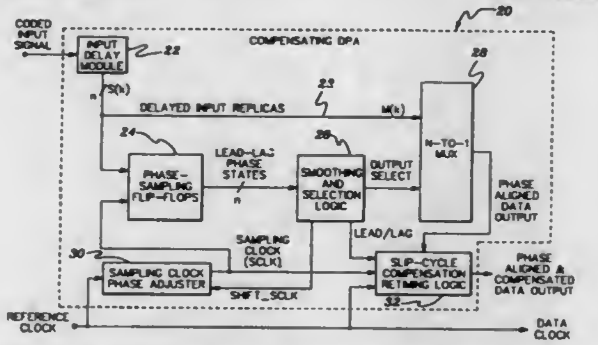
DIGITAL PHASE ALIGNMENT AND INTEGRATED MULTICHANNEL TRANSCEIVER EMPLOYING SAME

Christos J. Georgiou, White Plains; Thor A. Larsen, Hopewell Junction, and Ki W. Lee, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1993, Ser. No. 152,108

Int. Cl.^{6} H03D *3/24*

U.S. Cl. 375—371 **44 Claims**



1. A synchronizer for phase aligning an input signal, having a data transition, with a reference clock signal, said synchronizer comprising:

a delay circuit having an input coupled to receive the input signal, said delay circuit including a plurality of serially connected delay stages, each of said delay stages outputting a correspondingly delayed, input replica as the input signal propagates through said delay circuit;

clock adjustment means for receiving the reference clock signal and for producing therefrom a sampling clock signal having a clocking transition, said sampling clock signal having a same frequency as the reference clock signal and a phase offset from the input signal, said phase of the sampling clock signal being offset from the reference clock signal when the reference clock signal is in phase with the input signal;

selection means for detecting a phase relationship between said sampling clock signal and at least some of said input replicas, and for identifying based thereon one of said input replicas as synchronized with said sampling clock signal, said identified one of the input replicas comprising a synchronous replica; and

output means for retiming and for outputting the synchronous replica as a data output signal phase aligned with the reference clock signal, said output means for retiming the synchronous replica including means for compensating for said clock adjustment means' sampling clock signal phase offset relative to the reference clock signal when the reference clock signal is in phase with the input signal.

5,533,073

METHOD AND AN ARRANGEMENT FOR MINIMIZING A PHASE DIFFERENCE BETWEEN TWO DATASTREAMS PRIOR TO CHANGEOVER

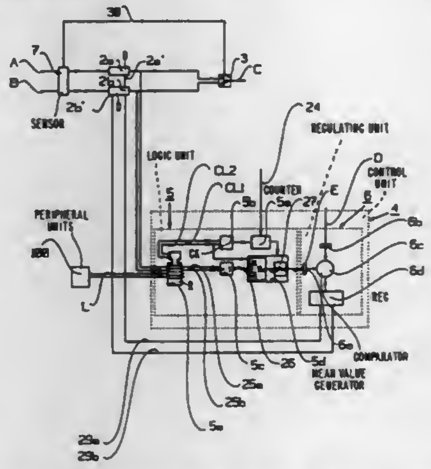
Karl Ö. Eriksson, Askim, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 26, 1993, Ser. No. 141,091

Claims priority, application Sweden, Oct. 26, 1992, 9203126

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 375—371 **16 Claims**



1. A method of minimizing a phase difference between two binary datastreams and selecting the datastream with the best signal quality comprising the steps of:

(a) determining a reference value for the phase difference;

(b) determining a numerical value representative of a total number of random samples of the binary amplitudes of the datastreams;

(c) determining time points at which the random samples of the datastreams shall be taken, the time points corresponding in number to the numerical value;

(d) taking, at each determined time point, a random sample from each of the datastreams;

(e) generating a similarity signal by establishing which random samples that are taken at the same time points have one of mutually the same and mutually different binary amplitudes;

(f) generating an actual value which corresponds to a proportion of the total number of random samples which at the determined time points have one of mutually the same and mutually different binary amplitudes;

(g) comparing the actual value with the reference value to obtain a comparison result; and

(h) in response to the comparison result, delaying the datastreams in relation to each other until the actual value and the reference value substantially agree with each other.

5,533,074

NUCLEAR REACTOR COOLANT LEVEL MONITORING SYSTEM

Timothy E. Mansell, 1480 Wire Rd., Aiken, S.C. 29801

Filed May 2, 1995, Ser. No. 432,985

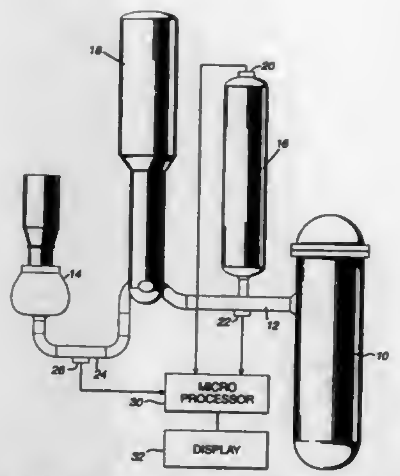
Int. Cl.^{6} G21C *17/035*

U.S. Cl. 376—258 **22 Claims**

1. An apparatus for determining a level of coolant in a nuclear reactor system, said nuclear reactor system having a pressurizer and a coolant loop, said coolant having a temperature and a density, said apparatus comprising:

first sensor means for sensing pressure in said pressurizer, said first sensor means issuing a first signal related to said pressure sensed in said pressurizer;

second sensor means for sensing pressure in said coolant loop, said second sensor means issuing a second signal related to said pressure in said coolant loop; and



controller means responsive to said first and said second sensor means for calculating said level of said coolant of said nuclear reactor from said first and said second signals.

5,533,075

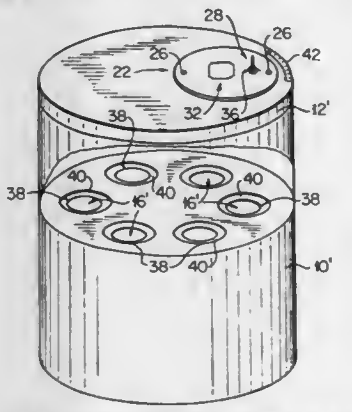
SPENT FUEL CONTAINER ALIGNMENT DEVICE AND METHOD

Stewart D. Jones, Mechanicville, and George V. Chapek, Scotia, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 7, 1995, Ser. No. 473,460

Int. Cl.^{6} G21F *5/008*

U.S. Cl. 376—272 **17 Claims**



11. A method for determining the alignment position of an access opening of a cover for a spent fuel container with respect to each of a plurality of annularly arranged fuel pockets within the spent fuel container so that spent fuel can be placed into each of said fuel pockets through said access opening, said method comprising:

preestablishing an alignment target for each of the fuel pockets;

mounting a support plate including a laser admittance window therein over the access opening of the cover of the spent fuel container;

affixing a laser to said support plate in alignment with said laser admittance window in an orientation wherein, when the laser is energized, a laser beam is directed into said container through the window;

energizing the laser and rotating the cover until the laser beam directed by the laser into said container is in alignment with the target of a first fuel pocket;

using an index ring arrangement at the top of the container to determine the angular position of the cover, and hence the relative angular alignment position of the first fuel pocket, when the laser beam is in alignment with the target of the first fuel pocket; and

repeating the process for each of the other fuel pockets.

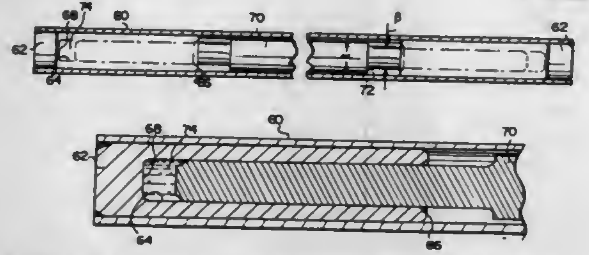
5,533,076
CONTROL ROD ABSORBER TUBE WITH INTERFERENCE FIT AND VISCOUS DAMPENING BETWEEN THE END PLUG AND ABSORBER ROD

James E. Holden, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1995, Ser. No. 488,836

Int. Cl.^{6} G21C *7/10*

U.S. Cl. 376—327 **9 Claims**



1. Joint structure for neutron-absorbing material of a control rod for a nuclear reactor, comprising:

an elongated absorber tube;

an absorber rod disposed within said absorber tube and formed of a neutron-absorbing material;

an end plug at one end of said absorber tube and having a bore opening into the interior of said tube;

said absorber rod having an end portion received within said end plug bore in an interference fit therebetween, said absorber rod having an end face spaced from a base of said bore to define a gas pocket within said bore, the interference fit between said bore and said end portion affording substantial frictional resistance to relative movement of said end plug and said absorber rod, and said gas pocket providing a viscous dampening effect upon relative movement of said end plug and said absorber rod, in response to acceleration or deceleration loads on said joint structure in an axial direction of said absorber tube and said absorber rod.

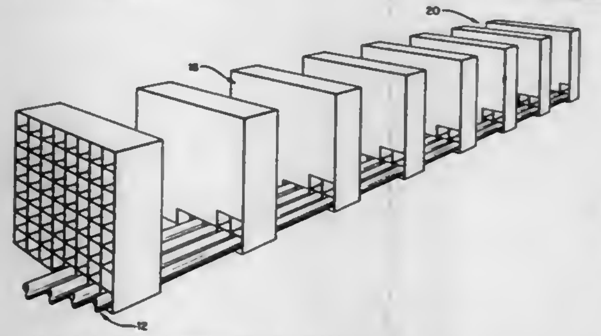
5,533,077
METHOD FOR PREVENTING SCRATCHES ON FUEL RODS DURING FUEL BUNDLE ASSEMBLY

Eric B. Johansson, Wrightsville Beach, and Edward S. Walker, Wilmington, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 142,265, Oct. 25, 1993, abandoned. This application Feb. 22, 1995, Ser. No. 389,861

Int. Cl.^{6} G21C *3/32*

U.S. Cl. 376—434 **15 Claims**



1. A method for preventing scratching of nuclear fuel rod surfaces during fuel bundle assembly, comprising the steps of:

standing a first spacer on its side atop a support surface, said first spacer having a first cell;

standing a second spacer on its side atop said support surface spaced from said first spacer by an interval, said second spacer having a first cell which is aligned with said first cell of said first spacer;

passing a leading end of a circumferentially continuous metal or alloy tube through said first cells of said first and second spacers and then stopping said tube in a temporary position such that a first portion of said tube is seated in said first cell of said first spacer and a second portion of said tube is seated in said first cell of said second spacer, wherein said tube is made of metal or alloy having a yield strength equal to at least about 140,000 psi, and said tube has a wall thickness of 0.003 to 0.006 inch and a length greater than said interval;

sliding a fuel rod inside said tube; and

removing said tube while holding said fuel rod in place.

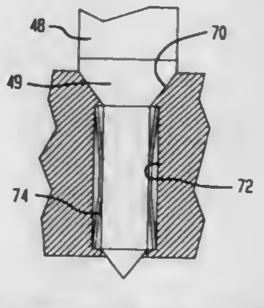
5,533,078
NUCLEAR FUEL ASSEMBLY FOR A PRESSURIZED WATER REACTOR

David W. Christiansen, Kennewick, and John W. Long, Richland, both of Wash., assignors to Siemens Power Corporation, Richland, Wash.

Filed Sep. 29, 1994, Ser. No. 314,758

Int. Cl.^{6} G21C *3/34*

U.S. Cl. 376—438 **3 Claims**



1. A nuclear fuel assembly having a predetermined overall length for a pressurized water reactor, comprising:

(a) a lower tie plate having at least one aperture;

(b) a guide tube having an upper end and a lower end, the lower end connected to the lower tie plate;

(c) spacer grids spaced along the guide tube;

(d) an upper tie plate which is attached to the upper end of the guide tube;

(e) an instrumentation tube attached at one end to the lower tie plate and attached at an opposite end to the upper tie plate;

(f) extended fuel rods which extend to the lower tie plate and which are spaced radially and supported along the guide tube by the spacer grids, at least one of the extended fuel rods having at a lower end a fuel rod lower end cap, the lower end cap being secured by a first spring which exerts a lateral force against the lower end cap within the aperture in the lower tie plate, the first spring being disposed within the aperture in the lower tie plate.

5,533,079
INVENTORY MONITORING APPARATUS

Eric R. Colburn; Max A. Fedor, both of Wexford; Robert G. Gillio, Lancaster, and Daniel W. Neu, Pittsburgh, all of Pa., assignors to MedSelect Systems, Inc., Cranberry Township, Pa.

Continuation-in-part of Ser. No. 9,055, Jan. 25, 1993, Pat. No. 5,404,384. This application Jan. 25, 1994, Ser. No. 186,285

Int. Cl.^{6} G06F *15/24*

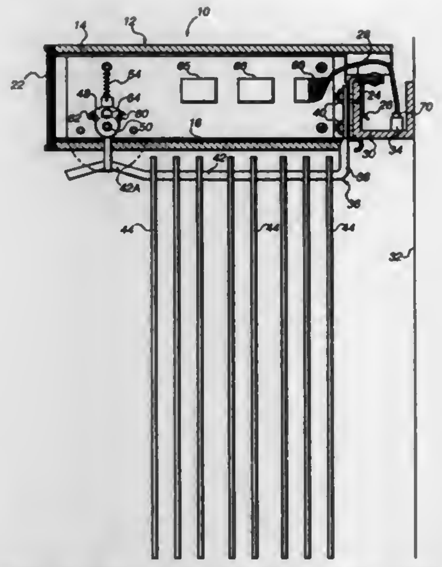
U.S. Cl. 377—6 **7 Claims**

1. Apparatus for real-time counting of objects added to or subtracted from a location having a plurality of storage sites and whose inventory is to be monitored, said apparatus comprising:

sensor means for generating a first signal indicative of an object being added to said location, a second signal indicative of an object being subtracted from said location and a third signal indicative of which of said plurality of storage sites an object was added or subtracted;

said sensor means being operable to detect movement of an object in one direction to generate said first signal, movement of an object in a generally opposite direction to generate said second signal and movement of an object in said one direction or said generally opposite direction to generate said third signal; and

means operatively connected to said sensor means for counting said signals generated by said sensor means to provide a real-time total of said objects at said location and a real-time identification as to which of said plurality of storage sites said objects are located.



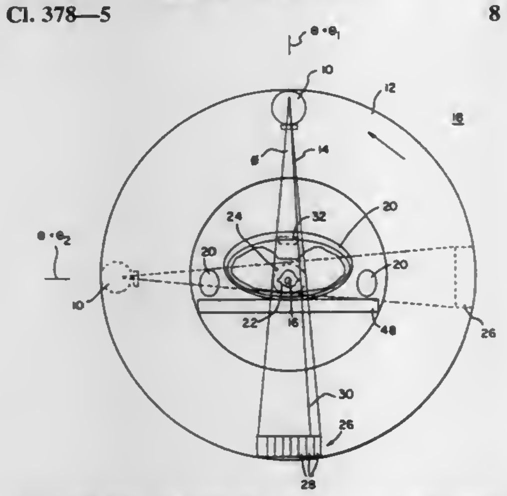
5,533,080
REDUCED FIELD-OF-VIEW CT SYSTEM FOR IMAGING COMPACT EMBEDDED STRUCTURES

Norbert J. Pelc, Los Altos, Calif., assignor to Lunar Corporation, Madison, Wis.

Continuation of Ser. No. 216,235, Mar. 22, 1994, Pat. No. 5,485,492, which is a continuation-in-part of Ser. No. 52,228, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 860,818, Mar. 31, 1992, abandoned. This application May 8, 1995, Ser. No. 438,138

Int. Cl.^{6} G01N *23/00*

U.S. Cl. 378—5 **8 Claims**



1. A CT machine for imaging bone in vivo comprising:

a patient table sized to receive and support substantially the entire extent of an adult human;

a radiation source collimated to form a beam of x-rays having a width, within a beam plane, substantially less than the width of the patient table but substantially equal to the width of a bone of a supine patient resting against the patient table within the beam plane, the radiation source providing x-rays at a first and second energy directed at the patient table;

a detector, opposing the radiation source about the patient table to produce first and second tomographic data of attenuation measurements associated with the first and energies respectively;

a computational means operating on the first and second tomographic projection set to produce a third tomographic projection set of attenuation measurements depending substantially on only the absorption of x-rays by one of two basis materials;

wherein the one basis material is bone;

means for displaying a tomographic image of bone from the third tomographic projection set.

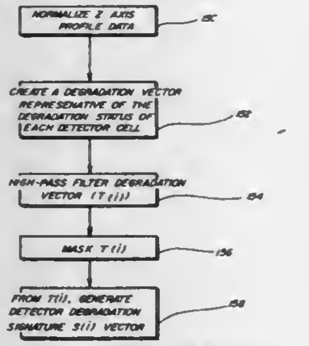
5,533,081
GUIDED RINGFIX ALGORITHM FOR IMAGE RECONSTRUCTION

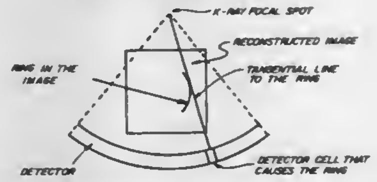
Jiang Hsieh, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Jan. 17, 1995, Ser. No. 373,410

Int. Cl.^{6} A61B *6/03*

U.S. Cl. 378—15 **13 Claims**


NORMALIZE Z AXIS PROFILE DATA
150
CREATE A DEGRADATION VECTOR REPRESENATIVE OF THE DEGRADATION STATUS OF EACH DETECTOR CELL
152
HIGH-PASS FILTER DEGRADATION VECTOR (T(i))
154
MASK T(i)
156
FROM T(i), GENERATE DETECTOR DEGRADATION SIGNATURE S(i) VECTOR
158


X-RAY FOCAL SPOT
RECONSTRUCTED IMAGE
RING IN THE IMAGE
TANGENTIAL LINE TO THE RING
DETECTOR
DETECTOR CELL THAT CAUSES THE RING

9. A system for producing a tomographic image of an object from data acquired in a helical scan, said system comprising a detector having a plurality of detector cells, a detector degradation signature (S(i)) vector being created prior to scanning a patient and stored in a memory unit of the system, said system further comprising a computer coupled to said detector and said memory unit, said computer programmed to correct the image data obtained from said detector cells for any ring error resulting from detector cell degradation by:

subsequent to scanning the patient, if the image data contains a ring error, identifying a detector cell contributing to the ring error;

determining, from the detector degradation signature vector, if the identified cell is a degraded cell; and

if the identified cell is a degraded cell, performing ring error correction processing on such data.

5,533,082
COMPUTER TOMOGRAPH

Dietrich H. W. Grönemeyer, and Rainer M. M. Seibel, both of Schulstr. 10, D-4330 Muehlheim/Ruhr, Germany

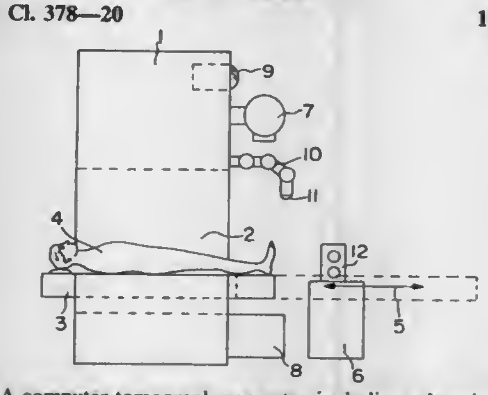
PCT No. PCT/EP92/02362, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/14697, PCT Pub. Date Aug. 5, 1993

PCT Filed Oct. 14, 1992, Ser. No. 211,470

Claims priority, application Germany, Jan. 28, 1992, 42 02 302.5

Int. Cl.^{6} A61B *17/22*

U.S. Cl. 378—20 **10 Claims**



1. A computer tomograph apparatus including a housing having a front side with a patient receiving opening in which computer-controlled scanning devices for generating computer tomograms are arranged, and having a motor-driven, computer-controlled patient gurney designed as an operating table slidably disposed therein, the patient gurney being driven from the front side of the housing, whereby an operating and treatment station for the patient is arranged in front of the front side of the housing, the station having additional diagnostic and/or intervention aids, the front side of the housing comprising:

- a plurality of information displays coupled to a computer, said displays being in the form of display screens;
- an X-ray tube disposed above the patient gurney, and an X-ray picture amplifier disposed below the patient gurney for generating an X-ray photograph of the patient for display on one of said plurality of display screens; and
- a computer controlled arm having a position indicator arranged thereon, said arm being movable on all sides, said position indicator generating at least one light beam aimed at the site of intervention or treatment on the patient's body, the position indicator being controlled depending on
- information from the computer tomograms or other patient data stored in the computer.

5,533,083
VACUUM OPTICAL SYSTEM

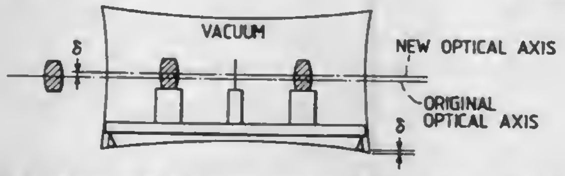
Komei Nagai, Hachiouji; Yoshinori Iketaki, Oume, and Yoshiaki Horikawa, Hachiouji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo-to, Japan

Continuation of Ser. No. 118,246, Sep. 9, 1993, Pat. No. 5,432,831. This application Apr. 28, 1995, Ser. No. 431,325

Claims priority, application Japan, Sep. 10, 1992, 4-242232; Sep. 14, 1992, 4-244841

Int. Cl.^{6} G02B *21/26*

U.S. Cl. 378—44 **20 Claims**



5. A vacuum optical system, comprising a vacuum chamber for incorporating an optical system used in a vacuum and having a predetermined accuracy, said vacuum chamber being equipped with a member, on which said optical system is at least mounted, supported by such parts that when a pressure in said vacuum chamber changes to deform said vacuum chamber, an amount of displacement transmitted to said optical system being smaller than a predetermined tolerance depending on said predetermined accuracy necessary for said optical system, and wherein a device having a moving mechanism for moving said vacuum optical system on said member on which said optical system is mounted is connected, through a power transmission mechanism having means for compensating said deformation of said vacuum chamber, with a driving mechanism for driving said moving mechanism attached to said vacuum chamber;

- wherein wavelengths of soft X rays are used, and wherein said optical system includes one soft X-ray optical element for focusing soft X rays emitted from a soft X-ray source onto an object and another soft X-ray optical element for converging one beam selected from a group including soft X rays and fluorescent X rays transmitted through said object at a predetermined position.

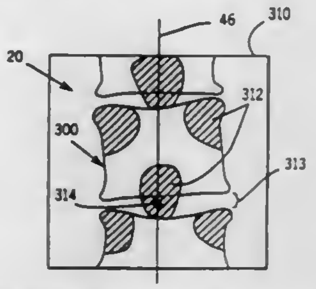
5,533,084
BONE DENSITOMETER WITH IMPROVED VERTEBRAL CHARACTERIZATION

Richard B. Mazess, Madison, Wis., assignor to Lunar Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 241,270, May 10, 1994, which is a continuation-in-part of Ser. No. 67,651, May 26, 1993, Pat. No. 5,291,537, which is a division of Ser. No. 944,626, Sep. 14, 1992, Pat. No. 5,228,068, and a continuation-in-part of Ser. No. 73,264, Jun. 7, 1992, Pat. No. 5,306,306, which is a continuation of Ser. No. 862,096, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 655,011, Feb. 13, 1991, abandoned. This application Nov. 23, 1994, Ser. No. 344,255

Int. Cl.^{6} G01B *15/02*

U.S. Cl. 378—54 **12 Claims**



1. A method of measuring bone density of vertebrae of a spine, the vertebrae including centrums of trabecular bone with rearward extending denser spinal processes, the method comprising the steps of:

- (a) scanning the vertebrae with a beam of radiation directed along an anterior-posterior axis to acquire a matrix of discrete data elements each having a value and a defined location through said vertebrae, and wherein the value of each data element is related to a physical characteristic of the material of the vertebrae at the defined location;
- (b) employing a digital computer to:
  - (1) review the values of the data elements and their defined locations to identify at least one vertebra;
  - (2) identify zones of data elements within the at least one vertebra where the data elements measure radiation substantially attenuated by the bone of both the centrum and the spinal processes;
  - (3) exclude the zones identified in step (b)(2) from a calculation of the physical characteristic of the material of the at least one vertebra; and
- (c) display the measure of the physical characteristic determined in step (3).

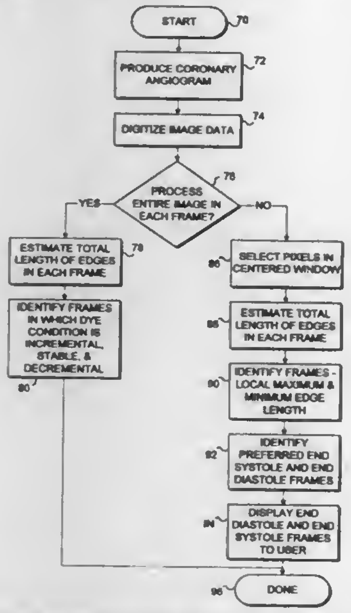
5,533,085
AUTOMATIC INDEXING OF CINE-ANGIOGRAMS

Florence H. Sheehan, Mercer Island; Gregory L. Zick, Kirkland, and Hain-Ching H. Liu, Seattle, all of Wash., assignors to University of Washington, Seattle, Wash.

Filed Feb. 27, 1995, Ser. No. 395,034

Int. Cl.^{6} H65G *1/60*

U.S. Cl. 378—95 **36 Claims**



START
70
PRODUCE CORONARY ANGIOGRAM
72
DIGITIZE IMAGE DATA
74
PROCESS ENTIRE IMAGE IN EACH FRAME?
76
YES
NO
ESTIMATE TOTAL LENGTH OF EDGES IN EACH FRAME
78
IDENTIFY FRAMES IN WHICH DYE CONDITION IS INCREMENTAL, STABLE, & DECREMENTAL
80
SELECT PIXELS IN CENTERED WINDOW
86
ESTIMATE TOTAL LENGTH OF EDGES IN EACH FRAME
88
IDENTIFY FRAMES - LOCAL MAXIMUM & MINIMUM EDGE LENGTH
90
IDENTIFY PREFERRED END SYSTOLE AND END DIASTOLE FRAMES
92
DISPLAY END DIASTOLE AND END SYSTOLE FRAMES TO USER
94
DONE
96

1. A method for automatically selecting specific images from a plurality of images produced during a coronary angiography procedure, said specific images that are selected depicting a defined portion of a cardiac cycle, said method comprising the steps of:

- (a) providing digital data representing each of the plurality of images, said digital data including digital values for each of a plurality of picture elements comprising each image;
- (b) using the digital data for each image, determining a total length of edges in at least a portion of each image, by detecting differences in the digital data for picture elements disposed on opposite sides of an edge; and
- (c) as a function of the total length of the edges in each image, selecting the specific images that depict the defined portion of the cardiac cycle from the plurality of images.

35. A method for selecting specific frames from an angiography sequence, comprising the steps of:

- (a) providing digital data corresponding to a plurality of images of a coronary artery made sequentially in time during the angiography sequence, said digital data indicating gray scale values for a plurality of pixels comprising the images;
- (b) using the digital data, estimating a parameter indicative of a separation between branches of the coronary artery in the images over time; and
- (c) in response to the separation between the branches of the coronary artery that occur during the angiography sequence, selecting the specific frames.

5,533,086
X-RAY EXAMINATION APPARATUS

Wilhelmus A. Crins; Wilhelmus M. J. A. Van Den Berk; Eric A. Von Reth, and Hermanus P. M. Rijpert, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

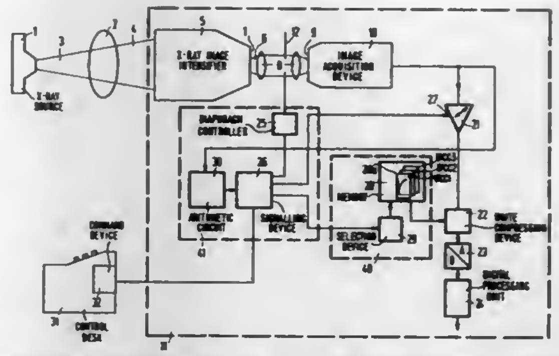
Filed Jan. 3, 1994, Ser. No. 176,626

Claims priority, application European Pat. Off., Jan. 4, 1993, 93200007

Int. Cl.^{6} H04N *1/00*

U.S. Cl. 378—98.2 **11 Claims**

1. An x-ray examination apparatus comprising an x-ray source for producing an x-ray image by irradiating an object, an imaging arrangement incorporating an x-ray image intensifier, an image acquisition device for acquiring an image produced on an output screen of the image intensifier and producing a primary video signal, imaging control means for adjusting imaging parameters, a video amplifier for converting the primary video signal into an amplified video signal, said video amplifier having a control input being coupled to the imaging control means for adjusting an amplification ratio of the video amplifier in dependence on an average value of signal amplitudes of the primary video signal, an analog-to-digital converter having an input range and a white compression device for matching a dynamic range of the amplified video signal to the input range of the analog-to-digital converter, and white-compression adjustment means for adjusting the amount of white-compression produced by the white-compression device in dependence on the primary video signal.



5,533,087
X-RAY IMAGING SYSTEM INCLUDING BRIGHTNESS CONTROL

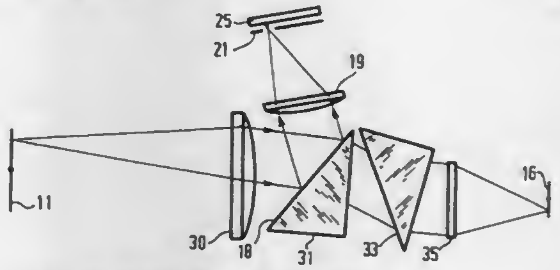
Rudolph M. Snoeren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 993,341, Dec. 18, 1992. This application Sep. 28, 1994, Ser. No. 314,037

Claims priority, application European Pat. Off., Dec. 19, 1991, 91203356

Int. Cl.^{6} H05G *1/64*

U.S. Cl. 378—98.3 **12 Claims**



1. An X-ray imaging system, comprising:

- an X-ray source for emitting an X-ray beam capable of forming an X-ray image after irradiation of an object to be arranged within the X-ray beam,
- an X-ray detector for converting the X-ray image into an optical image on an exit screen,
- a control unit for controlling the X-ray source,
- image conversion means for converting said optical image into an electronic image, said image conversion means including an image conversion element having an input optical surface, said input optical surface having a primary function of transmitting incident image light received from said exit screen into said image conversion element for image conversion thereof and having an incidental function of reflecting a portion of said incident image light, and
- means for directing said portion of said incident image light reflected by said input optical surface onto a photosensitive sensor connected to said control unit for supplying a sensed signal to said control unit.

5,533,088

METHOD OF COMPENSATING FOR RADIATION SCATTER IN AN X-RAY IMAGING SYSTEM

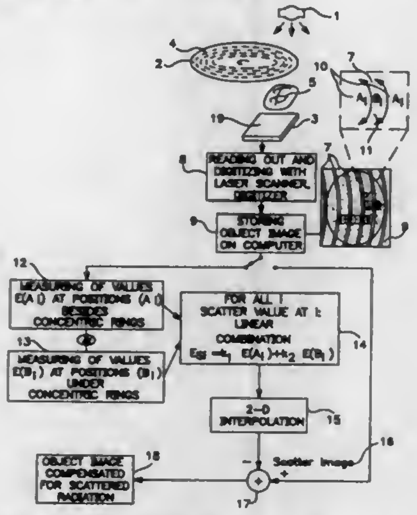
Christiaan Fivez, Heverlee, Belgium, assignor to AGFA-Gevaert, Mortsel, Belgium

Filed Jun. 6, 1995, Ser. No. 465,838

Claims priority, application European Pat. Off., Jun. 23, 1994, 94201801

Int. Cl.^{6} H05G *1/64*

U.S. Cl. 378—98.4 **6 Claims**


1
4
2
10
7
5
19
3
A1
B1
A1
7
11
8
READING OUT AND DIGITIZING WITH LASER SCANNER DIGITIZER
9
STORING OBJECT IMAGE ON COMPUTER
12
MEASURING OF VALUES E(A i) AT POSITIONS (A i) BESIDES CONCENTRIC RINGS
13
MEASURING OF VALUES E(B1) AT POSITIONS (B1) UNDER CONCENTRIC RINGS
FOR ALL i SCATTER VALUE AT i: LINEAR COMBINATION Esi = k1 E(A1)+k2 E(B1)
14
2-D INTERPOLATION
15
16
Scatter Image
OBJECT IMAGE COMPENSATED FOR SCATTERED RADIATION
18
17

1. A method of compensating for scattered radiation in a 2-dimensional x-ray system comprising the steps of:

exposing an object and a radiation shield comprising a plurality of X-ray opaque bodies, to x-rays emitted by an x-ray source during an exposure time T, the shield being positioned between said x-ray source and said object, so that during a known fraction f_j ($f_j>0$ and $f_j<1$) of said exposure time T a plurality of areas j of said object are temporarily shielded by said opaque bodies,

exposing a two-dimensional radiation detector to x-rays transmitted by a combination of said object and said shield during said exposure time T,

measuring radiation E_1 received by said detector at temporarily shielded areas j of said radiation detector,

measuring radiation E_2 received by said detector in areas closely adjacent to said temporarily shielded areas j that have not been shielded by said opaque bodies during said exposure time T,

calculating radiation scatter values E_s received by said detector at said temporarily shielded areas j of said radiation detector, by using said fraction f_j of said exposure time T and said measured radiation E_1 and said measured radiation E_2,

calculating radiation scatter values for all areas of said detector means by interpolating the calculated radiation scatter values E_s,

measuring radiation received by said radiation detector at all areas of said radiation detector where it has not yet been measured, and

subtracting interpolated radiation scatter values from the measured radiation values for all areas of said radiation detector.

5,533,089

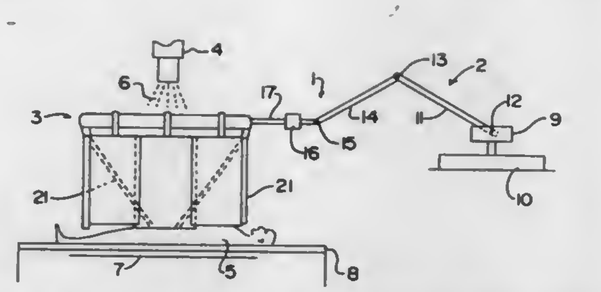
X-RAY COLLIMATING AND BODY SHIELDING ACCESSORY INSTRUMENT

Phoebe Mulhern, 162 Pawnee St., Ronkonkoma, N.Y. 11779

Filed Feb. 6, 1995, Ser. No. 383,977

Int. Cl.^{6} G21K *1/02*

U.S. Cl. 378—150 **11 Claims**



1. An instrument comprising a unit having a central aperture, and manually operable rack means supporting said unit for locating the aperture of the unit between a subject and a radiological source, said unit being positionable proximal to the subject and independent of said source for the purpose of exposing a desired area of the subject to radiological exposure while shielding its surrounding areas, and wherein radio-opaque shutters hinged to the unit are manipulative to obtain adjustments in the size, shape and perimeter of said aperture for radiological exposure of the desired area of the subject, wherein the unit has a multisided frame defining the aperture, and the radio-opaque shutters are hinged to sides of the frame, wherein the shutters are flexible, and wherein an x-ray photographic film is disposed below the subject, translucent perforations are provided along the bottom sides of the shutters, which sides are opposite to and facing the hinged sides, and x-rays passing through the perforations and registered upon the film provide a scale indication of the size of the aperture.

5,533,090

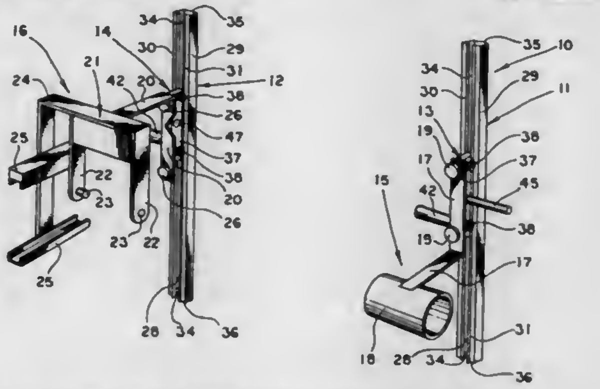
APPARATUS FOR ADJUSTING AND ALIGNING THE POSITION OF X-RAY EQUIPMENT

Richard C. Nyzen, 620 Merriman Rd., Akron, Ohio 44303

Filed Nov. 7, 1994, Ser. No. 335,165

Int. Cl.^{6} H05G *1/02*

U.S. Cl. 378—197 **20 Claims**



1. An x-ray system adapted to be mounted on one wall of a room comprising a first track adapted to be mounted on the wall, a second track adapted to be mounted on the wall spaced from and parallel to said first track, first traveller means moveable on and carried by only said first track and adapted to carry an x-ray source positioner, second traveller means moveable on and carried by only said second track and adapted to carry an x-ray receiver, means to align said first and second traveller means, and means to hold said first and second traveller means at their aligned position.

5,533,091

NOISE SUPPRESSION ALGORITHM AND SYSTEM

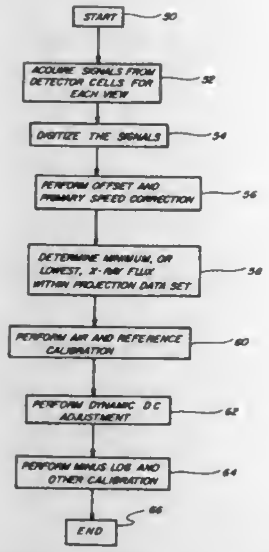
Jiang Hsieh, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Apr. 28, 1995, Ser. No. 430,435

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 378—210 **20 Claims**

1. A method for generating an image from projection data obtained in a CT scan, the projection data being collected in projection data sets, each projection data set corresponding to one view, said method comprising the steps of:


START
50
ACQUIRE SIGNALS FROM DETECTOR CELLS FOR EACH VIEW
52
DIGITIZE THE SIGNALS
54
PERFORM OFFSET AND PRIMARY SPEED CORRECTION
56
DETERMINE MINIMUM, OR LOWEST, X-RAY FLUX WITHIN PROJECTION DATA SET
58
PERFORM AIR AND REFERENCE CALIBRATION
60
PERFORM DYNAMIC DC ADJUSTMENT
62
PERFORM MINUS LOG AND OTHER CALIBRATION
64
END
66

determining a minimum value X-ray beam flux for a projection data set for a view; and

adjusting the projection data of the projection data set in accordance with the following:

$$P_k=P_k-\zeta_k\gamma w_k$$

where ζ_k is a function of minimum flux, γ is a scaling factor, w_k is a weighting factor and P_k represents the view number k.

5,533,092

ORDER WIRE IN TELEPHONE COMMUNICATION SYSTEM

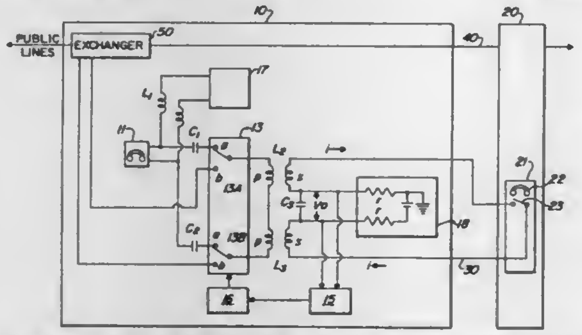
Shinzi Kaziwara, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Feb. 18, 1993, Ser. No. 18,824

Claims priority, application Japan, Feb. 24, 1992, 4-035502

Int. Cl.^{6} H04M *1/24;3/08;3/22*

U.S. Cl. 379—21 **3 Claims**



1. An order wire circuit, installed in addition to a trunk connecting a master station and a dependent station in a telephone system, comprising:

a first telephone terminal located in the master station;

a second telephone terminal located in the dependent station;

a telephone line connecting said first and second telephone terminals;

hooking detection means installed in said master station, for specifically detecting a hook state operation initiated in the dependent station by an operator of said second telephone terminal;

switching means for switching said telephone line from said first telephone terminal to a public line when said hook state operation initiated in the dependent station by an operator, is specifically detected.

5,533,093

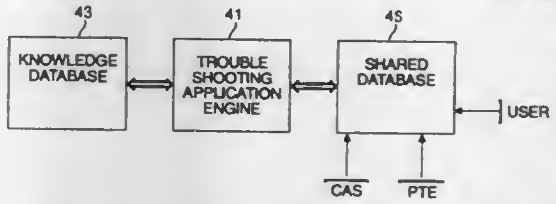
AUTOMATED TROUBLE-SHOOTING MECHANISM RESIDENT IN CRAFTSPERSON'S PORTABLE TEST AND COMMUNICATIONS DEVICE

Michael D. Horton, Ojai; Onofrio Schillaci, Camarillo, and Raymond W. Rischpater, Felton, all of Calif., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 235,317, Apr. 29, 1994. This application Nov. 14, 1994, Ser. No. 343,699

Int. Cl.^{6} H04M *1/24*

U.S. Cl. 379—21 **25 Claims**



6. A supervisory control mechanism, which is contained in a portable test unit employed by a craftsperson to test a communication line, said supervisory control mechanism comprising an information processing, trouble-shooting application engine, and first and second databases coupled thereto, said first database being a knowledge database containing rules and static parameters which define the characteristics and behavior of said application engine, said second data base being a shared database which stores parameter data associated with one or more tests conducted on said line, said trouble-shooting application engine being operative to analyze multiple sources of information, including user inputs from said craftsperson, parametric data embedded in a problem dispatch, test data obtained through the execution of local tests, and remote test data, and to derive therefrom a trouble-shooting strategy that is output to said craftsperson, so as to enable said craftsperson to locate the cause of a problem that gave rise to the generation of said problem dispatch.

5,533,094

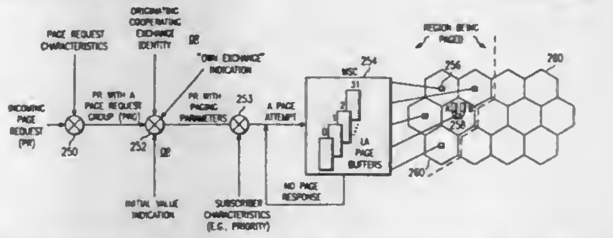
ALLOCATION OF PAGING CAPACITY IN CELLULAR APPLICATIONS BY STORING A SET OF PAGE REQUEST GROUP DESIGNATIONS, PAGING EXTENTS AND PAGING PRIORITY PARAMETERS

K. Raj Sanmugam, Montreal, Canada, assignor to Telefonaktiebolaget L M Ericsson, A Corp. of Sweden, Stockholm, Sweden

Filed May 12, 1992, Ser. No. 881,598

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 379—57 **21 Claims**


PAGE REQUEST CHARACTERISTICS
ORIGINATING COOPERATING EXCHANGE IDENTITY
"OWN EXCHANGE" INDICATION
REGION BEING PAGED
INCOMING PAGE REQUEST (PR)
PR WITH A PAGE REQUEST GROUP (PRG)
PR WITH PAGING PARAMETERS
A PAGE ATTEMPT
250
252
253
254
256
258
260
280
MSC
LA PAGE BUFFERS
NO PAGE RESPONSE
INITIAL VALUE INDICATION
SUBSCRIBER CHARACTERISTICS (E.G., PRIORITY)

1. A method of paging mobile stations within a cellular telecommunications exchange comprising:

storing a set of own exchange page request group designations, paging extents and paging priority parameters for paging requests from uncooperating exchanges;

assigning to each page request received by said exchange a page request group designation based upon the characteristics of the page request, said characteristics of said page request including indications of a most probably location and an alternative location of the mobile station to which the page is directed;

assigning to each of said page requests received a paging extent designation to be associated with one or more page attempts and representing the geographic area within the exchange to which each page attempt is to be broadcast;

assigning to each page attempt in response to said page request a paying priority which is related to the page request group designation and the paging extent designation, of said page request;

retrieving said own exchange paging parameters in the event the page request is received from an uncooperating exchange causing the foregoing steps of assigning to fail; and

executing each page attempt within said telecommunications exchange in a sequential order based upon its assigned paging priority.

5,533,095

DATA TRANSFER SYSTEM

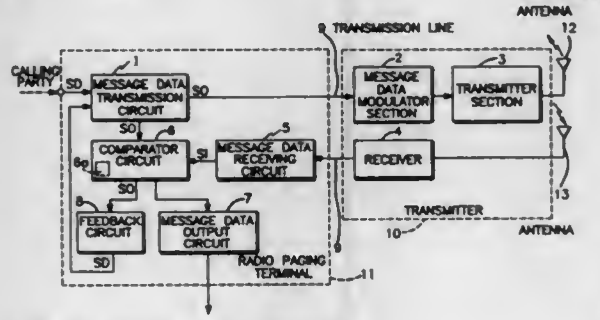
Hirofumi Kikuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1993, Ser. No. 137,266

Claims priority, application Japan, Oct. 21, 1992, 4-282621

Int. Cl.^{6} H04Q *7/10*

U.S. Cl. 379—57 **4 Claims**



3. A data transfer system comprising:

a radio paging terminal including a message data transmission circuit for transmitting message data inputted by a calling party to a transmission line; and

a transmitter whose input is connected to said transmission line, said transmitter comprising a modulator section for modulating said message data input to said transmission line and a transmitter section connected to said modulator section for transmitting said modulated message data;

said transmitter further including:

a receiver within said transmitter for simultaneously receiving radio waves radiated from said transmitter section and for demodulating said received radio waves as received message data, an output of said receiver being connected to said radio paging terminal;

said radio paging terminal further comprising:

a message data receiving circuit whose input is connected to said output of said receiver for receiving the message data received by said receiver;

a comparator circuit for comparing the received message data with the message data transmitted by said message data transmission circuit; and

a feedback circuit connected to said comparator circuit for feeding the message data back to said message data transmission circuit for retransmission of said message data to said transmitter when said comparator determines that there is a difference between the message data received from said message data receiving circuit and the message data transmitted from said message data transmission circuit.

5,533,096

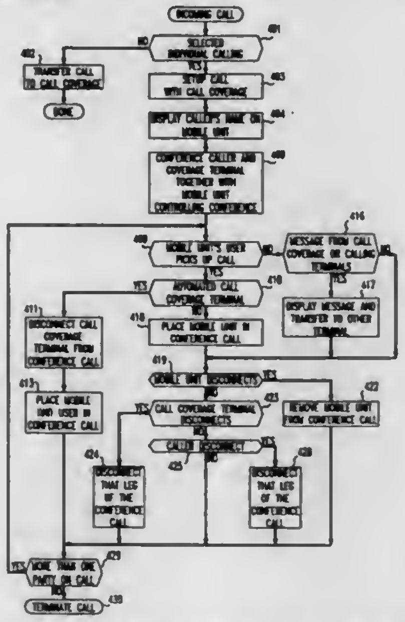
SEND-ALL-CALLS FEATURE FOR A WIRELESS HANDSET

Bruce M. Bales, Louisville, Colo., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 76,564, Jun. 14, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,936

Int. Cl.^{6} H04Q *7/38;* **H04M** *3/54*

U.S. Cl. 379—58 **12 Claims**


INCOMING CALL
401
SELECTED INDIVIDUAL CALLING
NO
YES
402
TRANSFER CALL TO CALL COVERAGE
DONE
403
SETUP CALL WITH CALL COVERAGE
404
DISPLAY CALLER'S NAME ON MOBILE UNIT
406
CONFERENCE CALLER AND COVERAGE TERMINAL TOGETHER WITH MOBILE UNIT CONTROLLING CONFERENCE
416
408
MOBILE UNIT'S USER PICKS UP CALL
MESSAGE FROM CALL COVERAGE OR CALLING TERMINALS
410
417
DISPLAY MESSAGE AND TRANSFER TO OTHER TERMINAL
411
DISCONNECT CALL COVERAGE TERMINAL FROM CONFERENCE CALL
418
PLACE MOBILE UNIT IN CONFERENCE CALL
419
MOBILE UNIT DISCONNECTS
413
PLACE MOBILE UNIT USER IN CONFERENCE CALL
422
REMOVE MOBILE UNIT FROM CONFERENCE CALL
423
CALL COVERAGE TERMINAL DISCONNECTS
CALLER DISCONNECT
424
425
428
DISCONNECT THAT LEG OF THE CONFERENCE CALL
DISCONNECT THAT LEG OF THE CONFERENCE CALL
429
MORE THAN ONE PARTY ON CALL
430
TERMINATE CALL

7. A method for providing a send-all-call operation by a called telephone terminal and the called telephone terminal for connection to a telecommunication switching system, the method comprising:

receiving a call setup message from the telecommunication switching system indicating that a call is being established from a calling telecommunication terminal and the call setup message having caller identification information identifying the calling telecommunication terminal;

establishing a call connection between the calling telecommunication set and a call coverage terminal through the telecommunication switching system with the call connection being controlled by the called telephone terminal which is a handheld wireless mobile telephone unit if the caller identification information is found in a table defining selected individuals;

transferring the call to the call coverage terminal via the telecommunication switching system if the caller identification information is not found in the table defining selected individuals; and

the establishing step comprises the steps of receiving call control messages from the calling telephone terminal and relaying the call control messages from the calling telephone terminal to the call coverage terminal via the telecommunication switching system and receiving call control messages from the call coverage terminal and relaying the call control messages from the call coverage terminal to the calling telephone terminal via the telecommunication switching system for the duration of the call.

5,533,097

PORTABLE COMMUNICATION SYSTEM COMPRISING A LOCAL AND WIDE AREA COMMUNICATION UNITS WHICH CAN STORE A COMMUNICATION WHEN THE WIDE AREA COMMUNICATION SYSTEM IS NOT AVAILABLE

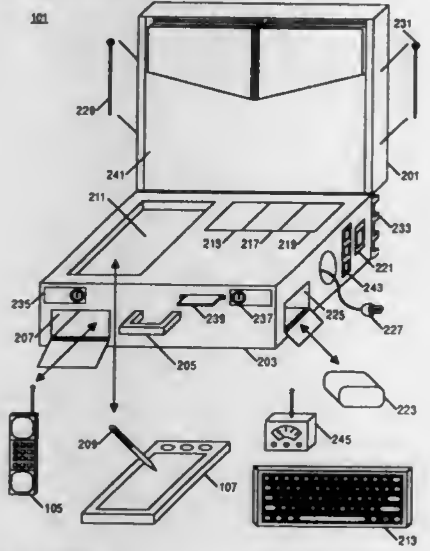
Eric K. Crane, Wheaton; David E. Morgan, Lisle, both of Ill., and Neil Wellenstein, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 842,277, Feb. 26, 1992, abandoned. This application Dec. 8, 1993, Ser. No. 164,871

Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 379—58 **37 Claims**

35. A communication system, comprising:



a portable housing;

a local-area wireless communication unit disposed in the portable housing including a transceiver to communicate with a plurality of local-area wireless personal communication devices, wherein at least some of the personal communication devices are different from one another;

a wide-area communication unit disposed in the portable housing including a transceiver to communicate with at least one wide-area communication system;

control means disposed in the portable housing for selectively controlling the local-area wireless communication unit and the wide-area communication unit;

means, disposed in the portable housing, for storing a communication when a wide-area communication system is not available to the wide-area communication unit; and

means for forwarding the communication when the wide-area communication system becomes available to the wide-area communication unit.

5,533,098

WIDE-AREA-NETWORK TRUNKED RADIO SYSTEM WHICH CONTROLS THE SIGNAL LEVEL OF A SPECIFIC WIRELESS VOICE CHANNEL OF A LOCAL AREA NETWORK TRUNKED RADIO SYSTEM

Won-cheon Lee, Seoul, Rep. of Korea, assignor to Goldstar Information & Communications, Ltd., Seoul, Rep. of Korea

Filed Sep. 7, 1994, Ser. No. 301,793

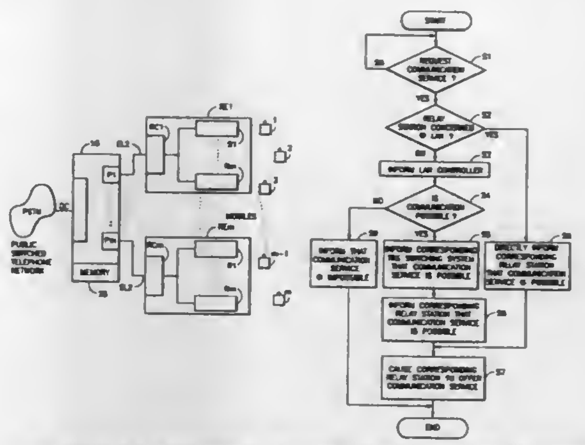
Claims priority, application Rep. of Korea, Sep. 15, 1993, 1993-18580

Int. Cl.^{6} H04Q *7/28*

U.S. Cl. 379—58 **9 Claims**

1. A wide-area-network (WAN) trunked radio system (TRS) comprising:

a plurality of local-area-network (LAN) TRSs for providing mobiles located in a predetermined area with selective wireless communication service and wireless communication signal level in accordance therewith, and outputting relevant information, on the wireless communication signal level and wireless communication service to said mobiles via a first exclusive line;


PSTN
PUBLIC SWITCHED TELEPHONE NETWORK
MEMORY
MOBILES
START
REQUEST COMMUNICATION SERVICE ?
YES
NO
RELAY STATION CONCERNED IN LAN ?
INFORM LAN CONTROLLER
IS COMMUNICATION POSSIBLE ?
INFORM THAT COMMUNICATION SERVICE IS IMPOSSIBLE
THAT COMMUNICATION SERVICE IS POSSIBLE
DIRECTLY INFORM CORRESPONDING RELAY STATION THAT COMMUNICATION SERVICE IS POSSIBLE
INFORM CORRESPONDING RELAY STATION THAT COMMUNICATION SERVICE IS POSSIBLE
CAUSE CORRESPONDING RELAY STATION TO OFFER COMMUNICATION SERVICE
END

a LAN TRS information memory for storing the relevant information of said respective LAN TRSs which is output on said first exclusive line; and

a LAN TRS controller means, connected to said first exclusive line and said LAN TRS information memory, for storing the information supplied from said first exclusive line in said LAN TRS information memory, and for analyzing the stored information and providing instructions to said LAN TRSs for controlling the signal level of a specific wireless voice channel and the offering of wireless communication service to a specific mobile via said first exclusive line.

5,533,099

MULTI-MODE RADIO TELEPHONE

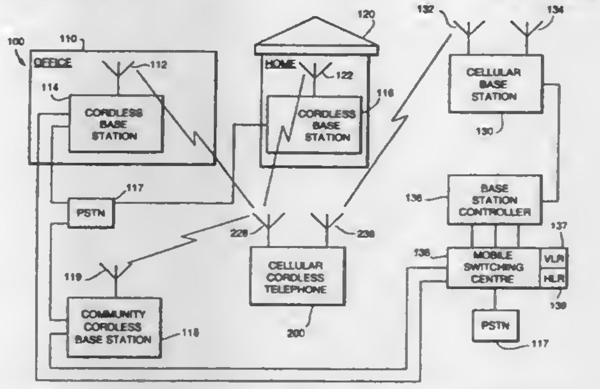
John D. Byrne, Shepperton, United Kingdom, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Mar. 21, 1995, Ser. No. 407,682

Claims priority, application United Kingdom, Mar. 22, 1994, 9405659

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 379—58 **10 Claims**



1. A radio telephone operative in two radio telephone systems in each of which transmission and reception occur in time slots, the radio telephone comprising first means for predicting the temporal overlap or coincidence of receive and transmit slots in the two systems and second means, responsive to the first means, for avoiding or reducing the interference consequent upon the predicted overlap or coincidence.

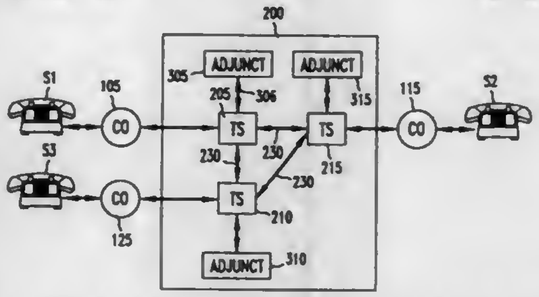
5,533,100
COMMUNICATIONS SYSTEM CALL COMPLETE ARRANGEMENT

Saundra V. Bass, Somerset; Donald L. Blosser, Freehold; Andre K. Crump, Summit; David B. Kerr, Fogelsville; Frank C. LaPorta, Millington; Ted M. Ricci, Atlantic Highlands, and William H. Stenger, Sr., Marlboro, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jul. 29, 1994, Ser. No. 282,450

Int. Cl.^{6} H04M ***1/64***

U.S. Cl. 379—67 **6 Claims**



1. A method of processing a telephone call from a calling telephone station to a called telephone station, said calling telephone station being associated with a particular telephone number, said call being routed over a telephone network, said method comprising the steps of

receiving said telephone from said calling station and determining if said called telephone station is busy,

if said called telephone station is not busy, then connecting said calling telephone station to said called telephone station via said telephone network,

if said called telephone station is busy, storing said calling telephone number and at least the time of said telephone call in memory and terminating said telephone call, and

following an expiration of a predetermined period of time, placing a telephone call to said called telephone station and presenting said stored calling telephone number and said time of said telephone call to a user associated with said called telephone station, and wherein said step of terminating includes the step of

responsive to said calling number including a country code, announcing to a calling party at said stored calling station the time for said call at said called station.

5,533,101
EXTENSION PHONE TYPE CORDLESS TELEPHONE SET

Shozo Miyagawa, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto, Japan

Filed Jul. 28, 1994, Ser. No. 281,696

Claims priority, application Japan, Jul. 28, 1993, 5-186126

Int. Cl.^{6} H04M ***11/00***

U.S. Cl. 379—61 **6 Claims**

1. An extension phone cordless telephone comprising:

a terminating set operative from power supplied from a commercial power line;

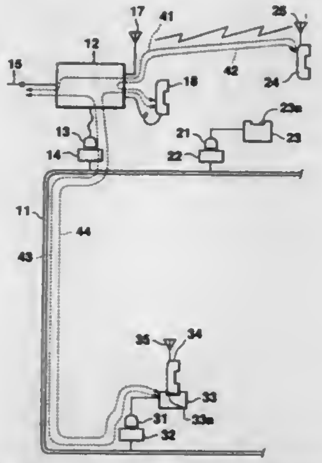
a plurality of branch sets, each branch set including an associated stand, said stand operating using power from said commercial power line;

said terminating set including:

a terminating set radio communication circuit including a radio transceiver operating to effect radio communication with one of said branch sets; and

a terminating set wire communication circuit including a wire line communication transceiver operating to effect wire communication with one of said branch sets using a signal superimposed on said commercial power line;

each stand including:



a branch set connecting portion for transmitting and receiving at least a transmission/reception signal and a control signal to and from said branch sets; and

a stand wire communication circuit including a wire line communication transceiver operating to effect communication using a signal superimposed on said commercial power line with said terminating set wire communication circuit;

each of said plurality of branch sets including:

a branch set communication circuit, including a radio communication circuit operating to communicate with said radio transceiver in said terminating set via wireless communications;

a stand connecting portion for connecting with said stand; and

a communication controller, controlling said stand wire communication circuit and said branch set communication circuit, such that only one branch set can communicate via wireless communications with said terminating set, and another branch set can communicate via said wire communications with said terminating set while said one branch set is communicating via wireless communications.

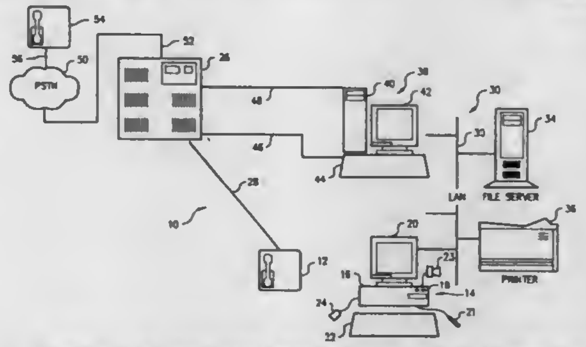
5,533,102
TELEPHONE AUTO ATTENDANT SYSTEM FOR DELIVERING CHOSEN GREETINGS TO CALLERS WHILE ON THE PHONE

Michael J. Robinson, and Robert C. Greco, both of Seattle, Wash., assignors to Active Voice, Seattle, Wash.

Continuation of Ser. No. 125,606, Sep. 22, 1993, abandoned. This application May 24, 1995, Ser. No. 449,569

Int. Cl.^{6} H04M ***11/06***

U.S. Cl. 379—67 **32 Claims**



1. A method for processing an incoming call in a telephonic system, the system including a visual display visible to a user, whereby the user is provided with information about a telephone call received by the system from a caller, which call is directed to the user, and the user is given a choice of possible responses for handling the call while the user is presently engaged in on-going voice communications with a first party via a first telephonic communication channel, the method comprising the steps of:

(a) establishing a second communication channel between the telephonic system and the user's display while leaving the on-going voice communications via the first telephonic communication channel intact;

(b) transmitting a message from the telephonic system to the user's display over the second communication channel, the message including visual symbols representing information concerning the telephone call and displaying the visual symbols on the display;

(c) making available to the user a possible response to the message which response consists of choosing one of a plurality of greetings to be audibly played to the caller;

(d) the telephonic system receiving from the user a response indicating the user's chosen greeting, the response being given by the user through an input device; and

(e) audibly playing the chosen greeting to the caller.

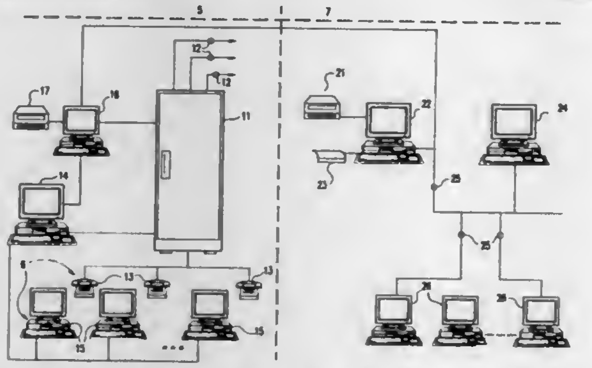
5,533,103
CALLING SYSTEM AND METHOD

Stephen D. Peavey, Meriden; James E. Ogden, New Fairfield; William J. Hoyt, Middletown; Ino Dunn, Norwalk; Paul E. Zmuda, Stratford; David A. Jamroga, Stamford, all of Conn., and Jacob W. Jorgensen, Teaneck, N.J., assignors to Electronic Information Systems, Inc., Stamford, Conn.

Continuation of Ser. No. 234,484, Apr. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 473,941

Int. Cl.^{6} H04M ***11/10***

U.S. Cl. 379—69 **1 Claim**



1. An automated calling system which stores a digital voice record of at least a portion of a conversation between an agent and a customer from which digital voice record an audible version of said conversation can be recreated for verification of a data input by the agent to a customer record in response to the conversation, comprising in combination:

an agent telephone set, and an agent station including an agent data input means, and an agent data display means;

call processor means;

call manager means;

a first data link establishing a two way data communications link between said call manager means and said agent data input means and said agent data display means;

a second data link establishing two way data communications between said call processor means and said call manager means;

said call processor means connecting a telephone trunk to said agent telephone set to establish a two way voice communication link between the customer and the agent telephone set;

means to store customer records;

said call manager means transmitting over said first data link customer record data to said agent data display means from said means to store customer records and storing, in said means to store customer records, changes to said customer data inputted from said agent data input means;

a digital voice recorder means;

a voice communications link between said call processor means and said digital voice recorder means;

said call manager means transmitting over said second data link a begin recording command, to said call processor means in response to an input to begin recording from said agent station to said call manager means over said first data link;

said call processor means transmitting said at least a portion of said conversation between the agent and the customer over said voice communications link to said digital voice recorder means;

said call manager means transmitting a customer identifier and an agent identifier to said digital voice recorder means; and

said digital voice recorder means recording said digital voice record of said at least a portion of said conversation, along with said customer identifier and said agent identifier.

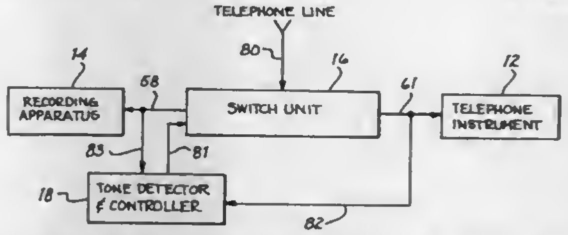
5,533,104
TELEPHONE ANSWERING DEVICE AND METHOD

Mark H. Weiss, 49 Bilmore Estates, Phoenix, Ariz. 85016; Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230, and Harry M. Weiss, 49 Biltmore Estates, Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 719,820, Jun. 24, 1991, abandoned. This application Oct. 14, 1992, Ser. No. 961,071

Int. Cl.^{6} H04M ***9/06;11/10***

U.S. Cl. 379—70 **8 Claims**



1. A telephone answering device comprising, in combination:

a telephone instrument;

at least one message recording machine;

person actuated switching means coupled to the telephone instrument and to the message recording machine for permitting a person who answers an incoming call via the telephone instrument switch the incoming call from the telephone instrument to the message recording machine, wherein the message recording machine can record a message from a calling party after disconnecting the telephone instrument from the incoming call to prevent the person from both recording and hearing over the telephone instrument the message from the calling party that is being recorded on the message recording machine; and

tone detector and controller means coupled to the telephone instrument, to the person actuated switching means and to the message recording machine for automatically coupling a telephone line over which the incoming call is received, through the person actuated switching means, to the message recording machine in response to a predetermined tone code received during the incoming call, irrespective of the most recently manually effected condition of the person actuated switching means.

5,533,105
METHOD AND APPARATUS FOR EMULATING A TELEPHONE WITH A MODEM AND HEADSET

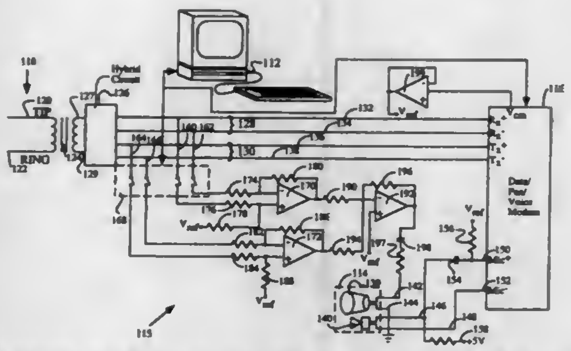
Paul M. Brown, Morgan Hill; Shahin Hedayat, San Ramon, and George V. Urbani, Morgan Hill, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 15, 1993, Ser. No. 121,615

Int. Cl.^{6} H04M ***11/00;1/64;1/00***

U.S. Cl. 379—93 **21 Claims**

1. An apparatus for connecting to a telephone line, said apparatus comprising:



a modem including a receive line for receiving information from said telephone line and a transmit line for transmitting information to said telephone line, said receive and transmit lines each including separate tip and ring lines;

an acoustic transducer device for receiving and producing sounds; and

a connection circuit including:

a first amplifier for receiving signals from said transmit line, said first amplifier having first and second input nodes connected through a switch to said tip and ring lines, respectively, of said transmit line;

a second amplifier for receiving signals from said receive line, said second amplifier having first and second input nodes connected through a switch to said tip and ring lines, respectively, of said receive line; and

a third amplifier for receiving outputs from said first and second amplifiers said third amplifier having a first input node connected to outputs of said first and second amplifiers and having a second input node connected to a reference voltage, an output of said third amplifier being received by said acoustic transducer device, said first, second and third amplifiers being differential amplifiers.

5,533,106

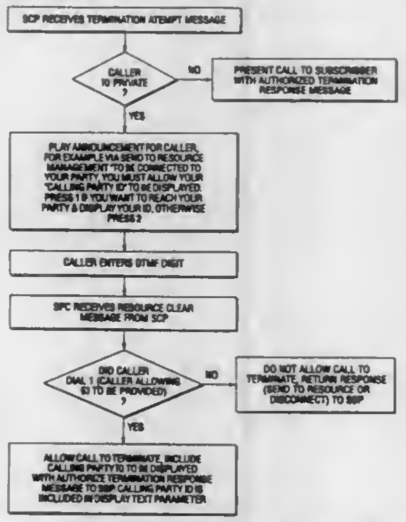
METHOD AND SYSTEM FOR PROCESSING CALLS WHEREIN THE DISPLAY OF CALLING PARTY ID INFORMATION HAS BEEN INHIBITED

Mark S. Blumhardt, Niwot, Colo., assignor to US WEST Technologies, Inc., Boulder, Colo.

Filed Jun. 27, 1994, Ser. No. 267,090

Int. Cl.^{6} H04M *15/00;1/56*

U.S. Cl. 379—142 **7 Claims**


SCP RECEIVES TERMINATION ATEMPT MESSAGE
CALLER ID PRIVATE ?
NO
PRESENT CALL TO SUBSCRIBER WITH AUTHORIZED TERMINATION RESPONSE MESSAGE
YES
PLAY ANNOUNCEMENT FOR CALLER, FOR EXAMPLE VIA SEND TO RESOURCE MANAGEMENT "TO BE CONNECTED TO YOUR PARTY, YOU MUST ALLOW YOUR "CALLING PARTY ID" TO BE DISPLAYED. PRESS 1 IF YOU WANT TO REACH YOUR PARTY & DISPLAY YOUR ID, OTHERWISE PRESS 2
CALLER ENTERS DTMF DIGIT
SPC RECEIVES RESOURCE CLEAR MESSAGE FROM SCP
DID CALLER DIAL 1 (CALLER ALLOWING ID TO BE PROVIDED) ?
NO
DO NOT ALLOW CALL TO TERMINATE, RETURN RESPONSE (SEND TO RESOURCE OR DISCONNECT) TO SSP
YES
ALLOW CALL TO TERMINATE, INCLUDE CALLING PARTY ID TO BE DISPLAYED WITH AUTHORIZE TERMINATION RESPONSE MESSAGE TO SSP CALLING PARTY ID IS INCLUDED IN DISPLAY TEXT PARAMETER

1. For use in an Advanced Intelligent Network (AIN) having at least one Service Switching Point (SSP) in electrical communication with a Service Control Point (SCP) or Adjunct Processor (AP) via an appropriate signalling link, said SCP/AP having corresponding service logic, a method for detecting and processing calls from a calling party to a subscribing called party wherein the display of calling party ID information is unavailable or has been inhibited, comprising:

detecting an AIN Termination Attempt trigger at said SSP when attempting to terminate a call from said calling party to said subscribing called party;

suspending normal call processing at said SSP upon detection of said AIN Termination Attempt trigger;

generating an AIN Termination Attempt message at said SSP for receipt by said SCP/AP, said AIN Termination Attempt message requesting further call processing instructions;

determining at said SCP/AP whether said calling party ID information has been inhibited; and

if said calling party ID information has been inhibited, generating a predetermined response message at said SCP/AP for receipt by said SSP instructing said SSP to intercept said call, play a selected terminating announcement or request said calling party to display its ID information and perform further call processing.

5,533,107

METHOD FOR ROUTING CALLS BASED ON PREDETERMINED ASSIGNMENTS OF CALLERS GEOGRAPHIC LOCATIONS

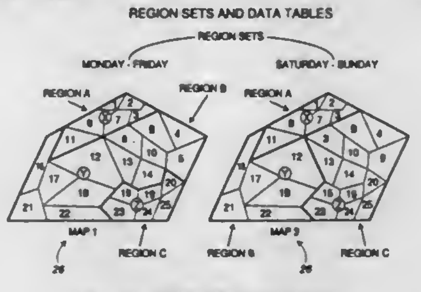
Janine M. Irwin, Duluth; James M. Seymour; Iris Y. Chen, both of Roswell; James M. Davis, Alpharetta; David C. Sowell, Atlanta; Nailesh B. Desai, Norcross, and Julia B. Torbert, Stone Mountain, all of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Filed Mar. 1, 1994, Ser. No. 204,677

Int. Cl.^{6} H02M *3/42;15/00*

U.S. Cl. 379—201 **49 Claims**

REGION SETS AND DATA TABLES



MONDAY - FRIDAY
TABLE 1 - MAP 1 BLOCK GROUP-TO-REGION FUNCTION

BG	R	BG	R	BG	R	BG	R	BG	R
1	A	6	A	11	A	16	B	21	B
2	A	7	A	12	B	17	B	22	B
3	A	8	B	13	B	18	B	23	C
4	B	9	B	14	B	19	C	24	C
5	B	10	B	15	C	20	C	25	C

SATURDAY - SUNDAY
TABLE 2 - MAP 2 BLOCK GROUP-TO-REGION FUNCTION

BG	R	BG	R	BG	R	BG	R	BG	R
1	A	6	A	11	A	16	B	21	B
2	A	7	A	12	B	17	B	22	B
3	A	8	C	13	C	18	B	23	C
4	C	9	C	14	C	19	C	24	C
5	C	10	C	15	C	20	C	25	C

1. A method of routing a call from a caller to a particular subscriber location of a plurality of subscriber locations said subscriber locations located in a predetermined geographic area, based in part on the geographic location of the caller, said call being placed by dialing a single telephone number that is operative for serving all of said subscriber location, comprising the steps of:

retrieving a block group identifier from a database based on all the digits, including the area code, of the calling party number of said caller, said block group identifier being a value, in said database, that represents the block group area from which said call originated;

correlating said block group identifier to a common identifier, said common identifier being a value in said database representing an intersection data set of a plurality of intersection data sets, said intersection data sets created by:

defining a first geographic map area as a geographic data set representing said predetermined geographic area, said geographic map area encompassing a plurality of block group areas;

dividing said first geographic map area into a first set of first regions thereby defining a first region set, each of said first regions encompassing at least one of said block group areas and each of said first regions corresponding to a preselected location for receiving a call from the corresponding first region, said first region set designated for calls made during a first time interval;

dividing said first geographic map area into a second set of second regions thereby defining a second region set, each of said second regions encompassing at least one of said block group areas and each of said second regions corresponding to a preselected location for receiving a call from the corresponding second region, said second region set designated for calls made during a second time interval; and

intersecting said first region set with said second region set thereby defining intersection data sets common to said first region set and said second region set, said intersection data sets containing a quantity of data less than the sum of the quantity of data contained in said first region set and said second region set, said intersection data sets operative for call routing during both said first time interval and said second time interval, thereby reducing the total amount of data associated with routing calls from each of said dividing steps; and

routing said call to a particular subscriber location based on said common identifier.

5,533,108

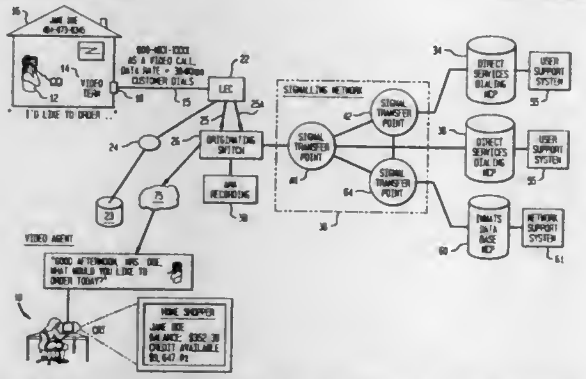
METHOD AND SYSTEM FOR ROUTING PHONE CALLS BASED ON VOICE AND DATA TRANSPORT CAPABILITY

Rosemary H. Harris, Colts Neck, and Richard F. Bruno, Morristown, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Mar. 18, 1994, Ser. No. 215,069

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 379—201 **24 Claims**



1. A method for routing a phone call from a caller through a public switched telephone network to a destination number selected by a network subscriber based on voice and data transport capability, wherein the phone call is one of either a voice or data call and wherein the destination number is one of a plurality of destination numbers selected by the subscriber identified by a common telephone number, comprising

associating with a phone call a plurality of discriminators common to both voice and data calls and an additional data rate discriminator for a data call corresponding to the data rate used by the calling party,

accessing a first database in response to receiving the common telephone number from the calling party to obtain a routing number,

selecting a second database based on the routing number,

accessing the second database for obtaining a destination number selected by the subscriber for a voice call based on the common discriminators and a separate destination number selected by the subscriber for a data call, wherein the separate destination number selected by the subscriber for a data call is based on the common discriminators and the data rate used by the caller, and

completing the phone call by directing the phone call to the destination number selected by the subscriber.

5,533,109

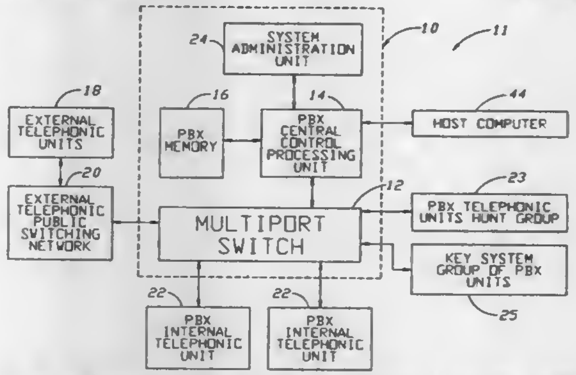
TELECOMMUNICATION SYSTEM WITH USER MODIFIABLE PBX TERMINATING CALL FEATURE CONTROLLER AND METHOD

Daniel F. Baker, Rolling Meadows, Ill., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 30, 1994, Ser. No. 316,701

Int. Cl.^{6} H04M *3/00*

U.S. Cl. 379—201 **18 Claims**


10
11
24
SYSTEM ADMINISTRATION UNIT
18
EXTERNAL TELEPHONIC UNITS
16
PBX MEMORY
14
PBX CENTRAL CONTROL PROCESSING UNIT
44
HOST COMPUTER
20
EXTERNAL TELEPHONIC PUBLIC SWITCHING NETWORK
12
MULTIPORT SWITCH
23
PBX TELEPHONIC UNITS HUNT GROUP
KEY SYSTEM GROUP OF PBX UNITS
25
22
PBX INTERNAL TELEPHONIC UNIT
22
PBX INTERNAL TELEPHONIC UNIT

1. In a telecommunication system having a private branch exchange (PBX) with a multiport switch controlled by a central control processing unit and a PBX main memory for directing telephonic calls to terminate at identified ones of a plurality of PBX internal telephonic units placed at predetermined positions and connected with the multiport switch, the improvement comprising:

means for storing a call handling feature script defining call handling operations for telephonic calls directed to an identified PBX internal telephonic unit and in which the call handling feature script includes an ordered set of call handling statements with each of the statements defining a particular call servicing operation; and

means for modifying the call handling feature script in response to the entry of user commands via a data entry terminal coupled with the central control processing unit of the PBX to alter the call handling operations of telephonic calls terminating at the identified PBX internal telephonic unit while the PBX is actively on-line and without requiring the reprogramming and recompiling of programmed code.

5,533,110

HUMAN MACHINE INTERFACE FOR TELEPHONE FEATURE INVOCATION

Deborah L. Pinard; Eliana M. O. Peres, and Ronald A. Evans, all of Kanata, Canada, assignors to Mitel Corporation, Canada

Filed Nov. 29, 1994, Ser. No. 346,600

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 379—201 **19 Claims**

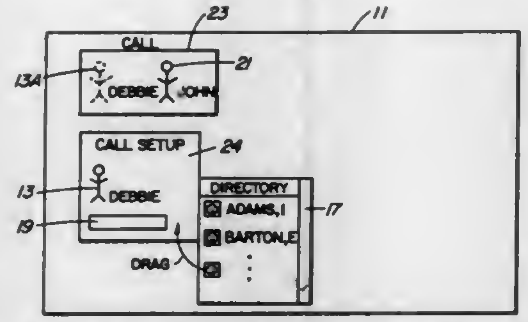
1. A method of providing a visual indication to a first communication connection (CC) subscriber of the status of a telephone CC, comprising the steps of:

(a) providing an icon on a display that represents the first CC subscriber,

(b) providing a call setup icon on a display representing a command to set up a CC,

(c) dragging the icon representing the first CC subscriber to the call setup icon,

(d) automatically displaying a directory of subscribers,



(e) dragging an identity of a second CC subscriber from the directory to the call setup icon,

(f) establishing a CC between communication apparatus used by the first subscriber and communication apparatus used by the second CC subscriber via subscriber's lines,

(g) changing the identity of the calls setup icon to a call icon,

(h) displaying an icon representing the second CC subscriber in the call icon, and

(i) displaying a new call setup icon,

whereby icons representing CC subscribers of a call in progress are both represented and are visually discernible by the first CC subscriber in the call icon.

5,533,111

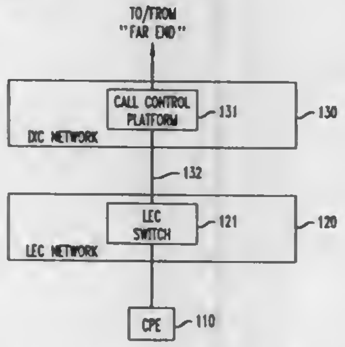
SYSTEM FOR ORIGINATING AND RECEIVING TELEPHONE CALLS OVER A VIRTUAL PIPED CONNECTION, AND SPECIALIZED CUSTOMER PREMISE EQUIPMENT FOR USE IN THE SYSTEM

Gabriel G. Schlanger, West Orange, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 367,386

Int. Cl.^{6} H04M *3/42;11/00;7/00*

U.S. Cl. 379—201 **27 Claims**



1. A method for completing a telephone call originated from a subscriber location, comprising the steps of

establishing an initial connection between specialized CPE at said subscriber location and a call control platform in an IXC network;

after said initial connection is established, enabling said CPE to respond to in-band signaling from said call control platform and disabling said CPE from generating a disconnect signal that would otherwise cause said CPE to be disconnected from said call control platform when said CPE is placed in an on-hook condition; and

initiating an outbound call from said CPE by establishing a connection between said call control platform and a destination using in-band signaling between said CPE and said call control platform.

5,533,112

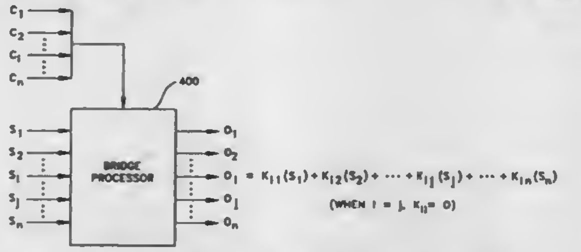
VOLUME CONTROL IN DIGITAL TELECONFERENCING

Gunner D. Danneels, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1994, Ser. No. 221,080

Int. Cl.^{6} H04M *3/56*

U.S. Cl. 379—202 **14 Claims**



8. An apparatus for processing audio signals, comprising:

(a) means for receiving a plurality of input streams $\{S_1, \ldots, S_{n-1}, S_n\}$ from a plurality of stations participating in a real-time audio conference;

(b) means for generating a plurality of output streams from the plurality of input streams, wherein each output stream O_i is generated as a sum of products of each input stream and a plurality of corresponding volume-control factors $\{K_1, \ldots, K_{n-1}, K_n\}$, such that:

$$O_i=K_{i1}S_1+\ldots+K_{i(n-1)}S_{n-1}+K_{in}S_n$$

wherein at least one volume-control factor is independent of at least one other corresponding volume-control factor used to generate a different output stream; and

(c) means for transmitting the output streams to the stations, wherein each output stream is transmitted to a corresponding station.

5,533,113

AUTOMATIC POSITION MANAGING SYSTEM

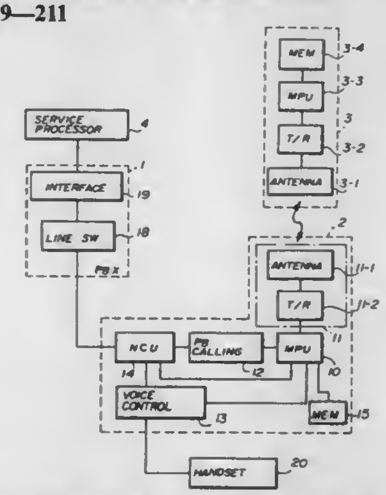
Masayuki Ozawa; Takashi Gounji, and Kenji Morosawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 30, 1992, Ser. No. 969,738

Claims priority, application Japan, Nov. 7, 1991, 3-291388

Int. Cl.^{6} H04M *3/42;11/00*

U.S. Cl. 379—211 **26 Claims**



1. An automatic position managing system for a communication system which includes a plurality of telephone sets coupled to a private branch exchange, said automatic position managing system comprising:

a radio card which is carried by a user having a corresponding seating place, said radio card including means for storing information related to the user and means for transmitting the stored information by a radio signal;

first means, coupled to a telephone set of the plurality of telephone sets, for receiving the radio signal from said radio card and supplying data to the private branch exchange in response to the radio signal received from said radio card, wherein said first means calls said radio card at predetermined intervals, and said radio card transmits the radio signal in response to a call from said first means;

second means, coupled to the private branch exchange, for automatically detecting a position of the user carrying said radio card based on the data received from said first means via the private branch exchange, by associating the user with the telephone set to which said first means is coupled, for storing management data and for determining the relationship between said radio card and the telephone set such that if said radio card belongs to the user of the telephone set, the radio card is registered in the management data indicating the user is at the corresponding seating place and if the radio card does not belong to the user of the telephone set, present location data related to a present seating place of the user is registered in the management data; and

third means for calling, when a call is received, the telephone set located at the corresponding seating place of the user when the user is seated at the corresponding seating place and for directly calling a selected telephone set of the plurality of telephone seats based on the location of the user, when the user is not at the corresponding seating place.

5,533,114

TELECOMMUNICATION SYSTEM COMPRISING SUBSCRIBER CONNECTION UNITS HAVING INDEPENDENT ROUTING ABILITY

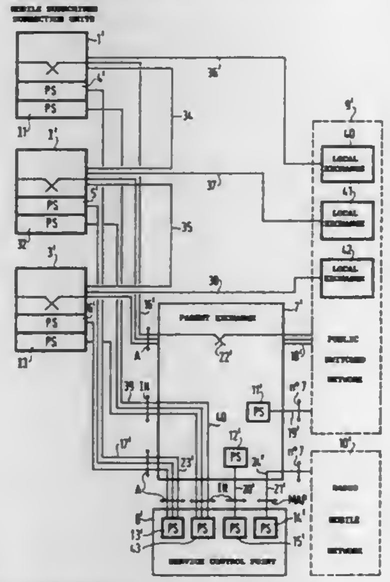
Michel Ballard, Clamart, and Edouard Issenmann, Le Chesnay, both of, France, assignors to Alcatel Cit, Paris, France

Continuation of Ser. No. 727,722, Jul. 10, 1991, abandoned. This application Feb. 24, 1994, Ser. No. 201,094

Claims priority, application France, Jul. 11, 1990, 90 08838; Sep. 28, 1990, 90 12005

Int. Cl.^{6} H04M *7/06;7/14;11/00*

U.S. Cl. 379—220 **11 Claims**



1. A telecommunication system comprising:

subscriber connection units having independent routing ability for a telecommunications network having an intelligent network structure, said telecommunications network including exchanges controlled by service control point means by means of predetermined operations constituting an intelligent network interface, and conveyed by protocols that are compatible with CCITT protocol No. 7;

each of the subscriber connection units being connected to an associated parent exchange via speech links and to said service control point means via a first No. 7 signalling link for controlling subscriber access to the associated parent exchange;

wherein the subscriber connection units are also connected to said service control point means via a second No. 7 signalling link conveying the intelligent network interface for the purpose of enabling said service control point means to control connections between subscribers connected to the same subscriber connection unit, connections between subscribers connected to different ones of said subscriber connection units, and connections from said subscriber connection units to a public switched network without requiring a speech link via the associated parent exchange.

5,533,115

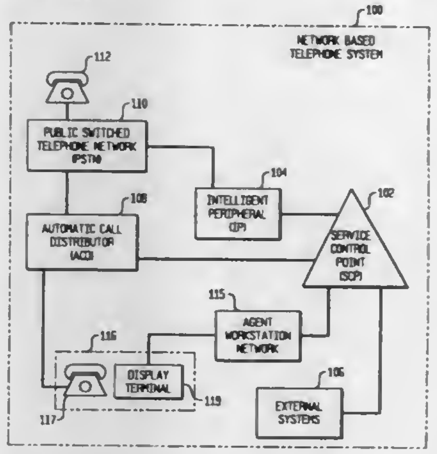
NETWORK-BASED TELEPHONE SYSTEM PROVIDING COORDINATED VOICE AND DATA DELIVERY

Steven A. Hollenbach, Neshanic Station; Michael A. Martin, Hillsboro, both of N.J.; Thomas S. Novak, San Ramon, Calif., and Robert S. Warznak, Pennington, N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 168,612, Jan. 31, 1994. This application Nov. 4, 1994, Ser. No. 334,120

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 379—220 **11 Claims**


100
NETWORK BASED TELEPHONE SYSTEM
112
110
PUBLIC SWITCHED TELEPHONE NETWORK (PSTN)
104
INTELLIGENT PERIPHERAL (IP)
102
SERVICE CONTROL POINT (SCP)
108
AUTOMATIC CALL DISTRIBUTOR (ACD)
115
AGENT WORKSTATION NETWORK
116
DISPLAY TERMINAL
119
117
106
EXTERNAL SYSTEMS

1. A method of processing a phone call from a caller in a telephone network, the telephone network including a plurality of switches and an intelligent peripheral (IP) for interfacing the plurality of switches with a service control point (SCP), the method comprising the steps of:

receiving the phone call at one of the plurality of switches;

forwarding the phone call to the IP;

requesting, by the IP, that the SCP perform a call processing request;

accessing service logic within the SCP, the service logic specifying handling of the phone call according to the call processing request;

requesting, by the service logic, data from one or more external systems;

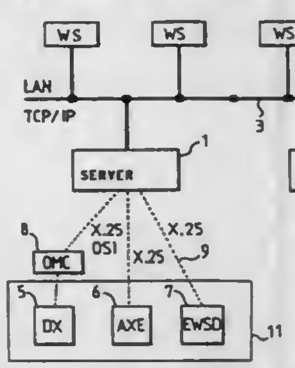
receiving, at the SCP, data from the one or more external systems in response to the service logic request;

routing the phone call to a selected telephone based on the data received from the one or more external systems; and

routing the received data to the selected telephone.

5,533,116
NETWORK MANAGEMENT SYSTEM

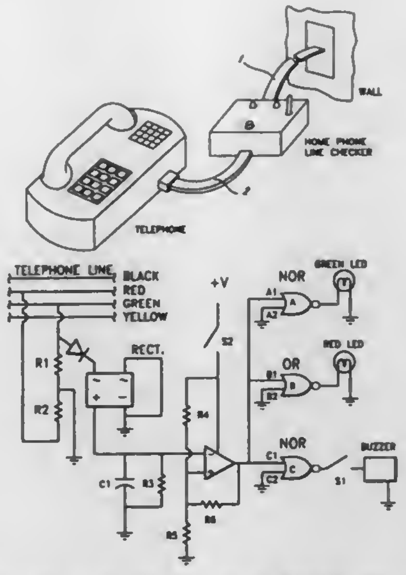
Timo Vesterinen, Espoo, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland
PCT No. PCT/FI93/00087, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO93/18598, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 10, 1993, Ser. No. 302,793
Claims priority, application Finland, Mar. 10, 1992, 921035
Int. Cl.^{6} H04M *3/64*
U.S. Cl. 379—243 **11 Claims**



1. A telecommunications network, comprising:
a plurality of network elements having internal command languages, said internal command languages being mutually different in at least two of said network elements, and at least one of said network elements being provided with a reading command for reading internal data structures of any internal command or command response of said at least one of said network elements,
a network management system for configuration and reading data or states of said network elements, said system comprising:
memory for storing parameters describing the respective said internal command language of each of said network elements,
means for generating service requests in a network-independent format,
conversion means for converting said service requests in a network independent format into commands according to the respective said internal command language of a respective said network element which is a target of service, by means of parameters describing the respective said internal command language of said respective network element,
means for sending said converted commands to said respective network element which is the target of service, and
means for receiving command responses sent by the respective said network element which is the target of service, and for converting said command responses into said network-independent format; and
said network management system utilizes said reading command to update said parameters which describe the respective said internal command language of said at least one network element in said memory of said network management system.

5,533,117
LINE STATUS INDICATOR FOR USE WITH TELEPHONES SHARING A SINGLE LINE

Chong H. Kim, 16807 Woodridge Cir., Fountain Valley, Calif. 92708, assignor to Chong H. Kim, Fountain Valley, Calif.
Filed Aug. 3, 1993, Ser. No. 101,203
Int. Cl.^{6} H04M *1/00*
U.S. Cl. 379—377 **1 Claim**

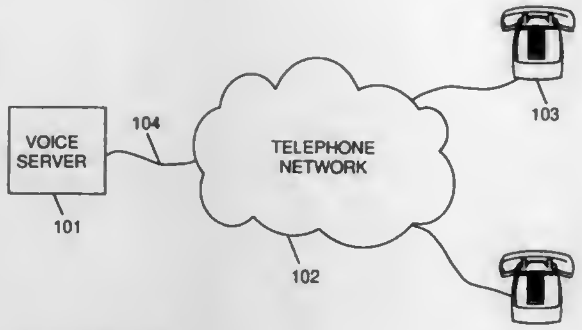


1. A means of accessing and reporting telephone line-status by use of a voltage divider comprising two resistors designated as a first resistor and a second resistor, one end of the first resistor being connected to a wire inside a green colored conduit within a telephone line and to an input of a diode, and the other end of said first resistor being connected to one end of the second resistor and to the ground, the other end of said second resistor being connected to a wire inside a red conduit within said telephone line, an output of said diode being connected to an input of a full-wave bridge rectifier, an output of said full-wave bridge rectifier being connected to a signal-smoothing RC circuit that consists of one capacitor and one resistor, an output of said signal-smoothing rectifier being connected to an input of a voltage amplifier that has one feedback resistor and a voltage reference input from a voltage divider circuit, the divider circuit consists of two resistors designated as a first resistor and a second resistor, one end of the first resistor of the divider circuit connected to a voltage source, the other end of said first resistor of the divider circuit connected to a voltage amplification IC chip reference voltage input pin and to one end of the second resistor of said divider circuit, the other end of said second resistor of the divider circuit connected to said ground, an output of said voltage amplifier being connected to first, second and third Information displaying circuits, the output of the voltage amplifier being connected to a NOR gate of the first displaying circuit, the output of said NOR gate connected to a green colored LED, the output of said voltage amplifier connected to an OR gate of the second displaying circuit, the output of said OR gate connected to a red colored LED, the output of said voltage amplifier connected to a NOR gate of the third displaying circuit, the output of said NOR gate connected to a switch, and an output of said switch connected to a buzzer.

5,533,118
VOICE ACTIVITY DETECTION METHOD AND APPARATUS USING THE SAME

Claude Cesaro, Le Cannet, and Gerard Richter, Saint Jeannet, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 28, 1994, Ser. No. 202,615
Claims priority, application European Pat. Off., Apr. 29, 1993, 93480048
Int. Cl.^{6} H04M *1/00*
U.S. Cl. 379—386 **11 Claims**

1. A method for detecting the presence of voice signals in a telephone network which also utilizes single and dual tone multi-frequency signals for effecting network control including the steps:
receiving signals from the telephone network;
determining the maximum value A max of the received signal during a sampling window and a measure E of the energy;



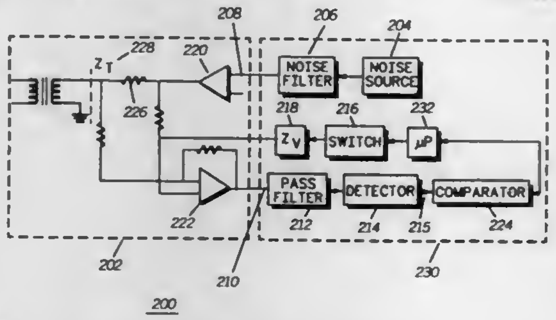
computing the ratio,

$$r = \frac{A^2\max}{E}$$

comparing the said computed ratio r to a threshold value and measuring the signal level; and
indicating voice activity only when the ratio r exceeds said threshold value of 5.2 and the received signal level exceeds a predetermined value of –43 db.

5,533,119
METHOD AND APPARATUS FOR SIDETONE OPTIMIZATION

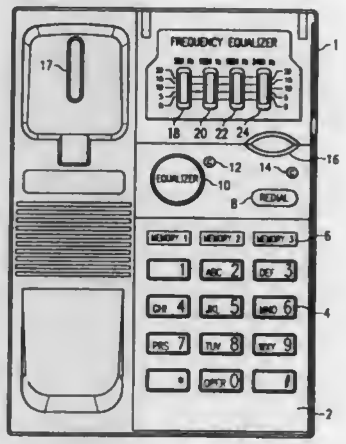
Gary E. Adair, Plantation, and Paul Joyce, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 31, 1994, Ser. No. 250,873
Int. Cl.^{6} H04M *1/58*
U.S. Cl. 379—391 **15 Claims**



8. A sidetone optimization circuit comprising:
a noise source for generating a noise burst;
a filter for filtering the noise burst and providing a band limited noise signal;
a telephone interface circuit for receiving the band limited noise signal and providing a sidetone signal based on the band limited noise signal, the telephone interface circuit including:
a transmit amplifier for amplifying the band limited noise signal;
an operational amplifier responsive to the band limited noise signal for
generating the sidetone signal;
an impedance control network coupled to the telephone interface circuit for automatically adjusting the sidetone signal;
a second filter for filtering the sidetone signal;
a detector responsive to the sidetone signal for providing a DC level; and
a comparator for comparing the DC level to a predetermined level, the impedance control network automatically adjusting the DC level when the sidetone signal does not equal the predetermined level.

5,533,120
ACOUSTIC FEEDBACK CANCELLATION FOR EQUALIZED AMPLIFYING SYSTEMS

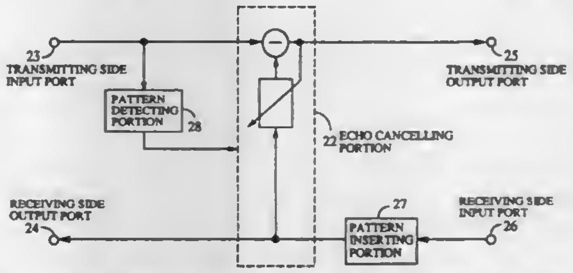
William Staudacher, Denton, Tex., assignor to Tandy Corporation, Ft. Worth, Tex.
Filed Feb. 1, 1994, Ser. No. 189,883
Int. Cl.^{6} H03G *5/00*
U.S. Cl. 379—392 **21 Claims**



1. An acoustic feedback cancellation apparatus for use in an audio amplification system which receives an acoustically coupled input signal, comprising:
a notch filter responsive to the acoustically coupled input signal for selectively attenuating an input signal frequency component indicative of acoustically coupled feedback and for generating a filtered output signal;
a multi-band equalizer responsive to the filtered output signal for providing an equalizer output signal;
an amplifier which amplifies said equalizer output signal and provides an amplifier output signal; and
adaptive apparatus responsive to the acoustically coupled input signal for tracking the frequency value of the input signal frequency component to be attenuated by the notch filter.

5,533,121
ECHO CANCELLER AND METHOD FOR CONTROLLING ECHO CANCELLATION

Shigeaki Suzuki, and Yushi Naito, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 6, 1994, Ser. No. 301,344
Claims priority, application Japan, Sep. 7, 1993, 5-222496
Int. Cl.^{6} H04M *1/58*
U.S. Cl. 379—410 **44 Claims**


23
TRANSMITTING SIDE INPUT PORT
25
TRANSMITTING SIDE OUTPUT PORT
PATTERN DETECTING PORTION
28
22 ECHO CANCELLING PORTION
RECEIVING SIDE OUTPUT PORT
24
27
PATTERN INSERTING PORTION
RECEIVING SIDE INPUT PORT
26

1. An echo canceller which cancels echo generated at 2-wire/4-wire conversion portion by impedance mismatching comprising:
(a) an echo cancelling means for cancelling echo signal;
(b) a pattern inserting means for extracting a predetermined portion of a receiving side pulse code modulation (PCM) input signal and inserting a predetermined bit-pattern sequence into a receiving side PCM output signal in place of the extracted portion; and

(c) a pattern detecting means for detecting a predetermined bit pattern by monitoring a transmitting side input PCM signal, and disabling the echo cancelling function of the echo cancelling means when the predetermined bit-pattern is detected.

5,533,122

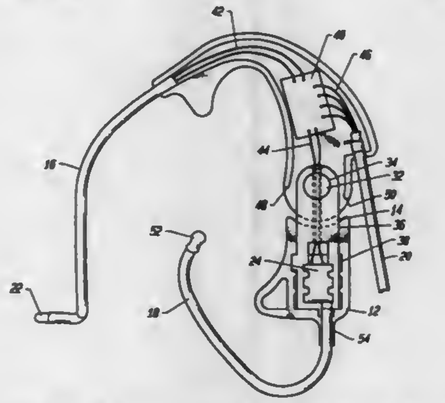
ARTICULATED HEADSET SUPPORT

Phillip A. Gattey, Los Gatos; Christine Burris, Santa Cruz, and Wolfgang W. Jensen, Aptos, all of Calif., assignors to ACS Wireless, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 255,232, Jun. 7, 1994, Pat. No. 5,414,769, which is a continuation of Ser. No. 103,344, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 925,317, Aug. 4, 1992, Pat. No. 5,260,997, which is a continuation of Ser. No. 785,531, Oct. 31, 1991, abandoned. This application Apr. 26, 1995, Ser. No. 429,034

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—430 **6 Claims**



1. An articulated headset support, to be worn on an ear, comprising:

a main housing having a bottom surface that rests on top of the ear and extends to the back of the ear behind the pinna;

a secondary housing having a side surface that adjustably contacts the lower-back portion of the ear behind the pinna; and

friction hinge means for pivotally connecting said main housing with said secondary housing, said hinge means being located behind the pinna at the back of the ear, said hinge means allowing the position of the main housing to be adjusted with respect to the secondary housing to permit the bottom surface of the main housing and the side surface of the secondary housing to be drawn closer together in a clamping motion so that a tight fit around the ear is achieved thereby providing enhanced stability.

5,533,123

PROGRAMMABLE DISTRIBUTED PERSONAL SECURITY

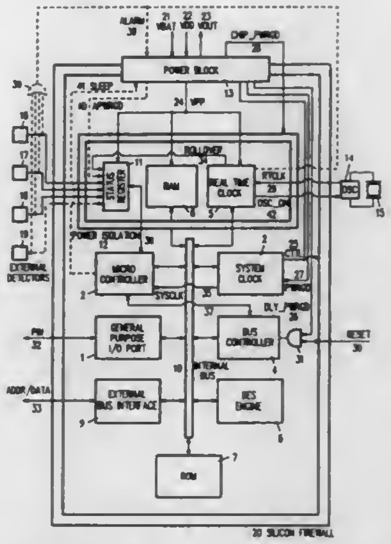
Gordon Force, San Jose, Calif.; Timothy D. Davis, Arlington, Tex.; Richard L. Duncan, Bedford, Tex.; Thomas M. Norcross, Arlington, Tex.; Michael J. Shay, Arlington, Tex., and Timothy A. Short, Duncanville, Tex., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 28, 1994, Ser. No. 267,788

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—4 **14 Claims**

1. A system for processing and storing sensitive information, including messages received and generated by the system and keys used to encrypt and decrypt the messages, and securing the information against potential attacks, the system comprising:



(a) a cryptographic engine for performing cryptographic operations on messages using a first key;

(b) one or more detectors for detecting events characteristic of an attack;

(c) a plurality of potential responses to detected events; and

(d) a programmable filter for correlating detected events with one or more operational factors and for selecting and invoking one or more responses based upon the correlation.

5,533,124

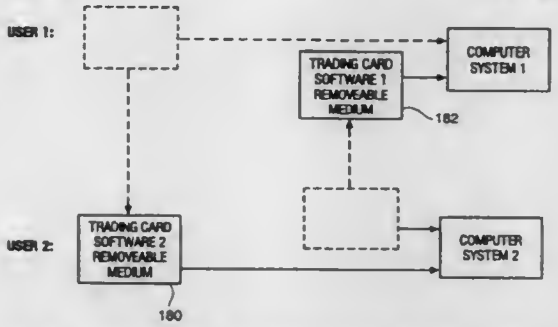
ELECTRONIC TRADING CARD SYSTEM

Jeannette K. Smith, 10785 S. Pine Dr., Parker, Colo. 80210, and Janet L. Roucis, 1122 S. Flower Cir., Lakewood, Colo. 80232

Filed Dec. 7, 1994, Ser. No. 351,026

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—4 **16 Claims**


USER 1:
COMPUTER SYSTEM 1
TRADING CARD SOFTWARE 1 REMOVEABLE MEDIUM
182
USER 2:
TRADING CARD SOFTWARE 2 REMOVEABLE MEDIUM
180
COMPUTER SYSTEM 2

1. An electronic trading card system for use in a processor, said processor having a memory and an apparatus for reading from a removable storage media, said system comprising:

means for loading a copy protected form of a control program and subject data into said memory from said removable storage media;

means for maintaining said control program and said subject data in said copy protected form when resident in said memory; and

means for expunging said control program and said subject data from said memory when said control program ceases executing.

5,533,125

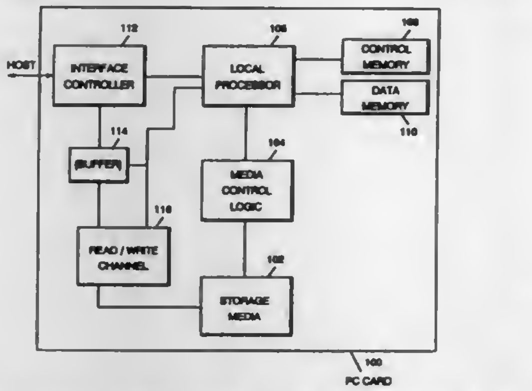
REMOVABLE COMPUTER SECURITY DEVICE

Daniel Bensimon, Boca Raton; Neal A. Osborn, Delray Beach, and Joaquin F. Pacheco, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 397,017, Mar. 1, 1995, abandoned, which is a continuation of Ser. No. 43,425, Apr. 6, 1993, abandoned. This application Jul. 18, 1995, Ser. No. 503,536

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—4 **10 Claims**



1. An information storage system, for use in a computer or other information processing system, said information storage system comprising:

an information storage device for storing information including a read-only password and a read/write password;

said storage system having selectable read-only and read/write password protected modes of operation;

when said read-only mode is selected, said storage system being unlocked to permit read-only access to said storage device in response to a match between an incoming password and a read-only password stored in said storage device; and

when said read/write mode is selected, said storage system being unlocked to permit read/write access to said storage device in response to a match between an incoming password and a read/write password stored in said storage device;

whereby, when one or more of said password protected modes have been selected, and in the event the information storage system is removed from the information processing system, access to the storage device will be locked until a password is sent to said storage system that matches one of said read-only or read/write passwords stored in said storage device.

5,533,126

KEY PROTECTION DEVICE FOR SMART CARDS

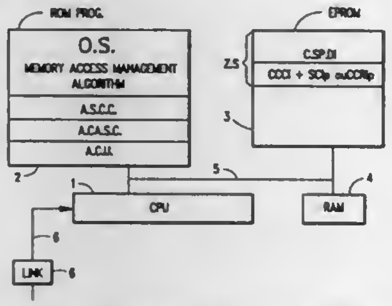
Michel Hazard, Mareil Sur Mauldre, France, assignor to BULL CP8, Louveciennes, France

Filed Apr. 21, 1994, Ser. No. 230,737

Claims priority, application France, Apr. 22, 1993, 93 04773

Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—25 **14 Claims**



1. A user key protection device for a smart card comprising:

at least one user coded key stored within said smart card, said at least one user coded key is coded (CCCi) using a specific key specific to each smart card, a user key, and a user key coding/decoding algorithm (A.S.C.C.) executed by a microprocessor within said smart card;

protection data corresponding to dependent data of each of said at least one user coded key generated and stored in association with a respective at least one user coded key (CCCi) in a memory area of said smart card;

a detection device installed in said smart card allowing the smart card to verify integrity of said at least one user coded key (CCCi) by comparing said protection data to verification data generated using the at least one user coded key (CCCi); and

an interlock device installed in the smart card allowing the smart card to block any further calculation using the at least one user coded key (CCCi) in the event that said verification data is not identical to said protection data.

5,533,127

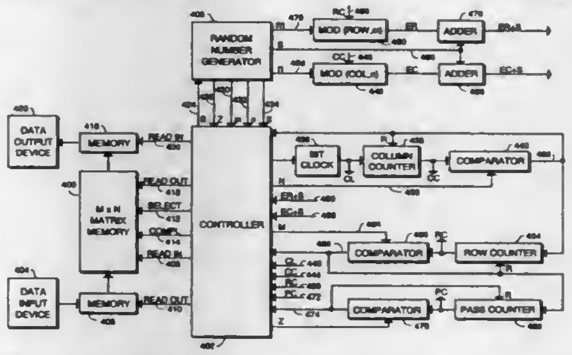
ENCRYPTION SYSTEM

Willis J. Luther, Irvine, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

Filed Mar. 18, 1994, Ser. No. 214,563

Int. Cl.^{6} H04L *9/28;9/00*

U.S. Cl. 380—28 **37 Claims**



30. Apparatus for encrypting a M row by N column matrix of data, comprising:

means for selecting a number of encryption passes Z to be made through the data;

means for selecting integers m and n which determine that each mth row and each nth column are to be encrypted in each encryption pass;

means for selecting an integer S which determines that S successive rows following each mth row and S successive columns following each nth column are to be encrypted in each encryption pass; and

means for taking a binary complement of the data in each mth row and the S successive following rows of the M rows of data and each nth column and the S successive following columns of the N columns of data in each of the Z encryption passes.

5,533,128

PSEUDO-RANDOM TRANSPOSITION CIPHER SYSTEM AND METHOD

Arnold Vobach, 11114 Ashcroft, Houston, Tex. 77096

Filed Jan. 18, 1995, Ser. No. 374,314

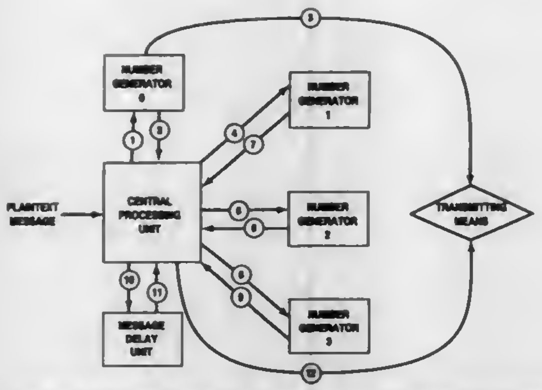
Int. Cl.^{6} H04L *9/28;9/00*

U.S. Cl. 380—28 **5 Claims**

1. A cipher system for use by a sender and a receiver, comprising:

a. a source of plaintext alphabet characters:

b. a sender central processing unit to receive a plaintext message of plaintext alphabet characters from the source and to encode each character, the central processing unit comprising:



- i. means for assigning a pseudo-randomly determined numerical synonym to each address from a serially numbered collection, of cardinality at least as great as that of the plaintext alphabet;
- ii. means for pseudo-randomly assigning an address to each plaintext alphabet character; and
- iii. means for inducing a transpostion of the numerical synonym used to represent the plaintext character with the numerical synonym at another address by each use of a plaintext alphabet character;

the sender central processing unit further comprising a memory unit to store the addresses and their assigned numerical synonyms and plaintext alphabet characters;

c. a sender number generator to develop an initializing integer, transmitted to the receiver, which the sender central processing unit uses to determine the choices of the numerical synonyms, the assignment of alphabet characters to addresses, and the generation of transpositions of numerical synonyms;

d. a first number generator for each of the sender and receiver to generate a digit string to be used by sender and receiver to determine the sequence of numerical synonyms to be assigned to the sequentially labeled addresses;

e. a second number generator for each of the sender and receiver to generate a digit string to be used by sender and receiver to determine the assignment of plaintext alphabet characters to addresses;

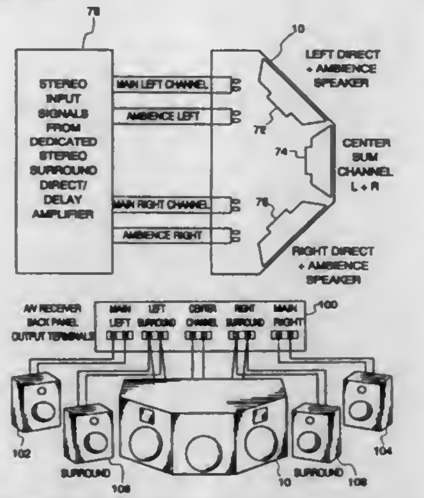
f. a third number generator for each of the sender and receiver to generate a digit string to be used by sender and receiver to determine the transpositions of numerical synonyms associated with successive uses of plaintext alphabet characters;

g. a receiver central processing unit to receive an encrypted message and, utilizing the initializing integer and secret key, to decrypt each message, the receiver central processing unit comprising:
- i. means for determining distinct numerical synonyms to be associated with each of the set of addresses of a set of addresses equal in number to those of the sender central processing unit, the numerical synonyms provided from a string of digits available to both sender and receiver;
- ii. means for further assigning the plaintext alphabet characters to distinct addresses as determined by a digit string available to both sender and receiver;
- iii. means for providing for the transposition of the numerical synonyms of plaintext alphabet characters, after each successive use of each alphabet character, with those at other addresses, as determined by a digit string available to both sender and receiver; and
- iv. means for reproducing the plaintext message, having determined the correct alphabet characters to be associated with the received numerical synonyms;

the receiver central processing unit further comprising a memory to store the addresses and their assigned numerical synonyms and plaintext alphabet characters; and

h. a message delay unit for each of the sender and receiver central processing units to buffer alphabet characters or digit strings received by the sender or receiver central processing units, respectively.

5,533,129
MULTI-DIMENSIONAL SOUND REPRODUCTION SYSTEM
Herbert I. Gefvert, 495 S. Green Bay Rd., Lake Forest, Ill. 60045
Filed Aug. 24, 1994, Ser. No. 295,253
Int. Cl.⁶ H04R *5/00*
U.S. Cl. 381—24 **9 Claims**



1. A multi-dimensional sound reproduction system housed in one or more speaker enclosures for creating multiple audio soundfields in a defined listening area responsive to a plurality of signals comprising:

a loudspeaker enclosure having a multiply-segmented face portion, said enclosure comprising,
- a centrally located binaural voice coil loudspeaker facing directly forward from the face portion of said enclosure into the defined listening area,
- a left-side located binaural voice coil loudspeaker, canted away from said centrally located loudspeaker, facing left of center forward from the face portion of said enclosure to provide left-side audio coverage of the defined listening area with audio channel separation from said centrally located loudspeaker, and
- a right-side located binaural voice coil loudspeaker, canted away from said centrally located loudspeaker, facing right of center forward from the face portion of said enclosure to provide right-side audio coverage of the defined listening area with audio channel separation from said centrally located loudspeaker; and
- a network for receiving, combining and delivering plural signals, said network comprising,

means for receiving audio left channel signals including means for receiving left channel tweeter and left channel main signals,

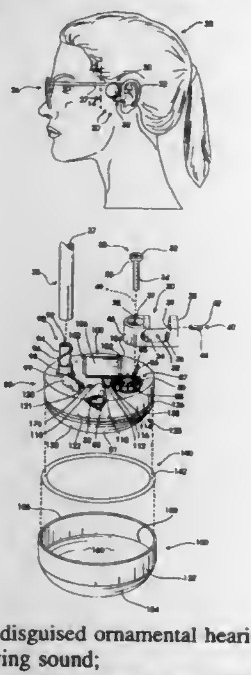
means for receiving audio right channel signals including means for receiving right channel tweeter and right channel main signals,

means for deriving center channel signals from a combination of said received signals, delivering said derived center channel signals to the voice coils of the central loudspeaker,

means for deriving a left surround effects channel from a combination of said received signals, delivering said received left and derived left surround effects channel signals to the voice coils of the left-side loudspeaker, said left surround effects deriving means comprises means for deriving an ambience left signal by subtracting the received right signal from the received left signal, and

means for deriving a right surround effects channel signal from a combination of said received signals, delivering said received right and derived right surround effects channel signals to the voice coils of the right-side loudspeaker, said right surround effects deriving means comprises means for deriving an ambience right signal by subtracting the received left signal from the received right signal.

5,533,130
COSMETICALLY DISGUISED HEARING AID
Ed Staton, 1929 Lakeshore Dr., Hot Springs, Ark. 71913
Filed Aug. 15, 1994, Ser. No. 290,520
Int. Cl.⁶ H04R *25/00;* **G02C** *5/14*
U.S. Cl. 381—68.5 **19 Claims**



1. A cosmetically disguised ornamental hearing aid comprising: means for amplifying sound;

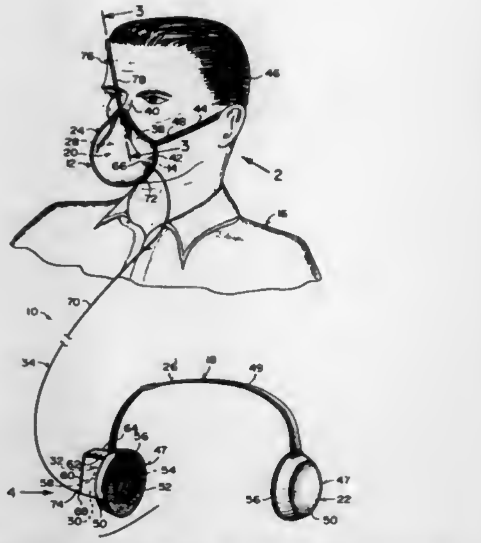
a casing for housing said means for amplifying sound, said casing having a front surface projecting away from a wearer and a rear surface projecting towards the wearer;

a decorative, removable, hollow shell snap fitted to said casing to cover said front surface;

a concealed sound jack projecting from said casing rear surface towards the ear of the wearer; and,

clasp means projecting from said rear surface for attaching said hearing aid to an eyeglass temple, said clasp means movable between a first position engaging said eyeglass frame and an inoperative, concealed position proximate said rear surface and unattached to said eyeglass temple, said clasp means comprising a rotatable hub pivoted to said casing rear surface, an integral spaced apart foot, and a channel formed between said hub and said foot in which a portion of said eyeglass frame may be captivated.

5,533,131
ANTI-EAVESDROPPING DEVICE
C. A. Kury, P.O. Box W, Teaticket, Mass.
Filed May 23, 1994, Ser. No. 247,293
Int. Cl.⁶ H04B *3/00*
U.S. Cl. 381—77 **7 Claims**



1. An anti-eavesdropping device which comprises:

a) means comprising a face mask for containing sound waves emanating from a mouth of a first person, said face mask comprising a flexible covering to fit over the mouth and nose of the first person, a cushion on a periphery of said flexible covering to form an acoustic seal about the mouth and nose, and a strap extending from said flexible covering to fit about the head of the first person;

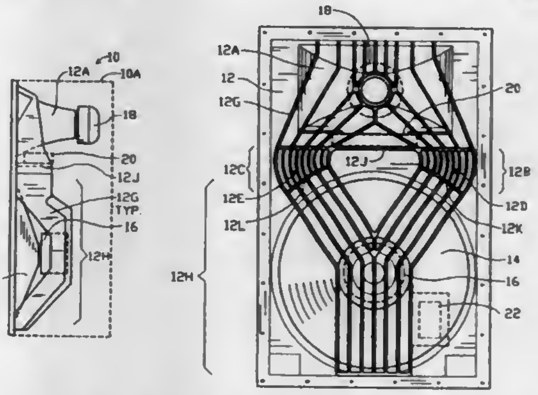
b) means comprising a headset for containing sound waves entering into the ears of a second person;

c) means comprising a microphone in said face mask for converting the sound waves into electric waves;

d) means in said headset for converting the electric waves back into the sound waves, so that the two people can engage in conversation, in which no sound will escape into the environment to be detected in any way, comprising an amplifier electrically connected to said headset, a power supply electrically connected to said amplifier, and means for electrically connecting said amplifier to said microphone; and

e) breathing means mounted on said face mask to permit breathing by said first person while preventing sound to leave said face mask comprising an elongated hollow tube extending upwardly from said face mask adjacent the nose of said first person, said elongated hollow tube containing a plurality of staggered baffles some of which extend upwardly and some of which extend downwardly so that air can enter said hollow tube while said baffles prevent sound from exiting said hollow tube.

5,533,132
LOUDSPEAKER THERMAL MANAGEMENT STRUCTURE
Douglas J. Button, Champaign, Ill., assignor to JBL Incorporated, Northridge, Calif.
Filed Jan. 23, 1995, Ser. No. 377,038
Int. Cl.⁶ H04R *1/02;* **H05K** *7/20*
U.S. Cl. 381—90 **11 Claims**



1. A loudspeaker assembly that is thermally managed to accomplish self-cooling from acoustic air movement, comprising:

an enclosure having acoustic port means and a diaphragm opening defining a diaphragm-mounting ring, said enclosure being made otherwise substantially air-tight;

a vibrational acoustic diaphragm mounted in the diaphragm-mounting ring in a substantially air-tight manner;

electrical driving means, operationally coupled to said dia

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phragm for generating sound, disposed within said enclosure, said driving means manifesting a source of heat;
thermally-conductive driver mounting means structurally and thermally coupled with said driving means;
frame means, extending rearwardly from a region of said enclosure surrounding the diaphragm opening, holding said driver mounting means structurally secured to said enclosure; and
a plurality of thermally-conductive cooling vanes in thermal engagement with said driver mounting means and traversing the port means such that reciprocal air movement in the port means from vibration of said diaphragm exerts a cooling effect on said electrical driving means via a thermal path through said cooling vanes and said driver mounting means, the cooling effect increasing with sound level.

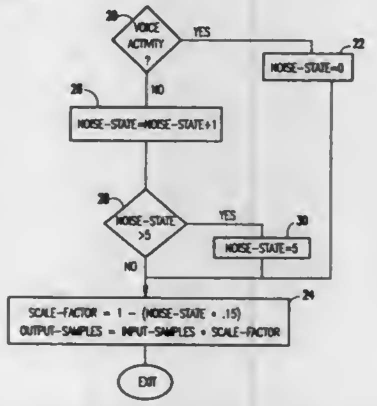
5,533,133
NOISE SUPPRESSION IN DIGITAL VOICE COMMUNICATIONS SYSTEMS

Allan Lamkin, Arlington, Va.; W. Robert Kepley, III, Gaithersburg, Md.; Prabhat K. Gupta, Germantown, Md., and Adrian J. Morris, Gaithersburg, Md., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 26, 1993, Ser. No. 37,946

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 381—94 **3 Claims**


20
VOICE ACTIVITY ?
YES
22
NOISE-STATE=0
NO
26
NOISE-STATE=NOISE-STATE+1
28
NOISE-STATE >5
YES
30
NOISE-STATE=5
NO
24
SCALE-FACTOR = 1 - (NOISE-STATE • .15)
OUTPUT-SAMPLES = INPUT-SAMPLES • SCALE-FACTOR
EXIT

1. A method of noise suppression based on the detection of voice activity in a communications system comprising the steps of:
receiving voice signal samples and voice signal parameters including an average signal level, a zero crossing and a slope of the average signal level;
periodically updating the voice signal parameters;
comparing said updated average signal level parameters with high and low level thresholds, said updated zero crossing parameter with a zero crossing threshold, and said updated slope parameter with a slope threshold;
determining voice activity on said comparing step;
if voice activity exists, setting a noise state to zero, but if voice activity does not exist, then incrementing the noise state by one;
testing the noise state to determine its value and if the noise state is greater than a predetermined value, setting the noise state to said predetermined value;
setting a scale factor to one minus the product of the noise state and an attenuation constant; and
generating output samples as a product of the input samples times the scale factor.

5,533,134
MOTIONAL FEEDBACK LOUDSPEAKER APPARATUS HAVING A COUPLING MEMBER FOR CONNECTING A VOICE COIL BOBBIN WITH A DETECTING COIL BOBBIN

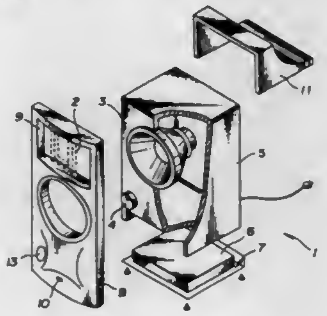
Kunihiko Tokura, Saitama; Masaru Uryu, and Kenji Yamada, both of Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

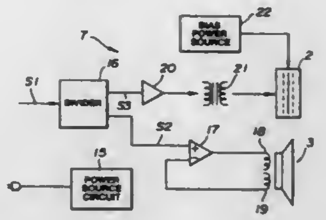
Filed Aug. 8, 1994, Ser. No. 287,294

Claims priority, application Japan, Aug. 16, 1993, 5-202418

Int. Cl.^{6} H04R *3/00*

U.S. Cl. 381—96 **15 Claims**





1. A loudspeaker apparatus comprising
a diaphragm,
driving means for driving said diaphragm, said driving means having a first bobbin, a voice coil wound about the first bobbin, and a driving magnetic circuit for generating the driving power driving said diaphragm along with said voice coil,
detection means having its terminal voltage changed responsive to the rate of displacement of said diaphragm or said first bobbin, said detection means having a second bobbin arranged coaxially as said first bobbin, a detection coil wound about said second bobbin and a detection magnetic circuit for detecting displacement of said diaphragm or said first bobbin along with said detection coil,
a coupling member interconnecting said first and second bobbins so that the first and second bobbins are coaxially aligned to each other, said coupling member interconnecting the first and second bobbins so that the end of the first bobbin is protruded beyond the end of the second bobbin along the direction of a coaxial line, the coupling member having its outer surface smoothly curved towards the center from outside of said coaxial line.

5,533,135
CROSSOVER SYSTEM

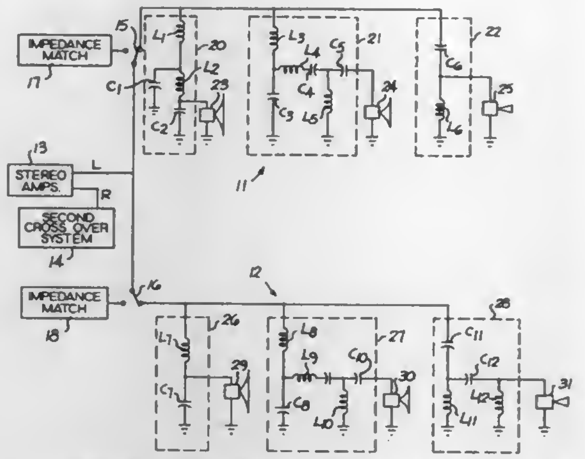
Phillip A. Gary, P.O. Box 71770, Madison Heights, Mich. 48071

Filed Apr. 10, 1995, Ser. No. 419,189

Int. Cl.^{6} H03G *5/00*

U.S. Cl. 381—99 **6 Claims**

4. A speaker system to be connected to a source of audio signals to produce audible sounds from the signals, the system comprising:
(a) a first set of loudspeakers comprising first and second speakers;
(b) a first crossover network connected to the first set of speakers and comprising:



(i) means to transmit audio signals in a first range of audio frequencies below a first frequency to the first speaker to produce sound pressure at approximately a first level, and
(ii) means to transmit audio signals in a second range of audio frequencies above the first frequency to the second speaker to produce sound pressure at approximately a second level, the second level being higher than the first level by a predetermined amount;
(c) a second set of loudspeakers comprising third and fourth speakers; and
(d) a second crossover network connected to the second set of speakers and comprising:
(i) means to transmit audio signals in the first range of audio frequencies to the third speaker to produce sound pressure at approximately the second level, and
(ii) means to transmit audio signals in the second range of audio frequencies above the first frequency to the fourth speaker to produce sound pressure at approximately the first level.

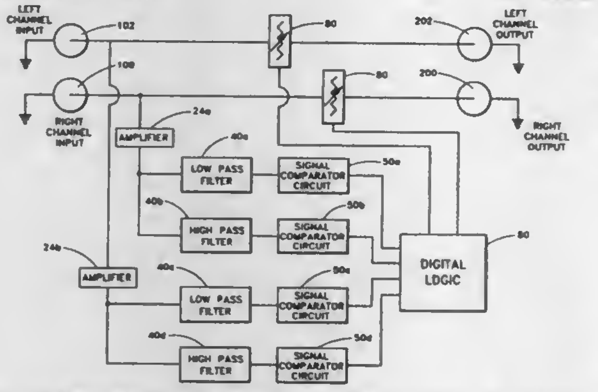
5,533,136
CIRCUIT FOR ATTENUATING COMMERCIAL INTERRUPTIONS DURING RADIO BROADCASTING

Terry L. Smith, 3246 S. 61st Ave., Cicero, Ill. 60650

Filed Nov. 4, 1993, Ser. No. 145,582

Int. Cl.^{6} H03G *3/00*

U.S. Cl. 381—107 **14 Claims**



1. An attenuating circuit for attenuating commercial interruptions in an audio signal, said attenuating circuit comprising:
(a) low pass filter means for receiving said audio signal and for passing only low frequency components of said audio signal, said low frequency components being beneath a determined frequency;
(b) low frequency comparator means for generating a low frequency detection signal whenever the amplitude of said low frequency components exceeds a first threshold value;
(c) high pass filter means for receiving said audio signal and for passing only high frequency components of said audio signal, said high frequency components being above said determined frequency;
(d) high frequency comparator means for generating a high frequency detection signal whenever the amplitude of said high frequency components exceeds a second threshold value;
(e) logic means for receiving said low frequency detection signal and said high frequency detection signal and for generating an attenuating signal whenever said low frequency detection signal is active and said high frequency detection signal is null; and
(f) attenuation means four receiving said attenuation signal and for substantially attenuating the strength of said audio signal whenever said attenuation signal is active.

5,533,137
EARPHONES

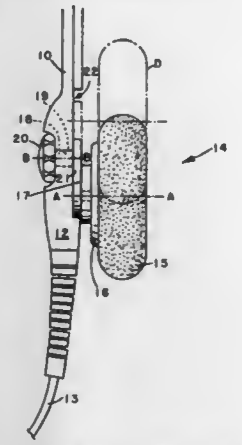
Richard Holmes, Nuneaton, United Kingdom, assignor to Virtuality IP Limited, Leicester, United Kingdom

Filed Jun. 10, 1994, Ser. No. 258,062

Claims priority, application United Kingdom, Jun. 16, 1993, 9312381

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—183 **5 Claims**



1. A head-mounted apparatus comprising a member adapted, when worn, to locate about a head of a wearer in a generally horizontal plane extending rearwardly from the bridge of the nose of the wearer and an earphone mounting means housing an earphone and being attached to one side of said member, said earphone mounting means being rotatable relative to said member about an axis eccentric of the earphone with said axis lying generally parallel to said plane, said axis extending transversely through said side of said member with the position of the earphone mounting means being adjustable relative to the member about said axis through more than 180 degrees to accommodate different ear positions.

5,533,138
IMAGE COMPRESSION ENCODING AND DECODING METHOD AND APPARATUS THEREFOR

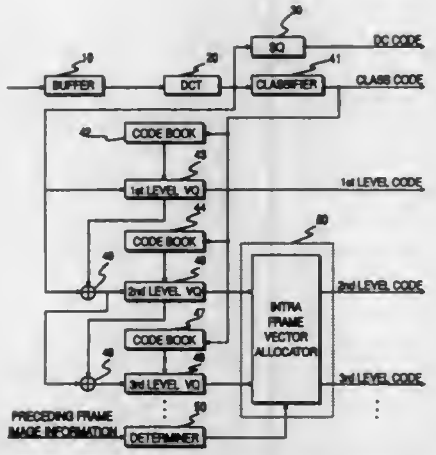
Yong-Kyu Kim, Seoul, Rep. of Korea; Tianmin Liu, Lawrenceville; Steven T. Jaffe, Freehold, both of N.J., and Christopher H. Strolle, Glenside, Pa., assignors to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation of Ser. No. 851,019, Mar. 13, 1992, abandoned. This application May 9, 1994, Ser. No. 239,848

Int. Cl.^{6} H04N *7/12;* **G06K** *9/36*

U.S. Cl. 382—232 **20 Claims**

1. An image compression encoding method for a video signal that describes a sequence of television image frames, some of said television image flames including images of objects having edges



that are directed in various directions, said image compression encoding method comprising:

a discrete-cosine transform generation step wherein each said television image frame is segmented into a plurality of closely packed non-overlapping image blocks arranged in rows and in columns, each said image block being of prescribed beight and width dimensions, portions of the video signal descriptive of each said image block being transformed to a respective two-dimensional discrete cosine transform block, each said discrete cosine transform block being composed of a respective plurality of coefficients each manifested as a respective electrical signal, one of said coefficients being a direct-current coefficient and the others of said coefficients being alternating-current coefficients in two-dimensional spatial frequency;

a scalar quantization step for scalar quantizing the direct-current coefficient of each said discrete cosine transform block, thereby generating a respective direct-current code for each said discrete cosine transform block, each said respective direct-current code having exactly n bits therein;

a classification step for classifying the alternating-current coefficients of each said discrete cosine transform block as belonging to a selected one of m classes, thereby generating a respective class code for each said discrete cosine transform block;

a first-level vector quantization step for approximating a vector formed from the classified alternating-current coefficients of each said discrete cosine transform block with a selected one of f first-level approximation vectors prescribed for each class, and identifying the selected one of said first-level approximation vectors by a respective first index having exactly g bits therein, said selected first-level approximation vector providing an approximation of said vector formed from the classified alternating-current coefficients of each said discrete cosine transform block with no more error than any other of said first-level approximation vectors prescribed for said selected class, said respective first index having exactly g bits and being supplied as a first-level code for each said discrete cosine transform block, the direct-current code and the class code and the first-level code for each said discrete cosine transform block together forming an independently decodable code having a number B of encoding bits that is a positive integer equal to the quantity $n+(\log_2 m)+f\ g$ or the closest positive integer rounding upward from said quantity, f, g, m, and n being positive integers of predetermined respective values so that the number B is unchanging;

a step of determining after each said first-level vector-quantization step on one said discrete cosine transform block whether a first prescribed amount of permissible vector-quantization error is exceeded by a first-level error vector that is defined by all the alternating-current coefficients of said one discrete cosine transform block decremented by corresponding ones of the alternating-current coefficients of the first-level approximation vector selected in said first-level vector quantization step on said one said discrete cosine transform block;

a second-level vector quantization step of approximating each said first-level error vector that exceeds said first prescribed amount of permissible vector-quantization error with a selected one of a plurality of second-level approximation vectors prescribed for said selected class, said selected second-level approximation vector providing an approximation of said first-level error vector with no more error than any other of said second-level approximation vectors prescribed for said selected class, and identifying said selected second-level approximation vector with a respective second index, thereby generating a second-level code for each said discrete cosine transform block the respective first-level error vector of which exceeds said first prescribed amount of permissible vector-quantization error, said second-level code depending for its decoding on the first-level code for the same discrete cosine transform block and being included in a dependently decodable code for said same discrete cosine transform block;

a step of determining after each said second-level vector-quantization step on one said discrete cosine transform block whether a second prescribed amount of permissible vector-quantization error is exceeded by a second-level error vector that is defined by all the alternating-current coefficients of said one said discrete cosine transform block decremented by corresponding ones of the alternating-current coefficients of the first-level approximation vector selected in said first-level vector quantization step on said one said discrete cosine transform block and further decremented by corresponding ones of the alternating-current coefficients of the second-level approximation vector selected in said second-level vector quantization step on said one said discrete cosine transform block;

a third-level vector quantization step of approximating each said second-level error vector that exceeds said second prescribed amount of permissible vector-quantization error, with a closest one of a plurality of third-level approximation vectors prescribed for said selected class, said selected third-level approximation vector providing an approximation of said second-level error vector with no more error than any other of said third-level approximation vectors prescribed for said selected class, and identifying said selected third-level approximation vector with a respective third index, thereby generating a third-level code for each said discrete cosine transform block the respective second-level error vector of which exceeds said second prescribed amount of permissible vector-quantization error, said third-level code depending for its decoding on the first-level code and the second-level code for the same discrete cosine transform block and being included in said dependently decodable code for said same discrete cosine transform block; and

an intra-frame vector allocation step of determining prior to encoding each next television image frame the quantity of bits by which the result of encoding an immediately preceding television image frame departed from a number of bits prescribed for each television image frame, and using that quantity as an error signal in a degenerative feedback subroutine that adjusts at least one of said first and second prescribed amounts of permissible vector-quantization error during encoding of said next television image frame, for controlling the number of bits said second-level and third-level vector quantization steps together contribute for inclusion in said dependently decodable codes within each successive television image frame;

said image compression encoding method included within a method using a helical-scanning tape recorder for tape recording a digital electric signal representative of said discrete cosine transform blocks on a tape along parallel tracks crossing a surface of said tape at a prescribed skew angle;

in which said method for tape recording said digital electric signal, successive independently decodable codes generated for each said discrete cosine transform block by said scalar quantization, classification and first-level vector quantization steps are recorded at a predetermined bit rate in regularly spaced equal-length segments of said tracks, as respective portions of said digital electric signal; and

in which said method for tape recording, said dependently decodable codes are recorded in portions of said tracks between said regularly spaced equal-length segments, as respective further portions of said digital electric signal.

5,533,139

COATING DENSITY ANALYZER AND METHOD USING IMAGE PROCESSING

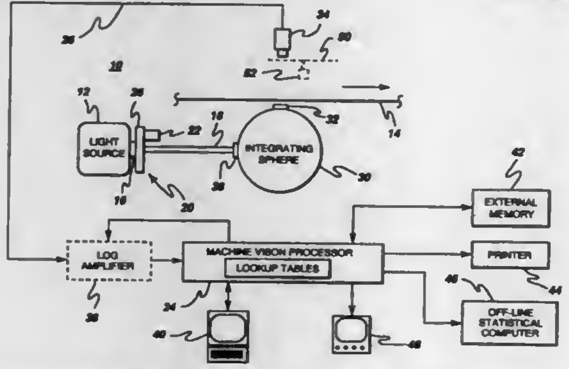
Galen H. Parker, Rochester; Douglas S. Finnicum, Webster, and Richard D. Young, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 891,318, May 29, 1992, abandoned.

This application Sep. 12, 1994, Ser. No. 304,603

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 382—108 **35 Claims**



1. An image processor based system having a two-dimensional imaging area, said system for recognizing a predefined continuous-type density imperfection in a coating on a moving coated web passing through said imaging area, said system comprising:

a non-coherent light source providing uniform illumination of said web while said web passes through said two-dimensional imaging area;

full-frame image acquisition and full-field integration means for accumulating coating density data representative of a plurality of different regions of said illuminated moving coated web, each region of said plurality of different regions being co-extensive, passing sequentially through said imaging area, and having a corresponding full-frame image, said full-field integration means for outputting integrated image data representative of a sum of said corresponding full-frame images; and

an image processor coupled to said image acquisition and integration means, said image processor being programmed to recognize said at least one density imperfection of said predefined continuous-type in said coating using said integrated image data output by said integration means.

5,533,140

DEVICE FOR TRANSMITTING AND/OR STORING SIGNALS CORRESPONDING TO ONE OR MORE TEXTURES IN A PICTURE, DEVICE FOR SYNTHESIZING TEXTURE SIGNALS FOR SUCH A TRANSMITTING AND/OR STORAGE DEVICE, AND SYSTEM FOR TRANSMITTING AND/OR STORING SIGNALS CORRESPONDING TO T

Jacques A. Sirat, Limeil Brevannes, and Christophe Oddou, Ablon S/S, both of, France, assignors to U.S. Philips Corporation, New York, N.Y.

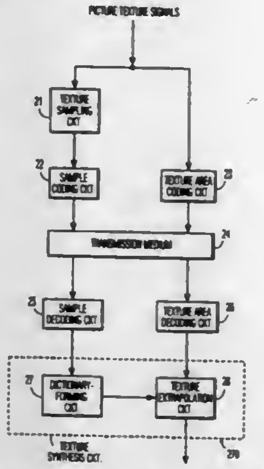
Continuation of Ser. No. 991,037, Dec. 15, 1992, abandoned.

This application Nov. 28, 1994, Ser. No. 345,877

Claims priority, application France, Dec. 18, 1991, 91 15724; Dec. 23, 1991, 91 16034

Int. Cl.^{6} G06K *9/52*

U.S. Cl. 382—108 **9 Claims**



1. Apparatus for transmitting a video picture which is received at an input of said apparatus in the form of digital signals corresponding to the luminosities of pixels of said video picture, blocks of said signals constituting texture signals representative of textures in said video picture formed by the corresponding blocks of pixels; said apparatus comprising:

a sampling stage coupled to said input for deriving a reference sample of the texture signals relating to an area of the video picture having substantially homogeneous texture, said reference sample including data blocks representative of blocks of pixels in a sample of said area of the video picture;

a first coding stage coupled to said sampling stage for encoding said reference sample of the texture signals relating to said area of the video picture so as to form a coded reference sample signal;

a second coding stage coupled to said input for encoding the texture signals relating to said video picture so as to form coded texture signals;

a transmission medium coupled to said first and second coding stages for transmitting the coded reference sample signal and the coded texture signals, said transmission medium comprising at least one of a communication channel and storage means;

decoding means coupled to said transmission medium for receiving therefrom the transmitted coded reference sample signal and the coded texture signals, and decoding said signals to derive a decoded reference sample signal and decoded texture signals; and

picture synthesizing means coupled to said decoding means for (i) combining the decoded texture signals to derive an approximative synthesis of the video picture, and (ii) extrapolating said approximative synthesis of the video picture by replacing pixels in said area of substantially homogeneous texture with pixel blocks represented by the decoded reference sample signal, thereby completing synthesis of the video picture.

5,533,141
PORTABLE PEN POINTING DEVICE AND A PROCESSING SYSTEM WITH PEN POINTING DEVICE

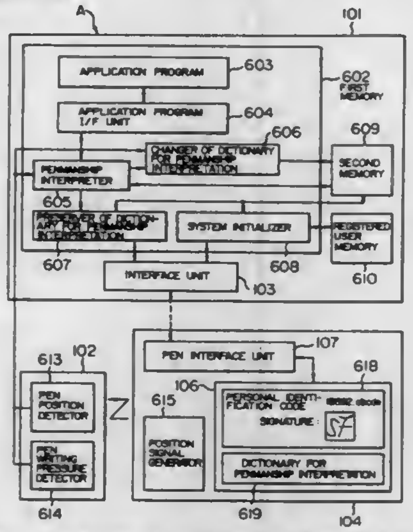
Seiji Futatsugi, Inagi; Keiji Kojima, Sagamihara; Yoshiki Matsuda, Kokubunji; Yoshinori Kitahara, Musashimurayama, and Masato Mogaki, Hachioji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1992, Ser. No. 996,039

Claims priority, application Japan, Dec. 27, 1991, 3-346342

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—119 **13 Claims**


A
101
APPLICATION PROGRAM
603
602
FIRST MEMORY
APPLICATION PROGRAM I/F UNIT
604
606
609
CHANGER OF DICTIONARY FOR PENMANSHIP INTERPRETATION
PENMANSHIP INTERPRETER
SECOND MEMORY
605
PREPARER OF DICTIONARY FOR PENMANSHIP INTERPRETATION
SYSTEM INITIALIZER
REGISTERED USER MEMORY
607
608
610
INTERFACE UNIT
103
107
PEN INTERFACE UNIT
613
102
618
106
615
PEN POSITION DETECTOR
PERSONAL IDENTIFICATION CODE
SIGNATURE :
PEN WRITING PRESSURE DETECTOR
POSITION SIGNAL GENERATOR
DICTIONARY FOR PENMANSHIP INTERPRETATION
614
619
104

1. A portable pen pointing device in the form of a portable pen and which is handled like a pen to input information to a separate processor body, the portable pen pointing device comprising:

memory means for storing user-specific information,

wherein said user-specific information includes the user's signature for identifying the user, user-specific penmanship/handwriting information for interpreting the user's penmanship/handwriting when the user inputs a writing sample to said processor body using said portable pen pointing device, and a user-specific personal identification code; and

pen interface means for supplying said user-specific information to a corresponding processor interface on said separate processor body.

5,533,142
METHOD FOR ADJUSTING READ-OUT AND PROCESSING CONDITIONS FOR MAGEN IMAGES

Hideya Takeo, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1993, Ser. No. 136,022

Claims priority, application Japan, Oct. 15, 1992, 4-277541

Int. Cl.⁶ G06K *9/00;9/34;* **G01N** *23/04;* **G06F** *15/00*

U.S. Cl. 382—128 **11 Claims**

9. A method for determining an image recording pattern of a Magen image, wherein an image recording pattern of a Magen radiation image, which has been recorded in a subdivision pattern composed of at least a single subdivision, is determined, the method comprising the steps of:

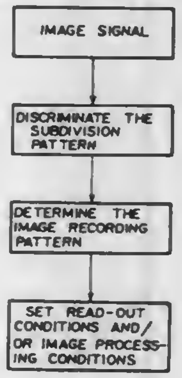


IMAGE SIGNAL
DISCRIMINATE THE SUBDIVISION PATTERN
DETERMINE THE IMAGE RECORDING PATTERN
SET READ-OUT CONDITIONS AND/ OR IMAGE PROCESSING CONDITIONS

i) discriminating the kind of the subdivision pattern of the Magen image on the basis of an image signal, which represents the Magen radiation image, or information given by an image recording system, which carries out an image recording operation, to determine whether the subdivision pattern is a one-on-one pattern, two-on-one pattern or four-on-one pattern, and

ii) determining, based on the kind of subdivision pattern which has been discriminated, an image recording pattern of the Magen image to be an ordinary image recording pattern when the subdivision pattern is a one-on-one pattern, a double-contrasted image recording pattern when the subdivision pattern is a two-on-one pattern, or pressed stomach image recording pattern when the subdivision pattern is a four-on-one pattern.

5,533,143
METHOD FOR DETERMINING THE ORIENTATION IN WHICH AN OBJECT WAS PLACED WHEN THE IMAGE OF THE OBJECT WAS RECORDED

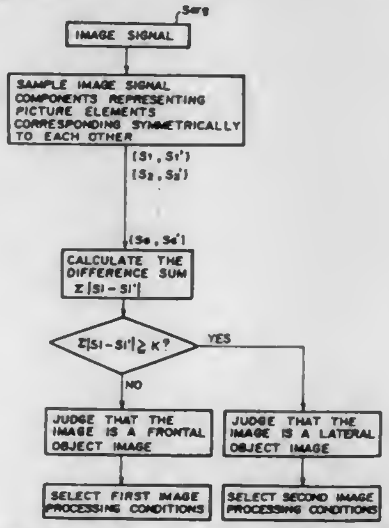
Hideya Takeo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1994, Ser. No. 233,980

Claims priority, application Japan, Apr. 27, 1993, 5-100877

Int. Cl.⁶ G06K *9/46*

U.S. Cl. 382—132 **19 Claims**


Sorg
IMAGE SIGNAL
SAMPLE IMAGE SIGNAL COMPONENTS REPRESENTING PICTURE ELEMENTS CORRESPONDING SYMMETRICALLY TO EACH OTHER
(S1 , S1')
(S2 , S2')
(Sn , Sn')
CALCULATE THE DIFFERENCE SUM Σ|Si − Si'|
Σ|Si − Si'| ≥ K?
YES
NO
JUDGE THAT THE IMAGE IS A FRONTAL OBJECT IMAGE
JUDGE THAT THE IMAGE IS A LATERAL OBJECT IMAGE
SELECT FIRST IMAGE PROCESSING CONDITIONS
SELECT SECOND IMAGE PROCESSING CONDITIONS

1. A method for determining an orientation from a recorded image of a physical object, wherein the orientation, in which the physical object was placed when the image of the physical object was recorded, is determined, the method comprising the steps of:

i) retrieving an image signal of the physical object which is stored on an image storing means, the image represented by said image signal being capable of taking either a symmetric orientation or an asymmetric orientation with respect to a center line of the image serving as the axis of symmetry, said image signal being made up of a series of image signal components representing picture elements in the image,

ii) sending the retrieved image signal to an image processing means,

iii) calculating, using said image processing means, the difference between values of image signal components representing at least a single pair of picture elements, which correspond symmetrically to each other with respect to the center line of the image, and calculating a characteristic value, which represents symmetry or asymmetry of the image, from the value of said difference by carrying out a predetermined operation, and

iv) using said image processing means for making a judgment from the level of said characteristic value as to determine whether the image of the object represents a symmetric orientation or an asymmetric orientation.

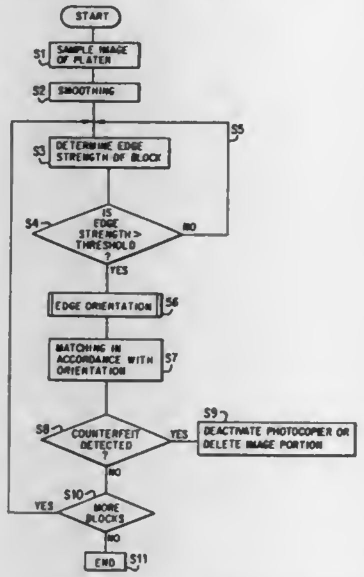
5,533,144
ANTI-COUNTERFEIT PATTERN DETECTOR AND METHOD

Zhigang Fan, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1994, Ser. No. 323,652

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—135 **14 Claims**


START
S1
SAMPLE IMAGE OF PLATEN
S2
SMOOTHING
S5
S3
DETERMINE EDGE STRENGTH OF BLOCK
S4
IS EDGE STRENGTH > THRESHOLD ?
NO
YES
EDGE ORIENTATION
S6
MATCHING IN ACCORDANCE WITH ORIENTATION
S7
S9
S8
COUNTERFEIT DETECTED ?
YES
DEACTIVATE PHOTOCOPIER OR DELETE IMAGE PORTION
NO
S10
YES
MORE BLOCKS
NO
END
S11

1. An anti-counterfeit detector for detecting whether an image to be photocopied is a currency note, the detector comprising:

storage means for storing a plurality of templates, each of said plurality of templates comprising at least one predetermined anchor point;

examining means for examining a portion of said image to be photocopied and for determining whether said portion contains a predetermined pixel intensity arrangement, wherein said predetermined pixel intensity arrangement is an edge and said examining means comprises means for calculating edge strength within said portion in accordance with the following equations:

$$f(x,y)=|d_V|^3(x,y)+|d_H|^3(x,y)$$

and

$$W=\Sigma f(x,y)$$

where d_V and d_H are differences in intensity of neighboring pixels in vertical and horizontal directions respectively, W is edge strength and summation is over said portion;

orientation determining means for determining an orientation of said predetermined pixel intensity arrangement;

positioning means for positioning said plurality of templates in alignment with said predetermined pixel intensity arrangement in accordance with said orientation determined by said orientation determining means;

matching means for comparing said plurality of templates to said predetermined pixel intensity arrangement.

5,533,145
CONTINUOUS TWO DIMENSIONAL MONITORING OF THIN WEBS OF TEXTILE MATERIALS

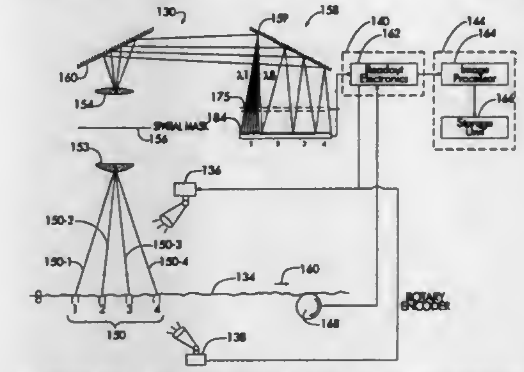
Frederick M. Shofner, and Joseph C. Baldwin, both of Knoxville, Tenn., assignors to Zellweger Uster, Inc., Knoxville, Tenn.

Continuation of Ser. No. 999,114, Dec. 31, 1992, abandoned.

This application Oct. 26, 1994, Ser. No. 329,660

Int. Cl.⁶ G06K *9/00;* **B07C** *5/00;* **G01N** *21/86;* **G01V** *9/04*

U.S. Cl. 382—141 **17 Claims**



1. An apparatus for monitoring a web of textile material, said web including a plurality of entities, comprising:

an imaging unit for receiving electromagnetic radiation from said web and producing image signals in response thereto, said image signals corresponding to images of portions of said web including said entities, said web being in motion relative to said imaging unit, said imaging unit for scanning stripe images at first and second fixed locations simultaneously in a direction substantially perpendicular to the direction of relative motion of said web and scanning successive stripe images at said first and second fixed locations at subsequent times while said web is in motion past said fixed locations to produce a plurality of first stripe images and a plurality of second stripe images, such that each stripe image from the first location is produced at a different time from each of the other stripe images from the first location and further such that each of the stripe images from the first location depicts a different portion of the web as compared to other stripe images from the first location, and such that each stripe image from the second location is produced at a different time from each of the other stripe images from the second location and further such that each of the stripe images from the second location depicts a different portion of the web as compared to other stripe images from the second location; and

processing means for receiving said image signals from said imaging units, for producing and storing digital data corresponding to the image signals received from said imaging unit, said processing means further comprising means for producing and storing digital data corresponding to a first composite image generated by sequentially accessing each of the plurality of said first stripe images and for producing and storing digital data corresponding to a second composite image generated by sequentially accessing each of the plurality of said second stripe images, said processing means further comprising means for analyzing the digital data, for finding entities of interest in said web based on the analysis of the digital data, for determining parameters of said found entities of interest, and for producing output signals indicating parameters of entities of interest in said web.

5,533,146
WELD BEAD QUALITY DETERMINING APPARATUS

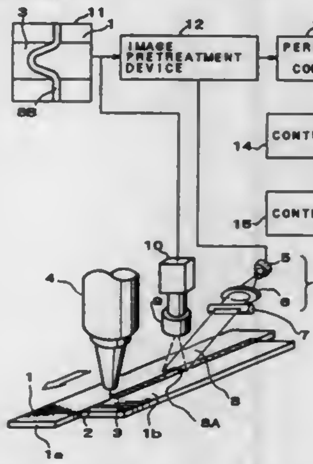
Takao Iwai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 942,770, Sep. 10, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 341,040

Claims priority, application Japan, Sep. 11, 1991, 3-258738

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—150 **12 Claims**



1. An apparatus for determining a quality of a weld bead, comprising:

a slit beam emitter for producing a slit beam of light and projecting the slit beam of light obliquely and downwardly on a weld bead joining metal sheets with a width direction of the slit beam of light perpendicular to a longitudinal direction of the weld bead so that the slit beam of light makes an illuminated band on an upper surface of a welded assembly of the metal sheets, a portion of the illuminated band crossing the weld bead being distorted from an extension of the remaining portion of the illuminated band corresponding to a configuration of an upper surface of the weld bead;

a CCD camera, disposed above the illuminated band and moved along the weld bead, for photographing the illuminated band and making a photograph plane, which includes an image of the illuminated band, for each position as the CCD camera is moved along the weld bead, the image of the illuminated band being brighter than a remaining portion of the photograph plane and having a brightest level at a width center of the image in a width direction of the image;

an image pretreatment device, connected to the CCD camera, for scanning each photograph plane along a scanning line which extends substantially perpendicularly to a longitudinal direction of the image and is moved in the longitudinal direction of the image, the image pretreatment device generating an analog signal corresponding to the image of the illuminated band, detecting, along the scanning line, opposite edges of the image of the illuminated band having a brightness level that is greater than a selected reference brightness level, the reference brightness level being selected from a predetermined number of different reference brightness levels by adopting a greatest one of the predetermined number of different reference brightness levels for which edges are detected as the selected reference brightness level, determining a width center of the image as a center of the width of the detected opposite edges of the image along the scanning line, and then converting at least a portion of a signal that corresponds to only the width center of the image into a digital signal for each position of the scanning line as it is moved in the longitudinal direction of the image at predetermined intervals;

a computer, connected to the image pretreatment device and including a memory and a RAM disk, for temporarily storing the digital signal produced by the image pretreatment device, wherein:

the digital signal is stored in the memory for each position of the scanning line as it is moved in the longitudinal direction of the image at predetermined intervals,

after scanning all of the positions of the scanning line, storing in the RAM disk one-dimensional data that corresponds to a center line of the image for each photograph plane,

the center line is based upon the width centers,

the computer reads all the data stored in the RAM disk after welding along a weld line between the metal sheets has been completed, determines characteristics of the image for each photograph plane, compares the characteristics of the image of each photograph plane with respective predetermined limits for an acceptable weld bead so as to determine whether the weld bead is acceptable;

an inspection controller, connected to the computer, for starting and stopping operation of the computer; and

a welding machine controller, connected to the inspection controller, for starting and stopping operation of a welding machine and a conveyor carrying said metal sheets, so that an unacceptable weld bead will not be conveyed to a subsequent manufacturing step.

5,533,147
SEGMENTATION OF HANDWRITTEN PATTERNS USING STROKE AND JUMP VECTORS

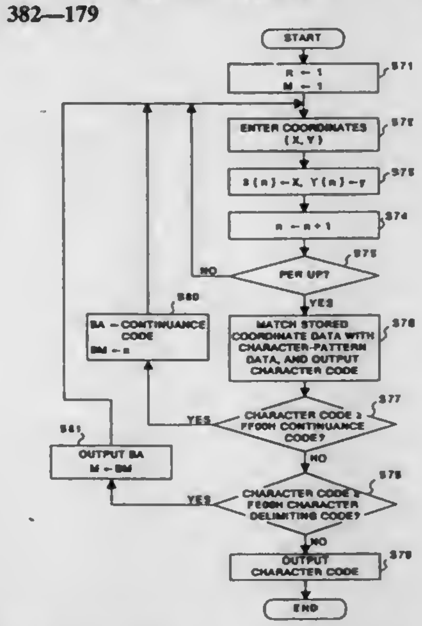
Tsunekazu Arai, Tokyo; Shinsuke Takeuchi, and Kazuhiro Matsubayashi, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 1,220, Jan. 6, 1993, abandoned, which is a continuation of Ser. No. 704,871, May 23, 1991, abandoned. This application Nov. 2, 1994, Ser. No. 334,003

Claims priority, application Japan, May 29, 1990, 2-137277

Int. Cl.^{6} G06K *9/62*

U.S. Cl. 382—179 **16 Claims**



1. A pattern delimiting method, comprising the steps of:

preparing a dictionary storing a string of stroke data each of which defined from a point of start of contact to a point of end of contact and jump vector data, which is represented as a movement from an end of contact point of one stroke to a start of contact point of a next stroke and feature data of the string corresponding to each other, said feature data indicating whether or not the string of stroke data and jump vector data forms an individual pattern;

matching an inputted string of stroke data and jump vector data with the string of stroke data and jump vector data stored in the dictionary beforehand and obtaining feature data of the matched string of stroke data and jump vector data from the dictionary; and

delimiting a string of stroke data and jump vector data composing an individual pattern from the inputted string of stroke data based on the feature data obtained from the matching.

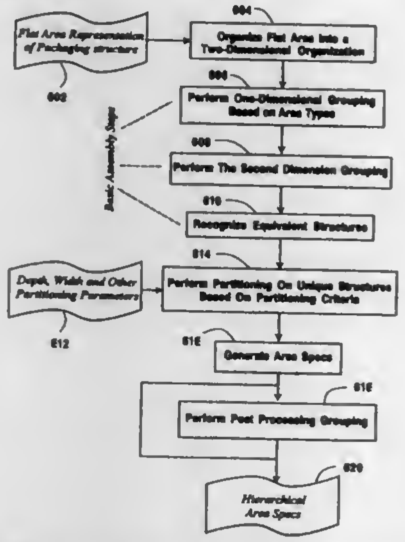
5,533,148
METHOD FOR RESTRUCTURING PHYSICAL DESIGN IMAGES INTO HIERARCHICAL DATA MODELS

John Y. Sayah, Fishkill, and Robert A. Rozwod, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1993, Ser. No. 129,926

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—240 **17 Claims**


Flat Area Representation of Packaging structure
802
804
Organize Flat Area Into a Two-Dimensional Organization
806
Perform One-Dimensional Grouping Based on Area Types
Basic Assembly Steps
808
Perform The Second Dimension Grouping
810
Recognize Equivalent Structures
814
Depth, Width and Other Partitioning Parameters
812
Perform Partitioning On Unique Structures Based On Partitioning Criteria
816
Generate Area Specs
818
Perform Post Processing Grouping
820
Hierarchical Area Specs

1. A method for restructuring a physical design image into a data model comprising the steps of:

providing a physical design image;

identifying leaf areas in the physical design image;

classifying the leaf areas as being of one or more types according to a characteristic of the leaf areas;

grouping adjacent leaf areas of equivalent type into one or more area arrays;

recognizing equivalent adjacent and non-adjacent area arrays and forming a set of one or more unique area arrays;

partitioning each unique area array into one or more partition areas;

recognizing equivalent partition areas and forming a set of one or more unique partition areas; and

generating area specifications for each unique partition area and for each unique leaf area.

5,533,149
COMPUTER BASED DIGITAL IMAGE NOISE REDUCTION METHOD BASED ON OVERLAPPING PLANAR APPROXIMATION

Martin Kaplan, Rochester, and Heemin Kwon, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

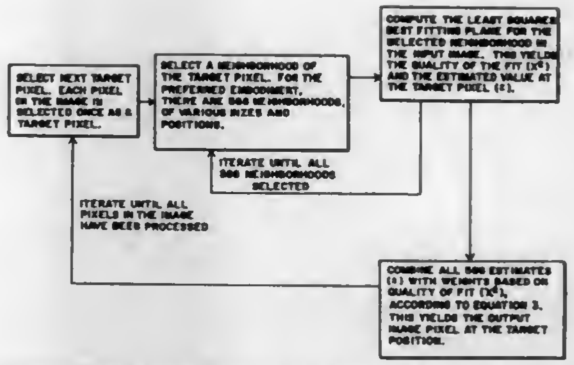
Continuation of Ser. No. 399,135, Aug. 28, 1989, abandoned. This application Oct. 23, 1991, Ser. No. 781,468

Int. Cl.^{6} G06K *9/40*

U.S. Cl. 382—260 **1 Claim**

1. A method of operating an image processing system, in which a photographic image is digitized by a digitizing image transducer, said digitizing image transducer producing digital imagery data representative of a digital image composed of an array of image picture elements, said image processing system producing, from said digital imagery data, an output image from which noise artifacts that have been introduced into said digital image in the course of the digitization of said photographic image are reduced, so as not to be discernible to the human eye, comprising the steps of:

a. selecting a target pixel position from said array of pixels of which said digital image is comprised;


SELECT NEXT TARGET PIXEL. EACH PIXEL IN THE IMAGE IS SELECTED ONCE AS A TARGET PIXEL.
SELECT A NEIGHBORHOOD OF THE TARGET PIXEL. FOR THE PREFERRED EMBODIMENT, THERE ARE 896 NEIGHBORHOODS, OF VARIOUS SIZES AND POSITIONS.
COMPUTE THE LEAST SQUARES BEST FITTING PLANE FOR THE SELECTED NEIGHBORHOOD IN THE INPUT IMAGE. THIS YIELDS THE QUALITY OF THE FIT (X^2) AND THE ESTIMATED VALUE AT THE TARGET PIXEL ($\hat{z}$).
ITERATE UNTIL ALL 896 NEIGHBORHOODS SELECTED
ITERATE UNTIL ALL PIXELS IN THE IMAGE HAVE BEEN PROCESSED
COMBINE ALL 896 ESTIMATES ($\hat{z}$) WITH WEIGHTS BASED ON QUALITY OF FIT (X^2), ACCORDING TO EQUATION 3. THIS YIELDS THE OUTPUT IMAGE PIXEL AT THE TARGET POSITION.

b. prescribing a neighborhood of pixels about said target pixel position;

c. for the neighborhood prescribed in step b, generating a signal representative of a goodness of fit (X^2) and an estimated value of the image pixel at said target pixel position in accordance with a least squares best fit plane for said prescribed neighborhood;

d. iterating steps b and c for respectively different types and respectively different positions of said prescribed neighborhood;

e. generating an output image pixel for said target pixel position in accordance with a summation of all estimated values of the image pixel at said target pixel position with weights based upon said goodness of fit (X^2);

f. iterating steps a through e for all pixels of said array of pixels, so as to produce output image signals associated with an output pixel array yielding a reduced noise digital image; and

g. applying the output image signals produced in step f to an image reproduction device, which produces an output image in which said noise artifacts have been reduced so as not to be discernible to the human eye.

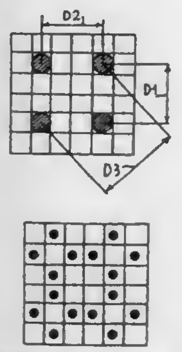
5,533,150
METHOD AND APPARATUS FOR IMPROVING THE DISPLAY OF GREYS IN A TWO-TONE DIGITISED IMAGE

Ferruccio Zulian, Milan, Italy, assignor to Bull HN Information Systems Italia S.p.A., Turin, Italy

Filed Apr. 22, 1994, Ser. No. 231,630

Int. Cl.^{6} H04N *1/40*

U.S. Cl. 382—275 **7 Claims**



1. A method for enhancing the display of greys in a two-tone digitised image comprising steps of:

a) generating a binary signal having first and second logic levels representative of at least one image map of a desired image having more than two tones;

b) storing in a temporary memory N consecutive bits in M consecutive rows of the said image map forming a subgroup of the said image map,

c) extracting from the said temporary memory a plurality of the said bits forming a scanning window comprising a central bit and a predetermined number of bits of the said subgroup around the said central bit;

d) identifying, via the bits of the said window an isolated image bit with the said first logic level, surrounded by bits at the said second logic level, at a distance from other bits of the said window at the said first logic level greater than two bits, and satisfying either one or the other of the following conditions, both conditions being tested:
the said isolated bit coincides with the said central bit,
the said central bit is at the said second logic level and the said isolated bit is disposed at a predetermined distance from the said central bit in one of a plurality of predetermined directions in the said window relative to the said central bit,
e) generating a modify signal for modifying the said central bit if the said isolated image bit satisfies either one or the other of the said conditions;
f) replacing the said central bit in the said binary signal with the said modify signal.

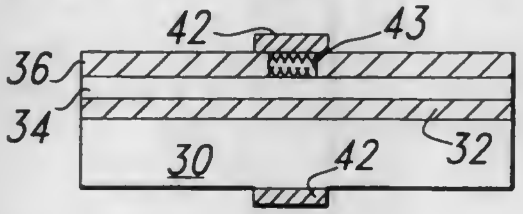
5,533,151
ACTIVE CLADDING OPTICAL MODULATOR USING AN ELECTRO-OPTIC POLYMER ON AN INORGANIC WAVEGUIDE

Jerry Leonard, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1995, Ser. No. 431,191

Int. Cl.^{6} G02B *6/122*

U.S. Cl. 385—3 **15 Claims**



1. An optical waveguide circuit comprising:
(a) a substrate;
(b) at least one inorganic waveguide core disposed within at least one cladding layer upon said substrate; and
(c) an active cladding region comprising an organic polymer material having an index of refraction lower than that of said inorganic waveguide core fabricated adjacent to said waveguide core,
wherein the phase of an optical signal having a mode primarily within said waveguide core may be modulated by controlling the index of refraction of said active cladding region.

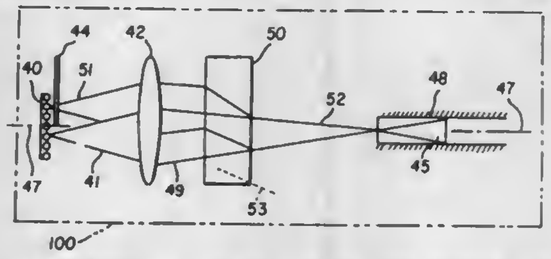
5,533,152
METHOD AND APPARATUS FOR COUPLING LIGHT EMITTED FROM A MULTI-MODE LASER DIODE ARRAY TO A MULTI-MODE OPTICAL FIBER

David Kessler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1995, Ser. No. 434,145

Int. Cl.^{6} G02B *6/27*

U.S. Cl. 385—11 **6 Claims**



1. An apparatus for coupling polarized light emitting from a multi-mode diode laser to an optical fiber comprising:
a half-wave plate, adjacent to the multi-mode diode laser in a path of the light such that substantially one-half of the light emitted from the multi-mode laser is rotated by the effect of the half-wave plate;
collecting optics, situated in the path of the light between the half-wave plate and the optical fiber; and
a double refractive prism, situated in the path of the light between the collecting optics and the optical fiber such that the double refractive prism displaces substantially one-half of the light by an amount approximately equal to a diameter of the optical fiber so as to overlap substantially one-half of the light onto another one-half of the light which then is inserted into the optical fiber.

5,533,153
OPTICAL RELAY AMPLIFIER WITH A BYPASS WAVEGUIDE

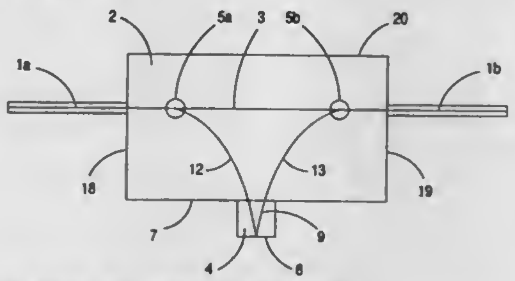
Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 425,071

Claims priority, application Japan, May 27, 1994, 6-115186

Int. Cl.^{6} G02B *6/28*

U.S. Cl. 385—24 **19 Claims**



1. An optical relay amplifier comprising:
a first optical coupler for dividing inputted signal light into a plurality of lights;
a first optical amplifier which is a semiconductor laser amplifier for amplifying one signal light of said divided plurality of lights, said first optical amplifier including a V-shaped optical waveguide path having two ends and a returning end portion having a reflection surface, one end of said two ends being connected to said first optical coupler;
a bypass optical waveguide path for passing remaining signal light of said divided plurality of lights therethrough; and
a second optical coupler for coupling the amplified light from said first optical amplifier with the passing light from said bypass optical waveguide path, the other end of said two ends being connected to said second optical coupler.

5,533,154
OPTICAL MEMORY

Kevin Smith, Suffolk, England, assignor to British Telecommunications, plc, London, England

PCT No. PCT/GB92/01882, § 371 Date Jul. 13, 1994, § 102(e) Date Jul. 13, 1994, PCT Pub. No. WO93/08574, PCT Pub. Date Apr. 29, 1993

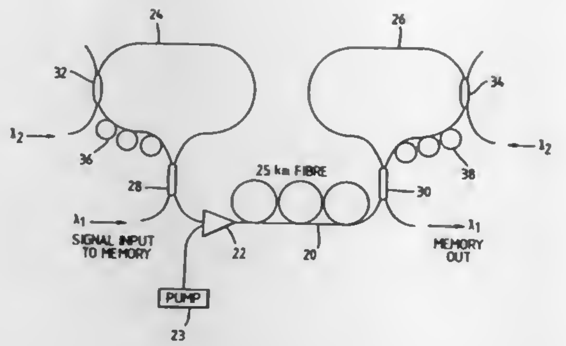
PCT Filed Oct. 14, 1992, Ser. No. 211,792

Claims priority, application United Kingdom, Oct. 18, 1991, 9122182

Int. Cl.^{6} G02B *6/26;6/42*

U.S. Cl. 385—27 **10 Claims**

1. An optical memory for storing optical signals of a first wavelength, the optical memory comprising a first, non-linear loop mirror switch having first and second optical ports, and an optical delay line having one end coupled to one port of the first non-linear loop mirror switch and its other end coupled to a reflector reflective at the first wavelength and operable to reflect signals of the first wavelength received via the delay line back into the delay line.



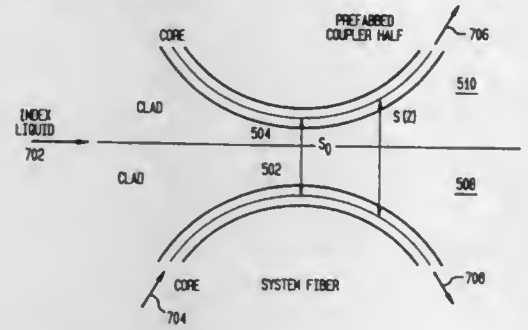
5,533,155
EVANESCENT FIELD COUPLER

Yvonne L. Barberio, Neshanic; Jon W. Engelberth, Denville, and Arthur E. Neeves, Morristown, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 366,939

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—30 **20 Claims**



1. An evanescent field coupler, comprising:
a coupler holder;
a first optical fiber mounted in a first substrate block;
first means for compliantly mounting said first substrate block to said coupler holder;
a second optical fiber mounted in a second substrate block; and
second means, coupled to at least one of said first substrate block and said second substrate block, for vertically positioning one of said first substrate block and said second substrate block with respect to the other to switch the coupler on and off;
wherein said first means elastically deforms during switching and/or alignment of said first substrate block and said second substrate block.

5,533,156
INTEGRATED OPITCAL FIBRE AND SUBSTRATE SUPPORTED OPTICAL WAVEGUIDE HAVING DIRECTLY CONNECTED OPTICAL CORES

Graeme D. Maxwell, and Benjamin J. Ainslie, both of Suffolk, England, assignors to British Telecommunications, plc, London, United Kingdom

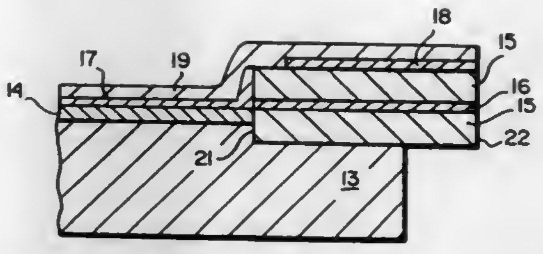
Continuation of Ser. No. 50,358, Aug. 10, 1993, Pat. No. 5,465,312. This application May 12, 1995, Ser. No. 440,460

Claims priority, application United Kingdom, Nov. 5, 1990, 9024022

Int. Cl.^{6} G02B *6/30*

U.S. Cl. 385—49 **8 Claims**

1. An optical device comprising:
(a) a primary substrate for mechanical support,
(b) an optical waveguiding structure which is supported on said substrate and which waveguiding structure comprises confining regions having a glass structure comprising silica and at



least one optically waveguiding path region the materials of which have a glass structure comprising silica with germania to increase the refractive index,
(c) at least one optical fibre having a core surrounded by a cladding wherein the core has a glass structure comprising silica with germania to increase the refractive index and the cladding has a glass structure comprising silica, wherein the end portion
(c1) is located between two layers of the waveguiding structure,
(c2) is fully integrated into the waveguiding structure and secured therein by material having a glass structure,
(c3) has the core directly connected by fusion to one of said path regions,
(c4) is aligned with at least the end portion of the path region to which its core is directly connected, and
(c5) extends beyond the edge of the substrate.

5,533,157
OPTICAL FIBER CONNECTOR BIASING ARRANGEMENT

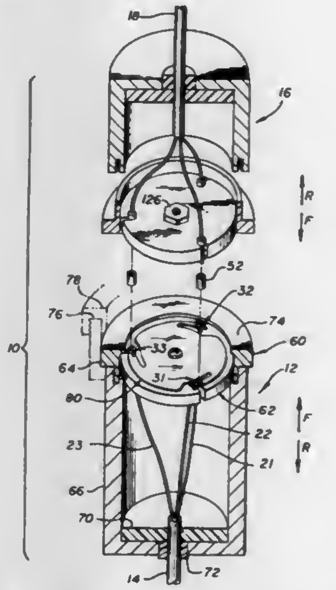
Bruce Coutts, Costa Mesa, Calif., assignor to ITT Corporation, Secaucus, N.J.

PCT No. PCT/US92/09403, § 371 Date Dec. 10, 1992, § 102(e) Date Dec. 10, 1992, PCT Pub. No. WO94/10593, PCT Pub. Date May 11, 1994

PCT Filed Nov. 2, 1992, Ser. No. 952,549

Int. Cl.^{6} G02B *6/36*

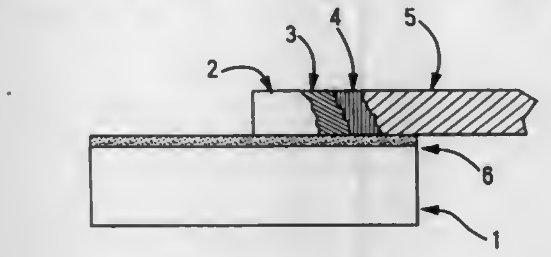
U.S. Cl. 385—53 **19 Claims**



1. An optical fiber connector that includes a housing having a yoke, for connecting to a second connector device, wherein said connector includes a terminus assembly that comprises a terminus body with a front part that is coupled to the front end of an optical fiber of an optical fiber assembly, wherein said terminus body must be capable of moving slightly forward and rearward with respect to said yoke while being biased forwardly, characterized by:

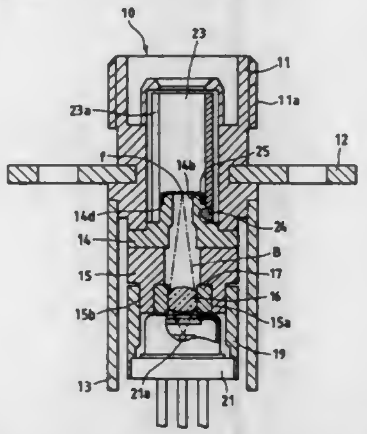
said yoke has a through hole and has front and rear surfaces facing respectively forwardly and rearwardly and spaced along said hole;
said terminus body lies in said hole and has a forward body shoulder lying forward of said yoke front surfaces;
said connector includes a spring member having a leaf spring portion with at least one leaf that has first and second opposite end parts with at least one end part which abuts said yoke front surface and that has a middle that lies forward of said yoke and that abuts said terminus body forward shoulder, said middle being resiliently deflectable rearwardly to allow said terminus body to be resiliently deflectable rearwardly.

5,533,158
ELECTROSTATIC BONDING OF OPTICAL FIBERS TO SUBSTRATES
Hongtao Han, Mechanicsburg, and Songsheng Tan, Pittsburgh, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Sep. 12, 1994, Ser. No. 269,302
Int. Cl.^{6} G02B *6/36*
U.S. Cl. 385—88 **30 Claims**



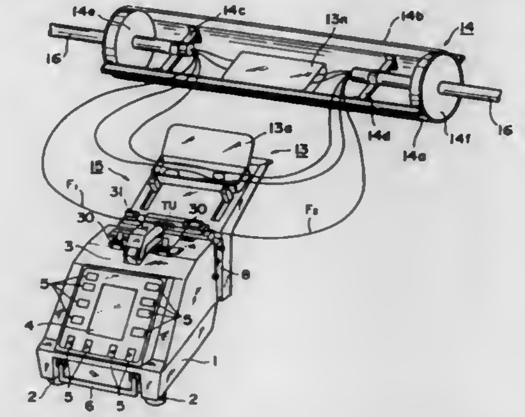
1. An optical interconnect, comprising at least one metallized optical fiber electrostatically bonded to a thin film of an alkali-containing glass, said alkali-containing glass being bonded to at least a portion of a planar surface of a semiconductive or conductive substrate.

5,533,159
MODULE FOR OPTICAL FIBER COMMUNICATION
Ken Okochi, Kakuta, and Kimihiro Kikuchi, Miyagi-ken, both of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Jan. 10, 1995, Ser. No. 370,993
Claims priority, application Japan, Jan. 26, 1994, 6-024774
Int. Cl.^{6} G02B *6/36*
U.S. Cl. 385—93 **5 Claims**



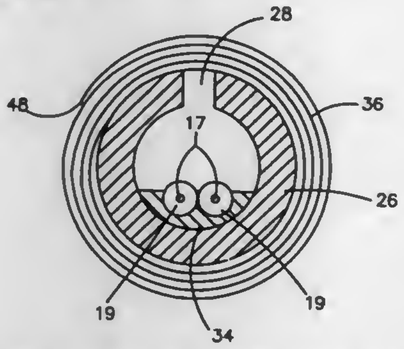
1. A module for optical communication, comprising:
a sleeve in which a ferrule holding an optical fiber is inserted;
a converging lens placed on an extension line of a center axis of the inserted ferrule;
a light emitting or receiving device;
an anti-reflection transparent film provided in the sleeve, a part of the film being adapted to bend so as to adhere closely to an end surface of the optical fiber and a surrounding end surface of the ferrule; and
a stopper member adapted to adhere closely to the end surface of the ferrule through the transparent film, said stopper member being capable of positioning the ferrule relative to the converging lens at a position where an image point, at which an image is formed from laser light having passed through the converging lens, is nearly coincident with the end surface of the optical fiber.

5,533,160
APPARATUS FOR SPLICING OPTICAL FIBERS
Tetsuaki Watanabe; Mikio Kobayashi, both of Yokohama, and Shikou Kodama, Kobe, all of, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jan. 31, 1995, Ser. No. 380,746
Claims priority, application Japan, Mar. 29, 1994, 6-059054
Int. Cl.^{6} G02B *6/255*
U.S. Cl. 385—96 **23 Claims**



12. An apparatus for splicing optical fibers, comprising:
an installation table for placing the optical fibers thereon;
a housing having an installation surface in a vicinity where said installation table is arranged, a front surface intersecting said installation surface at an obtuse angle, and a back surface opposing to said front surface;
an image sensor for observing the optical fibers placed on said installation table, being arranged in said housing;
a display mounted to said front surface of said housing, for displaying output from said image sensor;
a cover member bending along said installation surface and said front surface, said cover member being detachable from said housing; and
a gripping mechanism which can grip a tray which contains the optical fibers therein, being attached to said cover member, wherein said cover member is attachable to said back surface, and when said cover member is attached to said back surface, said tray can be gripped in a position on said cover member above said installation table, and said tray, said installation table and said display are aligned.

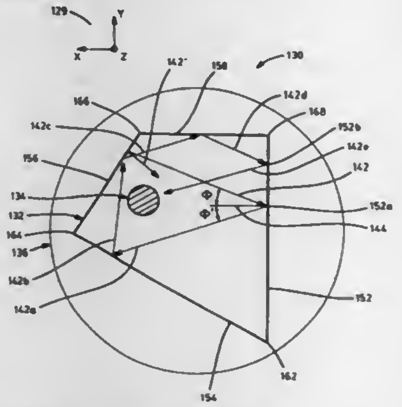
5,533,161
WRAP AROUND FIBER OPTIC COMPONENT PACKAGE AND PACKAGING METHOD
Randal A. Atkeisson, Phoenix, and Karl A. Fetting, Glendale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 5, 1993, Ser. No. 148,041
Int. Cl.^{6} G02B *6/255*
U.S. Cl. 385—99 **3 Claims**



1. A package for a fiber optic coupler formed of a plurality of optical fibers having a coupled region at which electromagnetic waves can be coupled therebetween and having at least one lead portion extending from said coupled region, said package comprising:
a primary protective body having a receiving space for receiving said coupled region and at least one opening through which said at least one lead portion extends; and
a flat wrappable secondary protective material comprised of a flat paper or cloth-like material impregnated with strengthening fibers and having an adhesive on one side thereof wrapped around said primary protective body a plurality of times resulting in a wrapper with at least one opening through which said at least one lead portion extends.

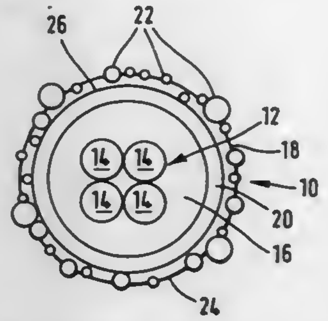
5,533,162
Patent Not Issued For This Number

5,533,163
OPTICAL FIBER STRUCTURE FOR EFFICIENT USE OF PUMP POWER
Martin H. Muendel, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jul. 29, 1994, Ser. No. 283,226
Int. Cl.^{6} G02B *6/22*
U.S. Cl. 385—126 **32 Claims**



28. An optical gain system, comprising
a pump source;
an optical fiber structure, said structure comprising:
a core selectively doped with an active gain species; and
an inner cladding surrounding said core for purposes of receiving pump energy and transferring the pump energy to said core as the pump energy propagates along the length of said inner cladding, said inner cladding having a cross-sectional shape in the form of a non-rectangular, convex polygon, said polygon having the property that, if a plurality of said polygons are used to tile a plane, all of said polygons will fit into the tiling such that no spacing will be present between adjacent polygons and, further, such that all said polygons will be mirror images of one another about any common side; and
means for imaging pump source radiation onto said inner cladding, said means for imaging being intermediate between said optical fiber structure and said pump source, for converging the radiation produced by said pump source such that the numerical aperture of the radiation closely matches the optical characteristics of said optical fiber structure.

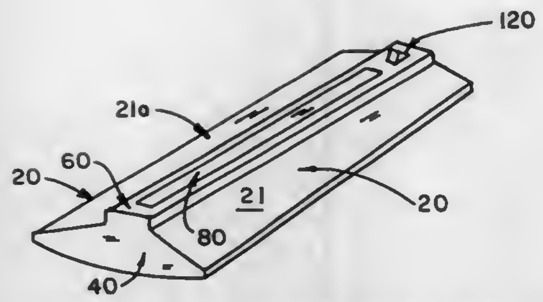
5,533,164
OPTICAL FIBRE ASSEMBLIES FOR BLOWN INSTALLATION
Roger S. Preston, Hertfordshire, and David B. Smith, Essex, both of, England, assignors to Pirelli General plc, London
Filed Sep. 30, 1994, Ser. No. 315,543
Claims priority, application United Kingdom, Oct. 1, 1993, 9320282
Int. Cl.^{6} G02B *6/02*
U.S. Cl. 385—128 **10 Claims**



1. An optical fibre assembly for blown installation, comprising:
a fibre unit having at least one coated optical fibre, the coating formed of at least one coating; and
an outer coating surrounding the unit, the outer coating having an external layer with an outer surface formed of a material containing particulate matter at least some of which projects from the outer surface of the external layer, an inner layer formed of a material having a lower modulus of elasticity than that of the external layer, and an intermediate layer, lacking particulate matter, disposed between the external and inner layers;
wherein the intermediate layer suppresses the propagation of cracks in the optical fibre assembly.

5,533,165
SMART STRUCTURE EGRESS CHANNEL
Kelly K. Burris, 3132 Lafayette Ave., St. Louis, Mo. 63104, and Herbert G. Smith, Jr., 1932 Cherokee Trail La., St. Louis, Mo. 63031
Filed Aug. 30, 1994, Ser. No. 298,042
Int. Cl.^{6} G02B *6/00*
U.S. Cl. 385—134 **8 Claims**

1. A smart structure egress channel for consolidating multiple sensor inputs in a multi-laminate structure into a single output comprising:
a. a pair of opposing channels each comprising:



- (i) a rectangularly shaped top surface having a concave bend, said surface located to extend from a vertical wall of an access extension to a vertical channel wall; and
- (ii) said vertical channel wall containing a plurality of openings through which fiber optic cable carries information into an interior cavity, and said vertical channel wall having extended therefrom a concaved rectangular base surface opposite of the top surface; and

b. a pair of opposing side panels, enclosing the ends of the channels, comprising:
- (i) a rectangular top region which is perpendicularly attached to the access extension; and
- (ii) a curved top region which is perpendicularly attached to and to follow the contour of the rectangular top surface of the channel; and
- (iii) a curved base region perpendicularly attached to and concaved to follow the contour of the channel base surface;

c. said access extension comprising:
- a pair of opposing vertical wall regions each of which are parallel to and attached to the aforementioned channel top surfaces while being perpendicularly attached to the rectangular top regions of the side panels, and a rectangular top region a top the vertical side walls.

5,533,166
METHOD FOR CALCULATING SPEED ESTIMATED VALUE IN SPEED CONTROL SYSTEM

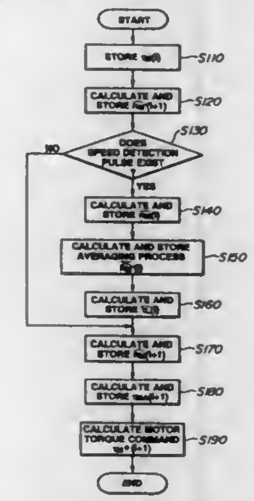
Yasuhiro Yoshida, and Yasuhiro Yamamoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 2, 1995, Ser. No. 397,859

Claims priority, application Japan, Mar. 3, 1994, 6-032738

Int. Cl.^{6} H02P *5/17*

U.S. Cl. 388—811 **5 Claims**



5. An estimating system for processing a speed estimating calculation in a speed control system, comprising:
- a storing means for storing the number of speed detection pulses obtained at each interval of a speed control process and time that the speed detection pulses was obtained;
- a calculating means for calculating a detection speed from the number of latest speed detection pulses and its detection time, and the number of the previously stored speed detection pulses and its detection time;
- an averaging means for executing an averaging process of motor model output corresponding to time that the detection speed was obtained;
- a deviating means for obtaining a difference between an output obtained at said averaging means and the detection speed;
- a torque estimated value calculating means for executing a calculation of a load torque estimation by multiplying the difference of said deviating means by an observer gain;
- a motor speed estimated value calculating means for executing an estimation of a motor speed for next processing from the difference of said deviating means and a difference between the detection speed and the motor model output;
- an amplifier means for calculating an output of a speed amplifier by constituting the speed amplifier by a proportion element and from a speed estimated value obtained by said motor speed estimated value calculating means;
- a torque command calculating means for obtaining a torque command by summing the speed amplifier and the load torque estimated value; and
- an torque command outputting means for outputting the torque command of said torque command calculating means at a start point of the next speed control interval.

5,533,167
HONEYCOMB HEATER ELEMENT HAVING FRONT REGION ADAPTED TO HEAT QUICKLY

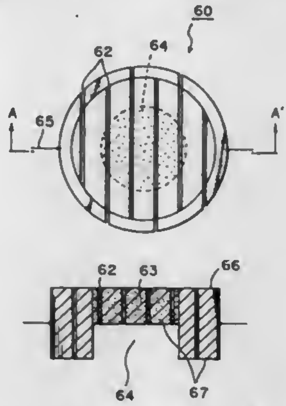
Tomoharu Kondo, Toki; Masato Ogawa, Komaki, and Keiji Noda, Nagoya, all of, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 15, 1993, Ser. No. 167,462

Claims priority, application Japan, Dec. 15, 1992, 4-334315; Nov. 30, 1993, 5-299464

Int. Cl.^{6} F01N *3/28;3/20;* **B01D** *53/36;* **H05B** *3/00*

U.S. Cl. 392—485 **4 Claims**



1. A heating element for heating fluid flowing therethrough, comprising:
- a honeycomb structure having a periphery, a front end for receiving a fluid flow, a back end through which the fluid flow exits, and a plurality of passages defined by partition walls extending along an axial direction of the honeycomb structure, said honeycomb structure being electrically conductive;
- means for applying electric current to said honeycomb structure to heat the fluid flow which passes through said passages from said front end to said back end;
- means for heating a front region of the honeycomb structure more quickly than a back region of the honeycomb structure, comprising a depression formed in the back end of the honeycomb structure, the front region of the honeycomb structure extending between the front end and the depression; and
- a plurality of slits extending through the partition walls and terminating at an end face of said depression.

5,533,168
DATA PROCESSING APPARATUS FOR OBTAINING OPTIMUM COMBINATION SOLUTION AND METHOD OF OBTAINING OPTIMUM COMBINATION SOLUTION

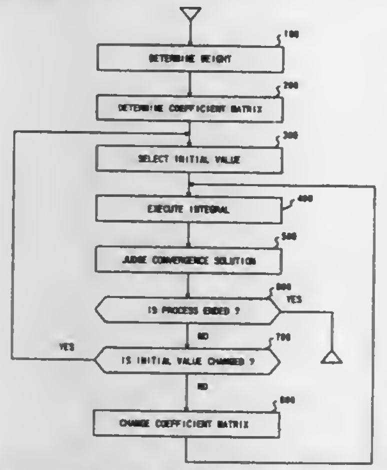
Shigeo Abe, Katsuta, and Junzo Kawakami, Mito, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 952,668, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 825,830, Jan. 28, 1992, abandoned, which is a continuation of Ser. No. 582,187, Sep. 26, 1990, abandoned. This application Mar. 6, 1995, Ser. No. 400,018

Claims priority, application Japan, Feb. 10, 1989, 1-029818; Oct. 12, 1989, 1-263845

Int. Cl.^{6} G06F *15/18;15/20*

U.S. Cl. 395—22 **13 Claims**



100
DETERMINE WEIGHT
200
DETERMINE COEFFICIENT MATRIX
300
SELECT INITIAL VALUE
400
EXECUTE INTEGRAL
500
JUDGE CONVERGENCE SOLUTION
600
IS PROCESS ENDED ?
YES
NO
700
YES
IS INITIAL VALUE CHANGED ?
NO
800
CHANGE COEFFICIENT MATRIX

2. A data processing method of obtaining an optimum combination of a plurality of variables, each of which takes a value within a range defined as between and including first and second predetermined values, by employing a neuronal net in which a plurality of neurons representing said variables respectively, are coupled with each other, and which is operated when these neurons become active based on an energy function represented by a summation of at least a constraint condition function and an evaluation function, said constraint condition function determining a condition of the values to be taken by said neurons and including equality functions and said evaluation function determining an evaluation value representing a degree of optimality of a combination of the values taken by said neurons, said method comprising the steps of:
- (a) determining a combination strength between every two of the neurons so as to make smaller an energy of a solution for satisfying a predetermined constraint condition that an energy of a solution obtained when a condition of one neuron is changed from an active state to an inactive state; and
- (b) obtaining a solution having a smaller energy and capable of making all the neurons stable based on the coupling strength between every two of the neurons, while gradually increasing a coupling strength for coupling an output of the neuron to its input.

5,533,169
NEURAL NETWORK SYSTEM HAVING DYNAMICALLY RECONFIGURABLE CONNECTIONS

Yves Burnod, Arcueil, and Pascal Leray, St Gilles, both of, France, assignors to France Telecom, and Telediffusion De France-TDF(SA), both of Paris, France

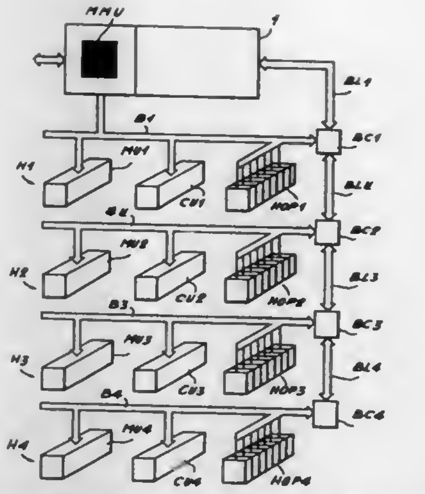
Filed Apr. 29, 1994, Ser. No. 235,302

Claims priority, application France, Apr. 29, 1993, 93 05266

Int. Cl.^{6} G06F *15/16;15/180;* **G06E** *1/00*

U.S. Cl. 395—27 **14 Claims**

1. A signal processing system, including a network of neural operators pilot controlled by a control unit, each neural operator being operable to perform a multilinear function bearing on at least one input vector made up of a plurality of input variables, said function defining an activity of said operator, said input variables being representative of at least one of input signals of the system and of activities of other operators of the network, said system comprising:



- memorization means being addressable by said control unit and organized into a plurality of memory spaces respectively associated with said operators, each memory space containing, at an activity address, an activity value provided by the operator associated with the memory space, and, for at least one subset of the operators of the network, said associated memory spaces containing values of addresses of the variables that make up the input vectors of the operators of said subset, said values of addresses being modifiable by said control unit to enable dynamic reconfiguration of interconnections between said neural operators of said network.

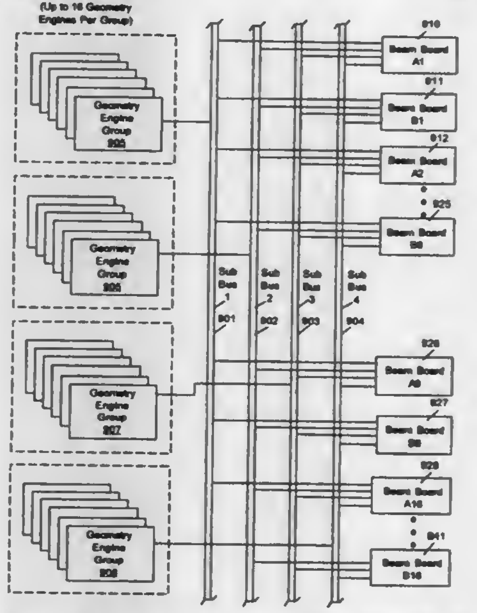
5,533,170
RASTERIZER FOR A PATTERN GENERATION APPARATUS

Robin L. Teitzel, Portland; Matthew J. Jolley; James B. Campbell, both of Beaverton; Richard K. George, Portland, and John Wipfli, Hillsboro, all of Oreg., assignors to ETEC Systems, Inc., Beaverton, Oreg.

Continuation of Ser. No. 970,293, Nov. 2, 1992. This application Nov. 22, 1994, Ser. No. 344,417

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—108 **13 Claims**



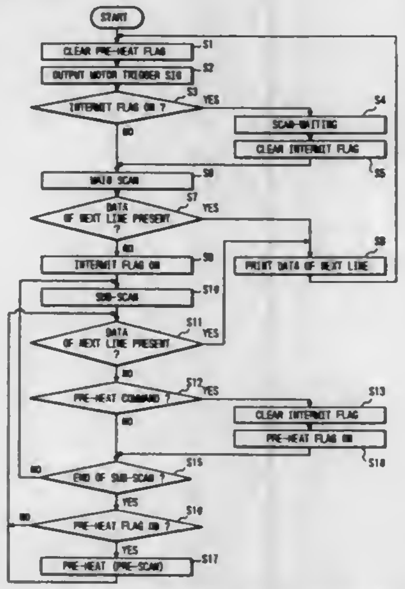
1. A rasterizer for generating energy beam modulation control signals for causing a plurality of energy beams coupled to the

rasterizer to paint a pattern constituted with a plurality of geometry primitives, the rasterizer comprising:

- (a) a processor for transforming and fracturing geometry data describing the: geometry primitives into a plurality of sub-frames of pixels, at least one geometry primitive at a time, for forming frames of pixels, which in turn are for forming stripes of pixels for forming the pattern, each frame is formed by a plurality of scan lines of pixels spanning the sub-frames of the frame in a pre-determined manner;
- (b) a plurality of geometry engines coupled to the processor for concurrently receiving the fractured geometry data corresponding to the sub-frames of at least one frame, and in response, concurrently generating pixel values for these sub-frames, at least one scan line at a time; and
- (c) a plurality of beam modules coupled to the geometry engines and the energy beams for concurrently receiving the pixel values of the sub-frames of the at least one frame, and in response, concurrently generating the modulation control signals for controlling modulation of the energy beams to paint the scan lines of a frame, one scan line at a time.

5,533,171
IMAGE RECORDING APPARATUS

Shigeo Miura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 17, 1993, Ser. No. 32,330
Claims priority, application Japan, Mar. 18, 1992, 4-062308; Apr. 28, 1992, 4-109988; Jun. 12, 1992, 4-153348
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—111 **33 Claims**

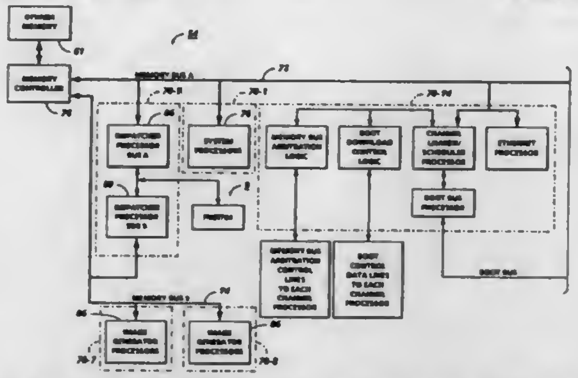


9. An image recording apparatus for recording an image on a recording medium, in a predetermined unit amount, using a recording head driven in accordance with image data, comprising:

- driving means for driving said recording head before a start of next recording in a predetermined unit amount when the next recording in the predetermined unit amount cannot be performed immediately after recording in the predetermined unit amount; and
- setting means for setting a drive condition of said recording head by said driving means in accordance with a size of the recording medium.

5,533,172
METHOD OF PRINTING A PRINT JOB WITH A PRINT FILE

Robert W. Hurtz, Webster; Jeffrey A. Smith, Rochester; Ronald T. Sosinski, and Ernest L. Legg, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 16, 1993, Ser. No. 168,618
Int. Cl.^{6} G06F *15/00*
U.S. Cl. 395—112 **6 Claims**



1. A method of printing a job to produce a set of prints in a printing system with a print file, controller and marker, the print file receiving a set of print-related information from a print-related information generating source for facilitating the producing of the set of prints with the marker, comprising the steps of:

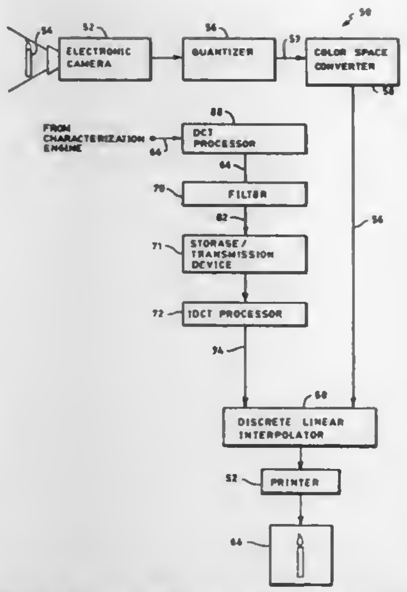
- a) producing the set of prints in a first mode, with the following steps, when the set of print-related information is less than a preselected quantity:
  - i) filling a portion of the print file with a set of the print-related information, and
  - ii) reading the set of print-related information, with the marker, for producing the set of prints; and
- b) when it is determined, with the controller, that the set of print-related information is greater than the preselected quantity, producing the set of prints in a second mode, with the following steps, when the set of print-related information exceeds the preselected quantity:
  - i) providing print-related information of the set of print-related information, which has yet to be read by the marker, to the print file,
  - ii) during said providing of said b(i), reading the print-related information currently residing in the print file, with the marker, for producing a plurality of prints,
  - iii) when the amount of print-related information currently residing in the print file either equals or exceeds a first preselected level, halting said providing of said b)(i) and continuing said reading of said b)(ii) until the amount of print-related information currently residing in the print file either is about equal to or drops below a second preselected level, and
  - iv) repeating steps b(i), b(ii) and, if necessary, b(iii) until the set of print-related information is provided to the print file and read by the marker.

5,533,173
METHOD AND APPARATUS FOR PROCESSING A COLOR MAP USING DISCRETE COSINE TRANSFORMS

Munib A. Wober, Haverhill, and Jinjou Lin, Tewksbury, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 780,025, Oct. 21, 1991, abandoned. This application Sep. 24, 1993, Ser. No. 126,339
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—114 **19 Claims**

1. A method for transforming data between two different color spaces, comprising the steps of:

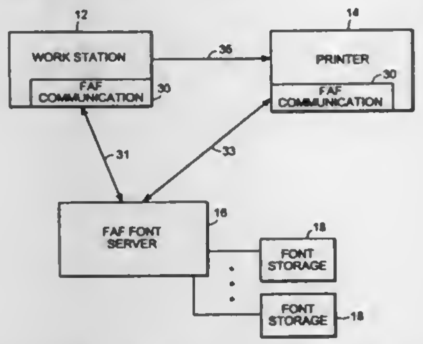
- generating a color map relating discrete values of the first color space to discrete values of the second color space;



- compressing the color map and generating a set of coefficients for predetermined locations upon the color map by performing a discrete cosine transformation of of said coefficients at said predetermined locations and generating a subset of coefficients by filtering said set of coefficients;
- decompressing said color map to produce a revised color map by performing an inverse discrete cosine transformation of said subset; and
- applying said revised color map to image data from said discrete values of the first color space to generate said image data in said discrete values of the second color space by multi-linear interpolation.

5,533,174
NETWORK FONT SERVER

James R. Flowers, Jr., Acton; Ned Batchelder, Brookline, and Edward W. Macomber, Sterling, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 26, 1993, Ser. No. 145,057
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—114 **41 Claims**

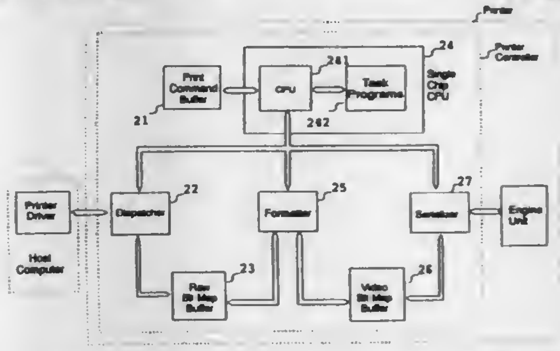


1. A communications network with printers and workstations, the network including:

- A. font storage devices for storing font files;
- B. one or more font servers, for providing to each of the printers and workstations printing and displaying information and bit maps or outlines of characters for printing or display in response to printing and display requirements frown the printers and workstations, respectively, said font servers including:
  - i. means for performing selected rendering instructions,
  - ii. means for performing character mappings,
  - iii. means for manipulating font-specific information in accordance with transformation matrices,
  - iv. means for manipulating bit maps and character outlines into formats which are compatible with the operating system and application software of the printer or workstation printer.

5,533,175
LOW COST PAGE PRINTER SYSTEM AND METHOD

James C. Y. Lung, Santa Clara, Calif., and Holy W. Chi, Taipei, Taiwan, assignors to Destiny Technology Corporation, Santa Clara, Calif.
Filed Mar. 4, 1994, Ser. No. 205,718
Int. Cl.^{6} G06K *15/00*
U.S. Cl. 395—115 **30 Claims**



1. A method of converting application data into video signals for driving a print engine, comprising the steps of:

- providing printer driver software for use in a bost computer for processing and compressing application data generated by application software to develop print data including print commands and raw bit map data; and
- providing a printer controller including a central processing unit, a first buffer means, and a second buffer means,
  - a) parsing the print data into print commands and raw bit map data,
  - b) sending the print commands to said central processing unit in the printer controller to provide print task management,
  - c) checking the status of said first buffer means to determine whether or not it is full, and
    - i) if the status of said first buffer means is not full, storing the raw bit map data in said first buffer means,
    - ii) if the status of said first buffer means is full, sending a buffer full signal to said host computer,
  - d) checking the status of said first buffer means to determine whether or not it is empty and checking the status of said second buffer means to determine whether or not it is full,
    - i) if the status of said first buffer means is not empty and if the status of said second buffer means is not full,
      - 1) fetching and decompressing the stored raw bit map data to develop video bit map data,
      - 2) storing the video bit map data in said second buffer means,
  - e) checking the status of said second buffer means to determine whether or not it is empty,
    - i) if the status of said second buffer means is not empty, fetching and serializing the stored video bit map data to develop video signals, and
  - f) using said video signals to drive a print engine.

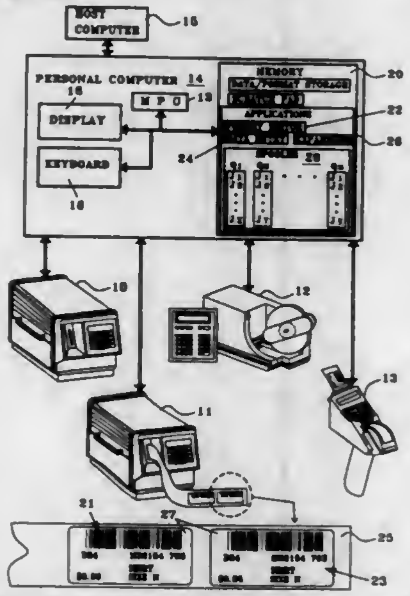
5,533,176
BAR CODE IDENTIFICATION SYSTEM FORMAT EDITOR

David J. Best, Miamisburg; James E. Globig, Hamilton; James G. Markham, Spring Valley, and Gina M. Craig, Dayton, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 783,579, Oct. 28, 1991, Pat. No. 5,234,622. This application May 14, 1993, Ser. No. 61,910

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—117 **24 Claims**



1. A method of generating multi-printer formats on a bar code identification system having a plurality of bar code printers of various types that print on a web of record members, each type of bar code printer having an associated set of printer function options selectable by a user to define a layout of fields for a record member representing a format and said system including an input device actuable by a user and a display, said method comprising:

prompting a user via said display to identify one or more printer types for which a format is to be generated;

determining, in response to the identity of a plurality of printer types by a user, the intersection of said sets of printer function options for said selected printer types to create a set of printer function options common to each of said identified printer types;

displaying information depicting options from said set of common printer function options to prompt a user to select from said displayed options to define a single format for said selected plurality of printers.

5,533,177
METHOD FOR DETECTING AND ESTIMATING THE SPATIAL POSITION OF OBJECTS FROM A TWO-DIMENSIONAL IMAGE

Brigitte Wirtz, Holzkirchen, and Chistoph Maggioni, München, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE91/00775, § 371 Date Apr. 22, 1993, § 102(e) Date Apr. 22, 1993, PCT Pub. No. WO92/08204, PCT Pub. Date May 14, 1992

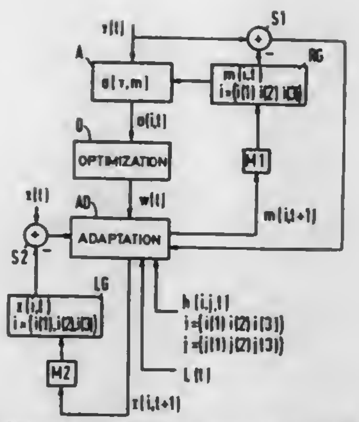
PCT Filed Oct. 2, 1991, Ser. No. 39,352

Claims priority, application Germany, Oct. 24, 1990, 40 33 857.6

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 395—119 **27 Claims**

1. A method for estimating position parameters of an object in space from a two-dimensional image using a Kobonen network having neurons, comprising the steps of:



a) prescribing indexable weighting vectors m(i)= (m(i,1), . . . , m(i,M)) of a dimension M and positional parameters x(i)=(x(i,1), . . . , x(i,N)) of a dimension N, allocated to the weighting factors, by whole numbers i that unambiguously identify each neuron i of the Kohonen network;

b) forming a pattern vector v=(v(1), . . . , v(k), . . . , v(M)) from two-dimensional coordinates p(k), g(k) of feature points in the image, whereby v(k) describes a respective feature point in the image in a respective form v(k)=(p(k),q(k));

c) applying the pattern vector v=(v(1), . . . v(k), . . . , v(M)) to each neuron i of the Kobonen network;

d) calculating a respective output value a(i)=a(v,m(i)) for the applied pattern vector v=(v(1), . . . , v(k), . . . , v(M)) in each neuron i of the Kohonen network; and

e) deriving sought positional parameters from respective positional parameters x(i)=(x(i, 1), . . . , x(i,N)) allocated to a neuron i having an optimum output value a(v,m(i)).

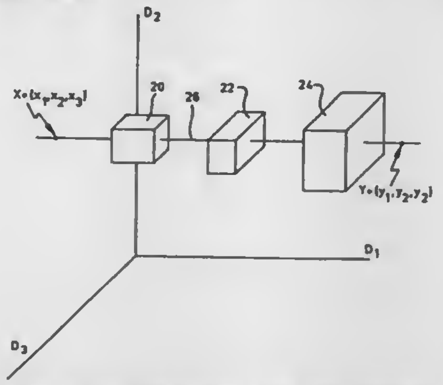
5,533,178
PROGRAM PRODUCT FOR DISPLAYING A LINE PASSING THROUGH A PLURALITY OF BOXES

Nimrod Megiddo, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 124,156, Sep. 20, 1993, Pat. No. 5,481,655. This application Jul. 31, 1995, Ser. No. 509,274

Int. Cl.^{6} G06T *15/00*

U.S. Cl. 395—119 **7 Claims**



1. A program product readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for digitally determining and displaying a line that passes through a set of K boxes of a display image in a computer system, the boxes defined by box data vertex values defined with respect to a coordinate system and stored in memory of the computer system, such that the line passes through display image surfaces of each box in the set and thereby comprises a transversal line of the display image, the method steps performed by the machine comprising:

producing a transformed set of digital box data vertex values comprising three-tuples (x_1, x_2, x_3) in the computer memory that define respective vertex values of the K boxes relative to axes D_1, D_2, and D_3 of the coordinate system such that the tuple position corresponding to a vertex value of a box is denoted either a_i or b_i, i=1, 2, 3 by a central processor unit of the computer system, where a vertex value of a box is denoted as an "a" if it is the minimum value of the box data vertex values along a respective D axis and the vertex value is denoted as a "b" if it is the maximum value of the box data vertex values along a respective D axis;

producing a partition set in the computer memory comprising all three-tuples determined by the central processor unit as having elements selected from the set {+, 0, −} such that each three-tuple element corresponds to a partition subset I_+, I_0, or I_-;

producing a set of linear inequality equations stored in the computer memory by the central processing unit that specify a set of line conditions comprising

(1) for all the K boxes and for every digital box data vertex value that is an element of the partition subset I_0, the maximum value of a box vertex value a_i is less than or equal to the minimum value of a box vertex value b_i for each box K,

(2) for every i that is an element of the partition subset I_+, all box data vertex values x_i are greater than zero and for every i that is an element of the partition subset I_-, the x_i are less than zero,

(3) for all i and j that are elements of the partition subset I_+ and for all the boxes K, the difference of the product a_ix_i and a box data vertex value y_i is less than or equal to the difference of b_jx_j and y_j,

(4) for all i and j that are elements of the partition subset I_- and for all the K boxes, the difference of the product a_ix_i and a box data vertex value y_i is greater than or equal to the difference of b_jx_j and y_j,

(5) for every i that is an element of the partition subset I_+ and for every j that is an element of the partition subset I_- and for all of the K boxes, the difference of the product b_ix_i and the box data vertex value y_i is greater than or equal to the difference of b_jx_j and y_j and also the difference of the product a_jx_j and the box data vertex value y_j is greater than or equal to the difference of a_ix_i and y_i;

producing a resultant solution comprising two three-tuples R=(r_1, r_2, r_3) and S=(s_1, s_2, s_3) in the computer memory that are determined by the central processor unit of the computer system to satisfy the line conditions and thereby determine the transversal line;

producing a central processor unit parametric representation of the transversal line determined by R and S in a form defined by an equation u+tv, where u and v are vectors and t is a scalar variable with respect to the coordinate system;

producing a display signal determined by the central processing unit as corresponding to the resultant solution and the parametric representation of the transversal line and set of boxes; and

displaying the plurality of objects and display signal simultaneously on a two-dimensional display of the computer system.

5,533,179
APPARATUS AND METHOD OF MODIFYING HARDWARE DESCRIPTION LANGUAGE STATEMENTS

Kayhan Kucukcakar, Scottsdale; Rajesh Gupta, Chandler, and Thomas Tkacik, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1994, Ser. No. 347,665

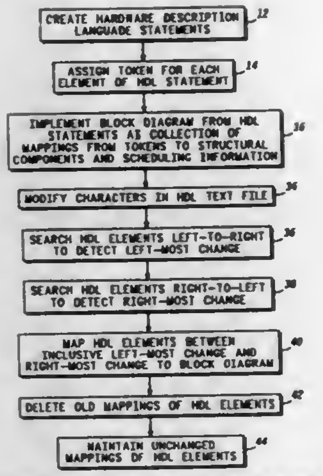
Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—133 **21 Claims**

1. A computer implemented method of modifying hardware description language (HDL) statements, comprising the steps of:

assigning tokens for each element of an original HDL description;

implementing said original HDL description as a block diagram from mappings of said tokens to structural components;


CREATE HARDWARE DESCRIPTION LANGUADE STATEMENTS
12
ASSIGN TOKEN FOR EACH ELEMENT OF HDL STATEMENT
14
IMPLEMENT BLOCK DIAGRAM FROM HDL STATEMENTS AS COLLECTION OF MAPPINGS FROM TOKENS TO STRUCTURAL COMPONENTS AND SCHEDULING INFORMATION
16
MODIFY CHARACTERS IN HDL TEXT FILE
34
SEARCH HDL ELEMENTS LEFT-TO-RIGHT TO DETECT LEFT-MOST CHANGE
36
SEARCH HDL ELEMENTS RIGHT-TO-LEFT TO DETECT RIGHT-MOST CHANGE
38
MAP HDL ELEMENTS BETWEEN INCLUSIVE LEFT-MOST CHANGE AND RIGHT-MOST CHANGE TO BLOCK DIAGRAM
40
DELETE OLD MAPPINGS OF HDL ELEMENTS
42
MAINTAIN UNCHANGED MAPPINGS OF HDL ELEMENTS
44

modifying said original HDL description to generate a modified HDL description;

detecting elements of said modified HDL description that changed and elements of said modified HDL description that stay the same;

mapping said elements that changed to said block diagram; and maintaining said elements that stayed the same.

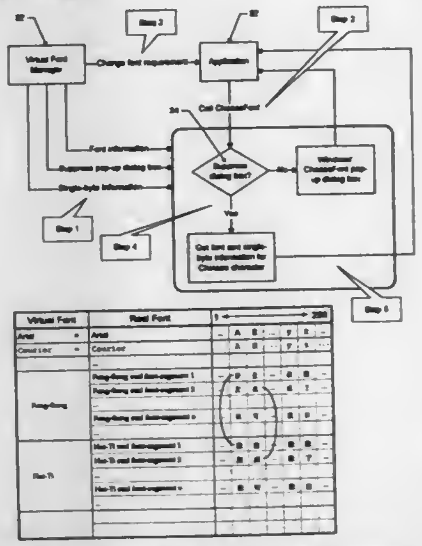
5,533,180
METHOD OF MANIPULATING FONTS CONTAINING LARGE NUMBERS OF CHARACTERS

Frank H. Zhou, and Qin-Mo Wang, both of Vancouver, Canada, assignors to Top Computech Co. Ltd., Canada

Filed Apr. 7, 1994, Ser. No. 224,585

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—150 **7 Claims**



1. A method of interfacing between a computer user and a computer application program to enable said user to manipulate, as one virtual font, a number "N" of special characters exceeding the number "X" of standard characters which said program can represent in one font, said program having user-activatable means for switching between different stored fonts to select a currently active font and font switching display means for enabling said user to monitor said font switching and selection, said method comprising the computer-implemented steps of:

a. dividing said special characters into a plurality of individually named font segments, each of said segments containing "X" characters;

b. storing said font segments with said stored fonts;

c. for each character input by said user:

i. determining wbether said input character is one of said special characters;

ii. if said input character is not one of said special characters, terminating performance of said method;

iii. if said input character is one of said special characters:

(1) determining which one of said stored font segments contains said input character;

(2) determining said currently active font from which characters are currently being selected by said program;

(3) if said font segment containing said input character is said currently active font, terminating performance of said method;

(4) if said font segment containing said input character is not said currently active font, automatically activating said font switching means to-select said font segment containing said input character as said currently active font while suppressing activation of said font switching display means; and,

(5) terminating performance of said method.

5,533,181

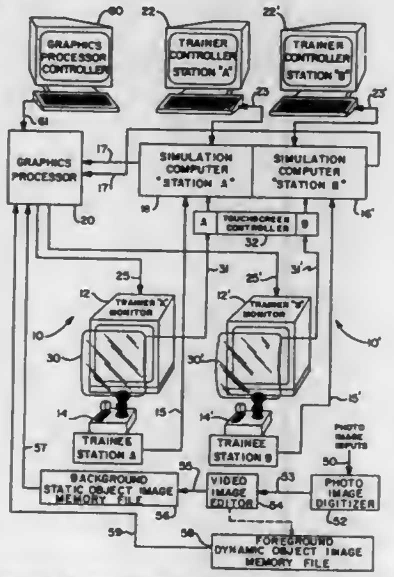
IMAGE ANIMATION FOR VISUAL TRAINING IN A SIMULATOR

Carl W. Bergsneider, Silver Lake, Ohio, assignor to Loral Corporation, New York, N.Y.

Continuation of Ser. No. 333,241, Nov. 2, 1994, abandoned, which is a continuation of Ser. No. 179,778, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 632,577, Dec. 24, 1990, abandoned. This application Jun. 21, 1995, Ser. No. 492,941

Int. Cl.⁶ G06T *13/00*

U.S. Cl. 395—152 **20 Claims**



1. In a simulator trainer including (a) a trainee station video monitor providing visual imagery of real-time events, (b) a trainer controller providing signals indicative of various training scenarios, (c) a graphics processor providing video imagery to the trainee video monitor, and (d) a simulation computer responsive to trainer controller and trainee station response signals to provide control signals to the graphics processor, a method of generating imagery animation comprising the steps of:

providing a photo image of an actual station to be simulated, for simulation training;

scanning the photo image to provide a digitized electronic signal indicative of the photo image;

editing the digitized photo image by removing all object images which exhibit dynamic character and inserting background shading in areas where dynamic object images have been removed, generating a static image;

loading the edited digitized static image into a first array of video memory files designated for background static object imagery, said first array having a first specific range of colors assigned thereto;

loading rendered dynamic object images into a second array of video memory files designated for foreground dynamic object imagery, said second array having a second specific range of colors assigned thereto, wherein said first specific range of colors is distinct from said second specific range of colors, and wherein the first array remains unchanged by the graphics processor and is only manipulated by the simulation computer when there is a change in the aircraft being simulated;

combining the background static and foreground dynamic object imageries into a composite video signal;

feeding the composite video signal into the trainee video monitor to provide background static object imagery and overlaying foreground dynamic object imagery; and

manipulating by the graphics processor only the foreground dynamic object imagery in accordance with simulation computer control signals, wherein the trainer controller functions to change training scenarios represented by the foreground dynamic object imagery corresponding to trainee responses received by the simulation computer, and wherein the background static and foreground dynamic object imageries employed in the training scenario are reconfigurable by the trainer controller for object imageries peculiar to an actual aircraft.

5,533,182

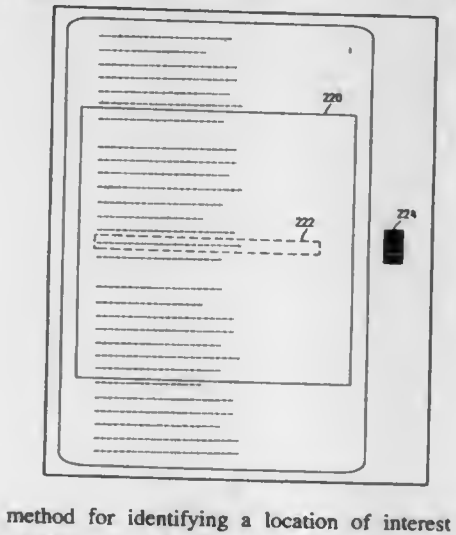
AURAL POSITION INDICATING MECHANISM FOR VIEWABLE OBJECTS

Cary L. Bates; Brian J. Cragun; Robert J. Donovan, all of Rochester; William Jaaskelainen, Oronoco; Jeffrey M. Ryan, Byron, and Bryan L. Striemer, Zumbrota, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1992, Ser. No. 995,473

Int. Cl.⁶ G06F *3/00;3/16*

U.S. Cl. 395—155 **28 Claims**



1. A method for identifying a location of interest within a viewable object, said method comprising the steps of:

marking said location of interest within said viewable object;

moving a position identifier within said viewable object; and

emitting a sound that indicates distance between said position identifier and said location of interest.

5,533,183

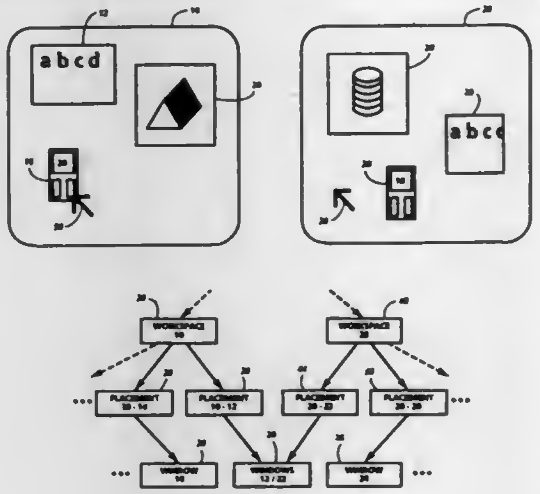
USER INTERFACE WITH MULTIPLE WORKSPACES FOR SHARING DISPLAY SYSTEM OBJECTS

D. Austin Henderson, Jr., Palo Alto; Stuart K. Card, Los Altos Hills, and John T. Maxwell, III, Sunnyvale, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 58,360, May 6, 1993, Pat. No. 5,394,521, which is a continuation of Ser. No. 805,343, Dec. 9, 1991, Pat. No. 5,233,687, which is a division of Ser. No. 30,766, Mar. 25, 1987, Pat. No. 5,072,412. This application Feb. 27, 1995, Ser. No. 394,858

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—158 **17 Claims**



1. A method of operating a system that includes:

a display;

a user input device for receiving signals from a user; and

a data processor that receives input signals from the user input device and provides output signals to the display; the output signals causing the display to present images that include display objects; each of a set of the display objects being perceptible as a distinct, coherent set of display features;

the method comprising:

operating the data processor to provide first output signals to the display; the first output signals causing the display to present a first workspace containing a first subset of the set of display objects; the display objects of the first subset being perceptible as having spatial positions relative to each other when presented by the display; the first subset including a first display object that is perceptible as a tool that augments a user's capabilities;

while the display is presenting the first workspace, receiving a switch signal sequence from the user input device; and

in response to the switch signal sequence, operating the data processor to provide second output signals to the display; the second output signals causing the display to cease presenting the first workspace and begin to present a second workspace containing a second subset of the set of display objects; the display objects of the second subset being perceptible as having spatial positions relative to each other when presented by the display; the second subset including a second display object that is perceptible as a tool that augments a user's capabilities; the first and second subsets of display objects being different from each other so that the first and second workspaces are perceptible as different workspaces; the second display object being perceptible as the same tool as the first display object.

5,533,184

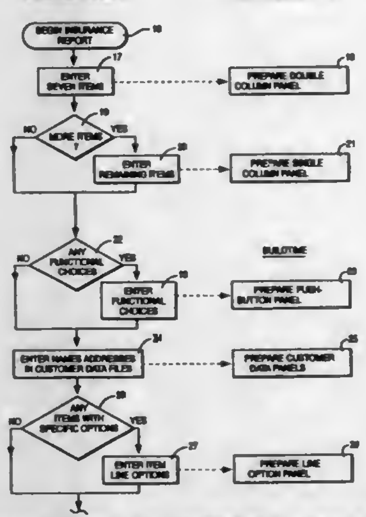
COMPUTER SYSTEM FOR DYNAMICALLY GENERATING DISPLAY SCREEN PANELS PROVIDING INTERACTIVE INTERFACES FOR APPLICATION PROGRAM STEPS

Jerry W. Malcolm, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1991, Ser. No. 747,167

Int. Cl.⁶ G06F *3/14*

U.S. Cl. 395—161 **12 Claims**



1. A computer system for dynamically generating a set of display screen panels to provide an interactive user interface to an application program having a plurality of steps comprising:

means for storing a set of rules controlling the layout of each screen panel,

means for storing data defining the layout of each of a plurality of basic screen panels,

means for storing said application program,

means for sequentially carrying out said steps in said application program, and

means responsive to the carrying out of each of said plurality of program steps for dynamically modifying the stored data defining the layout of one of said basic screen panels to provide a screen panel with the modified layout required for the user interface to said application program during said step.

5,533,185

PIXEL MODIFICATION UNIT FOR USE AS A FUNCTIONAL UNIT IN A SUPERSCALAR MICROPROCESSOR

Derek J. Lentz, Los Gatos, and Linley M. Young, San Diego, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 798,705, Nov. 27, 1991, abandoned. This application Oct. 28, 1993, Ser. No. 141,966

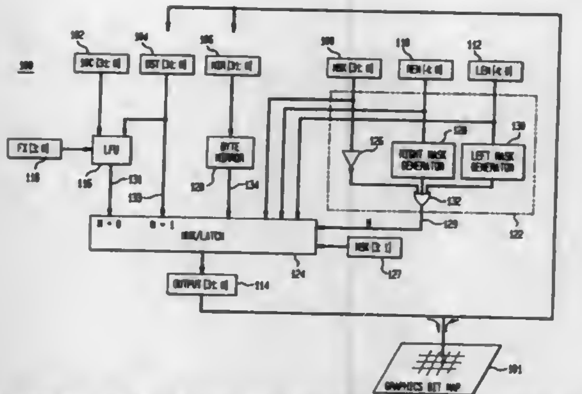
Int. Cl.⁶ G06F *15/00*

U.S. Cl. 395—162 **5 Claims**

1. A system for bitwise manipulation of raster graphics data as a functional unit that executes instructions within a superscalar microprocessor and shares a memory interface with other of a plurality of functional units, comprising:

bus means within the superscalar microprocessor, coupled to a logic function means, for receiving a source operand and a destination operand, said source and destination operands each comprising a plurality of bits;

logic function means within the superscalar microprocessor for performing a bitwise logic operation between said source operand and said destination operand to generate a modified destination operand, said source operand being selected from the group comprising fixed data and a secondary bit map, said destination operand being a primary bit map corresponding to an image to be manipulated;



a masking means within the superscalar microprocessor for generating multiplexer control signals; and

a multiplexer within the superscalar microprocessor that performs, in response to said multiplexer control signals, bit-wise selection between said bits of said modified destination operand and said destination operand to provide an output, said multiplexer coupled to at least said logic function means so as to receive said modified destination operand, to said masking means to receive said set of multiplexer control signals, and to said destination operand.

5,533,186

IMAGE FILING METHOD BASED ON SYMBOL RETRIEVAL CONDITION

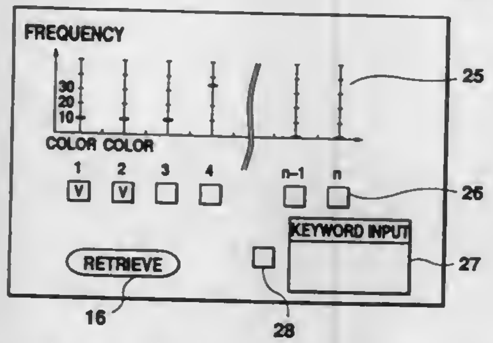
Mariko Tanahashi; Keiichi Koike, and Masatoshi Katoh, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1993, Ser. No. 19,038

Claims priority, application Japan, Feb. 28, 1992, 4-078524

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—164 **37 Claims**



1. An image filing method in which a plurality of images are registered in a storage means and a retrieval of the registered images is executed by adding a retrieval condition, each of the plurality of images having color defined by a color space, the method comprising the steps of:

(a) dividing the color space of each of the plurality of images into a plurality of color subspaces to assign a plurality of symbols, each of the plurality of symbols being specific to a corresponding one of the plurality of color subspaces;

(b) registering the images into the storage means corresponding to at least one condition of the kind, position and size of each of the plurality of symbols; and

(c) reading the images corresponding to at least one condition of the kind, position and size of the plurality of symbols as the retrieval condition out of the storage means.

5,533,187

MULTIPLE BLOCK MODE OPERATIONS IN A FRAME BUFFER SYSTEM DESIGNED FOR WINDOWING OPERATIONS

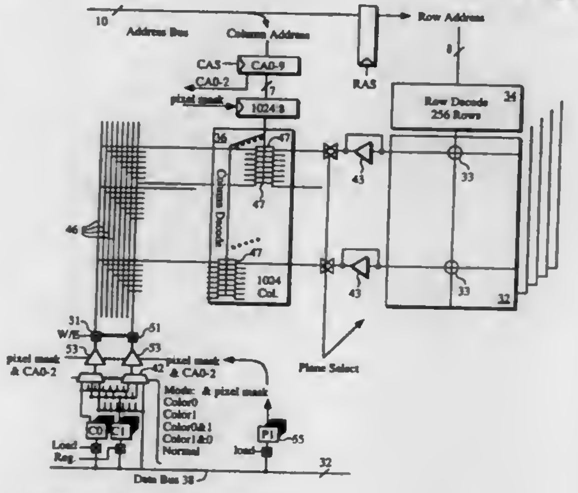
Curtis Priem, Fremont; Shuen C. Chang, San Jose, and Hal D. Ho, Milpitas, all of Calif., assignors to Sun Microsystems, Inc, Mountain View, and Samsung Semiconductor, Inc., San Jose, both of Calif.

Filed Oct. 29, 1993, Ser. No. 145,755

The portion of the term of this patent subsequent to Oct. 29, 2013, has been disclaimed.

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—164 **24 Claims**



1. A computer system comprising

a central processing unit,

main memory,

a busing system including a data bus having a number of data conductors,

an output display, and

a frame buffer joining the busing system to the output display, the frame buffer comprising

an array of memory cells for storing data indicating pixels to be displayed on the output display,

access circuitry for selecting memory cells in the array,

first and second color value registers each for storing a number of bits equivalent to one color value, and

circuitry for writing simultaneously color value data from the color value registers to a plurality of storage positions in the array which represent a number of individual pixels equivalent to the number of data conductors of the data busing system.

5,533,188

FAULT-TOLERANT PROCESSING SYSTEM

Daniel L. Palumbo, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 19, 1992, Ser. No. 963,170

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.02 **15 Claims**

1. A system for implementing fault-tolerant processing using a fiber optic network, comprising:

a plurality of backplanes including a local backplane and at least one external backplane;

a plurality of processing modules including at least one local processing module and at least one redundant processing module, each said processing module having a bus control, wherein each said local processing module is optically connected to the local backplane and each said redundant processing module is optically connected to one said external backplane, each said external backplane having an optical connection to at least one said redundant processing module, wherein each backplane comprises:

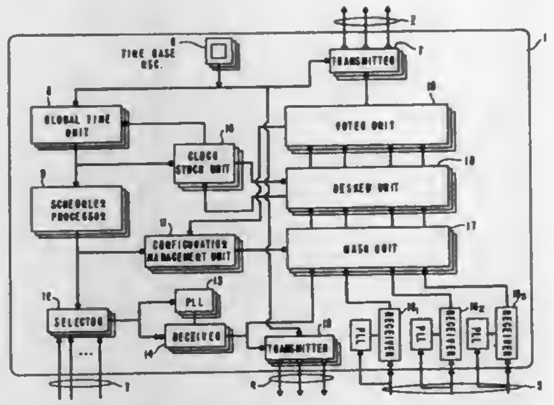
(a) redundancy management means for controlling access to the backplane, for comparing data from each said local processing module with data from each said redundant processing module and for producing corrected data based on the comparison, the redundancy management means of each said local backplane being optically interconnected to each said redundancy management means in each said external backplane;

(b) a local write bus optically connecting each said local processing module to said redundancy management means so that said data from each said local processing module are optically transmittable to said redundancy management means; and

(c) a local read bus optically connecting said redundancy management means to each said local processing module so that said corrected data are optically transmittable to each said local processing module;

wherein each said bus control optically connects said local processing module to the local read bus and the local write bus; and

said redundancy management means includes synchronizing means for synchronizing transmission of said data from each said local processing module through said local write bus and to each said local processing module through said local read bus.



5,533,189

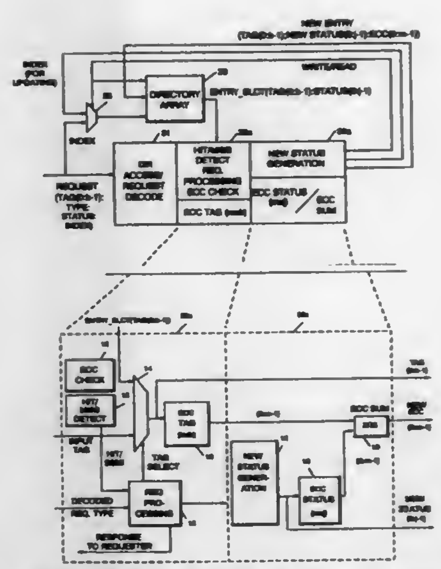
SYSTEM AND METHOD FOR ERROR CORRECTION CODE GENERATION

Hoichi Cheong, and Kimming So, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1994, Ser. No. 345,969

Int. Cl.^{6} G01R *31/28*; G06F *11/00*

U.S. Cl. 395—182.04 **7 Claims**



1. A data processing system comprising:

a processor;

a system memory;

a bus coupling said processor and said system memory;

a cache coupled to said processor;

a directory array coupled to said cache;

means for receiving a write or read request associated with an entry in said cache;

means for receiving tag bits associated with said received write or read request associated with said entry in said cache;

means, coupled to said means for receiving tag bits associated with said received write or read request associated with said entry in said cache, for generating an ECC associated with said received tag bits;

means for updating status bits associated with said received write or read request associated with said entry in said cache;

means, coupled to said means for updating status bits associated with said received write or read request associated with said entry in said cache, for generating an ECC associated with said updated status bits;

means, coupled to said means for generating an ECC associated with said received tag bits and said means for generating an ECC associated with said updated status bits, for summing said ECC associated with said received tag bits with said ECC associated with said updated status bits; and

means for storing said summed ECC, said updated status bits, and said tag bits in said directory array coupled to said cache.

5,533,190

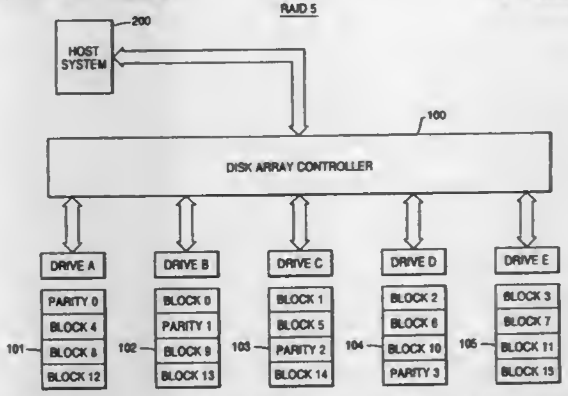
METHOD FOR MAINTAINING PARITY-DATA CONSISTENCY IN A DISK ARRAY

Charles D. Binford, Wichita, Kans.; Mark A. Gaertner, Woodbury, Minn., and Steven P. Denny, El Dorado, Kans., assignors to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, Milpitas, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed Dec. 21, 1994, Ser. No. 360,198

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.04 **14 Claims**



1. In an independent access disk array subsystem, a method for maintaining consistency between the contents of data and parity storage areas within redundancy groups in the array subsystem following a system reset which interrupts the execution of one or more disk write I/O operations, said method comprising the steps of:

examining current drive activities to identify unfinished write I/O operations in response to the receipt of a reset signal;

logging information necessary to identify said unfinished write I/O operations and the redundancy groups associated with said unfinished write I/O operations into a non-volatile memory;

checking for log entries in the non-volatile memory during a disk array subsystem initialization following the system reset;

for each one of said unfinished write I/O operations, performing a bit-wise exclusive-OR of corresponding portions of the data stored across the data storage areas within the redundancy group associated with said one of said unfinished write I/O operations to calculate parity consistent therewith; and

writing the calculated parity to said parity storage areas within said redundancy group associated with said one of said unfinished write I/O operations.

5,533,191

COMPUTER SYSTEM COMPRISING A PLURALITY OF TERMINAL COMPUTERS CAPABLE OF BACKING UP ONE ANOTHER ON OCCURRENCE OF A FAULT

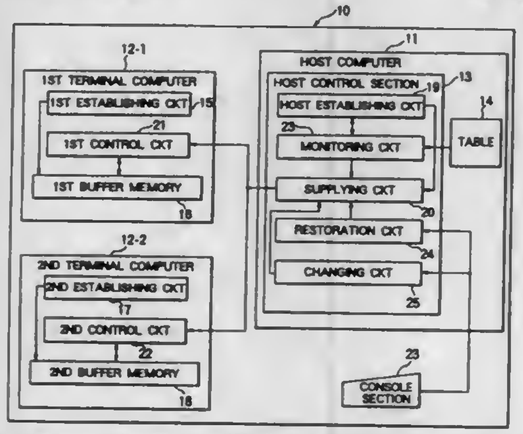
Tadayoshi Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 54,060, Apr. 29, 1993, abandoned. This application May 4, 1995, Ser. No. 433,827

Claims priority, application Japan, May 7, 1992, 4-114911

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.09 **6 Claims**



1. A computer system comprising a host computer and first through N-th terminal computers connected to said host computer, where N represents a positive integer which is greater than one, said first through said N- th terminal computers carrying out first through N-th jobs different from one another, said host computer comprising:

monitoring means for monitoring said first through said N-th terminal computers to judge whether or not a fault occurs in each of said first through said N-th terminal computers, said monitoring means producing a fault signal when said fault occurs in a faulty one of said first through said N-th terminal computers;

first producing means responsive to said fault signal for producing a command signal to a specific one of said first through said N-th terminal computers that is different from said faulty one of said first through said N-th terminal computers, said specific terminal computer being predetermined in each of said first through said N-th terminal computers; and

second producing means for producing an operating command signal and a stop command signal in accordance with a restoration command to supply said operating command signal and said stop command signal to a restored terminal computer and said specific terminal computer, respectively;

said computer system further comprising

console means connected to said host computer for supplying said second producing means with said restoration command when said faulty one of said first through said N-th terminal computers is restored to a normal state to be said restored terminal computer;

each of said first through said N-th terminal computers comprising:

control means responsive to said command signal, for controlling, on the basis of allotment information, a process of the job which is carried out at said faulty one of the first through the N-th terminal computers when said terminal computer is supplied with said command signal, said allotment information indicating said specific terminal computer in each of said first through said N-th terminal computers in correspondence to each of said first through said N-th jobs; said control means being responsive to said operating command signal, for restarting the job which is carried out at said restored terminal computer; said control means being responsive to said stop command signal, for stopping the control of the process of the job which is carried out at the faulty one of said first through said N-th terminal computers.

5,533,192

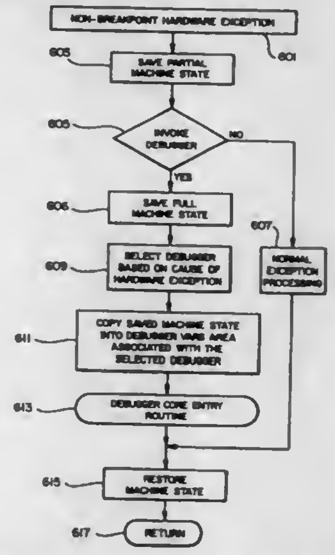
COMPUTER PROGRAM DEBUGGING SYSTEM AND METHOD

Robert J. Hawley, and Patricia A. Jemie, both of San Jose, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 21, 1994, Ser. No. 230,798

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—183.04 **21 Claims**


NON-BREAKPOINT HARDWARE EXCEPTION
601
603
SAVE PARTIAL MACHINE STATE
605
INVOKE DEBUGGER
NO
YES
606
SAVE FULL MACHINE STATE
607
NORMAL EXCEPTION PROCESSING
609
SELECT DEBUGGER BASED ON CAUSE OF HARDWARE EXCEPTION
611
COPY SAVED MACHINE STATE INTO DEBUGGER VARS AREA ASSOCIATED WITH THE SELECTED DEBUGGER
613
DEBUGGER CORE ENTRY ROUTINE
615
RESTORE MACHINE STATE
617
RETURN

9. In a computer system comprising first and second debuggers, each presenting a corresponding interface to a corresponding user, wherein the user uses each of the interfaces to debug a program by examining and modifying computer state information, a method for operating the computer system so as to have the first and second debuggers concurrently active for debugging the program, comprising the steps of:

storing first debugger state information in a first debugger memory area;

storing second debugger state information in a second debugger memory area;

receiving, from each of the first and second debuggers, primitive service requests to modify the computer state information, and in response thereto storing respective indications of the received primitive service requests in the corresponding first and second debugger memory areas; and

in response to the first debugger relinquishing control of the computer system, modifying the computer state in accordance with the indications of the received primitive service requests stored in the first debugger memory area.

5,533,193

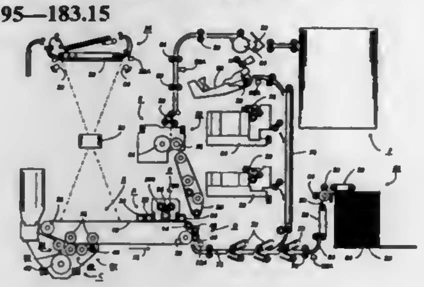
METHOD OF SAVING MACHINE FAULT INFORMATION INCLUDING TRANSFERRING SAID INFORMATION TO ANOTHER MEMORY WHEN AN OCCURRENCE OF PREDETERMINED EVENTS OR FAULTS OF A REPRODUCTION MACHINE IS RECOGNIZED

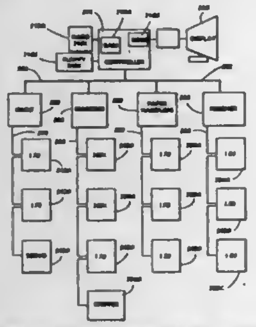
Gary W. Roscoe, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1994, Ser. No. 264,884

Int. Cl.^{6} G06F *11/30*

U.S. Cl. 395—183.15 **7 Claims**





1. A method of storing machine fault information including information indicating an occurrence of predetermined events in a reproduction machine having a plurality of components including a control with a first memory and a second memory, said method comprising the steps of:

setting the control to respond to an occurrence of a predetermined event;

setting said reproduction machine in a normal operation mode:

- capturing information on current faults and events of the reproduction machine and storing said data in the first memory;
- monitoring the operation of the machine in relation to said setting the control for the occurrence of the predetermined event; and
- upon recognizing the occurrence of the predetermined event, initiating a transfer of the information in the first memory to the second memory.

5,533,194

HARDWARE-ASSISTED HIGH SPEED MEMORY TEST APPARATUS AND METHOD

Donald J. Albin, Tucson, Ariz.; Andrew D. Walls, San Jose, Calif.; Adalberto G. Yanes, Sunnyvale, Calif., and Kevin G. Zitny, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

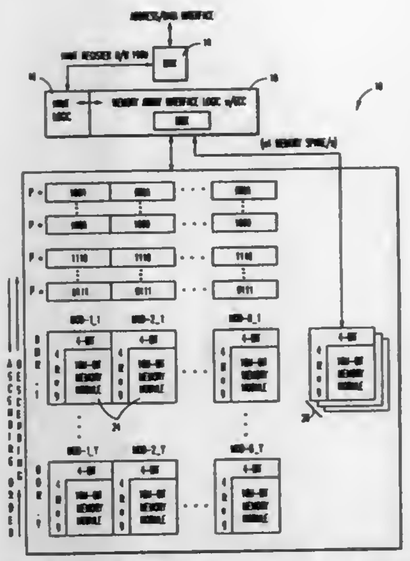
Filed Dec. 28, 1994, Ser. No. 364,689

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 395—183.18 **8 Claims**

1. A test system for a board-mounted memory array, said memory array including a plurality of memory modules, each memory module N bits wide by M bits long, said memory array including YM addresses of words that are XN bits long, where X and Y are integers, each word comprised of N bits from a common address value in each of X memory modules, said test system further comprising:

memory interface logic means mounted on said board, for addressing said memory array in response to address signals, and configured to utilize a first addressing procedure to access



addressed words at a first rate and, upon command, to utilize a second addressing procedure to address sequentially a span of words in contiguous addresses at a second rate that is faster than said first rate;

control means coupled to said memory interface logic means for enabling application of address signals thereto that are generated external to said board; and

hardware test means coupled to said control means and memory interface logic means and mounted on said board, said hardware test means for controlling said memory interface logic means to implement said second addressing procedure and to apply, in accord with a test protocol, test signals to a plurality of contiguous addresses in said memory array and to analyze output signals fed to said memory interface logic means from said contiguous memory addresses so as to determine error states in said output signals, said test protocol causing a writing of N bit test groups to each N bit-wide bit group in a module that stores a portion of a word at an address, said hardware test means causing said memory interface logic means to implement said second addressing procedure by addressing said plurality of contiguous addresses at a rate of an applied clock signal, one address per clock signal, said hardware test means further applying said test signals to sequential blocks of contiguous addresses, each block of contiguous addresses comprised of a small subset of M to enable coupling faults between said blocks of contiguous addresses to be determined.

5,533,195

TESTING TOOL FOR DIAGNOSING DEFECTIVE COMPUTER SYSTEM DEVICES

Paul E. LaRochelle, 40 Phillips Ave., Shrewsbury, Mass. 01545, and Arthur J. Beaverson, 37 Cobleigh Rd., Boxboro, Mass. 01719

Continuation of Ser. No. 86,594, Jul. 1, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 399,956

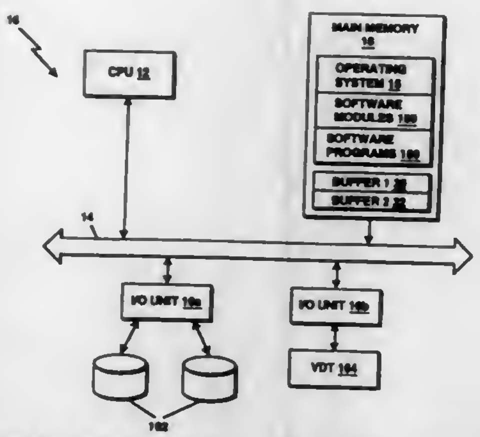
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.01 **7 Claims**

1. An apparatus, in a computer system, including input means for exercising components included in said computer system to efficiently detect intermittent failures in said computer system, said components including a system bus interconnecting a processor, a memory and at least one I/O unit coupled to an I/O device, said apparatus comprising:

an arrangement which includes:

- command means for specifying a software exerciser, entered at said input means;
- means for specifying at least one of said components for exercising, entered at said input means;



means for specifying at least one operation, entered at said input means, to be performed on said at least one of said components; and said apparatus further comprising

means for invoking said software exerciser in response to said command means, to perform said at least one operation specified by said mean for specifying at least one operation on said at least one component specified by said mean for specifying at least one of said components to establish interaction paths between substantially all of said components of said second computer system to manifest intermittent failures resulting from interaction between said components.

6. A method for exercising components of a computer system to efficiently detect intermittent failures in said system, said components including a system bus interconnecting a processor, a memory and at least one I/O unit coupled to an I/O device, said method comprising the steps of:

specifying a software exerciser;

specifying at least one of said components for exercising;

specifying at least one operation to be performed on said at least one of said components; and

invoking said software exerciser to perform said at least one operation on said at least one of said component in a manner that establishes interaction paths between substantially all of said component of said computer system to manifest intermittent failures resulting from interaction between said components.

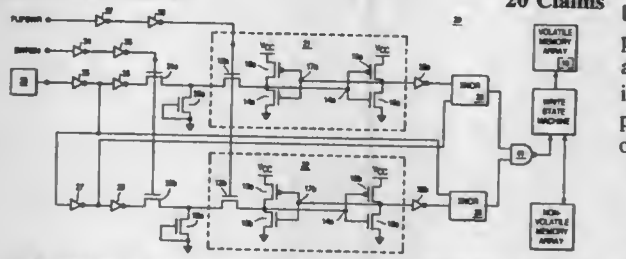
5,533,196
METHOD AND APPARATUS FOR TESTING FOR A SUFFICIENT WRITE VOLTAGE LEVEL DURING POWER UP OF A SRAM ARRAY

Joseph H. Salmon, Placerville, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 31, 1994, Ser. No. 189,307

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—185.07 **20 Claims**



1. A random access memory (RAM) testing apparatus that tests validity of data written to a RAM, said RAM testing apparatus comprising:

a pair of memory cells that stimulates an array cell of said RAM, said pair of memory cells being separate from said array cell, each of said memory cells in the pair being functionally similar to said array cell;

capacitive loading circuitry coupled to said pair of memory cells that provides a first capacitive lead to each of said pair of memory cells, said first capacitive lead being at least as great as a second capacitive lead to said array cell;

input circuitry coupled to said pair of memory cells that applies a first input signal to a first of said memory cells in said pair and for providing a second input signal to a second of said memory cells in said pair, said first input signal being logically inverse to said second input signal, said input circuitry operating during a write operation of said RAM;

comparing circuitry coupled to said pair of memory cells that compares values stored in each of said pair of memory cells after application of said first and said second input signals to said first and said second input signals to determine if each of said memory cells has stored a correct value; and

fail signal circuitry coupled to said comparing circuitry that generates a fail signal if said comparing circuitry indicates that either one of said pair of memory cells has not stored said correct value.

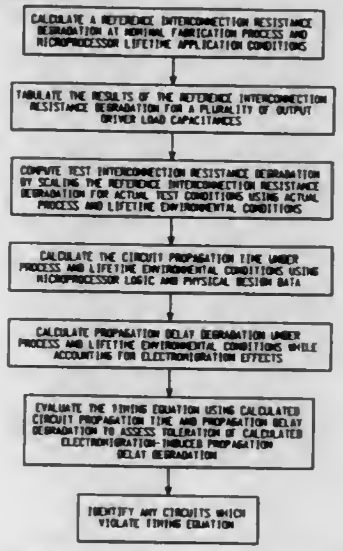
5,533,197
METHOD TO ASSESS ELECTROMIGRATION AND HOT ELECTRON RELIABILITY FOR MICROPROCESSORS

David E. Moran, South Burlington; Timothy J. O'Gorman, Williston, and Kimball M. Watson, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1994, Ser. No. 327,151

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.08 **12 Claims**


CALCULATE A REFERENCE INTERCONNECTION RESISTANCE DEGRADATION AT NOMINAL FABRICATION PROCESS AND MICROPROCESSOR LIFETIME APPLICATION CONDITIONS
TABULATE THE RESULTS OF THE REFERENCE INTERCONNECTION RESISTANCE DEGRADATION FOR A PLURALITY OF OUTPUT DRIVER LOAD CAPACITANCES
COMPUTE TEST INTERCONNECTION RESISTANCE DEGRADATION BY SCALING THE REFERENCE INTERCONNECTION RESISTANCE DEGRADATION FOR ACTUAL TEST CONDITIONS USING ACTUAL PROCESS AND LIFETIME ENVIRONMENTAL CONDITIONS
CALCULATE THE CIRCUIT PROPAGATION TIME UNDER PROCESS AND LIFETIME ENVIRONMENTAL CONDITIONS USING MICROPROCESSOR LOGIC AND PHYSICAL DESIGN DATA
CALCULATE PROPAGATION DELAY DEGRADATION UNDER PROCESS AND LIFETIME ENVIRONMENTAL CONDITIONS WHILE ACCOUNTING FOR ELECTROMIGRATION EFFECTS
EVALUATE THE TIMING EQUATION USING CALCULATED CIRCUIT PROPAGATION TIME AND PROPAGATION DELAY DEGRADATION TO ASSESS TOLERATION OF CALCULATED ELECTROMIGRATION-INDUCED PROPAGATION DELAY DEGRADATION
IDENTIFY ANY CIRCUITS WHICH VIOLATE TIMING EQUATION

1. A method of assessing propagation time degradation caused by electromigration effects in a microprocessor, wherein the microprocessor comprises a plurality of logic elements including at least a first logic element connected to a second logic element by an interconnection path having a time dependent resistance, and the propagation time degradation results from changes in the resistance over time, said method comprising the steps of:

calculating a reference interconnection resistance degradation for said interconnection resistance at nominal fabrication process and microprocessor lifetime application conditions;

tabulating the results of the reference interconnection resistance degradation calculations for a plurality of output driver load capacitances, said capacitances representing a variety of possible devices which may comprise the second logic element;

computing test interconnection resistance degradation by scaling the reference interconnection resistance degradation for actual test conditions using actual process and lifetime environmental conditions;

calculating the circuit propagation time under process and lifetime environmental conditions using microprocessor logic and physical design data;

calculating propagation delay degradation under process and lifetime environmental conditions while accounting for electromigration effects;

evaluating a timing equation using calculated circuit propagation time and propagation delay degradation to assess microprocessor toleration of calculated electromigration-induced propagation delay degradation; and

identifying circuits which violate said timing equation.

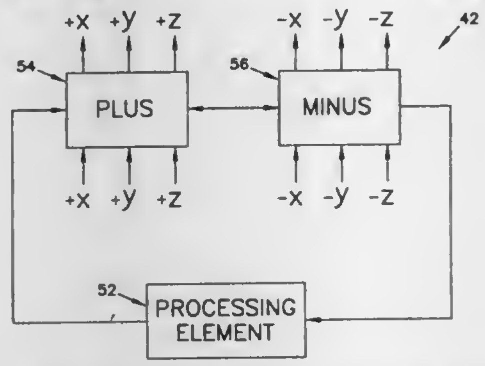
5,533,198
PRIORITY ROUTING OF PACKETS BETWEEN NODES IN A NETWORKED SYSTEM

Gregory M. Thorson, Altoona, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Filed Nov. 30, 1992, Ser. No. 983,979

Int. Cl.^{6} H04J *3/26*

U.S. Cl. 395—200.15 **20 Claims**



1. A method of routing a packet between a source and a destination node in a networked system having a plurality of nodes connected in an n-dimensional topology, wherein the topology comprises n dimensions, including a first and a second dimension, wherein the system comprises two or more nodes connected in 2n directions to other nodes in the system and wherein the 2n directions comprise first and second directions in each of the n dimensions, the system performing the method comprising the steps of:

defining a direction order for routing packets, wherein the direction order defines a priority for packet routing in each of the 2n directions, wherein the first direction of the first dimension, the second direction of the first dimension, the first direction of the second dimension, and the second direction of the second dimension all have different defined priorities for packet routing;

generating a header comprising routing information, wherein the routing information comprises information needed for routing in each dimension based on the direction order;

attaching the header to information to be transferred in order to form a packet; and

transferring the packet from the source node to the destination node, wherein the step of transferring the packet comprises routing the packet in the direction order.

5,533,199

Patent Not Issued For This Number

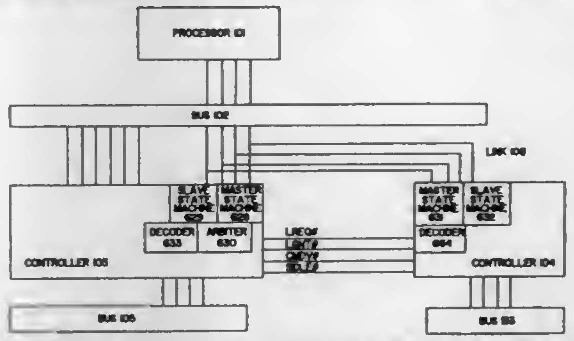
5,533,200
METHOD AND APPARATUS FOR TRANSMISSION OF SIGNALS OVER A SHARED LINE

Timothy M. Dobbins, and Zohar Bogin, both of Folsom, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 18, 1994, Ser. No. 210,560

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—280 **9 Claims**



1. A method for transmitting information between a plurality of semiconductor components in a computer system comprising the steps of:

sending signals of a first type over a first bus coupled to a first component and a second component in said computer system;

sending signals of a second type over said first bus;

sending signals transmitted along the first bus to a third component along a second bus, wherein the second bus comprises a smaller bus width than the first bus;

arbitrating access to the first bus between the first component, the second component, and the third component;

arbitrating access to the second bus between the second component and the third component;

defaulting control of the first bus to the first component until the second component requests control of the first bus wherein the second component awaits a first acknowledge signal from the first component before utilizing the first bus and the second bus;

granting the second component access to the first bus and the second bus; and

granting the third component access to the second bus wherein the third component requests access from the second component via a first request and awaits a first permit signal from the second component, the second component asserting the first permit signal after the second component has requested control of the first bus from the first component and received the first acknowledge from the first component.

5,533,201
METHOD AND APPARATUS FOR SIMULTANEOUS INTERCONNECTION OF MULTIPLE REQUESTORS TO MULTIPLE MEMORIES

Michael K. Benton, Malvern; Anthony P. Gold, Wayne, and Richard A. Schranz, Norristown, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation-in-part of Ser. No. 207,318, Mar. 7, 1994. This application Aug. 1, 1994, Ser. No. 283,975

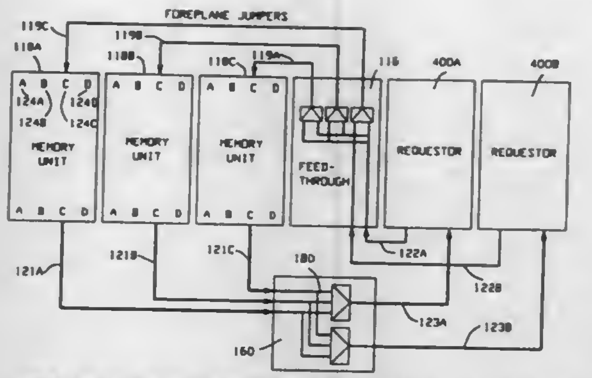
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—280 **18 Claims**

1. A switching system for connecting a plurality of requestors to a plurality of memory units without the need to employ a shared memory bus, comprising:

a first multiplexer, having input terminals coupled to the requestors and output terminals coupled to the memory units, to transfer fetch and store commands and data from the requestors to the memory units;

a first control logic means, coupled to said first multiplexer, for receiving commands from requestors indicating fetch and store operations, and for selecting one of said input terminals to be coupled to one of said output terminals of said first multiplexer for transferring fetch and store commands and



data to the memory units from the requestors, wherein said first control logic means selects the input and output terminals upon receiving said commands;

a second multiplexer, having input terminals coupled to the memory units and output terminals coupled to the requestors, to transfer data from said memory units to one of said requestors; and

a second control logic means, coupled to said second multiplexer, for selecting one of said input terminals to be coupled to one of said output terminals of said second multiplexer for transferring data to the requestors, wherein said data is transferred from the memory unit to the requestor, upon said second control logic means receiving an access grant signal from the requestor.

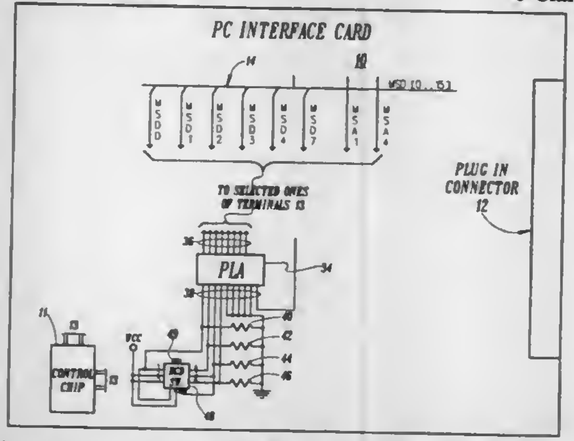
5,533,202
APPARATUS USING A BINARY CODED DECIMAL SWITCH AND A PROGRAMMABLE LOGIC ARRAY FOR SELECTIVELY COUPLING TERMINALS OF A CONTROLLER CHIP TO DATA BUS LINES

Angelo A. Blone, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glewview, Ill.

Filed Nov. 2, 1992, Ser. No. 970,318

Int. Cl.^{6} G06F *3/02*

U.S. Cl. 395—280 **6 Claims**



1. In a PC network interface card of the type including a controller chip coupled to a plurality of data bus lines and a plurality of mechanical connection devices for configuring the controller chip for proper operation by manually setting said plurality of mechanical connection devices to selectively couple terminals of the controller chip to said plurality of data bus lines, the improvement comprising:

a programmable logic array in place of said plurality of mechanical connection devices, said programmable logic array having outputs coupled to the terminals of said controller chip and to said plurality of data bus lines for configuring said controller chip by selective connection of said controller chip terminals to said plurality of data bus lines; and

a ten position binary coded decimal switch coupled across the input of said programmable logic array, said ten position binary coded decimal switch device developing a four bit binary coded decimal output for establishing a different configuration of said controller for each position thereof.

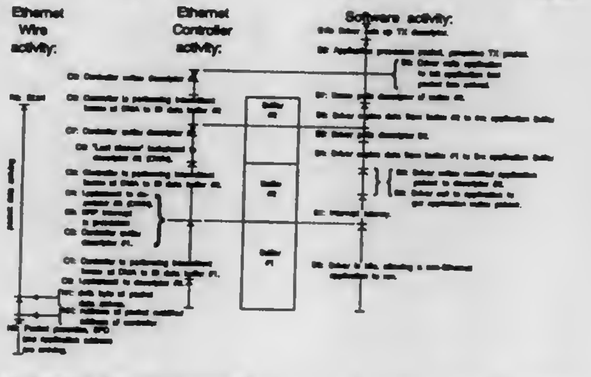
5,533,203
START OF PACKET RECEIVE INTERRUPT FOR ETHERNET CONTROLLER

Matthew J. Fischer, Mt. View; Glen Gibson, San Ramon; Jeffrey Dwork, and Thomas J. Runaldue, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 147,370, Nov. 5, 1993, abandoned. This application May 9, 1995, Ser. No. 437,068

Int. Cl.^{6} G06F *13/00;15/173*

U.S. Cl. 395—250 **5 Claims**



1. A system for increasing the speed at which data is received from a network comprising:

a plurality of buffer memory means;

an application memory means having a plurality of memory portions;

a controller for sequentially writing data received from the network to the plurality of buffer memory means and for generating an interrupt signal when a first buffer memory means is full;

a driver means for sequentially transferring data from the plurality of buffer memory means to the plurality of memory portions of the application memory means, the driver means being actuated upon receiving the interrupt signal whereby data transfer from the first buffer memory means to a first portion of the plurality of memory portions of the application memory means is performed while data is being written into a second buffer memory means;

a plurality of receive descriptors, the plurality of receive descriptors being set up by the driver means to indicate descriptor ownership status and start of packet status, each receive descriptor being associated with one of the plurality of buffer memory means, descriptor ownership status indicating whether the controller can write to the buffer memory means associated with the receive descriptor, and the start of packet status indicating whether a data packet can begin in the buffer memory means associated with the receive descriptor;

wherein the controller polls the plurality of receive descriptors for receive descriptor that indicates ownership of the receive descriptor by the controller and start of packet status before the controller write data into one of the plurality of buffer memory means;

wherein the controller updates the receive descriptor to relinguish ownership of the receive descriptor and to change the start of packet status after a particular one of the plurality of buffer memory means is filled; and

wherein the controller performs a lookahead polling of a succeeding receive descriptor when a specified byte of the data packet is provided to the controller.

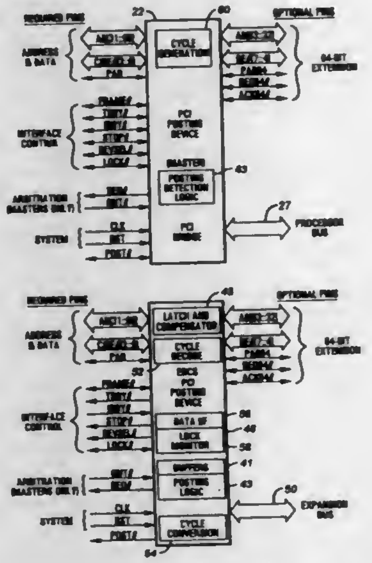
5,533,204
SPLIT TRANSACTION PROTOCOL FOR THE PERIPHERAL COMPONENT INTERCONNECT BUS

Roger E. Tipley, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 18, 1994, Ser. No. 229,233

Int. Cl.^{6} G06F *13/36;13/00*

U.S. Cl. 395—288 **6 Claims**



4. A method of performing posted read cycles in a computer system including a peripheral component interconnect bus, the peripheral component interconnect bus including a lock signal, a stop signal and a sideband post signal, the computer system further including at least one peripheral component interconnect bus master and at least one peripheral component interconnect target coupled to the peripheral component interconnect bus, said method comprising the steps of:

a master executing a first read cycle on the peripheral component interconnect bus;

a target decoding the read cycle and asserting the stop and post signals to post the read cycle, and then retrieving the data requested by the master during the read cycle;

the master asserting the lock signal to lock the target if the post and stop signals are asserted during the first read cycle;

the master releasing the peripheral component interconnect bus in response to the read cycle being posted;

the master subsequently re-gaining control of the peripheral component interconnect bus and executing a second read cycle;

the master negating and reasserting the lock signal during the second read cycle; and

the target monitoring the lock signal after posting the first read cycle, and providing the retrieved data on the peripheral component interconnect bus during the second read cycle if the lock signal is negated and reasserted.

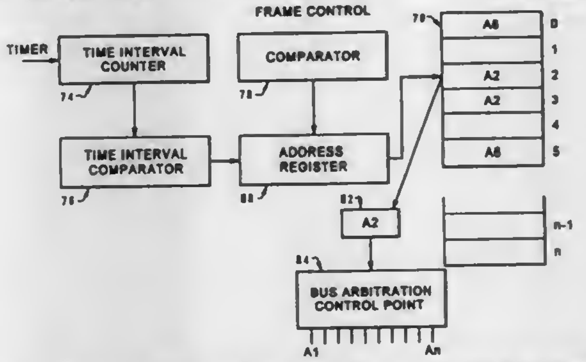
5,533,205
METHOD AND SYSTEM FOR EFFICIENT BUS ALLOCATION IN A MULTIMEDIA COMPUTER SYSTEM

John W. Blackledge, Jr., Boca Raton, Fla., and Bradly G. Frey, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1994, Ser. No. 220,326

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—297 **6 Claims**



1. A method for efficient bus allocation in a computer system having a processor, a memory and a plurality of input/output devices coupled together via a bus having a maximum data transfer rate, said method comprising the computer implemented steps of:

associating an arbitration level indicator with each of said plurality of input/output devices within said computer system;

ordering said arbitration level indicators to indicate a priority of bus access for each associated input/output device;

dividing access to said bus into a plurality of consecutive time intervals; and

selectively and temporarily reordering said arbitration level indicators within particular ones of said plurality of consecutive time intervals by:

- determining a required data transfer rate for a particular input/output device;
- calculating a first percentage of said maximum data transfer rate of said bus required to meet said required data transfer rate; and
- designating an arbitration level indicator associated with said particular input/output device as a highest priority for bus access during a first percentage of said plurality of consecutive time intervals;

wherein bus access for selected input/output devices may be guaranteed at predetermined fixed data rates.

DESIGN PATENTS

GRANTED JUL. 2, 1996

ERRATA

For CLASS	See PATENT NO.
D 9–448	D 371,295
D 9–456	D 371,296
D 9–436	D 371,297
D18–56	D 371,389

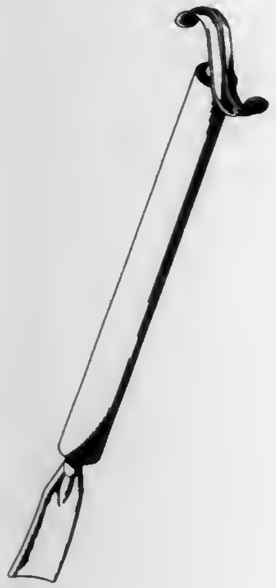
DESIGNS

JULY 2, 1996

371,231
COMBINATION DRESSING HOOK AND SHOE HORN

Arthur Traber, San Diego, and Robert S. Traber, Escondido, both of Calif., assignors to Caliputer, Inc., Escondido, Calif.
Filed May 15, 1995, Ser. No. 38,905
Term of patent 14 years

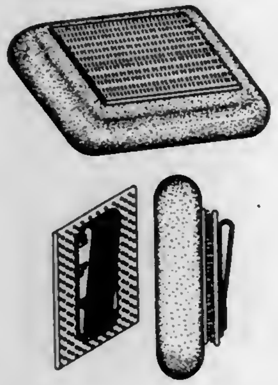
U.S. Cl. D2—642



371,232
COMBINED SWEAT PAD AND GARMENT CLIP

Leo J. Fleming, 3228 Sappington Pl., Fort Worth, Tex. 76116
Filed Jul. 8, 1993, Ser. No. 10,507
Term of patent 14 years

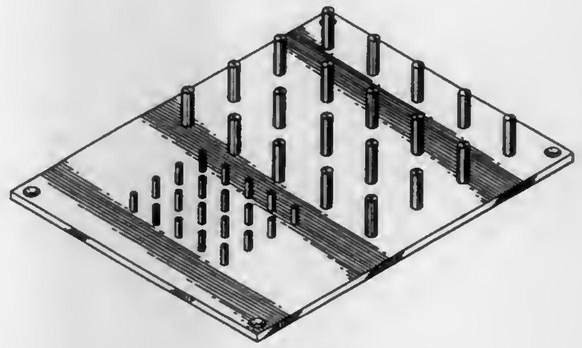
U.S. Cl. D2—853



371,233
THREAD SPOOL HOLDER

Martha A. Kelly, 1125 Comal Dr., Corpus Christi, Tex. 78407-1105
Filed May 22, 1995, Ser. No. 39,150
Term of patent 14 years

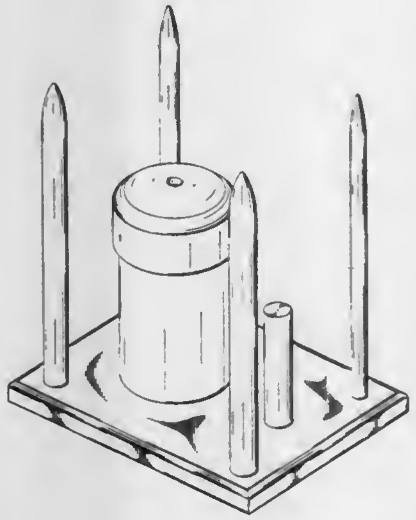
U.S. Cl. D3—25



371,234
CROCHET WORK STATION

Alice L. Hyche, 9405 Indian Springs Dr., Roswell, Ga. 30075
Filed Dec. 21, 1994, Ser. No. 32,601
Term of patent 14 years

U.S. Cl. D3—26



371,235

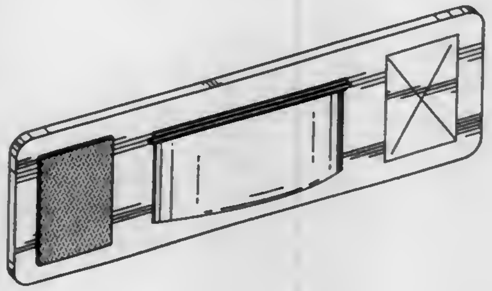
THERAPEUTIC WRAP WITH POCKET FOR ICE PACK

Walter B. Robertson, 95 Mundy Avenue, Kapuskasing, ON, Canada

Filed Sep. 22, 1994, Ser. No. 28,778

Term of patent 14 years

U.S. Cl. D3—215



371,236

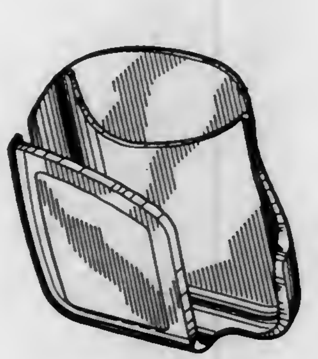
HOLSTER FOR A COMMUNICATION RECEIVER

William J. Scheid, Coral Springs, Fla., and Sacha B. Holland, Loxahatchee, both of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 3, 1995, Ser. No. 35,653

Term of patent 14 years

U.S. Cl. D3—218



371,237

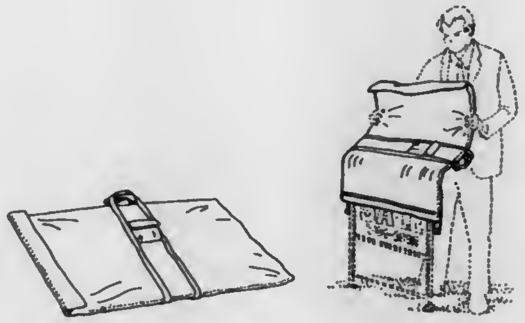
TOTE BAG FOR CARRYING AND STORING A REAL ESTATE SIGN

Sharon K. Pfeifer, 840 S. Garfield, Denver, Colo. 80209

Filed Apr. 25, 1994, Ser. No. 21,804

Term of patent 14 years

U.S. Cl. D3—276



371,238

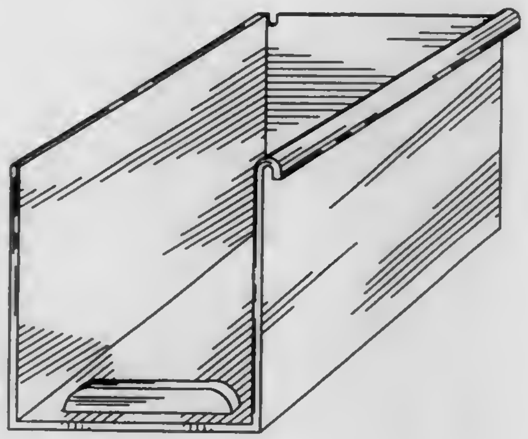
SHELF ORGANIZER

Phyllis A. Dingman, 5569 Makati Cir., San Jose, Calif. 95123

Filed Dec. 22, 1994, Ser. No. 32,612

Term of patent 14 years

U.S. Cl. D3—304



371,239

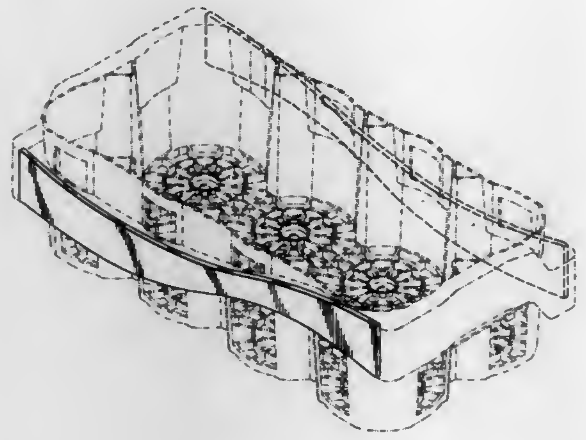
SIDE ELEMENT OF A BEVERAGE CONTAINER CASE

Daniel E. Kelly, Brookfield, Wis., assignor to Tulip Corporation, Milwaukee, Wis.

Filed Nov. 21, 1994, Ser. No. 31,180

Term of patent 14 years

U.S. Cl. D3—318



371,240

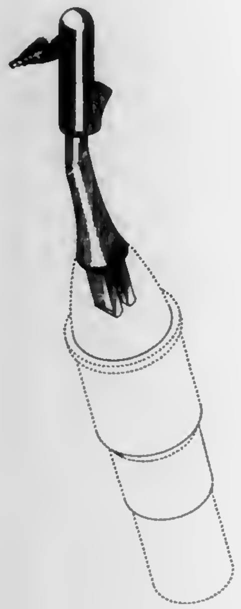
INTERDENTAL TOOTHCLEANER HOLDER FOR VIBRATING HANDLE

Don E. Millner, 212 Bruce Rd., Washington Crossing, Pa. 18977

Filed Apr. 3, 1995, Ser. No. 37,058

Term of patent 14 years

U.S. Cl. D4—101



371,241

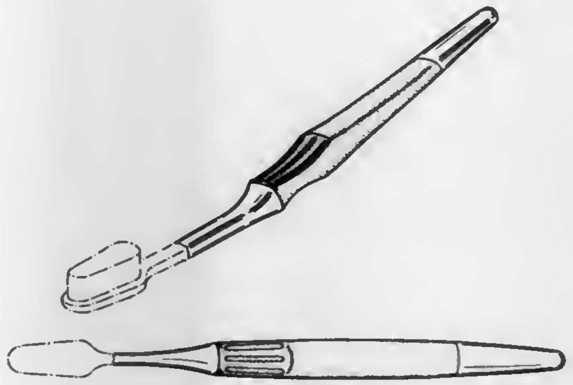
TOOTHBRUSH HANDLE

Thomas M. Dair, Yorktown Heights; Mari H. Ando, and Jarrod L. Linton, both of New York, all of N.Y., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Filed Mar. 22, 1995, Ser. No. 36,564

Term of patent 14 years

U.S. Cl. D4—104



371,242

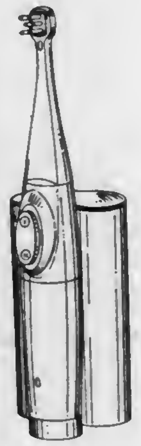
ELECTRIC TOOTHBRUSH WITH COMBINED CHARGING BASE AND BRUSH-HEAD CONTAINER THEREFOR

Scott T. Shimatsu, Alhambra; Cleve A. Graham, Simi Valley, and Spencer L. MacKay, Agoura Hills, all of Calif., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 7, 1994, Ser. No. 29,536

Term of patent 14 years

U.S. Cl. D4—108



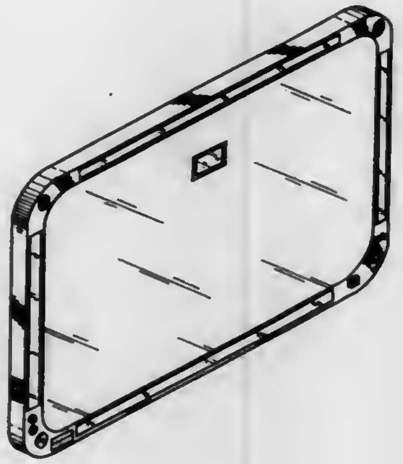
371,243
BATHROOM CONVENIENCE MIRROR

David S. Diaz, 2385 Green Lake Rd. NE, Rio Rancho, N.M. 87124-2548

Filed Apr. 28, 1995, Ser. No. 38,174

Term of patent 14 years

U.S. Cl. D6—300



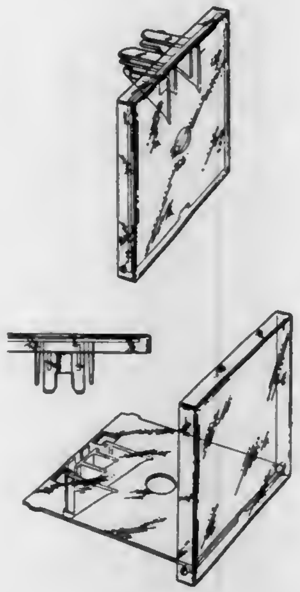
371,244
DISPLAY FRAME

Benjamin S. Weshler, Old Westbury, N.Y., assignor to Display Systems, Inc., Maspeth, N.Y.

Filed Jun. 6, 1995, Ser. No. 39,826

Term of patent 14 years

U.S. Cl. D6—314



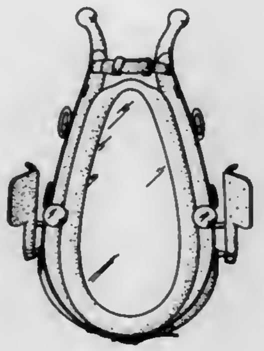
371,245
MIRROR

Rex Nelson, P.O. Box 292, Canaan, Me. 04924

Filed May 24, 1995, Ser. No. 39,227

Term of patent 14 years

U.S. Cl. D6—303



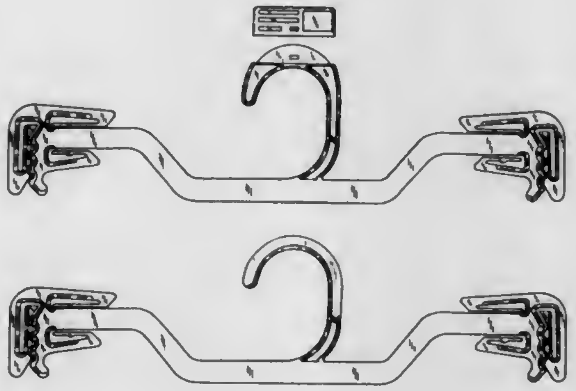
371,246
GARMENT HANGER

Stanley Gouldson, Northport, and Roland Harmer, Centereach, both of N.Y., assignors to Spotless Plastics Pty. Ltd., Victoria, Australia

Continuation-in-part of Ser. No. 870,696, Apr. 16, 1992, Pat. No. Des. 350,236. This application Sep. 15, 1993, Ser. No. 13,052

Term of patent 14 years

U.S. Cl. D6—326



371,247
SEPARATOR PANEL FOR FIREARM RANGE

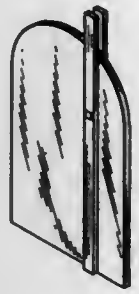
Michael R. Spielvogel, Tampa, Fla., assignor to Gun Range Authority, Tampa, Fla.

Filed Mar. 24, 1994, Ser. No. 20,324

The portion of the term of this patent subsequent to Jan. 9, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—332



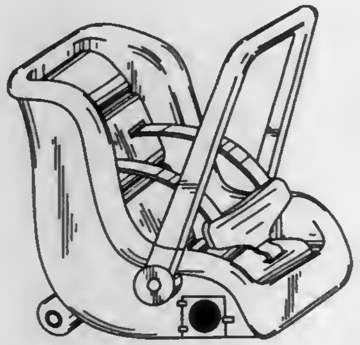
371,248
MUSICAL ROCKING INFANT CAR SEAT

Noah Niessen, and Sandra Niessen, both of 114 Edmund Park, Saskatoon, SK, Canada

Filed Sep. 22, 1994, Ser. No. 28,804

Term of patent 14 years

U.S. Cl. D6—333



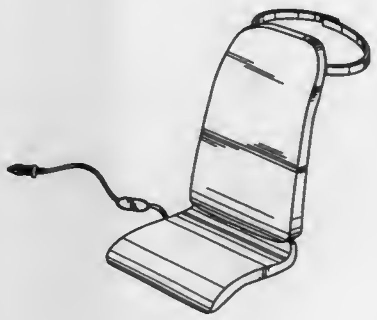
371,249
COOLED AUTOMOBILE SEAT

Richard C. Bowers, R.D. #2, Box 267, Seward, Pa. 15954

Filed Nov. 4, 1994, Ser. No. 30,690

Term of patent 14 years

U.S. Cl. D6—356



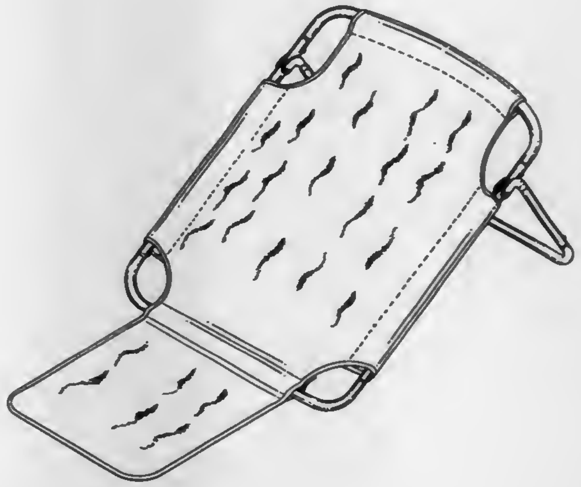
371,250
PORTABLE RECLINER FROM ASSEMBLED PIECES

Brett K. Herman, Honolulu, Hi., assignor to Brett Herman, Yakima, Wash.

Filed Aug. 22, 1994, Ser. No. 27,438

Term of patent 14 years

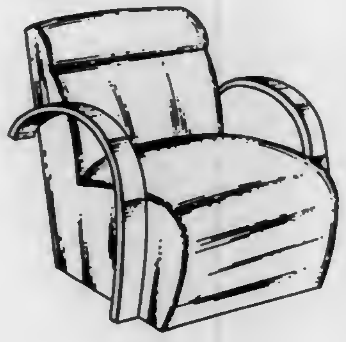
U.S. Cl. D6—368



371,251

SEAT

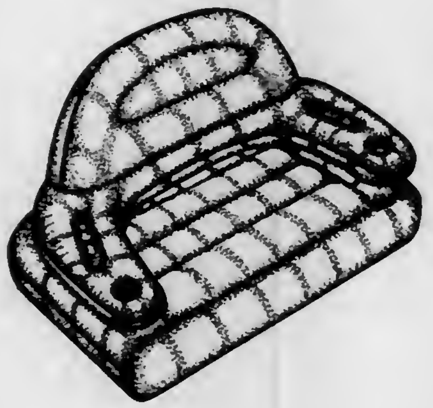
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Jul. 28, 1995, Ser. No. 41,987
Term of patent 14 years
U.S. Cl. D6—379



371,252

PORTABLE INFLATABLE SOFA

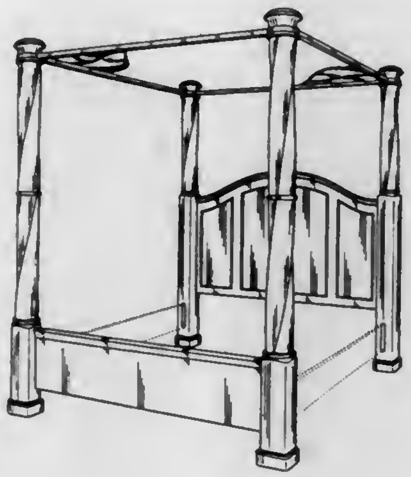
Eugene M. Chaput, 358 Alamos Rd., Portola Valley, Calif. 94028
Filed Jun. 9, 1995, Ser. No. 40,067
Term of patent 14 years
U.S. Cl. D6—381



371,253

BEDSTEAD

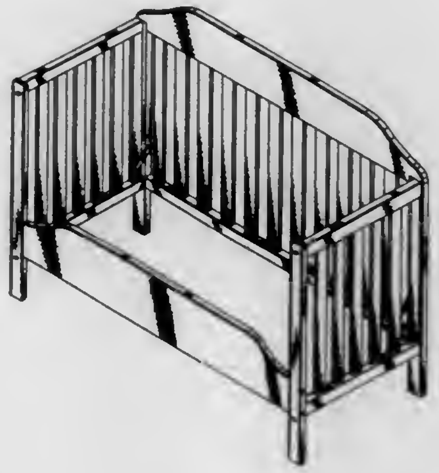
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Filed Jul. 31, 1995, Ser. No. 42,086
Term of patent 14 years
U.S. Cl. D6—389



371,254

CONVERTIBLE CRIB IN YOUTH BED CONFIGURATION

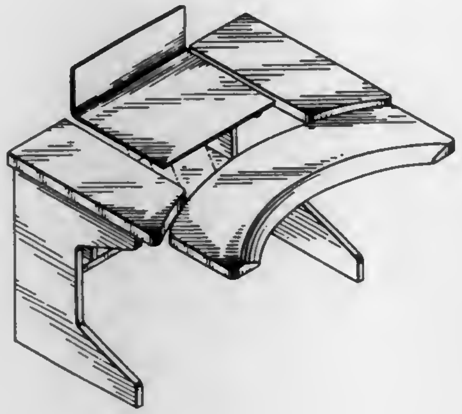
Lou Proano, and Rene D. Proano, both of 1648 Channelside Trail, Baldwinsville, N.Y. 13027-9052
Division of Ser. No. 11,756, Aug. 13, 1993, Pat. No. Des. 356,452. This application Feb. 3, 1995, Ser. No. 34,398
Term of patent 14 years
U.S. Cl. D6—391



371,255

ERGONOMIC COMPUTER WORKSTATION

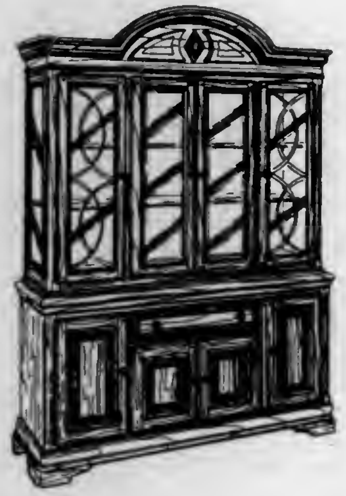
Paul E. Richard, 533 Junction La., Quakertown, Pa. 18951
Filed Sep. 2, 1993, Ser. No. 12,502
Term of patent 14 years
U.S. Cl. D6—426



371,256

CHINA CABINET

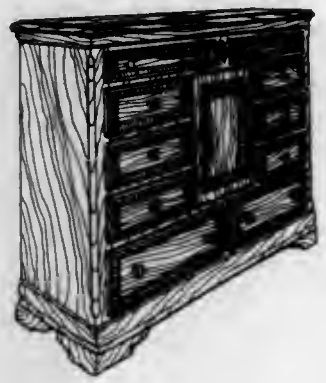
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 16, 1995, Ser. No. 36,282
Term of patent 14 years
U.S. Cl. D6—438



371,257

DRESSER

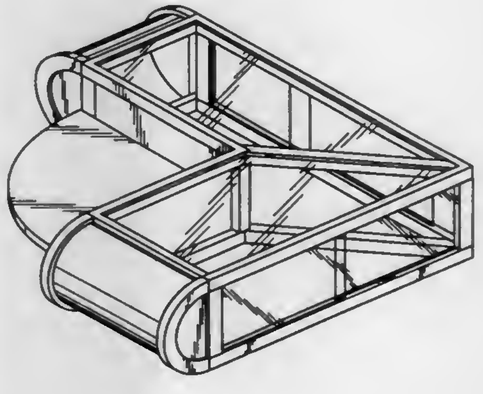
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 21, 1995, Ser. No. 36,488
Term of patent 14 years
U.S. Cl. D6—445



371,258

ILLUMINATED CORNER TABLE

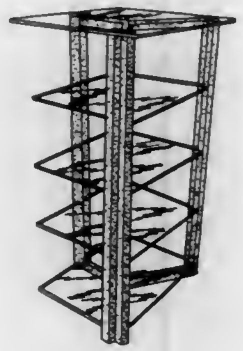
Renda Horton, P.O. Box 72, Kiefer, Okla. 74041
Filed Apr. 17, 1995, Ser. No. 37,577
Term of patent 14 years
U.S. Cl. D6—470



371,259

ENTERTAINMENT SYSTEM STAND

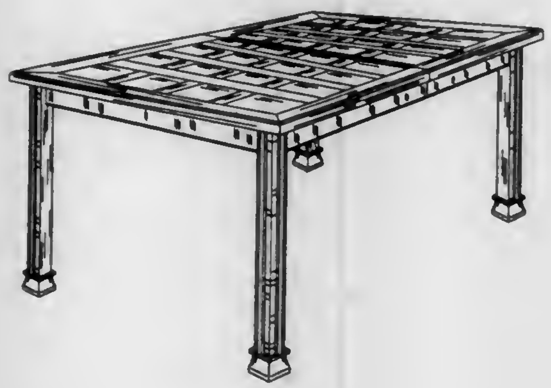
Jon P. Herbst, 2890 Skyline Dr., Eagan, Minn. 55121
Filed Mar. 6, 1995, Ser. No. 35,730
Term of patent 14 years
U.S. Cl. D6—479



371,260

TABLE

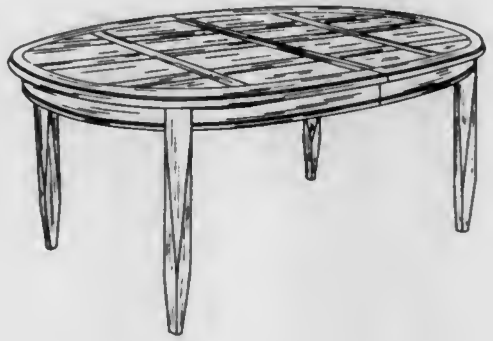
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 30,006
Term of patent 14 years
U.S. Cl. D6—480



371,261

TABLE

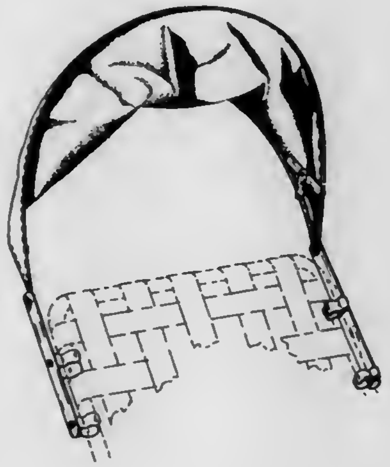
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 29,976
Term of patent 14 years
U.S. Cl. D6—480



371,262

COLLAPSIBLE SUN SHADE FOR CHAIR BACKS

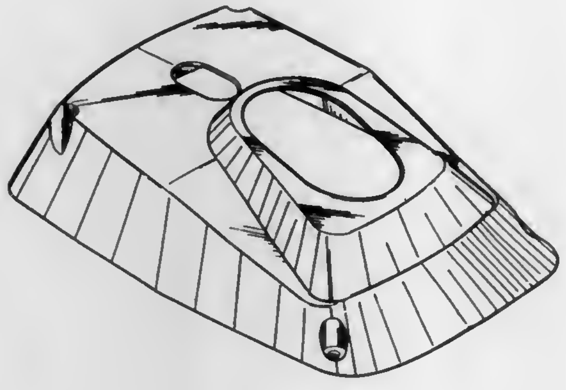
Daniel H. Forbes, Sr., 1062 Ocean Ave., Portland, Me. 04103
Filed Jun. 30, 1994, Ser. No. 25,368
Term of patent 14 years
U.S. Cl. D6—491



371,263

HOUSING COVER FOR CHAIR BASE

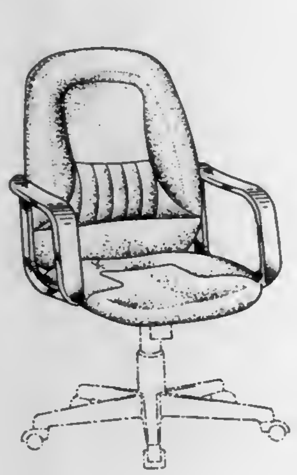
Clement Liu, No. 56-3, Kan Tung Tsun, Kuei Jen Hsiang, Tainan Hsian, Taiwan
Filed Mar. 14, 1995, Ser. No. 36,180
Term of patent 14 years
U.S. Cl. D6—495



371,264

CHAIR BODY

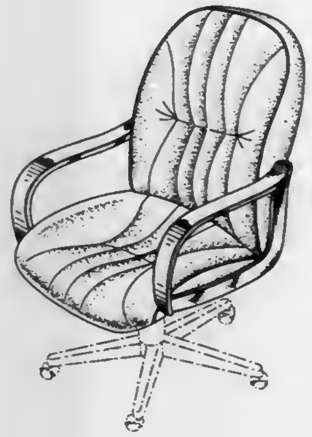
Ronald D. McDiarmid, La Habra, Calif., assignor to GRUGA, U.S.A., City of Industry, Calif.
Filed Mar. 22, 1995, Ser. No. 36,496
Term of patent 14 years
U.S. Cl. D6—502



371,265

CHAIR BODY

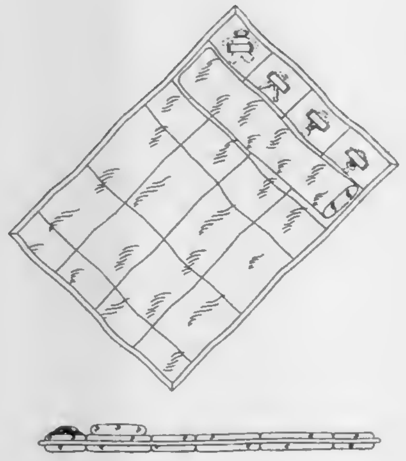
Ronald D. McDiarmid, La Habra, Calif., assignor to Gruga, U.S.A., City of Industry, Calif.
Filed Mar. 22, 1995, Ser. No. 36,497
Term of patent 14 years
U.S. Cl. D6—502



371,266

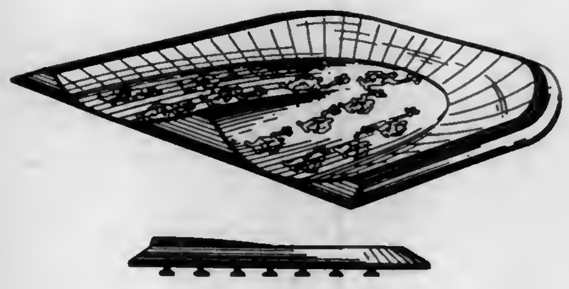
INFANT'S PORTABLE PLAY AND REST MAT

Andrea R. Ward, 14090 E. Quinn Cir., Aurora, Colo. 80015
Filed Oct. 19, 1994, Ser. No. 29,919
Term of patent 14 years
U.S. Cl. D6—596



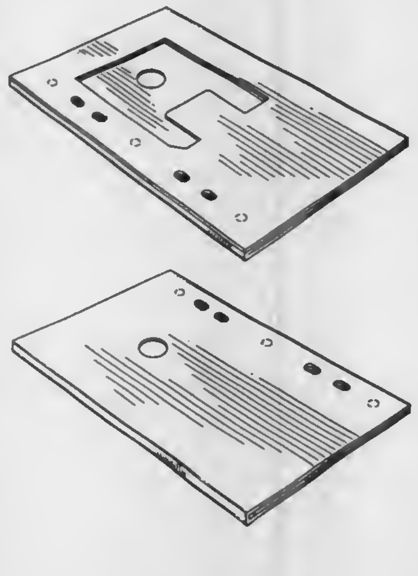
371,267
SEAT CUSHION

Patty A. Ivy, 14 Newberry La., Alma, Ak. 72921
Filed Jul. 7, 1994, Ser. No. 25,670
Term of patent 14 years
U.S. Cl. D6—599



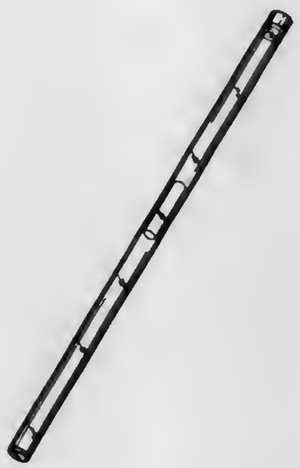
371,268
HOLDER FOR TRANSPORTING AND STORING DISKETTES

Rolf Johansson, Trollhättan, Sweden, assignor to Annons/Reklam AB, BorÅs, Sweden
Filed Nov. 24, 1993, Ser. No. 15,692
Claims priority, application Sweden, May 27, 1993, SE-931275
Term of patent 14 years
U.S. Cl. D6—626



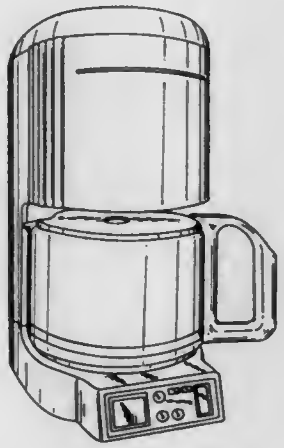
371,269
LUMINOUS DRINK STIRRER

Raymond D. Shattuck, P.O. Box 273, and Dorina Johnson, Rte. 11, both of Homer, N.Y. 13077
Filed Apr. 3, 1995, Ser. No. 37,088
Term of patent 14 years
U.S. Cl. D7—300.2



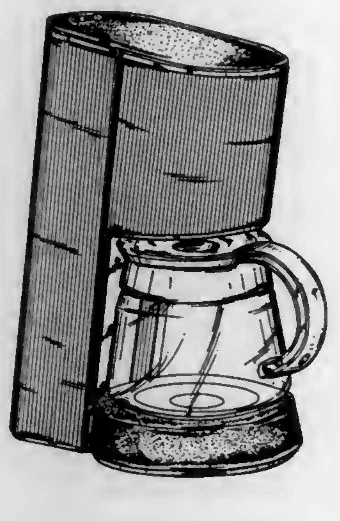
371,270
COFFEE MAKER

Randall P. Bell, River Forest, and Augusto A. Picozza, Crystal Lake, both of Ill., assignors to Sunbeam Products, Inc., Fort Lauderdale, Fla.
Filed Jan. 13, 1995, Ser. No. 34,940
Term of patent 14 years
U.S. Cl. D7—309



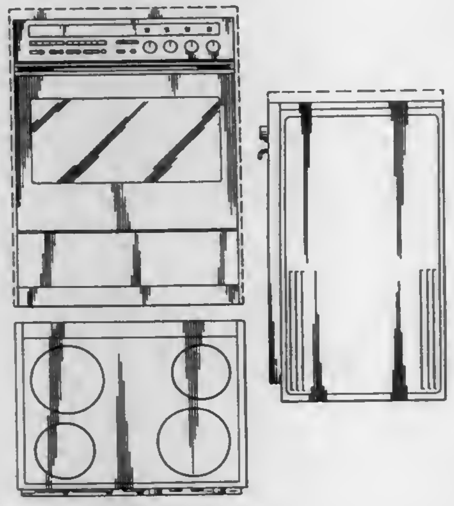
371,271
ELECTRIC COFFEEMAKER

Florian Seiffert, Wiesbaden, and Hartwig Kahlcke, Kronberg, both of, Germany, assignors to Robert Krups GmbH & Co. KG, Solingen, Germany
Filed May 26, 1995, Ser. No. 39,806
Claims priority, application France, Nov. 29, 1994, 0946481
Term of patent 14 years
U.S. Cl. D7—309



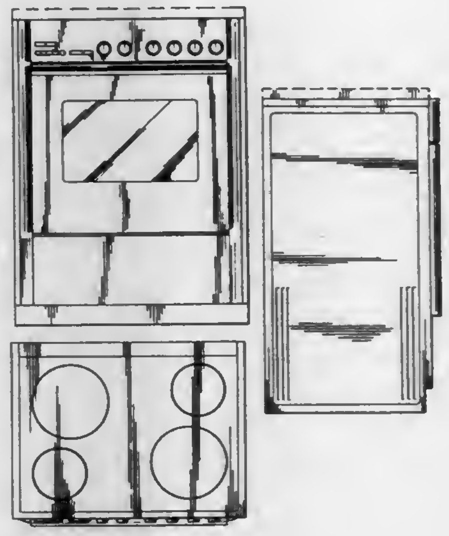
371,272
ELECTRIC RANGE

Gerd Wilsdorf, Olching, Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Germany
Filed Aug. 16, 1993, Ser. No. 11,854
Claims priority, application Germany, Feb. 15, 1993, M9301278.0
Term of patent 14 years
U.S. Cl. D7—340



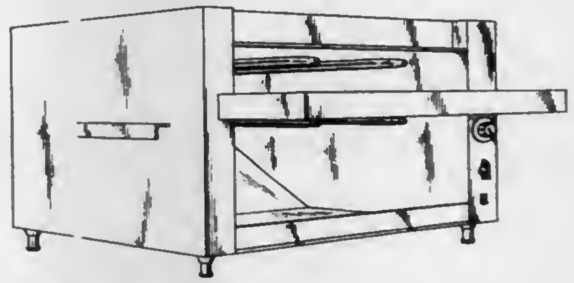
371,273
ELECTRIC RANGE

Gerd Wilsdorf, Olching, Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Germany
Filed Aug. 16, 1993, Ser. No. 11,855
Claims priority, application Germany, Feb. 15, 1993, M9301278.0
Term of patent 14 years
U.S. Cl. D7—340



371,274
CONTINUOUS TOASTER OVEN

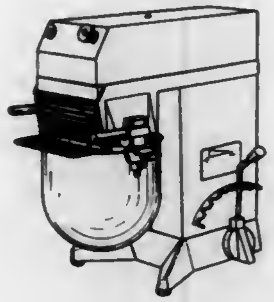
Nick Sitaras, Edison, N.J., assignor to American Food Equipment, Inc., Edison, N.J.
Filed Jan. 24, 1995, Ser. No. 34,141
Term of patent 14 years
U.S. Cl. D7—348



371,275

FOOD MIXING APPARATUS

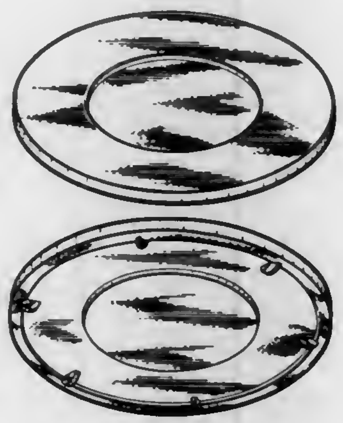
Jacques Fouquet, 6 Rue des Farges, Lyon, France
Filed Oct. 2, 1995, Ser. No. 44,876
Claims priority, application WIPO, May 15, 1995, DM/033010
Term of patent 14 years
U.S. Cl. D7—379



371,276

TRIVET

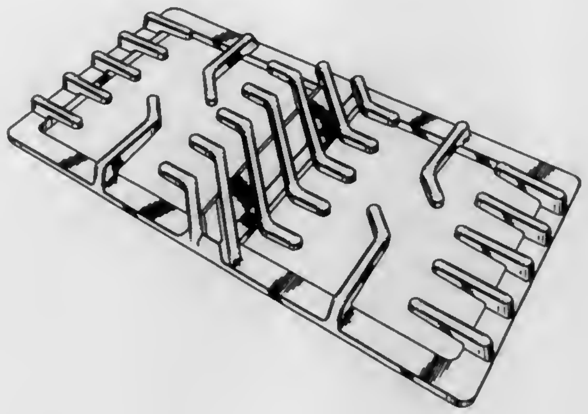
Douglas M. Laib, Kissimmee, Fla., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 10, 1994, Ser. No. 23,911
Term of patent 14 years
U.S. Cl. D7—388



371,277

COOKING GRATE

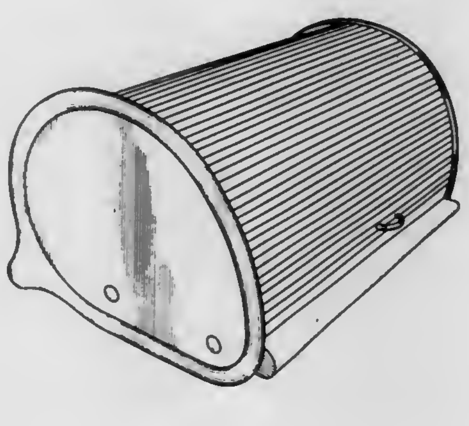
John J. Pink, Cedar Rapids, Iowa, assignor to Amana Refrigeration Inc., Amana, Iowa
Filed Feb. 4, 1994, Ser. No. 18,545
Term of patent 14 years
U.S. Cl. D7—408



371,278

BREAD BOX

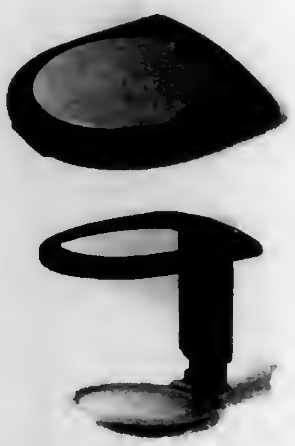
Carsten Jørgensen, Kriens, Switzerland, assignor to PI-Design AG, Triengen, Switzerland
Filed Aug. 1, 1994, Ser. No. 26,553
Claims priority, application Denmark, Feb. 2, 1994, 100/94
Term of patent 14 years
U.S. Cl. D7—609



371,279

FOLDABLE CUP HOLDER

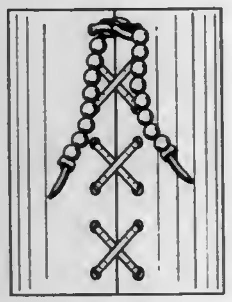
Patrick Marguerie, Annecy le Vieux, France, assignor to Impex SA, Les Abrets, France
Filed Apr. 11, 1995, Ser. No. 37,348
Claims priority, application Hague Agreement, Oct. 12, 1994, DM/030 960
Term of patent 14 years
U.S. Cl. D7—620



371,280

LEATHER CAN COVER

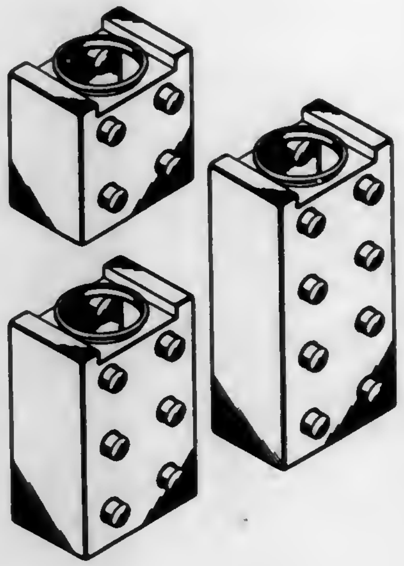
Joe M. Moreno, Rte. 1, Box 66-B, Cibolo, Tex. 78108
Filed Jul. 27, 1995, Ser. No. 41,937
Term of patent 14 years
U.S. Cl. D7—624



371,281

BUILDING BLOCK DRINK CONTAINER

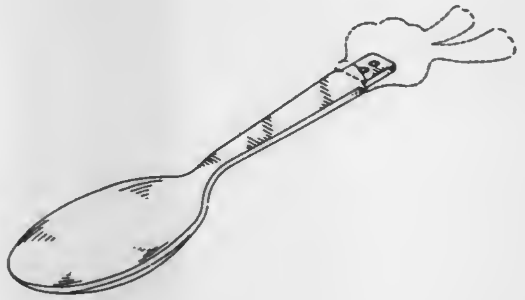
William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Aug. 22, 1994, Ser. No. 27,425
Term of patent 14 years
U.S. Cl. D7—625



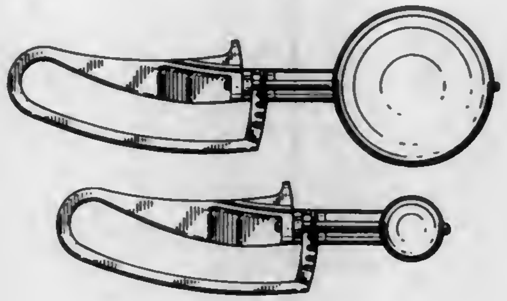
371,282

SPOON

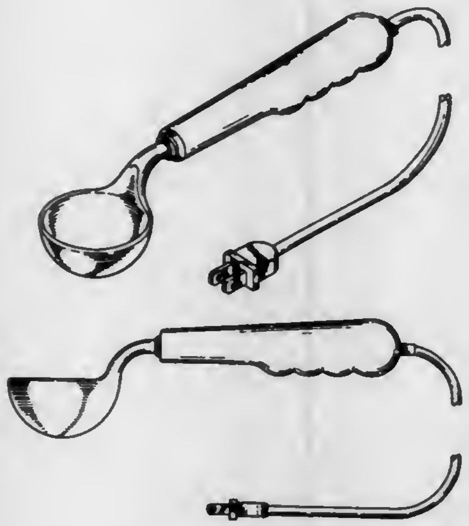
Holly B. Ronick, Old Lyme, Conn., assignor to The Nipper Group, Ltd., Old Lyme, Conn.
Filed Apr. 8, 1994, Ser. No. 21,092
Term of patent 14 years
U.S. Cl. D7—653



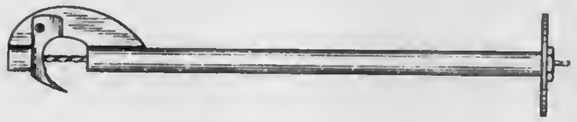
371,283
HAND PORTIONER
William A. Cooper, Uckfield, England, assignor to Mitchell & Cooper Limited, Sussex, England
Continuation-in-part of Ser. No. 20,654, Mar. 30, 1994, Pat. No. Des. 361,480. This application Jun. 7, 1995, Ser. No. 39,895
Claims priority, application United Kingdom, Oct. 1, 1993, 2034282
Term of patent 14 years
U.S. Cl. D7—681



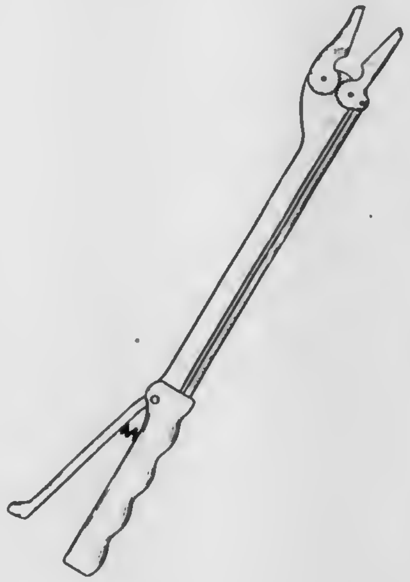
371,284
HEATED ICE CREAM SCOOP
Vernon L. Reinier, Jr., and Linda K. Reinier, both of 509 E. Adams Ave., Fairfield, Iowa 52556
Filed Jun. 8, 1995, Ser. No. 40,042
Term of patent 14 years
U.S. Cl. D7—681



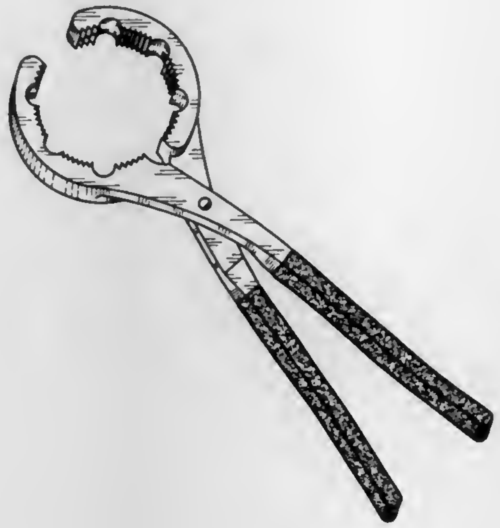
371,285
LIMB CUTTER
Arlen Becker, P.O. Box 747, McQueeney, Tex. 78123
Filed Dec. 7, 1994, Ser. No. 31,855
Term of patent 14 years
U.S. Cl. D8—1



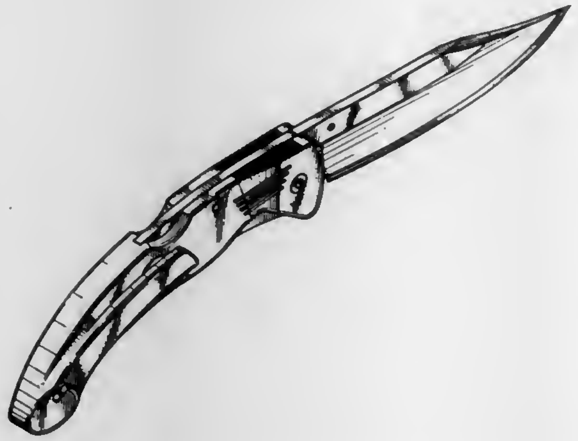
371,286
NAIL HOLDER
Ralph Garcia, 590 S. Santa Clara, New Braunfels, Tex. 78130
Filed Apr. 11, 1995, Ser. No. 37,372
Term of patent 14 years
U.S. Cl. D8—51



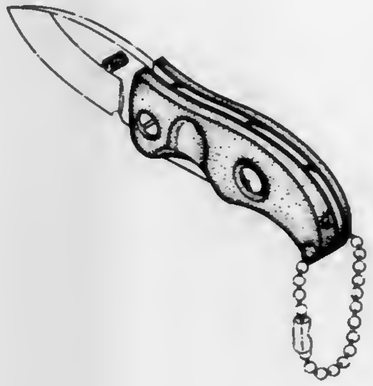
371,287
DRAIN NUT PLIERS
David S. Gilbert, Jr., 110 Rock Run Rd., Elizabeth, Pa. 15037
Filed May 30, 1995, Ser. No. 39,417
Term of patent 14 years
U.S. Cl. D8—52



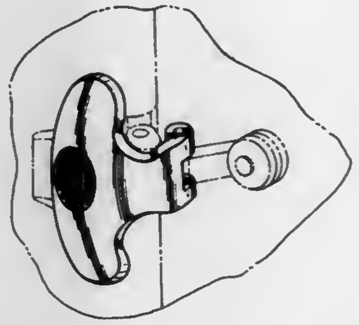
371,288
FOLDING KNIFE
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001
Filed Feb. 7, 1995, Ser. No. 34,531
Term of patent 14 years
U.S. Cl. D8—99



371,289
KNIFE-HANDLE
Kuo-Tai Huang, No. 20, Kung Shang Road, Wu Ku Hsiang, Taipei Hsien, Taiwan
Filed May 4, 1995, Ser. No. 38,397
Term of patent 14 years
U.S. Cl. D8—107



371,290
VEHICLE WINDOW LATCH HANDLE
John Ozark, Pointe Woods, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Sep. 26, 1994, Ser. No. 28,936
Term of patent 14 years
U.S. Cl. D8—307



371,291

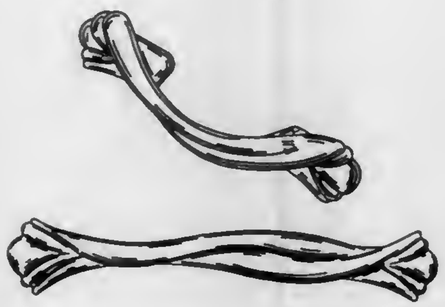
PULL

Frances G. H. Ainscough, McHenry, Ill., assignor to Newell Operating Company, Freeport, Ill.

Filed Aug. 3, 1994, Ser. No. 26,677

Term of patent 14 years

U.S. Cl. D8—315



371,292

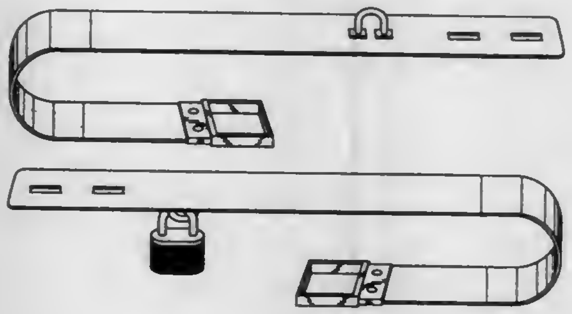
SECURITY BELT ASSEMBLY FOR LOCKABLE CRATES

Ruel Baker, 130-24 225 St., Laurelton, N.Y. 11413

Filed Jul. 17, 1995, Ser. No. 41,531

Term of patent 14 years

U.S. Cl. D8—333



371,293

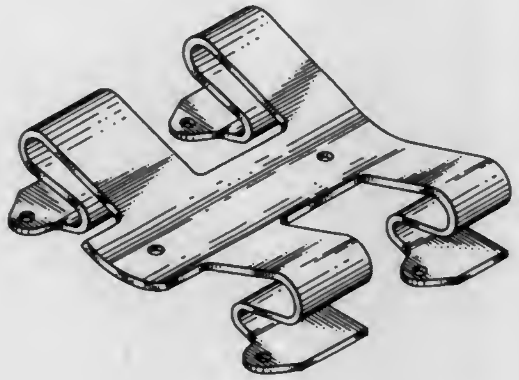
PUMP MOUNTING BRACKET

Ivar L. Schoenmeyr, San Juan Capistrano, Calif., assignor to Aquatec Water Systems, Inc., Anaheim, Calif.

Filed May 19, 1995, Ser. No. 39,117

Term of patent 14 years

U.S. Cl. D8—354



371,294

WALL PLUG

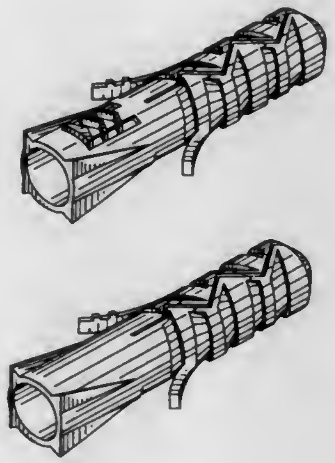
Robert P. Anquetin, Etrechy (Essonne), France, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 7, 1994, Ser. No. 29,539

Claims priority, application United Kingdom, Apr. 8, 1994, 2038243; Apr. 8, 1994, 2039489

Term of patent 14 years

U.S. Cl. D8—385



371,295

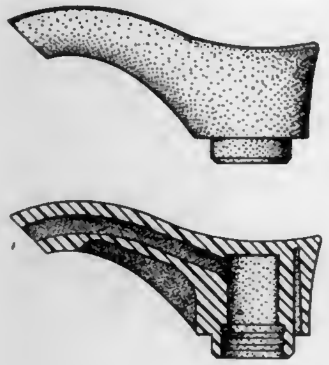
DISPENSING HEAD

Ronald Wadsworth, Cambria, Calif., and Linda E. Haner, Morristown, N.J., assignors to Calmar Inc., City of Industry, Calif.

Filed Jan. 6, 1995, Ser. No. 33,201

Term of patent 14 years

U.S. Cl. D9—448



371,296

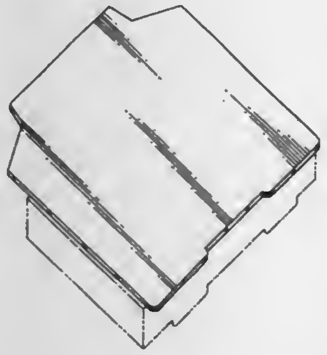
COVER FOR PIZZA BOX

John D Correll, 8459 Holly Dr., Canton, Mich. 48187

Continuation-in-part of Ser. No. 11,739, Aug. 13, 1993, Pat. No. Des. 356,254. This application Sep. 30, 1994, Ser. No. 29,195

Term of patent 14 years

U.S. Cl. D9—456



371,297

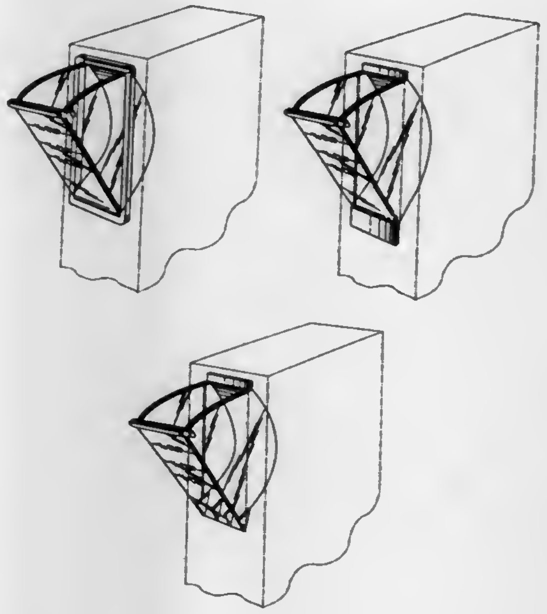
CLEAR PLASTIC MEASURING/DISPENSING SPOUT

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Continuation of Ser. No. 117,677, Sep. 8, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 32,103

Term of patent 14 years

U.S. Cl. D9—436



371,298

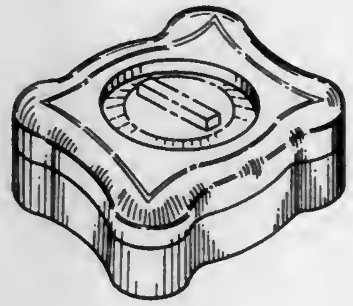
HANDLE FOR A PALM DRIVER

John C. Reddy, Columbus, and Robert L. Knox, Shiloh, both of Ga., assignors to J. H. Williams Company, Columbus, Ga.

Filed Jun. 9, 1995, Ser. No. 40,134

Term of patent 14 years

U.S. Cl. D8—107



371,299
BLIND RIVET INSTALLATION TOOL

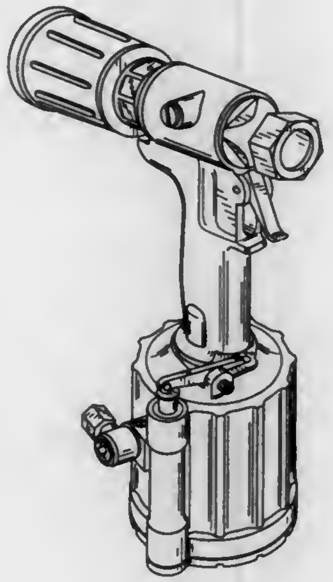
Hendrik E. Rosier, Kingston, N.Y., assignor to Huck International, Inc., Kingston, N.Y.

Filed Sep. 8, 1994, Ser. No. 28,151

The portion of the term of this patent subsequent to May 14, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8—68



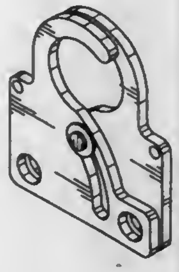
371,300
SAFETY DOUBLE LOCK

Brian L. Mordick, Shoreview, Minn., assignor to Federal-Hoffman, Inc., Anoka, Minn.

Filed Mar. 3, 1995, Ser. No. 35,677

Term of patent 14 years

U.S. Cl. D8—343



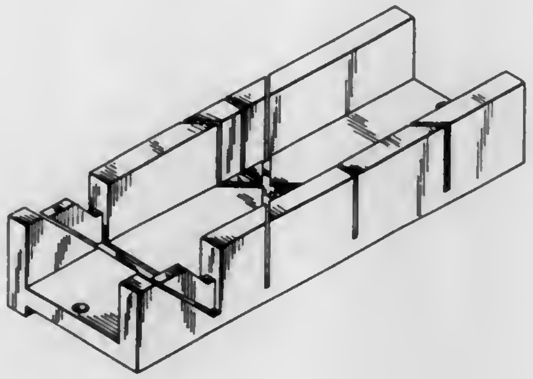
371,301
MITRE BOX

Daniel Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.

Filed Jun. 1, 1995, Ser. No. 39,668

Term of patent 14 years

U.S. Cl. D8—71



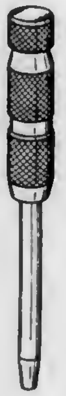
371,302
DOWEL PUNCH

Steven E. Spirer, 100B Oak St., Norwood, N.J. 07648

Filed May 25, 1995, Ser. No. 39,340

Term of patent 14 years

U.S. Cl. D8—47



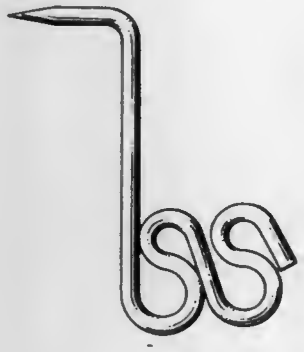
371,303
HOOK FOR HANGING PLASTIC VENT PIPES

Franklin H. Nielsen, P.O. Box 321, Thornton, Iowa 50479

Filed May 8, 1995, Ser. No. 38,522

Term of patent 14 years

U.S. Cl. D8—370



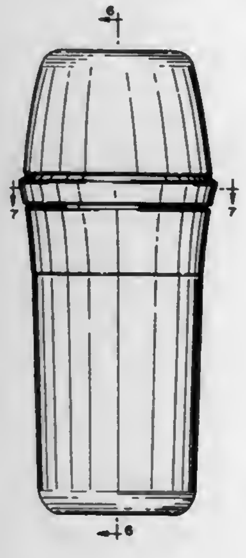
371,304
DISPENSER WITH OVERCAP

Frederik J. Onneweer, Tervuren, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.

Filed Dec. 30, 1993, Ser. No. 17,147

Term of patent 14 years

U.S. Cl. D9—503



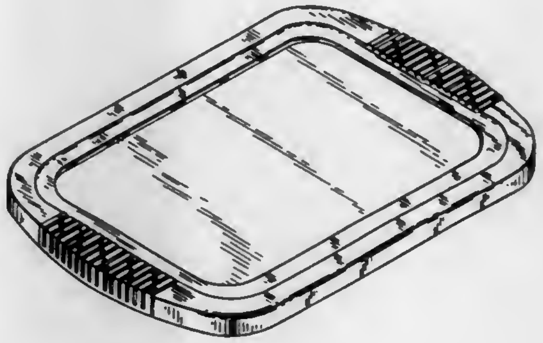
371,305
TOTE COVER

Cory J. Kruger, Gardner, Mass., assignor to Sterilite Corporation, Townsend, Mass.

Filed Aug. 6, 1993, Ser. No. 11,526

Term of patent 14 years

U.S. Cl. D9—435



371,306
COMBINED BOTTLE AND CAP

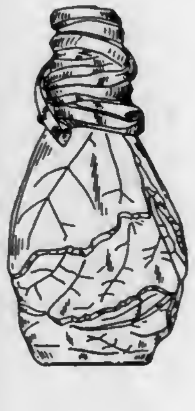
Serge Mansau, Boulogne, France, assignor to Societe Kenzo, Paris, France

Filed Dec. 20, 1994, Ser. No. 32,517

Claims priority, application WIPO, Jun. 20, 1994, DM/029 900

Term of patent 14 years

U.S. Cl. D9—549



371,307
WRIST WATCH

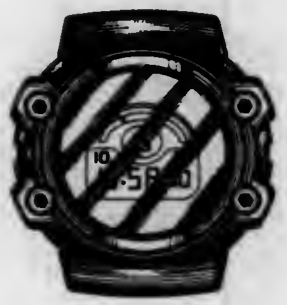
Akemi Tomita, Kawagoe, Japan; Richard W. Seymour, Kingston upon Thames, and David H. Powell, Loxwood, both of, United Kingdom, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 35,892

Claims priority, application Japan, Feb. 9, 1995, 7-3306

Term of patent 14 years

U.S. Cl. D10—38



371,308
WATCH

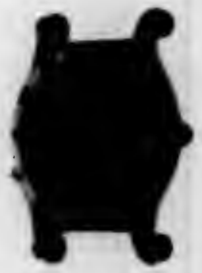
Severin S. Wunderman, Irvine, Calif., assignor to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd), Lengnau, Switzerland

Filed Jun. 5, 1995, Ser. No. 39,744

Claims priority, application WIPO, Dec. 6, 1994, DMA/002 719

Term of patent 14 years

U.S. Cl. D10—35



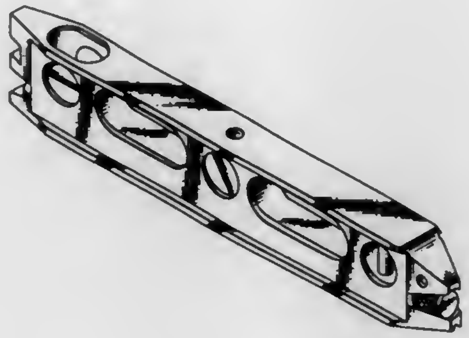
371,309
LASER BUBBLE LEVEL

James Webb, 877 Ave. B, Redondo Beach, Calif. 90277

Filed Aug. 4, 1995, Ser. No. 42,211

Term of patent 14 years

U.S. Cl. D10—69



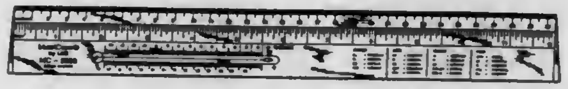
371,310
METRICONV® RULER

Julius C. Ekeoba, 3404 University Blvd., P.O. Box 23, Kensington, Md. 20895

Division of Ser. No. 29,703, Oct. 13, 1994. This application Jul. 24, 1995, Ser. No. 41,744

Term of patent 14 years

U.S. Cl. D10—71



371,311
ELECTRONIC SCALE WITH PRINTER

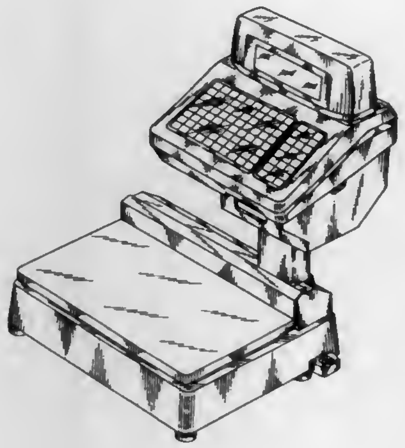
Osamu Mimoto, Sagamihara, Japan, assignor to Kabushiki Kaisha Tec, Shizuoka, Japan

Filed Jun. 1, 1995, Ser. No. 39,634

Claims priority, application Japan, Dec. 19, 1994, 6-38719

Term of patent 14 years

U.S. Cl. D10—91



371,312
AUDIBLE SIGNAL FOR ALARM UNITS

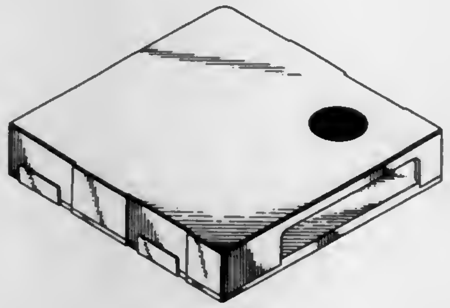
Kazushi Suzuki, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka, Japan

Filed Jul. 20, 1995, Ser. No. 41,633

Claims priority, application Japan, Feb. 10, 1995, 3469/1995

Term of patent 14 years

U.S. Cl. D10—116



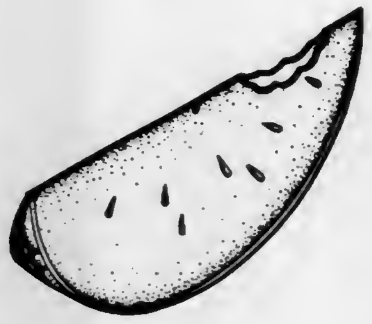
371,313
BELL

Chung-Shyan Huang, 1-1, Chang Mar Street, Hsiu Hsiang, Chang Hua Hsien, Taiwan

Filed Sep. 14, 1994, Ser. No. 28,412

Term of patent 14 years

U.S. Cl. D10—116



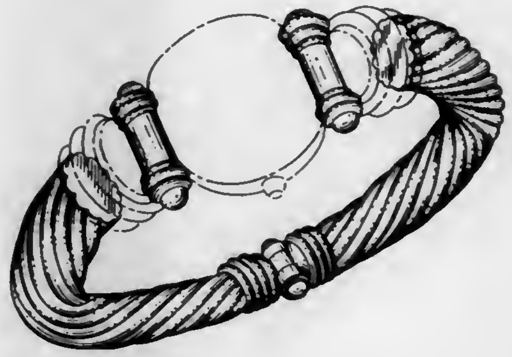
371,314
WATCH BRACELET

David Yurman, New York, N.Y., assignor to Yurman Design Inc., New York, N.Y.

Filed Nov. 17, 1994, Ser. No. 31,074

Term of patent 14 years

U.S. Cl. D11—3



371,315

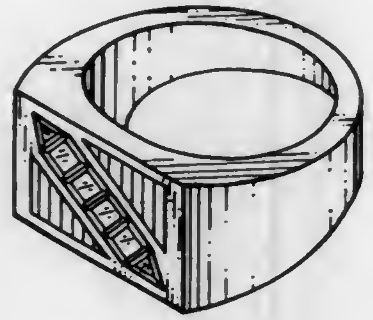
FINGER RING

Leslie C. Harrell, 9328 W. Laurel Pl., Littleton, Colo. 80123

Filed Oct. 12, 1994, Ser. No. 29,628

Term of patent 14 years

U.S. Cl. D11—30



371,316

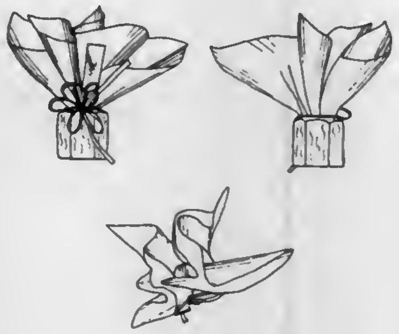
PARTY FAVOR

L. Karen Mervine, Dallas, Tex., assignor to Karen Mervine, Inc., Dallas, Tex.

Filed May 4, 1995, Ser. No. 38,472

Term of patent 14 years

U.S. Cl. D11—131



371,317

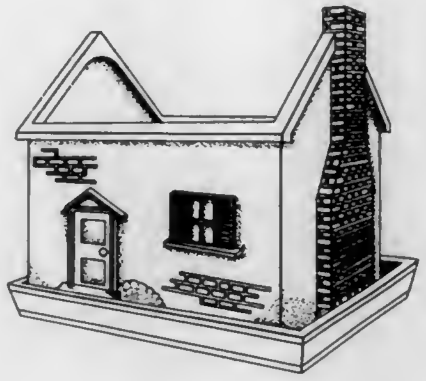
PLANTER

Christopher Hardy, Springfield, Ill., assignor to Design Ideas, Ltd., springfield, Ill.

Filed Jan. 10, 1995, Ser. No. 33,333

Term of patent 14 years

U.S. Cl. D11—155



371,318

FLOWER POT COVER

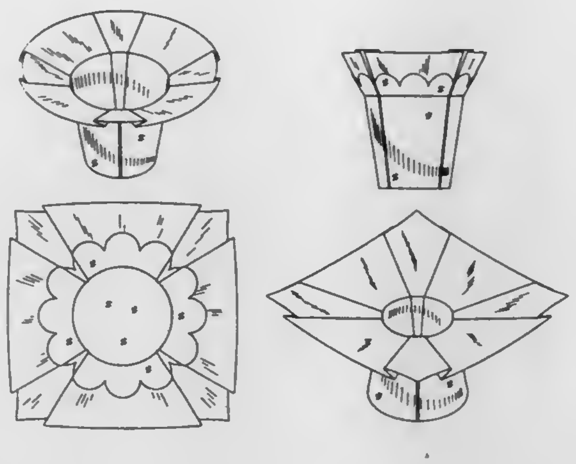
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.

Continuation-in-part of Ser. No. 809,637, Dec. 16, 1991, Pat. No. Des. 363,451, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 5, 1993, Ser. No. 3,288

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,319

FLOWER POT COVER

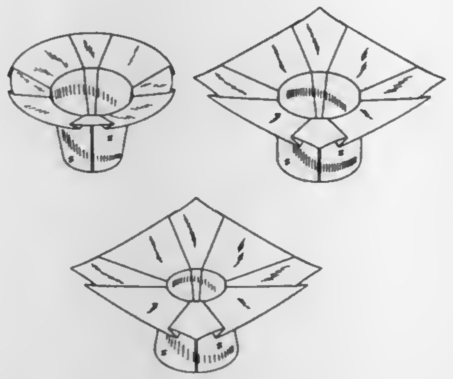
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.

Continuation-in-part of Ser. No. 809,637, Dec. 16, 1991, Pat. No. Des. 363,451, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 5, 1993, Ser. No. 3,539

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,320

FLOWER POT COVER

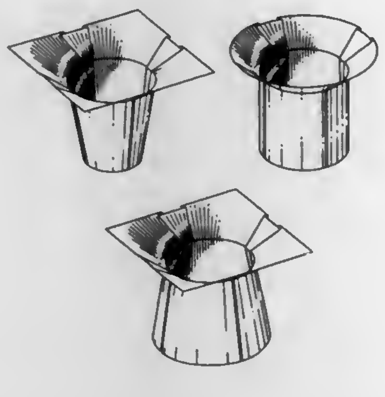
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.

Continuation-in-part of Ser. No. 807,678, Dec. 16, 1991, Pat. No. Des. 361,734, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 8, 1993, Ser. No. 3,580

The portion of the term of this patent subsequent to Aug. 29, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,321

FLOWER POT COVER

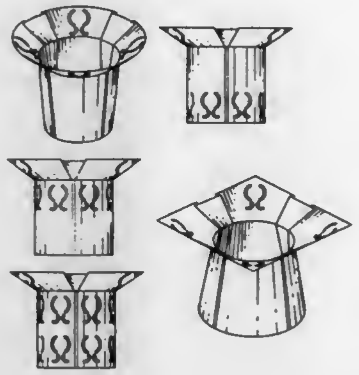
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.

Continuation-in-part of Ser. No. 808,554, Dec. 16, 1991, Pat. No. Des. 362,825, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 21, 1993, Ser. No. 3,899

The portion of the term of this patent subsequent to Oct. 3, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,322

FLOWER POT COVER

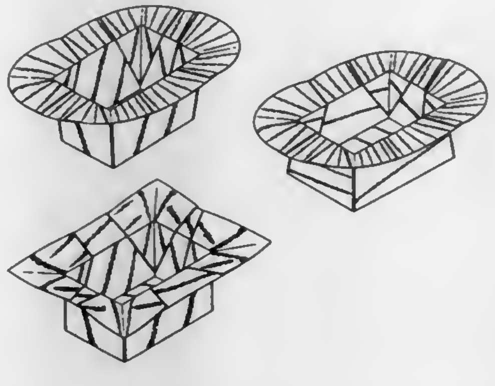
Donald E. Weder, and Joseph G. Sraeter, both of Highland, Ill., assignors to Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 808,558, Dec. 16, 1991, Pat. No. Des. 362,408, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272 is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 12, 1993, Ser. No. 4,961

The portion of the term of this patent subsequent to Sep. 19, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,323
FLOWER POT COVER

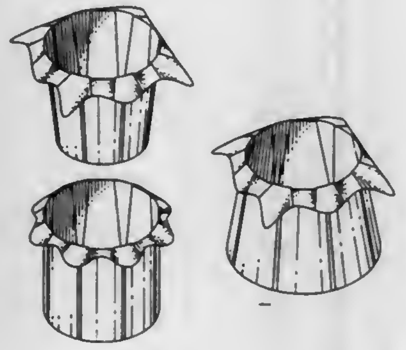
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.

Continuation-in-part of Ser. No. 808,550, Dec. 16, 1991, Pat. No. Des. 361,296, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application May 10, 1993, Ser. No. 8,190

The portion of the term of this patent subsequent to Aug. 15, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,324
FLOWER POT COVER

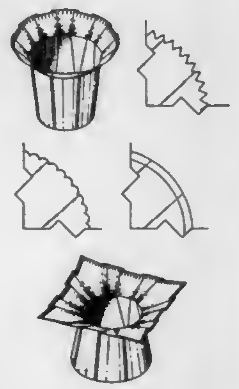
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Oklahoma City, Okla.

Continuation-in-part of Ser. No. 807,897, Dec. 16, 1991, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application May 10, 1993, Ser. No. 8,192

The portion of the term of this patent subsequent to Oct. 3, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



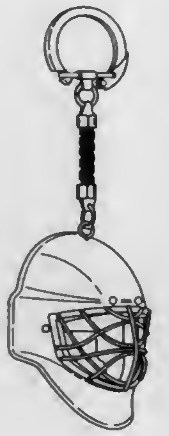
371,325
KEY CHAIN

Joseph R. Fritsche, Parma, Ohio, assignor to J.F. Sports Co., Cleveland, Ohio

Continuation of Ser. No. 30,264, Oct. 25, 1994, abandoned. This application Jul. 11, 1995, Ser. No. 41,278

Term of patent 14 years

U.S. Cl. D11—211



371,326
PULL TAB OF SLIDE FASTENER

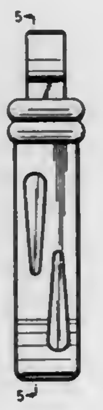
Chikako Ikehara, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 11, 1995, Ser. No. 38,761

Claims priority, application Japan, Nov. 30, 1994, 6-36589

Term of patent 14 years

U.S. Cl. D11—221



371,327
PULL TAB OF SLIDE FASTENER

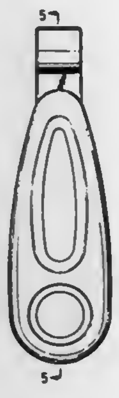
Hitomi Kawamura, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 11, 1995, Ser. No. 38,764

Claims priority, application Japan, Nov. 30, 1994, 6-36591

Term of patent 14 years

U.S. Cl. D11—221



371,328
EXTERIOR SURFACE CONFIGURATION OF AN AUTOMOBILE

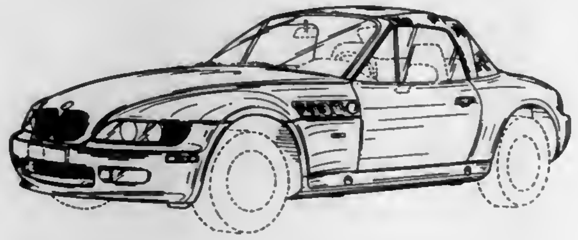
Joji Nagashima, Muenich, Germany, assignor to Bayerische Motoren Werke AG, Munich, Germany

Filed Sep. 27, 1994, Ser. No. 28,962

Claims priority, application Germany, Apr. 2, 1994, 94 02 969.5

Term of patent 14 years

U.S. Cl. D12—92



371,329
MOTOR VEHICLE

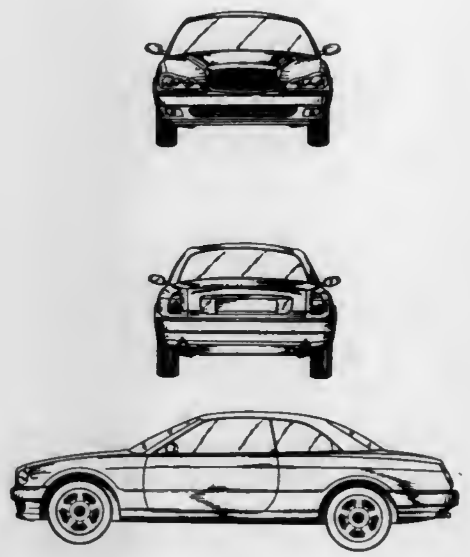
Royden Axe, Warwick, England, assignor to Rolls-Royce Motor Cars Limited, Crewe, England

Filed Sep. 1, 1994, Ser. No. 29,271

Claims priority, application United Kingdom, Mar. 1, 1994, 2037418

Term of patent 14 years

U.S. Cl. D12—92



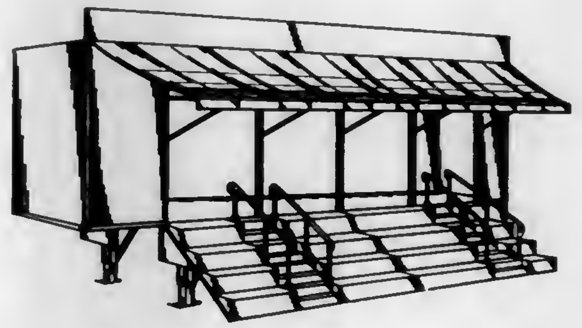
371,330
MOBILE DISPLAY PAVILION

Jack R. Wright, 300 Morrison, #638, Twin Falls, Id. 83301

Continuation-in-part of Ser. No. 81,010, Jun. 21, 1993, Pat. No. 5,375,899. This application May 17, 1994, Ser. No. 22,999

Term of patent 14 years

U.S. Cl. D12—97



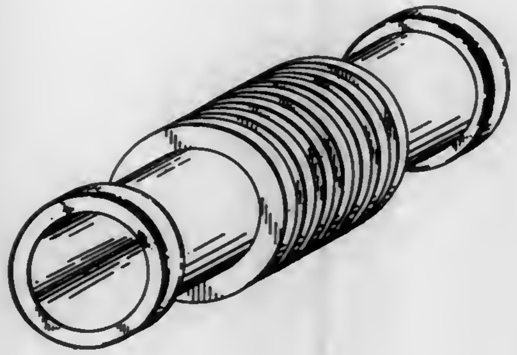
371,331
HOSE COUPLER FOR MOTORCYCLES AND OTHER VEHICLES

Wayne J. Mooradian, 12672 Bolivar Pl., Garden Grove, Calif. 92643

Filed Dec. 19, 1994, Ser. No. 32,397

Term of patent 14 years

U.S. Cl. D12—114



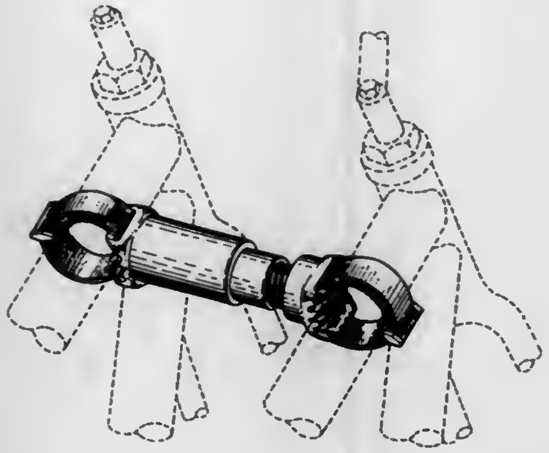
371,332
ADJUSTABLE SPACER-GRIPPER

Matthew J. Chappie, Ripon, and Wesley I. McWethy, Stockton, both of Calif., assignors to Action Manufacturing, Inc., Stockton, Calif.

Filed May 25, 1995, Ser. No. 39,532

Term of patent 14 years

U.S. Cl. D12—114



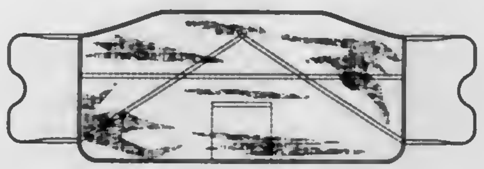
371,333
PATIENT LIFTING SLING

John P. Fennell, 8628 23 Ave., Brooklyn, N.Y. 11214

Filed Jul. 5, 1994, Ser. No. 25,506

Term of patent 14 years

U.S. Cl. D12—128



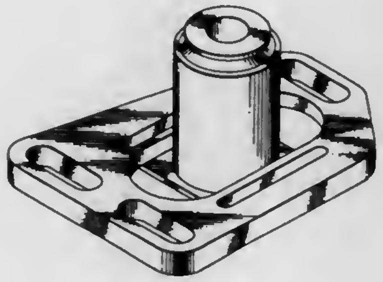
371,334
CASTER CAMBER ADJUSTMENT PLATE

John F. Hotchkis, Jr., and David Barden, both of Santa Fe Springs, Calif., assignors to Hotchkis Performance, L.P., Santa Fe Springs, Calif.

Filed Nov. 2, 1994, Ser. No. 30,580

Term of patent 14 years

U.S. Cl. D12—159



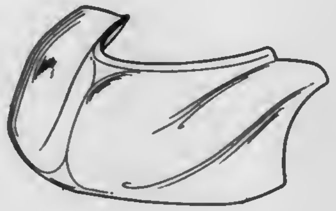
371,335
GO KART FAIRING

Donald E. Safrit, 1145 Shuping Mill Rd., Rockwell, N.C. 28138

Filed Nov. 29, 1994, Ser. No. 31,479

Term of patent 14 years

U.S. Cl. D12—181



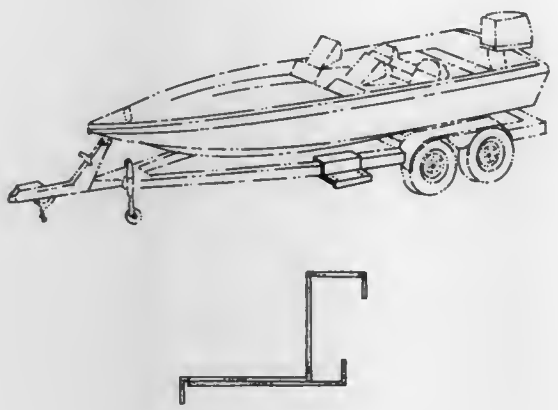
371,336
STEP FOR BOAT TRAILER

Richard A. Wilson, Lake Road 53-37, P.O. Box 202, Osage Beach, Mo. 65065

Filed Nov. 21, 1994, Ser. No. 31,289

Term of patent 14 years

U.S. Cl. D12—203



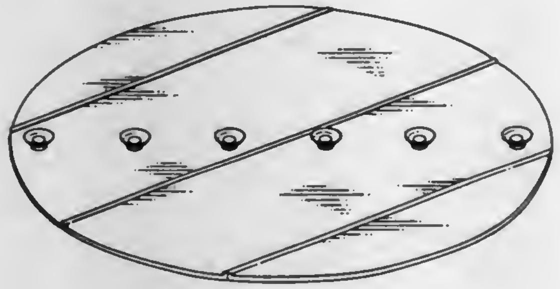
371,337
SPRAY SHIELD

Timothy Williams, 3829 Gannon La., Apt. 3308, Dallas, Tex. 75237

Filed Dec. 14, 1994, Ser. No. 32,189

Term of patent 14 years

U.S. Cl. D12—213



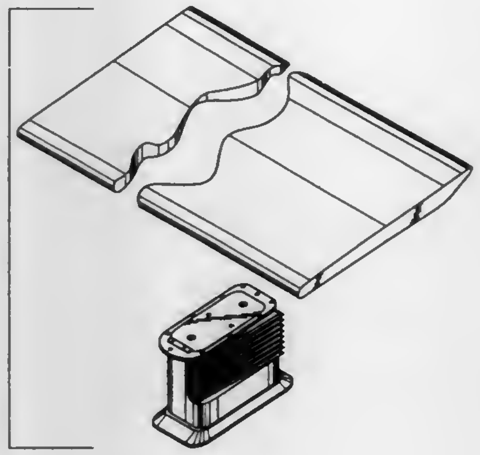
371,338
AIR WING FOR WATERCRAFT

Yori Hunter, 438 Vernon St. Apt. 301, Oakland, Calif. 94610

Filed Jun. 16, 1995, Ser. No. 40,406

Term of patent 14 years

U.S. Cl. D12—317



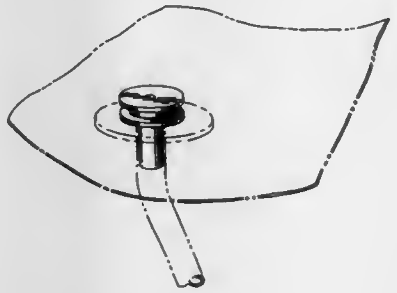
371,339
DRAIN FOR BOAT COVERINGS

Donald F. Schultz, 3073 Hayes Ave., Costa Mesa, Calif. 92626

Filed Feb. 6, 1995, Ser. No. 34,428

Term of patent 14 years

U.S. Cl. D12—318



371,340

RF SEPARATOR

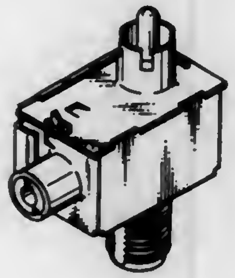
Masakazu Suzuki; Tatsuo Kato, and Toshifumi Nakakuki, all of Tokyo, Japan, assignors to Sony Corporation, and SMK Corporation, both of Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 20,792

Claims priority, application Japan, Oct. 1, 1993, 5-29508

Term of patent 14 years

U.S. Cl. D13—123



371,341

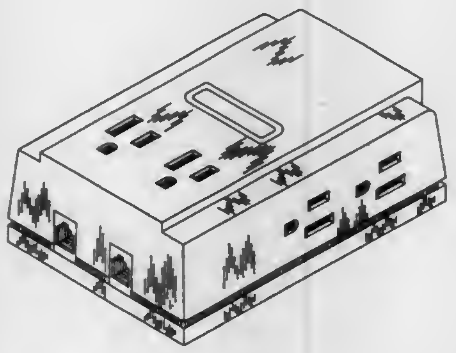
SIDE-ENTRY CURRENT TAP

Jerry Hung, and James Wang, both of Taipei Hsien, Taiwan, assignors to Primax Electronics, Ltd., Taipei Hsien, Taiwan

Filed Jan. 9, 1995, Ser. No. 33,259

Term of patent 14 years

U.S. Cl. D13—139



371,342

COAXIAL COUPLING FOR RADIO, TELEVISION AND CORDLESS TELEPHONE TRANSMITTERS

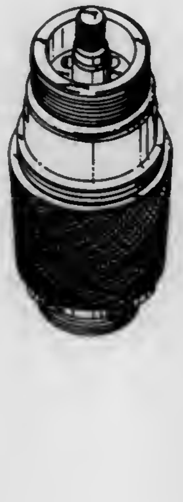
Hans O. Lundbäck, Markaryd, Sweden, assignor to Teracom Components AB, Horby, Sweden

Filed May 10, 1995, Ser. No. 38,649

Claims priority, application Sweden, Dec. 7, 1994, 94-2463

Term of patent 14 years

U.S. Cl. 213—151



371,343

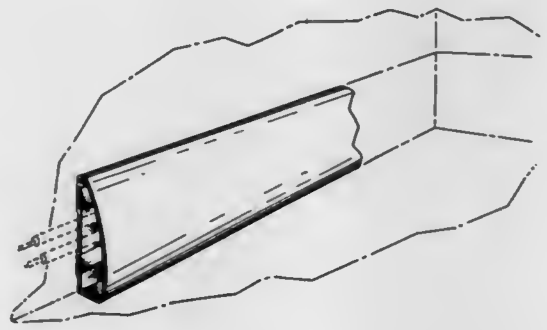
CONDUIT FOR MANAGING WIRES

John M. Loftus, Costa Mesa, Calif., assignor to Doug Mockett & Company, Inc., Manhattan Beach, Calif.

Filed Aug. 1, 1994, Ser. No. 26,608

Term of patent 14 years

U.S. Cl. D13—155



371,344

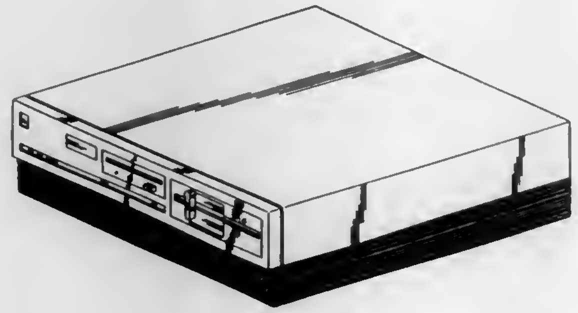
DESKTOP COMPUTER

Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.

Division of Ser. No. 24,326, Jun. 13, 1994, which is a continuation-in-part of Ser. No. 23,826, Jun. 1, 1994, abandoned. This application Aug. 3, 1995, Ser. No. 42,202

Term of patent 14 years

U.S. Cl. D14—100



371,345

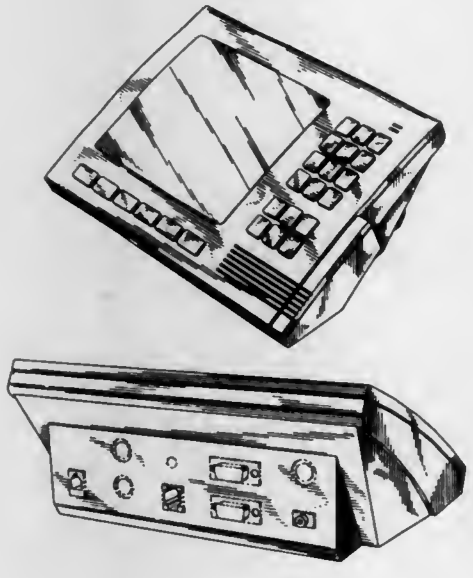
COMPUTER WITH INTEGRATED TELEPHONE

Rocco L. Martino, Villanova, Pa., and David Conroy, Brooklyn, N.Y., assignors to PC Phone, Inc., Villanova, Pa.

Filed Jan. 13, 1995, Ser. No. 33,490

Term of patent 14 years

U.S. Cl. D14—101



371,346

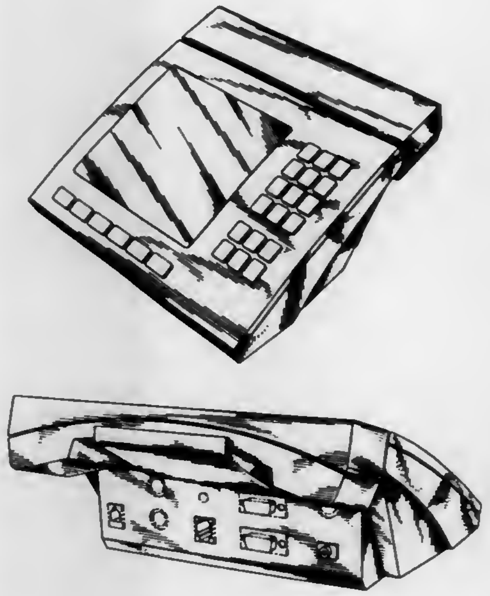
COMPUTER WITH INTERGRATED TELEPHONE

Rocco L. Martino, Villanova, Pa., and David Conroy, Brooklyn, N.Y., assignors to PC Phone, Inc., Villanova, Pa.

Filed Jan. 25, 1995, Ser. No. 34,032

Term of patent 14 years

U.S. Cl. D14—101



371,347

COMPUTER

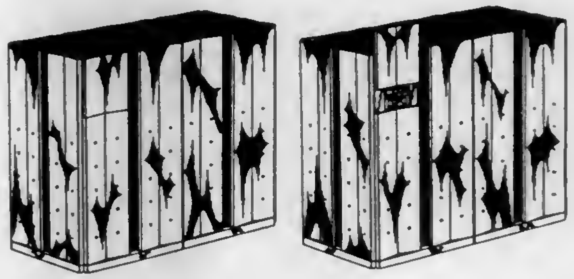
Toshiyuki Utsuki, Tachikawa; Takashi Yamamoto, Kodaira; Kenta Kumagai, Tokyo; Yutaka Yonezawa, Hachiouji; Tadahiro Yamaguchi, Fucyuu; Tamotsu Tsukaguchi, Tokyo; Shigeru Koizumi, Tokyo, and Fumio Kishida, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1995, Ser. No. 41,580

Claims priority, application Japan, May 10, 1995, 7-12826

Term of patent 14 years

U.S. Cl. D14—102



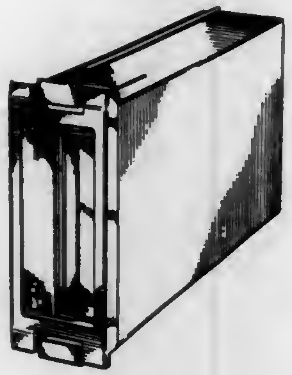
371,348
REMOVABLE HOUSING FOR COMPUTERS

Thomas E. Idleman, Santa Clara, and Robert S. Koontz, Atherton, both of Calif., assignors to Beaufort River, Inc., Hilton Head Island, S.C.

Filed Mar. 18, 1994, Ser. No. 20,068

Term of patent 14 years

U.S. Cl. D14—109



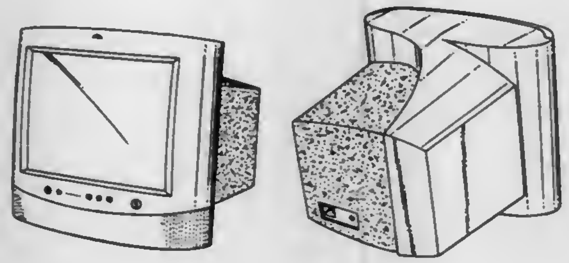
371,349
MONITOR

Matthew Barthelemy, Burlingame; Garry Goh, Mountain View; Daniel K. Harden, Palo ALto; Christopher Lenart, San Francisco, and Barbara Sauceda, Palo Alto, all of Calif., assignors to Acer America Inc., San Jose, Calif.

Filed May 22, 1995, Ser. No. 38,771

Term of patent 14 years

U.S. Cl. D14—113



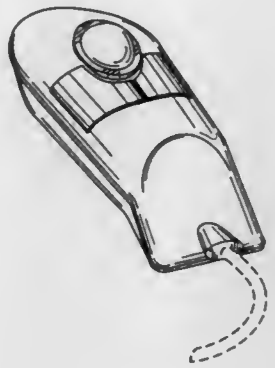
371,350
COMPUTER MOUSE

Tammy Chavarria, 7021 S. 115th, Seattle, Wash. 98178

Filed Jan. 23, 1995, Ser. No. 33,852

Term of patent 14 years

U.S. Cl. D14—114



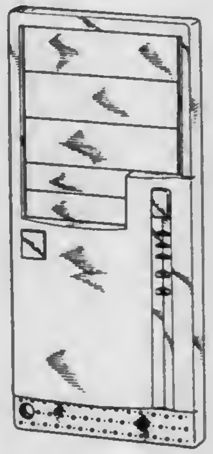
371,351
FRONT PANEL FOR A COMPUTER SYSTEM UNIT

Wen H. Lai, No. 57, Lane 350, Nanshang Rd., Gueishan Hsiang, Taoyuan Hsien, Taiwan

Filed May 31, 1995, Ser. No. 39,577

Term of patent 14 years

U.S. Cl. D14—115



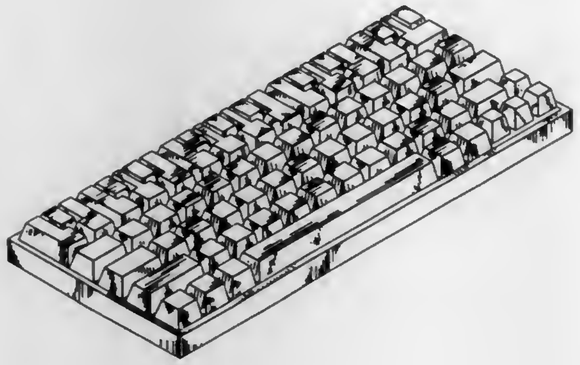
371,352
MUSICAL KEYBOARD

Randal L. Bertram, Raleigh, and John D. Swansey, Durham, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 31,743, Dec. 5, 1994. This application Sep. 15, 1995, Ser. No. 43,939

Term of patent 14 years

U.S. Cl. D14—115



371,353
CARTRIDGE WITH EXTERNAL CONNECTING TERMINAL FOR GAME MACHINE

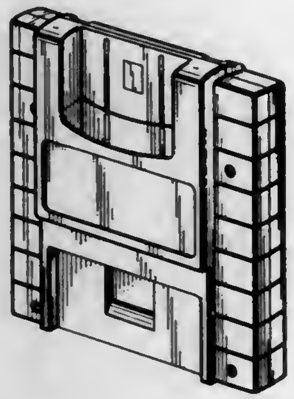
Kenichiro Ashida; Masahiko Ota, both of Kyoto, Japan, and Lance Barr, Redmond, Wash., assignors to Nintendo Co., Ltd., Japan

Filed Jun. 20, 1994, Ser. No. 24,687

Claims priority, application Japan, Dec. 28, 1993, 5-40640; Dec. 28, 1993, 5-40641; Dec. 28, 1993, 5-40642; Dec. 28, 1993, 5-40643

Term of patent 14 years

U.S. Cl. D14—121



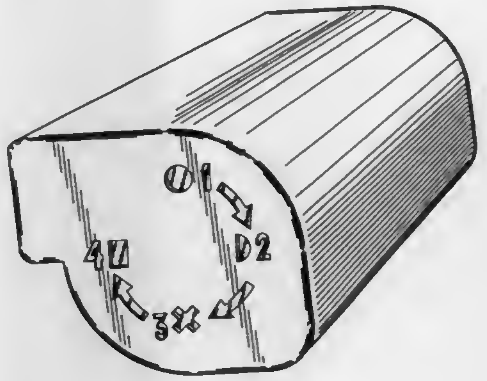
371,354
FILM CASSETTE WITH FILM EXPOSURE STATUS INDICIA

Daniel T. Meyerhoefer, Penfield, and Walter B. Sherwood, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 16, 1994, Ser. No. 31,148

Term of patent 14 years

U.S. Cl. D14—121



371,355
TELEVISION MONITOR

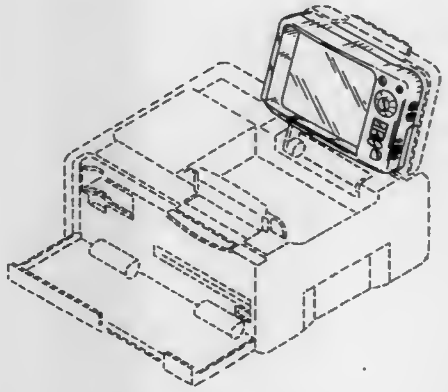
Toshiaki Sato, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Feb. 8, 1995, Ser. No. 34,616

Claims priority, application Japan, Aug. 8, 1994, 6-23653

Term of patent 14 years

U.S. Cl. D14—126



371,356

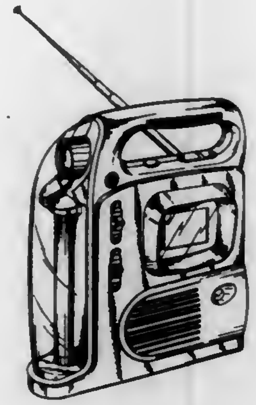
COMBINED LIQUID CRYSTAL TELEVISION AND LANTERN

Kaname Maruyama, Nagaoka, Japan, assignor to Twinbird Corporation, Japan

Filed Sep. 14, 1994, Ser. No. 28,431

Term of patent 14 years

U.S. Cl. D14—129



371,357

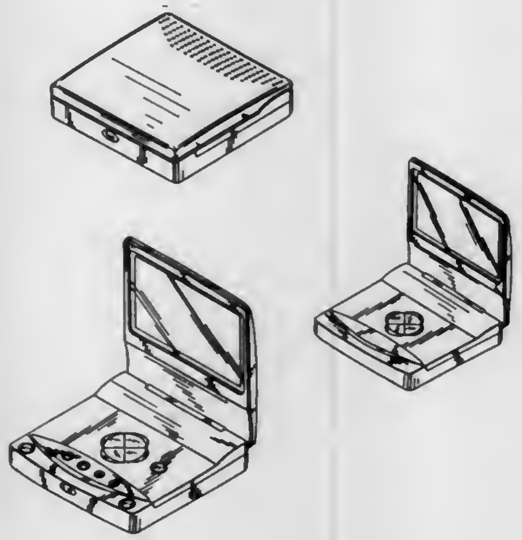
TELEVISION FOR A DIGITAL VIDEO DISC PLAYER

Mitsuhiro Nakamura, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Mar. 15, 1995, Ser. No. 36,197

Term of patent 14 years

U.S. Cl. D14—136



371,358

VIDEO DISC PLAYER

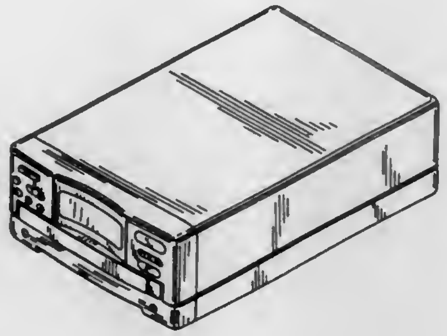
Yoshinobu Yamagishi, and Yoshinori Yamada, both of Tokyo, Japan, assignors to Sony Corporation, Japan

Filed Jan. 30, 1995, Ser. No. 34,193

Claims priority, application Japan, Jul. 28, 1994, 6-22725

Term of patent 14 years

U.S. Cl. D14—136



371,359

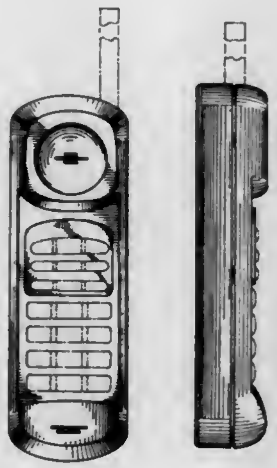
CORDLESS TELEPHONE HANDSET HOUSING

Joseph C. Ka Hung, Sai Kung, Hong Kong, assignor to Vtech Communications, Ltd., Hong Kong

Filed Jan. 5, 1995, Ser. No. 33,165

Term of patent 14 years

U.S. Cl. D14—147



371,360

HANDHELD TELEPHONE

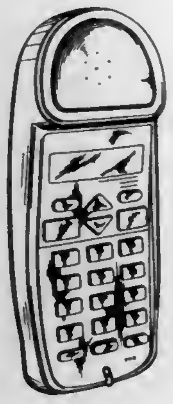
Laura A. Mahan, Kanata; Neal T. Cowan, Ottawa; John I. Johnson, Kinburn, and Frederic F. Trasmundi, Ottawa, all of, Canada, assignors to Northern Telecom Limited, Quebec, Canada

Filed May 18, 1995, Ser. No. 38,990

Claims priority, application Canada, Apr. 5, 1995, 1995-0760

Term of patent 14 years

U.S. Cl. D14—147



371,361

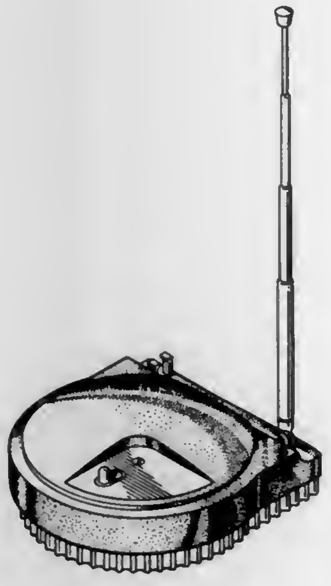
HOUSING FOR A RADIO TRANSMITTER

Ira Velinsky, Saratoga, Calif., assignor to Wano-Tech Corporation, Belmont, Calif.

Filed Nov. 9, 1994, Ser. No. 30,816

Term of patent 14 years

U.S. Cl. D14—155



371,362

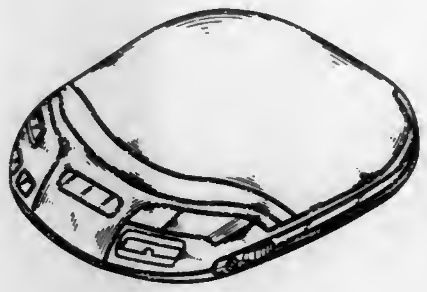
DIGITAL AUDIO DISK PLAYER

Michio Deguchi, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed May 11, 1995, Ser. No. 38,703

Term of patent 14 years

U.S. Cl. D14—156



371,363

RADIO RECEIVER

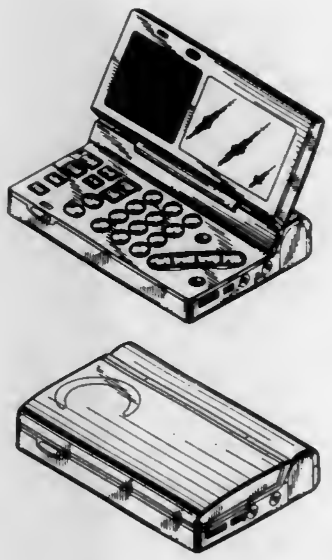
Keisuke Tejima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 9, 1995, Ser. No. 33,286

Claims priority, application Japan, Jul. 8, 1994, 6-20558

Term of patent 14 years

U.S. Cl. D14—193



371,364

RADIO APPARATUS

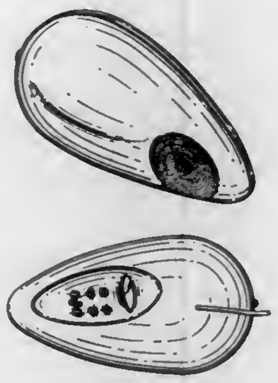
Philippe Starck, Paris, France, assignor to Thomas Consumer Electronics (Societe Anonyme), Courbevoie, France

Division of Ser. No. 26,661, Aug. 2, 1994. This application Sep. 1, 1995, Ser. No. 43,415

Claims priority, application France, Feb. 2, 1994, 94 0627

Term of patent 14 years

U.S. Cl. D14—195



371,365

COMBINED SPEAKER BOX AND AMPLIFIER

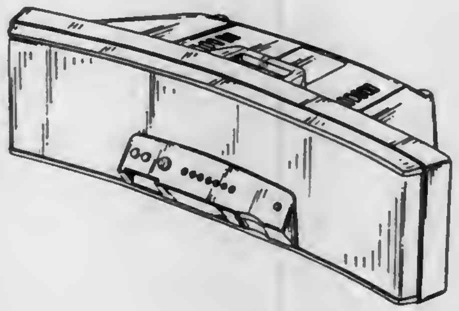
Manabu Kawada, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Apr. 28, 1995, Ser. No. 38,186

Claims priority, application Japan, Oct. 31, 1994, 6-33214

Term of patent 14 years

U.S. Cl. D14—214



371,366

LOUDSPEAKER

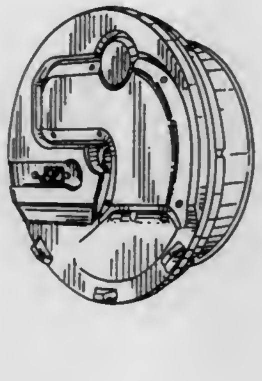
Tomohiko Kobayashi, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, and T/A Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 37,126

Claims priority, application Japan, Oct. 7, 1994, HEI6-30635

Term of patent 14 years

U.S. Cl. D121—216



371,367

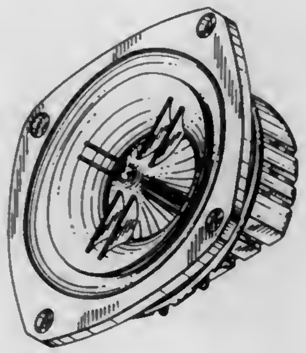
MID-RANGE TWEETER

Helio T. Bittencourt, Sao Paulo, Brazil, assignor to Leson-Laboratorio de Engenbaria Sonica Ltd., Sao Paulo, Brazil

Filed Aug. 11, 1994, Ser. No. 27,067

Term of patent 14 years

U.S. Cl. D14—222



371,368

EARPHONE

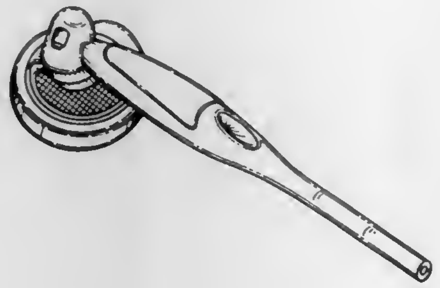
Haruo Hayashi, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Feb. 6, 1995, Ser. No. 34,432

Claims priority, application Japan, Aug. 15, 1994, 6-24430

Term of patent 14 years

U.S. Cl. D14—223



371,369

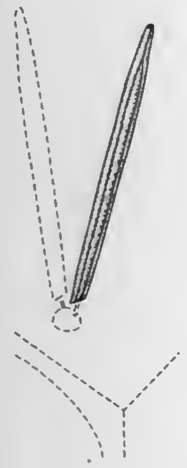
COVER FOR INDOOR TELEVISION ANTENNA

Steve Feldman, Portland, Oreg., assignor to Steven G. Feldman, Portland, Oreg.

Filed Apr. 24, 1995, Ser. No. 37,886

Term of patent 14 years

U.S. Cl. D14—230



371,370

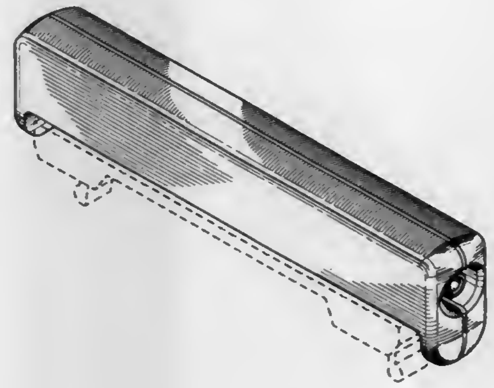
ANTENNA CONNECTOR MODULE

William E. Fenton, Coquitlam, and John L. Bates, Richmond, both of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1994, Ser. No. 27,894

Term of patent 14 years

U.S. Cl. D14—238



371,371

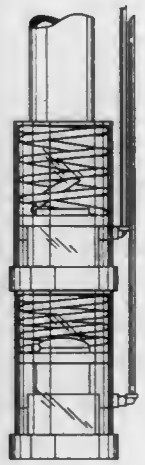
SUBMERSIBLE PUMP

Gary Hammond, 23 Iluka Street, Innes Park QLD 4670, Australia

Filed May 5, 1995, Ser. No. 38,460

Term of patent 14 years

U.S. Cl. D15—7



OL
188
SS
1
JL
2
996
MI

371,372

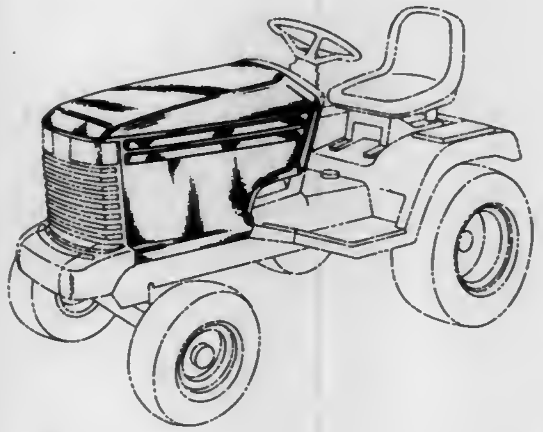
OUTER SURFACE OF VEHICLE HOOD

David A. Westimayer, Horicon, Wis.; William E. Crookes, Waldwick; Daniel R. Nickles, Hewitt, both of N.J., and Alberto J. Mantilla, Columbia, N.Y., assignors to Deere & Company, Moline, Ill.

Filed Oct. 24, 1994, Ser. No. 30,226

Term of patent 14 years

U.S. Cl. D15—31



371,373

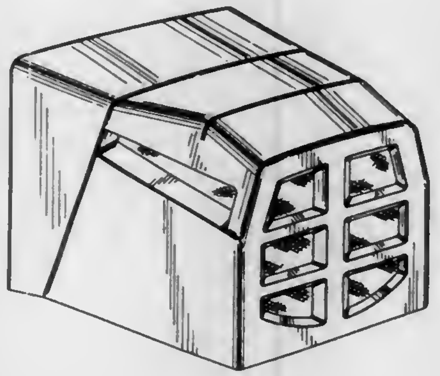
COWLING FOR CONCRETE SAW

Michael G. Kingsley, Independence, Mo., and Donald L. Rohrs, Overland Park, Kans., assignors to Diamant Boart, Inc., Kansas City, Mo.

Filed Jan. 11, 1995, Ser. No. 33,376

Term of patent 14 years

U.S. Cl. D15—133



371,374

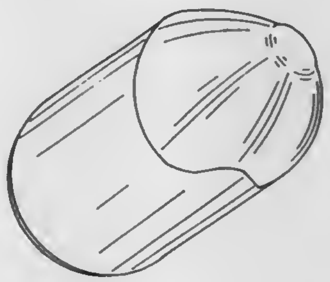
ASYMMETRICAL BUTTON INSERT FOR ROCK DRILLING

Udo Fischer, Vallingby; Torblöm Hartzell, Stockholm, and Kanko Kärki, Skogås, all of, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Apr. 12, 1995, Ser. No. 37,416

Term of patent 14 years

U.S. Cl. D15—139



371,375

35 MM CAMERA

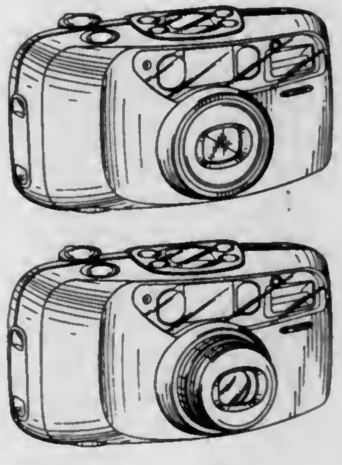
Tatsuyuki Hayashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 40,912

Claims priority, application Japan, Dec. 20, 1994, 6-38778

Term of patent 14 years

U.S. Cl. D16—209



371,376

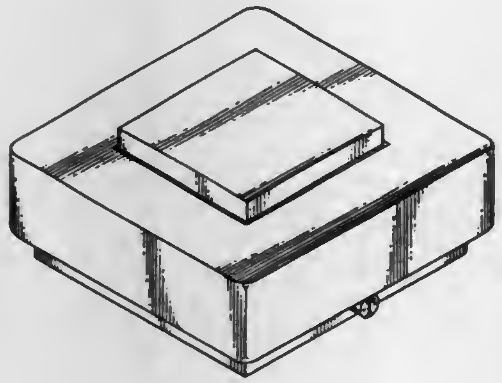
NIGHT VISION DEVICE

Carey Johnson, Jr., 2340 7th Ave., No. 62, New York, N.Y. 10030

Filed Jan. 19, 1995, Ser. No. 33,745

Term of patent 14 years

U.S. Cl. D16—130



371,377

ELECTRONIC CAMERA

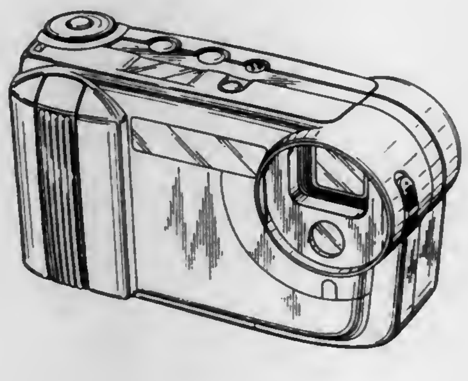
Kazuhiko Miyahara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1995, Ser. No. 38,083

Claims priority, application Japan, Nov. 5, 1994, 6-33831 U

Term of patent 14 years

U.S. Cl. D16—202



371,378

VIDEO CAMERA WITH VIDEO TAPE RECORDER

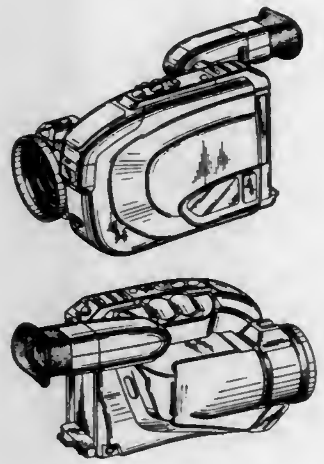
Masaaki Goto, Ehime, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1995, Ser. No. 40,731

Claims priority, application Japan, Dec. 28, 1994, 6-39931 U

Term of patent 14 years

U.S. Cl. D16—202



371,379

ELECTRONIC STILL CAMERA

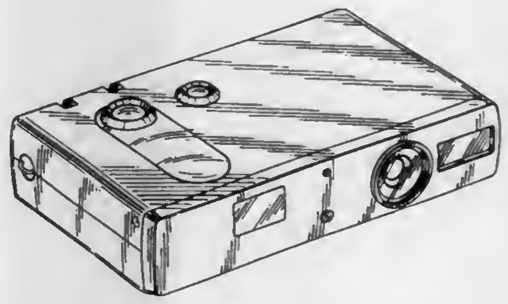
Hiroshi Goshima, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 3, 1995, Ser. No. 41,044

Claims priority, application Japan, Mar. 6, 1995, 7-6039

Term of patent 14 years

U.S. Cl. D16—202



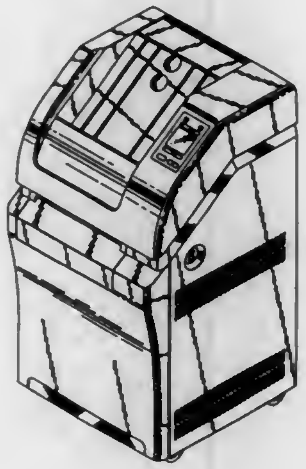
371,380
DRY SILVER FILM PROCESSOR

Bruce E. Nelson, Minneapolis; James A. Wilson, North St. Paul, both of Minn.; Curtis D. Ronnander, Woodville, Wis.; Larry D. Humlicek, Ham Lake; James R. Preston, Minneapolis, both of Minn.; Robert M. Biegler, Woodbury, Wis., and Steven W. Sorensen, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 22, 1994, Ser. No. 31,322

Term of patent 14 years

U.S. Cl. D16—247



371,381
SUNGLASSES

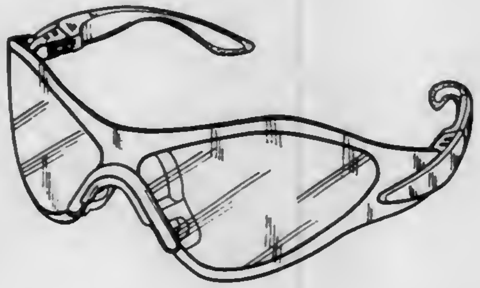
Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy

Filed Jun. 6, 1995, Ser. No. 39,867

Claims priority, application Italy, Dec. 12, 1994, TV940000069

Term of patent 14 years

U.S. Cl. D16—326



371,382
SUNGLASSES

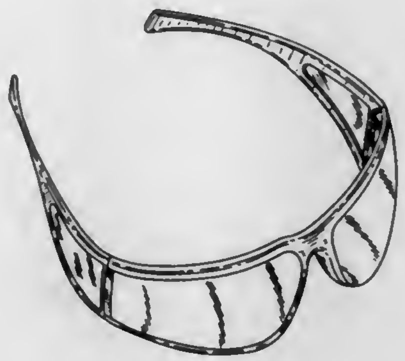
Pierre Berthet-Bondet, 30 Rue Brillat Savarin, Oyonnax, France

Filed Jul. 3, 1995, Ser. No. 41,048

Claims priority, application France, Jan. 18, 1995, 95 0397

Term of patent 14 years

U.S. Cl. D16—326



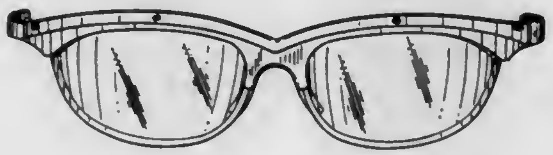
371,383
SUNGLASSES

Sheldon Goldman, Dix Hills, N.Y., assignor to Sungold Enterprises, Ltd., Farmingdale, N.Y.

Filed Oct. 19, 1994, Ser. No. 29,925

Term of patent 14 years

U.S. Cl. D16—327



371,384
SPECTACLE FRAME WITHOUT LENSES

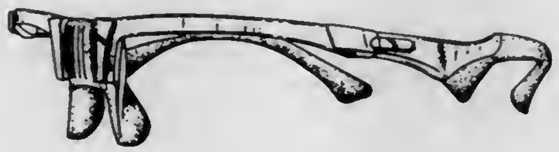
Patrick Bonnemere, Saint-Laurent-En-Grandvaux, France, assignor to Cebe International S.A., France

Filed Mar. 29, 1994, Ser. No. 20,589

Claims priority, application Hague Agreement, Sep. 29, 1993, DM/027418

Term of patent 14 years

U.S. Cl. D16—330



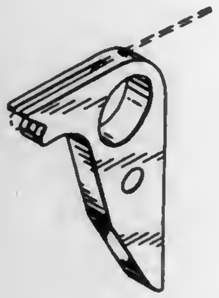
371,385
STRING LEVER FOR GUITARS

William G. Rudolph, 11460 Heather St., Coon Rapids, Minn. 55433, assignor to William G. Rudolph, Coon Rapids, Minn.

Filed Jun. 2, 1995, Ser. No. 39,765

Term of patent 14 years

U.S. Cl. D17—20



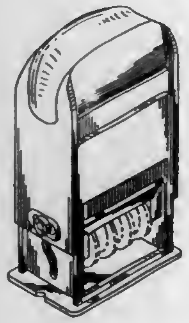
371,386
HAND-OPERATED STAMPER

Lawrence D. Smith, Ramsey, N.J., assignor to IDL Corporation, Carlstadt, N.J.

Continuation-in-part of Ser. No. 9,064, Jun. 2, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 31,815

Term of patent 14 years

U.S. Cl. D18—15



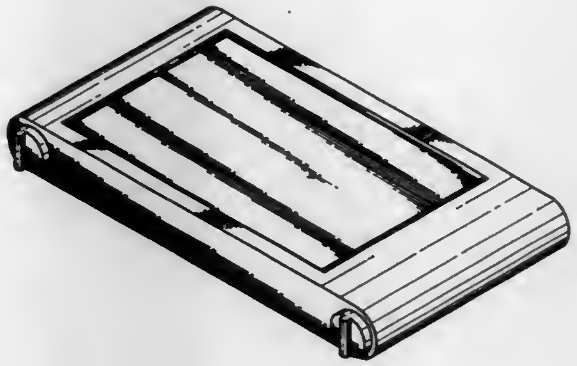
371,387
CALENDAR HOLDER

Allen W. Woock, P.O. Box 611, Roundup, Mont. 59072

Filed Mar. 14, 1994, Ser. No. 19,843

Term of patent 14 years

U.S. Cl. D19—20



371,388
MARKER

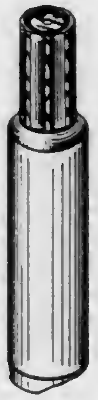
Kunio Ito, Funabashi; Naoki Kato, Ishioka, and Masayuki Kawasaki, Soka, all of, Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed Jan. 18, 1995, Ser. No. 33,669

Claims priority, application Japan, Jul. 21, 1994, 6-21808 U

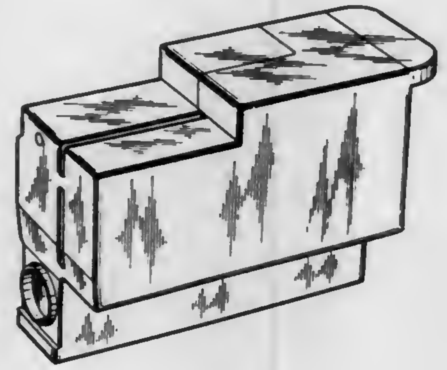
Term of patent 14 years

U.S. Cl. D19—49



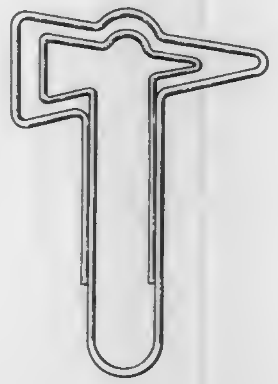
371,389
INK TANK FOR PRINTER

Yoichi Taneya, Yokohama; Hiroyuki Ishinaga, Tokyo; Hiroyuki Tokuda, Yokohama, and Tetsuya Sekine, Kawasaka, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1994, Ser. No. 32,824
Claims priority, application Japan, Jul. 5, 1994, 6-19892
The portion of the term of this patent subsequent to Mar. 12, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—56



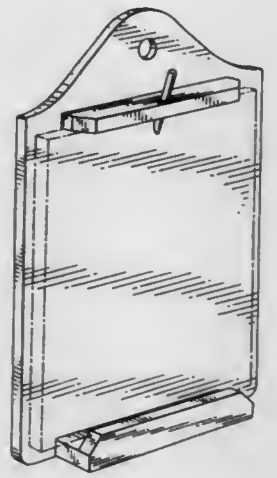
371,390
PAPERCLIP

Melvin T. Johnson, 2235 Plaster Rd., Apt. 20, Atlanta, Ga. 30345
Filed Jun. 22, 1995, Ser. No. 41,833
Term of patent 14 years
U.S. Cl. D19—65



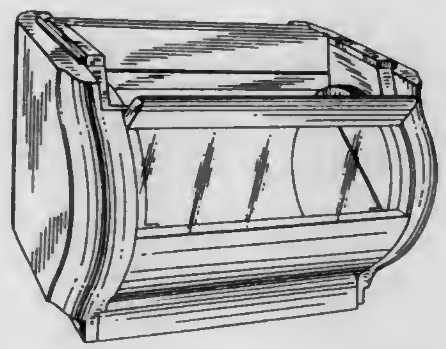
371,391
NOTE PAD HOLDER

Eric H. Meyer, Box 92, Freelton, Ontario, Canada
Filed Sep. 13, 1995, Ser. No. 43,825
Term of patent 14 years
U.S. Cl. D19—90



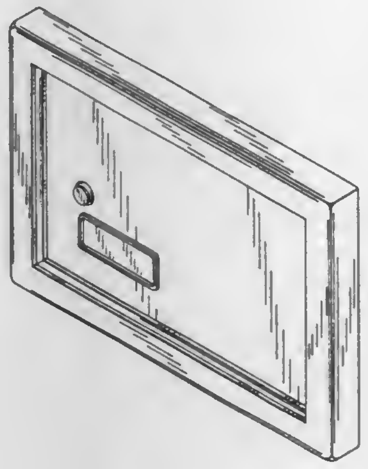
371,392
MODULE FOR A VENDING DISPLAY MACHINE

Barry Wingate, San Jose, Calif.; Kathleen G. Peepler; John A. Wickman, both of Houston, Tex.; Peter F. Kenaghan, Hampshire, United Kingdom, and Frank E. Mars, Glenmoore, Pa., assignors to Mars GB Limited, Slough, United Kingdom
Filed Jul. 8, 1994, Ser. No. 25,703
Claims priority, application United Kingdom, Jan. 10, 1994, 2036220
Term of patent 14 years
U.S. Cl. D20—1



371,393
HANDICAPPED ACCESS SIGN

Patrick J. McMillan, 6113 Golden Rd., Elgin, Iowa 52141
Filed Aug. 11, 1994, Ser. No. 27,042
Term of patent 14 years
U.S. Cl. D20—42

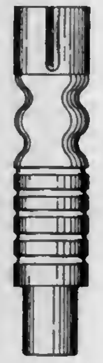


371,394

Patent Not Issued For This Number

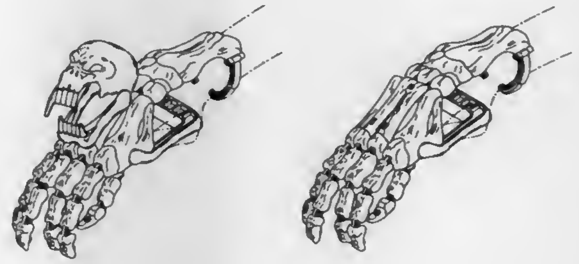
371,395
PLAYING PIECE FOR BOARD GAME

Iraj Moradinia, 3998 Briaridge Cir., Atlanta, Ga. 30340
Division of Ser. No. 2,668, Dec. 18, 1992, Pat. No. Des. 354,920. This application Jan. 18, 1995, Ser. No. 33,701
Term of patent 14 years
U.S. Cl. D21—53



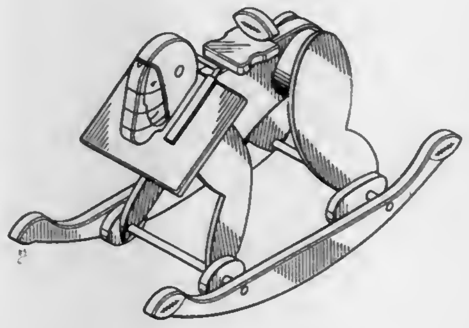
371,396
COMBINED TOY SKELETON ARM AND DETACHABLE SKULL UNIT

James S. W. Lee, Long Island City, N.Y., and Chiu K. Kwan, Hunghom Kowloon, Hong Kong, assignors to C.J. Associates, Ltd., Hunghom Kowloon, Hong Kong
Filed Mar. 16, 1995, Ser. No. 37,742
Term of patent 14 years
U.S. Cl. D21—59



371,397
FOOTBALL PLAYER ROCKER

Douglas S. Webster, 2283 Hidden Valley, Howell, Mich. 48843
Continuation-in-part of Ser. No. 879,869, May 7, 1992, abandoned. This application Aug. 2, 1994, Ser. No. 26,649
Term of patent 14 years
U.S. Cl. D21—68



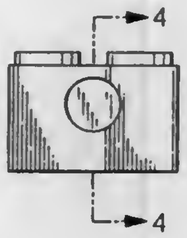
371,398
TOY CONSTRUCTION BLOCK WITH SIDE ORIFICES

Kenneth P. Glynn, Raritan Township, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.

Filed Feb. 24, 1995, Ser. No. 35,309

Term of patent 14 years

U.S. Cl. D21—108



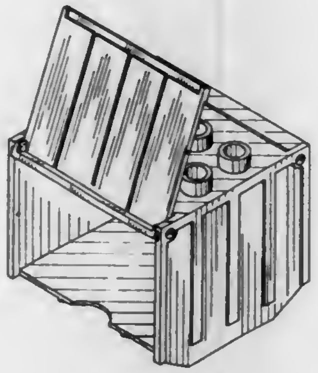
371,399
TOY CONTAINER

Jeannette Pardorf, Copenhagen, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,913

Term of patent 14 years

U.S. Cl. D21—108



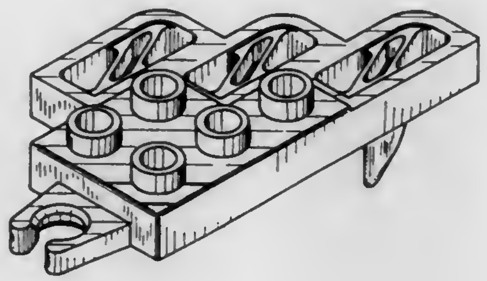
371,400
TOY PLOUGH

Henrik Høst, Roskilde, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,914

Term of patent 14 years

U.S. Cl. D21—108



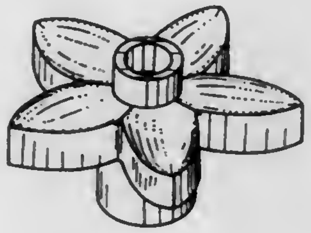
371,401
TOY BUILDING ELEMENT

Lotte M. Nielsen, Hellerup, and Synnøve Vatakar, Søborg, both of, Denmark, assignors to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,965

Term of patent 14 years

U.S. Cl. D21—108



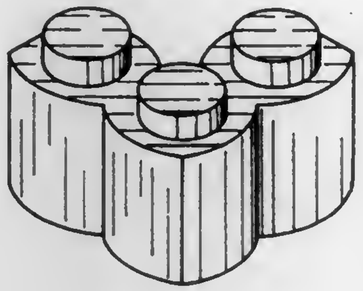
371,402
TOY BUILDING ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,968

Term of patent 14 years

U.S. Cl. D21—108



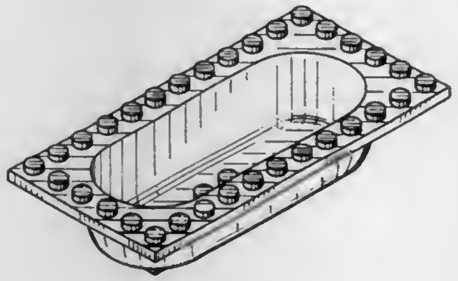
371,403
TOY BUILDING ELEMENT

Birthe G. Vorre, Vejle, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,983

Term of patent 14 years

U.S. Cl. D21—108



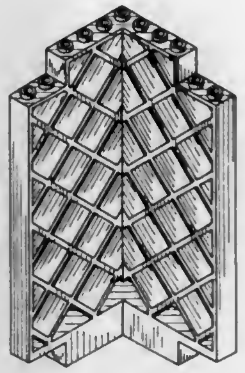
371,404
TOY BUILDING ELEMENT

Lene Köhler, Jelling, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,985

Term of patent 14 years

U.S. Cl. D21—108



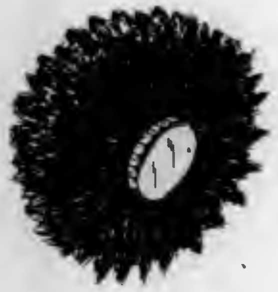
371,405
FOOT TOY

Marty M. Sedighzadeh, P.O. Box 36250, Denver, Colo. 801236

Filed May 8, 1995, Ser. No. 38,529

Term of patent 14 years

U.S. Cl. D21—203



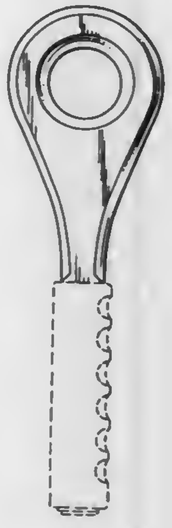
371,406
BALL PADDLE

Alexander Manu, Toronto, Canada, assignor to The Axis Group Inc., Toronto, Canada

Filed Apr. 25, 1995, Ser. No. 37,941

Term of patent 14 years

U.S. Cl. D21—213



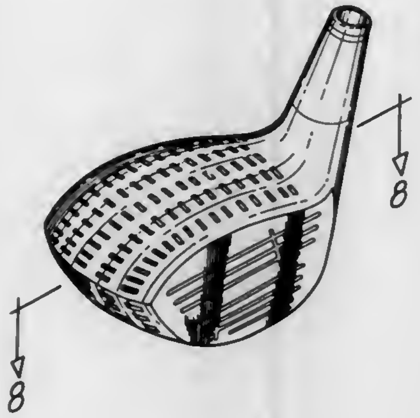
371,407
GOLF CLUB HEAD WITH INDENTATIONS

Robert Ritchie, and Douglas Jan, both of Hoffman Estates, Ill.

Filed Apr. 7, 1994, Ser. No. 21,021

Term of patent 14 years

U.S. Cl. D21—214



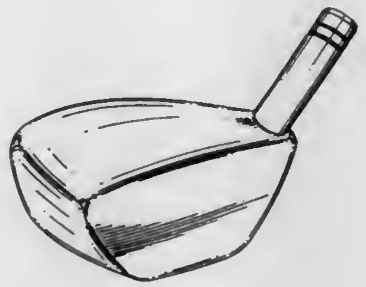
371,408
HOSEL FOR A GOLF CLUB HEAD

Danny C. Ashcraft, Vista; Richard De La Cruz, Pauma Valley, and Richard E. Parente, San Diego, all of Calif., assignors to Goldwin Golf U.S.A., Inc., Carlsbad, Calif.

Filed Jul. 5, 1994, Ser. No. 25,538

Term of patent 14 years

U.S. Cl. D21—221



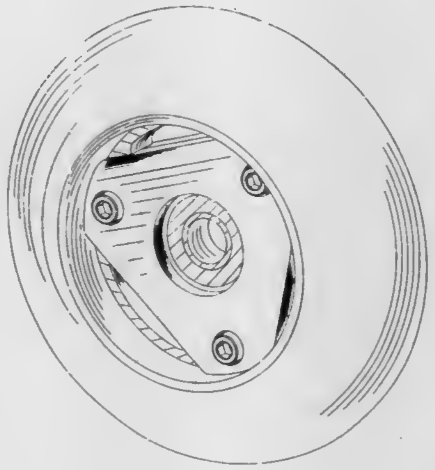
371,409
WHEEL FOR IN-LINE SKATES

Shawn M. Mohr, 3930 Laurel Canyon Blvd., Apt. 122, Studio City, Calif. 91604

Filed Mar. 8, 1995, Ser. No. 35,947

Term of patent 14 years

U.S. Cl. D21—226



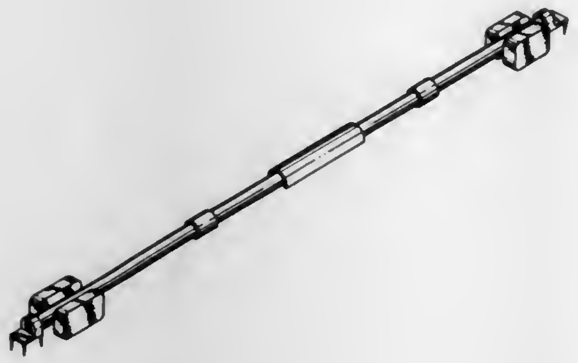
371,410
ICE DIVING SAFETY BEAM

Stephen J. Kupstas, 255 Courtland Blvd., Eastlake, Ohio 44095

Filed Mar. 3, 1994, Ser. No. 19,480

Term of patent 14 years

U.S. Cl. D21—236



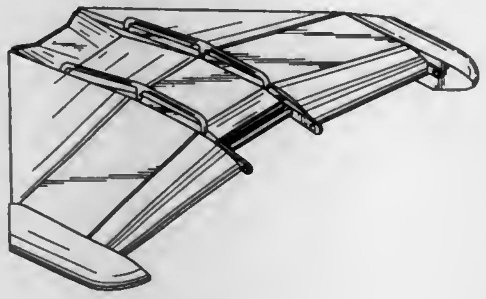
371,411
BOAT TOWED AMUSEMENT DEVICE

Joseph Albritton, Rte. 3 Box 130 Lot 227, Ozark, Ala. 36360

Filed Jul. 13, 1995, Ser. No. 41,413

Term of patent 14 years

U.S. Cl. D21—236



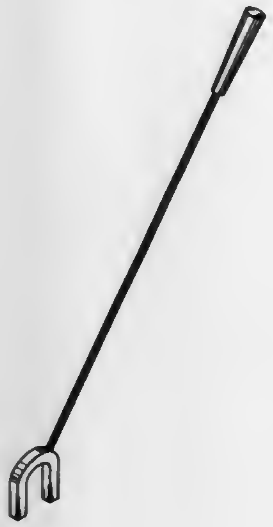
371,412
GOLF SWING PRACTICE DEVICE

Chuck Howard, 201 Ocean Ave., A902B, Santa Monica, Calif. 90402

Filed May 15, 1995, Ser. No. 38,896

Term of patent 14 years

U.S. Cl. D21—234



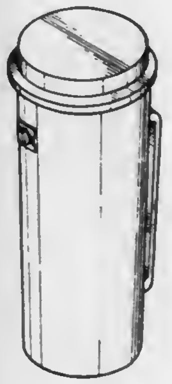
371,413
GOLF BALL CLEANER

Howard F. Crausby, and Lori R. Thomas, both of 921 W. 17th St., Davenport, Iowa 52804

Filed Jun. 20, 1995, Ser. No. 40,482

Term of patent 14 years

U.S. Cl. D21—234



371,414

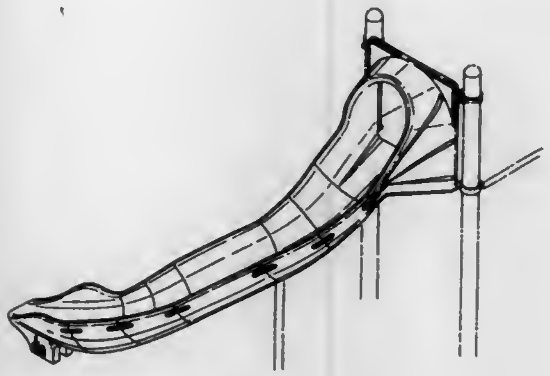
PLAYGROND SLIDE

Steven G. King, Long Lake, Minn., assignor to Landscape Structures Inc., Delano, Minn.

Filed Jun. 2, 1994, Ser. No. 23,883

Term of patent 14 years

U.S. Cl. D21—242



371,415

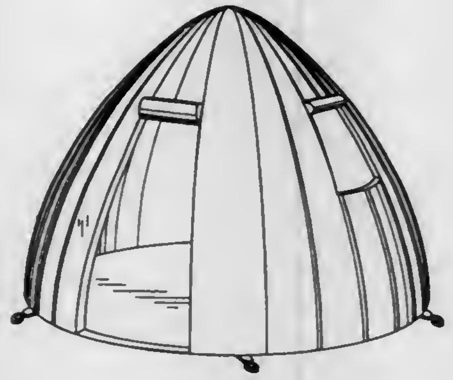
INFLATABLE DOME TENT

Virginio Fernandes, Sr., 352 Cranberry Bog Rd., Danielson, Conn. 06239

Filed Apr. 17, 1995, Ser. No. 37,579

Term of patent 14 years

U.S. Cl. D21—253



371,416

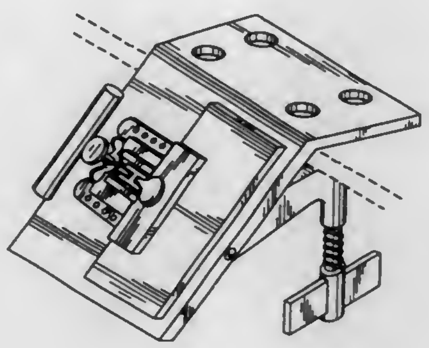
ARCHERY BOW HOLDER

John C. Bliss, R.D. 4, Box 249-3, Tunkhannock, Pa. 18657

Filed Sep. 22, 1994, Ser. No. 28,805

Term of patent 14 years

U.S. Cl. D22—107



371,417

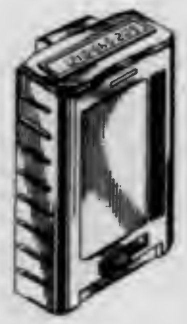
PERSONAL DEFENSE SPRAYER

H. Trent Franks, 7726 N. 30th Dr., Phoenix, Ariz. 85051

Filed Feb. 9, 1995, Ser. No. 34,654

Term of patent 14 years

U.S. Cl. D22—117



371,418

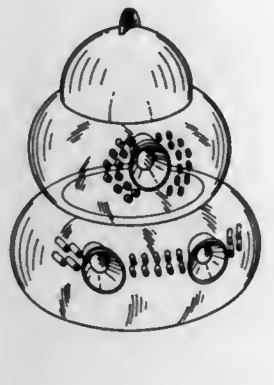
FLYING INSECT TRAP

Allen Rubel, Westfield, N.J., assignor to PIC Corporation, Orange, N.J.

Filed Feb. 3, 1995, Ser. No. 34,479

Term of patent 14 years

U.S. Cl. D22—122



371,419

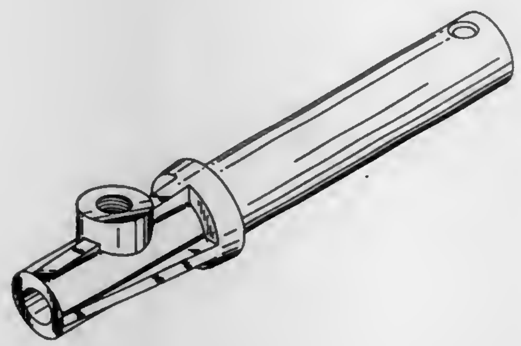
FISH STRINGER HOLDER

Edward A. Hohag, 7450 Washington Ave., Minneapolis, Minn. 55344

Filed Jul. 5, 1994, Ser. No. 25,566

Term of patent 14 years

U.S. Cl. D22—134



371,420

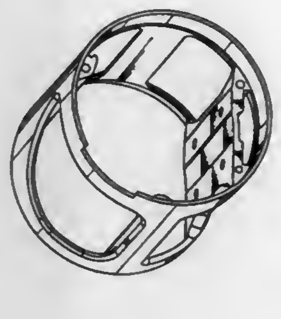
FISHING REEL FRAME

Bengt-Åke Henriksson, Svängsta, and Börje Moosberg, Mörrum, both of, Sweden, assignors to ABU AB, Svängsta, Sweden

Filed Mar. 31, 1995, Ser. No. 36,950

Term of patent 14 years

U.S. Cl. D22—140



371,421

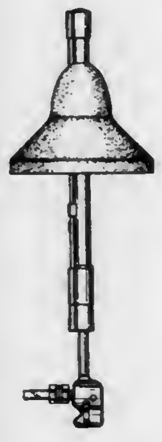
HOOK SETTING FISHING FLOAT

Paul E. Brackett, Sr., 4501 Countryaire Estates, Hackett, Ark. 72937

Filed Apr. 3, 1995, Ser. No. 37,021

Term of patent 14 years

U.S. Cl. D22—146



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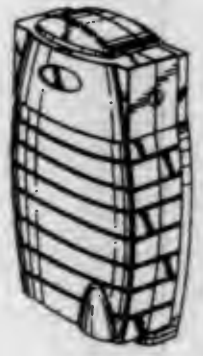
371,422
CABINET FOR PROGRAMMABLE IRRIGATION CONTROL SYSTEM

Michael T. Pearson, and Kishen Gohil, both of Surrey, United Kingdom, assignors to Imperial Underground Sprinkler co., Lenexa, Kans.

Filed Sep. 1, 1994, Ser. No. 27,918

Term of patent 14 years

U.S. Cl. D23—200



371,423
SEPTIC TANK

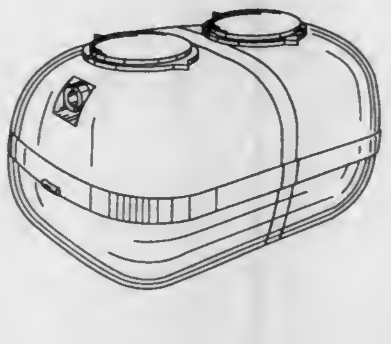
Daniel Salagnac, Senan, France, assignor to Eparco, Societe Anonyme, Paris, France

Filed Jun. 7, 1994, Ser. No. 24,123

Claims priority, application France, Dec. 8, 1993, 936 435

Term of patent 14 years

U.S. Cl. D23—203



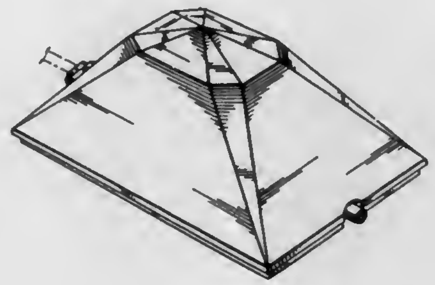
371,424
AQUARIUM AIR PUMP

Donald J. Tigert, Weatherford, Tex., and Donald F. Bryant, Gardner, Kans., assignors to Aquatank, Inc., Lenexa, Kans.

Filed Apr. 28, 1995, Ser. No. 38,097

Term of patent 14 years

U.S. Cl. D23—210



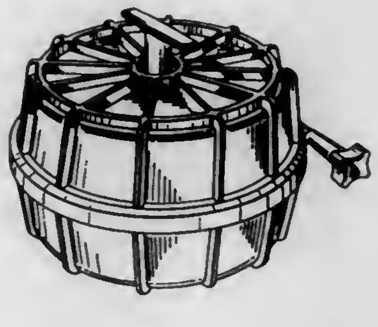
371,425
POND FILTER

James L. Anderson, 1105 Holly La., Burnsville, Minn. 55337

Filed May 22, 1995, Ser. No. 39,165

Term of patent 14 years

U.S. Cl. D23—210



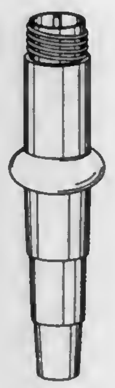
371,426
VALVE NOZZLE FOR INFLATOR

Michael D. Darin, P.O. Box 47, Station A, Prince George, Canada

Filed Apr. 3, 1995, Ser. No. 37,028

Term of patent 14 years

U.S. Cl. D23—213



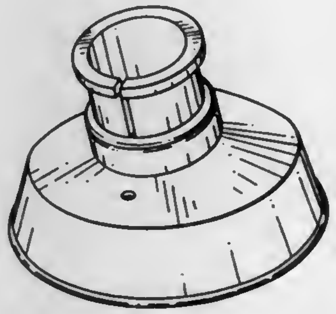
371,427
VAPOR RECOVERY FUEL NOZZLE DEFLECTOR

David J. Harris, Roanoke; Thomas L. Claussen, and John J. VanDaele, both of Fort Wayne, all of Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Mar. 1, 1995, Ser. No. 35,517

Term of patent 14 years

U.S. Cl. D23—227



371,428
FAUCET

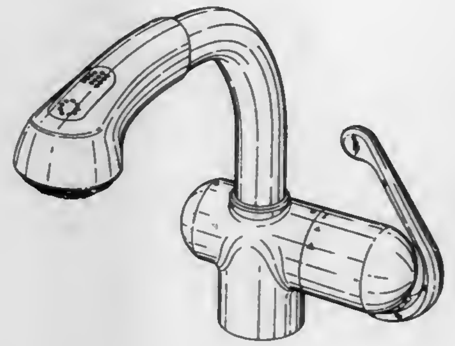
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Apr. 12, 1995, Ser. No. 37,424

Claims priority, application Germany, Oct. 31, 1994, 94 08 465.3

Term of patent 14 years

U.S. Cl. D23—238



371,429
INFRARED RADIATION ELEMENT

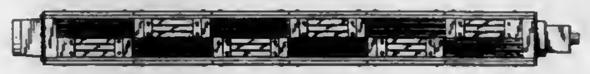
Rolf Ternlind, Fagersanna, Sweden, assignor to Infrarodteknik AB, Vanersborg, Sweden

Filed Sep. 22, 1994, Ser. No. 28,784

Claims priority, application Denmark, Mar. 28, 1994, 0274/94

Term of patent 14 years

U.S. Cl. D23—386



371,430
FAUCET HANDLE

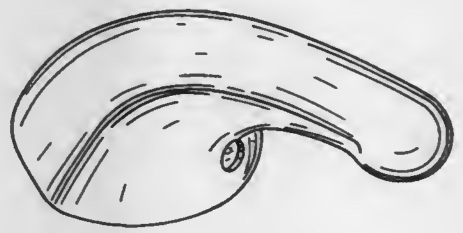
In-Ho Moon, Seoul, Rep. of Korea, assignor to American Standard Inc., Piscataway, N.J.

Filed Dec. 1, 1994, Ser. No. 31,609

Claims priority, application Rep. of Korea, Jun. 8, 1994, 1994-12320

Term of patent 14 years

U.S. Cl. D23—252



OL
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371,431

CONNECTOR FOR TUBE

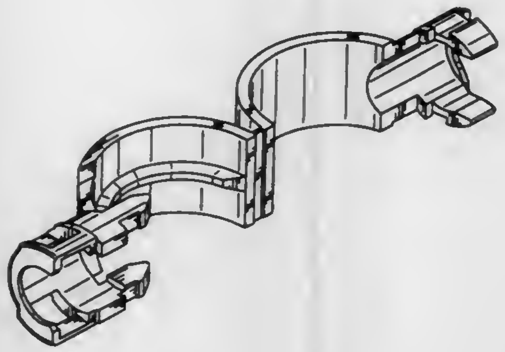
Bernard Streit, Anteuil, France, assignor to Sofanou S.A., Cerval, France

Filed Feb. 10, 1994, Ser. No. 18,616

Claims priority, application France, Aug. 17, 1993, 934337

Term of patent 14 years

U.S. Cl. D23—263



371,432

COVER PLATE FOR CONCEALED VALVE OF A SANITARY FIXTURE

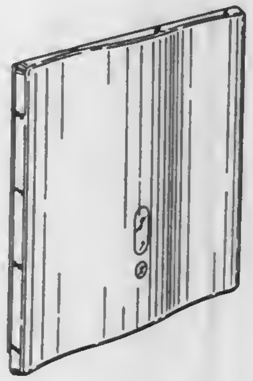
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Mar. 23, 1995, Ser. No. 36,588

Claims priority, application Germany, Oct. 31, 1994, M9408476.9

Term of patent 14 years

U.S. Cl. D23—303



371,433

HANDLE ASSEMBLY

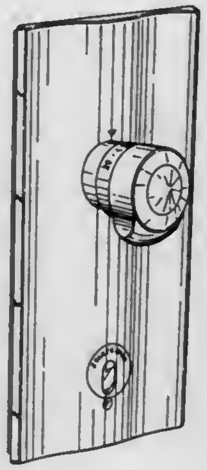
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Mar. 27, 1995, Ser. No. 36,758

Claims priority, application Germany, Oct. 31, 1994, M9408476.9

Term of patent 14 years

U.S. Cl. D23—304



371,434

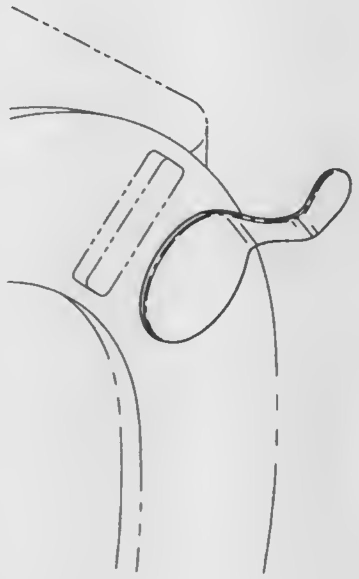
TOILET SEAT HANDLE

Wayne Ouzounian, 3295 Glendon Ave., Los Angeles, Calif. 90034

Filed Oct. 31, 1994, Ser. No. 30,485

Term of patent 14 years

U.S. Cl. D23—309



371,435

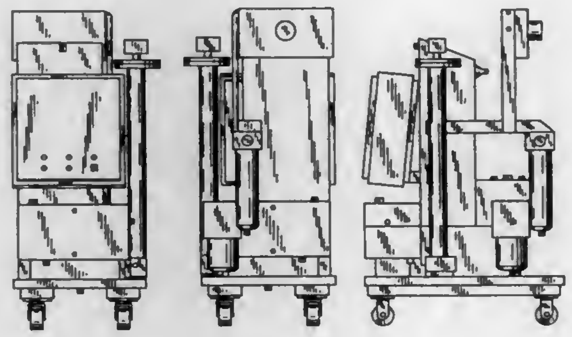
MOBILE FILTER APPARATUS

Steven F. Locke, 2821 NE. 65th Ave., Vancouver, Wash. 98661

Filed Apr. 20, 1995, Ser. No. 37,807

Term of patent 14 years

U.S. Cl. D23—365



371,436

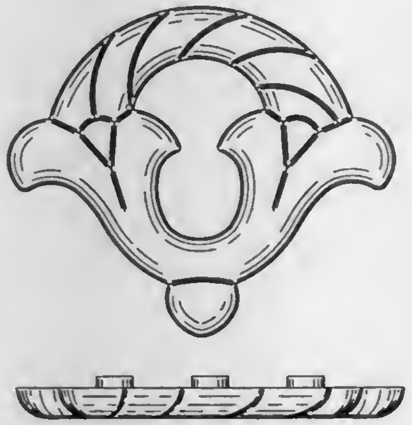
BLADE MEDALLION FOR A CEILING FAN

Jan Jaspers-Fayer, Idyllwild, and Scott Searle, Malibu, both of Calif., assignors to Minka Lighting, Inc., Corona, Calif.

Division of Ser. No. 10,231, Jun. 29, 1993. This application Jan. 11, 1994, Ser. No. 17,336

Term of patent 14 years

U.S. Cl. D23—411



371,437

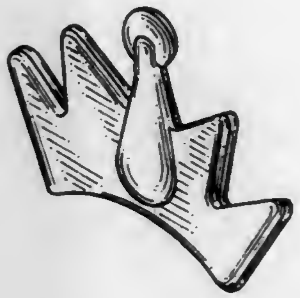
SOFTGEL CAPSULE

G. David Williams, Palm Harbor, Fla., assignor to R. P. Scherer Corporation, Troy, Mich.

Filed Jun. 27, 1995, Ser. No. 40,813

Term of patent 14 years

U.S. Cl. D24—104



371,438

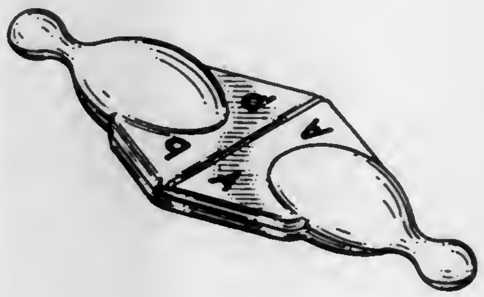
SOFTGEL CAPSULE

Gregory A. Schurig, Clearwater, and David G. Williams, Palm Harbor, both of Fla., assignors to R. P. Scherer Corporation, Troy, Mich.

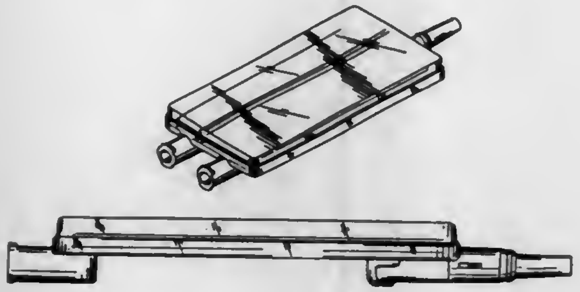
Filed Jun. 29, 1995, Ser. No. 40,897

Term of patent 14 years

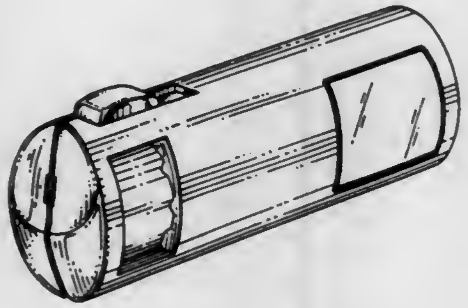
U.S. Cl. D24—104



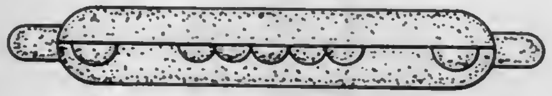
371,439
MULTIPLE COMPARTMENT CASSETTE
Thomas J. Bormann, Melville; Samuel T. Wortham, Huntington, and Vlado I. Matkovich, Glen Cove, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.
Filed Nov. 15, 1994, Ser. No. 31,224
Term of patent 14 years
U.S. Cl. D24—130



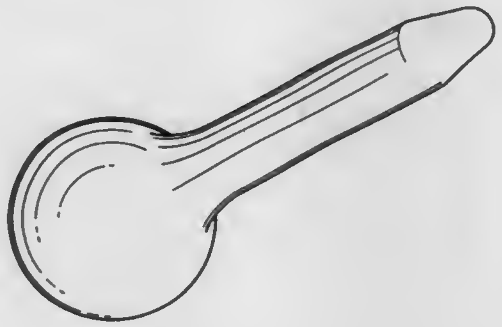
371,440
ANALYZER FOR BIOLOGICAL FLUIDS
Hans H. Petersen, Cambridge, England, assignor to Bayer Corporation, Elkhart, Ind.
Filed Dec. 12, 1994, Ser. No. 32,032
Term of patent 14 years
U.S. Cl. D24—186



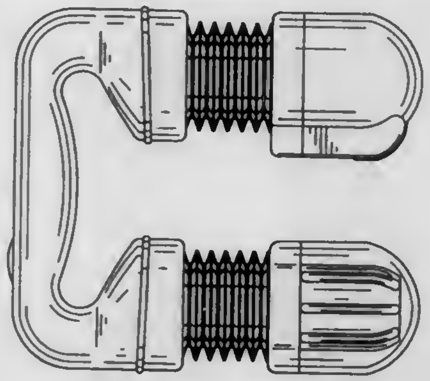
371,441
TEETH CORRECTION TOY
Yoichi Nakata; Hiroyuki Uehara; Ryotaro Sato, and Michiyo Kajinaga, all of Kanda, Japan, assignors to Pigeon Corporation, Tokyo, Japan
Filed Dec. 7, 1994, Ser. No. 31,847
Claims priority, application Japan, Jun. 8, 1994, 6-16795
Term of patent 14 years
U.S. Cl. D24—194



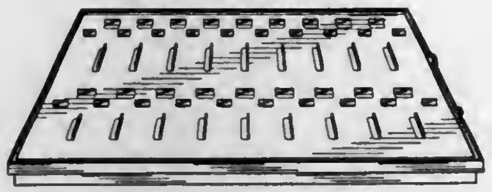
371,442
MASSAGE TOOL
Galina Semyonova, 340 E. 93rd St. Apt 22D, New York, N.Y. 10128
Filed Dec. 9, 1994, Ser. No. 31,962
Term of patent 14 years
U.S. Cl. D24—214



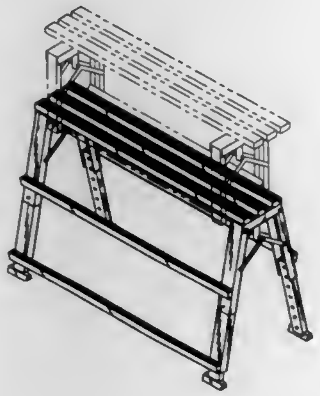
371,443
MASSAGER
Sen-Nen Lie, Kowloon, Hong Kong, assignor to Kolvin Industries Limited, Kowloon, Hong Kong
Filed Jan. 10, 1995, Ser. No. 33,319
Term of patent 14 years
U.S. Cl. D24—215



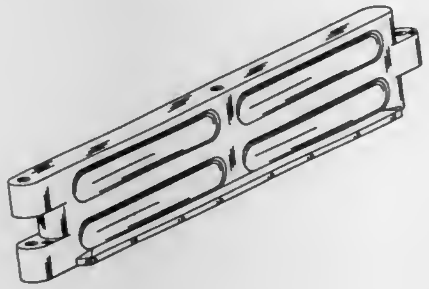
371,444
LABORATORY TRAY
Leon B. Madjar, Fuente del Castillo 36, Col. Tecamachalco, Naucalpan de Juarez, Estado de Mexico 53950, Mexico
Filed May 16, 1994, Ser. No. 22,944
Term of patent 14 years
U.S. Cl. D24—227



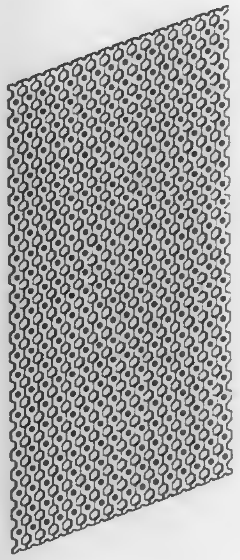
371,445
COLLAPSIBLE SCAFFOLDING
Richard Schulz, 845 North L St., Livermore, Calif. 94550
Filed Jan. 17, 1995, Ser. No. 33,577
Term of patent 14 years
U.S. Cl. D25—67



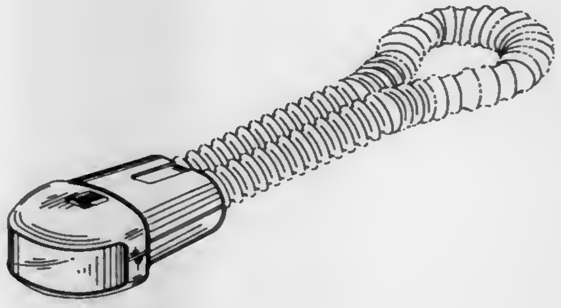
371,446
PLAYGROUND SURFACING BORDER PANEL
Gary VanDeusen, Hillsdale, Mich., assignor to The Shane Group, Inc., Hillsdale, Mich.
Filed Mar. 17, 1995, Ser. No. 36,316
Term of patent 14 years
U.S. Cl. D25—113



371,447
DECORATIVE LATTICE
George Williams, 33 Mercer Rd., Cambridge, Ontario, Canada
Filed Mar. 9, 1995, Ser. No. 35,931
Term of patent 14 years
U.S. Cl. D25—152



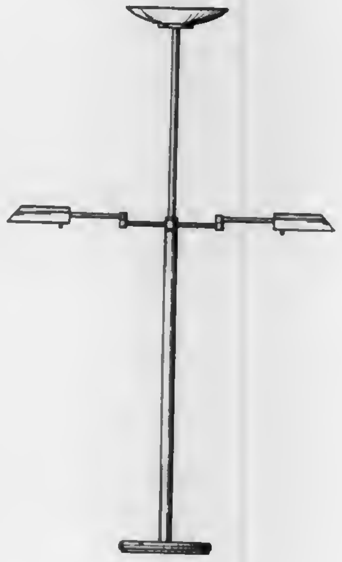
371,448
HEAD FOR A FLASHLIGHT
Paul S. Santarsiero, Avon, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,615
Term of patent 14 years
U.S. Cl. D26—43



371,449
LAMP

Thomas M. Huang, 5649 N. Peck Rd., Arcadia, Calif. 91006
Filed Apr. 12, 1995, Ser. No. 37,448
Term of patent 14 years

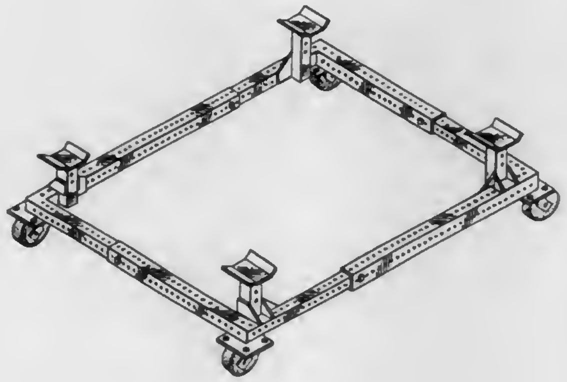
U.S. Cl. D26—65



371,450
ADJUSTABLE FOUR WHEEL VEHICLE DOLLY

Douglas Hodges, 672 W. 12th St., Unit 4, San Pedro, Calif. 90731
Filed Feb. 22, 1995, Ser. No. 35,196
Term of patent 14 years

U.S. Cl. D34—23



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2nd DAY OF JULY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*
  - Anttonen, Kari; Hokkanen, Seppo; and Timperi, Jukka, 5,531,564, Cl. 415-104.000.
- Aamot, Haldor. Elimination of used degreasing solution through biological degradation. 5,532,162, Cl. 435-264.000.
- Aaslyng, Dorrit A.: *See—*
  - Outtrup, Helle; Dambmann, Claus; Aaslyng, Dorrit A.; and Lindegaard, Poul, 5,531,918, Cl. 510-320.000.
- Ab Astra: *See—*
  - Kers, Tore A.; and Andersson, Kenneth B., 5,531,707, Cl. 604-200.000.
- Abate, Maurizio: *See—*
  - Ricco, Mario; Pacucci, Nicola; Abate, Maurizio; and Faggioli, Eugenio, 5,532,526, Cl. 307-104.000.
- ABB Industry Oy: *See—*
  - Huttunen, Ari, 5,532,568, Cl. 318-757.000.
- ABB Management AG: *See—*
  - Junker, Peter, 5,532,445, Cl. 219-61.000.
  - Meindl, Thomas; Meylan, Pierre; and Zierer, Thomas, 5,531,565, Cl. 415-144.000.
  - Strebel, Eduard, 5,533,044, Cl. 373-104.000.
- Abbott Laboratories: *See—*
  - Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhart, Donald J.; and Morrow, James D., 5,531,678, Cl. 604-51.000.
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhardt, Donald J.; and Morrow, James D., 5,531,699, Cl. 604-164.000.
  - Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
- Abe, Akinori; and Ando, Akitoshi, to Ishikawajima-Harima Heavy Industries Co., Ltd. Support structure for self-standing storage tank in liquified gas carrier sbip. 5,531,178, Cl. 114-74.00A.
- Abe, Katsunori: *See—*
  - Katada, Mitsutaka; Muramoto, Hidetoshi; Fuzino, Seizi; Hattori, Tadashi; and Abe, Katsunori, 5,532,176, Cl. 437-34.000.
- Abe, Kimihiro: *See—*
  - Tsuji, Masanori; Abe, Kimihiro; Sugiyama, Osamu; Yamamoto, Hiroshi; and Yagi, Sakai, 5,532,443, Cl. 200-275.000.
- Abe, Koichi: *See—*
  - Okazaki, Iwao; Miyake, Tohru; Abe, Koichi; and Ohshima, Keisuke, 5,532,047, Cl. 428-213.000.
- Abe, Masahiro: *See—*
  - Haraguchi, Hiroshi; Abe, Masahiro; and Nomura, Wataru, 5,532,520, Cl. 257-797.000.
- Abe, Shigeo; and Kawakami, Junzo, to Hitachi, Ltd. Data processing apparatus for obtaining optimum combination solution and method of obtaining optimum combination solution. 5,533,168, Cl. 395-22.000.
- Abe, Shunji, to Yamaichi Electronics Co., Ltd. IC retainer in IC socket. 5,531,608, Cl. 439-330.000.
- Aberg, Gunnar; and McCullough, John R., to Sepracor, Inc. Methods and compositions for treating urinary incontinence using optically pure (S)-oxybutynin. 5,532,278, Cl. 514-617.000.
- Abou-Gharbia, Magid A.: *See—*
  - Skotnicki, Jerauld S.; Palmer, Yvette L.; Koa, Wenling; and Abou-Gharbia, Magid A., 5,532,355, Cl. 540-456.000.
- Abraham, Nigel C. Optical data storage compact disc and method for manufacturing the same. 5,533,002, Cl. 369-275.300.
- Abrams, Robert M.: *See—*
  - Peters, Aemil J. M.; Masterson, Byron J.; and Abrams, Robert M., 5,532,681, Cl. 340-573.000.
- Abreu, Eduardo: *See—*
  - Mitra, Sanjit K.; Abreu, Eduardo; and Marchesani, Rossano, 5,533,063, Cl. 375-340.000.
- Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, to Hoffmann-La Roche Inc. Guanidine derivatives. 5,532,232, Cl. 514-183.000.
- Ackermann, Karl-August: *See—*
  - Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.
- Acosta, Donald C.; and Hu, Paul Y.-F., to International Business Machines Corporation. Cartridge magazine with cartridge processing status indicator. 5,532,888, Cl. 360-92.000.
- ACS Wireless, Inc.: *See—*
  - Gattey, Phillip A.; Burris, Christine; and Jensen, Wolfgang W., 5,533,122, Cl. 379-430.000.
- Action Industries: *See—*
  - Scott, Donald G., 5,531,506, Cl. 297-463.100.
- Active Voice: *See—*
  - Robinson, Michael J.; and Greco, Robert C., 5,533,102, Cl. 379-67.000.
- Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata, Yasuo; and Takahashi, Kazuhiro, to Olympus Optical Co., Ltd. Bending actuator having a coil sheath with a fixed distal end and a free proximal end. 5,531,664, Cl. 600-149.000.
- Adachi, Naoki: *See—*
  - Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, 5,533,045, Cl. 375-200.000.
- Adachi, Nobukazu: *See—*
  - Sugita, Takeshi; Adachi, Nobukazu; Kuroda, Akira; and Takano, Manabu, 5,532,806, Cl. 355-285.000.
- Adair, Gary E.; and Joyce, Paul, to Motorola, Inc. Method and apparatus for sidetone optimization. 5,533,119, Cl. 379-391.000.
- Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, to International Business Machines Corporation. Simplified fabrication methods for rim phase-shift masks. 5,532,089, Cl. 430-5.000.
- Adamo, Giuseppe, to Nikema S.r.l. Device with automatic feeder for driving ribbon-mounted screws. 5,531,142, Cl. 81-434.000.
- Adams, Barry T.: *See—*
  - Gocbenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.
- Adams Mfg. Corp.: *See—*
  - Adams, William E., 5,531,411, Cl. 248-65.000.
- Adams, Paul E.; Hach, Thomas G.; and Vinci, James N., to Lubrizol Corporation, The. Metal free hydraulic fluid with amine salt. 5,531,911, Cl. 508-408.000.
- Adams, Stefan: *See—*
  - Horn, Peter; Reich, Erhard; Adams, Stefan; and Chakrabarti, Sarbananda, 5,531,924, Cl. 252-182.180.
- Adams, Theodore P.; and Kroll, Mark W., to Angeion Corporation. Implantable defibrillator system and method having successive changeable defibrillation waveforms. 5,531,764, Cl. 607-5.000.
- Adams, Theodore P.: *See—*
  - Kroll, Mark W.; Nelson, Randall S.; and Adams, Theodore P., 5,531,766, Cl. 607-5.000.
  - Kroll, Mark W.; Adams, Theodore P.; Perttu, Joseph S.; and Supino, Charles, 5,531,782, Cl. 607-122.000.
- Adams, Thomas E., to AT&T Corp. Method of spiral resist deposition. 5,532,192, Cl. 437-229.000.
- Adams, William E., to Adams Mfg. Corp. Mounting clip for decorative lights. 5,531,411, Cl. 248-65.000.
- Adkins, Kenneth C., to National Semiconductor Corporation. Supply voltage compensated charge pump oscillator. 5,532,653, Cl. 331-143.000.
- Adler, Robert. Organic based led display matrix. 5,532,550, Cl. 313-500.000.
- Advanced Hardware Architectures: *See—*
  - Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., 5,532,693, Cl. 341-51.000.
- Advanced Micro Devices, Inc.: *See—*
  - Fischer, Matthew J.; Gibson, Glen; Dwork, Jeffrey; and Runaldue, Thomas J., 5,533,203, Cl. 395-250.000.
  - Thor, Allen, 5,533,017, Cl. 370-60.000.
- Advanced Recovery Systems, Inc.: *See—*
  - Carlson, Bryan J., 5,531,970, Cl. 423-3.000.
- Advani, Manik; and Trinh, Cuong, to WaferScale Integration, Inc. Sense amplifier with read current tracking and zero standby power consumption. 5,532,623, Cl. 327-51.000.
- Advantest Corporation: *See—*
  - Tokumoto, Isao, 5,532,818, Cl. 356-333.000.
- AEL Industries, Inc.: *See—*
  - Gertel, Eitan; and Sipes, Donald L., Jr., 5,532,857, Cl. 359-154.000.
- AER Energy Resources, Inc.: *See—*
  - Thibault, William C.; and Buzzrelli, Edward S., 5,532,086, Cl. 429-245.000.

Aerojet General Corporation: *See—*
Rindone, Renato R.; Huang, Der-Shing; and Hamel, Edward E., 5,532,390, Cl. 552-11.000.

Aerosonic Corporation: *See—*
Nielsen, Brian T. K.; and Miller, Ronald M., Sr., 5,532,698, Cl. 342-120.000.

Aerospatiale Societe Nationale Industrille: *See—*
Beziers, Daniel; Chataignier, Evelyne; and Noireaux, Patrick, 5,532,288, Cl. 522-71.000.

Afflitto, John: *See—*
Gaffar, Abdul; Nabi, Nuran; and Afflitto, John, 5,531,982, Cl. 424-49.000.

Agano, Toshitaka; and Shoji, Takashi, to Fuji Photo Film Co., Ltd. Apparatus and method of thermally recording information with shading correction. 5,532,727, Cl. 347-253.000.

Agano, Toshitaka: *See—*
Goto, Yasuhiko; Agano, Toshitaka; and Imai, Shinji, 5,532,726, Cl. 347-243.000.

Agar, Robert S. Unitary suspension clip for supporting partition walls. 5,531,052, Cl. 52-489.200.

Agarwal, Rohit; and Keith, Michael, to Intel Corporation. Process, apparatus and system for selecting quantization levels for encoding video signals. 5,532,940, Cl. 364-514.00R.

AGFA Division, Bayer Corporation: *See—*
Brook, Mark G.; and Tellam, Mark E., 5,532,846, Cl. 358-497.000.

AGFA-Gevaert: *See—*
Fivez, Christiaan, 5,533,088, Cl. 378-98.400.

Agfa-Gevaert, N.V.: *See—*
Tavernier, Serge; Op de Beeck, Werner; Ghekiere, Jean-Pierre; and Van Tendeloo, Gustaaf, 5,532,097, Cl. 430-110.000.

AGIP S.p.A.: *See—*
Burrafato, Giovanni; and Carminati, Stefano, 5,532,211, Cl. 507-103.000.

AGR International, Inc.: *See—*
Dimmick, Henry M.; Zanella, Mark F., Sr.; and Melnik, Thomas F., 5,532,605, Cl. 324-671.000.

Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., to International Business Machines Corporation. Communication system including method and apparatus for maintaining communications with a mobile terminal. 5,533,026, Cl. 370-94.100.

Ahmed, Mumtaz: *See—*
Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, 5,532,270, Cl. 514-456.000.

Ahmed, Sohail; and May, Kevin M., to Emerson Electric Co. Refrigeration centrifugal blower system. 5,531,267, Cl. 165-124.000.

Ahn, Jae B., to Daewoo Heavy Industries Ltd. Machining center having a rotary door openable by an automatic pallet changer. 5,531,004, Cl. 29-33.00P.

Ahn, Kyu-Hong; and Chang, Hak-Su, to Korea Institute of Science and Technology. Method and device for simultaneously measuring the flow speed and the depth of a river. 5,531,125, Cl. 73-861.270.

Ahuja, Suresh K.: *See—*
Bayley, Robert D.; Hoffend, Thomas R.; Fuller, Timothy J.; and Ahuja, Suresh K., 5,532,327, Cl. 526-180.000.

Aihara, Yukichi, to Matsushita Electric Industrial Co., Ltd. High frequency power amplifier. 5,532,646, Cl. 330-279.000.

Aikoh, Hideki; Takashima, Makoto; Nakamura, Hiroyuki; and Nakamura, Tohru, to Matsushita Electric Industrial Co., Ltd. Optical detector having stray carrier absorption regions between light receiving elements, and an optical head using the same. 5,532,999, Cl. 369-120.000.

Aimi, Kenichi: *See—*
Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, 5,531,133, Cl. 74-473.00R.

Ainslie, Benjamin J.: *See—*
Maxwell, Graeme D.; and Ainslie, Benjamin J., 5,533,156, Cl. 385-49.000.

Ainsworth, John D.; and Trainer, David R., to GEC Alsthom Limited. Multilevel converter with capacitor voltage balancing. 5,532,575, Cl. 323-211.000.

Air Products And Chemicals, Inc.: *See—*
Bonner, Brian B.; Garg, Diwakar; and Berger, Kerry R., 5,531,372, Cl. 228-220.000.
Golden, Timothy C.; Webley, Paul A.; Auvil, Steven R.; and Katz, Wilbur C., 5,531,809, Cl. 95-101.000.

AirSep Corporation: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
Fujita, Satoshi; Kagiyama, Naoto; and Momiyama, Masayoshi, 5,532,125, Cl. 435-6.000.
Iwasaki, Shinichiro; Sugiyama, Masanori; Umemura, Chiaki; Ookawa, Akemi; and Takahashi, Hisayoshi, 5,532,567, Cl. 318-701.000.
Nishii, Michiharu; Toda, Hiroshi; Kusano, Akihito; and Noda, Yoshiki, 5,531,514, Cl. 303-116.100.

Ajinomoto Co., Inc.: *See—*
Hirano, Atsuhiko; Yamahara, Satoshi; Kataoka, Takehiko; and Kishimoto, Shinichi, 5,532,015, Cl. 426-548.000.
Takemoto, Tadashi; and Kataoka, Takehiko, 5,532,407, Cl. 562-443.000.

Akahori, Yasushi: *See—*
Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.

Akamine, Tadao; Saito, Naoto; and Aoki, Kenji, to Seiko Instruments Inc. Impurity doping method with adsorbed diffusion source. 5,532,185, Cl. 437-141.000.

Akanabe, Yuichi, to Konica Corporation. Light beam scanning apparatus. 5,532,730, Cl. 347-259.000.

Akao, Mutsuo; Osanai, Hiroyuki; and Kawamura, Makoto, to Fuji Photo Film Co., Ltd. Easily openable package of photographic photosensitive materials and producing the same. 5,532,028, Cl. 428-35.200.

Akazaki, Shusuke: *See—*
Hasegawa, Yusuke; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,531,208, Cl. 123-673.000.

Akazawa, Takashi, to Minolta Camera Kabushiki Kaisha. Device for optically detecting an amount of remaining developer in an image forming apparatus. 5,532,790, Cl. 355-203.000.

Åkerberg, Dag E.; and van de Berg, Petrus, to Telefonaktiebolaget LM Ericsson. Digital fixed radio access system providing local mobility. 5,533,027, Cl. 370-195.100.

Akhtar, Masyood: *See—*
Smith, Charles; Akhtar, Masyood; Chau, Michael M.; and Savage, David, 5,532,513, Cl. 257-703.000.

Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, to Philips Electronics North America Corporation. Method and apparatus for decoding digital video using parallel processing. 5,532,744, Cl. 348-390.000.

Akiyama, Daisaku: *See—*
Arimura, Maki; Akiyama, Daisaku; and Nakagawa, Toshiko, 5,532,094, Cl. 252-79.100.

Akiyama, Yoshio: *See—*
Yamanaka, Nobuo; Fujie, Takashi; Hidaka, Hiroshi; and Akiyama, Yoshio, 5,531,339, Cl. 215-12.200.

Akiyoshi, Eiichi: *See—*
Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.

Akuta, Yoshimitsu: *See—*
Kin, Keiyu; Akuta, Yoshimitsu; and Sakaki, Yuji, 5,532,678, Cl. 340-438.000.

Akutagawa, Keizo: *See—*
Hashimoto, Takatsugu; Akutagawa, Keizo; Yagawa, Kazuo; Tanaka, Makoto; Yamagishi, Junichi; and Hachiya, Kazuo, 5,531,256, Cl. 152-209.00R.

Alabama Metal Industries Corporation: *See—*
Chenier, Gary J., Jr.; and Maylon, Gary J., 5,531,051, Cl. 52-255.000.

Albany Nordiskafilt AB: *See—*
Rydin, Björn, 5,531,251, Cl. 139-383.0AA.

Albar, Inc.: *See—*
Kaiser, Frederick; and Bobry, Howard H., 5,532,525, Cl. 307-64.000.

Albert, Frank-Michael: *See—*
Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.

Albin, Donald J.; Walls, Andrew D.; Yanes, Adalberto G.; and Zitny, Kevin G., to International Business Machines Corporation. Hardware-assisted high speed memory test apparatus and method. 5,533,194, Cl. 395-183.180.

Albone, Norman W. Nail clipper with index finger holder. 5,531,025, Cl. 30-28.000.

Albright, Jay D.; Delos Santos, Efren G.; Du, Xuemei; Reich, Marvin E.; and Venkatesan, Aranapakam M., to American Cyanamid Company. Tricyclic benzazepine vasopressin antagonists. 5,532,235, Cl. 514-215.000.

Alcan Aluminum Corporation: *See—*
Skibo, Michael D.; Schuster, David M.; and Bruski, Richard S., 5,531,425, Cl. 266-208.000.

Alcan International Limited: *See—*
Wainwright, Robin; and Evans, Kenneth A., 5,532,292, Cl. 523-179.000.

Alcan-Tech Co., Inc.: *See—*
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,532,193, Cl. 437-243.000.

Alcatel Cit: *See—*
Ballard, Michel; and Issenmann, Edouard, 5,533,114, Cl. 379-220.000.

Alcatel Italia S.p.A.: *See—*
Biella, Daniele, 5,532,701, Cl. 342-387.000.

Alcatel Mobile Communication France: *See—*
Mourot, Christophe; Olivier, René; and Le Strat, Evelyne, 5,533,047, Cl. 375-208.000.

Alcatel N.V.: *See—*
Hita de la Torre, Carlos; Escrihuela Langa, Francisco J.; Martinez Garcia, Francisco J.; and Blanco, Carlos H., 5,533,028, Cl. 370-95.300.

Alcatel Telspace: *See—*
Isard, Marc; and Bernier, Thierry, 5,533,050, Cl. 375-229.000.

Alcon Laboratories, Inc.: *See—*
Desai, Nayan N.; Quintana, Ronald P.; and Chowhan, Masood A., 5,532,224, Cl. 514-63.000.

Aldrich, Roger L., to Dometic Corporation, The. Recreational vehicle air conditioner ceiling grille with register. 5,531,641, Cl. 454-100.000.

Alexander Manufacturing Corporation: *See—*
Alexandres, Richard B.; and Hughett, Elmer, 5,532,075, Cl. 429-54.000.

Alexander, Stephen B.; Chaddick, Steve W.; and Huber, David R., to Ciena Corporation. Optical monitoring channel for wavelength division multiplexed optical communication system. 5,532,864, Cl. 359-177.000.

Alexandres, Richard B.; and Hughett, Elmer, to Alexander Manufacturing Corporation. Small battery cell. 5,532,075, Cl. 429-54.000.

Alferness, Clifton A., to InControl, Inc. Implantable atrial defibrillator having ischemia coordinated intervention therapy and method. 5,531,768, Cl. 607-6.000.

Alferness, Clifton A.; Helland, John R.; and Kreyenhagen, Paul. Implantable lead having a steering distal guide tip. 5,531,781, Cl. 607-122.000.

Alford, George; Cullimore, D. Roy; and Mikell, Al T. Method and apparatus for installing and removing biologically structured wall systems. 5,531,895, Cl. 210-610.000.

Alfred E. Mann Foundation For Scientific Research: *See—*
Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., 5,531,774, Cl. 607-56.000.

Alhorn, Dean C.: *See—*
Polites, Michael E.; and Alhorn, Dean C., 5,531,093, Cl. 73-1.00E.

Ali, Mahfuza B.: *See—*
Holmes, Gary L.; Smith, Terrance P.; Ali, Mahfuza B.; and Macomber, David W., 5,532,111, Cl. 430-281.100.

Allaire, Michael J.: *See—*
Cartmell, James V.; Sturtevant, Wayne R.; Wolf, Michael L.; and Allaire, Michael J., 5,531,999, Cl. 424-445.000.

Allegrini, Pietro; Nodari, Nereo; Malatesta, Vincenzo; and Crisci, Luciana, to Ministero Dell 'Universita' E Della Ricerca Scientifica E Technologica. Spiro-pyranic compounds endowed with photochromic characteristics. 5,532,361, Cl. 544-70.000.

Allen-Bradley Company, Inc.: *See—*
Scofield, Robert E., 5,532,468, Cl. 235-472.000.
Scofield, Robert E., 5,532,480, Cl. 250-235.000.

Allen, Marnie M.; Beazley, Aaron W.; and Hutchinson, Daniel J., to Conix Canada (Polycon Division). Process for the production of lightweight polyurethane moldings. 5,532,280, Cl. 521-51.000.

Allergan, Inc.: *See—*
Powell, Charles H., Jr., 5,531,963, Cl. 422-30.000.

Allgeier, Christopher L., Sr.: *See—*
Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.

Alliance Pharmaceutical Corp.: *See—*
Rosenberg, Gwen H., 5,531,219, Cl. 128-203.120.

Alliance Semiconductor Corporation: *See—*
Poteet, Kenneth A.; and Reddy, Chitranjan N., 5,532,966, Cl. 365-200.000.

AlliedSignal, Inc.: *See—*
Foote, Steven A.; and Stoddard, Damon R., 5,532,665, Cl. 335-296.000.
Madrigal, Alexander; and Watson, Michael J., 5,531,477, Cl. 280-743.100.
Van Der Puy, Michael; Bindu Madhavan, G. V.; Thenappan, Alagappan; and Tung, Hsueh S., 5,532,419, Cl. 570-167.000.

Almén, Torsten: *See—*
Berg, Arne; Almén, Torsten; Klaveness, Jo; Rongved, Pal; Thomassen, Terje; and Dugstad, Harald, 5,531,978, Cl. 424-1.110.

Almeter, David D.: *See—*
Sonnenberg, Sven; Rimai, Donald S.; Almeter, David D.; and Potucek, Martin, 5,532,802, Cl. 355-246.000.

Alpen, Richard. Interlocking front-load bulk storage containers. 5,531,517, Cl. 312-111.000.

Alpha-Beta Technology, Inc.: *See—*
Jamas, Spiros; Easson, D. Davidson, Jr.; and Ostroff, Gary R., 5,532,223, Cl. 514-54.000.

Alpha Enterprises, Inc.: *See—*
Weisburn, James T.; and Straslicka, Bruce C., 5,531,399, Cl. 242-608.600.

Alpine Engineered Products, Inc.: *See—*
Serban, George, 5,531,147, Cl. 83-478.000.

Alps Electric Co., Ltd.: *See—*
Igarashi, Sadao, 5,532,650, Cl. 330-300.000.
Okochi, Ken; and Kikuchi, Kimihiro, 5,533,159, Cl. 385-93.000.

Alter, Konrad G.; and Herbert, Newton J., to Nujenko Pty Ltd. Syringe unit. 5,531,705, Cl. 604-195.000.

Altstaedt, Volker: *See—*
Recker, Hans G.; Tesch, Helmut; Weber, Thomas; Altstaedt, Volker; and Boyd, Jack D., 5,532,296, Cl. 523-400.000.

Alul, Rushdi, to Dyad Pharmaceutical Corporation. Methods and compositions for sequence-specific hybridization of RNA by 2'-5' oligonucleotides. 5,532,130, Cl. 435-6.000.

Aluminum Company of America: *See—*
Powers, John H., 5,532,447, Cl. 219-121.430.

Alutecnos S.r.l.: *See—*
Betto, Massimo, 5,531,041, Cl. 43-24.000.

Alvarez, Jose A.: *See—*
Beyer, Douglas H.; Williams, Eugene V.; and Alvarez, Jose A., 5,532,902, Cl. 361-230.000.

Alvarez Tamargo, Francisco: *See—*
Sitges Menendez, Francisco Javier; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; and Martinez Valdes, Jose Maria, 5,531,882, Cl. 205-602.000.

Alves, Kenneth B. Attachment for dispensing chute and/or splash guard. 5,531,518, Cl. 366-68.000.

Alwafaie, Mohammed G. Skin closure clip. 5,531,760, Cl. 606-216.000.

Alza Corporation: *See—*
Wong, Patrick S.-L.; Theeuwes, Felix; Larsen, Steven D.; and Dong, Liang C., 5,531,736, Cl. 604-892.100.
Wong, Patrick S.-L.; Guittard, George V.; and Ayer, Atul D., 5,532,003, Cl. 424-473.000.

AM International, Inc.: *See—*
Hawkes, Richard B.; and Buschhaus, Michael C., 5,531,433, Cl. 271-10.010.

Amano, Hideaki: *See—*
Kodama, Kouji; Nishida, Hiroshi; Amano, Hideaki; and Matsushita, Toshio, 5,532,563, Cl. 318-440.000.

American Air Liquide: *See—*
Paganessi, Joseph E., 5,531,242, Cl. 137-255.000.

American Biosciences, Inc.: *See—*
Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.

American Cyanamid Company: *See—*
Albright, Jay D.; Delos Santos, Efren G.; Du, Xuemei; Reich, Marvin E.; and Venkatesan, Aranapakam M., 5,532,235, Cl. 514-215.000.
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,532,207, Cl. 504-228.000.
Woodruff, Keith F., 5,531,708, Cl. 604-208.000.

American Home Products Corporation: *See—*
Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,532,245, Cl. 514-272.000.
Malamas, Michael S.; and Gunawan, Iwan, 5,532,256, Cl. 514-361.000.
Skotnicki, Jerauld S.; Palmer, Yvette L.; Koa, Wenling; and Abou-Gharbia, Magid A., 5,532,355, Cl. 540-456.000.

American Innotek, Inc.: *See—*
Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; Cassidy, Clarence A.; and Cassidy, Terry H., 5,531,724, Cl. 604-327.000.

American Maize-Products Company: *See—*
Hedges, Allan; Shieh, Wen; and Ammeraal, Robert, 5,532,005, Cl. 426-7.000.

American Registry of Pathology: *See—*
Lo, Shyh-Ching; Shih, James W. K.; and Wang, Richard Y.-H., 5,532,134, Cl. 435-7.320.

American Superconductor Corporation: *See—*
Manlief, Michael D.; Riley, Gilbert N., Jr.; Voccio, John; and Rodenbush, Anthony J., 5,531,015, Cl. 29-599.000.

Ammeraal, Robert: *See—*
Hedges, Allan; Shieh, Wen; and Ammeraal, Robert, 5,532,005, Cl. 426-7.000.

Ammermann, Eberhard: *See—*
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,532,260, Cl. 514-383.000.

Amoco Corporation: *See—*
Gertel, Eitan; and Sipes, Donald L., Jr., 5,532,857, Cl. 359-154.000.
Ngo, David D., 5,532,110, Cl. 430-275.100.

Amorai-Moriya, Netzer; Brener, Igal M.; and Feldman, Leonard C., to AT&T Corp. Reverse side etching for producing layers with strain variation. 5,532,510, Cl. 257-618.000.

Amoroso, Eugene C. Fabric battery pouch. 5,531,601, Cl. 439-37.000.

Amphenol Corporation: *See—*
Gallusser, David O.; LeBaron, James B.; and Wheeler, Robert G., 5,531,614, Cl. 439-607.000.

Amway Corporation: *See—*
Haley, Kalliopi S.; and Fisher, Jeffrey J., 5,531,939, Cl. 510-182.000.

Anaebonam, Aloysius O.: *See—*
Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, 5,532,270, Cl. 514-456.000.

Analog Devices, Inc.: *See—*
Moore, Thomas D., 5,532,905, Cl. 361-723.000.

Anantharaman, Ven: *See—*
Yen, Larry Y.; Anantharaman, Ven; and Parekh, Bipin, 5,531,899, Cl. 210-638.000.

Anchor Bay Packaging Corporation: *See—*
Taravella, Philip; Blair, Edward J.; Domanski, Ronald S.; and Shippell, Joseph C., 5,531,165, Cl. 108-51.300.

Anders, Hermann: *See—*
Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.

Anderson, Daniel L.: *See—*
Kelman, David C.; McNulty, Donald E.; and Anderson, Daniel L., 5,531,793, Cl. 623-16.000.

Anderson, Donald C. Odor control system for toilets. 5,530,971, Cl. 4-215.000.

Anderson, Eric C.; Wilson, David F.; and Oxford, William V., to Apple Computer, Inc. Multiplexed digital audio and control/status serial protocol. 5,532,556, Cl. 375-356.000.

Andersson, Kenneth B.: *See—*
Kers, Tore A.; and Andersson, Kenneth B., 5,531,707, Cl. 604-200.000.

Ando, Akitoshi: *See—*
Abe, Akinori; and Ando, Akitoshi, 5,531,178, Cl. 114-74.00A.

Ando, Eiichi: *See—*

  - Miyazaki, Masami; and Ando, Eiichi, 5,532,062, Cl. 428-432.000.
- Ando, Hiroe: *See—*
  - Narikawa, Shiro; Tanaka, Hirokazu; Hooda, Iwakazu; Oikawa, Tomohiro; and Ando, Hiroe, 5,532,796, Cl. 355-210.000.
- Ando, Hirotake: *See—*
  - Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
- Ando, Yuichi: *See—*
  - Yoshida, Chisato; Ando, Yuichi; Kitamura, Kunio; and Yahata, Seiro, 5,531,261, Cl. 164-113.000.
- Andoh, Tomio: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Andre, Michel: *See—*
  - Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,530,996, Cl. 4-20.00R.
- Andrea, Ralph W., to GTE Government Systems Corporation. Method and apparatus for the rapid detection and measurement of differential phase offset between two identical binary code sequences. 5,533,038, Cl. 371-68.200.
- Andreoli, Anton: *See—*
  - Herzig, Paul; and Andreoli, Anton, 5,532,345, Cl. 534-612.000.
- Andrew, Bill D.: *See—*
  - Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., 5,531,250, Cl. 138-94.000.
- Andrx Pharmaceuticals, Inc.: *See—*
  - Grumet, Martin, 5,532,275, Cl. 514-567.000.
- Aneja, Arun P.; Drew, James H.; and Knox, Benjamin H., to Du Pont de Nemours, E. I., and Company. Continuous hollow filaments, yarns, and tows. 5,532,060, Cl. 428-398.000.
- Angeion Corporation: *See—*
  - Adams, Theodore P.; and Kroll, Mark W., 5,531,764, Cl. 607-5.000.
  - Kroll, Mark W.; Nelson, Randall S.; and Adams, Theodore P., 5,531,766, Cl. 607-5.000.
  - Kroll, Mark W.; McQuilkin, Gary L.; and Kroll, Kai C., 5,531,770, Cl. 607-8.000.
  - Kroll, Mark W.; Adams, Theodore P.; Perttu, Joseph S.; and Supino, Charles, 5,531,782, Cl. 607-122.000.
- Antane, Schuyler A.: *See—*
  - Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,532,245, Cl. 514-272.000.
- Antonio, Franklin P.: *See—*
  - Dean, Richard F.; Antonio, Franklin P.; Gilhousen, Klein S.; and Wheatley, Charles E., III, 5,533,011, Cl. 370-18.000.
- Anttonen, Kari; Hokkanen, Seppo; and Timperi, Jukka, to A. Ahlstrom Corporation. Centrifugal pump. 5,531,564, Cl. 415-104.000.
- Ao, Kenichi: *See—*
  - Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, 5,532,910, Cl. 361-813.000.
- Aoki, Izuo: *See—*
  - Sasaoka, Seiji; Aoki, Izuo; and Maruyama, Hiroshi, 5,532,008, Cl. 426-73.000.
- Aoki, Kazuo: *See—*
  - Ohkura, Tadahiro; Yoshida, Toshiyuki; Kainuma, Mitsuru; and Aoki, Kazuo, 5,532,581, Cl. 324-115.000.
- Aoki, Kenji: *See—*
  - Akamine, Tadao; Saito, Naoto; and Aoki, Kenji, 5,532,185, Cl. 437-141.000.
- Aoki, Sunao: *See—*
  - Okabe, Satoshi; and Aoki, Sunao, 5,532,996, Cl. 369-77.200.
- Aoki, Takuya: *See—*
  - Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
- Aoki, Yoshio: *See—*
  - Watanabe, Tetsu; and Aoki, Yoshio, 5,533,001, Cl. 369-275.200.
- Aotsuka, Tomoji: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Aoyama, Hirokazu: *See—*
  - Nakada, Tatsuo; and Aoyama, Hirokazu, 5,532,418, Cl. 570-166.000.
- Appella, Ettore: *See—*
  - Yoshimura, Teizo; Robinson, Elizabeth A.; Appella, Ettore; and Leonard, Edward J., 5,532,144, Cl. 435-70.100.
- Apple Computer, Inc.: *See—*
  - Anderson, Eric C.; Wilson, David F.; and Oxford, William V., 5,532,556, Cl. 375-356.000.
  - Hawley, Robert J.; and Jemie, Patricia A., 5,533,192, Cl. 395-183.040.
  - Townsley, David B.; and Chin, Shaoan, 5,532,524, Cl. 307-64.000.
- Applied Materials, Inc.: *See—*
  - Fodor, Mark A.; Bercaw, Craig A.; and Dornfest, Charles, 5,531,835, Cl. 118-728.000.
  - Sivaramakrishnam, Visweswaren; Nishizato, Hiroshi; Zhao, Jun; and Yokoyama, Ichiro, 5,531,183, Cl. 117-93.000.
- Applied Power Inc.: *See—*
  - Ward, James R.; and Stobbs, Thomas J., 5,531,422, Cl. 251-282.000.
- Aptargroup, Inc.: *See—*
  - Gross, Richard A.; and Schaffer, Eldon W., II, 5,531,363, Cl. 222-494.000.
- Arai, Masako: *See—*
  - Kida, Haruyasu; Arai, Masako; Tashiro, Yoichi; and Baba, Hideki, 5,532,021, Cl. 426-607.000.
- Arai, Takao: *See—*
  - Nakagaki, Harushige; Sugimura, Naozumi; Arai, Takao; and Ohara, Yasunori, 5,532,835, Cl. 358-335.000.
- Arai, Tsunekazu; Takeuchi, Shinsuke; and Matsubayashi, Kazuhiro, to Canon Kabushiki Kaisha. Segmentation of handwritten patterns using stroke and jump vectors. 5,533,147, Cl. 382-179.000.
- Araneo, Barbara A.: *See—*
  - Daynes, Raymond A.; and Araneo, Barbara A., 5,532,230, Cl. 514-178.000.
- Arcaro, David J., to Hewlett-Packard Company. Replaceable photoconductor-containing canister for an electrophotographic printer. 5,532,797, Cl. 355-213.000.
- Arch Development Corporation: *See—*
  - Stefansson, Kari, 5,532,351, Cl. 536-23.500.
- Arcus, Robert A.; and Marchetti, Alfred P., to Eastman Kodak Company. High-speed direct-positive photographic elements utilizing core-shell emulsions. 5,532,119, Cl. 430-567.000.
- Arfaei, Ahmad: *See—*
  - Gartner, Ellis M.; Cogliano, Joseph A.; Arfaei, Ahmad; Jardine, Leslie A.; Scheiner, Paul; and Duecker, Heyman C., 5,531,825, Cl. 106-808.000.
- Arima, Yutaka: *See—*
  - Kondo, Yoshikazu; and Arima, Yutaka, 5,532,938, Cl. 364-736.000.
- Arimura, Maki; Akiyama, Daisaku; and Nakagawa, Toshiko, to MEC Co., Ltd. Composition for treating copper or copper alloy surfaces. 5,532,094, Cl. 252-79.100.
- Aristech Chemical Corporation: *See—*
  - Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L.; and Cullo, Leonard A., 5,532,417, Cl. 568-853.000.
- Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, to International Business Machines Corporation. Flux composition and corresponding soldering method. 5,531,838, Cl. 148-23.000.
- Armstrong, John C., to Korite Minerals Limited. Method of manufacturing mammoth ivory jewelry. 5,531,023, Cl. 29-896.410.
- Arndt, Steven F.; Matienzo, Luis J.; Memis, Irving; Spalik, James; and Wu, Tien Y., to International Business Machines Corporation. Method for improving the adhesion of polymeric adhesives to nickel surfaces. 5,532,024, Cl. 427-327.000.
- Arnold, Stephen; Hendrie, Piers; and Bronk, Burt V., to United States of America, Army. Method and apparatus for suspending microparticles. 5,532,140, Cl. 435-34.000.
- Arthur D. Little, Inc.: *See—*
  - Fauteux, Denis G.; van Buren, Martin; and Powell, John, 5,531,871, Cl. 205-688.000.
- Asada, Hisao: *See—*
  - Ishino, Tsutomu; Maruyama, Ryoichi; Nakagami, Hiroshi; and Asada, Hisao, 5,531,304, Cl. 192-4.00R.
- Asada, Kiyozo: *See—*
  - Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, 5,532,337, Cl. 530-350.000.
- Asahara, Itsuo; and Takematsu, Minoru, to Nippon Zeon Co., Ltd. Block copolymer composition and pressure sensitive adhesive composition. 5,532,319, Cl. 525-89.000.
- Asahi Glass Company Ltd.: *See—*
  - Miyazaki, Masami; and Ando, Eiichi, 5,532,062, Cl. 428-432.000.
  - Miyazaki, Nobuyuki; Kodama, Shun-ichi; Takayanagi, Takashi; and Uchino, Bunji, 5,532,304, Cl. 524-261.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  - Nishikawa, Tomoyuki; and Saito, Yoshimi, 5,532,811, Cl. 355-316.000.
  - Takagi, Shigehide; Ito, Kuniomi; and Hidaka, Tsuneo, 5,531,794, Cl. 623-16.000.
  - Wakui, Yoshio, 5,532,740, Cl. 348-231.000.
- Asai, Mitsuo: *See—*
  - Nakanishi, Tetsuo; Asai, Mitsuo; Ohata, Hiroyuki; and Uchida, Keiichi, 5,532,302, Cl. 524-143.000.
- Asakura, Hiroshi: *See—*
  - Iwaki, Yuji; Kikuchi, Shuichi; and Asakura, Hiroshi, 5,531,322, Cl. 206-308.300.
- Asanae, Masumi; Ochiai, Masahisa; Kimura, Fumio; Funakawa, Akihiko; and Noshiro, Toshihiko, to Hitachi Metals, Ltd. Magnetic toner. 5,532,095, Cl. 430-106.600.
- Asano, Kaoru; and Ikekita, Yukimi, to TOA Medical Electronics Co., Ltd. Particle analyzing apparatus and method therefor. 5,532,943, Cl. 364-555.000.
- Asano, Katsuhiro: *See—*
  - Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
- Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, to Fuji Xerox Co., Ltd.; Nippon Light Metal Company, Ltd.; and Nikkei Techno-Research Co., Ltd. Dielectric drum and electrostatic recording device using the same. 5,532,721, Cl. 347-112.000.
- Asano, Koji; Shiraishi, Atsushi; and Ueda, Hidefumi, to Fujitsu Limited. Manufacturing apparatus for use in a micro-gravity environment. 5,531,185, Cl. 117-206.000.

- Asano, Youji, to Teijin Seiki Co., Ltd. Hydraulic system. 5,531,071, Cl. 60-441.000.
- Asano, Yuji; and Tomida, Wataru, to Brother Kogyo Kabushiki Kaisha. Facsimile machine. 5,532,840, Cl. 358-404.000.
- Ascent Pharmaceuticals, Inc.: *See—*
  - Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, 5,532,270, Cl. 514-456.000.
- Asea Brown Boveri AG: *See—*
  - Kuhnen, Gottfried, 5,532,454, Cl. 219-137.00R.
- Asea Brown Boveri, Inc.: *See—*
  - Smith, Rodney M.; and Poirier, Daniel J. J., 5,531,033, Cl. 34-117.000.
- Ash, James D.: *See—*
  - Coleman, Matthew R.; Futej, Gerald M.; and Ash, James D., 5,531,057, Cl. 53-308.000.
- Asselta, John A.; Balan, Albert L.; Boyko, Stephen; and Myers, James E., to International Business Machines Corporation. Computer system with improved power bus. 5,532,907, Cl. 361-775.000.
- Assistance Publique - Hopitaux de Paris: *See—*
  - Pruna, André, 5,532,239, Cl. 514-254.000.
- Association pour la Recherche en Imagerie de l'Hopital Antoine Beclere: *See—*
  - Dibie, Alain; and Musset, Dominique, 5,531,788, Cl. 623-11.000.
- ASTA Medica Aktiengesellschaft: *See—*
  - Koltringer, Peter, 5,532,269, Cl. 514-440.000.
- Astec International, Ltd.: *See—*
  - Hung, So W., 5,532,917, Cl. 363-67.000.
- Asturiana De Zinc, S.A.: *See—*
  - Sitges Menendez, Francisco Javier; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; and Martinez Valdes, Jose Maria, 5,531,882, Cl. 205-602.000.
- Asulab S.A.: *See—*
  - Wiget, Fridolin, 5,532,602, Cl. 324-605.000.
- AT&T Corp.: *See—*
  - Adams, Thomas E., 5,532,192, Cl. 437-229.000.
  - Amorai-Moriya, Netzer; Brener, Igal M.; and Feldman, Leonard C., 5,532,510, Cl. 257-618.000.
  - Avery, Douglas E., 5,531,026, Cl. 30-90.400.
  - Bales, Bruce M., 5,533,096, Cl. 379-58.000.
  - Barberio, Yvonne L.; Engelberth, Jon W.; and Neeves, Arthur E., 5,533,155, Cl. 385-30.000.
  - Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., 5,533,100, Cl. 379-67.000.
  - Blahut, Donald E.; Schell, William M.; Story, Guy A.; and Szurkowski, Edward S., 5,532,735, Cl. 348-13.000.
  - Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., 5,533,065, Cl. 375-341.000.
  - Filas, Robert W.; and Marchman, Herschel M., 5,531,343, Cl. 216-11.000.
  - Gnauck, Alan H.; and Jopson, Robert M., 5,532,868, Cl. 359-332.000.
  - Harris, Rosemary H.; and Bruno, Richard F., 5,533,108, Cl. 379-201.000.
  - Khorramabadi, Haideh; Tarsia, Maurice J.; and Tzeng, Liang D., 5,532,471, Cl. 250-214.00A.
  - Khoury, John M., 5,532,624, Cl. 327-95.000.
  - Russo, Anthony P., 5,531,099, Cl. 73-40.50A.
  - Schlanger, Gabriel G., 5,533,111, Cl. 379-201.000.
  - Umberger, Dean M.; and Ziemer, Craig B., 5,532,498, Cl. 250-551.000.
  - Viswanathan, Thayamkulangara R., 5,532,628, Cl. 327-77.000.
- AT&T Global Information Solutions Company: *See—*
  - Binford, Charles D.; Gaertner, Mark A.; and Denny, Steven P., 5,533,190, Cl. 395-182.040.
  - Nahar, Rathindra, 5,531,293, Cl. 186-59.000.
  - Psinakis, Leas N.; Villani, Thomas J.; and Etsch, August C., 5,532,939, Cl. 364-514.00C.
- Atkeisson, Randal A.; and Fetting, Karl A., to Honeywell Inc. Wrap around fiber optic component package and packaging method. 5,533,161, Cl. 385-99.000.
- Atkins, Stephen L. I.V. starting kit and coupling, and method. 5,531,720, Cl. 604-280.000.
- Atlantic Richfield Company: *See—*
  - Corrigan, Dennis, 5,532,978, Cl. 367-75.000.
  - Fletcher, Paul A.; and Walz, Gregory S., 5,531,270, Cl. 166-53.000.
  - Keenan, Alexander J., 5,531,890, Cl. 210-242.400.
- Atlas Copco Airpower, naamloze vennootschap: *See—*
  - Van Dyck, Christiaan, 5,531,571, Cl. 417-45.000.
- Atoma International Inc.: *See—*
  - Cetnar, Roman, 5,531,489, Cl. 292-225.000.
- Atomic Energy Of Canada Limited: *See—*
  - Breton, Dannys, 5,531,823, Cl. 106-713.000.
- Atotech USA, Inc.: *See—*
  - Baron, David T.; Taylor, Alexander R.; and Johal, Kuldip S., 5,531,889, Cl. 210-167.000.
- Atsumi, Akira: *See—*
  - Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.
- Attermeier, Kurt; Dudar, Thomas E.; Stiehl, Mark A.; and Tartaglia, Joseph M., to Sterling Winthrop, Inc.; and Baxter International, Inc. Safety cannula. 5,531,711, Cl. 604-242.000.
- Auchter, Gerhard: *See—*
  - Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.
- Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, to SanDisk Corporation. Soft errors handling in EEPROM devices. 5,532,962, Cl. 365-201.000.
- Aulbach, Michael: *See—*
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Aumann, Johann. Waterproof collar connection device. 5,532,037, Cl. 428-99.000.
- Aumasson, Michel, to Delsey (Societe Anonyme). Supporting device with rollers, and suitcases comprising at least one such device. 5,531,465, Cl. 280-63.000.
- Auria, Augustin: *See—*
  - Pons, Francesc; Perez, Pedro; and Auria, Augustin, 5,531,037, Cl. 38-77.800.
- Austin, Fred; Knowles, Gareth J.; and Rossi, Michael J., to Grumman Aerospace Corporation. Apparatus and method for controlling the shape of structures. 5,531,407, Cl. 244-219.000.
- Austin, Gregg A.; and Coppock, Gary E., to Bush Hog Corporation. Drivetrain and load bearing swivel hitch assemby and combine incorporating same. 5,531,283, Cl. 180-53.100.
- Australian Meriono Wool Harvesting, LTD.: *See—*
  - Lines, Lancelot H., 5,531,773, Cl. 607-046.000.
- Autogenics: *See—*
  - Love, Charles S.; Love, Jack W.; and Calvin, John H., 5,531,784, Cl. 623-2.000.
- Autogenics, Inc.: *See—*
  - Love, Jack W.; Love, Charles S.; Hudak, Philip J.; and Suggitt, Robert W., 5,531,785, Cl. 623-2.000.
- Automaxi Industries: *See—*
  - Ravier, Jean-Marie, 5,531,367, Cl. 224-329.000.
- Automotive Systems Laboratory, Inc: *See—*
  - Poole, Donald R., 5,531,941, Cl. 264-3.400.
- Auvil, Steven R.: *See—*
  - Golden, Timothy C.; Webley, Paul A.; Auvil, Steven R.; and Katz, Wilbur C., 5,531,809, Cl. 95-101.000.
- Averst, Douglas I.: *See—*
  - Liberti, Joseph C., Jr.; Averst, Douglas I.; Branch, Tony R.; and Carsello, Stephen R., 5,533,062, Cl. 375-334.000.
- Avery, Douglas E., to AT&T Corp. Stripping tool for armored fiber optic cables. 5,531,026, Cl. 30-90.400.
- Awarski, Donston E.: *See—*
  - Woo, James T. K.; Pompignano, Gary C.; Awarski, Donston E.; and Packard, Kevan A., 5,532,297, Cl. 523-408.000.
- Aydin, Oral: *See—*
  - Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.
- Ayer, Atul D.: *See—*
  - Wong, Patrick S.-L.; Guittard, George V.; and Ayer, Atul D., 5,532,003, Cl. 424-473.000.
- Ayre, Peter J.: *See—*
  - Kitson, Mark R.; and Ayre, Peter J., 5,531,206, Cl. 123-596.000.
- Azon Corporation: *See—*
  - Lubar, Michael J., 5,532,064, Cl. 428-478.200.
- Azuma, Atsushi, to Bando Chemical Industries, Ltd. Power transmission belt. 5,531,650, Cl. 474-260.000.
- Azumai, Hideo: *See—*
  - Kajitani, Tetsuji; Hikosaka, Ariyoshi; Azumai, Hideo; and Iwatsubo, Satoshi, 5,532,827, Cl. 358-298.000.
- Azzarella, Charles W. Golf putter. 5,531,439, Cl. 473-331.000.
- Azzarelli, Carol: *See—*
  - Azzarelli, Paul T.; and Azzarelli, Carol, 5,531,238, Cl. 135-66.000.
- Azzarelli, Paul T.; and Azzarelli, Carol. Attachment apparatus for a walker caddy container. 5,531,238, Cl. 135-66.000.
- B.A.G. Corporation: *See—*
  - Derby, Norwin C.; and Derby, Norman C., 5,531,252, Cl. 141-67.000.
- Baba, Hideki: *See—*
  - Kida, Haruyasu; Arai, Masako; Tashiro, Yoichi; and Baba, Hideki, 5,532,021, Cl. 426-607.000.
- Baba, Hisatoshi: *See—*
  - Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
- Baba, Tomoya: *See—*
  - Kaneko, Seiji; and Baba, Tomoya, 5,532,508, Cl. 257-336.000.
- Babcock & Wilcox Company, The: *See—*
  - Piccirillo, David P.; and Huston, John T., 5,530,987, Cl. 15-319.000.
  - Sarv, Hamid, 5,531,973, Cl. 423-235.000.
- Babcock BSH Aktiengesellschaft Vormals Buttner-Schilde-Haas AG: *See—*
  - Bold, Jörg, 5,531,946, Cl. 264-102.000.
- Babczinski, Peter: *See—*
  - Daum, Werner; Muller, Klaus-Helmut; Schwamborn, Michael; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,532,378, Cl. 548-263.800.
- Bachman, Michael S.; and Davis, Marc R. Method and apparatus for informing a driver of the propulsive capability of a vehicle powertrain. 5,532,671, Cl. 340-438.000.

- Bachmann, Bernd: *See—*
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Bacon, Edward R.: *See—*
  - Ruddy, Stephen B.; Roberts, Mary E.; McIntire, Gregory L.; Cooper, Eugene R.; and Bacon, Edward R., 5,531,979, Cl. 424-945.000.
- Badesha, Santokh S.: *See—*
  - Henry, Arnold W.; Seanor, Donald A.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Kaplan, Samuel; and Pan, David H., 5,531,813, Cl. 106-2.000.
- Bae, Sang M., to Hyundai Electronics Industries Co., Ltd. Method of forming a photoresist pattern in a semiconductor device. 5,532,114, Cl. 430-312.000.
- Baer, Ralph H.; and Orbanes, Philip E., to Western Publishing Co., Inc. Interactive audio-visual work. 5,531,600, Cl. 434-317.000.
- Baermann, Eckhard. Double-sided hinges. 5,530,992, Cl. 16-231.000.
- Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., to Tri-Con Industries, Ltd. Head restraint for passenger vehicles. 5,531,505, Cl. 297-408.000.
- Bagepalli, Bharat S. K.: *See—*
  - Saia, Richard J.; Ghezzo, Mario; Bagepalli, Bharat S. K.; and Durocher, Kevin M., 5,531,018, Cl. 29-622.000.
- Bahr, Bradley C.; and Selley, David B., to Dow Corning Corporation. Self-leveling silicone polish. 5,531,814, Cl. 106-3.000.
- Bahr, Martin: *See—*
  - Blum, Matthias; Heimerl, Josef; Bahr, Martin; and Bauer, Volker, 5,532,446, Cl. 219-121.250.
- Bailey, Ronald L., to Young Dental Manufacturing Company, Inc. Disposable dental prophylaxis contra-angle, method of making it, and drive gear for use therein. 5,531,599, Cl. 433-125.000.
- Bak, Chan S.; Kimura, Hiroshi; and Pastor, Ricardo C., to Hughes Aircraft Company. Flux grown, monosize oxide particles. 5,531,974, Cl. 423-263.000.
- Baker, Daniel F., to Rockwell International Corporation. Telecommunication system with user modifiable PBX terminating call feature controller and method. 5,533,109, Cl. 379-201.000.
- Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., to Massillon Community Hospital. Patient controlled self injection aid. 5,531,702, Cl. 604-181.000.
- Baker, George L.: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Baker, Gerald N.; and Crapo, Alan D., to Emerson Electric Co. Brushless permanent magnet condenser motor for refrigeration. 5,532,534, Cl. 310-89.000.
- Baker, Jeffrey J.; and Jaros, Philip, to White Mop Wringer Company. Child resistant step-on receptacle. 5,531,348, Cl. 220-264.000.
- Baker, John R. Golf ball dispenser. 5,531,356, Cl. 221-281.000.
- Baker, Ross G., Jr.: *See—*
  - Maschino, Steven; and Baker, Ross G., Jr., 5,531,778, Cl. 607-118.000.
- Balan, Albert L.: *See—*
  - Asselta, John A.; Balan, Albert L.; Boyko, Stephen; and Myers, James E., 5,532,907, Cl. 361-775.000.
- Balasubramanian, Peruvemba S.; Lee, Nathan J.; and Lekuch, Scott D., to International Business Machines Corporation. ASK demodulator implemented with digital bandpass filter. 5,532,641, Cl. 329-311.000.
- Baldwin, Joseph C.: *See—*
  - Shofner, Frederick M.; and Baldwin, Joseph C., 5,533,145, Cl. 382-141.000.
- Balentine, Douglas A.; and Harbowy, Matthew E., to Thomas J. Lipton Co., Division of Conopco, Inc. Process for preparation of purified tea components using preconcentration by cream separation and solubilization followed by medium pressure chromatography and/or preparative HPLC. 5,532,012, Cl. 426-425.000.
- Bales, Bruce M., to AT&T Corp. Send-all-calls feature for a wireless handset. 5,533,096, Cl. 379-58.000.
- Bales, Stephen E.; Langhoff, Charles A.; and Wheatley, John A., to Dow Chemical Company, The. Thiodiphenol copolycarbonates and their use as components of multilayered polymeric reflective bodies. 5,532,331, Cl. 528-196.000.
- Bales, Thomas O.: *See—*
  - Smith, Kevin W.; and Bales, Thomas O., 5,531,755, Cl. 606-170.000.
- Ball, Eric S.: *See—*
  - Ball, Harold L.; Bounds, Terry R.; Ball, Eric S.; and Ball, Jeffrey L., 5,531,894, Cl. 210-605.000.
- Ball, Harold L.; Bounds, Terry R.; Ball, Eric S.; and Ball, Jeffrey L., to Orenco Systems, Inc. Method of treating wastewater. 5,531,894, Cl. 210-605.000.
- Ball, Jeffrey L.: *See—*
  - Ball, Harold L.; Bounds, Terry R.; Ball, Eric S.; and Ball, Jeffrey L., 5,531,894, Cl. 210-605.000.
- Ballard, Michel; and Issenmann, Edouard, to Alcatel Cit. Telecommunication system comprising subscriber connection units having independent routing ability. 5,533,114, Cl. 379-220.000.
- Bally Gaming International, Inc.: *See—*
  - Kloss, Hans G.; and Heidel, Raymond J., 5,531,309, Cl. 194-202.000.
- Baltazar, Edward: *See—*
  - Young, Allen R.; Davidson, Jerry L.; and Baltazar, Edward, 5,531,112, Cl. 73-152.000.
- Ban, Naoto; and Kawashima, Hiroshi, to Koito Manufacturing Co., Ltd. Reflector for a vehicular lamp and method of producing a die therefor. 5,532,909, Cl. 362-61.000.
- Bando Chemical Industries, Ltd.: *See—*
  - Azuma, Atsushi, 5,531,650, Cl. 474-260.000.
- Banner, David: *See—*
  - Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.
- Banno, Yoshikazu: *See—*
  - Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
- Barbacci, Josephine A. Illuminated stents. 5,531,741, Cl. 606-15.000.
- Barbari, Edward P. Method & apparatus for dynamically creating and transmitting documents via facsimile equipment. 5,532,838, Cl. 358-400.000.
- Barber, Andrew: *See—*
  - Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.
- Barberio, Yvonne L.; Engelberth, Jon W.; and Neeves, Arthur E., to AT&T Corp. Evanescent field coupler. 5,533,155, Cl. 385-30.000.
- Barclay, David A.: *See—*
  - Decker, Lewis B., Jr.; Erickson, Dwight D.; and Barclay, David A., 5,531,976, Cl. 423-625.000.
- Bargeron, Kim G.: *See—*
  - Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.
- Bargiotti, Alberto; Caruso, Michele; Grandi, Maria; Ripamonti, Marina; and Suarato, Antonino, to Farmitalia Carlo Erba S.R.L. 3'-aziridino-anthracycline derivatives. 5,532,218, Cl. 514-34.000.
- Barkan, Edward D.: *See—*
  - Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 5,532,469, Cl. 235-472.000.
- Barken, Israel. Apparatus and method for computer controlled cryosurgery. 5,531,742, Cl. 606-21.000.
- Barlovatz-Meimon, Georgia: *See—*
  - Wang, Ning; Barlovatz-Meimon, Georgia; and Fredberg, Jeffrey J., 5,532,132, Cl. 435-7.210.
- Barnes, Austen H. Axial locking device. 5,530,999, Cl. 24-590.000.
- Barnett, Adam J. Sorting of differently identified articles. 5,531,331, Cl. 209-580.000.
- Barnett, Raymond E.: *See—*
  - Ngo, Tuan V.; and Barnett, Raymond E., 5,532,631, Cl. 327-110.000.
- Barnholt, Mark C., to Dana Corporation. Selectively lockable differential assembly. 5,531,653, Cl. 475-234.000.
- Barnwell, John W., to New York University. *Plasmodium vivax* blood stage antigens, PvESP-1, antibodies, and diagnostic assays. 5,532,133, Cl. 435-7.220.
- Baron, David T.; Taylor, Alexander R.; and Johal, Kuldip S., to Atotech USA, Inc. Method and apparatus for removing resist particles from stripping solutions for printed wireboards. 5,531,889, Cl. 210-167.000.
- Barracuda Technologies AB: *See—*
  - Eng, Kjell; and Wallin, Erik, 5,532,052, Cl. 428-229.000.
- Barrera, Carlos M.: *See—*
  - Zanini-Fisher, Margherita; Soltis, Richard E.; Logothetis, Eleftherios M.; and Barrera, Carlos M., 5,531,879, Cl. 204-427.000.
- Barretto, Victor B.; Heberling, Stephen S.; Summerfelt, Vernon E.; and Pohl, Christopher A., to Dionex Corporation. Ion-exchange composition employing resin attachment to dispersant and method for forming the same. 5,532,279, Cl. 521-28.000.
- Barron, Milagros C.: *See—*
  - Wilkerson, John M., III; Verstrat, Daniel W.; and Barron, Milagros C., 5,532,036, Cl. 428-96.000.
- Bartels, Günter: *See—*
  - Wagner, Eckhard; Becker, Günter; and Bartels, Günter, 5,531,799, Cl. 51-309.000.
- Bartholomew, Donald D., to Proprietary Technology, Inc. Motorcycle towing device. 5,531,560, Cl. 414-563.000.
- Bartholomew, Paul: *See—*
  - Rodrigues, Julio F.; and Bartholomew, Paul, 5,531,606, Cl. 439-188.000.
- Bartlett, Philip L.; Creazzo, Joseph A.; and Hammel, Howard S., to Du Pont de Nemours, E. I., and Company. Polymer foams containing gas barrier resins. 5,532,284, Cl. 521-134.000.
- Bartlett, Robert R.; and Kämmerer, Friedrich-Johannes, to Hoechst Aktiengesellschaft. Isoxazole-4-carboxamides and hydroxyalkylidenecyanoacetamides, pharmaceuticals containing these compounds and their use. 5,532,259, Cl. 514-378.000.
- Bartoszyk, Gerd: *See—*
  - Böttcher, Henning; Seyfried, Christoph; Bartoszyk, Gerd; and Greiner, Hartmut, 5,532,241, Cl. 514-254.000.
  - Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.

- Barwich, Juergen; Plaumann, Heinz; and Wistuba, Eckehardt, to BASF Aktiengesellschaft. Copolymers and blends which are self-curable under the action of atmospheric humidity. 5,532,321, Cl. 525-103.000.
- Barwich, Juergen: *See—*
  - Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.
- Barzashi, Fernando: *See—*
  - Galliani, Giulio; Barzashi, Fernando; Butti, Alina; Bonetti, Carla; and Toja, Emilio, 5,532,375, Cl. 546-334.000.
- Basche, Stephen M.: *See—*
  - Dietz, George J.; Hammer, Randall E.; Basche, Stephen M.; and Hawes, Kevin J., 5,532,522, Cl. 307-10.500.
- BASF Aktiengesellschaft: *See—*
  - Barwich, Juergen; Plaumann, Heinz; and Wistuba, Eckehardt, 5,532,321, Cl. 525-103.000.
  - Bermes, Rudolf; and Breitschaft, Walter, 5,531,797, Cl. 8-648.000.
  - Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.
  - Fischer, Rolf, 5,532,386, Cl. 549-322.000.
  - Horn, Peter; Reich, Erhard; Adams, Stefan; and Chakrabarti, Sarbananda, 5,531,924, Cl. 252-182.180.
  - Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.
  - Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,532,260, Cl. 514-383.000.
- BASF Corporation: *See—*
  - Krueger, David C., 5,531,958, Cl. 419-44.000.
  - Menovcik, Gregory L.; and Ohrbom, Walter H., 5,532,061, Cl. 428-423.100.
  - Narayan, Thirumurti; and Hicks, Steven, 5,532,285, Cl. 521-159.000.
  - Narayan, Thirumurti; and Hicks, Steven, 5,532,403, Cl. 560-26.000.
- Basile, Carlo: *See—*
  - Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, 5,532,744, Cl. 348-390.000.
- Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., to AT&T Corp. Communications system call complete arrangement. 5,533,100, Cl. 379-67.000.
- Bassett, Michael L.: *See—*
  - Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.
- Bataille, Alain, to Societe Francaise Des Amortisseurs de Carbon. One-piece obturator device with lubricated centering guide for pressurized hydraulic damper tubes. 5,531,299, Cl. 188-322.170.
- Batchelder, Ned: *See—*
  - Flowers, James R., Jr.; Batchelder, Ned; and Macomber, Edward W., 5,533,174, Cl. 395-114.000.
- Bates, Cary L.; Blades, Jerry A.; Kiel, Harvey G.; Romon, Raymond F.; and Ryan, Jeffrey M., to International Business Machines Corporation. Visually aging scroll bar. 5,532,715, Cl. 345-123.000.
- Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., to International Business Machines Corporation. Aural position indicating mechanism for viewable objects. 5,533,182, Cl. 395-155.000.
- Bates, Roger E.: *See—*
  - Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,531,474, Cl. 280-74.00D.
- Bates, Warren A.: *See—*
  - Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., 5,531,615, Cl. 439-631.000.
- Bateville Casket Company, Inc.: *See—*
  - Biondo, John P., 5,531,000, Cl. 27-27.000.
- Batich, Christopher D.: *See—*
  - Fuerst, Ronnie S.; Melker, Richard; and Batich, Christopher D., 5,532,029, Cl. 428-35.700.
- Battista, Richard M., to Sorrento Electronics, Inc. Multi-channel analysis system and method using digital signal processing. 5,532,944, Cl. 364-602.000.
- Bauchot, Frederic J.: *See—*
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Bauck, Randall C.: *See—*
  - Dunn, Paul F.; and Bauck, Randall C., 5,532,926, Cl. 364-178.000.
- Bauer, Barney J., to TRW Vehicle Safety Systems Inc. Vehicle seat belt restraint system. 5,531,479, Cl. 280-806.000.
- Bauer, Charles L.; Krenceski, Mary A.; and Fitzgerald, John J., to Eastman Kodak Company. Light-sensitive imaging element. 5,532,118, Cl. 430-533.000.
- Bauer, Daniel; Richard, Françoise; Hassoun, Muriel; Malle, Gérard; and Samain, Henri, to L'Oreal. Method for extracting malodorous compounds present in a formulation containing at least one compound carrying a thiol group and deodorized compositions thus obtained. 5,531,987, Cl. 424-76.210.
- Bauer, Volker: *See—*
  - Blum, Matthias; Heimerl, Josef; Bahr, Martin; and Bauer, Volker, 5,532,446, Cl. 219-121.250.
- Baxter International, Inc.: *See—*
  - Attermeier, Kurt; Dudar, Thomas E.; Stiehl, Mark A.; and Tartaglia, Joseph M., 5,531,711, Cl. 604-242.000.
- Baxter, John F., Jr. Oil spill detection system. 5,532,679, Cl. 340-539.000.
- Bayer Aktiengesellschaft: *See—*
  - Brandes, Wilhelm; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; Kuck, Karl-Heinz; and Krüger, Bernd-Wieland, 5,532,262, Cl. 514-388.000.
  - Daum, Werner; Muller, Klaus-Helmut; Schwamborn, Michael; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,532,378, Cl. 548-263.800.
  - König, Eberhard; Engbert, Theodor; and Pedain, Josef, 5,532,313, Cl. 524-590.000.
  - Montigny, Armand de; Kober, Hermann; Klinksiek, Bernd; and Schlak, Ottfried, 5,531,812, Cl. 106-2.000.
  - Schenke, Thomas; Krebs, Andreas; and Petersen, Uwe, 5,532,364, Cl. 544-105.000.
- Bayer Corporation: *See—*
  - Werner, Joachim; Kane, Scott A.; Boonstra, Eric F.; and Doerge, Herman P., 5,532,283, Cl. 521-131.000.
- Bayley, Robert D.; Hoffend, Thomas R.; Fuller, Timothy J.; and Ahuja, Suresh K., to Xerox Corporation. Random copolymers made by anionic polymerization, toners incorporating these copolymers and method for the manufacture thereof. 5,532,327, Cl. 526-180.000.
- Baylis, Alan D., to Zeneca Limited. Herbicidal composition containing glyphosate or a salt thereof. 5,532,205, Cl. 504-128.000.
- Bayne, Marvin L.; Thomas, Kenneth A., Jr.; and Conn, Gregory L., to Merck & Co., Inc. Purification and characterization of a glioma-derived growth factor having vascular endothelial cell growth promoting activity. 5,532,343, Cl. 530-399.000.
- Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., to International Business Machines Corporation. Method of forming a three dimensional high performance interconnection package. 5,531,022, Cl. 29-850.000.
- Bean, Lloyd F.; and Berko-Boateng, Victor, to Xerox Corporation. Edge raggedness and background removal by post development member. 5,532,092, Cl. 430-42.000.
- Beards, Ronald D.: *See—*
  - Khoury, George; Beards, Ronald D.; and Nisbet, John J., 5,532,637, Cl. 327-359.000.
- Bearings, Inc.: *See—*
  - Savino, Mark, 5,531,316, Cl. 198-844.200.
- Beattie, Kenneth L.: *See—*
  - Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, 5,532,128, Cl. 435-16.000.
- Beauregard, David E.: *See—*
  - Dezzani, Michael M.; and Beauregard, David E., 5,531,836, Cl. 148-233.000.
- Beaverson, Arthur J.: *See—*
  - LaRochelle, Paul E.; and Beaverson, Arthur J., 5,533,195, Cl. 395-185.010.
- Beazley, Aaron W.: *See—*
  - Allen, Marnie M.; Beazley, Aaron W.; and Hutchinson, Daniel J., 5,532,280, Cl. 521-51.000.
- Bechtel, Wolf-Dietrich: *See—*
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, to Sun Microsystems, Inc. Single in-line memory module. 5,532,954, Cl. 365-52.000.
- Becker, Günter: *See—*
  - Wagner, Eckhard; Becker, Günter; and Bartels, Günter, 5,531,799, Cl. 51-309.000.
- Beekman, George F.; Conroy, Gary M.; Hyde, Jeffrey R.; and Norris, Gene K., to Morton International, Inc. Ammonium chloride as a PVC co-stabilizer. 5,532,303, Cl. 524-180.000.
- Beerli, Markus, to Benninger AG. Device for yarn division on a sectional warping machine. 5,531,001, Cl. 28-198.000.
- Béguin, Jean-Luc; and Haefeli, Pierre, to Eta SA Fabriques d'Ebauches. Coupling device between a source of mechanical energy and an electrical energy generator in a timepiece. 5,532,982, Cl. 368-64.000.
- Behfar-Rad, Abbas; Perry, Charles H.; and Sachdev, Krishna G., to International Business Machines Corporation. Ceramic probe card and method for reducing leakage current. 5,532,608, Cl. 324-754.000.
- Behrendt, Chad J.: *See—*
  - Blanchette, Robert A.; Farrell, Roberta L.; and Behrendt, Chad J., 5,532,164, Cl. 435-277.000.
- Behringer, Hartmut; Pottkämper, Siegfried; Stephan, Hans-Werner; and Marcks, Gerrit, to Messer Griesheim GmbH. Process to transport acetylene. 5,531,075, Cl. 62-46.100.
- Behringwerke AG: *See—*
  - Singh, Sharat; Switchenko, Arthur C.; Lin, Cheng-I; Kurn, Nurith; and Ullman, Edwin F., 5,532,138, Cl. 435-7.930.
- Beier, Norbert: *See—*
  - Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, 5,532,276, Cl. 514-303.000.
- Beighle, Phillip L.: *See—*

- Bodager, Gregory A.; and Beighle, Phillip L., 5,532,115, Cl. 430-325.000.
- Beikirch, Thomas R.; and Plain, Margaret C., to Xerox Corporation. Simplified document handler job recovery system with reduced memory duplicate scanned image detection. 5,532,839, Cl. 358-401.000.
- Beiler, Emanuel S.: *See—*
  - Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; Phillips, Frederick W.; and Beiler, Emanuel S., 5,531,212, Cl. 126-104.00R.
- Beiley, Mark A.; and Fifield, John A., to International Business Machines Corporation. Multi-input transition detector with a single delay. 5,532,622, Cl. 326-95.000.
- Beisert, Stan: *See—*
  - Sosa, Jose M.; and Beisert, Stan, 5,531,967, Cl. 422-131.000.
- Bell Communications Research, Inc.: *See—*
  - Braun, David A., 5,532,737, Cl. 348-36.000.
  - Chen, Wai, 5,533,009, Cl. 370-17.000.
  - Cook, William J.; and Seymour, Paul D., 5,533,016. Cl. 370-54.000.
  - Hollenbach, Steven A.; Martin, Michael A.; Novak, Thomas S.; and Warznak, Robert S., 5,533,115, Cl. 379-220.000.
- Bell, Joseph W.; Carroll, Thomas J.; and Puglia, Wayne J., to Nabisco, Inc. Chewing gum containing hydrophobic flavorant encapsulated in a hydrophilic shell. 5,532,004, Cl. 426-5.000.
- Bell, Michael. Harness with adjustable means for supporting a tool belt. 5,531,292, Cl. 182-3.000.
- Bell, Randall R., III. Heavy construction equipment tire guard. 5,531,508, Cl. 301-37.230.
- Bell, Ray W. Strap secured condom. 5,531,230, Cl. 128-842.000.
- Bellaform Extrusionstechnik GmbH: *See—*
  - Metzger, Burkhard; and Ziolkowski, Hans, 5,531,947, Cl. 264-102.000.
- Belleau, Bernard, deceased (by Pierrette Belleau, executrix); and Nguyen-Ba, Nghe, to BioChem Pharma, Inc. Use of 1,3-oxathiolane nucleoside analogues in the treatment of hepatitis B. 5,532,246, Cl. 514-274.000.
- Belleau, Pierrette, executrix: *See—*
  - Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,532,246, Cl. 514-274.000.
- BellSouth Corporation: *See—*
  - Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
- Bender, Hans-Jürgen: *See—*
  - Klein, Achim; and Bender, Hans-Jürgen, 5,531,090, Cl. 72-236.000.
- Bendit, Barbara G. Clampshade. 5,532,912, Cl. 362-352.000.
- Benedetto, Adrian; and Schachtebeck, Winfried, to Krone Aktiengesellschaft. Device for mounting terminal strips in communications technology. 5,531,414, Cl. 248-201.000.
- Bennett, Brian D.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,532,370, Cl. 544-279.000.
- Bennett, Robert, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Cotton swabs with expanded tips. 5,531,671, Cl. 604-1.000.
- Benninger AG: *See—*
  - Beerli, Markus, 5,531,001, Cl. 28-198.000.
- BenOpcon, Inc.: *See—*
  - Betensky, Ellis I., 5,532,875, Cl. 359-399.000.
- Bensimon, Daniel; Osborn, Neal A.; and Pacheco, Joaquin F., to International Business Machines Corporation. Removable computer security device. 5,533,125, Cl. 380-4.000.
- Benson, Jonathan M.: *See—*
  - Fossan, Helge; and Benson, Jonathan M., 5,531,769, Cl. 607-7.000.
- Benton, Michael K.; Gold, Anthony P.; and Schranz, Richard A., to Unisys Corporation. Method and apparatus for simultaneous interconnection of multiple requestors to multiple memories. 5,533,201, Cl. 395-280.000.
- Benveniste, Victor M., to Eaton Corporation. Ion beam electron neutralizer. 5,531,420, Cl. 250-251.000.
- Benz, Patrick H.; and Ors, Jose A., to Benz Research and Development Corp. Contact lens having improved dimensional stability. 5,532,289, Cl. 523-106.000.
- Benz Research and Development Corp.: *See—*
  - Benz, Patrick H.; and Ors, Jose A., 5,532,289, Cl. 523-106.000.
- Benziger, Jay B.; Guliants, V. Vance; and Sundaresan, Sankaran, to Trustees of Princeton University. Catalytic process for the production of maleic anhydride. 5,532,385, Cl. 549-259.000.
- Beratan, Howard R.: *See—*
  - Sweetser, Kevin N.; Beratan, Howard R.; and Owen, Robert A., 5,532,484, Cl. 250-332.000.
- Bercaw, Craig A.: *See—*
  - Fodor, Mark A.; Bercaw, Craig A.; and Dornfest, Charles, 5,531,835, Cl. 118-728.000.
- Bercot, Dwayne: *See—*
  - Brun, Charles J., Jr.; Bercot, Dwayne; and Newport, Anthony, 5,531,588, Cl. 425-556.000.
- Berdel, Norbert; and Chojnowski, Marian, to Cerdec Aktiengesellschaft Keramische Farben. Metering pallet. 5,531,360, Cl. 222-185.100.
- Beresheim, Thomas H. Lock assembly having a bolt with an extending tang. 5,531,487, Cl. 292-146.000.
- Beretta, Giordano B., to Canon Information Systems, Inc. Method and apparatus for adjusting correlated color temperature. 5,532,848, Cl. 358-504.000.
- Berg, Arne; Almén, Torsten; Klaveness, Jo; Rongved, Pal; Thomassen, Terje; and Dugstad, Harald, to Nycomed Imaging AS. Aminopolycarboxylic acids and derivatives thereof. 5,531,978, Cl. 424-1.110.
- Bergemann, Eugene P.: *See—*
  - Datta, Rathin; and Bergemann, Eugene P., 5,532,148, Cl. 435-144.000.
- Berger, John G.; Priepke, Edward H.; and Torland, Peter J., to New Holland North America, Inc. Diesel engine reverse start inhibit. 5,531,070, Cl. 60-327.000.
- Berger, Kerry R.: *See—*
  - Bonner, Brian B.; Garg, Diwakar; and Berger, Kerry R., 5,531,372, Cl. 228-220.000.
- Berger-Paskin, Tirtsah: *See—*
  - Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.
- Berggren, Peter G. Combination chair for children. 5,531,502, Cl. 297-131.000.
- Bergsneider, Carl W., to Loral Corporation. Image animation for visual training in a simulator. 5,533,181, Cl. 395-152.000.
- Berkhof, Marc: *See—*
  - Giele, Vincent; and Berkhof, Marc, 5,531,783, Cl. 607-126.000.
- Berko-Boateng, Victor: *See—*
  - Bean, Lloyd F.; and Berko-Boateng, Victor, 5,532,092, Cl. 430-42.000.
- Berlaimont, Claude, to Fonderies Du Lion S.A.; and Nestor Martin S.A. Solid or liquid fuel stove. 5,531,213, Cl. 126-193.000.
- Berman, Dov: *See—*
  - Krams, Zvi; Berman, Dov; Bieber, Avigdor; and Livni, Avinoam, 5,532,728, Cl. 347-257.000.
- Bermes, Rudolf; and Breitschaft, Walter, to BASF Aktiengesellschaft. Aqueous dye preparations containing coumarin dyes. 5,531,797, Cl. 8-648.000.
- Bernabei, Ida: *See—*
  - Giannessi, Fabio; Scafetta, Nazareno; Bernabei, Ida; Tinti, Maria O.; and De Angelis, Francesco, 5,532,410, Cl. 562-567.000.
- Bernier, Thierry: *See—*
  - Isard, Marc; and Bernier, Thierry, 5,533,050, Cl. 375-229.000.
- Bernotas, Ronald C.: *See—*
  - Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,532,252, Cl. 514-309.000.
- Bernotat-Danielowski, Sabine: *See—*
  - Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücher, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, 5,532,255, Cl. 514-326.000.
- Berns, John S.; and Dickhut, Heinrich, to Cullom Machine Tool & Die, Inc. Vacuum mold blocks with cooling for corrugated tubing. 5,531,583, Cl. 425-193.000.
- Bertin, Claude L.; Cronin, John E.; and Perlman, David J., to International Business Machines Corporation. Cube wireability enhancement with chip-to-chip alignment and thickness control. 5,532,519, Cl. 257-777.000.
- Bertrand Faure Ltd.: *See—*
  - Hughes, Daniel, 5,531,503, Cl. 297-341.000.
- Besnier, Joseph, to Compagnie Generale Des Matieres Nucleaires. Automated analysis chain. 5,531,964, Cl. 422-63.000.
- Best, David J.; Globig, James E.; Markham, James G.; and Craig, Gina M., to Monarch Marking Systems, Inc. Bar code identification system format editor. 5,533,176, Cl. 395-117.000.
- Bestline Liner Systems: *See—*
  - Dobson, Richard M.; Herndon, Jefferey D.; and Hudson, Leo D., 5,531,273, Cl. 166-278.000.
- Beta Instrument Co., Ltd.: *See—*
  - Kyriakis, John, 5,532,588, Cl. 324-226.000.
- Betco Corporation: *See—*
  - Wright, Timothy J.; Hartman, Gary G.; and Culver, Jeffrey A., 5,532,291, Cl. 523-122.000.
- Betensky, Ellis I., to BenOpcon, Inc. Wide angle binocular system with variable power capability. 5,532,875, Cl. 359-399.000.
- Beth Israel Hospital: *See—*
  - Cantley, Lewis C.; and Songyang, Zhou, 5,532,167, Cl. 436-89.000.
- Betto, Massimo, to Alutecnos S.r.l. Guiding device for fishing-rod lines. 5,531,041, Cl. 43-24.000.
- Betz Laboratories, Inc.: *See—*
  - Minevski, Ljiljana V.; and Bockowski, Edmund J., 5,531,937, Cl. 252-394.000.
- Betz PaperChem, Inc.: *See—*
  - Schuster, Michael A.; Harrington, John C., IV; Liao, Wen P.; and Chen, Fu, 5,532,308, Cl. 524-447.000.
- Beuers, Joerg: *See—*
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- Beus, Glen S.: *See—*
  - Rink, Karl K.; Beus, Glen S.; Johnson, Kelly B.; and Monk, David B., 5,531,473, Cl. 280-737.000.
- Beyer, Douglas H.; Williams, Eugene V.; and Alvarez, Jose A., to Richmond Technology, Inc. Air ionizing device. 5,532,902, Cl. 361-230.000.
- Beziers, Daniel; Chataignier, Evelyne; and Noireaux, Patrick, to Aerospatiale Societe Nationale Industrille. Process for the preparation of a polysilane crosslinked by ionizing radiation and process for the production of a composite material having a polysilane matrix. 5,532,288, Cl. 522-71.000.

- Bhaskar, Bangalore R. R. U., to Comsat Corporation. Adaptive predictive coding with transform domain quantization based on block size adaptation, backward adaptive power gain control, split bit-allocation and zero input response compensation. 5,533,052, Cl. 375-244.000.
- Bhattacharyya, Bidyut K.: *See—*
  - Madrid, Anna; Jacobson, Scott; and Bhattacharyya, Bidyut K., 5,532,983, Cl. 368-113.000.
- Bianchini, Marco, to Consiglio Nazionale delle Ricercbe. Device serving as indicator of thermal history especially for frozen products and the like. 5,531,180, Cl. 116-216.000.
- Bianchini, Robert J.: *See—*
  - Shevade, Makarand; Bianchini, Robert J.; and Lee, Wilson, 5,531,986, Cl. 424-68.000.
- Bichon, Daniel: *See—*
  - Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,531,980, Cl. 424-9.520.
- Bickford, Charles. Masonry fixing. 5,531,553, Cl. 411-389.000.
- Bieber, Avigdor: *See—*
  - Krams, Zvi; Berman, Dov; Bieber, Avigdor; and Livni, Avinoam, 5,532,728, Cl. 347-257.000.
- Biek, Paul A., to Indresco Inc. Sensor impulse unit. 5,531,279, Cl. 173-178.000.
- Biella, Daniele, to Alcatel Italia S.p.A. Arrangement for comparing two temporally separated bursts of signal at two different frequencies. 5,532,701, Cl. 342-387.000.
- Bienvenu, Raymond L., Jr. Lightweight proppants and their use in hydraulic fracturing. 5,531,274, Cl. 166-280.000.
- Biese, John R.; and Vanden Heuvel, Gregory J., to Reynolds Consumer Products Inc. Bag folding apparatus. 5,531,660, Cl. 493-243.000.
- Biezen, Paul W. A. C.: *See—*
  - De Haan, Gerard; Biezen, Paul W. A. C.; and Ojo, Olukayode A., 5,532,750, Cl. 348-452.000.
- Big Sky Racks, Inc.: *See—*
  - Morford, Ted, 5,531,368, Cl. 224-551.000.
- Bindi, Dominique: *See—*
  - Drivon, Gilles; and Bindi, Dominique, 5,532,420, Cl. 570-170.000.
- Bindu Madhavan, G. V.: *See—*
  - Van Der Puy, Michael; Bindu Madhavan, G. V.; Thenappan, Alagappan; and Tung, Hsueh S., 5,532,419, Cl. 570-167.000.
- Binford, Charles D.; Gaertner, Mark A.; and Denny, Steven P., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Method for maintaining parity-data consistency in a disk array. 5,533,190, Cl. 395-182.040.
- Bingham, Joseph P.: *See—*
  - Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, 5,532,763, Cl. 348-744.000.
- Bio Medic Data Systems, Inc.: *See—*
  - Urbas, Donald J.; Ellwood, David; and Burne, John, 5,532,686, Cl. 340-825.540.
- Bio-Safe Specialty Products, Inc.: *See—*
  - Peters, Donald F., 5,531,927, Cl. 510-281.000.
- BioChem Pharma, Inc.: *See—*
  - Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,532,246, Cl. 514-274.000.
- Biochimica Opos SpA: *See—*
  - Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, 5,532,353, Cl. 540-215.000.
- Biondo, John P., to Bateville Casket Company, Inc. Slide locking externally removable casket hardware. 5,531,000, Cl. 27-27.000.
- Bione, Angelo A., to Zenith Electronics Corporation. Apparatus using a binary coded decimal switch and a programmable logic array for selectively coupling terminals of a controller chip to data bus lines. 5,533,202, Cl. 395-280.000.
- BioNebraska, Inc.: *See—*
  - Carlson, Randall R.; Stout, Jay S.; Wylie, Dwane E.; Wagner, Fred W.; and Riddell, Malcolm, 5,532,136, Cl. 435-7.920.
- Bioscience Consultants: *See—*
  - Wolfinbarger, Lloyd, Jr., 5,531,791, Cl. 623-16.000.
- BioTraces, Inc.: *See—*
  - Drukier, Andrzey K., 5,532,122, Cl. 435-5.000.
- Birchfield, Jerry W.: *See—*
  - Issa, Darrell E.; and Birchfield, Jerry W., 5,532,670, Cl. 340-429.000.
- Bishop, Robert P.: *See—*
  - Brookfield, David A.; and Bishop, Robert P., 5,531,102, Cl. 73-54.320.
- Bissen, Eugene T. Oscillating drum sander. 5,531,636, Cl. 451-130.000.
- Black, Michael, to Rapistan Demag Corporation. Automatic color-activated scanning treatment of dermatological conditions by laser. 5,531,740, Cl. 606-9.000.
- Blackledge, John W., Jr.; and Frey, Bradly G., to International Business Machines Corporation. Method and system for efficient bus allocation in a multimedia computer system. 5,533,205, Cl. 395-297.000.
- Blades, Jerry A.: *See—*
  - Bates, Cary L.; Blades, Jerry A.; Kiel, Harvey G.; Romon, Raymond F.; and Ryan, Jeffrey M., 5,532,715, Cl. 345-123.000.
- Blahut, Donald E.; Schell, William M.; Story, Guy A.; and Szurkowski, Edward S., to AT&T Corp. Method of advertisement selection for interactive service. 5,532,735, Cl. 348-13.000.
- Blair, Edward J.: *See—*
  - Taravella, Philip; Blair, Edward J.; Domanski, Ronald S.; and Shippell, Joseph C., 5,531,165, Cl. 108-51.300.
- Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., to International Business Machines Corporation. Fault tolerant computer memory systems and components employing dual level error correction and detection with disablement feature. 5,533,036, Cl. 371-40.100.
- Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., to AT&T Corp. Decreasing length tracebacks. 5,533,065, Cl. 375-341.000.
- Blanchard, Elwood N.: *See—*
  - Stouffer, Jan M.; Blanchard, Elwood N.; and Leffew, Kenneth W., 5,532,333, Cl. 528-308.200.
- Blanchette, Robert A.; Farrell, Roberta L.; and Behrendt, Chad J., to Sandoz Ltd. Biological control for wood products. 5,532,164, Cl. 435-277.000.
- Blanchfield, Phillip; and Hiltunen, David, to Carolina Knife Company, Inc. Split slitter. 5,531,536, Cl. 403-340.000.
- Blanco, Carlos H.: *See—*
  - Hita de la Torre, Carlos; Escrihuela Langa, Francisco J.; Martinez Garcia, Francisco J.; and Blanco, Carlos H., 5,533,028, Cl. 370-95.300.
- Blank, Eric. Card with removable reusable element. 5,531,482, Cl. 283-67.000.
- Blankenhorn, Glenn D., III: *See—*
  - Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.
- Blevins, David L.: *See—*
  - Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., 5,531,250, Cl. 138-94.000.
- Blistex Inc.: *See—*
  - Wojcik, Michael A.; and Donnantuono, Michael J., 5,531,349, Cl. 220-339.000.
- Block, Timothy M.; and Grafstrom, Robert H., to Thomas Jefferson University. Genetically engineered bacteria to identify and produce medically important agents. 5,532,124, Cl. 435-5.000.
- Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., to Sandia Corporation. Methods and apparatus for altering material using ion beams. 5,532,495, Cl. 250-492.210.
- Blosser, Donald L.: *See—*
  - Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., 5,533,100, Cl. 379-67.000.
- Blott, Patrick L.: *See—*
  - Webb, Julian A.; and Blott, Patrick L., 5,531,667, Cl. 602-8.000.
- Blum, Matthias; Heimerl, Josef; Bahr, Martin; and Bauer, Volker, to Leybold Durferrit. Magnetic deflection system for a high-power electron beam. 5,532,446, Cl. 219-121.250.
- Blum, Richard; Groh, Hans-Michael; Kuester, Willi; and Herr, Klaus-Jürgen, to Siemens Aktiengesellschaft. Switch cabinet with sealing elements for sealing a door when closed. 5,532,426, Cl. 174-356.00C.
- Blum, Ronald D.: *See—*
  - Gupta, Amitava; and Blum, Ronald D., 5,531,940, Cl. 264-1.700.
- Blumberg, Richard J.: *See—*
  - Waggoner, Charles D.; Blumberg, Richard J.; and Kotzur, Gary B., 5,532,630, Cl. 327-108.000.
- Blumhardt, Mark S., to US WEST Technologies, Inc. Method and system for processing calls wherein the display of calling party ID information has been inhibited. 5,533,106, Cl. 379-142.000.
- Bluzer, Nathan; and Forrester, Martin G., to Northrop Grumman Corp. Multispectral superconductive quantum detector. 5,532,485, Cl. 250-336.200.
- BMC Industries, Inc.: *See—*
  - Hughes, Frank J.; and Travnicek, Edward A., 5,531,935, Cl. 252-586.000.
- Board of Regents of Oklahoma State University, The: *See—*
  - Cheng, Nan-Zheng; and Stoecker, Barbara, 5,531,991, Cl. 424-195.100.
- Board of Regents, the University of Texas System: *See—*
  - Johnston, Stephen A.; and Dougherty, William G., 5,532,142, Cl. 435-69.100.
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- Board of Trustees operating Michigan State University: *See—*
  - Kanatzidis. Mercouri G.; Liao, Ju H.; and Marking, Gregory A., 5,531,936, Cl. 252-587.000.
- Boateng, Daniel A. D.: *See—*
  - Hampton, Cashman R. S. M.; Steiner, Victor E.; and Boateng, Daniel A. D., 5,531,903, Cl. 210-683.000.
- Bobry, Howard H.: *See—*
  - Kaiser, Frederick; and Bobry, Howard H., 5,532,525, Cl. 307-64.000.
- Boc Group, Inc., The: *See—*
  - Ojo, Adeola F.; Fitch, Frank R.; and Bülow, Martin, 5,531,808, Cl. 95-96.000.
  - Shirley, Arthur; and Ramachandran, Ramakrishnan, 5,532,384, Cl. 549-257.000.
- Bockowski, Edmund J.: *See—*
  - Minevski, Ljiljana V.; and Bockowski, Edmund J., 5,531,937, Cl. 252-394.000.
- Bodager, Gregory A.; and Beighle, Phillip L., to Du Pont de Nemours, E. I., and Company. Process for forming a colored image utilizing a non-photosensitive/photosensitive combination. 5,532,115, Cl. 430-325.000.

- Bode, Robert M.: *See—*
  - Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., 5,532,693, Cl. 341-51.000.
- Bodysonics, Inc.: *See—*
  - Peters, Aemil J. M.; Masterson, Byron J.; and Abrams, Robert M., 5,532,681, Cl. 340-573.000.
- Boehringer Ingelheim GmbH: *See—*
  - Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, 5,532,368, Cl. 544-267.000.
- Boehringer Ingelheim KG: *See—*
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Boehringer Ingelheim Pharmaceuticals, Inc.: *See—*
  - Kelly, Terence A., 5,532,358, Cl. 540-495.000.
- Boehringer Mannheim GmbH: *See—*
  - Ziegenhorn, Joachim; Schiefer, Sigbert; and Dräger, Brigitte, 5,532,172, Cl. 436-539.000.
- Bogan, Leonard E., Jr., to Rohm and Haas Company. Method for forming an aqueous dispersion of ceramic material. 5,532,307, Cl. 524-407.000.
- Bogin, Zohar: *See—*
  - Dobbins, Timothy M.; and Bogin, Zohar, 5,533,200, Cl. 395-280.000.
- Boitiau, Jean Paul: *See—*
  - Cameron, Charles; Cosyns, Jean; Sarrazin, Patrick; Boitiau, Jean Paul; and Courty, Philippe, 5,531,886, Cl. 208-251.00H.
- Bold, Jörg, to Babcock BSH Aktiengesellschaft Vormals Buttner-Schilde-Haas AG. Process for the production of staff panels according to a semidry method and installation for implementing the process. 5,531,946, Cl. 264-102.000.
- Bolli, Gerhard: *See—*
  - Futterer, Manfred; and Bolli, Gerhard, 5,531,104, Cl. 73-61.690.
- Bolton, Theodore S.; and Stopyra, Stephen, to Carrier Corporation. Power cord strain relief for room air conditioner. 5,532,435, Cl. 174-135.000.
- Bomann, Werner: *See—*
  - Schmidt, Michael; Bomann, Werner; Janott, Dietrich W.; and Werner, Herbert, 5,531,994, Cl. 424-405.000.
- Bonaccio, Anthony R., to International Business Machines Corporation. Precision level shifter w/current mirror. 5,532,619, Cl. 326-75.000.
- Bonekamp, Jeffrey E.; Swartzmiller, Steven B.; Donald, Robert J.; and Uzee, Andre J., to Dow Chemical Company, The. Thermoformable, chemical resistant polymer blends. 5,532,315, Cl. 525-71.000.
- Bonetti, Carla: *See—*
  - Galliani, Giulio; Barzashi, Fernando; Butti, Alina; Bonetti, Carla; and Toja, Emilio, 5,532,375, Cl. 546-334.000.
- Bonino, Joseph S.; Sieri, Philip; and Glowacki, John F., to Wheaton Inc. Machine for injection blow molding. 5,531,580, Cl. 425-136.000.
- Bonner, Brian B.; Garg, Diwakar; and Berger, Kerry R., to Air Products And Chemicals, Inc. Moisture-free atmosphere brazing of ferrous metals. 5,531,372, Cl. 228-220.000.
- Bonnet, Roselyne: *See—*
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Bonrath, Herbert; Hochgesang, Gerhard; Brüggemann, Ulrich; and Heil, Hans-Karl, to Preh-Werke GmbH & Co., KG. Push button switch. 5,532,444, Cl. 200-524.000.
- Boonstra, Eric F.: *See—*
  - Werner, Joachim; Kane, Scott A.; Boonstra, Eric F.; and Doerge, Herman P., 5,532,283, Cl. 521-131.000.
- Booth Manufacturing Company: *See—*
  - Cubow, Joseph; and Tritt, Charles, 5,531,853, Cl. 156-521.000.
- Borbone, Joseph A., to Emhart Glass Machinery Investments Inc. Valve block assembly for I.S. machine. 5,531,249, Cl. 137-884.000.
- Borden, Inc.: *See—*
  - Chawan, Dhyaneshwar B.; Merritt, Carleton G.; and Gillmore, Stephen R., 5,532,016, Cl. 426-557.000.
- Borg-Warner Automotive, Inc.: *See—*
  - Moyers, Chester E.; and Lenz, Robert L., 5,532,436, Cl. 174-151.000.
  - Roberts, Keith; Thomas, Christopher D.; Lamin, James L.; Skipper, Gary I.; and Larsen, Jonathan G., 5,531,305, Cl. 192-53.332.
- Borneby, Hans G., to Indian Head Industries, Inc. Expandable gasket, sealed joint and method of forming same. 5,531,454, Cl. 277-26.000.
- Borodovsky, Yan A., to Intel Corporation. Method and apparatus for enhanced contact and via lithography. 5,532,090, Cl. 430-5.000.
- Borst, Ronald W.; and David, Donald R., to Clay and Bailey Manufacturing Company. Temperature and pressure resistant shutoff valve. 5,531,247, Cl. 137-447.000.
- Bossen, Douglas C.: *See—*
  - Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., 5,533,036, Cl. 371-40.100.
- Bottacco, Carlo M. G., to Forbrose B.V. Automatic apparatus for metering spaghetti and the like. 5,531,362, Cl. 222-390.000.
- Böttcher, Henning; Seyfried, Christoph; Bartoszyk, Gerd; and Greiner, Hartmut, to Merck Patent Gesellschaft mit beschrankter Haftung. Piperidines and piperazines. 5,532,241, Cl. 514-254.000.
- Bottman, Jeffrey S., to Fluke Corporation. Cross-talk measurement apparatus with near-end compensation. 5,532,603, Cl. 324-628.000.
- Bouchard, Hervé; Bourzat, Jean-Dominique; and Commercon, Alain, to Rhone-Poulenc Rorer S.A. Taxoids, their preparation and pharmaceutical compositions containing them. 5,532,388, Cl. 549-510.000.
- Bouffard, Leif E.: *See—*
  - Erickson, William R.; and Bouffard, Leif E., 5,531,975, Cl. 423-319.000.
- Bougauchi, Masahiro: *See—*
  - Nakao, Tohru; Ono, Yuji; Bougauchi, Masahiro; and Morimoto, Yasuto, 5,532,240, Cl. 514-254.000.
- Bouleau, Jean-Paul A. A.; and Guillot, Gerard L. H., to Moulinex (Societe Anonyme). Sole for an electric steam iron with alternating vaporization and heating regions. 5,532,455, Cl. 219-245.000.
- Bounds, Terry R.: *See—*
  - Ball, Harold L.; Bounds, Terry R.; Ball, Eric S.; and Ball, Jeffrey L., 5,531,894, Cl. 210-605.000.
- Bourzat, Jean-Dominique: *See—*
  - Bouchard, Hervé; Bourzat, Jean-Dominique; and Commercon, Alain, 5,532,388, Cl. 549-510.000.
- Boverie, Serge; Demaya, Bernhard; and Titli, André, to Siemens Automotive S.A. Method of suppressing a pinging phenomenon affecting the operation of an internal combustion engine. 5,531,201, Cl. 123-425.000.
- Bowden, William L.: *See—*
  - Wang, Enoch I.; Bowden, William L.; and Lin, Lifun, 5,532,084, Cl. 429-224.000.
- Bowers, James D. Rivet assembly. 5,531,551, Cl. 411-70.000.
- Bowling, Nancy L., to Eli Lilly and Company. Modulation of calcium channels using benzothiophenes. 5,532,254, Cl. 514-320.000.
- Bowman, Patricia I.: *See—*
  - Newington, Ian M.; Parr, Kevin J.; Bowman, Patricia I.; and McCue, Karen A., 5,532,290, Cl. 523-122.000.
- Boyd, Jack D.: *See—*
  - Recker, Hans G.; Tesch, Helmut; Weber, Thomas; Altstaedt, Volker; and Boyd, Jack D., 5,532,296, Cl. 523-400.000.
- Boyer, Keith G., to Storage Technology Corporation. Fault tolerant fiber optic protocol for determining beginning of data. 5,533,039, Cl. 371-67.100.
- Boyette, James E., Jr.: *See—*
  - Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., 5,532,611, Cl. 324-758.000.
- Boyko, Stephen: *See—*
  - Asselta, John A.; Balan, Albert L.; Boyko, Stephen; and Myers, James E., 5,532,907, Cl. 361-775.000.
- Boyle, Patrick. Rockable billiard ball rack and method of racking balls. 5,531,646, Cl. 473-40.000.
- Boyle, William J., Jr.: *See—*
  - Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, 5,531,998, Cl. 424-426.000.
- Bracco International BV: *See—*
  - Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,531,980, Cl. 424-9.520.
- Bracco, Michael J.: *See—*
  - Fleek, Arthur E.; Camp, William O., Jr.; Warchocki, Gary M.; and Bracco, Michael J., 5,533,069, Cl. 375-344.000.
- Bradley, Ralph H.: *See—*
  - Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, 5,532,763, Cl. 348-744.000.
- Branch, Tony R.: *See—*
  - Liberti, Joseph C., Jr.; Averst, Douglas I.; Branch, Tony R.; and Carsello, Stephen R., 5,533,062, Cl. 375-334.000.
- Brandes, Wilhelm; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; Kuck, Karl-Heinz; and Krüger, Bernd-Wieland, to Bayer Aktiengesellschaft. Fungicidal active compound combinations. 5,532,262, Cl. 514-388.000.
- Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., to International Business Machines Corporation. Apparatus and method for segmentation and time synchronization of the transmission of multimedia data. 5,533,021, Cl. 370-60.100.
- Bratt, David W.: *See—*
  - Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., 5,531,561, Cl. 414-686.000.
- Braun Aktiengesellschaft: *See—*
  - Pons, Francesc; Perez, Pedro; and Auria, Augustin, 5,531,037, Cl. 38-77.800.
- Braun, David A., to Bell Communications Research, Inc. Camera arrangement with wide field of view. 5,532,737, Cl. 348-36.000.
- Braun, Max; Rudolph, Werner; Palsherm, Stefan; and Eichholz, Kerstin, to Solvay Fluor und Derivate GmbH. Production of carboxylic acid halides and carboxylate salts. 5,532,411, Cl. 562-861.000.
- Bräutigam, Matthias: *See—*
  - Neef, Gunter; Kirsch, Gerald; Stein-Eyer, Andreas; Schwarz, Katica; Bräutigam, Matthias; Thieroff-Ekerdt, Ruth; and Rach, Petra, 5,532,228, Cl. 514-167.000.
- Brawner, Jon M.: *See—*
  - Rich, Benny R.; and Brawner, Jon M., 5,532,046, Cl. 428-202.000.
- Brearley, Ann M.; and Gold, Harvey S., to Du Pont de Nemours, E. I., and Company. Near-infrared measurement and control of polyamide processes. 5,532,487, Cl. 250-339.120.
- Breed Automotive Technology, Inc.: *See—*
  - Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,531,474, Cl. 280-74.00D.
- Breitschaft, Walter: *See—*
  - Bermes, Rudolf; and Breitschaft, Walter, 5,531,797, Cl. 8-648.000.
- Brener, Igal M.: *See—*

  - Amorai-Moriya, Netzer; Brener, Igal M.; and Feldman, Leonard C., 5,532,510, Cl. 257-618.000.
- Brent America, Inc.: *See—*
  - Gorecki, George J., 5,531,820, Cl. 106-287.110.
- Breton, Dannys, to Atomic Energy Of Canada Limited. Low-heat high-performance concrete. 5,531,823, Cl. 106-713.000.
- Bridges, William B.: *See—*
  - Hayes, Robert R.; and Bridges, William B., 5,532,867, Cl. 359-329.000.
- Bridgestone Corporation: *See—*
  - Hashimoto, Takatsugu; Akutagawa, Keizo; Yagawa, Kazuo; Tanaka, Makoto; Yamagishi, Junichi; and Hachiya, Kazuo, 5,531,256, Cl. 152-209.00R.
  - Iino, Yasuhiro; Matsushima, Yosuke; Terazawa, Tomozane; and Sugiki, Shozo, 5,531,469, Cl. 280-728.300.
- Briggs, Barbara S.; and Zmijewski, Milton J., Jr., to Eli Lilly and Company. Removal of phthalyl groups from amides and esters using an amidase isolated from *Xanthobacter Agilis* . 5,532,149, Cl. 435-122.000.
- Briggs, Barbara S.; and Zmijewski, Milton J., Jr., to Eli Lilly and Company. Phthalyl amidase-producing *Xanthobacter agilis. 5,532,161, Cl. 435-252.100.*
- Brigham & Women's Hospital, Inc., The: *See—*
  - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Brinda, Paul D.; and Cosentino, Louis C., to Minntech Corporation. Method of manufacturing of hollow fiber cartridge with porous ring. 5,531,848, Cl. 156-77.000.
- Brink, Thomas J.; and Stone, James L., to Packaging Corporation of America. Paperboard container with integral paperboard pour spout. 5,531,376, Cl. 229-215.000.
- Brismark, Gustav: *See—*
  - Jamal, Karim; Gudmundson, Björn; and Brismark, Gustav, 5,533,067, Cl. 375-341.000.
- British Telecommunications, plc: *See—*
  - Maxwell, Graeme D.; and Ainslie, Benjamin J., 5,533,156, Cl. 385-49.000.
  - Smith, Kevin, 5,533,154, Cl. 385-27.000.
- Broadhead, Peter, to Rolls-Royce plc. Turbine blade. 5,531,568, Cl. 416-97.00R.
- Bronicki, Lucien Y.; and Elovic, Asher, to Ormat Turbines (1965) Ltd. Rankine cycle power plant utilizing organic working fluid. 5,531,073, Cl. 60-641.200.
- Bronk, Burt V.: *See—*
  - Arnold, Stephen; Hendrie, Piers; and Bronk, Burt V., 5,532,140, Cl. 435-34.000.
- Brook, Mark G.; and Tellam, Mark E., to AGFA Division, Bayer Corporation. Method and apparatus for positioning a focusing lens. 5,532,846, Cl. 358-497.000.
- Brookfield, David A.; and Bishop, Robert P., to Brookfield Engineering Laboratories, Inc. Viscometer usable in situ in large reactor vessels. 5,531,102, Cl. 73-54.320.
- Brookfield Engineering Laboratories, Inc.: *See—*
  - Brookfield, David A.; and Bishop, Robert P., 5,531,102, Cl. 73-54.320.
- Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., to General Motors Corporation. Brake actuator. 5,531,298, Cl. 188-78.000.
- Brooks, John: *See—*
  - Shaw, Ronald; Brooks, John; and Flemming, Frank, 5,532,773, Cl. 353-26.00A.
- Brooks, Troy L., to Wm. T. Burnett & Co., Inc. Densified thermo-bonded synthetic fiber batting. 5,532,050, Cl. 428-220.000.
- Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., to International Business Machines Corporation. Electro-etching tool using localized application of channelized flow of electrolyte. 5,531,874, Cl. 204-224.00M.
- Brother Kogyo Kabushiki Kaisha: *See—*
  - Asano, Yuji; and Tomida, Wataru, 5,532,840, Cl. 358-404.000.
  - Hattori, Yuji, 5,532,792, Cl. 355-206.000.
  - Sawada, Hidemasa, 5,531,819, Cl. 106-31.00R.
- Broussard, Golden R. Irrigation standpipe flow diverter and method for making same. 5,531,243, Cl. 137-315.000.
- Brouwer, Douglas J., to Kohler Co. Self-adjusting bearing. 5,531,524, Cl. 384-220.000.
- Brouwer, Emilio A. Specimen container. 5,531,966, Cl. 422-102.000.
- Brown, Charles G.: *See—*
  - Ward, Kevin R.; Brown, Charles G.; and Dzwonczyk, Roger R., 5,531,776, Cl. 607-105.000.
- Brown, Dennis T., to Research Development Foundation. Mutated alpha virus. 5,532,154, Cl. 435-235.100.
- Brown, Donald W.; Hannan, William F., III; and Pavlik, Dennis, to Westinghouse Electric Corporation. Reconfigurable hybrid power generation system. 5,532,573, Cl. 322-22.000.
- Brown, Jerry S.; and Conkling, John A., to United States of America, Navy. Energetic compositions containing no volatile solvents. 5,531,844, Cl. 149-19.300.
- Brown, Kevin. Acoustic imaging sound dome. 5,532,438, Cl. 181-155.000.
- Brown, Michael S.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- Brown, Paul M.; Hedayat, Shahin; and Urbani, George V., to Cirrus Logic, Inc. Method and apparatus for emulating a telephone with a modem and headset. 5,533,105, Cl. 379-93.000.
- Brown, Ronald E.: *See—*
  - Sparks, Douglas R.; Brown, Ronald E.; Healton, Robert L.; and Christenson, John C., 5,531,121, Cl. 73-716.000.
- Browning, James A., to DRACO. Shock-stabilized supersonic flame-jet method and apparatus. 5,531,590, Cl. 431-8.000.
- Bruchmann, Bernd: *See—*
  - Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.
- Bruderer AG: *See—*
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- Brueckner, Reinhard: *See—*
  - Schoen, Uwe; Brueckner, Reinhard; Meil, Joerg; and Thormaehlen, Dirk, 5,532,251, Cl. 514-300.000.
- Brüggemann, Ulrich: *See—*
  - Bonrath, Herbert; Hochgesang, Gerhard; Brüggemann, Ulrich; and Heil, Hans-Karl, 5,532,444, Cl. 200-524.000.
- Brühl, Hubert, to Mercedes-Benz AG. Hydraulic support. 5,531,426, Cl. 267-140.120.
- Bruker Instruments, Inc.: *See—*
  - Cory, David G.; and Maas, Werner E., 5,532,594, Cl. 324-307.000.
- Brummett, Barry J., to Taco Bell Corp. Automatic taco machine. 5,531,156, Cl. 99-450.100.
- Brun, Charles J., Jr.; Bercot, Dwayne; and Newport, Anthony, to Electra Form, Inc. Adjustable cam track for an injection molding machine. 5,531,588, Cl. 425-556.000.
- Brundiek, Horst; and Lohle, Willy, to Loesche GmbH. Air-swept mill. 5,531,388, Cl. 241-48.000.
- Brunetti, David: *See—*
  - Helmling, Walter; Brunetti, David; and Reiher, Uwe, 5,532,362, Cl. 544-77.000.
- Bruning, John H.: *See—*
  - Tronolone, Mark J.; Dewa, Paul G.; Platten, James E.; and Bruning, John H., 5,532,821, Cl. 356-359.000.
- Brunner, Timothy A.: *See—*
  - Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, 5,532,089, Cl. 430-5.000.
- Bruno, Richard F.: *See—*
  - Harris, Rosemary H.; and Bruno, Richard F., 5,533,108, Cl. 379-201.000.
- Bruski, Richard S.: *See—*
  - Skibo, Michael D.; Schuster, David M.; and Bruski, Richard S., 5,531,425, Cl. 266-208.000.
- Brusky, Carl J., to Kimberly-Clark Corporation. Tape fastener for conveying information and method of manufacture. 5,531,731, Cl. 604-390.000.
- Bryant, Peter J.; and Epstein, Jacob, to United Fuels Limited. Internal combustion engines. 5,531,199, Cl. 123-297.000.
- Bryant, Randy K. Keyless entry deadbolt lock. 5,531,086, Cl. 70-279.000.
- Buchan, William; Patrick, Edward; Takahashi, M.; and Howell, J. V., to Conner Peripherals, Inc. Data stream smoothing method and circuit for a tape drive. 5,532,886, Cl. 360-51.000.
- Buchheit, Rudy: *See—*
  - Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., 5,532,495, Cl. 250-492.210.
- Buchner, Peter; and Spalink, Gerd, to Sony Deutschland GmbH. Remote-controlled on-screen audio/video receiver control apparatus. 5,532,753, Cl. 348-569.000.
- Buchold, Henning: *See—*
  - Schlichting, Eberhard; Buchold, Henning; Mallok, Gerd; Gärtner, Fritz-Jürgen; and Stönner, Hans-Martin, 5,532,393, Cl. 554-170.000.
- Buckle, Philip E.; and Pollard-Knight, Denise V., to Fisons plc. Processing analytical reagents. 5,532,170, Cl. 436-527.000.
- Buckles, Warren E.; and Lundy, Richard A., to Superconductivy, Inc. Modular superconducting energy storage device. 5,532,664, Cl. 335-216.000.
- Buckley, Paul; and Wood, Christopher, to Lucas Industries Public Limited Company. Valve arrangement. 5,531,382, Cl. 239-124.000.
- Bueno, Serge, to Compagnie Generale D'Automatisme CGA-HBS. Method of transmitting data quickly and securely from a smart card during a remote transaction. 5,532,689, Cl. 340-928.000.
- Buettner, Dale. Coated golf club and apparatus and method for the manufacture thereof. 5,531,444, Cl. 473-349.000.
- Buis, Joseph. Anti-theft cage for securing a helmet on a motorcycle. 5,531,364, Cl. 224-413.000.
- BULL CP8: *See—*
  - Hazard, Michel, 5,533,126, Cl. 380-25.000.
- Bull HN Information Systems Italia S.p.A.: *See—*
  - Zulian, Ferruccio, 5,533,150, Cl. 382-275.000.
- Bülow, Martin: *See—*
  - Ojo, Adeola F.; Fitch, Frank R.; and Bülow, Martin, 5,531,808, Cl. 95-96.000.
- Bungo, William M.: *See—*
  - Spanier, Henry C.; Bungo, William M.; and Stevenson, John W., 5,532,010, Cl. 426-94.000.
- Bunya, Takashi: *See—*
  - Maekawa, Tomohiro; Kamoda, Hitoshi; Yui, Yasuji; Iima, Shin; and Bunya, Takashi, 5,531,527, Cl. 400-185.000.
- Burford Corporation: *See—*

  - McCalip, Timothy I.; Frazier, Jimmy R.; and Fagan, John E., 5,531,832, Cl. 118-622.000.
- Burgess, James F.: *See—*
  - Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.
- Burgi, Anthony C.: *See—*
  - Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,531,474, Cl. 280-74.00D.
- Burk, Mark J., to Du Pont de Nemours, E. I., and Company. Chiral phospholanes via chiral 1,4-diol cyclic sulfates. 5,532,395, Cl. 556-18.000.
- Burke, Cathie J.: *See—*
  - Hawkins, William G.; Burke, Cathie J.; Watrobski, Thomas E.; Tellier, Thomas A.; and Vandebroek, Sophie, 5,532,901, Cl. 361-212.000.
- Burke, Edward F.; and Knierim, David L., to Tektronix, Inc. Voltage mode drive of servo system. 5,532,566, Cl. 318-650.000.
- Burke, John T., to Lanxide Technology Company. Method of forming metal matrix composites by use of an immersion casting technique and products produced thereby. 5,531,260, Cl. 164-97.000.
- Burkes, J. Pate; Malone, Philip G.; and Wakeley, Lillian D. Method of increasing density and strength of highly siliceous cement-based materials. 5,531,824, Cl. 106-737.000.
- Burne, John: *See—*
  - Urbas, Donald J.; Ellwood, David; and Burne, John, 5,532,686, Cl. 340-825.540.
- Burnod, Yves; and Leray, Pascal, to France Telecom; and Telediffusion De France-TDF(SA). Neural network system having dynamically reconfigurable connections. 5,533,169, Cl. 395-27.000.
- Burns, Elizabeth G.; Visser, Susan A.; and Taylor, Jeffrey F., to Eastman Kodak Company. Thioether acrylate containing photopolymerizable compositions. 5,532,286, Cl. 522-37.000.
- Burns, Matthew M.; and Lodin, David W., to SciMed Life Systems, Inc. Innerless dilatation balloon catheter. 5,531,689, Cl. 604-99.000.
- Burrafato, Giovanni; and Carminati, Stefano, to Eniricerche S.p.A.; and AGIP S.p.A. Aqueous drilling muds fluidified by means of zirconium and aluminum complexes. 5,532,211, Cl. 507-103.000.
- Burris, Christine: *See—*
  - Gattey, Phillip A.; Burris, Christine; and Jensen, Wolfgang W., 5,533,122, Cl. 379-430.000.
- Burris, Kelly K.; and Smith, Herbert G., Jr. Smart structure egress channel. 5,533,165, Cl. 385-134.000.
- Burton, Douglas; and Jamieson, Eric K., to Otis Elevator Company. Bias torque for elevator hoist drive to avoid rollback, rollforward. 5,531,294, Cl. 187-292.000.
- Burton-Gorman, Nellie: *See—*
  - Ong, Estela T.; and Burton-Gorman, Nellie, 5,531,956, Cl. 419-2.000.
- Buschhaus, Michael C.: *See—*
  - Hawkes, Richard B.; and Buschhaus, Michael C., 5,531,433, Cl. 271-10.010.
- Bush Hog Corporation: *See—*
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- Bussat, Philippe: *See—*
  - Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, 5,531,980, Cl. 424-9.520.
- Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., to American Home Products Corporation. Substituted N-heteroaryl-1,2-diaminocyclobutene-3,4-dione compounds. 5,532,245, Cl. 514-272.000.
- Butler, Edward; Lundberg, Martin B.; Mokashi, Pushkar U.; Sartwell, Alfred L.; Shah, Hemen R.; and Tamlyn, Robert. No latency pipeline. 5,532,970, Cl. 365-230.050.
- Butterworth Jetting Systems, Inc.: *See—*
  - Pacht, Amos, 5,531,383, Cl. 239-251.000.
- Butti, Alina: *See—*
  - Galliani, Giulio; Barzashi, Fernando; Butti, Alina; Bonetti, Carla; and Toja, Emilio, 5,532,375, Cl. 546-334.000.
- Button, Douglas J., to JBL Incorporated. Loudspeaker thermal management structure. 5,533,132, Cl. 381-90.000.
- Butwell, Robert J.; McCune, Earl; Green, Michael; Huey, Hugo; Legarra, James R.; and Wilcox, Ross, to Communications & Power Industries. Method of and apparatus for heating a reaction vessel with microwave energy. 5,532,462, Cl. 219-695.000.
- Buzzrelli, Edward S.: *See—*
  - Thibault, William C.; and Buzzrelli, Edward S., 5,532,086, Cl. 429-245.000.
- Bybee, Steven D., to Morton International, Inc. Hybrid inflator testing tank. 5,531,098, Cl. 73-35.170.
- Byers, William A.: *See—*
  - Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., 5,532,598, Cl. 324-326.000.
- Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., to International Business Machines Corporation. ATM cell scheduler. 5,533,020, Cl. 370-60.100.
- Byrn, Jonathan W.: *See—*
  - Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.
- Byrne, John D., to Nokia Mobile Phones Ltd. Multi-mode radio telephone. 5,533,099, Cl. 379-58.000.
- Cahill, David F., to Eastman Kodak Company. Fuser roller skive mechanism having anti-gouging skive fingers. 5,532,810, Cl. 355-315.000.
- Cainelli, Gianfranco: *See—*
  - Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, 5,532,353, Cl. 540-215.000.
- Caldwell Manufacturing Company: *See—*
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- Calfo, Raymond M.: *See—*
  - Wolfe, William R.; and Calfo, Raymond M., 5,532,574, Cl. 322-37.000.
- Calgon Corporation: *See—*
  - Matz, Gary F.; and Richardson, Paul F., 5,532,413, Cl. 564-240.000.
- Calixto, Jorge Gabrielli Z. Expansion joint sealing element. 5,531,455, Cl. 277-34.000.
- Calmettes, Lionel; Detable, Pascal; and Andre, Michel, to Etablissements Caillau. Band clamp fitting structure. 5,530,996, Cl. 4-20.00R.
- Calvin, John H.: *See—*
  - Love, Charles S.; Love, Jack W.; and Calvin, John H., 5,531,784, Cl. 623-2.000.
- Camco Drilling Group Ltd.: *See—*
  - Murdock, Andrew D., 5,531,281, Cl. 175-431.000.
- Cameron, Charles; Cosyns, Jean; Sarrazin, Patrick; Boitiau, Jean Paul; and Courty, Philippe, to Institut Francals du Petrole. Process for the elimination of arsenic from hydrocarbons by passage over a presulphurated retention mass. 5,531,886, Cl. 208-251.00H.
- Cameron, Donald S.; and Gascoyne, John M., to Johnson Matthey Public Limited Company. Electrode. 5,531,883, Cl. 205-626.000.
- Camp, William O., Jr.: *See—*
  - Fleek, Arthur E.; Camp, William O., Jr.; Warchocki, Gary M.; and Bracco, Michael J., 5,533,069, Cl. 375-344.000.
- Campbell, James B.: *See—*
  - Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, 5,533,170, Cl. 395-108.000.
- Canale, Joseph E.: *See—*
  - Van Der Leeuw, Bart; Kowal, Albert E.; Pragt, Henrikus J. H.; and Canale, Joseph E., 5,532,543, Cl. 313-25.000.
- Cancer Research Fund of Contra Costa: *See—*
  - Ceriani, Roberto L.; Peterson, Jerry A.; and Larocca, David J., 5,532,135, Cl. 435-7.920.
- Canepa, George: *See—*
  - Pantelakis, Dimitris; Tedrow, Kerry; Javanifard, Johnny; and Canepa, George, 5,532,915, Cl. 363-60.000.
- Canon Information Systems, Inc.: *See—*
  - Beretta, Giordano B., 5,532,848, Cl. 358-504.000.
  - Luther, Willis J., 5,533,127, Cl. 380-28.000.
- Canon Kabushiki Kaisha: *See—*
  - Arai, Tsunekazu; Takeuchi, Shinsuke; and Matsubayashi, Kazuhiro, 5,533,147, Cl. 382-179.000.
  - Hashimoto, Shigeru; and Yokoyama, Akihiko, 5,532,871, Cl. 359-359.000.
  - Hirano, Hirofumi, 5,531,531, Cl. 400-629.000.
  - Honma, Yoshihiro, 5,532,758, Cl. 348-694.000.
  - Ishizuka, Koh; and Nishimura, Tetsuharu, 5,532,819, Cl. 356-356.000.
  - Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
  - Miura, Shigeo, 5,533,171, Cl. 395-111.000.
  - Mizoguchi, Yoshito, 5,532,801, Cl. 355-246.000.
  - Nakasugi, Mikio, 5,532,729, Cl. 347-257.000.
  - Nozawa, Keita; Yoshida, Satoshi; and Kukimoto, Tsutomu, 5,532,101, Cl. 430-125.000.
  - Ohyama, Kazuo; Onoda, Shigeyoshi; and Uchida, Haruo, 5,531,436, Cl. 271-275.000.
  - Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,532,713, Cl. 345-97.000.
  - Saito, Hironobu, 5,532,800, Cl. 355-245.000.
  - Sugita, Takeshi; Adachi, Nobukazu; Kuroda, Akira; and Takano, Manabu, 5,532,806, Cl. 355-285.000.
  - Suzuki, Koji; Sekiya, Toshiyuki; and Doi, Koji, 5,532,913, Cl. 363-25.000.
  - Watanabe, Tsuyoshi; Senba, Hisaaki; Matsumoto, Hiroshi; and Yanagida, Makoto, 5,532,799, Cl. 355-245.000.
  - Yonehara, Takao, 5,531,182, Cl. 117-7.000.
- Canon Sales Co., Inc.: *See—*
  - Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,532,193, Cl. 437-243.000.
- Cantley, Lewis C.; and Songyang, Zhou, to Beth Israel Hospital. Substrate specificity of protein kinases. 5,532,167, Cl. 436-89.000.
- Cantor, Philip Stephen: *See—*
  - Oliveira, Canrobert, 5,531,753, Cl. 606-166.000.
- Capistrano Labs, Inc.: *See—*
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- Cappel, Jerome P.: *See—*
  - Vogel, Alice M.; Wahl, Errol H.; Cappel, Jerome P.; and Ward, Thomas C., 5,532,023, Cl. 427-8.000.
- Cappelletti, Joseph; and Zakaria, Samir, to Inco Limited. Automated decoupler for rail cars. 5,531,337, Cl. 213-211.000.
- Capps, Ambers H.: *See—*
  - Duncan, Stewart C.; and Capps, Ambers H., 5,531,638, Cl. 451-364.000.
- Carapezza, William C.: *See—*
  - Wolk, Douglas J.; Carapezza, William C.; and Sylvester, Richard J., 5,531,082, Cl. 70-63.000.

- Carbomedics, Inc.: *See—*
  - More, Robert B.; Strzepa, Peter; Mewhort, Michael J.; and Reventas, Thomas S., 5,531,094, Cl. 73-4.00R.
- Card, Stuart K.: *See—*
  - Henderson, D. Austin, Jr.; Card, Stuart K.; and Maxwell, John T., III, 5,533,183, Cl. 395-158.000.
- Cardiac Pacemakers, Inc.: *See—*
  - Dahl, Roger W.; Wickham, Robert W., deceased; Swanson, David K.; and Lipson, David, 5,531,779, Cl. 607-119.000.
- Cardiovascular Imaging Systems, Inc.: *See—*
  - Moore, Thomas C.; and Jang, Yue-Teh, 5,531,700, Cl. 604-164.000.
- Carduner, Keith R.: *See—*
  - Leong, Dick Y.; Colvin, Alex D.; and Carduner, Keith R., 5,531,105, Cl. 73-116.000.
- Cargill, Incorporated: *See—*
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- Carls, Dennis R.: *See—*
  - Pearson, James E.; and Carls, Dennis R., 5,531,248, Cl. 137-625.460.
- Carlson, Bradley J.: *See—*
  - Stevens, Kenneth A.; and Carlson, Bradley J., 5,531,167, Cl. 108-106.000.
- Carlson, Bryan J., to Advanced Recovery Systems, Inc. Metal and fluorine values recovery from mineral ore treatment. 5,531,970, Cl. 423-3.000.
- Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., to Eli Lilly and Company. Benzothiophenes substituted at the 3-carbonyl. 5,532,382, Cl. 549-57.000.
- Carlson, Randall R.; Stout, Jay S.; Wylie, Dwane E.; Wagner, Fred W.; and Riddell, Malcolm, to BioNebraska, Inc. Monoclonal antibody assay and kit for detecting metal cations in body fluids. 5,532,136, Cl. 435-7.920.
- Carminati, Stefano: *See—*
  - Burrafato, Giovanni; and Carminati, Stefano, 5,532,211, Cl. 507-103.000.
- Carolina Knife Company, Inc.: *See—*
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- Carpenter, Martin A.: *See—*
  - Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
- Carpenter, Roy B., Jr., to Lightning Eliminators & Consultants, Inc. High-voltage surge eliminator. 5,532,897, Cl. 361-118.000.
- Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, to Merrell Pharmaceuticals Inc. Cyclic nitrones. 5,532,252, Cl. 514-309.000.
- Carr, Joseph N.: *See—*
  - DeVries, Robert A.; Sbick, Reed A.; Wells, G. Thomas; and Carr, Joseph N., 5,532,817, Cl. 356-318.000.
- Carr, Kenneth L., to Microwave Medical Systems, Inc. Dual mode microwave/ionizing probe. 5,531,662, Cl. 600-2.000.
- Carrier Corporation: *See—*
  - Bolton, Theodore S.; and Stopyra, Stephen, 5,532,435, Cl. 174-135.000.
  - Pellenz, Peter J.; and Dennis, Richard D., 5,531,076, Cl. 62-184.000.
- Carroll, Gary T.: *See—*
  - Smith, Gregory M.; Yeager, Michael W.; Pauley, J. Donald; and Carroll, Gary T., 5,533,061, Cl. 375-334.000.
- Carroll, Thomas J.: *See—*
  - Bell, Joseph W.; Carroll, Thomas J.; and Puglia, Wayne J., 5,532,004, Cl. 426-5.000.
- Carsello, Stephen R.: *See—*
  - Liberti, Joseph C., Jr.; Averst, Douglas I.; Branch, Tony R.; and Carsello, Stephen R., 5,533,062, Cl. 375-334.000.
- Carter, Robert: *See—*
  - Miraglia, Phillip; Christopherson, Dennis; Carter, Robert; and Umeda, Tadatoshi, 5,531,846, Cl. 156-64.000.
- Carter, Thurman B., to Weatherford US, Inc. Whipstock side support. 5,531,271, Cl. 166-117.600.
- Cartmell, James V.; Sturtevant, Wayne R.; Wolf, Michael L.; and Allaire, Michael J., to NDM, Inc. Rope-shaped wound dressing. 5,531,999, Cl. 424-445.000.
- Caruso, Michele: *See—*
  - Bargiotti, Alberto; Caruso, Michele; Grandi, Maria; Ripamonti, Marina; and Suarato, Antonino, 5,532,218, Cl. 514-34.000.
- Casals-Stenzel, Jorge: *See—*
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Cascade Microtech, Inc.: *See—*
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- Cassidy, Clarence A.: *See—*
  - Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; Cassidy, Clarence A.; and Cassidy, Terry H., 5,531,724, Cl. 604-327.000.
- Cassidy, Ronald F., to Pall Corporation. Gas supply systems. 5,531,220, Cl. 128-204.290.
- Cassidy, Terry H.: *See—*
  - Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; Cassidy, Clarence A.; and Cassidy, Terry H., 5,531,724, Cl. 604-327.000.
- Castagnani, Roberto: *See—*
  - Giannessi, Fabio; Castagnani, Roberto; De Angelis, Francesco; Tinti, Maria O.; and Misiti, Domenico, 5,532,409, Cl. 562-561.000.
- Castor, Rolf, to Siemens Elema AB. Gas analyzer and method for analyzing a gas. 5,531,096, Cl. 73-23.200.
- Catalfamo, Giuseppe. Smoothing mill with suction, by depression in three stages, of dust so generated. 5,531,639, Cl. 451-456.000.
- Caterpillar Inc.: *See—*
  - Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., 5,531,122, Cl. 73-760.000.
  - Codina, George; Copple, Donald L.; and Yakes, Kevin G., 5,532,529, Cl. 307-129.000.
  - Feucht, Dennis D.; Funke, Steven J.; and Meister, Steven F., 5,531,192, Cl. 123-90.120.
  - Kelley, Kurtis C., 5,532,301, Cl. 524-112.000.
- Catheter Imaging Systems: *See—*
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- Catheter Research, Inc.: *See—*
  - Hemmer, Chad G.; Steen, John A.; Forman, Michael R.; and McGrath, Jonathan R., 5,531,685, Cl. 604-95.000.
- Cathey, David A., to Micron Display Technology. Method for forming electron emitters. 5,532,177, Cl. 437-40.000.
- Cauldron Limited Partnership: *See—*
  - Engelsberg, Audrey C.; and Dehais, Joseph A., 5,531,857, Cl. 156-345.000.
- Cavadini, Flavio: *See—*
  - Eichenberger, Hans-Ulrich; Cavadini, Flavio; and Jager, Paul, 5,530,995. Cl. 19-231.000.
- Cavallerano, Alan: *See—*
  - Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, 5,532,744, Cl. 348-390.000.
- Celeritas Technologies, Ltd.: *See—*
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- Center for Prosthetics Orthotics, Inc.: *See—*
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- Centro de Investigacion y de Estudios Avanzados del I.P.N.: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Cerdec Aktiengesellschaft Keramische Farben: *See—*
  - Berdel, Norbert; and Chojnowski, Marian, 5,531,360, Cl. 222-185.100.
- Ceriani, Roberto L.; Peterson, Jerry A.; and Larocca, David J., to Cancer Research Fund of Contra Costa. Solid-phase competitive assay utilizing a fusion protein. 5,532,135, Cl. 435-7.920.
- Cernea, Raul-Adrian; Mehrotra, Sanjay; and Lee, Douglas J., to SanDisk Corporation. Method and circuit for simultaneously programming and verifying the programming of selected EEPROM cells. 5,532,964, Cl. 365-189.090.
- Cerrano, Franco: *See—*
  - Tribioli, Silvano; Giardinelli, Vito; Rocco, Francesco; and Cerrano, Franco, 5,532,079, Cl. 429-119.000.
- Cesaro, Claude; and Richter, Gerard, to International Business Machines Corporation. Voice activity detection method and apparatus using the same. 5,533,118, Cl. 379-386.000.
- Cetnar, Roman, to Atoma International Inc. Anti-kink cable for automotive door handles. 5,531,489, Cl. 292-225.000.
- Cha, Geun Sig, to Du Pont de Nemours, E. I., and Company. Potentiometric ion determinations using enhanced selectivity asymmetric ion-selective membranes. 5,531,870, Cl. 205-778.000.
- Cha, Soyoung S. Holographic diffraction image velocimetry for three-dimensional three-component particle fields or solid objects. 5,532,814, Cl. 356-28.500.
- Chaddick, Steve W.: *See—*
  - Alexander, Stephen B.; Chaddick, Steve W.; and Huber, David R., 5,532,864, Cl. 359-177.000.
- Chaguturu, Munirathnam K.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,532,370, Cl. 544-279.000.
- Chakrabarti, Sarbananda: *See—*
  - Horn, Peter; Reich, Erhard; Adams, Stefan; and Chakrabarti, Sarbananda, 5,531,924, Cl. 252-182.180.
- Challapali, Kiran: *See—*
  - Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, 5,532,744, Cl. 348-390.000.
- Chalmers, Dean R.: *See—*
  - Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., 5,531,561, Cl. 414-686.000.
- Chambers, John S.: *See—*
  - Forgit, Rachael A.; Godlove, Ronald E.; Chambers, John S.; Yuh, Huoy-Jen; McCumiskey, Robert E.; Zaman, Kamran U.; and Herbert, William G., 5,531,872, Cl. 204-486.000.
- Champion Technologies, Inc.: *See—*
  - Eaton, Paul, 5,531,103, Cl. 73-61.620.
- Chang, Chih-Ping. Rotation-driven structure for music box. 5,532,422, Cl. 84-95.100.
- Chang, Chih-Wei D.: *See—*
  - Saxena, Nirmal; and Chang, Chih-Wei D., 5,533,035, Cl. 371-38.100.
- Chang, David B.; Vali, Victor; and Webb, Donald H., to Hughes Aircraft Company. Apparatus and method for phase tomographic determination of fluid currents. 5,531,116, Cl. 73-597.000.
- Chang, Hak S.: *See—*

Kim, Soo D.; Chang, Hak S.; and Paik, Jong S., 5,531,124, Cl. 73-861.270.
Chang, Hak-Su: *See—*
Ahn, Kyu-Hong; and Chang, Hak-Su, 5,531,125, Cl. 73-861.270.
Chang, Kwang Ho: *See—*
Kim, Kyung Yong; Kim, Wang Sup; Yun, Jung Rak; and Chang, Kwang Ho, 5,532,197, Cl. 501-136.000.
Chang, Mike F.; Hshieh, Fwu-Iuan; Kwan, Sze-Hon; and Owyang, King, to Siliconix Incorporated. Method of making a field effect trench transistor having lightly doped epitaxial region on the surface portion thereof. 5,532,179, Cl. 437-40.000.
Chang, Shuen C.: *See—*
Priem, Curtis; Chang, Shuen C.; and Ho, Hai D., 5,533,187, Cl. 395-164.000.
Chang, Sung H., to Korea Telecommunication Authority. Bit allocation method for controlling transmission rate of video encoder. 5,532,746, Cl. 348-415.000.
Changmin Technology Co., Ltd.: *See—*
Kim, Soo D.; Chang, Hak S.; and Paik, Jong S., 5,531,124, Cl. 73-861.270.
Chantry, David; Gray, Patrick W.; and Hoekstra, Merl F., to ICOS Corporation. G protein-coupled receptor kinase GRK6. 5,532,151, Cl. 435-194.000.
Chao, Liang: *See—*
Lin, Tien-Ler; and Chao, Liang, 5,532,960, Cl. 365-185.290.
Chapek, George V.: *See—*
Jones, Stewart D.; and Chapek, George V., 5,533,075, Cl. 376-272.000.
Chapman, Michael J.; Merle, Thomas C.; and Rowden, David L., to Eastman Kodak Company. Method and apparatus for making a bubble spring assembly. 5,531,008, Cl. 29-230.000.
Charles, Kirk W.: *See—*
Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., 5,531,687, Cl. 604-95.000.
Charvin, Guy: *See—*
Frechet, Patrick; Fraisse, Georges; and Charvin, Guy, 5,531,790, Cl. 623-15.000.
Chataignier, Evelyne: *See—*
Beziers, Daniel; Chataignier, Evelyne; and Noireaux, Patrick, 5,532,288, Cl. 522-71.000.
Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., to Caterpillar Inc. Fatigue analysis and warning system. 5,531,122, Cl. 73-760.000.
Chau, Michael M.: *See—*
Smith, Charles; Akhtar, Masyood; Chau, Michael M.; and Savage, David, 5,532,513, Cl. 257-703.000.
Chawan, Dhyaneshwar B.; Merritt, Carleton G.; and Gillmore, Stephen R., to Borden, Inc. Couscous-like product made from pasta scrap. 5,532,016, Cl. 426-557.000.
Cheek, Ricky L. Gas vent and burner monitoring system. 5,531,214, Cl. 126-361.000.
Chemetron-Railway Products, Inc.: *See—*
Wechselberger, Emmerich E., 5,531,408, Cl. 246-257.000.
Chen, Chen Y. Connecting mechanism for bulb holder and socket. 5,531,610, Cl. 439-356.000.
Chen, Chin-Long: *See—*
Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., 5,533,036, Cl. 371-40.100.
Chen, Fu: *See—*
Schuster, Michael A.; Harrington, John C., IV; Liao, Wen P.; and Chen, Fu, 5,532,308, Cl. 524-447.000.
Chen, Hao-chia: *See—*
Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
Chen, Iris Y.: *See—*
Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
Chen, Jeng-I: *See—*
Tripathy, Sukant K.; Jeng, Ru-Jong; Kumar, Jayant; Marturunkakul, Sutiyao; and Chen, Jeng-I, 5,532,320, Cl. 525-100.000.
Chen, Phang-Lang: *See—*
Lee, Wen-Hwa; and Chen, Phang-Lang, 5,532,220, Cl. 514-44.000.
Chen, Ping. Rolling massaging device. 5,531,665, Cl. 601-118.000.
Chen, Shih-Yueh: *See—*
Fanchang, Wei-Chuan; and Chen, Shih-Yueh, 5,531,139, Cl. 81-59.100.
Chen, Shou-Mao. Handle assembly for suitcase. 5,530,990, Cl. 16-115.000.
Chen, Shou-Mao. Hanger supporter assembly. 5,531,335, Cl. 211-124.000.
Chen, Wai, to Bell Communications Research, Inc. Bandwidth management and access control for an ATM network. 5,533,009, Cl. 370-17.000.
Chen, Wen-sqn. Toothbrush having a tongue scraper disposed therein. 5,530,981, Cl. 15-111.000.
Cheng, David, to Koo, Ann F. Beam spot position detector having a detector moving mechanism. 5,532,499, Cl. 250-559.220.
Cheng, John C. Two-position collapsible canopy assembly that attaches to a pickup truck. 5,531,497, Cl. 296-100.000.
Cheng, Nan-Zheng; and Stoecker, Barbara, to Board of Regents of Oklahoma State University, The. Composition and method for treating hyperglycemia utilizing an extract of *Polygonum multiflorum. 5,531,991, Cl. 424-195.100.*
Cheng, Tzu-Ling: *See—*
Cheng, You-Jen; and Cheng, Tzu-Ling, 5,531,609, Cl. 439-340.000.
Cheng, You-Jen; and Cheng, Tzu-Ling. Structure of lamp socket. 5,531,609, Cl. 439-340.000.
Chenier, Gary J., Jr.; and Maylon, Gary J., to Alabama Metal Industries Corporation. Connector clip for corner bead. 5,531,051, Cl. 52-255.000.
Cheon, Byeong-sik: *See—*
Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, 5,532,812, Cl. 355-327.000.
Cheong, Hoichi; and So, Kimming, to International Business Machines Corporation. System and method for error correction code generation. 5,533,189, Cl. 395-182.040.
Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See—*
Bennett, Robert, 5,531,671, Cl. 604-1.000.
Chevron Chemical Company: *See—*
Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
Chi, Holy W.: *See—*
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Chiba, Hiromasa: *See—*
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Chihara, Tomoyoshi: *See—*
Hirata, Kei; Chihara, Tomoyoshi; Furuya, Nobumasa; and Sumikawa, Takeshi, 5,532,804, Cl. 355-251.000.
Chilkunda, Raghunath: *See—*
Raghavan, Srini; Jan, Der'e; and Chilkunda, Raghunath, 5,531,900, Cl. 210-651.000.
Chin, Albert K.: *See—*
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,531,856, Cl. 156-290.000.
Chin, Philip K. Reflection shadow sensor with light directing diffusive surface. 5,532,473, Cl. 250-214.0PR.
Chin, Shaoan: *See—*
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Chino, Takashi: *See—*
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.
Chisso Corporation: *See—*
Oka, Takahiro; and Chiba, Hiromasa, 5,532,325, Cl. 526-79.000.
Chiu, Anthony M., to Texas Instruments Incorporated. Wafer burn-in and test system. 5,532,614, Cl. 324-763.000.
Chiu, Ming-Hsiang. Overload protection device. 5,532,895, Cl. 361-35.000.
Chiu, Tin-Ho: *See—*
Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, 5,531,998, Cl. 424-426.000.
Choi, Kil-Yeong; Suh, Dong-Hack; Yi, Mi-Hie; Hong, Young-Taik; and Won, Jong-Chan, to Korea Research Institute of Chemical Technology. Process for preparing polyamideimide resins having high molecular weight. 5,532,334, Cl. 528-350.000.
Choi, Man C.; Kim, Soo K.; Lee, Je H.; Yang, Tae S.; and Woo, Sang J., to Goldstar Company, Ltd. Recording apparatus and method for a high definition video cassette recorder. 5,532,831, Cl. 358-335.000.
Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, to Samsung Electronics Co., Ltd. Apparatus for forming a copy of an original image on a sheet of paper. 5,532,812, Cl. 355-327.000.
Choi, Young S., to Daewoo Electronics Co., Ltd. Disc-cartridge front loading apparatus of a mini disc player. 5,532,995, Cl. 369-77.200.
Chojnowski, Marian: *See—*
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Chopin, Thierry; and Vilmin, Gabriel, to Rhone-Poulenc Chimie. Zirconium/cerium mixed oxide catalyst/catalyst support compositions having high/stable specific surfaces. 5,532,198, Cl. 502-304.000.
Chow, Che C.: *See—*
Henry, Arnold W.; Seanor, Donald A.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Kaplan, Samuel; and Pan, David H., 5,531,813, Cl. 106-2.000.
Chow, Jessie. Coupling mechanism of socket wrench extension. 5,531,140, Cl. 81-177.850.
Chowdhary, Manjit S.: *See—*
Cottrell, Ian W.; Goswami, Animesh; and Chowdhary, Manjit S., 5,532,350, Cl. 536-76.000.
Chowhan, Masood A.: *See—*
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Christenson, John C.: *See—*
Sparks, Douglas R.; Brown, Ronald E.; Healton, Robert L.; and Christenson, John C., 5,531,121, Cl. 73-716.000.
Christian, Richard E.; and Peake, Michael V., to Gates Rubber Company, The. Heat shrinkable hose clamp with heating indicator. 5,531,483, Cl. 285-93.000.
Christiansen, David: *See—*
Silver, Frederick H.; and Christiansen, David, 5,532,217, Cl. 514-21.000.
Christiansen, David W.; and Long, John W., to Siemens Power Corporation. Nuclear fuel assembly for a pressurized water reactor. 5,533,078, Cl. 376-438.000.
Christopherson, Dennis: *See—*

Miraglia, Phillip; Christopherson, Dennis; Carter, Robert; and Umeda, Tadatoshi, 5,531,846, Cl. 156-64.000.
Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., to Moore Business Forms, Inc. Multi-roller electrostatic toning. 5,532,100, Cl. 430-120.000.
Chrysler Corporation: *See—*
Kowall, David J., 5,531,498, Cl. 296-146.400.
Sherman, Howard M., 5,531,287, Cl. 180-417.000.
Chu, Barbara C.; Joyce, Gerald F.; and Orgel, Leslie E., to Salk Institute for Biological Studies, The. Replicative RNA-based amplification/detection systems. 5,532,126, Cl. 435-6.000.
Chu, May-Ying, to PolyPlus Battery Company, Inc. Rechargeable positive electrode. 5,532,077, Cl. 429-102.000.
Chuang, Tung-Han: *See—*
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Chubu Electric Power Co., Inc.: *See—*
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Chung, Alex H.: *See—*
Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.
Church, Mark A.; Deshpande, Annayya P.; and Desouches, Alain M., to International Business Machines Corporation. Thin film magnetic head fabrication method. 5,531,017, Cl. 29-603.120.
Church, Richard J.; and Hacias, Kenneth J., to Henkel Corporation. Composition and process for lubricating metal before cold forming. 5,531,912, Cl. 508-507.000.
Ciba-Geigy Corporation: *See—*
Föry, Werner; Kerber, Elmar; and Hudetz, Manfred, 5,532,203, Cl. 504-105.000.
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Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.
Savage, Gary V.; and Clevenger, James M., 5,532,287, Cl. 522-50.000.
Cielo, Robert. Hockey training gloves with attachable and removable weights. 5,530,967, Cl. 2-16.000.
Ciena Corporation: *See—*
Alexander, Stephen B.; Chaddick, Steve W.; and Huber, David R., 5,532,864, Cl. 359-177.000.
Cimino, George D.; Isaacs, Stephen T.; and Tessman, John W., to HRI Research, Inc. Method for rendering ligase-based amplification products unamplifiable. 5,532,146, Cl. 435-91.200.
Cimino, George D.: *See—*
Tessman, John W.; Cimino, George D.; Isaacs, Stephen T.; and Hearst, John E., 5,532,145, Cl. 435-91.200.
Circosta, Vincent. Auxiliary brake system for four-wheel-drive vehicle. 5,531,515, Cl. 303-143.000.
Cirrus Logic, Inc.: *See—*
Brown, Paul M.; Hedayat, Shahin; and Urbani, George V., 5,533,105, Cl. 379-93.000.
Claas Ohg: *See—*
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Claeyssen, Frank; Le Letty, Ronan; and Lhermet, Nicolas, to Figest B.V. Electric motor with vibrating elements and elastic coupling. 5,532,540, Cl. 310-323.000.
Clairson, Inc.: *See—*
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Clark, Daniel L.: *See—*
Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., 5,532,401, Cl. 558-95.000.
Clark, Jay V., to National Computer Systems, Inc. Variable printing and selective binding of booklets. 5,531,429, Cl. 270-58.110.
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Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., to Westinghouse Electric Corporation. Amorphous metal tagging system for underground structures including elongated particles of amorphous metal embedded in nonmagnetic and nonconductive material. 5,532,598, Cl. 324-326.000.
Clay and Bailey Manufacturing Company: *See—*
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Clean Burn, Inc.: *See—*
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CLECIM: *See—*
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Clemens, Anton H.; and Haughton, Victor M. Needle retraction system. 5,531,694, Cl. 604-110.000.
Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, to Ascent Pharmaceuticals, Inc. Composition and process for prevention and treatment of cutaneous immediate hypersensitivity reactions. 5,532,270, Cl. 514-456.000.
Clevenger, James M.: *See—*
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Cliffe, Andrew I.: *See—*
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Cloutier, Frank L.: *See—*
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Clover, Daniel S.; and Sisco, Mark S., to Fairfield Industries. Manhole cover lifting apparatus. 5,531,541, Cl. 404-25.000.
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Cobb, Joshua M.; and Parker, Peter K., to International Business Machines Corporation. Modified quartz plate to provide non-uniform light source. 5,532,457, Cl. 219-411.000.
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Codina, George; Copple, Donald L.; and Yakes, Kevin G., to Caterpillar Inc. Contactless inductance joystick switch. 5,532,529, Cl. 307-129.000.
Cogliano, Joseph A.: *See—*
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Cognex Corporation: *See—*
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Colburn, Eric R.; Fedor, Max A.; Gillio, Robert G.; and Neu, Daniel W., to MedSelect Systems, Inc. Inventory monitoring apparatus. 5,533,079, Cl. 377-6.000.
Colclough, Mark S., to Conductus, Inc. Squid control apparatus with non-cryogenic flux-locked loop disposed in close proximity to the squid. 5,532,592, Cl. 324-248.000.
Cole, Leland G. Electrolytic water purification process. 5,531,865, Cl. 205-751.000.
Coleman, Matthew R.; Futej, Gerald M.; and Ash, James D., to Crown Cork and Seal Company, Inc. Bottle cap delivery system. 5,531,057, Cl. 53-308.000.
Coleman, Princess A.: *See—*
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Coleman, Thomas J.; Schlotter, William K., IV; Coleman, Princess A.; and Schlotter, Ann M. Holder and enclosure for a piece of hard candy. 5,531,318, Cl. 206-738.000.
Coles, Peter; and Tamer, Attila, to Procter & Gamble Company, The. Elastic net-like substrate having a layer of fibers pre-bonded thereto for use in an absorbent article. 5,531,729, Cl. 604-384.000.
Colgate-Palmolive Co.: *See—*
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Collins, Burley B.; and Collins, Miller D. Method of manufacturing carped pads. 5,531,849, Cl. 156-78.000.
Collins, Laurence H. Amusement ride. 5,531,645, Cl. 472-97.000.
Collins, Miller D.: *See—*
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Comalco Aluminium Limited: *See—*
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Cominco Ltd.: *See—*
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Commercon, Alain: *See—*
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Commonwealth System of Higher Education, Temple University of The: *See—*
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Communications & Power Industries: *See—*
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Compagnie Generale D'Automatisme CGA-HBS: *See—*
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Compagnie Generale Des Matieres Nucleaires: *See—*
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Compaq Computer Corporation: *See—*
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- Computalog U.S.A., Inc.: *See—*
  - Young, Allen R.; Davidson, Jerry L.; and Baltazar, Edward, 5,531,112, Cl. 73-152.000.
- Comsat Corporation: *See—*
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- Condea Vista Company: *See—*
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- Conductus, Inc.: *See—*
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- Cone, Roger D.; and Mountjoy, Kathleen G., to Oregon Health Sciences University, a non-profit organization, State of Oregon, Acting by and Through the Oregon State Board of Higher Education on behalf of the. DNA encoding α melanocyte stimulating hormone receptor. 5,532,347, Cl. 536-23.500.
- Confalone, Pasquale N.: *See—*
  - Smyser, Thomas E.; and Confalone, Pasquale N., 5,532,356, Cl. 540-492.000.
- Congoleum Corporation: *See—*
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- Conix Canada (Polycon Division): *See—*
  - Allen, Marnie M.; Beazley, Aaron W.; and Hutchinson, Daniel J., 5,532,280, Cl. 521-51.000.
- Conkling, John A.: *See—*
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- Conn, Gregory L.: *See—*
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- Conner Peripherals, Inc.: *See—*
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  - Stefansky, Frederick M.; Shrinkle, Louis J.; and Fiers, Thomas A., 5,532,889, Cl. 360-97.010.
- Conroy, Gary M.: *See—*
  - Beekman, George F.; Conroy, Gary M.; Hyde, Jeffrey R.; and Norris, Gene K., 5,532,303, Cl. 524-180.000.
- Conroy, Keith M.: *See—*
  - DeAndrea, John J.; and Conroy, Keith M., 5,533,054, Cl. 375-286.000.
- Consiglio Nazionale delle Ricerche: *See—*
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- Consolidated Engineering Company, Inc.: *See—*
  - Crafton, Paul M.; and Crafton, Scott P., 5,531,423, Cl. 266-44.000.
- Contento, Michele: *See—*
  - Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, 5,532,353, Cl. 540-215.000.
- Cooval, Inc.: *See—*
  - Siver, Chester A., 5,531,244, Cl. 137-315.000.
- Converse, Harold G.: *See—*
  - Sweeney, Kenneth W.; and Converse, Harold G., 5,531,831, Cl. 118-600.000.
- Cook, John E.; and Hussey, Scott E. W., to Siemens Electric Limited. Rotary diesel electric EGR valve. 5,531,205, Cl. 123-568.000.
- Cook, Robert G.: *See—*
  - Smith, Lowell D.; and Cook, Robert G., 5,532,660, Cl. 335-14.000.
- Cook, William J.; and Seymour, Paul D., to Bell Communications Research, Inc. Communications network ring router. 5,533,016, Cl. 370-54.000.
- Cookingham, Gerald T., to Delco Electronics Corporation. Apparatus for illuminating instrument cluster pointers. 5,531,181, Cl. 116-288.000.
- Coombs, Peter M., to Gradco (Japan) Ltd. Telescoping registration member for sheet receivers. 5,531,437, Cl. 271-292.000.
- Cooper, Eugene R.: *See—*
  - Ruddy, Stephen B.; Roberts, Mary E.; McIntire, Gregory L.; Cooper, Eugene R.; and Bacon, Edward R., 5,531,979, Cl. 424-945.000.
- Copple, Donald L.: *See—*
  - Codina, George; Copple, Donald L.; and Yakes, Kevin G., 5,532,529, Cl. 307-129.000.
- Coppock, Gary E.: *See—*
  - Austin, Gregg A.; and Coppock, Gary E., 5,531,283, Cl. 180-53.100.
- Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., to Hoechst Celanese Corporation. Recyclable tufted fabric. 5,532,035, Cl. 428-95.000.
- Cordata, Inc.: *See—*
  - Kikinis, Dan, 5,532,719, Cl. 345-211.000.
- Cordell, Steven R. Method of operating a dumpster handling system. 5,531,562, Cl. 414-786.000.
- Cordis Corporation: *See—*
  - Solar, Ronald J., 5,531,690, Cl. 604-102.000.
- Cordoba, Michael V.: *See—*
  - Hardee, Kim C.; and Cordoba, Michael V., 5,532,618, Cl. 326-63.000.
- Corella, Arthur P. Flexible dispensing package. 5,531,358, Cl. 222-107.000.
- Corey, Michael C.: *See—*
  - Gilleo, Kenneth B.; and Corey, Michael C., 5,531,942, Cl. 264-5.000.
- Corley, Deryl. Batting practice device. 5,531,438, Cl. 273-26.00E.
- Cornell Research Foundation: *See—*
  - Fréchet, Jean M. J.; and Lee, Sze-Ming, 5,532,113, Cl. 430-296.000.
- Cornell Research Foundation, Inc.: *See—*
  - Fréchet, Jean M. J.; and Lee, Sze-Ming, 5,532,106, Cl. 430-191.000.
- Corrigan, Dennis, to Atlantic Richfield Company. Method of correction of seismic data for the effects of azimuthal anisotropy. 5,532,978, Cl. 367-75.000.
- Corrigan, Wilfred J., to LSI Logic Corporation. Wafer level integrated circuit testing with a sacrificial metal layer. 5,532,174, Cl. 437-8.000.
- Cortecs Limited: *See—*
  - Story, Michael J., 5,532,002, Cl. 424-456.000.
- Cory, David G.; and Maas Werner E., to Bruker Instruments, Inc. Method for suppressing solvent resonance signals in NMR experiments. 5,532,594, Cl. 324-307.000.
- Cosentino, Louis C.: *See—*
  - Brinda, Paul D.; and Cosentino, Louis C., 5,531,848, Cl. 156-77.000.
- Cosmo Oil Co., Ltd.: *See—*
  - Mizutani, Yoshihiro; Tomino, Takeshi; Yamamoto, Yasuo; Shibata, Yukio; and Yamazaki, Hatsutaro, 5,531,885, Cl. 208-210.000.
- Cosmo Research Institute: *See—*
  - Mizutani, Yoshihiro; Tomino, Takeshi; Yamamoto, Yasuo; Shibata, Yukio; and Yamazaki, Hatsutaro, 5,531,885, Cl. 208-210.000.
- Costa, Jill B.: *See—*
  - Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.
- Costa, Vincenzo F.: *See—*
  - Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., 5,531,150, Cl. 89-15.000.
- Cosyns, Jean: *See—*
  - Cameron, Charles; Cosyns, Jean; Sarrazin, Patrick; Boitiau, Jean Paul; and Courty, Philippe, 5,531,886, Cl. 208-251.00H.
- Cote, Sylvaine: *See—*
  - Levesque, Yvon; Cote, Sylvaine; and Gallagher, Denis, 5,531,726, Cl. 604-367.000.
- Cotter, David H.: *See—*
  - LeMay, Curtis E.; Woltjer, Bernard H.; and Cotter, David H., 5,531,311, Cl. 198-448.000.
- Cottrell, Ian W.; Goswami, Animesh; and Chowdhary, Manjit S., to Rhone-Poulenc Inc. Crosslinked polysaccharides useful as absorbent materials. 5,532,350, Cl. 536-76.000.
- Courtaulds Aerospace, Inc.: *See—*
  - Dang, Nguyen T.; Martin, Lawrence B.; and Jerrard, Richard, 5,531,710, Cl. 604-238.000.
- Courty, Philippe: *See—*
  - Cameron, Charles; Cosyns, Jean; Sarrazin, Patrick; Boitiau, Jean Paul; and Courty, Philippe, 5,531,886, Cl. 208-251.00H.
- Cousens, Lawrence S.; Eberhardt, Christine D.; Gray, Patrick; Tjoelker, Larry W.; Wilder, Cheryl L.; and Trong, Hai, to ICOS Corporation. Platelet-activating factor acetylhydrolase. 5,532,152, Cl. 435-197.000.
- Coussens, Eugene; and Dungan, Thomas. Distributed silicon controlled rectifiers for ESD protection. 5,532,896, Cl. 361-56.000.
- Coutts, Bruce, to ITT Corporation. Optical fiber connector biasing arrangement. 5,533,157, Cl. 385-53.000.
- Cowan, Timothy M.: *See—*
  - Kass, Lawrence T.; Cowan, Timothy M.; Reinertsen, Dennis; and Dunne, Stephen R., 5,531,068, Cl. 60-274.000.
- Coyle, Dennis J.; and Fitzgerald, Barry A., to Eastman Kodak Company. Gravure coating feeder apparatus. 5,531,161, Cl. 101-157.000.
- Crafton, Paul M.; and Crafton, Scott P., to Consolidated Engineering Company, Inc. Method and apparatus for heat treating metal castings. 5,531,423, Cl. 266-44.000.
- Crafton, Scott P.: *See—*
  - Crafton, Paul M.; and Crafton, Scott P., 5,531,423, Cl. 266-44.000.
- Cragun, Brian J.: *See—*
  - Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., 5,533,182, Cl. 395-155.000.
- Craig, Gina M.: *See—*
  - Best, David J.; Globig, James E.; Markham, James G.; and Craig, Gina M., 5,533,176, Cl. 395-117.000.
- Craig, Jeffrey: *See—*
  - Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, 5,532,962, Cl. 365-201.000.
- Crane, Eric K.; Morgan, David E.; and Wellenstein, Neil, to Motorola, Inc. Portable communication system comprising a local and wide area communication units which can store a communication when the wide area communication system is not available. 5,533,097, Cl. 379-58.000.
- Crapo, Alan D.: *See—*
  - Baker, Gerald N.; and Crapo, Alan D., 5,532,534, Cl. 310-89.000.
- Crawford, John, to Exposystems, Inc. Tightly fitting panel connection assembly. 5,531,539, Cl. 403-381.000.
- Crawford, Sylvia I.: *See—*
  - Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., 5,532,018, Cl. 426-582.000.
- Cray Research, Inc.: *See—*
  - Thorson, Gregory M., 5,533,198, Cl. 395-200.150.
- Creative Foam Corporation: *See—*
  - Hummel, Steven L.; Olender, James P.; Johnson, James B.; Reynolds, JoAnn; and Skaggs, Bill A., 5,531,326, Cl. 206-509.000.
- Creative Tech Marketing: *See—*
  - Gasper, Thomas M., 5,531,374, Cl. 229-109.000.
- Creative Urethanes: *See—*

  - Heitfiled, Richard V., 5,531,949, Cl. 264-135.000.
- Creazzo, Joseph A.: *See—*
  - Bartlett, Philip L.; Creazzo, Joseph A.; and Hammel, Howard S., 5,532,284, Cl. 521-134.000.
- Crins, Wilhelmus A.; Van Den Berk, Wilhelmus M. J. A.; Von Reth, Eric A.; and Rijpert, Hermanus P. M., to U.S. Philips Corporation. X-ray examination apparatus. 5,533,086, Cl. 378-98.200.
- Cripps, Peter K., to National Semiconductor Corporation. Data encoder/decoder for data transceiver. 5,533,056, Cl. 375-286.000.
- Crisci, Luciana: *See—*
  - Allegrini, Pietro; Nodari, Nereo; Malatesta, Vincenzo; and Crisci, Luciana, 5,532,361, Cl. 544-70.000.
- Crisler, Kenneth J.: *See—*
  - Jasper, Steven C.; and Crisler, Kenneth J., 5,533,004, Cl. 370-11.000.
- Crockett, Wendy P. Commuter's apron. 5,530,968, Cl. 2-46.000.
- Cronin, John E.: *See—*
  - Bertin, Claude L.; Cronin, John E.; and Perlman, David J., 5,532,519, Cl. 257-777.000.
- Crooker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., to Elf Atochem North America, Inc. Inhibition of 141B decomposition. 5,531,867, Cl. 203-86.000.
- Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., to American Cyanamid Company. (2-imidazolin-2-yl) fused heteropyridine compounds, intermediates for the preparation of and use of said compounds as herbicidal agents. 5,532,207, Cl. 504-228.000.
- Crosta, Emanuele. Seam protecting device for drum grinding or raising machines. 5,531,630, Cl. 451-5.000.
- Crowley, Craig W.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- Crown Cork and Seal Company, Inc.: *See—*
  - Coleman, Matthew R.; Futej, Gerald M.; and Ash, James D., 5,531,057, Cl. 53-308.000.
- Crummenauer, Michael; Dietrich, Uwe; and Galle, Alfred, to Fissler GmbH. Bottom-heated utensil for conductive or induction heating. 5,532,461, Cl. 219-621.000.
- Crump, Andre K.: *See—*
  - Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., 5,533,100, Cl. 379-67.000.
- Cruz, Jose L. Keypad controller for use with a video game. 5,531,443, Cl. 463-37.000.
- Cubow, Joseph; and Tritt, Charles, to Booth Manufacturing Company. Linerless label applicator. 5,531,853, Cl. 156-521.000.
- Cue Dee Produktor AB: *See—*
  - Gustafsson, Karl M.; and Sylvan, Herman P. S., 5,531,419, Cl. 248-519.000.
- Cukjati, Joseph F. Orthodontic jaw screw. 5,531,594, Cl. 433-1.000.
- Cullen, Thomas G.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., 5,532,367, Cl. 544-260.000.
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,532,370, Cl. 544-279.000.
- Cullimore, D. Roy: *See—*
  - Alford, George; Cullimore, D. Roy; and Mikell, Al T., 5,531,895, Cl. 210-610.000.
- Cullinan, George J.: *See—*
  - Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., 5,532,382, Cl. 549-57.000.
- Culling, Dennis A., to Harris Corporation. Radio frequency amplifiers with compensation signal to accommodate changes in the conduction point due to temperature changes. 5,532,648, Cl. 330-289.000.
- Cullo, Leonard A.: *See—*
  - Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L.; and Cullo, Leonard A., 5,532,417, Cl. 568-853.000.
- Cullom Machine Tool & Die, Inc.: *See—*
  - Berns, John S.; and Dickhut, Heinrich, 5,531,583, Cl. 425-193.000.
- Culver, Jeffrey A.: *See—*
  - Wright, Timothy J.; Hartman, Gary G.; and Culver, Jeffrey A., 5,532,291, Cl. 523-122.000.
- Cummins Engine Company, Inc.: *See—*
  - Clark, Kent H., 5,531,196, Cl. 123-195.00C.
- Cunningham, Hugh A.: *See—*
  - Kerr, Roger S.; and Cunningham, Hugh A., 5,531,854, Cl. 156-234.000.
- Cur, Nihat O.: *See—*
  - Kirby, David B.; and Cur, Nihat O., 5,532,034, Cl. 428-69.000.
- Curtin, Christopher J.: *See—*
  - Spindt, Christopher J.; Field, John E.; Morris, David L.; and Curtin, Christopher J., 5,532,548, Cl. 313-422.000.
- Cyberonics, Inc.: *See—*
  - Maschino, Steven; and Baker, Ross G., Jr., 5,531,778, Cl. 607-118.000.
- Cyrulik, Richard J.; and Eckert, Elmer H., to United States of America, Air Force. Pseudo random jammer with false target scintillation capability. 5,532,696, Cl. 342-14.000.
- Cytec Technology Corp.: *See—*
  - Nagaraj, D. R.; and Wang, Samuel S., 5,531,330, Cl. 209-167.000.
  - Recker, Hans G.; Tesch, Helmut; Weber, Thomas; Altstaedt, Volker; and Boyd, Jack D., 5,532,296, Cl. 523-400.000.
- Daab-Krzykowski, Andre: *See—*
  - Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
  - Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
- Dabrowski, Stanley P.; and Sincox, Mark, to Sevens Unlimited, Inc. Double poker. 5,531,440, Cl. 463-12.000.
- Dabrowski, Stanley P.; and Sincox, Mark, to Sevens Unlimited, Inc. a Nevada Corporation. Double poker. 5,531,441, Cl. 463-12.000.
- Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, to Biochimica Opos SpA. Process for the preparation of halogenated β-lactam compounds. 5,532,353, Cl. 540-215.000.
- D'Addeo, Michael L., to Motorola, Inc. Semiconductor inverter layout having improved electromigration characteristics in the output node. 5,532,509, Cl. 257-618.000.
- Daewoo Electronics Co., Ltd.: *See—*
  - Choi, Young S., 5,532,995, Cl. 369-77.200.
  - Kim, Seong-Min, 5,532,477, Cl. 250-225.000.
  - Lee, Changho, 5,532,761, Cl. 348-731.000.
  - Lee, Youn-Seong, 5,532,834, Cl. 358-335.000.
  - Yoon, Sang-Ho; and Kwon, Oh-Sang, 5,532,747, Cl. 348-416.000.
- Daewoo Heavy Industries Ltd.: *See—*
  - Ahn, Jae B., 5,531,004, Cl. 29-33.00P.
  - Lee, Jung D.; and Lee, Yong G., 5,531,859, Cl. 156-584.000.
- Dahl, Robert M. Wireless flight control system. 5,531,402, Cl. 244-75.00R.
- Dahl, Roger W.; Wickham, Robert W., deceased (by Duane Quiggle, administrator); Swanson, David K.; and Lipson, David, to Cardiac Pacemakers, Inc. Stent-type defibrillation electrode structures. 5,531,779, Cl. 607-119.000.
- Dahlgren, Arthur. Plate heat exchanger for liquids with different flows. 5,531,269, Cl. 165-167.000.
- Dahn, Michael S.; and Lange, M. Patricia, to Lange, M. Patricia. Self-guiding, multifunctional visceral catheter. 5,531,714, Cl. 604-264.000.
- Dai Nippon Printing Co., Ltd.: *See—*
  - Yoshida, Kazuya, 5,532,202, Cl. 503-227.000.
- Daiichi Denso Buhin Co., Ltd.: *See—*
  - Takano, Tsunesuke; and Sinzawa, Kouichi, 5,531,613, Cl. 439-544.000.
- Daikin Industries Ltd.: *See—*
  - Nakada, Tatsuo; and Aoyama, Hirokazu, 5,532,418, Cl. 570-166.000.
- Dale, James L., Jr., to FMC Corporation. Self-calibrating wheel alignment apparatus and method. 5,531,030, Cl. 33-203.000.
- Dallas Semiconductor Corp.: *See—*
  - Jiang, Ching-Lin; and Williams, Clark R., 5,532,958, Cl. 365-154.000.
- Dall'Asta, Leone: *See—*
  - Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, 5,532,353, Cl. 540-215.000.
- Dall'Occo, Tiziano; Guglielmi, Floriano; Zucchini, Umberto, deceased (by Maria Stagni, Silvia Zucchini, Chiara Zucchini, Matteo Zucchini, heirs), to Montell Technology Company bv. Process for preparing elastomeric ethylene copolymers. 5,532,326, Cl. 526-125.700.
- Dallos, Robert, Jr.: *See—*
  - Zbinden, Lyn R.; Dallos, Robert, Jr.; and Dick, Rodney G., 5,531,496, Cl. 296-96.210.
- Dambmann, Claus: *See—*
  - Outtrup, Helle; Dambmann, Claus; Aaslyng, Dorrit A.; and Lindegaard, Poul, 5,531,918, Cl. 510-320.000.
- Dana Corporation: *See—*
  - Barnholt, Mark C., 5,531,653, Cl. 475-234.000.
  - Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.
- Danek Medical, Inc.: *See—*
  - Ray, R. Charles, 5,531,745, Cl. 606-61.000.
  - Ray, R. Charles, 5,531,747, Cl. 606-61.000.
- Dang, Nguyen T.; Martin, Lawrence B.; and Jerrard, Richard, to Courtaulds Aerospace, Inc. Combination closure and syringe. 5,531,710, Cl. 604-238.000.
- Danneels, Gunner D., to Intel Corporation. Volume control in digital teleconferencing. 5,533,112, Cl. 379-202.000.
- Danzin, Charles: *See—*
  - Schirlin, Daniel G.; Collard, Jean-Noël; and Danzin, Charles, 5,532,397, Cl. 556-413.000.
- Dao, Huy-Can: *See—*
  - Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, 5,531,597, Cl. 433-119.000.
- Darby, Robert J., to T.H.E.M. Industries, Inc. Pallet system including end panels. 5,531,327, Cl. 206-600.000.
- Darling, Gary L., to Primary Millwork. Step for a stairway and method for making same. 5,531,048, Cl. 52-188.000.

- Darr, Alfred: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- Dasinger, Bruce L. Method of enhancing viscosity using heteropolysaccharide 105-4. 5,532,222, Cl. 514-54.000.
- Datta, Madhav: *See—*
  - Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., 5,531,874, Cl. 204-224.00M.
- Datta, Rathin; and Bergemann, Eugene P., to NTEC, Inc. Process for producing of citric acid and monovalent citrate salts. 5,532,148, Cl. 435-144.000.
- Daum, Werner; Muller, Klaus-Helmut; Schwamborn, Michael; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Sulphonylaminocarbonyltriazolinones. 5,532,378, Cl. 548-263.800.
- Dautet, Henri P. E. G.; and DesChamps, Joseph D. P., to EG&G Limited. Active quench circuit and reset circuit for avalanche photodiode. 5,532,474, Cl. 250-214.00R.
- Dauth, Wolfgang: *See—*
  - Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, 5,531,948, Cl. 264-122.000.
- David, Donald R.: *See—*
  - Borst, Ronald W.; and David, Donald R., 5,531,247, Cl. 137-447.000.
- Davidson, Jerry L.: *See—*
  - Young, Allen R.; Davidson, Jerry L.; and Baltazar, Edward, 5,531,112, Cl. 73-152.000.
- Davies, Barrie L.: *See—*
  - Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., 5,532,035, Cl. 428-95.000.
- Davies, Scott T.: *See—*
  - Reed, Steven J.; Davies, Scott T.; Wallgren, Robert L.; and Wojtan, George R., 5,531,611, Cl. 439-540.100.
- Davis, Bruce M.; Stetler, Steven S.; and Rebman, Chester L., to Storage Technology Corporation. System and method for calibrating a position sensing system. 5,532,583, Cl. 324-202.000.
- Davis, Christopher M.: *See—*
  - Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.
- Davis, James M.: *See—*
  - Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
- Davis, Marc R.: *See—*
  - Bachman, Michael S.; and Davis, Marc R., 5,532,671, Cl. 340-438.000.
- Davis, Stuart M.; Haines, Christopher P.; Leef, Alexander A.; and Moses, Peter R., to Duracell Inc. Additives for alkaline electrochemical cells having manganese dioxide cathodes. 5,532,085, Cl. 429-224.000.
- Davis, Timothy D.: *See—*
  - Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., 5,533,123, Cl. 380-4.000.
- Davis, William J., to Thermo-Tech, Inc. Fluid temperature monitor. 5,531,191, Cl. 123-41.150.
- Day, James; and Searl, Stephen, to General Electric Company. Low volume inlet reciprocating compressor for dual evaporator refrigeration system. 5,531,078, Cl. 62-199.000.
- Daynes, Raymond A.; and Araneo, Barbara A., to University of Utah Research Foundation. Methods for preventing progressive tissue necrosis, reperfusion injury, bacterial translocation and adult respiratory distress syndrome. 5,532,230, Cl. 514-178.000.
- Dazey Corporation: *See—*
  - Wooderson, Blaise M.; and Mendelson, Lewis A., 5,531,032, Cl. 34-90.000.
- Deak, Frederick R.: *See—*
  - Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., 5,531,615, Cl. 439-631.000.
- Deal, Jeffry T. Toy water bomb device. 5,531,626, Cl. 446-473.000.
- Deal, Jeffry T. Cartridge-type water bomb water gun conversion device. 5,531,627, Cl. 446-473.000.
- Dean, Richard D.; and Jones, Dick A. Body part immobilization device. 5,531,229, Cl. 128-866.000.
- Dean, Richard F.; Antonio, Franklin P.; Gilhousen, Klein S.; and Wheatley, Charles E., III, to Qualcomm Incorporated. Dual distributed antenna system. 5,533,011, Cl. 370-18.000.
- DeAndrea, John J.; and Conroy, Keith M., to Technitrol, Inc. Multi-level data transmitter. 5,533,054, Cl. 375-286.000.
- De Angelis, Francesco: *See—*
  - Giannessi, Fabio; Castagnani, Roberto; De Angelis, Francesco; Tinti, Maria O.; and Misiti, Domenico, 5,532,409, Cl. 562-561.000.
  - Giannessi, Fabio; Scafetta, Nazareno; Bernabei, Ida; Tinti, Maria O.; and De Angelis, Francesco, 5,532,410, Cl. 562-567.000.
- Debelleix, Olivier M.; and Thiriet, Fabien P., to Solaic (Societe Anonyme). Process for making secure the writing of sensitive data into the EEPROM data storage memory of a memory card and a memory card for use in the process. 5,532,463, Cl. 235-380.000.
- Debevec, John C.: *See—*
  - Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., 5,532,401, Cl. 558-95.000.
- De Caluwe, Robert: *See—*
  - Deflander, Joseph F.; De Caluwe, Robert; and Stulens, Marielle J. C., 5,531,325, Cl. 206-494.000.
- Deckel Maho GmbH: *See—*
  - Morshäuser, George; and Geissler, Alfred, 5,531,005, Cl. 29-33.00P.
- Decker, Lewis B., Jr.; Erickson, Dwight D.; and Barclay, David A., to Condea Vista Company. Preparation of alumina having increased porosity. 5,531,976, Cl. 423-625.000.
- Deere & Company: *See—*
  - Noonan, James T.; and Thompson, Warren L., 5,531,276, Cl. 172-662.000.
  - Noonan, James T.; and Thompson, Warren L., 5,531,277, Cl. 172-730.000.
  - Pfrimmer, Ernest, 5,531,062, Cl. 56-16.40B.
  - Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., 5,531,561, Cl. 414-686.000.
  - Thompson, Graham, 5,531,512, Cl. 303-9.610.
- Deflander, Joseph F.; De Caluwe, Robert; and Stulens, Marielle J. C., to Procter & Gamble Company, The. Storing and dispensing system for products packed in a sealed pouch. 5,531,325, Cl. 206-494.000.
- Degussa Aktiengesellschaft: *See—*
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- De Haan, Gerard; Biezen, Paul W. A. C.; and Ojo, Olukayode A., to U.S. Philips Corporation. Interlaced-to-sequential scan conversion. 5,532,750, Cl. 348-452.000.
- Dehais, Joseph A.: *See—*
  - Engelsberg, Audrey C.; and Dehais, Joseph A., 5,531,857, Cl. 156-345.000.
- Dehne, Heinz-Wilhelm: *See—*
  - Brandes, Wilhelm; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; Kuck, Karl-Heinz; and Krüger, Bernd-Wieland, 5,532,262, Cl. 514-388.000.
- Deike, Horst; and Petersen, Erwin, to WABCO Westinghouse Fahrzeugbremsen GmbH. Differential pawl activation apparatus. 5,531,288, Cl. 180-197.000.
- DeJager, Gregory L.; and Swenson, Erik R., to National Semiconductor Corporation. Multi-protocol packet framing over an isochronous network. 5,533,018, Cl. 370-60.100.
- de la Caffiniere, Jean-Yves, to Fixano. Osteosynthesis device for trochanteric or trochanteric-diaphyseal fracture. 5,531,748, Cl. 606-62.000.
- de la Fuente, Ricardo L., to Protecs Syringes International Corporation. Safety syringe. 5,531,706, Cl. 604-198.000.
- Delco Electronics Corporation: *See—*
  - Cookingham, Gerald T., 5,531,181, Cl. 116-288.000.
  - Dietz, George J.; Hammer, Randall E.; Basche, Stephen M.; and Hawes, Kevin J., 5,532,522, Cl. 307-10.500.
  - Kady, Mark A.; and Wenos, Vincent M., 5,533,058, Cl. 375-317.000.
  - Kearney, Mark B.; and Koglin, Dennis M., 5,532,627, Cl. 327-74.000.
  - Sparks, Douglas R.; Brown, Ronald E.; Healton, Robert L.; and Christenson, John C., 5,531,121, Cl. 73-716.000.
  - Thayer, Peter A.; and Murphy, Morgan D., 5,531,377, Cl. 236-49.300.
- Delfield Company, The: *See—*
  - Smith, Wayne W.; Frick, Thomas J.; and Moore, Earl H., 5,532,456, Cl. 219-400.000.
- Dell USA, L.P.: *See—*
  - Radloff, Timothy; and Garrett, Robert, 5,532,428, Cl. 174-35.0GC.
- Delos Santos, Efren G.: *See—*
  - Albright, Jay D.; Delos Santos, Efren G.; Du, Xuemei; Reich, Marvin E.; and Venkatesan, Aranapakam M., 5,532,235, Cl. 514-215.000.
- Delp, Gary S.: *See—*
  - Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.
  - Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.
- Delsey (Societe Anonyme): *See—*
  - Aumasson, Michel, 5,531,465, Cl. 280-63.000.
- DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., to Wisconsin Alumni Research Foundation. Homologated vitamin D_2 compounds and the corresponding 1α-hydroxylated derivatives. 5,532,391, Cl. 552-653.000.
- DeMar Technologies, Inc.: *See—*
  - Rains, Thersa J.; and Pempsell, Mark, 5,530,974, Cl. 5-81.10T.
- Demarest, Keith; Schwender, Charles; and Wustrow, David, to Ortho Pharmaceutical Corporation. Trifluoromethybenzylphosphonates useful in treating osteoporosis. 5,532,226, Cl. 514-134.000.
- Demaya, Bernhard: *See—*
  - Boverie, Serge; Demaya, Bernhard; and Titli, André, 5,531,201, Cl. 123-425.000.
- Dembicks, Andrew E.; and Herrmann, James E. Adjustable closure force control device for a bench vise and method. 5,531,428, Cl. 269-172.000.
- DeMeester, Gordon D.: *See—*
  - McGinley, John V. M.; Srivastava, Vishnu C.; and DeMeester, Gordon D., 5,532,597, Cl. 324-319.000.
- Demidov, German V.; and Osipov, Eduard S. Airborne vehicle. 5,531,400, Cl. 244-2.000.
- den Boer, Willem; and Gu, Tieer, to OIS Optical Imaging Systems, Inc. Method of fabricating a TFT with reduced channel length. 5,532,180, Cl. 437-40.000.

- Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Shinmura, Tetsuya; and Konishi, Kunihiko, 5,532,316, Cl. 525-71.000.
  - Shinmura, Tetsuya; and Konishi, Kunihiko, 5,532,317, Cl. 525-73.000.
- Dennis, Richard D.: *See—*
  - Pellenz, Peter J.; and Dennis, Richard D., 5,531,076, Cl. 62-184.000.
- Denny, Steven P.: *See—*
  - Binford, Charles D.; Gaertner, Mark A.; and Denny, Steven P., 5,533,190, Cl. 395-182.040.
- deNormand, Richard S.; Martini, James A.; and Westfall, Norman R., to Caldwell Manufacturing Company. Block and tackle window balance. 5,530,991, Cl. 16-198.000.
- Denton, William H. Portable stoopball striker. 5,531,449, Cl. 273-348.000.
- Dentsply Research & Development Corp.: *See—*
  - Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, 5,531,597, Cl. 433-119.000.
- Denutte, Hugo R. G.: *See—*
  - Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.
- DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., to Duracell Inc. Upward deflecting support disk for electrochemical cell seal. 5,532,081, Cl. 429-171.000.
- DePuy Inc.: *See—*
  - Kelman, David C.; McNulty, Donald E.; and Anderson, Daniel L., 5,531,793, Cl. 623-16.000.
- Derby, Norman C.: *See—*
  - Derby, Norwin C.; and Derby, Norman C., 5,531,252, Cl. 141-67.000.
- Derby, Norwin C.; and Derby, Norman C., to B.A.G. Corporation. Vacuum fill system. 5,531,252, Cl. 141-67.000.
- Derouet, Patrick R. J.; and Guimier, Michel S., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A. Self regulating bleed valve. 5,531,566, Cl. 415-145.000.
- Desai, Nailesh B.: *See—*
  - Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
- Desai, Nayan N.; Quintana, Ronald P.; and Chowhan, Masood A., to Alcon Laboratories, Inc. Contact lens cleaning composition containing polyalklene oxide modified siloxanes. 5,532,224, Cl. 514-63.000.
- DeSatnick, Allen H.: *See—*
  - Stone, Kevin R.; and DeSatnick, Allen H., 5,531,762, Cl. 606-232.000.
- Desbois, Gabriel: *See—*
  - Whitesel, J. Warren; and Desbois, Gabriel, 5,531,171, Cl. 111-121.000.
- Descamps, Pierre, to Dow Corning S. A. Electrical testing process. 5,532,606, Cl. 324-674.000.
- DesChamps, Joseph D. P.: *See—*
  - Dautet, Henri P. E. G.; and DesChamps, Joseph D. P., 5,532,474, Cl. 250-214.00R.
- Deshpande, Annayya P.: *See—*
  - Church, Mark A.; Deshpande, Annayya P.; and Desouches, Alain M., 5,531,017, Cl. 29-603.120.
- Desouches, Alain M.: *See—*
  - Church, Mark A.; Deshpande, Annayya P.; and Desouches, Alain M., 5,531,017, Cl. 29-603.120.
- Destiny Technology Corporation: *See—*
  - Lung, James C. Y.; and Chi, Holy W., 5,533,175, Cl. 395-115.000.
- Detable, Pascal: *See—*
  - Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,530,996, Cl. 4-20.00R.
- Deubzer, Bernward: *See—*
  - Hager, Rudolf; Wolferseder, Josef; and Deubzer, Bernward, 5,532,399, Cl. 556-428.000.
- Deutsche Aerospace AG: *See—*
  - Hessel, Stefan; Frank, Frank; Hauptmann, Gerhard; and Hiereth, Werner, 5,531,738, Cl. 606-2.000.
- Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V.: *See—*
  - Tamme, Rainer; and Huder, Karin, 5,531,969, Cl. 422-186.000.
- DeVault, Robert C.; McConnell, Benjamin W.; and Phillips, Benjamin A., to Martin Marietta Energy Systems, Inc. Hermetically sealed superconducting magnet motor. 5,532,532, Cl. 310-52.000.
- Devore, David D.: *See—*
  - Rosen, Robert K.; Nickias, Peter N.; Devore, David D.; Stevens, James C.; and Timmers, Francis J., 5,532,394, Cl. 556-11.000.
- DeVre, Michael W.: *See—*
  - Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.
- DeVries, Robert A.; Shick, Reed A.; Wells, G. Thomas; and Carr, Joseph N., to Dow Chemical Company, The. Method of optical inspection. 5,532,817, Cl. 356-318.000.
- Dewa, Paul G.: *See—*
  - Tronolone, Mark J.; Dewa, Paul G.; Platten, James E.; and Bruning, John H., 5,532,821, Cl. 356-359.000.
- Dewar, John A.: *See—*
  - Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.
- Dezzani, Michael M.; and Beauregard, David E., to Torrington Company, The. Rolling bearing and method of making same. 5,531,836, Cl. 148-233.000.
- Diafoil Hoechst Company, Limited: *See—*
  - Masuda, Narihiro; and Kawaguchi, Chikakazu, 5,532,049, Cl. 428-216.000.
- Dibie, Alain; and Musset, Dominique, to Foundation pour l'Avenir pour la Recherche Medicale Appliquee; and Association pour la Recherche en Imagerie de l'Hopital Antoine Beclere. Anti-Pulmonary embolism filter. 5,531,788, Cl. 623-11.000.
- DIC Digital Supply Corp.: *See—*
  - Gelardi, John A., 5,531,953, Cl. 264-296.000.
- Dick, Rodney G.: *See—*
  - Zbinden, Lyn R.; Dallos, Robert, Jr.; and Dick, Rodney G., 5,531,496, Cl. 296-96.210.
- Dickerson, Marvella; and Piper, Douglas E., to Woven Electronics Corp. Composite shield jacket for electrical transmission cable. 5,532,429, Cl. 174-36.000.
- Dickey, Daniel M. Apparatus and method for singulating articles. 5,531,312, Cl. 198-450.000.
- Dickhut, Heinrich: *See—*
  - Berns, John S.; and Dickhut, Heinrich, 5,531,583, Cl. 425-193.000.
- Dickinson, Donald L. Method for shrink wrapping luggage. 5,531,059, Cl. 53-413.000.
- Dietrich, Uwe: *See—*
  - Crummenauer, Michael; Dietrich, Uwe; and Galle, Alfred, 5,532,461, Cl. 219-621.000.
- Dietz, George J.; Hammer, Randall E.; Basche, Stephen M.; and Hawes, Kevin J., to Delco Electronics Corp. Printed circuit reader/exciter coil for vehicle security system. 5,532,522, Cl. 307-10.500.
- Digital Equipment Corporation: *See—*
  - Flowers, James R., Jr.; Batchelder, Ned; and Macomber, Edward W., 5,533,174, Cl. 395-114.000.
  - Mayrand, James F.; and Gregorich, James, 5,532,918, Cl. 363-89.000.
- Dillehay, David R.; and Turner, David W., to Thiokol Corporation. Flare pallet and process for making same. 5,531,163, Cl. 102-288.000.
- DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., to Eli Lilly and Company. Anti-obesity proteins. 5,532,336, Cl. 530-324.000.
- Dimmick, Henry M.; Zanella, Mark F., Sr.; and Melnik, Thomas F., to AGR International, Inc. Container inspection apparatus having diameter measuring means and associated method. 5,532,605, Cl. 324-671.000.
- DiNinno, Frank P.; Guthikonda, Ravindra N.; and Meurer, Laura C., to Merck & Co., Inc. Carbapenem antibiotics, compositions containing such compounds and methods of use. 5,532,261, Cl. 514-210.000.
- Dionex Corporation: *See—*
  - Barretto, Victor B.; Heberling, Stephen S.; Summerfelt, Vernon E.; and Pohl, Christopher A., 5,532,279, Cl. 521-28.000.
- Directed Electronics, Inc.: *See—*
  - Issa, Darrell E.; and Birchfield, Jerry W., 5,532,670, Cl. 340-429.000.
- Discovision Associates: *See—*
  - Getreuer, Kurt W.; and Grassens, Leonardus J., 5,532,989, Cl. 369-44.150.
- Dittler Brothers Incorporated: *See—*
  - Rich, Benny R.; and Brawner, Jon M., 5,532,046, Cl. 428-202.000.
- Dixon, Arthur E. Scanning beam laser microscope with wide range of magnification. 5,532,873, Cl. 359-388.000.
- Djuric, Stevan W.; Docter, Stephen H.; and Yu, Stella S., to G. D. Searle & Co. Leukotriene B_4 antagonists. 5,532,383, Cl. 546-196.000.
- D'Mannco, Inc.: *See—*
  - Mann, Donaerl B.; and Mann, Don M., 5,531,668, Cl. 602-13.000.
- Doany, Fuad E.: *See—*
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
- Dobbins, Timothy M.; and Bogin, Zohar, to Intel Corporation. Method and apparatus for transmission of signals over a shared line. 5,533,200, Cl. 395-280.000.
- Dober Chemical Corporation: *See—*
  - Dobrez, John G.; and Prendergast, Frank T., 5,531,905, Cl. 210-709.000.
- Dobloug, Anette: *See—*
  - Westby, Reidar; and Talbot, David W., 5,531,670, Cl. 602-41.000.
- Dobrez, John G.; and Prendergast, Frank T., to Dober Chemical Corporation. System and method to control laundry waste water treatment. 5,531,905, Cl. 210-709.000.
- Dobson, Richard M.; Herndon, Jefferey D.; and Hudson, Leo D., to Bestline Liner Systems. Well completion tool and process. 5,531,273, Cl. 166-278.000.
- Docter, Stephen H.: *See—*
  - Djuric, Stevan W.; Docter, Stephen H.; and Yu, Stella S., 5,532,383, Cl. 546-196.000.
- Dodart, André, to Thomson-CSF. Connection device to provide a connection, by coaxial cable, to a printed circuit. 5,532,659, Cl. 333-260.000.
- Dodge, James L. Camp sink with heat source. 5,530,973, Cl. 4-643.000.
- Doehner, Robert F., Jr.: *See—*
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,532,207, Cl. 504-228.000.
- Doerfel, Hans, to Kernforschungszentrum Karlsruhe GmbH. Detector system for direct internal dosimetry in human beings. 5,531,228, Cl. 128-653.100.
- Doerge, Herman P.: *See—*
  - Werner, Joachim; Kane, Scott A.; Boonstra, Eric F.; and Doerge, Herman P., 5,532,283, Cl. 521-131.000.
- Doi, Koji: *See—*
  - Suzuki, Koji; Sekiya, Toshiyuki; and Doi, Koji, 5,532,913, Cl. 363-25.000.

- Dolan, Michael G., to Celeritas Technologies, Ltd. Apparatus and method for compensating for limiter induced non-linear distortion in a wireless data communication system. 5,533,048, Cl. 375-222.000.
- Dolla, Franz, to Volkswagon AG. Pedal arrangement for a motor vehicle. 5,531,135, Cl. 74-512.000.
- Doluca, Tunc, to Maxim Integrated Products, Inc. Method and apparatus for multiple output regulation in a step-down switching regulator. 5,532,577, Cl. 323-282.000.
- Domanski, Ronald S.: *See—*
  - Taravella, Philip; Blair, Edward J.; Domanski, Ronald S.; and Shippell, Joseph C., 5,531,165, Cl. 108-51.300.
- Dombo, Berthold: *See—*
  - Pizzi, Antonio; Roll, Willi; and Dombo, Berthold, 5,532,330, Cl. 528-125.000.
- Dometic Corporation, The: *See—*
  - Aldrich, Roger L., 5,531,641, Cl. 454-100.000.
- Domhoff, Joseph E.: *See—*
  - Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
- Donald, Robert J.: *See—*
  - Bonekamp, Jeffrey E.; Swartzmiller, Steven B.; Donald, Robert J.; and Uzee, Andre J., 5,532,315, Cl. 525-71.000.
- Dong Kook Pharmaceutical Co., Ltd.: *See—*
  - Kim, Yong H.; Park, Hee S.; and Lee, Dong H., 5,532,381, Cl. 548-453.000.
- Dong, Liang C.: *See—*
  - Wong, Patrick S.-L.; Theeuwes, Felix; Larsen, Steven D.; and Dong, Liang C., 5,531,736, Cl. 604-892.100.
- Donnantuono, Michael J.: *See—*
  - Wojcik, Michael A.; and Donnantuono, Michael J., 5,531,349, Cl. 220-339.000.
- Donnell, Emerson B., Jr. Ajustable injection molding apparatus. 5,531,581, Cl. 425-145.000.
- Donnelly, Michael. Belt clip incorporating a multipurpose tool. 5,531,365, Cl. 224-576.000.
- Donovan, Robert J.: *See—*
  - Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., 5,533,182, Cl. 395-155.000.
- Dopaco, Inc.: *See—*
  - Eisman, Larry, 5,531,373, Cl. 229-108.000.
- Dorfner, Konrad: *See—*
  - Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.
- Dorius, Lee K.; and Samuelson, Laurence S., to International Business Machines Corporation. Negative pressure slider with optimized leading pocket for profile control. 5,532,890, Cl. 360-103.000.
- Dornfest, Charles: *See—*
  - Fodor, Mark A.; Bercaw, Craig A.; and Dornfest, Charles, 5,531,835, Cl. 118-728.000.
- Dornier GmbH: *See—*
  - Spaeh, Richard; Westphal, Manfred; Erdle, Erich; and Zurell, Klaus-Peter, 5,532,072, Cl. 429-34.000.
- Dorsch, Dieter: *See—*
  - Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.
  - Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, 5,532,276, Cl. 514-303.000.
- Dotson, Seldon L., to General Electric Company. Impact modifier for high nitrile resins and impact modified nitrile resin compositions. 5,532,318, Cl. 525-83.000.
- Dougherty, William G.: *See—*
  - Johnston, Stephen A.; and Dougherty, William G., 5,532,142, Cl. 435-69.100.
- Dounn, Paul J.; Kise, Terry L.; Schneider, Richard C.; and Tayefeh, Morovat, to International Business Machines Corporation. Adjustable read channel equalization for error processing in a recordable media drive. 5,533,031, Cl. 371-21.100.
- Dove, Derek B.: *See—*
  - Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, 5,532,089, Cl. 430-5.000.
- Dover Chemical Corporation: *See—*
  - Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., 5,532,401, Cl. 558-95.000.
- Dow Chemical Company, The: *See—*
  - Bales, Stephen E.; Langhoff, Charles A.; and Wheatley, John A., 5,532,331, Cl. 528-196.000.
  - Bonekamp, Jeffrey E.; Swartzmiller, Steven B.; Donald, Robert J.; and Uzee, Andre J., 5,532,315, Cl. 525-71.000.
  - DeVries, Robert A.; Shick, Reed A.; Wells, G. Thomas; and Carr, Joseph N., 5,532,817, Cl. 356-318.000.
  - Remmert, Mark A.; Oertel, Richard W.; and Moses, Paul J., Jr., 5,530,989, Cl. 16-110.00R.
  - Rosen, Robert K.; Nickias, Peter N.; Devore, David D.; Stevens, James C.; and Timmers, Francis J., 5,532,394, Cl. 556-11.000.
  - Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.
- Dow Corning Corporation: *See—*
  - Bahr, Bradley C.; and Selley, David B., 5,531,814, Cl. 106-3.000.
- Dow Corning S. A.: *See—*
  - Descamps, Pierre, 5,532,606, Cl. 324-674.000.
- Dow Corning Toray Silicone Co., LTD.: *See—*
  - Kobayashi, Hideki, 5,531,929, Cl. 252-321.000.
- Downey, Susan H.: *See—*
  - Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, 5,531,838, Cl. 148-23.000.
- Downs, Robert W.; and Simek, James C., to Vetco Pipeline Services, Inc. Magnetic field analysis method and apparatus for determining stress characteristics in a pipeline. 5,532,587, Cl. 324-220.000.
- Doyle, John B.: *See—*
  - Gauer, Edgar J.; and Doyle, John B., 5,532,876, Cl. 359-604.000.
- Dr. Hielscher GmbH: *See—*
  - Hielscher, Harald, 5,532,539, Cl. 310-316.000.
- DRACO: *See—*
  - Browning, James A., 5,531,590, Cl. 431-8.000.
- Dräger, Brigitte: *See—*
  - Ziegenhorn, Joachim; Schiefer, Sigbert; and Dräger, Brigitte, 5,532,172, Cl. 436-539.000.
- Drägerwerk Aktiengesellschaft: *See—*
  - Schlör, Georg; Reimers, Hans-Karsten; Vosberg, Dietrich; and Röhling, Holmer, 5,531,802, Cl. 55-274.000.
- Drahm, Wolfgang, to Endress + Hauser Flowtec AG. Coriolis-type mass flow sensor with flow condition compensating. 5,531,126, Cl. 73-861.357.
- Drayton Corporation: *See—*
  - Shelton, Jeff L.; Stallings, Kevin J.; and Hogan, Thomas H., 5,531,189, Cl. 122-379.000.
- Dreier, Kimberly A., to Procter & Gamble Company, The. Absorbent article having a pocket cuff. 5,531,730, Cl. 604-385.200.
- Drew, James H.: *See—*
  - Aneja, Arun P.; Drew, James H.; and Knox, Benjamin H., 5,532,060, Cl. 428-398.000.
- Drivon, Gilles; and Bindi, Dominique, to Elf Atochem S.A. Manufacture of solid perfluoroalkyl bromides. 5,532,420, Cl. 570-170.000.
- Drukier, Andrzey K., to BioTraces, Inc. Quantitation of gamma and x-ray emitting isotopes. 5,532,122, Cl. 435-5.000.
- DSM N.V.: *See—*
  - Hoogmartens, Ivan A. L.; Gelan, Joannes M. J. V.; Vanderzande, Dirk J. M.; and Froehling, Peter E., 5,532,328, Cl. 526-193.000.
- Du Pont de Nemours, E. I., and Company: *See—*
  - Aneja, Arun P.; Drew, James H.; and Knox, Benjamin H., 5,532,060, Cl. 428-398.000.
  - Bartlett, Philip L.; Creazzo, Joseph A.; and Hammel, Howard S., 5,532,284, Cl. 521-134.000.
  - Bodager, Gregory A.; and Beighle, Phillip L., 5,532,115, Cl. 430-325.000.
  - Brearley, Ann M.; and Gold, Harvey S., 5,532,487, Cl. 250-339.120.
  - Burk, Mark J., 5,532,395, Cl. 556-18.000.
  - Cha, Geun Sig, 5,531,870, Cl. 205-778.000.
  - Gallagher, Francis G., 5,532,404, Cl. 560-78.000.
  - Lee, Kiu-Seung, 5,532,059, Cl. 428-359.000.
  - Merchant, Abid N., 5,531,916, Cl. 510-412.000.
  - Nordstrom, J. David; Omura, Hisanori; Smith, Alan E.; and Thomson, David M., 5,532,027, Cl. 427-493.000.
  - Shen, Zhi-Yuan, 5,532,210, Cl. 505-200.000.
  - Stouffer, Jan M.; Blanchard, Elwood N.; and Leffew, Kenneth W., 5,532,333, Cl. 528-308.200.
- Du, Xuemei: *See—*
  - Albright, Jay D.; Delos Santos, Efren G.; Du, Xuemei; Reich, Marvin E.; and Venkatesan, Aranapakam M., 5,532,235, Cl. 514-215.000.
- Dubois, Jean-Paul, to KSB S.A. Process for improving the mechanical and sealing properties of elastomer gaskets, joints and seals and the seal obtained with this process. 5,532,299, Cl. 524-13.000.
- Dudar, Thomas E.: *See—*
  - Attermeier, Kurt; Dudar, Thomas E.; Stiehl, Mark A.; and Tartaglia, Joseph M., 5,531,711, Cl. 604-242.000.
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- Duecker, Heyman C.: *See—*
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- Duel, Susan B.: *See—*
  - Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
  - Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.

- Duerr, Karl W.; and Krivda, John J., to Duerr Tool & Die Co., Inc. Cartridge for printers. 5,531,528, Cl. 400-200.000.
- Duerr Tool & Die Co., Inc.: *See—*
  - Duerr, Karl W.; and Krivda, John J., 5,531,528, Cl. 400-200.000.
- Duffy, Dean R., to Minnesota Mining and Manufacturing Company. Zigzag filter media and frame having triangular pleat stabilizing elements. 5,531,892, Cl. 210-493.100.
- Duggal, Anil R.; and Yakymyshyn, Christopher P., to General Electric Company. Method of incorporating vertical cavity surface emitting lasers in an ultrasound detector. 5,532,981, Cl. 367-149.000.
- Dugstad, Harald: *See—*
  - Berg, Arne; Almén, Torsten; Klaveness, Jo; Rongved, Pal; Thomassen, Terje; and Dugstad, Harald, 5,531,978, Cl. 424-1.110.
- Dumas, Chris; and Winterer, Sean, to Zevex, Inc. Enteral feeding pump motor unit and method of use. 5,531,680, Cl. 604-67.000.
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  - Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., 5,533,123, Cl. 380-4.000.
- Duncan, Stewart C.; and Capps, Ambers H. Multipurpose hand-held tool designed for use with grinder. 5,531,638, Cl. 451-364.000.
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- Dunn, Ino: *See—*
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- Dunn, Paul F.; and Bauck, Randall C., to Maxtor Corporation. Control system filter having both early-off hold and multi-interval sampling functions. 5,532,926, Cl. 364-178.000.
- Dunne, Stephen R.: *See—*
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  - Smyser, Thomas E.; and Confalone, Pasquale N., 5,532,356, Cl. 540-492.000.
  - Wilkerson, Wendell W.; Earl, Richard A.; and Voss, Matthew E., 5,532,247, Cl. 514-277.000.
  - Wilkerson, Wendell W.; and Teleha, Christopher A., 5,532,249, Cl. 514-292.000.
- Duracell Inc.: *See—*
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  - DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., 5,532,081, Cl. 429-171.000.
  - Wang, Enoch I.; Bowden, William L.; and Lin, Lifun, 5,532,084, Cl. 429-224.000.
- Durametallic Corporation: *See—*
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- Durand, David; and Iannetta, Roger A., Jr., to Poly Flex Circuits, Inc. Method of making subsurface electronic circuits. 5,531,020, Cl. 29-840.000.
- Durham, Jayson T., to Serotech, Inc. Optical spectroscopic information storage. 5,532,998, Cl. 369-116.000.
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- Durocher, Kevin M.: *See—*
  - Saia, Richard J.; Ghezzo, Mario; Bagepalli, Bharat S. K.; and Durocher, Kevin M., 5,531,018, Cl. 29-622.000.
- Durr Industries, Inc.: *See—*
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- Duve, Hans, to HULS Aktiengesellschaft. Apparatus for determining decomposable organic carbon compounds present in a gaseous phase. 5,531,965, Cl. 422-80.000.
- Duzyk, Edward F.; and Fizer, Wallace E., to Trojan, Inc. Coated, labeled fluorescent lamp. 5,532,549, Cl. 313-489.000.
- Dwork, Jeffrey: *See—*
  - Fischer, Matthew J.; Gibson, Glen; Dwork, Jeffrey; and Runaldue, Thomas J., 5,533,203, Cl. 395-250.000.
- Dyad Pharmaceutical Corporation: *See—*
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- Dystar Japan Ltd.: *See—*
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- Dzwonczyk, Roger R.: *See—*
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  - Inoue, Haruo, 5,531,640, Cl. 453-17.000.
- Earl, Richard A.: *See—*
  - Wilkerson, Wendell W.; Earl, Richard A.; and Voss, Matthew E., 5,532,247, Cl. 514-277.000.
- Earle, Michael L. Automated bone cement mixing apparatus. 5,531,519, Cl. 366-139.000.
- Easson, D. Davidson, Jr.: *See—*
  - Jamas, Spiros; Easson, D. Davidson, Jr.; and Ostroff, Gary R., 5,532,223, Cl. 514-54.000.
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- Eastern Company, The: *See—*
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  - Bauer, Charles L.; Krenceski, Mary A.; and Fitzgerald, John J., 5,532,118, Cl. 430-533.000.
  - Burns, Elizabeth G.; Visser, Susan A.; and Taylor, Jeffrey F., 5,532,286, Cl. 522-37.000.
  - Cahill, David F., 5,532,810, Cl. 355-315.000.
  - Chapman, Michael J.; Merle, Thomas C.; and Rowden, David L., 5,531,008, Cl. 29-230.000.
  - Coyle, Dennis J.; and Fitzgerald, Barry A., 5,531,161, Cl. 101-157.000.
  - Fyson, John R., 5,532,780, Cl. 354-324.000.
  - Hassall, Stephen J.; May, Daniel R.; and Oehlbeck, Martin E., 5,532,786, Cl. 355-22.000.
  - Jeffers, Frederick J.; Smith, Neil; Freeman, Jay D.; Gandola, Kent R.; and Koeppe, Peter V., 5,532,584, Cl. 324-202.000.
  - Kaplan, Martin C.; and Kwon, Heemin, 5,533,149, Cl. 382-260.000.
  - Kerr, Roger S.; and Cunningham, Hugh A., 5,531,854, Cl. 156-234.000.
  - Kessler, David, 5,533,152, Cl. 385-11.000.
  - Martin, Thomas W., 5,532,725, Cl. 347-221.000.
  - Merkel, Paul B.; Merrill, James P.; Schmoeger, Jeffrey W.; and Mooberry, Jared B., 5,532,117, Cl. 430-504.000.
  - Nair, Mridula; Lobo, Lloyd A.; and Oltean, George L., 5,531,913, Cl. 252-62.530.
  - Parker, H. Galen; Finnicum, Douglas S.; and Young, Richard D., 5,533,139, Cl. 382-108.000.
  - Sonnenberg, Sven; Rimai, Donald S.; Almeter, David D.; and Potucek, Martin, 5,532,802, Cl. 355-246.000.
  - Stewart, Wallace S.; Merz, Gary E.; and Marshall, Dale C., 5,531,847, Cl. 156-73.100.
  - Trest, Jeffrey A., 5,531,827, Cl. 118-258.000.
- Eaton Corporation: *See—*
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  - Pearson, James E.; and Carls, Dennis R., 5,531,248, Cl. 137-625.460.
- Eaton, Paul, to Champion Technologies, Inc. Method and apparatus for determining velocity dependent corrosion rate. 5,531,103, Cl. 73-61.620.
- Eberhardt, Christine D.: *See—*
  - Cousens, Lawrence S.; Eberhardt, Christine D.; Gray, Patrick; Tjoelker, Larry W.; Wilder, Cheryl L.; and Trong, Hai, 5,532,152, Cl. 435-197.000.
- Ebihara, Ken: *See—*
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- Ebihara, Koichi: *See—*
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- ECC International Inc.: *See—*
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- Edelbrock Corporation: *See—*
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- Edwards, Philip D.; Warner, Peter; and Wolanin, Donald J., to Zeneca Limited. Heterocyclic amides. 5,532,366, Cl. 514-234.200.
- Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., to Square D Company. Contact block having convertible normally open or normally closed electrical contact. 5,532,441, Cl. 200-16.00A.

- Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., to Vidamed, Inc. Medical probe device and method. 5,531,676, Cl. 604-22.000.
- Edwards, Stuart D.: *See—*
    - Lundquist, Ingemar H.; and Edwards, Stuart D., 5,531,677, Cl. 604-22.000.
- Eferl, Franc: *See—*
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- EG&G Limited: *See—*
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- Egami, Noritaka, to Mitsubishi Denki Kabushiki Kaisha. Analog input apparatus. 5,532,582, Cl. 324-130.000.
- Egger, Christian: *See—*
    - Wolter, Herbert; Rose, Klaus; and Egger, Christian, 5,532,398, Cl. 556-420.000.
- Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, to Houston Advanced Research Center. Multi-site detection apparatus. 5,532,128, Cl. 435-16.000.
- Ehrlich, Daniel J.: *See—*
    - Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, 5,532,128, Cl. 435-16.000.
- Eichenberger, Hans-Ulrich; Cavadini, Flavio; and Jager, Paul, to Rieter Machine Works, Ltd. Combing machine having a web guide device. 5,530,995, Cl. 19-231.000.
- Eichholz, Kerstin: *See—*
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    - Kreuzer, Markus; and Eidenschink, Rudolf, 5,532,952, Cl. 365-108.000.
- Eigenmann, Oskar, to Bruderer AG. Single-shaft four-point punch press. 5,531,160, Cl. 100-258.00R.
- Eike, Masatoyo; and Miyazaki, Kunio, to Zexel Corporation. Control apparatus for a cooling unit with a heating function and a multi-compartment temperature management apparatus for a vehicle using this cooling unit. 5,531,264, Cl. 165-43.000.
- Eisai Co., Ltd.: *See—*
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- Electronic Information Systems, Inc.: *See—*
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- Electronic Retailing Systems International, Inc.: *See—*
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- Electronics and Telecommunications Research Institute: *See—*
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- Elektro-Thermit GmbH: *See—*
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- Element, Richard G.; and Morris, Roger A., to Sun Dial Industries, Inc. Photosensitive automatic blind controller. 5,532,560, Cl. 318-266.000.
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- Elf Atochem North America, Inc.: *See—*
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- Elf Atochem S.A.: *See—*
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- El-Hamamsy, Sayed-Amr: *See—*
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- Elholm, Tor, to Geco A.S. Device and method for positioning of towing systems for use in marine seismic surveys. 5,532,975, Cl. 367-16.000.
- Eli Lilly and Company: *See—*
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    - Briggs, Barbara S.; and Zmijewski, Milton J., Jr., 5,532,149, Cl. 435-122.000.
    - Briggs, Barbara S.; and Zmijewski, Milton J., Jr., 5,532,161, Cl. 435-252.100.
    - Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., 5,532,382, Cl. 549-57.000.
    - DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,532,336, Cl. 530-324.000.
    - Wong, David T.; and Oguiza, Juan I., 5,532,244, Cl. 514-255.000.
    - Wong, David T.; and Oguiza, Juan I., 5,532,250, Cl. 514-415.000.
    - Wong, David T.; and Oguiza, Juan I., 5,532,264, Cl. 514-415.000.
    - Wong, David T.; and Oguiza, Juan I., 5,532,268, Cl. 514-432.000.
- Elias, Carole L.: *See—*
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- Ellard, Gregory S.: *See—*
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- Eller, Mark: *See—*
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- Ellis, Matthew; Saunders, Rowland F.; Smith, James A.; and Noret, Patrick, to General Electric Company. Framem interpolator for increasing apparent acoustic frame rate in ultrasound imaging. 5,531,224, Cl. 128-660.070.
- Ellwood, David: *See—*
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- Emerson Electric Co.: *See—*
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- Emhart Glass Machinery Investments Inc.: *See—*
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- Endo, Osamu: *See—*
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- Endo, Takayoshi; and Kondo, Hiroki, to Yazaki Corporation. Waterproof-type terminal connection structure and method of producing same. 5,532,433, Cl. 174-84.00C.
- Endress + Hauser Flowtec AG: *See—*
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- Eng, Kjell; and Wallin, Erik, to Barracuda Technologies AB. Warp-knitted camouflage material. 5,532,052, Cl. 428-229.000.
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- Engelberth, Jon W.: *See—*
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- Engelhard Corporation: *See—*
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- Engelsberg, Audrey C.; and Dehais, Joseph A., to Cauldron Limited Partnership. Removal of surface contaminants by irradiation from a high energy source. 5,531,857, Cl. 156-345.000.
- Engelson, Erik T.; Hergenrother, Robert; and Eder, Joseph, to Target Therapeutics, Inc. Lubricious catheters. 5,531,715, Cl. 604-265.000.
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- Engström, Folke; and Isaksson, Juhani, to Foster Wheeler Energia Oy. Eliminating ash bridging in ceramic filters. 5,531,798, Cl. 48-77.000.
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- Ensminger, William D.; and Gavin, Robert F., to Michigan TransTech Corporation. Implantable access devices. 5,531,684, Cl. 604-93.000.
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- Eo, Ik-Soo: *See—*
    - Park, Gyeong-Lyong; Suh, Chung-Wook; and Eo, Ik-Soo, 5,532,695, Cl. 341-173.000.
- EP Technologies, Inc.: *See—*
    - Lundquist, Ingemar; and Thompson, Russell B., 5,531,686, Cl. 604-95.000.
- Eppendorf-Netheler-Hinz GmbH: *See—*
    - Sabloewski, Horst, 5,531,131, Cl. 73-864.180.
- Epstein, Jacob: *See—*
    - Bryant, Peter J.; and Epstein, Jacob, 5,531,199, Cl. 123-297.000.
- Er, Song S.: *See—*
    - Pliura, Diana; Wong, Lawrence T.; and Er, Song S., 5,532,352, Cl. 540-145.000.
- Erdle, Erich: *See—*
    - Spaeh, Richard; Westphal, Manfred; Erdle, Erich; and Zurell, Klaus-Peter, 5,532,072, Cl. 429-34.000.

- Erdley, Harold F. Self-calibrating three axis angular rate sensor. 5,531,115, Cl. 73-504.020.
- Ergenics, Inc.: *See—*
    - Golben, P. Mark, 5,532,074, Cl. 429-53.000.
- Erickson, Dwight D.: *See—*
    - Decker, Lewis B., Jr.; Erickson, Dwight D.; and Barclay, David A., 5,531,976, Cl. 423-625.000.
- Erickson, Jack N., Jr.; Gazza, Jack M.; Olivas, Victor S.; and Thompson, Charles A., to International Business Machines Corporation. Low tolerance positioning system in an automated handling system. 5,532,931, Cl. 364-478.060.
- Erickson, William R.; and Bouffard, Leif E., to Phosphate Engineering and Construction Co., Inc. Process for the production of phosphoric acid and calcium fluoride. 5,531,975, Cl. 423-319.000.
- Eriksson, Karl Ö., to Telefonaktiebolaget LM Ericsson. Method and an arrangement for minimizing a phase difference between two datastreams prior to changeover. 5,533,073, Cl. 375-371.000.
- Erilli, Rita, to Colgate-Palmolive Co. Microemulsion light duty liquid cleaning compositions. 5,531,938, Cl. 510-417.000.
- ERO Industries, Inc.: *See—*
    - Macedo, Antone, 5,531,657, Cl. 482-111.000.
- Errico, Joseph P.; Errico, Thomas J.; and Ralph, James, to Fastenetix, L.L.C. Posterior spinal polyaxial locking lateral mass screw plate assembly. 5,531,746, Cl. 606-61.000.
- Errico, Thomas J.: *See—*
    - Errico, Joseph P.; Errico, Thomas J.; and Ralph, James, 5,531,746, Cl. 606-61.000.
- Eschbach, Reiner: *See—*
    - McIntyre, Lloyd F.; and Eschbach, Reiner, 5,532,849, Cl. 358-534.000.
- Esco Technologies, Inc.: *See—*
    - Moruzzi, James A., 5,531,550, Cl. 409-179.000.
- Escrihuela Langa, Francisco J.: *See—*
    - Hita de la Torre, Carlos; Escrihuela Langa, Francisco J.; Martinez Garcia, Francisco J.; and Blanco, Carlos H., 5,533,028, Cl. 370-95.300.
- Espevik, Terje; and Marra, Marian N., to Incyte Pharmaceuticals, Inc. Neutralization of non-lipopolysaccharide compounds by bactericidal/permeability-increasing protein. 5,532,216, Cl. 514-21.000.
- Esselte Meto International GmbH: *See—*
    - Umbach, Dirk, 5,531,532, Cl. 400-692.000.
- Eta SA Fabriques d'Ebauches: *See—*
    - Béguin, Jean-Luc; and Haefeli, Pierre, 5,532,982, Cl. 368-64.000.
- Etablissements Caillau: *See—*
    - Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,530,996, Cl. 4-20.00R.
- Etablissements Mauguin SA: *See—*
    - Whitesel, J. Warren; and Desbois, Gabriel, 5,531,171, Cl. 111-121.000.
- ETEC Systems, Inc.: *See—*
    - Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, 5,533,170, Cl. 395-108.000.
- Ethicon Endo-Surgery: *See—*
    - Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.
- Ethicon Endo-Surgery, Inc.: *See—*
    - Uschold, Robert C.; Stephens, Randy R.; Mauch, Jeffrey; Smith, Richard C.; and Houser, Kevin, 5,531,758, Cl. 606-185.000.
- Etsch, August C.: *See—*
    - Psinakis, Leas N.; Villani, Thomas J.; and Etsch, August C., 5,532,939, Cl. 364-514.00C.
- Ettinger, Gil J.: *See—*
    - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Evans, Douglas: *See—*
    - Kensey, Kenneth; Nash, John E.; and Evans, Douglas, 5,531,759, Cl. 606-213.000.
- Evans, Kenneth A.: *See—*
    - Wainwright, Robin; and Evans, Kenneth A., 5,532,292, Cl. 523-179.000.
- Evans, Lloyd T.; King, Roderick W.; Mander, Lewis N.; Pearce, David W.; and Pharis, Richard P. Method of treating plants or plant tissues with C-16,17-dihydro gibberellins. 5,532,206, Cl. 504-176.000.
- Evans, Ronald A.: *See—*
    - Pinard, Deborah L.; Peres, Eliana M. O.; and Evans, Ronald A., 5,533,110, Cl. 379-201.000.
- Even-Esh, Alexander, to Snap-on Incorporated. Surgical tool and adjustable locking handle therefor. 5,531,750, Cl. 606-79.000.
- Ewerbring, Lars-Magnus: *See—*
    - Willars, Per H. A.; Grimlund, Olof E.; and Ewerbring, Lars-Magnus, 5,533,014, Cl. 370-18.000.
- Exposystems, Inc.: *See—*
    - Crawford, John, 5,531,539, Cl. 403-381.000.
- Exxon Chemical Patents, Inc.: *See—*
    - Gursky, Leonard J.; Fusco, James V.; and Flowers, Douglas D., 5,532,312, Cl. 525-232.000.
    - Lyford, John, IV, 5,532,405, Cl. 560-99.000.
- Exxon Production Research Company: *See—*
    - Schneider, William A., Jr., 5,532,976, Cl. 367-38.000.
- Exxon Research and Engineering Company: *See—*
    - Koo, Jayoung; and Luton, Michael J., 5,531,842, Cl. 148-654.000.
- Eyhorn, Thomas: *See—*
    - Kratel, Günter; Eyhorn, Thomas; Stohr, Günter; and Rell, Andreas, 5,532,458, Cl. 219-464.000.
- Eykmann, Rudolf; Fritze, Joachim; Uhrig, Birgit; and Schödel, Dieter, to Heraeus Kulzer GmbH. Syringe for the controlled discharge of viscous materials. 5,531,709, Cl. 604-218.000.
- Eyre, David R., to Washington Research Foundation. Methods of detecting collagen degradation in vivo. 5,532,169, Cl. 436-518.000.
- Faber, Michael W.: *See—*
    - Young, Patrick; Roop, John H.; and Faber, Michael W., 5,532,754, Cl. 348-569.000.
- Fagan, John E.: *See—*
    - McCalip, Timothy I.; Frazier, Jimmy R.; and Fagan, John E., 5,531,832, Cl. 118-622.000.
- Faggioli, Eugenio: *See—*
    - Ricco, Mario; Pacucci, Nicola; Abate, Maurizio; and Faggioli, Eugenio, 5,532,526, Cl. 307-104.000.
- Fagnani, Mauro; Ferrario, Bruno; and Sandri, Paolo, to SGS-Thomson Microelectronics, S.r.l. Circuit for controlling the rise of the output voltage of an amplifier at start up. 5,532,645, Cl. 330-265.000.
- Fahey, Kennan J.: *See—*
    - Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., 5,532,382, Cl. 549-57.000.
- Faigle, Ernest M.: *See—*
    - Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., 5,531,472, Cl. 280-735.000.
- Fain, Eric S., to Ventritex, Inc. Method and apparatus for delivering defibrillation shocks with improved effectiveness. 5,531,767, Cl. 607-5.000.
- Fair, Paul: *See—*
    - Poulson, Keith L.; Fair, Paul; and Parker, Robert M., 5,531,258, Cl. 160-376.000.
- Fairfield Industries: *See—*
    - Clover, Daniel S.; and Sisco, Mark S., 5,531,541, Cl. 404-25.000.
- Family Trust U/T/A, Southpac Trust International, Inc. as trustee of The: *See—*
    - Weder, Donald E., 5,531,058, Cl. 53-399.000.
- Fan, Zhigang, to Xerox Corporation. Anti-counterfeit pattern detector and method. 5,533,144, Cl. 382-135.000.
- Fanchang, Wei-Chuan; and Chen, Shih-Yueh. Unidirectional drive tool mechanism. 5,531,139, Cl. 81-59.100.
- Fanelli, Michael W.: *See—*
    - Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., 5,531,298, Cl. 188-78.000.
- Fanuc Ltd.: *See—*
    - Hara, Ryuichi; and Kobayashi, Eiichi, 5,532,924, Cl. 364-167.010.
- Farmitalia Carlo Erba S.R.L.: *See—*
    - Bargiotti, Alberto; Caruso, Michele; Grandi, Maria; Ripamonti, Marina; and Suarato, Antonino, 5,532,218, Cl. 514-34.000.
- Farooq, Shaji; Purushothaman, Sampath; Reddy, Srinivasa S. N.; and Sura, Vivek M., to International Business Machines Corporation. I/O pad adhesion layer for a ceramic substrate. 5,532,031, Cl. 428-623.000.
- Farrell, Roberta L.: *See—*
    - Blanchette, Robert A.; Farrell, Roberta L.; and Behrendt, Chad J., 5,532,164, Cl. 435-277.000.
- Fastenetix, L.L.C.: *See—*
    - Errico, Joseph P.; Errico, Thomas J.; and Ralph, James, 5,531,746, Cl. 606-61.000.
- Fauteux, Denis G.; van Buren, Martin; and Powell, John, to Arthur D. Little, Inc. Molecular complexes for use as electrolyte components. 5,531,871, Cl. 205-688.000.
- Favorite Brands International, Inc.: *See—*
    - O'Donnell, Lisa T.; and Wirebaugh, Ralph S., 5,532,017, Cl. 426-571.000.
- Fayet, Pierre; and Jaccoud, Bertrand, to Tetra Laval Holdings & Finance SA. Method of producing interiorly sterile packages possessing superior barrier properties. 5,531,060, Cl. 53-426.000.
- Fechter, Mark A.; and Hansen, George N. P., to Weasler Engineering, Inc. Shear element type clutch. 5,531,307, Cl. 192-56.400.
- Fedor, Max A.: *See—*
    - Colburn, Eric R.; Fedor, Max A.; Gillio, Robert G.; and Neu, Daniel W., 5,533,079, Cl. 377-6.000.
- Feeley, Peter S.: *See—*
    - Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., 5,532,693, Cl. 341-51.000.
- Feldkamp, Lee A.; Puskorius, Gintaras V.; James, John V.; and Marko, Kenneth A., to Ford Motor Company. Adaptive correction of torsional and wheel profile position irregularities for misfire detection. 5,531,108, Cl. 73-117.300.
- Feldman, Leonard C.: *See—*
    - Amorai-Moriya, Netzer; Brener, Igal M.; and Feldman, Leonard C., 5,532,510, Cl. 257-618.000.
- Fenlon, Christopher, to Ishida-Nonpareil Limited. Package testing. 5,531,101, Cl. 73-49.300.
- Fennell, Robert B. Universal fuse holder and cut-out with built-in safety features and method. 5,532,668, Cl. 337-168.000.
- Fenner, Thomas, to Hoechst Aktiengesellschaft. Annular dam slide valve. 5,531,421, Cl. 251-65.000.
- Fergason, James L. Folded variable birefringerence zeroth order hybrid aligned liquid crystal apparatus. 5,532,854, Cl. 359-93.000.

- Ferguson, Stephen P., to GPT Limited. Dual connections. 5,533,005, Cl. 370-16.000.
- Ferrario, Bruno: *See—*
  - Fagnani, Mauro; Ferrario, Bruno; and Sandri, Paolo, 5,532,645, Cl. 330-265.000.
- Festo KG: *See—*
  - Matsui, Akio, 5,531,151, Cl. 92-88.000.
- Fetting, Karl A.: *See—*
  - Atkeisson, Randal A.; and Fetting, Karl A., 5,533,161, Cl. 385-99.000.
- Feucht, Dennis D.; Funke, Steven J.; and Meister, Steven F., to Caterpillar Inc. Hydraulically actuated valve system. 5,531,192, Cl. 123-90.120.
- Field, John E.: *See—*
  - Spindt, Christopher J.; Field, John E.; Morris, David L.; and Curtin, Christopher J., 5,532,548, Cl. 313-422.000.
- Fierkens, Richard H. J. Electromechanical press and method of operating. 5,531,014, Cl. 29-566.300.
- Fiers, Thomas A.: *See—*
  - Stefansky, Frederick M.; Shrinkle, Louis J.; and Fiers, Thomas A., 5,532,889, Cl. 360-97.010.
- Fifield, John A.: *See—*
  - Beiley, Mark A.; and Fifield, John A., 5,532,622, Cl. 326-95.000.
  - Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., 5,533,036, Cl. 371-40.100.
- Figest B.V.: *See—*
  - Claeyssen, Frank; Le Letty, Ronan; and Lhermet, Nicolas, 5,532,540, Cl. 310-323.000.
- Figueroa C., Juan D. D.: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Filas, Robert W.; and Marchman, Herschel M., to AT&T Corp. Cylindrical fiber probe devices and methods of making them. 5,531,343, Cl. 216-11.000.
- Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, to BASF Aktiengesellschaft. Copolymers and mixtures which are self-curable with atmospheric humidity. 5,532,329, Cl. 526-279.000.
- Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., to General Electric Company. Direct stacked and flip chip power semiconductor device structures. 5,532,512, Cl. 257-686.000.
- Fina Technology, Inc.: *See—*
  - Sosa, Jose M.; and Beisert, Stan, 5,531,967, Cl. 422-131.000.
- Finberg, John P. M.: *See—*
  - Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.
- Fink, J. Stephen, to United States of America, Health and Human Services. Host cell line LVIP2.0Zc, useful in assays to identify ligands and ant agonists of G protein-coupled receptors. 5,532,157, Cl. 435-240.200.
- Finnicum, Douglas S.: *See—*
  - Parker, H. Galen; Finnicum, Douglas S.; and Young, Richard D., 5,533,139, Cl. 382-108.000.
- Fior de Venezuela: *See—*
  - Whipp, Roy H., 5,531,424, Cl. 266-156.000.
- Fiore, Dennis J.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Firebaugh, Ronald L.; and Schultz, Jim R., to Guardian Products, Inc. Method of lifting a patient with a sling. 5,530,975, Cl. 5-81.10T.
- Fischer, Jens-Dieter; and Siol, Werner, to Roehm GmbH Chemische Fabrik. Compatible polymer blends. 5,532,067, Cl. 428-500.000.
- Fischer, Matthew J.; Gibson, Glen; Dwork, Jeffrey; and Runaldue, Thomas J., to Advanced Micro Devices, Inc. Start of packet receive interrupt for ethernet controller. 5,533,203, Cl. 395-250.000.
- Fischer, Rolf, to BASF Aktiengesellschaft. Catalytic process for eliminating carboxylic ester and acyl groups from organic compounds. 5,532,386, Cl. 549-322.000.
- fischerwerke, Artur Fischer GmbH & Co. KG: *See—*
  - Lind, Stefan, 5,531,535, Cl. 403-297.000.
- Fisher Controls International, Inc.: *See—*
  - Gassman, George W., 5,532,925, Cl. 364-177.000.
- Fisher, Jeffrey J.: *See—*
  - Haley, Kalliopi S.; and Fisher, Jeffrey J., 5,531,939, Cl. 510-182.000.
- Fisons plc: *See—*
  - Buckle, Philip E.: and Pollard-Knight, Denise V., 5,532,170, Cl. 436-527.000.
- Fissler GmbH: *See—*
  - Crummenauer, Michael; Dietrich, Uwe; and Galle, Alfred, 5,532,461, Cl. 219-621.000.
- Fitch, Frank R.: *See—*
  - Ojo, Adeola F.; Fitch, Frank R.; and Bülow, Martin, 5,531,808, Cl. 95-96.000.
- Fitzgerald, Barry A.: *See—*
  - Coyle, Dennis J.; and Fitzgerald, Barry A., 5,531,161, Cl. 101-157.000.
- Fitzgerald, John J.: *See—*
  - Bauer, Charles L.; Krenceski, Mary A.; and Fitzgerald, John J., 5,532,118, Cl. 430-533.000.
- Fitzpatrick, Hugh M.: *See—*
  - Hansen, Robert J.; Ni, Chen C.; and Fitzpatrick, Hugh M., 5,532,979, Cl. 367-106.000.
- Fivez, Christiaan, to AGFA-Gevaert. Method of compensating for radiation scatter in an x-ray imaging system. 5,533,088, Cl. 378-98.400.
- Fixano: *See—*
  - de la Caffiniere, Jean-Yves, 5,531,748, Cl. 606-62.000.
- Fizer, Wallace E.: *See—*
  - Duzyk, Edward F.; and Fizer, Wallace E., 5,532,549, Cl. 313-489.000.
- FKI Industries, Inc.: *See—*
  - Kopman, Matthew W.; and Sorlien, Glenn A., 5,531,295, Cl. 188-21.000.
- Flanigan, David A.; Mancini, Vincent E.; and Harper, Michael R., to Thiokol Corporation. Methods of preparing gas generant formulations. 5,531,845, Cl. 149-109.600.
- Fleek, Arthur E.; and LaMaire, Richard O., to International Business Machines Corporation. Robust frequency management and acquisition in a wireless local area network that uses frequency-hopping radios. 5,533,025, Cl. 370-85.200.
- Fleek, Arthur E.; Camp, William O., Jr.; Warchocki, Gary M.; and Bracco, Michael J., to International Business Machines Corporation. Method and apparatus for digital frequency compensation of carrier drift in a PSK demodulator. 5,533,069, Cl. 375-344.000.
- Flemming, Frank: *See—*
  - Shaw, Ronald; Brooks, John; and Flemming, Frank, 5,532,773, Cl. 353-26.00A.
- Fletcher, Paul A.; and Walz, Gregory S., to Atlantic Richfield Company. Downhole flow control in multiple wells. 5,531,270, Cl. 166-53.000.
- Flippen, James. Printed sheet measuring device. 5,531,028, Cl. 33-1.00B.
- Flood, Eric; and Jarvis, Richard. Litter box with excrement removing screen. 5,531,186, Cl. 119-166.000.
- Flora, David B.: *See—*
  - DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,532,336, Cl. 530-324.000.
- Florida State University: *See—*
  - Holton, Robert A., 5,532,363, Cl. 544-97.000.
- Flory, Isaac L., IV, to Hubbell Incorporated. Operating circuit for electroluminescent panel. 5,532,553, Cl. 315-169.300.
- Flother, Frank-Ulrich: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- Flowers, Douglas D.: *See—*
  - Gursky, Leonard J.; Fusco, James V.; and Flowers, Douglas D., 5,532,312, Cl. 525-232.000.
- Flowers, James R., Jr.; Batchelder, Ned; and Macomber, Edward W., to Digital Equipment Corporation. Network font server. 5,533,174, Cl. 395-114.000.
- FloWind Corporation: *See—*
  - Hulls, John R., 5,531,567, Cl. 416-87.000.
- Fluke Corporation: *See—*
  - Bottman, Jeffrey S., 5,532,603, Cl. 324-628.000.
- Flynn, Richard M.: *See—*
  - Grenfell, Mark W.; Flynn, Richard M.; and Savu, Patricia M., 5,532,310, Cl. 524-463.000.
- FMC Corporation: *See—*
  - Dale, James L., Jr., 5,531,030, Cl. 33-203.000.
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., 5,532,367, Cl. 544-260.000.
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,532,370, Cl. 544-279.000.
- FMT Ltd.: *See—*
  - Otsuki, Akira, 5,532,843, Cl. 358-453.000.
- Foamseal, Inc.: *See—*
  - Guilmette, Bruce T., 5,531,357, Cl. 222-1.000.
- Fodor, Mark A.; Bercaw, Craig A.; and Dornfest, Charles, to Applied Materials, Inc. Patterned susceptor to reduce electrostatic force in a CVD chamber. 5,531,835, Cl. 118-728.000.
- Foerstner, Juergen: *See—*
  - Racanelli, Marco; Hwang, Bor-Yuan C.; Foerstner, Juergen; and Huang, Wen-Ling M., 5,532,175, Cl. 437-29.000.
- Foertsch, Robert D. Ski stabilizing device. 5,531,480, Cl. 280-818.000.
- Fogel, Keith E.: *See—*
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
- Foley, Kevin T.: *See—*
  - Malcolm, Roger J.; and Foley, Kevin T., 5,531,712, Cl. 604-247.000.
- Folk, Craig L.: *See—*
  - Sawhney, A. Paul S.; and Folk, Craig L., 5,531,063, Cl. 57-12.000.
- Fonderies Du Lion S.A.: *See—*
  - Berlaimont, Claude, 5,531,213, Cl. 126-193.000.
- Foote, Steven A.; and Stoddard, Damon R., to AlliedSignal, Inc. Low stress magnet interface. 5,532,665, Cl. 335-296.000.
- FOR S Inc.: *See—*
  - Shinkle, Carl W., 5,531,036, Cl. 37-405.000.
- Forbrose B.V.: *See—*
  - Bottacco, Carlo M. G., 5,531,362, Cl. 222-390.000.

- Forby, Robert G. Reconfigurable book support. 5,531,334, Cl. 211-119.000.
- Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., to National Semiconductor Corporation. Programmable distributed personal security. 5,533,123, Cl. 380-4.000.
- Ford Motor Company: *See—*
  - Feldkamp, Lee A.; Puskorius, Gintaras V.; James, John V.; and Marko, Kenneth A., 5,531,108, Cl. 73-117.300.
  - Leong, Dick Y.; Colvin, Alex D.; and Carduner, Keith R., 5,531,105, Cl. 73-116.000.
  - Meckstroth, Richard J.; and Toth, Gerard S., 5,531,648, Cl. 474-110.000.
  - Simplicean, Ionel E.; and Stancu, Sorin, 5,532,437, Cl. 181-150.000.
  - Talty, Timothy J., 5,532,709, Cl. 343-819.000.
  - Vecchio, Michael T.; and Luckett, Thomas J., 5,531,499, Cl. 296-146.700.
  - Zanini-Fisher, Margherita; Soltis, Richard E.; Logothetis, Eleftherios M.; and Barrera, Carlos M., 5,531,879, Cl. 204-427.000.
- Forestello, Philippe, to Schneider Electric SA. Indicator lamp. 5,531,616, Cl. 439-668.000.
- Forestier, Guy, to CLECIM. Installation for producing liquid metal by melting scrap iron. 5,533,043, Cl. 373-9.000.
- Forgit, Rachael A.; Godlove, Ronald E.; Chambers, John S.; Yuh, Huoy-Jen; McCumiskey, Robert E.; Zaman, Kamran U.; and Herbert, William G., to Xerox Corporation. Processes for preparing photoconductive members by electrophoresis. 5,531,872, Cl. 204-486.000.
- Forman, Michael R.: *See—*
  - Hemmer, Chad G.; Steen, John A.; Forman, Michael R.; and McGrath, Jonathan R., 5,531,685, Cl. 604-95.000.
- Formenti, Franco, to Veco S.R.L. Refrigerating system with auxiliary compressor-cooling device. 5,531,077, Cl. 62-197.000.
- Forrest, Bill, to Mountain Safety Research. Snowshoe binding assembly. 5,531,035, Cl. 36-125.000.
- Forrester, Martin G.: *See—*
  - Bluzer, Nathan; and Forrester, Martin G., 5,532,485, Cl. 250-336.200.
- Fortes, Jose-Mauro P., to General Electric Company. Closed loop maximum likelihood phase aberration correction in phased-array imaging systems. 5,531,117, Cl. 73-602.000.
- Fortier, Nancy E., to Procter & Gamble Company, The. Fat substitutes containing water soluble beta-carotene. 5,532,009, Cl. 426-73.000.
- Föry, Werner; Kerber, Elmar; and Hudetz, Manfred, to Ciba-Geigy Corporation. Selective safened herbicidal composition. 5,532,203, Cl. 504-105.000.
- Fossan, Helge; and Benson, Jonathan M., to Laerdal Manufacturing Corp. Truncated pulse defibrillator with flash tube switch. 5,531,769, Cl. 607-7.000.
- Fossella, Gregory, to Great Bay Tool Corporation. Auto-lock drill chuck. 5,531,549, Cl. 408-240.000.
- Foster Wheeler Energia Oy: *See—*
  - Engström, Folke; and Isaksson, Juhani, 5,531,798, Cl. 48-77.000.
- Fotsch, Paul D.: *See—*
  - Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., 5,531,122, Cl. 73-760.000.
- Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, to Dentsply Research & Development Corp. Transducer activated tool tip. 5,531,597, Cl. 433-119.000.
- Foundation pour l'Avenir pour la Recherche Medicale Appliquee: *See—*
  - Dibie, Alain; and Musset, Dominique, 5,531,788, Cl. 623-11.000.
- Fraganza, Fiorentino: *See—*
  - Mastronardi, Pasquale; Rossi, Antonio E.; and Fraganza, Fiorentino, 5,531,713, Cl. 604-263.000.
- Frager, James R. Rain gauge. 5,531,114, Cl. 73-170.170.
- Fraisse, Georges: *See—*
  - Frechet, Patrick; Fraisse, Georges; and Charvin, Guy, 5,531,790, Cl. 623-15.000.
- France Telecom: *See—*
  - Burnod, Yves; and Leray, Pascal, 5,533,169, Cl. 395-27.000.
  - Pirio, Francis; and Thomine, Jean-Baptiste, 5,532,861, Cl. 359-161.000.
- Frances, Maurice: *See—*
  - Lubetzky, David; and Frances, Maurice, 5,531,995, Cl. 424-409.000.
- Franck, William F., III; and Jamerson, James R., to Windsor Products, Inc. Cable lock device. 5,531,083, Cl. 70-58.000.
- Frank, David A., to Hughes Aircraft Company. Optical encoding and readout system using a liquid crystal modulator to encode light with an object's identification code and related sensor data. 5,532,470, Cl. 235-491.000.
- Frank, Edward: *See—*
  - Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,532,954, Cl. 365-52.000.
- Frank, Frank: *See—*
  - Hessel, Stefan; Frank, Frank; Hauptmann, Gerhard; and Hiereth, Werner, 5,531,738, Cl. 606-2.000.
- Frank, Shachar: *See—*
  - Lauterbur, Paul C.; and Frank, Shachar, 5,532,006, Cl. 424-9.322.
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.: *See—*
  - Wolter, Herbert; Rose, Klaus; and Egger, Christian, 5,532,398, Cl. 556-420.000.
- Frayman, Max. Compactly assembled tampon applicator. 5,531,674, Cl. 604-11.000.
- Frazier, Jimmy R.: *See—*
  - McCalip, Timothy I.; Frazier, Jimmy R.; and Fagan, John E., 5,531,832, Cl. 118-622.000.
- Fréchet, Jean M. J.; and Lee, Sze-Ming, to Cornell Research Foundation, Inc. Positive-tone photoresist containing diester dissolution inhibitors. 5,532,106, Cl. 430-191.000.
- Fréchet, Jean M. J.; and Lee, Sze-Ming, to Cornell Research Foundation. Method of making microelectronic structures utilzing photoresists containing C_3C_{12} water soluble sugar crosslinking agents. 5,532,113, Cl. 430-296.000.
- Frechet, Patrick; Fraisse, Georges; and Charvin, Guy, to MXM; and Frechet, Patrick. Device for extending living tissue. 5,531,790, Cl. 623-15.000.
- Fredberg, Jeffrey J.: *See—*
  - Wang, Ning; Barlovatz-Meimon, Georgia; and Fredberg, Jeffrey J., 5,532,132, Cl. 435-7.210.
- Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., to TDW Delaware, Inc. Device for plugging the interior of a pipe. 5,531,250, Cl. 138-94.000.
- Freeman, Jay D.: *See—*
  - Jeffers, Frederick J.; Smith, Neil; Freeman, Jay D.; Gandola, Kent R.; and Koeppe, Peter V., 5,532,584, Cl. 324-202.000.
- Freeman, Lewis G. Bulk lubricant delivery unit for a die caster. 5,531,262, Cl. 164-149.000.
- Freeman, Lonnie R.: *See—*
  - Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.
- Freeman, Michael B.; Hann, William M.; Paik, Yi H.; and Swift, Graham, to Rohm & Haas Company. Method of inhibiting corrosion in aqueous systems using poly(amino acids). 5,531,934, Cl. 252-390.000.
- Freitag, Sabine: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- French, Catherine A.: *See—*
  - Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., 5,532,693, Cl. 341-51.000.
- French, Ian D.: *See—*
  - Goodyear, Andrew L.; and French, Ian D., 5,532,190, Cl. 437-225.000.
- Freund Industrial Co., Ltd.: *See—*
  - Fusejima, Yasutoyo; Yamada, Tsugutoshi; Yamada, Shuri; and Takei, Narimichi, 5,531,826, Cl. 118-19.000.
- Frey, Bradly G.: *See—*
  - Blackledge, John W., Jr.; and Frey, Bradly G., 5,533,205, Cl. 395-297.000.
- Frick, Thomas J.: *See—*
  - Smith, Wayne W.; Frick, Thomas J.; and Moore, Earl H., 5,532,456, Cl. 219-400.000.
- Frigola-Constansa, Jordi; and Merce-Vidal, Ramon, to Laboratories Del Dr. Esteve, S.A. Use of 1-[4-[4-aryl (or heteroaryl)-1-piperazinyl]-butyl)-1H-azole derivatives for the preparation of medicaments intended for the treatment of disorders of gastric secretion. 5,532,234, Cl. 514-224.200.
- Frisch, Rudolf, to Congoleum Corporation. Embossing composition for preparing textured polymeric materials. 5,531,944, Cl. 264-52.000.
- Fritze, Joachim: *See—*
  - Eykmann, Rudolf; Fritze, Joachim; Uhrig, Birgit; and Schödel, Dieter, 5,531,709, Cl. 604-218.000.
- Froehling, Peter E.: *See—*
  - Hoogmartens, Ivan A. L.; Gelan, Joannes M. J. V.; Vanderzande, Dirk J. M.; and Froehling, Peter E., 5,532,328, Cl. 526-193.000.
- Fry's Metals, Inc.: *See—*
  - Gilleo, Kenneth B.; and Corey, Michael C., 5,531,942, Cl. 264-5.000.
- Fuerst, Ronnie S.; Melker, Richard; and Batich, Christopher D. Materials and methods utilizing a temporary visual indicator. 5,532,029, Cl. 428-35.700.
- Fuji Electric Co., Ltd.: *See—*
  - Seki, Yasukazu, 5,532,502, Cl. 257-213.000.
  - Tajima, Hirokazu; and Umida, Hidetoshi, 5,532,570, Cl. 318-809.000.
- Fuji Jukogyo Kabushiki Kaisha: *See—*
  - Matsuura, Takashi, 5,531,198, Cl. 123-294.000.
- Fuji Oil Company, Limited: *See—*
  - Kida, Haruyasu; Arai, Masako; Tashiro, Yoichi; and Baba, Hideki, 5,532,021, Cl. 426-607.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Agano, Toshitaka; and Shoji, Takashi, 5,532,727, Cl. 347-253.000.
  - Akao, Mutsuo; Osanai, Hiroyuki; and Kawamura, Makoto, 5,532,028, Cl. 428-35.200.
  - Goto, Yasuhiko; Agano, Toshitaka; and Imai, Shinji, 5,532,726, Cl. 347-243.000.
  - Hirata, Hidetoshi; and Katagiri, Shingo, 5,531,394, Cl. 242-345.200.
  - Horie, Seiji; Sano, Kenji; Suzuki, Nobuo; and Watarai, Shu, 5,532,099, Cl. 430-115.000.
  - Konagaya, Tatsuya, 5,532,787, Cl. 355-71.000.
  - Matsumoto, Hirotaka; Yamaguchi, Jun; Yanagihara, Naoto; and Yamamoto, Hisashi, 5,532,373, Cl. 546-4.000.
  - Matsumoto, Nobuo, 5,532,779, Cl. 354-319.000.
  - Mizukawa, Yuki; Motoki, Masuji; Sato, Tadahisa; and Takahashi, Osamu, 5,532,377, Cl. 548-262.400.
  - Mizutani, Shigemitsu, 5,531,632, Cl. 451-6.000.
  - Namiki, Tomizo; Suzuki, Tamotsu; and Miyata, Yukihide, 5,532,722, Cl. 347-153.000.
  - Noguchi, Yukio, 5,532,778, Cl. 354-221.000.

  - Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,532,116, Cl. 430-331.000.
  - Takeo, Hideya, 5,533,142, Cl. 382-128.000.
  - Takeo, Hideya, 5,533,143, Cl. 382-132.000.
  - Uesugi, Akio; and Kakei, Tsutomu, 5,531,840, Cl. 148-552.000.
  - Usami, Yoshihisa, 5,532,851, Cl. 359-73.000.
  - Yagihara, Morio; Sasaki, Hirotomo; Mifune, Hiroyuki; and Kato, Shinji, 5,532,120, Cl. 430-600.000.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Noguchi, Yukio, 5,532,778, Cl. 354-221.000.
- Fuji Xerox Co., Ltd.: *See—*
  - Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, 5,532,721, Cl. 347-112.000.
  - Fukunaga, Hideki; Yasukawa, Kaoru; Nakayama, Hideo; Ueki, Nobuaki; Otoma, Hiromi; and Fuse, Mario, 5,533,042, Cl. 372-50.000.
  - Hirata, Kei; Chihara, Tomoyoshi; Furuya, Nobumasa; and Sumikawa, Takeshi, 5,532,804, Cl. 355-251.000.
  - Kogure, Yoshio, 5,532,793, Cl. 355-207.000.
  - Ota, Takeshi, 5,533,153, Cl. 385-24.000.
  - Takahashi, Yasuhito; Kimura, Tsutomu; and Isosu, Toru, 5,532,791, Cl. 355-206.000.
- Fujie, Takashi: *See—*
  - Yamanaka, Nobuo; Fujie, Takashi; Hidaka, Hiroshi; and Akiyama, Yoshio, 5,531,339, Cl. 215-12.200.
- Fujieda, Masanao; Yano, Nobuyuki; Mimura, Yoshiaki; and Isogai, Naoki, to Nidek Co., Ltd. Ophthalmic apparatus with positioning control. 5,532,772, Cl. 351-211.000.
- Fujihara, Shiro, to NEC Corporation. Barrel shifter. 5,532,949, Cl. 364-715.080.
- Fujii, Takao: *See—*
  - Koga, Masahiro; Tanaka, Toshio; Fujii, Takao; and Masegi, Tsukio, 5,532,408, Cl. 562-466.000.
- Fujikura Ltd.: *See—*
  - Furuichi, Kenji; and Gotoh, Moritaka, 5,531,290, Cl. 180-271.000.
  - Otsuki, Akira, 5,532,843, Cl. 358-453.000.
  - Sawano, Hiroyuki; Yamanaka, Masayoshi; Kurosawa, Yutaka; and Miyamoto, Matsuhiro, 5,531,064, Cl. 57-204.000.
- Fujimori, Yoshinori: *See—*
  - Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.
- Fujimoto, Edward K., to Pierce Chemical Company. Biotin containing heterobifunctional cleavable compounds. 5,532,379, Cl. 548-304.100.
- Fujino, Takeshi: *See—*
  - Sakamoto, Shinobu; and Fujino, Takeshi, 5,532,872, Cl. 359-384.000.
- Fujioka, Junzo: *See—*
  - Tabata, Hitoshi; Murata, Osamu; Fujioka, Junzo; and Minakata, Shunichi, 5,532,504, Cl. 257-252.000.
- Fujioka, Seiji: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Fujioka, Takafumi; Teramoto, Shuji; Tominaga, Michiaki; and Yabuuchi, Yoichi, to Otsuka Pharmaceutical Company, Limited. Agent for treating thrombosis and phosphodiesterase inhibitor. 5,532,253, Cl. 514-312.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Katsura, Yousuke; Tomishi, Tetsuo; Inoue, Yoshikazu; and Takasugi, Hisashi, 5,532,258, Cl. 514-370.000.
  - Niwa, Mineo; Tamura, Kouichi; Kaizu, Tsutomu; and Kobayashi, Masakazu, 5,532,137, Cl. 435-7.920.
  - Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.
- Fujishima, Satoru, to Murata Manufacturing Co., Ltd. Ultrasonic motor. 5,532,541, Cl. 310-325.000.
- Fujita, Satoshi; Kagiyama, Naoto; and Momiyama, Masayoshi, to Aisin Seiki Kabushiki Kaisha. Method for assaying nucleic acids. 5,532,125, Cl. 435-6.000.
- Fujita, Teruo; Karaki, Morihiro; Irie, Mitsuru; and Nakane, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Focus error detecting device. 5,532,987, Cl. 369-44.240.
- Fujito, Katsuyuki: *See—*
  - Utsumi, Kuniaki; Yamamoto, Hiroaki; and Fujito, Katsuyuki, 5,532,865, Cl. 359-189.000.
- Fujitsu Isotec Limited: *See—*
  - Saito, Yukio; Kawamura, Takumi; Okuyama, Masaki; and Munekata, Tsutomu, 5,531,431, Cl. 271-4.010.
- Fujitsu Limited: *See—*
  - Asano, Koji; Shiraishi, Atsushi; and Ueda, Hidefumi, 5,531,185, Cl. 117-206.000.
  - Ishikawa, Tetsuro, 5,532,586, Cl. 324-212.000.
  - Kageyama, Hironobu; and Nakamura, Mitsuo, 5,532,914, Cl. 363-50.000.
  - Kato, Masayuki; and Ito, Hiroyasu, 5,532,855, Cl. 359-117.000.
  - Kaziwara, Shinzi, 5,533,092, Cl. 379-21.000.
  - Kimura, Kouichi; Nishii, Kouta; and Ishizuka, Masanobu, 5,531,950, Cl. 264-135.000.
  - Kobayashi, Yasushi, 5,532,186, Cl. 437-182.000.
  - Matsuda, Manabu; and Shoji, Hajime, 5,533,041, Cl. 372-50.000.
  - Murayama, Masami; Yoshimura, Shuji; Kawamata, Tetsuo; and Yoshioka, Atsushi, 5,532,682, Cl. 340-825.060.
  - Orita, Akira; Kawakami, Takaaki; and Sakata, Tetsuya, 5,533,007, Cl. 370-17.000.
  - Ozawa, Masayuki; Gounji, Takashi; and Morosawa, Kenji, 5,533,113, Cl. 379-211.000.
  - Sugawara, Shigekazu, 5,532,183, Cl. 437-101.000.
  - Tada, Katsuyuki; and Kitamori, Katsuya, 5,532,862, Cl. 359-161.000.
  - Uchida, Tetsuya, 5,533,006, Cl. 370-16.100.
  - Wada, Jun, 5,532,507, Cl. 257-280.000.
- Fujiwara, Goro: *See—*
  - Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
- Fujiwara, Kyoji, to Nitto Boseki Co., Ltd. Light transmissive sound absorbing member. 5,532,440, Cl. 181-289.000.
- Fukai, Shigeru: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Fukanuma, Tetsuhiko; Goto, Kunifumi; Tsumagari, Yuichi; and Iwanami, Shigeki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Nippondenso Co., Ltd. Scroll type compressor. 5,531,579, Cl. 418-55.200.
- Fukanuma, Tetsuhiko: *See—*
  - Takemoto, Tsuyoshi; Hisanaga, Shigeru; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, 5,531,578, Cl. 418-55.100.
- Fukasawa, Atsushi; Horiguchi, Kenji; Sato, Takuro; Sugimoto, Hiroki; and Takizawa, Yumi, to OKI Electric Industry Co., Ltd. Code-division multiple-access system with improved utilization of upstream and downstream channels. 5,533,012, Cl. 370-18.000.
- Fukazawa, Nobuyuki: *See—*
  - Kawauchi, Nobuya; Fukazawa, Nobuyuki; Ishibashi, Hiroki; and Otsuka, Kengo, 5,532,349, Cl. 536-55.300.
- Fukino, Kunihiro, to Nikon Corporation. Lens barrel having suppressed load torque and moment of inertia. 5,532,883, Cl. 359-825.000.
- Fukuda, Masayuki: *See—*
  - Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.
- Fukuda, Minoru; Ochi, Hiroyuki; and Fukui, Takaaki, to Sumitomo Wiring Systems, Ltd. Grommet for wire harness with inner surface having densely arranged projections or plateaus. 5,531,459, Cl. 277-178.000.
- Fukuda, Takashi: *See—*
  - Sudani, Kiyoshi; Kano, Masato; Sugimoto, Yukihiro; Fukuda, Takashi; and Iwahashi, Toru, 5,531,943, Cl. 264-29.100.
- Fukui, Atsushi; Nishii, Kanji; Takamoto, Kenji; and Ito, Masami, to Matsushita Electric Industrial Co., Ltd. Method of measuring optical characteristics of liquid crystal cells, measurement equipment therefor and method for manufacturing liquid crystal devices. 5,532,823, Cl. 356-364.000.
- Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, to Ube Industries, Ltd.; and Toyota Jidosha Kabushiki Kaisha. Resin composition for automobile bumper. 5,532,309, Cl. 524-451.000.
- Fukui, Takaaki: *See—*
  - Fukuda, Minoru; Ochi, Hiroyuki; and Fukui, Takaaki, 5,531,459, Cl. 277-178.000.
- Fukui, Yoshimitsu: *See—*
  - Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, 5,531,089, Cl. 72-241.800.
- Fukumoto, Takehiko: *See—*
  - Terauchi, Takanobu; Sakurada, Toyohisa; Fukumoto, Takehiko; and Suzuki, Hiroshi, 5,532,421, Cl. 585-671.000.
- Fukunaga, Hideki; Yasukawa, Kaoru; Nakayama, Hideo; Ueki, Nobuaki; Otoma, Hiromi; and Fuse, Mario, to Fuji Xerox Co., Ltd. Semiconductor laser device and driving method for the same as well as tracking servo system employing the same. 5,533,042, Cl. 372-50.000.
- Fukuoka, Yoshitaka: *See—*
  - Hanari, Jun; Miyagi, Takeshi; Matsumoto, Kazuhiro; Tohdake, Ayako; and Fukuoka, Yoshitaka, 5,532,906, Cl. 361-749.000.
- Fukutomi, Naoki: *See—*
  - Yamadera, Takashi; Takeuchi, Kazumasa; Obata, Ritsuko; Fukutomi, Naoki; and Suzuki, Kazuko, 5,532,105, Cl. 430-156.000.
- Fullemann, James S., to Merlin Instrument Company. Injection septum with dust wiper. 5,531,810, Cl. 96-105.000.
- Fuller, Timothy J.: *See—*
  - Bayley, Robert D.; Hoffend, Thomas R.; Fuller, Timothy J.; and Ahuja, Suresh K., 5,532,327, Cl. 526-180.000.
- Funakawa, Akihiko: *See—*
  - Asanae, Masumi; Ochiai, Masahisa; Kimura, Fumio; Funakawa, Akihiko; and Noshiro, Toshihiko, 5,532,095, Cl. 430-106.600.
- Funamoto, Kyota, to Pioneer Electronic Corporation. Recording and reproducing method for writable type disk driving apparatus. 5,532,992, Cl. 369-47.000.
- Funk, Gerald A.: *See—*
  - Monroe, Stephen H.; Goettmann, James A.; and Funk, Gerald A., 5,532,298, Cl. 524-13.000.
- Funke, Steven J.: *See—*
  - Feucht, Dennis D.; Funke, Steven J.; and Meister, Steven F., 5,531,192, Cl. 123-90.120.
- Furuichi, Kenji; and Gotoh, Moritaka, to Fujikura Ltd. Safety apparatus for fuel tank. 5,531,290, Cl. 180-271.000.

- Furuichi, Kiyoshi: *See—*
  - Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.
- Furukawa, Hideo: *See—*
  - Ishikawa, Hiroshi; Furukawa, Hideo; Shimizu, Masatoshi; and Nakauchi, Norio, 5,531,654, Cl. 477-120.000.
- Furusawa, Takanori: *See—*
  - Higashiyama, Yasushi; and Furusawa, Takanori, 5,532,887, Cl. 360-64.000.
- Furuta, Naofumi, to Sunx Kabushiki Kaisha. Photoelectric switch monitoring the duration of pulsed light to prevent false signals due to ambient conditions. 5,532,472, Cl. 250-214.00B.
- Furutani, Koji: *See—*
  - Tonegawa, Ken; Mandai, Harufumi; Tsuru, Teruhisa; Katou, Mitsuhide; and Furutani, Koji, 5,532,658, Cl. 333-246.000.
- Furuya, Nobumasa: *See—*
  - Hirata, Kei; Chihara, Tomoyoshi; Furuya, Nobumasa; and Sumikawa, Takeshi, 5,532,804, Cl. 355-251.000.
- Furuyama, Tohru: *See—*
  - Kushiyama, Natsuki; Furuyama, Tohru; and Numata, Kenji, 5,532,963, Cl. 365-201.000.
- Fusada, Tamotsu, to Kanto Special Steel Works, Ltd. Roll caster shell for use in a continuous sheet casting machine. 5,531,659, Cl. 492-48.000.
- Fusco, James V.: *See—*
  - Gursky, Leonard J.; Fusco, James V.; and Flowers, Douglas D., 5,532,312, Cl. 525-232.000.
- Fuse, Mario: *See—*
  - Fukunaga, Hideki; Yasukawa, Kaoru; Nakayama, Hideo; Ueki, Nobuaki; Otoma, Hiromi; and Fuse, Mario, 5,533,042, Cl. 372-50.000.
- Fusejima, Yasutoyo; Yamada, Tsugutoshi; Yamada, Shuri; and Takei, Narimichi, to Freund Industrial Co., Ltd. Granular material coating apparatus. 5,531,826, Cl. 118-19.000.
- Futatsugi, Seiji; Kojima, Keiji; Matsuda, Yoshiki; Kitahara, Yoshinori; and Mogaki, Masato, to Hitachi, Ltd. Portable pen pointing device and a processing system with pen pointing device. 5,533,141, Cl. 382-119.000.
- Futej, Gerald M.: *See—*
  - Coleman, Matthew R.; Futej, Gerald M.; and Ash, James D., 5,531,057, Cl. 53-308.000.
- Futterer, Manfred; and Bolli, Gerhard, to SIA Schweizer Schmirgel. Device and method for automatic detection of the height of sedimentation in a sedimentometer. 5,531,104, Cl. 73-61.690.
- Fuzino, Seizi: *See—*
  - Katada, Mitsutaka; Muramoto, Hidetoshi; Fuzino, Seizi; Hattori, Tadashi; and Abe, Katsunori, 5,532,176, Cl. 437-34.000.
- Fyson, John R., to Eastman Kodak Company. Photographic processing method using a cartridge. 5,532,780, Cl. 354-324.000.
- G. D. Searle & Co.: *See—*
  - Djuric, Stevan W.; Docter, Stephen H.; and Yu, Stella S., 5,532,383, Cl. 546-196.000.
- Gabrilove, Janice L.: *See—*
  - Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., 5,532,341, Cl. 530-351.000.
- Gademann, Lothar; Miekley, Klaus; Ziegenbein, Botho; and Reppich, Andreas, to Robert Bosch GmbH. Sensor with quartz tuning fork. 5,531,091, Cl. 73-1.0DV.
- Gaertner, Mark A.: *See—*
  - Binford, Charles D.; Gaertner, Mark A.; and Denny, Steven P., 5,533,190, Cl. 395-182.040.
- Gaffar, Abdul; Nabi, Nuran; and Afflitto, John, to Colgate Palmolive Company. Antimicrobial oral composition. 5,531,982, Cl. 424-49.000.
- Galante, Nicholas R.: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Galbi, Duane E.: *See—*
  - Houghton, Russell J.; and Galbi, Duane E., 5,532,969, Cl. 365-226.000.
- Galbreath, Inc.: *See—*
  - Kruzick, Kent, 5,531,559, Cl. 414-498.000.
- Galen (Chemicals) Limited: *See—*
  - Dudzik, Mark H. F., 5,531,340, Cl. 215-254.000.
- Gallagher, Denis: *See—*
  - Levesque, Yvon; Cote, Sylvaine; and Gallagher, Denis, 5,531,726, Cl. 604-367.000.
- Gallagher, Francis G., to Du Pont de Nemours, E. I., and Company. Monomer recovery process for contaminated polymers. 5,532,404, Cl. 560-78.000.
- Galland, M. Stephen: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Gallant, Michel; Gareau, Yves; Guay, Daniel; Labelle, Marc; and Prasit, Petpiboon, to Merck Frosst Canada, Inc. Indole derivatives with affinity for the cannabinoid receptor. 5,532,237, Cl. 514-235.200.
- Gallatin, W. Michael; and Vazeux, Rosemay, to ICOS Corporation. Assay for 1-CAM related protein expression. 5,532,127, Cl. 435-6.000.
- Galle, Alfred: *See—*
  - Crummenauer, Michael; Dietrich, Uwe; and Galle, Alfred, 5,532,461, Cl. 219-621.000.
- Gallet, J. Diores: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Galliani, Giulio; Barzashi, Fernando; Butti, Alina; Bonetti, Carla; and Toja, Emilio, to Roussel-UCLAF. Process for preparing 1,2,5,6-tetrahydropyridin-3-carboxaldehyde oximes. 5,532,375, Cl. 546-334.000.
- Gallup, Darrell L., to Union Oil Company of California. Method for water remediation. 5,531,902, Cl. 210-673.000.
- Gallusser, David O.; LeBaron, James B.; and Wheeler, Robert G., to Amphenol Corporation. Composite canned data bus coupler connector. 5,531,614, Cl. 439-607.000.
- Gammell, Paul M., to United States of America, Navy. Subsurface examination of non-ferrous material for detecting corrosion by measuring magnetic traction. 5,532,589, Cl. 324-228.000.
- Gandola, Kent R.: *See—*
  - Jeffers, Frederick J.; Smith, Neil; Freeman, Jay D.; Gandola, Kent R.; and Koeppe, Peter V., 5,532,584, Cl. 324-202.000.
- Gandy, Richard F.: *See—*
  - Goodall, Roy J.; and Gandy, Richard F., 5,531,612, Cl. 439-541.500.
- Ganon Kabushiki Kaisha: *See—*
  - Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
- Gante, Joachim: *See—*
  - Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücher, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, 5,532,255, Cl. 514-326.000.
- Ganz, Rudolf; Rosenfelder, Ottmar; and Schwandner, Barbara, to Hoechst CeramTec Aktiengesellschaft. Method of operating heat exchangers. 5,531,265, Cl. 165-110.000.
- Ganzcorp Investments, Inc.: *See—*
  - Ganzhorn, Donald W., Jr., 5,531,107, Cl. 73-117.000.
- Ganzhorn, Donald W., Jr., to Ganzcorp Investments, Inc. Method and apparatus for establishing virtual inertia in a chassis dynamometer. 5,531,107, Cl. 73-117.000.
- GAO Gesellschaft fur Automation und Organisation mbH: *See—*
  - Haghiri-Tehrani, Yahya, 5,531,145, Cl. 83-27.000.
- Garakani, Arman M.; and Koljonen, Juha, to Cognex Corporation. Automated optical inspection apparatus. 5,532,739, Cl. 348-87.000.
- Gardner, Steven H., to Pacific Communication Sciences, Inc. Cellular digital packet data mobile data base station. 5,533,029, Cl. 370-94.100.
- Gardosi, Giancarlo, to Grimac Royal Falcon Corp. Platen assembly for coffee maker using pre-dosaged coffee filter packets. 5,531,152, Cl. 99-289.00R.
- Gareau, Yves: *See—*
  - Gallant, Michel; Gareau, Yves; Guay, Daniel; Labelle, Marc; and Prasit, Petpiboon, 5,532,237, Cl. 514-235.200.
- Garg, Diwakar: *See—*
  - Bonner, Brian B.; Garg, Diwakar; and Berger, Kerry R., 5,531,372, Cl. 228-220.000.
- Garner, Harold E.; and Nuttall, Michael W., to Universal Product Innovations, Inc. Toy welding apparatus with sparking mechanism. 5,531,623, Cl. 446-22.000.
- Garrett, Robert: *See—*
  - Radloff, Timothy; and Garrett, Robert, 5,532,428, Cl. 174-35.0GC.
- Garrido, Guillermo: *See—*
  - Mole, James; Queille, Philippe; and Garrido, Guillermo, 5,531,169, Cl. 110-346.000.
- Gartner, Ellis M.; Cogliano, Joseph A.; Arfaei, Ahmad; Jardine, Leslie A.; Scheiner, Paul; and Duecker, Heyman C., to W. R. Grace & Co.-Conn. Hydraulic cement set accelerators based on nitroalcohols. 5,531,825, Cl. 106-808.000.
- Gärtner, Fritz-Jürgen: *See—*
  - Schlichting, Eberhard; Buchold, Henning; Mallok, Gerd; Gärtner, Fritz-Jürgen; and Stönner, Hans-Martin, 5,532,393, Cl. 554-170.000.
- Gary, Phillip A. Crossover system. 5,533,135, Cl. 381-99.000.
- Gas Research Institute: *See—*
  - Pathak, Vijay K.; and Leppin, Dennis, 5,531,866, Cl. 202-185.200.
- Gascoyne, John M.: *See—*
  - Cameron, Donald S.; and Gascoyne, John M., 5,531,883, Cl. 205-626.000.
- Gaspar, Arsène, to Valeo Systems d'Essuyage. Brush holder plate for a direct current electric commutating motor and an electric motor equipped therewith. 5,532,536, Cl. 310-239.000.
- Gasper, Thomas M., to Creative Tech Marketing. Automatically-operating bottom structure in a collapsible container. 5,531,374, Cl. 229-109.000.
- Gassman, George W., to Fisher Controls International, Inc. Current-to-pressure transducer with selectable, adjustable input filter. 5,532,925, Cl. 364-177.000.
- Gaston, Charles A., to International Business Machines Corporation. Proximity effect compensation in scattering-mask lithographic projection systems and apparatus therefore. 5,532,496, Cl. 250-492.220.
- Gasworth, Steven M.: *See—*
  - Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.
- Gates, Roger: *See—*
  - Tibbott, Ian; and Gates, Roger, 5,531,457, Cl. 277-53.000.
- Gates Rubber Company, The: *See—*
  - Christian, Richard E.; and Peake, Michael V., 5,531,483, Cl. 285-93.000.
- Gateway Technologies, Inc.: *See—*

- Payne, Ed; Perry, Bernard T.; and Walker, Terry D., 5,532,039, Cl. 428-116.000.
- Gathright, J. Paul: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Gattey, Phillip A.; Burris, Christine; and Jensen, Wolfgang W., to ACS Wireless, Inc. Articulated headset support. 5,533,122, Cl. 379-430.000.
- Gauer, Edgar J.; and Doyle, John B. Remotely controlled, day/night mirror apparatus. 5,532,876, Cl. 359-604.000.
- Gavin, Robert F.: *See—*
  - Ensminger, William D.; and Gavin, Robert F., 5,531,684, Cl. 604-93.000.
- Gay, Eddie C.: *See—*
  - Miller, William E.; Gay, Eddie C.; and Tomczuk, Zygmunt, 5,531,868, Cl. 205-44.000.
- Gazza, Jack M.: *See—*
  - Erickson, Jack N., Jr.; Gazza, Jack M.; Olivas, Victor S.; and Thompson, Charles A., 5,532,931, Cl. 364-478.060.
- Gebauer, Ludwig: *See—*
  - Herdlicka, Alwin; Gebauer, Ludwig; and Grundmann, Gabriele, 5,531,546, Cl. 405-259.500.
- GEC Alsthom Limited: *See—*
  - Ainsworth, John D.; and Trainer, David R., 5,532,575, Cl. 323-211.000.
- Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., to Abbott Laboratories. Method of altering composition of nutritional product during enteral tube feeding. 5,531,734, Cl. 604-890.100.
- Geckle, Ronita K.: *See—*
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
  - Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
- Geco A.S.: *See—*
  - Elholm, Tor, 5,532,975, Cl. 367-16.000.
- Gefvert, Herbert I. Multi-dimensional sound reproduction system. 5,533,129, Cl. 381-24.000.
- Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., to Lockheed Missiles & Space Company. Lightweight gun systems. 5,531,150, Cl. 89-15.000.
- Gegner, Joel P., to Motorola, Inc. Variable frequency, zero voltage switching, quasi-resonant converters with resonant bridge switch. 5,532,919, Cl. 363-124.000.
- Gehlhaus, Jürgen: *See—*
  - Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.
- Gehman, Bruce: *See—*
  - Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, 5,531,948, Cl. 264-122.000.
- Geiger, Wolfgang; and Rubl, Erwin, to VSB VOGELSBERGER Umwelttechnischer Anlagenbau GmbH. Arrangement for separation of coarse matter and/or bulky solids in rainwater relief structures. 5,531,888, Cl. 210-162.000.
- Geissler, Alfred: *See—*
  - Morshäuser, George; and Geissler, Alfred, 5,531,005, Cl. 29-33.00P.
- Gelan, Joannes M. J. V.: *See—*
  - Hoogmartens, Ivan A. L.; Gelan, Joannes M. J. V.; Vanderzande, Dirk J. M.; and Froehling, Peter E., 5,532,328, Cl. 526-193.000.
- Gelardi, Anthony L.: *See—*
  - O'Brien, Patrick J.; Thomas, Alvin; Rufo, George, Jr.; Durham, Larry; and Gelardi, Anthony L., 5,531,321, Cl. 206-232.000.
- Gelardi, John A., to DIC Digital Supply Corp. Process of making a one-piece box. 5,531,953, Cl. 264-296.000.
- Gelman Sciences Inc.: *See—*
  - Hu, Hopin; and Hou, Chung-Jen, 5,531,893, Cl. 210-500.350.
- Gemstar Development Corporation: *See—*
  - Yuen, Henry C.; and Kwoh, Daniel S., 5,532,732, Cl. 348-1.000.
- Genentech, Inc.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- General Electirc Company: *See—*
  - Weir, Michael P.; and Sutherland, Hunt A., 5,532,601, Cl. 324-539.000.
- General Electric Company: *See—*
  - Day, James; and Searl, Stephen, 5,531,078, Cl. 62-199.000.
  - Dotson, Seldon L., 5,532,318, Cl. 525-83.000.
  - Duggal, Anil R.; and Yakymyshyn, Christopher P., 5,532,981, Cl. 367-149.000.
  - Ellis, Matthew; Saunders, Rowland F.; Smith, James A.; and Noret, Patrick, 5,531,224, Cl. 128-660.070.
  - Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.
  - Fortes, Jose-Mauro P., 5,531,117, Cl. 73-602.000.
  - Herd, Kenneth G.; and Laskaris, Evangelos T., 5,532,663, Cl. 335-216.000.
  - Hershey, John E.; Riza, Nabeel A.; and Hassan, Amer A., 5,532,860, Cl. 359-159.000.
  - Holden, James E., 5,533,076, Cl. 376-327.000.
  - Hsieh, Jiang, 5,533,081, Cl. 378-15.000.
  - Hsieh, Jiang, 5,533,091, Cl. 378-210.000.
  - Johansson, Eric B.; and Walker, Edward S., 5,533,077, Cl. 376-434.000.
  - Mannava, Seetha R.; Risbeck, James D.; and Jacobs, Larry G., 5,531,570, Cl. 416-241.00R.
  - Saia, Richard J.; Ghezzo, Mario; Bagepalli, Bharat S. K.; and Durocher, Kevin M., 5,531,018, Cl. 29-622.000.
  - Savkar, Sudhir D.; Lisek, Brain D.; and Sundell, Robert E., 5,531,081, Cl. 68-17.00A.
  - Seeley, Robert E., 5,531,569, Cl. 416-222.000.
- General Motors Corporation: *See—*
  - Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., 5,531,298, Cl. 188-78.000.
  - Hall, Arthur, III; and Najmon, Ralph L., 5,531,652, Cl. 475-36.000.
  - Koenig, Melissa M.; and Vukovich, William J., 5,531,302, Cl. 192-3.300.
  - Kollar, Craig A.; Szerlag, Donald; Lajack, William C.; and Koneval, Kevin, 5,531,046, Cl. 49-360.000.
  - Raszkowski, James A., 5,531,303, Cl. 192-4.00A.
- Genz, Manfred: *See—*
  - Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.
- Georg Fischer Rohrleitungssysteme AG: *See—*
  - Steinmetz, Hans W.; and Petry, Dirk A., 5,532,459, Cl. 219-535.000.
- George, John B., to Thomson Consumer Electronics, Inc. Protection circuit for dynamic focus amplifier. 5,532,558, Cl. 315-382.100.
- George, Richard K.: *See—*
  - Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, 5,533,170, Cl. 395-108.000.
- Georgiou, Christos J.; Larsen, Thor A.; and Lee, Ki W., to International Business Machines Corporation. Digital phase alignment and integrated multichannel transceiver employing same. 5,533,072, Cl. 375-371.000.
- Gerhard Weber: *See—*
  - Schultheiss, Rolf; and Weber, Gerhard, 5,531,751, Cl. 606-96.000.
- Gerics, Louis J.: *See—*
  - Nicklas, Michael H.; and Gerics, Louis J., 5,531,216, Cl. 126-599.000.
- Gerome Manufacturing Company, Inc.: *See—*
  - Stoyko, Michael T., 5,532,427, Cl. 174-35.00R.
- Gerry Baby Products Company: *See—*
  - Poulson, Keith L.; Fair, Paul; and Parker, Robert M., 5,531,258, Cl. 160-376.000.
- Gertel, Eitan; and Sipes, Donald L., Jr., to AEL Industries, Inc.; and Amoco Corporation. Wide dynamic range optical link using DSSC linearizer. 5,532,857, Cl. 359-154.000.
- Gesche, Roland: *See—*
  - Latz, Rudolf; and Gesche, Roland, 5,531,877, Cl. 204-298.190.
- Gest, William E.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Getreuer, Kurt W.; and Grassens, Leonardus J., to Discovision Associates. Seek actuator for optical recording. 5,532,989, Cl. 369-44.150.
- Geyer, David L.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Ghekiere, Jean-Pierre: *See—*
  - Tavernier, Serge; Op de Beeck, Werner; Ghekiere, Jean-Pierre; and Van Tendeloo, Gustaaf, 5,532,097, Cl. 430-110.000.
- Gheorghiu, Mihail. Process for the preparation of methyl fatty acid esters starting from natural oil or fat, methyl esters obtained in this way and use thereof. 5,532,392, Cl. 554-169.000.
- Ghezzo, Mario: *See—*
  - Saia, Richard J.; Ghezzo, Mario; Bagepalli, Bharat S. K.; and Durocher, Kevin M., 5,531,018, Cl. 29-622.000.
- Giannessi, Fabio; Castagnani, Roberto; De Angelis, Francesco; Tinti, Maria O.; and Misiti, Domenico, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Process for producing R-aminocarnitine and S-aminocarnitine. 5,532,409, Cl. 562-561.000.
- Giannessi, Fabio; Scafetta, Nazareno; Bernabei, Ida; Tinti, Maria O.; and De Angelis, Francesco, to Sigma-Tau Industrie Farmaceutiche Ruinite S.p.A. Process for manufacturing L(-)-carnitine from a waste product having opposite configuration. 5,532,410, Cl. 562-567.000.
- Giardinelli, Vito: *See—*
  - Tribioli, Silvano; Giardinelli, Vito; Rocco, Francesco; and Cerrano, Franco, 5,532,079, Cl. 429-119.000.
- Gibson, Glen: *See—*
  - Fischer, Matthew J.; Gibson, Glen; Dwork, Jeffrey; and Runaldue, Thomas J., 5,533,203, Cl. 395-250.000.
- Giele, Vincent; and Berkhof, Marc, to Vitatron Medical, B.V. Pacing lead with x-ray visible soluble covering and method of inserting same into a patient's heart. 5,531,783, Cl. 607-126.000.

- Gigante, Luigi. Sports installation for the practice of a game known as hit ball. 5,531,452, Cl. 273-411.000.
- Gijbels, Koenraad; and Steinman, Lawrence, to Leland Stanford Junior University, The Board of Trustees of the. Treatment of central nervous system inflammatory disease with matrix metalloprotease inhibitors. 5,532,265, Cl. 514-419.000.
- Gilbert, David S., Jr. Drain nut pliers. 5,531,141, Cl. 81-426.500.
- Gilchrest, Barbara A.; Yaar, Mina; and Eller, Mark, to Trustees of Boston University. Stimulation of tanning by DNA fragments or single-stranded DNA. 5,532,001, Cl. 424-450.000.
- Gilhousen, Klein S.: *See—*
  - Dean, Richard F.; Antonio, Franklin P.; Gilhousen, Klein S.; and Wheatley, Charles E., III, 5,533,011, Cl. 370-18.000.
- Gill, John M., to Sun Hockey, Inc. Hockey puck with integral rollers and method of assembly. 5,531,442, Cl. 273-128.00R.
- Gilleo, Kenneth B.; and Corey, Michael C., to Fry's Metals, Inc. Method of making electroconductive adhesive particles for Z-axis application. 5,531,942, Cl. 264-5.000.
- Gilligan, Paul J., to DuPont Merck Pharmaceutical Company, The. Antipsychotic nitrogen-containing bicyclic compounds. 5,532,243, Cl. 514-255.000.
- Gillingham, Peter B., to Mosaid Technologies Incorporated. Method of multilevel dram sense and restore. 5,532,955, Cl. 365-149.000.
- Gillio, Robert G.: *See—*
  - Colburn, Eric R.; Fedor, Max A.; Gillio, Robert G.; and Neu, Daniel W., 5,533,079, Cl. 377-6.000.
- Gillmore, Stephen R.: *See—*
  - Chawan, Dhyaneshwar B.; Merritt, Carleton G.; and Gillmore, Stephen R., 5,532,016, Cl. 426-557.000.
- Gimpelj, Mathias M.: *See—*
  - Jager, Rene I.; Vizmuller, Peter; and Gimpelj, Mathias M., 5,532,651, Cl. 331-96.000.
- Giordano, Antonio, to Commonwealth System of Higher Education, Temple University of The. Tumor suppressor protein PRB2, related gene products, and DNA encoding therefor. 5,532,340, Cl. 530-350.000.
- Givens, Willie. Support attachment for ease in side emptying a wheelbarrow. 5,531,463, Cl. 280-47.200.
- Givler, Gregory C. Apparatus for removing an undeformed rivet from a hole. 5,531,009, Cl. 29-243.530.
- GKN Automotive AG: *See—*
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- Glac, Edward Q.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Glidden Company, The: *See—*
  - Woo, James T. K.; Pompignano, Gary C.; Awarski, Donston E.; and Packard, Kevan A., 5,532,297, Cl. 523-408.000.
- Globig, James E.: *See—*
  - Best, David J.; Globig, James E.; Markham, James G.; and Craig, Gina M., 5,533,176, Cl. 395-117.000.
- Glowacki, John F.: *See—*
  - Bonino, Joseph S.; Sieri, Philip; and Glowacki, John F., 5,531,580, Cl. 425-136.000.
- Gloyd, David A.; Hodge, Colin G.; Jones, Thomas C.; Kremenchugsky, Vladimir; and Siminauer, Robert M., to Ohmeda Inc. Incubator mattress tilt mechanism. 5,531,663, Cl. 600-22.000.
- Gnauck, Alan H.; and Jopson, Robert M., to AT&T Corp. Apparatus and method for compensating chromatic dispersion produced in optical phase conjugation or other types of optical signal conversion. 5,532,868, Cl. 359-332.000.
- Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., to Dana Corporation. Wear indicator for an automatically adjusting friction torque device. 5,531,308, Cl. 192-70.250.
- Godlove, Ronald E.: *See—*
  - Forgit, Rachael A.; Godlove, Ronald E.; Chambers, John S.; Yuh, Huoy-Jen; McCumiskey, Robert E.; Zaman, Kamran U.; and Herbert, William G., 5,531,872, Cl. 204-486.000.
- Godry, Thomas J.: *See—*
  - Ragi, Elias G.; and Godry, Thomas J., 5,531,266, Cl. 165-115.000.
- Goel, Sanjay: *See—*
  - Nerz, John E.; Wu, Han; and Goel, Sanjay, 5,532,087, Cl. 429-248.000.
- Goertz, Hendrik M. H. G., to U.S. Philips Corporation. Method of transmitting picture data from a transmitter to a selected receiver. 5,532,734, Cl. 348-8.000.
- Goettmann, James A.: *See—*
  - Monroe, Stephen H.; Goettmann, James A.; and Funk, Gerald A., 5,532,298, Cl. 524-13.000.
- Goetz, George W.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Goff, William G., III: *See—*
  - Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
- Goglio, Luigi. Process for packaging coffee. 5,532,011, Cl. 426-316.000.
- Golabi, Manooch: *See—*
  - Ruesch, Rodney A.; and Golabi, Manooch, 5,532,953, Cl. 365-145.000.
- Golben, P. Mark, to Ergenics, Inc. Segmented hydride battery. 5,532,074, Cl. 429-53.000.
- Gold, Anthony P.: *See—*
  - Benton, Michael K.; Gold, Anthony P.; and Schranz, Richard A., 5,533,201, Cl. 395-280.000.
- Gold, Harvey S.: *See—*
  - Brearley, Ann M.; and Gold, Harvey S., 5,532,487, Cl. 250-339.120.
- Goldberg, Joshua I., to Dynamics Controls Corporation. Method of building an expulsive blanket using composite materials and stitched attachment. 5,531,405, Cl. 244-134.00B.
- Golden, Timothy C.; Webley, Paul A.; Auvil, Steven R.; and Katz, Wilbur C., to Air Products and Chemicals, Inc. Pretreatment layer for CO-VSA. 5,531,809, Cl. 95-101.000.
- Goldhardt, Donald J.: *See—*
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhardt, Donald J.; and Morrow, James D., 5,531,699, Cl. 604-164.000.
- Goldhart, Donald J.: *See—*
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhart, Donald J.; and Morrow, James D., 5,531,678, Cl. 604-51.000.
- Goldlen, Harry J.: *See—*
  - Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, 5,531,838, Cl. 148-23.000.
- Goldner, Ronald B.; and Slaven, Semyon, to Tufts University. Transparent, electrically-conductive, ion-blocking layer for electrochromic windows. 5,532,869, Cl. 359-275.000.
- Goldstar Company, Ltd.: *See—*
  - Choi, Man C.; Kim, Soo K.; Lee, Je H.; Yang, Tae S.; and Woo, Sang J., 5,532,831, Cl. 358-335.000.
  - Hong, Sung H., 5,532,749, Cl. 348-449.000.
  - Jung, Kwang G., 5,532,479, Cl. 250-231.110.
  - Park, Sang W.; and Kim, Hyun C., 5,532,547, Cl. 313-414.000.
- Goldstar Electron Co., Ltd.: *See—*
  - Lee, Jae S., 5,532,968, Cl. 365-222.000.
  - Park, Seung K., 5,532,579, Cl. 323-314.000.
- Goldstar Information & Communications, Ltd.: *See—*
  - Lee, Won-cheon, 5,533,098, Cl. 379-58.000.
- Goldstein, Joseph L.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- Goldstein, Karen L.; and Mannon, Kirby L. Heat and cold packs containing garnet crystals. 5,531,777, Cl. 607-114.000.
- Golla, Carla M.: *See—*
  - Pascucci, Luigi; Padoan, Silvia; Golla, Carla M.; Maccarrone, Marco; and Olivo, Marco, 5,532,972, Cl. 365-233.000.
- Golub, Lorne M.; Ramamurthy, Nungavarum S.; McNamara, Thomas F.; and Ryan, Maria E., to Research Foundation of State University of New York, The. Tetracyclines including non-antimicrobial chemically-modified tetracyclines inhibit excessive glycosylation of different types of collagen and other proteins during diabetes. 5,532,227, Cl. 514-152.000.
- Gomi, Hiroshi: *See—*
  - Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, 5,532,809, Cl. 355-308.000.
- Gonzalez, Carlos H.: *See—*
  - Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., 5,532,667, Cl. 336-177.000.
- Gonzalez-Hernandez, Jesus: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Goodall, Roy J.; and Gandy, Richard F. Multi-port modular jack assembly. 5,531,612, Cl. 439-541.500.
- Goodman, Charles A.: *See—*
  - Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., 5,532,667, Cl. 336-177.000.
- Goodyear, Andrew L.; and French, Ian D., to U.S. Philips Corporation. Plasma treatment method in electronic device manufacture. 5,532,190, Cl. 437-225.000.
- Gord, John C.: *See—*
  - Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., 5,531,774, Cl. 607-56.000.
- Gordon, Ralph A.: *See—*
  - Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., 5,531,298, Cl. 188-78.000.
- Gore, Thomas D. Base for mounting a telescopic sight on a gun. 5,531,039, Cl. 42-101.000.
- Gorecki, George J., to Brent America, Inc. Composition and method for treatment of phosphated metal surfaces. 5,531,820, Cl. 106-287.110.
- Goro S.A.: *See—*
  - Schick, Jean-François, 5,531,012, Cl. 29-432.100.
- Goswami, Animesh: *See—*
  - Cottrell, Ian W.; Goswami, Animesh; and Chowdhary, Manjit S., 5,532,350, Cl. 536-76.000.
- Goto, Atsuo, to Olympus Optical Co., Ltd. Invisible information recording medium. 5,532,104, Cl. 430-139.000.

Goto, Hideki: *See—*

Saka, Yuuji; and Goto, Hideki, 5,532,431, Cl. 174-52.300.

Goto, Hiroshi, to Ricoh Company, Ltd. Thermosensitive recording medium. 5,532,201, Cl. 503-213.000.

Goto, Jiro: *See—*

Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.

Goto, Kunifumi: *See—*

Fukanuma, Tetsuhiko; Goto, Kunifumi; Tsumagari, Yuichi; and Iwanami, Shigeki, 5,531,579, Cl. 418-55.200.

Goto, Masaru: *See—*

Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, 5,532,809, Cl. 355-308.000.

Goto, Naoyuki: *See—*

Kawashima, Yasuyuki; and Goto, Naoyuki, 5,532,194, Cl. 501-9.000.

Goto, Tetsuo: *See—*

Mori, Ryuichi; Goto, Tetsuo; and Nishioka, Sunao, 5,532,782, Cl. 354-402.000.

Goto, Tetsuro; Katayama, Akira; and Hasuda, Masanori, to Nikon Corporation. Camera having means for correcting shutter time by measuring the actual exposure time. 5,532,785, Cl. 354-430.000.

Goto, Yasuhiko; Agano, Toshitaka; and Imai, Shinji, to Fuji Photo Film Co., Ltd. Thermal recording apparatus for recording an image of stable density without an increase in laser output power. 5,532,726, Cl. 347-243.000.

Gotoh, Moritaka: *See—*

Furuichi, Kenji; and Gotoh, Moritaka, 5,531,290, Cl. 180-271.000.

Gottl, Max: *See—*

Klinger, Georg; and Gottl, Max, 5,532,707, Cl. 343-793.000.

Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, to Merck Patent Gesellschaft mit beschrankter Haftung. Acrylacetamides. 5,532,266, Cl. 514-428.000.

Goulding, Charles T. Pastry supporting cup cover. 5,531,347, Cl. 220-256.000.

Goulet, Mark; Parsons, William H.; Organ, Helen M.; Sinclair, Peter J.; Wong, Frederick; and Wyvratt, Matthew J., to Merck Co., Inc. O-aryl,O-alkyl, and O-alkenyl-macrolides having immunosuppressive activity. 5,532,248, Cl. 514-291.000.

Gounji, Takashi: *See—*

Ozawa, Masayuki; Gounji, Takashi; and Morosawa, Kenji, 5,533,113, Cl. 379-211.000.

GPT Limited: *See—*

Ferguson, Stephen P., 5,533,005, Cl. 370-16.000.

Gradco (Japan) Ltd.: *See—*

Coombs, Peter M., 5,531,437, Cl. 271-292.000.

Grafstrom, Robert H.: *See—*

Block, Timothy M.; and Grafstrom, Robert H., 5,532,124, Cl. 435-5.000.

Graham, Linda L.: *See—*

Houghton, Richard D.; Graham, Linda L.; and Krutsch, David P., 5,532,209, Cl. 504-339.000.

Grandi, Maria: *See—*

Bargiotti, Alberto; Caruso, Michele; Grandi, Maria; Ripamonti, Marina; and Suarato, Antonino, 5,532,218, Cl. 514-34.000.

Graphic Packaging Corporation: *See—*

Walsh, Joseph C.; and Conatser, Robert L., 5,531,852, Cl. 156-227.000.

Grassens, Leonardus J.: *See—*

Getreuer, Kurt W.; and Grassens, Leonardus J., 5,532,989, Cl. 369-44.150.

Gray, Patrick: *See—*

Cousens, Lawrence S.; Eberhardt, Christine D.; Gray, Patrick; Tjoelker, Larry W.; Wilder, Cheryl L.; and Trong, Hai, 5,532,152, Cl. 435-197.000.

Gray, Patrick W.: *See—*

Chantry, David; Gray, Patrick W.; and Hoekstra, Merl F., 5,532,151, Cl. 435-194.000.

Gray, William H. Longshoreman's stacking pin tool and process. 5,531,011, Cl. 29-428.000.

Graziano, Michael J.; Hauris, Jon F.; and Stanley, Daniel L., to International Business Machines Corporation. Switching of multiple multimedia data streams. 5,532,937, Cl. 364-514.00C.

Great Bay Tool Corporation: *See—*

Fossella, Gregory, 5,531,549, Cl. 408-240.000.

Greber, Gerhard: *See—*

Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.

Greco, Robert C.: *See—*

Robinson, Michael J.; and Greco, Robert C., 5,533,102, Cl. 379-67.000.

Green Cross Corporation, The: *See—*

Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.

Green, Kevin D. Laser level and square. 5,531,031, Cl. 33-365.000.

Green, Michael: *See—*

Butwell, Robert J.; McCune, Earl; Green, Michael; Huey, Hugo; Legarra, James R.; and Wilcox, Ross, 5,532,462, Cl. 219-695.000.

Green, Ross M., to Wavedriver Limited. Vehicle cooling system. 5,531,285, Cl. 180-65.200.

Greene, Carl C., Jr.: *See—*

Oglesby, Robert L.; Smith, Leigh A. B.; Jordan, Larry S.; Greene, Carl C., Jr.; and Leonard, Wayne E., Sr., 5,531,233, Cl. 131-69.000.

Greene, Robert H.; Cliffe, Andrew I.; and Hunziger, Karl B. Spray gun. 5,531,384, Cl. 239-708.000.

Greenly, John B.: *See—*

Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., 5,532,495, Cl. 250-492.210.

Gregorich, James: *See—*

Mayrand, James F.; and Gregorich, James, 5,532,918, Cl. 363-89.000.

Greiner, Hartmut: *See—*

Böttcher, Henning; Seyfried, Christoph; Bartoszyk, Gerd; and Greiner, Hartmut, 5,532,241, Cl. 514-254.000.

Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.

Greiner, Horst: *See—*

Pal, Uday; Landes, Harald; and Greiner, Horst, 5,532,071, Cl. 429-12.000.

Greminger, Douglas C.: *See—*

Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.

Grenfell, Mark W.; Flynn, Richard M.; and Savu, Patricia M., to Minnesota Mining and Manufacturing Company. Surfactants to create fluoropolymer dispersions in fluorinated liquids. 5,532,310, Cl. 524-463.000.

Gresl, Charles, Jr.: *See—*

Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,531,856, Cl. 156-290.000.

Griat, Jacqueline, to L'Oreal. Stable acidic oil-in-water type emulsions and compositions containing them. 5,531,993, Cl. 424-401.000.

Grimac Royal Falcon Corp.: *See—*

Gardosi, Giancarlo, 5,531,152, Cl. 99-289.00R.

Grimlund, Olof E.: *See—*

Willars, Per H. A.; Grimlund, Olof E.; and Ewerbring, Lars-Magnus, 5,533,014, Cl. 370-18.000.

Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, to Massachusetts Institute of Technology; TASC, Inc.; and Brigham & Women's Hospital, Inc., The. System and method of registration of three-dimensional data sets including anatomical body data. 5,531,520, Cl. 382-131.000.

Grisham, Thomas L.; and Peters, Janet K., to Revtech Industries, Inc. Gas sparging method for removing volatile contaminants from liquids. 5,531,904, Cl. 210-703.000.

Groh, Hans-Michael: *See—*

Blum, Richard; Groh, Hans-Michael; Kuester, Willi; and Herr, Klaus-Jürgen, 5,532,426, Cl. 174-356.00C.

Grönemeyer, Dietrich H. W.; and Seibel, Rainer M. M. Computer tomograph. 5,533,082, Cl. 378-20.000.

Gross, Richard A.; and Schaffer, Eldon W., II, to Aptargroup, Inc. Dispensing closure cartridge valve system. 5,531,363, Cl. 222-494.000.

Grosveld, Franklin G.; and Kioussis, Dimitris, to Medical Research Council, The. Isolated DNA molecules for intergration site independent gene expression in mammalian host cells. 5,532,143, Cl. 435-69.100.

Grube, Gary W.; Markison, Timothy W.; Pendleton, Matthew A.; and Rybicki, Mathew A., to Motorola, Inc. Method and apparatus for providing a communication system infrastructure. 5,533,008, Cl. 370-17.000.

Grumet, Martin, to Andrx Pharmaceuticals, Inc. Method of promoting wound healing and scar regression. 5,532,275, Cl. 514-567.000.

Grumman Aerospace Corporation: *See—*

Austin, Fred; Knowles, Gareth J.; and Rossi, Michael J., 5,531,407, Cl. 244-219.000.

Grundmann, Gabriele: *See—*

Herdlicka, Alwin; Gebauer, Ludwig; and Grundmann, Gabriele, 5,531,546, Cl. 405-259.500.

GS Biochem AB: *See—*

Landh, Tomas; and Larsson, Kåre, 5,531,925, Cl. 252-299.010.

GTE Government Systems Corporation: *See—*

Andrea, Ralph W., 5,533,038, Cl. 371-68.200.

Gu, Show M. Skate combination. 5,531,462, Cl. 280-7.130.

Gu, Tieer: *See—*

den Boer, Willem; and Gu, Tieer, 5,532,180, Cl. 437-40.000.

Guardian Products, Inc.: *See—*

Firebaugh, Ronald L.; and Schultz, Jim R., 5,530,975, Cl. 5-81.10T.

Guardian Royalty Corporation: *See—*

Winner, Kevin, 5,531,359, Cl. 222-153.110.

Guay, Daniel: *See—*

Gallant, Michel; Gareau, Yves; Guay, Daniel; Labelle, Marc; and Prasit, Petpiboon, 5,532,237, Cl. 514-235.200.

Gubernator, Klaus: *See—*

Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.

Gübitz, Franz; Nething, Jean-Pierre; and Schremmer, Mathias, to Hoechst Aktiengesellschaft. Composite article of a carrier layer and decorative layer, and a process for its production. 5,532,065, Cl. 428-480.000.

Gudmundson, Björn: *See—*

Jamal, Karim; Gudmundson, Björn; and Brismark, Gustav, 5,533,067, Cl. 375-341.000.

Guedes, Yvon: *See—*

Makowski, Pierre; Sfez, Rémi; and Guedes, Yvon, 5,533,015, Cl. 370-31.000.

Guerin, Jean-Michel, to Xerox Corporation. Electro-optical device for variable scan width. 5,532,859, Cl. 359-249.000.

Guerinot, William F.: *See—*

Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, 5,532,763, Cl. 348-744.000.

Guglielmi, Floriano: *See—*

Dall'Occo, Tiziano; Guglielmi, Floriano; Zucchini, Umberto, deceased, 5,532,326, Cl. 526-125.700.

Guilford, Werner B., to Roller Bearing Company of America. Cam follower assembly. 5,531,137, Cl. 74-569.000.

Guillot, Gerard L. H.: *See—*

Bouleau, Jean-Paul A. A.; and Guillot, Gerard L. H., 5,532,455, Cl. 219-245.000.

Guilmette, Bruce T., to Foamseal, Inc. Hose containment system. 5,531,357, Cl. 222-1.000.

Guimier, Michel S.: *See—*

Derouet, Patrick R. J.; and Guimier, Michel S., 5,531,566, Cl. 415-145.000.

Guittard, George V.: *See—*

Wong, Patrick S.-L.; Guittard, George V.; and Ayer, Atul D., 5,532,003, Cl. 424-473.000.

Guliants, V. Vance: *See—*

Benziger, Jay B.; Guliants, V. Vance; and Sundaresan, Sankaran, 5,532,385, Cl. 549-259.000.

Gullberg, Grant T.; and Zeng, Gengsheng L., to University of Utah, The. Displaced center-of-rotation fan-beam tomography for cardiac imaging. 5,532,490, Cl. 250-363.040.

Gunawan, Iwan: *See—*

Malamas, Michael S.; and Gunawan, Iwan, 5,532,256, Cl. 514-361.000.

Gundjian, Arshavir, to Nocopi International Inc. Latent image printing process and apparatus and substrate therefor. 5,532,200, Cl. 503-201.000.

Gundlach, Kurt B.; and Colt, Richard L., to Xerox Corporation. Thermal ink jet composition. 5,531,815, Cl. 106-20.00R.

Gundlach, Ronald: *See—*

Johnson, James E.; Shumate, Christopher B.; Siu, Andy W.; and Gundlach, Ronald, 5,531,959, Cl. 422-70.000.

Gunji, Shizuka: *See—*

Ninomiya, Ryoji; Muraya, Hideaki; and Gunji, Shizuka, 5,532,935, Cl. 364-492.000.

Gupta, Amitava; and Blum, Ronald D., to Innotech, Inc. Method for manufacturing photochromic lenses. 5,531,940, Cl. 264-1.700.

Gupta, Prabhat K.: *See—*

Lamkin, Allan; Kepley, W. Robert, III; Gupta, Prabhat K.; and Morris, Adrian J., 5,533,133, Cl. 381-94.000.

Gupta, Rajesh: *See—*

Kucukcakar, Kayhan; Gupta, Rajesh; and Tkacik, Thomas, 5,533,179, Cl. 395-133.000.

Gupta, Rajiv: *See—*

MacRobbie, Edward; Shamlou, Daryush; Gupta, Rajiv; and Halim, Raouf, 5,532,576, Cl. 323-274.000.

Gursky, Leonard J.; Fusco, James V.; and Flowers, Douglas D., to Exxon Chemical Patents, Inc. Tire sidewall composition. 5,532,312, Cl. 525-232.000.

Gusmano, Donald J., to Xerox Corporation. High speed high resolution platen scanning system using a plurality of scanning units. 5,532,845, Cl. 358-474.000.

Gustafson, Ake. Method of winding a coil on a chuck having guide pins. 5,531,390, Cl. 242-441.200.

Gustafsson, Karl M.; and Sylvan, Herman P. S., to Cue Dee Produktor AB; and Telefonaktiebolaget L M Ericsson. Mast base, especially for a temporarily erected mast. 5,531,419, Cl. 248-519.000.

Guterman, Daniel C.: *See—*

Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, 5,532,962, Cl. 365-201.000.

Guthikonda, Ravindra N.: *See—*

DiNinno, Frank P.; Guthikonda, Ravindra N.; and Meurer, Laura C., 5,532,261, Cl. 514-210.000.

Guy, Paul: *See—*

Scheie, Carl E.; and Guy, Paul, 5,531,446, Cl. 473-227.000.

H. B. Fuller Licensing & Financing, Inc.: *See—*

Rolando, Thomas E.; Voss, Peter A.; and Ryan, Christopher M., 5,532,058, Cl. 428-341.000.

Haapamāki, Tarja: *See—*

Pulliainen, Martti; and Haapamāki, Tarja, 5,531,873, Cl. 204-196.000.

Haase, Margit: *See—*

Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.

Habermehl, G. Lyle; and Scherer, Paul T., to Habermehl, G. Lyle. Screwdriver with replaceable bit assembly. 5,531,143, Cl. 81-438.000.

Hach, Thomas G.: *See—*

Adams, Paul E.; Hach, Thomas G.; and Vinci, James N., 5,531,911, Cl. 508-408.000.

Hachiya, Kazuo: *See—*

Hashimoto, Takatsugu; Akutagawa, Keizo; Yagawa, Kazuo; Tanaka, Makoto; Yamagishi, Junichi; and Hachiya, Kazuo, 5,531,256, Cl. 152-209.00R.

Hacias, Kenneth J.: *See—*

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Hadvary, Paul: *See—*

Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.

Haefeli, Pierre: *See—*

Béguin, Jean-Luc; and Haefeli, Pierre, 5,532,982, Cl. 368-64.000.

Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., to Hughes Aircraft Company. Low-temperature-cofired-ceramic (LTCC) tape structures including cofired ferromagnetic elements, drop-in components and multi-layer transformer. 5,532,667, Cl. 336-177.000.

Hager, Rudolf; Wolferseder, Josef; and Deubzer, Bernward, to Wacker-Chemie GmbH. Process for the preparation or organosilicon compounds carrying sulfur-containing organic radicals. 5,532,399, Cl. 556-428.000.

Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation und Organisation mbH. Method for making IC card having severable mini chip card. 5,531,145, Cl. 83-27.000.

Hailey, James E.; and Nigborowicz, John J., to Thomson Consumer Electronics, Inc. Deletion of entries from the channel mapping list of a videocassette recorder. 5,532,832, Cl. 358-335.000.

Haines, Christopher P.: *See—*

Davis, Stuart M.; Haines, Christopher P.; Leef, Alexander A.; and Moses, Peter R., 5,532,085, Cl. 429-224.000.

Haisma, Jan: *See—*

Postma, Lambertus; Maas, Henricus G. R.; Haisma, Jan; Ruigrok, Jacobus J. M.; and Somers, Gerardus H. J., 5,531,016, Cl. 29-603.160.

Hakey, Mark C.; Holmes, Steven J.; and Wursthorn, John M., to International Business Machines Corporation. Electrical connect and method of fabrication for semiconductor cube technology. 5,532,518, Cl. 257-774.000.

HaL Computer Systems, Inc.: *See—*

Saxena, Nirmal; and Chang, Chih-Wei D., 5,533,035, Cl. 371-38.100.

Hale, Zoë M.; and Marks, Robert, to United States of America, Air Force. Optical waveguide chemical and biological sensor. 5,532,493, Cl. 250-458.100.

Haley, Kalliopi S.; and Fisher, Jeffrey J., to Amway Corporation. Concentrated glass and window cleaning composition and method of use. 5,531,939, Cl. 510-182.000.

Haley, Kevin: *See—*

Kolman, Frank; and Haley, Kevin, 5,531,021, Cl. 29-843.000.

Halim, Raouf: *See—*

MacRobbie, Edward; Shamlou, Daryush; Gupta, Rajiv; and Halim, Raouf, 5,532,576, Cl. 323-274.000.

Hall, Arthur, III; and Najmon, Ralph L., to General Motors Corporation. Power transmission. 5,531,652, Cl. 475-36.000.

Hall, David: *See—*

Wasinger, Eric; and Hall, David, 5,531,796, Cl. 8-102.000.

Hama, Norio, to Seiko Epson Corporation. Wrist-mounted-type antenna device and apparatus having the antenna device. 5,532,705, Cl. 343-718.000.

Hamada, Itsunari: *See—*

Kim, Min-Su; and Hamada, Itsunari, 5,532,900, Cl. 361-127.000.

Hamada, Yukimasa: *See—*

Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.

Hamamatsu Photonics K.K.: *See—*

Inuzuka, Eiji; Oguri, Shigehisa; Suzuki, Kouji; Nagata, Wataru; and Hiruma, Yasushi, 5,532,607, Cl. 324-750.000.

Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.

Yamashita, Takaji; and Tanaka, Eiichi, 5,532,489, Cl. 250-363.030.

Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, to Konica Corporation. Copying machine having automatic document feeding device. 5,532,809, Cl. 355-308.000.

Hamano, Kanako: *See—*

Nakajima, Akio; Muramatsu, Hideo; Suzuki, Hiroyuki; and Hamano, Kanako, 5,532,841, Cl. 358-408.000.

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Himeno, Kiyoshi; Hihara, Toshio; Hamano, Yoshiharu; and Kubo, Shinji, 5,532,344, Cl. 534-581.000.

Hamel, Edward E.: *See—*

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Hamilton Company: *See—*

Johnson, James E.; Shumate, Christopher B.; Siu, Andy W.; and Gundlach, Ronald, 5,531,959, Cl. 422-70.000.

Hamm, Hans. Spring fastener for holding insulation against an inner surface of cavity walling. 5,531,053, Cl. 52-713.000.

Hammel, Howard S.: *See—*

Bartlett, Philip L.; Creazzo, Joseph A.; and Hammel, Howard S., 5,532,284, Cl. 521-134.000.

Hammer, Randall E.: *See—*

Dietz, George J.; Hammer, Randall E.; Basche, Stephen M.; and Hawes, Kevin J., 5,532,522, Cl. 307-10.500.

Hammett, Eddie G. Method and apparatus for handling railcar brake shoes. 5,531,379, Cl. 238-1.000.

Hammond, James M.: *See—*

  Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., 5,532,611, Cl. 324-758.000.

Hampel, Manfred: *See—*

  Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,532,260, Cl. 514-383.000.

Hamper, Bruce C.; and Leschinsky, Kindrick L., to Monsanto Company. Benzoyl derivatives and synthesis thereof. 5,532,416, Cl. 568-314.000.

Hampton, Cashman R. S. M.; Steiner, Victor E.; and Boateng, Daniel A. D., to Cominco Ltd. Fluoride removal from metal sulphate solution and a method of waste utilization. 5,531,903, Cl. 210-683.000.

Han, Hongtao; and Tan, Songsheng, to Whitaker Corporation, The. Electrostatic bonding of optical fibers to substrates. 5,533,158, Cl. 385-88.000.

Hanari, Jun; Miyagi, Takeshi; Matsumoto, Kazuhiro; Tohdake, Ayako; and Fukuoka, Yoshitaka, to Kabushiki Kaisha Toshiba. Wiring substrate. 5,532,906, Cl. 361-749.000.

Hann, Heather B.: *See—*

  Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.

Hann, William M.: *See—*

  Freeman, Michael B.; Hann, William M.; Paik, Yi H.; and Swift, Graham, 5,531,934, Cl. 252-390.000.

Hannah, Delbert R., Jr. Recreational vehicle awning tightener. 5,531,239, Cl. 135-88.100.

Hannan, William F., III: *See—*

  Brown, Donald W.; Hannan, William F., III; and Pavlik, Dennis, 5,532,573, Cl. 322-22.000.

Hansen, George N. P.: *See—*

  Fechter, Mark A.; and Hansen, George N. P., 5,531,307, Cl. 192-56.400.

Hansen, Robert J.; Ni, Chen C.; and Fitzpatrick, Hugh M., to United States of America, Navy. Towed array strain-sensing noise canceller. 5,532,979, Cl. 367-106.000.

Hara, Hirofumi: *See—*

  Ichinose, Kiyohiro; Hara, Hirofumi; and Ochiai, Hiroshi, 5,531,830, Cl. 118-423.000.

Hara, Hiroyasu: *See—*

  Ikeno, Masayuki; and Hara, Hiroyasu, 5,532,294, Cl. 523-212.000.

Hara, Ryuichi; and Kobayashi, Eiichi, to Fanuc Ltd. Attitude control method of a visual sensor utilized for an industrial robot. 5,532,924, Cl. 364-167.010.

Harada, Hisashi: *See—*

  Koyama, Toshiaki; Hirose, Shinichi; and Harada, Hisashi, 5,532,652, Cl. 331-116.0FE.

Harada, Nobua: *See—*

  McGeer, Patrick L.; Harada, Nobua; Kimura, Horoshi; McGeer, Edith G.; and Schulzer, Michael, 5,532,219, Cl. 514-42.000.

Harada, Shoichi: *See—*

  Yokoyama, Yoshinobu; Suzuki, Kenji; Seki, Yoshiyuki; Harada, Shoichi; and Shimizu, Etsuo, 5,532,908, Cl. 362-30.000.

Haraguchi, Hiroshi; Abe, Masahiro; and Nomura, Wataru, to Kabushiki Kaisha Toshiba. Semiconductor wafer with alignment marks. 5,532,520, Cl. 257-797.000.

Harbowy, Christopher: *See—*

  Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.

Harbowy, Matthew E.: *See—*

  Balentine, Douglas A.; and Harbowy, Matthew E., 5,532,012, Cl. 426-425.000.

Hardee, Kim C.; and Cordoba, Michael V., to United Memories, Inc.; and Nippon Steel Semiconductor Corporation. Stress mode circuit for an integrated circuit with on-chip voltage down converter. 5,532,618, Cl. 326-63.000.

Hardiman, Christopher J.: *See—*

  Kinlen, Patrick J.; Silverman, David C.; Tokas, Edward F.; and Hardiman, Christopher J., 5,532,025, Cl. 427-388.100.

Harper, Donald K., Jr.; Laub, Michael F.; Pacelli, James P.; and Schnoor, William J., to Whitaker Corporation, The. Adapter assembly for a small outline package. 5,531,602, Cl. 439-70.000.

Harper, Michael R.: *See—*

  Flanigan, David A.; Mancini, Vincent E.; and Harper, Michael R., 5,531,845, Cl. 149-109.600.

Harrelson, Glen R., to Riverwood International Corporation. Basket-style article carrier with a single integral partition. 5,531,319, Cl. 206-162.000.

Harrer, Harald: *See—*

  Wolf, Herbert; and Harrer, Harald, 5,531,413, Cl. 248-188.200.

Harreus, Albrecht: *See—*

  Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.

Harrington, John C., IV: *See—*

  Schuster, Michael A.; Harrington, John C., IV; Liao, Wen P.; and Chen, Fu, 5,532,308, Cl. 524-447.000.

Harris Corporation: *See—*

  Culling, Dennis A., 5,532,648, Cl. 330-289.000.

  Horton, Michael D.; Schillaci, Onofrio; and Rischpater, Raymond W., 5,533,093, Cl. 379-21.000.

  Watrous, Donald L.; and Temple, Victor A. K., 5,532,635, Cl. 327-310.000.

Harris, Derek B.: *See—*

  Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., 5,531,874, Cl. 204-224.00M.

Harris, Howard T. Urogenital muscle exercise sensor system. 5,531,226, Cl. 128-774.000.

Harris-Johnson Industries, Inc.: *See—*

  Pipan, Gregory F., 5,531,297, Cl. 188-65.100.

Harris, Laura L., to Inwave Corporation. Lightweight display systems and methods for making and employing same. 5,532,711, Cl. 345-55.000.

Harris, Rosemary H.; and Bruno, Richard F., to AT&T Corp. Method and system for routing phone calls based on voice and data transport capability. 5,533,108, Cl. 379-201.000.

Harrison, Edward S.; Ruskowski, Edward J.; and Melquist, James, to McDonnell Douglas Technologies Inc. Thermoplastic syntactic foams and their preparation. 5,532,295, Cl. 523-218.000.

Hartman, Frederick A.: *See—*

  Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.

Hartman, Gary G.: *See—*

  Wright, Timothy J.; Hartman, Gary G.; and Culver, Jeffrey A., 5,532,291, Cl. 523-122.000.

Hartrick, Thomas V.; Stevens, Jeffrey N.; and Sabia, Nicholas J., to International Business Machines Corporation. Data processing system and method to enforce payment of royalties when copying softcopy books. 5,532,920, Cl. 364-419.100.

Harvey, Dennis N.; and Jenniges, Randal L., to MTS Systems Corporation. Optical motion sensor. 5,532,824, Cl. 356-375.000.

Harvey, James R.: *See—*

  Mallon, Charles B.; Harvey, James R.; and Nicolini, Claudio F., 5,531,914, Cl. 252-62.540.

Harwood, Warren K.; Tervo, Paul A.; and Koxxy, Martin J., to Cascade Microtech, Inc. Wafer probe station baving environment control enclosure. 5,532,609, Cl. 324-754.000.

Hasbro, Inc.: *See—*

  Meiser, Daniel G.; and Stewart, Randolph C., 5,531,210, Cl. 124-66.000.

Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, to Senju Pharmaceutical Co., Ltd; and Green Cross Corporation, The. Benzothiazole compound, production thereof and use thereof. 5,532,257, Cl. 514-367.000.

Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, to Matsushita Electric Industrial Co., Ltd. Automatic vehicle identification system, interrogator and responder included in the same. 5,533,045, Cl. 375-200.000.

Hasegawa, Rei: *See—*

  Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, 5,532,488, Cl. 250-341.300.

Hasegawa, Yusuke; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio feedback control system for internal combustion engine. 5,531,208, Cl. 123-673.000.

Hasegawa, Yutaka: *See—*

  Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.

Hashida, Takashi: *See—*

  Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, 5,532,337, Cl. 530-350.000.

Hashimoto, Shigeru; and Yokoyama, Akihiko, to Canon Kabushiki Kaisha. Two-wavelength antireflection film. 5,532,871, Cl. 359-359.000.

Hashimoto, Takatsugu; Akutagawa, Keizo; Yagawa, Kazuo; Tanaka, Makoto; Yamagishi, Junichi; and Hachiya, Kazuo, to Bridgestone Corporation. Flame-retardant rubber tires. 5,531,256, Cl. 152-209.00R.

Hashimoto, Takeshi: *See—*

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Hassall, Stephen J.; May, Daniel R.; and Oehlbeck, Martin E., to Eastman Kodak Company. Methods for assembling depth image systems. 5,532,786, Cl. 355-22.000.

Hassan, Amer A.: *See—*

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Hassenboehler, Charles B., Jr. Cigarette filter micropleated web and method of manufacture. 5,531,235, Cl. 131-332.000.

Hassler, Dietrich; and Hoheisel, Martin, to Siemens Aktiengesellschaft. X-ray image sensor. 5,532,491, Cl. 250-370.090.

Hassoun, Muriel: *See—*

  Bauer, Daniel; Richard, Françoise; Hassoun, Muriel; Malle, Gérard; and Samain, Henri, 5,531,987, Cl. 424-76.210.

Hasuda, Masanori: *See—*

  Goto, Tetsuro; Katayama, Akira; and Hasuda, Masanori, 5,532,785, Cl. 354-430.000.

Hata, Jiro: *See—*

  Ishizuka, Shuichi; Kawamura, Kohei; Hata, Jiro; and Suzuki, Akira, 5,531,834, Cl. 118-723.00I.

Hatanaka, Masahiko, to Kabushiki Kaisha Toshiba. Method and apparatus of nuclear magnetic resonance imaging with nonlinearly processed image display. 5,531,223, Cl. 128-653.200.

Hatfield, Eric P., to James River Paper Company, Inc. Method and apparatus for forming tubular plastic film. 5,531,952, Cl. 264-171.260.

Hatta, Taizo: *See—*

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  Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, 5,532,376, Cl. 548-263.200.

Hattori, Morishige: *See—*

  Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.

Hattori, Tadashi: *See—*

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Hattori, Tatsuya; Nishida, Makoto; Oshima, Masuji; and Yoshida, Hiroyuki, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling vehicle driving power. 5,532,929, Cl. 364-431.070.

Hattori, Yuji, to Brother Kogyo Kabushiki Kaisha. Printing apparatus with immediate interrupt. 5,532,792, Cl. 355-206.000.

Hauck, Paul L.: *See—*

  Ubaldi, Richard A.; Hauck, Paul L.; and Walls, Kevin J., 5,531,170, Cl. 110-349.000.

Haughton, Victor M.: *See—*

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Hauptmann, Gerhard: *See—*

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  Graziano, Michael J.; Hauris, Jon F.; and Stanley, Daniel L., 5,532,937, Cl. 364-514.00C.

Hawes, Alcye Y. Do it yourself hem line marker with chalk. 5,531,029, Cl. 33-9.00A.

Hawes, Kevin J.: *See—*

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Hawkes, Richard B.; and Buschhaus, Michael C., to AM International, Inc. Sheet material handling apparatus. 5,531,433, Cl. 271-10.010.

Hawkins, William G.; Burke, Cathie J.; Watrobski, Thomas E.; Tellier, Thomas A.; and Vandebroek, Sophie, to Xerox Corporation. Office environment level electrostatic discharge protection. 5,532,901, Cl. 361-212.000.

Hawley, Robert J.; and Jemie, Patricia A., to Apple Computer, Inc. Computer program debugging system and method. 5,533,192, Cl. 395-183.040.

Hayakawa, Nanahiro; and Ohta, Satoshi, to Yamaichi Electronics Co., Ltd. IC carrier to which an IC can be mounted with the leads thereof supported in a non-contacting state. 5,531,329, Cl. 206-722.000.

Hayakawa, Nanahiro: *See—*

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Hayakawa, Tatsuya, to Sugatsune Industrial Co., Ltd. Device for holding a flap door to a horizontal position. 5,530,993, Cl. 16-332.000.

Hayase, Isao; Machida, Shigeru; Mitsuya, Shunichi; and Kouno, Takeshi, to Hitachi, Ltd. Scroll type fluid machine having a lever driving mechanism. 5,531,577, Cl. 418-55.100.

Hayashi, Itoe, to Nikon Corporation. Microscope objective lens. 5,532,879, Cl. 359-661.000.

Hayashi, Itoe: *See—*

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Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, to Sobue, Kenji; and Takara Shuzo Co., Ltd. Proteins comprising calmodulin- and actin-binding human caldesmon polypeptide fragments. 5,532,337, Cl. 530-350.000.

Hayashi, Tetsuaki, to Kubota Corporation. Vehicle having a four-wheel steering device. 5,531,466, Cl. 280-91.100.

Hayashi, Yasuhiro: *See—*

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Hayashikoshi, Masanori: *See—*

  Mori, Shigeru; Suzuki, Tomio; and Hayashikoshi, Masanori, 5,532,961, Cl. 365-189.050.

Hayes, John W. Die lubricant applicator. 5,531,085, Cl. 72-43.000.

Hayes, Robert R.; and Bridges, William B., to Hughes Aircraft Company. Bias stabilization circuit and method for a linearized directional coupler modulator. 5,532,867, Cl. 359-329.000.

Hazama, Kiyoaki: *See—*

  Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, 5,532,080, Cl. 429-164.000.

Hazard, Michel, to BULL CP8. Key protection device for smart cards. 5,533,126, Cl. 380-25.000.

Hazelden, Roger J., to Lucas Industries public limited company. Optical torque sensor. 5,531,127, Cl. 73-862.336.

He, Tianqing; and Regimand, Ali, to Troxler Electronic Laboratories, Inc. Nuclear gauge with compensation for sample irregularities. 5,532,492, Cl. 250-390.050.

Health Research, Inc.: *See—*

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Healton, Robert L.: *See—*

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Hearst, John E.: *See—*

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Heberling, Stephen S.: *See—*

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Hedayat, Shahin: *See—*

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Hedges, Allan; Shieh, Wen; and Ammeraal, Robert, to American Maize-Products Company. Process for removal of residual cyclodextrin. 5,532,005, Cl. 426-7.000.

Hedrick, James L., Jr.: *See—*

  Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.

Heeks, George J.: *See—*

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Heide, Jorgen; and Olsen, Ole R., to ReSound Corporation. Method for fabricating a hearing aid housing. 5,531,954, Cl. 264-496.000.

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Heidelberger Druckmaschinen AG: *See—*

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Heider, Juergen; Juengst, Stefan; and Wahrendorff, Peter, to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH. Metal-halide discharge lamp with ceramic discharge vessel, and method of its manufacture. 5,532,552, Cl. 313-623.000.

Heil, Hans-Karl: *See—*

  Bonrath, Herbert; Hochgesang, Gerhard; Brüggemann, Ulrich; and Heil, Hans-Karl, 5,532,444, Cl. 200-524.000.

Heimerl, Josef: *See—*

  Blum, Matthias; Heimerl, Josef; Bahr, Martin; and Bauer, Volker, 5,532,446, Cl. 219-121.250.

Heinecke, Steven B.; and Peterson, Donald G., to Minnesota Mining and Manufacturing Company. Carrier delivered dressing and method of manufacture. 5,531,855, Cl. 156-252.000.

Heitfiled, Richard V., to Creative Urethanes. Methods and molds for making a roller skating wheel having curvilinear paths through the hub. 5,531,949, Cl. 264-135.000.

Helenowski, Tomasz K. Ventricular catheter. 5,531,673, Cl. 604-9.000.

Helland, John R.: *See—*

  Alferness, Clifton A.; Helland, John R.; and Kreyenhagen, Paul, 5,531,781, Cl. 607-122.000.

Heller, Michael J., to Enterprise Partners II, L.P. Self-organizing molecular photonic structures based on chromophore- and fluorophore-containing polynucleotides and methods of their use. 5,532,129, Cl. 435-6.000.

Helmling, Walter; Brunetti, David; and Reiher, Uwe, to Hoechst Celanese Corporation. Fiber-reactive triphenodioxazine dyes. 5,532,362, Cl. 544-77.000.

Hemmer, Chad G.; Steen, John A.; Forman, Michael R.; and McGrath, Jonathan R., to Catheter Research, Inc.; and Schneider (USA) Inc. Steerable variable stiffness device. 5,531,685, Cl. 604-95.000.

Hemosol Inc.: *See—*

  Pliura, Diana; Wong, Lawrence T.; and Er, Song S., 5.532,352, Cl. 540-145.000.

Henderson, D. Austin, Jr.; Card, Stuart K.; and Maxwell, John T., III, to Xerox Corporation. User interface with multiple workspaces for sharing display system objects. 5,533,183, Cl. 395-158.000.

Henderson, H. Thurman: *See—*

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Hendricks, William L.: *See—*

  Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., 5,531,150, Cl. 89-15.000.

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Henkel Corporation: *See—*

  Church, Richard J.; and Hacias, Kenneth J., 5,531,912, Cl. 508-507.000.

Henkel, Daniel P. Remote and powerless miniature fatigue monitor and method. 5,531,123, Cl. 73-795.000.

Henning, Jürgen, to Klinikum der Albert-Ludwigs Universitat Freiburg. Method for the measurment of magnetic resonance ("Continuous Saturation"). 5,532,596, Cl. 324-309.000.

Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., to FMC Corporation. Insecticidal pteridines and 8-deazapteridines. 5,532,367, Cl. 544-260.000.

- Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., to FMC Corporation. 2,4-diamino-5,6-disubstituted- and 5,6,7-trisubstituted 5-deazapteridines as insecticides. 5,532,370, Cl. 544-279.000.
- Henry, Arnold W.; Seanor, Donald A.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Kaplan, Samuel; and Pan, David H., to Xerox Corporation. Fusing system with monoamino functional silicone release agent. 5,531,813, Cl. 106-2.000.
- Heraeus Kulzer GmbH: *See—*
  - Eykmann, Rudolf; Fritze, Joachim; Uhrig, Birgit; and Schödel, Dieter, 5,531,709, Cl. 604-218.000.
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  - Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., 5,532,598, Cl. 324-326.000.
- Herbert, Newton J.: *See—*
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- Herbert, William G.: *See—*
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  - Yuh, Huoy-Jen; Herbert, William G.; and Maier, Gary J., 5,532,093, Cl. 430-58.000.
- Hercules Incorporated: *See—*
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  - Luzio, Gary A.; and Thompson, Samuel A., 5,531,716, Cl. 604-265.000.
  - Thompson, Samuel A., 5,531,735, Cl. 604-891.100.
- Herd, Kenneth G.; and Laskaris, Evangelos T., to General Electric Company. Support structure for a superconducting coil. 5,532,663, Cl. 335-216.000.
- Herdlicka, Alwin; Gebauer, Ludwig; and Grundmann, Gabriele, to Hilti Aktiengesellschaft. Mortar composition. 5,531,546, Cl. 405-259.500.
- Hergenrother, Robert: *See—*
  - Engelson, Erik T.; Hergenrother, Robert; and Eder, Joseph, 5,531,715, Cl. 604-265.000.
- Hermes Schleifmittel GmbH & Co: *See—*
  - Wagner, Eckhard; Becker, Günter; and Bartels, Günter, 5,531,799, Cl. 51-309.000.
- Herndon, Jefferey D.: *See—*
  - Dobson, Richard M.; Herndon, Jefferey D.; and Hudson, Leo D., 5,531,273, Cl. 166-278.000.
- Herr, Klaus-Jürgen: *See—*
  - Blum, Richard; Groh, Hans-Michael; Kuester, Willi; and Herr, Klaus-Jürgen, 5,532,426, Cl. 174-356.00C.
- Herrmann, James E.: *See—*
  - Dembicks, Andrew E.; and Herrmann, James E., 5,531,428, Cl. 269-172.000.
- Herrmann, Thomas R., to Paragon Trade Brands, Inc. Apparatus and method for applying transverse tensioned elastic. 5,531,850, Cl. 156-161.000.
- Hershbarger, Russell A., to Silicon Systems, Inc. Low frequency common mode rejection in a clock circuit. 5,533,053, Cl. 375-257.000.
- Hershey, John E.; Riza, Nabeel A.; and Hassan, Amer A., to General Electric Company. Spatial synchronization for optical communication system. 5,532,860, Cl. 359-159.000.
- Hertel, Richard J., to ITT Corporation. Apparatus and method for monitoring and bounding the path of a ground vehicle. 5,532,690, Cl. 340-989.000.
- Herzig, Paul; and Andreoli, Anton, to Ciba-Geigy Corporation. Fiber reactive phthalimidylazo dyes and use thereof. 5,532,345, Cl. 534-612.000.
- Hesse, Judy A.: *See—*
  - Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.
- Hessel, Stefan; Frank, Frank; Hauptmann, Gerhard; and Hiereth, Werner, to Deutsche Aerospace AG. Process for operating a laser. 5,531,738, Cl. 606-2.000.
- Hessler, Thomas R.: *See—*
  - Mastri, Dominick L.; Kolesa, Michael S.; and Hessler, Thomas R., 5,531,763, Cl. 606-148.000.
- Heuer, Hubert: *See—*
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Hewlett-Packard Company: *See—*
  - Arcaro, David J., 5,532,797, Cl. 355-213.000.
  - Kerschner, Ronald K., 5,531,434, Cl. 271-263.000.
  - Lim, Chuin K.; and Cloutier, Frank L., 5,532,825, Cl. 358-296.000.
  - Nguyen, Nhat M.; and Negus, Kevin J., 5,532,655, Cl. 333-1.000.
  - Shields, James P.; and Moffatt, John R., 5,531,817, Cl. 106-22.00R.
  - Wickramanayake, Palitha, 5,531,816, Cl. 106-20.00R.
  - Yamanaka, Haruhiko, 5,532,590, Cl. 324-239.000.
- Heyveld, Doyle G.: *See—*
  - Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., 5,531,122, Cl. 73-760.000.
- Hicks & Otis Prints, Inc.: *See—*
  - Wade, Linwood E., 5,532,045, Cl. 428-187.000.
- Hicks, Steven: *See—*
  - Narayan, Thirumurti; and Hicks, Steven, 5,532,285, Cl. 521-159.000.
  - Narayan, Thirumurti; and Hicks, Steven, 5,532,403, Cl. 560-26.000.
- Hida, Tadayoshi; Ishida, Yasutaka; and Takamizawa, Tohru, to NSK Ltd. Sealed ball bearing. 5,531,525, Cl. 384-482.000.
- Hidaka, Hiroshi: *See—*
  - Yamanaka, Nobuo; Fujie, Takashi; Hidaka, Hiroshi; and Akiyama, Yoshio, 5,531,339, Cl. 215-12.200.
- Hidaka, Keiki; and Uehara, Shigekatsu, to Mitsubishi Precision Co., Ltd.; and East Japan Railway Company. Non-contact speed measuring apparatus for railroad vehicle. 5,532,697, Cl. 342-104.000.
- Hidaka, Tsuneo: *See—*
  - Takagi, Shigehide; Ito, Kuniomi; and Hidaka, Tsuneo, 5,531,794, Cl. 623-16.000.
- Hideo, Suzuki, to Yamaha Corporation. Tone generating apparatus incorporating tone control utliizing compression and expansion. 5,532,424, Cl. 84-607.000.
- Hiejima, Katsuhiro; and Miyauchi, Hidekazu, to Nissho Corporation. Apparatus for dosing a liquid medicine. 5,531,688, Cl. 604-96.000.
- Hielscher, Harald, to Dr. Hielscher GmbH. Method and circuitry for the safe oscillation build-up of ultrasonic disintegrators. 5,532,539, Cl. 310-316.000.
- Hiereth, Werner: *See—*
  - Hessel, Stefan; Frank, Frank; Hauptmann, Gerhard; and Hiereth, Werner, 5,531,738, Cl. 606-2.000.
- Higashinakagawa, Emiko: *See—*
  - Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.
- Higashiyama, Yasushi; and Furusawa, Takanori, to Kabushiki Kaisha Toshiba. Magnetic recording and reproduction apparatus. 5,532,887, Cl. 360-64.000.
- Higson, Sêamus P. J.: *See—*
  - Vadgama, Pankaj M.; and Higson, Sêamus P. J., 5,531,878, Cl. 204-415.000.
- Higuma, Junichiro: *See—*
  - Mihara, Takashi; Tsuchiya, Masaki; Higuma, Junichiro; Kikuchi, Seiji; and Okada, Hiromi, 5,532,731, Cl. 347-250.000.
- Higurashi, Masakazu: *See—*
  - Yagi, Takashi; Higurashi, Masakazu; Tsuruoka, Hiroka; and Nomura, Isao, 5,532,163, Cl. 435-271.000.
- Hihara, Toshio: *See—*
  - Himeno, Kiyoshi; Hihara, Toshio; Hamano, Yoshiharu; and Kubo, Shinji, 5,532,344, Cl. 534-581.000.
- Hikasa, Tadashi: *See—*
  - Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,532,055, Cl. 428-318.600.
- Hikosaka, Ariyoshi: *See—*
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- Hilbert, Samuel D.: *See—*
  - Weaver, Max A.; Krutak, James J.; Coates, Clarence A.; Pruett, Wayne P.; and Hilbert, Samuel D., 5,532,332, Cl. 528-230.000.
- Hill, Bradley B., to University of Kentucky Research Foundation. Method of tendon repair. 5,531,232, Cl. 128-898.000.
- Hill, Robert B.: *See—*
  - Johnson, Joel C.; and Hill, Robert B., 5,532,771, Cl. 351-211.000.
- Hilpert, Kurt: *See—*
  - Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.
- Hilti Aktiengesellschaft: *See—*
  - Herdlicka, Alwin; Gebauer, Ludwig; and Grundmann, Gabriele, 5,531,546, Cl. 405-259.500.
- Hiltunen, David: *See—*
  - Blanchfield, Phillip; and Hiltunen, David, 5,531,536, Cl. 403-340.000.
- Himeno, Kiyoshi; Hihara, Toshio; Hamano, Yoshiharu; and Kubo, Shinji, to Dystar Japan Ltd. Process for producing a monoazodye by diazo-coupling of a p-nitroanaline derivative with a N,N-substituted analine derivative. 5,532,344, Cl. 534-581.000.
- Hind, Ron M.: *See—*
  - Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., 5,531,561, Cl. 414-686.000.
- Hintermeier, Mary P.: *See—*
  - Stanczyk, Thomas F.; Milano, Frank K.; and Hintermeier, Mary P., 5,532,928, Cl. 364-406.000.
- Hinton, Randall D.: *See—*
  - Janzen, Edward G.; Wilcox, Allan L.; and Hinton, Randall D., 5,532,277, Cl. 514-579.000.
- Hirabayashi, Hirohide: *See—*
  - Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, 5,533,045, Cl. 375-200.000.
- Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Refrigerant circulating system. 5,531,080, Cl. 62-470.000.
- Hirai Engineering Corporation: *See—*
  - Hirai, Takashi; and Kaneko, Yoshio, 5,531,049, Cl. 52-200.000.
- Hirai, Hidenori: *See—*
  - Nishikawa, Katuhiko; Ikeda, Hiroya; Hirai, Hidenori; and Ogawa, Yoshio, 5,532,756, Cl. 348-630.000.
- Hirai, Takashi; and Kaneko, Yoshio, to Hirai Engineering Corporation. Roof mounted light transmitting frame. 5,531,049, Cl. 52-200.000.

- Hiraiwa, Masashi, to Hitachi, Ltd. Digital interface system for offices connected by plural digital lines. 5,533,022, Cl. 370-68.100.
- Hiraiwa, Nobuo: *See—*
  - Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
- Hirano, Atsuhiko; Yamahara, Satoshi; Kataoka, Takehiko; and Kishimoto, Shinichi, to Ajinomoto Co., Inc. Process for producing α-L-aspartyl-L-phenylalanine methyl ester. 5,532,015, Cl. 426-548.000.
- Hirano, Hirofumi, to Canon Kabushiki Kaisha. Paper feed device for a recording apparatus. 5,531,531, Cl. 400-629.000.
- Hirano, Yasuhiko: *See—*
  - Ieki, Tsutomu; and Hirano, Yasuhiko, 5,532,654, Cl. 332-102.000.
- Hirata, Haruhiko; Hori, Michio; and Umiji, Toru, to Kabushiki Kaisha Toshiba. Fuel cell. 5,532,073, Cl. 429-34.000.
- Hirata, Hidetoshi; and Katagiri, Shingo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having variable force reel pressing device. 5,531,394, Cl. 242-345.200.
- Hirata, Kei; Chihara, Tomoyoshi; Furuya, Nobumasa; and Sumikawa, Takeshi, to Fuji Xerox Co., Ltd. Device for developing an electrostatic image on an image member. 5,532,804, Cl. 355-251.000.
- Hirata, Yasuo: *See—*
  - Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata, Yasuo; and Takahashi, Kazuhiro, 5,531,664, Cl. 600-149.000.
- Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, to Nit Data Communications Victor Company of Japan; and Systems Corporation. Optical radio transmission system and a method for adjusting optical axes thereof. 5,532,858, Cl. 359-159.000.
- Hirose, Shinichi: *See—*
  - Koyama, Toshiaki; Hirose, Shinichi; and Harada, Hisashi, 5,532,652, Cl. 331-116.0FE.
- Hirose, Toshiyuki; Nishijima, Shigetoshi; Yamamoto, Yohzoh; Kawachi, Hideshi; and Tsugawa, Michio, to Mitsui Petrochemical Industries, Ltd. Polyolefin multilayer laminate, vessel and packaging material. 5,532,030, Cl. 428-35.700.
- Hirota, Hiroyuki: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Hirsch, Hans L.: *See—*
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- Hirth, Bradford H.: *See—*
  - Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,532,245, Cl. 514-272.000.
- Hiruma, Yasushi: *See—*
  - Inuzuka, Eiji; Oguri, Shigehisa; Suzuki, Kouji; Nagata, Wataru; and Hiruma, Yasushi, 5,532,607, Cl. 324-750.000.
- Hisanaga, Shigeru: *See—*
  - Takemoto, Tsuyoshi; Hisanaga, Shigeru; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, 5,531,578, Cl. 418-55.100.
- Hishii, Toshiyasu: *See—*
  - Tsujide, Tohru; Hishii, Toshiyasu; and Nakaizumi, Kazuo, 5,532,610, Cl. 324-757.000.
- Hissong, James B.: *See—*
  - Netterville, James L.; and Hissong, James B., 5,531,752, Cl. 606-99.000.
- Hitachi Chemical Company, Ltd.: *See—*
  - Lee, Virgil J.; Wang, Ying; Taran, Carmen; and Marocco, Matthew L., III, 5,532,374, Cl. 546-167.000.
  - Yamadera, Takashi; Takeuchi, Kazumasa; Obata, Ritsuko; Fukutomi, Naoki; and Suzuki, Kazuko, 5,532,105, Cl. 430-156.000.
- Hitachi, Ltd.: *See—*
  - Abe, Shigeo; and Kawakami, Junzo, 5,533,168, Cl. 395-22.000.
  - Futatsugi, Seiji; Kojima, Keiji; Matsuda, Yoshiki; Kitahara, Yoshinori; and Mogaki, Masato, 5,533,141, Cl. 382-119.000.
  - Hayase, Isao; Machida, Shigeru; Mitsuya, Shunichi; and Kouno, Takeshi, 5,531,577, Cl. 418-55.100.
  - Hiraiwa, Masashi, 5,533,022, Cl. 370-68.100.
  - Kawanami, Yoshimi; and Ohnishi, Tsuyoshi, 5,532,494, Cl. 250-491.100.
  - Kodama, Kouji; Nishida, Hiroshi; Amano, Hideaki; and Matsushita, Toshio, 5,532,563, Cl. 318-440.000.
  - Kubo, Morihiro; Ishigaki, Yukio; Itoh, Takeshi; and Misawa, Hirokazu, 5,532,638, Cl. 327-368.000.
  - Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
  - Masaki, Ryoso; and Mutoh, Nobuyoshi, 5,532,571, Cl. 318-809.000.
  - Miyao, Masumasa; Kawano, Yuji; and Sato, Masaki, 5,532,826, Cl. 358-296.000.
  - Muranaka, Yasushi; Yamashita, Hisao; and Miyadera, Hiroshi, 5,531,184, Cl. 117-108.000.
  - Nagasu, Akira; Yamamoto, Yoshimi; Tobita, Tomoyuki; and Onose, Toshihiro, 5,531,120, Cl. 73-706.000.
  - Nakagaki, Harushige; Sugimura, Naozumi; Arai, Takao; and Ohara, Yasunori, 5,532,835, Cl. 358-335.000.
  - Ose, Yoichi; Yoshinari, Kiyomi; Yano, Masayoshi; and Mimura, Tadao, 5,532,483, Cl. 250-288.000.
  - Otsubo, Toru; Suzuki, Yasumichi; Sasaki, Shinji; Ohara, Kazuhiro; and Sasaki, Ichirou, 5,531,862, Cl. 156-643.100.
  - Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.
  - Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.
  - Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, 5,532,569, Cl. 318-802.000.
- Hitachi Maxell Kabushiki Kaisha: *See—*
  - Kosaki, Shinichi; Tanaka, Yoshito; and Kuwa, Tadahiro, 5,531,324, Cl. 206-449.000.
- Hitachi Maxell, Ltd.: *See—*
  - Kawarai, Seigi; Yoshida, Kenichiro; and Kato, Akira, 5,532,042, Cl. 428-141.000.
- Hitachi Metals, Ltd.: *See—*
  - Asanae, Masumi; Ochiai, Masahisa; Kimura, Fumio; Funakawa, Akihiko; and Noshiro, Toshihiko, 5,532,095, Cl. 430-106.600.
- Hita de la Torre, Carlos; Escrihuela Langa, Francisco J.; Martinez Garcia, Francisco J.; and Blanco, Carlos H., to Alcatel N.V. Communications subsystem between base stations and base station controllers in burst communications systems. 5,533,028, Cl. 370-95.300.
- Ho, Hai D.: *See—*
  - Priem, Curtis; Chang, Shuen C.; and Ho, Hai D., 5,533,187, Cl. 395-164.000.
- Ho, Kuan-Jen. Universal camera supporting jibs. 5,531,412, Cl. 248-123.200.
- Hochgesang, Gerhard: *See—*
  - Bonrath, Herbert; Hochgesang, Gerhard; Brüggemann, Ulrich; and Heil, Hans-Karl, 5,532,444, Cl. 200-524.000.
- Hodge, Colin G.: *See—*
  - Gloyd, David A.; Hodge, Colin G.; Jones, Thomas C.; Kremenchugsky, Vladimir; and Siminauer, Robert M., 5,531,663, Cl. 600-22.000.
- Hodgson, Darel E.: *See—*
  - Richman, Roger H.; Inal, Osman T.; Zimmerly, Charles A.; and Hodgson, Darel E., 5,531,369, Cl. 228-109.000.
- Hoechst Aktiengesellschaft: *See—*
  - Bartlett, Robert R.; and Kämmerer, Friedrich-Johannes, 5,532,259, Cl. 514-378.000.
  - Fenner, Thomas, 5,531,421, Cl. 251-65.000.
  - Gübitz, Franz; Nething, Jean-Pierre; and Schremmer, Mathias, 5,532,065, Cl. 428-480.000.
  - Rittner, Siegbert; Rüffer, Hans-Martin; Schmid, Jörg; and Wisser, Thomas, 5,532,406, Cl. 562-424.000.
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Hoechst Celanese Corporation: *See—*
  - Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., 5,532,035, Cl. 428-95.000.
  - Helmling, Walter; Brunetti, David; and Reiher, Uwe, 5,532,362, Cl. 544-77.000.
- Hoechst CeramTec Aktiengesellschaft: *See—*
  - Ganz, Rudolf; Rosenfelder, Ottmar; and Schwandner, Barbara, 5,531,265, Cl. 165-110.000.
- Hoekstra, Merl F.: *See—*
  - Chantry, David; Gray, Patrick W.; and Hoekstra, Merl F., 5,532,151, Cl. 435-194.000.
- Hoffend, Thomas R.: *See—*
  - Bayley, Robert D.; Hoffend, Thomas R.; Fuller, Timothy J.; and Ahuja, Suresh K., 5,532,327, Cl. 526-180.000.
- Hoffman, Robert E.: *See—*
  - Travelute, Fred L.; and Hoffman, Robert E., 5,531,951, Cl. 264-143.000.
- Hoffmann, James A.: *See—*
  - DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,532,336, Cl. 530-324.000.
- Hoffmann-La Roche Inc.: *See—*
  - Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.
- Hogan, Michael E.: *See—*
  - Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, 5,532,128, Cl. 435-16.000.
- Hogan, Thomas H.: *See—*
  - Shelton, Jeff L.; Stallings, Kevin J.; and Hogan, Thomas H., 5,531,189, Cl. 122-379.000.
- Hoge, Ralf: *See—*
  - Schmale, Gerhard; Hoge, Ralf; and Zynch, Martin, 5,531,504, Cl. 297-362.000.
- Hoggins, James T.: *See—*
  - Klocek, Paul; and Hoggins, James T., 5,532,048, Cl. 428-215.000.
- Hoheisel, Martin: *See—*
  - Hassler, Dietrich; and Hoheisel, Martin, 5,532,491, Cl. 250-370.090.
- Hohman, Timothy R. Beverage keg handling device. 5,531,495, Cl. 294-31.200.
- Hohto Shoji Co., Ltd.: *See—*
  - Shiboh, Yukio, 5,531,043, Cl. 43-131.000.
- Hokkanen, Seppo: *See—*

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Hokuriku Electric Industry Co., Ltd.: *See—*
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Holden, James E., to General Electric Company. Control rod absorber tube with interference fit and viscous dampening between the end plug and absorber rod. 5,533,076, Cl. 376-327.000.
Hollenbach, Steven A.; Martin, Michael A.; Novak, Thomas S.; and Warznak, Robert S., to Bell Communications Research, Inc. Network-based telephone system providing coordinated voice and data delivery. 5,533,115, Cl. 379-220.000.
Holler, Larry D. Process for obtaining ganglioside lipids. 5,532,141, Cl. 435-74.000.
Hollingsworth GmbH: *See—*
  Loeffler, Walter, 5,530,994, Cl. 19-109.000.
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  Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, 5,532,128, Cl. 435-16.000.
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Holmes, Gary L.; Smith, Terrance P.; Ali, Mahfuza B.; and Macomber, David W., to Minnesota Mining and Manufacturing Company. Reactive polymeric dyes. 5,532,111, Cl. 430-281.100.
Holmes, Richard, to Virtuality IP Limited. Earphones. 5,533,137, Cl. 381-183.000.
Holmes, Steven J.: *See—*
  Hakey, Mark C.; Holmes, Steven J.; and Wursthorn, John M., 5,532,518, Cl. 257-774.000.
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
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  Ichinose, Kiyohiro; Hara, Hirofumi; and Ochiai, Hiroshi, 5,531,830, Cl. 118-423.000.
  Ishikawa, Hiroshi; Furukawa, Hideo; Shimizu, Masatoshi; and Nakauchi, Norio, 5,531,654, Cl. 477-120.000.
  Kin, Keiyu; Akuta, Yoshimitsu; and Sakaki, Yuji, 5,532,678, Cl. 340-438.000.
  Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
  Shiomi, Kazuyuki; Mizuguchi, Hiroshi; and Imakado, Shoji, 5,531,642, Cl. 464-74.000.
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  Atkeisson, Randal A.; and Fetting, Karl A., 5,533,161, Cl. 385-99.000.
  Wacker, Paul C.; and Smith, Gary A., 5,532,922, Cl. 364-15.200.
Hong, Chin-Tan. Shrinkable label inserting machine. 5,531,858, Cl. 156-556.000.
Hong, Jung-Kook; Kaneko, Toyohisa; and Takahashi, Junichi, to International Business Machines Corporation. Method and system for displaying selected portions of a motion video image. 5,532,833, Cl. 358-335.000.
Hong, Sung H., to Goldstar Co., Ltd. Sample rate conversion device for processing non-standard television signal. 5,532,749, Cl. 348-449.000.
Hong, Young-Taik: *See—*
  Choi, Kil-Yeong; Suh, Dong-Hack; Yi, Mi-Hie; Hong, Young-Taik; and Won, Jong-Chan, 5,532,334, Cl. 528-350.000.
Honjo, Yoshihiro; Yamakawa, Yoshisuke; Kawahara, Hiroshi; and Tsunoda, Eizo, to TDK Corporation. Magnetic recording media and method for making them. 5,532,041, Cl. 428-141.000.
Honma, Hisanori, to Kabushiki Kaisha Toshiba. Closed-type compressor. 5,531,574, Cl. 417-415.000.
Honma, Kazuo: *See—*
  Watanabe, Michiko; Makino, Takahiro; and Honma, Kazuo, 5,532,160, Cl. 435-252.100.
Honma, Yoshihiro, to Canon Kabushiki Kaisha. Feedback clamp circuit for analog-to-digital conversion. 5,532,758, Cl. 348-694.000.
Honomizo, Seiji, to Noritsu Koki Co., Ltd. Keyboard for photographic printing apparatus. 5,532,691, Cl. 341-22.000.
Hoogmartens, Ivan A. L.; Gelan, Joannes M. J. V.; Vanderzande, Dirk J. M.; and Froehling, Peter E., to DSM N.V. Process for the preparation of a polymer. 5,532,328, Cl. 526-193.000.
Hopper, Philip K.: *See—*
  Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,531,856, Cl. 156-290.000.
Horcher GmbH: *See—*
  Horcher, Stefan, 5,530,976, Cl. 5-89.100.
Horcher, Stefan, to Horcher GmbH. Lifting device with fluid filled traction element for handicapped persons. 5,530,976, Cl. 5-89.100.
Hori, Michio: *See—*
  Hirata, Haruhiko; Hori, Michio; and Umiji, Toru, 5,532,073, Cl. 429-34.000.
Hori, Tsuguo, to NEC Corporation. High frequency signal detecting circuit. 5,533,057, Cl. 375-295.000.
Horie, Seiji; Sano, Kenji; Suzuki, Nobuo; and Watarai, Shu, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 5,532,099, Cl. 430-115.000.
Horiguchi, Kenji: *See—*
  Fukasawa, Atsushi; Horiguchi, Kenji; Sato, Takuro; Sugimoto, Hiroki; and Takizawa, Yumi, 5,533,012, Cl. 370-18.000.
Horikawa, Yoshiaki: *See—*
  Nagai, Komei; Iketaki, Yoshinori; and Horikawa, Yoshiaki, 5,533,083, Cl. 378-44.000.
Horiuchi, Yasuhiro: *See—*
  Okamoto, Yoshiyuki; Horiuchi, Yasuhiro; Yamada, Kouichi; Yamaguchi, Kazuhiko; and Sugi, Hidekuni, 5,531,111, Cl. 73-149.000.
Horiuchi, Yoshiro, to Sony Corporation. Color selecting electrode mounting frame for CRT and process for production of same. 5,532,546, Cl. 313-407.000.
Horn, Peter; Reich, Erhard; Adams, Stefan; and Chakrabarti, Sarbananda, to BASF Aktiengesellschaft. Liquid urethane-containing polyisocyanate mixtures which can be used to prepare the polyurethane foam. 5,531,924, Cl. 252-182.180.
Horton, Michael D.; Schillaci, Onofrio; and Rischpater, Raymond W., to Harris Corporation. Automated trouble-shooting mechanism resident in craftsperson's portable test and communications device. 5,533,093, Cl. 379-21.000.
Hoshikawa, Tsuguo: *See—*
  Yoshikuwa, Masakatsu; and Hoshikawa, Tsuguo, 5,531,488, Cl. 292-216.000.
Hoshino, Kazuhiro, to Sony Corporation. Method of and apparatus for evaluating reliability of metal interconnect. 5,532,600, Cl. 324-537.000.
Hoshino, Ryoichi; and Shibata, Hiroki, to Showa Aluminum Corporation. Heat exchanger. 5,531,268, Cl. 165-153.000.
Hosoe, Katsuharu; and Yamamoto, Toshihisa, to Nippondenso Co., Ltd. Control apparatus for engine. 5,531,200, Cl. 123-417.000.
Hosokawa Bepex Corporation: *See—*
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Hosono, Hiroshi: *See—*
  Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
Hosoya, Yoshihiro; Morita, Masaya; and Tsuyama, Seishi, to NKK Corporation. Continously annealed cold-rolled steel sheet excellent in balance between deep drawability and resistance to secondary-work embrittlement and method for manufacturing same. 5,531,839, Cl. 148-330.000.
Hou, Chung-Jen: *See—*
  Hu, Hopin; and Hou, Chung-Jen, 5,531,893, Cl. 210-500.350.
Houck, Merle L.: *See—*
  Russo, Gerald M.; Majeed, Kardar M.; and Houck, Merle L., 5,531,919, Cl. 510-200.000.
Houghton, Richard D.; Graham, Linda L.; and Krutsch, David P., to Rohm and Haas Company. Propanil dispersible granule formulation. 5,532,209, Cl. 504-339.000.
Houghton, Russell J.; and Galbi, Duane E., to International Business Machines Corporation. Clocking circuit with increasing delay as supply voltage VDD. 5,532,969, Cl. 365-226.000.
House, Jeffrey W.; House, William P.; and House, William K., to Infi-Shield Inc. Method for sealing a pipe juncture. 5,531,485, Cl. 285-230.000.
House, William K.: *See—*
  House, Jeffrey W.; House, William P.; and House, William K., 5,531,485, Cl. 285-230.000.
House, William P.: *See—*
  House, Jeffrey W.; House, William P.; and House, William K., 5,531,485, Cl. 285-230.000.
Houser, Kevin: *See—*
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  Eggers, Mitchell D.; Hogan, Michael E.; Beattie, Kenneth L.; Shumaker, John; Ehrlich, Daniel J.; and Hollis, Mark, 5,532,128, Cl. 435-16.000.
Houston, Clifford L.: *See—*
  Houston, Rocky J.; and Houston, Clifford L., 5,531,478, Cl. 280-762.000.
Houston, Rocky J.; and Houston, Clifford L. Spider web clearing device for all-terrain vehicles. 5,531,478, Cl. 280-762.000.
Howell, J. V.: *See—*
  Buchan, William; Patrick, Edward; Takahashi, M.; and Howell, J. V., 5,532,886, Cl. 360-51.000.
Howell Laboratories, Inc.: *See—*
  Miers, Gary L., 5,531,887, Cl. 210-135.000.
Howley, Peter M.: *See—*
  Huibregtse, Jon M.; Scheffner, Martin; and Howley, Peter M., 5,532,348, Cl. 536-23.500.
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Hoyt, William J.: *See—*
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HRI Research, Inc.: *See—*
  Cimino, George D.; Isaacs, Stephen T.; and Tessman, John W., 5,532,146, Cl. 435-91.200.
Hshieh, Fwu-Iuan: *See—*

  Chang, Mike F.; Hshieh, Fwu-Iuan; Kwan, Sze-Hon; and Owyang, King, 5,532,179, Cl. 437-40.000.
Hsieh, Jiang, to General Electric Company. Guided ringfix algorithm for image reconstruction. 5,533,081, Cl. 378-15.000.
Hsieh, Jiang, to General Electric Company. Noise suppression algorithm and system. 5,533,091, Cl. 378-210.000.
Hsu, Cheng-Hui, to Pro-Techtor International. Stopping device for tape measures. 5,531,395, Cl. 242-381.600.
Hsu, Louis L.: *See—*
  Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, 5,532,089, Cl. 430-5.000.
Hu, Hopin; and Hou, Chung-Jen, to Gelman Sciences Inc. Inter-penetrating network charge modified microporous membrane. 5,531,893, Cl. 210-500.350.
Hu, Jia: *See—*
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Hu, Paul Y.-F.: *See—*
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Huang, Der-Shing: *See—*
  Rindone, Renato R.; Huang, Der-Shing; and Hamel, Edward E., 5,532,390, Cl. 552-11.000.
Huang, Hao, to SL Montevideo Technology, Inc. Virtual hall-effect signal generating for a brushless sensorless electrical rotary machine. 5,532,561, Cl. 318-439.000.
Huang, Henry I.: *See—*
  Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
Huang, Huang C. Electric connector. 5,531,604, Cl. 439-79.000.
Huang, Paul L.: *See—*
  Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
Huang, Peter: *See—*
  Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
Huang, Philip L.: *See—*
  Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
Huang, Wen-Ling M.: *See—*
  Racanelli, Marco; Hwang, Bor-Yuan C.; Foerstner, Juergen; and Huang, Wen-Ling M., 5,532,175, Cl. 437-29.000.
Huang, W. James; Johns, Douglas B.; and Kronenthal, Richard L., to Lifecore Biomedical, Inc. Ionically crosslinked carboxyl-containing polysaccharides for adhesion prevention. 5,532,221, Cl. 514-53.000.
Hubbard, Gordon D.: *See—*
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Hubbell Incorporated: *See—*
  Flory, Isaac L., IV, 5,532,553, Cl. 315-169.300.
  Sutherland, Ralph W., 5,532,911, Cl. 362-220.000.
Huber, David R.: *See—*
  Alexander, Stephen B.; Chaddick, Steve W.; and Huber, David R., 5,532,864, Cl. 359-177.000.
Hudak, Philip J.: *See—*
  Love, Jack W.; Love, Charles S.; Hudak, Philip J.; and Suggitt, Robert W., 5,531,785, Cl. 623-2.000.
Huder, Karin: *See—*
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Hudson, Leo D.: *See—*
  Dobson, Richard M.; Herndon, Jefferey D.; and Hudson, Leo D., 5,531,273, Cl. 166-278.000.
Huene, Donald R. Bone plug fixation assembly, expansible plug assembly therefor, and method of fixation. 5,531,792, Cl. 623-16.000.
Huey, Hugo: *See—*
  Butwell, Robert J.; McCune, Earl; Green, Michael; Huey, Hugo; Legarra, James R.; and Wilcox, Ross, 5,532,462, Cl. 219-695.000.
Huff, Robert O.; and Shadeck, Louis M., to Jacobs Chuck Technology Corporation. Chuck with torque limiting mechanism and inclined plane for final tightening. 5,531,461, Cl. 279-62.000.
Hughes Aircraft Company: *See—*
  Bak, Chan S.; Kimura, Hiroshi; and Pastor, Ricardo C., 5,531,974, Cl. 423-263.000.
  Chang, David B.; Vali, Victor; and Webb, Donald H., 5,531,116, Cl. 73-597.000.
  Frank, David A., 5,532,470, Cl. 235-491.000.
  Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., 5,532,667, Cl. 336-177.000.
  Hayes, Robert R.; and Bridges, William B., 5,532,867, Cl. 359-329.000.
  Kent, Bruce C., 5,532,632, Cl. 327-141.000.
  Lamkin, Allan; Kepley, W. Robert, III; Gupta, Prabhat K.; and Morris, Adrian J., 5,533,133, Cl. 381-94.000.
  Stanchina, William E.; Metzger, Robert A.; and Rensch, David B., 5,532,486, Cl. 257-201.000.
Hughes, Daniel, to Bertrand Faure Ltd. Vehicle seat track assembly. 5,531,503, Cl. 297-341.000.
Hughes Electronics: *See—*
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Hughes, Frank J.; and Travnicek, Edward A., to BMC Industries, Inc. Photochromic naphthopyran compounds. 5,531,935, Cl. 252-586.000.
Hughett, Elmer: *See—*
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Huibregtse, Jon M.; Scheffner, Martin; and Howley, Peter M., to United States of America, America. E6 associated protein and methods of use thereof. 5,532,348, Cl. 536-23.500.
Hujazi, Monica: *See—*
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HULS Aktiengesellschaft: *See—*
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Hummel, Steven L.; Olender, James P.; Johnson, James B.; Reynolds, JoAnn; and Skaggs, Bill A., to Creative Foam Corporation. Reinforcement and container using same. 5,531,326, Cl. 206-509.000.
Hung, Chien-chuan. Towels having a massage device disposed thereto. 5,531,666, Cl. 601-129.000.
Hung, So W., to Astec International, Ltd. Power factor corrected rectifying circuit. 5,532,917, Cl. 363-67.000.
Hunziger, Karl B.: *See—*
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Hupf, Charles J., to Regal Ware, Inc. Method and apparatus for determining the mechanical durability of the surface finish of a cooking vessel. 5,531,095, Cl. 73-7.000.
Huppert, Jean: *See—*
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Hurst, Carl P.; and Hujazi, Monica. Twist and snap fastener made of identical mating parts. 5,530,998, Cl. 24-575.000.
Hurtz, Robert W.; Smith, Jeffrey A.; Sosinski, Ronald T.; and Legg, Ernest L., to Xerox Corporation. Method of printing a print job with a print file. 5,533,172, Cl. 395-112.000.
Hussey, Scott E. W.: *See—*
  Cook, John E.; and Hussey, Scott E. W., 5,531,205, Cl. 123-568.000.
Husted, Wayne. Condiment mill with a one-way clutch. 5,531,389, Cl. 241-169.100.
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Huston, John T.: *See—*
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Hutchinson, Daniel J.: *See—*
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Huttunen, Ari, to ABB Industry Oy. Method for braking an alternating-current motor. 5,532,568, Cl. 318-757.000.
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  Racanelli, Marco; Hwang, Bor-Yuan C.; Foerstner, Juergen; and Huang, Wen-Ling M., 5,532,175, Cl. 437-29.000.
Hybl-Sutherland, Eva: *See—*
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Hyundai Electronics America: *See—*
  Binford, Charles D.; Gaertner, Mark A.; and Denny, Steven P., 5,533,190, Cl. 395-182.040.
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  Bae, Sang M., 5,532,114, Cl. 430-312.000.
  Kim, Jae K., 5,532,515, Cl. 257-751.000.
  Woo, Sang H., 5,532,182, Cl. 437-52.000.
Iannetta, Roger A., Jr.: *See—*
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Ibiden Co., Ltd.: *See—*
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Icenogle, Robert O. Marine lower unit altering process. 5,531,010, Cl. 29-401.100.
Ichihara, Masaki, to NEC Corporation. Digital radio receiver having limiter amplifiers and logarithmic detector. 5,533,064, Cl. 375-340.000.
Ichinose, Kiyohiro; Hara, Hirofumi; and Ochiai, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Surface treatment apparatus. 5,531,830, Cl. 118-423.000.
ICOS Corporation: *See—*
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  Cousens, Lawrence S.; Eberhardt, Christine D.; Gray, Patrick; Tjoelker, Larry W.; Wilder, Cheryl L.; and Trong, Hai, 5,532,152, Cl. 435-197.000.
  Gallatin, W. Michael; and Vazeux, Rosemay, 5,532,127, Cl. 435-6.000.
Idaho Research Foundation, Inc.: *See—*
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- Ide, Russell D.; and Zeidan, Fouad Y., to KMC, Inc. Fluid dampened support having variable stiffness and damping. 5,531,522, Cl. 384-99.000.
- Ieki, Hideharu: *See—*
  - Koike, Jun; and Ieki, Hideharu, 5,532,537, Cl. 310-313.00A.
- Ieki, Tsutomu; and Hirano, Yasuhiko, to Murata Manufacturing Co., Ltd. FSK modulator using saw resonator with switchable capacitors. 5,532,654, Cl. 332-102.000.
- Igarashi, Akira: *See—*
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- Igarashi, Sadao, to Alps Electric Co., Ltd. High-frequency amplifier. 5,532,650, Cl. 330-300.000.
- Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, to Sumitomo Chemical Company, Limited. Composite foam molded article process for production thereof, and foamable powder composition. 5,532,055, Cl. 428-318.600.
- Iha, Michiaki: *See—*
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- Iida, Akiyoshi: *See—*
  - Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
- Iihara, Junji: *See—*
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- Iijima, Yasuteru: *See—*
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- Iino, Yasuhiro; Matsushima, Yosuke; Terazawa, Tomozane; and Sugiki, Shozo, to Bridgestone Corporation. Air bag housing pad cover and production thereof. 5,531,469, Cl. 280-728.300.
- Ikari, Hideyuki: *See—*
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- Ikeda, Hiroki: *See—*
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- Ikeda, Hiroya: *See—*
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- Ikeda, Shinya: *See—*
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- Ikekita, Yukimi: *See—*
  - Asano, Kaoru; and Ikekita, Yukimi, 5,532,943, Cl. 364-555.000.
- Ikemoto, Kimikazu: *See—*
  - Iwai, Takao; Ikemoto, Kimikazu; Yanagisawa, Taminori; Natsumi, Fumiaki; and Shiraki, Toshiro, 5,532,450, Cl. 219-121.630.
- Ikeno, Masayuki; and Hara, Hiroyasu, to Shin-Etsu Chemical Co., Ltd. Thixotropic fluorosilicone gel composition. 5,532,294, Cl. 523-212.000.
- Iketaki, Yoshinori: *See—*
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- Ikkala, Olli: *See—*
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- Ilic, Kosta: *See—*
  - Shah, Jaffar; Ilic, Kosta; Peck, Joseph E.; and Wang, Zu-Yi, 5,533,037, Cl. 371-62.000.
- Illawarra Technology Corporation Limited, The: *See—*
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- Imai, Shinji: *See—*
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- Imakado, Shoji: *See—*
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- Inaba, Michihiko: *See—*
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- Inaba, Yutaka: *See—*
  - Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,532,713, Cl. 345-97.000.
- Inagaki, Hazime: *See—*
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- Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, to Toppan Printing Co., Ltd. Image transfer device. 5,532,724, Cl. 347-213.000.
- Inal, Osman T.: *See—*
  - Richman, Roger H.; Inal, Osman T.; Zimmerly, Charles A.; and Hodgson, Darel E., 5,531,369, Cl. 228-109.000.
- Inalfa Industries, B.V.: *See—*
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- Inatani, Shujiro, to Rays Engineering Co., Ltd. Rotary forging apparatus. 5,531,088, Cl. 72-84.000.
- Inco Limited: *See—*
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- InControl, Inc.: *See—*
  - Alferness, Clifton A., 5,531,768, Cl. 607-6.000.
- Incyte Pharmaceuticals, Inc.: *See—*
  - Espevik, Terje; and Marra, Marian N., 5,532,216, Cl. 514-21.000.
- Indian Head Industries, Inc.: *See—*
  - Borneby, Hans G., 5,531,454, Cl. 277-26.000.
- Indigo N.V.: *See—*
  - Landa, Benzion, 5,532,805, Cl. 355-256.000.
- Indresco Inc.: *See—*
  - Biek, Paul A., 5,531,279, Cl. 173-178.000.
- Industria Prodotti Medicinali I.PM. S.r.L.: *See—*
  - Mastronardi, Pasquale; Rossi, Antonio E.; and Fraganza, Fiorentino, 5,531,713, Cl. 604-263.000.
- Industrial Metal Products Corporation: *See—*
  - Judge, Edward E., 5,531,631, Cl. 451-5.000.
- Infi-Shield Inc.: *See—*
  - House, Jeffrey W.; House, William P.; and House, William K., 5,531,485, Cl. 285-230.000.
- Ingersoll-Rand Company: *See—*
  - Riley, James R.; and Richards, Othel C., 5,531,633, Cl. 451-28.000.
  - Willis, Paul E., 5,531,542, Cl. 404-101.000.
- Innotech, Inc.: *See—*
  - Gupta, Amitava; and Blum, Ronald D., 5,531,940, Cl. 264-1.700.
- Innova Champion Discs, Inc.: *See—*
  - Dunipace, David B., 5,531,624, Cl. 446-46.000.
- Ino, Toshiaki: *See—*
  - Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, 5,532,794, Cl. 355-208.000.
- Inobe, Kazuhiko: *See—*
  - Konno, Masaki; Inobe, Kazuhiko; Yoshiura, Kenichi; and Itoh, Shuji, 5,532,466, Cl. 235-441.000.
- Inomata, Shigemitsu; and Komori, Mikio, to Japan Tobacco Inc. Apparatus for controlling the filling amount of shredded tobacco in cigarettes. 5,531,234, Cl. 131-84.100.
- Inoue, Akihisa: *See—*
  - Masumoto, Tsuyoshi; Inoue, Akihisa; Kaji, Toshihiko; Iihara, Junji; and Takano, Yoshishige, 5,532,069, Cl. 428-552.000.
- Inoue, Atsushi, to Uniden Corporation. Receiver capable of selectively receiving satellite broadcast TV signals and audio SCPC signals. 5,532,760, Cl. 348-729.000.
- Inoue, Haruo, to Eagle Co., Ltd. Coin dispenser. 5,531,640, Cl. 453-17.000.
- Inoue, Ikunori; and Tsujihara, Susumu, to Matsushita Electric Industrial Co., Ltd. Image correction apparatus using a displayed test signal. 5,532,765, Cl. 348-807.000.
- Inoue, Kazuhiko; and Watanabe, Takashi, to TEAC Corporation. Disk storage having notched front bezel. 5,532,994, Cl. 369-77.200.
- Inoue, Masaharu: *See—*
  - Terashi, Mitugi; Inoue, Masaharu; and Usijima, Yutaka, 5,532,043, Cl. 428-152.000.
- Inoue, Yoshikazu: *See—*
  - Katsura, Yousuke; Tomishi, Tetsuo; Inoue, Yoshikazu; and Takasugi, Hisashi, 5,532,258, Cl. 514-370.000.
- Institut Francals du Petrole: *See—*
  - Cameron, Charles; Cosyns, Jean; Sarrazin, Patrick; Boitiau, Jean Paul; and Courty, Philippe, 5,531,886, Cl. 208-251.00H.
- Institute of Gas Technology: *See—*
  - Ong, Estela T.; and Burton-Gorman, Nellie, 5,531,956, Cl. 419-2.000.
- Intel Corporation: *See—*
  - Agarwal, Rohit; and Keith, Michael, 5,532,940, Cl. 364-514.00R.
  - Borodovsky, Yan A., 5,532,090, Cl. 430-5.000.
  - Danneels, Gunner D., 5,533,112, Cl. 379-202.000.
  - Dobbins, Timothy M.; and Bogin, Zohar, 5,533,200, Cl. 395-280.000.
  - Kolman, Frank; and Haley, Kevin, 5,531,021, Cl. 29-843.000.
  - Madrid, Anna; Jacobson, Scott; and Bhattacharyya, Bidyut K., 5,532,983, Cl. 368-113.000.
  - Mar, Monte F.; and Madland, Paul D., 5,532,636, Cl. 327-543.000.
  - Pantelakis, Dimitris; Tedrow, Kerry; Javanifard, Johnny; and Canepa, George, 5,532,915, Cl. 363-60.000.
  - Robinson, Kurt B., 5,532,945, Cl. 364-707.000.
  - Salmon, Joseph H., 5,533,196, Cl. 395-185.070.
- Intermedics, Inc.: *See—*
  - Prutchi, David, 5,531,772, Cl. 607-17.000.
- International Business Machines Corporation: *See—*
  - Acosta, Donald C.; and Hu, Paul Y.-F., 5,532,888, Cl. 360-92.000.
  - Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, 5,532,089, Cl. 430-5.000.
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
  - Albin, Donald J.; Walls, Andrew D.; Yanes, Adalberto G.; and Zitny, Kevin G., 5,533,194, Cl. 395-183.180.

  - Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, 5,531,838, Cl. 148-23.000.
  - Arndt, Steven F.; Matienzo, Luis J.; Memis, Irving; Spalik, James; and Wu, Tien Y., 5,532,024, Cl. 427-327.000.
  - Asselta, John A.; Balan, Albert L.; Boyko, Stephen; and Myers, James E., 5,532,907, Cl. 361-775.000.
  - Balasubramanian, Peruvemba S.; Lee, Nathan J.; and Lekuch, Scott D., 5,532,641, Cl. 329-311.000.
  - Bates, Cary L.; Blades, Jerry A.; Kiel, Harvey G.; Romon, Raymond F.; and Ryan, Jeffrey M., 5,532,715, Cl. 345-123.000.
  - Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., 5,533,182, Cl. 395-155.000.
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
  - Behfar-Rad, Abbas; Perry, Charles H.; and Sachdev, Krishna G., 5,532,608, Cl. 324-754.000.
  - Beiley, Mark A.; and Fifield, John A., 5,532,622, Cl. 326-95.000.
  - Bensimon, Daniel; Osborn, Neal A.; and Pacheco, Joaquin F., 5,533,125, Cl. 380-4.000.
  - Bertin, Claude L.; Cronin, John E.; and Perlman, David J., 5,532,519, Cl. 257-777.000.
  - Blackledge, John W., Jr.; and Frey, Bradly G., 5,533,205, Cl. 395-297.000.
  - Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., 5,533,036, Cl. 371-40.100.
  - Bonaccio, Anthony R., 5,532,619, Cl. 326-75.000.
  - Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.
  - Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., 5,531,874, Cl. 204-224.00M.
  - Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.
  - Cesaro, Claude; and Richter, Gerard, 5,533,118, Cl. 379-386.000.
  - Cheong, Hoichi; and So, Kimming, 5,533,189, Cl. 395-182.040.
  - Church, Mark A.; Deshpande, Annayya P.; and Desouches, Alain M., 5,531,017, Cl. 29-603.120.
  - Cobb, Joshua M.; and Parker, Peter K., 5,532,457, Cl. 219-411.000.
  - Dorius, Lee K.; and Samuelson, Laurence S., 5,532,890, Cl. 360-103.000.
  - Dounn, Paul J.; Kise, Terry L.; Schneider, Richard C.; and Tayefeh, Morovat, 5,533,031, Cl. 371-21.100.
  - Erickson, Jack N., Jr.; Gazza, Jack M.; Olivas, Victor S.; and Thompson, Charles A., 5,532,931, Cl. 364-478.060.
  - Farooq, Shaji; Purushothaman, Sampath; Reddy, Srinivasa S. N.; and Sura, Vivek M., 5,532,031, Cl. 428-623.000.
  - Fleek, Arthur E.; and LaMaire, Richard O., 5,533,025, Cl. 370-85.200.
  - Fleek, Arthur E.; Camp, William O., Jr.; Warchocki, Gary M.; and Bracco, Michael J., 5,533,069, Cl. 375-344.000.
  - Gaston, Charles A., 5,532,496, Cl. 250-492.220.
  - Georgiou, Christos J.; Larsen, Thor A.; and Lee, Ki W., 5,533,072, Cl. 375-371.000.
  - Graziano, Michael J.; Hauris, Jon F.; and Stanley, Daniel L., 5,532,937, Cl. 364-514.00C.
  - Hakey, Mark C.; Holmes, Steven J.; and Wursthorn, John M., 5,532,518, Cl. 257-774.000.
  - Hartrick, Thomas V.; Stevens, Jeffrey N.; and Sabia, Nicholas J., 5,532,920, Cl. 364-419.100.
  - Hong, Jung-Kook; Kaneko, Toyohisa; and Takahashi, Junichi, 5,532,833, Cl. 358-335.000.
  - Houghton, Russell J.; and Galbi, Duane E., 5,532,969, Cl. 365-226.000.
  - Kato, Yoshimine, 5,532,184, Cl. 437-133.000.
  - Kendall, Rodney A., 5,532,903, Cl. 361-234.000.
  - Kiyono, Satsuo, 5,532,189, Cl. 437-209.000.
  - Krounbi, Mohamad T.; Renaldo, Alfred F.; and Werner, Douglas J., 5,532,109, Cl. 430-271.000.
  - Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., 5,532,611, Cl. 324-758.000.
  - Malcolm, Jerry W., 5,533,184, Cl. 395-161.000.
  - Megiddo, Nimrod, 5,533,178, Cl. 395-119.000.
  - Moran, David E.; O'Gorman, Timothy J.; and Watson, Kimball M., 5,533,197, Cl. 395-185.080.
  - Potter, Terence M.; and Muhich, John S., 5,532,947, Cl. 364-715.010.
  - Sayah, John Y.; and Rozwod, Robert A., 5,533,148, Cl. 382-240.000.
  - Stoehr, Roland; and Kratt, Rudolf, 5,532,657, Cl. 333-243.000.
  - Tsujino, Hitoshi, 5,532,891, Cl. 360-106.000.
- International Laboratory Technology Corp.: *See—*
  - Staats, Victor, 5,531,984, Cl. 424-78.070.
- International Organic Solutions Corp.: *See—*
  - Wickham, Daniel E., 5,531,898, Cl. 210-606.000.
- International Paper: *See—*
  - Monroe, Stephen H.; Goettmann, James A.; and Funk, Gerald A., 5,532,298, Cl. 524-13.000.
- Inuzuka, Eiji; Oguri, Shigehisa; Suzuki, Kouji; Nagata, Wataru; and Hiruma, Yasushi, to Hamamatsu Photonics K.K. Semiconductor device inspection system involving superimposition of image data for detecting flaws in the semiconductor device. 5,532,607, Cl. 324-750.000.
- Inwave Corporation: *See—*
  - Harris, Laura L., 5,532,711, Cl. 345-55.000.
- Irie, Mitsuru: *See—*
  - Fujita, Teruo; Karaki, Morihiro; Irie, Mitsuru; and Nakane, Kazuhiko, 5,532,987, Cl. 369-44.240.
- Irie, Yoshio: *See—*
  - Yano, Kazutaka; Kajikawa, Katsuhiro; Nagasuna, Kinya; and Irie, Yoshio, 5,532,323, Cl. 525-384.000.
- Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., to Whitaker Corporation, The. Coplanar computer docking apparatus. 5,531,615, Cl. 439-631.000.
- Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., to BellSouth Corporation. Method for routing calls based on predetermined assignments of callers geographic locations. 5,533,107, Cl. 379-201.000.
- Isaacs, Stephen T.: *See—*
  - Cimino, George D.; Isaacs, Stephen T.; and Tessman, John W., 5,532,146, Cl. 435-91.200.
  - Tessman, John W.; Cimino, George D.; Isaacs, Stephen T.; and Hearst, John E., 5,532,145, Cl. 435-91.200.
- Isaksson, Juhani: *See—*
  - Engström, Folke; and Isaksson, Juhani, 5,531,798, Cl. 48-77.000.
- Isard, Marc; and Bernier, Thierry, to Alcatel Telspace. System for receiving a phase and amplitude modulated digital signal. 5,533,050, Cl. 375-229.000.
- Isco, Inc.: *See—*
  - Wright, Paul G.; Nicholls, Curtis W.; and McDonald, Clifford L., Jr., 5,531,961, Cl. 422-80.000.
- Ishibashi, Hiroki: *See—*
  - Kawauchi, Nobuya; Fukazawa, Nobuyuki; Ishibashi, Hiroki; and Otsuka, Kengo, 5,532,349, Cl. 536-55.300.
- Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, to Kabushiki Kaisha Toshiba. Apparatus and method for evaluating orientation film. 5,532,488, Cl. 250-341.300.
- Ishida, Kazutoshi: *See—*
  - Osako, Nobutaka; Ishida, Kazutoshi; Nakai, Yasunori; and Murakami, Takeshi, 5,531,649, Cl. 474-205.000.
- Ishida, Ken: *See—*
  - Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, 5,532,080, Cl. 429-164.000.
- Ishida-Nonpareil Limited: *See—*
  - Fenlon, Christopher, 5,531,101, Cl. 73-49.300.
- Ishida, Yasutaka: *See—*
  - Hida, Tadayoshi; Ishida, Yasutaka; and Takamizawa, Tohru, 5,531,525, Cl. 384-482.000.
- Ishigaki, Yukio: *See—*
  - Kubo, Morihiro; Ishigaki, Yukio; Itoh, Takeshi; and Misawa, Hirokazu, 5,532,638, Cl. 327-368.000.
- Ishihara Sangyo Kaisha Ltd.: *See—*
  - Sakurai, Kaoru, 5,531,977, Cl. 423-634.000.
- Ishihara, Toshiaki: *See—*
  - Miyamoto, Yasuhiro; Ishihara, Toshiaki; and Uda, Minoru, 5,531,864, Cl. 162-199.000.
- Ishikawa, Hiromichi: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Ishikawa, Hiroshi; Furukawa, Hideo; Shimizu, Masatoshi; and Nakauchi, Norio, to Honda Giken Kogyo Kabushiki Kaisha. Control system for vehicle automatic transmission. 5,531,654, Cl. 477-120.000.
- Ishikawa, Masahiro, to Mitsubishi Denki Kabushiki. Control unit, plug-in unit, transformer, zero-phase current transformer, and frequency measuring circuit applied to control center. 5,532,432, Cl. 174-60.000.
- Ishikawa, Tetsuro, to Fujitsu Limited. Method and apparatus for detecting magnetic disk defects using a complete disk erasure magnet. 5,532,586, Cl. 324-212.000.
- Ishikawajima-Harima Heavy Industries Co., Ltd.: *See—*
  - Abe, Akinori; and Ando, Akitoshi, 5,531,178, Cl. 114-74.00A.
- Ishimaru, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 5,532,718, Cl. 345-211.000.
- Ishino, Tsutomu; Maruyama, Ryoichi; Nakagami, Hiroshi; and Asada, Hisao, to Kabushiki Kaisha Komatsu Seisakusho. Creep preventing control system for hydrostatic-mechanical transmissions. 5,531,304, Cl. 192-4.00R.
- Ishiwata, Yoshirou: *See—*
  - Sawai, Kiichi; Mitani, Takahiko; Ninomiya, Naohisa; and Ishiwata, Yoshirou, 5,532,272, Cl. 514-492.000.
- Ishizuka, Koh; and Nishimura, Tetsuharu, to Canon Kabushiki Kaisha. Rotary detector having an optical system for guiding two diffracted lights. 5,532,819, Cl. 356-356.000.
- Ishizuka, Masanobu: *See—*
  - Kimura, Kouichi; Nishii, Kouta; and Ishizuka, Masanobu, 5,531,950, Cl. 264-135.000.
- Ishizuka, Shuichi; Kawamura, Kohei; Hata, Jiro; and Suzuki, Akira, to Tokyo Electron Kabushiki Kaisha. Plasma film forming method and apparatus and plasma processing apparatus. 5,531,834, Cl. 118-723.001.
- ISIS PHARMA GmbH: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- Isobe, Kunio: *See—*

- Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, 5,531,089, Cl. 72-241.800.
- Isogai, Naoki: *See—*
  - Fujieda, Masanao; Yano, Nobuyuki; Mimura, Yoshiaki; and Isogai, Naoki, 5,532,772, Cl. 351-211.000.
- Isosu, Toru: *See—*
  - Takahashi, Yasuhito; Kimura, Tsutomu; and Isosu, Toru, 5,532,791, Cl. 355-206.000.
- Israel Institute for Biological Research: *See—*
  - Karton, Yishai; and Kleiman, Moshe, 5,531,930, Cl. 252-363.500.
- Issa, Darrell E.; and Birchfield, Jerry W., to Directed Electronics, Inc. Method of indicating the threat level of an incoming shock to an electronically secured vehicle and apparatus therefore. 5,532,670, Cl. 340-429.000.
- Issenmann, Edouard: *See—*
  - Ballard, Michel; and Issenmann, Edouard, 5,533,114, Cl. 379-220.000.
- Itaki, Yohichi, to NEC Corporation. Convergence error detecting apparatus capable of being applied to projection-type displays having different scanning frequencies. 5,532,764, Cl. 348-745.000.
- Ito, Hiroyasu: *See—*
  - Kato, Masayuki; and Ito, Hiroyasu, 5,532,855, Cl. 359-117.000.
- Ito, Katsuhisa: *See—*
  - Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.
- Ito, Kuniomi: *See—*
  - Takagi, Shigehide; Ito, Kuniomi; and Hidaka, Tsuneo, 5,531,794, Cl. 623-16.000.
- Ito, Masami: *See—*
  - Fukui, Atsushi; Nishii, Kanji; Takamoto, Kenji; and Ito, Masami, 5,532,823, Cl. 356-364.000.
- Ito, Noboru: *See—*
  - Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, 5,532,798, Cl. 355-221.000.
- Itoh, Kosaku, to Tetra Laval Holdings & Finance S.A. Mechanism for righting a tipped package along a conveyor line. 5,531,310, Cl. 198-395.000.
- Itoh, Shuji: *See—*
  - Konno, Masaki; Inobe, Kazuhiko; Yoshiura, Kenichi; and Itoh, Shuji, 5,532,466, Cl. 235-441.000.
- Itoh, Takeshi: *See—*
  - Kubo, Morihiro; Ishigaki, Yukio; Itoh, Takeshi; and Misawa, Hirokazu, 5,532,638, Cl. 327-368.000.
- Itou, Makoto: *See—*
  - Kumeji, Yasushi; Nishimura, Seiichi; Nakajima, Yoshinobu; and Itou, Makoto, 5,532,662, Cl. 333-185.000.
- Itoyama, Motoyuki: *See—*
  - Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, 5,532,794, Cl. 355-208.000.
- ITT Corporation: *See—*
  - Coutts, Bruce, 5,533,157, Cl. 385-53.000.
  - Hertel, Richard J., 5,532,690, Cl. 340-989.000.
- Ivy Hill Corporation: *See—*
  - O'Brien, Patrick J.; Thomas, Alvin; Rufo, George, Jr.; Durham, Larry; and Gelardi, Anthony L., 5,531,321, Cl. 206-232.000.
- Iwahashi, Toru: *See—*
  - Sudani, Kiyoshi; Kano, Masato; Sugimoto, Yukihiro; Fukuda, Takashi; and Iwahashi, Toru, 5,531,943, Cl. 264-29.100.
- Iwai, Takao; Ikemoto, Kimikazu; Yanagisawa, Taminori; Natsumi, Fumiaki; and Shiraki, Toshiro, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method capable of manufacturing two or more different types of welded panels. 5,532,450, Cl. 219-121.630.
- Iwai, Takao, to Toyota Jidosha Kabushiki Kaisha. Weld bead quality determining apparatus. 5,533,146, Cl. 382-150.000.
- Iwaki, Masahiro: *See—*
  - Nakayama, Toyoo; Taira, Seizo; Kawamura, Hiroyuki; Shibuya, Masaoki; and Iwaki, Masahiro, 5,532,267, Cl. 514-467.000.
- Iwaki, Tsutomu: *See—*
  - Yamamura, Yasuharu; Seri, Hajime; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,532,076, Cl. 429-59.000.
- Iwaki, Yuji; Kikuchi, Shuichi; and Asakura, Hiroshi, to Sony Corporation. Storage case. 5,531,322, Cl. 206-308.300.
- Iwamoto, Masayuki, to Shinohara Machinery Co., Ltd. Press plate registering method. 5,531,162, Cl. 101-171.000.
- Iwanami, Shigeki: *See—*
  - Fukanuma, Tetsuhiko; Goto, Kunifumi; Tsumagari, Yuichi; and Iwanami, Shigeki, 5,531,579, Cl. 418-55.200.
- Iwasaki, Makoto: *See—*
  - Miyabe, Kanji; Orita, Nobuhiro; Iwasaki, Makoto; Tsurumaru, Yohka; and Nakahara, Toshitsugu, 5,531,901, Cl. 210-668.000.
- Iwasaki, Shinichiro; Sugiyama, Masanori; Umemura, Chiaki; Ookawa, Akemi; and Takahashi, Hisayoshi, to Aisin Seiki Kabushiki Kaisha. Controller for switched reluctance motor. 5,532,567, Cl. 318-701.000.
- Iwase, Hiroyuki: *See—*
  - Nakata, Takuya; Iwase, Hiroyuki; and Miyamoto, Hiromu, 5,532,425, Cl. 84-609.000.
- Iwatsubo, Satoshi: *See—*
  - Kajitani, Tetsuji; Hikosaka, Ariyoshi; Azumai, Hideo; and Iwatsubo, Satoshi, 5,532,827, Cl. 358-298.000.
- Ixtlan Aktiengesellschaft: *See—*
  - Probst, Gastone, 5,531,157, Cl. 99-451.000.
- Iyatomi, Nobuyoshi: *See—*
  - Takayama, Susumu; Mikami, Yasuie; Iyatomi, Nobuyoshi; and Orikasa, Minoru, 5,531,906, Cl. 210-712.000.
- J. D. Carreker & Associates, Inc.: *See—*
  - Josephson, Stanley M.; Kopesec, Michael F.; Royal, P. Darrell; Stephens, Thomas S.; and Thompson, Mitchell D., 5,532,464, Cl. 235-379.000.
- Jaaskelainen, William: *See—*
  - Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., 5,533,182, Cl. 395-155.000.
- Jaccoud, Bertrand: *See—*
  - Fayet, Pierre; and Jaccoud, Bertrand, 5,531,060, Cl. 53-426.000.
- Jäckel, Klaus: *See—*
  - Schiffel, Reinhard; Jäckel, Klaus; Stadler, Bruno; and Vogel, Holger, 5,533,030, Cl. 370-120.000.
- Jackson, Daryl L. Method of removing a minable product from an underground seam and bottom hole tool. 5,531,507, Cl. 299-13.000.
- Jackson Products, Inc.: *See—*
  - Pleune, Daniel A.; and Roe, William E., 5,532,767, Cl. 351-118.000.
- Jackson, William T.: *See—*
  - Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., 5,532,382, Cl. 549-57.000.
- Jacobs Chuck Technology Corporation: *See—*
  - Huff, Robert O.; and Shadeck, Louis M., 5,531,461, Cl. 279-62.000.
- Jacobs, Larry G.: *See—*
  - Mannava, Seetha R.; Risbeck, James D.; and Jacobs, Larry G., 5,531,570, Cl. 416-241.00R.
- Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, to Novo Nordisk A/S. [1,2,4]triazolo[4,3-a]quinoxaline compounds. 5,532,236, Cl. 514-228.500.
- Jacobson, Scott: *See—*
  - Madrid, Anna; Jacobson, Scott; and Bhattacharyya, Bidyut K., 5,532,983, Cl. 368-113.000.
- Jacques, Carol. Automated trowelling system. 5,531,584, Cl. 425-221.000.
- Jaffe, Steven T.: *See—*
  - Kim, Yong-Kyu; Liu, Tianmin; Jaffe, Steven T.; and Strolle, Christopher H., 5,533,138, Cl. 382-232.000.
- Jager, Paul: *See—*
  - Eichenberger, Hans-Ulrich; Cavadini, Flavio; and Jager, Paul, 5,530,995, Cl. 19-231.000.
- Jager, Rene I.; Vizmuller, Peter; and Gimpelj, Mathias M., to Motorola, Inc. Tunable voltage controlled oscillator having microstrip resonator with cuts for better tuning. 5,532,651, Cl. 331-96.000.
- Jain, Amit: *See—*
  - Lee, Neville K.; Jain, Amit; and Martin, Roy E., 5,532,884, Cl. 359-833.000.
- Jaker, Marc L.: *See—*
  - Roberto, Feliziani; and Jaker, Marc L., 5,531,717, Cl. 604-271.000.
- Jamal, Karim; Gudmundson, Björn; and Brismark, Gustav, to Telefonaktiebolaget LM Ericsson. Method and device for estimating transmitted signals in a receiver in digital signal transmission operations. 5,533,067, Cl. 375-341.000.
- Jamas, Spiros; Easson, D. Davidson, Jr.; and Ostroff, Gary R., to Alpha-Beta Technology, Inc. Use of aqueous soluble glucan preparations to stimulate platelet production. 5,532,223, Cl. 514-54.000.
- Jamerson, James R.: *See—*
  - Franck, William F., III; and Jamerson, James R., 5,531,083, Cl. 70-58.000.
- James, David C., to James Group, The. Method for data compression. 5,533,051, Cl. 375-240.000.
- James Group, The: *See—*
  - James, David C., 5,533,051, Cl. 375-240.000.
- James, Guy L.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- James, John V.: *See—*
  - Feldkamp, Lee A.; Puskorius, Gintaras V.; James, John V.; and Marko, Kenneth A., 5,531,108, Cl. 73-117.300.
- James River Paper Company, Inc.: *See—*
  - Hatfield, Eric P., 5,531,952, Cl. 264-171.260.
- Jamieson, Eric K.: *See—*
  - Burton, Douglas; and Jamieson, Eric K., 5,531,294, Cl. 187-292.000.
- Jamison, John R. Ballistics measuring system. 5,531,113, Cl. 73-167.000.
- Jamroga, David A.: *See—*
  - Peavey, Stephen D.; Ogden, James E.; Hoyt, William J.; Dunn, Ino; Zmuda, Paul E.; Jamroga, David A.; and Jorgensen, Jacob W., 5,533,103, Cl. 379-69.000.
- Jan, Der'e: *See—*
  - Raghavan, Srini; Jan, Der'e; and Chilkunda, Raghunath, 5,531,900, Cl. 210-651.000.
- Jang, Yue-Teh: *See—*
  - Moore, Thomas C.; and Jang, Yue-Teh, 5,531,700, Cl. 604-164.000.
- Janott, Dietrich W.: *See—*
  - Schmidt, Michael; Bomann, Werner; Janott, Dietrich W.; and Werner, Herbert, 5,531,994, Cl. 424-405.000.
- Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, to North American Philips Corporation. Single panel color projection video display. 5,532,763, Cl. 348-744.000.

- Janzen, Edward G.; Wilcox, Allan L.; and Hinton, Randall D., to Oklahoma Medical Research Foundation. Spin trap nitronyl hindered phenols. 5,532,277, Cl. 514-579.000.
- Japan Atomic Energy Research Institute: *See—*
  - Katagiri, Masaki; Taguchi, Yoshito; and Uchida, Toshio, 5,531,074, Cl. 62-6.000.
- Japan Servo Co., Ltd.: *See—*
  - Sakamoto, Masafumi, 5,532,531, Cl. 310-49.00R.
- Japan Tobacco Inc.: *See—*
  - Inomata, Shigemitsu; and Komori, Mikio, 5,531,234, Cl. 131-84.100.
- Jardine, Leslie A.: *See—*
  - Gartner, Ellis M.; Cogliano, Joseph A.; Arfaei, Ahmad; Jardine, Leslie A.; Scheiner, Paul; and Duecker, Heyman C., 5,531,825, Cl. 106-808.000.
- Jaros, Philip: *See—*
  - Baker, Jeffrey J.; and Jaros, Philip, 5,531,348, Cl. 220-264.000.
- Jarvis, Richard: *See—*
  - Flood, Eric; and Jarvis, Richard, 5,531,186, Cl. 119-166.000.
- Jasper, Steven C.; and Crisler, Kenneth J., to Motorola, Inc. Method for providing and selecting amongst multiple data rates in a time division multiplexed system. 5,533,004, Cl. 370-11.000.
- Javanifard, Johnny: *See—*
  - Pantelakis, Dimitris; Tedrow, Kerry; Javanifard, Johnny; and Canepa, George, 5,532,915, Cl. 363-60.000.
- Jayapalan, Jay P., to Motorola, Inc. Packet data in an analog cellular radiotelephone system. 5,533,019, Cl. 370-60.100.
- JBL Incorporated: *See—*
  - Button, Douglas J., 5,533,132, Cl. 381-90.000.
- JBS S.A.: *See—*
  - Jeanson, Jean-François; and Huppert, Jean, 5,531,554, Cl. 411-399.000.
- Jeanson, Jean-François; and Huppert, Jean, to JBS S.A. Self-retaining means for fasteners particularly screws. 5,531,554, Cl. 411-399.000.
- Jeffers, Frederick J.; Smith, Neil; Freeman, Jay D.; Gandola, Kent R.; and Koeppe, Peter V., to Eastman Kodak Company. MR sensor including calibration circuit wherein signals are averaged for determining a correction factor and pole pieces are shaped to reduce field in gap therebetween. 5,532,584, Cl. 324-202.000.
- Jemie, Patricia A.: *See—*
  - Hawley, Robert J.; and Jemie, Patricia A., 5,533,192, Cl. 395-183.040.
- Jen, Hsieh C. Foldable pulp molded cushioning material. 5,532,044, Cl. 428-167.000.
- Jeng, Ru-Jong: *See—*
  - Tripathy, Sukant K.; Jeng, Ru-Jong; Kumar, Jayant; Marturunkakul, Sutiyao; and Chen, Jeng-I, 5,532,320, Cl. 525-100.000.
- Jennen, Wolfgang, to Claas Ohg. Endless track mechanism. 5,531,282, Cl. 180-9.100.
- Jenniges, Randal L.: *See—*
  - Harvey, Dennis N.; and Jenniges, Randal L., 5,532,824, Cl. 356-375.000.
- Jenoptik Communications GmbH: *See—*
  - Schiffel, Reinhard; Jäckel, Klaus; Stadler, Bruno; and Vogel, Holger, 5,533,030, Cl. 370-120.000.
- Jensen, Reginald S. Pill pulverizer: apparatus. 5,531,386, Cl. 241-36.000.
- Jensen, Wolfgang W.: *See—*
  - Gattey, Phillip A.; Burris, Christine; and Jensen, Wolfgang W., 5,533,122, Cl. 379-430.000.
- JEOL Ltd.: *See—*
  - Okamura, Michio, 5,532,572, Cl. 320-1.000.
- Jeppesen, Lone: *See—*
  - Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, 5,532,236, Cl. 514-228.500.
- Jerrard, Richard: *See—*
  - Dang, Nguyen T.; Martin, Lawrence B.; and Jerrard, Richard, 5,531,710, Cl. 604-238.000.
- Jiang, Ching-Lin; and Williams, Clark R., to Dallas Semiconductor Corp. Dual storage cell memory. 5,532,958, Cl. 365-154.000.
- Jin, Yu; and Joshi, Shrinivas G. Sensing and signal processing devices using quasi-SH (shear horizontal) acoustic waves. 5,532,538, Cl. 310-313.00R.
- Jinno, Osamu, to Taiho Kogyo Co., Ltd. Method of manufacturing a metal gasket. 5,532,026, Cl. 427-409.000.
- Joalto Design, Inc.: *See—*
  - Townsend, John A., 5,531,470, Cl. 280-730.200.
- Johal, Kuldip S.: *See—*
  - Baron, David T.; Taylor, Alexander R.; and Johal, Kuldip S., 5,531,889, Cl. 210-167.000.
- Johansson, Eric B.; and Walker, Edward S., to General Electric Company. Method for preventing scratches on fuel rods during fuel bundle assembly. 5,533,077, Cl. 376-434.000.
- Johenning, John B., to Strata Flotation, Inc. Softsided waterbed with interchangeable cover. 5,530,978, Cl. 5-451.000.
- John D. Brush & Co., Inc.: *See—*
  - Wolk, Douglas J.; Carapezza, William C.; and Sylvester, Richard J., 5,531,082, Cl. 70-63.000.
- John Wyeth & Brother, Limited: *See—*
  - Cliffe, Ian A., 5,532,242, Cl. 514-255.000.
- Johns, Douglas B.: *See—*
  - Huang, W. James; Johns, Douglas B.; and Kronenthal, Richard L., 5,532,221, Cl. 514-53.000.
- Johns Hopkins University, The: *See—*
  - Vogelstein, Bert, 5,532,108, Cl. 435-240.200.
- Johnsen, Asle. Device for ensuring free water passage to roof rainwater outlets in connection with ice formation. 5,531,543, Cl. 405-37.000.
- Johnson, Adrienne M. Method of making an applique. 5,531,176, Cl. 112-475.240.
- Johnson & Johnson, Inc.: *See—*
  - Levesque, Yvon; Cote, Sylvaine; and Gallagher, Denis, 5,531,726, Cl. 604-367.000.
- Johnson, Carroll L. Forward propelling, retractable float tube fin, with automatic propulsion vanes. 5,531,621, Cl. 441-61.000.
- Johnson, David C.: *See—*
  - Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., 5,531,615, Cl. 439-631.000.
- Johnson, David L.; and Senior, Richard C., to Mobil Oil Corporation. FCC catalyst stripper. 5,531,884, Cl. 208-150.000.
- Johnson, James B.: *See—*
  - Hummel, Steven L.; Olender, James P.; Johnson, James B.; Reynolds, JoAnn; and Skaggs, Bill A., 5,531,326, Cl. 206-509.000.
- Johnson, James E.; Shumate, Christopher B.; Siu, Andy W.; and Gundlach, Ronald, to Hamilton Company. Automated liquid handling and computer controlled system and method for solid phase chromatographic extractions. 5,531,959, Cl. 422-70.000.
- Johnson, Jay G.: *See—*
  - Olsen, James M.; Johnson, Jay G.; and Hu, Jia, 5,531,697, Cl. 604-131.000.
- Johnson, Jerry L.: *See—*
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,532,207, Cl. 504-228.000.
- Johnson, Joel C.; and Hill, Robert B., to EDI of Louisiana, Inc. Eye fundus optical scanner system and method. 5,532,771, Cl. 351-211.000.
- Johnson, Kelly B.: *See—*
  - Rink, Karl K.; Beus, Glen S.; Johnson, Kelly B.; and Monk, David B., 5,531,473, Cl. 280-737.000.
- Johnson, Linda: *See—*
  - White, Doug, 5,532,675, Cl. 340-515.000.
- Johnson Matthey Electronics, Inc.: *See—*
  - Smith, Charles; Akhtar, Masyood; Chau, Michael M.; and Savage, David, 5,532,513, Cl. 257-703.000.
- Johnson Matthey Public Limited Company: *See—*
  - Cameron, Donald S.; and Gascoyne, John M., 5,531,883, Cl. 205-626.000.
- Johnson, Michael F.: *See—*
  - Pink, Edward N.; and Johnson, Michael F., 5,531,537, Cl. 403-356.000.
- Johnson, Peter A., to Sequoia Semiconductor, Inc. Built-in self-test global clock drive architecture. 5,533,032, Cl. 371-22.500.
- Johnson, Robert D.: *See—*
  - Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., 5,532,035, Cl. 428-95.000.
- Johnston, Stephen A.; and Dougherty, William G., to Board of Regents, the University of Texas System; and State of Oregon, The, Acting By and Through the Oregon State System of Higher Education, on Behalf of Oregon State University. Method of isolation and purification of fusion polypeptides. 5,532,142, Cl. 435-69.100.
- Jolley, Matthew J.: *See—*
  - Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, 5,533,170, Cl. 395-108.000.
- Jones, Barry D.: *See—*
  - Sewell, Frederic D.; and Jones, Barry D., 5,531,800, Cl. 55-223.000.
  - Sewell, Frederic D.; and Jones, Barry D., 5,531,801, Cl. 55-223.000.
- Jones, Dick A.: *See—*
  - Dean, Richard D.; and Jones, Dick A., 5,531,229, Cl. 128-866.000.
- Jones, Gregory B.; Lopes, Joseph B.; and Martel, Gerald R., to United States of America, Navy. Method of displaying time series data on finite resolution display device. 5,532,717, Cl. 345-202.000.
- Jones, Robert L., to United States of America, Navy. India-stabilized zirconia coating for composites. 5,532,057, Cl. 428-334.000.
- Jones, Robert W.: *See—*
  - Rochelo, Donald R.; and Jones, Robert W., 5,531,328, Cl. 206-706.000.
- Jones, Stewart D.; and Chapek, George V., to United States of America, Energy. Spent fuel container alignment device and method. 5,533,075, Cl. 376-272.000.
- Jones, Thomas C.: *See—*
  - Gloyd, David A.; Hodge, Colin G.; Jones, Thomas C.; Kremenchugsky, Vladimir; and Siminauer, Robert M., 5,531,663, Cl. 600-22.000.
- Jopson, Robert M.: *See—*
  - Gnauck, Alan H.; and Jopson, Robert M., 5,532,868, Cl. 359-332.000.
- Jordan, Larry S.: *See—*
  - Oglesby, Robert L.; Smith, Leigh A. B.; Jordan, Larry S.; Greene, Carl C., Jr.; and Leonard, Wayne E., Sr., 5,531,233, Cl. 131-69.000.
- Jorgensen, Jacob W.: *See—*
  - Peavey, Stephen D.; Ogden, James E.; Hoyt, William J.; Dunn, Ino; Zmuda, Paul E.; Jamroga, David A.; and Jorgensen, Jacob W., 5,533,103, Cl. 379-69.000.
- Joseph, Robert L.: *See—*
  - Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.

  Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
Josephson, Stanley M.; Kopesec, Michael F.; Royal, P. Darrell; Stephens, Thomas S.; and Thompson, Mitchell D., to J. D. Carreker & Associates, Inc. Electronic check presentment system having a return item notification system incorporated therein. 5,532,464, Cl. 235-379.000.
Joshi, Jagmohan, to University of Maryland Eastern Shore. Foliar-applied methanol and nitrogen for increased productivity on leguminous plants. 5,532,204, Cl. 504-118.000.
Joshi, Shrinivas G.: *See—*
  Jin, Yu; and Joshi, Shrinivas G., 5,532,538, Cl. 310-313.00R.
Joyce, Gerald F.: *See—*
  Chu, Barbara C.; Joyce, Gerald F.; and Orgel, Leslie E., 5,532,126, Cl. 435-6.000.
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  Adair, Gary E.; and Joyce, Paul, 5,533,119, Cl. 379-391.000.
Judge, Edward E., to Industrial Metal Products Corporation. Microfinishing tool with axially variable machining effect. 5,531,631, Cl. 451-5.000.
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  Stibolt, Paul E.; and Judy, Russell E., 5,531,050, Cl. 52-254.000.
Juengst, Stefan: *See—*
  Heider, Juergen; Juengst, Stefan; and Wahrendorff, Peter, 5,532,552, Cl. 313-623.000.
Jung, Kwang G., to Goldstar Co., Ltd. Temperature, pressure, vibration or humidity sensor based on reflected light from a bimetallic, plastic or dehumidifying material. 5,532,479, Cl. 250-231.110.
Junker, Peter, to ABB Management AG. Apparatus and process for the longitudinal–side welding of tubes to flat steel bars. 5,532,445, Cl. 219-61.000.
Junker, Warren R.: *See—*
  Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., 5,532,598, Cl. 324-326.000.
Juraczyk, Horst: *See—*
  Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücber, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, 5,532,255, Cl. 514-326.000.
Juri, Tatsuro: *See—*
  Ootaka, Hideki; and Juri, Tatsuro, 5,532,837, Cl. 358-336.000.
Jurus, Kevin D.: *See—*
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Kabushiki Gaisha Ishii Hyoki: *See—*
  Nakano, Teruyuki, 5,531,315, Cl. 198-779.000.
Kabushiki Kaisha Komatsu Seisakusbo: *See—*
  Ishino, Tsutomu; Maruyama, Ryoichi; Nakagami, Hiroshi; and Asada, Hisao, 5,531,304, Cl. 192-4.00R.
  Kitabayashi, Hiroyuki; Kuroda, Yoshiaki; Kamada, Ikuo; and Ooenoki, Toshiyuki, 5,531,087, Cl. 72-37.000.
  Murakami, Taku, 5,532,449, Cl. 219-121.590.
  Tsuda, Yukihiro; and Mori, Akira, 5,532,712, Cl. 345-87.000.
Kabushiki Kaisha Meidensha: *See—*
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Kabushiki Kaisha Nagao Kogyo: *See—*
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Kabushiki Kaisha Shimomura Seisakusho: *See—*
  Shimomura, Taizo, 5,531,548, Cl. 408-145.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
  Yokoyama, Yoshinobu; Suzuki, Kenji; Seki, Yoshiyuki; Harada, Shoichi; and Shimizu, Etsuo, 5,532,908, Cl. 362-30.000.
Kabushiki Kaisha TOPCON: *See—*
  Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.
Kabushiki Kaisba Toshiba: *See—*
  Hanari, Jun; Miyagi, Takeshi; Matsumoto, Kazuhiro; Tohdake, Ayako; and Fukuoka, Yoshitaka, 5,532,906, Cl. 361-749.000.
  Haraguchi, Hiroshi; Abe, Masahiro; and Nomura, Wataru, 5,532,520, Cl. 257-797.000.
  Hatanaka, Masahiko, 5,531,223, Cl. 128-653.200.
  Higashiyama, Yasushi; and Furusawa, Takanori, 5,532,887, Cl. 360-64.000.
  Hirata, Haruhiko; Hori, Michio; and Umiji, Toru, 5,532,073, Cl. 429-34.000.
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  Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, 5,532,488, Cl. 250-341.300.
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  Kushiyama, Natsuki; Furuyama, Tohru; and Numata, Kenji, 5,532,963, Cl. 365-201.000.
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  Sato, Yasushi, 5,532,634, Cl. 327-216.000.
  Takebuchi, Masataka; Tohyama, Daisuke; and Ogura, Hidemitsu, 5,532,181, Cl. 437-43.000.
  Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.
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Kabushiki Kaisha Toyoda Jidoshokki Seisakushi: *See—*
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
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  Takemoto, Tsuyoshi; Hisanaga, Shigeru; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, 5,531,578, Cl. 418-55.100.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
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  Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
Kabushiki Kaisya Advance: *See—*
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Kabushiki Kaisya Ohara: *See—*
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Kadono, Shinichi; Mishima, Kiyoshi; Takahasi, Akihisa; and Taniuchi, Akira, to MANAC Inc. Process for preparing brominated polystyrene. 5,532,322, Cl. 525-357.000.
Kady, Mark A.; and Wenos, Vincent M., to Delco Electronics Corporation. Method and apparatus for low current RF signal detection. 5,533,058, Cl. 375-317.000.
Kaforey, Judy M.: *See—*
  Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.
Kaga, Hideaki: *See—*
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Kagami, Yuichi; and Kanda, Takashi, to Nisca Corporation. Image data transferring system and method. 5,532,844, Cl. 358-468.000.
Kageyama, Hironobu; and Nakamura, Mitsuo, to Fujitsu Limited. DC-DC converter apparatus. 5,532,914, Cl. 363-50.000.
Kagiyama, Naoto: *See—*
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Kainuma, Mitsuru: *See—*
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Kaiser Aerospace and Electronics Corporation: *See—*
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Kaiser, Frederick; and Bobry, Howard H., to Albar, Inc. Congeneration power system. 5,532,525, Cl. 307-64.000.
Kaizu, Tsutomu: *See—*
  Niwa, Mineo; Tamura, Kouichi; Kaizu, Tsutomu; and Kobayashi, Masakazu, 5,532,137, Cl. 435-7.920.
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Kajikawa, Katsuhiro: *See—*
  Yano, Kazutaka; Kajikawa, Katsuhiro; Nagasuna, Kinya; and Irie, Yoshio, 5,532,323, Cl. 525-384.000.
Kajitani, Tetsuji; Hikosaka, Ariyoshi; Azumai, Hideo; and Iwatsubo, Satoshi, to Mita Industrial Co., Ltd. Apparatus for reproducing image densities using pixel processing and method of use thereof. 5,532,827, Cl. 358-298.000.
Kakegawa, Takeshi: *See—*
  Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, 5,532,063, Cl. 428-446.000.
Kakei, Tsutomu: *See—*
  Uesugi, Akio; and Kakei, Tsutomu, 5,531,840, Cl. 148-552.000.
Kako, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Engine-controlling atmospheric pressure detection system. 5,532,930, Cl. 364-431.050.
Kali-Chemie Pharma GmbH: *See—*
  Schoen, Uwe; Brueckner, Reinhard; Meil, Joerg; and Thormaehlen, Dirk, 5,532,251, Cl. 514-300.000.
Kallemeyn, Hogen J. Tool holder system. 5,531,415, Cl. 248-220.310.
Kalmanasb, Michael H., to Kaiser Aerospace and Electronics Corporation. High speed, high ambient viewability liquid crystal display assembly. 5,532,852, Cl. 359-73.000.
Kalter, Howard L.: *See—*
  Blake, Robert M.; Bossen, Douglas C.; Chen, Chin-Long; Fifield, John A.; and Kalter, Howard L., 5,533,036, Cl. 371-40.100.
Kamada, Ikuo: *See—*
  Kitabayashi, Hiroyuki; Kuroda, Yoshiaki; Kamada, Ikuo; and Ooenoki, Toshiyuki, 5,531,087, Cl. 72-37.000.

Kameo, Yohdoh; Matsumoto, Kazuo; and Suzuki, Jun, to Satellite Communication Laboratory Co., Ltd. Multi-phase PSK signal decoder including phase display generator with phase correcting feedback. 5,533,060, Cl. 375-332.000.
Kämmerer, Friedrich-Johannes: *See—*
  Bartlett, Robert R.; and Kämmerer, Friedrich-Johannes, 5,532,259, Cl. 514-378.000.
Kamoda, Hitoshi: *See—*
  Maekawa, Tomohiro; Kamoda, Hitoshi; Yui, Yasuji; Iima, Shin; and Bunya, Takashi, 5,531,527, Cl. 400-185.000.
Kamon, Hiroki: *See—*
  Okinaka, Kenji; Ota, Yasutaka; Mori, Kobji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
Kanatzidis, Mercouri G.; Liao, Ju H.; and Marking, Gregory A., to Board of Trustees operating Michigan State University. Alkali metal quaternary chalcogenides and process for the preparation thereof. 5,531,936, Cl. 252-587.000.
Kanazawa, Masaru: *See—*
  Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
Kanda, Takashi: *See—*
  Kagami, Yuichi; and Kanda, Takashi, 5,532,844, Cl. 358-468.000.
Kane, Scott A.: *See—*
  Werner, Joachim; Kane, Scott A.; Boonstra, Eric F.; and Doerge, Herman P., 5,532,283, Cl. 521-131.000.
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, to Sankyo Company, Limited. Intermediates for griseolic acid derivatives. 5,532,369, Cl. 544-276.000.
Kaneko, Seiji; and Baba, Tomoya, to Sharp Kabushiki Kaisha. Semiconductor device with LDD structure. 5,532,508, Cl. 257-336.000.
Kaneko, Tetsuya: *See—*
  Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
Kaneko, Toyohisa: *See—*
  Hong, Jung-Kook; Kaneko, Toyohisa; and Takahashi, Junichi, 5,532,833, Cl. 358-335.000.
Kaneko, Yoshio: *See—*
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Kanemori, Yuzuru: *See—*
  Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
Kanfoush, Daniel E.: *See—*
  Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., 5,532,100, Cl. 430-120.000.
Kano, Masato: *See—*
  Sudani, Kiyoshi; Kano, Masato; Sugimoto, Yukihiro; Fukuda, Takashi; and Iwahashi, Toru, 5,531,943, Cl. 264-29.100.
Kanto Special Steel Works, Ltd.: *See—*
  Fusada, Tamotsu, 5,531,659, Cl. 492-48.000.
Kao Corporation: *See—*
  Maruta, Masayuki; and Shimizu, Jun, 5,532,096, Cl. 430-108.000.
Kaplan, Martin C.; and Kwon, Heemin, to Eastman Kodak Company. Computer based digital image noise reduction method based on overlapping planar approximation. 5,533,149, Cl. 382-260.000.
Kaplan, Samuel: *See—*
  Henry, Arnold W.; Seanor, Donald A.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Kaplan, Samuel; and Pan, David H., 5,531,813, Cl. 106-2.000.
Karaki, Morihiro: *See—*
  Fujita, Teruo; Karaki, Morihiro; Irie, Mitsuru; and Nakane, Kazuhiko, 5,532,987, Cl. 369-44.240.
Karam, Ronald E.; Reddy, Vaddi B.; Northrop, Shellie K.; and Zhang, Yan, to Osram Sylvania Inc. Phosphor and method of making same. 5,531,928, Cl. 252-301.40F.
Karam, Ronald E.: *See—*
  Qi, Ru-Yi; and Karam, Ronald E., 5,531,926, Cl. 252-301.40F.
Karcz, Peter G.: *See—*
  Spann, Kyle T.; and Karcz, Peter G., 5,532,816, Cl. 356-139.090.
Karlsson, Peter: *See—*
  Ohlsson, Thomas; and Karlsson, Peter, 5,532,951, Cl. 364-724.170.
Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, to Neste Oy. Metal compound/protonic acid containing electrically conductive compositions and methods for their preparation. 5,531,932, Cl. 252-518.000.
Karton, Yishai; and Kleiman, Moshe, to Israel Institute for Biological Research. Aluminum metal composition flake having reduced coating. 5,531,930, Cl. 252-363.500.
Kasahara, Kenichi: *See—*
  Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.
Kashiwada, Tomonori: *See—*
  Shigematsu, Masayuki; Nakazato, Koji; Kashiwada, Tomonori; and Nishimura, Masayuki, 5,532,870, Cl. 359-341.000.
Kashiyama, Motohisa: *See—*
  Yagi, Sakai; Tsuji, Masanori; and Kashiyama, Motohisa, 5,531,607, Cl. 439-246.000.
Kass, Lawrence T.; Cowan, Timothy M.; Reinertsen, Dennis; and Dunne, Stephen R., to UOP. Combination catalyst/adsorber system for treating an engine exhaust gas stream. 5,531,068, Cl. 60-274.000.
Katada, Mitsutaka; Muramoto, Hidetoshi; Fuzino, Seizi; Hattori, Tadashi; and Abe, Katsunori, to Nippondenso Co., Ltd. Process for fabricating a complementary MIS transistor. 5,532,176, Cl. 437-34.000.
Katagiri, Masaki; Taguchi, Yoshito; and Uchida, Toshio, to Japan Atomic Energy Research Institute; and Sumitomo Heavy Industries, Ltd. Electronic device freezed by intermittently driven refrigerator. 5,531,074, Cl. 62-6.000.
Katagiri, Shingo: *See—*
  Hirata, Hidetoshi; and Katagiri, Shingo, 5,531,394, Cl. 242-345.200.
Katagiri, Tatsuo: *See—*
  Okato, Nobuyoshi; Katagiri, Tatsuo; Osada, Kuniaki; and Shirakawa, Keiji, 5,532,460, Cl. 219-621.000.
Katakura, Kazunori: *See—*
  Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,532,713, Cl. 345-97.000.
Kataoka, Takehiko: *See—*
  Hirano, Atsuhiko; Yamahara, Satoshi; Kataoka, Takehiko; and Kishimoto, Shinichi, 5,532,015, Cl. 426-548.000.
  Takemoto, Tadashi; and Kataoka, Takehiko, 5,532,407, Cl. 562-443.000.
Katayama, Akira: *See—*
  Goto, Tetsuro; Katayama, Akira; and Hasuda, Masanori, 5,532,785, Cl. 354-430.000.
Katayama, Mikio: *See—*
  Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
Katayama Special Industries, Ltd.: *See—*
  Sugikawa, Hirofumi, 5,531,955, Cl. 419-2.000.
Katayama, Yasutaka: *See—*
  Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.
Kathrein-Werke KG: *See—*
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Kato, Akira: *See—*
  Kawarai, Seigi; Yoshida, Kenichiro; and Kato, Akira, 5,532,042, Cl. 428-141.000.
Kato, Hiroaki: *See—*
  Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
Kato, Ikunoshin: *See—*
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Kato, Keisuke: *See—*
  Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.
Kato, Koki: *See—*
  Miwa, Tetsuyuki; Nakao, Munehiro; Suzuki, Nobuo; and Kato, Koki, 5,532,769, Cl. 351-205.000.
Kato, Masahiro: *See—*
  Kohno, Masahiro; Nittaya, Hiroshi; and Kato, Masahiro, 5,532,948, Cl. 364-715.060.
Kato, Masataka: *See—*
  Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.
Kato, Masayuki; and Ito, Hiroyasu, to Fujitsu Limited. Optical space switch device. 5,532,855, Cl. 359-117.000.
Kato, Shinji: *See—*
  Yagihara, Morio; Sasaki, Hirotomo; Mifune, Hiroyuki; and Kato, Shinji, 5,532,120, Cl. 430-600.000.
Kato, Tadashi: *See—*
  Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
Kato, Yosbimine, to International Business Machines Corporation. Method of fabricating a semiconductor device using quantum dots or wires. 5,532,184, Cl. 437-133.000.
Katoh, Masatosbi: *See—*
  Tanahashi, Mariko; Koike, Keiichi; and Katoh, Masatoshi, 5,533,186, Cl. 395-164.000.
Katoo, Chisachi: *See—*
  Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
Katou, Mitsuhide: *See—*
  Tonegawa, Ken; Mandai, Harufumi; Tsuru, Teruhisa; Katou, Mitsuhide; and Furutani, Koji, 5,532,658, Cl. 333-246.000.
Katsu, Toshiyuki, deceased (by Yuko Katsu, legal representative), to Pioneer Electronic Corporation. Bidirectional communication system in a remote control system for an audio/video system. 5,532,684, Cl. 340-825.250.
Katsu, Yuko, legal representative: *See—*
  Katsu, Toshiyuki, deceased, 5,532,684, Cl. 340-825.250.
Katsuda, Takayuki, to Toyota Jidosha Kabushiki Kaisha. Electric control apparatus for shock absorber. 5,532,921, Cl. 364-424.050.

- Katsuhiko, Toyoda, to Suzuki Motor Corporation. Catalyst deterioration-determining device of an internal combustion engine. 5,531,069, Cl. 60-276.000.
- Katsura, Yousuke; Tomishi, Tetsuo; Inoue, Yoshikazu; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. H_2-receptor antagonist thiazoles. 5,532,258, Cl. 514-370.000.
- Katz, Wilbur C.: *See*—
  - Golden, Timothy C.; Webley, Paul A.; Auvil, Steven R.; and Katz, Wilbur C., 5,531,809, Cl. 95-101.000.
- Kauffman, Thomas F.; Sharak, Matthew L.; and Schmidt, Robert C., Jr., to National Starch and Chemical Investment Holding Corporation. Water-sensitive rubber-based hot melt adhesives. 5,532,306, Cl. 524-274.000.
- Kauffmann, Myriam, to L'Oreal. Aqueous cosmetic or dermo-pharmaceutical composition containing, in suspension, hydrated spheroids of a hydrophilic lipidic substance. 5,532,000, Cl. 424-450.000.
- Kaufmann, Dieter: *See*—
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- Kawachi, Hideshi: *See*—
  - Hirose, Toshiyuki; Nishijima, Shigetoshi; Yamamoto, Yohzoh; Kawachi, Hideshi; and Tsugawa, Michio, 5,532,030, Cl. 428-35.700.
- Kawae, Kunihiro: *See*—
  - Shinozaki, Tadaaki; Toguchi, Manabu; Kawae, Kunihiro; and Murano, Kazuo, 5,532,822, Cl. 356-363.000.
- Kawaguchi, Chikakazu: *See*—
  - Masuda, Narihiro; and Kawaguchi, Chikakazu, 5,532,049, Cl. 428-216.000.
- Kawaguchi, Susumu: *See*—
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Kawahara, Hiroshi: *See*—
  - Honjo, Yoshihiro; Yamakawa, Yoshisuke; Kawahara, Hiroshi; and Tsunoda, Eizo, 5,532,041, Cl. 428-141.000.
- Kawahara, Nobuyuki: *See*—
  - Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.
- Kawai, Hiroyuki: *See*—
  - Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
- Kawai, Shigeru: *See*—
  - Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.
- Kawai, Shuichi, to NEC Corporaton. Clock generating circuit generating a plurality of non-overlapping clock signals. 5,532,633, Cl. 327-174.000.
- Kawakami, Junzo: *See*—
  - Abe, Shigeo; and Kawakami, Junzo, 5,533,168, Cl. 395-22.000.
- Kawakami, Takaaki: *See*—
  - Orita, Akira; Kawakami, Takaaki; and Sakata, Tetsuya, 5,533,007, Cl. 370-17.000.
- Kawakami, Yasuo, to Pioneer Electronic Corporation. Receiver having ACG circuit. 5,532,647, Cl. 330-284.000.
- Kawamata, Tetsuo: *See*—
  - Murayama, Masami; Yoshimura, Shuji; Kawamata, Tetsuo; and Yoshioka, Atsushi, 5,532,682, Cl. 340-825.060.
- Kawamoto, Atunobu, to Mitsubishi Denki Kabushiki Kaisha. Hybrid integrated circuit device with heat suppression means provided in the vicinity of solder bonding areas. 5,532,517, Cl. 257-773.000.
- Kawamura, Hiroyuki: *See*—
  - Nakayama, Toyoo; Taira, Seizo; Kawamura, Hiroyuki; Shibuya, Masaoki; and Iwaki, Masahiro, 5,532,267, Cl. 514-467.000.
- Kawamura, Kohei: *See*—
  - Ishizuka, Shuichi; Kawamura, Kohei; Hata, Jiro; and Suzuki, Akira, 5,531,834, Cl. 118-723.00I.
- Kawamura, Makoto: *See*—
  - Akao, Mutsuo; Osanai, Hiroyuki; and Kawamura, Makoto, 5,532,028, Cl. 428-35.200.
- Kawamura, Nobuya: *See*—
  - Fukui, Osamu; Ueno, Koubei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
- Kawamura, Takumi: *See*—
  - Saito, Yukio; Kawamura, Takumi; Okuyama, Masaki; and Munekata, Tsutomu, 5,531,431, Cl. 271-4.010.
- Kawamura, Yasunori, to Rohm Co., Ltd. Automatic color control circuit having a control signal storing capacitor. 5,532,829, Cl. 358-315.000.
- Kawanami, Yoshimi; and Ohnishi, Tsuyoshi, to Hitachi, Ltd. Treatment and observation apparatus using scanning probe. 5,532,494, Cl. 250-491.100.
- Kawano, Eiichiro: *See*—
  - Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.
- Kawano, Hiroyuki: *See*—
  - Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, 5,532,051, Cl. 428-217.000.
- Kawano, Kumi; and Matsui, Fumio, to Pioneer Electronic Corporation. Recording method for an optical recording medium. 5,532,032, Cl. 428-64.100.
- Kawano, Michihiko. Elbow provided with guide vanes. 5,531,484, Cl. 285-156.000.
- Kawano, Yuji: *See*—
  - Miyao, Masumasa; Kawano, Yuji; and Sato, Masaki, 5,532,826, Cl. 358-296.000.
- Kawarai, Seigi; Yoshida, Kenichiro; and Kato, Akira, to Hitachi Maxell, Ltd. Magnetic recording medium. 5,532,042, Cl. 428-141.000.
- Kawasaki, Hirofumi: *See*—
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Kawasaki Jukogyo Kabushiki Kaisha: *See*—
  - Tabata, Hitoshi; Murata, Osamu; Fujioka, Junzo; and Minakata, Shunichi, 5,532,504, Cl. 257-252.000.
- Kawasaki, Katsuyuki: *See*—
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Kawasaki Steel Corporation: *See*—
  - Kobayashi, Kenichiro; and Keida, Hisaya, 5,532,621, Cl. 326-86.000.
  - Nakano, Tadashi; Sato, Nobuyoshi; Ohta, Tomohiro; and Yamamoto, Hiroshi, 5,532,191, Cl. 437-228.000.
  - Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, 5,531,089, Cl. 72-241.800.
- Kawase, Hajime: *See*—
  - Taniuchi, Osamu; Okumura, Hitoshi; Kawase, Hajime; Nankoh, Youichi; and Nakata, Hiroyuki, 5,531,605, Cl. 439-157.000.
- Kawashima, Hiroshi: *See*—
  - Ban, Naoto; and Kawashima, Hiroshi, 5,532,909, Cl. 362-61.000.
- Kawashima, Yasuyuki; and Goto, Naoyuki, to Kabushiki Kaisya Ohara. Cordierite glass-ceramic and method for manufacturing the same. 5,532,194, Cl. 501-9.000.
- Kawata, Shoji: *See*—
  - Oie, Masayuki; Kawata, Shoji; Yamada, Takamasa; and Ikeda, Shinya, 5,532,107, Cl. 430-192.000.
- Kawauchi, Nobuya; Fukazawa, Nobuyuki; Ishibashi, Hiroki; and Otsuka, Kengo, to Mitsui Toatsu Chemicals, Inc. Process for producing 1-(2'-deoxy-β-D-erythro-pentofuranosyl)-5-trifluoromethyluracil derivatives. 5,532,349, Cl. 536-55.300.
- Kaziwara, Shinzi, to Fujitsu Limited. Order wire in telephone communication system. 5,533,092, Cl. 379-21.000.
- KDY Associates, Inc.: *See*—
  - Kipman, Yair Y.; McDonald, Paul A.; and Schuchatowitz, Robert D., 5,532,815, Cl. 356-139.030.
- Kearney, Mark B.; and Koglin, Dennis M., to Delco Electronics Corporation. Stackable voltage comparator circuit for a multiple voltage window detector. 5,532,627, Cl. 327-74.000.
- Kearney, William T., III: *See*—
  - Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
- Keates, Richard H.: *See*—
  - Schneider, Richard T.; and Keates, Richard H., 5,532,770, Cl. 351-205.000.
- Keenan, Alexander J., to Atlantic Richfield Company. Oil separation and disposal systems. 5,531,890, Cl. 210-242.400.
- Keeney, Stanley C., to Texas Instruments Incorporated. On-chip series terminated CMOS(Bi-CMOS) driver. 5,532,616, Cl. 326-30.000.
- Keida, Hisaya: *See*—
  - Kobayashi, Kenichiro; and Keida, Hisaya, 5,532,621, Cl. 326-86.000.
- Keith, Kevin C. Corner mountable display device for greeting cards. 5,531,038, Cl. 40-124.100.
- Keith, Michael: *See*—
  - Agarwal, Rohit; and Keith, Michael, 5,532,940, Cl. 364-514.00R.
- Kelada, Maher I. Method and apparatus for spill free liquid transfer. 5,531,240, Cl. 137-15.000.
- Kelley, Edward P.: *See*—
  - Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., 5,531,122, Cl. 73-760.000.
- Kelley, Kurtis C., to Caterpillar Inc. Protectively coated position sensor, the coating, and process for coating. 5,532,301, Cl. 524-112.000.
- Kellner, Andreas; and Schubert, Peter, to Robert Bosch GmbH. Vehicle brake system. 5,531,509, Cl. 303-114.100.
- Kelly, Terence A., to Boehringer Ingelheim Pharmaceuticals, Inc. Method for preparing alkyl-5,11-dihydro-6h-dipyrido[3,2-B:2',3'-E] [1,4] diazepin-6-ones. 5,532,358, Cl. 540-495.000.
- Kelman, David C.; McNulty, Donald E.; and Anderson, Daniel L., to DePuy Inc. Orthopedic implant augmentation and stabilization device. 5,531,793, Cl. 623-16.000.
- Kelsey-Hayes: *See*—

  - Tackett, Wendell D., 5,531,513, Cl. 303-84.200.
- Kelson, Lance P.; and Kelson, Ross J. Cooperative medical sampling and needle removal devices. 5,531,323, Cl. 206-366.000.
- Kelson, Ross J.: *See*—
  - Kelson, Lance P.; and Kelson, Ross J., 5,531,323, Cl. 206-366.000.
- Kelton, Anthony D.: *See*—
  - Crooker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., 5,531,867, Cl. 203-86.000.
- Kempka, Steven N.; and Walters, Robert N. Directed flow fluid rinse trough. 5,531,236, Cl. 134-182.000.
- Kendall, Rodney A., to International Business Machines Corporation. Membrane electrostatic chuck. 5,532,903, Cl. 361-234.000.
- Kenney, Donald M. Memory precharge scheme using spare column. 5,532,965, Cl. 365-200.000.
- Kensey, Kenneth; Meikle, James, Jr.; Clupper, Harold; and Nash, John E. Methods and stabilized instruments for performing medical procedures percutaneously without a trocar. 5,531,757, Cl. 606-185.000.
- Kensey, Kenneth; Nash, John E.; and Evans, Douglas, to Kensey Nash Corporation. System for closing a percutaneous puncture formed by a trocar to prevent tissue at the puncture from herniating. 5,531,759, Cl. 606-213.000.
- Kensey Nash Corporation: *See*—
  - Kensey, Kenneth; Nash, John E.; and Evans, Douglas, 5,531,759, Cl. 606-213.000.
- Kent, Bruce C., to Hughes Aircraft Company. Method and circuit for synchronizing an input data stream with a sample clock. 5,532,632, Cl. 327-141.000.
- Kepley, W. Robert, III: *See*—
  - Lamkin, Allan; Kepley, W. Robert, III; Gupta, Prabhat K.; and Morris, Adrian J., 5,533,133, Cl. 381-94.000.
- Kerber, Elmar: *See*—
  - Föry, Werner; Kerber, Elmar; and Hudetz, Manfred, 5,532,203, Cl. 504-105.000.
- Kerner, Wolfgang, to Mercedes-Benz AG. Occupant restraint system for motor vehicles with an airbag. 5,531,476, Cl. 280-743.100.
- Kernforschungszentrum Karlsruhe GmbH: *See*—
  - Doerfel, Hans, 5,531,228, Cl. 128-653.100.
- Kerr, David B.: *See*—
  - Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., 5,533,100, Cl. 379-67.000.
- Kerr, Roger S.; and Cunningham, Hugh A., to Eastman Kodak Company. De-laminator apparatus and method. 5,531,854, Cl. 156-234.000.
- Kers, Tore A.; and Andersson, Kenneth B., to Ab Astra. Device for introducing a substance into a body cavity of a patient. 5,531,707, Cl. 604-200.000.
- Kerschner, Ronald K., to Hewlett-Packard Company. Multiple page sensor for automatic document feeder. 5,531,434, Cl. 271-263.000.
- Kessler, David, to Eastman Kodak Company. Method and apparatus for coupling light emitted from a multi-mode laser diode array to a multi-mode optical fiber. 5,533,152, Cl. 385-11.000.
- Kessler, Ilan: *See*—
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Khayat, Joseph M., to Unitrode Corporation. Off-line controller having a line voltage detector and a switched current bootstrap circuit. 5,532,626, Cl. 327-53.000.
- Khorramabadi, Haideh; Tarsia, Maurice J.; and Tzeng, Liang D., to AT&T Corp. Optical transimpedance amplifier with high dynamic range. 5,532,471, Cl. 250-214.00A.
- Khoury, George; Beards, Ronald D.; and Nisbet, John J., to Northern Telecom Limited. Linear low-noise mixer. 5,532,637, Cl. 327-359.000.
- Khoury, John M., to AT&T Corp. High-speed and accurate sample and hold circuits. 5,532,624, Cl. 327-95.000.
- Kida, Haruyasu; Arai, Masako; Tashiro, Yoichi; and Baba, Hideki, to Fuji Oil Company, Limited. Chocolate. 5,532,021, Cl. 426-607.000.
- Kiel, Harvey G.: *See*—
  - Bates, Cary L.; Blades, Jerry A.; Kiel, Harvey G.; Romon, Raymond F.; and Ryan, Jeffrey M., 5,532,715, Cl. 345-123.000.
- Kikinis, Dan, to Cordata, Inc. Remote control of display functions. 5,532,719, Cl. 345-211.000.
- Kikinis, Ronald: *See*—
  - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Kikuchi, Hirofumi, to NEC Corporation. Data transfer system. 5,533,095, Cl. 379-57.000.
- Kikuchi, Kimihiro: *See*—
  - Okochi, Ken; and Kikuchi, Kimihiro, 5,533,159, Cl. 385-93.000.
- Kikuchi, Seiji: *See*—
  - Mihara, Takashi; Tsuchiya, Masaki; Higuma, Junichiro; Kikuchi, Seiji; and Okada, Hiromi, 5,532,731, Cl. 347-250.000.
- Kikuchi, Shuichi: *See*—
  - Iwaki, Yuji; Kikuchi, Shuichi; and Asakura, Hiroshi, 5,531,322, Cl. 206-308.300.
- Kikuta, Michio: *See*—
  - Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
- Kim, Chong H., to Kim, Chong H. Line status indicator for use with telephones sharing a single line. 5,533,117, Cl. 379-377.000.
- Kim, Hyun C.: *See*—
  - Park, Sang W.; and Kim, Hyun C., 5,532,547, Cl. 313-414.000.
- Kim, Jae K., to Hyundai Electronics Industries Co., Ltd. Semiconductor connecting device. 5,532,515, Cl. 257-751.000.
- Kim, Jong-Young: *See*—
  - Seo, Bo-Sung; and Kim, Jong-Young, 5,532,620, Cl. 326-81.000.
- Kim, Kyung Yong; Kim, Wang Sup; Yun, Jung Rak; and Chang, Kwang Ho, to Korea Institute of Science and Technology. Dielectric material for high frequencies. 5,532,197, Cl. 501-136.000.
- Kim, Kyung-hwan: *See*—
  - Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, 5,532,812, Cl. 355-327.000.
- Kim, Min-Su; and Hamada, Itsunari, to Shinko Electric Industries Co., Ltd. Semiconductor arrester. 5,532,900, Cl. 361-127.000.
- Kim, Seong-Min, to Daewoo Electronics Co., Ltd. Optical pickup apparatus having lens group for determining paths of an incident beam and a reflected & beam. 5,532,477, Cl. 250-225.000.
- Kim, Soo D.; Chang, Hak S.; and Paik, Jong S., to Changmin Technology Co., Ltd. Ultrasonic flow measuring method and apparatus thereof. 5,531,124, Cl. 73-861.270.
- Kim, Soo K.: *See*—
  - Choi, Man C.; Kim, Soo K.; Lee, Je H.; Yang, Tae S.; and Woo, Sang J., 5,532,831, Cl. 358-335.000.
- Kim, Wang Sup: *See*—
  - Kim, Kyung Yong; Kim, Wang Sup; Yun, Jung Rak; and Chang, Kwang Ho, 5,532,197, Cl. 501-136.000.
- Kim, Yong H.; Park, Hee S.; and Lee, Dong H., to Dong Kook Pharmaceutical Co., Ltd. Process for preparing pyrrolizine derivatives. 5,532,381, Cl. 548-453.000.
- Kim, Yong-kook: *See*—
  - Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, 5,532,812, Cl. 355-327.000.
- Kim, Yong-Kyu; Liu, Tianmin; Jaffe, Steven T.; and Strolle, Christopher H., to SamSung Electronics Co., Ltd. Image compression encoding and decoding method and apparatus therefor. 5,533,138, Cl. 382-232.000.
- Kim, Young-gi: *See*—
  - Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, 5,532,812, Cl. 355-327.000.
- Kimball, Gregory J.; and Pikus, Ilya, to Hosokawa Bepex Corporation. Method for thermally processing polyester pellets. 5,532,335, Cl. 528-495.000.
- Kimberly-Clark Corporation: *See*—
  - Brusky, Carl J., 5,531,731, Cl. 604-390.000.
- Kimoto, Akihiro: *See*—
  - Nakayama, Hisayuki; Kimoto, Akihiro; and Tsuchino, Kuniko, 5,531,917, Cl. 510-114.000.
- Kimura, Akihiro, to Kabushiki Kaisha Nagao Kogyo; and Kimura Drawing Co., Ltd. Automatic centrifugal fluidizing barrel processing apparatus. 5,531,637, Cl. 451-329.000.
- Kimura Drawing Co., Ltd.: *See*—
  - Kimura, Akihiro, 5,531,637, Cl. 451-329.000.
- Kimura, Eisuke: *See*—
  - Hasegawa, Yusuke; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,531,208, Cl. 123-673.000.
- Kimura, Fumio: *See*—
  - Asanae, Masumi; Ochiai, Masahisa; Kimura, Fumio; Funakawa, Akihiko; and Noshiro, Toshihiko, 5,532,095, Cl. 430-106.600.
- Kimura, Hiroshi: *See*—
  - Bak, Chan S.; Kimura, Hiroshi; and Pastor, Ricardo C., 5,531,974, Cl. 423-263.000.
- Kimura, Horoshi: *See*—
  - McGeer, Patrick L.; Harada, Nobua; Kimura, Horoshi; McGeer, Edith G.; and Schulzer, Michael, 5,532,219, Cl. 514-42.000.
- Kimura, Katsutaka: *See*—
  - Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.
- Kimura, Kazuaki: *See*—
  - Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.
- Kimura, Kazuya; Takenaka, Kenji; and Maeda, Takahiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakushi. Capacity control valve for a variable capacity refrigerant compressor. 5,531,572, Cl. 417-222.200.
- Kimura, Kouichi; Nishii, Kouta; and Ishizuka, Masanobu, to Fujitsu Limited. Method of manufacturing a casing for an electronic apparatus. 5,531,950, Cl. 264-135.000.
- Kimura, Misako: *See*—
  - Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,532,369, Cl. 544-276.000.
- Kimura, Tomomichi: *See*—
  - Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, 5,532,993, Cl. 369-75.100.
- Kimura, Tsutomu: *See*—
  - Takahashi, Yasuhito; Kimura, Tsutomu; and Isosu, Toru, 5,532,791, Cl. 355-206.000.
- Kin, Keiyu; Akuta, Yoshimitsu; and Sakaki, Yuji, to Honda Giken Kogyo Kabushiki Kaisha. Hydroplaning detector apparatus. 5,532,678, Cl. 340-438.000.

King, Roderick W.: *See—*

Evans, Lloyd T.; King, Roderick W.; Mander, Lewis N.; Pearce, David W.; and Pharis, Richard P., 5,532,206, Cl. 504-176.000.

Kinlen, Patrick J.; Silverman, David C.; Tokas, Edward F.; and Hardiman, Christopher J. Corrosion inhibiting compositions. 5,532,025, Cl. 427-388.100.

Kinne, James: *See—*

Moses, Donald W.; Hustig, Charles H.; Kinne, James; and Najafi, Hossein L., 5,532,950, Cl. 364-724.190.

Kinnunen, Jorma; and Mikkonen, Silvo, to Valmet Corporation. Method and device for reeling a paper or board web in a drum reel-up or equivalent. 5,531,396, Cl. 242-526.300.

Kinoshita, Katsutoshi: *See—*

Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.

Kioussis, Dimitris: *See—*

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Kipman, Yair Y.; McDonald, Paul A.; and Schuchatowitz, Robert D., to KDY Associates, Inc. System and method for aligning a first surface with respect to a second surface. 5,532,815, Cl. 356-139.030.

Kirby, David B.; and Cur, Nihat O., to Whirlpool Corporation. Getter system for vacuum insulation panel. 5,532,034, Cl. 428-69.000.

Kirsch, Gerald: *See—*

Neef, Gunter; Kirsch, Gerald; Stein-Eyer, Andreas; Schwarz, Katica; Bräutigam, Matthias; Thieroff-Ekerdt, Ruth; and Rach, Petra, 5,532,228, Cl. 514-167.000.

Kise, Terry L.: *See—*

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Kishi, Satoru: *See—*

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Kishi, Tetsuji: *See—*

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Kishimoto, Shinichi: *See—*

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Kishimoto, Tokihiko: *See—*

Nagahata, Takaya; Shirasaki, Toshiyuki; Kishimoto, Tokihiko; and Kishimoto, Yoshinobu, 5,532,723, Cl. 347-209.000.

Kishimoto, Yoshinobu: *See—*

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Kishimura, Kotaro: *See—*

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Kitabayashi, Hiroyuki; Kuroda, Yoshiaki; Kamada, Ikuo; and Ooenoki, Toshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Metal sheet bending machine. 5,531,087, Cl. 72-37.000.

Kitagaki, Tetsuo: *See—*

Ogawa, Kinya; Kitagaki, Tetsuo; and Yamamoto, Akira, 5,532,273, Cl. 514-546.000.

Kitahama, Masanori: *See—*

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Kitahara, Yoshinori: *See—*

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Kitai, Mikio: *See—*

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Kitamori, Katsuya: *See—*

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Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, to Shin-Etsu Chemical Co., Ltd. Automatic apparatus for inspecting powdery product. 5,532,942, Cl. 364-555.000.

Kitamura, Kunio: *See—*

Yoshida, Chisato; Ando, Yuichi; Kitamura, Kunio; and Yahata, Seiro, 5,531,261, Cl. 164-113.000.

Kitamura, Masato: *See—*

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Kitson, Mark R.; and Ayre, Peter J. Capacitative discharge ignition system for internal combustion engines. 5,531,206, Cl. 123-596.000.

Kiyokawa, Kenji, to Sony Corporation. Rearrangement apparatus for manufacturing system. 5,531,556, Cl. 414-225.000.

Kiyono, Satsuo, to International Business Machines Corporation. Method of making semiconductor package. 5,532,189, Cl. 437-209.000.

Kizawa, Satoru: *See—*

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Klein, Achim; and Bender, Hans-Jürgen, to SMS Schloemann-Siemag Aktiengesellschaft. Adjusting device for the brush roll in a roll stand. 5,531,090, Cl. 72-236.000.

Klein, Dietbert: *See—*

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Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.

Klinger, Georg; and Gottl, Max, to Kathrein-Werke KG. Directional antenna, in particular dipole antenna. 5,532,707, Cl. 343-793.000.

Klinikum der Albert-Ludwigs Universitat Freiburg: *See—*

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Klinkhammer, Ronald W., to Oral Logic, Inc. Apparatus for injection molding a plastic monolith. 5,531,582, Cl. 425-190.000.

Klinksiek, Bernd: *See—*

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Kloberdanz, Thomas W., to Marathon Oil Company. Method for recovering entrained liquid from natural gas. 5,531,811, Cl. 95-261.000.

Klobucar, Joseph M., to Durr Industries, Inc. Regenerative thermal oxidizer with heat exchanger columns. 5,531,593, Cl. 432-181.000.

Klocek, Paul; and Hoggins, James T., to Texas Instruments Incorporated. Polymeric infrared optical protective coating. 5,532,048, Cl. 428-215.000.

Kloss, Hans G.; and Heidel, Raymond J., to Bally Gaming International, Inc. Method and apparatus for detecting fraud or theft in a gaming machine. 5,531,309, Cl. 194-202.000.

KMC, Inc.: *See—*

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Knapp, Benjamin P.; and Kraft, Clifford H., to SPX Corporation. Method and apparatus for combining video images on a pixel basis. 5,532,714, Cl. 345-114.000.

Knierim, David L.: *See—*

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Knoll, Peter; and Noll, Martin, to Robert Bosch GmbH. Method and device for operating an ultrasonic sensor. 5,531,118, Cl. 73-628.000.

Knotek, Evan M., to EMK Enterprises, LLC. Needle puncture prevention device. 5,531,704, Cl. 604-192.000.

Knowles, Gareth J.: *See—*

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Knox, Benjamin H.: *See—*

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Knutson, Kirby J. Coil spring display device. 5,530,970, Cl. 2-209.130.

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Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misao; Kishi, Satoru; and Maruko, Chiaki, to Mitsui Toatsu Chemicals, Inc. Molding material. 5,532,054, Cl. 428-294.000.

Kobayashi, Eiichi: *See—*

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Kobayashi, Hideki, to Dow Corning Toray Silicone Co., LTD. Silicone antifoam compositions. 5,531,929, Cl. 252-321.000.

Kobayashi, Kenichiro; and Keida, Hisaya, to Kawasaki Steel Corporation. Output buffer circuit, input buffer circuit and bi-directional buffer circuit for plural voltage systems. 5,532,621, Cl. 326-86.000.

Kobayashi, Kenji: *See—*

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Kobayashi, Masakazu: *See—*

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Kobayashi, Mikio: *See—*

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Kobayashi, Seiji, to Sony Corporation. Recording device capable of detecting the change in length and position of the pit edge. 5,533,003, Cl. 369-275.400.

Kobayashi, Yasushi, to Fujitsu Limited. Process for manufacturing bumped tab tape. 5,532,186, Cl. 437-182.000.

Kober, Hermann: *See—*

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Kobussen, Jaap: *See—*

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Kobussen, Jos; Kobussen, Mart; and Kobussen, Jaap, to Townsend Engineering Company. Method of linking a strand of uncased coextruded meat emulsion product. 5,532,014, Cl. 426-513.000.

Kobussen, Mart: *See—*

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Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, to Mitsui Toatsu Chemicals, Inc. Intermediate for furanyl insecticide. 5,532,365, Cl. 544-212.000.

Kodama, Kouji; Nishida, Hiroshi; Amano, Hideaki; and Matsushita, Toshio, to Hitachi, Ltd. Disk device with auxiliary battery and start method thereof. 5,532,563, Cl. 318-440.000.

Kodama, Shikou: *See—*

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Kodama, Shun-ichi: *See—*

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Koefod, Robert S., to Cargill, Incorporated. Corrosion-inhibiting salt deicers. 5,531,931, Cl. 252-387.000.

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Koenig, Melissa M.; and Vukovich, William J., to General Motors Corporation. Controlled capacity torque converter clutch lock-up transition control. 5,531,302, Cl. 192-3.300.

Koeppe, Peter V.: *See—*

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Koga, Masahiro; Tanaka, Toshio; Fujii, Takao; and Masegi, Tsukio, to Teijin Limited. α-chain-modified isocarbacyclins and process for the production thereof. 5,532,408, Cl. 562-466.000.

Koglin, Dennis M.: *See—*

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Kogure, Yoshikazu, to NEC Corporation. Underwater branching device. 5,532,478, Cl. 250-227.240.

Kogure, Yoshio, to Fuji Xerox Co., Ltd. Paper transport apparatus capable of removing less jammed paper in image forming apparatus. 5,532,793, Cl. 355-207.000.

Kohler Co.: *See—*

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Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., to Ciba-Geigy Corporation. Coreactive photoinitators. 5,532,112, Cl. 430-281.100.

Kohlpaintner, Christian: *See—*

Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.

Kohno, Masahiro; Nittaya, Hiroshi; and Kato, Masahiro, to Sumitomo Metal Industries, Ltd. Rank order filter. 5,532,948, Cl. 364-715.060.

Koike, Jun; and Ieki, Hideharu, to Murata Manufacturing Co., Ltd. Zinc oxide piezoelectric crystal film on sapphire plane. 5,532,537, Cl. 310-313.00A.

Koike, Keiichi: *See—*

Tanahashi, Mariko; Koike, Keiichi; and Katoh, Masatoshi, 5,533,186, Cl. 395-164.000.

Koito Manufacturing Co., Ltd.: *See—*

Ban, Naoto; and Kawashima, Hiroshi, 5,532,909, Cl. 362-61.000.

Koizumi, Satoru, to Sharp Kabushiki Kaisha. Disk apparatus including a disk driving member adapted to hold two different size disks. 5,533,000, Cl. 369-270.000.

Kojima, Hiroyoshi: *See—*

Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.

Kojima, Keiji: *See—*

Futatsugi, Seiji; Kojima, Keiji; Matsuda, Yoshiki; Kitahara, Yoshinori; and Mogaki, Masato, 5,533,141, Cl. 382-119.000.

Kojima, Shinji; and Nakayama, Koichi, to Singer Company N.V., The. Auxiliary bed device for overlock machine. 5,531,172, Cl. 112-260.000.

Kolan, Hans-George H.: *See—*

Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., 5,532,611, Cl. 324-758.000.

Kolesa, Michael S.: *See—*

Mastri, Dominick L.; Kolesa, Michael S.; and Hessler, Thomas R., 5,531,763, Cl. 606-148.000.

Koljonen, Juha: *See—*

Garakani, Arman M.; and Koljonen, Juha, 5,532,739, Cl. 348-87.000.

Kollar, Craig A.; Szerlag, Donald; Lajack, William C.; and Koneval, Kevin, to General Motors Corporation. Power sliding window assembly. 5,531,046, Cl. 49-360.000.

Kolman, Frank; and Haley, Kevin, to Intel Corporation. Method of making solder shape array package. 5,531,021, Cl. 29-843.000.

Koltringer, Peter, to ASTA Medica Aktiengesellschaft. Preparation for treating circulatory changes. 5,532,269, Cl. 514-440.000.

Komatsu, Kenji; and Takano, Tomotaka, to Yamaha Hatsudoki Kabushiki Kaisha. Cylinder head for engine. 5,531,194, Cl. 123-193.500.

Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, to Honda Giken Kogyo Kabushiki Kaisha. Catalyst activating system in multi-cylinder internal combustion engine. 5,531,203, Cl. 123-481.000.

Komobuchi, Hiroyoshi, to Matsushita Electric Industrial Co., Ltd. Solid-state image pickup device. 5,532,743, Cl. 348-297.000.

Komori, Katsuhiro: *See—*

Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, 5,531,133, Cl. 74-473.00R.

Komori, Mikio: *See—*

Inomata, Shigemitsu; and Komori, Mikio, 5,531,234, Cl. 131-84.100.

Komoriya, Isao: *See—*

Hasegawa, Yusuke; Komoriya, Isao; Akazaki, Shusuke; and Kimura, Eisuke, 5,531,208, Cl. 123-673.000.

Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, to SS Pharmaceutical Co., Ltd. Piperazine substituted carboxylic acid derivatives for treating hyperlipimia. 5,532,371, Cl. 544-360.000.

Konagaya, Tatsuya, to Fuji Photo Film Co., Ltd. Photographic printing shutter. 5,532,787, Cl. 355-71.000.

Kondo, Hiroki: *See—*

Endo, Takayoshi; and Kondo, Hiroki, 5,532,433, Cl. 174-84.00C.

Kondo, Hisashi, to NEC Corporation. Paging receiver and radio frequency channel searching method for the same. 5,532,683, Cl. 340-825.030.

Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, to Sharp Kabushiki Kaishá. Inspecting method, inspecting apparatus, and defect correcting method. 5,532,615, Cl. 324-770.000.

Kondo, Tomoharu; Ogawa, Masato; and Noda, Keiji, to NGK Insulators, Ltd. Honeycomb heater element having front region adapted to heat quickly. 5,533,167, Cl. 392-485.000.

Kondo, Yoshikazu; and Arima, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Numerical arithmetic processing unit. 5,532,938, Cl. 364-736.000.

Koneval, Kevin: *See—*

Kollar, Craig A.; Szerlag, Donald; Lajack, William C.; and Koneval, Kevin, 5,531,046, Cl. 49-360.000.

Konica Corporation: *See—*

Akanabe, Yuichi, 5,532,730, Cl. 347-259.000.

Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, 5,532,809, Cl. 355-308.000.

Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, 5,532,080, Cl. 429-164.000.

Yasuda, Kazuo; and Takahashi, Satoshi, 5,532,803, Cl. 355-251.000.

König, Eberhard; Engbert, Theodor; and Pedain, Josef, to Bayer Aktiengesellschaft. Heat curable coating compositions and their use as top coats. 5,532,313, Cl. 524-590.000.

Konishi, Hiroshige: *See—*

Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.

Konishi, Kunihiko: *See—*

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Shinmura, Tetsuya; and Konishi, Kunihiko, 5,532,317, Cl. 525-73.000.

Konno, Masaki; Inobe, Kazuhiko; Yoshiura, Kenichi; and Itoh, Shuji, to Matsushita Electric Industrial Co., Ltd. Portable electronic equipment. 5,532,466, Cl. 235-441.000.

Konosu, Osamu: *See—*

Okamoto, Takami; Maki, Hideaki; and Konosu, Osamu, 5,532,545, Cl. 313-407.000.

Koo, Ann F.: *See—*

Cheng, David, 5,532,499, Cl. 250-559.220.

Koo, Jayoung; and Luton, Michael J., to Exxon Research and Engineering Company. Method of preparing a high strength dual phase steel plate with superior toughness and weldability (LAW219). 5,531,842, Cl. 148-654.000.

Kopesec, Michael F.: *See—*

Josephson, Stanley M.; Kopesec, Michael F.; Royal, P. Darrell; Stephens, Thomas S.; and Thompson, Mitchell D., 5,532,464, Cl. 235-379.000.

Kopman, Matthew W.; and Sorlien, Glenn A., to FKI Industries, Inc. Parking brake for hand truck. 5,531,295, Cl. 188-21.000.

Koppel, Christophe, to Societe Europeenne De Propulsion. Optimized system for feeding a reignitable rocket engine. 5,531,067, Cl. 60-259.000.

Koranek, David J.: *See—*

Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.

Korea Institute of Science and Technology: *See—*

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Kim, Kyung Yong; Kim, Wang Sup; Yun, Jung Rak; and Chang, Kwang Ho, 5,532,197, Cl. 501-136.000.

Korea Research Institute of Chemical Technology: *See—*

Choi, Kil-Yeong; Suh, Dong-Hack; Yi, Mi-Hie; Hong, Young-Taik; and Won, Jong-Chan, 5,532,334, Cl. 528-350.000.

Korea Telecommunication Authority: *See—*

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Park, Gyeong-Lyong; Suh, Chung-Wook; and Eo, Ik-Soo, 5,532,695, Cl. 341-173.000.

Korite Minerals Limited: *See—*

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Korman, Charles S.: *See—*

Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.

- Kosaki, Shinichi; Tanaka, Yoshito; and Kuwa, Tadahiro, to Showa Yuki Kabushiki Kaisba; and Hitachi Maxell Kabushiki Kaisha. Case for flat objects. 5,531,324, Cl. 206-449.000.
- Koshikawa, Kazushige: *See—*
  - Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.
- Koshino, Katsuhiko, to Matsushita Electric Industrial Co., Ltd. Cam apparatus using an electromagnet and gears for decelerating a motor. 5,531,132, Cl. 74-435.000.
- Kotani, Hirokazu: *See—*
  - Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, 5,532,337, Cl. 530-350.000.
- Kotliar, Abraham M.: *See—*
  - Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, 5,531,998, Cl. 424-426.000.
- Kotzur, Gary B.: *See—*
  - Waggoner, Charles D.; Blumberg, Richard J.; and Kotzur, Gary B., 5,532,630, Cl. 327-108.000.
- Koubek, Timothy C.; Puletti, Paul P.; and Wieczorek, Joseph, Jr., to National Starch and Chemical Investment Holding Corporation. Water-borne, water redjspersible, laminating adhesives for nonwoven applications. 5,532,300, Cl. 524-47.000.
- Kouchi, Kunihiro: *See—*
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Kouno, Takeshi: *See—*
  - Hayase, Isao; Machida, Shigeru; Mitsuya, Shunichi; and Kouno, Takeshi, 5,531,577, Cl. 418-55.100.
- Koutavas, Ioannis. Dental articulator and method. 5,531,595, Cl. 433-65.000.
- Kovacik, Paul J.: *See—*
  - Leopold, Edmund A.; and Kovacik, Paul J., 5,531,047, Cl. 52-172.000.
- Kowal, Albert E.: *See—*
  - Van Der Leeuw, Bart; Kowal, Albert E.; Pragt, Henrikus J. H.; and Canale, Joseph E., 5,532,543, Cl. 313-25.000.
- Kowall, David J., to Chrysler Corporation. Vehicle body with powered lift type tailgate. 5,531,498, Cl. 296-146.400.
- Koxxy, Martin J.: *See—*
  - Harwood, Warren K.; Tervo, Paul A.; and Koxxy, Martin J., 5,532,609, Cl. 324-754.000.
- Koya, Hidehiko: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, to Canon Kabushiki Kaisha. Optical information processing method and apparatus including measuring and correcting the offset of a tracking error signal from an output of a photodetector using a vibrating objective lens. 5,532,990, Cl. 369-44.320.
- Koyama, Toshiaki; Hirose, Shinichi; and Harada, Hisashi, to Mitsubishi Denki Kabushiki Kaisha. Oscillation circuit with enable/disable frequency stabilization. 5,532,652, Cl. 331-116.0FE.
- Kozo Niwa: *See—*
  - Yamazaki, Hiroko; Kuroda, Masahiro; and Niwa, Kozo, 5,531,992, Cl. 424-195.100.
- Kozono, Hiroyuki, to Kabushiki Kaisha Toshiba. High frequency semiconductor device. 5,532,514, Cl. 257-728.000.
- Kradon, Inc.: *See—*
  - Kraft, Larry; and Holman, Don, 5,531,352, Cl. 220-675.000.
- Kraft, Clifford H.: *See—*
  - Knapp, Benjamin P.; and Kraft, Clifford H., 5,532,714, Cl. 345-114.000.
- Kraft Foods, Inc.: *See—*
  - Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., 5,532,018, Cl. 426-582.000.
  - Miller, Mark S.; and Surber, Kevin J., 5,532,019, Cl. 426-589.000.
  - Miller, Mark S.; and Surber, Kevin J., 5,532,022, Cl. 426-660.000.
- Kraft, Larry; and Holman, Don, to Kradon, Inc. Agricultural container. 5,531,352, Cl. 220-675.000.
- Krams, Zvi; Berman, Dov; Bieber, Avigdor; and Livni, Avinoam, to Scitex Corporation Ltd. Laser scanning apparatus. 5,532,728, Cl. 347-257.000.
- Krappitz, Harald: *See—*
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- Kratel, Günter; Eyhorn, Thomas; Stohr, Günter; and Rell, Andreas, to Wacker-Chemie GmbH. Radiant heater, in particular, for heating a glass-ceramic hot plate. 5,532,458, Cl. 219-464.000.
- Kratt, Rudolf: *See—*
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- Krebs, Andreas: *See—*
  - Schenke, Thomas; Krebs, Andreas; and Petersen, Uwe, 5,532,364, Cl. 544-105.000.
- Krebs, Christian, to Messer Griesheim GmbH. Apparatus for the monitored metering of no into patients' respiratory air. 5,531,218, Cl. 128-203.120.
- Kremenchugsky, Vladimir: *See—*
  - Gloyd, David A.; Hodge, Colin G.; Jones, Thomas C.; Kremenchugsky, Vladimir; and Siminauer, Robert M., 5,531,663, Cl. 600-22.000.
- Krenceski, Mary A.: *See—*
  - Bauer, Charles L.; Krenceski, Mary A.; and Fitzgerald, John J., 5,532,118, Cl. 430-533.000.
- Krenz, Eric L.; and Tammen, David J., to Motorola, Inc. Single compact dual mode antenna. 5,532,708, Cl. 343-795.000.
- Krenz, Eric L.: *See—*
  - Kuffner, Stephen L.; and Krenz, Eric L., 5,532,643, Cl. 333-246.000.
- Kresta, Harvey G.: *See—*
  - Ullmann, Ralph J.; and Kresta, Harvey G., 5,531,355, Cl. 221-191.000.
- Kreuzer, Markus; and Eidenschink, Rudolf, to NEMATEL Dr, R. Eidenshink. Selectively alterable optical data memory. 5,532,952, Cl. 365-108.000.
- Kreyenhagen, Paul: *See—*
  - Alferness, Clifton A.; Helland, John R.; and Kreyenhagen, Paul, 5,531,781, Cl. 607-122.000.
- Kriesel, Marshall S.; and Thompson, Thomas N., to Science Incorporated. Mixing and delivery syringe assembly. 5,531,683, Cl. 604-89.000.
- Krishna, Arvind: *See—*
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Krishnamurthy, Gopalan; and Lee, Ronald B., to Zenith Electronics Corporation. Simplified complex multiplier in error tracking loop. 5,533,070, Cl. 375-346.000.
- Krishnamurthy, Gopalan; and Lee, Ronald B., to Zenith Electronics Corporation. Error tracking loop incorporating simplified cosine look-up table. 5,533,071, Cl. 375-346.000.
- Krivda, John J.: *See—*
  - Duerr, Karl W.; and Krivda, John J., 5,531,528, Cl. 400-200.000.
- Kroll, Kai C.: *See—*
  - Kroll, Mark W.; McQuilkin, Gary L.; and Kroll, Kai C., 5,531,770, Cl. 607-8.000.
- Kroll, Mark W.; Nelson, Randall S.; and Adams, Theodore P., to Angeion Corporation. Implantable cardioverter defibrillator pulse generator kite-tail electrode system. 5,531,766, Cl. 607-5.000.
- Kroll, Mark W.; McQuilkin, Gary L.; and Kroll, Kai C., to Angeion Corporation. Device and method for determining defibrillation thresholds. 5,531,770, Cl. 607-8.000.
- Kroll, Mark W.; Adams, Theodore P.; Perttu, Joseph S.; and Supino, Charles, to Angeion Corporation. Implantable medical electrode with reduced number of conductors. 5,531,782, Cl. 607-122.000.
- Kroll, Mark W.: *See—*
  - Adams, Theodore P.; and Kroll, Mark W., 5,531,764, Cl. 607-5.000.
- Krone Aktiengesellschaft: *See—*
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- Kronenthal, Richard L.: *See—*
  - Huang, W. James; Johns, Douglas B.; and Kronenthal, Richard L., 5,532,221, Cl. 514-53.000.
- Krounbi, Mohamad T.; Renaldo, Alfred F.; and Werner, Douglas J., to International Business Machines Corporation. Azo dyes as adhesion promotion additive in polydimethylglutarimide. 5,532,109, Cl. 430-271.000.
- Krska, Egon J., to Pro-Eco Limited. Method and apparatus of removing a coil of material from a mandrel. 5,531,398, Cl. 242-533.700.
- Krueger, David C., to BASF Corporation. Process for improving the debinding rate of ceramic and metal injection molded products. 5,531,958, Cl. 419-44.000.
- Krueger, William J.; and Eckstein, Victor G., to Quad/Tech, Inc. Solvent recovery system for ink jet printer. 5,532,720, Cl. 347-7.000.
- Krüger, Bernd-Wieland: *See—*
  - Brandes, Wilhelm; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; Kuck, Karl-Heinz; and Krüger, Bernd-Wieland, 5,532,262, Cl. 514-388.000.
- Krutak, James J.: *See—*
  - Weaver, Max A.; Krutak, James J.; Coates, Clarence A.; Pruett, Wayne P.; and Hilbert, Samuel D., 5,532,332, Cl. 528-230.000.
- Krutsch, David P.: *See—*
  - Houghton, Richard D.; Graham, Linda L.; and Krutsch, David P., 5,532,209, Cl. 504-339.000.
- Kruzick, Kent, to Galbreath, Inc. Vehicle mounted hook hoist for loading, transporting and dumping containers. 5,531,559, Cl. 414-498.000.
- KSB Aktiengesellschaft: *See—*
  - Kussmann, Wolfgang, 5,531,576, Cl. 418-53.000.
  - Riel, Axel, 5,531,456, Cl. 277-38.000.
- KSB S.A.: *See—*
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- Ku, George: *See—*
  - Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,532,252, Cl. 514-309.000.
- Küber, Frank: *See—*
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Kubo, Masaaki; and Hayakawa, Nanahiro, to Yamaichi Electronics Co., Ltd. Device for aligning contacting portions of contacts in IC socket. 5,531,603, Cl. 439-72.000.
- Kubo, Morihiro; Ishigaki, Yukio; Itoh, Takeshi; and Misawa, Hirokazu, to Hitachi, Ltd.; and Chubu Electric Power Co., Inc. Superconducting energy storage apparatus. 5,532,638, Cl. 327-368.000.
- Kubo, Shinji: *See—*

  - Himeno, Kiyoshi; Hihara, Toshio; Hamano, Yoshiharu; and Kubo, Shinji, 5,532,344, Cl. 534-581.000.
- Kubo Technical Office: *See—*
  - Kubo, Tetsujiro, 5,531,869, Cl. 502-202.000.
- Kubo, Tetsujiro, to Kubo Technical Office. Metal catalyst carried on carrier making use of tourmaline and its production. 5,531,869, Cl. 502-202.000.
- Kubota Corporation: *See—*
  - Hayashi, Tetsuaki, 5,531,466, Cl. 280-91.100.
- Kubota, Keiichi: *See—*
  - Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.
- Kuck, Karl-Heinz: *See—*
  - Brandes, Wilhelm; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; Kuck, Karl-Heinz; and Krüger, Bernd-Wieland, 5,532,262, Cl. 514-388.000.
- Kucukcakar, Kayhan; Gupta, Rajesh; and Tkacik, Thomas, to Motorola, Inc. Apparatus and method of modifying hardware description language statements. 5,533,179, Cl. 395-133.000.
- Kudoh, Kazuhiro, to NEC Corporation. Selective calling receiver capable of providing a message by a speech sound. 5,532,688, Cl. 340-825.440.
- Kuester, Willi: *See—*
  - Blum, Richard; Groh, Hans-Michael; Kuester, Willi; and Herr, Klaus-Jürgen, 5,532,426, Cl. 174-356.00C.
- Kuffner, Stephen L.; and Krenz, Eric L., to Motorola, Inc. Manufacturably improved asymmetric stripline enhanced aperture coupler. 5,532,643, Cl. 333-246.000.
- Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, to Boehringer Ingelheim GmbH. Xanthine derivatives with adenosine-antagonistic activity. 5,532,368, Cl. 544-267.000.
- Kuhar, Otto, to Newell Operating Company. Cordless, balanced window covering. 5,531,257, Cl. 160-168.100.
- Kühlein, Klaus: *See—*
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Kuhn, Franz J.: *See—*
  - Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, 5,532,368, Cl. 544-267.000.
- Kuhn, John F.: *See—*
  - Salapow, Thomas M.; Wolf, Roger P.; Scanio, Thomas J.; and Kuhn, John F., 5,531,803, Cl. 55-498.000.
- Kuhnen, Gottfried, to Asea Brown Boveri AG. Method of joining metal parts by fusion welding. 5,532,454, Cl. 219-137.00R.
- Kuhns, Jesse J.: *See—*
  - Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.
- Kukimoto, Tsutomu: *See—*
  - Nozawa, Keita; Yoshida, Satoshi; and Kukimoto, Tsutomu, 5,532,101, Cl. 430-125.000.
- Kumar, Jayant: *See—*
  - Tripathy, Sukant K.; Jeng, Ru-Jong; Kumar, Jayant; Marturunkakul, Sutiyao; and Chen, Jeng-I, 5,532,320, Cl. 525-100.000.
- Kumar, Nalin: *See—*
  - Xie, Chenggang; Patterson, Donald E.; and Kumar, Nalin, 5,531,880, Cl. 204-478.000.
- Kume, Hitoshi: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.
- Kumeji, Yasushi; Nishimura, Seiichi; Nakajima, Yoshinobu; and Itou, Makoto, to Matsushita Electric Industrial Co., Ltd. Inductive component having an opening in the exterior mold. 5,532,662, Cl. 333-185.000.
- Kummer, Martin E.: *See—*
  - Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.
- Kumonaka, Takahiro: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Kung, Hsiang-fu: *See—*
  - Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
- Kunisaki, Shinichi: *See—*
  - Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
- Kupneski, Michael J.: *See—*
  - Masters, Ronald A.; Maile, Michael S.; Underwood, David C.; Kupneski, Michael J.; and Roetker, Timothy C., 5,531,933, Cl. 510-429.000.
- Kurabayashi, Toru: *See—*
  - Nishizawa, Jun-ichi; and Kurabayashi, Toru, 5,532,511, Cl. 257-627.000.
- Kurahashi, Motofumi: *See—*
  - Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, 5,532,051, Cl. 428-217.000.
- Kuraishi, Tadayuki: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, to Nitto Denko Corp.; and Tohoku Ricoh Co., Ltd. Printer and a method of sorting out and cutting papers printed thereby. 5,531,530, Cl. 400-593.000.
- Kuriki, Makoto; Uehira, Kazutake; Takahashi, Yukio; and Sakai, Shigenobu, to Nippon Telegraph and Telephone Corporation. Display and image capture apparatus. 5,532,736, Cl. 348-20.000.
- Kurita Water Industries, Ltd.: *See—*
  - Miyabe, Kanji; Orita, Nobuhiro; Iwasaki, Makoto; Tsurumaru, Yohka; and Nakahara, Toshitsugu, 5,531,901, Cl. 210-668.000.
- Kurn, Nurith: *See—*
  - Singh, Sharat; Switchenko, Arthur C.; Lin, Cheng-I; Kurn, Nurith; and Ullman, Edwin F., 5,532,138, Cl. 435-7.930.
- Kuroda, Akira: *See—*
  - Sugita, Takeshi; Adachi, Nobukazu; Kuroda, Akira; and Takano, Manabu, 5,532,806, Cl. 355-285.000.
- Kuroda, Masahiro: *See—*
  - Yamazaki, Hiroko; Kuroda, Masahiro; and Niwa, Kozo, 5,531,992, Cl. 424-195.100.
- Kuroda, Yoshiaki: *See—*
  - Kitabayashi, Hiroyuki; Kuroda, Yoshiaki; Kamada, Ikuo; and Ooenoki, Toshiyuki, 5,531,087, Cl. 72-37.000.
- Kurokawa, Teruhisa: *See—*
  - Ohashi, Tsuneaki; Tsuno, Nobuo; and Kurokawa, Teruhisa, 5,531,837, Cl. 148-280.000.
- Kuroki, Hiroyuki: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Kurosawa, Atsushi: *See—*
  - Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, 5,532,993, Cl. 369-75.100.
- Kurosawa, Yutaka: *See—*
  - Sawano, Hiroyuki; Yamanaka, Masayoshi; Kurosawa, Yutaka; and Miyamoto, Matsuhiro, 5,531,064, Cl. 57-204.000.
- Kurose, Yutaka: *See—*
  - Ochiai, Tameichi; Kurose, Yutaka; Nagao, Takumi; Tsukahara, Takako; and Imamura, Satoru, 5,532,342, Cl. 534-693.000.
- Kuroyanagi, Tomihiko: *See—*
  - Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.
- Kury, C. A. Anti-eavesdropping device. 5,533,131, Cl. 381-77.000.
- Kusaka, Hiroya; Sakaguchi, Takashi; and Nakayama, Masaaki, to Matsushita Electric Industrial Co., Ltd. Image pickup apparatus with horizontal line interpolation function having three image pickup units shifted in vertical phase from one another. 5,532,742, Cl. 348-264.000.
- Kusaka, Yosuke, to Nikon Corporation. Apparatus and method for adjusting the focus of a camera during scanning drive and non-scanning drive of a photographic lens. 5,532,783, Cl. 354-402.000.
- Kusaka, Yosuke: *See—*
  - Utagawa, Ken; and Kusaka, Yosuke, 5,532,781, Cl. 354-402.000.
- Kusano, Akihito: *See—*
  - Nishii, Michiharu; Toda, Hiroshi; Kusano, Akihito; and Noda, Yoshiki, 5,531,514, Cl. 303-116.100.
- Kusano, Takuo: *See—*
  - Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, 5,532,721, Cl. 347-112.000.
- Kushiyama, Natsuki; Furuyama, Tohru; and Numata, Kenji, to Kabushiki Kaisha Toshiba. Semiconductor memory and screening test method thereof. 5,532,963, Cl. 365-201.000.
- Kussmann, Wolfgang, to KSB Aktiengesellschaft. Wobble plate pump with side chambers through which fluid flows. 5,531,576, Cl. 418-53.000.
- Kuster, Frank, to Elektro-Thermit GmbH. Method for intermediate cast type welding of finely pearlitized rails. 5,531,259, Cl. 164-54.000.
- Kutzner, Martin: *See—*
  - Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, 5,531,948, Cl. 264-122.000.
- Kuwa, Tadahiro: *See—*
  - Kosaki, Shinichi; Tanaka, Yoshito; and Kuwa, Tadahiro, 5,531,324, Cl. 206-449.000.
- Kuwata, Nobuhiro, to Sumitomo Electric Industries, Ltd. Field effect transistor including a cap with a doped layer formed therein. 5,532,505, Cl. 257-269.000.
- Kuwata, Yuri; Okabayashi, Ichiro; and Kishi, Tetsuji, to Matsushita Electric Industrial Co., Ltd. High speed data transfer device having improved efficiency. 5,533,034, Cl. 371-32.000.
- Kuwazuru, Yosei; Igarashi, Akira; and Minamida, Isao, to Takeda Chemical Industries, Ltd. Method for treatment of termite. 5,531,981, Cl. 424-45.000.
- Kwan, Sze-Hon: *See—*
  - Chang, Mike F.; Hshieh, Fwu-Iuan; Kwan, Sze-Hon; and Owyang, King, 5,532,179, Cl. 437-40.000.
- Kwoh, Daniel S.: *See—*
  - Yuen, Henry C.; and Kwoh, Daniel S., 5,532,732, Cl. 348-1.000.
- Kwon, Heemin: *See—*

Kaplan, Martin C.; and Kwon, Heemin, 5,533,149, Cl. 382-260.000.

Kwon, Oh-Sang: *See—*

Yoon, Sang-Ho; and Kwon, Oh-Sang, 5,532,747, Cl. 348-416.000.

Kyokado Engineering Co., Ltd.: *See—*

Shimada, Shunsuke, 5,531,547, Cl. 405-262.000.

Kyriakis, John, to Beta Instrument Co., Ltd. Cable eccentricity gauge including an E-shaped core and a sensor coil disposed between an outer tip of the central limb and the cable. 5,532,588, Cl. 324-226.000.

Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, to Hamamatsu Photonics K.K. Photomultiplier for cascade-multiplying photoelectrons. 5,532,551, Cl. 313-533.000.

Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., to Eastern Company, The. Key for rotary plug and cylinder lock, and method of forming the key. 5,531,084, Cl. 70-409.000.

Laakso, Jukka: *See—*

Kämä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.

Labedan, Jean-Denis; and Regnier, Laurent, to Nadella. Cartridge for a rolling bearing having an oblique contact and the application thereof in a vehicle steering column. 5,531,526, Cl. 384-518.000.

Labelle, Marc: *See—*

Gallant, Michel; Gareau, Yves; Guay, Daniel; Labelle, Marc; and Prasit, Petpiboon, 5,532,237, Cl. 514-235.200.

Labler, Ludvik: *See—*

Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.

Laboratories Del Dr. Esteve, S.A.: *See—*

Frigola-Constansa, Jordi; and Merce-Vidal, Ramon, 5,532,234, Cl. 514-224.200.

LaBounty Manufacturing, Inc.: *See—*

Labounty, Roy E., 5,531,007, Cl. 30-134.000.

Labounty, Roy E., to LaBounty Manufacturing, Inc. Shear processor for steel structures. 5,531,007, Cl. 30-134.000.

Ladd, David L.: *See—*

Snow, Robert A.; Ladd, David L.; and Hoyer, Denton W., 5,532,150, Cl. 435-188.000.

Ladner, David W.: *See—*

Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,532,207, Cl. 504-228.000.

Laerdal Manufacturing Corp.: *See—*

Fossan, Helge; and Benson, Jonathan M., 5,531,769, Cl. 607-7.000.

Lagasse, Peter F.: *See—*

Richardson, Jerry R.; Price, Gerald R.; Richardson, Everett V.; and Lagasse, Peter F., 5,532,687, Cl. 340-870.330.

Lagerlöf, Rolf, to Telefonaktiebolaget LM Ericsson. Device for distribution of microwave signals. 5,532,661, Cl. 333-125.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*

Mole, James; Queille, Philippe; and Garrido, Guillermo, 5,531,169, Cl. 110-346.000.

Lajack, William C.: *See—*

Kollar, Craig A.; Szerlag, Donald; Lajack, William C.; and Koneval, Kevin, 5,531,046, Cl. 49-360.000.

Lalikos, Anthony J.: *See—*

O'Melia, Lawrence F.; and Lalikos, Anthony J., 5,531,841, Cl. 148-265.000.

LaMaire, Richard O.: *See—*

Fleek, Arthur E.; and LaMaire, Richard O., 5,533,025, Cl. 370-85.200.

Lamin, James L.: *See—*

Roberts, Keith; Thomas, Christopher D.; Lamin, James L.; Skipper, Gary I.; and Larsen, Jonathan G., 5,531,305, Cl. 192-53.332.

Lamkin, Allan; Kepley, W. Robert, III; Gupta, Prabhat K.; and Morris, Adrian J., to Hughes Aircraft Company. Noise suppression in digital voice communications systems. 5,533,133, Cl. 381-94.000.

Lammers, Franciscus H. T., to U.S. Philips Corporation. Converter including direct current detection. 5,532,528, Cl. 307-125.000.

Lamper, Anthonie H.; and Reinten, Hans, to OCE-Nederland, B.V. Electro-optical scanning unit having adjustable connecting elements between linear arrays of electro-optical and lens-units. 5,532,882, Cl. 359-819.000.

Lampman, David A.; and Liu, Haiying, to Picker International, Inc. Three-dimensional spiral echo volume imaging. 5,532,595, Cl. 324-309.000.

Landa, Benzion, to Indigo N.V. Method and apparatus for direct printing of images. 5,532,805, Cl. 355-256.000.

Landes, Harald: *See—*

Pal, Uday; Landes, Harald; and Greiner, Horst, 5,532,071, Cl. 429-12.000.

Landh, Tomas; and Larsson, Kåre, to GS Biochem AB. Particles, method of preparing said particles and uses thereof. 5,531,925, Cl. 252-299.010.

Landis, Robert A., to Mead Corporation, The. Microcapsule-containing cohesive coating. 5,532,293, Cl. 523-210.000.

Lane, Steven O.: *See—*

Reinhardt, Victor S.; and Lane, Steven O., 5,532,706, Cl. 343-778.000.

Lange, M. Patricia: *See—*

Dahn, Michael S.; and Lange, M. Patricia, 5,531,714, Cl. 604-264.000.

Langer, Werner: *See—*

Filges, Ulrich; Aydin, Oral; Auchter, Gerhard; Barwich, Juergen; Anders, Hermann; Langer, Werner; and Vorspohl, Klaus, 5,532,329, Cl. 526-279.000.

Langhoff, Charles A.: *See—*

Bales, Stephen E.; Langhoff, Charles A.; and Wheatley, John A., 5,532,331, Cl. 528-196.000.

Lanne, Fabien P.: *See—*

Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.

Lanoe, Thierry, to Societe d'Applications Generales d'Electricate et de Mecanique SAGEM. Receiving housing for dissipator electronic components. 5,532,430, Cl. 174-52.300.

Lanxide Technology Company: *See—*

Burke, John T., 5,531,260, Cl. 164-97.000.

LaPorta, Frank C.: *See—*

Bass, Saundra V.; Blosser, Donald L.; Crump, Andre K.; Kerr, David B.; LaPorta, Frank C.; Ricci, Ted M.; and Stenger, William H., Sr., 5,533,100, Cl. 379-67.000.

Lara Consultants, S.r.l.: *See—*

La Rocca, Aldo V., 5,532,451, Cl. 219-121.640.

Larke, Carroll W.: *See—*

Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., 5,532,401, Cl. 558-95.000.

Larkin, Robert F., to Martin Marietta Corporation. Continuously variable hydrostatic transmission having swashplate-mounted cylinder blocks. 5,531,072, Cl. 60-492.000.

La Rocca, Aldo V., to Lara Consultants, S.r.l. Combined cutting and welding process for manufacturing structural products, and apparatus implementing such a process. 5,532,451, Cl. 219-121.640.

Larocca, David J.: *See—*

Ceriani, Roberto L.; Peterson, Jerry A.; and Larocca, David J., 5,532,135, Cl. 435-7.920.

LaRochelle, Paul E.; and Beaverson, Arthur J. Testing tool for diagnosing defective computer system devices. 5,533,195, Cl. 395-185.010.

Larose, Daniel J. Arthroscopic surgical punch. 5,531,756, Cl. 606-184.000.

Larsen, Jonathan G.: *See—*

Roberts, Keith; Thomas, Christopher D.; Lamin, James L.; Skipper, Gary I.; and Larsen, Jonathan G., 5,531,305, Cl. 192-53.332.

Larsen, Steven D.: *See—*

Wong, Patrick S.-L.; Theeuwes, Felix; Larsen, Steven D.; and Dong, Liang C., 5,531,736, Cl. 604-892.100.

Larsen, Thor A.: *See—*

Georgiou, Christos J.; Larsen, Thor A.; and Lee, Ki W., 5,533,072, Cl. 375-371.000.

Larsson, Kåre: *See—*

Landh, Tomas; and Larsson, Kåre, 5,531,925, Cl. 252-299.010.

Lash, Glen R., to Procter & Gamble Company, The. Absorbent structures containing thermally-bonded stiffened fibers and superabsorbent material. 5,531,728, Cl. 604-378.000.

Laska, Gregory A.: *See—*

Nyberg, Mark R.; Laska, Gregory A.; and Stetson, Daniel J., 5,532,893, Cl. 360-133.000.

Laskaris, Evangelos T.: *See—*

Herd, Kenneth G.; and Laskaris, Evangelos T., 5,532,663, Cl. 335-216.000.

Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., to Chevron Chemical Company. Laminate of ethylene-alkyl acrylate copolymer and polyester. 5,532,066, Cl. 428-483.000.

Latz, Rudolf; and Gesche, Roland, to Leybold Aktiengesellschaft. Microwave-enhanced sputtering configuration. 5,531,877, Cl. 204-298.190.

Lau, Werner: *See—*

Steinkamp, Manfred; Lau, Werner; and McGarian, Bruce, 5,531,280, Cl. 175-230.000.

Laub, Michael F.: *See—*

Harper, Donald K., Jr.; Laub, Michael F.; Pacelli, James P.; and Schnoor, William J., 5,531,602, Cl. 439-70.000.

Lauro, Paul A.: *See—*

Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.

Lauterbur, Paul C.; and Frank, Shachar, to University of Illinois, The Board of Trustees of the. Magnetic gels which change volume in response to voltage changes for MRI. 5,532,006, Cl. 424-9.322.

Lax, Ronald G.: *See—*

Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,531,676, Cl. 604-22.000.

LeBaron, James B.: *See—*

Gallusser, David O.; LeBaron, James B.; and Wheeler, Robert G., 5,531,614, Cl. 439-607.000.

Le Blanc, Loic; and Pagliari, Rene, to Rhone-Poulenc Chimie. Twin-screw extrusion of silicone doughs suited for SiH/SiVi RTV compositions. 5,531,923, Cl. 252-182.140.

Lechner, Manfred; Klein, Dietbert; and Koelbl, Wolfgang. Welding robot. 5,532,452, Cl. 219-124.340.

Lee, Changho, to Daewoo Electronics Co., Ltd. Method for automatic reservation tuning for broadcasting receivers and device therefor. 5,532,761, Cl. 348-731.000.

Lee, Dong H.: *See—*

Kim, Yong H.; Park, Hee S.; and Lee, Dong H., 5,532,381, Cl. 548-453.000.

Lee, Douglas J.: *See—*

Cernea, Raul-Adrian; Mehrotra, Sanjay; and Lee, Douglas J., 5,532,964, Cl. 365-189.090.

Lee, Jae S., to Goldstar Electron Co., Ltd. Self refresh control circuit for memory cell array. 5,532,968, Cl. 365-222.000.

Lee, Je H.: *See—*

Choi, Man C.; Kim, Soo K.; Lee, Je H.; Yang, Tae S.; and Won, Sang J., 5,532,831, Cl. 358-335.000.

Lee, Jung D.; and Lee, Yong G., to Daewoo Heavy Industries Ltd. Electronic component feeder. 5,531,859, Cl. 156-584.000.

Lee, Jung-Hyuck, to Samsung Electronics Co., Ltd. Method for suppressing peak current in a video RAM and in a serial access memory block. 5,532,967, Cl. 365-206.000.

Lee, Ki W.: *See—*

Georgiou, Christos J.; Larsen, Thor A.; and Lee, Ki W., 5,533,072, Cl. 375-371.000.

Lee, Kiu-Seung, to Du Pont de Nemours, E. I., and Company. Poly(p-phenylene terephthalamide) pulp. 5,532,059, Cl. 428-359.000.

Lee, Nathan J.: *See—*

Balasubramanian, Peruvemba S.; Lee, Nathan J.; and Lekuch, Scott D., 5,532,641, Cl. 329-311.000.

Lee, Neville K.; Jain, Amit; and Martin, Roy E., to Quantum Corporation. Apparatus and method for fabricating a deflection mirror tower. 5,532,884, Cl. 359-833.000.

Lee, Ronald B.: *See—*

Krishnamurthy, Gopalan; and Lee, Ronald B., 5,533,070, Cl. 375-346.000.

Krishnamurthy, Gopalan; and Lee, Ronald B., 5,533,071, Cl. 375-346.000.

Lee, Seung-Hun, to Samsung Electronics Co., Ltd. Reference voltage generator utilizing CMOS transistor. 5,532,578, Cl. 323-313.000.

Lee, Sze-Ming: *See—*

Fréchet, Jean M. J.; and Lee, Sze-Ming, 5,532,106, Cl. 430-191.000.

Fréchet, Jean M. J.; and Lee, Sze-Ming, 5,532,113, Cl. 430-296.000.

Lee, Virgil J.; Wang, Ying; Taran, Carmen; and Marocco, Matthew L., III, to Hitachi Chemical Company, Ltd. Method of preparation of bis-quinolines. 5,532,374, Cl. 546-167.000.

Lee, Wen-Hwa; and Chen, Phang-Lang, to University of California, The Regents of the. Genetic mechanisms of tumor suppression. 5,532,220, Cl. 514-44.000.

Lee, Wilson: *See—*

Shevade, Makarand; Bianchini, Robert J.; and Lee, Wilson, 5,531,986, Cl. 424-68.000.

Lee, Won-cheon, to Goldstar Information & Communications, Ltd. Wide-area-network trunked radio system which controls the signal level of a specific wireless voice channel of a local area network trunked radio system. 5,533,098, Cl. 379-58.000.

Lee, Yong G.: *See—*

Lee, Jung D.; and Lee, Yong G., 5,531,859, Cl. 156-584.000.

Lee, Youn-Seong, to Daewoo Electronics Co. Ltd. Video cassette recorder capable of automatically removing interferences between a recording signal and a broadcast signal. 5,532,834, Cl. 358-335.000.

Leef, Alexander A.: *See—*

Davis, Stuart M.; Haines, Christopher P.; Leef, Alexander A.; and Moses, Peter R., 5,532,085, Cl. 429-224.000.

Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., to New York University; American Biosciences, Inc.; and United States of America, Health and Human Services. Anti-HIV protein, TAP 29, from tricosanthes, DNA coding therefor and therapeutic uses thereof. 5,532,214, Cl. 214-2.000.

Leffew, Kenneth W.: *See—*

Stouffer, Jan M.; Blanchard, Elwood N.; and Leffew, Kenneth W., 5,532,333, Cl. 528-308.200.

Legarra, James R.: *See—*

Butwell, Robert J.; McCune, Earl; Green, Michael; Huey, Hugo; Legarra, James R.; and Wilcox, Ross, 5,532,462, Cl. 219-695.000.

Legg, Ernest L.: *See—*

Hurtz, Robert W.; Smith, Jeffrey A.; Sosinski, Ronald T.; and Legg, Ernest L., 5,533,172, Cl. 395-112.000.

Lehr, Erich: *See—*

Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, 5,532,368, Cl. 544-267.000.

Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, to BASF Aktiengesellschaft. 4-substituted bis(2,6-diisopropylphenyl)-carbodiimides, their preparation, their use, and 4-substituted 2,6-diisopropylphenyl isocyanates which can be used for their preparation. 5,532,414, Cl. 564-252.000.

Leibman, George: *See—*

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Leichty, Philip L.: *See—*

Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.

Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.

Leininger, Robert L. Security control system for the storage area of a delivery truck. 5,532,521, Cl. 307-10.200.

Leistner, Edith: *See—*

Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.

Lekuch, Scott D.: *See—*

Balasubramanian, Peruvemba S.; Lee, Nathan J.; and Lekuch, Scott D., 5,532,641, Cl. 329-311.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*

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Le Letty, Ronan: *See—*

Claeyssen, Frank; Le Letty, Ronan; and Lhermet, Nicolas, 5,532,540, Cl. 310-323.000.

LeMay, Curtis E.; Woltjer, Bernard H.; and Cotter, David H., to Rapistan Demag Corporation. Conveyor article propelling roller drive system. 5,531,311, Cl. 198-448.000.

Lennartsson, Kenneth: *See—*

Stefansson, Lars; and Lennartsson, Kenneth, 5,531,460, Cl. 277-206.00R.

Lentz, Derek J.; and Young, Linley M., to Seiko Epson Corporation. Pixel modification unit for use as a functional unit in a superscalar microprocessor. 5,533,185, Cl. 395-162.000.

Lenz, Robert L.: *See—*

Moyers, Chester E.; and Lenz, Robert L., 5,532,436, Cl. 174-151.000.

Leonard, Edward J.: *See—*

Yoshimura, Teizo; Robinson, Elizabeth A.; Appella, Ettore; and Leonard, Edward J., 5,532,144, Cl. 435-70.100.

Leonard, Jerry, to Texas Instruments Incorporated. Active cladding optical modulator using an electro-optic polymer on an inorganic waveguide. 5,533,151, Cl. 385-3.000.

Leonard, Wayne E., Sr.: *See—*

Oglesby, Robert L.; Smith, Leigh A. B.; Jordan, Larry S.; Greene, Carl C., Jr.; and Leonard, Wayne E., Sr., 5,531,233, Cl. 131-69.000.

Leong, Dick Y.; Colvin, Alex D.; and Carduner, Keith R., to Ford Motor Company. Method and system for determining engine oil consumption. 5,531,105, Cl. 73-116.000.

Leopold, Edmund A.; and Kovacik, Paul J., to PPG Industries, Inc. Glazing unit having three or more glass sheets and having a low thermal edge, and method of making same. 5,531,047, Cl. 52-172.000.

Lepard, Steven D.: *See—*

Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,531,308, Cl. 192-70.250.

Leppanen, Pentti, to Nokia Mobile Phones Limited. Communication method and system. 5,533,013, Cl. 370-18.000.

Leppin, Dennis: *See—*

Pathak, Vijay K.; and Leppin, Dennis, 5,531,866, Cl. 202-185.200.

Leray, Pascal: *See—*

Burnod, Yves; and Leray, Pascal, 5,533,169, Cl. 395-27.000.

Lerner, David: *See—*

Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.

Leschinsky, Kindrick L.: *See—*

Hamper, Bruce C.; and Leschinsky, Kindrick L., 5,532,416, Cl. 568-314.000.

Lesinski, S. George; and Henderson, H. Thurman. Implantable auditory system with micromachined microsensor and microactuator. 5,531,787, Cl. 623-10.000.

Le Strat, Evelyne: *See—*

Mourot, Christophe; Olivier, René; and Le Strat, Evelyne, 5,533,047, Cl. 375-208.000.

Leupold, Herbert A., to United States of America, Army. Magnetostatic charged particle trap. 5,532,666, Cl. 335-306.000.

Lev, Mordechai: *See—*

Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Dornhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.

Levesque, Yvon; Cote, Sylvaine; and Gallagher, Denis, to Johnson & Johnson, Inc. Sphagnum moss composition for the production of sheeted absorbent and method for evaluating the potential of sphagnum moss material for absorbing liquid. 5,531,726, Cl. 604-367.000.

Levocz, Reynold J.; and Szewc, Joseph W. Golf putter. 5,531,445, Cl. 473-341.000.

Levy, Ruth: *See—*

Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.

Lew, Albert C.: *See—*

Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., 5,532,367, Cl. 544-260.000.

Lewandowski, Brian C. Method for providing a T-shirt having a configuration resembling that of a fortune cookie. 5,530,969, Cl. 2-115.000.

Lewis, Douglas E., to Lewis, Douglas Edward. Forensically-acceptable determinations of gestational fetal exposure to drugs and other chemical agents. 5,532,131, Cl. 435-7.900.

Lewis, Douglas Edward: *See—*
Lewis, Douglas E., 5,532,131, Cl. 435-7.900.

Lex Computer and Management Corporation: *See—*
Schuler, Chester L., 5,532,830, Cl. 358-335.000.

Leybold Aktiengesellschaft: *See—*
Latz, Rudolf; and Gesche, Roland, 5,531,877, Cl. 204-298.190.
Saunders, Mark; and Ocker, Berthold, 5,531,876. Cl. 204-298.120.

Leybold Durferrit: *See—*
Blum, Matthias; Heimerl, Josef; Bahr, Martin; and Bauer, Volker, 5,532,446, Cl. 219-121.250.

Leybold Materials GmbH: *See—*
Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, 5,531,948, Cl. 264-122.000.

Lezdey, John; and Wachter, Allan. Antiviral compositions and method of use. 5,532,215, Cl. 514-8.000.

Lhermet, Nicolas: *See—*
Claeyssen, Frank; Le Letty, Ronan; and Lhermet, Nicolas, 5,532,540, Cl. 310-323.000.

L'Hernault, Claude; and Neel, Ludovic, to Societe National Des Poudres et Explosifs. Inorganic resins, process for their preparation and materials for heat protection. 5,532,196, Cl. 501-128.000.

Li, Tung L., to QPL Limited. Structure and method for providing a lead frame with enhanced solder wetting leads. 5,531,860, Cl. 156-625.100.

Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, to NEC Research Institute, Inc. Planar optical mesh-connected tree interconnect network. 5,532,856, Cl. 359-118.000.

Liang, Kun, to Riverwood International Corporation. Method and apparatus for stabilizing cartons in a packaging machine. 5,531,056, Cl. 53-251.000.

Liang, Louis H. Methods and apparatus for test and burn-in of integrated circuit devices. 5,532,612, Cl. 324-760.000.

Liao, Ju H.: *See—*
Kanatzidis, Mercouri G.; Liao, Ju H.; and Marking, Gregory A., 5,531,936, Cl. 252-587.000.

Liao, Wen P.: *See—*
Schuster, Michael A.; Harrington, John C., IV; Liao, Wen P.; and Chen, Fu, 5,532,308, Cl. 524-447.000.

Liaw, Shiou H.; and Shih, Jiaw-Ren, to Taiwan Semiconductor Manufacturing Company. Gate process for NMOS ESD protection circuits. 5,532,178, Cl. 437-57.000.

Liberti, Joseph C., Jr.; Averst, Douglas I.; Branch, Tony R.; and Carsello, Stephen R., to Motorola, Inc. Method and apparatus for carrier tracking and demodulation. 5,533,062, Cl. 375-334.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
Oltmanns, Karl-Heinz, 5,532,535, Cl. 310-90.000.

Liedenbaum, Coen T. H. F.; and Reid, John J. E., to U.S. Philips Corporation. Optical signal-regenerating unit and transmission system comprising such a unit. 5,532,863, Cl. 359-176.000.

Liedtke, David J. Compound slingshot. 5,531,209, Cl. 124-20.100.

Lifecore Biomedical, Inc.: *See—*
Huang, W. James; Johns, Douglas B.; and Kronenthal, Richard L., 5,532,221, Cl. 514-53.000.

Lightning Eliminators & Consultants, Inc.: *See—*
Carpenter, Roy B., Jr., 5,532,897, Cl. 361-118.000.

Lim, Chuin K.; and Cloutier, Frank L., to Hewlett-Packard Company. Add-on scanner for existing ink jet printer. 5,532,825, Cl. 358-296.000.

Lin, Chao-Chi. Sliding type switch assembly. 5,532,442, Cl. 200-16.00C.

Lin, Cheng-I: *See—*
Singh, Sharat; Switchenko, Arthur C.; Lin, Cheng-I; Kurn, Nurith; and Ullman, Edwin F., 5,532,138, Cl. 435-7.930.

Lin, Ching-Bin; and Chuang, Tung-Han. Process for making metallized plastic molding pellets for shielding electromagnetic interference. 5,531,851, Cl. 156-180.000.

Lin, Gi S. Hand pump apparatus having two pumping strokes. 5,531,575, Cl. 417-526.000.

Lin, Jingdong, to Motorola, Inc. Method, digital signal processing module and system for efficiently selecting a pre-emphasis filter during line probing. 5,533,049, Cl. 375-222.000.

Lin, Jinjou: *See—*
Wober, Munib A.; and Lin, Jinjou, 5,533,173, Cl. 395-114.000.

Lin, John W.-P.; and Richards, W. Conrad, to Xerox Corporation. Ink jet ink compositions and printing processes. 5,531,818, Cl. 106-23.00C.

Lin, Jung-Chih. Multi-step engine air intake volume control device. 5,531,207, Cl. 123-572.000.

Lin, Lawrence I. Inter-laboratory performance monitoring system. 5,532,941, Cl. 364-552.000.

Lin, Lifun: *See—*
Wang, Enoch I.; Bowden, William L.; and Lin, Lifun, 5,532,084, Cl. 429-224.000.

Lin, Pi-Chu. Power drill with drill bit unit capable of providing intermittent axial impact. 5,531,278, Cl. 173-176.000.

Lin, Tien-Ler; and Chao, Liang, to Macronix International Co., Ltd. Negative voltage generator for flash EPROM design. 5,532,960, Cl. 365-185.290.

Lincoln, David G.: *See—*
Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., 5,531,687, Cl. 604-95.000.

Lind, Stefan, to fischerwerke, Artur Fischer GmbH & Co. KG. Double connector for connecting two bodies. 5,531,535, Cl. 403-297.000.

Lindab Aktiebolag: *See—*
Stefansson, Lars; and Lennartsson, Kenneth, 5,531,460, Cl. 277-206.00R.

Lindegaard, Poul: *See—*
Outtrup, Helle; Dambmann, Claus; Aaslyng, Dorrit A.; and Lindegaard, Poul, 5,531,918, Cl. 510-320.000.

Lindgren, Peter B. Line attachment means as for a chemical lightstick. 5,531,418, Cl. 248-317.000.

Lindström, Helge: *See—*
Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.

Lines, Lancelot H., to Australian Meriono Wool Harvesting, LTD. Method and apparatus for handling animals. 5,531,773, Cl. 607-046.000.

Linke, Richard A.: *See—*
Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.

Lipson, David: *See—*
Dahl, Roger W.; Wickham, Robert W., deceased; Swanson, David K.; and Lipson, David, 5,531,779, Cl. 607-119.000.

Lisek, Brain D.: *See—*
Savkar, Sudhir D.; Lisek, Brain D.; and Sundell, Robert E., 5,531,081, Cl. 68-17.00A.

Liu, Duixian: *See—*
Stephens, Gerald D.; and Liu, Duixian, 5,532,703, Cl. 343-702.000.

Liu, Hain-Ching H.: *See—*
Sheehan, Florence H.; Zick, Gregory L.; and Liu, Hain-Ching H., 5,533,085, Cl. 378-95.000.

Liu, Haiying: *See—*
Lampman, David A.; and Liu, Haiying, 5,532,595, Cl. 324-309.000.

Liu, Jehon-Fu. Device for treating waste from wash basin. 5,531,387, Cl. 241-46.013.

Liu, Jian H. Dynamic driving structure for the ornamental music box. 5,532,423, Cl. 84-95.200.

Liu, Robert Z. Brake control mechanism for a bicycle. 5,531,296, Cl. 188-24.210.

Liu, Tianmin: *See—*
Kim, Yong-Kyu; Liu, Tianmin; Jaffe, Steven T.; and Strolle, Christopher H., 5,533,138, Cl. 382-232.000.

Livni, Avinoam: *See—*
Krams, Zvi; Berman, Dov; Bieber, Avigdor; and Livni, Avinoam, 5,532,728, Cl. 347-257.000.

Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., to International Business Machines Corporation. Miniature probe positioning actuator. 5,532,611, Cl. 324-758.000.

Lo, Shyh-Ching; Shih, James W. K.; and Wang, Richard Y.-H., to American Registry of Pathology. Mycoplasma diagnostic assay. 5,532,134, Cl. 435-7.320.

Lobb, David R. Variable displacement rotary internal combustion engine. 5,531,197, Cl. 123-243.000.

Lobo, Lloyd A.: *See—*
Nair, Mridula; Lobo, Lloyd A.; and Oltean, George L., 5,531,913, Cl. 252-62.530.

Lockhead Missiles & Space Company, Inc.: *See—*
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Lockheed Environmental Systems & Technologies Co.: *See—*
Schlienger, Max P., 5,532,448, Cl. 219-121.430.

Lockheed Missiles & Space Company: *See—*
Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., 5,531,150, Cl. 89-15.000.

Lockwood, James C., to United States of America, Navy. Preprocessor and adaptive beamformer for active signals of arbitrary waveform. 5,532,700, Cl. 342-378.000.

Lodin, David W.: *See—*
Burns, Matthew M.; and Lodin, David W., 5,531,689, Cl. 604-99.000.

Loeffler, Walter, to Hollingsworth GmbH. Dust and trash removal system for carding machines. 5,530,994, Cl. 19-109.000.

Loesche GmbH: *See—*
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Logothetis, Eleftherios M.: *See—*
Zanini-Fisher, Margherita; Soltis, Richard E.; Logothetis, Eleftherios M.; and Barrera, Carlos M., 5,531,879, Cl. 204-427.000.

Logsdon, Dana K. Multi-function drum cap. 5,531,351, Cl. 220-571.100.

Logue, Delmar L. Apparatus for detecting surface flaws in cylindrical articles by means of asymmetric magnetic detection. 5,532,591, Cl. 324-242.000.

Lohle, Willy: *See—*
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Lohmann, Walter E., Jr.: *See—*
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Long, John W.: *See—*
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Lopes, Joseph B.: *See—*
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Loral Corporation: *See—*
Bergsneider, Carl W., 5,533,181, Cl. 395-152.000.

Lord Corporation: *See—*
Sexsmith, Frederick H., 5,532,314, Cl. 524-611.000.

L'Oreal: *See—*

Bauer, Daniel; Richard, Françoise; Hassoun, Muriel; Malle, Gérard; and Samain, Henri, 5,531,987, Cl. 424-76.210.
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Lorenz, Gisela: *See—*
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Lorenzo, Joseph P.: *See—*
Martin, Eric A.; Vaccaro, Kenneth; Waters, William; Lorenzo, Joseph P.; and Spaziani, Stephen, 5,532,173, Cl. 437-2.000.

Lorraine, Jack R., to Siemens Automotive Corporation. Fuel rail assembly having internal electrical connectors. 5,531,202, Cl. 123-456.000.

Los, Marinus: *See—*
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,532,207, Cl. 504-228.000.

Loughrin, Thomas D.: *See—*
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Louw, Hendrik H. Heating device. 5,531,217, Cl. 126-624.000.

Love, Charles S.; Love, Jack W.; and Calvin, John H., to Autogenics. Test device for and method of testing rapid assembly tissue heart valve. 5,531,784, Cl. 623-2.000.

Love, Charles S.: *See—*
Love, Jack W.; Love, Charles S.; Hudak, Philip J.; and Suggitt, Robert W., 5,531,785, Cl. 623-2.000.

Love, Jack W.; Love, Charles S.; Hudak, Philip J.; and Suggitt, Robert W., to Autogenics, Inc. Prosthetic heart valve holder. 5,531,785, Cl. 623-2.000.

Love, Jack W.: *See—*
Love, Charles S.; Love, Jack W.; and Calvin, John H., 5,531,784, Cl. 623-2.000.

Lowe, Danny E.; and Jurus, Kevin D. Method of making a full face wheel. 5,531,024, Cl. 29-894.323.

Lozano-Pérez, Tomas: *See—*
Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.

L. S. C., Liao. Exercise device for building and rehabilitating waist. 5,531,658, Cl. 482-142.000.

LSI Logic Corporation: *See—*
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LSI Logic Corportion: *See—*
Pasch, Nicholas F.; and Patrick, Roger, 5,532,516, Cl. 257-752.000.

Lu, Kuo-Hui; and Peng, Chin-Huang. Dart board mounting structure. 5,531,450, Cl. 273-348.000.

Lu, Yao K. Thermal pot. 5,531,350, Cl. 220-421.000.

Lubar, Michael J., to Azon Corporation. Film article. 5,532,064, Cl. 428-478.200.

Lubetzky, David; and Frances, Maurice, to Makhteshim Chemical Works Ltd. Low ecotoxic formulations of pesticides. 5,531,995, Cl. 424-409.000.

Lubrizol Corporation, The: *See—*
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Lucas Industries Public Limited Company: *See—*
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Luckett, Thomas J.: *See—*
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Lues, Ingeborg: *See—*
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Lui, Sam. Edge-based interlaced to progressive video conversion system. 5,532,751, Cl. 348-452.000.

Lunar Corporation: *See—*
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Pelc, Norbert J., 5,533,080, Cl. 378-5.000.

Lund, VanMetre. Spread spectrum communication system. 5,533,046, Cl. 375-200.000.

Lundberg, Martin B.: *See—*
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Lundquist, Ingemar; and Thompson, Russell B., to EP Technologies, Inc. Catheter steering mechanism. 5,531,686, Cl. 604-95.000.

Lundquist, Ingemar H.; and Edwards, Stuart D., to Vidamed, Inc. Steerable medical probe with stylets. 5,531,677, Cl. 604-22.000.

Lundquist, Ingemar H.: *See—*
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Lundy, Richard A.: *See—*
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Lung, James C. Y.; and Chi, Holy W., to Destiny Technology Corporation. Low cost page printer system and method. 5,533,175, Cl. 395-115.000.

Lupke, Manfred A. A. Travelling mold with separation of mold blocks. 5,531,585, Cl. 425-233.000.

Lusher, David M.: *See—*
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Luther Medical Products, Inc.: *See—*
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Luther, Ronald B., to Luther Medical Products, Inc. Over-the-needle catheter. 5,531,701, Cl. 604-165.000.

Luther, Willis J., to Canon Information Systems, Inc. Encryption system. 5,533,127, Cl. 380-28.000.

Luton, Michael J.: *See—*
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Luyckx, Erik; and Timmermans, Jozef M. K., to U.S. Philips Corporation. Apparatus for gradually switching video presentation of stored pictures. 5,532,836, Cl. 358-335.000.

Luzio, Gary A.; and Thompson, Samuel A., to Hercules Incorporated. Medical devices subject to triggered disintegration. 5,531,716, Cl. 604-265.000.

Lyford, John, IV, to Exxon Chemical Patents Inc. Preparation of plasticizer or polyol esters by the staged addition of the lower boiling point reactant. 5,532,405, Cl. 560-99.000.

Lynch, Jeffrey J.: *See—*
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Lynn, Lawrence A., to Lynn, Lawrence A. Blood aspiration assembly components and blunt needle aspirators. 5,531,672, Cl. 604-4.000.

Lyon, Dan; Perrone, Terrance; and Rutz, Joseph. Volume control system for a chromatograph. 5,531,106, Cl. 73-61.560.

Lyuu, Yuh-Dauh: *See—*
Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.

M. B. Walton, Inc.: *See—*
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Ma, Yinfa. Quantitative retinol assay for serum and dried blood spots. 5,532,166, Cl. 436-86.000.

Maas, Henricus G. R.: *See—*
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Maas, Werner E.: *See—*
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Maass, Burkhard, to Heidelberger Druckmaschinen AG. Device for conveying a continuous shingled sheet stream. 5,531,313, Cl. 198-689.100.

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Macedo, Antone, to ERO Industries, Inc. Modular aquatic exercise equipment assembly. 5,531,657, Cl. 482-111.000.

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Machida, Shigeru: *See—*
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Macomber, David W.: *See—*
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Macomber, Edward W.: *See—*
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MacRobbie, Edward; Shamlou, Daryush; Gupta, Rajiv; and Halim, Raouf, to Rockwell International Corporation. Efficient, well regulated, DC-DC power supply up-converter for CMOS integrated circuits. 5,532,576, Cl. 323-274.000.

Macronix International Co., Ltd.: *See—*
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Madden, Martin: *See—*
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Madison Metropolitan Sewerage District: *See—*
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Madland, Paul D.: *See—*
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Madrid, Anna; Jacobson, Scott; and Bhattacharyya, Bidyut K., to Intel Corporation. Circuit design for point-to-point chip for high speed testing. 5,532,983, Cl. 368-113.000.

Madrigal, Alexander; and Watson, Michael J., to AlliedSignal Inc. Method of folding an airbag. 5,531,477, Cl. 280-743.100.

Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, to Canon Sales Co., Inc.; Alcan-Tech Co., Inc.; and Semiconductor Process Laboratory Co., Ltd. Method for forming insulating film. 5,532,193, Cl. 437-243.000.

Maeda, Takahiro: *See—*
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Maekawa, Tomohiro; Kamoda, Hitoshi; Yui, Yasuji; Iima, Shin; and Bunya, Takashi, to Sony Corporation. Apparatus and method for video printing. 5,531,527, Cl. 400-185.000.

Maggioni, Chistoph: *See—*
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Mahmoud, Issa S.: *See—*
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- Maier, Gary J.: *See—*
  - Yuh, Huoy-Jen; Herbert, William G.; and Maier, Gary J., 5,532,093, Cl. 430-58.000.
- Maile, Michael S.: *See—*
  - Masters, Ronald A.; Maile, Michael S.; Underwood, David C.; Kupneski, Michael J.; and Roetker, Timothy C., 5,531,933, Cl. 510-429.000.
- Majeed, Kardar M.: *See—*
  - Russo, Gerald M.; Majeed, Kardar M.; and Houck, Merle L., 5,531,919, Cl. 510-200.000.
- Majer, Hans-Werner; Schöffel, Jörgen; and Schänzel, Rainer, to ZF Friedrichshafen AG. Assisted steering mechanism, in particular for motor vehicles. 5,531,286, Cl. 180-441.000.
- Majewski, Dennis A.: *See—*
  - Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.
- Mak, Tak W.: *See—*
  - Suzuki, Haruhiko; and Mak, Tak W., 5,532,158, Cl. 435-240.200.
- Makhteshim Chemical Works Ltd.: *See—*
  - Lubetzky, David; and Frances, Maurice, 5,531,995, Cl. 424-409.000.
- Maki, Hideaki: *See—*
  - Okamoto, Takami; Maki, Hideaki; and Konosu, Osamu, 5,532,545, Cl. 313-407.000.
- Makino, Takahiro: *See—*
  - Watanabe, Michiko; Makino, Takahiro; and Honma, Kazuo, 5,532,160, Cl. 435-252.100.
- Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, to Hitachi, Ltd. High speed low noise current collecting equipment and method on collecting current. 5,531,301, Cl. 191-55.000.
- Makowski, Pierre; Sfez, Rémi; and Guedes, Yvon, to U.S. Philips Corporation. Transmission system comprising at least two subscriber devices exchanging information signals in the simplex of half-duplex mode. 5,533,015, Cl. 370-31.000.
- Malamas, Michael S.; and Gunawan, Iwan, to American Home Products Corporation. New azolidinediones and thiadiazolidinediones as antihyperglycemic agents. 5,532,256, Cl. 514-361.000.
- Malatesta, Vincenzo: *See—*
  - Allegrini, Pietro; Nodari, Nereo; Malatesta, Vincenzo; and Crisci, Luciana, 5,532,361, Cl. 544-70.000.
- Malcolm, Jerry W., to International Business Machines Corporation. Computer system for dynamically generating display screen panels providing interactive interfaces for application program steps. 5,533,184, Cl. 395-161.000.
- Malcolm, Roger J.; and Foley, Kevin T. Surgical suction regulator valve. 5,531,712, Cl. 604-247.000.
- Malhi, Satwinder, to Texas Instruments Incorporated. Field reconfigurable logic/memory array. 5,532,957, Cl. 365-154.000.
- Malikowski, Willi: *See—*
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- Malle, Gérard: *See—*
  - Bauer, Daniel; Richard, Françoise; Hassoun, Muriel; Malle, Gérard; and Samain, Henri, 5,531,987, Cl. 424-76.210.
- Mallinckrodt Medical, Inc.: *See—*
  - Vacca, Rita D., 5,531,255, Cl. 141-285.000.
- Mallok, Gerd: *See—*
  - Schlichting, Eberhard; Buchold, Henning; Mallok, Gerd; Gärtner, Fritz-Jürgen; and Stönner, Hans-Martin, 5,532,393, Cl. 554-170.000.
- Mallon, Charles B.; Harvey, James R.; and Nicolini, Claudio F., to Union Carbide Chemicals & Plastics Technology Corporation. Magnetic coating composition. 5,531,914, Cl. 252-62.540.
- Malone, Philip G.: *See—*
  - Burkes, J. Pate; Malone, Philip G.; and Wakeley, Lillian D., 5,531,824, Cl. 106-737.000.
- Maltese, Roy D. Appliance for washing, massaging, or heat-treating the back. 5,530,983, Cl. 15-160.000.
- MANAC Inc.: *See—*
  - Kadono, Shinichi; Mishima, Kiyoshi; Takahasi, Akihisa; and Taniuchi, Akira, 5,532,322, Cl. 525-357.000.
- Mancini, Vincent E.: *See—*
  - Flanigan, David A.; Mancini, Vincent E.; and Harper, Michael R., 5,531,845, Cl. 149-109.600.
- Mandai, Harufumi: *See—*
  - Tonegawa, Ken; Mandai, Harufumi; Tsuru, Teruhisa; Katou, Mitsuhide; and Furutani, Koji, 5,532,658, Cl. 333-246.000.
- Mander, Lewis N.: *See—*
  - Evans, Lloyd T.; King, Roderick W.; Mander, Lewis N.; Pearce, David W.; and Pharis, Richard P., 5,532,206, Cl. 504-176.000.
- Maneval, James E.; McCarthy, Kathryn L.; McCarthy, Michael J.; and Powell, Robert L., to University of California, The Regents of The. Nuclear magnetic resonance imaging rheometer. 5,532,593, Cl. 324-306.000.
- Mangan, John S.: *See—*
  - Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, 5,532,962, Cl. 365-201.000.
- Manlief, Michael D.; Riley, Gilbert N., Jr.; Voccio, John; and Rodenbush, Anthony J., to American Superconductor Corporation. Method of making superconducting wind-and-react coils. 5,531,015, Cl. 29-599.000.
- Mann, Don M.: *See—*
  - Mann, Donaerl B.; and Mann, Don M., 5,531,668, Cl. 602-13.000.
- Mann, Donaerl B.; and Mann, Don M., to D'Mannco, Inc. Inflatable palmar bladder. 5,531,668, Cl. 602-13.000.
- Mannava, Seetha R.; Risbeck, James D.; and Jacobs, Larry G., to General Electric Company. Distortion control for laser shock peened gas turbine engine compressor blade edges. 5,531,570, Cl. 416-241.00R.
- Mannon, Kirby L.: *See—*
  - Goldstein, Karen L.; and Mannon, Kirby L., 5,531,777, Cl. 607-114.000.
- Manosalva, Edgar G.: *See—*
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhart, Donald J.; and Morrow, James D., 5,531,678, Cl. 604-51.000.
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhardt, Donald J.; and Morrow, James D., 5,531,699, Cl. 604-164.000.
- Mansell, Timothy E. Nuclear reactor coolant level monitoring system. 5,533,074, Cl. 376-258.000.
- Mao, Simon J. T.: *See—*
  - Parker, Roger A.; and Mao, Simon J. T., 5,532,400, Cl. 556-449.000.
- Mao, Zhenhau; and Newton, Dee, to Motorola, Inc. Method of synthesizing alkaline metal intercalation materials for electrochemical cells. 5,531,920, Cl. 252-182.100.
- Mar, Monte F.; and Madland, Paul D., to Intel Corporation. Source-switched charge pump circuit. 5,532,636, Cl. 327-543.000.
- Marantz, Calvin. Tissue biopsy specimen strainer and method. 5,532,168, Cl. 436-176.000.
- Marathon Oil Company: *See—*
  - Kloberdanz, Thomas W., 5,531,811, Cl. 95-261.000.
- Marchesani, Rossano: *See—*
  - Mitra, Sanjit K.; Abreu, Eduardo; and Marchesani, Rossano, 5,533,063, Cl. 375-340.000.
- Marchetti, Alfred P.: *See—*
  - Arcus, Robert A.; and Marchetti, Alfred P., 5,532,119, Cl. 430-567.000.
- Marchman, Herschel M.: *See—*
  - Filas, Robert W.; and Marchman, Herschel M., 5,531,343, Cl. 216-11.000.
- Marcks, Gerrit: *See—*
  - Behringer, Hartmut; Pottkämper, Siegfried; Stephan, Hans-Werner; and Marcks, Gerrit, 5,531,075, Cl. 62-46.100.
- Marechal, Robert R., to Societe Industrielle et Commerciale de Materiel Aeronautique. Underframe for a passenger aircraft seat, and a seat including such an underframe. 5,531,404, Cl. 244-118.600.
- Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, to United States Surgical Corporation. Polycarbonate-based block copolymers and devices. 5,531,998, Cl. 424-426.000.
- Market, Roger A. Apparatus and method of connecting and terminating electrical conductors. 5,531,618, Cl. 439-840.000.
- Markham, James G.: *See—*
  - Best, David J.; Globig, James E.; Markham, James G.; and Craig, Gina M., 5,533,176, Cl. 395-117.000.
- Marking, Gregory A.: *See—*
  - Kanatzidis, Mercouri G.; Liao, Ju H.; and Marking, Gregory A., 5,531,936, Cl. 252-587.000.
- Markison, Timothy W.: *See—*
  - Grube, Gary W.; Markison, Timothy W.; Pendleton, Matthew A.; and Rybicki, Mathew A., 5,533,008, Cl. 370-17.000.
- Marko, Kenneth A.: *See—*
  - Feldkamp, Lee A.; Puskorius, Gintaras V.; James, John V.; and Marko, Kenneth A., 5,531,108, Cl. 73-117.300.
- Markovics, James M.; and Nealey, Richard H., to Xerox Corporation. Multilayer electrophotographic imaging member. 5,532,103, Cl. 430-131.000.
- Marks, Robert: *See—*
  - Hale, Zoë M.; and Marks, Robert, 5,532,493, Cl. 250-458.100.
- Marks, Robert J., to Square D Company. Neutral lug assembly for a panelboard. 5,531,617, Cl. 439-723.000.
- Marley, Christopher: *See—*
  - Pink, David; and Marley, Christopher, 5,532,927, Cl. 364-424.030.
- Marocco, Matthew L., III: *See—*
  - Lee, Virgil J.; Wang, Ying; Taran, Carmen; and Marocco, Matthew L., III, 5,532,374, Cl. 546-167.000.
- Marra, Marian N.: *See—*
  - Espevik, Terje; and Marra, Marian N., 5,532,216, Cl. 514-21.000.
- Marshall, Dale C.: *See—*
  - Stewart, Wallace S.; Merz, Gary E.; and Marshall, Dale C., 5,531,847, Cl. 156-73.100.
- Marshall, Richard: *See—*
  - Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., 5,532,441, Cl. 200-16.00A.
- Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., to Genentech, Inc.; and Board of Regents, The University of Texas System. Ras farnesyl transferase inhibitors. 5,532,359, Cl. 540-522.000.
- Martel, Gerald R.: *See—*
  - Jones, Gregory B.; Lopes, Joseph B.; and Martel, Gerald R., 5,532,717, Cl. 345-202.000.
- Martin, Brian C.: *See—*

  - Parkinson, Thomas D.; and Martin, Brian C., 5,532,617, Cl. 326-32.000.
- Martin, Eric A.; Vaccaro, Kenneth; Waters, William; Lorenzo, Joseph P.; and Spaziani, Stephen, to United States of America, Air Force. FET optical receiver using backside illumination, indium materials species. 5,532,173, Cl. 437-2.000.
- Martin, Lawrence B.: *See—*
  - Dang, Nguyen T.; Martin, Lawrence B.; and Jerrard, Richard, 5,531,710, Cl. 604-238.000.
- Martin Marietta Corporation: *See—*
  - Larkin, Robert F., 5,531,072, Cl. 60-492.000.
- Martin Marietta Energy Systems, Inc.: *See—*
  - DeVault, Robert C.; McConnell, Benjamin W.; and Phillips, Benjamin A., 5,532,532, Cl. 310-52.000.
- Martin, Michael A.: *See—*
  - Hollenbach, Steven A.; Martin, Michael A.; Novak, Thomas S.; and Warznak, Robert S., 5,533,115, Cl. 379-220.000.
- Martin, Roy E.: *See—*
  - Lee, Neville K.; Jain, Amit; and Martin, Roy E., 5,532,884, Cl. 359-833.000.
- Martin, Thomas W., to Eastman Kodak Company. Transparent media for minimizing curl during printing of high density thermal dye transfer images. 5,532,725, Cl. 347-221.000.
- Martinez, David M.; and Edlinger, Erich, to McCulloch Corporation. Hedge trimmer drive assembly. 5,531,027, Cl. 30-216.000.
- Martinez, Jose D. L. L.: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, to Centro de Investigacion y de Estudios Avanzados del I.P.N. Method for the preparation of instant fresh corn dough or masa. 5,532,013, Cl. 426-496.000.
- Martinez Garcia, Francisco J.: *See—*
  - Hita de la Torre, Carlos; Escrihuela Langa, Francisco J.; Martinez Garcia, Francisco J.; and Blanco, Carlos H., 5,533,028, Cl. 370-95.300.
- Martinez Valdes, Jose Maria: *See—*
  - Sitges Menendez, Francisco Javier; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; and Martinez Valdes, Jose Maria, 5,531,882, Cl. 205-602.000.
- Martini, James A.: *See—*
  - deNormand, Richard S.; Martini, James A.; and Westfall, Norman R., 5,530,991, Cl. 16-198.000.
- Marturunkakul, Sutiyao: *See—*
  - Tripathy, Sukant K.; Jeng, Ru-Jong; Kumar, Jayant; Marturunkakul, Sutiyao; and Chen, Jeng-I, 5,532,320, Cl. 525-100.000.
- Marugame, Tomoyuki: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Maruko, Chiaki: *See—*
  - Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misau; Kishi, Satoru; and Maruko, Chiaki, 5,532,054, Cl. 428-294.000.
- Marumo, Masakazu. Space game floater apparatus. 5,531,644, Cl. 472-68.000.
- Maruta, Masayuki; and Shimizu, Jun, to Kao Corporation. Electrophotographic carrier and production process therefor. 5,532,096, Cl. 430-108.000.
- Maruyama, Eiki; Nasu, Makoto; Misawa, Yoshisada; and Takeda, Soichi, to MK Seiko, Co., Ltd. Bread baking apparatus. 5,531,153, Cl. 99-327.000.
- Maruyama, Hiroshi: *See—*
  - Sasaoka, Seiji; Aoki, Izuo; and Maruyama, Hiroshi, 5,532,008, Cl. 426-73.000.
- Maruyama, Hitoshi: *See—*
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Maruyama, Ohji, to Ricoh Company, Ltd. Duplex document feeder for a facsimile machine. 5,532,847, Cl. 358-498.000.
- Maruyama, Ryoichi: *See—*
  - Ishino, Tsutomu; Maruyama, Ryoichi; Nakagami, Hiroshi; and Asada, Hisao, 5,531,304, Cl. 192-4.00R.
- Masaki, Ryoso; and Mutoh, Nobuyoshi, to Hitachi, Ltd. Control apparatus for induction motor. 5,532,571, Cl. 318-809.000.
- Maschino, Steven; and Baker, Ross G., Jr., to Cyberonics, Inc. Circumneural electrode assembly. 5,531,778, Cl. 607-118.000.
- Masegi, Tsukio: *See—*
  - Koga, Masahiro; Tanaka, Toshio; Fujii, Takao; and Masegi, Tsukio, 5,532,408, Cl. 562-466.000.
- Mason, Ray. Spacer for worn clutch brakes. 5,531,306, Cl. 192-13.00R.
- Massachusetts Institute of Technology: *See—*
  - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Massillon Community Hospital: *See—*
  - Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.
- Masters, Ronald A.; Maile, Michael S.; Underwood, David C.; Kupneski, Michael J.; and Roetker, Timothy C., to Procter & Gamble Company, The. Liquid hard surface detergent compositions containing specific polycarboxylate detergent builders. 5,531,933, Cl. 510-429.000.
- Masterson, Byron J.: *See—*
  - Peters, Aemil J. M.; Masterson, Byron J.; and Abrams, Robert M., 5,532,681, Cl. 340-573.000.
- Mastri, Dominick L.; Kolesa, Michael S.; and Hessler, Thomas R., to United States Surgical Corporation. Suture cinching apparatus. 5,531,763, Cl. 606-148.000.
- Mastronardi, Pasquale; Rossi, Antonio E.; and Fraganza, Fiorentino, to Industria Prodotti Medicinali I.PM. S.r.L. Needle catheter with safety device. 5,531,713, Cl. 604-263.000.
- Masuda, Koji: *See—*
  - Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, 5,532,721, Cl. 347-112.000.
- Masuda, Misao: *See—*
  - Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misao; Kishi, Satoru; and Maruko, Chiaki, 5,532,054, Cl. 428-294.000.
- Masuda, Mitsunobu: *See—*
  - Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
- Masuda, Narihiro; and Kawaguchi, Chikakazu, to Diafoil Hoechst Company, Limited. Magnetic recording medium having a calendered polyester layer with a specified deformation ratio. 5,532,049, Cl. 428-216.000.
- Masuda, Noboru: *See—*
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Masumoto, Tsuyoshi; Inoue, Akihisa; Kaji, Toshihiko; Iihara, Junji; and Takano, Yoshishige, to Masumoto, Tsuyoshi; and Inoue, Akihisa. Aluminum alloy and method of preparing the same. 5,532,069, Cl. 428-552.000.
- Mateer, David G.; and Pogue, D. Michael, to Paulsen, Al W. Foldable eyeglasses having locking means. 5,532,766, Cl. 351-63.000.
- Matheis, Mark A.: *See—*
  - Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., 5,532,100, Cl. 430-120.000.
- Matienzo, Luis J.: *See—*
  - Arndt, Steven F.; Matienzo, Luis J.; Memis, Irving; Spalik, James; and Wu, Tien Y., 5,532,024, Cl. 427-327.000.
- Matsuba, Mitsuo: *See—*
  - Yamamoto, Masatoshi; Matsuba, Mitsuo; Kaga, Hideaki; and Shibata, Masaki, 5,531,263, Cl. 164-404.000.
- Matsubayashi, Kazuhiro: *See—*
  - Arai, Tsunekazu; Takeuchi, Shinsuke; and Matsubayashi, Kazuhiro, 5,533,147, Cl. 382-179.000.
- Matsuda, Hideaki: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Matsuda, Manabu; and Shoji, Hajime, to Fujitsu Limited. Optical transmission and reception device. 5,533,041, Cl. 372-50.000.
- Matsuda, Yoshiki: *See—*
  - Futatsugi, Seiji; Kojima, Keiji; Matsuda, Yoshiki; Kitahara, Yoshinori; and Mogaki, Masato, 5,533,141, Cl. 382-119.000.
- Matsudo, Masahiko: *See—*
  - Nagasawa, Yasushi; Yamashita, Satoru; and Matsudo, Masahiko, 5,532,613, Cl. 324-761.000.
- Matsui, Akio, to Festo KG. Rodless cylinder. 5,531,151, Cl. 92-88.000.
- Matsui, Fumio: *See—*
  - Kawano, Kumi; and Matsui, Fumio, 5,532,032, Cl. 428-64.100.
- Matsui, Makoto; and Yamamoto, Hisashi, to Eisai Co., Ltd. Process for the preparation of α-tocopherol derivatives. 5,532,387, Cl. 549-411.000.
- Matsui, Tetsuo: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Matsuki, Toshitsugu; and Santa, Toshihiro, to Teijin Limited. Ultraviolet ray-absorbing aromatic compound and polymeric composition containing the same. 5,532,412, Cl. 564-158.000.
- Matsumoto, Hiroshi: *See—*
  - Watanabe, Tsuyoshi; Senba, Hisaaki; Matsumoto, Hiroshi; and Yanagida, Makoto, 5,532,799, Cl. 355-245.000.
- Matsumoto, Hirotaka; Yamaguchi, Jun; Yanagihara, Naoto; and Yamamoto, Hisashi, to Fuji Photo Film Co., Ltd. Aluminate complex and use thereof in photopolymerizable composition and image-forming material. 5,532,373, Cl. 546-4.000.
- Matsumoto, Hiroyuki; and Niwa, Tatsuo, to Nikon Corporation. High resolution read-only magneto-optical disk and method and apparatus for reproducing information therefrom. 5,532,984, Cl. 369-13.000.
- Matsumoto, Kazuhiro: *See—*
  - Hanari, Jun; Miyagi, Takeshi; Matsumoto, Kazuhiro; Tohdake, Ayako; and Fukuoka, Yoshitaka, 5,532,906, Cl. 361-749.000.
- Matsumoto, Kazuo: *See—*
  - Kameo, Yohdoh; Matsumoto, Kazuo; and Suzuki, Jun, 5,533,060, Cl. 375-332.000.
- Matsumoto, Manabu: *See—*

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Matsumoto, Nobuo, to Fuji Photo Film Co., Ltd. Photographic processor. 5,532,779, Cl. 354-319.000.
Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, to Suntory Limited; and Takuma Co, Ltd. Germ-free liquid dispenser. 5,531,908, Cl. 210-760.000.
Matsumoto, Shinji: *See—*
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Matsumoto, Toshitaka: *See—*
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Matsumura, Akira; Ohata, Masashi; and Seio, Mamoru, to Nippon Paint Co., Ltd. Method for correcting defect in color filter. 5,531,881, Cl. 204-507.000.
Matsuno, Hirozumi: *See—*
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Matsushita Electric Corporation of America: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Aihara, Yukichi, 5,532,646, Cl. 330-279.000.
Aikoh, Hideki; Takashima, Makoto; Nakamura, Hiroyuki; and Nakamura, Tohru, 5,532,999, Cl. 369-120.000.
Fukui, Atsushi; Nishii, Kanji; Takamoto, Kenji; and Ito, Masami, 5,532,823, Cl. 356-364.000.
Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, 5,533,045, Cl. 375-200.000.
Inoue, Ikunori; and Tsujihara, Susumu, 5,532,765, Cl. 348-807.000.
Komobuchi, Hiroyoshi, 5,532,743, Cl. 348-297.000.
Konno, Masaki; Inobe, Kazuhiko; Yoshiura, Kenichi; and Itoh, Shuji, 5,532,466, Cl. 235-441.000.
Koshino, Katsuhiko, 5,531,132, Cl. 74-435.000.
Kumeji, Yasushi; Nishimura, Seiichi; Nakajima, Yoshinobu; and Itou, Makoto, 5,532,662, Cl. 333-185.000.
Kusaka, Hiroya; Sakaguchi, Takashi; and Nakayama, Masaaki, 5,532,742, Cl. 348-264.000.
Kuwata, Yuri; Okabayashi, Ichiro; and Kishi, Tetsuji, 5,533,034, Cl. 371-32.000.
Mitsuse, Toshihiko, 5,532,828, Cl. 358-298.000.
Ootaka, Hideki; and Juri, Tatsuro, 5,532,837, Cl. 358-336.000.
Utsumi, Kuniaki; Yamamoto, Hiroaki; and Fujito, Katsuyuki, 5,532,865, Cl. 359-189.000.
Yamamura, Yasuharu; Seri, Hajime; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,532,076, Cl. 429-59.000.
Matsushita Electronics Corporation: *See—*
Okamoto, Takami; Maki, Hideaki; and Konosu, Osamu, 5,532,545, Cl. 313-407.000.
Matsushita, Kouji: *See—*
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Matsushita, Toshio: *See—*
Kodama, Kouji; Nishida, Hiroshi; Amano, Hideaki; and Matsushita, Toshio, 5,532,563, Cl. 318-440.000.
Matsuura, Takashi, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for automobile engine. 5,531,198, Cl. 123-294.000.
Matsuzaki, Fumiaki; Yanaki, Toshio; and Yamaguchi, Michihiro, to Shiseido Company Ltd. Controlled release preparation for bioactive substances. 5,532,305, Cl. 525-54.200.
Matsuzawa, Osamu, to Tanaka Kikinzoku Kogyo, K.K. Process of preparing clad contact material. 5,531,371, Cl. 228-175.000.
Matz, Gary F.; and Richardson, Paul F., to Calgon Corporation. Storage stable biocide composition and process for making the same. 5,532,413, Cl. 564-240.000.
Matzek, Lester T., to Motorola, Inc. Carrier to interference ratio measurement. 5,533,055, Cl. 375-286.000.
Mauch, Jeffrey: *See—*
Uschold, Robert C.; Stephens, Randy R.; Mauch, Jeffrey; Smith, Richard C.; and Houser, Kevin, 5,531,758, Cl. 606-185.000.
Mauler, Frank: *See—*
Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.
Maurer, David A.: *See—*
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Maurer, Raymond N.; and Maurer, David A. Cart with snap-locking members. 5,531,464, Cl. 280-47.350.
Maurer, Steven W.: *See—*
Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
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Maxtor Corporation: *See—*
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Maxwell, G. Patrick: *See—*
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Maxwell, Graeme D.; and Ainslie, Benjamin J., to British Telecommunications, plc. Integrated opitcal fibre and substrate supported optical waveguide having directly connected optical cores. 5,533,156, Cl. 385-49.000.
Maxwell, John T., III: *See—*
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May, Daniel R.: *See—*
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May, Kevin M.: *See—*
Ahmed, Sohail; and May, Kevin M., 5,531,267, Cl. 165-124.000.
Mayers, Clay; and Whiting, Douglas L., to Stac Electronics, Inc. Data compression apparatus and method using matching string searching and Huffman encoding. 5,532,694, Cl. 341-67.000.
Maylon, Gary J.: *See—*
Chenier, Gary J., Jr.; and Maylon, Gary J., 5,531,051, Cl. 52-255.000.
Mayrand, James F.; and Gregorich, James, to Digital Equipment Corporation. High power factor switched DC power supply. 5,532,918, Cl. 363-89.000.
Mazda Motor Corporation: *See—*
Nakamura, Jun, 5,531,013, Cl. 29-436.000.
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Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., to Abbott Laboratories. Apparatus for adding marker dye to nutritional product during enternal tube feeding. 5,531,682, Cl. 604-84.000.
Mazer, Terrence B.: *See—*
Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
Mazess, Richard B., to Lunar Corporation. Bone densitometer with improved vertebral characterization. 5,533,084, Cl. 378-54.000.
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Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., 5,531,472, Cl. 280-735.000.
McCalip, Timothy I.; Frazier, Jimmy R.; and Fagan, John E., to Burford Corporation. Nozzle assembly for pan oiler. 5,531,832, Cl. 118-622.000.
McCamish, Mark A.: *See—*
Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.
McCarthy, Kathryn L.: *See—*
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McCarthy, Michael J.: *See—*
Maneval, James E.; McCarthy, Kathryn L.; McCarthy, Michael J.; and Powell, Robert L., 5,532,593, Cl. 324-306.000.
McClanahan, Robert F.: *See—*
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McCombs, Norman R., to AirSep Corporation. Apparatus and method for supplying oxygen to passengers on board aircraft. 5,531,807, Cl. 95-26.000.
McConnell, Benjamin W.: *See—*
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McCue, Karen A.: *See—*
Newington, Ian M.; Parr, Kevin J.; Bowman, Patricia I.; and McCue, Karen A., 5,532,290, Cl. 523-122.000.
McCulloch Corporation: *See—*
Martinez, David M.; and Edlinger, Erich, 5,531,027, Cl. 30-216.000.

McCullough, Francis P. Flexible carbon fiber electrode with low modulus and high electrical conductivity, battery employing the carbon fiber electrode, and method of manufacture. 5,532,083, Cl. 429-210.000.
McCullough, John R.: *See—*
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McCumiskey, Robert E.: *See—*
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McCune, Earl: *See—*
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McDonald, Clifford L., Jr.: *See—*
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McDonald, Paul A.: *See—*
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McDonnell Douglas Technologies Inc.: *See—*
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McDowell, Robert S.: *See—*
Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
McGarian, Bruce: *See—*
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McGeer, Edith G.: *See—*
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McGeer, Patrick L.; Harada, Nobua; Kimura, Horoshi; McGeer, Edith G.; and Schulzer, Michael, to University of British Columbia, The. Dapsone and promin for the treatment of dementia. 5,532,219, Cl. 514-42.000.
McGinley, John V. M.; Srivastava, Vishnu C.; and DeMeester, Gordon D., to Picker International, Inc. Passive shimming technique for MRI magnets. 5,532,597, Cl. 324-319.000.
McGrath, Jonathan R.: *See—*
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McIntire, Gregory L.: *See—*
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McIntyre, Dale C.: *See—*
Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., 5,532,495, Cl. 250-492.210.
McIntyre, Lloyd F.; and Eschbach, Reiner, to Xerox Corporation. Facsimile with local correction of TRC based on destination TRC requirements. 5,532,849, Cl. 358-534.000.
McManus, James V.: *See—*
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McMurtrey, David K.; and Pawsat, Dennis P., to Wald Manufacturing Co., Inc,. Bicycle hub cone nut locking arrangement. 5,531,511, Cl. 301-110.500.
McNamara, Thomas F.: *See—*
Golub, Lorne M.; Ramamurthy, Nungavarum S.; McNamara, Thomas F.; and Ryan, Maria E., 5,532,227, Cl. 514-152.000.
McNulty, Donald E.: *See—*
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McPherson, Thurman W., II: *See—*
Ng, Ricky C.; and McPherson, Thurman W., II, 5,531,272, Cl. 166-277.000.
McQuilkin, Gary L.: *See—*
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McQuillan, Raymond. Device for clearing pipes or other lines with pressurized gas. 5,530,988, Cl. 15-406.000.
Mead Corporation, The: *See—*
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MEC Co., Ltd.: *See—*
Arimura, Maki; Akiyama, Daisaku; and Nakagawa, Toshiko, 5,532,094, Cl. 252-79.100.
Meckstroth, Richard J.; and Toth, Gerard S., to Ford Motor Company. Accessory drive system for an automotive engine. 5,531,648, Cl. 474-110.000.
Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, to Merck Patent Gesellschaft mit beschrankter Haftung. Imidazopyridines. 5,532,276, Cl. 514-303.000.
Medical Research Council, The: *See—*
Grosveld, Franklin G.; and Kioussis, Dimitris, 5,532,143, Cl. 435-69.100.
Medical Scientific, Inc.: *See—*
Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.
MedSelect Systems, Inc.: *See—*
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Medtronic, Inc.: *See—*
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Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., to TRW Vehicle Safety Systems Inc. Air bag inflator and method of assembly. 5,531,475, Cl. 280-741.000.
MegaDyne Medical Products, Inc.: *See—*
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Megahertz Corporation: *See—*
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Megiddo, Nimrod, to International Business Machines Corporation. Program product for displaying a line passing through a plurality of boxes. 5,533,178, Cl. 395-119.000.
Mehnert, David: *See—*
Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., 5,532,018, Cl. 426-582.000.
Mehrotra, Sanjay: *See—*
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Cernea, Raul-Adrian; Mehrotra, Sanjay; and Lee, Douglas J., 5,532,964, Cl. 365-189.090.
Meibach, Ronald L.: *See—*
Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., 5,532,018, Cl. 426-582.000.
Meidhof, Helmuth, to Rieter Automatik GmbH. Closable extrusion nozzle for thermoplastic materials. 5,531,587, Cl. 425-382.00R.
Meijer, Thomas H. D. Bale collector with rollers and baler suitable thereof. 5,531,555, Cl. 414-24.500.
Meikle, James, Jr.: *See—*
Kensey, Kenneth; Meikle, James, Jr.; Clupper, Harold; and Nash, John E., 5,531,757, Cl. 606-185.000.
Meil, Joerg: *See—*
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Meindl, Thomas; Meylan, Pierre; and Zierer, Thomas, to ABB Management AG. Appliance for extracting secondary air from an axial compressor. 5,531,565, Cl. 415-144.000.
Meiser, Daniel G.; and Stewart, Randolph C., to Hasbro, Inc. Toy gun. 5,531,210, Cl. 124-66.000.
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Melde, Chris R. Dental hand piece with water distribution system. 5,531,596, Cl. 433-104.000.
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Melnik, Thomas F.: *See—*
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Melquist, James: *See—*
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Melzer, Guido: *See—*
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Memis, Irving: *See—*
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Mendelson, Lewis A.: *See—*
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Mendori, Hiroaki: *See—*
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Menes, Cesar M. Elastomeric driver for epidural resistance syringe. 5,531,696, Cl. 604-131.000.
Menicon Co., Ltd.: *See—*
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Mennen Company, The: *See—*
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Menovcik, Gregory L.; and Ohrbom, Walter H., to BASF Corporation. Carbamate-functional polyester polymer or oligomer having pendant carbomate groups. 5,532,061, Cl. 428-423.100.
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Mercedes-Benz AG: *See—*
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Merce-Vidal, Ramon: *See—*

- Frigola-Constansa, Jordi; and Merce-Vidal, Ramon, 5,532,234, Cl. 514-224.200.
- Merchant, Abid N., to Du Pont de Nemours, E. I., and Company. Hydrofluorocarbon cleaning compositions. 5,531,916, Cl. 510-412.000.
- Merck & Co., Inc.: *See—*
  - Bayne, Marvin L.; Thomas, Kenneth A., Jr.; and Conn, Gregory L., 5,532,343, Cl. 530-399.000.
  - DiNinno, Frank P.; Guthikonda, Ravindra N.; and Meurer, Laura C., 5,532,261, Cl. 514-210.000.
- Merck Co., Inc.: *See—*
  - Goulet, Mark; Parsons, William H.; Organ, Helen M.; Sinclair, Peter J.; Wong, Frederick; and Wyvratt, Matthew J., 5,532,248, Cl. 514-291.000.
- Merck Frosst Canada, Inc.: *See—*
  - Gallant, Michel; Gareau, Yves; Guay, Daniel; Labelle, Marc; and Prasit, Petpiboon, 5,532,237, Cl. 514-235.200.
- Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
  - Böttcher, Henning; Seyfried, Christoph; Bartoszyk, Gerd; and Greiner, Hartmut, 5,532,241, Cl. 514-254.000.
  - Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.
  - Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, 5,532,276, Cl. 514-303.000.
  - Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücher, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, 5,532,255, Cl. 514-326.000.
- Merkel, Paul B.; Merrill, James P.; Schmoeger, Jeffrey W.; and Mooberry, Jared B., to Eastman Kodak Company. Photographic element containing certain azoaniline dyes. 5,532,117, Cl. 430-504.000.
- Merle, Thomas C.: *See—*
  - Chapman, Michael J.; Merle, Thomas C.; and Rowden, David L., 5,531,008, Cl. 29-230.000.
- Merlin Instrument Company: *See—*
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- Merrell Pharmaceuticals Inc.: *See—*
  - Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,532,252, Cl. 514-309.000.
  - Parker, Roger A.; and Mao, Simon J. T., 5,532,400, Cl. 556-449.000.
  - Schirlin, Daniel G.; Collard, Jean-Noël; and Danzin, Charles, 5,532,397, Cl. 556-413.000.
- Merrick, Edwin B.: *See—*
  - Power, John S.; O'Mahony, John J.; and Merrick, Edwin B., 5,531,221, Cl. 128-205.180.
- Merrill, James P.: *See—*
  - Merkel, Paul B.; Merrill, James P.; Schmoeger, Jeffrey W.; and Mooberry, Jared B., 5,532,117, Cl. 430-504.000.
- Merritt, Carleton G.: *See—*
  - Chawan, Dhyaneshwar B.; Merritt, Carleton G.; and Gillmore, Stephen R., 5,532,016, Cl. 426-557.000.
- Mersch, Steven H.: *See—*
  - Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.
- Mertelsmann, Roland: *See—*
  - Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., 5,532,341, Cl. 530-351.000.
- Merz, Gary E.: *See—*
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- Messer Griesheim GmbH: *See—*
  - Behringer, Hartmut; Pottkämper, Siegfried; Stephan, Hans-Werner; and Marcks, Gerrit, 5,531,075, Cl. 62-46.100.
  - Krebs, Christian, 5,531,218, Cl. 128-203.120.
- Metagenics, Inc.: *See—*
  - Paul, Stephen M., 5,531,988, Cl. 424-93.400.
  - Paul, Stephen M., 5,531,989, Cl. 424-93.400.
- Metallgesellschaft Aktiengesellschaft: *See—*
  - Schlichting, Eberhard; Buchold, Henning; Mallok, Gerd; Gärtner, Fritz-Jürgen; and Stönner, Hans-Martin, 5,532,393, Cl. 554-170.000.
- Metro Industries, Inc.: *See—*
  - Stevens, Kenneth A.; and Carlson, Bradley J., 5,531,167, Cl. 108-106.000.
- Metzger, Burkhard; and Ziolkowski, Hans, to Bellaform Extrusionstechnik GmbH. Process and installation for the manufacture of pencils. 5,531,947, Cl. 264-102.000.
- Metzger, Robert A.: *See—*
  - Stanchina, William E.; Metzger, Robert A.; and Rensch, David B., 5,532,486, Cl. 257-201.000.
- Metzner, Jurgen: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- Meurer, Laura C.: *See—*
  - DiNinno, Frank P.; Guthikonda, Ravindra N.; and Meurer, Laura C., 5,532,261, Cl. 514-210.000.
- Mewhort, Michael J.: *See—*
  - More, Robert B.; Strzepa, Peter; Mewhort, Michael J.; and Reventas, Thomas S., 5,531,094, Cl. 73-4.00R.
- Meyers, Paul F., to Capistrano Labs, Inc. Ultrasound probe with bubble trap. 5,531,119, Cl. 73-661.000.
- Meylan, Pierre: *See—*
  - Meindl, Thomas; Meylan, Pierre; and Zierer, Thomas, 5,531,565, Cl. 415-144.000.
- Mezger, Manfred; and Ries-Müller, Klaus, to Robert Bosch GmbH. Method of detecting a leaky exhaust valve. 5,531,100, Cl. 73-47.000.
- Michaud, Paul J. Idle brake light system. 5,532,674, Cl. 340-479.000.
- Michelson, Gary K., to Michelson, Gary K. Spinal bone waxer. 5,531,749, Cl. 606-93.000.
- Michigan TransTech Corporation: *See—*
  - Ensminger, William D.; and Gavin, Robert F., 5,531,684, Cl. 604-93.000.
- Mickael, Medhat W., to Western Atlas International, Inc. System for measuring epithermal neutron porosity having reduced borehole effect. 5,532,481, Cl. 250-269.400.
- Micro-Med, Inc.: *See—*
  - Miller, Frederick N., 5,532,139, Cl. 435-29.000.
- Microelectronics and Computer Technology Corporation: *See—*
  - Xie, Chenggang; Patterson, Donald E.; and Kumar, Nalin, 5,531,880, Cl. 204-478.000.
- Micron Display Technology: *See—*
  - Cathey, David A., 5,532,177, Cl. 437-40.000.
- Microtecnica S.p.A.: *See—*
  - Tribioli, Silvano; Giardinelli, Vito; Rocco, Francesco; and Cerrano, Franco, 5,532,079, Cl. 429-119.000.
- Microwave Medical Systems, Inc.: *See—*
  - Carr, Kenneth L., 5,531,662, Cl. 600-2.000.
- Miekley, Klaus: *See—*
  - Gademann, Lothar; Miekley, Klaus; Ziegenbein, Botho; and Reppich, Andreas, 5,531,091, Cl. 73-1.0DV.
- Miers, Gary L., to Howell Laboratories, Inc. Manually operated reverse osmosis desalinization system. 5,531,887, Cl. 210-135.000.
- Mifune, Hiroyuki: *See—*
  - Yagihara, Morio; Sasaki, Hirotomo; Mifune, Hiroyuki; and Kato, Shinji, 5,532,120, Cl. 430-600.000.
- Migliorini, Pier L., to Solis S.R.L. Apparatus for positioning the foot portion of tubular knitted articles. 5,531,173, Cl. 112-470.150.
- Mihara, Takashi; Tsuchiya, Masaki; Higuma, Junichiro; Kikuchi, Seiji; and Okada, Hiromi, to Mita Industrial Co., Ltd. Method and apparatus for adjusting image forming positions to allow plural images to be formed on plural recording sheets. 5,532,731, Cl. 347-250.000.
- Mikami, Yasuie: *See—*
  - Takayama, Susumu; Mikami, Yasuie; Iyatomi, Nobuyoshi; and Orikasa, Minoru, 5,531,906, Cl. 210-712.000.
- Mikan, Peter J. Redundant indicator for detecting neutral position of joystick member. 5,532,476, Cl. 250-221.000.
- Mikell, Al T.: *See—*
  - Alford, George; Cullimore, D. Roy; and Mikell, Al T., 5,531,895, Cl. 210-610.000.
- Mikkonen, Silvo: *See—*
  - Kinnunen, Jorma; and Mikkonen, Silvo, 5,531,396, Cl. 242-526.300.
- Milano, Frank K.: *See—*
  - Stanczyk, Thomas F.; Milano, Frank K.; and Hintermeier, Mary P., 5,532,928, Cl. 364-406.000.
- Miller, Frederick N., to Micro-Med, Inc. Micro lysis-analysis process to measure cell characteristics and diagnose diseases. 5,532,139, Cl. 435-29.000.
- Miller, John E. Variable distance marker. 5,532,677, Cl. 340-286.010.
- Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., to Kraft Foods, Inc. Method for manufacture of low fat natural cheese. 5,532,018, Cl. 426-582.000.
- Miller, Mark S.; and Surber, Kevin J., to Kraft Foods, Inc. Process for making stable emulsified dressings with polyol fatty acid polyesters. 5,532,019, Cl. 426-589.000.
- Miller, Mark S.; and Surber, Kevin J., to Kraft Foods, Inc. Aqueous gel matrix for replacement of confection fats. 5,532,022, Cl. 426-660.000.
- Miller, Ronald M., Sr.: *See—*
  - Nielsen, Brian T. K.; and Miller, Ronald M., Sr., 5,532,698, Cl. 312-120.000.
- Miller, William E.; Gay, Eddie C.; and Tomczuk, Zygmunt, to United States of America, Energy. Advanced electrorefiner design. 5,531,868, Cl. 205-44.000.
- Milliken Research Corporation: *See—*
  - Moore, Patrick D.; Valenti, Michael A.; and VanDahm, Richard A., 5,532,346, Cl. 534-729.000.
- Millipore Investment Holdings Limited: *See—*
  - Tom, Glenn M.; and McManus, James V., 5,531,971, Cl. 423-210.000.
  - Yen, Larry Y.; Anantharaman, Ven; and Parekh, Bipin, 5,531,899, Cl. 210-638.000.
- Mimura, Masahiro: *See—*
  - Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, 5,533,045, Cl. 375-200.000.
- Mimura, Tadao: *See—*
  - Ose, Yoichi; Yoshinari, Kiyomi; Yano, Masayoshi; and Mimura, Tadao, 5,532,483, Cl. 250-288.000.
- Mimura, Yoshiaki: *See—*
  - Fujieda, Masanao; Yano, Nobuyuki; Mimura, Yoshiaki; and Isogai, Naoki, 5,532,772, Cl. 351-211.000.
- Minakata, Shunichi: *See—*
  - Tabata, Hitoshi; Murata, Osamu; Fujioka, Junzo; and Minakata, Shunichi, 5,532,504, Cl. 257-252.000.
- Minamida, Isao: *See—*

  - Kuwazuru, Yosei; Igarashi, Akira; and Minamida, Isao, 5,531,981, Cl. 424-45.000.
- Minck, Klaus-Otto: *See—*
  - Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, 5,532,276, Cl. 514-303.000.
- Mine Safety Appliances Company: *See—*
  - Salapow, Thomas M.; Wolf, Roger P.; Scanio, Thomas J.; and Kuhn, John F., 5,531,803, Cl. 55-498.000.
- Minevski, Ljiljana V.; and Bockowski, Edmund J., to Betz Laboratories, Inc. Water soluble cyclic amine-dicarboxylic acid-alkanol amine salt corrosion inhibitor. 5,531,937, Cl. 252-394.000.
- Minges, Roland: *See—*
  - Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.
- Ministero Dell 'Universita' E Della Ricerca Scientifica E Technologica: *See—*
  - Allegrini, Pietro; Nodari, Nereo; Malatesta, Vincenzo; and Crisci, Luciana, 5,532,361, Cl. 544-70.000.
- Minkin, Yuriy, to Transco Products Inc. Silencer assembly with acoustical modules therein. 5,532,439, Cl. 181-224.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Duffy, Dean R., 5,531,892, Cl. 210-493.100.
  - Grenfell, Mark W.; Flynn, Richard M.; and Savu, Patricia M., 5,532,310, Cl. 524-463.000.
  - Heinecke, Steven B.; and Peterson, Donald G., 5,531,855, Cl. 156-252.000.
  - Holmes, Gary L.; Smith, Terrance P.; Ali, Mahfuza B.; and Macomber, David W., 5,532,111, Cl. 430-281.100.
  - Nyberg, Mark R.; Laska, Gregory A.; and Stetson, Daniel J., 5,532,893, Cl. 360-133.000.
  - Sirvio, Larry M.; and Swenson, Barbara C., 5,532,311, Cl. 525-54.200.
  - Sweaton, Michael C., 5,532,894, Cl. 361-18.000.
  - Sweeney, Kenneth W.; and Converse, Harold G., 5,531,831, Cl. 118-600.000.
  - Wood, Leigh E., 5,531,732, Cl. 604-391.000.
  - Yonkoski, Roger K.; and Savu, Patricia M., 5,532,121, Cl. 430-617.000.
- Minntech Corporation: *See—*
  - Brinda, Paul D.; and Cosentino, Louis C., 5,531,848, Cl. 156-77.000.
- Minolta Camera Kabushiki Kaisha: *See—*
  - Akazawa, Takashi, 5,532,790, Cl. 355-203.000.
  - Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, 5,532,798, Cl. 355-221.000.
  - Nakajima, Akio; Muramatsu, Hideo; Suzuki, Hiroyuki; and Hamano, Kanako, 5,532,841, Cl. 358-408.000.
  - Shibata, Etsuko; and Nakamura, Hiromu, 5,532,866, Cl. 359-216.000.
  - Yaginuma, Shigeru; and Yamamoto, Junichi, 5,532,789, Cl. 355-202.000.
- Mintz, Yosef. Method and system for obtaining information from a plurality of remote stations. 5,532,702, Cl. 342-463.000.
- Miraglia, Phillip; Christopherson, Dennis; Carter, Robert; and Umeda, Tadatoshi, to Recycling Concepts, Ltd. Apparatus and method for resealing toner cartridges. 5,531,846, Cl. 156-64.000.
- Misawa, Hirokazu: *See—*
  - Kubo, Morihiro; Ishigaki, Yukio; Itoh, Takeshi; and Misawa, Hirokazu, 5,532,638, Cl. 327-368.000.
- Misawa, Yoshisada: *See—*
  - Maruyama, Eiki; Nasu, Makoto; Misawa, Yoshisada; and Takeda, Soichi, 5,531,153, Cl. 99-327.000.
- Mishima, Akio: *See—*
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Mishima, Kiyoshi: *See—*
  - Kadono, Shinichi; Mishima, Kiyoshi; Takahasi, Akihisa; and Taniuchi, Akira, 5,532,322, Cl. 525-357.000.
- Misiti, Domenico: *See—*
  - Giannessi, Fabio; Castagnani, Roberto; De Angelis, Francesco; Tinti, Maria O.; and Misiti, Domenico, 5,532,409, Cl. 562-561.000.
- Misner, Michael O.: *See—*
  - Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., 5,531,084, Cl. 70-409.000.
- Mita Industrial Co., Ltd.: *See—*
  - Kajitani, Tetsuji; Hikosaka, Ariyoshi; Azumai, Hideo; and Iwatsubo, Satoshi, 5,532,827, Cl. 358-298.000.
  - Mihara, Takashi; Tsuchiya, Masaki; Higuma, Junichiro; Kikuchi, Seiji; and Okada, Hiromi, 5,532,731, Cl. 347-250.000.
  - Nishiyama, Shigeru; Hayashi, Yasuhiro; and Yamane, Naoki, 5,531,253, Cl. 141-90.000.
- Mitani, Takahiko: *See—*
  - Sawai, Kiichi; Mitani, Takahiko; Ninomiya, Naohisa; and Ishiwata, Yoshirou, 5,532,272, Cl. 514-492.000.
- Mitchell, Kim; and Mitchnick, Mark, to SunSmart, Inc. Visibly transparent UV sunblock compositions and cosmetic products containing the same. 5,531,985, Cl. 424-59.000.
- Mitchnick, Mark: *See—*
  - Mitchell, Kim; and Mitchnick, Mark, 5,531,985, Cl. 424-59.000.
- Mitel Corporation: *See—*
  - Pinard, Deborah L.; Peres, Eliana M. O.; and Evans, Ronald A., 5,533,110, Cl. 379-201.000.
- Mitel, Inc.: *See—*
  - Moore, Harry W., III, 5,532,676, Cl. 327-545.000.
- Mitra, Sanjit K.; Abreu, Eduardo; and Marchesani, Rossano, to University of California, The Regents of the. Method and apparatus for multipath channel shaping. 5,533,063, Cl. 375-340.000.
- Mitsubishi Chemical Corporation: *See—*
  - Ochiai, Tameichi; Kurose, Yutaka; Nagao, Takumi; Tsukahara, Takako; and Imamura, Satoru, 5,532,342, Cl. 534-693.000.
- Mitsubishi Chemical MKV Company: *See—*
  - Oshima, Masabumi; and Watanabe, Yoshiyuki, 5,532,068, Cl. 428-520.000.
- Mitsubishi Denki Kabushiki: *See—*
  - Ishikawa, Masahiro, 5,532,432, Cl. 174-60.000.
- Mitsubishi Denki Kabushiki Kaisha: *See—*
  - Egami, Noritaka, 5,532,582, Cl. 324-130.000.
  - Fujita, Teruo; Karaki, Morihiro; Irie, Mitsuru; and Nakane, Kazuhiko, 5,532,987, Cl. 369-44.240.
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
  - Ishimaru, Yoshiyuki, 5,532,718, Cl. 345-211.000.
  - Kako, Hajime, 5,532,930, Cl. 364-431.050.
  - Kawamoto, Atunobu, 5,532,517, Cl. 257-773.000.
  - Kondo, Yoshikazu; and Arima, Yutaka, 5,532,938, Cl. 364-736.000.
  - Koyama, Toshiaki; Hirose, Shinichi; and Harada, Hisashi, 5,532,652, Cl. 331-116.0FE.
  - Mizutani, Takao, 5,532,533, Cl. 310-68.00B.
  - Mori, Shigeru; Suzuki, Tomio; and Hayashikoshi, Masanori, 5,532,961, Cl. 365-189.050.
  - Nakata, Masafumi, 5,532,933, Cl. 364-474.240.
  - Niwa, Tomomitsu, 5,532,932, Cl. 364-474.300.
  - Suzuki, Shigeaki; and Naito, Yushi, 5,533,121, Cl. 379-410.000.
  - Takeno, Shozui; Moriyasu, Masaharu; Machida, Kazumichi; and Yasunaga, Seiji, 5,532,434, Cl. 174-110.00R.
  - Tanahashi, Mariko; Koike, Keiichi; and Katoh, Masatoshi, 5,533,186, Cl. 395-164.000.
  - Watanabe, Hajime, 5,532,956, Cl. 365-149.000.
  - Yasuda, Yukio, 5,532,562, Cl. 318-439.000.
- Mitsubishi Gas Chemical Company, Inc.: *See—*
  - Ohya, Kazuyuki; and Sayama, Norio, 5,531,945, Cl. 264-60.000.
- Mitsubishi Jidosha Engineering Kabushiki Kaisha: *See—*
  - Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, 5,531,133, Cl. 74-473.00R.
- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, 5,531,133, Cl. 74-473.00R.
- Mitsubishi Materials Corporation: *See—*
  - Mogi, Katsumi; and Endo, Osamu, 5,531,635, Cl. 451-72.000.
- Mitsubishi Precision Co., Ltd.: *See—*
  - Hidaka, Keiki; and Uehara, Shigekatsu, 5,532,697, Cl. 342-104.000.
- Mitsubishi Rayon Co., Ltd.: *See—*
  - Watanabe, Seigo; and Oh-Kita, Motomu, 5,532,199, Cl. 502-311.000.
- Mitsuboshi Belting Ltd.: *See—*
  - Osako, Nobutaka; Ishida, Kazutoshi; Nakai, Yasunori; and Murakami, Takeshi, 5,531,649, Cl. 474-205.000.
- Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See—*
  - Yoshikuwa, Masakatsu; and Hoshikawa, Tsuguo, 5,531,488, Cl. 292-216.000.
- Mitsui Petrochemical Industries, Ltd.: *See—*
  - Hirose, Toshiyuki; Nishijima, Shigetoshi; Yamamoto, Yohzoh; Kawachi, Hideshi; and Tsugawa, Michio, 5,532,030, Cl. 428-35.700.
- Mitsui Toatsu Chemicals, Inc.: *See—*
  - Kawauchi, Nobuya; Fukazawa, Nobuyuki; Ishibashi, Hiroki; and Otsuka, Kengo, 5,532,349, Cl. 536-55.300.
  - Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misao; Kishi, Satoru; and Maruko, Chiaki, 5,532,054, Cl. 428-294.000.
  - Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.
- Mitsuse, Toshihiko, to Matsushita Electric Industrial Co., Ltd. Image forming apparatus with edge smoothing. 5,532,828, Cl. 358-298.000.
- Mitsuya, Shunichi: *See—*
  - Hayase, Isao; Machida, Shigeru; Mitsuya, Shunichi; and Kouno, Takeshi, 5,531,577, Cl. 418-55.100.
- Miura, Shigeo, to Canon Kabushiki Kaisha. Image recording apparatus. 5,533,171, Cl. 395-111.000.
- Miwa, Tetsuyuki; Nakao, Munehiro; Suzuki, Nobuo; and Kato, Koki, to Nidek Co., Ltd. Ophthalmologic alignment device with automatic alignment means. 5,532,769, Cl. 351-205.000.
- Miyabe, Kanji; Orita, Nobuhiro; Iwasaki, Makoto; Tsurumaru, Yohka; and Nakahara, Toshitsugu, to Kurita Water Industries, Ltd. Method of treatment of a fluid containing volatile organic halogenated compounds. 5,531,901, Cl. 210-668.000.
- Miyadera, Hiroshi: *See—*
  - Muranaka, Yasushi; Yamashita, Hisao; and Miyadera, Hiroshi, 5,531,184, Cl. 117-108.000.

- Miyagawa, Shozo, to Rohm Co. Ltd. Extension phone type cordless telephone set. 5,533,101, Cl. 379-61.000.
- Miyagi, Takeshi: *See—*
  - Hanari, Jun; Miyagi, Takeshi; Matsumoto, Kazuhiro; Tohdake, Ayako; and Fukuoka, Yoshitaka, 5,532,906, Cl. 361-749.000.
- Miyago, Makoto: *See—*
  - Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
- Miyake, Tohru: *See—*
  - Okazaki, Iwao; Miyake, Tohru; Abe, Koichi; and Ohshima, Keisuke, 5,532,047, Cl. 428-213.000.
- Miyake, Wataru: *See—*
  - Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, 5,532,569, Cl. 318-802.000.
- Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,532,776, Cl. 354-106.000.
- Miyamoto, Hidenori: *See—*
  - Soshi, Isao; Miyamoto, Hidenori; and Nakamura, Toshiyuki, 5,532,775, Cl. 354-106.000.
- Miyamoto, Hiromu: *See—*
  - Nakata, Takuya; Iwase, Hiroyuki; and Miyamoto, Hiromu, 5,532,425, Cl. 84-609.000.
- Miyamoto, Matsuhiro: *See—*
  - Sawano, Hiroyuki; Yamanaka, Masayoshi; Kurosawa, Yutaka; and Miyamoto, Matsuhiro, 5,531,064, Cl. 57-204.000.
- Miyamoto, Yasuhiro; Ishihara, Toshiaki; and Uda, Minoru, to NGK Insulators, Ltd. Method of molding shaped pulp articles from fiber pulp, and shaped pulp article. 5,531,864, Cl. 162-199.000.
- Miyamura, Kazuya: *See—*
  - Onogi, Takayuki; Yamashita, Keiji; and Miyamura, Kazuya, 5,532,768, Cl. 351-160.00R.
- Miyano, Yuichi, to Kabushiki Kaisha Toshiba. Character image encoding/decoding system. 5,532,752, Cl. 348-468.000.
- Miyao, Masumasa; Kawano, Yuji; and Sato, Masaki, to Hitachi, Ltd. Facsimile apparatus. 5,532,826, Cl. 358-296.000.
- Miyata, Yukihide: *See—*
  - Namiki, Tomizo; Suzuki, Tamotsu; and Miyata, Yukihide, 5,532,722, Cl. 347-153.000.
- Miyauchi, Hidekazu: *See—*
  - Hiejima, Katsuhiro; and Miyauchi, Hidekazu, 5,531,688, Cl. 604-96.000.
- Miyazaki, Kunio: *See—*
  - Eike, Masatoyo; and Miyazaki, Kunio, 5,531,264, Cl. 165-43.000.
- Miyazaki, Masami; and Ando, Eiichi, to Asahi Glass Company Ltd. Low emissivity film. 5,532,062, Cl. 428-432.000.
- Miyazaki, Nobuyuki; Kodama, Shun-ichi; Takayanagi, Takashi; and Uchino, Bunji, to Asahi Glass Company Ltd. Resin composition for coating. 5,532,304, Cl. 524-261.000.
- Miyazaki, Shinichirou; and Watanabe, Kazuo, to Sony Corporation. APC and ACC processing using common circuitry. 5,532,757, Cl. 348-646.000.
- Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, to Konica Corporation. Cylindrical type dry battery and battery chamber. 5,532,080, Cl. 429-164.000.
- Mizoguchi, Yoshito, to Canon Kabushiki Kaisha. Image forming method superposing first and second developing operations on an image bearing member. 5,532,801, Cl. 355-246.000.
- Mizuguchi, Hiroshi: *See—*
  - Shiomi, Kazuyuki; Mizuguchi, Hiroshi; and Imakado, Shoji, 5,531,642, Cl. 464-74.000.
- Mizuguchi, Ryuzo: *See—*
  - Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, 5,532,376, Cl. 548-263.200.
- Mizuide, Masuya: *See—*
  - Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.
- Mizukawa, Yuki; Motoki, Masuji; Sato, Tadahisa; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Photographic coupler and silver halide color photographic material. 5,532,377, Cl. 548-262.400.
- Mizuno, Hiroyuki: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Mizutani, Shigemitsu, to Fuji Photo Film Co., Ltd. Apparatus for detecting the surface of a member to be ground, method of manufacturing feelers, and automatic inspection/grinding apparatus. 5,531,632, Cl. 451-6.000.
- Mizutani, Shinji, to Nikon Corporation. Aligning method. 5,532,091, Cl. 430-22.000.
- Mizutani, Takao, to Mitsubishi Denki Kabushiki Kaisha. Servo motor integral with control apparatus. 5,532,533, Cl. 310-68.00B.
- Mizutani, Yoshihiro; Tomino, Takeshi; Yamamoto, Yasuo; Shibata, Yukio; and Yamazaki, Hatsutaro, to Cosmo Oil Co., Ltd.; and Cosmo Research Institute. Hydroconversion process for heavy hydrocarbon oil. 5,531,885, Cl. 208-210.000.
- MK Seiko, Co., Ltd.: *See—*
  - Maruyama, Eiki; Nasu, Makoto; Misawa, Yoshisada; and Takeda, Soichi, 5,531,153, Cl. 99-327.000.
- Mobil Oil Corporation: *See—*
  - Johnson, David L.; and Senior, Richard C., 5,531,884, Cl. 208-150.000.
  - Ng, Ricky C.; and McPherson, Thurman W., II, 5,531,272, Cl. 166-277.000.
- Mobin, Mohammad S.: *See—*
  - Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., 5,533,065, Cl. 375-341.000.
- Moffatt, John R.: *See—*
  - Shields, James P.; and Moffatt, John R., 5,531,817, Cl. 106-22.00R.
- Mogaki, Masato: *See—*
  - Futatsugi, Seiji; Kojima, Keiji; Matsuda, Yoshiki; Kitahara, Yoshinori; and Mogaki, Masato, 5,533,141, Cl. 382-119.000.
- Mogi, Katsumi; and Endo, Osamu, to Mitsubishi Materials Corporation. Truing apparatus for wafer polishing pad. 5,531,635, Cl. 451-72.000.
- Mokashi, Pushkar U.: *See—*
  - Butler, Edward; Lundberg, Martin B.; Mokashi, Pushkar U.; Sartwell, Alfred L.; Shah, Hemen R.; and Tamlyn, Robert, 5,532,970, Cl. 365-230.050.
- Mole, James; Queille, Philippe; and Garrido, Guillermo, to Imperial Chemical Industries PLC; and L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Treatment of liquid waste material. 5,531,169, Cl. 110-346.000.
- Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., to Origin Medsystems, Inc. Endoscopic inflatable retraction devices. 5,531,856, Cl. 156-290.000.
- Møllgaard, Annette: *See—*
  - Rasmussen, Lars; Møllgaard, Annette; Petersen, Bent R.; and Sørensen, Niels H., 5,531,795, Cl. 8-94.210.
- Momiyama, Masayoshi: *See—*
  - Fujita, Satoshi; Kagiyama, Naoto; and Momiyama, Masayoshi, 5,532,125, Cl. 435-6.000.
- Momose, Hiroaki, to Seiko Epson Corporation. Paper-feed control apparatus for printer. 5,531,435, Cl. 271-258.030.
- Monarch Marking Systems, Inc.: *See—*
  - Best, David J.; Globig, James E.; Markham, James G.; and Craig, Gina M., 5,533,176, Cl. 395-117.000.
- Moncrief, Frank, to Riverwood International Corporation. Carrier sleeve erecting apparatus and method. 5,531,661, Cl. 493-313.000.
- Monk, David B.: *See—*
  - Rink, Karl K.; Beus, Glen S.; Johnson, Kelly B.; and Monk, David B., 5,531,473, Cl. 280-737.000.
- Monnens, Randy E. Remote control device carrousels. 5,531,332, Cl. 211-13.000.
- Monoi, Makoto, to Kabushiki Kaisha Toshiba. Charge transfer device with multi-line read structure. 5,532,503, Cl. 257-233.000.
- Monroe, Kenneth H. Method for making sportscards. 5,532,788, Cl. 355-77.000.
- Monroe, Stephen H.; Goettmann, James A.; and Funk, Gerald A., to International Paper. Degradable agricultural mat. 5,532,298, Cl. 524-13.000.
- Monsanto Company: *See—*
  - Hamper, Bruce C.; and Leschinsky, Kindrick L., 5,532,416, Cl. 568-314.000.
- Montell Technology Company bv: *See—*
  - Dall'Occo, Tiziano; Guglielmi, Floriano; Zucchini, Umberto, deceased, 5,532,326, Cl. 526-125.700.
- Montigny, Armand de; Kober, Hermann; Klinksiek, Bernd; and Schlak, Ottfried, to Bayer Aktiengesellschaft. Impregnating emulsion for mineral building materials. 5,531,812, Cl. 106-2.000.
- Mooberry, Jared B.: *See—*
  - Merkel, Paul B.; Merrill, James P.; Schmoeger, Jeffrey W.; and Mooberry, Jared B., 5,532,117, Cl. 430-504.000.
- Moody, Ernest W. Poker-style card game. 5,531,448, Cl. 273-292.000.
- Moore Business Forms, Inc.: *See—*
  - Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., 5,532,100, Cl. 430-120.000.
- Moore, Earl H.: *See—*
  - Smith, Wayne W.; Frick, Thomas J.; and Moore, Earl H., 5,532,456, Cl. 219-400.000.
- Moore, Harry W., III, to Mitel, Inc. Battery switch for ram backup. 5,532,676, Cl. 327-545.000.
- Moore, Larry, to Tac Star Industries, Inc. Laser module mounting means for weapons and other applications. 5,531,040, Cl. 42-103.000.
- Moore, Malcolm A. S.: *See—*
  - Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., 5,532,341, Cl. 530-351.000.
- Moore, Patrick D.; Valenti, Michael A.; and VanDahm, Richard A., to Milliken Research Corporation. Hydroxynaphthalenecarboxylic acid compounds and azo colorants made therefrom. 5,532,346, Cl. 534-729.000.
- Moore, Thomas C.; and Jang, Yue-Teh, to Cardiovascular Imaging Systems, Inc. Convertible tip catheters and sheaths. 5,531,700, Cl. 604-164.000.
- Moore, Thomas D., to Analog Devices, Inc. Thermally enhanced leadframe for packages that utilize a large number of leads. 5,532,905, Cl. 361-723.000.
- Moran, David E.; O'Gorman, Timothy J.; and Watson, Kimball M., to International Business Machines Corporation. Method to assess electromigration and hot electron reliability for microprocessors. 5,533,197, Cl. 395-185.080.
- More, Robert B.; Strzepa, Peter; Mewhort, Michael J.; and Reventas, Thomas S., to Carbomedics, Inc. Apparatus for testing prosthetic heart valve hinge mechanism. 5,531,094, Cl. 73-4.00R.
- Morfit, Stephen J.: *See—*

  - Skwarek, Gary M.; and Morfit, Stephen J., 5,531,703, Cl. 604-187.000.
- Morford, Ted, to Big Sky Racks, Inc. Vehicle mounted locking firearm support. 5,531,368, Cl. 224-551.000.
- Morgan, David E.: *See—*
  - Crane, Eric K.; Morgan, David E.; and Wellenstein, Neil, 5,533,097, Cl. 379-58.000.
- Mori, Akira: *See—*
  - Tsuda, Yukihiro; and Mori, Akira, 5,532,712, Cl. 345-87.000.
- Mori, Kohji: *See—*
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Mori, Ryuichi; Goto, Tetsuo; and Nishioka, Sunao, to Nikon Corporation. Camera having a depth priority operation mode. 5,532,782, Cl. 354-402.000.
- Mori, Shigeru; Suzuki, Tomio; and Hayashikoshi, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having extended data out function. 5,532,961, Cl. 365-189.050.
- Mori, Toshio: *See—*
  - Yamazaki, Kenji; and Mori, Toshio, 5,531,789, Cl. 623-12.000.
- Morikawa, Kiyoshi: *See—*
  - Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, 5,532,993, Cl. 369-75.100.
- Morimitsu, Tatsuya: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Morimoto, Yasuto: *See—*
  - Nakao, Tohru; Ono, Yuji; Bougauchi, Masahiro; and Morimoto, Yasuto, 5,532,240, Cl. 514-254.000.
- Morimura, Yasuhiro: *See—*
  - Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
- Morita, Masaya: *See—*
  - Hosoya, Yoshihiro; Morita, Masaya; and Tsuyama, Seishi, 5,531,839, Cl. 148-330.000.
- Morita, Toshihiko: *See—*
  - Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, 5,531,133, Cl. 74-473.00R.
- Moriyasu, Masaharu: *See—*
  - Takeno, Shozui; Moriyasu, Masaharu; Machida, Kazumichi; and Yasunaga, Seiji, 5,532,434, Cl. 174-110.00R.
- Morizane, Toshinori. Modifier for porous materials and method of modifying porous materials. 5,531,822, Cl. 106-600.000.
- Mork, David A., to Sauer Inc. Electrohydraulic fan control. 5,531,190, Cl. 123-41.120.
- Morosawa, Kenji: *See—*
  - Ozawa, Masayuki; Gounji, Takashi; and Morosawa, Kenji, 5,533,113, Cl. 379-211.000.
- Morphometrix Inc.: *See—*
  - Stein, Alfred, 5,532,874, Cl. 359-394.000.
- Morris, Adrian J.: *See—*
  - Lamkin, Allan; Kepley, W. Robert, III; Gupta, Prabhat K.; and Morris, Adrian J., 5,533,133, Cl. 381-94.000.
- Morris, David L.: *See—*
  - Spindt, Christopher J.; Field, John E.; Morris, David L.; and Curtin, Christopher J., 5,532,548, Cl. 313-422.000.
- Morris, Roger A.: *See—*
  - Element, Richard G.; and Morris, Roger A., 5,532,560, Cl. 318-266.000.
- Morrissey, Gerald; and Morrissey, Suzanne. Apparatus and method for controlling human lactation. 5,531,231, Cl. 128-846.000.
- Morrissey, Suzanne: *See—*
  - Morrissey, Gerald; and Morrissey, Suzanne, 5,531,231, Cl. 128-846.000.
- Morrow, James D.: *See—*
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhart, Donald J.; and Morrow, James D., 5,531,678, Cl. 604-51.000.
  - Tomba, Todd C.; Manosalva, Edgar G.; Goldhardt, Donald J.; and Morrow, James D., 5,531,699, Cl. 604-164.000.
- Morshäuser, George; and Geissler, Alfred, to Deckel Maho GmbH. Device for fixed positioning of a pallet on a work table. 5,531,005, Cl. 29-33.00P.
- Morton International, Inc.: *See—*
  - Beekman, George F.; Conroy, Gary M.; Hyde, Jeffrey R.; and Norris, Gene K., 5,532,303, Cl. 524-180.000.
  - Bybee, Steven D., 5,531,098, Cl. 73-35.170.
  - Rink, Karl K.; Beus, Glen S.; Johnson, Kelly B.; and Monk, David B., 5,531,473, Cl. 280-737.000.
- Moruzzi, James A., to Esco Technologies, Inc. Clamp release mechanism for an end finishing tool. 5,531,550, Cl. 409-179.000.
- Mosaid Technologies Incorporated: *See—*
  - Gillingham, Peter B., 5,532,955, Cl. 365-149.000.
- Moses, Donald W.; Hustig, Charles H.; Kinne, James; and Najafi, Hossein L., to Wadia Digital Corporation. Dynamic digital filter using neural networks. 5,532,950, Cl. 364-724.190.
- Moses, Paul J., Jr.: *See—*
  - Remmert, Mark A.; Oertel, Richard W.; and Moses, Paul J., Jr., 5,530,989, Cl. 16-110.00R.
- Moses, Peter R.: *See—*
  - Davis, Stuart M.; Haines, Christopher P.; Leef, Alexander A.; and Moses, Peter R., 5,532,085, Cl. 429-224.000.
- Mosior, Donald J., to Sage Products, Inc. Biohazardous waste container. 5,531,346, Cl. 220-254.000.
- Mosley, Demmie L., to Titan Specialties, Inc. Select fire gun assembly and electronic module for underground jet perforating using resistive blasting caps. 5,531,164, Cl. 102-312.000.
- Motoki, Masuji: *See—*
  - Mizukawa, Yuki; Motoki, Masuji; Sato, Tadahisa; and Takahashi, Osamu, 5,532,377, Cl. 548-262.400.
- Motorola, Inc.: *See—*
  - Adair, Gary E.; and Joyce, Paul, 5,533,119, Cl. 379-391.000.
  - Crane, Eric K.; Morgan, David E.; and Wellenstein, Neil, 5,533,097, Cl. 379-58.000.
  - D'Addeo, Michael L., 5,532,509, Cl. 257-618.000.
  - Gegner, Joel P., 5,532,919, Cl. 363-124.000.
  - Grube, Gary W.; Markison, Timothy W.; Pendleton, Matthew A.; and Rybicki, Mathew A., 5,533,008, Cl. 370-17.000.
  - Jager, Rene I.; Vizmuller, Peter; and Gimpelj, Mathias M., 5,532,651, Cl. 331-96.000.
  - Jasper, Steven C.; and Crisler, Kenneth J., 5,533,004, Cl. 370-11.000.
  - Jayapalan, Jay P., 5,533,019, Cl. 370-60.100.
  - Krenz, Eric L.; and Tammen, David J., 5,532,708, Cl. 343-795.000.
  - Kucukcakar, Kayhan; Gupta, Rajesh; and Tkacik, Thomas, 5,533,179, Cl. 395-133.000.
  - Kuffner, Stephen L.; and Krenz, Eric L., 5,532,643, Cl. 333-246.000.
  - Liberti, Joseph C., Jr.; Averst, Douglas I.; Branch, Tony R.; and Carsello, Stephen R., 5,533,062, Cl. 375-334.000.
  - Lin, Jingdong, 5,533,049, Cl. 375-222.000.
  - Mao, Zhenhau; and Newton, Dee, 5,531,920, Cl. 252-182.100.
  - Matzek, Lester T., 5,533,055, Cl. 375-286.000.
  - Nerz, John E.; Wu, Han; and Goel, Sanjay, 5,532,087, Cl. 429-248.000.
  - Racanelli, Marco; Hwang, Bor-Yuan C.; Foerstner, Juergen; and Huang, Wen-Ling M., 5,532,175, Cl. 437-29.000.
  - Tarbouriech, Jean-Claude, 5,532,899, Cl. 361-126.000.
  - Yu, Chris C.; and Yu, Tat-Kwan, 5,531,861, Cl. 156-636.100.
- Motsenbocker, Marvin A., to Takeda Chemical Industries, Ltd. Phenothiazine derivatives, their production and use. 5,532,171, Cl. 436-533.000.
- Moulinex (Societe Anonyme): *See—*
  - Bouleau, Jean-Paul A. A.; and Guillot, Gerard L. H., 5,532,455, Cl. 219-245.000.
- Mountain Safety Research: *See—*
  - Forrest, Bill, 5,531,035, Cl. 36-125.000.
- Mountjoy, Kathleen G.: *See—*
  - Cone, Roger D.; and Mountjoy, Kathleen G., 5,532,347, Cl. 536-23.500.
- Mourot, Christophe; Olivier, René; and Le Strat, Evelyne, to Alcatel Mobile Communication France. Threshold detector for digital radio transmission systems, devices comprising a threshold detector of this kind and corresponding utilization. 5,533,047, Cl. 375-208.000.
- Moving Magnet Technologies S.A.: *See—*
  - Oudet, Claude; and Prudham, Daniel, 5,532,585, Cl. 324-207.220.
- Moyers, Chester E.; and Lenz, Robert L., to Borg-Warner Automotive, Inc. Method of installing and holding cable sealing components into an outlet. 5,532,436, Cl. 174-151.000.
- MTS Systems Corporation: *See—*
  - Harvey, Dennis N.; and Jenniges, Randal L., 5,532,824, Cl. 356-375.000.
- Muacevic, Gojko: *See—*
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Mueller, Walter B., to W. R. Grace & Co.-Conn. High moisture transmission medical film. 5,532,053, Cl. 428-287.000.
- Muendel, Martin H., to Polaroid Corporation. Optical fiber structure for efficient use of pump power. 5,533,163, Cl. 385-126.000.
- Muhich, John S.: *See—*
  - Potter, Terence M.; and Muhich, John S., 5,532,947, Cl. 364-715.010.
- Mulhern, Phoebe. X-ray collimating and body shielding accessory instrument. 5,533,089, Cl. 378-150.000.
- Müller, Klaus: *See—*
  - Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.
- Muller, Klaus-Helmut: *See—*
  - Daum, Werner; Muller, Klaus-Helmut; Schwamborn, Michael; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,532,378, Cl. 548-263.800.
- Multifastener Corporation: *See—*
  - Takahashi, Takao; and Takehara, Hiroshi, 5,531,552, Cl. 411-179.000.
- Munekata, Tsutomu: *See—*
  - Saito, Yukio; Kawamura, Takumi; Okuyama, Masaki; and Munekata, Tsutomu, 5,531,431, Cl. 271-4.010.
- Murakami, Takeshi: *See—*
  - Osako, Nobutaka; Ishida, Kazutoshi; Nakai, Yasunori; and Murakami, Takeshi, 5,531,649, Cl. 474-205.000.
- Murakami, Taku, to Kabushiki Kaisha Komatsu Seisakusho. Using plasma ARC and thermite to demolish concrete. 5,532,449, Cl. 219-121.590.
- Muramatsu, Hideo: *See—*
  - Nakajima, Akio; Muramatsu, Hideo; Suzuki, Hiroyuki; and Hamano, Kanako, 5,532,841, Cl. 358-408.000.

- Muramatsu, Takayoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Rear arm pivot structure for motorcycle. 5,531,289, Cl. 180-227.000.
- Muramoto, Hidetoshi: *See—*
  - Katada, Mitsutaka; Muramoto, Hidetoshi; Fuzino, Seizi; Hattori, Tadashi; and Abe, Katsunori, 5,532,176, Cl. 437-34.000.
- Muranaka, Yasushi; Yamashita, Hisao; and Miyadera, Hiroshi, to Hitachi, Ltd. Method for producing synthetic diamond thin film, the thin film and device using it. 5,531,184, Cl. 117-108.000.
- Murano, Kazuo: *See—*
  - Shinozaki, Tadaaki; Toguchi, Manabu; Kawae, Kunihiro; and Murano, Kazuo, 5,532,822, Cl. 356-363.000.
- Murata Kikai Kabushiki Kaisha: *See—*
  - Yamamoto, Atsushi, 5,531,391, Cl. 242-35.60R.
- Murata, Makoto: *See—*
  - Onoda, Motonobu; Tsuchiya, Takeshi; Tamegai, Etsuo; Ogawa, Katsuaki; and Murata, Makoto, 5,531,195, Cl. 123-193.600.
- Murata Manufacturing Co., Ltd.: *See—*
  - Fujishima, Satoru, 5,532,541, Cl. 310-325.000.
  - Ieki, Tsutomu; and Hirano, Yasuhiko, 5,532,654, Cl. 332-102.000.
  - Koike, Jun; and Ieki, Hideharu, 5,532,537, Cl. 310-313.00A.
  - Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, 5,531,019, Cl. 29-623.500.
  - Tonegawa, Ken; Mandai, Harufumi; Tsuru, Teruhisa; Katou, Mitsuhide; and Furutani, Koji, 5,532,658, Cl. 333-246.000.
  - Yoshida, Ryuhei; and Wajima, Masaya, 5,532,542, Cl. 310-348.000.
- Murata, Osamu: *See—*
  - Tabata, Hitoshi; Murata, Osamu; Fujioka, Junzo; and Minakata, Shunichi, 5,532,504, Cl. 257-252.000.
- Muraya, Hideaki: *See—*
  - Ninomiya, Ryoji; Muraya, Hideaki; and Gunji, Shizuka, 5,532,935, Cl. 364-492.000.
- Murayama, Masami; Yoshimura, Shuji; Kawamata, Tetsuo; and Yoshioka, Atsushi, to Fujitsu Limited. Control data transmission system. 5,532,682, Cl. 340-825.060.
- Murdock, Andrew D., to Camco Drilling Group Ltd. Rotary drilling tools. 5,531,281, Cl. 175-431.000.
- Murofushi, Yoshinobu: *See—*
  - Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,532,369, Cl. 544-276.000.
- Murphy, Morgan D.: *See—*
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- Musset, Dominique: *See—*
  - Dibie, Alain; and Musset, Dominique, 5,531,788, Cl. 623-11.000.
- Muto, Hiroyasu, to NEC Corporation. Frequency error detecting device capable of correctly detecting a frequency error between a carrier frequency and a standard frequency. 5,533,068, Cl. 375-344.000.
- Muto, Masayuki: *See—*
  - Saji, Ikutaro; Muto, Masayuki; Tanno, Norihiko; and Yoshigi, Mayumi, 5,532,372, Cl. 544-368.000.
- Mutoh, Nobuyoshi: *See—*
  - Masaki, Ryoso; and Mutoh, Nobuyoshi, 5,532,571, Cl. 318-809.000.
- MXM: *See—*
  - Frechet, Patrick; Fraisse, Georges; and Charvin, Guy, 5,531,790, Cl. 623-15.000.
- Myers, James E.: *See—*
  - Asselta, John A.; Balan, Albert L.; Boyko, Stephen; and Myers, James E., 5,532,907, Cl. 361-775.000.
- Myles, Kevin M.: *See—*
  - Redey, Laszlo I.; Myles, Kevin M.; Vissers, Donald R.; and Prakash, Jai, 5,532,078, Cl. 429-104.000.
- Nabi, Nuran: *See—*
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- Nabisco, Inc.: *See—*
  - Bell, Joseph W.; Carroll, Thomas J.; and Puglia, Wayne J., 5,532,004, Cl. 426-5.000.
  - Silver, Richard S., 5,532,020, Cl. 426-604.000.
  - Spanier, Henry C.; Bungo, William M.; and Stevenson, John W., 5,532,010, Cl. 426-94.000.
- Nabuurs, Martinus W. M., to Inalfa Industries, B.V. Roof panel assembly. 5,531,501, Cl. 296-221.000.
- Nadella: *See—*
  - Labedan, Jean-Denis; and Regnier, Laurent, 5,531,526, Cl. 384-518.000.
- Nagahata, Takaya; Shirasaki, Toshiyuki; Kishimoto, Tokihiko; and Kishimoto, Yoshinobu, to Rohm Co., Ltd. Drive IC for a printing head. 5,532,723, Cl. 347-209.000.
- Nagai, Komei; Iketaki, Yoshinori; and Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Vacuum optical system. 5,533,083, Cl. 378-44.000.
- Nagano, Eiki; Takemura, Susumu; Enomoto, Masayuki; Sakaki, Masaharu; and Kizawa, Satoru, to Sumitomo Chemical Co., Ltd. Pyrimidone derivatives and their use. 5,532,208, Cl. 504-239.000.
- Nagao, Takumi: *See—*
  - Ochiai, Tameichi; Kurose, Yutaka; Nagao, Takumi; Tsukahara, Takako; and Imamura, Satoru, 5,532,342, Cl. 534-693.000.
- Nagaraj, D. R.; and Wang, Samuel S., to Cytec Technology Corp. Method of depressing non-sulfide silicate gangue minerals. 5,531,330, Cl. 209-167.000.
- Nagaraj, Krishnasawamy, to Texas Instruments Incorporated. Bipolar track and hold circuit. 5,532,629, Cl. 327-94.000.
- Nagasaka, Yoshizo; and Namiki, Takao, to Tomy Company, Ltd. Game device. 5,531,447, Cl. 273-249.000.
- Nagasawa, Yasushi; Yamashita, Satoru; and Matsudo, Masahiko, to Tokyo Electron Kabushiki Kaisha; and Tokyo Electron Yamanashi Kabushiki Kaisha. Probe needle. 5,532,613, Cl. 324-761.000.
- Nagashima, Motoyasu: *See—*
  - Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
- Nagasu, Akira; Yamamoto, Yoshimi; Tobita, Tomoyuki; and Onose, Toshihiro, to Hitachi, Ltd. Compact differential pressure transmitter having first and second damper chambers. 5,531,120, Cl. 73-706.000.
- Nagasuna, Kinya: *See—*
  - Yano, Kazutaka; Kajikawa, Katsuhiro; Nagasuna, Kinya; and Irie, Yoshio, 5,532,323, Cl. 525-384.000.
- Nagata, Shinichi, to New Oji Paper Co. Ltd. Dielectric constant measuring method and apparatus. 5,532,604, Cl. 324-636.000.
- Nagata, Wataru: *See—*
  - Inuzuka, Eiji; Oguri, Shigehisa; Suzuki, Kouji; Nagata, Wataru; and Hiruma, Yasushi, 5,532,607, Cl. 324-750.000.
- Naghshineh, Mahmoud: *See—*
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- Nagoshi, Mitsuru: *See—*
  - Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, 5,532,809, Cl. 355-308.000.
- Nagura, Koji: *See—*
  - Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,532,551, Cl. 313-533.000.
- Nahar, Rathindra, to AT&T Global Information Solutions Company. Check-out counter gap filler. 5,531,293, Cl. 186-59.000.
- Naiki, Mitsuru; Takeoka, Yuichi; and Suehiro, Seishi, to Nippon Zoki Pharmaceutical Co., Ltd. Furanone derivatives for the suppression or treatment of autoimmune diseases. 5,532,271, Cl. 514-473.000.
- Naimpally, Saiprasad V., to Matsushita Electric Corporation of America. Hybrid analog/digital television transmission system. 5,532,748, Cl. 348-432.000.
- Nair, Mridula; Lobo, Lloyd A.; and Oltean, George L., to Eastman Kodak Company. Haze-free transparent film-forming aqueous coating compositions for magnetic recording layers. 5,531,913, Cl. 252-62.530.
- Naito, Yushi: *See—*
  - Suzuki, Shigeaki; and Naito, Yushi, 5,533,121, Cl. 379-410.000.
- Najafi, Hossein L.: *See—*
  - Moses, Donald W.; Hustig, Charles H.; Kinne, James; and Najafi, Hossein L., 5,532,950, Cl. 364-724.190.
- Najmon, Ralph L.: *See—*
  - Hall, Arthur, III; and Najmon, Ralph L., 5,531,652, Cl. 475-36.000.
- Nakada, Tatsuo; and Aoyama, Hirokazu, to Daikin Industries Ltd. Method of producing 1,1,1,2,3,3,-hexafluoropropane and tetrafluorochloropropene. 5,532,418, Cl. 570-166.000.
- Nakagaki, Harushige; Sugimura, Naozumi; Arai, Takao; and Ohara, Yasunori, to Hitachi, Ltd. Tracking control in apparatus for fast reproducing digital information signal from magnetic tape. 5,532,835, Cl. 358-335.000.
- Nakagami, Hiroshi: *See—*
  - Ishino, Tsutomu; Maruyama, Ryoichi; Nakagami, Hiroshi; and Asada, Hisao, 5,531,304, Cl. 192-4.00R.
- Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, to Minolta Camera Kabushiki Kaisha. Charging device having a plate electrode and a cleaning device for cleaning edges of the plate electrode. 5,532,798, Cl. 355-221.000.
- Nakagawa, Shiro: *See—*
  - Tsuchida, Atsuko; and Nakagawa, Shiro, 5,531,097, Cl. 73-29.020.
- Nakagawa, Toshiko: *See—*
  - Arimura, Maki; Akiyama, Daisaku; and Nakagawa, Toshiko, 5,532,094, Cl. 252-79.100.
- Nakagawara, Chikashi, to Kabushiki Kaisha Toshiba. Variable gain amplifying circuit. 5,532,644, Cl. 330-254.000.
- Nakagome, Yoshinobu: *See—*
  - Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.
- Nakahara, Toshitsugu: *See—*
  - Miyabe, Kanji; Orita, Nobuhiro; Iwasaki, Makoto; Tsurumaru, Yohka; and Nakahara, Toshitsugu, 5,531,901, Cl. 210-668.000.
- Nakai, Yasunori: *See—*
  - Osako, Nobutaka; Ishida, Kazutoshi; Nakai, Yasunori; and Murakami, Takeshi, 5,531,649, Cl. 474-205.000.
- Nakaizumi, Kazuo: *See—*
  - Tsujide, Tohru; Hishii, Toshiyasu; and Nakaizumi, Kazuo, 5,532,610, Cl. 324-757.000.
- Nakajima, Akio; Muramatsu, Hideo; Suzuki, Hiroyuki; and Hamano, Kanako, to Minolta Camera Kabushiki Kaisha. Facsimile apparatus comprising a plurality of image reading units. 5,532,841, Cl. 358-408.000.
- Nakajima, Hideo: *See—*
  - Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
- Nakajima, Yasuhisa: *See—*
  - Sakai, Yuji; and Nakajima, Yasuhisa, 5,532,762, Cl. 348-738.000.
- Nakajima, Yasuo: *See—*

  - Shimamune, Takayuki; and Nakajima, Yasuo, 5,531,875, Cl. 204-290.00R.
- Nakajima, Yoshinobu: *See—*
  - Kumeji, Yasushi; Nishimura, Seiichi; Nakajima, Yoshinobu; and Itou, Makoto, 5,532,662, Cl. 333-185.000.
- Nakakura, Toshiyuki: *See—*
  - Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misao; Kishi, Satoru; and Maruko, Chiaki, 5,532,054, Cl. 428-294.000.
- Nakamichi Corporation: *See—*
  - Nakamichi, Niro, 5,532,985, Cl. 369-34.000.
  - Sakiyama, Kazuhiro, 5,532,986, Cl. 369-36.000.
- Nakamichi, Niro, to Nakamichi Corporation. Disk player with magazine. 5,532,985, Cl. 369-34.000.
- Nakamura, Hiromu: *See—*
  - Shibata, Etsuko; and Nakamura, Hiromu, 5,532,866, Cl. 359-216.000.
- Nakamura, Hiroyuki: *See—*
  - Aikoh, Hideki; Takashima, Makoto; Nakamura, Hiroyuki; and Nakamura, Tohru, 5,532,999, Cl. 369-120.000.
- Nakamura, Jun, to Mazda Motor Corporation. Method of and apparatus for assembling work unit. 5,531,013, Cl. 29-436.000.
- Nakamura, Kiyoshi: *See—*
  - Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, 5,532,569, Cl. 318-802.000.
- Nakamura, Makoto, to Nissan Motor Co., Ltd. Intake and exhaust valve control of internal combustion engine. 5,531,193, Cl. 123-90.150.
- Nakamura, Masayoshi; and Ikeda, Hiroki, to Sumitomo Wiring Systems, Ltd. Fitting construction of electrical connection box. 5,531,345, Cl. 220-3.800.
- Nakamura, Mitsuo: *See—*
  - Kageyama, Hironobu; and Nakamura, Mitsuo, 5,532,914, Cl. 363-50.000.
- Nakamura, Shin-ichi: *See—*
  - Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, 5,532,088, Cl. 430-4.000.
- Nakamura, Takeshi, to NEC Corporation. Semiconductor device having wiring take-out cells. 5,532,501, Cl. 257-208.000.
- Nakamura, Tohru: *See—*
  - Aikoh, Hideki; Takashima, Makoto; Nakamura, Hiroyuki; and Nakamura, Tohru, 5,532,999, Cl. 369-120.000.
- Nakamura, Toshiyuki: *See—*
  - Soshi, Isao; Miyamoto, Hidenori; and Nakamura, Toshiyuki, 5,532,775, Cl. 354-106.000.
- Nakamura, Yoshiyuki: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Nakane, Kazuhiko: *See—*
  - Fujita, Teruo; Karaki, Morihiro; Irie, Mitsuru; and Nakane, Kazuhiko, 5,532,987, Cl. 369-44.240.
- Nakanishi, Tetsuo; Asai, Mitsuo; Ohata, Hiroyuki; and Uchida, Keiichi, to Shin-Etsu Chemical Co., Ltd.; and Nissin Chemical Industry Co., Ltd. Flame retardant composition and method for use in synthetic thermoplastic resins. 5,532,302, Cl. 524-143.000.
- Nakano, Tadashi; Sato, Nobuyoshi; Ohta, Tomohiro; and Yamamoto, Hiroshi, to Kawasaki Steel Corporation. Method of chemical mechanical polishing planarization of an insulating film using an etching stop. 5,532,191, Cl. 437-228.000.
- Nakano, Tadayoshi, to NEC Corporation. Computer system comprising a plurality of terminal computers capable of backing up one another on occurrence of a fault. 5,533,191, Cl. 395-182.090.
- Nakano, Teruyuki, to Kabushiki Gaisba Ishii Hyoki. Apparatus for carrying extra-thin printed boards, etc.. 5,531,315, Cl. 198-779.000.
- Nakano, Yoshifumi: *See—*
  - Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
- Nakao, Munehiro: *See—*
  - Miwa, Tetsuyuki; Nakao, Munehiro; Suzuki, Nobuo; and Kato, Koki, 5,532,769, Cl. 351-205.000.
- Nakao, Tohru; Ono, Yuji; Bougauchi, Masahiro; and Morimoto, Yasuto, to Yoshitomi Pharmaceutical Industries, Ltd. Condensed thiophene compound and pharmaceutical use thereof. 5,532,240, Cl. 514-254.000.
- Nakase, Ryoichi; and Ozawa, Shigeyuki, to Sanshin Kogyo Kabushiski Kaisha. Control device for marine propulsion unit engine. 5,531,619, Cl. 440-1.000.
- Nakase, Ryoichi: *See—*
  - Ozawa, Shigeyuki; and Nakase, Ryoichi, 5,531,620, Cl. 440-89.000.
- Nakasugi, Mikio, to Canon Kabushiki Kaisha. Scanner motor with ceramic sleeve bearing. 5,532,729, Cl. 347-257.000.
- Nakata, Hiroyuki: *See—*
  - Taniuchi, Osamu; Okumura, Hitoshi; Kawase, Hajime; Nankoh, Youichi; and Nakata, Hiroyuki, 5,531,605, Cl. 439-157.000.
- Nakata, Kiyoshi: *See—*
  - Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, 5,532,569, Cl. 318-802.000.
- Nakata, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. CAD/CAM system and method of generating machining paths for the same. 5,532,933, Cl. 364-474.240.
- Nakata, Takuya; Iwase, Hiroyuki; and Miyamoto, Hiromu, to Yamaha Corporation. Automatic performance device having a function to optionally add a phrase performance during an automatic performance. 5,532,425, Cl. 84-609.000.
- Nakatsuji, Masahiro; and Suzuki, Kenzaburo, to Nikon Corporation. Zoom lens utilizing inner focus system. 5,532,881, Cl. 359-684.000.
- Nakauchi, Norio: *See—*
  - Ishikawa, Hiroshi; Furukawa, Hideo; Shimizu, Masatoshi; and Nakauchi, Norio, 5,531,654, Cl. 477-120.000.
- Nakaya, Michihiko: *See—*
  - Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.
- Nakaya, Teruomi: *See—*
  - Okamoto, Osamu; and Nakaya, Teruomi, 5,531,957, Cl. 419-8.000.
- Nakayama, Hideo: *See—*
  - Fukunaga, Hideki; Yasukawa, Kaoru; Nakayama, Hideo; Ueki, Nobuaki; Otoma, Hiromi; and Fuse, Mario, 5,533,042, Cl. 372-50.000.
- Nakayama, Hisayuki; Kimoto, Akihiro; and Tsuchino, Kuniko, to Senju Pharmaceutical Co., Ltd. Method for stabilizing an agent for contact lenses. 5,531,917, Cl. 510-114.000.
- Nakayama, Koichi: *See—*
  - Kojima, Shinji; and Nakayama, Koichi, 5,531,172, Cl. 112-260.000.
- Nakayama, Masaaki: *See—*
  - Kusaka, Hiroya; Sakaguchi, Takashi; and Nakayama, Masaaki, 5,532,742, Cl. 348-264.000.
- Nakayama, Motohiro: *See—*
  - Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, 5,532,051, Cl. 428-217.000.
- Nakayama, Toyoo; Taira, Seizo; Kawamura, Hiroyuki; Shibuya, Masaoki; and Iwaki, Masahiro, to Torii & Co., Ltd. Amidinonaphthyl furancarboxylate derivatives and acid addition salts therof. 5,532,267, Cl. 514-467.000.
- Nakazato, Koji: *See—*
  - Shigematsu, Masayuki; Nakazato, Koji; Kashiwada, Tomonori; and Nishimura, Masayuki, 5,532,870, Cl. 359-341.000.
- Nakazawa, Kiyoshi: *See—*
  - Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
- Nalco Limited: *See—*
  - Williams, Paul J.; and Tolkien, Susan, 5,531,907, Cl. 210-727.000.
- Namiki, Takao: *See—*
  - Nagasaka, Yoshizo; and Namiki, Takao, 5,531,447, Cl. 273-249.000.
- Namiki, Tomizo; Suzuki, Tamotsu; and Miyata, Yukihide, to Fuji Photo Film Co., Ltd. Image forming device and method for transferring ink using a heated pneumatic drum. 5,532,722, Cl. 347-153.000.
- Nankoh, Youichi: *See—*
  - Taniuchi, Osamu; Okumura, Hitoshi; Kawase, Hajime; Nankoh, Youichi; and Nakata, Hiroyuki, 5,531,605, Cl. 439-157.000.
- Narayan, Thirumurti; and Hicks, Steven, to BASF Corporation. Water-blown polyurethane sealing devices and compositions for producing same. 5,532,285, Cl. 521-159.000.
- Narayan, Thirumurti; and Hicks, Steven, to BASF Corporation. Water-blown polyurethane sealing devices and compositions for producing same. 5,532,403, Cl. 560-26.000.
- Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., to Medical Scientific, Inc.; and Ethicon Endo-Surgery. Alternative current pathways for bipolar surgical cutting tool. 5,531,744, Cl. 606-48.000.
- Narikawa, Shiro; Tanaka, Hirokazu; Honda, Iwakazu; Oikawa, Tomohiro; and Ando, Hiroe, to Sharp Kabushiki Kaisha. Image forming apparatus. 5,532,796, Cl. 355-210.000.
- Narita, Ryoichi: *See—*
  - Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, 5,532,910, Cl. 361-813.000.
- Nash, John E.: *See—*
  - Kensey, Kenneth; Meikle, James, Jr.; Clupper, Harold; and Nash, John E., 5,531,757, Cl. 606-185.000.
  - Kensey, Kenneth; Nash, John E.; and Evans, Douglas, 5,531,759, Cl. 606-213.000.
- Nashimoto, Ryuuzoh: *See—*
  - Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.
- Nasu, Makoto: *See—*
  - Maruyama, Eiki; Nasu, Makoto; Misawa, Yoshisada; and Takeda, Soichi, 5,531,153, Cl. 99-327.000.
- National Aerospace Laboratory of Science & Technology Agency: *See—*
  - Okamoto, Osamu; and Nakaya, Teruomi, 5,531,957, Cl. 419-8.000.
- National Computer Systems, Inc.: *See—*
  - Clark, Jay V., 5,531,429, Cl. 270-58.110.
- National Instruments Corporation: *See—*
  - Shah, Jaffar; Ilic, Kosta; Peck, Joseph E.; and Wang, Zu-Yi, 5,533,037, Cl. 371-62.000.
- National Semiconductor Corporation: *See—*
  - Adkins, Kenneth C., 5,532,653, Cl. 331-143.000.
  - Cripps, Peter K., 5,533,056, Cl. 375-286.000.

  - DeJager, Gregory L.; and Swenson, Erik R., 5,533,018, Cl. 370-60.100.
  - Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., 5,533,123, Cl. 380-4.000.
- National Starch and Chemical Investment Holding Corporation: *See—*
  - Kauffman, Thomas F.; Sharak, Matthew L.; and Schmidt, Robert C., Jr., 5,532,306, Cl. 524-274.000.
  - Koubek, Timothy C.; Puletti, Paul P.; and Wieczorek, Joseph, Jr., 5,532,300, Cl. 524-47.000.
  - Wilkerson, John M., III; Verstrat, Daniel W.; and Barron, Milagros C., 5,532,036, Cl. 428-96.000.
- Natsumi, Fumiaki: *See—*
  - Iwai, Takao; Ikemoto, Kimikazu; Yanagisawa, Taminori; Natsumi, Fumiaki; and Shiraki, Toshiro, 5,532,450, Cl. 219-121.630.
- Nawata, Katsumi; Ushijima, Fumihiro; Taguchi, Toshiyuki; and Inagaki, Hazime, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Measuring apparatus for a component contained in exhalation. 5,531,225, Cl. 128-719.000.
- NDM, Inc.: *See—*
  - Cartmell, James V.; Sturtevant, Wayne R.; Wolf, Michael L.; and Allaire, Michael J., 5,531,999, Cl. 424-445.000.
- Nealey, Richard H.: *See—*
  - Markovics, James M.; and Nealey, Richard H., 5,532,103, Cl. 430-131.000.
- Nealy, Robert B. Quick disconnect leash for surfboard and the like. 5,531,622, Cl. 441-75.000.
- Neau, Eugene L.: *See—*
  - Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., 5,532,495, Cl. 250-492.210.
- NEC Corporation: *See—*
  - Fujihara, Shiro, 5,532,949, Cl. 364-715.080.
  - Hori, Tsuguo, 5,533,057, Cl. 375-295.000.
  - Ichihara, Masaki, 5,533,064, Cl. 375-340.000.
  - Itaki, Yohichi, 5,532,764, Cl. 348-745.000.
  - Kikuchi, Hirofumi, 5,533,095, Cl. 379-57.000.
  - Kogure, Yoshikazu, 5,532,478, Cl. 250-227.240.
  - Kondo, Hisashi, 5,532,683, Cl. 340-825.030.
  - Kudoh, Kazuhiro, 5,532,688, Cl. 340-825.440.
  - Muto, Hiroyasu, 5,533,068, Cl. 375-344.000.
  - Nakamura, Takeshi, 5,532,501, Cl. 257-208.000.
  - Nakano, Tadayoshi, 5,533,191, Cl. 395-182.090.
  - Ninomiya, Kazuhisa; and Sato, Toshiya, 5,532,959, Cl. 365-185.300.
  - Okamura, Hitoshi; and Ohkawa, Shin-Ichi, 5,532,500, Cl. 257-207.000.
  - Okunaga, Kazuo, 5,532,640, Cl. 327-537.000.
  - Owada, Junichi, 5,533,024, Cl. 370-84.000.
  - Senda, Yuzo, 5,532,745, Cl. 348-405.000.
  - Takahashi, Satoshi, 5,532,685, Cl. 340-825.460.
  - Takai, Kenichi, 5,532,642, Cl. 330-15.000.
  - Tamagawa, Akio, 5,532,916, Cl. 363-62.000.
  - Tsuda, Hiroki, 5,533,059, Cl. 375-327.000.
  - Tsujide, Tohru; Hishii, Toshiyasu; and Nakaizumi, Kazuo, 5,532,610, Cl. 324-757.000.
  - Yasuzato, Tadao; Nozue, Hiroshi; and Shiraki, Seiichi, 5,532,497, Cl. 250-548.000.
- NEC Corporaton: *See—*
  - Kawai, Shuichi, 5,532,633, Cl. 327-174.000.
- NEC Research Institute, Inc.: *See—*
  - Li, Yao; Linke, Richard A.; Lyuu, Yuh-Dauh; Kasahara, Kenichi; Kawai, Shigeru; and Kubota, Keiichi, 5,532,856, Cl. 359-118.000.
- Neeco, Inc.: *See—*
  - Needham, Donald G., 5,532,282, Cl. 521-93.000.
- Needham, Donald G., to Neeco, Inc. Polyolefin-based composition for rotational molding. 5,532,282, Cl. 521-93.000.
- Neef, Gunter; Kirsch, Gerald; Stein-Eyer, Andreas; Schwarz, Katica; Bräutigam, Matthias; Thieroff-Ekerdt, Ruth; and Rach, Petra, to Schering Aktiengesellschaft. Side-chain homologous vitamin D derivatives, process for their production, pharmaceutical preparations containing these derivatives and their use as pharmaceutical agents. 5,532,228, Cl. 514-167.000.
- Neel, Ludovic: *See—*
  - L'Hernault, Claude; and Neel, Ludovic, 5,532,196, Cl. 501-128.000.
- Neely, William G.: *See—*
  - Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., 5,532,035, Cl. 428-95.000.
- Neeves, Arthur E.: *See—*
  - Barberio, Yvonne L.; Engelberth, Jon W.; and Neeves, Arthur E., 5,533,155, Cl. 385-30.000.
- Negus, Kevin J.: *See—*
  - Nguyen, Nhat M.; and Negus, Kevin J., 5,532,655, Cl. 333-1.000.
- Nelson, Randall S.: *See—*
  - Kroll, Mark W.; Nelson, Randall S.; and Adams, Theodore P., 5,531,766, Cl. 607-5.000.
- NEMATEL Dr, R. Eidenshink: *See—*
  - Kreuzer, Markus; and Eidenschink, Rudolf, 5,532,952, Cl. 365-108.000.
- Nerz, John E.; Wu, Han; and Goel, Sanjay, to Motorola, Inc. Electrochemical cell. 5,532,087, Cl. 429-248.000.
- Neste Oy: *See—*
  - Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.
- Nestor Martin S.A.: *See—*
  - Berlaimont, Claude, 5,531,213, Cl. 126-193.000.
- Nething, Jean-Pierre: *See—*
  - Gübitz, Franz; Nething, Jean-Pierre; and Schremmer, Mathias, 5,532,065, Cl. 428-480.000.
- Nettekoven, William S.; and Steckel, Eric S., to MegaDyne Medical Products, Inc. Resposable electrode. 5,531,743, Cl. 606-41.000.
- Netterville, James L.; and Hissong, James B., to Xomed, Inc. Vocal cord medialization tool. 5,531,752, Cl. 606-99.000.
- Neu, Daniel W.: *See—*
  - Colburn, Eric R.; Fedor, Max A.; Gillio, Robert G.; and Neu, Daniel W., 5,533,079, Cl. 377-6.000.
- New England Biolabs, Inc.: *See—*
  - Xu, Shuang-yong; and Xiao, Jianping, 5,532,153, Cl. 435-199.000.
- New Holland North America, Inc.: *See—*
  - Berger, John G.; Priepke, Edward H.; and Torland, Peter J., 5,531,070, Cl. 60-327.000.
  - Olson, Daniel E.; Sokol, David G.; and Walker, Kevin, 5,532,673, Cl. 340-450.200.
- New Oji Paper Co. Ltd.: *See—*
  - Nagata, Shinichi, 5,532,604, Cl. 324-636.000.
- New York University: *See—*
  - Barnwell, John W., 5,532,133, Cl. 435-7.220.
  - Lee-Huang, Sylvia; Huang, Philip L.; Chen, Hao-chia; Kung, Hsiang-fu; Huang, Peter; Huang, Henry I.; and Huang, Paul L., 5,532,214, Cl. 214-2.000.
  - Schlessinger, Joseph, 5,532,123, Cl. 435-6.000.
- Newcomb, Elliott S. Toy simulated hot-air balloon. 5,531,401, Cl. 244-31.000.
- Newell Operating Company: *See—*
  - Kuhar, Otto, 5,531,257, Cl. 160-168.100.
- Newington, Ian M.; Parr, Kevin J.; Bowman, Patricia I.; and McCue, Karen A., to Reckitt & Colman Inc. Antimicrobial polymers and compositions containing them. 5,532,290, Cl. 523-122.000.
- Newport, Anthony: *See—*
  - Brun, Charles J., Jr.; Bercot, Dwayne; and Newport, Anthony, 5,531,588, Cl. 425-556.000.
- Newton, Dee: *See—*
  - Mao, Zhenhau; and Newton, Dee, 5,531,920, Cl. 252-182.100.
- Ng, Ricky C.; and McPherson, Thurman W., II, to Mobil Oil Corporation. Low temperature underwater epoxy system for zone isolation, remedial cementing, and casing repair. 5,531,272, Cl. 166-277.000.
- NGK Insulators, Ltd.: *See—*
  - Kondo, Tomoharu; Ogawa, Masato; and Noda, Keiji, 5,533,167, Cl. 392-485.000.
  - Miyamoto, Yasuhiro; Ishihara, Toshiaki; and Uda, Minoru, 5,531,864, Cl. 162-199.000.
  - Ohashi, Tsuneaki; Tsuno, Nobuo; and Kurokawa, Teruhisa, 5,531,837, Cl. 148-280.000.
- Ngo, David D., to Amoco Corporation. Photoimageable polyimide coating. 5,532,110, Cl. 430-275.100.
- Ngo, Tuan V.; and Barnett, Raymond E., to VTC Inc. Active pull-down write driver for three-terminal inductive load. 5,532,631, Cl. 327-110.000.
- Nguyen, Nhat M.; and Negus, Kevin J., to Hewlett-Packard Company. Method and apparatus for AC/DC signal multiplexing. 5,532,655, Cl. 333-1.000.
- Nguyen-Ba, Nghe: *See—*
  - Belleau, Bernard, deceased; and Nguyen-Ba, Nghe, 5,532,246, Cl. 514-274.000.
- Ni, Chen C.: *See—*
  - Hansen, Robert J.; Ni, Chen C.; and Fitzpatrick, Hugh M., 5,532,979, Cl. 367-106.000.
- Nicholls, Curtis W.: *See—*
  - Wright, Paul G.; Nicholls, Curtis W.; and McDonald, Clifford L., Jr., 5,531,961, Cl. 422-80.000.
- Nickias, Peter N.: *See—*
  - Rosen, Robert K.; Nickias, Peter N.; Devore, David D.; Stevens, James C.; and Timmers, Francis J., 5,532,394, Cl. 556-11.000.
- Nicklas, Michael H.; and Gerics, Louis J. Solar energy concentrating system having an automatic safety means. 5,531,216, Cl. 126-599.000.
- Nicolini, Claudio F.: *See—*
  - Mallon, Charles B.; Harvey, James R.; and Nicolini, Claudio F., 5,531,914, Cl. 252-62.540.
- Nidek Co., Ltd.: *See—*
  - Fujieda, Masanao; Yano, Nobuyuki; Mimura, Yoshiaki; and Isogai, Naoki, 5,532,772, Cl. 351-211.000.
  - Miwa, Tetsuyuki; Nakao, Munehiro; Suzuki, Nobuo; and Kato, Koki, 5,532,769, Cl. 351-205.000.
- Nielsen, Brian T. K.; and Miller, Ronald M., Sr., to Aerosonic Corporation. Transponder squawk calibration. 5,532,698, Cl. 342-120.000.
- Nielsen, Flemming E.: *See—*
  - Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, 5,532,236. Cl. 514-228.500.
- Nielsen, Per M.: *See—*
  - Pedersen, Hanne H.; Olsen, Hans S.; and Nielsen, Per M., 5,532,007. Cl. 426-56.000.
- Niemi, Timo: *See—*
  - Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.
- Nigborowicz, John J.: *See—*

  - Hailey, James E.; and Nigborowicz, John J., 5,532,832, Cl. 358-335.000.
- Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
  - Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, 5,532,063, Cl. 428-446.000.
- Nii, Nobuhiko: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Niidoi, Hideo, to Tecno Wasino Co., Ltd. NC loader for NC machine tool. 5,531,144, Cl. 82-127.000.
- Niitsu, Chiyomi: *See—*
  - Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,532,116, Cl. 430-331.000.
- Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, to Kawasaki Steel Corporation. Sheet crown control method and rolling equipment line for endless rolling. 5,531,089, Cl. 72-241.800.
- Nikema S.r.l.: *See—*
  - Adamo, Giuseppe, 5,531,142, Cl. 81-434.000.
- Nikkei Techno-Research Co., Ltd.: *See—*
  - Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, 5,532,721, Cl. 347-112.000.
- Nikon Corporation: *See—*
  - Fukino, Kunihiro, 5,532,883, Cl. 359-825.000.
  - Goto, Tetsuro; Katayama, Akira; and Hasuda, Masanori, 5,532,785, Cl. 354-430.000.
  - Hayashi, Itoe, 5,532,879, Cl. 359-661.000.
  - Kusaka, Yosuke, 5,532,783, Cl. 354-402.000.
  - Matsumoto, Hiroyuki; and Niwa, Tatsuo, 5,532,984, Cl. 369-13.000.
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,532,776, Cl. 354-106.000.
  - Mizutani, Shinji, 5,532,091, Cl. 430-22.000.
  - Mori, Ryuichi; Goto, Tetsuo; and Nishioka, Sunao, 5,532,782, Cl. 354-402.000.
  - Nakatsuji, Masahiro; and Suzuki, Kenzaburo, 5,532,881, Cl. 359-684.000.
  - Nishimura, Hitoshi; and Owashi, Masao, 5,532,784, Cl. 354-410.000.
  - Sakamoto, Shinobu; and Fujino, Takeshi, 5,532,872, Cl. 359-384.000.
  - Shinozaki, Tadaaki; Toguchi, Manabu; Kawae, Kunihiro; and Murano, Kazuo, 5,532,822, Cl. 356-363.000.
  - Soshi, Isao; Miyamoto, Hidenori; and Nakamura, Toshiyuki, 5,532,775, Cl. 354-106.000.
  - Suenaga, Yutaka; and Hayashi, Itoe, 5,532,878, Cl. 359-657.000.
  - Utagawa, Ken; and Kusaka, Yosuke, 5,532,781, Cl. 354-402.000.
- Nilsson, Kurt. Enzymatic method for synthesis of carbohydrates. 5,532,147, Cl. 435-100.000.
- Ninomiya, Kazuhisa; and Sato, Toshiya, to NEC Corporation. Electrically erasable and programmable read only memory device equipped with inspection circuit for threshold levels of memory cells. 5,532,959, Cl. 365-185.300.
- Ninomiya, Naohisa: *See—*
  - Sawai, Kiichi; Mitani, Takahiko; Ninomiya, Naohisa; and Ishiwata, Yoshirou, 5,532,272, Cl. 514-492.000.
- Ninomiya, Ryoji; Muraya, Hideaki; and Gunji, Shizuka, to Kabushiki Kaisha Toshiba. Electronic device capable of automatically controlling power assumption of components employed in accordance with operating time period by user. 5,532,935, Cl. 364-492.000.
- Nippon Light Metal Company, Ltd.: *See—*
  - Asano, Kazuo; Masuda, Koji; Kusano, Takuo; and Ebihara, Ken, 5,532,721, Cl. 347-112.000.
- Nippon Paint Co., Ltd.: *See—*
  - Matsumura, Akira; Ohata, Masashi; and Seio, Mamoru, 5,531,881, Cl. 204-507.000.
  - Tsuboniwa, Noriyuki; Urano, Satoshi; Tsuge, Otohiko; and Hatta, Taizo, 5,532,360, Cl. 544-68.000.
  - Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, 5,532,376, Cl. 548-263.200.
- Nippon Piston Ring Co., Ltd.: *See—*
  - Onoda, Motonobu; Tsuchiya, Takeshi; Tamegai, Etsuo; Ogawa, Katsuaki; and Murata, Makoto, 5,531,195, Cl. 123-193.600.
- Nippon Shokubai Co., Ltd.: *See—*
  - Yano, Kazutaka; Kajikawa, Katsuhiro; Nagasuna, Kinya; and Irie, Yoshio, 5,532,323, Cl. 525-384.000.
- Nippon Soda Co., Ltd.: *See—*
  - Sasaoka, Seiji; Aoki, Izuo; and Maruyama, Hiroshi, 5,532,008, Cl. 426-73.000.
- Nippon Steel Corporation: *See—*
  - Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, 5,532,051, Cl. 428-217.000.
- Nippon Steel Semiconductor Corporation: *See—*
  - Hardee, Kim C.; and Cordoba, Michael V., 5,532,618, Cl. 326-63.000.
- Nippon Telegraph and Telephone Corporation: *See—*
  - Kuriki, Makoto; Uehira, Kazutake; Takahashi, Yukio; and Sakai, Shigenobu, 5,532,736, Cl. 348-20.000.
- Nippon Thompson Co., Ltd.: *See—*
  - Ochiai, Isao; and Satou, Osamu, 5,531,521, Cl. 384-15.000.
- Nippon Yakin Kogyo Co., Ltd.: *See—*
  - Okato, Nobuyoshi; Katagiri, Tatsuo; Osada, Kuniaki; and Shirakawa, Keiji, 5,532,460, Cl. 219-621.000.
- Nippon Zeon Co., Ltd.: *See—*
  - Asahara, Itsuo; and Takematsu, Minoru, 5,532,319, Cl. 525-89.000.
  - Oie, Masayuki; Kawata, Shoji; Yamada, Takamasa; and Ikeda, Shinya, 5,532,107, Cl. 430-192.000.
- Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
  - Naiki, Mitsuru; Takeoka, Yuichi; and Suehiro, Seishi, 5,532,271, Cl. 514-473.000.
- Nippondenso Co., Ltd.: *See—*
  - Fukanuma, Tetsuhiko; Goto, Kunifumi; Tsumagari, Yuichi; and Iwanami, Shigeki, 5,531,579, Cl. 418-55.200.
  - Hosoe, Katsuharu; and Yamamoto, Toshihisa, 5,531,200, Cl. 123-417.000.
  - Katada, Mitsutaka; Muramoto, Hidetoshi; Fuzino, Seizi; Hattori, Tadashi; and Abe, Katsunori, 5,532,176, Cl. 437-34.000.
  - Okamoto, Yoshiyuki; Horiuchi, Yasuhiro; Yamada, Kouichi; Yamaguchi, Kazuhiko; and Sugi, Hidekuni, 5,531,111, Cl. 73-149.000.
  - Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, 5,532,910, Cl. 361-813.000.
  - Takemoto, Tsuyoshi; Hisanaga, Shigeru; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, 5,531,578, Cl. 418-55.100.
  - Tatsuya, Hirata, 5,532,692, Cl. 340-825.540.
- Nisbet, John J.: *See—*
  - Khoury, George; Beards, Ronald D.; and Nisbet, John J., 5,532,637, Cl. 327-359.000.
- Nisca Corporation: *See—*
  - Kagami, Yuichi; and Kanda, Takashi, 5,532,844, Cl. 358-468.000.
- Nishida, Hiroshi: *See—*
  - Kodama, Kouji; Nishida, Hiroshi; Amano, Hideaki; and Matsushita, Toshio, 5,532,563, Cl. 318-440.000.
- Nishida, Makoto: *See—*
  - Hattori, Tatsuya; Nishida, Makoto; Oshima, Masuji; and Yoshida, Hiroyuki, 5,532,929, Cl. 364-431.070.
- Nishii, Kanji: *See—*
  - Fukui, Atsushi; Nishii, Kanji; Takamoto, Kenji; and Ito, Masami, 5,532,823, Cl. 356-364.000.
- Nishii, Kouta: *See—*
  - Kimura, Kouichi; Nishii, Kouta; and Ishizuka, Masanobu, 5,531,950, Cl. 264-135.000.
- Nishii, Michiharu; Toda, Hiroshi; Kusano, Akihito; and Noda, Yoshiki, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake system for vehicle. 5,531,514, Cl. 303-116.100.
- Nishijima, Shigetoshi: *See—*
  - Hirose, Toshiyuki; Nishijima, Shigetoshi; Yamamoto, Yohzoh; Kawachi, Hideshi; and Tsugawa, Michio, 5,532,030, Cl. 428-35.700.
- Nishikawa, Katuhiko; Ikeda, Hiroya; Hirai, Hidenori; and Ogawa, Yoshio, to Sony Corporation. Color video signal detector and color video signal detecting method. 5,532,756, Cl. 348-630.000.
- Nishikawa, Tomoyuki; and Saito, Yoshimi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Sheet feed mechanism with control for advancement and retraction of paper. 5,532,811, Cl. 355-316.000.
- Nishimura, Hitoshi; and Owashi, Masao, to Nikon Corporation. Eye-gaze detecting adapter. 5,532,784, Cl. 354-410.000.
- Nishimura, Masayuki: *See—*
  - Shigematsu, Masayuki; Nakazato, Koji; Kashiwada, Tomonori; and Nishimura, Masayuki, 5,532,870, Cl. 359-341.000.
- Nishimura, Seiichi: *See—*
  - Kumeji, Yasushi; Nishimura, Seiichi; Nakajima, Yoshinobu; and Itou, Makoto, 5,532,662, Cl. 333-185.000.
- Nishimura, Tetsuharu: *See—*
  - Ishizuka, Koh; and Nishimura, Tetsuharu, 5,532,819, Cl. 356-356.000.
- Nishio, Azuma: *See—*
  - Suzuki, Toshimitsu; and Nishio, Azuma, 5,532,380, Cl. 548-327.500.
- Nishio, Takeyoshi: *See—*
  - Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
- Nishioka, Sunao: *See—*
  - Mori, Ryuichi; Goto, Tetsuo; and Nishioka, Sunao, 5,532,782, Cl. 354-402.000.
- Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, to Nippon Steel Corporation. Steel sheet excellent in coating sharpness, defect-formation resistance and workability. 5,532,051, Cl. 428-217.000.
- Nishiyama, Haruo: *See—*
  - Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, 5,532,794, Cl. 355-208.000.
- Nishiyama, Shigeru; Hayashi, Yasuhiro; and Yamane, Naoki, to Mita Industrial Co., Ltd. Powder filling apparatus and a method for filling a container with powder. 5,531,253, Cl. 141-90.000.
- Nishizato, Hiroshi: *See—*
  - Sivaramakrishnam, Visweswaren; Nishizato, Hiroshi; Zhao, Jun; and Yokoyama, Ichiro, 5,531,183, Cl. 117-93.000.
- Nishizawa, Jun-ichi; and Kurabayashi, Toru, to Research Development Corp. of Japan; Nishzawa, Jun-ichi; and Zaidan Hojin Handotai Kenkyu Shinokai. Semiconductor device comprising a highspeed static induction transistor. 5,532,511, Cl. 257-627.000.
- Nishzawa, Jun-ichi: *See—*
  - Nishizawa, Jun-ichi; and Kurabayashi, Toru, 5,532,511, Cl. 257-627.000.
- Nissan Motor Co., Ltd.: *See—*
  - Nakamura, Makoto, 5,531,193, Cl. 123-90.150.

Terai, Takehiro, 5,531,471, Cl. 280-732.000.
Nissho Corporation: *See—*
Hiejima, Katsuhiro; and Miyauchi, Hidekazu, 5,531,688, Cl. 604-96.000.
Nissin Chemical Industry Co., Ltd.: *See—*
Nakanishi, Tetsuo; Asai, Mitsuo; Ohata, Hiroyuki; and Uchida, Keiichi, 5,532,302, Cl. 524-143.000.
Nit Data Communications Victor Company of Japan: *See—*
Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
Nittaya, Hiroshi: *See—*
Kohno, Masahiro; Nittaya, Hiroshi; and Kato, Masahiro, 5,532,948, Cl. 364-715.060.
Nittetsu Mining Co., Ltd.: *See—*
Takayama, Snsumu; Mikami, Yasuie; Iyatomi, Nobuyoshi; and Orikasa, Minoru, 5,531,906, Cl. 210-712.000.
Nitto Boseki Co., Ltd.: *See—*
Fujiwara, Kyoji, 5,532,440, Cl. 181-289.000.
Nitto Denko Corp.: *See—*
Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
Nitto Kogyo Co., Ltd.: *See—*
Saito, Shinji; and Sugizaki, Akihiko, 5,532,808, Cl. 355-290.000.
Niwa, Kozo: *See—*
Yamazaki, Hiroko; Kuroda, Masahiro; and Niwa, Kozo, 5,531,992, Cl. 424-195.100.
Niwa, Mineo; Tamura, Kouichi; Kaizu, Tsutomu; and Kobayashi, Masakazu, to Fujisawa Pharmaceutical Co., Ltd. Anti-FR-900506 substance antibodies and highly-sensitive enzyme immunoassay method. 5,532,137, Cl. 435-7.920.
Niwa, Tatsuo: *See—*
Matsumoto, Hiroyuki; and Niwa, Tatsuo, 5,532,984, Cl. 369-13.000.
Niwa, Tomomitsu, to Mitsubishi Denki Kabushiki Kaisha. Numerical control unit. 5,532,932, Cl. 364-474.300.
Nix, J. Lamar; and Ruse, Guy F., to Quantum Peripherals Colorado, Inc. Soft adjacent layer biased magnetoresistive device incorporating a natural flux closure design utilizing coplanar permanent magnet thin film stabilization. 5,532,892, Cl. 360-113.000.
NKK Corporation: *See—*
Hosoya, Yoshihiro; Morita, Masaya; and Tsuyama, Seishi, 5,531,839, Cl. 148-330.000.
Nocopi International Inc.: *See—*
Gundjian, Arshavir, 5,532,200, Cl. 503-201.000.
Noda, Keiji: *See—*
Kondo, Tomoharu; Ogawa, Masato; and Noda, Keiji, 5,533,167, Cl. 392-485.000.
Noda, Yoshiki: *See—*
Nishii, Michiharu; Toda, Hiroshi; Kusano, Akihito; and Noda, Yoshiki, 5,531,514, Cl. 303-116.100.
Nodari, Nereo: *See—*
Allegrini, Pietro; Nodari, Nereo; Malatesta, Vincenzo; and Crisci, Luciana, 5,532,361, Cl. 544-70.000.
Nogami, Yuji: *See—*
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.
Noguchi, Yukio, to Fuji Photo Optical Co., Ltd.; and Fuji Photo Film Co., Ltd. Camera with adjustable viewfinder. 5,532,778, Cl. 354-221.000.
Nohtomi, Nobuo: *See—*
Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, 5,532,993, Cl. 369-75.100.
Noireaux, Patrick: *See—*
Beziers, Daniel; Chataignier, Evelyne; and Noireaux, Patrick, 5,532,288, Cl. 522-71.000.
Nokia Mobile Phones Ltd.: *See—*
Byrne, John D., 5,533,099, Cl. 379-58.000.
Leppanen, Pentti, 5,533,013, Cl. 370-18.000.
Nokia Telecommunications OY: *See—*
Vesterinen, Timo, 5,533,116, Cl. 379-243.000.
Nokubo, Seiji, to Sumitomo Electric Industries, Ltd. Pump and motor interposed rubber sealing gasket having plural guide protrusions. 5,531,573, Cl. 417-360.000.
Noll, Martin: *See—*
Knoll, Peter; and Noll, Martin, 5,531,118, Cl. 73-628.000.
Nomaki, Tatsuo: *See—*
Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, 5,532,488, Cl. 250-341.300.
Nomura, Ichiro: *See—*
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
Nomura, Isao: *See—*
Yagi, Takashi; Higurashi, Masakazu; Tsuruoka, Hiroka; and Nomura, Isao, 5,532,163, Cl. 435-271.000.
Nomura, Nobuaki: *See—*
Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, 5,531,089, Cl. 72-241.800.
Nomura, Takao: *See—*
Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
Nomura, Wataru: *See—*
Haraguchi, Hiroshi; Abe, Masahiro; and Nomura, Wataru, 5,532,520, Cl. 257-797.000.
Noonan, James T.; and Thompson, Warren L., to Deere & Company. Flip-up C-shank standard for a cultivator. 5,531,276, Cl. 172-662.000.
Noonan, James T.; and Thompson, Warren L., to Deere & Company. Bent wing sweep. 5,531,277, Cl. 172-730.000.
Norcott, Maurice H.: *See—*
Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
Norcross, Thomas M.: *See—*
Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., 5,533,123, Cl. 380-4.000.
Nordica S.p.A.: *See—*
Tessari, Pino, 5,530,997, Cl. 24-68.0SK.
Nordstrom, J. David; Omura, Hisanori; Smith, Alan E.; and Thomson, David M., to Du Pont de Nemours, E. I., and Company. UV light treatment of clear coat to improve acid etch resistance. 5,532,027, Cl. 427-493.000.
Noret, Patrick: *See—*
Ellis, Matthew; Saunders, Rowland F.; Smith, James A.; and Noret, Patrick, 5,531,224, Cl. 128-660.070.
Noritsu Koki Co., Ltd.: *See—*
Honomizo, Seiji, 5,532,691, Cl. 341-22.000.
Norman, Robert D.: *See—*
Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, 5,532,962, Cl. 365-201.000.
Norris, Gene K.: *See—*
Beekman, George F.; Conroy, Gary M.; Hyde, Jeffrey R.; and Norris, Gene K., 5,532,303, Cl. 524-180.000.
North American Philips Corporation: *See—*
Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, 5,532,763, Cl. 348-744.000.
North American Refractories Company: *See—*
Hyde, Jack, 5,531,586, Cl. 425-352.000.
Northern Telecom Limited: *See—*
Khoury, George; Beards, Ronald D.; and Nisbet, John J., 5,532,637, Cl. 327-359.000.
Northrop Grumman Corp.: *See—*
Bluzer, Nathan; and Forrester, Martin G., 5,532,485, Cl. 250-336.200.
Northrop, Shellie K.: *See—*
Karam, Ronald E.; Reddy, Vaddi B.; Northrop, Shellie K.; and Zhang, Yan, 5,531,928, Cl. 252-301.40F.
Norz, Wolfgang; and Rohr, Günter, to Union Special GmbH. Sewing machine for sewing seams on a tubular workpiece. 5,531,174, Cl. 112-470.290.
Noshiro, Toshihiko: *See—*
Asanae, Masumi; Ochiai, Masahisa; Kimura, Fumio; Funakawa, Akihiko; and Noshiro, Toshihiko, 5,532,095, Cl. 430-106.600.
Novak, Thomas S.: *See—*
Hollenbach, Steven A.; Martio, Michael A.; Novak, Thomas S.; and Warznak, Robert S., 5,533,115, Cl. 379-220.000.
Novo Nordisk A/S: *See—*
Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, 5,532,236, Cl. 514-228.500.
Outtrup, Helle; Dambmann, Claus; Aaslyng, Dorrit A.; and Lindegaard, Poul, 5,531,918, Cl. 510-320.000.
Pedersen, Hanne H.; Olsen, Hans S.; and Nielsen, Per M., 5,532,007, Cl. 426-56.000.
Rasmussen, Lars; Møllgaard, Annette; Petersen, Bent R.; and Sørensen, Niels H., 5,531,795, Cl. 8-94.210.
Noyori, Ryoji; Kitamura, Masato; and Tokunaga, Makoto, to Takasago International Corporation. Process for producing optically active hydroxyalkylphosphonates. 5,532,402, Cl. 558-178.000.
Nozawa, Keita; Yoshida, Satoshi; and Kukimoto, Tsutomu, to Canon Kabushiki Kaisha. Image forming method. 5,532,101, Cl. 430-125.000.
Nozue, Hiroshi: *See—*
Yasuzato, Tadao; Nozue, Hiroshi; and Shiraki, Seiichi, 5,532,497, Cl. 250-548.000.
NSK Ltd.: *See—*
Hida, Tadayoshi; Ishida, Yasutaka; and Takamizawa, Tohru, 5,531,525, Cl. 384-482.000.
Tomaru, Masaki, 5,531,317, Cl. 280-775.000.
NTEC, Inc.: *See—*
Datta, Rathin; and Bergemann, Eugene P., 5,532,148, Cl. 435-144.000.
Nu-Kote International, Inc.: *See—*
Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
Nuchols, Richard P.: *See—*
Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.
Nujenko Pty Ltd: *See—*

Alter, Konrad G.; and Herbert, Newton J., 5,531,705, Cl. 604-195.000.
Numata, Kenji: *See—*
Kushiyama, Natsuki; Furuyama, Tohru; and Numata, Kenji, 5,532,963, Cl. 365-201.000.
Nusser, Dennis W. Input apparatus scaled for non-adults and adults having small hands. 5,531,529, Cl. 400-472.000.
Nuttall, Michael W.: *See—*
Garner, Harold E.; and Nuttall, Michael W., 5,531,623, Cl. 446-22.000.
Nyberg, Mark R.; Laska, Gregory A.; and Stetson, Daniel J., to Minnesota Mining and Manufacturing Company. Parallelogram-shaped lifter for cleaning a flexible magnetic recording disc. 5,532,893, Cl. 360-133.000.
Nycomed Imaging AS: *See—*
Berg, Arne; Almén, Torsten; Klaveness, Jo; Rongved, Pal; Thomassen, Terje; and Dugstad, Harald, 5,531,978, Cl. 424-1.110.
Nyzen, Richard C. Apparatus for adjusting and aligning the position of x-ray equipment. 5,533,090, Cl. 378-197.000.
Oare, David: *See—*
Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
Obata, Ritsuko: *See—*
Yamadera, Takashi; Takeuchi, Kazumasa; Obata, Ritsuko; Fukutomi, Naoki; and Suzuki, Kazuko, 5,532,105, Cl. 430-156.000.
O'Brien, Patrick J.; Thomas, Alvin; Rufo, George, Jr.; Durham, Larry; and Gelardi, Anthony L., to Ivy Hill Corporation. Glueless storage package. 5,531,321, Cl. 206-232.000.
OCE-Nederland, B.V.: *See—*
Lamper, Anthonie H.; and Reinten, Hans, 5,532,882, Cl. 359-819.000.
Ochi, Hiroyuki: *See—*
Fukuda, Minoru; Ochi, Hiroyuki; and Fukui, Takaaki, 5,531,459, Cl. 277-178.000.
Ochiai, Hiroshi: *See—*
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Ochiai, Isao; and Satou, Osamu, to Nippon Thompson Co., Ltd. Linear rolling guide unit. 5,531,521, Cl. 384-15.000.
Ochiai, Masahisa: *See—*
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Ochiai, Tameichi; Kurose, Yutaka; Nagao, Takumi; Tsukahara, Takako; and Imamura, Satoru, to Mitsubishi Chemical Corporation. Azo metal chelate compound. 5,532,342, Cl. 534-693.000.
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O'Donnell, Lisa T.; and Wirebaugh, Ralph S., to Favorite Brands International, Inc. Melt restricted marshmallow. 5,532,017, Cl. 426-571.000.
Oehlbeck, Martin E.: *See—*
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Oertel, Richard W.: *See—*
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Ogasawara, Shinobu: *See—*
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Ogasawara, Toshifumi; and Shinoda, Masafumi, to Mazda Motor Corporation. Apparatus for coating vehicle body. 5,531,833, Cl. 118-698.000.
Ogawa, Katsuaki: *See—*
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Ogawa, Kinya; Kitagaki, Tetsuo; and Yamamoto, Akira, to Shin-Etsu Chemical Co., Ltd. Method for controlling pink bollworm through disturbance of male-female communication thereof. 5,532,273, Cl. 514-546.000.
Ogawa, Masato: *See—*
Kondo, Tomoharu; Ogawa, Masato; and Noda, Keiji, 5,533,167, Cl. 392-485.000.
Ogawa, Yoshio: *See—*
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Ogden, James E.: *See—*
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Ogden Projects, Inc.: *See—*
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Oglesby, Robert L.; Smith, Leigh A. B.; Jordan, Larry S.; Greene, Carl C., Jr.; and Leonard, Wayne E., Sr., to R. J. Reynolds Tobacco Company. Method of and apparatus for applying adhesive to cigarette paper and the paper and cigarette produced thereby. 5,531,233, Cl. 131-69.000.
O'Gorman, Timothy J.: *See—*
Moran, David E.; O'Gorman, Timothy J.; and Watson, Kimball M., 5,533,197, Cl. 395-185.080.
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Wong, David T.; and Oguiza, Juan I., 5,532,264, Cl. 514-415.000.
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Ogura, Hidemitsu: *See—*
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Oguri, Shigehisa: *See—*
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Ohara, Kazuhiro: *See—*
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Ohara, Yasunori: *See—*
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Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Method and apparatus for estimating disturbance acting on vehicle tired wheel based on wheel angular velocity and equation of state. 5,531,110, Cl. 73-146.000.
Ohashi, Kunio: *See—*
Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, 5,532,794, Cl. 355-208.000.
Ohashi, Tsuneaki; Tsuno, Nobuo; and Kurokawa, Teruhisa, to NGK Insulators, Ltd. Method for increasing oxidation resistance of Fe-Cr-Al alloy. 5,531,837, Cl. 148-280.000.
Ohata, Hiroyuki: *See—*
Nakanishi, Tetsuo; Asai, Mitsuo; Ohata, Hiroyuki; and Uchida, Keiichi, 5,532,302, Cl. 524-143.000.
Ohata, Masashi: *See—*
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Ohio State University, The: *See—*
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Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, to Kabushiki Kaisha TOPCON. Optical distance meter and light source device used for the same. 5,532,813, Cl. 356-5.010.
Ohkawa, Shin-Ichi: *See—*
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Oh-Kita, Motomu: *See—*
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Ohkura, Tadahiro; Yoshida, Toshiyuki; Kainuma, Mitsuru; and Aoki, Kazuo, to Otax Co., Ltd. Connector for measuring apparatus. 5,532,581, Cl. 324-115.000.
Ohlson, John; and Slivkoff, William, to Stanford Telecommunications, Inc. Practical means for dynamic allocation of individual demodulators to a multiplicity of received RF signals. 5,533,023, Cl. 370-69.100.
Ohlsson, Thomas; and Karlsson, Peter, to Siemens-Elema AB. Device for eliminating ringing in filtered ECG signals. 5,532,951, Cl. 364-724.170.
Ohmeda Inc.: *See—*
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Ohngemach, Jörg: *See—*
Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.
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Ohnuma, Kazutomi: *See—*
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Ohrbom, Walter H.: *See—*
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Ohtomo, Fumio: *See—*
Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.

- Ohtsuka, Mari: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Ohya, Kazuyuki; and Sayama, Norio, to Mitsubishi Gas Chemical Company, Inc. Process for the production of base board for printed wiring. 5,531,945, Cl. 264-60.000.
- Ohyama, Kazuo; Onoda, Shigeyoshi; and Uchida, Haruo, to Canon Kabushiki Kaisha. Sheet transport apparatus with minimized load between electrostatic generating device and transport belt. 5,531,436, Cl. 271-275.000.
- Oie, Masayuki; Kawata, Shoji; Yamada, Takamasa; and Ikeda, Shinya, to Nippon Zeon Co., Ltd. Positive resist composition. 5,532,107, Cl. 430-192.000.
- Oikawa, Sirou: *See—*
  - Tonami, Hiromichi; and Oikawa, Sirou, 5,532,475, Cl. 250-214.0VT.
- Oikawa, Tomohiro: *See—*
  - Narikawa, Shiro; Tanaka, Hirokazu; Honda, Iwakazu; Oikawa, Tomohiro; and Ando, Hiroe, 5,532,796, Cl. 355-210.000.
- OIS Optical Imaging Systems, Inc.: *See—*
  - den Boer, Willem; and Gu, Tieer, 5,532,180, Cl. 437-40.000.
- Ojo, Adeola F.; Fitch, Frank R.; and Bülow, Martin, to Boc Group, Inc., The. Removal of carbon dioxide from gas streams. 5,531,808, Cl. 95-96.000.
- Ojo, Olukayode A.: *See—*
  - De Haan, Gerard; Biezen, Paul W. A. C.; and Ojo, Olukayode A., 5,532,750, Cl. 348-452.000.
- Oka, Ken K.: *See—*
  - Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., 5,531,561, Cl. 414-686.000.
- Oka, Takahiro; and Chiba, Hiromasa, to Chisso Corporation. Process for producing high stiffness polypropylene. 5,532,325, Cl. 526-79.000.
- Okabayashi, Ichiro: *See—*
  - Kuwata, Yuri; Okabayashi, Ichiro; and Kishi, Tetsuji, 5,533,034, Cl. 371-32.000.
- Okabe, Satoshi; and Aoki, Sunao, to Olympus Optical Co., Ltd. Drive unit for optical memory device having a first housing enveloping a second housing. 5,532,996, Cl. 369-77.200.
- Okada, Hiromi: *See—*
  - Mihara, Takashi; Tsuchiya, Masaki; Higuma, Junichiro; Kikuchi, Seiji; and Okada, Hiromi, 5,532,731, Cl. 347-250.000.
- Okada, Kazuhiro. Method of manufacturing physical quantity detector. 5,531,002, Cl. 29-25.410.
- Okada, Kazuhiro. Device for moving a suspended weight body. 5,531,092, Cl. 73-1.00D.
- Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, to Canon Kabushiki Kaisha. Driving method for liquid crystal device. 5,532,713, Cl. 345-97.000.
- Okamoto, James, to Quickie Designs Inc. Powered wheelchair with a detachable power drive assembly. 5,531,284, Cl. 180-65.100.
- Okamoto, Masaya: *See—*
  - Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
- Okamoto, Osamu; and Nakaya, Teruomi, to National Aerospace Laboratory of Science & Technology Agency. Method for manufacturing a mounting object provided with a metallic heat-resistant two-dimensional fastener. 5,531,957, Cl. 419-8.000.
- Okamoto, Takami; Maki, Hideaki; and Konosu, Osamu, to Matsushita Electronics Corporation. Color cathode ray tube. 5,532,545, Cl. 313-407.000.
- Okamoto, Yoshiyuki; Horiuchi, Yasuhiro; Yamada, Kouichi; Yamaguchi, Kazuhiko; and Sugi, Hidekuni, to Nippondenso Co., Ltd. Structure of a volumetric measuring apparatus. 5,531,111, Cl. 73-149.000.
- Okamura, Hiroshi, to Kabushiki Kaisha Toshiba. Magnetic recording/reproducing apparatus having integrated circuit for holding low frequency full wave rectified signal. 5,532,885, Cl. 360-46.000.
- Okamura, Hitoshi; and Ohkawa, Shin-Ichi, to NEC Corporation. Semiconductor integrated circuit device having clock signal wiring construction for suppressing clock skew. 5,532,500, Cl. 257-207.000.
- Okamura, Michio, to JEOL Ltd. Storage capacitor power supply. 5,532,572, Cl. 320-1.000.
- Okamura, Toshimasa: *See—*
  - Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, 5,532,063, Cl. 428-446.000.
- Okato, Nobuyoshi; Katagiri, Tatsuo; Osada, Kuniaki; and Shirakawa, Keiji, to Nippon Yakin Kogyo Co., Ltd. Induction cookware formed of titanium alloy and method of making same. 5,532,460, Cl. 219-621.000.
- Okazaki, Iwao; Miyake, Tohru; Abe, Koichi; and Ohshima, Keisuke, to Toray Industries, Inc. Biaxially oriented, laminated polyester film. 5,532,047, Cl. 428-213.000.
- Oketani, Toshikazu: *See—*
  - Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
- OKI Electric Industry Co., Ltd.: *See—*
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  - Yamaguchi, Norio; and Shiino, Haruhiro, 5,533,066, Cl. 375-341.000.
- Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, to Toda Kogyo Corporation. Granulated particles for magnetic particles for magnetic recording, and process for producing the same. 5,531,922, Cl. 252-62.560.
- Oklahoma Medical Research Foundation: *See—*
  - Janzen, Edward G.; Wilcox, Allan L.; and Hinton, Randall D., 5,532,277, Cl. 514-579.000.
- Okochi, Ken; and Kikuchi, Kimihiro, to Alps Electric Co., Ltd. Module for optical fiber communication. 5,533,159, Cl. 385-93.000.
- Okoro, Clement A.: *See—*
  - Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, 5,531,838, Cl. 148-23.000.
- Okuda, Shinya: *See—*
  - Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.
- Okumura, Hitoshi: *See—*
  - Taniuchi, Osamu; Okumura, Hitoshi; Kawase, Hajime; Nankoh, Youichi; and Nakata, Hiroyuki, 5,531,605, Cl. 439-157.000.
- Okunaga, Kazuo, to NEC Corporation. Voltage generator circuit generating stable negative potential. 5,532,640, Cl. 327-537.000.
- Okuyama, Masaki: *See—*
  - Saito, Yukio; Kawamura, Takumi; Okuyama, Masaki; and Munekata, Tsutomu, 5,531,431, Cl. 271-4.010.
- Olender, James P.: *See—*
  - Hummel, Steven L.; Olender, James P.; Johnson, James B.; Reynolds, JoAnn; and Skaggs, Bill A., 5,531,326, Cl. 206-509.000.
- Olivas, Victor S.: *See—*
  - Erickson, Jack N., Jr.; Gazza, Jack M.; Olivas, Victor S.; and Thompson, Charles A., 5,532,931, Cl. 364-478.060.
- Oliveira, Canrobert, to Cantor, Philip Stephen. Surgical correction of astigmatism. 5,531,753, Cl. 606-166.000.
- Olivier, René: *See—*
  - Mourot, Christophe; Olivier, René; and Le Strat, Evelyne, 5,533,047, Cl. 375-208.000.
- Olivo, Marco: *See—*
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- Olsen, Hans S.: *See—*
  - Pedersen, Hanne H.; Olsen, Hans S.; and Nielsen, Per M., 5,532,007, Cl. 426-56.000.
- Olsen, James M.; Johnson, Jay G.; and Hu, Jia, to SIMS Deltec, Inc. Systems and methods for cassette identification for drug pumps. 5,531,697, Cl. 604-131.000.
- Olsen, James M., to SIMS Deltec, Inc. Optical reflection systems and methods for cassette identification fordrug pumps. 5,531,698, Cl. 604-131.000.
- Olsen, Ole R.: *See—*
  - Heide, Jorgen; and Olsen, Ole R., 5,531,954, Cl. 264-496.000.
- Olson, Daniel E.; Sokol, David G.; and Walker, Kevin, to New Holland North America, Inc. Fuel fill monitoring system and method. 5,532,673, Cl. 340-450.200.
- Olson, Jeremy H.: *See—*
  - Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., 5,531,298, Cl. 188-78.000.
- Oltean, George L.: *See—*
  - Nair, Mridula; Lobo, Lloyd A.; and Oltean, George L., 5,531,913, Cl. 252-62.530.
- Oltmanns, Karl-Heinz, to Licentia Patent-Verwaltungs-GmbH. Electric drive for an automotive vehicle. 5,532,535, Cl. 310-90.000.
- Olympus Optical Co., Ltd.: *See—*
  - Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata, Yasuo; and Takahashi, Kazuhiro, 5,531,664, Cl. 600-149.000.
  - Goto, Atsuo, 5,532,104, Cl. 430-139.000.
  - Nagai, Komei; Iketaki, Yoshinori; and Horikawa, Yoshiaki. 5,533,083, Cl. 378-44.000.
  - Okabe, Satoshi; and Aoki, Sunao, 5,532,996, Cl. 369-77.200.
  - Ootsuka, Yasunobu, 5,532,774, Cl. 354-106.000.
  - Yamada, Hiroshi, 5,532,555, Cl. 315-241.00P.
- O'Mahony, John J.: *See—*
  - Power, John S.; O'Mahony, John J.; and Merrick, Edwin B., 5,531,221, Cl. 128-205.180.
- O'Melia, Lawrence F.; and Lalikos, Anthony J., to Titeflex Corporation. Fluoropolymer aluminum laminate. 5,531,841, Cl. 148-265.000.
- Omi, Hiroshi: *See—*
  - Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, 5,532,910, Cl. 361-813.000.
- Omura, Hisanori: *See—*
  - Nordstrom, J. David; Omura, Hisanori; Smith, Alan E.; and Thomson, David M., 5,532,027, Cl. 427-493.000.
- O'Neil, Patrick J.: *See—*
  - Schubert, David P.; and O'Neil, Patrick J., 5,531,149, Cl. 89-1.140.
- Ong, Beng S., to Xerox Corporation. Toner compositions with negative charge enhancing additives. 5,532,098, Cl. 430-110.000.
- Ong, Estela T.; and Burton-Gorman, Nellie, to Institute of Gas Technology. Ribbed electrodes for molten carbonate fuel cells. 5,531,956, Cl. 419-2.000.
- Ono, Yuji: *See—*
  - Nakao, Tohru; Ono, Yuji; Bougauchi, Masahiro; and Morimoto, Yasuto, 5,532,240, Cl. 514-254.000.

- Onoda, Motonobu; Tsuchiya, Takeshi; Tamegai, Etsuo; Ogawa, Katsuaki; and Murata, Makoto, to Nippon Piston Ring Co., Ltd. Piston ring. 5,531,195, Cl. 123-193.600.
- Onoda, Shigeyoshi: *See—*
  - Ohyama, Kazuo; Onoda, Shigeyoshi; and Uchida, Haruo, 5,531,436, Cl. 271-275.000.
- Onogi, Takayuki; Yamashita, Keiji; and Miyamura, Kazuya, to Menicon Co., Ltd. Contact lens. 5,532,768, Cl. 351-160.00R.
- Onose, Toshihiro: *See—*
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- Ontario Cancer Institute: *See—*
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- Ooenoki, Toshiyuki: *See—*
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- Ookawa, Akemi: *See—*
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- Ootaka, Hideki; and Juri, Tatsuro, to Matsushita Electric Industrial Co., Ltd. Digital video signal processing apparatus. 5,532,837, Cl. 358-336.000.
- Ootsuka, Yasunobu, to Olympus Optical Co., Ltd. Film data recording/reproducing apparatus for a camera by writing/reading pits recorded on a film. 5,532,774, Cl. 354-106.000.
- Op de Beeck, Werner: *See—*
  - Tavernier, Serge; Op de Beeck, Werner; Ghekiere, Jean-Pierre; and Van Tendeloo, Gustaaf, 5,532,097, Cl. 430-110.000.
- Oral Logic, Inc.: *See—*
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- Orbanes, Philip E.: *See—*
  - Baer, Ralph H.; and Orbanes, Philip E., 5,531,600, Cl. 434-317.000.
- Oregon Health Sciences University, a non-profit organization, State of Oregon, Acting by and Through the Oregon State Board of Higher Education on behalf of the: *See—*
  - Cone, Roger D.; and Mountjoy, Kathleen G., 5,532,347, Cl. 536-23.500.
- Orenco Systems, Inc.: *See—*
  - Ball, Harold L.; Bounds, Terry R.; Ball, Eric S.; and Ball, Jeffrey L., 5,531,894, Cl. 210-605.000.
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  - Goulet, Mark; Parsons, William H.; Organ, Helen M.; Sinclair, Peter J.; Wong, Frederick; and Wyvratt, Matthew J., 5,532,248, Cl. 514-291.000.
- Orgel, Leslie E.: *See—*
  - Chu, Barbara C.; Joyce, Gerald F.; and Orgel, Leslie E., 5,532,126, Cl. 435-6.000.
- Origin Medsystems, Inc.: *See—*
  - Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,531,856, Cl. 156-290.000.
- Orikasa, Minoru: *See—*
  - Takayama, Susumu; Mikami, Yasuie; Iyatomi, Nobuyoshi; and Orikasa, Minoru, 5,531,906, Cl. 210-712.000.
- Orita, Akira; Kawakami, Takaaki; and Sakata, Tetsuya, to Fujitsu Limited. ISDN line circuit monitor system. 5,533,007, Cl. 370-17.000.
- Orita, Nobuhiro: *See—*
  - Miyabe, Kanji; Orita, Nobuhiro; Iwasaki, Makoto; Tsurumaru, Yohka; and Nakahara, Toshitsugu, 5,531,901, Cl. 210-668.000.
- Oritsuki, Ryouji: *See—*
  - Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.
- Ormat Turbines (1965) Ltd: *See—*
  - Bronicki, Lucien Y.; and Elovic, Asher, 5,531,073, Cl. 60-641.200.
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  - Benz, Patrick H.; and Ors, Jose A., 5,532,289, Cl. 523-106.000.
- Ortho Pharmaceutical Corporation: *See—*
  - Demarest, Keith; Schwender, Charles; and Wustrow, David, 5,532,226, Cl. 514-134.000.
- Osada, Kuniaki: *See—*
  - Okato, Nobuyoshi; Katagiri, Tatsuo; Osada, Kuniaki; and Shirakawa, Keiji, 5,532,460, Cl. 219-621.000.
- Osako, Nobutaka; Ishida, Kazutoshi; Nakai, Yasunori; and Murakami, Takeshi, to Mitsuboshi Belting Ltd. Toothed power transmission belt. 5,531,649, Cl. 474-205.000.
- Osanai, Hiroyuki: *See—*
  - Akao, Mutsuo; Osanai, Hiroyuki; and Kawamura, Makoto, 5,532,028, Cl. 428-35.200.
- Osborn, Neal A.: *See—*
  - Bensimon, Daniel; Osborn, Neal A.; and Pacheco, Joaquin F., 5,533,125, Cl. 380-4.000.
- Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., to Breed Automotive Technology, Inc. Inflator assembly. 5,531,474, Cl. 280-74.00D.
- Osburn, Coy D.: *See—*
  - Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., 5,531,250, Cl. 138-94.000.
- Ose, Yoichi; Yoshinari, Kiyomi; Yano, Masayoshi; and Mimura, Tadao, to Hitachi, Ltd. Mass spectrometer and ion source. 5,532,483, Cl. 250-288.000.
- Oshima, Masabumi; and Watanabe, Yoshiyuki, to Mitsubishi Chemical MKV Company. Resin composite and gasket. 5,532,068, Cl. 428-520.000.
- Oshima, Masabumi: *See—*
  - Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
- Oshima, Masuji: *See—*
  - Hattori, Tatsuya; Nishida, Makoto; Oshima, Masuji; and Yoshida, Hiroyuki, 5,532,929, Cl. 364-431.070.
- Osip, Thomas W.: *See—*
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
- Osipov, Eduard S.: *See—*
  - Demidov, German V.; and Osipov, Eduard S., 5,531,400, Cl. 244-2.000.
- Osram Sylvania Inc.: *See—*
  - Karam, Ronald E.; Reddy, Vaddi B.; Northrop, Shellie K.; and Zhang, Yan, 5,531,928, Cl. 252-301.40F.
  - Qi, Ru-Yi; and Karam, Ronald E., 5,531,926, Cl. 252-301.40F.
- Osswald, Mathias: *See—*
  - Mederski, Werner; Dorsch, Dieter; Osswald, Mathias; Beier, Norbert; Schelling, Pierre; Minck, Klaus-Otto; and Lues, Ingeborg, 5,532,276, Cl. 514-303.000.
- Ostroff, Gary R.: *See—*
  - Jamas, Spiros; Easson, D. Davidson, Jr.; and Ostroff, Gary R., 5,532,223, Cl. 514-54.000.
- Ostroff, Stuart S.: *See—*
  - Wasserstrom, David E.; and Ostroff, Stuart S., 5,531,540, Cl. 404-6.000.
- Ota, Takeshi, to Fuji Xerox Co., Ltd. Optical relay amplifier with a bypass waveguide. 5,533,153, Cl. 385-24.000.
- Ota, Yasutaka: *See—*
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kobji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Otax Co., Ltd.: *See—*
  - Ohkura, Tadahiro; Yoshida, Toshiyuki; Kainuma, Mitsuru; and Aoki, Kazuo, 5,532,581, Cl. 324-115.000.
- Otis Elevator Company: *See—*
  - Burton, Douglas; and Jamieson, Eric K., 5,531,294, Cl. 187-292.000.
- Otoma, Hiromi: *See—*
  - Fukunaga, Hideki; Yasukawa, Kaoru; Nakayama, Hideo; Ueki, Nobuaki; Otoma, Hiromi; and Fuse, Mario, 5,533,042, Cl. 372-50.000.
- Otsubo, Toru; Suzuki, Yasumichi; Sasaki, Shinji; Ohara, Kazuhiro; and Sasaki, Ichirou, to Hitachi, Ltd. Method of and apparatus for removing foreign particles. 5,531,862, Cl. 156-643.100.
- Otsuka, Kengo: *See—*
  - Kawauchi, Nobuya; Fukazawa, Nobuyuki; Ishibashi, Hiroki; and Otsuka, Kengo, 5,532,349, Cl. 536-55.300.
- Otsuka Pharmaceutical Company, Limited: *See—*
  - Fujioka, Takafumi; Teramoto, Shuji; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,532,253, Cl. 514-312.000.
- Otsuki, Akira, to Fujikura Ltd.; and FMT Ltd. Parallel processing apparatus based on arbitrary determination of processing areas of image data. 5,532,843, Cl. 358-453.000.
- Otto, Detlev: *See—*
  - Janssen, Peter J.; Bradley, Ralph H.; Bingham, Joseph P.; Guerinot, William F.; and Otto, Detlev, 5,532,763, Cl. 348-744.000.
- Oudet, Claude; and Prudham, Daniel, to Moving Magnet Technologies S.A. Position sensor incorporating a permanent magnet and a magnetism-sensitive probe and including primary and secondary air gaps. 5,532,585, Cl. 324-207.220.
- Ousborne, Jeffrey. Automatic message playback system. 5,532,680, Cl. 340-567.000.
- Outtrup, Helle; Dambmann, Claus; Aaslyng, Dorrit A.; and Lindegaard, Poul, to Novo Nordisk A/S. Novel proteases. 5,531,918, Cl. 510-320.000.
- Owada, Junichi, to NEC Corporation. Radio channel selection method and system. 5,533,024, Cl. 370-84.000.
- Owada, Naoko: *See—*
  - Yamamura, Yasuharu; Seri, Hajime; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,532,076, Cl. 429-59.000.
- Owashi, Masao: *See—*
  - Nishimura, Hitoshi; and Owashi, Masao, 5,532,784, Cl. 354-410.000.
- Owen, Robert A.: *See—*
  - Sweetser, Kevin N.; Beratan, Howard R.; and Owen, Robert A., 5,532,484, Cl. 250-332.000.
- Owsley, Patrick A.: *See—*
  - Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., 5,532,693, Cl. 341-51.000.
- Owyang, King: *See—*
  - Chang, Mike F.; Hshieh, Fwu-Iuan; Kwan, Sze-Hon; and Owyang, King, 5,532,179, Cl. 437-40.000.
- Oxford, William V.: *See—*
  - Anderson, Eric C.; Wilson, David F.; and Oxford, William V., 5,532,556, Cl. 375-356.000.
- Ozawa, Masayuki; Gounji, Takashi; and Morosawa, Kenji, to Fujitsu Limited. Automatic position managing system. 5,533,113, Cl. 379-211.000.
- Ozawa, Shigeyuki; and Nakase, Ryoichi, to Sanshin Industries Co., Ltd. Water-cooled exhaust system for watercraft. 5,531,620, Cl. 440-89.000.
- Ozawa, Shigeyuki: *See—*
  - Nakase, Ryoichi; and Ozawa, Shigeyuki, 5,531,619, Cl. 440-1.000.
- Pacelli, James P.: *See—*

Harper, Donald K., Jr.; Laub, Michael F.; Pacelli, James P.; and Schnoor, William J., 5,531,602, Cl. 439-70.000.

Pacesetter, Inc.: *See—*

Vachon, David J., 5,531,780, Cl. 607-120.000.

Pacheco, Joaquin F.: *See—*

Bensimon, Daniel; Osborn, Neal A.; and Pacheco, Joaquin F., 5,533,125, Cl. 380-4.000.

Pacht, Amos, to Butterworth Jetting Systems, Inc. Swivel jet assembly. 5,531,383, Cl. 239-251.000.

Pacific Communication Sciences, Inc.: *See—*

Gardner, Steven H., 5,533,029, Cl. 370-94.100.

Packaging Corporation of America: *See—*

Brink, Thomas J.; and Stone, James L., 5,531,376, Cl. 229-215.000.

Packard, Kevan A.: *See—*

Woo, James T. K.; Pompignano, Gary C.; Awarski, Donston E.; and Packard, Kevan A., 5,532,297, Cl. 523-408.000.

Pacucci, Nicola: *See—*

Ricco, Mario; Pacucci, Nicola; Abate, Maurizio; and Faggioli, Eugenio, 5,532,526, Cl. 307-104.000.

Padoan, Silvia: *See—*

Pascucci, Luigi; Padoan, Silvia; Golla, Carla M.; Maccarrone, Marco; and Olivo, Marco, 5,532,972, Cl. 365-233.000.

Pae, Yong-Gug: *See—*

Song, Jun-ho; Pae, Yong-Gug; and Park, Wun-yong, 5,532,853, Cl. 359-87.000.

Paganessi, Joseph E., to American Air Liquide. Cylinder solvent pumping system. 5,531,242, Cl. 137-255.000.

Pagliari, Rene: *See—*

Le Blanc, Loic; and Pagliari, Rene, 5,531,923, Cl. 252-182.140.

Paik, Jong S.: *See—*

Kim, Soo D.; Chang, Hak S.; and Paik, Jong S., 5,531,124, Cl. 73-861.270.

Paik, Yi H.: *See—*

Freeman, Michael B.; Hann, William M.; Paik, Yi H.; and Swift, Graham, 5,531,934, Cl. 252-390.000.

Pal, Uday; Landes, Harald; and Greiner, Horst, to Siemens Aktiengesellschaft. Process for sealing high-temperature fuel cells. 5,532,071, Cl. 429-12.000.

Pall Corporation: *See—*

Cassidy, Ronald F., 5,531,220, Cl. 128-204.290.

Palm, Lars-Erik, to Tetra Laval Holdings & Finance SA. Packaging container and blank for producing the same. 5,531,375, Cl. 229-137.000.

Palmer, Yvette L.: *See—*

Skotnicki, Jerauld S.; Palmer, Yvette L.; Koa, Wenling; and Abou-Gharbia, Magid A., 5,532,355, Cl. 540-456.000.

Palsherm, Stefan: *See—*

Braun, Max; Rudolph, Werner; Palsherm, Stefan; and Eichholz, Kerstin, 5,532,411, Cl. 562-861.000.

Palumbo, Daniel L., to United States of America, National Aeronautics and Space Administration. Fault-tolerant processing system. 5,533,188, Cl. 395-182.020.

Pan, David H.: *See—*

Henry, Arnold W.; Seanor, Donald A.; Heeks, George J.; Eddy, Clifford O.; Chow, Che C.; Badesha, Santokh S.; Kaplan, Samuel; and Pan, David H., 5,531,813, Cl. 106-2.000.

Pantelakis, Dimitris; Tedrow, Kerry; Javanifard, Johnny; and Canepa, George, to Intel Corporation. Method and apparatus for providing an ultra low power regulated negative charge pump. 5,532,915, Cl. 363-60.000.

Panunzio, Mauro: *See—*

Da Col, Marco; Dall'Asta, Leone; Resta, Irene; Cainelli, Gianfranco; Contento, Michele; Panunzio, Mauro; and Umani Ronchi, Achille, 5,532,353, Cl. 540-215.000.

Paragon Trade Brands, Inc.: *See—*

Herrmann, Thomas R., 5,531,850, Cl. 156-161.000.

Parekh, Bipin: *See—*

Yen, Larry Y.; Anantharaman, Ven; and Parekh, Bipin, 5,531,899, Cl. 210-638.000.

Parham, Dennis E.; and Sampson, Mark J., to Mead Corporation, The. Device for stabilizing containers in a gravity feed tray. 5,531,336, Cl. 211-183.000.

Park, Gyeong-Lyong; Suh, Chung-Wook; and Eo, Ik-Soo, to Electronics and Telecommunications Research Institute; and Korea Telecommunication Authority. Power of two length pseudorandom noise sequence generator. 5,532,695, Cl. 341-173.000.

Park, Hee S.: *See—*

Kim, Yong H.; Park, Hee S.; and Lee, Dong H., 5,532,381, Cl. 548-453.000.

Park, Sang W.; and Kim, Hyun C., to Goldstar Co., Ltd. Electron gun for a color cathode-ray tube. 5,532,547, Cl. 313-414.000.

Park, Seung K., to Goldstar Electron Co., Ltd. Temperature stabilized low reference voltage generator. 5,532,579, Cl. 323-314.000.

Park, Wun-yong: *See—*

Song, Jun-ho; Pae, Yong-Gug; and Park, Wun-yong, 5,532,853, Cl. 359-87.000.

Parker, Andrew J., to Regent Lighting Corporation. Mounting means for a door of sheet material. 5,531,486, Cl. 292-63.000.

Parker, H. Galen; Finnicum, Douglas S.; and Young, Richard D., to Eastman Kodak Company. Coating density analyzer and method using image processing. 5,533,139, Cl. 382-108.000.

Parker, Peter K.: *See—*

Cobb, Joshua M.; and Parker, Peter K., 5,532,457, Cl. 219-411.000.

Parker, Robert D. Door security device allowing partial door opening. 5,531,490, Cl. 292-262.000.

Parker, Robert M.: *See—*

Poulson, Keith L.; Fair, Paul; and Parker, Robert M., 5,531,258, Cl. 160-376.000.

Parker, Roger A.; and Mao, Simon J. T., to Merrell Pharmaceuticals Inc. 2,6-di-alkyl-4-silyl-phenols as antiatheroscelerotic agents. 5,532,400, Cl. 556-449.000.

Parkinson, Thomas D.; and Martin, Brian C., to Philips Electronics North America Corporation. CMOS input with temperature and V_{CC} compensated threshold. 5,532,617, Cl. 326-32.000.

Parr, Kevin J.: *See—*

Newington, Ian M.; Parr, Kevin J.; Bowman, Patricia I.; and McCue, Karen A., 5,532,290, Cl. 523-122.000.

Parsons, William H.: *See—*

Goulet, Mark; Parsons, William H.; Organ, Helen M.; Sinclair, Peter J.; Wong, Frederick; and Wyvratt, Matthew J., 5,532,248, Cl. 514-291.000.

Pasch, Nicholas F.; and Patrick, Roger, to LSI Logic Corportion. Techniques for via formation and filling. 5,532,516, Cl. 257-752.000.

Pascucci, Luigi; Padoan, Silvia; Golla, Carla M.; Maccarrone, Marco; and Olivo, Marco, to SGS-Thomson Microelectronics, S.r.l. Method and circuit for timing the reading of nonvolatile memories. 5,532,972, Cl. 365-233.000.

Pastor, Ricardo C.: *See—*

Bak, Chan S.; Kimura, Hiroshi; and Pastor, Ricardo C., 5,531,974, Cl. 423-263.000.

Patel, Baiju V.: *See—*

Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.

Patel, Bharat B., to Phillips Petroleum Company. Composition comprising a viscosity promoter and a magnesium compound and process using the composition. 5,532,212, Cl. 507-140.000.

Patel, Chandrakant B.; and Yang, Jian, to Samsung Electronics Co., Ltd. Apparatus for suppressing ghosts in signals modulating a carrier in quadrature phasing with a video carrier. 5,532,755, Cl. 348-614.000.

Patel, Kundanbhai M.: *See—*

Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, 5,531,998, Cl. 424-426.000.

Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH: *See—*

Heider, Juergen; Juengst, Stefan; and Wahrendorff, Peter, 5,532,552, Cl. 313-623.000.

Patent-Treuhand-Gesellschaft fuer Elektrische Gluehlampen mbh: *See—*

Weiss, Werner; and Wagner, Gerhard, 5,532,195, Cl. 501-54.000.

Pathak, Vijay K.; and Leppin, Dennis, to Gas Research Institute. Water and organic constituent separator system and method. 5,531,866, Cl. 202-185.200.

Patrick, Edward: *See—*

Buchan, William; Patrick, Edward; Takahashi, M.; and Howell, J. V., 5,532,886, Cl. 360-51.000.

Patrick, Roger: *See—*

Pasch, Nicholas F.; and Patrick, Roger, 5,532,516, Cl. 257-752.000.

Patterson, Donald E.: *See—*

Xie, Chenggang; Patterson, Donald E.; and Kumar, Nalin, 5,531,880, Cl. 204-478.000.

Paul, Stephen M., to Metagenics, Inc. Bacteria and immunoglobulin-containing composition for human gastrointestinal health. 5,531,988, Cl. 424-93.400.

Paul, Stephen M., to Metagenics, Inc. Immunoglobulin and fiber-containing composition for human gastrointestinal health. 5,531,989, Cl. 424-93.400.

Pauley, J. Donald: *See—*

Smith, Gregory M.; Yeager, Michael W.; Pauley, J. Donald; and Carroll, Gary T., 5,533,061, Cl. 375-334.000.

Pauli, Giles A., to Texas Instruments Incorporated. Optical tracking system. 5,532,997, Cl. 369-112.000.

Paulsen, Al W.: *See—*

Mateer, David G.; and Pogue, D. Michael, 5,532,766, Cl. 351-63.000.

Pavlik, Dennis: *See—*

Brown, Donald W.; Hannan, William F., III; and Pavlik, Dennis, 5,532,573, Cl. 322-22.000.

Pawsat, Dennis P.: *See—*

McMurtrey, David K.; and Pawsat, Dennis P., 5,531,511, Cl. 301-110.500.

Payne, Ed; Perry, Bernard T.; and Walker, Terry D., to Gateway Technologies, Inc. Thermal barriers for buildings, appliances and textiles. 5,532,039, Cl. 428-116.000.

Peake, Clinton J.: *See—*

Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., 5,532,367, Cl. 544-260.000.

Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,532,370, Cl. 544-279.000.

Peake, Michael V.: *See—*

Christian, Richard E.; and Peake, Michael V., 5,531,483, Cl. 285-93.000.

Pearce, David W.: *See—*

Evans, Lloyd T.; King, Roderick W.; Mander, Lewis N.; Pearce, David W.; and Pharis, Richard P., 5,532,206, Cl. 504-176.000.

Pearson, James E.; and Carls, Dennis R., to Eaton Corporation. Butterfly valve. 5,531,248, Cl. 137-625.460.

Peavey, Stephen D.; Ogden, James E.; Hoyt, William J.; Dunn, Ino; Zmuda, Paul E.; Jamroga, David A.; and Jorgensen, Jacob W., to Electronic Information Systems, Inc. Calling system and method. 5,533,103, Cl. 379-69.000.

Peck, Joseph E.: *See—*

Shah, Jaffar; Ilic, Kosta; Peck, Joseph E.; and Wang, Zu-Yi, 5,533,037, Cl. 371-62.000.

Pedain, Josef: *See—*

König, Eberhard; Engbert, Theodor; and Pedain, Josef, 5,532,313, Cl. 524-590.000.

Pedersen, Hanne H.; Olsen, Hans S.; and Nielsen, Per M., to Novo Nordisk A/S. Method for production of a meat hydrolyzate. 5,532,007, Cl. 426-56.000.

Pederson, Les H. Tire shear. 5,531,146, Cl. 83-467.100.

Pelc, Norbert J., to Lunar Corporation. Reduced field-of-view CT system for imaging compact embedded structures. 5,533,080, Cl. 378-5.000.

Pellenz, Peter J.; and Dennis, Richard D., to Carrier Corporation. Multi-split fan control. 5,531,076, Cl. 62-184.000.

Pellicane, Jack E.; Russett, Jon P.; and Sands, Jeffery L., to Specialty Equipment Companies, Inc. Cooking apparatus for two-sided cooking. 5,531,155, Cl. 99-349.000.

Pempsell, Mark: *See—*

Rains, Thersa J.; and Pempsell, Mark, 5,530,974, Cl. 5-81.10T.

Pendleton, Matthew A.: *See—*

Grube, Gary W.; Markison, Timothy W.; Pendleton, Matthew A.; and Rybicki, Mathew A., 5,533,008, Cl. 370-17.000.

Peng, Chin-Huang: *See—*

Lu, Kuo-Hui; and Peng, Chin-Huang, 5,531,450, Cl. 273-348.000.

Peng, Jung-Ching. Cabinet for compact disk containers. 5,531,516, Cl. 312-9.460.

Penston, Philip A., III. Boxing game system and method of play. 5,531,453, Cl. 273-440.000.

Pepin, Henry J.; Scovil, Brian J.; and Welch, Jeffrey M., to SciMed Life Systems, Inc. Multiple member intravascular guide catheter. 5,531,721, Cl. 604-282.000.

Perdreaux, Rene: *See—*

Foulkes, Harvey B.; Warrin, George E.; Dao, Huy-Can; and Perdreaux, Rene, 5,531,597, Cl. 433-119.000.

Perego, Luciano, to Tapematic U.S.A., Inc. Continuous feed and discharge flow through cassette loading apparatus and system. 5,531,397, Cl. 242-532.100.

Peres, Eliana M. O.: *See—*

Pinard, Deborah L.; Peres, Eliana M. O.; and Evans, Ronald A., 5,533,110, Cl. 379-201.000.

Perez, Manuel, III. Combination outdoor cooker and smoker. 5,531,154, Cl. 99-340.000.

Perez, Pedro: *See—*

Pons, Francesc; Perez, Pedro; and Auria, Augustin, 5,531,037, Cl. 38-77.800.

Perfect Fit Industries, Inc.: *See—*

Whitley, John W., 5,530,979, Cl. 5-500.000.

Perkins, Christopher M., to Procter & Gamble Company, The. Detergent compositions containing ethylenediamine-N,N'-diglutaric acid or 2-hydroxypropylenediamine-N,N'-disuccinic acid. 5,531,915, Cl. 510-294.000.

Perlman, David J.: *See—*

Bertin, Claude L.; Cronin, John E.; and Perlman, David J., 5,532,519, Cl. 257-777.000.

Perlman, Kato L.: *See—*

DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,532,391, Cl. 552-653.000.

Perma Pile Foundation Restoration Systems, Inc.: *See—*

Willcox, Frederick E., II, 5,531,544, Cl. 405-231.000.

Permelec Electrode Co., Ltd.: *See—*

Shimamune, Takayuki; and Nakajima, Yasuo, 5,531,875, Cl. 204-290.00R.

Perni, Robert B.: *See—*

Wentland, Mark P.; and Perni, Robert B., 5,532,263, Cl. 514-406.000.

Perrone, Terrance: *See—*

Lyon, Dan; Perrone, Terrance; and Rutz, Joseph, 5,531,106, Cl. 73-61.560.

Perry, Bernard T.: *See—*

Payne, Ed; Perry, Bernard T.; and Walker, Terry D., 5,532,039, Cl. 428-116.000.

Perry, Charles H.: *See—*

Behfar-Rad, Abbas; Perry, Charles H.; and Sachdev, Krishna G., 5,532,608, Cl. 324-754.000.

Perry, John W. Transform method and spectrograph for displaying characteristics of speech. 5,532,936, Cl. 364-514.00A.

Perry, Larry C.; and Maxwell, G. Patrick. Medical protheses containing a gel-filler comprising principally water and cellulose derivative. 5,531,786, Cl. 623-8.000.

Perryman, Owen J., Jr. Produce ripening apparatus and method. 5,531,158, Cl. 99-467.000.

Perttu, Joseph S.: *See—*

Kroll, Mark W.; Adams, Theodore P.; Perttu, Joseph S.; and Supino, Charles, 5,531,782, Cl. 607-122.000.

Peters, Aemil J. M.; Masterson, Byron J.; and Abrams, Robert M., to Bodysonics, Inc. Protection device for power frequency magnetic fields. 5,532,681, Cl. 340-573.000.

Peters, Donald F., to Bio-Safe Specialty Products, Inc. Stain removing compositions and methods of using the same. 5,531,927, Cl. 510-281.000.

Peters, Janet K.: *See—*

Grisham, Thomas L.; and Peters, Janet K., 5,531,904, Cl. 210-703.000.

Petersen, Bent R.: *See—*

Rasmussen, Lars; Møllgaard, Annette; Petersen, Bent R.; and Sørensen, Niels H., 5,531,795, Cl. 8-94.210.

Petersen, Erwin: *See—*

Deike, Horst; and Petersen, Erwin, 5,531,288, Cl. 180-197.000.

Petersen, Uwe: *See—*

Schenke, Thomas; Krebs, Andreas; and Petersen, Uwe, 5,532,364, Cl. 544-105.000.

Peterson, Donald G.: *See—*

Heinecke, Steven B.; and Peterson, Donald G., 5,531,855, Cl. 156-252.000.

Peterson, Jerry A.: *See—*

Ceriani, Roberto L.; Peterson, Jerry A.; and Larocca, David J., 5,532,135, Cl. 435-7.920.

Peterson, Robert W. System and method for packaging bales of hay and an improved wrapping apparatus. 5,531,061, Cl. 53-526.000.

Petruccello, John P., to Teleflex, Inc. Remote control assembly having rotatable end fitting. 5,531,134, Cl. 74-502.400.

Petry, Dirk A.: *See—*

Steinmetz, Hans W.; and Petry, Dirk A., 5,532,459, Cl. 219-535.000.

Pfefferle, William C.; and Sweet, E. Jack, to Precision Combustion, Inc. Fuel injector and igniter assembly. 5,531,066, Cl. 60-39.822.

Pfrimmer, Ernest, to Deere & Company. Tensioning mechanism for upper mower conditioner roll. 5,531,062, Cl. 56-16.40B.

Pharis, Richard P.: *See—*

Evans, Lloyd T.; King, Roderick W.; Mander, Lewis N.; Pearce, David W.; and Pharis, Richard P., 5,532,206, Cl. 504-176.000.

Philips Electronics North America Corporation: *See—*

Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, 5,532,744, Cl. 348-390.000.

Parkinson, Thomas D.; and Martin, Brian C., 5,532,617, Cl. 326-32.000.

Van Der Leeuw, Bart; Kowal, Albert E.; Pragt, Henrikus J. H.; and Canale, Joseph E., 5,532,543, Cl. 313-25.000.

Phillips, Benjamin A.: *See—*

DeVault, Robert C.; McConnell, Benjamin W.; and Phillips, Benjamin A., 5,532,532, Cl. 310-52.000.

Phillips, Frederick W.: *See—*

Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; Phillips, Frederick W.; and Beiler, Emanuel S., 5,531,212, Cl. 126-104.00R.

Phillips Petroleum Company: *See—*

Patel, Bharat B., 5,532,212, Cl. 507-140.000.

Phipps, Ann E.; and Santucci, David M., to Texas Instruments Incorporated. Calculator with table generation capability. 5,532,946, Cl. 364-710.140.

Phosphate Engineering and Construction Co., Inc.: *See—*

Erickson, William R.; and Bouffard, Leif E., 5,531,975, Cl. 423-319.000.

Piccirillo, David P.; and Huston, John T., to Babcock & Wilcox Company, The. Condensate drain controller. 5,530,987, Cl. 15-319.000.

Picker International, Inc.: *See—*

Lampman, David A.; and Liu, Haiying, 5,532,595, Cl. 324-309.000.

McGinley, John V. M.; Srivastava, Vishnu C.; and DeMeester, Gordon D., 5,532,597, Cl. 324-319.000.

Pickett, John E.: *See—*

Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., 5,532,100, Cl. 430-120.000.

Pierce Chemical Company: *See—*

Fujimoto, Edward K., 5,532,379, Cl. 548-304.100.

Piero, Darlene K.: *See—*

Baker, Denise J.; Blankenhorn, Glenn D., III; Freeman, Lonnie R.; Hann, Heather B.; Hesse, Judy A.; Kaforey, Judy M.; and Piero, Darlene K., 5,531,702, Cl. 604-181.000.

Pierson, William G.: *See—*

Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.

Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.

Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.

Pikus, Ilya: *See—*

Kimball, Gregory J.; and Pikus, Ilya, 5,532,335, Cl. 528-495.000.

Piltingsrud, Stephen M., to Truth Hardware Corporation. Automatic window sash and lock operator. 5,531,045, Cl. 49-279.000.

Pinard, Deborah L.; Peres, Eliana M. O.; and Evans, Ronald A., to Mitel Corporation. Human machine interface for telephone feature invocation. 5,533,110, Cl. 379-201.000.

Pink, David; and Marley, Christopher, to V. L. Churchill, Ltd. Automotive diagnostic tool. 5,532,927, Cl. 364-424.030.

Pink, Edward N.; and Johnson, Michael F., to Edelbrock Corporation. Cylindrical key and slot coupling. 5,531,537, Cl. 403-356.000.

Pioneer Electronic Corporation: *See—*

Funamoto, Kyota, 5,532,992, Cl. 369-47.000.

Katsu, Toshiyuki, deceased, 5,532,684, Cl. 340-825.250.

Kawakami, Yasuo, 5,532,647, Cl. 330-284.000.

Kawano, Kumi; and Matsui, Fumio, 5,532,032, Cl. 428-64.100.

Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, 5,532,993, Cl. 369-75.100.

Yokogama, Fumihiko, 5,532,988, Cl. 369-44.280.

Piontek, Carl J.: *See—*

Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.

Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.

Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,681, Cl. 604-83.000.

Pipan, Gregory F., to Harris-Johnson Industries, Inc. Rope locking device. 5,531,297, Cl. 188-65.100.

Piper, Douglas E.: *See—*

Dickerson, Marvella; and Piper, Douglas E., 5,532,429, Cl. 174-36.000.

Pirelli General plc: *See—*

Preston, Roger S.; and Smith, David B., 5,533,164, Cl. 385-128.000.

Pirio, Francis; and Thomine, Jean-Baptiste, to France Telecom. Optical fiber transmission system with compensation for line distortions. 5,532,861, Cl. 359-161.000.

Pizzi, Antonio; Roll, Willi; and Dombo, Berthold, to Rutgerswerke Aktiengesellschaft. Heat-curable tannin-based binding agents. 5,532,330, Cl. 528-125.000.

Plain, Margaret C.: *See—*

Beikirch, Thomas R.; and Plain, Margaret C., 5,532,839, Cl. 358-401.000.

Plankenhorn, Horst: *See—*

Schreiber-Prillwitz, Wolfgang; and Plankenhorn, Horst, 5,532,187, Cl. 437-182.000.

Platten, James E.: *See—*

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Platzer, Erich: *See—*

Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., 5,532,341, Cl. 530-351.000.

Plaumann, Heinz: *See—*

Barwich, Juergen; Plaumann, Heinz; and Wistuba, Eckehardt, 5,532,321, Cl. 525-103.000.

Plazarin, James J. Vehicle level alarm. 5,532,672, Cl. 340-440.000.

Pless, Benjamin D., to Ventritex, Inc. Method and apparatus for producing configurable biphasic defibrillation waveforms. 5,531,765, Cl. 607-5.000.

Pleune, Daniel A.; and Roe, William E., to Jackson Products, Inc. Pantoscopic and length adjustable safety spectacle. 5,532,767, Cl. 351-118.000.

Pliura, Diana; Wong, Lawrence T.; and Er, Song S., to Hemosol Inc. Selective crosslinking of hemoglobin by oxidized, ring-opened saccharides. 5,532,352, Cl. 540-145.000.

Plotz, Kevin G.: *See—*

Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.

Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.

Podd, Victor T. Active bulkhead corner with enhanced commodity discharge. 5,531,361, Cl. 222-198.000.

Podvin, Richard T. Protective shield for vehicle door. 5,531,500, Cl. 296-152.000.

Poetsch, Eike: *See—*

Köhler, Manfred; Ohngemach, Jörg; Poetsch, Eike; Eidenschink, Rudolf; Greber, Gerhard; Dorsch, Dieter; Gehlhaus, Jürgen; Dorfner, Konrad; and Hirsch, Hans L., 5,532,112, Cl. 430-281.100.

Pogue, D. Michael: *See—*

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Pohl, Christopher A.: *See—*

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Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.

Poirier, Daniel J. J.: *See—*

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Pola Chemical Industries, Inc.: *See—*

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Polaroid Corporation: *See—*

Muendel, Martin H., 5,533,163, Cl. 385-126.000.

Wober, Munib A.; and Lin, Jinjou, 5,533,173, Cl. 395-114.000.

Polites, Michael E.; and Alhorn, Dean C., to United States of America, National Aeronautics and Space Administration. Means for positioning and repositioning scanning instruments. 5,531,093, Cl. 73-1.00E.

Pollard-Knight, Denise V.: *See—*

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Poly Flex Circuits, Inc.: *See—*

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PolyPlus Battery Company, Inc.: *See—*

Chu, May-Ying, 5,532,077, Cl. 429-102.000.

Pompignano, Gary C.: *See—*

Woo, James T. K.; Pompignano, Gary C.; Awarski, Donston E.; and Packard, Kevan A., 5,532,297, Cl. 523-408.000.

Pond, Ramona G.: *See—*

Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., 5,532,667, Cl. 336-177.000.

Pons, Francesc; Perez, Pedro; and Auria, Augustin, to Braun Aktiengesellschaft. Water proportioning device for steam irons. 5,531,037, Cl. 38-77.800.

Poole, Donald R., to Automotive Systems Laboratory, Inc. Process for preparing azide-free gas generant composition. 5,531,941, Cl. 264-3.400.

Pope, Peter J.: *See—*

DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., 5,532,081, Cl. 429-171.000.

Postma, Lambertus; Maas, Henricus G. R.; Haisma, Jan; Ruigrok, Jacobus J. M.; and Somers, Gerardus H. J., to U.S. Philips Corporation. Method of manufacturing a thin-film magnetic head. 5,531,016, Cl. 29-603.160.

Poteet, Kenneth A.; and Reddy, Chitranjan N., to Alliance Semiconductor Corporation. Random access memory redundancy circuit employing fusible links. 5,532,966, Cl. 365-200.000.

Potter, Terence M.; and Muhich, John S., to International Business Machines Corporation. Combined decoder/adder circuit which provides improved access speed to a cache. 5,532,947, Cl. 364-715.010.

Pottkämper, Siegfried: *See—*

Behringer, Hartmut; Pottkämper, Siegfried; Stephan, Hans-Werner; and Marcks, Gerrit, 5,531,075, Cl. 62-46.100.

Potucek, Martin: *See—*

Sonnenberg, Sven; Rimai, Donald S.; Almeter, David D.; and Potucek, Martin, 5,532,802, Cl. 355-246.000.

Poulson, Keith L.; Fair, Paul; and Parker, Robert M., to Gerry Baby Products Company. Folding soft gate. 5,531,258, Cl. 160-376.000.

Powell, Anne M.: *See—*

Talbot, Neil; Rexroad, Caird E., Jr.; Pursel, Vernon G.; and Powell, Anne M., 5,532,156, Cl. 435-240.200.

Powell, Charles H., Jr., to Allergan, Inc. Method for disinfecting a contact lens and detecting the presence of an oxidative disinfectant. 5,531,963, Cl. 422-30.000.

Powell, John: *See—*

Fauteux, Denis G.; van Buren, Martin; and Powell, John, 5,531,871, Cl. 205-688.000.

Powell, Robert L.: *See—*

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Power, John S.; O'Mahony, John J.; and Merrick, Edwin B., to Puritan Bennett Corporation. Double and single acting piston ventilators. 5,531,221, Cl. 128-205.180.

Powers, John H., to Aluminum Company of America. Method of cleaning an aluminum surface by plasma treatment. 5,532,447, Cl. 219-121.430.

PPG Industries, Inc.: *See—*

Leopold, Edmund A.; and Kovacik, Paul J., 5,531,047, Cl. 52-172.000.

Pragt, Henrikus J. H.: *See—*

Van Der Leeuw, Bart; Kowal, Albert E.; Pragt, Henrikus J. H.; and Canale, Joseph E., 5,532,543, Cl. 313-25.000.

Prakash, Jai: *See—*

Redey, Laszlo I.; Myles, Kevin M.; Vissers, Donald R.; and Prakash, Jai, 5,532,078, Cl. 429-104.000.

Prasit, Petpiboon: *See—*

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Pratt & Whitney Canada, Inc.: *See—*

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Precision Combustion, Inc.: *See—*

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Preh-Werke GmbH & Co., KG: *See—*

Bonrath, Herbert; Hochgesang, Gerhard; Brüggemann, Ulrich; and Heil, Hans-Karl, 5,532,444, Cl. 200-524.000.

Prendergast, Frank T.: *See—*

Dobrez, John G.; and Prendergast, Frank T., 5,531,905, Cl. 210-709.000.

President and Fellows of Harvard University: *See—*

Wang, Ning; Barlovatz-Meimon, Georgia; and Fredberg, Jeffrey J., 5,532,132, Cl. 435-7.210.

Preston, Roger S.; and Smith, David B., to Pirelli General plc. Optical fibre assemblies for blown installation. 5,533,164, Cl. 385-128.000.

Price, Gerald R.: *See—*

Richardson, Jerry R.; Price, Gerald R.; Richardson, Everett V.; and Lagasse, Peter F., 5,532,687, Cl. 340-870.330.

Price, Tim U., to Megahertz Corporation. Line current protection circuit for use with a PCMCIA-architecture modem card. 5,532,898, Cl. 361-119.000.

Pride, Michael: *See—*

Thanavala, Yasmin; Thakur, Arvind; Roitt, Ivan; and Pride, Michael, 5,531,990, Cl. 424-131.100.

Priem, Curtis; Chang, Shuen C.; and Ho, Hai D., to Sun Microsystems, Inc; and Samsung Semiconductor, Inc. Multiple block mode operations in a frame buffer system designed for windowing operations. 5,533,187, Cl. 395-164.000.

Priepke, Edward H.: *See—*

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Primary Millwork: *See—*

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Pro-Techtor International: *See—*

Hsu, Cheng-Hui, 5,531,395, Cl. 242-381.600.

Probst, Gastone, to Ixtlan Aktiengesellschaft. Sterilization and homogenization of fluid substances by high frequecy vibration. 5,531,157, Cl. 99-451.000.

Procter & Gamble Company, The: *See—*

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Fortier, Nancy E., 5,532,009, Cl. 426-73.000.

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Masters, Ronald A.; Maile, Michael S.; Underwood, David C.; Kupneski, Michael J.; and Roetker, Timothy C., 5,531,933, Cl. 510-429.000.

Perkins, Christopher M., 5,531,915, Cl. 510-294.000.

Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.

Vogel, Alice M.; Wahl, Errol H.; Cappel, Jerome P.; and Ward, Thomas C., 5,532,023, Cl. 427-8.000.

Proprietary Technology, Inc.: *See—*

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Propst, Charles, to Timbarco, Corp. c/o Belfint, Lyons & Schuman. Method of recycling plastic coated containers. 5,531,863, Cl. 162-5.000.

Protecs Syringes International Corporation: *See—*

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Prücher, Helmut: *See—*

Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.

Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücher, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, 5,532,255, Cl. 514-326.000.

Prudham, Daniel: *See—*

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Pruna, André, to Assistance Publique - Hopitaux de Paris. Therapeutic application of fluoroquinolone derivatives. 5,532,239, Cl. 514-254.000.

Prutchi, David, to Intermedics, Inc. Rate responsive cardiac pacemaker with filtered impedance sensing and method. 5,531,772, Cl. 607-17.000.

Psinakis, Leas N.; Villani, Thomas J.; and Etsch, August C., to AT&T Global Information Solutions Company. Method and apparatus for data communication efficiency analysis. 5,532,939, Cl. 364-514.00C.

Pugach, Joseph: *See—*

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Puginier, Jerome: *See—*

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Puglia, Wayne J.: *See—*

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Puletti, Paul P.: *See—*

Koubek, Timothy C.; Puletti, Paul P.; and Wieczorek, Joseph, Jr., 5,532,300, Cl. 524-47.000.

Pulliainen, Martti; and Haapamāki, Tarja, to Savcor-Consulting Oy. Electrode arrangement to be used in the cathodic protection of concrete structures and a fixing element. 5,531,873, Cl. 204-196.000.

Pundsack, Arnold L.: *See—*

Soden, Philip H.; and Pundsack, Arnold L., 5,532,102, Cl. 430-128.000.

Purac Biochem B.V.: *See—*

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Puritan Bennett Corporation: *See—*

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Pursel, Vernon G.: *See—*

Talbot, Neil; Rexroad, Caird E., Jr.; Pursel, Vernon G.; and Powell, Anne M., 5,532,156, Cl. 435-240.200.

Purushothaman, Sampath: *See—*

Farooq, Shaji; Purushothaman, Sampath; Reddy, Srinivasa S. N.; and Sura, Vivek M., 5,532,031, Cl. 428-623.000.

Puskorius, Gintaras V.: *See—*

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Q. P. Corporation: *See—*

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Qi, Ru-Yi; and Karam, Ronald E., to Osram Sylvania Inc. Phosphor and method of making same. 5,531,926, Cl. 252-301.40F.

QPL Limited: *See—*

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Quad/Tech, Inc.: *See—*

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Qualcomm Incorporated: *See—*

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Quantum Corporation: *See—*

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Quantum Peripherals Colorado, Inc.: *See—*

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Quarderer, George J.: *See—*

Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.

Quarles, Dwight R. Metallic fence system. 5,531,427, Cl. 256-22.000.

Queille, Philippe: *See—*

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Quickie Designs Inc.: *See—*

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Quiggle, Duane, administrator: *See—*

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Quintana, Ronald P.: *See—*

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R. J. Reynolds Tobacco Company: *See—*

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Racanelli, Marco; Hwang, Bor-Yuan C.; Foerstner, Juergen; and Huang, Wen-Ling M., to Motorola, Inc. Method of adjusting a threshold voltage for a semiconductor device fabricated on a semiconductor on insulator substrate. 5,532,175, Cl. 437-29.000.

Rach, Petra: *See—*

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Rackley, Ronald L., Sr. Buffer covering. 5,530,986, Cl. 15-247.000.

Rackman, Michael I.: *See—*

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Racom Systems, Inc.: *See—*

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Raddatz, Peter; Gante, Joachim; Juraczyk, Horst; Wurziger, Hanns; Prücher, Helmut; Bernotat-Danielowski, Sabine; and Melzer, Guido, to Merck Patent Gesellschaft mit beschrankter Haftung. Adhesion receptor antagonists. 5,532,255, Cl. 514-326.000.

Radloff, Timothy; and Garrett, Robert, to Dell USA, L.P. Snap-in resilient emi grounding clip apparatus for computer structures. 5,532,428, Cl. 174-35.0GC.

Rae, Rory; Oka, Ken K.; Hubbard, Gordon D.; Rocco, Frank F.; Bratt, David W.; Chalmers, Dean R.; and Hind, Ron M., to Deere & Company. Loader parking stand system. 5,531,561, Cl. 414-686.000.

Raghavan, Srini; Jan, Der'e; and Chilkunda, Raghunath, to University of Arizona. Modification of polyvinylidene fluoride membrane and method of filtering. 5,531,900, Cl. 210-651.000.

Ragi, Elias G.; and Godry, Thomas J., to UOP. Method of indirect heat exchange for two phase flow distribution. 5,531,266, Cl. 165-115.000.

Rains, Thersa J.; and Pempsell, Mark, to DeMar Technologies, Inc. Patient repositioning and position maintenance device. 5,530,974, Cl. 5-81.10T.

Rajivan, Sathyanandan, to Sun Microsystems, Inc. Wave propagation logic. 5,532,625, Cl. 326-98.000.

Ralls, Gene R.: *See—*

Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., 5,531,250, Cl. 138-94.000.

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Ramachandran, Ramakrishnan: *See—*

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Ramamurthy, Nungavarum S.: *See—*

Golub, Lorne M.; Ramamurthy, Nungavarum S.; McNamara, Thomas F.; and Ryan, Maria E., 5,532,227, Cl. 514-152.000.

Ramirez, Jose G. Reinforced wooden wall. 5,531,054, Cl. 52-741.100.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*

Rosenberg, Eugene, 5,532,231, Cl. 514-183.000.

Ramtron International Corporation: *See—*

Ruesch, Rodney A.; and Golabi, Manooch, 5,532,953, Cl. 365-145.000.

Ranoux, Claude. Spontaneous cycle fertilization method. 5,532,155, Cl. 435-240.200.

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Raskevicius, Leo, to Sargent Manufacturing Company. Ratcheting latch mechanism for a vertical rod door exit device. 5,531,492, Cl. 292-335.000.
Rasmussen, John. Condensate trap and drain for systems under pressure. 5,531,241, Cl. 137-188.000.
Rasmussen, Lars; Møllgaard, Annette; Petersen, Bent R.; and Sørensen, Niels H., to Novo Nordisk A/S. Method for casein finishing of leather. 5,531,795, Cl. 8-94.210.
Raszkowski, James A., to General Motors Corporation. torque mechanism for a power transmission. 5,531,303, Cl. 192-4.00A.
Ratner, Alan S., to United States of America, National Security Agency. Device for and method of correcting errors in formatted modem transmissions. 5,533,033, Cl. 371-30.000.
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Rawson, Thomas E.: *See—*
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Ray, Partha S.: *See—*
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Ray, R. Charles, to Danek Medical, Inc. System for stabilizing the spine and reducing spondylolisthesis. 5,531,745, Cl. 606-61.000.
Ray, R. Charles, to Danek Medical Inc. System for stabilizing the spine and reducing spondylolisthesis. 5,531,747, Cl. 606-61.000.
Rays Engineering Co., Ltd.: *See—*
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Reckitt & Colman Inc.: *See—*
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Redey, Laszlo I.; Myles, Kevin M.; Vissers, Donald R.; and Prakash, Jai, to University of Chicago, The. Electrochemical cell. 5,532,078, Cl. 429-104.000.
Reed, Steven J.; Davies, Scott T.; Wallgren, Robert L.; and Wojtan, George R., to Thomas & Betts Corporation. Connector module for local area network. 5,531,611, Cl. 439-540.100.
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Reliance Electric Industrial Company: *See—*
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Ricco, Mario; Pacucci, Nicola; Abate, Maurizio; and Faggioli, Eugenio, to Elasis Sistema Ricerca Fiat Nel Mezzogiorno Societa Consortile per Azioni. Control circuit for predominantly inductive loads in particular electroinjectors. 5,532,526, Cl. 307-104.000.

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Rittner, Siegbert; Rüffer, Hans-Martin; Schmid, Jörg; and Wisser, Thomas, to Hoechst Aktiengesellschaft. Process for preparing aromatic hydroxycarboxylic acids. 5,532,406, Cl. 562-424.000.
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Roberto, Feliziani; and Jaker, Marc L., to RTC, Inc. Non-contaminating probe and methods of making and using same. 5,531,717, Cl. 604-271.000.
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- Rolando, Thomas E.; Voss, Peter A.; and Ryan, Christopher M., to H. B. Fuller Licensing & Financing, Inc. Dry-bonded film laminate employing polyurethane dispersion adhesives with improved crosslinkers. 5,532,058, Cl. 428-341.000.
- Roley, David R.: *See—*
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- Roscoe, Gary W., to Xerox Corporation. Method of saving machine fault information including transferring said information to another memory when an occurrence of predetermined events or faults of a reproduction machine is recognized. 5,533,193, Cl. 395-183.150.
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- Rosen, Robert K.; Nickias, Peter N.; Devore, David D.; Stevens, James C.; and Timmers, Francis J., to Dow Chemical Company, The. Addition polymerization catalysts comprising reduced oxidation state metal complexes. 5,532,394, Cl. 556-11.000.
- Rosenbach, Arnie. Portable hand activated carbonator. 5,531,254, Cl. 141-113.000.
- Rosenberg, Eugene, to Ramot University Authority for Applied Research and Industrial Development Ltd. Antibacterial agent. 5,532,231, Cl. 514-183.000.
- Rosenberg, Gwen H., to Alliance Pharmaceutical Corp. Use of liquid fluorocarbons to facilitate pulmonary drug delivery. 5,531,219, Cl. 128-203.120.
- Rosenberg, Marvin; and Wasson, Irving. Portable ultrasonic dental cleaning device. 5,531,598, Cl. 433-119.000.
- Rosenfelder, Ottmar: *See—*
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- Rossi, Michael J.: *See—*
  - Austin, Fred; Knowles, Gareth J.; and Rossi, Michael J., 5,531,407, Cl. 244-219.000.
- Rostoker, Michael D., to LSI Logic Corporation. Floorplanning technique using multi-partitioning based on a partition cost factor for non-square shaped partitions. 5,532,934, Cl. 364-488.000.
- Rotay, Craig J.; and Zielke, Christopher, to SGS-Thomson Microelectronics, Inc. Method and structure for improving RF amplifier gain, linearity, and switching speed utilizing Schottky diode technology. 5,532,639, Cl. 327-376.000.
- Roucis, Janet L.: *See—*
  - Smith, Jeannette K.; and Roucis, Janet L., 5,533,124, Cl. 380-4.000.
- Roussel-UCLAF: *See—*
  - Galliani, Giulio; Barzashi, Fernando; Butti, Alina; Bonetti, Carla; and Toja, Emilio, 5,532,375, Cl. 546-334.000.
- Roustaei, Alex. Optical scanning head. 5,532,467, Cl. 235-472.000.
- Rowden, David L.: *See—*
  - Chapman, Michael J.; Merle, Thomas C.; and Rowden, David L., 5,531,008, Cl. 29-230.000.
- Rowley, David S.: *See—*
  - Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., 5,531,687, Cl. 604-95.000.
- Royal, P. Darrell: *See—*
  - Josephson, Stanley M.; Kopesec, Michael F.; Royal, P. Darrell; Stephens, Thomas S.; and Thompson, Mitchell D., 5,532,464, Cl. 235-379.000.
- Roycroft, Marie A.: *See—*
  - Roycroft, Terence J.; and Roycroft, Marie A., 5,531,179, Cl. 114-270.000.
- Roycroft, Terence J.; and Roycroft, Marie A. Wheel-retraction apparatus and method for amphibious vehicle. 5,531,179, Cl. 114-270.000.
- Rozenwasser, Avraham M.: *See—*
  - Rozenwasser, David, 5,531,065, Cl. 59-80.000.
- Rozenwasser, David, to Rozenwasser, Avraham M. Fine jewelry diamond cut rope chain and method of manufacture thereof. 5,531,065, Cl. 59-80.000.
- Rozwod, Robert A.: *See—*
  - Sayah, John Y.; and Rozwod, Robert A., 5,533,148, Cl. 382-240.000.
- RTC, Inc.: *See—*
  - Roberto, Feliziani; and Jaker, Marc L., 5,531,717, Cl. 604-271.000.
- Ruddy, Stephen B.; Roberts, Mary E.; McIntire, Gregory L.; Cooper, Eugene R.; and Bacon, Edward R., to Sterling Winthrop Inc. Compositions of iodophenoxy alkanes and iodophenyl ethers and pharmaceutically acceptable clays for visualization of the gastrointestinal tract. 5,531,979, Cl. 424-945.000.
- Rudolph, Werner: *See—*
  - Braun, Max; Rudolph, Werner; Palsherm, Stefan; and Eichholz, Kerstin, 5,532,411, Cl. 562-861.000.
- Rudy, Wayne M., to Engelhard Corporation. Staged three-way conversion catalyst and method of using the same. 5,531,972, Cl. 423-212.000.
- Ruelle, Philipe, to SIEPEL-Societe Industrielle d'Etudes et Protection Electroique. Device for positioning antennas inside a measurment chamber of the anechoic or of the semi-anechoic type. 5,532,704, Cl. 343-703.000.
- Ruesch, Rodney A.; and Golabi, Manooch, to Ramtron International Corporation. Ferroelectric memory sensing method using distinct read and write voltages. 5,532,953, Cl. 365-145.000.
- Ruescher, Edward H. Spare tire lifting device. 5,531,558, Cl. 414-463.000.
- Rüffer, Hans-Martin: *See—*
  - Rittner, Siegbert; Rüffer, Hans-Martin; Schmid, Jörg; and Wisser, Thomas, 5,532,406, Cl. 562-424.000.
- Rufo, George, Jr.: *See—*
  - O'Brien, Patrick J.; Thomas, Alvin; Rufo, George, Jr.; Durham, Larry; and Gelardi, Anthony L., 5,531,321, Cl. 206-232.000.
- Ruhl, Erwin: *See—*
  - Geiger, Wolfgang; and Ruhl, Erwin, 5,531,888, Cl. 210-162.000.
- Ruhland-Fritsch, Beatrice: *See—*
  - Reist, Elmer J.; Ruhland-Fritsch, Beatrice; and Sturm, Pricilla A., 5,532,225, Cl. 514-81.000.
- Ruigrok, Jacobus J. M.: *See—*
  - Postma, Lambertus; Maas, Henricus G. R.; Haisma, Jan; Ruigrok, Jacobus J. M.; and Somers, Gerardus H. J., 5,531,016, Cl. 29-603.160.
- Ruiz-Torres, Maximiano: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Rule, Orville R., III: *See—*
  - Schulman, Joseph H.; and Rule, Orville R., III, 5,531,679, Cl. 604-65.000.
- Runaldue, Thomas J.: *See—*
  - Fischer, Matthew J.; Gibson, Glen; Dwork, Jeffrey; and Runaldue, Thomas J., 5,533,203, Cl. 395-250.000.
- Ruohonen, Heikki: *See—*
  - Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.
- Ruse, Guy F.: *See—*
  - Nix, J. Lamar; and Ruse, Guy F., 5,532,892, Cl. 360-113.000.
- Ruskowski, Edward J.: *See—*
  - Harrison, Edward S.; Ruskowski, Edward J.; and Melquist, James, 5,532,295, Cl. 523-218.000.
- Russett, Jon P.: *See—*
  - Pellicane, Jack E.; Russett, Jon P.; and Sands, Jeffery L., 5,531,155, Cl. 99-349.000.
- Russo, Anthony P., to AT&T Corp. Underground conduit defect localization. 5,531,099, Cl. 73-40.50A.
- Russo, Gerald M.; Majeed, Kardar M.; and Houck, Merle L., to Roman Adhesives, Inc. Wallpaper stripper. 5,531,919, Cl. 510-200.000.
- Rutgerswerke Aktiengesellschaft: *See—*
  - Pizzi, Antonio; Roll, Willi; and Dombo, Berthold, 5,532,330, Cl. 528-125.000.
- Ruttenberg, Gideon. Pulsating drip laterals. 5,531,381, Cl. 239-99.000.
- Rutz, Joseph: *See—*
  - Lyon, Dan; Perrone, Terrance; and Rutz, Joseph, 5,531,106, Cl. 73-61.560.
- Ryan, Christopher M.: *See—*
  - Rolando, Thomas E.; Voss, Peter A.; and Ryan, Christopher M., 5,532,058, Cl. 428-341.000.
- Ryan, Frank S.: *See—*
  - Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., 5,531,874, Cl. 204-224.00M.
- Ryan, Jeffrey M.: *See—*
  - Bates, Cary L.; Blades, Jerry A.; Kiel, Harvey G.; Romon, Raymond F.; and Ryan, Jeffrey M., 5,532,715, Cl. 345-123.000.
  - Bates, Cary L.; Cragun, Brian J.; Donovan, Robert J.; Jaaskelainen, William; Ryan, Jeffrey M.; and Striemer, Bryan L., 5,533,182, Cl. 395-155.000.
- Ryan, Maria E.: *See—*
  - Golub, Lorne M.; Ramamurthy, Nungavarum S.; McNamara, Thomas F.; and Ryan, Maria E., 5,532,227, Cl. 514-152.000.
- Rybicki, Mathew A.: *See—*
  - Grube, Gary W.; Markison, Timothy W.; Pendleton, Matthew A.; and Rybicki, Mathew A., 5,533,008, Cl. 370-17.000.
- Rydin, Björn, to Albany Nordiskafilt AB. Method of making loop seam for double layered papermaking fabric. 5,531,251, Cl. 139-383.0AA.
- Ryhänen, Tapani, to Vaisala Oy. Capacitive transducer feedback-controlled by means of electrostatic force and method for controlling the profile of the transducing element in the transducer. 5,531,128, Cl. 73-862.623.
- Ryobi North America: *See—*

  - Stolzer, J. Timothy, 5,531,538, Cl. 403-374.000.
- Sabia, Nicholas J.: *See—*
  - Hartrick, Thomas V.; Stevens, Jeffrey N.; and Sabia, Nicholas J., 5,532,920, Cl. 364-419.100.
- Sabloewski, Horst, to Eppendorf-Netheler-Hinz GmbH. Device for adjusting correction factor of a plunger lift pipet. 5,531,131, Cl. 73-864.180.
- Sachdev, Krishna G.: *See—*
  - Behfar-Rad, Abbas; Perry, Charles H.; and Sachdev, Krishna G., 5,532,608, Cl. 324-754.000.
- Sachse, Hans. Tube-shaped ureter splint. 5,531,718, Cl. 604-280.000.
- Sadhir, Rajender K.: *See—*
  - Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., 5,532,598, Cl. 324-326.000.
- Sage Products, Inc.: *See—*
  - Mosior, Donald J., 5,531,346, Cl. 220-254.000.
- Sahyoun, Youssef Y. Speaker resistance sensing and power limit setting circuit. 5,532,649, Cl. 330-297.000.
- Saia, Richard J.; Ghezzo, Mario; Bagepalli, Bharat S. K.; and Durocher, Kevin M., to General Electric Company. Method of micromachining electromagnetically actuated current switches with polyimide reinforcement seals, and switches produced thereby. 5,531,018, Cl. 29-622.000.
- Saidi, Eileen S. Solid electrolytes containing tetrabutyl ammonium thiocyanate and electrochemical cells produced therefrom. 5,532,082, Cl. 429-192.000.
- Saidian, Jacob. Electric light socket constructions. 5,532,557, Cl. 315-362.000.
- Saikatsu, Hiromasa: *See—*
  - Tsunezawa, Ichiro; Saikatsu, Hiromasa; and Ohta, Tsuyoshi, 5,532,669, Cl. 338-184.000.
- Sail D. White Enterprises, Inc.: *See—*
  - White, Donald, 5,531,468, Cl. 280-463.000.
- Saito, Akihisa: *See—*
  - Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
- Saito, Daisuke: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Saito, Hironobu, to Canon Kabushiki Kaisha. Separating apparatus and electrophotographic image forming apparatus using the same. 5,532,800, Cl. 355-245.000.
- Saito, Naoto: *See—*
  - Akamine, Tadao; Saito, Naoto; and Aoki, Kenji, 5,532,185, Cl. 437-141.000.
- Saito, Shinji; and Sugizaki, Akihiko, to Nitto Kogyo Co., Ltd. Elastic fixing roller for electrophotographic copying machine. 5,532,808, Cl. 355-290.000.
- Saito, Takeshige: *See—*
  - Ohishi, Masahiro; Ohtomo, Fumio; Kimura, Kazuaki; Yabe, Masaaki; Katayama, Yasutaka; Koshikawa, Kazushige; and Saito, Takeshige, 5,532,813, Cl. 356-5.010.
- Saito, Yoshimi: *See—*
  - Nishikawa, Tomoyuki; and Saito, Yoshimi, 5,532,811, Cl. 355-316.000.
- Saito, Yukio; Kawamura, Takumi; Okuyama, Masaki; and Munekata, Tsutomu, to Fujitsu Isotec Limited. Paper feeder for portable printer. 5,531,431, Cl. 271-4.010.
- Saji, Ikutaro; Muto, Masayuki; Tanno, Norihiko; and Yoshigi, Mayumi, to Sumitomo Pharmaceuticals Company, Ltd. Imide derivatives, and their production and use. 5,532,372, Cl. 544-368.000.
- Saka, Yuuji; and Goto, Hideki, to Sumitomo Wiring Systems, Ltd. Sealing construction for electrical connection box and method for forming packing used therefor. 5,532,431, Cl. 174-52.300.
- Sakaguchi, Takashi: *See—*
  - Kusaka, Hiroya; Sakaguchi, Takashi; and Nakayama, Masaaki, 5,532,742, Cl. 348-264.000.
- Sakai, Hideko: *See—*
  - Hasegawa, Makoto; Adachi, Naoki; Mimura, Masahiro; Hirabayashi, Hirohide; and Sakai, Hideko, 5,533,045, Cl. 375-200.000.
- Sakai, Hideo: *See—*
  - Koba, Tomohita; Nakakura, Toshiyuki; Sakai, Hideo; Masuda, Misao; Kishi, Satoru; and Maruko, Chiaki, 5,532,054, Cl. 428-294.000.
- Sakai, Shigenobu: *See—*
  - Kuriki, Makoto; Uehira, Kazutake; Takahashi, Yukio; and Sakai, Shigenobu, 5,532,736, Cl. 348-20.000.
- Sakai, Shinji: *See—*
  - Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
- Sakai, Yuji; and Nakajima, Yasuhisa, to Sony Corporation. Digital broadcast receiver that switches between NICAM audio and analog audio. 5,532,762, Cl. 348-738.000.
- Sakaki, Masaharu: *See—*
  - Nagano, Eiki; Takemura, Susumu; Enomoto, Masayuki; Sakaki, Masaharu; and Kizawa, Satoru, 5,532,208, Cl. 504-239.000.
- Sakaki, Yuji: *See—*
  - Kin, Keiyu; Akuta, Yoshimitsu; and Sakaki, Yuji, 5,532,678, Cl. 340-438.000.
- Sakamoto, Masafumi, to Japan Servo Co., Ltd. Permanent magnet type brushless motor. 5,532,531, Cl. 310-49.00R.
- Sakamoto, Shinobu; and Fujino, Takeshi, to Nikon Corporation. Viewing tube for microscope. 5,532,872, Cl. 359-384.000.
- Sakane, Kazuo: *See—*
  - Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.
- Sakane, Manabu: *See—*
  - Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
- Sakashita, Takeshi; Shimoda, Tomoaki; and Kishimura, Kotaro. Copolymeric polycarbonates, a method for their preparation, and compositions thereof. 5,532,324, Cl. 525-462.000.
- Sakata, Tetsuya: *See—*
  - Orita, Akira; Kawakami, Takaaki; and Sakata, Tetsuya, 5,533,007, Cl. 370-17.000.
- Sakiyama, Kazuhiro, to Nakamichi Corporation. Automatic disk playing apparatus. 5,532,986, Cl. 369-36.000.
- Sakurada, Toyohisa: *See—*
  - Terauchi, Takanobu; Sakurada, Toyohisa; Fukumoto, Takehiko; and Suzuki, Hiroshi, 5,532,421, Cl. 585-671.000.
- Sakurai, Kaoru, to Ishihara Sangyo Kaisha Ltd. Process for producing acicular γ-FeOOH particles. 5,531,977, Cl. 423-634.000.
- Salapow, Thomas M.; Wolf, Roger P.; Scanio, Thomas J.; and Kuhn, John F., to Mine Safety Appliances Company. Metal cover for respirator cartridge. 5,531,803, Cl. 55-498.000.
- Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L.; and Cullo, Leonard A., to Aristech Chemical Corporation. Manufacture of neopentyl glycol (IV). 5,532,417, Cl. 568-853.000.
- Salk Institute for Biological Studies, The: *See—*
  - Chu, Barbara C.; Joyce, Gerald F.; and Orgel, Leslie E., 5,532,126, Cl. 435-6.000.
- Salmon, Joseph H., to Intel Corporation. Method and apparatus for testing for a sufficient write voltage level during power up of a SRAM array. 5,533,196, Cl. 395-185.070.
- Salzsauler, Donald J.; and Salzsauler, Richard J. Stretch film. 5,531,393, Cl. 242-160.400.
- Salzsauler, Richard J.: *See—*
  - Salzsauler, Donald J.; and Salzsauler, Richard J., 5,531,393, Cl. 242-160.400.
- Samain, Henri: *See—*
  - Bauer, Daniel; Richard, Françoise; Hassoun, Muriel; Malle, Gérard; and Samain, Henri, 5,531,987, Cl. 424-76.210.
- Sampson, Mark J.: *See—*
  - Parham, Dennis E.; and Sampson, Mark J., 5,531,336, Cl. 211-183.000.
- Samsung Electronics Co., Ltd.: *See—*
  - Choi, Min-ho; Kim, Kyung-hwan; Cheon, Byeong-sik; Kim, Young-gi; Shin, Hwa-seong; and Kim, Yong-kook, 5,532,812, Cl. 355-327.000.
  - Kim, Yong-Kyu; Liu, Tianmin; Jaffe, Steven T.; and Strolle, Christopher H., 5,533,138, Cl. 382-232.000.
  - Lee, Jung-Hyuck, 5,532,967, Cl. 365-206.000.
  - Lee, Seung-Hun, 5,532,578, Cl. 323-313.000.
  - Patel, Chandrakant B.; and Yang, Jian, 5,532,755, Cl. 348-614.000.
  - Seo, Bo-Sung; and Kim, Jong-Young, 5,532,620, Cl. 326-81.000.
  - Song, Jun-ho; Pae, Yong-Gug; and Park, Wun-yong, 5,532,853, Cl. 359-87.000.
  - Strolle, Christopher H.; and Weckenbrock, Hermann J., 5,532,820, Cl. 358-310.000.
  - Yoo, Han-Ju, 5,532,559, Cl. 318-254.000.
- Samsung Semiconductor, Inc.: *See—*
  - Priem, Curtis; Chang, Shuen C.; and Ho, Hai D., 5,533,187, Cl. 395-164.000.
- Samuelson, Laurence S.: *See—*
  - Dorius, Lee K.; and Samuelson, Laurence S., 5,532,890, Cl. 360-103.000.
- Sanchez-Sinencio, Feliciano: *See—*
  - Martinez-Bustos, Fernando; Figueroa C., Juan D. D.; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; Martinez, Jose D. L. L.; and Ruiz-Torres, Maximiano, 5,532,013, Cl. 426-496.000.
- Sandia Corporation: *See—*
  - Bloomquist, Douglas D.; Buchheit, Rudy; Greenly, John B.; McIntyre, Dale C.; Neau, Eugene L.; and Stinnett, Regan W., 5,532,495, Cl. 250-492.210.
- SanDisk Corporation: *See—*
  - Auclair, Daniel L.; Craig, Jeffrey; Mangan, John S.; Norman, Robert D.; Guterman, Daniel C.; and Mehrotra, Sanjay, 5,532,962, Cl. 365-201.000.
  - Cernea, Raul-Adrian; Mehrotra, Sanjay; and Lee, Douglas J., 5,532,964, Cl. 365-189.090.
- Sandoval, Juan. Infinite kaleidoscopes. 5,532,877, Cl. 359-616.000.
- Sandoz Ltd.: *See—*
  - Blanchette, Robert A.; Farrell, Roberta L.; and Behrendt, Chad J., 5,532,164, Cl. 435-277.000.
- Sandri, Paolo: *See—*
  - Fagnani, Mauro; Ferrario, Bruno; and Sandri, Paolo, 5,532,645, Cl. 330-265.000.
- Sands, Jeffery L.: *See—*
  - Pellicane, Jack E.; Russett, Jon P.; and Sands, Jeffery L., 5,531,155, Cl. 99-349.000.
- Sankyo Company, Limited: *See—*
  - Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,532,369, Cl. 544-276.000.

Sanmugam, K. Raj, to Telefonaktiebolaget L M Ericsson, A Corp. of Sweden. Allocation of paging capacity in cellular applications by storing a set of page request group designations, paging extents and paging priority parameters. 5,533,094, Cl. 379-57.000.

Sano, Kenji: *See—*
Horie, Seiji; Sano, Kenji; Suzuki, Nobuo; and Watarai, Shu, 5,532,099, Cl. 430-115.000.

Sano, Yoshinobu, to Kabushiki Kaisha Toshiba. Resolution conversion system. 5,532,716, Cl. 345-132.000.

Sanshin Industries Co., Ltd.: *See—*
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Sanshin Kogyo Kabushiski Kaisha: *See—*
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Santa, Toshihiro: *See—*
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Santel, Hans-Joachim: *See—*
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Santucci, David M.: *See—*
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Sanwa Kagaku Kenkyusho Co., Ltd.: *See—*
Sawai, Kiichi; Mitani, Takahiko; Ninomiya, Naohisa; and Ishiwata, Yoshirou, 5,532,272, Cl. 514-492.000.

Sardella, Louis M. Method and apparatus for feeding sheets. 5,531,432, Cl. 271-10.010.

Sargeant, Sean A.: *See—*
DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., 5,532,081, Cl. 429-171.000.

Sargent Manufacturing Company: *See—*
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Sarrazin, Patrick: *See—*
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Sartwell, Alfred L.: *See—*
Butler, Edward; Lundberg, Martin B.; Mokashi, Pushkar U.; Sartwell, Alfred L.; Shah, Hemen R.; and Tamlyn, Robert, 5,532,970, Cl. 365-230.050.

Sarv, Hamid, to Babcock & Wilcox Company, The. Production of plasma generated NO_x reducing precursors from a molecular nitrogen and hydrocarbon mixture. 5,531,973, Cl. 423-235.000.

Sasaki, Hideyuki: *See—*
Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, 5,532,488, Cl. 250-341.300.

Sasaki, Hirotomo: *See—*
Yagihara, Morio; Sasaki, Hirotomo; Mifune, Hiroyuki; and Kato, Shinji, 5,532,120, Cl. 430-600.000.

Sasaki, Ichirou: *See—*
Otsubo, Toru; Suzuki, Yasumichi; Sasaki, Shinji; Ohara, Kazuhiro; and Sasaki, Ichirou, 5,531,862, Cl. 156-643.100.

Sasaki, Minoru; and Watanabe, Sinichirou, to Kabushiki Kaisya Advance. Skin attachment type electric thermal treatment device. 5,531,775, Cl. 607-96.000.

Sasaki, Shinji: *See—*
Otsubo, Toru; Suzuki, Yasumichi; Sasaki, Shinji; Ohara, Kazuhiro; and Sasaki, Ichirou, 5,531,862, Cl. 156-643.100.

Sasaki, Yoshio, to Sony Corporation. Recording and/or reproducing apparatus and method of controlling same. 5,532,991, Cl. 369-44.350.

Sasano, Akira: *See—*
Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.

Sasaoka, Seiji; Aoki, Izuo; and Maruyama, Hiroshi, to Nippon Soda Co., Ltd. Feedstuff for ruminant. 5,532,008, Cl. 426-73.000.

Satellite Communication Laboratory Co., Ltd.: *See—*
Kameo, Yohdoh; Matsumoto, Kazuo; and Suzuki, Jun, 5,533,060, Cl. 375-332.000.

Sato, Masaki: *See—*
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Sato, Masatoshi: *See—*
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Sato, Motoharu; and Watanabe, Masaya, to Mazda Motor Corporation. Power plant for automobile. 5,531,291, Cl. 180-297.000.

Sato, Nobuyoshi: *See—*
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Sato, Susumu: *See—*
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Sato, Tadahisa: *See—*
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Sato, Takuro: *See—*
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Sato, Toshiya: *See—*
Ninomiya, Kazuhisa; and Sato, Toshiya, 5,532,959, Cl. 365-185.300.

Sato, Yasushi, to Kabushiki Kaisha Toshiba. High-integration J-K flip-flop circuit. 5,532,634, Cl. 327-216.000.

Satoh, Makoto; Shimamoto, Noboru; Takei, Hiroshi; and Hashimoto, Takeshi, to Shin-Etsu Chemical Co., Ltd. Fixing belt. 5,532,056, Cl. 428-332.000.

Satou, Masamichi: *See—*
Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.

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Saunders, Mark; and Ocker, Berthold, to Leybold Aktiengesellschaft. Sputter cathode. 5,531,876, Cl. 204-298.120.

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Sauter, Hubert: *See—*
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,532,260, Cl. 514-383.000.

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Savage, Gary V.; and Clevenger, James M., to Ciba-Geigy Corporation. Radiation cured drug release controlling membrane. 5,532,287, Cl. 522-50.000.

Savcor-Consulting Oy: *See—*
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Savitt, Jacob: *See—*
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Savkar, Sudhir D.; Lisek, Brain D.; and Sundell, Robert E., to General Electric Company. Two piece laundry additive dispenser cup. 5,531,081, Cl. 68-17.00A.

Savolainen, Esko: *See—*
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Sawada, Nobutaka: *See—*
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Sawai, Kiichi; Mitani, Takahiko; Ninomiya, Naohisa; and Ishiwata, Yoshirou, to Sanwa Kagaku Kenkyusho Co., Ltd. 3-oxygermylpropionic acid polymer, pharmaceutical composition containing same and method of preventing and/or curing symptoms of immune diseases using same. 5,532,272, Cl. 514-492.000.

Sawano, Hiroyuki; Yamanaka, Masayoshi; Kurosawa, Yutaka; and Miyamoto, Matsuhiro, to Fujikura Ltd. Optical fiber cable containing ribbon fibers. 5,531,064, Cl. 57-204.000.

Sawhney, A. Paul S.; and Folk, Craig L., to United States of America, Agriculture. Device for forming core/wrap yarn. 5,531,063, Cl. 57-12.000.

Saxena, Nirmal; and Chang, Chih-Wei D., to HaL Computer Systems, Inc. Error detection and correction method and apparatus. 5,533,035, Cl. 371-38.100.

Sayah, John Y.; and Rozwod, Robert A., to International Business Machines Corporation. Method for restructuring physical design images into hierarchical data models. 5,533,148, Cl. 382-240.000.

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Schering Aktiengesellschaft: *See—*
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Schingnitz, Gunter: *See—*
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Schirlin, Daniel G.; Collard, Jean-Noël; and Danzin, Charles, to Merrell Pharmaceuticals Inc. Substituted silyl alkylene amines. 5,532,397, Cl. 556-413.000.

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Schlichting, Eberhard; Buchold, Henning; Mallok, Gerd; Gärtner, Fritz-Jürgen; and Stönner, Hans-Martin, to Metallgesellschaft Aktiengesellschaft. Process of preparing wax ester. 5,532,393, Cl. 554-170.000.

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Schlör, Georg; Reimers, Hans-Karsten; Vosberg, Dietrich; and Röhling, Holmer, to Drägerwerk Aktiengesellschaft. Suction device with a filter insert in the suction line. 5,531,802, Cl. 55-274.000.

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Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, to Leybold Materials GmbH. Process for the production of partially reduced indium oxide-tin oxide targets. 5,531,948, Cl. 264-122.000.

Schlotter, Ann M.: *See—*
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Schlotter, William K., IV: *See—*
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Schneider Electric SA: *See—*
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Schneider (USA) Inc.: *See—*
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Schneider Medical Technologies, Inc.: *See—*
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Schneider, Michel; Bichon, Daniel; Bussat, Philippe; Puginier, Jerome; and Hybl-Sutherland, Eva, to Bracco International BV. Stable microbubbles suspensions injectable into living organisms. 5,531,980, Cl. 424-9.520.

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Schneider, Richard T.; and Keates, Richard H. Apparatus and methods for evaluating vision through an intraocular lens. 5,532,770, Cl. 351-205.000.

Schneider, William A., Jr., to Exxon Production Research Company. Curved-ray replacement dynamics. 5,532,976, Cl. 367-38.000.

Schnoes, Heinrich K.: *See—*
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Schnoor, William J.: *See—*
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Schoen, Uwe; Brueckner, Reinhard; Meil, Joerg; and Thormaehlen, Dirk, to Kali-Chemie Pharma GmbH. Method of treating cardiac arrhythmia with 3-benzoyl-3, 7-diazabicyclo[3.3.1]nonane compounds. 5,532,251, Cl. 514-300.000.

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Schremmer, Mathias: *See—*
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Schueman Enterprises, Inc.: *See—*
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Schueman, Gerald L., to Schueman Enterprises, Inc. Safety means for controlling an air powered actuator for retracting the locking pins of a slider. 5,531,467, Cl. 280-149.200.

- Schuler, Chester L., to Lex Computer and Management Corporation. Routing apparatus and method for video composition. 5,532,830, Cl. 358-335.000.
- Schulman, Joseph H.; and Rule, Orville R., III. Fluidic infusion system for catheter or probe. 5,531,679, Cl. 604-65.000.
- Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., to Alfred E. Mann Foundation For Scientific Research. Multichannel implantable cochlear stimulator having programmable bipolar, monopolar or multipolar electrode configurations. 5,531,774, Cl. 607-56.000.
- Schultheiss, Rolf; and Weber, Gerhard, to Gerhard Weber. Aiming tube assembly. 5,531,751, Cl. 606-96.000.
- Schultz, Jim R.: *See—*
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- Schulz, Richard H.: *See—*
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- Schuster, Michael A.; Harrington, John C., IV; Liao, Wen P.; and Chen, Fu, to Betz PaperChem, Inc. Method for improving retention and drainage characteristics in alkaline papermaking. 5,532,308, Cl. 524-447.000.
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- Schwarz, Alois. Device for absorbing radiant heat energy. 5,531,215, Cl. 126-578.000.
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- Science Incorporated: *See—*
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- Sciencetech Inc.: *See—*
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- SciMed Life Systems, Inc.: *See—*
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  - Pepin, Henry J.; Scovil, Brian J.; and Welch, Jeffrey M., 5,531,721, Cl. 604-282.000.
- Scitex Corporation Ltd.: *See—*
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- Scofield, Robert E., to Allen-Bradley Company, Inc. Bar code reader for scanning an area at variable sweep angles. 5,532,468, Cl. 235-472.000.
- Scofield, Robert E., to Allen-Bradley Company, Inc. Dynamic damper for an oscillating mirror in a code reader. 5,532,480, Cl. 250-235.000.
- Scott, Donald G., to Action Industries. Retractable sofa table with extended table surface. 5,531,506, Cl. 297-463.100.
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- Sedy, Josef, to Durametallic Corporation. Face seal with angled grooves. 5,531,458, Cl. 277-96.100.
- Seegmiller, Ben L.; and Reeves, John A., Jr. Cable bolt structure and method. 5,531,545, Cl. 405-259.400.
- Seeley, Robert E., to General Electric Company. Bucket to wheel dovetail design for turbine rotors. 5,531,569, Cl. 416-222.000.
- Seibel, Rainer M. M.: *See—*
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- Seifried, Lynn M.; and Tettemer, Susan A., to Medtronic, Inc. Fabricating a combination feedthrough/capacitor including a metallized tantalum or niobium pin. 5,531,003, Cl. 29-25.420.
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- Seiko Instruments Inc.: *See—*
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- Seio, Mamoru: *See—*
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- Seki, Yoshiyuki: *See—*
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- Sekiguchi, Akira; and Uchida, Yoshinori, to Zexel Corporation. Injection timing device for fuel injection system. 5,531,204, Cl. 123-502.000.
- Sekiguchi, Masaaki: *See—*
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- Sekiya, Toshiyuki: *See—*
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- Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., to Nu-Kote International, Inc. Refill assembly and system for ink-jet printer cartridges. 5,531,055, Cl. 53-86.000.
- Sellers, Charles A., to Compaq Computer Corporation. Collapsible keyboard structure for a notebook computer, responsive to opening and closing of the computer's lid. 5,532,904, Cl. 361-680.000.
- Selley, David B.: *See—*
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- Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., to TRW Vehicle Safety Systems, Inc. Apparatus and method for controlling an occupant restraint system. 5,531,472, Cl. 280-735.000.
- Semiconductor Energy Laboratory Co., Ltd.: *See—*
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- Senba, Hisaaki: *See—*
  - Watanabe, Tsuyoshi; Senba, Hisaaki; Matsumoto, Hiroshi; and Yanagida, Makoto, 5,532,799, Cl. 355-245.000.
- Senda, Yuzo, to NEC Corporation. Motion picture adaptive prediction encoder with a quantization parameter decided in accordance with block classification. 5,532,745, Cl. 348-405.000.
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- Senior, Richard C.: *See—*
  - Johnson, David L.; and Senior, Richard C., 5,531,884, Cl. 208-150.000.
- Senju Pharmaceutical Co., Ltd: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
  - Nakayama, Hisayuki; Kimoto, Akihiro; and Tsuchino, Kuniko, 5,531,917, Cl. 510-114.000.
- Seo, Bo-Sung; and Kim, Jong-Young, to Samsung Electronics Co., Ltd. Input buffer circuit capable of corresponding to variation of operating voltage in semiconductor integrated circuit. 5,532,620, Cl. 326-81.000.
- Sepracor, Inc.: *See—*
  - Aberg, Gunnar; and McCullough, John R., 5,532,278, Cl. 514-617.000.
- Sequoia Semiconductor, Inc.: *See—*
  - Johnson, Peter A., 5,533,032, Cl. 371-22.500.
- Serban, George, to Alpine Engineered Products, Inc. Saw guard. 5,531,147, Cl. 83-478.000.
- Seri, Hajime: *See—*
  - Yamamura, Yasuharu; Seri, Hajime; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,532,076, Cl. 429-59.000.
- Serotech, Inc.: *See—*
  - Durham, Jayson T., 5,532,998, Cl. 369-116.000.
- Servedio, Michael: *See—*
  - Lo, Jiann-Chang; Servedio, Michael; Hammond, James M.; Boyette, James E., Jr.; and Kolan, Hans-George H., 5,532,611, Cl. 324-758.000.
- Sevens Unlimited, Inc.: *See—*
  - Dabrowski, Stanley P.; and Sincox, Mark, 5,531,440, Cl. 463-12.000.
- Sevens Unlimited, Inc. a Nevada Corporation: *See—*
  - Dabrowski, Stanley P.; and Sincox, Mark, 5,531,441, Cl. 463-12.000.
- Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., to Procter & Gamble Company, The. Biodegradable fabric softener compositions with improved perfume longevity. 5,531,910, Cl. 510-102.000.
- Sewell, Frederic D.; and Jones, Barry D. Liquid spray air purification and controlled humidification apparatus. 5,531,800, Cl. 55-223.000.
- Sewell, Frederic D.; and Jones, Barry D. Liquid spray air purification and controlled humidification apparatus with air quality monitor and controller. 5,531,801, Cl. 55-223.000.

- Sexsmith, Frederick H., to Lord Corporation. Aqueous silane-phenolic adhesive compositions, their preparation and use. 5,532,314, Cl. 524-611.000.
- Seyfried, Christoph: *See—*
  - Böttcher, Henning; Seyfried, Christoph; Bartoszyk, Gerd; and Greiner, Hartmut, 5,532,241, Cl. 514-254.000.
  - Gottschlich, Rudolf; Ackermann, Karl-August; Prücher, Helmut; Seyfried, Christoph; Greiner, Hartmut; Bartoszyk, Gerd; Mauler, Frank; Stohrer, Manfred; and Barber, Andrew, 5,532,266, Cl. 514-428.000.
- Seymour, James M.: *See—*
  - Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
- Seymour, Paul D.: *See—*
  - Cook, William J.; and Seymour, Paul D., 5,533,016, Cl. 370-54.000.
- Sfez, Rémi: *See—*
  - Makowski, Pierre; Sfez, Rémi; and Guedes, Yvon, 5,533,015, Cl. 370-31.000.
- SGS-Thomson Microelectronics, Inc.: *See—*
  - Rotay, Craig J.; and Zielke, Christopher, 5,532,639, Cl. 327-376.000.
  - Waggoner, Charles D.; Blumberg, Richard J.; and Kotzur, Gary B., 5,532,630, Cl. 327-108.000.
- SGS-Thomson Microelectronics, S.r.l.: *See—*
  - Fagnani, Mauro; Ferrario, Bruno; and Sandri, Paolo, 5,532,645, Cl. 330-265.000.
  - Pascucci, Luigi; Padoan, Silvia; Golla, Carla M.; Maccarrone, Marco; and Olivo, Marco, 5,532,972, Cl. 365-233.000.
- Shackelford, Howard L., Jr.: *See—*
  - Shackelford, Howard L., Sr.; and Shackelford, Howard L., Jr., 5,531,754, Cl. 606-167.000.
- Shackelford, Howard L., Sr.; and Shackelford, Howard L., Jr. Retractable surgical blade device and associated method. 5,531,754, Cl. 606-167.000.
- Shadeck, Louis M.: *See—*
  - Huff, Robert O.; and Shadeck, Louis M., 5,531,461, Cl. 279-62.000.
- Shah, Hemen R.: *See—*
  - Butler, Edward; Lundberg, Martin B.; Mokashi, Pushkar U.; Sartwell, Alfred L.; Shah, Hemen R.; and Tamlyn, Robert, 5,532,970, Cl. 365-230.050.
- Shah, Jaffar; Ilic, Kosta; Peck, Joseph E.; and Wang, Zu-Yi, to National Instruments Corporation. Latency error detection circuit for a measurement system. 5,533,037, Cl. 371-62.000.
- Shamlou, Daryush: *See—*
  - MacRobbie, Edward; Shamlou, Daryush; Gupta, Rajiv; and Halim, Raouf, 5,532,576, Cl. 323-274.000.
- Shapiro, Andrew A.: *See—*
  - Haertling, Carol; Shapiro, Andrew A.; Goodman, Charles A.; Pond, Ramona G.; Washburn, Robert D.; McClanahan, Robert F.; Gonzalez, Carlos H.; and Lusher, David M., 5,532,667, Cl. 336-177.000.
- Sharak, Matthew L.: *See—*
  - Kauffman, Thomas F.; Sharak, Matthew L.; and Schmidt, Robert C., Jr., 5,532,306, Cl. 524-274.000.
- Sharkey, Hugh R.: *See—*
  - Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,531,676, Cl. 604-22.000.
- Sharp Corporation: *See—*
  - Shu, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; and Yamamoto, Makoto, 5,532,580, Cl. 323-354.000.
- Sharp Kabushiki Kaisha: *See—*
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  - Koizumi, Satoru, 5,533,000, Cl. 369-270.000.
  - Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
  - Narikawa, Shiro; Tanaka, Hirokazu; Honda, Iwakazu; Oikawa, Tomohiro; and Ando, Hiroe, 5,532,796, Cl. 355-210.000.
  - Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, 5,532,794, Cl. 355-208.000.
- Shaw, Ronald; Brooks, John; and Flemming, Frank, to Shaw, Ronald. Method and apparatus for indexing and retrieval of a continuous visual image medium. 5,532,773, Cl. 353-26.00A.
- Shawbitz, Louis M.: *See—*
  - Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.
- Shay, Michael J.: *See—*
  - Force, Gordon; Davis, Timothy D.; Duncan, Richard L.; Norcross, Thomas M.; Shay, Michael J.; and Short, Timothy A., 5,533,123, Cl. 380-4.000.
- Sheehan, Florence H.; Zick, Gregory L.; and Liu, Hain-Ching H., to University of Washington. Automatic indexing of cine-angiograms. 5,533,085, Cl. 378-95.000.
- Sheller, David T., to W. R. Grace & Co.-Conn. Process for welding a stack of thin metal sheets. 5,532,453, Cl. 219-127.000.
- Shelton, Jeff L.; Stallings, Kevin J.; and Hogan, Thomas H., to Drayton Corporation. Automated damping port rodder. 5,531,189, Cl. 122-379.000.
- Shen, Hsiang-Sheng: *See—*
  - Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., 5,531,150, Cl. 89-15.000.
- Shen, Richard: *See—*
  - Akiwumi-Assani, Olu; Basile, Carlo; Cavallerano, Alan; Challapali, Kiran; Shen, Richard; and Wittig, Karl, 5,532,744, Cl. 348-390.000.
- Shen, Zhi-Yuan, to Du Pont de Nemours, E. I., and Company. High temperature superconductor dielectric slow wave structures for accelerators and traveling wave tubes. 5,532,210, Cl. 505-200.000.
- Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, to Symbol Technologies, Inc. Hand held bar code reader with input and display device and processor. 5,532,469, Cl. 235-472.000.
- Sherman, Howard M., to Chrysler Corporation. Power steering system with vibration and noise suppression. 5,531,287, Cl. 180-417.000.
- Sherwood Medical Company: *See—*
  - Swisher, David R., 5,531,695, Cl. 604-111.000.
- Shevade, Makarand; Bianchini, Robert J.; and Lee, Wilson, to Mennen Company, The. Low residue antiperspirant solid stick composition. 5,531,986, Cl. 424-68.000.
- Shi, Leathen: *See—*
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
- Shibata, Etsuko; and Nakamura, Hiromu, to Minolta Camera Kabushiki Kaisha. Polygonal mirror and manufacturing method thereof and light beam scanning optical apparatus using the polygonal mirror. 5,532,866, Cl. 359-216.000.
- Shibata, Hiroki: *See—*
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- Shibata, Masaki: *See—*
  - Yamamoto, Masatoshi; Matsuba, Mitsuo; Kaga, Hideaki; and Shibata, Masaki, 5,531,263, Cl. 164-404.000.
- Shibata, Yukio: *See—*
  - Mizutani, Yoshihiro; Tomino, Takeshi; Yamamoto, Yasuo; Shibata, Yukio; and Yamazaki, Hatsutaro, 5,531,885, Cl. 208-210.000.
- Sbibata, Yutaka: *See—*
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- Shiboh, Yukio, to Hohto Shoji Co., Ltd. Poisonous bait container for crawling insects. 5,531,043, Cl. 43-131.000.
- Shibuya, Masaoki: *See—*
  - Nakayama, Toyoo; Taira, Seizo; Kawamura, Hiroyuki; Shibuya, Masaoki; and Iwaki, Masahiro, 5,532,267, Cl. 514-467.000.
- Shick, Reed A.: *See—*
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- Shieh, Wen: *See—*
  - Hedges, Allan; Shieh, Wen; and Ammeraal, Robert, 5,532,005, Cl. 426-7.000.
- Shields, James E.: *See—*
  - DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,532,336, Cl. 530-324.000.
- Shields, James P.; and Moffatt, John R., to Hewlett-Packard Company. Use of high viscosity, meltable gel inks for controlling bleed. 5,531,817, Cl. 106-22.00R.
- Shigematsu, Masayuki; Nakazato, Koji; Kashiwada, Tomonori; and Nishimura, Masayuki, to Sumitomo Electric Industries, Ltd. Optical fiber amplifier and optical amplifier repeater. 5,532,870, Cl. 359-341.000.
- Shih, Da-Yuan: *See—*
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
- Shih, James W. K.: *See—*
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- Shih, Jiaw-Ren: *See—*
  - Liaw, Shiou H.; and Shih, Jiaw-Ren, 5,532,178, Cl. 437-57.000.
- Shiino, Haruhiro: *See—*
  - Yamaguchi, Norio; and Shiino, Haruhiro, 5,533,066, Cl. 375-341.000.
- Shimada, Shunsuke, to Kyokado Engineering Co., Ltd. Reinforced earth construction. 5,531,547, Cl. 405-262.000.
- Shimadzu Corporation: *See—*
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- Shimamoto, Noboru: *See—*
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- Shimamune, Takayuki; and Nakajima, Yasuo, to Permelec Electrode Co., Ltd. Electrode substrate for electrolysis and production method thereof. 5,531,875, Cl. 204-290.00R.
- Shimano Inc.: *See—*
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- Shimasaki, Yuichi: *See—*
  - Komatsuda, Takashi; Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Oketani, Toshikazu; and Aoki, Takuya, 5,531,203, Cl. 123-481.000.
- Shimizu, Chikako: *See—*
  - Hase, Takema; Kumonaka, Takahiro; Shimizu, Chikako; Hosono, Hiroshi; Aotsuka, Tomoji; Nakamura, Yoshiyuki; Matsui, Tetsuo; and Ishikawa, Hiromichi, 5,532,257, Cl. 514-367.000.
- Shimizu, Etsuo: *See—*
  - Yokoyama, Yoshinobu; Suzuki, Kenji; Seki, Yoshiyuki; Harada, Shoichi; and Shimizu, Etsuo, 5,532,908, Cl. 362-30.000.
- Shimizu, Jun: *See—*
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  - Ishikawa, Hiroshi; Furukawa, Hideo; Shimizu, Masatoshi; and Nakauchi, Norio, 5,531,654, Cl. 477-120.000.
- Shimizu, Tatsuaki: *See—*
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- Shimizu, Tatsuo: *See—*
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- Shimoda, Tomoaki: *See—*
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- Shimomura, Taizo, to Kabushiki Kaisha Shimomura Seisakusho. Drill for hardly machinable materials and drilling method using the same. 5,531,548, Cl. 408-145.000.
- Shin-Etsu Chemical Co., Ltd.: *See—*
  - Ikeno, Masayuki; and Hara, Hiroyasu, 5,532,294, Cl. 523-212.000.
  - Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.
  - Nakanishi, Tetsuo; Asai, Mitsuo; Ohata, Hiroyuki; and Uchida, Keiichi, 5,532,302, Cl. 524-143.000.
  - Ogawa, Kinya; Kitagaki, Tetsuo; and Yamamoto, Akira, 5,532,273, Cl. 514-546.000.
  - Satoh, Makoto; Shimamoto, Noboru; Takei, Hiroshi; and Hashimoto, Takeshi, 5,532,056, Cl. 428-332.000.
  - Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, 5,532,063, Cl. 428-446.000.
  - Terauchi, Takanobu; Sakurada, Toyohisa; Fukumoto, Takehiko; and Suzuki, Hiroshi, 5,532,421, Cl. 585-671.000.
- Shin, Hwa-seong: *See—*
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- Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, to Shin-Etsu Chemical Co., Ltd.; and Nihon Shinku Gijutsu Kabushiki Kaisha. Silicon oxide depositing source and coated film. 5,532,063, Cl. 428-446.000.
- Shing, Lee T. Machine for tapering pipe ends with different diameters. 5,531,006, Cl. 29-33.00T.
- Shinkle, Carl W., to FOR S Inc. Forklift vehicle plow attachment. 5,531,036, Cl. 37-405.000.
- Shinko Electric Industries Co., Ltd.: *See—*
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- Shinmura, Tetsuya; and Konishi, Kunihiko, to Denki Kagaku Kogyo Kabushiki Kaisha. Method for producing a molded heat-resistant resin product. 5,532,316, Cl. 525-71.000.
- Shinmura, Tetsuya; and Konishi, Kunihiko, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing a maleimide-modified heat-resistant abs resin. 5,532,317, Cl. 525-73.000.
- Shinoda, Masafumi: *See—*
  - Ogasawara, Toshifumi; and Shinoda, Masafumi, 5,531,833, Cl. 118-698.000.
- Shinohara Machinery Co., Ltd.: *See—*
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- Shinohara, Sueharu: *See—*
  - Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,532,055, Cl. 428-318.600.
- Shinomiya, Teruhiko: *See—*
  - Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
- Shinozaki, Fumiaki: *See—*
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- Shinozaki, Michio: *See—*
  - Inagaki, Minoru; Fukai, Shigeru; Shinozaki, Michio; Marugame, Tomoyuki; Kuroki, Hiroyuki; Morimitsu, Tatsuya; and Andoh, Tomio, 5,532,724, Cl. 347-213.000.
- Shinozaki, Tadaaki; Toguchi, Manabu; Kawae, Kunihiro; and Murano, Kazuo, to Nikon Corporation. Method of measuring orthogonality of stage unit. 5,532,822, Cl. 356-363.000.
- Shiomi, Kazuyuki; Mizuguchi, Hiroshi; and Imakado, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Vibration-proof power take-off device for engine including two displacement absorbing joint members connected by a resilient member. 5,531,642, Cl. 464-74.000.
- Shippell, Joseph C.: *See—*
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- Shiraishi, Atsushi: *See—*
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- Shiraishi, Shirou: *See—*
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- Shirakawa, Keiji: *See—*
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- Shiraki, Seiichi: *See—*
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- Shiraki, Toshiro: *See—*
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- Shirasaki, Toshiyuki: *See—*
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- Shirley, Arthur; and Ramachandran, Ramakrishnan, to BOC Group, Inc., The. Process for producing hydrocarbon partial oxidation products. 5,532,384, Cl. 549-257.000.
- Shiseido Company Ltd.: *See—*
  - Matsuzaki, Fumiaki; Yanaki, Toshio; and Yamaguchi, Michihiro, 5,532,305, Cl. 525-54.200.
- Shlisky, Brian. Autoclavable cap for a hazardous material container. 5,531,341, Cl. 215-308.000.
- Shofner, Frederick M.; and Baldwin, Joseph C., to Zellweger Uster, Inc. Continuous two dimensional monitoring of thin webs of textile materials. 5,533,145, Cl. 382-141.000.
- Shoji, Hajime: *See—*
  - Matsuda, Manabu; and Shoji, Hajime, 5,533,041, Cl. 372-50.000.
- Shoji, Takashi: *See—*
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- Shojo, Yoshihiro: *See—*
  - Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, 5,532,798, Cl. 355-221.000.
- Shonfeld, David; and Schoenfeld, Joel S., to Univec Inc. Single use syringe assembly. 5,531,691, Cl. 604-110.000.
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- Showa Aluminum Corporation: *See—*
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- Showa Sangyo Co., Ltd.: *See—*
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- Showa Yuki Kabushiki Kaisha: *See—*
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- Shrinkle, Louis J.: *See—*
  - Stefansky, Frederick M.; Shrinkle, Louis J.; and Fiers, Thomas A., 5,532,889, Cl. 360-97.010.
- Shu, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; and Yamamoto, Makoto, to Yozan, Inc.; and Sharp Corporation. Circuit for weighted addition. 5,532,580, Cl. 323-354.000.
- Shumaker, John: *See—*
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- Shumate, Christopher B.: *See—*
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- SI Diamond Technology, Incorporated: *See—*
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- SIA Schweizer Schmirgel: *See—*
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- Sieck, Charles F.: *See—*
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- Siemens Aktiengesellschaft: *See—*
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  - Hassler, Dietrich; and Hoheisel, Martin, 5,532,491, Cl. 250-370.090.
  - Pal, Uday; Landes, Harald; and Greiner, Horst, 5,532,071, Cl. 429-12.000.
  - Wirtz, Brigitte; and Maggioni, Chistoph, 5,533,177, Cl. 395-119.000.
- Siemens Automotive Corporation: *See—*
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- Siemens Electric Limited: *See—*
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- Siemens Elema AB: *See—*
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  - Ohlsson, Thomas; and Karlsson, Peter, 5,532,951, Cl. 364-724.170.
- Siemens Power Corporation: *See—*
  - Christiansen, David W.; and Long, John W., 5,533,078, Cl. 376-438.000.
- SIEPEL-Societe Industrielle d'Etudes et Protection Electroique: *See—*
  - Ruelle, Philipe, 5,532,704, Cl. 343-703.000.
- Sieri, Philip: *See—*
  - Bonino, Joseph S.; Sieri, Philip; and Glowacki, John F., 5,531,580, Cl. 425-136.000.
- Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
  - Giannessi, Fabio; Castagnani, Roberto; De Angelis, Francesco; Tinti, Maria O.; and Misiti, Domenico, 5,532,409, Cl. 562-561.000.
- Sigma-Tau Industrie Farmaceutiche Ruinite S.p.A.: *See—*

  - Giannessi, Fabio; Scafetta, Nazareno; Bernabei, Ida; Tinti, Maria O.; and De Angelis, Francesco, 5,532,410, Cl. 562-567.000.
- Silicon Systems, Inc.: *See—*
  - Hershbarger, Russell A., 5,533,053, Cl. 375-257.000.
- Silicon Video Corporation: *See—*
  - Spindt, Christopher J.; Field, John E.; Morris, David L.; and Curtin, Christopher J., 5,532,548, Cl. 313-422.000.
- Siliconix Incorporated: *See—*
  - Chang, Mike F.; Hshieh, Fwu-Iuan; Kwan, Sze-Hon; and Owyang, King, 5,532,179, Cl. 437-40.000.
- Silver, Frederick H.; and Christiansen, David. Process for the mineralization of collagen fibers, product produced thereby and use thereof to repair bone. 5,532,217, Cl. 514-21.000.
- Silver, Richard S., to Nabisco, Inc. Low calorie tablespread made from liquid triglyceride oils. 5,532,020, Cl. 426-604.000.
- Silverman, David C.: *See—*
  - Kinlen, Patrick J.; Silverman, David C.; Tokas, Edward F.; and Hardiman, Christopher J., 5,532,025, Cl. 427-388.100.
- Silverman, Ian R.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; and Silverman, Ian R., 5,532,367, Cl. 544-260.000.
- Simek, James C.: *See—*
  - Downs, Robert W.; and Simek, James C., 5,532,587, Cl. 324-220.000.
- Siminauer, Robert M.: *See—*
  - Gloyd, David A.; Hodge, Colin G.; Jones, Thomas C.; Kremenchugsky, Vladimir; and Siminauer, Robert M., 5,531,663, Cl. 600-22.000.
- Simon, Bernard, to Mavil. Cable way formed by welded trelliswork. 5,531,410, Cl. 248-49.000.
- Simplicean, Ionel E.; and Stancu, Sorin, to Ford Motor Company. Speaker assembly. 5,532,437, Cl. 181-150.000.
- SIMS Deltec, Inc.: *See—*
  - Olsen, James M.; Johnson, Jay G.; and Hu, Jia, 5,531,697, Cl. 604-131.000.
  - Olsen, James M., 5,531,698, Cl. 604-131.000.
- Sinclair, Peter J.: *See—*
  - Goulet, Mark; Parsons, William H.; Organ, Helen M.; Sinclair, Peter J.; Wong, Frederick; and Wyvratt, Matthew J., 5,532,248, Cl. 514-291.000.
- Sincox, Mark: *See—*
  - Dabrowski, Stanley P.; and Sincox, Mark, 5,531,440, Cl. 463-12.000.
  - Dabrowski, Stanley P.; and Sincox, Mark, 5,531,441, Cl. 463-12.000.
- Singer Company N.V., The: *See—*
  - Kojima, Shinji; and Nakayama, Koichi, 5,531,172, Cl. 112-260.000.
- Singh, Sharat; Switchenko, Arthur C.; Lin, Cheng-I; Kurn, Nurith; and Ullman, Edwin F., to Behringwerke AG. Method and kits for determining peroxidatively active catalysts. 5,532,138, Cl. 435-7.930.
- Singleton, Ogle R., to Singleton Technology, Inc. Handle for control of mobile riding toys. 5,531,494, Cl. 294-1.100.
- Singleton Technology, Inc.: *See—*
  - Singleton, Ogle R., 5,531,494, Cl. 294-1.100.
- Sintokogio, Ltd.: *See—*
  - Yamamoto, Masatoshi; Matsuba, Mitsuo; Kaga, Hideaki; and Shibata, Masaki, 5,531,263, Cl. 164-404.000.
- Sinzawa, Kouichi: *See—*
  - Takano, Tsunesuke; and Sinzawa, Kouichi, 5,531,613, Cl. 439-544.000.
- Siol, Werner: *See—*
  - Fischer, Jens-Dieter; and Siol, Werner, 5,532,067, Cl. 428-500.000.
- Sipes, Donald L., Jr.: *See—*
  - Gertel, Eitan; and Sipes, Donald L., Jr., 5,532,857, Cl. 359-154.000.
- Sirat, Jacques A.; and Oddou, Christophe, to U.S. Philips Corporation. Device for transmitting and/or storing signals corresponding to one or more textures in a picture, device for synthesizing texture signals for such a transmitting and/or storage device, and system for transmitting and/or storing signals corresponding to t. 5,533,140, Cl. 382-108.000.
- Sirvio, Larry M.; and Swenson, Barbara C., to Minnesota Mining and Manufacturing Company. Process for modifying surfaces. 5,532,311, Cl. 525-54.200.
- Sisco, Mark S.: *See—*
  - Clover, Daniel S.; and Sisco, Mark S., 5,531,541, Cl. 404-25.000.
- Sitges Menendez, Fernando: *See—*
  - Sitges Menendez, Francisco Javier; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; and Martinez Valdes, Jose Maria, 5,531,882, Cl. 205-602.000.
- Sitges Menendez, Francisco Javier; Sitges Menendez, Fernando; Alvarez Tamargo, Francisco; and Martinez Valdes, Jose Maria, to Asturiana De Zinc, S.A. Procedure for cleaning the anodes of electrolytic tanks. 5,531,882, Cl. 205-602.000.
- Siu, Andy W.: *See—*
  - Johnson, James E.; Shumate, Christopher B.; Siu, Andy W.; and Gundlach, Ronald, 5,531,959, Cl. 422-70.000.
- Sivaramakrishnam, Visweswaren; Nishizato, Hiroshi; Zhao, Jun; and Yokoyama, Ichiro, to Applied Materials, Inc. Vaporization sequence for multiple liquid precursors used in semiconductor thin film applications. 5,531,183, Cl. 117-93.000.
- Siver, Chester A., to Conval, Inc. Hemispherical ball valve. 5,531,244, Cl. 137-315.000.
- Sivik, Mark R.: *See—*
  - Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,531,910, Cl. 510-102.000.
- Skaggs, Bill A.: *See—*
  - Hummel, Steven L.; Olender, James P.; Johnson, James B.; Reynolds, JoAnn; and Skaggs, Bill A., 5,531,326, Cl. 206-509.000.
- Skelton, Wayne F. Security door lock. 5,531,491, Cl. 292-293.000.
- Skibo, Michael D.; Schuster, David M.; and Bruski, Richard S., to Alcan Aluminum Corporation. Apparatus for continuously preparing castable metal matrix composite material. 5,531,425, Cl. 266-208.000.
- Skipper, Gary I.: *See—*
  - Roberts, Keith; Thomas, Christopher D.; Lamin, James L.; Skipper, Gary I.; and Larsen, Jonathan G., 5,531,305, Cl. 192-53.332.
- Sklar, Jeffrey S. Infant nursing device. 5,531,338, Cl. 215-11.100.
- Skotnicki, Jerauld S.; Palmer, Yvette L.; Koa, Wenling; and Abou-Gharbia, Magid A., to American Home Products Corporation. Carbamates of rapamycin. 5,532,355, Cl. 540-456.000.
- Skwarek, Gary M.; and Morfit, Stephen J., to Schering-Plough HealthCare Products, Inc. Applicator for semisolid medications. 5,531,703, Cl. 604-187.000.
- SL Montevideo Technology, Inc.: *See—*
  - Huang, Hao, 5,532,561, Cl. 318-439.000.
- Slack, Ian S.: *See—*
  - Corbin, James A.; Johnson, Robert D.; Neely, William G.; Slack, Ian S.; and Davies, Barrie L., 5,532,035, Cl. 428-95.000.
- Slane, Albert A.: *See—*
  - Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Lynch, Jeffrey J.; Plotz, Kevin G.; Sendelbach, Lee A.; and Slane, Albert A., 5,533,021, Cl. 370-60.100.
- Slater, Charles N.: *See—*
  - Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., 5,532,401, Cl. 558-95.000.
- Slaven, Semyon: *See—*
  - Goldner, Ronald B.; and Slaven, Semyon, 5,532,869, Cl. 359-275.000.
- Slivkoff, William: *See—*
  - Ohlson, John; and Slivkoff, William, 5,533,023, Cl. 370-69.100.
- Sloan-Kettering Institute for Cancer Research: *See—*
  - Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., 5,532,341, Cl. 530-351.000.
- Smiley, David L.: *See—*
  - DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,532,336, Cl. 530-324.000.
- Smith, Alan E.: *See—*
  - Nordstrom, J. David; Omura, Hisanori; Smith, Alan E.; and Thomson, David M., 5,532,027, Cl. 427-493.000.
- Smith & Nephew plc: *See—*
  - Webb, Julian A.; and Blott, Patrick L., 5,531,667, Cl. 602-8.000.
- Smith, Charles; Akhtar, Masyood; Chau, Michael M.; and Savage, David, to Johnson Matthey Electronics, Inc. Metal-ceramic composite lid. 5,532,513, Cl. 257-703.000.
- Smith, David B.: *See—*
  - Preston, Roger S.; and Smith, David B., 5,533,164, Cl. 385-128.000.
- Smith, Gary A.: *See—*
  - Wacker, Paul C.; and Smith, Gary A., 5,532,922, Cl. 364-15.200.
- Smith, Gregory M.; Yeager, Michael W.; Pauley, J. Donald; and Carroll, Gary T., to Racom Systems, Inc. Method and apparatus for detecting an FSK encoded carrier signal. 5,533,061, Cl. 375-334.000.
- Smith, Herbert G., Jr.: *See—*
  - Burris, Kelly K.; and Smith, Herbert G., Jr., 5,533,165, Cl. 385-134.000.
- Smith, James A.: *See—*
  - Ellis, Matthew; Saunders, Rowland F.; Smith, James A.; and Noret, Patrick, 5,531,224, Cl. 128-660.070.
- Smith, Jeannette K.; and Roucis, Janet L. Electronic trading card system. 5,533,124, Cl. 380-4.000.
- Smith, Jeffrey A.: *See—*
  - Hurtz, Robert W.; Smith, Jeffrey A.; Sosinski, Ronald T.; and Legg, Ernest L., 5,533,172, Cl. 395-112.000.
- Smith, Kevin, to British Telecommunications, plc. Optical memory. 5,533,154, Cl. 385-27.000.
- Smith, Kevin W.; and Bales, Thomas O., to Symbiosis Corporation. Cobalt base alloy end effectors for laparoscopic surgical scissors. 5,531,755, Cl. 606-170.000.
- Smith, Leigh A. B.: *See—*
  - Oglesby, Robert L.; Smith, Leigh A. B.; Jordan, Larry S.; Greene, Carl C., Jr.; and Leonard, Wayne E., Sr., 5,531,233, Cl. 131-69.000.
- Smith, Lowell D.; and Cook, Robert G., to Square D Company. Manual override mechanism for a remote controlled circuit breaker. 5,532,660, Cl. 335-14.000.
- Smith, Neil: *See—*
  - Jeffers, Frederick J.; Smith, Neil; Freeman, Jay D.; Gandola, Kent R.; and Koeppe, Peter V., 5,532,584, Cl. 324-202.000.
- Smith, Richard C.: *See—*
  - Uschold, Robert C.; Stephens, Randy R.; Mauch, Jeffrey; Smith, Richard C.; and Houser, Kevin, 5,531,758, Cl. 606-185.000.
- Smith, Rodney M.; and Poirier, Daniel J. J., to Asea Brown Boveri, Inc. Controlled profile drying hood. 5,531,033, Cl. 34-117.000.
- Smith, Terrance P.: *See—*
  - Holmes, Gary L.; Smith, Terrance P.; Ali, Mahfuza B.; and Macomber, David W., 5,532,111, Cl. 430-281.100.
- Smith, Terry L. Circuit for attenuating commercial interruptions during radio broadcasting. 5,533,136, Cl. 381-107.000.
- Smith, Wayne W.; Frick, Thomas J.; and Moore, Earl H., to Delfield Company, The. Temperature and humidity controllable doorless oven. 5,532,456, Cl. 219-400.000.

- Smith, Winthrop W., to E-Systems, Inc. Non-coherent radar system having improved resolution capabilities. 5,532,699, Cl. 342-195.000.
- Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; Phillips, Frederick W.; and Beiler, Emanuel S., to Clean Burn, Inc. Multi oil furnace. 5,531,212, Cl. 126-104.00R.
- Smoker, Benuel F.: *See—*
  - Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; Phillips, Frederick W.; and Beiler, Emanuel S., 5,531,212, Cl. 126-104.00R.
- SMS Schloemann-Siemag Aktiengesellschaft: *See—*
  - Klein, Achim; and Bender, Hans-Jürgen, 5,531,090, Cl. 72-236.000.
- Smyser, Thomas E.; and Confalone, Pasquale N., to DuPont Merck Pharmaceutical Company, The. Method for preparing N,N'-disubstituted cyclic ureas. 5,532,356, Cl. 540-492.000.
- Snap-on Incorporated: *See—*
  - Even-Esh, Alexander, 5,531,750, Cl. 606-79.000.
- Snoeren, Rudolph M., to U.S. Philips Corporation. X-ray imaging system including brightness control. 5,533,087, Cl. 378-98.300.
- Snoke, Phillip J.; Rowley, David S.; Lincoln, David G.; and Charles, Kirk W., to Catheter Imaging Systems. Steerable catheter. 5,531,687, Cl. 604-95.000.
- Snow, Robert A.; Ladd, David L.; and Hoyer, Denton W., to Sterling Winthrop, Inc. Low diol polyalkylene oxide biologically active proteinaceous substances. 5,532,150, Cl. 435-188.000.
- So, Kimming: *See—*
  - Cheong, Hoichi; and So, Kimming, 5,533,189, Cl. 395-182.040.
- Sobue, Kenji: *See—*
  - Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, 5,532,337, Cl. 530-350.000.
- Societe d'Applications Generales d'Electricate et de Mecanique SAGEM: *See—*
  - Lanoe, Thierry, 5,532,430, Cl. 174-52.300.
- Societe Europeenne De Propulsion: *See—*
  - Koppel, Christophe, 5,531,067, Cl. 60-259.000.
- Societe Francaise Des Amortisseurs de Carbon: *See—*
  - Bataille, Alain, 5,531,299, Cl. 188-322.170.
- Societe Industrielle et Commerciale de Materiel Aeronautique: *See—*
  - Marechal, Robert R., 5,531,404, Cl. 244-118.600.
- Societe National Des Poudres et Explosifs: *See—*
  - L'Heroault, Claude; and Neel, Ludovic, 5,532,196, Cl. 501-128.000.
- Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A.: *See—*
  - Derouet, Patrick R. J.; and Guimier, Michel S., 5,531,566, Cl. 415-145.000.
- Soden, Philip H.; and Pundsack, Arnold L., to Xerox Corporation. Apparatus and process for preparation of migration imaging members. 5,532,102, Cl. 430-128.000.
- Soho, Inc.: *See—*
  - Towfigh, Keivan, 5,531,168, Cl. 108-108.000.
- Sokol, David G.: *See—*
  - Olson, Daniel E.; Sokol, David G.; and Walker, Kevin, 5,532,673, Cl. 340-450.200.
- Solaic (Societe Anonyme): *See—*
  - Debelleix, Olivier M.; and Thiriet, Fabien P., 5,532,463, Cl. 235-380.000.
- Solar, Catherine: *See—*
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Solar, Ronald J., to Cordis Corporation. Rapid exchange catheter. 5,531,690, Cl. 604-102.000.
- Solazzo, Anthony. Ureteral catheter connector adapter. 5,531,723, Cl. 604-283.000.
- Solis S.R.L.: *See—*
  - Migliorini, Pier L., 5,531,173, Cl. 112-470.150.
- Soltis, Richard E.: *See—*
  - Zanini-Fisher, Margherita; Soltis, Richard E.; Logothetis, Eleftherios M.; and Barrera, Carlos M., 5,531,879, Cl. 204-427.000.
- Solvay Fluor und Derivate GmbH: *See—*
  - Braun, Max; Rudolph, Werner; Palsherm, Stefan; and Eichholz, Kerstin, 5,532,411, Cl. 562-861.000.
- Somers, Gerardus H. J.: *See—*
  - Postma, Lambertus; Maas, Henricus G. R.; Haisma, Jan; Ruigrok, Jacobus J. M.; and Somers, Gerardus H. J., 5,531,016, Cl. 29-603.160.
- Somers, Todd C.: *See—*
  - Marsters, James C., Jr.; Brown, Michael S.; Crowley, Craig W.; Goldstein, Joseph L.; James, Guy L.; McDowell, Robert S.; Oare, David; Rawson, Thomas E.; Reynolds, Mark; and Somers, Todd C., 5,532,359, Cl. 540-522.000.
- Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, to Hitachi, Ltd. TFT active matrix liquid crystal display with gate lines having two layers, the gate electrode connected to the wider layer only. 5,532,850, Cl. 359-59.000.
- Sommerhalter, Louis, Jr. Leg stabilization sleeping device. 5,530,980, Cl. 5-648.000.
- Sone, Takurou, to Yamaha Corporation. Karaoke network system serving spare events during idling time. 5,532,923, Cl. 364-138.000.
- Song, Jun-ho; Pae, Yong-Gug; and Park, Wun-yong, to Samsung Electronics Co., Ltd. Reparable display device matrix for repairing the electrical connection of a bonding pad to its associated signal line. 5,532,853, Cl. 359-87.000.
- Songyang, Zhou: *See—*
  - Cantley, Lewis C.; and Songyang, Zhou, 5,532,167, Cl. 436-89.000.
- Sonnenberg, Sven; Rimai, Donald S.; Almeter, David D.; and Potucek, Martin, to Eastman Kodak Company. Piezoelectric sensor for in-situ monitoring of electrostatographic developers. 5,532,802, Cl. 355-246.000.
- Sony Corporation: *See—*
  - Horiuchi, Yoshiro, 5,532,546, Cl. 313-407.000.
  - Hoshino, Kazuhiro, 5,532,600, Cl. 324-537.000.
  - Iwaki, Yuji; Kikuchi, Shuichi; and Asakura, Hiroshi, 5,531,322, Cl. 206-308.300.
  - Kiyokawa, Kenji, 5,531,556, Cl. 414-225.000.
  - Kobayashi, Seiji, 5,533,003, Cl. 369-275.400.
  - Maekawa, Tomohiro; Kamoda, Hitoshi; Yui, Yasuji; Iima, Shin; and Bunya, Takashi, 5,531,527, Cl. 400-185.000.
  - Miyazaki, Shinichirou; and Watanabe, Kazuo, 5,532,757, Cl. 348-646.000.
  - Nishikawa, Katuhiko; Ikeda, Hiroya; Hirai, Hidenori; and Ogawa, Yoshio, 5,532,756, Cl. 348-630.000.
  - Sakai, Yuji; and Nakajima, Yasuhisa, 5,532,762, Cl. 348-738.000.
  - Sasaki, Yoshio, 5,532,991, Cl. 369-44.350.
  - Tokura, Kunihiko; Uryu, Masaru; and Yamada, Kenji, 5,533,134, Cl. 381-96.000.
  - Watanabe, Tetsu; and Aoki, Yoshio, 5,533,001, Cl. 369-275.200.
  - Willis, Robert N., 5,531,563, Cl. 414-794.300.
- Sony Deutschland GmbH: *See—*
  - Buchner, Peter; and Spalink, Gerd, 5,532,753, Cl. 348-569.000.
- Sony Electronics, Inc.: *See—*
  - Willis, Robert N., 5,531,563, Cl. 414-794.300.
- Sørensen, Niels H.: *See—*
  - Rasmussen, Lars; Møllgaard, Annette; Petersen, Bent R.; and Sørensen, Niels H., 5,531,795, Cl. 8-94.210.
- Sorlien, Glenn A.: *See—*
  - Kopman, Matthew W.; and Sorlien, Glenn A., 5,531,295, Cl. 188-21.000.
- Sorrento Electronics, Inc.: *See—*
  - Battista, Richard M., 5,532,944, Cl. 364-602.000.
- Sosa, Jose M.; and Beisert, Stan, to Fina Technology, Inc. Apparatus for reducing polymerization inhibitor in recycle streams. 5,531,967, Cl. 422-131.000.
- Soshi, Isao; Miyamoto, Hidenori; and Nakamura, Toshiyuki, to Nikon Corporation. Camera with film feed correction. 5,532,775, Cl. 354-106.000.
- Soshi, Isao: *See—*
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,532,776, Cl. 354-106.000.
- Sosinski, Ronald T.: *See—*
  - Hurtz, Robert W.; Smith, Jeffrey A.; Sosinski, Ronald T.; and Legg, Ernest L., 5,533,172, Cl. 395-112.000.
- Southern Imperial, Inc.: *See—*
  - Valiulis, Stanley J.; and Valiulis, Stanley C., 5,531,417, Cl. 248-303.000.
- Sowell, David C.: *See—*
  - Irwin, Janine M.; Seymour, James M.; Chen, Iris Y.; Davis, James M.; Sowell, David C.; Desai, Nailesh B.; and Torbert, Julia B., 5,533,107, Cl. 379-201.000.
- Spaeh, Richard; Westphal, Manfred; Erdle, Erich; and Zurell, Klaus-Peter, to Dornier GmbH. Serially arranged fuel cells for large scale power generation. 5,532,072, Cl. 429-34.000.
- Spaethe, Stephen M.: *See—*
  - Carlson, Donald G.; Cullinan, George J.; Fahey, Kennan J.; Jackson, William T.; Roehm, Neal W.; and Spaethe, Stephen M., 5,532,382, Cl. 549-57.000.
- Spaleck, Walter: *See—*
  - Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, 5,532,396, Cl. 556-11.000.
- Spalik, James: *See—*
  - Arldt, Roy L.; Downey, Susan H.; Goldlen, Harry J.; Mahmoud, Issa S.; Okoro, Clement A.; and Spalik, James, 5,531,838, Cl. 148-23.000.
  - Arndt, Steven F.; Matienzo, Luis J.; Memis, Irving; Spalik, James; and Wu, Tien Y., 5,532,024, Cl. 427-327.000.
- Spalink, Gerd: *See—*
  - Buchner, Peter; and Spalink, Gerd, 5,532,753, Cl. 348-569.000.
- Spanier, Henry C.; Bungo, William M.; and Stevenson, John W., to Nabisco, Inc. Coated canine biscuits and preparation process. 5,532,010, Cl. 426-94.000.
- Spann, Kyle T.; and Karcz, Peter G., to Stellar Industries, Inc. Laser tracking wheel alignment measurement apparatus and method. 5,532,816, Cl. 356-139.090.
- Sparks, Anthony L., to Reliance Electric Industrial Company. High temperature heated valve. 5,531,245, Cl. 137-341.000.
- Sparks, Douglas R.; Brown, Ronald E.; Healton, Robert L.; and Christenson, John C., to Delco Electronics Corporation. Micromachined integrated pressure sensor with oxide polysilicon cavity sealing. 5,531,121, Cl. 73-716.000.
- Spaziani, Stephen: *See—*
  - Martin, Eric A.; Vaccaro, Kenneth; Waters, William; Lorenzo, Joseph P.; and Spaziani, Stephen, 5,532,173, Cl. 437-2.000.

- Specht, Paul B., to M. B. Walton, Inc. Wringable flat-surface sponge mop. 5,530,982, Cl. 15-119.200.
- Specialty Equipment Companies, Inc.: *See—*
  - Pellicane, Jack E.; Russett, Jon P.; and Sands, Jeffery L., 5,531,155, Cl. 99-349.000.
- Spencer, Elbert M.: *See—*
  - Laabs, Timothy P.; Misner, Michael O.; Schulz, Richard H.; and Spencer, Elbert M., 5,531,084, Cl. 70-409.000.
- Spera, Frank A.: *See—*
  - Brophy, Denis J.; Datta, Madhav; Harris, Derek B.; Ryan, Frank S.; and Spera, Frank A., 5,531,874, Cl. 204-224.00M.
- Spindt, Christopher J.; Field, John E.; Morris, David L.; and Curtin, Christopher J., to Silicon Video Corporation. Field forming electrodes on high voltage spacers. 5,532,548, Cl. 313-422.000.
- Springer, Scott L., to Rite-Hite Corporation. Drive screw system with nested mobile supports. 5,531,557, Cl. 414-401.000.
- SPX Corporation: *See—*
  - Knapp, Benjamin P.; and Kraft, Clifford H., 5,532,714, Cl. 345-114.000.
- Square D Company: *See—*
  - Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., 5,532,441, Cl. 200-16.00A.
  - Marks, Robert J., 5,531,617, Cl. 439-723.000.
  - Smith, Lowell D.; and Cook, Robert G., 5,532,660, Cl. 335-14.000.
- SRI International: *See—*
  - Reist, Elmer J.; Ruhland-Fritsch, Beatrice; and Sturm, Pricilla A., 5,532,225, Cl. 514-81.000.
- Srivastava, Vishnu C.: *See—*
  - McGinley, John V. M.; Srivastava, Vishnu C.; and DeMeester, Gordon D., 5,532,597, Cl. 324-319.000.
- SS Pharmaceutical Co., Ltd.: *See—*
  - Komoto, Teruo; Hirota, Hiroyuki; Sato, Susumu; Ohtsuka, Mari; Koya, Hidehiko; Mizuno, Hiroyuki; and Kuraishi, Tadayuki, 5,532,371, Cl. 544-360.000.
- Staats, Victor, to International Laboratory Technology Corp. Antimicrobial composition. 5,531,984, Cl. 424-78.070.
- Stac Electronics, Inc.: *See—*
  - Mayers, Clay; and Whiting, Douglas L., 5,532,694, Cl. 341-67.000.
- Stadler, Bruno: *See—*
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- Stagni, Maria, Silvia Zucchini, Chiara Zucchini, Matteo Zucchini, heirs: *See—*
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- Stallings, Kevin J.: *See—*
  - Shelton, Jeff L.; Stallings, Kevin J.; and Hogan, Thomas H., 5,531,189, Cl. 122-379.000.
- Stanchina, William E.; Metzger, Robert A.; and Rensch, David B., to Hughes Aircraft Company. Heterojunction diode with low turn-on voltage. 5,532,486, Cl. 257-201.000.
- Stancu, Sorin: *See—*
  - Simplicean, Ionel E.; and Stancu, Sorin, 5,532,437, Cl. 181-150.000.
- Stanczyk, Thomas F.; Milano, Frank K.; and Hintermeier, Mary P., to Recra Environmental, Inc. Computer system and method for waste accounting, reduction, and evaluation. 5,532,928, Cl. 364-406.000.
- Stanford Telecommunications, Inc.: *See—*
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- Stanley, Daniel L.: *See—*
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- Starsight Telecast Inc.: *See—*
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- State of Oregon, The, Acting By and Through the Oregon State System of Higher Education, on Behalf of Oregon State University: *See—*
  - Johnston, Stephen A.; and Dougherty, William G., 5,532,142, Cl. 435-69.100.
- Staton, Ed. Cosmetically disguised hearing aid. 5,533,130, Cl. 381-68.500.
- Staudacher, William, to Tandy Corporation. Acoustic feedback cancellation for equalized amplifying systems. 5,533,120, Cl. 379-392.000.
- Stearns, Stanley D.; and Wentworth, Wayne E. High voltage spark excitation and ionization system including disc detector. 5,532,599, Cl. 324-464.000.
- Steckel, Eric S.: *See—*
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- Steen, John A.: *See—*
  - Hemmer, Chad G.; Steen, John A.; Forman, Michael R.; and McGrath, Jonathan R., 5,531,685, Cl. 604-95.000.
- Steenackers, Pieter D., to Scambia Industrial Developments AG. Catalytic converter for the catalytic treatment of exhaust gas. 5,531,968, Cl. 422-176.000.
- Steer, Graham E., to E. R. Squibb & Sons, Inc. Male incontinence device. 5,531,725, Cl. 604-349.000.
- Stefansky, Frederick M.; Shrinkle, Louis J.; and Fiers, Thomas A., to Conner Peripherals, Inc. Winchester drive card including an actuator arm body, actuator arm plates, and a VCM magnet external to a controlled environment. 5,532,889, Cl. 360-97.010.
- Stefansson, Kari, to Arch Development Corporation. Nucleic acid sequences encoding OMGP. 5,532,351, Cl. 536-23.500.
- Stefansson, Lars; and Lennartsson, Kenneth, to Lindab Aktiebolag. U-shaped sealing device on a pipe. 5,531,460, Cl. 277-206.00R.
- Steffens, Charles E., Jr.: *See—*
  - Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., 5,531,472, Cl. 280-735.000.
- Stein, Alfred, to Morphometrix Inc. Multiscanning confocal microscopy. 5,532,874, Cl. 359-394.000.
- Steiner, Victor E.: *See—*
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- Steinkamp, Manfred; Lau, Werner; and McGarian, Bruce. Drill string anchor. 5,531,280, Cl. 175-230.000.
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- Steinmetz, Hans W.; and Petry, Dirk A., to Georg Fischer Rohrleitungssysteme AG. Welding sleeve of thermoplastic material. 5,532,459, Cl. 219-535.000.
- Stellar Industries, Inc.: *See—*
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- Stephens, Gerald D.; and Liu, Duixian, to Valor Enterprises, Inc. Antenna coupler for portable cellular telephones. 5,532,703, Cl. 343-702.000.
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- Steritech, Inc.: *See—*
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- Stetler, Steven S.: *See—*
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- Stevenson, Donald R.; Clark, Daniel L.; Debevec, John C.; Slater, Charles N.; and Larke, Carroll W., to Dover Chemical Corporation. Process for production of tris(nonylphenyl) phosphite. 5,532,401, Cl. 558-95.000.
- Stevenson, John W.: *See—*
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- Stewart, Erik J.: *See—*
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- Stewart, Randolph C.: *See—*
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- Stewart, Wallace S.; Merz, Gary E.; and Marshall, Dale C., to Eastman Kodak Company. Ultrasonic method for forming individual pillowed chips of light lock material. 5,531,847, Cl. 156-73.100.

- Stibolt, Paul E.; and Judy, Russell E. Drywall corner finishing device. 5,531,050, Cl. 52-254.000.
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- Stone, Kevin R.; and DeSatnick, Allen H., to Stone, Kevin R. Suture anchor assembly. 5,531,762, Cl. 606-232.000.
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- Storm, Shawn: *See—*
  - Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,532,954, Cl. 365-52.000.
- Stormo, Keith E., to Idaho Research Foundation, Inc. Dynamic bed reactor. 5,531,897, Cl. 210-606.000.
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- Story, Michael J., to Cortecs Limited. Gelatin pharmaceutical formulations. 5,532,002, Cl. 424-456.000.
- Stouffer, Jan M.; Blanchard, Elwood N.; and Leffew, Kenneth W., to Du Pont de Nemours, E. I., and Company. Production of poly(ethylene terephthalate). 5,532,333, Cl. 528-308.200.
- Stout, Jay S.: *See—*
  - Carlson, Randall R.; Stout, Jay S.; Wylie, Dwane E.; Wagner, Fred W.; and Riddell, Malcolm, 5,532,136, Cl. 435-7.920.
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- Stransky, Werner: *See—*
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  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
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- Strata Flotation, Inc.: *See—*
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- Strebel, Eduard, to ABB Management AG. Method of electrode regulation of a DC arc furnace and electrode regulation device. 5,533,044, Cl. 373-104.000.
- Streu, Joachim: *See—*
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- Striemer, Bryan L.: *See—*
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- Strojnik, Primoz: *See—*
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- Strolle, Christopher H.; and Weckenbrock, Hermann J., to SamSung Electronics Co., Ltd. Digital modulators for use with sub-nyquist sampling of raster-scanned samples of image intensity. 5,532,820, Cl. 358-310.000.
- Strolle, Christopher H.: *See—*
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- Strom, Grant C. Carry out caddy for shopping carts. 5,531,366, Cl. 224-153.000.
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- Subbiah, Rajagopal, to Westinghouse Electric Corporation. Rotor journal bearing having adjustable bearing pads. 5,531,523, Cl. 384-117.000.
- Suda, Takeo: *See—*
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- Sudani, Kiyoshi; Kano, Masato; Sugimoto, Yukihiro; Fukuda, Takashi; and Iwahashi, Toru, to Sumitomo Metal Industries, Ltd. Method of making a carbon/metal composite. 5,531,943, Cl. 264-29.100.
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- Suenaga, Yutaka; and Hayashi, Itoe, to Nikon Corporation. Objective lens system for microscope. 5,532,878, Cl. 359-657.000.
- Sugatsune Industrial Co., Ltd.: *See—*
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- Sugawara, Shigekazu, to Fujitsu Limited. Semiconductor device having heavily doped silicon film. 5,532,183, Cl. 437-101.000.
- Suggitt, Robert W.: *See—*
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- Sugie, Hiroyuki: *See—*
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- Sugikawa, Hirofumi, to Katayama Special Industries, Ltd. Method of manufacturing a metallic porous sheet having pores surrounded by a three-dimensional net-shaped framework of metallic layers. 5,531,955, Cl. 419-2.000.
- Sugiki, Shozo: *See—*
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- Sugita, Takeshi; Adachi, Nobukazu; Kuroda, Akira; and Takano, Manabu, to Canon Kabushiki Kaisha. Image fixing apparatus having means for preventing temperature unevenness. 5,532,806, Cl. 355-285.000.
- Sugita, Yuji: *See—*
  - Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.
- Sugiyama, Masanori: *See—*
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- Sugiyama, Osamu: *See—*
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- Sumitomo Chemical Company, Limited: *See—*
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- Sumitomo Heavy Industries, Ltd.: *See—*
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- Sumitomo Metal Industries, Ltd.: *See—*
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  - Sudani, Kiyoshi; Kano, Masato; Sugimoto, Yukihiro; Fukuda, Takashi; and Iwahashi, Toru, 5,531,943, Cl. 264-29.100.
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  - Saka, Yuuji; and Goto, Hideki, 5,532,431, Cl. 174-52.300.
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- Sun Medical Technology Research Corporation: *See—*
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- Sun Microsystems, Inc: *See—*
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- Sun Microsystems, Inc.: *See—*
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- Sundell, Robert E.: *See—*
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- SunSmart, Inc.: *See—*
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- Suntory Limited: *See—*
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  - Buckles, Warren E.; and Lundy, Richard A., 5,532,664, Cl. 335-216.000.
- Supino, Charles: *See—*
  - Kroll, Mark W.; Adams, Theodore P.; Perttu, Joseph S.; and Supino, Charles, 5,531,782, Cl. 607-122.000.
- Sura, Vivek M.: *See—*
  - Farooq, Shaji; Purushothaman, Sampath; Reddy, Srinivasa S. N.; and Sura, Vivek M., 5,532,031, Cl. 428-623.000.
- Surber, Kevin J.: *See—*
  - Miller, Mark S.; Surber, Kevin J.; Mehnert, David; Wrezel, Paul; Crawford, Sylvia I.; and Meibach, Ronald L., 5,532,018, Cl. 426-582.000.
  - Miller, Mark S.; and Surber, Kevin J., 5,532,019, Cl. 426-589.000.
  - Miller, Mark S.; and Surber, Kevin J., 5,532,022, Cl. 426-660.000.
- Suspa Compart Aktiengesellschaft: *See—*
  - Wolf, Herbert; and Harrer, Harald, 5,531,413, Cl. 248-188.200.
- Sutherland, Hunt A.: *See—*
  - Weir, Michael P.; and Sutherland, Hunt A., 5,532,601, Cl. 324-539.000.
- Sutherland, Ralph W., to Hubbell Incorporated. Lighting fixture barrier with lamp insertion channel. 5,532,911, Cl. 362-220.000.
- Suzuki, Akira: *See—*
  - Ishizuka, Shuichi; Kawamura, Kohei; Hata, Jiro; and Suzuki, Akira, 5,531,834, Cl. 118-723.00I.
- Suzuki, Haruhiko; and Mak, Tak W., to Ontario Cancer Institute. Interleukin-2 receptor deficient mammals. 5,532,158, Cl. 435-240.200.
- Suzuki, Hidetoshi: *See—*
  - Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
- Suzuki, Hirofumi: *See—*
  - Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.
- Suzuki, Hiroshi: *See—*
  - Terauchi, Takanobu; Sakurada, Toyohisa; Fukumoto, Takehiko; and Suzuki, Hiroshi, 5,532,421, Cl. 585-671.000.
- Suzuki, Hiroyuki: *See—*
  - Nakajima, Akio; Muramatsu, Hideo; Suzuki, Hiroyuki; and Hamano, Kanako, 5,532,841, Cl. 358-408.000.
- Suzuki, Isamu: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Suzuki, Jun: *See—*
  - Kameo, Yohdoh; Matsumoto, Kazuo; and Suzuki, Jun, 5,533,060, Cl. 375-332.000.
- Suzuki, Katsuaki: *See—*
  - Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, 5,532,569, Cl. 318-802.000.
- Suzuki, Kazuko: *See—*
  - Yamadera, Takashi; Takeuchi, Kazumasa; Obata, Ritsuko; Fukutomi, Naoki; and Suzuki, Kazuko, 5,532,105, Cl. 430-156.000.
- Suzuki, Kenji: *See—*
  - Yokoyama, Yoshinobu; Suzuki, Kenji; Seki, Yoshiyuki; Harada, Shoichi; and Shimizu, Etsuo, 5,532,908, Cl. 362-30.000.
- Suzuki, Kenzaburo: *See—*
  - Nakatsuji, Masahiro; and Suzuki, Kenzaburo, 5,532,881, Cl. 359-684.000.
- Suzuki, Koji; Sekiya, Toshiyuki; and Doi, Koji, to Canon Kabushiki Kaisha. Electric power source. 5,532,913, Cl. 363-25.000.
- Suzuki, Kouji: *See—*
  - Inuzuka, Eiji; Oguri, Shigehisa; Suzuki, Kouji; Nagata, Wataru; and Hiruma, Yasushi, 5,532,607, Cl. 324-750.000.
- Suzuki Motor Corporation: *See—*
  - Katsuhiko, Toyoda, 5,531,069, Cl. 60-276.000.
- Suzuki, Nobuo: *See—*
  - Horie, Seiji; Sano, Kenji; Suzuki, Nobuo; and Watarai, Shu, 5,532,099, Cl. 430-115.000.
  - Miwa, Tetsuyuki; Nakao, Munehiro; Suzuki, Nobuo; and Kato, Koki, 5,532,769, Cl. 351-205.000.
- Suzuki, Shigeaki; and Naito, Yushi, to Mitsubishi Denki Kabushiki Kaisha. Echo canceller and method for controlling echo cancellation. 5,533,121, Cl. 379-410.000.
- Suzuki, Sou: *See—*
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Aqucous alkaline developing solution. 5,532,116, Cl. 430-331.000.
- Suzuki, Tamotsu: *See—*
  - Namiki, Tomizo; Suzuki, Tamotsu; and Miyata, Yukihide, 5,532,722, Cl. 347-153.000.
- Suzuki, Tetsuo: *See—*
  - Shindoh, Toshihiko; Kakegawa, Takeshi; Urano, Kazuhiko; Okamura, Toshimasa; Suzuki, Tetsuo; and Sato, Masatoshi, 5,532,063, Cl. 428-446.000.
- Suzuki, Tomio: *See—*
  - Mori, Shigeru; Suzuki, Tomio; and Hayashikoshi, Masanori, 5,532,961, Cl. 365-189.050.
- Suzuki, Toshimitsu; and Nishio, Azuma, to Pola Chemical Industries, Inc. R,R,S,S-2-nitroimidazole derivatives. 5,532,380, Cl. 548-327.500.
- Suzuki, Yasumichi: *See—*
  - Otsubo, Toru; Suzuki, Yasumichi; Sasaki, Shinji; Ohara, Kazuhiro; and Sasaki, Ichirou, 5,531,862, Cl. 156-643.100.
- Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, to Nippondenso Co., Ltd. Hybrid integrated circuit and process for producing same. 5,532,910, Cl. 361-813.000.
- Swanson, David K.: *See—*
  - Dahl, Roger W.; Wickham, Robert W., deceased; Swanson, David K.; and Lipson, David, 5,531,779, Cl. 607-119.000.
- Swartz, Jerome: *See—*
  - Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 5,532,469, Cl. 235-472.000.
- Swartzmiller, Steven B.: *See—*
  - Bonekamp, Jeffrey E.; Swartzmiller, Steven B.; Donald, Robert J.; and Uzee, Andre J., 5,532,315, Cl. 525-71.000.

Sweaton, Michael C., to Minnesota Mining and Manufacturing Company. Overvoltage protection circuit. 5,532,894, Cl. 361-18.000.
Sweeney, Kenneth W.; and Converse, Harold G., to Minnesota Mining and Manufacturing Company. Static blending device. 5,531,831, Cl. 118-600.000.
Sweet, E. Jack: *See—*
  Pfefferle, William C.; and Sweet, E. Jack, 5,531,066, Cl. 60-39.822.
Sweetser, Kevin N.; Beratan, Howard R.; and Owen, Robert A., to Texas Instruments Incorporated. Defective pixel signal substitution in thermal imaging systems. 5,532,484, Cl. 250-332.000.
Swenson, Barbara C.: *See—*
  Sirvio, Larry M.; and Swenson, Barbara C., 5,532,311, Cl. 525-54.200.
Swenson, Erik R.: *See—*
  DeJager, Gregory L.; and Swenson, Erik R., 5,533,018, Cl. 370-60.100.
Swift, Graham: *See—*
  Freeman, Michael B.; Hann, William M.; Paik, Yi H.; and Swift, Graham, 5,531,934, Cl. 252-390.000.
Swisher, Curtis N.: *See—*
  Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.
Swisher, David R., to Sherwood Medical Company. Tamper evident sleeve. 5,531,695, Cl. 604-111.000.
Switchenko, Arthur C.: *See—*
  Singh, Sharat; Switchenko, Arthur C.; Lin, Cheng-I; Kurn, Nurith; and Ullman, Edwin F., 5,532,138, Cl. 435-7.930.
Swoboda, Johann: *See—*
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Sylvan, Herman P. S.: *See—*
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Sylvester, Richard J.: *See—*
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Symbios Logic Inc.: *See—*
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Symbiosis Corporation: *See—*
  Smith, Kevin W.; and Bales, Thomas O., 5,531,755, Cl. 606-170.000.
Symbol Technologies, Inc.: *See—*
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  Thornton, Janine M.; and Thornton, Michael G., 5,531,129, Cl. 73-863.240.
Sysgration Ltd.: *See—*
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Systems Corporation: *See—*
  Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
Szerlag, Donald: *See—*
  Kollar, Craig A.; Szerlag, Donald; Lajack, William C.; and Koneval, Kevin, 5,531,046, Cl. 49-360.000.
Szewc, Joseph W.: *See—*
  Levocz, Reynold J.; and Szewc, Joseph W., 5,531,445, Cl. 473-341.000.
Szurkowski, Edward S.: *See—*
  Blahut, Donald E.; Schell, William M.; Story, Guy A.; and Szurkowski, Edward S., 5,532,735, Cl. 348-13.000.
T.H.E.M. Industries, Inc.: *See—*
  Darby, Robert J., 5,531,327, Cl. 206-600.000.
Tabata, Hitoshi; Murata, Osamu; Fujioka, Junzo; and Minakata, Shunichi, to Kawasaki Jukogyo Kabushiki Kaisha. Process for the production of dielectric thin films. 5,532,504, Cl. 257-252.000.
Tac Star Industries, Inc.: *See—*
  Moore, Larry, 5,531,040, Cl. 42-103.000.
Tachibana, Makoto: *See—*
  Kondo, Naofumi; Katayama, Mikio; Okamoto, Masaya; Miyago, Makoto; Nakazawa, Kiyoshi; Kanemori, Yuzuru; and Tachibana, Makoto, 5,532,615, Cl. 324-770.000.
Tackett, Wendell D., to Kelsey-Hayes. High pressure accumulator/bypass valve with stationary high pressure seal. 5,531,513, Cl. 303-84.200.
Taco Bell Corp.: *See—*
  Brummett, Barry J., 5,531,156, Cl. 99-450.100.
Tada, Katsuyuki; and Kitamori, Katsuya, to Fujitsu Limited. Line switching system. 5,532,862, Cl. 359-161.000.
Taguchi, Toshiyuki: *See—*
  Nawata, Katsumi; Ushijima, Fumihiro; Taguchi, Toshiyuki; and Inagaki, Hazime, 5,531,225, Cl. 128-719.000.
Taguchi, Yoshito: *See—*
  Katagiri, Masaki; Taguchi, Yoshito; and Uchida, Toshio, 5,531,074, Cl. 62-6.000.
Taiho Kogyo Co., Ltd.: *See—*
  Jinno, Osamu, 5,532,026, Cl. 427-409.000.
Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, to Murata Manufacturing Co., Ltd. Solid oxide fuel cell and manufacturing method thereof. 5,531,019, Cl. 29-623.500.
Taira, Seizo: *See—*
  Nakayama, Toyoo; Taira, Seizo; Kawamura, Hiroyuki; Shibuya, Masaoki; and Iwaki, Masahiro, 5,532,267, Cl. 514-467.000.
Taiwan Semiconductor Manufacturing Company: *See—*
  Liaw, Shiou H.; and Shih, Jiaw-Ren, 5,532,178, Cl. 437-57.000.
Tajima, Hirokazu; and Umida, Hidetoshi, to Fuji Electric Co., Ltd. Variable speed control apparatus for induction motor. 5,532,570, Cl. 318-809.000.
Takagi, Hiroshi: *See—*
  Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, 5,531,019, Cl. 29-623.500.
Takagi, Shigehide; Ito, Kuniomi; and Hidaka, Tsuneo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Ceramic device providing an environment for the promotion and formation of new bone. 5,531,794, Cl. 623-16.000.
Takahashi, Hisayoshi: *See—*
  Iwasaki, Shinichiro; Sugiyama, Masanori; Umemura, Chiaki; Ookawa, Akemi; and Takahashi, Hisayoshi, 5,532,567, Cl. 318-701.000.
Takahashi, Junichi: *See—*
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Takahashi, Kazuhiro: *See—*
  Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata, Yasuo; and Takahashi, Kazuhiro, 5,531,664, Cl. 600-149.000.
Takahashi, M.: *See—*
  Buchan, William; Patrick, Edward; Takahashi, M.; and Howell, J. V., 5,532,886, Cl. 360-51.000.
Takahashi, Osamu: *See—*
  Mizukawa, Yuki; Motoki, Masuji; Sato, Tadahisa; and Takahashi, Osamu, 5,532,377, Cl. 548-262.400.
Takahashi, Satoshi, to NEC Corporation. Call alarming apparatus for paging system. 5,532,685, Cl. 340-825.460.
Takahashi, Satoshi: *See—*
  Yasuda, Kazuo; and Takahashi, Satoshi, 5,532,803, Cl. 355-251.000.
Takahashi, Shinji; and Tuchiya, Toshihisa, to Ibiden Co., Ltd. Solder-precoated conductor circuit substrate and method of producing the same. 5,532,070, Cl. 428-643.000.
Takahashi, Takao; and Takehara, Hiroshi, to Multifastener Corporation. Self-attaching nut and method of making same. 5,531,552, Cl. 411-179.000.
Takahashi, Tohru, to Terumo Kabushiki Kaisha. Vascular catheter with helical space. 5,531,719, Cl. 604-280.000.
Takahashi, Toshimichi: *See—*
  Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
Takahashi, Yasuhito; Kimura, Tsutomu; and Isosu, Toru, to Fuji Xerox Co., Ltd. Error detection apparatus for detecting errors of toner sensing in an image forming apparatus. 5,532,791, Cl. 355-206.000.
Takahashi, Yukio: *See—*
  Kuriki, Makoto; Uehira, Kazutake; Takahashi, Yukio; and Sakai, Shigenobu, 5,532,736, Cl. 348-20.000.
Takahasi, Akihisa: *See—*
  Kadono, Shinichi; Mishima, Kiyoshi; Takahasi, Akihisa; and Taniuchi, Akira, 5,532,322, Cl. 525-357.000.
Takai, Hideo: *See—*
  Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
Takai, Kenichi, to NEC Corporation. Feedforward-type distortion compensation circuit. 5,532,642, Cl. 330-15.000.
Takamizawa, Tohru: *See—*
  Hida, Tadayoshi; Ishida, Yasutaka; and Takamizawa, Tohru, 5,531,525, Cl. 384-482.000.
Takamoto, Kenji: *See—*
  Fukui, Atsushi; Nishii, Kanji; Takamoto, Kenji; and Ito, Masami, 5,532,823, Cl. 356-364.000.
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Takano, Tomotaka: *See—*
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Takano, Tsunesuke; and Sinzawa, Kouichi, to Daiichi Denso Buhin Co., Ltd. Connector attachment component. 5,531,613, Cl. 439-544.000.
Takano, Yasushi: *See—*
  Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
Takano, Yoshishige: *See—*
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Takara Shuzo Co., Ltd.: *See—*
  Hayashi, Ken'ichiro; Hashida, Takashi; Asada, Kiyozo; Kotani, Hirokazu; Kato, Ikunoshin; and Sobue, Kenji, 5,532,337, Cl. 530-350.000.
Takasago International Corporation: *See—*
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Takase Dyeing & Printing Works, Ltd.: *See—*
  Terashi, Mitugi; Inoue, Masaharu; and Usijima, Yutaka, 5,532,043, Cl. 428-152.000.
Takashima, Makoto: *See—*

  Aikoh, Hideki; Takashima, Makoto; Nakamura, Hiroyuki; and Nakamura, Tohru, 5,532,999, Cl. 369-120.000.
Takashima, Norio: *See—*
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Takasugi, Hisashi: *See—*
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Takayama, Makoto: *See—*
  Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.
Takayama, Susumu; Mikami, Yasuie; Iyatomi, Nobuyoshi; and Orikasa, Minoru, to Nittetsu Mining Co., Ltd. Process for treatment of sodium hydroxide waste liquor containing aluminum. 5,531,906, Cl. 210-712.000.
Takayanagi, Takashi: *See—*
  Miyazaki, Nobuyuki; Kodama, Shun-ichi; Takayanagi, Takashi; and Uchino, Bunji, 5,532,304, Cl. 524-261.000.
Takebuchi, Masataka; Tohyama, Daisuke; and Ogura, Hidemitsu, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor nonvolatile memory device having different gate insulating thicknesses. 5,532,181, Cl. 437-43.000.
Takechi, Toshisada: *See—*
  Nikaido, Hideyuki; Nomura, Nobuaki; Takechi, Toshisada; Fukui, Yoshimitsu; Kitahama, Masanori; Isobe, Kunio; and Takashima, Norio, 5,531,089, Cl. 72-241.800.
Takeda Chemical Industries, Ltd.: *See—*
  Kuwazuru, Yosei; Igarashi, Akira; and Minamida, Isao, 5,531,981, Cl. 424-45.000.
  Motsenbocker, Marvin A., 5,532,171, Cl. 436-533.000.
Takeda, Katsuhiko: *See—*
  Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, 5,532,798, Cl. 355-221.000.
Takeda, Soichi: *See—*
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Takeda, Takaaki: *See—*
  Hirohashi, Kazutoshi; Shinomiya, Teruhiko; Sakane, Manabu; Ushijima, Keishi; Takeda, Takaaki; Satou, Masamichi; Kikuta, Michio; and Nagashima, Motoyasu, 5,532,858, Cl. 359-159.000.
Takeda, Toshihiko: *See—*
  Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.
Takehana, Sakae: *See—*
  Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata, Yasuo; and Takahashi, Kazuhiro, 5,531,664, Cl. 600-149.000.
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Takematsu, Minoru: *See—*
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Takemoto, Masanori: *See—*
  Nishiura, Tetsuya; Kurahashi, Motofumi; Takemoto, Masanori; Kawano, Hiroyuki; Nakayama, Motohiro; and Yamada, Masato, 5,532,051, Cl. 428-217.000.
Takemoto, Tadashi; and Kataoka, Takehiko, to Ajinomoto Co., Inc. Process for recovering L-phenylalanine. 5,532,407, Cl. 562-443.000.
Takemoto, Takeshi, to Ricoh Company, Ltd. Heating roller having electrodes for supplying power to a heating element. 5,532,807, Cl. 355-289.000.
Takemoto, Toshiyuki: *See—*
  Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.
Takemoto, Tsuyoshi; Hisanaga, Shigeru; Watanabe, Yasushi; and Fukanuma, Tetsuhiko, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll compressor. 5,531,578, Cl. 418-55.100.
Takemura, Susumu: *See—*
  Nagano, Eiki; Takemura, Susumu; Enomoto, Masayuki; Sakaki, Masaharu; and Kizawa, Satoru, 5,532,208, Cl. 504-239.000.
Takemura, Tadashi; Morita, Toshihiko; Aimi, Kenichi; and Komori, Katsuhiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Jidosha Engineering Kabushiki Kaisha. Shift lever assembly for transmission having turning inhibiting members. 5,531,133, Cl. 74-473.00R.
Takenaka, Kenji: *See—*
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Takeno, Shozui; Moriyasu, Masaharu; Machida, Kazumichi; and Yasunaga, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Insulated wire. 5,532,434, Cl. 174-110.00R.
Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method for adjusting read-out and processing conditions for Magen images. 5,533,142, Cl. 382-128.000.
Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method for determining the orientation in which an object was placed when the image of the object was recorded. 5,533,143, Cl. 382-132.000.
Takeoka, Yuichi: *See—*
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Takeuchi, Kazumasa: *See—*
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  Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.
Takeuchi, Shinsuke: *See—*
  Arai, Tsunekazu; Takeuchi, Shinsuke; and Matsubayashi, Kazuhiro, 5,533,147, Cl. 382-179.000.
Takizawa, Yumi: *See—*
  Fukasawa, Atsushi; Horiguchi, Kenji; Sato, Takuro; Sugimoto, Hiroki; and Takizawa, Yumi, 5,533,012, Cl. 370-18.000.
Takuma Co, Ltd.: *See—*
  Matsumoto, Nobuya; Morimura, Yasuhiro; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; and Kanazawa, Masaru, 5,531,908, Cl. 210-760.000.
Talbot, David W.: *See—*
  Westby, Reidar; and Talbot, David W., 5,531,670, Cl. 602-41.000.
Talbot, Neil; Rexroad, Caird E., Jr.; Pursel, Vernon G.; and Powell, Anne M., to United States of America, Agriculture. Hepatocyte cell line derived from the epiblast of pig blastocysts. 5,532,156, Cl. 435-240.200.
Talty, Timothy J., to Ford Motor Company. Directional antenna for vehicle entry system. 5,532,709, Cl. 343-819.000.
Tamagawa, Akio, to NEC Corporation. Voltage converting circuit and multiphase clock generating circuit used for driving the same. 5,532,916, Cl. 363-62.000.
Tamaki, Kenji: *See—*
  Koyama, Osamu; Kato, Tadashi; Usui, Masayuki; Watanabe, Yoshihiko; Baba, Hisatoshi; Ando, Hirotake; Nakajima, Hideo; Sakai, Shinji; and Tamaki, Kenji, 5,532,990, Cl. 369-44.320.
Tambo, Norihito; and Shimizu, Tatsuo, to Tambo, Norihito; Shimizu, Tatsuo; and Tsukishima Kikai Co., Ltd. Process for disposing of waste water. 5,531,896, Cl. 210-605.000.
Tamegai, Etsuo: *See—*
  Onoda, Motonobu; Tsuchiya, Takeshi; Tamegai, Etsuo; Ogawa, Katsuaki; and Murata, Makoto, 5,531,195, Cl. 123-193.600.
Tamer, Attila: *See—*
  Coles, Peter; and Tamer, Attila, 5,531,729, Cl. 604-384.000.
Tamlyn, Robert: *See—*
  Butler, Edward; Lundberg, Martin B.; Mokashi, Pushkar U.; Sartwell, Alfred L.; Shah, Hemen R.; and Tamlyn, Robert, 5,532,970, Cl. 365-230.050.
Tamme, Rainer; and Huder, Karin, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V. Solar energy installation for chemical conversions. 5,531,969, Cl. 422-186.000.
Tammen, David J.: *See—*
  Krenz, Eric L.; and Tammen, David J., 5,532,708, Cl. 343-795.000.
Tamura, Kouichi: *See—*
  Niwa, Mineo; Tamura, Kouichi; Kaizu, Tsutomu; and Kobayashi, Masakazu, 5,532,137, Cl. 435-7.920.
Tan, Songsheng: *See—*
  Han, Hongtao; and Tan, Songsheng, 5,533,158, Cl. 385-88.000.
Tanahashi, Mariko; Koike, Keiichi; and Katoh, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Image filing method based on symbol retrieval condition. 5,533,186, Cl. 395-164.000.
Tanaka, Akira: *See—*
  Ishibashi, Mitsuru; Sasaki, Hideyuki; Nomaki, Tatsuo; Tanaka, Akira; and Hasegawa, Rei, 5,532,488, Cl. 250-341.300.
Tanaka, Eiichi: *See—*
  Yamashita, Takaji; and Tanaka, Eiichi, 5,532,489, Cl. 250-363.030.
Tanaka, Hirokazu: *See—*
  Narikawa, Shiro; Tanaka, Hirokazu; Honda, Iwakazu; Oikawa, Tomohiro; and Ando, Hiroe, 5,532,796, Cl. 355-210.000.
Tanaka Kikinzoku Kogyo, K.K.: *See—*
  Matsuzawa, Osamu, 5,531,371, Cl. 228-175.000.
Tanaka, Kiyoshi, to Uniden Corporation. Channel switching control method and a cordless telephone system using the same. 5,533,010, Cl. 370-18.000.
Tanaka, Makoto: *See—*
  Hashimoto, Takatsugu; Akutagawa, Keizo; Yagawa, Kazuo; Tanaka, Makoto; Yamagishi, Junichi; and Hachiya, Kazuo, 5,531,256, Cl. 152-209.00R.
Tanaka, Masaru: *See—*
  Tatsumi, Kenzo; Tanaka, Masaru; and Suda, Takeo, 5,532,795, Cl. 355-210.000.
Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, to Hitachi, Ltd. Nonvolatile semiconductor memory having enhanced speed for erasing and programming. 5,532,971, Cl. 365-230.060.
Tanaka, Toshio: *See—*
  Koga, Masahiro; Tanaka, Toshio; Fujii, Takao; and Masegi, Tsukio, 5,532,408, Cl. 562-466.000.
Tanaka, Yoshito: *See—*
  Kosaki, Shinichi; Tanaka, Yoshito; and Kuwa, Tadahiro, 5,531,324, Cl. 206-449.000.

Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Nakata, Kiyoshi; Tsutsui, Yoshio; Miyake, Wataru; and Suzuki, Katsuaki, to Hitachi, Ltd. Inverter control apparatus. 5,532,569, Cl. 318-802.000.
Tandy Corporation: *See—*
  Staudacher, William, 5,533,120, Cl. 379-392.000.
Tang, Reginald T.-H.: *See—*
  Mares, Frank; Boyle, William J., Jr.; Tang, Reginald T.-H.; Patel, Kundanbhai M.; Kotliar, Abraham M.; and Chiu, Tin-Ho, 5,531,998, Cl. 424-426.000.
Tang, Yu-Chang, to Sysgration Ltd. Uninterruptible power system. 5,532,523, Cl. 307-64.000.
Taniguchi, Hideaki: *See—*
  Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,532,850, Cl. 359-59.000.
Taniuchi, Akira: *See—*
  Kadono, Shinichi; Mishima, Kiyoshi; Takahasi, Akihisa; and Taniuchi, Akira, 5,532,322, Cl. 525-357.000.
Taniuchi, Osamu; Okumura, Hitoshi; Kawase, Hajime; Nankoh, Youichi; and Nakata, Hiroyuki, to Sumitomo Wiring Systems, Ltd. Lever type connector. 5,531,605, Cl. 439-157.000.
Tanner, Stephen F., to Encon Safety Products. Emergency eyewash fountain. 5,530,972, Cl. 4-620.000.
Tanno, Norihiko: *See—*
  Saji, Ikutaro; Muto, Masayuki; Tanno, Norihiko; and Yoshigi, Mayumi, 5,532,372, Cl. 544-368.000.
Tapematic U.S.A., Inc.: *See—*
  Perego, Luciano, 5,531,397, Cl. 242-532.100.
Taran, Carmen: *See—*
  Lee, Virgil J.; Wang, Ying; Taran, Carmen; and Marocco, Matthew L., III, 5,532,374, Cl. 546-167.000.
Taravella, Philip; Blair, Edward J.; Domanski, Ronald S.; and Shippell, Joseph C., to Anchor Bay Packaging Corporation. Structural member for use in a pallet or a shipping container. 5,531,165, Cl. 108-51.300.
Tarbouriech, Jean-Claude, to Motorola, Inc. Voltage protection structure for semiconductor devices. 5,532,899, Cl. 361-126.000.
Target Therapeutics, Inc.: *See—*
  Engelson, Erik T.; Hergenrother, Robert; and Eder, Joseph, 5,531,715, Cl. 604-265.000.
Tarsia, Maurice J.: *See—*
  Khorramabadi, Haideh; Tarsia, Maurice J.; and Tzeng, Liang D., 5,532,471, Cl. 250-214.00A.
Tartaglia, Joseph M.: *See—*
  Attermeier, Kurt; Dudar, Thomas E.; Stiehl, Mark A.; and Tartaglia, Joseph M., 5,531,711, Cl. 604-242.000.
TASC, Inc.: *See—*
  Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
Tashiro, Yoichi: *See—*
  Kida, Haruyasu; Arai, Masako; Tashiro, Yoichi; and Baba, Hideki, 5,532,021, Cl. 426-607.000.
Tasi, Chin-Lin. Handy gas torch. 5,531,592, Cl. 431-255.000.
Tatematsu, Susumu; Sugie, Hiroyuki; Uchida, Naoya; Tsukiyama, Yasumitsu; and Ikari, Hideyuki. Bearing structure for auger-type ice making machines. 5,531,079, Cl. 62-354.000.
Tatsumi, Kenzo; Tanaka, Masaru; and Suda, Takeo, to Ricoh Company, Ltd. Method of and system for cleaning roller members. 5,532,795, Cl. 355-210.000.
Tatsumi, Masayuki: *See—*
  Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,532,055, Cl. 428-318.600.
Tatsuya, Hirata, to Nippondenso Co., Ltd. Communication system. 5,532,692, Cl. 340-825.540.
Tavernier, Serge; Op de Beeck, Werner; Gbekiere, Jean-Pierre; and Van Tendeloo, Gustaaf, to Agfa-Gevaert, N.V. Positively charged toner for use in electrostatography. 5,532,097, Cl. 430-110.000.
Tayefeh, Morovat: *See—*
  Dounn, Paul J.; Kise, Terry L.; Schneider, Richard C.; and Tayefeh, Morovat, 5,533,031, Cl. 371-21.100.
Taylor, Alexander R.: *See—*
  Baron, David T.; Taylor, Alexander R.; and Johal, Kuldip S., 5,531,889, Cl. 210-167.000.
Taylor, Jeffrey F.: *See—*
  Burns, Elizabeth G.; Visser, Susan A.; and Taylor, Jeffrey F., 5,532,286, Cl. 522-37.000.
TDK Corporation: *See—*
  Honjo, Yoshihiro; Yamakawa, Yoshisuke; Kawahara, Hiroshi; and Tsunoda, Eizo, 5,532,041, Cl. 428-141.000.
  Tsuchida, Atsuko; and Nakagawa, Shiro, 5,531,097, Cl. 73-29.020.
TDW Delaware, Inc.: *See—*
  Freeman, Eric N.; Blevins, David L.; Ralls, Gene R.; Andrew, Bill D.; Wilson, Buddy A.; and Osburn, Coy D., 5,531,250, Cl. 138-94.000.
TEAC Corporation: *See—*
  Inoue, Kazuhiko; and Watanabe, Takashi, 5,532,994, Cl. 369-77.200.
Technion Research and Development Foundation Ltd.: *See—*
  Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.
Technitrol, Inc.: *See—*
  DeAndrea, John J.; and Conroy, Keith M., 5,533,054, Cl. 375-286.000.
Tecno Wasino Co., Ltd.: *See—*
  Niidoi, Hideo, 5,531,144, Cl. 82-127.000.
Tedrow, Kerry: *See—*
  Pantelakis, Dimitris; Tedrow, Kerry; Javanifard, Johnny; and Canepa, George, 5,532,915, Cl. 363-60.000.
Teijin Limited: *See—*
  Koga, Masahiro; Tanaka, Toshio; Fujii, Takao; and Masegi, Tsukio, 5,532,408, Cl. 562-466.000.
  Matsuki, Toshitsugu; and Santa, Toshihiro, 5,532,412, Cl. 564-158.000.
Teijin Seiki Co., Ltd.: *See—*
  Asano, Youji, 5,531,071, Cl. 60-441.000.
Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, to ETEC Systems, Inc. Rasterizer for a pattern generation apparatus. 5,533,170, Cl. 395-108.000.
Tektronix, Inc.: *See—*
  Burke, Edward F.; and Knierim, David L., 5,532,566, Cl. 318-650.000.
Telediffusion De France-TDF(SA): *See—*
  Burnod, Yves; and Leray, Pascal, 5,533,169, Cl. 395-27.000.
Teleflex, Inc.: *See—*
  Petruccello, John P., 5,531,134, Cl. 74-502.400.
Telefonaktiebolaget L M Ericsson: *See—*
  Gustafsson, Karl M.; and Sylvan, Herman P. S., 5,531,419, Cl. 248-519.000.
Telefonaktiebolaget L M Ericsson, A Corp. of Sweden: *See—*
  Sanmugam, K. Raj, 5,533,094, Cl. 379-57.000.
Telefonaktiebolaget LM Ericsson: *See—*
  Eriksson, Karl Ö., 5,533,073, Cl. 375-371.000.
  Jamal, Karim; Gudmundson, Björn; and Brismark, Gustav, 5,533,067, Cl. 375-341.000.
  Lagerlöf, Rolf, 5,532,661, Cl. 333-125.000.
  Willars, Per H. A.; Grimlund, Olof E.; and Ewerbring, Lars-Magnus, 5,533,014, Cl. 370-18.000.
  Åkerberg, Dag E.; and van de Berg, Petrus, 5,533,027, Cl. 370-195.100.
Teleha, Christopher A.: *See—*
  Wilkerson, Wendell W.; and Teleha, Christopher A., 5,532,249, Cl. 514-292.000.
Tellam, Mark E.: *See—*
  Brook, Mark G.; and Tellam, Mark E., 5,532,846, Cl. 358-497.000.
Tellier, Thomas A.: *See—*
  Hawkins, William G.; Burke, Cathie J.; Watrobski, Thomas E.; Tellier, Thomas A.; and Vandebroek, Sophie, 5,532,901, Cl. 361-212.000.
Temple, Victor A. K.: *See—*
  Watrous, Donald L.; and Temple, Victor A. K., 5,532,635, Cl. 327-310.000.
Terada, Katsuyuki: *See—*
  Makino, Toshiaki; Terada, Katsuyuki; Sebata, Michio; Hattori, Morishige; Takai, Hideo; Yasui, Toshi; Oshima, Masabumi; Iida, Akiyoshi; Takano, Yasushi; Katoo, Chisachi; and Kobayashi, Kenji, 5,531,301, Cl. 191-55.000.
Terai, Takehiro, to Nissan Motor Co., Ltd. Air bag and lid arrangement for vehicle. 5,531,471, Cl. 280-732.000.
Teramoto, Shuji: *See—*
  Fujioka, Takafumi; Teramoto, Shuji; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,532,253, Cl. 514-312.000.
Terasawa, Takeshi: *See—*
  Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.
Terashi, Mitugi; Inoue, Masaharu; and Usijima, Yutaka, to Takase Dyeing & Printing Works, Ltd. Photoreflective sheet. 5,532,043, Cl. 428-152.000.
Terauchi, Takanobu; Sakurada, Toyohisa; Fukumoto, Takehiko; and Suzuki, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Method for the isomerization of cis-alkenyl compounds. 5,532,421, Cl. 585-671.000.
Terazawa, Tomozane: *See—*
  Iino, Yasuhiro; Matsushima, Yosuke; Terazawa, Tomozane; and Sugiki, Shozo, 5,531,469, Cl. 280-728.300.
Terumo Kabushiki Kaisha: *See—*
  Takahashi, Tohru, 5,531,719, Cl. 604-280.000.
Tervo, Paul A.: *See—*
  Harwood, Warren K.; Tervo, Paul A.; and Koxxy, Martin J., 5,532,609, Cl. 324-754.000.
Tesch, Helmut: *See—*
  Lehrich, Friedhelm; Pohl, Siegmund; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; Swoboda, Johann; Genz, Manfred; Scholz, Guenter; and Streu, Joachim, 5,532,414, Cl. 564-252.000.
  Recker, Hans G.; Tesch, Helmut; Weber, Thomas; Altstaedt, Volker; and Boyd, Jack D., 5,532,296, Cl. 523-400.000.
Teshima, Koichi; Fujimori, Yoshinori; Nakamura, Shin-ichi; Fukuda, Masayuki; Inaba, Michihiko; Higashinakagawa, Emiko; Ohtake, Yasuhisa; and Akiyoshi, Eiichi, to Kabushiki Kaisha Toshiba. Shadow mask plate material and shadow mask. 5,532,088, Cl. 430-4.000.
Tessari, Pino, to Nordica S.p.A. Lever particularly for sports shoes. 5,530,997, Cl. 24-68.0SK.
Tessman, John W.; Cimino, George D.; Isaacs, Stephen T.; and Hearst, John E., to Steritech, Inc. Methods for treatment of enzyme preparations. 5,532,145, Cl. 435-91.200.
Tessman, John W.: *See—*
  Cimino, George D.; Isaacs, Stephen T.; and Tessman, John W., 5,532,146, Cl. 435-91.200.
Testa, James: *See—*

  Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,532,954, Cl. 365-52.000.
Tetra Laval Holdings & Finance S.A.: *See—*
  Itoh, Kosaku, 5,531,310, Cl. 198-395.000.
Tetra Laval Holdings & Finance SA: *See—*
  Fayet, Pierre; and Jaccoud, Bertrand, 5,531,060, Cl. 53-426.000.
  Palm, Lars-Erik, 5,531,375, Cl. 229-137.000.
Tettemer, Susan A.: *See—*
  Seifried, Lynn M.; and Tettemer, Susan A., 5,531,003, Cl. 29-25.420.
Teva Pharmaceutical Industries Ltd.: *See—*
  Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.
Texas Instruments Incorporated: *See—*
  Chiu, Anthony M., 5,532,614, Cl. 324-763.000.
  Keeney, Stanley C., 5,532,616, Cl. 326-30.000.
  Klocek, Paul; and Hoggins, James T., 5,532,048, Cl. 428-215.000.
  Leonard, Jerry, 5,533,151, Cl. 385-3.000.
  Malhi, Satwinder, 5,532,957, Cl. 365-154.000.
  Nagaraj, Krishnasawamy, 5,532,629, Cl. 327-94.000.
  Pauli, Giles A., 5,532,997, Cl. 369-112.000.
  Phipps, Ann E.; and Santucci, David M., 5,532,946, Cl. 364-710.140.
  Sweetser, Kevin N.; Beratan, Howard R.; and Owen, Robert A., 5,532,484, Cl. 250-332.000.
  Tserng, Hua Q., 5,532,506, Cl. 257-276.000.
Thakur, Arvind: *See—*
  Thanavala, Yasmin; Thakur, Arvind; Roitt, Ivan; and Pride, Michael, 5,531,990, Cl. 424-131.100.
Thanavala, Yasmin; Thakur, Arvind; Roitt, Ivan; and Pride, Michael, to Health Research, Inc.; and University College London. Method of raising an immune response with an anti-idiotypic antibody having correspondence with human hepatitis B surface antigen. 5,531,990, Cl. 424-131.100.
Thayer, Peter A.; and Murphy, Morgan D., to Delco Electronics Corporation. Method and apparatus for calibration of comfort control IR sensor. 5,531,377, Cl. 236-49.300.
Theeuwes, Felix: *See—*
  Wong, Patrick S.-L.; Theeuwes, Felix; Larsen, Steven D.; and Dong, Liang C., 5,531,736, Cl. 604-892.100.
Thenappan, Alagappan: *See—*
  Van Der Puy, Michael; Bindu Madhavan, G. V.; Thenappan, Alagappan; and Tung, Hsueh S., 5,532,419, Cl. 570-167.000.
Thermo-Tech, Inc.: *See—*
  Davis, William J., 5,531,191, Cl. 123-41.150.
Thibault, William C.; and Buzzrelli, Edward S., to AER Energy Resources, Inc. Anode assembly with thin metal current collector and electrochemical cell comprising an anode support structure and a gas release system. 5,532,086, Cl. 429-245.000.
Thieroff-Ekerdt, Ruth: *See—*
  Neef, Gunter; Kirsch, Gerald; Stein-Eyer, Andreas; Schwarz, Katica; Bräutigam, Matthias; Thieroff-Ekerdt, Ruth; and Rach, Petra, 5,532,228, Cl. 514-167.000.
Thiokol Corporation: *See—*
  Dillehay, David R.; and Turner, David W., 5,531,163, Cl. 102-288.000.
  Flanigan, David A.; Mancini, Vincent E.; and Harper, Michael R., 5,531,845, Cl. 149-109.600.
Thiriet, Fabien P.: *See—*
  Debelleix, Olivier M.; and Thiriet, Fabien P., 5,532,463, Cl. 235-380.000.
Thomas, Alvin: *See—*
  O'Brien, Patrick J.; Thomas, Alvin; Rufo, George, Jr.; Durham, Larry; and Gelardi, Anthony L., 5,531,321, Cl. 206-232.000.
Thomas & Betts Corporation: *See—*
  Reed, Steven J.; Davies, Scott T.; Wallgren, Robert L.; and Wojtan, George R., 5,531,611, Cl. 439-540.100.
  Rodrigues, Julio F.; and Bartholomew, Paul, 5,531,606, Cl. 439-188.000.
Thomas, Christopher D.: *See—*
  Roberts, Keith; Thomas, Christopher D.; Lamin, James L.; Skipper, Gary I.; and Larsen, Jonathan G., 5,531,305, Cl. 192-53.332.
Thomas, Craig E.: *See—*
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Thomas J. Lipton Co., Division of Conopco, Inc.: *See—*
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Thomas Jefferson University: *See—*
  Block, Timothy M.; and Grafstrom, Robert H., 5,532,124, Cl. 435-5.000.
Thomas, Kenneth A., Jr.: *See—*
  Bayne, Marvin L.; Thomas, Kenneth A., Jr.; and Conn, Gregory L., 5,532,343, Cl. 530-399.000.
Thomasino, Robert F.: *See—*
  Woods, James L.; and Thomasino, Robert F., 5,531,166, Cl. 108-51.300.
Thomassen, Terje: *See—*
  Berg, Arne; Almén, Torsten; Klaveness, Jo; Rongved, Pal; Thomassen, Terje; and Dugstad, Harald, 5,531,978, Cl. 424-1.110.
Thomine, Jean-Baptiste: *See—*
  Pirio, Francis; and Thomine, Jean-Baptiste, 5,532,861, Cl. 359-161.000.
Thompson, Charles A.: *See—*
  Erickson, Jack N., Jr.; Gazza, Jack M.; Olivas, Victor S.; and Thompson, Charles A., 5,532,931, Cl. 364-478.060.
Thompson, Earl E., Sr. Nozzle device with jet seal and method. 5,531,380, Cl. 239-1.000.
Thompson, Graham, to Deere & Company. Brake system for a motor vehicle. 5,531,512, Cl. 303-9.610.
Thompson, Mitchell D.: *See—*
  Josephson, Stanley M.; Kopesec, Michael F.; Royal, P. Darrell; Stephens, Thomas S.; and Thompson, Mitchell D., 5,532,464, Cl. 235-379.000.
Thompson, Richard J.: *See—*
  Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., 5,531,472, Cl. 280-735.000.
Thompson, Russell B.: *See—*
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Thompson, Samuel A., to Hercules Incorporated. Medical devices containing triggerable disintegration agents. 5,531,735, Cl. 604-891.100.
Thompson, Samuel A.: *See—*
  Luzio, Gary A.; and Thompson, Samuel A., 5,531,716, Cl. 604-265.000.
Thompson, Thomas N.: *See—*
  Kriesel, Marshall S.; and Thompson, Thomas N., 5,531,683, Cl. 604-89.000.
Thompson, Warren L.: *See—*
  Noonan, James T.; and Thompson, Warren L., 5,531,276, Cl. 172-662.000.
  Noonan, James T.; and Thompson, Warren L., 5,531,277, Cl. 172-730.000.
Thomson Consumer Electronics, Inc.: *See—*
  George, John B., 5,532,558, Cl. 315-382.100.
  Hailey, James E.; and Nigborowicz, John J., 5,532,832, Cl. 358-335.000.
  Wignot, Leroy S., 5,532,733, Cl. 348-6.000.
Thomson-CSF: *See—*
  Dodart, André, 5,532,659, Cl. 333-260.000.
Thomson, David M.: *See—*
  Nordstrom, J. David; Omura, Hisanori; Smith, Alan E.; and Thomson, David M., 5,532,027, Cl. 427-493.000.
Thomson, Robert I.: *See—*
  Christy, Orrin D.; Kanfoush, Daniel E.; Matheis, Mark A.; Pickett, John E.; and Thomson, Robert I., 5,532,100, Cl. 430-120.000.
Thor, Allen, to Advanced Micro Devices, Inc. Line interface device for fast-packet switching network. 5,533,017, Cl. 370-60.000.
Thore, Pierre, to Elf Aquitaine Production. Processing method for obtaining a stack section with zero offsets. 5,532,977, Cl. 367-53.000.
Thormaehlen, Dirk: *See—*
  Schoen, Uwe; Brueckner, Reinhard; Meil, Joerg; and Thormaehlen, Dirk, 5,532,251, Cl. 514-300.000.
Thornton, Janine M.; and Thornton, Michael G., to Synectic Technology, Inc. Apparatus for extracting wear particles from used oil filters. 5,531,129, Cl. 73-863.240.
Thornton, Michael G.: *See—*
  Thornton, Janine M.; and Thornton, Michael G., 5,531,129, Cl. 73-863.240.
Thorson, Gregory M., to Cray Research, Inc. Direction order priority routing of packets between nodes in a networked system. 5,533,198, Cl. 395-200.150.
Tibbott, Ian; and Gates, Roger, to Pratt & Whitney Canada, Inc. Gas turbine engine feather seal arrangement. 5,531,457, Cl. 277-53.000.
Timbarco, Corp. c/o Belfint, Lyons & Schuman: *See—*
  Propst, Charles, 5,531,863, Cl. 162-5.000.
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  Luyckx, Erik; and Timmermans, Jozef M. K., 5,532,836, Cl. 358-335.000.
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  Giannessi, Fabio; Scafetta, Nazareno; Bernabei, Ida; Tinti, Maria O.; and De Angelis, Francesco, 5,532,410, Cl. 562-567.000.
Tipley, Roger E., to Compaq Computer Corporation. Split transaction protocol for the peripheral component interconnect bus. 5,533,204, Cl. 395-288.000.
Tirtowidjojo, Cheryl A.: *See—*
  Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.
Tirtowidjojo, Danil: *See—*
  Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, 5,532,389, Cl. 549-522.000.
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- Cousens, Lawrence S.; Eberhardt, Christine D.; Gray, Patrick; Tjoelker, Larry W.; Wilder, Cheryl L.; and Trong, Hai, 5,532,152, Cl. 435-197.000.
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- TOA Medical Electronics Co., Ltd.: *See—*
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- Tobita, Tomoyuki: *See—*
  - Nagasu, Akira; Yamamoto, Yoshimi; Tobita, Tomoyuki; and Onose, Toshihiro, 5,531,120, Cl. 73-706.000.
- Toda, Hiroshi: *See—*
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- Toda Kogyo Corporation: *See—*
  - Okinaka, Kenji; Ota, Yasutaka; Mori, Kohji; Kawasaki, Hirofumi; Uegami, Masayuki; Mishima, Akio; Yamashita, Katsumi; Yamasaki, Minoru; Matsumoto, Manabu; Kouchi, Kunihiro; and Kamon, Hiroki, 5,531,922, Cl. 252-62.560.
- Todo, Kazuo: *See—*
  - Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, 5,532,080, Cl. 429-164.000.
- Toguchi, Manabu: *See—*
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- Tohdake, Ayako: *See—*
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- Tohoku Ricoh Co., Ltd.: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Tohyama, Daisuke: *See—*
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- Tokai Corporation: *See—*
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- Tokumoto, Isao, to Advantest Corporation. Difference dispersive double-path monochromator having wavelength-independent imaging point. 5,532,818, Cl. 356-333.000.
- Tokunaga, Makoto: *See—*
  - Noyori, Ryoji; Kitamura, Masato; and Tokunaga, Makoto, 5,532,402, Cl. 558-178.000.
- Tokunoh, Yoshiaki, to Kabushiki Kaisha Toshiba. Copying machine with sorter unit. 5,531,430, Cl. 270-58.020.
- Tokura, Kunihiko; Uryu, Masaru; and Yamada, Kenji, to Sony Corporation. Motional feedback loudspeaker apparatus having a coupling member for connecting a voice coil bobbin with a detecting coil bobbin. 5,533,134, Cl. 381-96.000.
- Tokuyama, Mitsuru; Ino, Toshiaki; Itoyama, Motoyuki; Ohashi, Kunio; and Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Electrophotographic image stabilization control apparatus. 5,532,794, Cl. 355-208.000.
- Tokyo Electron Kabushiki Kaisha: *See—*
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- Tokyo Electron Yamanashi Kabushiki Kaisha: *See—*
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- Tolkien, Susan: *See—*
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- Tom, Glenn M.; and McManus, James V., to Millipore Investment Holdings Limited. Process for purifying semiconductor process gases to remove lewis acid and oxidant impurities therefrom. 5,531,971, Cl. 423-210.000.
- Tomaru, Masaki, to NSK Ltd. Tilt-type steering column device. 5,531,317, Cl. 280-775.000.
- Tomasulo, James. Cleaning system for removal of soluble hydrocarbon residue from surfaces. 5,531,188, Cl. 122-379.000.
- Tomba, Todd C.; Manosalva, Edgar G.; Goldhart, Donald J.; and Morrow, James D., to Abbott Laboratories. Method of using a spring-loaded reciprocable stylet holder to eject a T-fastener. 5,531,678, Cl. 604-51.000.
- Tomba, Todd C.; Manosalva, Edgar G.; Goldhardt, Donald J.; and Morrow, James D., to Abbott Laboratories. Spring-loaded reciprocable stylet holder. 5,531,699, Cl. 604-164.000.
- Tomczuk, Zygmunt: *See—*
  - Miller, William E.; Gay, Eddie C.; and Tomczuk, Zygmunt, 5,531,868, Cl. 205-44.000.
- Tomida, Wataru: *See—*
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- Tomino, Takeshi: *See—*
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- Tomy Company, Ltd.: *See—*
  - Nagasaka, Yoshizo; and Namiki, Takao, 5,531,447, Cl. 273-249.000.
- Tonami, Hiromichi; and Oikawa, Sirou, to Shimadzu Corporation. Method and apparatus for two-dimensional radiation detection. 5,532,475, Cl. 250-214.0VT.
- Tonegawa, Ken; Mandai, Harufumi; Tsuru, Teruhisa; Katou, Mitsuhide; and Furutani, Koji, to Murata Manufacturing Co., Ltd. Mounting structure for electronic component. 5,532,658, Cl. 333-246.000.
- Top Computech Co. Ltd.: *See—*
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- Toppan Printing Co., Ltd.: *See—*
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- Toray Industries, Inc.: *See—*
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- Torbert, Julia B.: *See—*
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- Torii & Co., Ltd.: *See—*
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- Torland, Peter J.: *See—*
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- Torrington Company, The: *See—*
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- Toth, Gerard S.: *See—*
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- Totsuka, Mikio: *See—*
  - Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,532,116, Cl. 430-331.000.
- Towfigh, Keivan, to Soho, Inc. Adjustable table and shelf unit. 5,531,168, Cl. 108-108.000.
- Townsend Engineering Company: *See—*
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- Townsend, John A., to Joalto Design, Inc. Side air bag incorporated in vehicle outer armrest. 5,531,470, Cl. 280-730.200.
- Townsley, David B.; and Chin, Shaoan, to Apple Computer, Inc. Distributed power regulation in a portable computer to optimize heat dissipation and maximize battery run-time for various power modes. 5,532,524, Cl. 307-64.000.
- Toyama, Satoru: *See—*
  - Hirahara, Takuho; Kawaguchi, Susumu; Shimizu, Tatsuaki; Kawasaki, Katsuyuki; Masuda, Noboru; Ogasawara, Shinobu; Konishi, Hiroshige; Maruyama, Hitoshi; Sumida, Yoshihiro; Ueyama, Akemi; Toyama, Satoru; Suzuki, Sou; and Akahori, Yasushi, 5,531,080, Cl. 62-470.000.
- Toyo Chemical Co., Ltd.: *See—*
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- Toyota Jidosha Kabushiki Kaisha: *See—*
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  - Hattori, Tatsuya; Nishida, Makoto; Oshima, Masuji; and Yoshida, Hiroyuki, 5,532,929, Cl. 364-431.070.
  - Iwai, Takao; Ikemoto, Kimikazu; Yanagisawa, Tamiaori; Natsumi, Fumiaki; and Shiraki, Toshiro, 5,532,450, Cl. 219-121.630.
  - Iwai, Takao, 5,533,146, Cl. 382-150.000.
  - Katsuda, Takayuki, 5,532,921, Cl. 364-424.050.
  - Nawata, Katsumi; Ushijima, Fumihiro; Taguchi, Toshiyuki; and Inagaki, Hazime, 5,531,225, Cl. 128-719.000.
  - Ohashi, Hideki; Kawai, Hiroyuki; Kojima, Hiroyoshi; Hiraiwa, Nobuo; Asano, Katsuhiro; Umeno, Takaji; and Takahashi, Toshimichi, 5,531,110, Cl. 73-146.000.
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- Travelute, Fred L.; and Hoffman, Robert E., to Wellman, Inc. Method of forming staple fibers from self-texturing filaments. 5,531,951, Cl. 264-143.000.
- Travnicek, Edward A.: *See—*

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- Trelles, Mario A., to COHERENT, INC. Method of treating veins. 5,531,739, Cl. 606-2.500.
- Trent, David L.; Quarderer, George J.; Bargeron, Kim G.; Greminger, Douglas C.; Koranek, David J.; Stewart, Erik J.; Swisher, Curtis N.; Tirtowidjojo, Cheryl A.; and Tirtowidjojo, Danil, to Dow Chemical Company, The. Process for preparing alkylene oxides. 5,532,389, Cl. 549-522.000.
- Trest, Jeffrey A., to Eastman Kodak Company. Coating apparatus having a stagnation prevention device. 5,531,827, Cl. 118-258.000.
- Tri-Con Industries, Ltd.: *See—*
  - Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.
- Tribioli, Silvano; Giardinelli, Vito; Rocco, Francesco; and Cerrano, Franco, to Whitehead Alenia Sistemi Subacquei S.p.A.; and Microtecnica S.p.A. Electrolyte-activated battery. 5,532,079, Cl. 429-119.000.
- Trinh, Cuong: *See—*
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- Tripathy, Sukant K.; Jeng, Ru-Jong; Kumar, Jayant; Marturunkakul, Sutiyao; and Chen, Jeng-I, to University of Massachusetts Lowell. Second order nonlinear optical interpenetrating polymer networks. 5,532,320, Cl. 525-100.000.
- Tritt, Charles: *See—*
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- Trojan, Inc.: *See—*
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- Trong, Hai: *See—*
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- Tronolone, Mark J.; Dewa, Paul G.; Platten, James E.; and Bruning, John H., to Tropel Corporation. Testing of recessed surfaces at grazing incidence. 5,532,821, Cl. 356-359.000.
- Tropel Corporation: *See—*
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- Troxler Electronic Laboratories, Inc.: *See—*
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- Trustees of Boston University: *See—*
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- Trustees of Princeton University: *See—*
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- Truth Hardware Corporation: *See—*
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  - Vetter, Gregory J., 5,531,138, Cl. 74-606.00R.
- TRW Inc.: *See—*
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- TRW Vehicle Safety Systems Inc.: *See—*
  - Bauer, Barney J., 5,531,479, Cl. 280-806.000.
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
  - Semchena, John H.; Faigle, Ernest M.; Thompson, Richard J.; Mazur, Joseph F.; and Steffens, Charles E., Jr., 5,531,472, Cl. 280-735.000.
- Tsagas, Nicolaos. Indicator of the air pressure in the pneumatic tires of a vehicle based on a capacitive coupling. 5,531,109, Cl. 73-146.500.
- Tsai, Chin-Tien; and Tsai, Shu-yen. Wire brush. 5,530,985, Cl. 15-229.110.
- Tsai, James. Retractable handle assembly for a suitcase. 5,531,300, Cl. 190-115.000.
- Tsai, Shu-yen: *See—*
  - Tsai, Chin-Tien; and Tsai, Shu-yen, 5,530,985, Cl. 15-229.110.
- Tschopp, Thomas B.: *See—*
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- Tserng, Hua Q., to Texas Instruments Incorporated. Integrated circuit adapted for improved thermal impedance. 5,532,506, Cl. 257-276.000.
- Tsuboniwa, Noriyuki; Urano, Satoshi; Tsuge, Otohiko; and Hatta, Taizo, to Nippon Paint Co., Ltd. Method for handling (2-Alkyl)acryloyl isocyanate, method for stabilizing (2-Alkyl)acryloyl isocyanate, method for producing (2-Alkyl)acryloyl isocyanate, heterocyclic compound, and method for producing heterocyclic compound. 5,532,360, Cl. 544-68.000.
- Tsuboniwa, Noriyuki: *See—*
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- Tsuchida, Atsuko; and Nakagawa, Shiro, to TDK Corporation. Absolute humidity meter. 5,531,097, Cl. 73-29.020.
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- Tsuchiya, Masaki: *See—*
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- Tsuchiya, Takeshi: *See—*
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- Tsuda, Hiroki, to NEC Corporation. Carrier phase lock detecting apparatus used in PSK-modulated signal receiver for satellite communication system. 5,533,059, Cl. 375-327.000.
- Tsuda, Yukihiro; and Mori, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Drive circuit for use with transmissive scattered liquid crystal display device. 5,532,712, Cl. 345-87.000.
- Tsugawa, Michio: *See—*
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- Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Triazole compounds, their intermediates, and method for production of the same. 5,532,376, Cl. 548-263.200.
- Tsuge, Otohiko: *See—*
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- Tsuji, Masanori; Abe, Kimihiro; Sugiyama, Osamu; Yamamoto, Hiroshi; and Yagi, Sakai, to Yazaki Corporation. Pressure contact terminal. 5,532,443, Cl. 200-275.000.
- Tsuji, Masanori: *See—*
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- Tsuji, Yoichiro: *See—*
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- Tsujide, Tohru; Hishii, Toshiyasu; and Nakaizumi, Kazuo, to NEC Corporation. Apparatus for testing semicondctor wafer. 5,532,610, Cl. 324-757.000.
- Tsujihara, Susumu: *See—*
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- Tsujino, Hitoshi, to International Business Machines Corporation. Disk drive apparatus. 5,532,891, Cl. 360-106.000.
- Tsukahara, Takako: *See—*
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- Tsukishima Kikai Co., Ltd.: *See—*
  - Tambo, Norihito; and Shimizu, Tatsuo, 5,531,896, Cl. 210-605.000.
- Tsukiyama, Yasumitsu: *See—*
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- Tsunezawa, Ichiro; Saikatsu, Hiromasa; and Ohta, Tsuyoshi, to Hokuriku Electric Industry Co., Ltd. Terminal for high-voltage variable resistor. 5,532,669, Cl. 338-184.000.
- Tsuno, Nobuo: *See—*
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- Tsuruoka, Hiroka: *See—*
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- Tsutsui, Yoshio: *See—*
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- Tsutsumi, Kunihiro, to Rohm Co., Ltd. Video image display and video camera for producing a mirror image. 5,532,741, Cl. 348-239.000.
- Tsuyama, Seishi: *See—*
  - Hosoya, Yoshihiro; Morita, Masaya; and Tsuyama, Seishi, 5,531,839, Cl. 148-330.000.
- Tuchiya, Toshihisa: *See—*
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- Tung, Hsueh S.: *See—*
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- Turner, David W.: *See—*
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- Tyler, Nelson. Attachment frame for mounting camera equipment to an aircraft. 5,531,403, Cl. 244-118.100.
- Tyler, Stanley R. Brake operating mechanism. 5,531,136, Cl. 74-523.000.
- Tzeng, Liang D.: *See—*
  - Khorramabadi, Haideh; Tarsia, Maurice J.; and Tzeng, Liang D., 5,532,471, Cl. 250-214.00A.
- Ubaldi, Richard A.; Hauck, Paul L.; and Walls, Kevin J., to Ogden Projects, Inc. Compound curvature, domical structure for waste-to-energy facilities. 5,531,170, Cl. 110-349.000.
- Ube Industries, Ltd.: *See—*

Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
Uchida, Haruo: *See—*
  Ohyama, Kazuo; Onoda, Shigeyoshi; and Uchida, Haruo, 5,531,436, Cl. 27:-275.000.
Uchida, Hiromichi, to Toyo Chemical Co., Ltd. Optical disc accomodation device. 5,531,320, Cl. 206-308.100.
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Uchida, Tetsuya, to Fujitsu Limited. Control system for a ring type network system. 5,533,006, Cl. 370-16.100.
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  Sekiguchi, Akira; and Uchida, Yoshinori, 5,531,204, Cl. 123-502.000.
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Ueda, Hidefumi: *See—*
  Asano, Koji; Shiraishi, Atsushi; and Ueda, Hidefumi, 5,531,185, Cl. 117-206.000.
Ueda, Hiroshi. Production method for implanted hair articles comprising superfine fibers. 5,531,342, Cl. 216-7.000.
Ueda, Yasuhiro: *See—*
  Adachi, Hideyuki; Takehana, Sakae; Ueda, Yasuhiro; Hirata. Yasuo; and Takahashi, Kazuhiro, 5,531,664, Cl. 600-149.000.
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Uehara, Shigekatsu: *See—*
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  Kuriki, Makoto; Uehira, Kazutake; Takahashi, Yukio; and Sakai, Shigenobu, 5,532,736, Cl. 348-20.000.
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  Fukui, Osamu; Ueno, Kouhei; Nakano, Yoshifumi; Hamada, Yukimasa; Nishio, Takeyoshi; Nomura, Takao; and Kawamura, Nobuya, 5,532,309, Cl. 524-451.000.
Uesugi, Akio; and Kakei, Tsutomu, to Fuji Photo Film Co., LTD. Method of producing support for planographic printing plate. 5,531,840, Cl. 148-552.000.
Ueyama, Akemi: *See—*
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Uhrig, Birgit: *See—*
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Umani Ronchi, Achille: *See—*
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Umbach, Dirk, to Esselte Meto International GmbH. Printer and a printer with a fastening device for attaching a peripheral device to the printer. 5,531,532, Cl. 400-692.000.
Umberger, Dean M.; and Ziemer, Craig B., to AT&T Corp. High sensitivity control circuit for optical solid-state relays. 5,532,498, Cl. 250-551.000.
Umeda, Tadatoshi: *See—*
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  Agriculture: *See—*
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    Talbot, Neil; Rexroad, Caird E., Jr.; Pursel, Vernon G.; and Powell, Anne M., 5,532,156, Cl. 435-240.200.
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    Hale, Zoë M.; and Marks, Robert, 5,532,493, Cl. 250-458.100.
    Martin, Eric A.; Vaccaro, Kenneth; Waters, William; Lorenzo, Joseph P.; and Spaziani, Stephen, 5,532,173, Cl. 437-2.000.
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  National Aeronautics and Space Administration: *See—*
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    Polites, Michael E.; and Alhorn, Dean C., 5,531,093, Cl. 73-1.00E.
  National Security Agency: *See—*
    Ratner, Alan S., 5,533,033, Cl. 371-30.000.
  Navy: *See—*
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    Gammell, Paul M., 5,532,589, Cl. 324-228.000.
    Hansen, Robert J.; Ni, Chen C.; and Fitzpatrick, Hugh M., 5,532,979, Cl. 367-106.000.
    Jones, Gregory B.; Lopes, Joseph B.; and Martel, Gerald R., 5,532,717, Cl. 345-202.000.
    Jones, Robert L., 5,532,057, Cl. 428-334.000.
    Lockwood, James C., 5,532,700, Cl. 342-378.000.
    Zehner, William J., 5,532,973, Cl. 367-13.000.
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U.S. Philips Corporation: *See—*
  Crins, Wilhelmus A.; Van Den Berk, Wilhelmus M. J. A.; Von Reth, Eric A.; and Rijpert, Hermanus P. M., 5,533,086, Cl. 378-98.200.
  De Haan, Gerard; Biezen, Paul W. A. C.; and Ojo, Olukayode A., 5,532,750, Cl. 348-452.000.
  Goertz, Hendrik M. H. G., 5,532,734, Cl. 348-8.000.
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  Lammers, Franciscus H. T., 5,532,528, Cl. 307-125.000.
  Liedenbaum, Coen T. H. F.; and Reid, John J. E., 5,532,863, Cl. 359-176.000.
  Luyckx, Erik; and Timmermans, Jozef M. K., 5,532,836, Cl. 358-335.000.
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  Postma, Lambertus; Maas, Henricus G. R.; Haisma, Jan; Ruigrok, Jacobus J. M.; and Somers, Gerardus H. J., 5,531,016, Cl. 29-603.160.
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  Vervoordeldonk, Michaël J., 5,532,565, Cl. 318-610.000.
United States Surgical Corporation: *See—*
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  Mastri, Dominick L.; Kolesa, Michael S.; and Hessler, Thomas R., 5,531,763, Cl. 606-148.000.
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  Stubblefield, Reggie W., 5,531,159, Cl. 108-102.000.
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  Maneval, James E.; McCarthy, Kathryn L.; McCarthy, Michael J.; and Powell, Robert L., 5,532,593, Cl. 324-306.000.
  Mitra, Sanjit K.; Abreu, Eduardo; and Marchesani, Rossano, 5,533,063, Cl. 375-340.000.
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  Redey, Laszlo I.; Myles, Kevin M.; Vissers, Donald R.; and Prakash, Jai, 5,532,078, Cl. 429-104.000.
University of Illinois, The Board of Trustees of the: *See—*
  Lauterbur, Paul C.; and Frank, Shachar, 5,532,006, Cl. 424-9.322.
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University of Southern California: *See—*
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University of Utah, The: *See—*
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  Sheehan, Florence H.; Zick, Gregory L.; and Liu, Hain-Ching H., 5,533,085, Cl. 378-95.000.
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  Kass, Lawrence T.; Cowan, Timothy M.; Reinertsen, Dennis; and Dunne, Stephen R., 5,531,068, Cl. 60-274.000.
  Ragi, Elias G.; and Godry, Thomas J., 5,531,266, Cl. 165-115.000.
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  Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, 5,532,376, Cl. 548-263.200.
Urbach, Brian A., to TRW Inc. Protective cover for a ball joint assembly. 5,531,534, Cl. 403-12.000.
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  Brown, Paul M.; Hedayat, Shahin; and Urbani, George V., 5,533,105, Cl. 379-93.000.
Urbank, Vincent. Roller construction for the launching and recovery of personal watercraft. 5,531,177, Cl. 114-48.000.
Urbas, Donald J.; Ellwood, David; and Burne, John, to Bio Medic Data Systems, Inc. Programmable transponder. 5,532,686, Cl. 340-825.540.
Uryu, Masaru: *See—*
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Uschold, Robert C.; Stephens, Randy R.; Mauch, Jeffrey; Smith, Richard C.; and Houser, Kevin, to Ethicon Endo-Surgery, Inc. Sliding reducer seal for surgical trocar. 5,531,758, Cl. 606-185.000.
Ushijima, Fumihiro: *See—*
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Utagawa, Ken; and Kusaka, Yosuke, to Nikon Corporation. Focus detection device for an optical system. 5,532,781, Cl. 354-402.000.
Utsumi, Kuniaki; Yamamoto, Hiroaki; and Fujito, Katsuyuki, to Matsushita Electric Industrial Co., Ltd. Fiber optic communication terminal, fiber optic communication system, and its wavelength setting method. 5,532,865, Cl. 359-189.000.
Uy, William C. Spatter shielding and vapor venting device for frying pan. 5,531,354, Cl. 220-731.000.
Uzee, Andre J.: *See—*
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Vacca, Rita D., to Mallinckrodt Medical, Inc. Apparatus used in producing prefilled sterile delivery devices. 5,531,255, Cl. 141-285.000.
Vaccaro, Kenneth: *See—*
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Vachon, David J., to Pacesetter, Inc. Implantable stimulation lead having an advanceable therapeutic drug delivery system. 5,531,780, Cl. 607-120.000.
Vadgama, Pankaj M.; and Higson, Sêamus P. J., to Victoria University of Manchester, The. Sensor devices. 5,531,878, Cl. 204-415.000.
Vaisala Oy: *See—*
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Valiulis, Stanley J.; and Valiulis, Stanley C., to Southern Imperial, Inc. Loop hook with label holder. 5,531,417, Cl. 248-303.000.
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VanDahm, Richard A.: *See—*
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van de Berg, Petrus: *See—*
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Van Der Leeuw, Bart; Kowal, Albert E.; Pragt, Henrikus J. H.; and Canale, Joseph E., to Philips Electronics North America Corporation. High density discharge lamp with pinched-on containment shield. 5,532,543, Cl. 313-25.000.
Van Der Puy, Michael; Bindu Madhavan, G. V.; Thenappan, Alagappan; and Tung, Hsueh S., to AlliedSignal Inc. Processes for the preparation of fluorinated olefins and hydrofluorocarbons using fluorinated olefin. 5,532,419, Cl. 570-167.000.
van der Veen, Johannes S., to Vitatron Medical, B.V. Dual chamber pacemaker system and method with improved switching between synchronous and asyncrhonous behavior. 5,531,771, Cl. 607-9.000.
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Van Dyck, Christiaan, to Atlas Copco Airpower, naamloze vennootschap. Regulating device with starting and stopping device for screw-type compressors, and starting and stopping device used hereby. 5,531,571, Cl. 417-45.000.
Van Hale, Gregory L. Aspiration unit. 5,531,722, Cl. 604-280.000.
Van Tendeloo, Gustaaf: *See—*
  Tavernier, Serge; Op de Beeck, Werner; Ghekiere, Jean-Pierre; and Van Tendeloo, Gustaaf, 5,532,097, Cl. 430-110.000.
Van Velthuijsen, John A., to Purac Biochem B.V. Oral hygiene preparation. 5,531,983, Cl. 424-49.000.
Vara, James E. Storage system for electrical appliances, powercords and adapters. 5,531,333, Cl. 211-13.000.

- Varghese, John K. Portable baby swing. 5,531,656, Cl. 482-69.000.
- Varnau, David, to Center for Prosthetics Orthotics, Inc. Cervical brace with interlock assembly. 5,531,669, Cl. 602-18.000.
- Vass, Richard T. Methods and apparatus for producing a composition material and products of the methods and apparatus. 5,532,281, Cl. 521-76.000.
- Vazeux, Rosemay: *See—*
  - Gallatin, W. Michael; and Vazeux, Rosemay, 5,532,127, Cl. 435-6.000.
- VDO Kienzle GmbH: *See—*
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- Vecchio, Michael T.; and Luckett, Thomas J., to Ford Motor Company. Collapsible automotive trim panel boss. 5,531,499, Cl. 296-146.700.
- Veco S.R.L.: *See—*
  - Formenti, Franco, 5,531,077, Cl. 62-197.000.
- Veinberg, Alex: *See—*
  - Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.
- Venkatesan, Aranapakam M.: *See—*
  - Albright, Jay D.; Delos Santos, Efren G.; Du, Xuemei; Reich, Marvin E.; and Venkatesan, Aranapakam M., 5,532,235, Cl. 514-215.000.
- Ventritex, Inc.: *See—*
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- Verge, Clarence: *See—*
  - Zarate, Carlos E.; Zarate, H. Graciela; and Verge, Clarence, 5,532,980, Cl. 367-139.000.
- Verstrat, Daniel W.: *See—*
  - Wilkerson, John M., III; Verstrat, Daniel W.; and Barron, Milagros C., 5,532,036, Cl. 428-96.000.
- Vervoordeldonk, Michaël J., to U.S. Philips Corporation. Controller. 5,532,565, Cl. 318-610.000.
- Vesterinen, Timo, to Nokia Telecommunications OY. Network management system. 5,533,116, Cl. 379-243.000.
- Vetco Pipeline Services, Inc.: *See—*
  - Downs, Robert W.; and Simek, James C., 5,532,587, Cl. 324-220.000.
- Vetter, Gregory J., to Truth Hardware Corporation. Window operator housing. 5,531,138, Cl. 74-606.00R.
- Vezzoli, Osvaldo. Alignment, ejection and dragging apparatus for sewing buckles and belt carriers on belts. 5,531,175, Cl. 112-470.330.
- Victoria University of Manchester, The: *See—*
  - Vadgama, Pankaj M.; and Higson, Sêamus P. J., 5,531,878, Cl. 204-415.000.
- Vidamed, Inc.: *See—*
  - Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,531,676, Cl. 604-22.000.
  - Lundquist, Ingemar H.; and Edwards, Stuart D., 5,531,677, Cl. 604-22.000.
- Vieth, Reinhold W. Topical administration of vitamin D to mammals. 5,532,229, Cl. 514-168.000.
- Vietz, Terry: *See—*
  - Rinker, David E.; and Vietz, Terry, 5,531,042, Cl. 43-42.060.
- Villani, Thomas J.: *See—*
  - Psinakis, Leas N.; Villani, Thomas J.; and Etsch, August C., 5,532,939, Cl. 364-514.00C.
- Vilmin, Gabriel: *See—*
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- Vinci, James N.: *See—*
  - Adams, Paul E.; Hach, Thomas G.; and Vinci, James N., 5,531,911, Cl. 508-408.000.
- Virtanen, Esa: *See—*
  - Kärnä, Toivo; Laakso, Jukka; Niemi, Timo; Ruohonen, Heikki; Savolainen, Esko; Lindström, Helge; Virtanen, Esa; and Ikkala, Olli, 5,531,932, Cl. 252-518.000.
- Virtuality IP Limited: *See—*
  - Holmes, Richard, 5,533,137, Cl. 381-183.000.
- Visser, Susan A.: *See—*
  - Burns, Elizabeth G.; Visser, Susan A.; and Taylor, Jeffrey F., 5,532,286, Cl. 522-37.000.
- Vissers, Donald R.: *See—*
  - Redey, Laszlo I.; Myles, Kevin M.; Vissers, Donald R.; and Prakash, Jai, 5,532,078, Cl. 429-104.000.
- Viswanathan, Thayamkulangara R., to AT&T Corp. Fast comparator circuit. 5,532,628, Cl. 327-77.000.
- Vitatron Medical, B.V.: *See—*
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  - van der Veen, Johannes S., 5,531,771, Cl. 607-9.000.
- Vizmuller, Peter: *See—*
  - Jager, Rene I.; Vizmuller, Peter; and Gimpelj, Mathias M., 5,532,651, Cl. 331-96.000.
- Vobach, Arnold. Pseudo-random transposition cipher system and method. 5,533,128, Cl. 380-28.000.
- Voccio, John: *See—*
  - Manlief, Michael D.; Riley, Gilbert N., Jr.; Voccio, John; and Rodenbush, Anthony J., 5,531,015, Cl. 29-599.000.
- Voelcker, Alexander: *See—*
  - Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, 5,531,962, Cl. 420-587.000.
- Voet, Jonathan K.: *See—*
  - Sell, Ryan M.; Allgeier, Christopher L., Sr.; Carpenter, Martin A.; Lev, Mordechai; Kearney, William T., III; Goff, William G., III; Domhoff, Joseph E.; and Voet, Jonathan K., 5,531,055, Cl. 53-86.000.
- Vogel, Alice M.; Wahl, Errol H.; Cappel, Jerome P.; and Ward, Thomas C., to Procter & Gamble Company, The. Wrinkle reducing composition. 5,532,023, Cl. 427-8.000.
- Vogel, Holger: *See—*
  - Schiffel, Reinhard; Jäckel, Klaus; Stadler, Bruno; and Vogel, Holger, 5,533,030, Cl. 370-120.000.
- Vogelstein, Bert, to Johns Hopkins University, The. Gene deleted in colorectal cancer of humans. 5,532,108, Cl. 435-240.200.
- Volkswagon AG: *See—*
  - Dolla, Franz, 5,531,135, Cl. 74-512.000.
- Volz, Keith L.: *See—*
  - Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., 5,531,615, Cl. 439-631.000.
- vonMeier, James J. Pre-septic tank fluid filter. 5,531,891, Cl. 210-251.000.
- Von Reth, Eric A.: *See—*
  - Crins, Wilhelmus A.; Van Den Berk, Wilhelmus M. J. A.; Von Reth, Eric A.; and Rijpert, Hermanus P. M., 5,533,086, Cl. 378-98.200.
- Vorspohl, Klaus: *See—*
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- Vosberg, Dietrich: *See—*
  - Schlör, Georg; Reimers, Hans-Karsten; Vosberg, Dietrich; and Röhling, Holmer, 5,531,802, Cl. 55-274.000.
- Voss, Matthew E.: *See—*
  - Wilkerson, Wendell W.; Earl, Richard A.; and Voss, Matthew E., 5,532,247, Cl. 514-277.000.
- Voss, Peter A.: *See—*
  - Rolando, Thomas E.; Voss, Peter A.; and Ryan, Christopher M., 5,532,058, Cl. 428-341.000.
- Vounatsos, Constantin. Single-use syringe. 5,531,693, Cl. 604-110.000.
- VSB VOGELSBERGER Umwelttechnischer Anlagenbau GmbH: *See—*
  - Geiger, Wolfgang; and Ruhl, Erwin, 5,531,888, Cl. 210-162.000.
- VTC Inc.: *See—*
  - Ngo, Tuan V.; and Barnett, Raymond E., 5,532,631, Cl. 327-110.000.
- Vukovich, William J.: *See—*
  - Koenig, Melissa M.; and Vukovich, William J., 5,531,302, Cl. 192-3.300.
- W. R. Grace & Co.-Conn.: *See—*
  - Gartner, Ellis M.; Cogliano, Joseph A.; Arfaei, Ahmad; Jardine, Leslie A.; Scheiner, Paul; and Duecker, Heyman C., 5,531,825, Cl. 106-808.000.
  - Mueller, Walter B., 5,532,053, Cl. 428-287.000.
  - Sheller, David T., 5,532,453, Cl. 219-127.000.
- WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
  - Deike, Horst; and Petersen, Erwin, 5,531,288, Cl. 180-197.000.
- Wachter, Allan: *See—*
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- Wacker-Chemie GmbH: *See—*
  - Hager, Rudolf; Wolferseder, Josef; and Deubzer, Bernward, 5,532,399, Cl. 556-428.000.
  - Kratel, Günter; Eyhorn, Thomas; Stohr, Günter; and Rell, Andreas, 5,532,458, Cl. 219-464.000.
- Wacker, Paul C.; and Smith, Gary A., to Honeywell Inc. Non-linear control system for a single input single output process. 5,532,922, Cl. 364-15.200.
- Wada, Jun, to Fujitsu Limited. MES field effect transistor possessing lightly doped drain. 5,532,507, Cl. 257-280.000.
- Wade, Linwood E., to Hicks & Otis Prints, Inc. Vehicle part having weather sealed mirror finish decorative portion integral therewith. 5,532,045, Cl. 428-187.000.
- Wadia Digital Corporation: *See—*
  - Moses, Donald W.; Hustig, Charles H.; Kinne, James; and Najafi, Hossein L., 5,532,950, Cl. 364-724.190.
- WaferScale Integration, Inc.: *See—*
  - Advani, Manik; and Trinh, Cuong, 5,532,623, Cl. 327-51.000.
- Waggoner, Charles D.; Blumberg, Richard J.; and Kotzur, Gary B., to SGS-Thomson Microelectronics, Inc. Receiver circuit with a bus-keeper feature. 5,532,630, Cl. 327-108.000.
- Wagner, Eckhard; Becker, Günter; and Bartels, Günter, to Hermes Schleifmittel GmbH & Co. Ceramic corundum abrasive. 5,531,799, Cl. 51-309.000.
- Wagner, Fred W.: *See—*
  - Carlson, Randall R.; Stout, Jay S.; Wylie, Dwane E.; Wagner, Fred W.; and Riddell, Malcolm, 5,532,136, Cl. 435-7.920.
- Wagner, Gerhard: *See—*
  - Weiss, Werner; and Wagner, Gerhard, 5,532,195, Cl. 501-54.000.
- Wahl, Errol H.: *See—*
  - Vogel, Alice M.; Wahl, Errol H.; Cappel, Jerome P.; and Ward, Thomas C., 5,532,023, Cl. 427-8.000.
- Wahrendorff, Peter: *See—*
  - Heider, Juergen; Juengst, Stefan; and Wahrendorff, Peter, 5,532,552, Cl. 313-623.000.
- Wainwright, Robin; and Evans, Kenneth A., to Alcan International Limited. Intumescent compositions. 5,532,292, Cl. 523-179.000.
- Wajima, Masaya: *See—*
  - Yoshida, Ryuhei; and Wajima, Masaya, 5,532,542, Cl. 310-348.000.
- Wakabayashi, Hiroshi: *See—*

  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,532,776, Cl. 354-106.000.
- Wakeley, Lillian D.: *See—*
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- Wakita, Takeo: *See—*
  - Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.
- Wakui, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Image-data recording device and image-reproduction device for an electronic still camera. 5,532,740, Cl. 348-231.000.
- Wald Manufacturing Co., Inc,: *See—*
  - McMurtrey, David K.; and Pawsat, Dennis P., 5,531,511, Cl. 301-110.500.
- Walker, Edward S.: *See—*
  - Johansson, Eric B.; and Walker, Edward S., 5,533,077, Cl. 376-434.000.
- Walker, George F.: *See—*
  - Beaman, Brain S.; Doany, Fuad E.; Fogel, Keith E.; Hedrick, James L., Jr.; Lauro, Paul A.; Norcott, Maurice H.; Ritsko, John J.; Shi, Leathen; Shih, Da-Yuan; and Walker, George F., 5,531,022, Cl. 29-850.000.
- Walker, Kevin: *See—*
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- Walker, Morris P.: *See—*
  - Crooker, Richard M.; Elsheikh, Maher Y.; Kelton, Anthony D.; Walker, Morris P.; and Wright, Danny W., 5,531,867, Cl. 203-86.000.
- Walker, Terry D.: *See—*
  - Payne, Ed; Perry, Bernard T.; and Walker, Terry D., 5,532,039, Cl. 428-116.000.
- Walker, William E. Quick wipe eraser for chalkboards. 5,530,984, Cl. 15-209.100.
- Wallenius, Ronald. Landscape edging device and method. 5,531,044, Cl. 47-33.000.
- Wallgren, Robert L.: *See—*
  - Reed, Steven J.; Davies, Scott T.; Wallgren, Robert L.; and Wojtan, George R., 5,531,611, Cl. 439-540.100.
- Wallin, Erik: *See—*
  - Eng, Kjell; and Wallin, Erik, 5,532,052, Cl. 428-229.000.
- Walls, Andrew D.: *See—*
  - Albin, Donald J.; Walls, Andrew D.; Yanes, Adalberto G.; and Zitny, Kevin G., 5,533,194, Cl. 395-183.180.
- Walls, Kevin J.: *See—*
  - Ubaldi, Richard A.; Hauck, Paul L.; and Walls, Kevin J., 5,531,170, Cl. 110-349.000.
- Walsh, Joseph C.; and Conatser, Robert L., to Graphic Packaging Corporation. Apparatus and method for end sealing a carton. 5,531,852, Cl. 156-227.000.
- Walters, Robert N.: *See—*
  - Kempka, Steven N.; and Walters, Robert N., 5,531,236, Cl. 134-182.000.
- Walther, Gerhard: *See—*
  - Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, 5,532,368, Cl. 544-267.000.
  - Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, 5,532,233, Cl. 514-219.000.
- Walton, Joseph E.; Mazer, Terrence B.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., to Abbott Laboratories. Apparatus for altering composition of nutritional product during enteral tube feeding. 5,531,681, Cl. 604-83.000.
- Walton, Joseph E.: *See—*
  - Geckle, Ronita K.; Mazer, Terrence B.; Walton, Joseph E.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; McCamish, Mark A.; Joseph, Robert L.; and Pierson, William G., 5,531,734, Cl. 604-890.100.
  - Mazer, Terrence B.; Walton, Joseph E.; Geckle, Ronita K.; Piontek, Carl J.; Duel, Susan B.; Daab-Krzykowski, Andre; Joseph, Robert L.; Pierson, William G.; Loughrin, Thomas D.; and Osip, Thomas W., 5,531,682, Cl. 604-84.000.
- Walz, Gregory S.: *See—*
  - Fletcher, Paul A.; and Walz, Gregory S., 5,531,270, Cl. 166-53.000.
- Wang, Enoch I.; Bowden, William L.; and Lin, Lifun, to Duracell Inc. Manganese dioxide product. 5,532,084, Cl. 429-224.000.
- Wang, James H.: *See—*
  - Latiolais, Jerry G.; Gathright, J. Paul; Galante, Nicholas R.; Galland, M. Stephen; Gallet, J. Diores; Compton, Lewis R.; Baker, George L.; and Wang, James H., 5,532,066, Cl. 428-483.000.
- Wang, Kun. Control device for folding and expanding armrail of a playpen. 5,530,977, Cl. 5-99.100.
- Wang, Ning; Barlovatz-Meimon, Georgia; and Fredberg, Jeffrey J., to President and Fellows of Harvard University; and University of Paris. Method for regulating formation of a complex of plasminogen activator, its receptor and inhibitor. 5,532,132, Cl. 435-7.210.
- Wang, Qin-Mo: *See—*
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- Wang, Richard Y.-H.: *See—*
  - Lo, Shyh-Ching; Shih, James W. K.; and Wang, Richard Y.-H., 5,532,134, Cl. 435-7.320.
- Wang, Samuel S.: *See—*
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- Wang, Ying: *See—*
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- Wang, Zu-Yi: *See—*
  - Shah, Jaffar; Ilic, Kosta; Peck, Joseph E.; and Wang, Zu-Yi, 5,533,037, Cl. 371-62.000.
- Warchocki, Gary M.: *See—*
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- Ward, James F. Multi-purpose pet harness. 5,531,187, Cl. 119-856.000.
- Ward, James R.; and Stobbs, Thomas J., to Applied Power Inc. Double latching valve. 5,531,422, Cl. 251-282.000.
- Ward, Kevin R.; Brown, Charles G.; and Dzwonczyk, Roger R., to Ohio State University, The. Non-invasive aortic impingement and core and cerebral temperature manipulation method. 5,531,776, Cl. 607-105.000.
- Ward, Ronald K.; and Ward, William M. Drinking cup device. 5,531,353, Cl. 220-729.000.
- Ward, Thomas C.: *See—*
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- Ward, William M.: *See—*
  - Ward, Ronald K.; and Ward, William M., 5,531,353, Cl. 220-729.000.
- Warner, Peter: *See—*
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- Warrick, Richard E.: *See—*
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- Warrin, George E.: *See—*
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- Warznak, Robert S.: *See—*
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- Washburn, Robert D.: *See—*
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- Washington Research Foundation: *See—*
  - Eyre, David R., 5,532,169, Cl. 436-518.000.
- Wasinger, Eric; and Hall, David, to Wasinger, Eric. Process for desizing and color fading garments. 5,531,796, Cl. 8-102.000.
- Wasserstrom, David E.; and Ostroff, Stuart S., to Yew Corporation. Reinforcement system for highway barriers. 5,531,540, Cl. 404-6.000.
- Wasson, Irving: *See—*
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- Watanabe, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Memory cell structure for semiconductor device and dynamic semiconductor memory device. 5,532,956, Cl. 365-149.000.
- Watanabe, Kazuo: *See—*
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- Watanabe, Kimio: *See—*
  - Kuramoto, Mitsuo; Fujioka, Seiji; Nii, Nobuhiko; Watanabe, Kimio; Shibata, Yutaka; Suzuki, Isamu; Saito, Daisuke; and Matsuda, Hideaki, 5,531,530, Cl. 400-593.000.
- Watanabe, Masaya: *See—*
  - Sato, Motoharu; and Watanabe, Masaya, 5,531,291, Cl. 180-297.000.
- Watanabe, Michiko; Makino, Takahiro; and Honma, Kazuo, to Q. P. Corporation. Ice nucleus-forming bacterium strain *Xanthomonas campestris* FERM BP-4191 and process for cultivation of the same. 5,532,160, Cl. 435-252.100.
- Watanabe, Seigo; and Oh-Kita, Motomu, to Mitsubishi Rayon Co., Ltd. Carrier-supported catalyst for the synthesis of unsaturated aldehydes and unsaturated carboxylic acids and process for preparing the same. 5,532,199, Cl. 502-311.000.
- Watanabe, Sinichirou: *See—*
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- Watanabe, Takashi: *See—*
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- Watanabe, Tetsu; and Aoki, Yoshio, to Sony Corporation. Magneto-optical disk system with specified thickness for protective layer relative to the numerical aperture of the objective lens. 5,533,001, Cl. 369-275.200.
- Watanabe, Tetsuaki; Kobayashi, Mikio; and Kodama, Shikou, to Sumitomo Electric Industries, Ltd. Apparatus for splicing optical fibers. 5,533,160, Cl. 385-96.000.
- Watanabe, Tsuyoshi; Senba, Hisaaki; Matsumoto, Hiroshi; and Yanagida, Makoto, to Canon Kabushiki Kaisha. Image forming apparatus having contact member capable of contacting with image bearing member. 5,532,799, Cl. 355-245.000.
- Watanabe, Yasushi: *See—*
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- Watanabe, Yoshihiko: *See—*
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- Watanabe, Yoshiyuki: *See—*

- Oshima, Masabumi; and Watanabe, Yoshiyuki, 5,532,068, Cl. 428-520.000.
- Watarai, Shu: *See—*
  - Horie, Seiji; Sano, Kenji; Suzuki, Nobuo; and Watarai, Shu, 5,532,099, Cl. 430-115.000.
- Waterhouse, Paul; Stevens, John; and Leibman, George, to Electronic Retailing Systems International, Inc. Technique for locating electronic labels in an electronic price display system. 5,532,465, Cl. 235-383.000.
- Waters, William: *See—*
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- Wathen, Boyd J.: *See—*
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- Watkins, James O. Confetti party favor. 5,531,628, Cl. 446-475.000.
- Watrobski, Thomas E.: *See—*
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- Watrous, Donald L.; and Temple, Victor A. K., to Harris Corporation. Voltage clamp circuit and method. 5,532,635, Cl. 327-310.000.
- Watson, Kimball M.: *See—*
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- Watson, Michael J.: *See—*
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- Wavedriver Limited: *See—*
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- Weasler Engineering, Inc.: *See—*
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- Weatherford US, Inc.: *See—*
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- Weaver, Max A.; Krutak, James J.; Coates, Clarence A.; Pruett, Wayne P.; and Hilbert, Samuel D. Light-absorbing polymers. 5,532,332, Cl. 528-230.000.
- Webb, Donald H.: *See—*
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- Webb, Julian A.; and Blott, Patrick L., to Smith & Nephew plc. Orthopaedic casting bandages. 5,531,667, Cl. 602-8.000.
- Webb, Thomas E.; Stromberg, Paul C.; and Schumm, Dorothy E., to Ohio State University, The. Monoclonal antibody to canine placental oncofetal protein for detecting cancer. 5,532,159, Cl. 435-240.270.
- Webber, Michael R.: *See—*
  - Gegaregian, Albert A.; Costa, Vincenzo F.; Hendricks, William L.; Maximovich, Milan G.; Savitt, Jacob; Shen, Hsiang-Sheng; and Webber, Michael R., 5,531,150, Cl. 89-15.000.
- Weber, Gerhard: *See—*
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- Weber, Gunther: *See—*
  - Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, 5,532,274, Cl. 514-565.000.
- Weber, Karl H.; Harreus, Albrecht; Stransky, Werner; Walther, Gerhard; Casals-Stenzel, Jorge; Muacevic, Gojko; Heuer, Hubert; and Bechtel, Wolf-Dietrich, to Boehringer Ingelheim KG. Hetrazepine compounds which have useful pharmaceutical utility. 5,532,233, Cl. 514-219.000.
- Weber, Karl-Heinz: *See—*
  - Kufner-Muhl, Ulrike; Weber, Karl-Heinz; Walther, Gerhard; Stransky, Werner; Ensinger, Helmut; Schingnitz, Gunter; Kuhn, Franz J.; and Lehr, Erich, 5,532,368, Cl. 544-267.000.
- Weber, Thomas: *See—*
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- Webley, Paul A.: *See—*
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- Webster, Donald, to Comalco Aluminium Limited. Magnesium-lithium alloys of high toughness. 5,531,806, Cl. 75-594.000.
- Wechselberger, Emmerich E., to Chemetron-Railway Products, Inc. Railroad switch stand. 5,531,408, Cl. 246-257.000.
- Weckenbrock, Hermann J.: *See—*
  - Strolle, Christopher H.; and Weckenbrock, Hermann J., 5,532,820, Cl. 358-310.000.
- Weder, Donald E., to Family Trust U/T/A, Southpac Trust International, Inc. as trustee of The. Means for securing a decorative cover about a flower pot. 5,531,058, Cl. 53-399.000.
- Weigert, Martin: *See—*
  - Schlott, Martin; Kutzner, Martin; Weigert, Martin; Dauth, Wolfgang; and Gehman, Bruce, 5,531,948, Cl. 264-122.000.
- Weiner, Robert S. Creel. 5,531,392, Cl. 242-131.000.
- Weir, Michael P.; and Sutherland, Hunt A., to General Electirc Company. Circuit integrity test system. 5,532,601, Cl. 324-539.000.
- Weisburn, James T.; and Straslicka, Bruce C., to Alpha Enterprises, Inc. Tape reel. 5,531,399, Cl. 242-608.600.
- Weise, Wolfgang; Voelcker, Alexander; Kaufmann, Dieter; Malikowski, Willi; Beuers, Joerg; and Krappitz, Harald, to Degussa Aktiengesellschaft. Cadmium-free silver alloy brazing solder, method of using said solder, and metal articles brazed with said solder. 5,531,962, Cl. 420-587.000.
- Weiss, Harry M.: *See—*
  - Weiss, Mark H.; Rackman, Michael I.; and Weiss, Harry M., 5,533,104, Cl. 379-70.000.
- Weiss, Mark H.; Rackman, Michael I.; and Weiss, Harry M. Telephone answering device and method. 5,533,104, Cl. 379-70.000.
- Weiss, Werner; and Wagner, Gerhard, to Patent-Treuhand-Gesellschaft fuer Elektrische Gluehlampen mbh. Doped quartz glass, and enclosures for electrical apparatus made therefor. 5,532,195, Cl. 501-54.000.
- Welch, Jeffrey M.: *See—*
  - Pepin, Henry J.; Scovil, Brian J.; and Welch, Jeffrey M., 5,531,721, Cl. 604-282.000.
- Welch, Thomas A.: *See—*
  - Baetz, Robert J.; Dewar, John A.; Dunsmore, Douglas K.; Harbowy, Christopher; Majewski, Dennis A.; Shawbitz, Louis M.; and Welch, Thomas A., 5,531,505, Cl. 297-408.000.
- Welker, Brian H. Pipeline sampling enclosure. 5,531,130, Cl. 73-863.810.
- Wellenstein, Neil: *See—*
  - Crane, Eric K.; Morgan, David E.; and Wellenstein, Neil, 5,533,097, Cl. 379-58.000.
- Wellman, Inc.: *See—*
  - Travelute, Fred L.; and Hoffman, Robert E., 5,531,951, Cl. 264-143.000.
- Wells, G. Thomas: *See—*
  - DeVries, Robert A.; Shick, Reed A.; Wells, G. Thomas; and Carr, Joseph N., 5,532,817, Cl. 356-318.000.
- Wells, William M., III: *See—*
  - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Welschof, Hans-Heinrich, to GKN Automotive AG. Constant velocity universal ball joint. 5,531,643, Cl. 464-144.000.
- Welte, Karl; Platzer, Erich; Gabrilove, Janice L.; Mertelsmann, Roland; and Moore, Malcolm A. S., to Sloan-Kettering Institute for Cancer Research. Human pluripotent hematopoietic colony stimulating factor. 5,532,341, Cl. 530-351.000.
- Wenos, Vincent M.: *See—*
  - Kady, Mark A.; and Wenos, Vincent M., 5,533,058, Cl. 375-317.000.
- Wentland, Mark P.; and Perni, Robert B., to Sterling Winthrop Inc. Benzothiopyranoindazole antitumor agents. 5,532,263, Cl. 514-406.000.
- Wentworth, Wayne E.: *See—*
  - Stearns, Stanley D.; and Wentworth, Wayne E., 5,532,599, Cl. 324-464.000.
- Wenzel, Udo; Weber, Gunther; Metzner, Jurgen; Darr, Alfred; Freitag, Sabine; Flother, Frank-Ulrich; Albert, Frank-Michael; Haase, Margit; and Leistner, Edith, to ISIS PHARMA GmbH. Orally administerable drugs for the treatment of central dopamine deficiency conditions. 5,532,274, Cl. 514-565.000.
- Werner, Douglas J.: *See—*
  - Krounbi, Mohamad T.; Renaldo, Alfred F.; and Werner, Douglas J., 5,532,109, Cl. 430-271.000.
- Werner, Herbert: *See—*
  - Schmidt, Michael; Bomann, Werner; Janott, Dietrich W.; and Werner, Herbert, 5,531,994, Cl. 424-405.000.
- Werner, Joachim; Kane, Scott A.; Boonstra, Eric F.; and Doerge, Herman P., to Bayer Corporation. Azeotropic compositions of 1,1,1,4,4,4-hexafluorobutane and 2-methyl butane and the use thereof in the production of foams. 5,532,283, Cl. 521-131.000.
- Wessel, Hans P.: *See—*
  - Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,532,232, Cl. 514-183.000.
- West, Joseph H. Protective garment for baseball umpires having an inner cushioned layer and an outer layer of interconnected plates. 5,530,966, Cl. 2-2.000.
- Westby, Reidar; and Talbot, David W., to Dobloug, Anette. Heat conserving bandage. 5,531,670, Cl. 602-41.000.
- Western Atlas International, Inc.: *See—*
  - Mickael, Medhat W., 5,532,481, Cl. 250-269.400.
- Western Publishing Co., Inc.: *See—*
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- Westfall, Norman R.: *See—*
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- Westinghouse Electric Corporation: *See—*
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  - Clark, William G., Jr.; Junker, Warren R.; Byers, William A.; Herald, John J.; and Sadhir, Rajender K., 5,532,598, Cl. 324-326.000.
  - Subbiah, Rajagopal, 5,531,523, Cl. 384-117.000.
  - Wolfe, William R.; and Calfo, Raymond M., 5,532,574, Cl. 322-37.000.
- Westlake, Heidi M.: *See—*
  - Meduvsky, Alex G.; Goetz, George W.; Glac, Edward Q.; Maurer, Steven W.; Geyer, David L.; Fiore, Dennis J.; Westlake, Heidi M.; and Gest, William E., 5,531,475, Cl. 280-741.000.
- Westphal, Manfred: *See—*
  - Spaeh, Richard; Westphal, Manfred; Erdle, Erich; and Zurell, Klaus-Peter, 5,532,072, Cl. 429-34.000.
- Wetterwald, Michelle M.: *See—*
  - Ahmadi, Hamid; Bauchot, Frederic J.; Bonnet, Roselyne; Kessler, Ilan; Krishna, Arvind; Lanne, Fabien P.; Naghshineh, Mahmoud; Solar, Catherine; and Wetterwald, Michelle M., 5,533,026, Cl. 370-94.100.
- Whang, William. Adhesive moistener. 5,531,828, Cl. 118-264.000.
- Wheatley, Charles E., III: *See—*

  - Dean, Richard F.; Antonio, Franklin P.; Gilhousen, Klein S.; and Wheatley, Charles E., III, 5,533,011, Cl. 370-18.000.
- Wheatley, John A.: *See—*
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- Wheaton Inc.: *See—*
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- Wheeler, Robert G.: *See—*
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- Whipp, Roy H., to Fior de Venezuela. Fluidized bed direct reduction plant. 5,531,424, Cl. 266-156.000.
- Whirlpool Corporation: *See—*
  - Kirby, David B.; and Cur, Nihat O., 5,532,034, Cl. 428-69.000.
- Whitaker Corporation, The: *See—*
  - Han, Hongtao; and Tan, Songsheng, 5,533,158, Cl. 385-88.000.
  - Harper, Donald K., Jr.; Laub, Michael F.; Pacelli, James P.; and Schnoor, William J., 5,531,602, Cl. 439-70.000.
  - Irlbeck, Robert D.; Renn, Robert M.; Volz, Keith L.; Deak, Frederick R.; Johnson, David C.; and Bates, Warren A., 5,531,615, Cl. 439-631.000.
- White, Donald, to Sail D. White Enterprises, Inc. Trailer articulation device. 5,531,468, Cl. 280-463.000.
- White, Doug, to Johnson, Linda. Alarm tester. 5,532,675, Cl. 340-515.000.
- White Mop Wringer Company: *See—*
  - Baker, Jeffrey J.; and Jaros, Philip, 5,531,348, Cl. 220-264.000.
- White, Steven J.: *See—*
  - Grimson, W. Eric L.; White, Steven J.; Ettinger, Gil J.; Wells, William M., III; Lozano-Pérez, Tomas; and Kikinis, Ronald, 5,531,520, Cl. 382-131.000.
- Whitehead Alenia Sistemi Subacquei S.p.A.: *See—*
  - Tribioli, Silvano; Giardinelli, Vito; Rocco, Francesco; and Cerrano, Franco, 5,532,079, Cl. 429-119.000.
- Whitesel, J. Warren; and Desbois, Gabriel, to Etablissements Mauguin SA. Liquid product device. 5,531,171, Cl. 111-121.000.
- Whiting, Douglas L.: *See—*
  - Mayers, Clay; and Whiting, Douglas L., 5,532,694, Cl. 341-67.000.
- Whitley, John W., to Perfect Fit Industries, Inc. Mattress coverings. 5,530,979, Cl. 5-500.000.
- Whitmoyer, David I.: *See—*
  - Schulman, Joseph H.; Gord, John C.; Strojnik, Primoz; Whitmoyer, David I.; and Wolfe, James H., 5,531,774, Cl. 607-56.000.
- Wiacek, Marian: *See—*
  - DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., 5,532,081, Cl. 429-171.000.
- Wickham, Daniel E., to International Organic Solutions Corp. Sewage and contamination remediation and materials for effecting same. 5,531,898, Cl. 210-606.000.
- Wickham, Robert W., deceased (by Duane Quiggle, administrator): *See—*
  - Dahl, Roger W.; Wickham, Robert W., deceased; Swanson, David K.; and Lipson, David, 5,531,779, Cl. 607-119.000.
- Wickramanayake, Palitha, to Hewlett-Packard Company. Bleed-alleviated, waterfast, pigment-based ink-jet ink compositions. 5,531,816, Cl. 106-20.00R.
- Wieczorek, Joseph, Jr.: *See—*
  - Koubek, Timothy C.; Puletti, Paul P.; and Wieczorek, Joseph, Jr., 5,532,300, Cl. 524-47.000.
- Wiget, Fridolin, to Asulab S.A. Diagnostic circuit and method for amperometrically determining the current passing through a sensor. 5,532,602, Cl. 324-605.000.
- Wignot, Leroy S., to Thomson Consumer Electronics, Inc. Remodulation of a cable box output signal to a UHF channel. 5,532,733, Cl. 348-6.000.
- Wilcox, Allan L.: *See—*
  - Janzen, Edward G.; Wilcox, Allan L.; and Hinton, Randall D., 5,532,277, Cl. 514-579.000.
- Wilcox, Ross: *See—*
  - Butwell, Robert J.; McCune, Earl; Green, Michael; Huey, Hugo; Legarra, James R.; and Wilcox, Ross, 5,532,462, Cl. 219-695.000.
- Wilder, Cheryl L.: *See—*
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- Wildi, Eric J.: *See—*
  - Fillion, Raymond A.; Wildi, Eric J.; Korman, Charles S.; El-Hamamsy, Sayed-Amr; Gasworth, Steven M.; DeVre, Michael W.; and Burgess, James F., 5,532,512, Cl. 257-686.000.
- Wilfong, Gary R., Jr. Archery arm guard. 5,531,211, Cl. 124-86.000.
- Wilkerson, John M., III; Verstrat, Daniel W.; and Barron, Milagros C., to National Starch and Chemical Investment Holding Corporation. Methods for reducing volatile organic chemical contents of carpets. 5,532,036, Cl. 428-96.000.
- Wilkerson, Wendell W.; Earl, Richard A.; and Voss, Matthew E., to DuPont Merck Pharmaceutical Company, The. Neurotransmitter releasers useful for cognition enhancement. 5,532,247, Cl. 514-277.000.
- Wilkerson, Wendell W.; and Teleha, Christopher A., to DuPont Merck Pharmaceutical Company, The. Disubstituted polycyclic systems as cognition enhancers. 5,532,249, Cl. 514-292.000.
- Willars, Per H. A.; Grimlund, Olof E.; and Ewerbring, Lars-Magnus, to Telefonaktiebolaget LM Ericsson. Non-continuous transmission for seamless handover in DS-CDMA systems. 5,533,014, Cl. 370-18.000.
- Willcox, Frederick E., II, to Perma Pile Foundation Restoration Systems, Inc. Pile cap. 5,531,544, Cl. 405-231.000.
- Willebeek-LeMair, Marc H.: *See—*
  - Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Patel, Baiju V.; Plotz, Kevin G.; Schaffa, Frank A.; and Willebeek-LeMair, Marc H., 5,533,020, Cl. 370-60.100.
- Williams, Clark R.: *See—*
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- Williams, Eugene V.: *See—*
  - Beyer, Douglas H.; Williams, Eugene V.; and Alvarez, Jose A., 5,532,902, Cl. 361-230.000.
- Williams, Kurt T., to Robertshaw Controls Company. Fuel control system, control device therefor and methods of making and operating the same. 5,531,589, Cl. 431-6.000.
- Williams, Paul J.; and Tolkien, Susan, to Nalco Limited. Treatment of agricultural waste. 5,531,907, Cl. 210-727.000.
- Willibey, Douglas D.: *See—*
  - Brooks, Frank W., Sr.; Fanelli, Michael W.; Gordon, Ralph A.; Willibey, Douglas D.; Olson, Jeremy H.; and Holmes, Donald E., 5,531,298, Cl. 188-78.000.
- Willis, Paul E., to Ingersoll-Rand Company. Dual auger/conveyor drive for a paver. 5,531,542, Cl. 404-101.000.
- Willis, Robert N., to Sony Corporation; and Sony Electronics, Inc. Tray saddle arrangement for automated product handling system. 5,531,563, Cl. 414-794.300.
- Willow, Robert E. Flange bearing bolted rail frog for railroad turnouts and crossings. 5,531,409, Cl. 246-458.000.
- Wilson, Buddy A.: *See—*
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- Wilson, David F.: *See—*
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- Wilson Sporting Goods Co.: *See—*
  - Scheie, Carl E.; and Guy, Paul, 5,531,446, Cl. 473-227.000.
- Wiltshire, Curtis B. Memo pad assembly. 5,531,481, Cl. 281-44.000.
- Windsor Products, Inc.: *See—*
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- Winegard Company: *See—*
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- Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, to BASF Aktiengesellschaft. Fungicidal mixtures. 5,532,260, Cl. 514-383.000.
- Winner International Royalty Corporation: *See—*
  - Winner, James E., 5,531,344, Cl. 222-1.000.
- Winner, James E., to Winner International Royalty Corporation. Actuator for a personal protective spray canister. 5,531,344, Cl. 222-1.000.
- Winner, Kevin, to Guardian Royalty Corporation. Holder for personal protection devices. 5,531,359, Cl. 222-153.110.
- Winter, Andreas; Küber, Frank; Aulbach, Michael; Bachmann, Bernd; Klein, Robert; Kühlein, Klaus; Spaleck, Walter; and Kohlpaintner, Christian, to Hoechst Aktiengesellschaft. Metallocene compound. 5,532,396, Cl. 556-11.000.
- Winterer, Sean: *See—*
  - Dumas, Chris; and Winterer, Sean, 5,531,680, Cl. 604-67.000.
- Winters, Kel D.; Owsley, Patrick A.; French, Catherine A.; Bode, Robert M.; and Feeley, Peter S., to Advanced Hardware Architectures. Adaptive data compression system with systolic string matching logic. 5,532,693, Cl. 341-51.000.
- Wipfli, John: *See—*
  - Teitzel, Robin L.; Jolley, Matthew J.; Campbell, James B.; George, Richard K.; and Wipfli, John, 5,533,170, Cl. 395-108.000.
- Wirebaugh, Ralph S.: *See—*
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- Wirtz, Brigitte; and Maggioni, Chistoph, to Siemens Aktiengesellschaft. Method for detecting and estimating the spatial position of objects from a two-dimensional image. 5,533,177, Cl. 395-119.000.
- Wirz, Beat: *See—*
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- Wisser, Thomas: *See—*
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- Witsken, Anthony. Apparatus and methods for wet grinding. 5,531,385, Cl. 241-21.000.
- Wittig, Karl: *See—*
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- Wm. T. Burnett & Co., Inc.: *See—*

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Wolfe, William R.; and Calfo, Raymond M., to Westinghouse Electric Corporation. Brushless exciter protection circuit. 5,532,574, Cl. 322-37.000.

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Wolfinbarger, Lloyd, Jr., to Bioscience Consultants. Composition for repair of defects in osseous tissues, method of making, and prosthesis. 5,531,791, Cl. 623-16.000.

Wolk, Douglas J.; Carapezza, William C.; and Sylvester, Richard J., to John D. Brush & Co., Inc. Portable security case. 5,531,082, Cl. 70-63.000.

Wolter, Herbert; Rose, Klaus; and Egger, Christian, to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Silanes, process for their preparation and their application to prepare polymers and polycondensates. 5,532,398, Cl. 556-420.000.

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Wong, David T.; and Oguiza, Juan I., to Eli Lilly and Company. Potentiation of drug response. 5,532,250, Cl. 514-415.000.

Wong, David T.; and Oguiza, Juan I., to Eli Lilly and Company. Potentiation of drug response. 5,532,264, Cl. 514-415.000.

Wong, David T.; and Oguiza, Juan I., to Eli Lilly and Company. Potentiation of drug response. 5,532,268, Cl. 514-432.000.

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Wong, Patrick S.-L.; Theeuwes, Felix; Larsen, Steven D.; and Dong, Liang C., to Alza Corporation. Osmotic device for delayed delivery of agent. 5,531,736, Cl. 604-892.100.

Wong, Patrick S.-L.; Guittard, George V.; and Ayer, Atul D., to ALZA Corporation. Pentoxifylline therapy. 5,532,003, Cl. 424-473.000.

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Wright, Peter J. Global planarization of multiple layers. 5,532,188, Cl. 437-195.000.

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Gusmano, Donald J., 5,532,845, Cl. 358-474.000.

Hawkins, William G.; Burke, Cathie J.; Watrobski, Thomas E.; Tellier, Thomas A.; and Vandebroek, Sophie, 5,532,901, Cl. 361-212.000.

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Xu, Shuang-yong; and Xiao, Jianping, to New England Biolabs, Inc. Method for cloning and producing the SacI restriction endonuclease. 5,532,153, Cl. 435-199.000.

Yaar, Mina: *See—*

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Yabe, Masaaki: *See—*

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Yagi, Takashi; Higurashi, Masakazu; Tsuruoka, Hiroka; and Nomura, Isao, to Showa Sangyo Co., Ltd. Process for refining oil and fat. 5,532,163, Cl. 435-271.000.

Yagihara, Morio; Sasaki, Hirotomo; Mifune, Hiroyuki; and Kato, Shinji, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing selenium compound. 5,532,120, Cl. 430-600.000.

Yaginuma, Shigeru; and Yamamoto, Junichi, to Minolta Camera Kabushiki Kaisha. Electrostatic copier having a marking unit for indicating unnecessary print matter on once-used paper. 5,532,789, Cl. 355-202.000.

Yahata, Seiro: *See—*

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Kodaka, Kenji; Kinoshita, Katsutoshi; Wakita, Takeo; Shiraishi, Shirou; Ohnuma, Kazutomi; Yamada, Eiichi; Yasui, Naoko; Nakaya, Michihiko; Matsuno, Hirozumi; Kawahara, Nobuyuki; and Ebihara, Koichi, 5,532,365, Cl. 544-212.000.

Yamada, Fumiya: *See—*

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Yamada, Hiroshi, to Olympus Optical Co., Ltd. Electronic flash apparatus using gate controlled switching device directly driven by CPU. 5,532,555, Cl. 315-241.00P.

Yamada, Kenji: *See—*

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Yamada, Takamasa: *See—*

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Yamada, Tsugutoshi: *See—*

Fusejima, Yasutoyo; Yamada, Tsugutoshi; Yamada, Shuri; and Takei, Narimichi, 5,531,826, Cl. 118-19.000.

Yamadera, Takashi; Takeuchi, Kazumasa; Obata, Ritsuko; Fukutomi, Naoki; and Suzuki, Kazuko, to Hitachi Chemical Company, Ltd. Photolithographically viahole-forming photosensitive element comprising two photosensitive layers for the fabrication process of multilayer wiring board. 5,532,105, Cl. 430-156.000.

Yamagishi, Junichi: *See—*

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Yamaguchi, Norio; and Shiino, Haruhiro, to Oki Electric Industry Co., Ltd. Apparatus and method for estimating maximum likelihood sequence using optimum sampling phase. 5,533,066, Cl. 375-341.000.

Yamaha Corporation: *See—*

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Yamaha Hatsudoki Kabushiki Kaisha: *See—*

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Yamamoto, Atsushi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for automatically inspecting and winding yarn, stopping and removing defective yarn and reconnecting and restarting winding after defective yarn is removed. 5,531,391, Cl. 242-35.60R.

Yamamoto, Hiroaki: *See—*

Utsumi, Kuniaki; Yamamoto, Hiroaki; and Fujito, Katsuyuki, 5,532,865, Cl. 359-189.000.

Yamamoto, Hiroshi: *See—*

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Yamamoto, Masatoshi; Matsuba, Mitsuo; Kaga, Hideaki; and Shibata, Masaki, to Sintokogio, Ltd. Oscillating trough for shot blast. 5,531,263, Cl. 164-404.000.

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Yamamura, Yasuharu; Seri, Hajime; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage alloy and electrode therefrom. 5,532,076, Cl. 429-59.000.

Yamanaka, Haruhiko, to Hewlett-Packard Company. Apparatus for measuring circuit parameters wherein errors due to transmission lines are prevented. 5,532,590, Cl. 324-239.000.

Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, to Fujisawa Pharmaceutical Co., Ltd. Intermediates for cephem compounds. 5,532,354, Cl. 540-225.000.

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Yamanaka, Nobuo; Fujie, Takashi; Hidaka, Hiroshi; and Akiyama, Yoshio, to Yoshino Kogyosho Co., Ltd. Bottle of synthetic resin. 5,531,339, Cl. 215-12.200.

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Yamane, Takuro, to Shimano Inc. Hub mechanism for a bicycle. 5,531,510, Cl. 301-110.500.

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Yamashita, Takaji; and Tanaka, Eiichi, to Hamamatsu Photonics K.K. Positron imaging apparatus. 5,532,489, Cl. 250-363.030.

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Yamazaki, Hiroko; Kuroda, Masahiro; and Niwa, Kozo, to Kozo Niwa. Low molecular weight vegetable composition. 5,531,992, Cl. 424-195.100.

Yamazaki, Keaji; and Mori, Toshio, to Sun Medical Technology Research Corporation. Sealing system of an artificial internal organ. 5,531,789, Cl. 623-12.000.

Yamazaki, Mitsuo: *See*—

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Yamazaki, Nobuo, to Tokai Corporation. Safety device for use in lighter. 5,531,591, Cl. 431-153.000.

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Watanabe, Tsuyoshi; Senba, Hisaaki; Matsumoto, Hiroshi; and Yanagida, Makoto, 5,532,799, Cl. 355-245.000.

Yanagihara, Naoto: *See*—

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Yanagisawa, Tatsuya; Nohtomi, Nobuo; Sawada, Nobutaka; Yamada, Fumiya; Kajihara, Kiyohito; Morikawa, Kiyoshi; Kurosawa, Atsushi; Kimura, Tomomichi; and Yamashita, Toshiroh, to Pioneer Electronic Corporation. Vibration damping suspension mechanism for recorded data reproducing apparatus. 5,532,993, Cl. 369-75.100.

Yanaki, Toshio: *See*—

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Yanes, Adalberto G.: *See*—

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Yang, Chi-Kuo. Shelter means on umbrella ferrules for concealing wire ends of rib-fastening wire. 5,531,237, Cl. 135-28.000.

Yang, Jian: *See*—

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Yang, Tai-Her. Differential gear system using the change in input direction to control the output speed ratio. 5,531,651, Cl. 475-12.000.

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Yano, Kazutaka; Kajikawa, Katsuhiro; Nagasuna, Kinya; and Irie, Yoshio, to Nippon Shokubai Co., Ltd. Method for production of absorbent resin. 5,532,323, Cl. 525-384.000.

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Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.

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Yashiro, Hajime: *See*—

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Yashiro, Toru, to Ricoh Company, Ltd.; and Yamada Chemical Co., Ltd. Optical information recording medium. 5,532,033, Cl. 428-64.100.

Yasoshima, Haruo, to Tsukineko, Inc. Fan-shaped stamp pad. 5,531,829, Cl. 118-264.000.

Yasuda, Kazuo; and Takahashi, Satoshi, to Konica Corporation. Developing apparatus with improved toner conveyance. 5,532,803, Cl. 355-251.000.

Yasuda, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling DC motor with H-bridge switching circuit. 5,532,562, Cl. 318-439.000.

Yasui, Naoko: *See*—

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Yasukawa, Kaoru: *See*—

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Yasukawa, Ko: *See*—

Tomita, Motowo; Sugita, Yuji; Takemoto, Toshiyuki; Furuichi, Kiyoshi; Takayama, Makoto; Yasukawa, Ko; Ito, Katsuhisa; Yamaji, Noboru; and Yano, Shinya, 5,532,339, Cl. 530-350.000.

Yasunaga, Seiji: *See*—

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Yasuzato, Tadao; Nozue, Hiroshi; and Shiraki, Seiichi, to NEC Corporation. Optical aligner equipped with luminance sensor on movable stage. 5,532,497, Cl. 250-548.000.

Yates, David C.: *See*—

Nardella, Paul C.; Yates, David C.; Kuhns, Jesse J.; Nuchols, Richard P.; Madden, Martin; and Mersch, Steven H., 5,531,744, Cl. 606-48.000.

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Yazaki Corporation: *See*—

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Tsuji, Masanori; Abe, Kimihiro; Sugiyama, Osamu; Yamamoto, Hiroshi; and Yagi, Sakai, 5,532,443, Cl. 200-275.000.

Yeager, Michael W.: *See*—

Smith, Gregory M.; Yeager, Michael W.; Pauley, J. Donald; and Carroll, Gary T., 5,533,061, Cl. 375-334.000.

Yellin, Haim: *See*—

Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, 5,532,415, Cl. 564-308.000.

Yen, Larry Y.; Anantharaman, Ven; and Parekh, Bipin, to Millipore Investment Holdings Limited. Ion exchange polyethylene membrane and process. 5,531,899, Cl. 210-638.000.

Yew Corporation: *See*—

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Yi, Mi-Hie: *See*—

Choi, Kil-Yeong; Suh, Dong-Hack; Yi, Mi-Hie; Hong, Young-Taik; and Won, Jong-Chan, 5,532,334, Cl. 528-350.000.

Yiu, Chih-Hao. Scoring system for dart games. 5,531,451, Cl. 273-371.000.

Yoder, David J.: *See*—

Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; Phillips, Frederick W.; and Beiler, Emanuel S., 5,531,212, Cl. 126-104.00R.

Yokogama, Fumihiko, to Pioneer Electronic Corporation. Tracking apparatus for sampled servo system which performs tracking control using signals identifying tracks as even or odd numbered. 5,532,988, Cl. 369-44.280.

Yokono, Kojiro: *See*—

Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,532,544, Cl. 313-310.000.

Yokoyama, Akihiko: *See*—

Hashimoto, Shigeru; and Yokoyama, Akihiko, 5,532,871, Cl. 359-359.000.

Yokoyama, Ichiro: *See*—

Sivaramakrishnam, Visweswaren; Nishizato, Hiroshi; Zhao, Jun; and Yokoyama, Ichiro, 5,531,183, Cl. 117-93.000.

Yokoyama, Toshio: *See*—

Hamanaka, Izumi; Nagoshi, Mitsuru; Yokoyama, Toshio; Matsumoto, Toshitaka; Gomi, Hiroshi; Goto, Masaru; and Sekiguchi, Masaaki, 5,532,809, Cl. 355-308.000.

Yokoyama, Yoshinobu; Suzuki, Kenji; Seki, Yoshiyuki; Harada, Shoichi; and Shimizu, Etsuo, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Lighting device for zigzag-operated shift lever. 5,532,908, Cl. 362-30.000.

Yonehara, Takao, to Canon Kabushiki Kaisha. Method of making a semiconductor thin-film. 5,531,182, Cl. 117-7.000.

Yonekawa, Noboru: *See*—

Nakagami, Yasuhiro; Matsushita, Kouji; Yonekawa, Noboru; Ito, Noboru; Shojo, Yoshihiro; and Takeda, Katsuhiko, 5,532,798, Cl. 355-221.000.

Yonkoski, Roger K.; and Savu, Patricia M., to Minnesota Mining and Manufacturing Company. Mottle reducing agent for photothermographic and thermographic elements. 5,532,121, Cl. 430-617.000.

Yoo, Han-Ju, to Samsung Electronics Co., Ltd. Apparatus for and method of providing continuous driving current to a commutatorless motor. 5,532,559, Cl. 318-254.000.

Yoo, Tae W. Micro-acupuncture needle for a finger of a hand. 5,531,675, Cl. 604-20.000.

Yoon, Inbae. Methods for suturing tissue sections. 5,531,761, Cl. 606-223.000.

Yoon, Sang-Ho; and Kwon, Oh-Sang, to Daewoo Electronics Co., Ltd. Method for effectuating half-pixel motion compensation in decoding an image signal. 5,532,747, Cl. 348-416.000.

Yoppolo, Robert A.: *See*—

DePalma, Christopher L.; Pope, Peter J.; Sargeant, Sean A.; Wiacek, Marian; and Yoppolo, Robert A., 5,532,081, Cl. 429-171.000.

Yoshida, Chisato; Ando, Yuichi; Kitamura, Kunio; and Yahata, Seiro, to Rheo-Technology, Ltd. Process for diecasting graphite cast iron at solid-liquid coexisting state. 5,531,261, Cl. 164-113.000.

Yoshida, Hiroyuki: *See*—

Hattori, Tatsuya; Nishida, Makoto; Oshima, Masuji; and Yoshida, Hiroyuki, 5,532,929, Cl. 364-431.070.

Yoshida, Kazuya, to Dai Nippon Printing Co., Ltd. Thermal transfer sheet. 5,532,202, Cl. 503-227.000.

Yoshida, Keiichi: *See*—

Tanaka, Toshihiro; Kato, Masataka; Yoshida, Keiichi; Kume, Hitoshi; Nakagome, Yoshinobu; and Kimura, Katsutaka, 5,532,971, Cl. 365-230.060.

Yoshida, Kenichiro: *See*—

Kawarai, Seigi; Yoshida, Kenichiro; and Kato, Akira, 5,532,042, Cl. 428-141.000.

Yoshida, Koujiro: *See*—

Mizoguchi, Shuri; Ishida, Ken; Todo, Kazuo; Hazama, Kiyoaki; and Yoshida, Koujiro, 5,532,080, Cl. 429-164.000.

Yoshida, Ryuhei; and Wajima, Masaya, to Murata Manufacturing Co., Ltd. Energy-trap chip-type piezoelectric resonance component. 5,532,542, Cl. 310-348.000.

Yoshida, Satoshi: *See*—

Nozawa, Keita; Yoshida, Satoshi; and Kukimoto, Tsutomu, 5,532,101, Cl. 430-125.000.

Yoshida, Toshiyuki: *See*—

Ohkura, Tadahiro; Yoshida, Toshiyuki; Kainuma, Mitsuru; and Aoki, Kazuo, 5,532,581, Cl. 324-115.000.

Yoshida, Yasuhiro; and Yamamoto, Yasuhiro, to Kabushiki Kaisha Meidensha. Method for calculating speed estimated value in speed control system. 5,533,166, Cl. 388-811.000.

Yoshida, Yoshiki: *See*—

Yamanaka, Hideaki; Yoshida, Yoshiki; Goto, Jiro; Terasawa, Takeshi; Okuda, Shinya; and Sakane, Kazuo, 5,532,354, Cl. 540-225.000.

Yoshigi, Mayumi: *See*—

Saji, Ikutaro; Muto, Masayuki; Tanno, Norihiko; and Yoshigi, Mayumi, 5,532,372, Cl. 544-368.000.

Yoshikoshi, Hideo: *See*—

Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,532,942, Cl. 364-555.000.

Yoshikuwa, Masakatsu; and Hoshikawa, Tsuguo, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicle door lock device. 5,531,488, Cl. 292-216.000.

Yoshimura, Shuji: *See*—

Murayama, Masami; Yoshimura, Shuji; Kawamata, Tetsuo; and Yoshioka, Atsushi, 5,532,682, Cl. 340-825.060.

Yoshimura, Tamotsu, to Rohm Co., Ltd. Planar T-type LC filter with recesses between terminal electrodes. 5,532,656, Cl. 333-185.000.

Yoshimura, Teizo; Robinson, Elizabeth A.; Appella, Ettore; and Leonard, Edward J., to United States of America, Health and Human Services. Process for preparing human derived monocyte attracting purified peptide products useful in a method of treating infection and neoplasms in a human body. 5,532,144, Cl. 435-70.100.

Yoshinari, Kiyomi: *See*—

Ose, Yoichi; Yoshinari, Kiyomi; Yano, Masayoshi; and Mimura, Tadao, 5,532,483, Cl. 250-288.000.

Yoshino Kogyosho Co., Ltd.: *See*—

Yamanaka, Nobuo; Fujie, Takashi; Hidaka, Hiroshi; and Akiyama, Yoshio, 5,531,339, Cl. 215-12.200.

Yoshino, Yoshimi: *See*—

Suzuki, Yasutoshi; Ao, Kenichi; Yoshino, Yoshimi; Narita, Ryoichi; and Omi, Hiroshi, 5,532,910, Cl. 361-813.000.

Yoshioka, Atsushi: *See*—

Murayama, Masami; Yoshimura, Shuji; Kawamata, Tetsuo; and Yoshioka, Atsushi, 5,532,682, Cl. 340-825.060.

Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, to Ganon Kabushiki Kaisha. Electron-emitting device with electron-emitting region insulated from electrodes. 5,532,544, Cl. 313-310.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—

Nakao, Tohru; Ono, Yuji; Bougauchi, Masahiro; and Morimoto, Yasuto, 5,532,240, Cl. 514-254.000.

Yoshiura, Kenichi: *See*—

Konno, Masaki; Inobe, Kazuhiko; Yoshiura, Kenichi; and Itoh, Shuji, 5,532,466, Cl. 235-441.000.

Youdim, Moussa B. H.; Finberg, John P. M.; Levy, Ruth; Sterling, Jeffrey; Lerner, David; Berger-Paskin, Tirtsah; Yellin, Haim; and Veinberg, Alex, to Teva Pharmaceutical Industries Ltd.; and Technion Research and Development Foundation Ltd. R-enantiomer of N-propargyl-1-aminoindan, salts, compositions and uses thereof. 5,532,415, Cl. 564-308.000.

Young, Allen R.; Davidson, Jerry L.; and Baltazar, Edward, to Computalog U.S.A., Inc. Fluid holdup tool for deviated wells. 5,531,112, Cl. 73-152.000.

Young, Daniel L.: *See*—

Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; Cassidy, Clarence A.; and Cassidy, Terry H., 5,531,724, Cl. 604-327.000.

Young, David G.: *See*—

Chatham, Michael D.; Fotsch, Paul D.; Heyveld, Doyle G.; Kelley, Edward P.; Lohmann, Walter E., Jr.; Roley, David R.; Sieck, Charles F.; and Young, David G., 5,531,122, Cl. 73-760.000.

Young Dental Manufacturing Company, Inc.: *See*—

Bailey, Ronald L., 5,531,599, Cl. 433-125.000.

Young, Linley M.: *See*—

Lentz, Derek J.; and Young, Linley M., 5,533,185, Cl. 395-162.000.

Young, Patrick; Roop, John H.; and Faber, Michael W., to Starsight Telecast Inc. Background television schedule system. 5,532,754, Cl. 348-569.000.

Young, Richard D.: *See*—

Parker, H. Galen; Finnicum, Douglas S.; and Young, Richard D., 5,533,139, Cl. 382-108.000.

Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; Cassidy, Clarence A.; and Cassidy, Terry H., to American Innotek, Inc. Fluid containment bag. 5,531,724, Cl. 604-327.000.

Yozan, Inc.: *See*—

Shu, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; and Yamamoto, Makoto, 5,532,580, Cl. 323-354.000.

Yu, Chris C.; and Yu, Tat-Kwan, to Motorola, Inc. Chemical-mechanical-polishing pad cleaning process for use during the fabrication of semiconductor devices. 5,531,861, Cl. 156-636.100.

Yu, Stella S.: *See*—

Djuric, Stevan W.; Docter, Stephen H.; and Yu, Stella S., 5,532,383, Cl. 546-196.000.

Yu, Tat-Kwan: *See*—

Yu, Chris C.; and Yu, Tat-Kwan, 5,531,861, Cl. 156-636.100.

Yuan, Chi-Min: *See*—

Adair, William J.; Brunner, Timothy A.; Dove, Derek B.; Hsu, Louis L.; and Yuan, Chi-Min, 5,532,089, Cl. 430-5.000.

Yuen, Henry C.; and Kwoh, Daniel S., to Gemstar Development Corporation. Apparatus and methods for using compressed codes for monitoring television program viewing. 5,532,732, Cl. 348-1.000.

Yuh, Huoy-Jen; Herbert, William G.; and Maier, Gary J., to Xerox Corporation. Imaging member. 5,532,093, Cl. 430-58.000.

Yuh, Huoy-Jen: *See*—

Forgit, Rachael A.; Godlove, Ronald E.; Chambers, John S.; Yuh, Huoy-Jen; McCumiskey, Robert E.; Zaman, Kamran U.; and Herbert, William G., 5,531,872, Cl. 204-486.000.

Yui, Yasuji: *See*—

Maekawa, Tomohiro; Kamoda, Hitoshi; Yui, Yasuji; Iima, Shin; and Bunya, Takashi, 5,531,527, Cl. 400-185.000.

Yun, Jung Rak: *See*—

Kim, Kyung Yong; Kim, Wang Sup; Yun, Jung Rak; and Chang, Kwang Ho, 5,532,197, Cl. 501-136.000.

Yuyama, Yoshiaki: *See*—

Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,532,193, Cl. 437-243.000.

Zaidan Hojin Handotai Kenkyu Shinokai: *See*—

Nishizawa, Jun-ichi; and Kurabayashi, Toru, 5,532,511, Cl. 257-627.000.

Zakaria, Samir: *See*—

Cappelletti, Joseph; and Zakaria, Samir, 5,531,337, Cl. 213-211.000.

Zaman, Kamran U.: *See*—

Forgit, Rachael A.; Godlove, Ronald E.; Chambers, John S.; Yuh, Huoy-Jen; McCumiskey, Robert E.; Zaman, Kamran U.; and Herbert, William G., 5,531,872, Cl. 204-486.000.

Zanella, Mark F., Sr.: *See*—

Dimmick, Henry M.; Zanella, Mark F., Sr.; and Melnik, Thomas F., 5,532,605, Cl. 324-671.000.

Zanen, Pieter O. Single lens apparatus for three-dimensional imaging having focus-related convergence compensation. 5,532,777, Cl. 354-114.000.

Zanini-Fisher, Margherita; Soltis, Richard E.; Logothetis, Eleftherios M.; and Barrera, Carlos M., to Ford Motor Company. Hego sensor without characteristic shift down. 5,531,879, Cl. 204-427.000.

Zarate, Carlos E.; Zarate, H. Graciela; and Verge, Clarence, to Sciencetech Inc. Vibrational anti-fouling system. 5,532,980, Cl. 367-139.000.

Zarate, H. Graciela: *See*—

Zarate, Carlos E.; Zarate, H. Graciela; and Verge, Clarence, 5,532,980, Cl. 367-139.000.

Zatler, Andrej; and Eferl, Franc. Level switch. 5,532,527, Cl. 307-118.000.

Zbinden, Lyn R.; Dallos, Robert, Jr.; and Dick, Rodney G., to Saturn Corporation. Automotive glass enclosure retaining fixture. 5,531,496, Cl. 296-96.210.

Zehner, William J., to United States of America, Navy. Resolving power target for side-scanning sonars. 5,532,973, Cl. 367-13.000.

Zehner, William J., to United States of America, Navy. Beam pattern measuring apparatus for side-scanning sonars. 5,532,974, Cl. 367-013.000.

Zeidan, Fouad Y.: *See*—

Ide, Russell D.; and Zeidan, Fouad Y., 5,531,522, Cl. 384-99.000.

- Zelinka, Gregory A., to Madison Metropolitan Sewerage District. Automated dissolved oxygen and biochemical oxygen demand analyzer. 5,531,960, Cl. 422-79.000.
- Zelinski, George. Bowling ball. 5,531,647, Cl. 473-126.000.
- Zellweger Uster, Inc.: *See—*
  - Shofner, Frederick M.; and Baldwin, Joseph C., 5,533,145, Cl. 382-141.000.
- Zeneca Limited: *See—*
  - Baylis, Alan D., 5,532,205, Cl. 504-128.000.
  - Edwards, Philip D.; Warner, Peter; and Wolanin, Donald J., 5,532,366, Cl. 514-234.200.
- Zeng, Gengsheng L.: *See—*
  - Gullberg, Grant T.; and Zeng, Gengsheng L., 5,532,490, Cl. 250-363.040.
- Zenith Electronics Corporation: *See—*
  - Bione, Angelo A., 5,533,202, Cl. 395-280.000.
  - Krishnamurthy, Gopalan; and Lee, Ronald B., 5,533,070, Cl. 375-346.000.
  - Krishnamurthy, Gopalan; and Lee, Ronald B., 5,533,071, Cl. 375-346.000.
- Zevex, Inc.: *See—*
  - Dumas, Chris; and Winterer, Sean, 5,531,680, Cl. 604-67.000.
- Zexel Corporation: *See—*
  - Eike, Masatoyo; and Miyazaki, Kunio, 5,531,264, Cl. 165-43.000.
  - Sekiguchi, Akira; and Uchida, Yoshinori, 5,531,204, Cl. 123-502.000.
- ZF Friedrichshafen AG: *See—*
  - Majer, Hans-Werner; Schöffel, Jörgen; and Schänzel, Rainer, 5,531,286, Cl. 180-441.000.
- Zhang, Hongyong, to Semiconductor Energy Laboratory Co., Ltd. Laser processing method. 5,533,040, Cl. 372-25.000.
- Zhang, Yan: *See—*
  - Karam, Ronald E.; Reddy, Vaddi B.; Northrop, Shellie K.; and Zhang, Yan, 5,531,928, Cl. 252-301.40F.
- Zhao, Jun: *See—*
  - Sivaramakrishnam, Visweswaren; Nishizato, Hiroshi; Zhao, Jun; and Yokoyama, Ichiro, 5,531,183, Cl. 117-93.000.
- Zhong, Chun-Chium. Universal joint device for a toy. 5,531,625, Cl. 446-120.000.
- Zhou, Frank H.; and Wang, Qin-Mo, to Top Computech Co. Ltd. Method of manipulating fonts containing large numbers of characters. 5,533,180, Cl. 395-150.000.
- Zick, Gregory L.: *See—*
  - Sheehan, Florence H.; Zick, Gregory L.; and Liu, Hain-Ching H., 5,533,085, Cl. 378-95.000.
- Ziegenbein, Botho: *See—*
  - Gademann, Lothar; Miekley, Klaus; Ziegenbein, Botho; and Reppich, Andreas, 5,531,091, Cl. 73-1.0DV.
- Ziegenhorn, Joachim; Schiefer, Sigbert; and Dräger, Brigitte, to Boehringer Mannheim GmbH. Process and reagent for the determination of low density lipoproteins (LDL). 5,532,172, Cl. 436-539.000.
- Zielke, Christopher: *See—*
  - Rotay, Craig J.; and Zielke, Christopher, 5,532,639, Cl. 327-376.000.
- Ziemer, Craig B.: *See—*
  - Umberger, Dean M.; and Ziemer, Craig B., 5,532,498, Cl. 250-551.000.
- Zierer, Thomas: *See—*
  - Meindl, Thomas; Meylan, Pierre; and Zierer, Thomas, 5,531,565, Cl. 415-144.000.
- Zimmerly, Charles A.: *See—*
  - Richman, Roger H.; Inal, Osman T.; Zimmerly, Charles A.; and Hodgson, Darel E., 5,531,369, Cl. 228-109.000.
- Ziolkowski, Hans: *See—*
  - Metzger, Burkhard; and Ziolkowski, Hans, 5,531,947, Cl. 264-102.000.
- Zitny, Kevin G.: *See—*
  - Albin, Donald J.; Walls, Andrew D.; Yanes, Adalberto G.; and Zitny, Kevin G., 5,533,194, Cl. 395-183.180.
- Zmijewski, Milton J., Jr.: *See—*
  - Briggs, Barbara S.; and Zmijewski, Milton J., Jr., 5,532,149, Cl. 435-122.000.
  - Briggs, Barbara S.; and Zmijewski, Milton J., Jr., 5,532,161, Cl. 435-252.100.
- Zmuda, Paul E.: *See—*
  - Peavey, Stephen D.; Ogden, James E.; Hoyt, William J.; Dunn, Ino; Zmuda, Paul E.; Jamroga, David A.; and Jorgensen, Jacob W., 5,533,103, Cl. 379-69.000.
- Zorzolo, Alessandro, to Comelz S.p.A. Control unit for an electric drive motor of industrial processing machinery. 5,532,564, Cl. 318-551.000.
- Zucchini, Umberto, deceased (by Maria Stagni, Silvia Zucchini, Chiara Zucchini, Matteo Zucchini, heirs): *See—*
  - Dall'Occo, Tiziano; Guglielmi, Floriano; Zucchini, Umberto, deceased, 5,532,326, Cl. 526-125.700.
- Zulian, Ferruccio, to Bull HN Information Systems Italia S.p.A. Method and apparatus for improving the display of greys in a two-tone digitized image. 5,533,150, Cl. 382-275.000.
- Zurell, Klaus-Peter: *See—*
  - Spaeh, Richard; Westphal, Manfred; Erdle, Erich; and Zurell, Klaus-Peter, 5,532,072, Cl. 429-34.000.
- Zynch, Martin: *See—*
  - Schmale, Gerhard; Hoge, Ralf; and Zynch, Martin, 5,531,504, Cl. 297-362.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2nd DAY OF JULY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Borg, James C., to Oregon Precision Industries, Inc. Carrier strap for bottles or jugs. Re. 35,288, Cl. 294-87.200.
- Caruso, Richard. Hair curler. Re. 35,287, Cl. 132-251.000.
- Druskoczi, Sue. Surgical collar and liner therefor. Re. 35,290, Cl. 602-18.000.
- Idemitsu Kosan Company Limited: *See—*
  - Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, Re. 35,289, Cl. 526-129.000.
- Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, to Idemitsu Kosan Company Limited. Process for production of styrene polymers. Re. 35,289, Cl. 526-129.000.
- Kuramoto, Masahiko: *See—*
  - Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, Re. 35,289, Cl. 526-129.000.
- Oregon Precision Industries, Inc.: *See—*
  - Borg, James C., Re. 35,288, Cl. 294-87.200.
- Uoi, Michitake: *See—*
  - Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, Re. 35,289, Cl. 526-129.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

- Applied Chemical Solutions: *See—*
  - Geatz, Tobin, B1 5,148,945, Cl. 222-1.000.
- Bächler, Werner; Forth, Hans-Joachim; Klein, Hans-Hermann; and Strasser, Wilhelm, to Leybold Aktiengesellschaft. Cryopump, and a method for the operation thereof. B1 4,757,689, Cl. 62-55.500.
- Bally, Marcel B.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- BOC Group, Inc.: *See—*
  - Renzi, Ernesto, B1 4,993,171, Cl. 34-92.000.
- Brewer, Daniel R.: *See—*
  - Bruehl, Thomas L.; Brewer, Daniel R.; Hay, Clifford C.; and Childers, William H., B1 5,051,835, Cl. 358-311.000.
- Bruehl, Thomas L.; Brewer, Daniel R.; Hay, Clifford C.; and Childers, William H., to Paramount Pictures Corporation. Method of processing theatrical film. B1 5,051,835, Cl. 358-311.000.
- Burke, Edward J.; and Nancarrow, Gregory J., to Marlow Industries Incorporated. Temperature controlled picnic box. B1 4,726,193, Cl. 62-457.700.
- Carobbi, Renato; and Innocenti, Franco, to Inalco SpA. Method for preparing high-purity crystalline lactulose. B1 5,003,061, Cl. 536-127.000.
- Childers, William H.: *See—*
  - Bruehl, Thomas L.; Brewer, Daniel R.; Hay, Clifford C.; and Childers, William H., B1 5,051,835, Cl. 358-311.000.
- Christian, Gil S.: *See—*
  - Newman, Edward G.; Christian, Gil S.; and Jenkins, Michael D., B1 5,305,244, Cl. 364-708.100.
- Computer Products & Services, Inc.: *See—*
  - Newman, Edward G.; Christian, Gil S.; and Jenkins, Michael D., B1 5,305,244, Cl. 364-708.100.
- Cullis, Pieter R.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- D'Ambro, Dominic; and Giangiulio, Clayton E., to Le-Jo Enterprises, Inc. Produce wedger. B1 4,569,280, Cl. 99-538.000.
- Forth, Hans-Joachim: *See—*
  - Bächler, Werner; Forth, Hans-Joachim; Klein, Hans-Hermann; and Strasser, Wilhelm, B1 4,757,689, Cl. 62-55.500.
- Fountain, Michael W.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- Fujikoki America, Inc.: *See—*
  - Watanabe, Masaru; and Yamamoto, Osamu, B1 5,060,485, Cl. 62-225.000.
- Geatz, Tobin, to Applied Chemical Solutions. Apparatus and method for the transfer and delivery of high purity chemicals. B1 5,148,945, Cl. 222-1.000.
- Giangiulio, Clayton E.: *See—*
  - D'Ambro, Dominic; and Giangiulio, Clayton E., B1 4,569,280, Cl. 99-538.000.
- Ginsberg, Richard S.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- Hay, Clifford C.: *See—*
  - Bruehl, Thomas L.; Brewer, Daniel R.; Hay, Clifford C.; and Childers, William H., B1 5,051,835, Cl. 358-311.000.
- Hofmann, John E.; and Sun, William H., to Nalco Fuel Tech. Process and apparatus for the thermal decomposition of nitrous oxide. B1 5,048,432, Cl. 110-345.000.
- Hope, Michael J.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- Inalco SpA: *See—*
  - Carobbi, Renato; and Innocenti, Franco, B1 5,003,061, Cl. 536-127.000.
- Innocenti, Franco: *See—*
  - Carobbi, Renato; and Innocenti, Franco, B1 5,003,061, Cl. 536-127.000.
- Jablonski, Regina L.: *See—*
  - Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., B1 4,880,635, Cl. 424-450.000.
- Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., to Liposome Company, Inc. Dehydrated liposomes. B1 4,880,635, Cl. 424-450.000.
- Jenkins, Michael D.: *See—*
  - Newman, Edward G.; Christian, Gil S.; and Jenkins, Michael D., B1 5,305,244, Cl. 364-708.100.
- Klein, Hans-Hermann: *See—*
  - Bächler, Werner; Forth, Hans-Joachim; Klein, Hans-Hermann; and Strasser, Wilhelm, B1 4,757,689, Cl. 62-55.500.
- Le-Jo Enterprises, Inc.: *See—*
  - D'Ambro, Dominic; and Giangiulio, Clayton E., B1 4,569,280, Cl. 99-538.000.
- Leybold Aktiengesellschaft: *See—*
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- Ternlind, Rolf, to Infrarodteknik AB. Infrared radiation element. 371,429, Cl. D23-386.000.
- Thomas Consumer Electronics (Societe Anonyme): *See*—
  - Starck, Philippe, 371,364, Cl. D14-195.000.
- Thomas, Lori R.: *See*—
  - Crausby, Howard F.; and Thomas, Lori R., 371,413, Cl. D21-234.000.
- Thomasville Furniture Industries, Inc.: *See*—
  - Walters, Guy A., III; and Tobin, Avis E., Jr., 371,260, Cl. D6-480.000.
  - Walters, Guy A., III; and Tobin, Avis E., Jr., 371,261, Cl. D6-480.000.
- Thompson, Lynn C. Folding knife. 371,288, Cl. D8-99.000.
- Tigert, Donald J.; and Bryant, Donald F., to Aquatank, Inc. Aquarium air pump. 371,424, Cl. D23-210.000.
- Tobin, Avis E., Jr.: *See*—
  - Walters, Guy A., III; and Tobin, Avis E., Jr., 371,260, Cl. D6-480.000.
  - Walters, Guy A., III; and Tobin, Avis E., Jr., 371,261, Cl. D6-480.000.
- Tokheim Corporation: *See*—
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- Tokuda, Hiroyuki: *See*—
  - Taneya, Yoichi; Ishinaga, Hiroyuki; Tokuda, Hiroyuki; and Sekine, Tetsuya, 371,389, Cl. D18-56.000.
- Tomita, Akemi; Seymour, Richard W.; and Powell, David H., to Casio Computer Co., Ltd. Wrist watch. 371,307, Cl. D10-38.000.
- Traber, Arthur; and Traber, Robert S., to Caliputer, Inc. Combination dressing hook and shoe horn. 371,231, Cl. D2-642.000.
- Traber, Robert S.: *See*—
  - Traber, Arthur; and Traber, Robert S., 371,231, Cl. D2-642.000.
- Trasmundi, Frederic F.: *See*—
  - Mahan, Laura A.; Cowan, Neal T.; Johnson, John I.; and Trasmundi, Frederic F., 371,360, Cl. D14-147.000.
- Trust International, Inc.: *See*—
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- Tulip Corporation: *See*—
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- Uehara, Hiroyuki: *See*—
  - Nakata, Yoichi; Uehara, Hiroyuki; Sato, Ryotaro; and Kajinaga, Michiyo, 371,441, Cl. D24-194.000.
- Universal Furniture Industries, Inc.: *See*—
  - Paus, Michael J., 371,256, Cl. D6-438.000.
  - Paus, Michael J., 371,257, Cl. D6-445.000.
- Utsuki, Toshiyuki; Yamamoto, Takashi; Kumagai, Kenta; Yonezawa, Yutaka; Yamaguchi, Tadahiro; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, to Hitachi, Ltd. Computer. 371,347, Cl. D14-102.000.
- VanDaele, John J.: *See*—
  - Harris, David J.; Claussen, Thomas L.; and VanDaele, John J., 371,427, Cl. D23-227.000.
- VanDeusen, Gary, to Shane Group, Inc., The. Playground surfacing border panel. 371,446, Cl. D25-113.000.
- Vatakar, Synnøve: *See*—
  - Nielsen, Lotte M.; and Vatakar, Synnøve, 371,401, Cl. D21-108.000.
- Velinsky, Ira, to Wano-Tech Corporation. Housing for a radio transmitter. 371,361, Cl. D14-155.000.
- Vorre, Birthe G., to INTERLEGO AG. Toy building element. 371,403, Cl. D21-108.000.
- Vtech Communications, Ltd.: *See*—
  - Ka Hung, Joseph C., 371,359, Cl. D14-147.000.
- Wadsworth, Ronald; and Haner, Linda E., to Calmar Inc. Dispensing head. 371,295, Cl. D9-448.000.
- Walters, Guy A., III; and Tobin, Avis E., Jr., to Thomasville Furniture Industries, Inc. Table. 371,260, Cl. D6-480.000.
- Walters, Guy A., III; and Tobin, Avis E., Jr., to Thomasville Furniture Industries, Inc. Table. 371,261, Cl. D6-480.000.
- Wang, James: *See*—
  - Hung, Jerry; and Wang, James, 371,341, Cl. D13-139.000.
- Wano-Tech Corporation: *See*—
  - Velinsky, Ira, 371,361, Cl. D14-155.000.
- Ward, Andrea R. Infant's portable play and rest mat. 371,266, Cl. D6-596.000.
- Webb, James. Laser bubble level. 371,309, Cl. D10-69.000.
- Webster, Douglas S. Football player rocker. 371,397, Cl. D21-68.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,318, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,319, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,320, Cl. D11-164.000.

- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,321, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Trust International, Inc.; and Southpac Trust International, Inc. Flower pot cover. 371,322, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,323, Cl. D11-164.000.
- Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 371,324, Cl. D11-164.000.
- Weshler, Benjamin S., to Display Systems, Inc. Display frame. 371,244, Cl. D6-314.000.
- Westimayer, David A.; Crookes, William E.; Nickles, Daniel R.; and Mantilla, Alberto J., to Deere & Company. Outer surface of vehicle hood. 371,372, Cl. D15-31.000.
- Wickman, John A.: *See*—
  - Wingate, Barry; Peeples, Kathleen G.; Wickman, John A.; Kenaghan, Peter F.; and Mars, Frank E., 371,392, Cl. D20-1.000.
- Williams, David G., to R. P. Scherer Corporation. Softgel capsule. 371,437, Cl. D24-104.000.
- Williams, David G.: *See*—
  - Schurig, Gregory A.; and Williams, David G., 371,438, Cl. D24-104.000.
- Williams, George. Decorative lattice. 371,447, Cl. D25-152.000.
- Williams, Timothy. Spray shield. 371,337, Cl. D12-213.000.
- Wilsdorf, Gerd, to Bosch-Siemens Hausgeraete GmbH. Electric range. 371,272, Cl. D7-340.000.
- Wilsdorf, Gerd, to Bosch-Siemens Hausgeraete GmbH. Electric range. 371,273, Cl. D7-340.000.
- Wilson, James A.: *See*—
  - Nelson, Bruce E.; Wilson, James A.; Ronnander, Curtis D.; Humlicek, Larry D.; Preston, James R.; Biegler, Robert M.; and Sorensen, Steven W., 371,380, Cl. D16-247.000.
- Wilson, Richard A. Step for boat trailer. 371,336, Cl. D12-203.000.
- Wingate, Barry; Peeples, Kathleen G.; Wickman, John A.; Kenaghan, Peter F.; and Mars, Frank E., to Mars GB Limited. Module for a vending display machine. 371,392, Cl. D20-1.000.
- Woock, Allen W. Calendar holder. 371,387, Cl. D19-20.000.
- Wortham, Samuel T.: *See*—
  - Bormann, Thomas J.; Wortham, Samuel T.; and Matkovich, Vlado I., 371,439, Cl. D24-130.000.
- Wright, Jack R. Mobile display pavilion. 371,330, Cl. D12-97.000.
- Wunderman, Severin S., to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd). Watch. 371,308, Cl. D10-39.000.
- Yamada, Yoshinori: *See*—
  - Yamagishi, Yoshinobu; and Yamada, Yoshinori, 371,358, Cl. D14-136.000.
- Yamagishi, Yoshinobu; and Yamada, Yoshinori, to Sony Corporation. Video disc player. 371,358, Cl. D14-136.000.
- Yamaguchi, Tadahiro: *See*—
  - Utsuki, Toshiyuki; Yamamoto, Takashi; Kumagai, Kenta; Yonezawa, Yutaka; Yamaguchi, Tadahiro; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, 371,347, Cl. D14-102.000.
- Yamaha Corporation: *See*—
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- Yamamoto, Takashi: *See*—
  - Utsuki, Toshiyuki; Yamamoto, Takashi; Kumagai, Kenta; Yonezawa, Yutaka; Yamaguchi, Tadahiro; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, 371,347, Cl. D14-102.000.
- YKK Corporation: *See*—
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  - Kawamura, Hitomi, 371,327, Cl. D11-221.000.
- Yonezawa, Yutaka: *See*—
  - Utsuki, Toshiyuki; Yamamoto, Takashi; Kumagai, Kenta; Yonezawa, Yutaka; Yamaguchi, Tadahiro; Tsukaguchi, Tamotsu; Koizumi, Shigeru; and Kishida, Fumio, 371,347, Cl. D14-102.000.
- Yurman, David, to Yurman Design Inc. Watch bracelet. 371,314, Cl. D11-3.000.
- Yurman Design Inc.: *See*—
  - Yurman, David, 371,314, Cl. D11-3.000.

LIST OF PLANT PATENTEES

Dura Flor S.A.: *See*—
  Skotak, Chester, Jr., 9,597, Cl. Plt.-88.800.
  Skotak, Chester, Jr., 9,598, Cl. Plt.-88.800.
  Skotak, Chester, Jr., 9,599, Cl. Plt.-88.800.
Skotak, Chester, Jr., to Dura Flor S.A. Neoregelia plant named 'Ultima'. 9,597, Cl. Plt.-88.800.
Skotak, Chester, Jr., to Dura Flor S.A. Neoregelia plant named 'Sheba'. 9,598, Cl. Plt.-88.800.
Skotak, Chester, Jr., to Dura Flor S.A. Neoregelia plant named 'Morado'. 9,599, Cl. Plt.-88.800.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
2nd DAY OF JULY, 1996

Akers, Charles K.: *See*—
  Albrechcinski, Thomas M.; and Akers, Charles K., H1,562, Cl. 422-98.000.
Albrechcinski, Thomas M.; and Akers, Charles K., to United States of America, Army. Heat sensitive liquid chemical agent and pesticide detector and method of using. H1,562, Cl. 422-98.000.
Blanco, Ruth J.: *See*—
  Prieto, Nelson E.; Carty, JanElsa E.; Blanco, Ruth J.; and Schmidt, William W., H1,559, Cl. 510-235.000.
Blyth, David A.: *See*—
  Snyder, A. Peter; Miller, Maryalice; and Blyth, David A., H1,563, Cl. 435-7.320.
Brodof, Terry A.; Bryant, Ronald O.; and Davis, Harold W. Superabsorbent, continuous filament web. H1,565, Cl. 604-368.000.
Bryant, Ronald O.: *See*—
  Brodof, Terry A.; Bryant, Ronald O.; and Davis, Harold W., H1,565, Cl. 604-368.000.
Carstens, Jerry E.: *See*—
  Goulait, David J. K.; and Carstens, Jerry E., H1,558, Cl. 156-210.000.
Carty, JanElsa E.: *See*—
  Prieto, Nelson E.; Carty, JanElsa E.; Blanco, Ruth J.; and Schmidt, William W., H1,559, Cl. 510-235.000.
Chrysler Corporation: *See*—
  Kargilis, John S., H1,555, Cl. 73-116.000.
  Noel, Phares A., H1,556, Cl. 104-172.400.
Davis, Harold W.: *See*—
  Brodof, Terry A.; Bryant, Ronald O.; and Davis, Harold W., H1,565, Cl. 604-368.000.
Exxon Production Research Company: *See*—
  Thompson, Artur H., H1,561, Cl. 367-188.000.
Feldmann, Robert J.: *See*—
  Gill, Robert A.; and Feldmann, Robert J., H1,560, Cl. 342-385.000.
Fessenden, Kali K.: *See*—
  Joubert, Carl A.; Fessenden, Kali K.; and Myers, Karen V., H1,557, Cl. 128-782.000.
Gill, Robert A.; and Feldmann, Robert J., to United States of America, Air Force. Crash site locator beacon. H1,560, Cl. 342-385.000.
Goulait, David J. K.; and Carstens, Jerry E. Method for manufacturing and an absorbent article having elastically extensible portions. H1,558, Cl. 156-210.000.
Horton, Donald W., to United States of America, Army. Magnell hardness tester. H1,554, Cl. 73-82.000.
Joubert, Carl A.; Fessenden, Kali K.; and Myers, Karen V. Swallowing rehabilitation. H1,557, Cl. 128-782.000.
Kargilis, John S., to Chrysler Corporation. Piston top dead center locating tool. H1,555, Cl. 73-116.000.
Miller, Maryalice: *See*—
  Snyder, A. Peter; Miller, Maryalice; and Blyth, David A., H1,563, Cl. 435-7.320.
Myers, Karen V.: *See*—
  Joubert, Carl A.; Fessenden, Kali K.; and Myers, Karen V., H1,557, Cl. 128-782.000.
Noel, Phares A., to Chrysler Corporation. Invented power & free conveyor carrier trolley wheel detection device. H1,556, Cl. 104-172.400.
Pedersen, Michael J. Clean diesel fuel and methods of producing clean diesel fuel. H1,553, Cl. 44-268.000.
Prieto, Nelson E.; Carty, JanElsa E.; Blanco, Ruth J.; and Schmidt, William W., to Shell Oil Company. Secondary alkyl sulfate-containing light duty liquid detergent compositions. H1,559, Cl. 510-235.000.
Schmidt, William W.: *See*—
  Prieto, Nelson E.; Carty, JanElsa E.; Blanco, Ruth J.; and Schmidt, William W., H1,559, Cl. 510-235.000.
Shell Oil Company: *See*—
  Prieto, Nelson E.; Carty, JanElsa E.; Blanco, Ruth J.; and Schmidt, William W., H1,559, Cl. 510-235.000.
  St. Clair, David J., H1,564, Cl. 525-98.000.
Snyder, A. Peter; Miller, Maryalice; and Blyth, David A., to United States of America, Army. Chemical agent monitor for immunoassay detection. H1,563, Cl. 435-7.320.
St. Clair, David J., to Shell Oil Company. Functionalized block copolymers cured with isocyanates. H1,564, Cl. 525-98.000.
Thompson, Artur H., to Exxon Production Research Company. Method and apparatus for detection of seismic and electromagnetic waves. H1,561, Cl. 367-188.000.
United States of America
  Air Force: *See*—
    Gill, Robert A.; and Feldmann, Robert J., H1,560, Cl. 342-385.000.
  Army: *See*—
    Albrechcinski, Thomas M.; and Akers, Charles K., H1,562, Cl. 422-98.000.
    Horton, Donald W., H1,554, Cl. 73-82.000.
    Snyder, A. Peter; Miller, Maryalice; and Blyth, David A., H1,563, Cl. 435-7.320.

CLASSIFICATION OF PATENTS

ISSUED JULY 2, 1996

NOTE—First number, class; second number, subclass; third number, patent number

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1 E	5,531,093
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CLASS 123

41.12	5,531,190
41.15	5,531,191
90.12	5,531,192
90.15	5,531,193
193.5	5,531,194
193.6	5,531,195
195 C	5,531,196
243	5,531,197
294	5,531,198
297	5,531,199
417	5,531,200
425	5,531,201
456	5,531,202
481	5,531,203
502	5,531,204
568	5,531,205
572	5,531,207
596	5,531,206
673	5,531,208

CLASS 124

20.1	5,531,209
66	5,531,210
86	5,531,211

CLASS 126

104 R	5,531,212
193	5,531,213
361	5,531,214
578	5,531,215
599	5,531,216
624	5,531,217

CLASS 128

203.12	5,531,218
	5,531,219
204.29	5,531,220
205.18	5,531,221
653.1	5,531,227
	5,531,228
653.2	5,531,223
660.07	5,531,224
719	5,531,225
774	5,531,226
842	5,531,230
846	5,531,231
866	5,531,229
898	5,531,232

CLASS 131

69	5,531,233
84.1	5,531,234
332	5,531,235

CLASS 132

251	Re.35,287

CLASS 134

182	5,531,236

CLASS 135

28	5,531,237
66	5,531,238
88.1	5,531,239

CLASS 137

15	5,531,240
188	5,531,241
255	5,531,242
315	5,531,243
	5,531,244
341	5,531,245
355.21	5,531,246
447	5,531,247
625.46	5,531,248
884	5,531,249

CLASS 138

94	5,531,250

CLASS 139

383 AA	5,531,251

CLASS 141

67	5,531,252
90	5,531,253
113	5,531,254
285	5,531,255

CLASS 148

23	5,531,838
233	5,531,836
265	5,531,841
280	5,531,837
330	5,531,839
552	5,531,840
654	5,531,842

CLASS 149

19.3	5,531,844
46	5,531,843
109.6	5,531,845

CLASS 152

209 R	5,531,256

CLASS 156

64	5,531,846
73.1	5,531,847
77	5,531,848
78	5,531,849
161	5,531,850
180	5,531,851
227	5,531,852
234	5,531,854
252	5,531,855
290	5,531,856
345	5,531,857
521	5,531,853
556	5,531,858
584	5,531,859
625.1	5,531,860
636.1	5,531,861
643.1	5,531,862

CLASS 160

168.1	5,531,257
376	5,531,258

CLASS 162

5	5,531,863
199	5,531,864

CLASS 164

54	5,531,259
97	5,531,260
113	5,531,261
149	5,531,262
404	5,531,263

CLASS 165

43	5,531,264
110	5,531,265
115	5,531,266
124	5,531,267
153	5,531,268
167	5,531,269

CLASS 166

53	5,531,270
117.6	5,531,271
277	5,531,272
278	5,531,273
280	5,531,274

CLASS 169

16	5,531,275

CLASS 172

662	5,531,276
730	5,531,277

CLASS 173

176	5,531,278
178	5,531,279

CLASS 174

35 GC	5,532,428
35 R	5,532,427
36	5,532,429
52.3	5,532,430
	5,532,431
60	5,532,432
84 C	5,532,433
110 R	5,532,434
135	5,532,435
151	5,532,436
356 C	5,532,426

CLASS 175

230	5,531,280
431	5,531,281

CLASS 180

9.1	5,531,282
53.1	5,531,283
65.1	5,531,284
65.2	5,531,285
197	5,531,288
227	5,531,289
271	5,531,290
297	5,531,291
417	5,531,287
441	5,531,286

CLASS 181

150	5,532,437
155	5,532,438
224	5,532,439
289	5,532,440

CLASS 182

3	5,531,292

CLASS 186

59	5,531,293

CLASS 187

292	5,531,294

CLASS 188

21	5,531,295
24.21	5,531,296
65.1	5,531,297
78	5,531,298
322.17	5,531,299

CLASS 190

115	5,531,300

CLASS 191

55	5,531,301

CLASS 192

3.3	5,531,302
4 A	5,531,303
4 R	5,531,304
13 R	5,531,306
53.332	5,531,305
56.4	5,531,307
70.25	5,531,308

CLASS 194

202	5,531,309

CLASS 198

395	5,531,310
448	5,531,311
450	5,531,312
689.1	5,531,313
779	5,531,315
844.2	5,531,316

CLASS 200

16 A	5,532,441
16 C	5,532,442
275.000	5,532,443
524.000	5,532,444

CLASS 202

185.2.	5,531,866

CLASS 203

86	5,531,867

CLASS 204

196	5,531,873
224 M	5,531,874
290 R	5,531,875
298.12	5,531,876
298.19	5,531,877
298.41	B1 5,037,522
415	5,531,878
427	5,531,879
478	5,531,880
486	5,531,872
507	5,531,881

CLASS 205

44	5,531,868
602	5,531,882
626	5,531,883
688	5,531,871
751	5,531,865
778	5,531,870

CLASS 206

162	5,531,319
232	5,531,321
308.1	5,531,320
308.3	5,531,322
366	5,531,323
449	5,531,324
494	5,531,325
509	5,531,326
600	5,531,327
706	5,531,328
722	5,531,329
738	5,531,318

CLASS 208

150	5,531,884
210	5,531,885
251 H	5,531,886

CLASS 209

167	5,531,330
580	5,531,331

CLASS 210

135	5,531,887
162	5,531,888
167	5,531,889
242.4	5,531,890
251	5,531,891
493.1	5,531,892
500.35	5,531,893
605	5,531,894
	5,531,896
606	5,531,897
	5,531,898
610	5,531,895
638	5,531,899
651	5,531,900
668	5,531,901
673	5,531,902
683	5,531,903
703	5,531,904
709	5,531,905
712	5,531,906
727	5,531,907
760	5,531,908

CLASS 211

13	5,531,332
	5,531,333
119	5,531,334
124	5,531,335
183	5,531,336

CLASS 213

211	5,531,337

CLASS 214

2	5,532,214

CLASS 215

11.1	5,531,338
12.2	5,531,339
254	5,531,340
308	5,531,341

CLASS 216

7	5,531,342
11	5,531,343

CLASS 219

61	5,532,445
121.25	5,532,446
121.43	5,532,447
	5,532,448
121.59	5,532,449
121.63	5,532,450
121.64	5,532,451
124.34	5,532,452
127	5,532,453
137 R	5,532,454
245	5,532,455
400	5,532,456
411	5,532,457
464	5,532,458
535	5,532,459
621	5,532,460
	5,532,461
695	5,532,462

CLASS 220

3.8	5,531,345
254	5,531,346
256	5,531,347
264	5,531,348
339	5,531,349
421	5,531,350
571.1	5,531,351
675	5,531,352
729	5,531,353
731	5,531,354

CLASS 221

191	5,531,355
281	5,531,356

CLASS 222

1	5,531,344
	5,531,357
	B1 5,148,945
107	5,531,358
153.11	5,531,359
185.1	5,531,360
198	5,531,361
390	5,531,362
494	5,531,363

CLASS 224

153	5,531,366
329.000	5,531,367
413	5,531,364
551	5,531,368
576	5,531,365

CLASS 228

109	5,531,369
173.4	5,531,370
175	5,531,371
220	5,531,372

CLASS 229

108	5,531,373
109	5,531,374
137	5,531,375
215	5,531,376

CLASS 235

379	5,532,464
380	5,532,463
383	5,532,465
441	5,532,466
472	5,532,467
	5,532,468
	5,532,469
491	5,532,470

CLASS 236

49.3	5,531,377

CLASS 237

67	5,531,378

CLASS 238

1	5,531,379

CLASS 239

1	5,531,380
99	5,531,381
124	5,531,382
251	5,531,383
708	5,531,384

CLASS 241

21	5,531,385
36	5,531,386
46.013	5,531,387
48	5,531,388
169.1	5,531,389

CLASS 242

35.60 R	5,531,391
131	5,531,392
160.400	5,531,393
345.2	5,531,394
381.6	5,531,395
441.200	5,531,390
526.300	5,531,396
532.1	5,531,397
533.7	5,531,398
608.6	5,531,399

CLASS 244

2	5,531,400
31	5,531,401
75 R	5,531,402
118.1	5,531,403
118.6	5,531,404
134 B	5,531,405
208	5,531,406
219	5,531,407

CLASS 246

257	5,531,408
458	5,531,409

CLASS 248

49	5,531,410
65	5,531,411
123.2	5,531,412
188.2	5,531,413
201	5,531,414
220.31	5,531,415
222.51	5,531,416
303	5,531,417
317	5,531,418
519	5,531,419

CLASS 250

214 A	5,532,471
214 B	5,532,472
214 PR	5,532,473
214 R	5,532,474
214 VT	5,532,475
221	5,532,476
225	5,532,477
227.24	5,532,478
231.11	5,532,479
235	5,532,480
251	5,531,420
269.4	5,532,481
	5,532,482
288	5,532,483
332	5,532,484
336.2	5,532,485
339.12	5,532,487
341.3	5,532,488
363.03	5,532,489
363.04	5,532,490
370.09	5,532,491
390.05	5,532,492
458.1	5,532,493
491.1	5,532,494
492.21	5,532,495
492.22	5,532,496
548	5,532,497
551	5,532,498
559.22	5,532,499
575	B1 5,077,480

CLASS 251

65	5,531,421
282	5,531,422

CLASS 252

62.53	5,531,913
62.54	5,531,914
62.56	5,531,922
79.1	5,532,094
182.1	5,531,920
182.14	5,531,923
182.18	5,531,924
299.01	5,531,925
301.4 F	5,531,926
	5,531,928
321	5,531,929
363.5	5,531,930
387	5,531,931
390	5,531,934
394	5,531,937
518	5,531,932
586	5,531,935
587	5,531,936

CLASS 256

22	5,531,427

CLASS 257

201	5,532,486
207	5,532,500
208	5,532,501
213	5,532,502
233	5,532,503
252	5,532,504
269	5,532,505
276	5,532,506
280	5,532,507
336	5,532,508
618	5,532,509
	5,532,510
627	5,532,511
686	5,532,512
703	5,532,513
728	5,532,514
751	5,532,515
752	5,532,516
773	5,532,517
774	5,532,518
777	5,532,519
797	5,532,520

CLASS 264

1.700	5,531,940
3.4	5,531,941
5	5,531,942
29.1	5,531,943
52	5,531,944
60	5,531,945
102	5,531,946
	5,531,947
122	5,531,948
135	5,531,949
	5,531,950
143	5,531,951
171.260	5,531,952
296	5,531,953
496	5,531,954

CLASS 266

44	5,531,423
156	5,531,424
208	5,531,425

CLASS 267

140.12	5,531,426

CLASS 269

172	5,531,428

CLASS 270

58.02	5,531,430
58.11	5,531,429

CLASS 271

4.01	5,531,431
10.01	5,531,432
	5,531,433
258.03	5,531,435
263	5,531,434
275	5,531,436
292	5,531,437

CLASS 273

26 E	5,531,438
128 R	5,531,442
249	5,531,447
292	5,531,448
348	5,531,449
	5,531,450
371	5,531,451
411	5,531,452
440	5,531,453

CLASS 277

26	5,531,454
34	5,531,455
38	5,531,456
53	5,531,457
96.1	5,531,458
178	5,531,459
206 R	5,531,460

CLASS 279

62	5,531,461

CLASS 280

7.13	5,531,462
47.2	5,531,463
47.35	5,531,464
63	5,531,465
74 D	5,531,474
91.1	5,531,466
149.2	5,531,467
463	5,531,468
728.3	5,531,469
730.2	5,531,470
732	5,531,471
735	5,531,472
737	5,531,473
741	5,531,475
743.1	5,531,476
	5,531,477
762	5,531,478
775	5,531,317
806	5,531,479
818	5,531,480

CLASS 281

44	5,531,481

CLASS 283

67	5,531,482

CLASS 285

93	5,531,483
156	5,531,484
230	5,531,485

CLASS 292

32	5,531,493
63	5,531,486
146	5,531,487
216	5,531,488
225	5,531,489
262	5,531,490
293	5,531,491
335	5,531,492

CLASS 294

1.1	5,531,494
31.2	5,531,495
87.2	Re.35,288

CLASS 296

96.21	5,531,496
100	5,531,497
146.4	5,531,498
146.7	5,531,499
152	5,531,500
221	5,531,501

CLASS 297

131	5,531,502
341	5,531,503
362	5,531,504
408	5,531,505
463.1	5,531,506

CLASS 299

13	5,531,507

CLASS 301

37.23	5,531,508
110.5	5,531,510
	5,531,511

CLASS 303

9.61	5,531,512
84.2	5,531,513
114.1	5,531,509
116.1	5,531,514
143	5,531,515

CLASS 307

10.2	5,532,521
10.5	5,532,522
64	5,532,523
	5,532,524
	5,532,525
104	5,532,526
118	5,532,527
125	5,532,528
129	5,532,529

CLASS 310

49 R	5,532,531
52	5,532,532
68 B	5,532,533
89	5,532,534
90	5,532,535
239	5,532,536
313 A	5,532,537
313 R	5,532,538
316	5,532,539
323	5,532,540
325	5,532,541
348	5,532,542

CLASS 312

9.46	5,531,516
111	5,531,517

CLASS 313

25	5,532,543
310	5,532,544
407	5,532,545
	5,532,546
414	5,532,547
422	5,532,548
489	5,532,549
500	5,532,550
533	5,532,551
623	5,532,552

CLASS 315

169.3	5,532,553
241 P	5,532,555
362	5,532,557
382.1	5,532,558

CLASS 318

254	5,532,559
266	5,532,560
439	5,532,561
	5,532,562
440	5,532,563
551.000	5,532,564
610	5,532,565
650	5,532,566
701.000	5,532,567
757	5,532,568
802	5,532,569
809	5,532,570
	5,532,571

CLASS 320

1	5,532,572

CLASS 322

22	5,532,573
37	5,532,574

CLASS 323

211	5,532,575
274	5,532,576
282	5,532,577
313	5,532,578
314	5,532,579
354	5,532,580

CLASS 324

115	5,532,581
130	5,532,582
202	5,532,583
	5,532,584
207.22	5,532,585
212	5,532,586
220	5,532,587
226	5,532,588
228	5,532,589
239	5,532,590
242	5,532,591
248	5,532,592
306	5,532,593
307	5,532,594
309	5,532,595
	5,532,596
319	5,532,597
326	5,532,598
464	5,532,599
537	5,532,600
539	5,532,601
605	5,532,602
628	5,532,603
636	5,532,604
671	5,532,605
674	5,532,606
750	5,532,607
754	5,532,608
	5,532,609
757	5,532,610
758	5,532,611
760	5,532,612
761	5,532,613
763	5,532,614
770	5,532,615

CLASS 326

30	5,532,616
32	5,532,617
63	5,532,618
75	5,532,619
81	5,532,620
86	5,532,621
95	5,532,622
98	5,532,625

CLASS 327

51	5,532,623
53	5,532,626
74	5,532,627
77	5,532,628
94	5,532,629
95	5,532,624
108	5,532,630
110	5,532,631
141	5,532,632
174	5,532,633
216	5,532,634
310	5,532,635
359	5,532,637
368	5,532,638
376	5,532,639
537	5,532,640
543	5,532,636
545	5,532,676

CLASS 329

311	5,532,641

CLASS 330

15	5,532,642
254	5,532,644
265	5,532,645
279	5,532,646
284	5,532,647
289	5,532,648
297	5,532,649
300	5,532,650

CLASS 331

96	5,532,651
116 FE	5,532,652
143	5,532,653

CLASS 332

102	5,532,654

CLASS 333

1	5,532,655
125	5,532,661
185	5,532,656
	5,532,662
243	5,532,657
246	5,532,643
	5,532,658
260	5,532,659

CLASS 335

14	5,532,660
216	5,532,663
	5,532,664
296	5,532,665
306	5,532,666

CLASS 336

177	5,532,667

CLASS 337

168	5,532,668

CLASS 338

184	5,532,669

CLASS 340

286.01	5,532,677
429	5,532,670
438	5,532,671
	5,532,678
440	5,532,672
450.2	5,532,673
479	5,532,674
515	5,532,675
539	5,532,679
567	5,532,680
573	5,532,681
825.03	5,532,683
825.06	5,532,682
825.25	5,532,684
825.44	5,532,688
825.46	5,532,685
825.54	5,532,686
	5,532,692
870.33	5,532,687
928	5,532,689
989	5,532,690

CLASS 341

22	5,532,691
51	5,532,693
67	5,532,694
173	5,532,695

CLASS 342

14	5,532,696
104	5,532,697
120	5,532,698
195	5,532,699
378	5,532,700
387	5,532,701
463	5,532,702

CLASS 343

702	5,532,703
703	5,532,704
718	5,532,705
778	5,532,706
793	5,532,707
795	5,532,708
819	5,532,709

CLASS 345

55	5,532,711
87	5,532,712
97	5,532,713
114	5,532,714
123	5,532,715
132	5,532,716
202	5,532,717
211	5,532,718
	5,532,719

CLASS 347

7	5,532,720
112	5,532,721
153	5,532,722
209	5,532,723
213	5,532,724
221	5,532,725
243	5,532,726
250	5,532,731
253	5,532,727
257	5,532,728
	5,532,729
259	5,532,730

CLASS 348

1	5,532,732
6	5,532,733
8	5,532,734
13	5,532,735
20	5,532,736
36	5,532,737
61	5,532,738
87	5,532,739
231	5,532,740
239	5,532,741
264	5,532,742
297	5,532,743
390	5,532,744
405	5,532,745
415	5,532,746
416	5,532,747
432	5,532,748
449	5,532,749
452	5,532,750
	5,532,751
468	5,532,752
569	5,532,753
	5,532,754
614	5,532,755
630	5,532,756
646	5,532,757
694	5,532,758
729	5,532,760
731	5,532,761
738	5,532,762
744	5,532,763
745	5,532,764
807	5,532,765

CLASS 351

63	5,532,766
118	5,532,767
160 R	5,532,768
205	5,532,769
	5,532,770
211	5,532,771
	5,532,772

CLASS 353

26 A	5,532,773

CLASS 354

106	5,532,774
	5,532,775
	5,532,776
114	5,532,777
221	5,532,778
319	5,532,779
324	5,532,780
402	5,532,781
	5,532,782
	5,532,783
410	5,532,784
430	5,532,785

CLASS 355

22	5,532,786
71	5,532,787
77	5,532,788
202	5,532,789
203	5,532,790
206	5,532,791
	5,532,792
207	5,532,793
208	5,532,794
210	5,532,795
	5,532,796
213	5,532,797
221	5,532,798
245	5,532,799
	5,532,800
246	5,532,801
	5,532,802
251	5,532,803
	5,532,804
256	5,532,805
285	5,532,806
289	5,532,807
290	5,532,808
308	5,532,809
315	5,532,810
316	5,532,811
327	5,532,812

CLASS 356

5.01	5,532,813
28.5	5,532,814
139.03	5,532,815
139.09	5,532,816
318	5,532,817
333	5,532,818
356	5,532,819
359	5,532,821
363	5,532,822
364	5,532,823
375	5,532,824

CLASS 358

296	5,532,825
	5,532,826
298	5,532,827
	5,532,828
310	5,532,820
311	B1 5,051,835
315	5,532,829
335	5,532,830
	5,532,831
	5,532,832
	5,532,833
	5,532,834
	5,532,835
	5,532,836
336	5,532,837
400	5,532,838
401	5,532,839
404	5,532,840
408	5,532,841
453	5,532,843
468	5,532,844
474	5,532,845
497	5,532,846
498	5,532,847
504	5,532,848
534	5,532,849

CLASS 359

59	5,532,850
73	5,532,851
	5,532,852
87	5,532,853
93	5,532,854
117	5,532,855
118	5,532,856
154	5,532,857
159	5,532,858
	5,532,860
161	5,532,861
	5,532,862
176	5,532,863
177	5,532,864
189	5,532,865
216	5,532,866
249	5,532,859
275	5,532,869
329	5,532,867
332	5,532,868
341	5,532,870
359	5,532,871
384	5,532,872
388	5,532,873
394	5,532,874
399	5,532,875
604	5,532,876
616	5,532,877
657	5,532,878
661	5,532,879
665	5,532,880
684	5,532,881
819	5,532,882
825	5,532,883
833	5,532,884

CLASS 360

46	5,532,885
51	5,532,886
64	5,532,887
92	5,532,888
97.01	5,532,889
103	5,532,890
106	5,532,891
113	5,532,892
133	5,532,893

CLASS 361

18	5,532,894
35	5,532,895
56	5,532,896
118	5,532,897
119	5,532,898
126	5,532,899
127	5,532,900
212	5,532,901
230	5,532,902
234	5,532,903
680	5,532,904
723	5,532,905
749	5,532,906
775	5,532,907
813	5,532,910

CLASS 362

30	5,532,908
61	5,532,909
220	5,532,911
352	5,532,912

CLASS 363

25	5,532,913
50	5,532,914
60	5,532,915
62	5,532,916
67	5,532,917
89	5,532,918
124	5,532,919

CLASS 364

15.2	5,532,922
138	5,532,923
167.01	5,532,924
177	5,532,925
178	5,532,926
406	5,532,928
419.1	5,532,920
424.03	5,532,927
424.05	5,532,921
424.07	B1 4,918,608
431.05	5,532,930
431.07	5,532,929
474.24	5,532,933
474.3	5,532,932
478.06	5,532,931
488	5,532,934
492	5,532,935
514 A	5,532,936
514 C	5,532,937
	5,532,939
514 R	5,532,940
552	5,532,941
555	5,532,942
555.000	5,532,943
602	5,532,944
707	5,532,945
708.1	B1 5,305,244
710.14	5,532,946
715.01	5,532,947
715.06	5,532,948
715.08	5,532,949
724.17	5,532,951
724.19	5,532,950
736	5,532,938

CLASS 365

52	5,532,954
108	5,532,952
145	5,532,953
149	5,532,955
	5,532,956
154	5,532,957
	5,532,958
185.29	5,532,960
185.3	5,532,959
189.05	5,532,961
189.09	5,532,964
200	5,532,965
	5,532,966
201	5,532,962
	5,532,963
206	5,532,967
222	5,532,968
226	5,532,969
230.05	5,532,970
230.06	5,532,971
233	5,532,972

CLASS 366

68	5,531,518
139	5,531,519

CLASS 367

13	5,532,973
	5,532,974
16	5,532,975
38	5,532,976
53	5,532,977
75	5,532,978
106	5,532,979
139	5,532,980
149	5,532,981

CLASS 368

64	5,532,982
113	5,532,983

CLASS 369

13	5,532,984
34	5,532,985
36	5,532,986
44.150	5,532,989
44.240	5,532,987
44.28	5,532,988
44.320	5,532,990
44.350	5,532,991
47	5,532,992
75.1	5,532,993
77.2	5,532,994
	5,532,995
	5,532,996
112	5,532,997
116	5,532,998
120	5,532,999
270	5,533,000
275.2	5,533,001
275.3	5,533,002
275.4	5,533,003

CLASS 370

11	5,533,004
16	5,533,005
16.1	5,533,006
17	5,533,008
	5,533,009
17.000	5,533,007
18	5,533,010
	5,533,011
	5,533,012
	5,533,013
	5,533,014
31	5,533,015
54	5,533,016
60	5,533,017
60.1	5,533,018
	5,533,019
	5,533,020
	5,533,021
68.1	5,533,022
69.1	5,533,023
84	5,533,024
85.2	5,533,025
94.1	5,533,026
	5,533,029
95.3	5,533,028
120	5,533,030
195.1	5,533,027

CLASS 371

21.1	5,533,031
22.5	5,533,032
30	5,533,033
32	5,533,034
38.1	5,533,035
40.1	5,533,036
62	5,533,037
67.1	5,533,039
68.2	5,533,038

CLASS 372

25	5,533,040
50	5,533,041
	5,533,042

CLASS 373

9	5,533,043
104	5,533,044

CLASS 375

200	5,533,045
	5,533,046
208	5,533,047
222	5,533,048
	5,533,049
229	5,533,050
240	5,533,051
244	5,533,052
257	5,533,053
286	5,533,054
	5,533,055
	5,533,056
295	5,533,057
317	5,533,058
327	5,533,059
332	5,533,060
334	5,533,061
	5,533,062
340	5,533,063
	5,533,064
341	5,533,065
	5,533,066
	5,533,067
344	5,533,068
	5,533,069
346	5,533,070
	5,533,071
356	5,532,556
371	5,533,072
	5,533,073

CLASS 376

258	5,533,074
272	5,533,075
327	5,533,076
434	5,533,077
438	5,533,078

CLASS 377

6	5,533,079

CLASS 378

5	5,533,080
15	5,533,081
20	5,533,082
44	5,533,083
54	5,533,084
95	5,533,085
98.2	5,533,086
98.3	5,533,087
98.4	5,533,088
150	5,533,089
197	5,533,090
210	5,533,091

CLASS 379

21	5,533,092
	5,533,093
57	5,533,094
	5,533,095
58	5,533,096
	5,533,097
	5,533,098

5,533,099
61 5,533,101
67 5,533,100
5,533,102
69 5,533,103
70 5,533,104
93 5,533,105
142 5,533,106
201 5,533,107
5,533,108
5,533,109
5,533,110
5,533,111
202 5,533,112
211 5,533,113
220 5,533,114
5,533,115
243 5,533,116
377 5,533,117
386 5,533,118
391 5,533,119
392 5,533,120
410 5,533,121
430 5,533,122

CLASS 380
4 5,533,123
5,533,124
5,533,125
25 5,533,126
28 5,533,127
5,533,128

CLASS 381
24 5,533,129
68.5 5,533,130
77 5,533,131
90 5,533,132
94 5,533,133
96 5,533,134
99 5,533,135
107 5,533,136
183 5,533,137

CLASS 382
108 5,533,139
5,533,140
119 5,533,141
128 5,533,142
131 5,531,520
132 5,533,143
135 5,533,144
141 5,533,145
150 5,533,146
179 5,533,147
232 5,533,138
240 5,533,148
260 5,533,149
275 5,533,150

CLASS 384
15 5,531,521
99 5,531,522
117 5,531,523
220 5,531,524
482 5,531,525
518 5,531,526

CLASS 385
3 5,533,151
11 5,533,152
24 5,533,153
27 5,533,154
30 5,533,155
49 5,533,136
53 5,533,157
88 5,533,158
93 5,533,159
96 5,533,160
99 5,533,161
126 5,533,163
128 5,533,164
134 5,533,165

CLASS 388
811 5,533,166

CLASS 392
485 5,533,167

CLASS 395
22 5,533,168
27 5,533,169
108 5,533,170
111 5,533,171
112 5,533,172
114 5,533,173
5,533,174
115 5,533,175
117 5,533,176
119 5,533,177
5,533,178
133 5,533,179

150 5,533,180
152 5,533,181
155 5,533,182
158 5,533,183
161 5,533,184
162 5,533,185
164 5,533,186
5,533,187
182.02 5,533,188
182.04 5,533,189
5,533,190
182.09 5,533,191
183.04 5,533,192
183.15 5,533,193
183.18 5,533,194
185.01 5,533,195
185.07 5,533,196
185.08 5,533,197
200.15 5,533,198
250 5,533,203
280 5,533,200
5,533,201
5,533,202
288 5,533,204
297 5,533,205

CLASS 400
185 5,531,527
200 5,531,528
472 5,531,529
593 5,531,530
629 5,531,531
692 5,531,532

CLASS 403
12 5,531,534
297 5,531,535
340 5,531,536
356 5,531,537
374 5,531,538
381 5,531,539

CLASS 404
6 5,531,540
25 5,531,541
101 5,531,542

CLASS 405
37 5,531,543
231 5,531,544
259.4 5,531,545
259.5 5,531,546
262 5,531,547

CLASS 408
145 5,531,548
240 5,531,549

CLASS 409
179 5,531,550

CLASS 411
70 5,531,551
179 5,531,552
389 5,531,553
399 5,531,554

CLASS 414
24.5 5,531,555
225 5,531,556
401 5,531,557
463 5,531,558
498 5,531,559
563 5,531,560
686 5,531,561
786 5,531,562
794.3 5,531,563

CLASS 415
104 5,531,564
144 5,531,565
145 5,531,566

CLASS 416
87 5,531,567
97 R 5,531,568
222 5,531,569
241 R 5,531,570

CLASS 417
45 5,531,571
222.2 5,531,572
360 5,531,573
415 5,531,574
526 5,531,575

CLASS 418
53 5,531,576
55.1 5,531,577
5,531,578
55.2 5,531,579

CLASS 419
2 5,531,955
5,531,956
8 5,531,957
44 5,531,958

CLASS 420
587 5,531,962

CLASS 422
30 5,531,963
63 5,531,964
70 5,531,959
79 5,531,960
80 5,531,961
5,531,965
102 5,531,966
131 5,531,967
176 5,531,968
186 5,531,969

CLASS 423
3 5,531,970
210 5,531,971
212 5,531,972
235 5,531,973
263 5,531,974
319 5,531,975
625 5,531,976
634 5,531,977

CLASS 424
1.11 5,531,978
9.322 5,532,006
9.52 5,531,980
45 5,531,981
49 5,531,982
5,531,983
59 5,531,985
68 5,531,986
76.21 5,531,987
78.07 5,531,984
93.4 5,531,988
5,531,989
131.1 5,531,990
195.1 5,531,991
5,531,992
401 5,531,993
405 5,531,994
409 5,531,995
424 5,531,997
426 5,531,998
445 5,531,999
450 5,532,000
5,532,001
B1 4,880,635
456 5,532,002
473 5,532,003
945 5,531,979

CLASS 425
136 5,531,580
145 5,531,581
190 5,531,582
193 5,531,583
221 5,531,584
233 5,531,585
352 5,531,586
382 R 5,531,587
556 5,531,588

CLASS 426
5 5,532,004
7 5,532,005
56 5,532,007
73 5,532,008
5,532,009
94 5,532,010
316 5,532,011
425 5,532,012
496 5,532,013
513 5,532,014
548 5,532,015
557 5,532,016
571 5,532,017
582 5,532,018
589 5,532,019
604 5,532,020
607 5,532,021
660 5,532,022

CLASS 427
8 5,532,023
327 5,532,024
388.1 5,532,025
409 5,532,026
493 5,532,027

CLASS 428
35.2 5,532,028
35.7 5,532,029
5,532,030
64.1 5,532,032

5,532,033
69 5,532,034
95 5,532,035
96 5,532,036
99 5,532,037
116 5,532,039
141 5,532,040
5,532,041
5,532,042
152 5,532,043
167 5,532,044
187 5,532,045
202 5,532,046
213 5,532,047
215 5,532,048
216 5,532,049
217 5,532,051
220 5,532,050
229 5,532,052
287 5,532,053
294 5,532,054
318.6 5,532,055
332 5,532,056
334 5,532,057
341 5,532,058
359 5,532,059
398 5,532,060
423.1 5,532,061
432 5,532,062
446 5,532,063
478.2 5,532,064
480 5,532,065
483 5,532,066
500 5,532,067
520 5,532,068
552 5,532,069
623 5,532,031
643 5,532,070

CLASS 429
12 5,532,071
34 5,532,072
5,532,073
53 5,532,074
54 5,532,075
59 5,532,076
102 5,532,077
104 5,532,078
119 5,532,079
164 5,532,080
171 5,532,081
192 5,532,082
210 5,532,083
224 5,532,084
5,532,085
245 5,532,086
248 5,532,087

CLASS 430
4 5,532,088
5 5,532,089
5,532,090
22 5,532,091
42 5,532,092
58 5,532,093
106.6 5,532,095
108 5,532,096
110 5,532,097
5,532,098
115 5,532,099
120 5,532,100
125 5,532,101
128 5,532,102
131 5,532,103
139 5,532,104
156 5,532,105
191 5,532,106
192 5,532,107
271 5,532,109
275.1 5,532,110
281.1 5,532,111
5,532,112
296 5,532,113
312 5,532,114
325 5,532,115
331 5,532,116
504 5,532,117
533 5,532,118
567 5,532,119
600 5,532,120
617 5,532,121

CLASS 431
6 5,531,589
8 5,531,590
153 5,531,591
255 5,531,592

CLASS 432
181 5,531,593

CLASS 433
1 5,531,594

65 5,531,595
104 5,531,596
119 5,531,597
5,531,598
125 5,531,599

CLASS 434
317 5,531,600
912 5,532,710

CLASS 435
5 5,532,122
5,532,124
6 5,532,123
5,532,125
5,532,126
5,532,127
5,532,129
5,532,130
7.21 5,532,132
7.22 5,532,133
7.32 5,532,134
7.9 5,532,131
7.92 5,532,135
5,532,136
5,532,137
7.93 5,532,138
16 5,532,128
29 5,532,139
34 5,532,140
69.1 5,532,142
5,532,143
70.1 5,532,144
74 5,532,141
91.2 5,532,145
5,532,146
100 5,532,147
122 5,532,149
144 5,532,148
188 5,532,150
194 5,532,151
197 5,532,152
199 5,532,153
235.1 5,532,154
240.2 5,532,108
5,532,155
5,532,156
5,532,157
5,532,158
240.27 5,532,159
252.1 5,532,160
5,532,161
264 5,532,162
271 5,532,163
277 5,532,164

CLASS 436
86 5,532,166
89 5,532,167
176 5,532,168
518 5,532,169
527 5,532,170
533 5,532,171
539 5,532,172

CLASS 437
2 5,532,173
8 5,532,174
29 5,532,175
34 5,532,176
40 5,532,177
5,532,179
5,532,180
43 5,532,181
52 5,532,182
57 5,532,178
101 5,532,183
133 5,532,184
141 5,532,185
182 5,532,186
5,532,187
195 5,532,188
209 5,532,189
225 5,532,190
228 5,532,191
229 5,532,192
243 5,532,193

CLASS 439
37 5,531,601
70 5,531,602
72 5,531,603
79 5,531,604
157 5,531,605
188 5,531,606
246 5,531,607
330 5,531,608
340 5,531,609
356 5,531,610
540.1 5,531,611
541.5 5,531,612
544 5,531,613
607 5,531,614

631 5,531,615
668 5,531,616
723 5,531,617
840 5,531,618

CLASS 440
1 5,531,619
89 5,531,620

CLASS 441
61 5,531,621
75 5,531,622

CLASS 446
22 5,531,623
46 5,531,624
120 5,531,625
473 5,531,626
5,531,627
475 5,531,628

CLASS 451
5 5,531,630
5,531,631
6 5,531,632
28 5,531,633
39 5,531,634
72 5,531,635
130 5,531,636
329 5,531,637
364 5,531,638
456 5,531,639

CLASS 453
17 5,531,640

CLASS 454
100 5,531,641

CLASS 463
12 5,531,440
5,531,441
37 5,531,443

CLASS 464
74 5,531,642
144 5,531,643

CLASS 472
68 5,531,644
97 5,531,645

CLASS 473
40 5,531,646
126 5,531,647
227 5,531,446
331 5,531,439
341 5,531,445
349 5,531,444

CLASS 474
110 5,531,648
205 5,531,649
260 5,531,650

CLASS 475
12 5,531,651
36 5,531,652
234 5,531,653

CLASS 477
120 5,531,654

CLASS 482
69 5,531,656
111 5,531,657
142 5,531,658

CLASS 492
48 5,531,659

CLASS 493
243 5,531,660
313 5,531,661

CLASS 501
9 5,532,194
34 5,532,195
128 5,532,196
136 5,532,197

CLASS 502
202 5,531,869
304 5,532,198
311 5,532,199

CLASS 503
201 5,532,200
213 5,532,201
227 5,532,202

CLASS 504
105 5,532,203

118 5,532,204
128 5,532,205
176 5,532,206
228 5,532,207
239 5,532,208
339 5,532,209

CLASS 505
200 5,532,210

CLASS 507
103 5,532,211
140 5,532,212

CLASS 508
408 5,531,911
507 5,531,912

CLASS 510
102 5,531,910
114 5,531,917
182 5,531,939
200 5,531,919
281 5,531,927
294 5,531,915
320 5,531,918
412 5,531,916
417 5,531,938
429 5,531,933

CLASS 514
8 5,532,215
21 5,532,216
5,532,217
34 5,532,218
42 5,532,219
44 5,532,220
53 5,532,221
54 5,532,222
5,532,223
63 5,532,224
81 5,532,225
134 5,532,226
152 5,532,227
167 5,532,228
168 5,532,229
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56 : 5,531,811

DESIGN PATENTS

01 : 371,297
371,411
02 : 371,267
04 : 371,417
05 : 371,421
06 : 371,231
371,238
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371,372

STATUTORY INVENTION REGISTRATIONS

06 : H1553
24 : H1554
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26 : H1555
H1556
36 : H1562
37 : H1565
39 : H1558
H1560
48 : H1557
H1559
H1561
H1564

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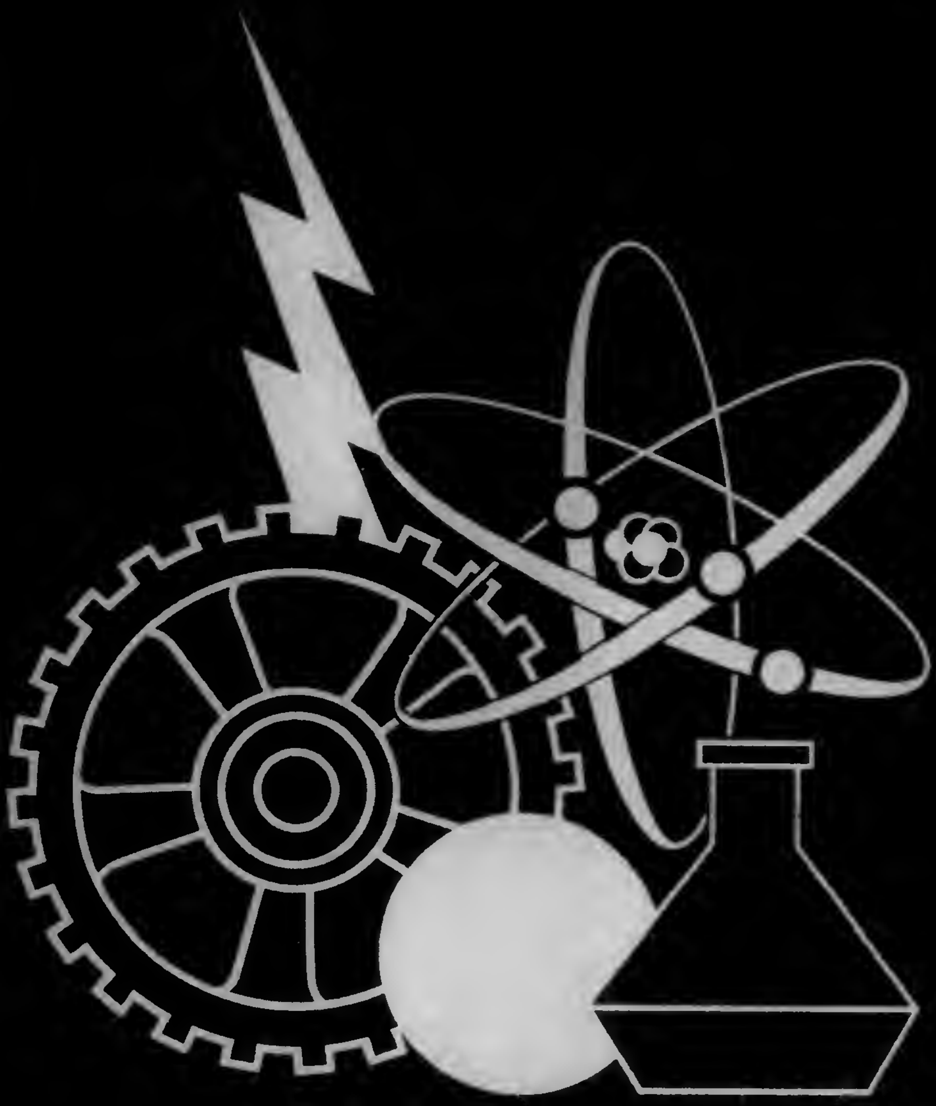
PATENTS

July 9, 1996



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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	125.00	250.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 6, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,224,219 through 5,226,178
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 4, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,843,641 through 4,845,776
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 2, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,525,785 through 4,527,286
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED May 1, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent No.	Serial Number	Issue Date
Re. 32,426	06/757,267	05/26/87
(4,446,288)	(06/285,561)	(05/01/84)
Re. 32,819	06/848,572	01/03/89
(4,446,179)	(06/468,721)	(05/01/84)
4,445,233	06/524,925	05/01/84
4,445,255	06/379,606	05/01/84
4,445,262	06/451,677	05/01/84
4,445,271	06/293,023	05/01/84
4,445,277	06/437,593	05/01/84
4,445,289	06/385,797	05/01/84
4,445,291	06/460,155	05/01/84
4,445,302	06/386,342	05/01/84
4,445,303	06/371,562	05/01/84
4,445,311	06/343,268	05/01/84
4,445,325	06/526,213	05/01/84
4,445,326	06/380,630	05/01/84
4,445,330	06/279,743	05/01/84
4,445,331	06/307,703	05/01/84
4,445,333	06/284,062	05/01/84
4,445,334	06/296,461	05/01/84
4,445,335	06/279,742	05/01/84
4,445,346	06/464,562	05/01/84
4,445,350	06/325,552	05/01/84
4,445,359	06/291,154	05/01/84
4,445,364	06/340,589	05/01/84
4,445,369	06/437,038	05/01/84
4,445,371	06/373,327	05/01/84
4,445,375	06/239,018	05/01/84
4,445,378	06/444,150	05/01/84
4,445,379	06/362,736	05/01/84
4,445,386	06/356,054	05/01/84
4,445,387	06/389,292	05/01/84
4,445,388	06/392,669	05/01/84
4,445,389	06/300,830	05/01/84
4,445,392	06/340,197	05/01/84
4,445,393	06/340,151	05/01/84
4,445,405	06/327,086	05/01/84
4,445,407	06/406,576	05/01/84
4,445,418	06/417,946	05/01/84
4,445,424	06/307,713	05/01/84
4,445,425	06/283,547	05/01/84
4,445,430	06/315,554	05/01/84
4,445,443	06/542,093	05/01/84
4,445,450	06/402,815	05/01/84
4,445,454	06/348,594	05/01/84
4,445,458	06/400,245	05/01/84
4,445,461	06/387,932	05/01/84
4,445,462	06/437,983	05/01/84
4,445,466	06/397,368	05/01/84
4,445,468	06/397,788	05/01/84
4,445,471	06/302,236	05/01/84
4,445,474	06/446,700	05/01/84
4,445,478	06/479,798	05/01/84
4,445,480	06/460,899	05/01/84
4,445,487	06/367,222	05/01/84
4,445,489	06/294,352	05/01/84
4,445,494	06/304,941	05/01/84
4,445,498	06/412,206	05/01/84
4,445,500	06/428,850	05/01/84

Patent No.	Serial Number	Issue Date
4,445,514	06/275,117	05/01/84
4,445,515	06/317,515	05/01/84
4,445,520	06/346,808	05/01/84
4,445,526	06/307,295	05/01/84
4,445,541	06/280,473	05/01/84
4,445,546	06/330,797	05/01/84
4,445,549	06/346,243	05/01/84
4,445,552	06/325,250	05/01/84
4,445,559	06/485,895	05/01/84
4,445,561	06/389,798	05/01/84
4,445,564	06/320,077	05/01/84
4,445,566	06/358,809	05/01/84
4,445,572	06/293,576	05/01/84
4,445,576	06/381,226	05/01/84
4,445,581	06/415,164	05/01/84
4,445,584	06/300,061	05/01/84
4,445,586	06/409,387	05/01/84
4,445,587	06/331,132	05/01/84
4,445,589	06/491,601	05/01/84
4,445,593	06/434,507	05/01/84
4,445,594	06/316,636	05/01/84
4,445,597	06/389,526	05/01/84
4,445,598	06/376,166	05/01/84
4,445,599	06/315,567	05/01/84
4,445,601	06/353,478	05/01/84
4,445,608	06/285,331	05/01/84
4,445,611	06/362,395	05/01/84
4,445,617	06/410,080	05/01/84
4,445,620	06/380,517	05/01/84
4,445,624	06/383,430	05/01/84
4,445,627	06/308,585	05/01/84
4,445,660	06/366,915	05/01/84
4,445,668	06/401,866	05/01/84
4,445,672	06/316,020	05/01/84
4,445,674	06/373,049	05/01/84
4,445,678	06/381,453	05/01/84
4,445,679	06/332,305	05/01/84
4,445,696	06/468,339	05/01/84
4,445,699	06/309,928	05/01/84
4,445,703	06/396,436	05/01/84
4,445,704	06/323,308	05/01/84
4,445,713	06/399,626	05/01/84
4,445,714	06/361,326	05/01/84
4,445,716	06/371,831	05/01/84
4,445,721	06/322,957	05/01/84
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4,739,809	06/873,050	04/26/88
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4,740,394	06/905,351	04/26/88
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4,740,772	06/918,878	04/26/88
4,740,774	06/892,657	04/26/88
4,740,776	06/542,286	04/26/88
4,740,780	06/747,861	04/26/88
4,740,784	06/883,475	04/26/88
4,740,785	06/776,720	04/26/88
4,740,791	06/624,719	04/26/88
4,740,795	06/868,256	04/26/88
4,740,797	06/923,272	04/26/88
4,740,799	06/837,405	04/26/88
4,740,801	06/919,241	04/26/88
4,740,812	06/802,238	04/26/88
4,740,813	06/939,840	04/26/88
4,740,838	06/937,897	04/26/88
4,740,839	07/060,873	04/26/88
4,740,840	07/096,167	04/26/88
4,740,847	06/854,023	04/26/88
4,740,853	06/870,626	04/26/88
4,740,860	06/874,287	04/26/88
4,740,871	06/948,475	04/26/88
4,740,873	07/083,917	04/26/88
4,740,877	06/879,739	04/26/88
4,740,885	07/024,883	04/26/88
4,740,910	06/878,695	04/26/88
4,740,912	06/935,923	04/26/88
4,740,915	06/844,270	04/26/88
4,740,924	06/828,513	04/26/88
4,740,930	06/816,669	04/26/88
4,740,931	07/095,914	04/26/88
4,740,934	07/087,582	04/26/88
4,740,944	07/052,773	04/26/88
4,740,952	06/922,571	04/26/88
4,740,967	07/043,863	04/26/88
4,740,970	06/807,912	04/26/88
4,740,978	06/834,987	04/26/88
4,740,979	06/840,551	04/26/88
4,740,983	07/090,288	04/26/88
4,740,984	06/474,607	04/26/88
4,740,985	06/948,267	04/26/88
4,740,988	06/929,497	04/26/88
4,740,994	06/863,004	04/26/88
4,740,996	06/932,140	04/26/88
4,741,001	06/859,067	04/26/88
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4,741,010	06/888,980	04/26/88
4,741,016	06/926,191	04/26/88
4,741,023	06/945,931	04/26/88
4,741,037	06/921,862	04/26/88
4,741,039	06/364,931	04/26/88
4,741,040	07/073,885	04/26/88
4,741,041	06/776,052	04/26/88
4,741,046	06/757,653	04/26/88
4,741,048	06/920,195	04/26/88
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5,107,553	07/747,645	04/28/92
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5,107,564	07/643,229	04/28/92
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5,107,575	07/594,689	04/28/92
5,107,578	07/692,625	04/28/92

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5,107,596	07/637,454	04/28/92
5,107,597	07/573,058	04/28/92
5,107,601	07/511,043	04/28/92
5,107,602	07/623,738	04/28/92
5,107,604	07/414,957	04/28/92
5,107,611	07/153,484	04/28/92
5,107,612	07/532,860	04/28/92
5,107,614	07/718,372	04/28/92
5,107,616	07/628,099	04/28/92
5,107,618	07/709,042	04/28/92
5,107,619	07/677,987	04/28/92
5,107,620	07/518,429	04/28/92
5,107,625	07/560,571	04/28/92
5,107,632	07/476,158	04/28/92
5,107,635	07/668,599	04/28/92
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5,107,653	07/613,103	04/28/92
5,107,659	07/642,443	04/28/92
5,107,664	07/731,209	04/28/92
5,107,669	07/530,316	04/28/92
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5,107,687	07/613,472	04/28/92
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5,107,690	07/658,692	04/28/92
5,107,691	07/677,638	04/28/92
5,107,704	07/168,872	04/28/92
5,107,708	07/457,762	04/28/92
5,107,709	07/503,003	04/28/92
5,107,712	07/565,555	04/28/92
5,107,717	07/597,414	04/28/92
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5,107,726	07/702,322	04/28/92
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5,107,736	07/582,238	04/28/92
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5,107,752	07/328,035	04/28/92
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5,107,845	07/460,133	04/28/92
5,107,846	07/573,752	04/28/92
5,107,853	07/637,779	04/28/92
5,107,857	07/515,214	04/28/92
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5,107,874	07/751,917	04/28/92
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5,107,969	07/402,009	04/28/92
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5,107,981	07/455,394	04/28/92
5,107,984	07/123,298	04/28/92
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5,108,014	07/513,002	04/28/92
5,108,016	07/592,916	04/28/92
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5,108,035	07/512,666	04/28/92
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5,108,038	07/568,783	04/28/92
5,108,041	07/451,243	04/28/92
5,108,053	07/668,190	04/28/92
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5,108,076	07/497,509	04/28/92
5,108,088	07/559,474	04/28/92
5,108,100	07/540,113	04/28/92
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5,108,104	07/693,437	04/28/92
5,108,106	07/434,326	04/28/92
5,108,109	07/537,874	04/28/92
5,108,110	07/751,530	04/28/92
5,108,111	07/577,522	04/28/92
5,108,112	07/747,975	04/28/92
5,108,115	07/597,003	04/28/92
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5,108,123	07/681,766	04/28/92
5,108,126	07/583,139	04/28/92
5,108,127	07/550,296	04/28/92
5,108,136	07/482,502	04/28/92
5,108,141	07/435,806	04/28/92
5,108,146	07/733,678	04/28/92
5,108,149	07/608,201	04/28/92
5,108,151	07/596,949	04/28/92
5,108,157	07/639,340	04/28/92
5,108,160	07/545,747	04/28/92
5,108,164	07/644,083	04/28/92
5,108,165	07/711,274	04/28/92
5,108,175	07/350,612	04/28/92
5,108,185	07/365,172	04/28/92
5,108,186	07/497,490	04/28/92
5,108,195	07/749,710	04/28/92
5,108,202	07/464,175	04/28/92
5,108,207	07/379,887	04/28/92
5,108,214	07/714,814	04/28/92

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5,108,216	07/580,112	04/28/92	5,108,583	07/424,420	04/28/92
5,108,233	07/554,012	04/28/92	5,108,587	07/429,068	04/28/92
5,108,242	07/742,321	04/28/92	5,108,602	07/564,458	04/28/92
5,108,250	07/577,992	04/28/92	5,108,603	07/680,560	04/28/92
5,108,251	07/501,282	04/28/92	5,108,606	07/676,057	04/28/92
5,108,255	07/629,052	04/28/92	5,108,608	07/449,834	04/28/92
5,108,259	07/286,101	04/28/92	5,108,610	07/713,078	04/28/92
5,108,268	07/554,898	04/28/92	5,108,616	07/369,238	04/28/92
5,108,271	07/643,436	04/28/92	5,108,622	07/714,101	04/28/92
5,108,277	07/543,672	04/28/92	5,108,624	07/491,979	04/28/92
5,108,281	07/495,972	04/28/92	5,108,627	07/649,448	04/28/92
5,108,282	07/495,973	04/28/92	5,108,628	07/690,885	04/28/92
5,108,283	07/461,524	04/28/92	5,108,648	07/599,183	04/28/92
5,108,286	07/652,517	04/28/92	5,108,649	07/433,367	04/28/92
5,108,288	07/715,507	04/28/92	5,108,654	07/272,442	04/28/92
5,108,290	07/595,567	04/28/92	5,108,655	07/358,881	04/28/92
5,108,326	07/665,347	04/28/92	5,108,656	07/533,161	04/28/92
5,108,327	07/636,493	04/28/92	5,108,657	07/416,485	04/28/92
5,108,330	07/736,644	04/28/92	5,108,658	07/645,541	04/28/92
5,108,332	07/635,139	04/28/92	5,108,666	07/348,274	04/28/92
5,108,335	07/654,951	04/28/92	5,108,669	07/573,014	04/28/92
5,108,336	07/667,651	04/28/92	5,108,674	07/495,769	04/28/92
5,108,338	07/552,943	04/28/92	5,108,686	07/670,047	04/28/92
5,108,341	07/394,282	04/28/92	5,108,687	07/398,608	04/28/92
5,108,343	07/521,601	04/28/92	5,108,688	07/477,801	04/28/92
5,108,345	07/674,578	04/28/92	5,108,689	07/445,868	04/28/92
5,108,351	07/609,581	04/28/92	5,108,690	07/597,797	04/28/92
5,108,353	07/690,491	04/28/92	5,108,692	07/410,784	04/28/92
5,108,354	07/653,604	04/28/92	5,108,704	07/245,435	04/28/92
5,108,359	07/628,089	04/28/92	5,108,706	07/244,688	04/28/92
5,108,364	07/479,700	04/28/92	5,108,714	07/594,668	04/28/92
5,108,369	07/494,109	04/28/92	5,108,719	07/631,116	04/28/92
5,108,372	07/626,626	04/28/92	5,108,726	07/233,767	04/28/92
5,108,376	07/612,789	04/28/92	5,108,736	07/158,088	04/28/92
5,108,379	07/709,490	04/28/92	5,108,742	07/581,353	04/28/92
5,108,383	07/447,722	04/28/92	5,108,749	07/454,739	04/28/92
5,108,385	07/555,900	04/28/92	5,108,756	07/611,212	04/28/92
5,108,392	07/746,141	04/28/92	5,108,766	07/600,706	04/28/92
5,108,397	07/511,254	04/28/92	5,108,768	07/275,952	04/28/92
5,108,406	07/627,410	04/28/92	5,108,779	07/633,727	04/28/92
5,108,408	07/511,777	04/28/92	5,108,784	07/604,041	04/28/92
5,108,409	07/506,338	04/28/92	5,108,785	07/408,120	04/28/92
5,108,417	07/583,882	04/28/92	5,108,789	07/489,162	04/28/92
5,108,420	07/649,593	04/28/92	5,108,794	07/423,340	04/28/92
5,108,423	07/632,479	04/28/92	5,108,801	07/467,033	04/28/92
5,108,426	07/550,825	04/28/92	5,108,805	07/249,171	04/28/92
5,108,427	07/638,336	04/28/92	5,108,808	07/432,522	04/28/92
5,108,429	07/667,671	04/28/92	5,108,810	07/512,028	04/28/92
5,108,430	07/571,947	04/28/92	5,108,812	07/408,385	04/28/92
5,108,437	07/244,446	04/28/92	5,108,817	07/516,205	04/28/92
5,108,448	07/500,876	04/28/92	5,108,819	07/479,897	04/28/92
5,108,453	07/493,112	04/28/92	5,108,822	07/634,529	04/28/92
5,108,465	07/544,441	04/28/92	5,108,823	07/459,983	04/28/92
5,108,468	07/674,989	04/28/92	5,108,841	07/355,219	04/28/92
5,108,480	07/597,874	04/28/92	5,108,843	07/441,949	04/28/92
5,108,481	07/654,871	04/28/92	5,108,846	07/551,780	04/28/92
5,108,483	07/590,418	04/28/92	5,108,854	07/649,396	04/28/92
5,108,486	07/678,471	04/28/92	5,108,855	07/669,940	04/28/92
5,108,487	07/490,198	04/28/92	5,108,856	07/512,010	04/28/92
5,108,489	07/734,101	04/28/92	5,108,860	07/552,524	04/28/92
5,108,509	07/520,462	04/28/92	5,108,867	07/408,151	04/28/92
5,108,511	07/514,987	04/28/92	5,108,880	07/630,667	04/28/92
5,108,514	07/652,565	04/28/92	5,108,889	07/256,785	04/28/92
5,108,516	07/727,453	04/28/92	5,108,904	07/499,144	04/28/92
5,108,523	07/557,629	04/28/92	5,108,908	07/582,643	04/28/92
5,108,527	07/339,183	04/28/92	5,108,916	07/361,049	04/28/92
5,108,537	07/610,474	04/28/92	5,108,920	07/361,855	04/28/92
5,108,539	07/513,381	04/28/92	5,108,931	07/245,421	04/28/92
5,108,544	07/597,686	04/28/92	5,108,932	07/386,996	04/28/92
5,108,558	07/367,924	04/28/92	5,108,961	07/698,661	04/28/92
5,108,561	07/624,215	04/28/92	5,108,968	07/505,881	04/28/92
5,108,566	07/500,314	04/28/92	5,108,976	07/593,376	04/28/92
5,108,567	07/656,064	04/28/92	5,108,994	07/528,575	04/28/92
5,108,568	07/599,601	04/28/92	5,108,998	07/512,812	04/28/92
5,108,571	07/770,772	04/28/92	5,108,999	07/631,181	04/28/92
5,108,575	07/564,688	04/28/92	5,109,000	07/517,391	04/28/92
			5,109,004	07/506,842	04/28/92
			5,109,008	07/423,202	04/28/92

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5,109,019	07/376,976	04/28/92	5,109,202	07/383,110	04/28/92
5,109,023	07/622,506	04/28/92	5,109,212	07/493,285	04/28/92
5,109,030	07/746,078	04/28/92	5,109,213	07/726,358	04/28/92
5,109,035	07/628,766	04/28/92	5,109,215	07/684,551	04/28/92
5,109,037	07/538,804	04/28/92	5,109,218	07/561,842	04/28/92
5,109,045	07/615,196	04/28/92	5,109,224	07/602,257	04/28/92
5,109,054	07/682,158	04/28/92	5,109,227	07/575,843	04/28/92
5,109,061	07/487,093	04/28/92	5,109,228	07/493,754	04/28/92
5,109,075	07/500,660	04/28/92	5,109,231	07/653,865	04/28/92
5,109,076	07/450,333	04/28/92	5,109,242	07/599,288	04/28/92
5,109,078	07/678,470	04/28/92	5,109,253	07/730,473	04/28/92
5,109,089	07/720,927	04/28/92	5,109,264	07/554,406	04/28/92
5,109,092	07/647,688	04/28/92	5,109,285	07/372,006	04/28/92
5,109,099	07/568,290	04/28/92	5,109,287	07/364,423	04/28/92
5,109,101	07/645,084	04/28/92	5,109,299	07/671,515	04/28/92
5,109,102	07/608,088	04/28/92	5,109,301	07/645,449	04/28/92
5,109,103	07/667,214	04/28/92	5,109,314	07/535,401	04/28/92
5,109,105	07/366,723	04/28/92	5,109,315	07/260,453	04/28/92
5,109,107	07/631,558	04/28/92	5,109,319	07/607,718	04/28/92
5,109,108	07/565,128	04/28/92	5,109,322	07/753,636	04/28/92
5,109,123	07/217,475	04/28/92	5,109,323	07/616,614	04/28/92
5,109,124	07/306,798	04/28/92	5,109,330	07/029,685	04/28/92
5,109,131	07/295,516	04/28/92	5,109,340	07/540,152	04/28/92
5,109,140	07/509,215	04/28/92	5,109,350	07/301,418	04/28/92
5,109,143	07/616,372	04/28/92	5,109,356	07/530,099	04/28/92
5,109,145	07/356,354	04/28/92	5,109,363	06/532,425	04/28/92
5,109,157	07/672,825	04/28/92	5,109,384	07/486,082	04/28/92
5,109,158	06/947,515	04/28/92	5,109,386	07/579,597	04/28/92
5,109,179	07/464,458	04/28/92	5,109,398	07/483,231	04/28/92
5,109,180	07/755,606	04/28/92	5,109,411	07/542,258	04/28/92
5,109,182	07/505,842	04/28/92	5,109,421	07/560,805	04/28/92
5,109,185	07/414,691	04/28/92	5,109,425	07/251,500	04/28/92
5,109,193	07/534,915	04/28/92	5,109,436	07/486,764	04/28/92
5,109,195	07/449,209	04/28/92	5,109,442	07/501,146	04/28/92
5,109,200	07/610,280	04/28/92	5,109,446	07/626,269	04/28/92
5,109,201	07/448,125	04/28/92	5,109,474	07/660,789	04/28/92
			5,109,482	07/657,675	04/28/92
			5,109,513	07/457,795	04/28/92

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 04/19/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,367,198	06/275,420	06/19/81	01/04/83	04/22/96
4,392,476	06/220,195	12/23/80	07/12/83	04/24/96
4,513,865	06/496,593	05/20/83	04/30/85	04/26/96
4,622,966	06/631,536	07/16/84	11/18/86	04/26/96
4,624,264	06/330,501	12/14/81	11/25/86	04/26/96
4,698,361	06/867,446	05/28/86	10/06/87	04/25/96
4,772,262	07/045,708	04/27/87	09/20/88	04/23/96
4,791,993	07/102,713	09/30/87	12/20/88	04/24/96
4,838,794	07/207,232	06/16/88	06/13/89	04/25/96
4,929,090	07/261,588	10/24/88	05/29/90	04/23/96
4,977,903	07/509,258	04/13/90	12/18/90	04/24/96
5,024,662	07/492,749	03/13/90	06/18/91	04/25/96
5,038,598	07/579,144	09/07/90	08/13/91	04/25/96
5,056,528	07/568,085	08/16/90	10/15/91	04/24/96
5,063,522	07/551,764	07/10/90	11/05/91	04/25/96
5,094,579	07/600,442	10/19/90	03/10/92	04/24/96
5,101,739	07/637,344	01/04/91	04/07/92	04/25/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 04/26/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,397,743	06/390,287	06/21/82	08/09/83	04/30/96
4,513,865	06/496,593	05/20/83	04/30/85	04/26/96
4,546,974	06/528,977	09/02/83	10/15/85	05/02/96
4,619,280	06/474,975	03/14/83	10/28/86	05/03/96
4,622,966	06/631,536	07/16/84	11/18/86	04/26/96
4,624,264	06/330,501	12/14/81	11/25/86	04/26/96
4,658,651	06/732,946	05/13/85	04/21/87	04/30/96
4,685,447	06/715,457	03/25/85	08/11/87	04/30/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,712,699	06/914,384	10/02/86	12/15/87	04/30/96
4,913,206	07/361,543	06/05/89	04/03/90	04/30/96
5,005,222	07/541,741	06/21/90	04/09/91	04/30/96
5,007,437	07/512,520	04/19/90	04/16/91	04/30/96
5,046,614	07/559,398	07/26/90	09/10/91	05/02/96
5,067,717	07/611,683	11/07/90	11/26/91	04/30/96
5,083,839	07/544,602	06/27/90	01/28/92	04/30/96
5,084,777	07/681,148	04/05/91	01/28/92	04/30/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 05/03/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,375,411	06/254,739	04/16/81	03/01/83	05/06/96
4,426,325	06/339,788	01/15/82	01/17/84	05/03/96
4,426,336	06/297,736	08/31/81	01/17/84	05/03/96
4,619,280	06/474,975	03/14/83	10/28/86	05/03/96
4,649,462	06/786,696	10/11/85	03/10/87	05/08/96
4,685,848	06/700,835	02/12/85	08/11/87	05/06/96
4,719,053	06/462,340	01/31/83	01/12/88	05/03/96
4,719,150	06/827,328	02/07/86	01/12/88	05/03/96
4,719,212	06/948,444	12/29/86	01/12/88	05/03/96
4,720,541	06/627,497	07/06/84	01/19/88	05/10/96
4,720,577	06/783,212	10/02/85	01/19/88	05/03/96
4,732,440	06/790,134	10/22/85	03/22/88	05/06/96
4,924,019	07/298,845	01/18/89	05/08/90	05/06/96
4,957,170	07/386,309	07/28/89	09/18/90	05/10/96
5,052,930	07/489,691	03/07/90	10/01/91	05/08/96
5,054,131	07/545,694	06/29/90	10/08/91	05/09/96
5,078,046	07/400,146	11/24/89	01/07/92	05/09/96
5,079,472	07/541,901	06/22/90	01/07/92	05/03/96
5,081,078	07/443,881	11/30/89	01/14/92	05/03/96
5,081,080	07/512,732	04/20/90	01/14/92	05/03/96
5,081,150	07/512,078	04/12/90	01/14/92	05/03/96
5,081,212	07/414,535	09/29/89	01/14/92	05/03/96
5,081,214	07/564,043	08/07/90	01/14/92	05/03/96
5,081,263	07/450,402	12/14/89	01/14/92	05/03/96
5,081,322	07/479,401	02/13/90	01/14/92	05/03/96
5,082,504	07/462,489	01/10/90	01/21/92	05/03/96
5,082,632	07/126,734	11/30/87	01/21/92	05/03/96
5,082,845	07/311,910	02/17/89	01/21/92	05/03/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 05/10/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,641,238	06/680,107	12/10/84	02/03/87	05/16/96
4,751,081	06/593,691	03/26/84	06/14/88	05/15/96
4,799,277	07/175,680	03/21/88	01/24/89	05/15/96
4,887,741	07/175,108	03/30/88	12/19/89	05/16/96
4,895,991	07/302,587	01/25/89	01/23/90	05/16/96
4,957,170	07/386,309	07/28/89	09/18/90	05/10/96
4,981,343	07/306,119	02/06/89	01/01/91	05/16/96
5,016,796	07/601,344	10/23/90	05/21/91	05/14/96
5,078,407	07/581,593	09/12/90	01/07/92	05/16/96
5,082,406	07/545,808	06/29/90	01/21/92	05/10/96
5,084,423	07/502,321	03/30/90	01/28/92	05/16/96
5,086,281	07/664,237	03/04/91	02/04/92	05/16/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 05/17/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,474,251	06/324,251	11/25/81	10/02/84	05/22/96
4,578,093	06/613,573	05/24/84	03/25/86	05/17/96
4,581,853	06/598,395	04/10/84	04/15/86	05/17/96
4,622,483	06/707,966	03/04/85	11/11/86	05/17/96
4,629,607	06/686,993	12/27/84	12/16/86	05/21/96
4,656,339	06/674,698	11/26/84	04/07/87	05/21/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,664,435	06/664,054	10/23/84	05/12/87	05/23/96
4,687,737	06/751,461	07/02/85	08/18/87	05/20/96
4,712,526	06/821,893	01/23/86	12/15/87	05/22/96
4,712,731	06/888,120	07/22/86	12/15/87	05/20/96
4,830,695	07/120,846	11/16/87	05/16/89	05/22/96
4,833,477	07/275,660	11/22/88	05/23/89	05/20/96
4,886,125	07/119,266	11/09/87	12/12/89	05/20/96
4,911,688	07/219,437	07/15/86	03/27/90	05/23/96
4,953,780	07/402,339	09/05/89	09/04/90	05/20/96
5,017,232	07/492,668	03/13/90	05/21/91	05/17/96
5,028,663	07/469,684	02/22/90	07/02/91	05/20/96
5,035,227	07/474,559	02/02/90	07/30/91	05/21/96
5,066,257	07/477,714	02/09/90	11/19/91	05/20/96
5,070,546	07/537,910	06/12/90	12/10/91	05/21/96
5,077,853	07/639,905	01/10/91	01/07/92	05/20/96
5,079,879	07/573,498	08/27/90	01/14/92	05/22/96
5,079,905	07/529,611	05/29/90	01/14/92	05/17/96
5,083,854	07/480,270	02/15/90	01/28/92	05/17/96
5,085,115	07/578,075	09/05/90	02/04/92	05/22/96
5,086,354	07/316,019	02/27/89	02/04/92	05/20/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 05/24/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,396,172	06/275,341	06/19/81	08/02/83	05/30/96
4,423,523	06/404,516	07/30/82	01/03/84	05/24/96
4,479,667	06/258,645	04/29/81	10/30/84	05/31/96
4,503,863	06/302,340	09/15/81	03/12/85	05/31/96
4,512,166	06/401,417	07/23/82	04/23/85	05/31/96
4,576,301	06/537,680	09/30/83	03/18/86	05/30/96
4,641,482	06/433,001	10/06/82	02/10/87	05/29/96
4,720,786	06/854,381	04/21/86	01/19/88	05/30/96
4,721,121	06/829,503	02/14/86	01/26/88	05/31/96
4,820,096	07/095,911	09/14/87	04/11/89	05/30/96
4,854,210	07/089,401	08/26/87	08/08/89	05/30/96
4,873,702	07/260,288	10/20/88	10/10/89	05/29/96
4,905,761	07/226,352	07/29/88	03/06/90	05/30/96
4,913,327	07/256,032	10/11/88	04/03/90	05/31/96
4,916,995	07/300,358	01/23/89	04/17/90	05/29/96
4,979,572	07/325,691	03/20/89	12/25/90	05/29/96
5,073,074	07/558,981	07/26/90	12/17/91	05/29/96

Errata

In the list of patents which expired on December 15, 1995, due to failure to pay maintenance fees, in the O.G. of February 20, 1996, the following patent should not have appeared:

Patent Number	Serial Number	Filing Date	Issue Date
4,712,709	06/856,172	04/28/86	12/15/87

Errata

In the list of patents which expired on May 18, 1995 due to failure to pay maintenance fees, in the O.G. of August 01, 1995, the following patent should not have appeared:

Patent Number	Serial Number	Filing Date	Issue Date
4,665,955	06/825,575	02/04/86	05/19/87

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

D. 354,583, Re. S.N. 29/051,332, Feb. 20, 1996, Cl. D27, WATERPIPE, Mark R. Newman, Owner of Record: *Inventor*, Attorney or Agent: Victor Flores, Ex. Gp.: 2901

D. 354,828, Re. S.N. 29/051,312, Nov. 30, 1995, Cl. D99/33, MAIL BOX, Tucker Willis, et. al., Owner of Record: *Chainomeles, Inc., Dallas, Tex.*, Attorney or Agent: Stanley R. Moore, Ex. Gp.: 2903

5,092,866, Re. S.N. 08/648,397, May 15, 1996, Cl. 606, FLEXIBLE INTER-VERTEBRAL STABILIZER AS WELL AS PROCESS AND APPARATUS DETERMINING ON VERIFYING IT'S TENSION BEFORE INSTALLATION ON THE SPINAL COLUMN, Francis Bread, et. al., Owner of Record: *Inventors*, Attorney or Agent: Edward R. Freedman, Ex. Gp.: 3308

5,103,469, Re. S.N. 08/547,153, Oct. 24, 1995, Cl. 378/16, X-RAY CT SCANNER, Shigeru Tanaka, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki, Japan*, Attorney or Agent: Michael L. Leetzow, Ex. Gp.: 2506

4,146,471, Re. S.N. 08/606,568, Feb. 26, 1996, Cl. 210/715, LIQUID CLARIFICATION APPARATUS AND METHOD, David Wyness, Owner of Record: *Inventor*, Attorney or Agent: Jeffry Smith, Ex. Gp.: 1308

5,154,809, Re. S.N. 08/613,075, Mar. 8, 1996, Cl. 204/182.400, PROCESS FOR PURIFYING WATER, Yoram Oren, et. al., Owner of Record: *Millipore Corp., Bedford, Mass.,* Attorney or Agent: Peter C. Lando, Ex. Gp.: 1102

5,155,494, Re. S.N. 08/323,498, Oct. 13, 1994, Cl. 343/713, VEHICLE ANTENNA SYSTEM, Everette T. Bryant, et. al., Owner of Record: *Larsen Electronics Inc., Vancouver, Wash.,* Attorney or Agent: William Y. Conwell, Ex. Gp.: 2508

5,223,672, Re. S.N. 08/510,230, Aug. 2, 1995, Cl. 174/52, CHARACTER READER AND RECOGNIZER, Masaya Yamanari, et. al., Owner of Record: *TRW Inc., Redondo Beach, Calif.,* Attorney or Agent: Robert F. Ziems, Ex. Gp.: 2103

5,240,321, Re. S.N. 08/648,480, May 15, 1996, Cl. 366, VERTICAL SCREW MIXER, Peter Miller, Owner of Record: *Alteen Distributors LTD, Alberta, Canada,* Attorney or Agent: James J. Hill, Ex. Gp.: 3206

5,263,042, Re. S.N. 08/558,505, Nov. 16, 1995, Cl. 372/72, DIFFUSION REFLECTOR, Minoru Kojima, et. al., Owner of Record: *Miyachi Technos Corp., Noda City, Japan,* Attorney or Agent: Alan Holler, Ex. Gp.: 2501

5,289,974, Re. S.N. 08/609,882, Mar. 1, 1996, Cl. 239/72, SPRAY GUN HAVING TRIGGER OVERTRAVEL PROTECTION AND MAXIMUM FLOW ADJUSTMENT KNOW WARNING, Thomas E. Grime, et. al., Owner of Record: *Ransburg Corp., Indianapolis, Ind.,* Attorney or Agent: Oliver E. Todd, Jr., Ex. Gp.: 3104

5,292,209, Re. S.N. 08/612,128, Mar. 7, 1996, Cl. 405/302, BEARING PLATE, Frank Calandra, et. al., Owner of Record: *Jenmar Corp., Pittsburgh, Pa.,* Attorney or Agent: Russell D. Orkin, Ex. Gp.: 3506

5,302,278, Re. S.N. 08/633,271, Apr. 10, 1996, Cl. 205/296, CYANIDE-FREE PLATING SOLUTIONS FOR MONOVALENT METALS, Fred I. Nobel, et. al., Owner of Record: *Learonal, Inc., Freeport, N.Y.,* Attorney or Agent: Allan A. Fanucci, Ex. Gp.: 1102

5,311,604, Re. S.N. 08/644,463, May 10, 1996, Cl. 385/14, METHOD OF MANUFACTURING DEVICES FOR OPTICAL FIBER NETWORKS AND DEVICES MANUFACTURED THEREBY, Arnd Rogner, et. al., Owner of Record: *Minnesota Mining And Manufacturing, St. Paul, Minn.,* Attorney or Agent: David G. Burleson, Ex. Gp.: 2501

5,360,655, Re. S.N. 08/556,120, Nov. 9, 1995, Cl. 493, FOLDED SHEET ARTICLES, George Wallace McDonald, Owner of Record: *Inventor,* Attorney or Agent: J. Harold Nissen, Ex. Gp.: 3205

5,384,977, Re. S.N. 08/559,044, Nov. 15, 1995, Cl. 36/28, SPORTS FOOTWEAR, Wong K. Chee, Owner of Record: *Global Sports Technologies, British Virgin Islands,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 2404

5,452,193, Re. S.N. 08/642,309, May 3, 1996, Cl. 362/366, INCLINED CEILING DOWNLIGHT FIXTURES, Jon D. Hinnefeld, et. al., Owner of Record: *National Service Industries, Inc., Atlanta, Ga.,* Attorney or Agent: Kenneth E. Darnell, Ex. Gp.: 3406

5,478,142, Re. S.N. 08/644,245, May 10, 1996, Cl. 303/36, SINGLE SIDED CONTROL VALVE, Luann M. Lalone, et. al., Owner of Record: *New York Air Brake, Watertown, N.Y.,* Attorney or Agent: Perry Palan, Ex. Gp.: 3103

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,230,504, Reexam. No. 90/004,249, May 28, 1996, Cl. 437/048, METHOD OF MAKING IMPLANT PROGRAMMABLE N-CHANNEL ROM, Chang-Kiang Kuo, Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Kevin J. Meek, Baker & Botts, Dallas, Tex., Ex. Gp.: 1104, Requester: Owner

4,295,897, Reexam. No. 90/004,250, May 28, 1996, Cl. 437/034, METHOD OF MAKING CMOS INTEGRATED CIRCUIT DEVICE, Graham S. Tubbs, et. al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Kevin J. Meek, Baker & Botts, Dallas, Tex., Ex. Gp.: 1104, Requester: Owner

4,316,493, Reexam. No. 90/004,251, May 28, 1996, Cl. 160/168.1, VERTICAL BLIND CONTROLS, Joseph P. Arena, Owner of Record: *Newell Operating Co., Freeport, Ill.,* Attorney or Agent: Foley & Lardner, Milwaukee, Wis., Ex. Gp.: 3509, Requester: Owner

4,443,811, Reexam. No. 90/004,252, May 28, 1996, Cl. 257/372, CMOS INTEGRATED CIRCUIT DEVICE, Graham S. Tubbs, et. al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Baker & Botts, Dallas, Tex., Ex. Gp.: 2503, Requester: Owner

4,458,366, Reexam. No. 90/004,253, May 28, 1996, Cl. 623/003, ARTIFICIAL IMPLANTABLE BLOOD PUMP, David C. MacGregor, Owner of Record: *David C. MacGregor, Islington, Ontario, Canada,* Attorney or Agent: Sim & McBurney, Toronto, Canada, Ex. Gp.: 3308, Requester: Thermo Cardiosystems Inc., c/o Gilbert H. Hennessey, Fish & Richardson, Boston, Mass.

4,500,748, Reexam. No. 90/004,209, April 4, 1996, Cl. 174/21A, FLAME RETARDANT ELECTRICAL CABLE, Gary S. Klein, Owner of Record: *Furon Co., Laguna Niguel, Calif.,* Attorney or Agent: Christopher B. Fagen, Fay Sharpe Beall Fagen Minnich & McKee, Cleveland, Ohio, Ex. Gp.: 2019, Requester: Comtran Corp., c/o John J. McDonnell, Banner & Allegretti, Chicago, Ill.

4,623,823, Reexam. No. 90/004,211, Apr. 9, 1996, Cl. 315/058, ELECTRICAL ADAPTER FOR USE IN CONNECTION WITH FLUORESCENT LAMPS, H. Joseph Engel, Owner of Record: *H. Joseph Engel, Invine, Calif.,* Attorney or Agent: Knobble Martens Olson & Bear, Newport Beach, Calif., Ex. Gp.: 2502, Requester: Owner

4,654,502, Reexam. No. 90/004,257, May 30, 1996, Cl. 219/85.13, METHOD FOR REFLOW SOLDERING OF SURFACE MOUNTED DEVICES TO PRINTED CIRCUIT BOARDS, Edward J. Furtek, Owner of Record: *Vitronics Corp., New Market, N.H.,* Attorney or Agent: Wolf, Greenfield & Sacks, Boston, Mass., Ex. Gp.: 2106, Requester: Conceptronic, Inc., c/o Weingarten, Schurgin, Gagnebin & Hayes, Boston, Mass.

4,919,484, Reexam. No. 90/004,259, May 31, 1996, Cl. 297/474, ANTI-CINCH SEAT BELT SYSTEM, Jerry D. Bougher, et. al., Owner of Record: *Indiana Mills & Manufacturing, Inc., Westfield, Ind.,* Attorney or Agent: John V. Moriarty, Woodward, Emhardt, Naughton, Moriarty & McNett, Indianapolis, Ind., Ex. Gp.: 3507, Requester: Owner

5,065,360, Reexam. No. 90/004,214, April 10, 1996, Cl. 395/800, PORTABLE DATA STORAGE AND EDITING DEVICE, Douglas J. Kelly, Owner of Record: *Taurus Systems, LLC, Chicago, Ill.,* Attorney or Agent: Lowe Price LeBlanc Becker & Shur, Alexandria, Va., Ex. Gp.: 2309, Requester: Gregg C. Vanderbeiden, c/o Trace Research & Development Center, Madison, Wis.

5,302,169, Reexam. No. 90/004,258, May 30, 1996, Cl. 602/016, POST OPERATIVE KNEE BRACE, Dean A. Taylor, Owner of Record: *Generation II Orthotics, Inc., Richmond, Canada,* Attorney or Agent: Townsend and Townsend and Crew, San Francisco, Calif., Ex. Gp.: 3302, Requester: Owner

5,302,414, Reexam. No. 90/004,204, April 3, 1996, Cl. 427/192, GAS-DYNAMIC SPRAYING METHOD FOR APPLYING A COATING, Anatoly P. Alkhimov, et. al., Owner of Record: *Inventor,* Attorney or Agent: Emch Shaffer Schaub & Porcello, Toledo, Ohio, Ex. Gp.: 1112, Requester: Owner

5,327,380, Reexam. No. 90/004,254, May 28, 1996, Cl. 365/195, METHOD AND APPARATUS FOR INHIBITING A PREDECODER WHEN SELECTING A REDUNDANT ROW LINE, David V. Kersh, et. al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Robert N. Rountree, Texas Instruments Inc., Dallas, Tex., Ex. Gp.: 2511, Requester: Owner

5,420,927, Reexam. No. 90/004,215, April 10, 1996, Cl: 380/023, METHOD FOR CERTIFYING PUBLIC KEYS IN A DIGITAL SIGNATURE SCHEME, Silvio Micali, Owner of Record: *Inventor,* Attorney or Agent: Foley Hoag & Eliot, Boston, Mass., Ex. Gp.: 2202, Requester: Owner

5,428,412, Reexam. No. 90/004,256, May 29, 1996, Cl. 351/177, METHOD FOR TREATING MYOPIA WITH AN ASPHERIC CORNEAL CONTACT LENS, Nick Stoyan, Owner of Record: *Contex, Inc., Sherman Oaks, Calif.,* Attorney or Agent: David J. Oldenkamp, Poms Smith Lande & Rose, Los Angeles, Calif., Ex. Gp.: 2516, Requester: Roy W. Hardin, Harris, Tucker & Hardin, Dallas, Tex.

5,475,640, Reexam. No. 90/004,255, May 28, 1996, Cl. 365/200, METHOD AND APPARATUS FOR INHIBITING A PREDECODER WHEN SELECTING A REDUNDANT ROW LINE, David V. Kersh III, et. al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Robert N. Roundtree, Texas Instruments Inc., Dallas, Tex., Ex. Gp.: 2511, Requester: Owner

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Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal, This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
FEBRUARY 05, 1996
DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
104,120	71/083,090	05/04/1915
104,124	71/080,039	05/04/1915
104,148	71/082,211	05/04/1915
104,167	71/080,560	05/04/1915
323,692	71/359,282	04/30/1935
323,715	71/353,718	04/30/1935
323,731	71/359,382	04/30/1935
323,755	71/359,453	04/30/1935
323,758	71/359,532	04/30/1935
323,760	71/359,624	04/30/1935
323,766	71/359,702	04/30/1935
323,780	71/357,202	04/30/1935
323,796	71/359,089	04/30/1935
323,811	71/348,962	04/30/1935
605,296	71/623,430	05/03/1955
605,318	71/658,388	05/03/1955
605,325	71/668,611	05/03/1955
605,330	71/657,047	05/03/1955
605,334	71/664,779	05/03/1955
605,339	71/669,387	05/03/1955
605,340	71/670,474	05/03/1955
605,341	71/671,226	05/03/1955
605,342	71/672,728	05/03/1955
605,357	71/669,495	05/03/1955
605,358	71/669,496	05/03/1955
605,365	71/655,081	05/03/1955
605,376	71/669,052	05/03/1955
605,380	71/669,746	05/03/1955
605,385	71/670,376	05/03/1955
605,392	71/661,652	05/03/1955
605,398	71/623,284	05/03/1955
605,399	71/635,139	05/03/1955
605,405	71/655,557	05/03/1955
605,406	71/657,255	05/03/1955
605,435	71/631,891	05/03/1955
605,436	71/631,892	05/03/1955
605,440	71/648,287	05/03/1955
605,449	71/666,345	05/03/1955
605,450	71/666,465	05/03/1955
605,453	71/667,852	05/03/1955
605,454	71/668,370	05/03/1955
605,456	71/668,521	05/03/1955
605,458	71/668,640	05/03/1955
605,465	71/663,864	05/03/1955
605,467	71/667,433	05/03/1955
605,476	71/666,662	05/03/1955
605,479	71/669,812	05/03/1955
605,480	71/670,511	05/03/1955
605,501	71/667,762	05/03/1955
605,502	71/667,915	05/03/1955
605,503	71/667,917	05/03/1955
605,505	71/668,229	05/03/1955
605,507	71/669,986	05/03/1955
605,508	71/670,101	05/03/1955
605,515	71/668,238	05/03/1955
605,523	71/654,200	05/03/1955
605,528	71/670,803	05/03/1955
605,542	71/671,033	05/03/1955
605,544	71/671,358	05/03/1955
605,546	71/671,775	05/03/1955
605,548	71/639,852	05/03/1955
605,551	71/650,893	05/03/1955
605,567	71/669,172	05/03/1955
605,568	71/669,202	05/03/1955
605,577	71/663,012	05/03/1955
605,579	71/667,522	05/03/1955
605,590	71/657,774	05/03/1955
605,593	71/659,475	05/03/1955
605,595	71/642,985	05/03/1955
605,599	71/666,961	05/03/1955
605,617	71/659,487	05/03/1955
605,618	71/661,782	05/03/1955
605,624	71/658,996	05/03/1955
605,628	71/661,735	05/03/1955
605,632	71/638,488	05/03/1955
605,634	71/644,108	05/03/1955
605,636	71/670,962	05/03/1955
605,637	71/637,836	05/03/1955
1,009,412	73/006,339	04/29/1975
1,009,413	73/013,211	04/29/1975
1,009,414	73/013,786	04/29/1975
1,009,417	73/001,843	04/29/1975
1,009,420	73/024,890	04/29/1975
1,009,421	73/028,804	04/29/1975
1,009,422	73/030,567	04/29/1975
1,009,424	73/013,159	04/29/1975
1,009,430	73/022,319	04/29/1975
1,009,431	73/022,320	04/29/1975
1,009,432	73/022,321	04/29/1975
1,009,433	73/022,574	04/29/1975
1,009,434	73/022,576	04/29/1975
1,009,435	73/022,579	04/29/1975
1,009,436	73/022,934	04/29/1975

Reg. No.	Serial Number	Reg. Date
1,009,437	73/022,935	04/29/1975
1,009,438	73/022,937	04/29/1975
1,009,439	73/022,939	04/29/1975
1,009,440	73/022,941	04/29/1975
1,009,441	73/023,130	04/29/1975
1,009,442	73/023,131	04/29/1975
1,009,443	73/023,132	04/29/1975
1,009,444	73/023,133	04/29/1975
1,009,445	73/023,134	04/29/1975
1,009,446	73/023,135	04/29/1975
1,009,447	73/023,136	04/29/1975
1,009,448	73/023,138	04/29/1975
1,009,449	73/023,139	04/29/1975
1,009,450	73/023,140	04/29/1975
1,009,451	73/023,141	04/29/1975
1,009,453	73/029,066	04/29/1975
1,009,457	73/022,354	04/29/1975
1,009,463	73/032,214	04/29/1975
1,009,464	73/033,962	04/29/1975
1,009,465	73/034,214	04/29/1975
1,009,466	73/034,587	04/29/1975
1,009,467	73/002,470	04/29/1975
1,009,468	73/007,754	04/29/1975
1,009,474	73/000,127	04/29/1975
1,009,476	73/000,763	04/29/1975
1,009,477	73/002,262	04/29/1975
1,009,480	73/008,762	04/29/1975
1,009,484	73/002,640	04/29/1975
1,009,496	73/008,010	04/29/1975
1,009,503	73/000,758	04/29/1975
1,009,507	73/010,193	04/29/1975
1,009,515	73/015,747	04/29/1975
1,009,518	73/011,577	04/29/1975
1,009,519	73/011,674	04/29/1975
1,009,522	73/013,832	04/29/1975
1,009,525	73/017,150	04/29/1975
1,009,526	73/019,273	04/29/1975
1,009,527	73/023,048	04/29/1975
1,009,528	73/002,208	04/29/1975
1,009,529	73/010,532	04/29/1975
1,009,533	73/006,350	04/29/1975
1,009,534	73/007,422	04/29/1975
1,009,535	73/012,138	04/29/1975
1,009,541	73/008,459	04/29/1975
1,009,544	73/020,538	04/29/1975
1,009,545	73/001,414	04/29/1975
1,009,546	73/003,368	04/29/1975
1,009,547	73/012,923	04/29/1975
1,009,553	73/020,462	04/29/1975
1,009,567	73/017,625	04/29/1975
1,009,568	73/002,779	04/29/1975
1,009,569	73/015,127	04/29/1975
1,009,573	73/009,793	04/29/1975
1,009,582	73/026,047	04/29/1975
1,009,583	73/029,461	04/29/1975
1,009,584	73/029,549	04/29/1975
1,009,587	73/012,646	04/29/1975
1,009,591	73/010,787	04/29/1975
1,009,593	73/012,355	04/29/1975
1,009,594	73/021,218	04/29/1975
1,009,598	73/009,295	04/29/1975
1,009,599	73/011,407	04/29/1975
1,009,600	73/014,749	04/29/1975
1,009,601	73/014,887	04/29/1975
1,009,605	73/023,805	04/29/1975
1,009,611	73/016,231	04/29/1975
1,009,615	73/024,409	04/29/1975
1,009,616	73/024,486	04/29/1975
1,009,617	73/024,487	04/29/1975
1,009,620	73/026,284	04/29/1975
1,009,621	73/029,622	04/29/1975
1,009,628	72/464,129	04/29/1975
1,009,630	72/422,168	04/29/1975
1,009,631	72/422,169	04/29/1975
1,009,633	72/463,423	04/29/1975
1,009,634	72/404,121	04/29/1975
1,009,636	72/459,029	04/29/1975
1,009,637	72/430,302	04/29/1975
1,009,639	72/449,762	04/29/1975
1,009,640	72/454,966	04/29/1975
1,009,641	72/457,667	04/29/1975
1,009,645	72/461,415	04/29/1975
1,009,646	72/462,363	04/29/1975
1,009,647	72/463,877	04/29/1975
1,009,648	72/465,553	04/29/1975
1,009,649	72/437,800	04/29/1975
1,009,652	72/462,441	04/29/1975
1,009,658	72/452,570	04/29/1975
1,009,662	72/455,796	04/29/1975
1,009,664	72/461,727	04/29/1975
1,009,671	72/465,006	04/29/1975
1,009,677	72/458,481	04/29/1975
1,009,678	72/463,593	04/29/1975
1,009,682	72/466,713	04/29/1975
1,009,687	72/439,605	04/29/1975
1,009,688	72/439,990	04/29/1975
1,009,689	72/445,121	04/29/1975
1,009,700	72/437,643	04/29/1975
1,009,706	72/443,062	04/29/1975
1,009,711	72/465,825	04/29/1975
1,009,713	72/425,721	04/29/1975
1,009,714	72/431,328	04/29/1975
1,009,723	72/466,264	04/29/1975
1,009,725	72/463,029	04/29/1975
1,009,732	72/465,576	04/29/1975
1,009,734	72/451,512	04/29/1975
1,009,735	72/451,515	04/29/1975
1,009,736	72/437,593	04/29/1975
1,009,737	72/426,156	04/29/1975
1,009,739	72/426,158	04/29/1975
1,009,740	72/445,572	04/29/1975
1,009,743	72/464,343	04/29/1975
1,009,746	73/006,226	04/29/1975
1,009,749	73/007,590	04/29/1975
1,009,750	73/010,714	04/29/1975
1,009,760	73/011,288	04/29/1975
1,009,761	72/463,204	04/29/1975
1,009,762	72/457,362	04/29/1975
1,009,763	72/434,639	04/29/1975
1,009,766	72/464,474	04/29/1975
1,009,767	72/446,688	04/29/1975
1,009,768	72/449,096	04/29/1975
1,009,776	72/434,125	04/29/1975
1,009,777	72/444,721	04/29/1975
1,009,778	72/465,707	04/29/1975

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Cobra Wearing Apparel LTD. DBA Probe Co., New York, New York, Reg. No. 1,280,793, for the mark "PROBE", Canc. No. 24,797.

End Devices, Inc., Midland, Tex., Reg. No. 1,064,694, for the mark "SCADA" and design, Canc. No. 24,664.

Kustom Koncepts, Inc., Louisville, Ky., Reg. No. 1,622,386, for the mark "KOMFORT KOACH", Canc. No. 24,034.

Portable Computer Support Group, Inc., Dallas, Tex., Reg. No. 1,433,593, for the mark "LUCID", Canc. No. 24,639.

Eltrex International, Amherst, Ohio, Reg. No. 1,648,676, for the mark "FIRST IMPRESSIONS", Canc. No. 24,842.

Hospedajes Y Alojamientos Turisticos Temporarios S.A., Reg. No. 1,635,088, for the mark "BUZIOS BEUEN CLUB", Canc. No. 24,146.

Pier 25, Inc., Philadelphia, Pa., Reg. No. 1,600,049, for the mark "THE AMAZON CLUB THE SUMMER LEGEND", Canc. No. 24,535.

Lory Farber Ltd., Oklahoma City, Okla., 1,596,525, for the mark "BRIO", Canc. No. 24,635.

Galaxy Computer Services, Inc., Oak Brook, Ill., Reg. No. 1,599,295, for the mark "WELDPRO", Canc. No. 24,896.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from April through June 1996. Information includes:

- subclasses established or abolished (major changes)
- subclass title, indent, or positive change
- changes to existing classes and subclasses definitions (minor changes)

The Reclassification Alert Report may appear from time to time in the Official Gazette and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

The general public may purchase copies of Classification Orders or Classification Definitions by contacting the Editorial Division at 703-305-6101 or 703-305-5099. Payment can be made through a Deposit Account, or by check made payable to "Commissioner of Patents and Trademarks" and sent to:

Chief, Editorial Division
Office of Classification Support
U.S. Patent and Trademark Office
Crystal Mall 2, Room 303
Washington, D.C. 20231

June 4, 1996

JOHN F. TERAPANE, JR.
Administrator for Search and
Information Resources

RECLASSIFICATION ALERT REPORT

April 1996—June 1996

Class	First Subclass	Last Subclass	Action	Order Number
2			DEFN CHANGE	1596
12			DEFN CHANGE	1599
15			DEFN CHANGE	1597
15			DEFN CHANGE	1599
16			DEFN CHANGE	1598
19			DEFN CHANGE	1597
24			DEFN CHANGE	1596
29			DEFN CHANGE	1595
29			DEFN CHANGE	1599
30			DEFN CHANGE	1599
33			DEFN CHANGE	1599
34			DEFN CHANGE	1595
37			DEFN CHANGE	1599
40			DEFN CHANGE	1601
42			DEFN CHANGE	1596
44			DEFN CHANGE	1599
53			DEFN CHANGE	1595
53			DEFN CHANGE	1599
57			DEFN CHANGE	1599
59			DEFN CHANGE	1598
70			DEFN CHANGE	1599
74			DEFN CHANGE	1593
74			DEFN CHANGE	1599
76			DEFN CHANGE	1599
79			DEFN CHANGE	1599
81			DEFN CHANGE	1597
81			DEFN CHANGE	1599
83			DEFN CHANGE	1599
84			DEFN CHANGE	1599
92			DEFN CHANGE	1593
100			DEFN CHANGE	1599

Class	First Subclass	Last Subclass	Action	Order Number
101			DEFN CHANGE	1595
104			DEFN CHANGE	1593
104			DEFN CHANGE	1600
114			DEFN CHANGE	1599
118			DEFN CHANGE	1596
118			DEFN CHANGE	1599
119	83	95	ABOLISH	1597
119	156	160	ABOLISH	1597
119	600	633	ESTABLISH	1597
119	650	678	ESTABLISH	1597
119	861		ABOLISH	1597
119	867	869	ESTABLISH	1597
131			DEFN CHANGE	1602
132			DEFN CHANGE	1597
132			DEFN CHANGE	1599
134			DEFN CHANGE	1597
137	87		ABOLISH	1594
137	87.1	87.06	ESTABLISH	1594
137	115	119	ABOLISH	1594
137	115.01	115.09	ESTABLISH	1594
137	115.1		ESTABLISH	1594
137	115.11	115.19	ESTABLISH	1594
137	115.2		ESTABLISH	1594
137	115.21	115.28	ESTABLISH	1594
137	116.3		INDENT CHANGE	1594
137	116.5		INDENT CHANGE	1594
137	118.01	118.07	ESTABLISH	1594
137	119.01	119.09	ESTABLISH	1594
137	119.1		ESTABLISH	1594
140			DEFN CHANGE	1599
141			DEFN CHANGE	1594
141			DEFN CHANGE	1599
142			DEFN CHANGE	1599
144			DEFN CHANGE	1597
144	1	3	ABOLISH	1599
144	1.1		ESTABLISH	1599
144	2.1		ESTABLISH	1599
144	3.1		ESTABLISH	1599
144	3.5		ESTABLISH	1599
144	4.1	4.9	ESTABLISH	1599
144	5		TITLE CHANGE	1599
144	6.5		ESTABLISH	1599
144	7	16	TITLE CHANGE	1599
144	10		POSITION CHANGE	1599
144	18		TITLE CHANGE	1599
144	19		POSITION CHANGE	1599
144	20	25	POSITION CHANGE	1599
144	20	28	INDENT CHANGE	1599
144	23		TITLE CHANGE	1599
144	24		TITLE CHANGE	1599
144	24.02	24.25	ESTABLISH	1599
144	28.1	28.11	INDENT CHANGE	1599
144	28.2	28.7	INDENT CHANGE	1599
144	28.6		TITLE CHANGE	1599
144	28.71	28.72	INDENT CHANGE	1599
144	28.8		INDENT CHANGE	1599
144	28.9		INDENT CHANGE	1599
144	30		INDENT CHANGE	1599
144	33		INDENT CHANGE	1599
144	34		ABOLISH	1599
144	34.1	34.6	ESTABLISH	1599
144	35		ABOLISH	1599
144	35.1		ESTABLISH	1599
144	35.2		ESTABLISH	1599
144	37		INDENT CHANGE	1599
144	42		POSITION CHANGE	1599
144	48.1	48.7	ESTABLISH	1599
144	49		POSITION CHANGE	1599
144	50		TITLE CHANGE	1599
144	51		TITLE CHANGE	1599
144	53		TITLE CHANGE	1599
144	55		TITLE CHANGE	1599
144	56		TITLE CHANGE	1599
144	65		TITLE CHANGE	1599
144	65		POSITION CHANGE	1599
144	67		POSITION CHANGE	1599

Class	First Subclass	Last Subclass	Action	Order Number
144	68	73	POSITION CHANGE	1599
144	72		TITLE CHANGE	1599
144	72	76	INDENT CHANGE	1599
144	74		TITLE CHANGE	1599
144	75		TITLE CHANGE	1599
144	76		POSITION CHANGE	1599
144	77		TITLE CHANGE	1599
144	82		TITLE CHANGE	1599
144	82		POSITION CHANGE	1599
144	82	84	INDENT CHANGE	1599
144	83		POSITION CHANGE	1599
144	84		TITLE CHANGE	1599
144	85		TITLE CHANGE	1599
144	85	89	POSITION CHANGE	1599
144	90		ABOLISH	1599
144	90.1		ESTABLISH	1599
144	91		POSITION CHANGE	1599
144	91.2		ESTABLISH	1599
144	92		TITLE CHANGE	1599
144	93		ABOLISH	1599
144	93.1		ESTABLISH	1599
144	93.2		ESTABLISH	1599
144	96		TITLE CHANGE	1599
144	96		INDENT CHANGE	1599
144	98		TITLE CHANGE	1599
144	98	100	INDENT CHANGE	1599
144	99		TITLE CHANGE	1599
144	104		TITLE CHANGE	1599
144	104		INDENT CHANGE	1599
144	106		INDENT CHANGE	1599
144	108		TITLE CHANGE	1599
144	108		INDENT CHANGE	1599
144	114		ABOLISH	1599
144	114.1		ESTABLISH	1599
144	115		TITLE CHANGE	1599
144	116		TITLE CHANGE	1599
144	116		INDENT CHANGE	1599
144	117		ABOLISH	1599
144	117.1	117.4	ESTABLISH	1599
144	118		TITLE CHANGE	1599
144	118		INDENT CHANGE	1599
144	119		ABOLISH	1599
144	119.1		ESTABLISH	1599
144	119.2		ESTABLISH	1599
144	120		POSITION CHANGE	1599
144	122		TITLE CHANGE	1599
144	124		TITLE CHANGE	1599
144	124	126	INDENT CHANGE	1599
144	125		TITLE CHANGE	1599
144	126		TITLE CHANGE	1599
144	127		ABOLISH	1599
144	127.1		ESTABLISH	1599
144	127.2		ESTABLISH	1599
144	128	130	TITLE CHANGE	1599
144	130.2		ESTABLISH	1599
144	131		INDENT CHANGE	1599
144	132		TITLE CHANGE	1599
144	132		POSITION CHANGE	1599
144	133		ABOLISH	1599
144	133.1	133.3	ESTABLISH	1599
144	134		ABOLISH	1599
144	134.1	134.3	ESTABLISH	1599
144	135.2	135.4	ESTABLISH	1599
144	136		ABOLISH	1599
144	136.1	136.9	ESTABLISH	1599
144	136.95		ESTABLISH	1599
144	137		TITLE CHANGE	1599
144	137		INDENT CHANGE	1599
144	138		TITLE CHANGE	1599
144	142		TITLE CHANGE	1599
144	142		INDENT CHANGE	1599
144	143		TITLE CHANGE	1599
144	143		INDENT CHANGE	1599
144	144		ABOLISH	1599
144	144.1	144.4	ESTABLISH	1599
144	144.41		ESTABLISH	1599

Class	First Subclass	Last Subclass	Action	Order Number
144	144.5		ABOLISH	1599
144	144.51		ESTABLISH	1599
144	144.52		ESTABLISH	1599
144	145		ABOLISH	1599
144	145.1	145.4	ESTABLISH	1599
144	148		TITLE CHANGE	1599
144	150		TITLE CHANGE	1599
144	152		TITLE CHANGE	1599
144	154.5		ESTABLISH	1599
144	155		TITLE CHANGE	1599
144	155	161	INDENT CHANGE	1599
144	156		TITLE CHANGE	1599
144	159		TITLE CHANGE	1599
144	162		ABOLISH	1599
144	162.1		ESTABLISH	1599
144	163		TITLE CHANGE	1599
144	164		TITLE CHANGE	1599
144	164	166	INDENT CHANGE	1599
144	166		TITLE CHANGE	1599
144	168	172	TITLE CHANGE	1599
144	168	171	INDENT CHANGE	1599
144	174		TITLE CHANGE	1599
144	177	179	TITLE CHANGE	1599
144	177	179	INDENT CHANGE	1599
144	181.2		ESTABLISH	1599
144	181.3		ESTABLISH	1599
144	182		TITLE CHANGE	1599
144	183		TITLE CHANGE	1599
144	185		TITLE CHANGE	1599
144	187		TITLE CHANGE	1599
144	191		TITLE CHANGE	1599
144	192		TITLE CHANGE	1599
144	193		ABOLISH	1599
144	193.1		ESTABLISH	1599
144	193.2		ESTABLISH	1599
144	195		TITLE CHANGE	1599
144	195.1	195.9	ESTABLISH	1599
144	196		TITLE CHANGE	1599
144	198		ABOLISH	1599
144	198.1		ESTABLISH	1599
144	200		TITLE CHANGE	1599
144	201		TITLE CHANGE	1599
144	203		TITLE CHANGE	1599
144	204.2		ESTABLISH	1599
144	205		TITLE CHANGE	1599
144	205		POSITION CHANGE	1599
144	206		POSITION CHANGE	1599
144	207		TITLE CHANGE	1599
144	208		ABOLISH	1599
144	208.1	208.9	ESTABLISH	1599
144	208.91		ESTABLISH	1599
144	208.92		ESTABLISH	1599
144	209		ABOLISH	1599
144	209.1		ESTABLISH	1599
144	211	216	TITLE CHANGE	1599
144	215.2	215.4	ESTABLISH	1599
144	218		TITLE CHANGE	1599
144	218	241	INDENT CHANGE	1599
144	221	239	TITLE CHANGE	1599
144	241		TITLE CHANGE	1599
144	242		ABOLISH	1599
144	242.1		ESTABLISH	1599
144	243		TITLE CHANGE	1599
144	245		ABOLISH	1599
144	245.1	245.7	ESTABLISH	1599
144	246		ABOLISH	1599
144	246.1		ESTABLISH	1599
144	246.2		ESTABLISH	1599
144	247		INDENT CHANGE	1599
144	248		INDENT CHANGE	1599
144	248.2	248.7	ESTABLISH	1599
144	249		ABOLISH	1599
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144	250.11	250.26	ESTABLISH	1599
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144	252.2		ESTABLISH	1599
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144	253.91		ESTABLISH	1599
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144	255		TITLE CHANGE	1599
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144	256.1		POSITION CHANGE	1599
144	256.1		INDENT CHANGE	1599
144	256.2	256.4	INDENT CHANGE	1599
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144	259	271	INDENT CHANGE	1599
144	262	267	TITLE CHANGE	1599
144	266		POSITION CHANGE	1599
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144	278.1	278.3	ESTABLISH	1599
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144	286.1		ESTABLISH	1599
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144	342		TITLE CHANGE	1599
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144	352		TITLE CHANGE	1599
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144	365		TITLE CHANGE	1599
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144	382	389	ESTABLISH	1599
144	391	430	ESTABLISH	1599
147			DEFN CHANGE	1599
148			ABOLISH	1596
152			DEFN CHANGE	1598
156			DEFN CHANGE	1599
156			DEFN CHANGE	1601
157			DEFN CHANGE	1599
164			DEFN CHANGE	1599
166			DEFN CHANGE	1594
169			DEFN CHANGE	1594
172			DEFN CHANGE	1593
172			DEFN CHANGE	1598
173			DEFN CHANGE	1599
175			DEFN CHANGE	1599
178			DEFN CHANGE	1599
180			DEFN CHANGE	1598
180	79		ABOLISH	1593
180	79.1	79.5	ABOLISH	1593
180	131	163	ABOLISH	1593
180	204		TITLE CHANGE	1593
180	400	449	ESTABLISH	1593
180	DIG.1	DIG.22	ABOLISH	1593
184			DEFN CHANGE	1598
193			DEFN CHANGE	1594
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198			DEFN CHANGE	1598
198			DEFN CHANGE	1599
200			DEFN CHANGE	1600
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208			DEFN CHANGE	1594
210			DEFN CHANGE	1594
219			DEFN CHANGE	1593
219			DEFN CHANGE	1599
221			DEFN CHANGE	1595
221			INDENT CHANGE	1596
221			DEFN CHANGE	1600
222			DEFN CHANGE	1594
224	30	42	ABOLISH	1596

Class	First Subclass	Last Subclass	Action	Order Number
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224	148		ABOLISH	1596
224	148.1	148.7	ESTABLISH	1596
224	151		ABOLISH	1596
224	153	156	INDENT CHANGE	1596
224	202	216	ABOLISH	1596
224	224	229	ABOLISH	1596
224	252		ABOLISH	1596
224	253		ABOLISH	1596
224	412	463	ESTABLISH	1596
224	484		ESTABLISH	1596
224	486		ESTABLISH	1596
224	487		ESTABLISH	1596
224	575	587	ESTABLISH	1596
224	600	684	ESTABLISH	1596
224	901.2		ESTABLISH	1596
224	901.4		ESTABLISH	1596
224	901.6		ESTABLISH	1596
224	901.8		ESTABLISH	1596
225			DEFN CHANGE	1599
229			DEFN CHANGE	1601
241			DEFN CHANGE	1599
242			DEFN CHANGE	1599
248			DEFN CHANGE	1596
251			DEFN CHANGE	1594
266			DEFN CHANGE	1594
270	1.01	1.03	ESTABLISH	1595
270	1.1		ABOLISH	1595
270	5		ABOLISH	1595
270	5.01	5.03	ESTABLISH	1595
270	30		ABOLISH	1595
270	30.01	30.09	ESTABLISH	1595
270	30.1		ESTABLIH	1595
270	30.11	30.13	ESTABLISH	1595
270	31		ABOLISH	1595
270	39		ABOLISH	1595
270	39.01	39.09	ESTABLISH	1595
270	52		ABOLISH	1595
270	52.01	52.09	ESTABLISH	1595
270	52.1		ESTABLISH	1595
270	52.11	52.19	ESTABLISH	1595
270	52.2		ESTABLISH	1595
270	52.21	52.29	ESTABLISH	1595
270	52.3		ESTABLISH	1595
270	52.5		ABOLISH	1595
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270	57		ABOLISH	1595
270	58		ABOLISH	1595
270	58.01	58.09	ESTABLISH	1595
270	58.1		ESTABLISH	1595
270	58.11	58.19	ESTABLISH	1595
270	58.2		ESTABLISH	1595
270	58.21	58.29	ESTABLISH	1595
270	58.3		ESTABLISH	1595
270	58.31	58.34	ESTABLISH	1595
270	95		ABOLISH	1595
271			DEFN CHANGE	1595
273	85	87	ABOLISH	1600
273	87.2		ABOLISH	1600
273	87.4		ABOLISH	1600
273	88	91	ABOLISH	1600
273	93		ABOLISH	1600
273	94		ABOLISH	1600
273	108.1		ESTABLISH	1600
273	108.2		ESTABLISH	1600
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273	108.22		ESTABLISH	1600
273	108.3		ESTABLISH	1600
273	108.31	108.33	ESTABLISH	1600
273	108.4		ESTABLISH	1600
273	108.41		ESTABLISH	1600
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273	108.51	108.57	ESTABLISH	1600
273	138		ABOLISH	1600
273	138.1	138.5	ESTABLISH	1600
273	244.1		ESTABLISH	1600
273	244.2		ESTABLISH	1600
273	310	316	ABOLISH	1600
273	317.1	317.9	ESTABLISH	1600
273	433	439	ABOLISH	1600
273	440.1		ESTABLISH	1600
273	461		ESTABLISH	1600
273	DIG.28		ABOLISH	1600
280			DEFN CHANGE	1596
280	91		ABOLISH	1593
280	91.1		ESTABLISH	1593
281			DEFN CHANGE	1595
283			DEFN CHANGE	1601
294			DEFN CHANGE	1596
297			DEFN CHANGE	1599
301			DEFN CHANGE	1598
305	10	14	ABOLISH	1598
305	16	18	ABOLISH	1598
305	21	32	ABOLISH	1598
305	35	39	ABOLISH	1598
305	54	58	ABOLISH	1598
305	59		TITLE CHANGE	1598
305	100	204	ESTABLISH	1598
312			DEFN CHANGE	1596
318			DEFN CHANGE	1593
336			DEFN CHANGE	1599
341			DEFN CHANGE	1600
346			DEFN CHANGE	1600
355			DEFN CHANGE	1595
362			DEFN CHANGE	1600
364			DEFN CHANGE	1600
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412			DEFN CHANGE	1599
414			DEFN CHANGE	1599
417			DEFN CHANGE	1594
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424			DEFN CHANGE	1602
425			DEFN CHANGE	1599
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428	40	42	ABOLISH	1601
428	40.1	40.9	ESTABLISH	1601
428	41.1	41.9	ESTABLISH	1601
428	42.1	42.3	ESTABLISH	1601
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450			DEFN CHANGE	1601
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451			DEFN CHANGE	1601
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455			DEFN CHANGE	1600
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474			DEFN CHANGE	1598
477			DEFN CHANGE	1593
492			DEFN CHANGE	1597
492			DEFN CHANGE	1599
493			DEFN CHANGE	1599
546	268	284	ABOLISH	1602
546	268.1		ESTABLISH	1602
546	268.4		ESTABLISH	1602
546	268.7		ESTABLISH	1602
546	269.1		ESTABLISH	1602
546	269.4		ESTABLISH	1602
546	269.7		ESTABLISH	1602
546	270.1		ESTABLISH	1602
546	270.4		ESTABLISH	1602
546	270.7		ESTABLISH	1602
546	271.1		ESTABLISH	1602
546	271.4		ESTABLISH	1602
546	271.7		ESTABLISH	1602

Class	First Subclass	Last Subclass	Action	Order Number
546	272.1		ESTABLISH	1602
546	272.4		ESTABLISH	1602
546	272.7		ESTABLISH	1602
546	273.1		ESTABLISH	1602
546	273.4		ESTABLISH	1602
546	273.7		ESTABLISH	1602
546	274.1		ESTABLISH	1602
546	274.4		ESTABLISH	1602
546	274.7		ESTABLISH	1602
546	275.1		ESTABLISH	1602
546	275.4		ESTABLISH	1602
546	275.7		ESTABLISH	1602
546	278.1		ESTABLISH	1602
546	278.4		ESTABLISH	1602
546	278.7		ESTABLISH	1602
546	279.1		ESTABLISH	1602
546	279.4		ESTABLISH	1602
546	279.7		ESTABLISH	1602
546	280.1		ESTABLISH	1602
546	280.4		ESTABLISH	1602
546	280.7		ESTABLISH	1602
546	281.1		ESTABLISH	1602
546	281.4		ESTABLISH	1602
546	281.7		ESTABLISH	1602
546	282.1		ESTABLISH	1602
546	282.4		ESTABLISH	1602
546	282.7		ESTABLISH	1602
546	283.1		ESTABLISH	1602
546	283.4		ESTABLISH	1602
546	283.7		ESTABLISH	1602
546	284.1		ESTABLISH	1602
546	284.4		ESTABLISH	1602
546	284.7		ESTABLISH	1602
604			DEFN CHANGE	1597

Department of Commerce
Patent and Trademark Office

[Docket #: 951019254-6136-02]
RIN 0651-XX05

Change in Procedure Relating to an Application Filing Date

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Change in Procedure.

Summary: The Patent and Trademark Office (PTO) is implementing a change in procedure relating to the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings. Under this new procedure, the PTO will accord a filing date to any application that contains something that can be construed as a written description, any necessary drawing, and, in a nonprovisional application, at least one claim, regardless of whether the application is filed without all the pages of the specification or without all of the figures of the drawings. Applications filed without all the pages of the specification or without all of the figures of the drawings will be treated by mailing a notice indicating that the application has been accorded a filing date, but is missing pages of the specification or figures of drawings. The notice will indicate that failure to timely (37 CFR1.181(f)) file a petition under 37 CFR 1.53(c) or 1.182 in response to such notice will result in the PTO treating the original application papers (the original disclosure of the invention) as including only those application papers present in the PTO on the date of deposit.

Effective Date: July 22, 1996.

For Further Information Contact: Robert W. Bahr by telephone at (703) 305-9285, by facsimile at (703) 308-6916, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail addressed to Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231.

Supplementary Information

The PTO is implementing a change in procedure relating to the treatment of applications filed without all the pages of the specification (Section 608.01 of the Manual of Patent Examining Procedure (MPEP)) (*e.g.*, with page numbering revealing that page(s) are missing), or without all of the figures of the drawings (MPEP 608.02) (*e.g.*, without drawing figures that are mentioned in the specification). The procedure set forth in this notice will be incorporated into the next revision of the MPEP.

The current treatment of applications that fail to identify the names of the actual inventor(s) (*e.g.*, an application naming the inventorship only as "Jane Doe et al.") as required by 37 CFR 1.41(a) and 1.53(b) is not affected by the adoption of the procedure set forth in this notice.

In a Notice entitled "Proposed Changes in Procedures Relating to an Application Filing Date" (Filing Date Notice), published in the *Federal Register* at 60 FR 56982-84 (November 13, 1995), and in the PTO *Official Gazette* at 1181 *Off. Gaz. Pat. Office* 12-13 (December 5, 1995), the PTO proposed a change in procedure relating to the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings. In view of the comments received in response to the Filing Date Notice, the PTO is adopting the proposed change.

The adopted procedure for the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings is set forth below.

APPLICATIONS FILED WITHOUT ALL PAGES OF SPECIFICATION

The Initial Application Examination Division reviews application papers to determine whether all of the pages of the specification are present in the application. If the application is filed without all of the page(s) of the specification, but containing something that can be construed as a written description, at least one drawing figure, if necessary under 35 U.S.C. 113, the names of all the inventors, and, in a nonprovisional application, at least one claim, the Initial Application Examination Division will mail a "Notice of Omitted Items" indicating that the application papers so deposited have been accorded a filing date, but are lacking some page(s) of the specification.

The mailing of a "Notice of Omitted Items" will permit the applicant to either: (1) promptly establish prior receipt in the PTO of the page(s) at issue (generally by way of a date-stamped postcard receipt (MPEP 503)), or (2) promptly submit the omitted page(s) in a nonprovisional application and accept the date of such submission as the application filing date. An applicant asserting that the page(s) was in fact deposited in the PTO with the application papers must file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application), which will be refunded if it is determined that the page(s) was in fact received by the PTO with the application papers deposited on filing) with evidence of such deposit within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)). An applicant desiring to submit the omitted page(s) in a nonprovisional application and accept the date of such submission as the application filing date must file any omitted page(s) with an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such page(s) and a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) requesting the later filing date within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)).

An applicant willing to accept the application as deposited in the PTO need not respond to the "Notice of Omitted Items," and the failure to file a petition under 37 CFR 1.53(c) or 1.182 (and the requisite petition fee) as discussed above within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)) will be treated as constructive acceptance by the applicant of the application as deposited in the PTO. Amendment of the specification is required in a nonprovisional application to renumber the pages consecutively and cancel any incomplete sentences caused by the absence of the omitted pages. Such amendment should be by way of preliminary amendment submitted prior to the first Office action to avoid delays in the prosecution of the application.

If the application does not contain anything that can be construed as a written description, the Initial Application Examination Division will mail a Notice of Incomplete Application (PTO-1123) indicating that the application lacks the specification required by 35 U.S.C. 112. The applicant may file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application)) asserting that: (1) the missing specification was submitted, or (2) the application papers as deposited contain an adequate written description under 35 U.S.C. 112. The petition under 37 CFR 1.53(c) must be accompanied by sufficient evidence (37 CFR 1.181(b)) to establish the applicant's entitlement to the requested filing date (*e.g.*, a date-stamped postcard receipt (MPEP 503) to establish prior receipt in the PTO of the missing specification). Alternatively, the applicant may submit the omitted specification, including at least one claim in a nonprovisional application, accompanied by an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to the specification being submitted and accept the date of such submission as the application filing date.

Original claims form part of the original disclosure and provide their own written description. *See In re Anderson*, 471 F.2d 1237, 176 USPQ 331 (CCPA 1973). As such, an application that contains at least one claim, but does not contain anything which can be construed as a written description of such claim(s), would be unusual.

NONPROVISIONAL APPLICATIONS FILED WITHOUT AT LEAST ONE CLAIM

35 U.S.C. 111(a)(2) requires that an application for patent include, *inter alia*, "a specification as prescribed by section 112 of this title," and 35 U.S.C. 111(a)(4) provides that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 112, first paragraph, provides, in part, that "[t]he specification shall contain a written description of the invention," and 35 U.S.C. 112, second paragraph, provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." Also, the Court of Appeals for the Federal Circuit stated in *Litton Systems, Inc. v. Whirlpool Corp.*:

> Both statute, 35 U.S.C. 111 [(a)], and federal regulations, 37 CFR 1.51 [(a)(1)], make clear the requirement that an application for a patent *must* include . . . a specification and claims. . . . The omission of any *one* of these component parts makes a patent application incomplete and thus not entitled to a filing date.

728 F.2d 1423, 1437, 221 USPQ 97, 105 (Fed. Cir. 1984) (citing *Gearon v. United States*, 121 F.Supp 652, 654, 101 USPQ 460, 461 (Ct. Cl. 1954), *cert. denied*, 348 U.S. 942, 104 USPQ 409 (1955)) (emphasis in the original).

Therefore, in an application filed under 35 U.S.C. 111(a), a claim is a statutory requirement for according a filing date to the application. 35 U.S.C. 162 and 171 make 35 U.S.C. 112 applicable to plant and design applications, and 35 U.S.C. 162 specifically requires the specification in a plant patent application to contain a claim. 35 U.S.C.111(b)(2), however, provides that "[a] claim, as required by the second through fifth paragraphs of section 112, shall not be required in a provisional application." Thus, with the exception of provisional applications filed under 35 U.S.C. 111(b), any application filed without at least one claim is incomplete and not entitled to a filing date.

If a nonprovisional application does not contain at least one claim, a "Notice of Incomplete Application" will be mailed to the applicant(s) indicating that no filing date has been granted and setting a period for submitting a claim. The filing date will be the date of receipt of at least one claim. *See In re Mattson*, 208 USPQ 168 (Comm'r Pats. 1980).

As 37 CFR 1.53(b)(2)(ii) permits the conversion of an application filed under 35 U.S.C. 111(a) to an application under 35 U.S.C. 111(b), an applicant in an application, other than for a design patent, filed under 35 U.S.C. 111(a) on or after June 8, 1995, without at least one claim has the alternative of filing a petition under 37 CFR 1.53(b)(2)(ii) to convert such application into an application under 35 U.S.C. 111(b), which does not require a claim to been entitled to its date of deposit as a filing date. Such a petition, however, must be filed prior to the expiration of twelve months after the date of deposit of the application under 35 U.S.C. 111(a), and comply with the other requirements of 37 CFR 1.53(b)(2)(ii).

APPLICATIONS FILED WITHOUT ANY DRAWINGS

35 U.S.C. 111(a)(2)(B) and 111(b)(2)(B) each provide, in part, that an "application shall include . . . a drawing as prescribed by section 113 of this title" and 35 U.S.C.111(a)(4) and 111(b)(4) each provide, in part, that the "filing date . . . shall be the date on which . . . any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 113 in turn provides that an "applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented."

Applications filed without drawings are initially inspected to determine whether a drawing is referred to in the specification, and if not, whether a drawing is necessary for an understanding of the invention. 35 U.S.C. 113.

In general, it has been PTO practice to treat an application that contains at least one process or method claim as an application for which a drawing is not necessary for an understanding of the invention under 35 U.S.C. 113. The same practice has been followed in composition applications. Other situations in which drawings are usually not considered necessary for an understanding of the invention under 35 U.S.C. 113 are:

I. *Coated articles or products*: where the invention resides solely in coating or impregnating a conventional sheet (*e.g.*, paper or cloth, or an article of known and conventional character with a particular composition), unless significant details of structure or arrangement are involved in the article claims;

II. *Articles made from a particular material or composition*: where the invention consists in making an article of a particular material or composition, unless significant details of structure or arrangement are involved in the article claims;

III. *Laminated Structures*: where the claimed invention involves only laminations of sheets (and coatings) of specified material unless significant details of structure or arrangement (other than the mere order of the layers) are involved in the article claims; or

IV. *Articles, apparatus or systems where sole distinguishing feature is presence of a particular material*: where the invention resides solely in the use of a particular material in an otherwise old article, apparatus or system recited broadly in the claims, for example:

a. A hydraulic system distinguished solely by the use therein of a particular hydraulic fluid;

b. Packaged sutures wherein the structure and arrangement of the package are conventional and the only distinguishing feature is the use of a particular material.

A nonprovisional application having at least one claim, or a provisional application having at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, not describing drawing figures in the specification, and filed without drawings will usually be processed for examination, so long as the application contains something that can be construed as a written description and the names of all the inventors. A nonprovisional application having at least one claim, or a provisional application having at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, describing drawing figure(s) in the specification, but filed without drawings will be treated as an application filed without all of the drawing figures referred to in the specification as discussed below, so long as the application contains something that can be construed as a written description and the names of all the inventors. In a situation in which the appropriate examining group determines that drawings are necessary under 35 U.S.C. 113 the filing date issue will be reconsidered on reference from the examining group.

If a nonprovisional application does not have at least one claim, or a provisional application does not have at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, and is filed without drawings, the Initial Application Examination Division will mail a "Notice of Incomplete Application" indicating that the application lacks drawings and that 35 U.S.C. 113 requires a drawing where necessary for the understanding of the subject matter sought to be patented.

The applicant may file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application)) asserting that (1) the drawing(s) at issue was submitted, or (2) the drawing(s) is not necessary under 35 U.S.C. 113 for a filing date. The petition must be accompanied by sufficient evidence to establish the applicant's entitlement to the requested filing date (*e.g.*, a date-stamped postcard receipt (MPEP 503) to establish prior receipt in the PTO of the drawing(s) at issue). Alternatively, the applicant may submit drawing(s) accompanied by an oath or declaration incompliance with 37 CFR 1.63 and 1.64 referring to the drawing(s) being submitted and accept the date of such submission as the application filing date.

In design applications, the Initial Application Examination Division will mail a "Notice of Incomplete Application" indicating that the application lacks the drawings required under 35 U.S.C. 113. The applicant may: (1) promptly file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i)) asserting that the missing drawing(s) was submitted, or (2) promptly submit drawing(s) accompanied by an oath or declaration in compliance with 37 CFR 1.63 and 1.64 and accept the date of such submission as the application filing date. 37 CFR 1.154(a) provides that the claim in a design application "shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described." As such, petitions under 37 CFR 1.53(c) asserting that drawings are unnecessary under 35 U.S.C. 113 for a filing date in a design application will not be found persuasive.

APPLICATIONS FILED WITHOUT ALL FIGURES OF DRAWINGS

The Initial Application Examination Division reviews application papers to determine whether all mentioned drawing figures in the specification are present in the application. If the application is filed without all of the drawing figure(s) referred to in the specification, and the application contains something that can be construed as a written description, at least one drawing, if necessary under 35 U.S.C. 113, the names of all the inventors, and, in a nonprovisional application, at least one claim, the Initial Application Examination Division will mail a "Notice of Omitted Items" indicating that the application papers so deposited have been accorded a filing date, but are lacking some of the drawings described in the specification.

The mailing of a "Notice of Omitted Items" will permit the applicant to either: (1) promptly establish prior receipt in the PTO of the drawing(s) at issue (generally by way of a date-stamped postcard receipt (MPEP 503)), or (2) promptly submit the omitted drawing(s) in a nonprovisional application and accept the date of such submission as the application filing date. An applicant asserting that the drawing(s) was in fact deposited in the PTO with the application papers must file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application), which will be refunded if it is determined that the drawing(s) was in fact received by the PTO with the application papers deposited on filing) with evidence of such deposit within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)). An applicant desiring to submit the omitted drawings in a nonprovisional application and accept the date of such submission as the application filing date must file any omitted drawing(s) with an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such drawing(s) and a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) requesting the later filing date within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)).

An applicant willing to accept the application as deposited in the PTO need not respond to the "Notice of Omitted Items," and the failure to file a petition under 37 CFR1.53(c) or 1.182 (and the requisite petition fee) as discussed above within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)) will be treated as constructive acceptance by the applicant of the application as deposited in the PTO. Amendment of the specification is required in a nonprovisional application to cancel all references to the omitted drawing, both in the brief and detailed descriptions of the drawings and including any reference numerals shown only in the omitted drawings. In addition, a separate letter is required in a nonprovisional application to renumber the drawing figures consecutively (showing the proposed changes in red ink), if necessary, and amendment of the specification is required to correct the references to the drawing figures to correspond with any relabelled drawing figures, both in the brief and detailed descriptions of the drawings. Such amendment and correction to the drawing figures, if necessary, should be by way of preliminary amendment submitted prior to the first Office action to avoid delays in the prosecution of the application.

SUBSEQUENT TREATMENT OF APPLICATION

In instances in which a "Notice of Incomplete Application" has been mailed, further action by the applicant is necessary for the application to be accorded a filing date. As such, the application will be retained in the Initial Application Examination Division to await such action. Unless the applicant either completes the application or files a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) or 1.17(q)) within the period set in the "Notice of Incomplete Application," the application will be processed as an incomplete application under 37 CFR 1.53(c).

In instances in which a "Notice of Omitted Items" has been mailed, the application will be retained in the Initial Application Examination Division for a period of two months from the mailing date of "Notice of Omitted Items" to permit the applicant to either: (1) establish prior receipt in the PTO of the page(s) or drawing(s) at issue, or (2) promptly submit the omitted page(s) or drawing(s) in a nonprovisional application and accept the date of such submission as the application filing date. Extensions of time under 37 CFR 1.136 will not be applicable to this two-month time period.

The grant of a petition under 37 CFR 1.182 to accept the omitted page(s) or drawing(s) in a nonprovisional application and accord the date of such submission as the application filing

date will be indicated by the issuance of a new filing receipt indicating the filing date accorded the application.

Unless the applicant timely files a petition under 37 CFR 1.53(c) or 1.182 (and the requisite petition fee), the application will maintain the filing date as of the date of deposit of the application papers in the PTO, and the original application papers (*i.e.*, the original disclosure of the invention) will include only those application papers present in the PTO on the date of deposit. Nonprovisional applications that are complete under 35 CFR 1.51(a)(1) will then be forwarded to the appropriate examining group for examination of the application. Provisional applications that are complete under 35 CFR 1.51(a)(2) will then be forwarded to Files Repository. The current practice for treating applications that are not complete under 37 CFR 1.51(a) will remain unchanged (37 CFR 1.53(d)).

Any petition under 37 CFR 1.53(c) or 1.182 not filed within this two-month period may be dismissed as untimely. 37 CFR 1.181(f). Under the adopted procedure, the PTO may strictly adhere to the two-month period set forth in 37 CFR 1.181(f), and dismiss as untimely any petition not filed within this two-month period. This strict adherence to the two-month period set forth in 37 CFR 1.181(f) is justified as such applications will now be forwarded for examination at the end of this two-month period. It is further justified in instances in which the applicant seeks to submit the omitted page(s) or drawing(s) in a nonprovisional application and request the date of such submission as the application filing date since: (1) according the application a filing date later than the date of deposit may affect the date of expiration of any patent issuing on the application due to the changes to 35 U.S.C. 154 contained in Public Law 103-465, § 532, 108 Stat. 4809 (1994), and (2) the filing of a continuation-in-part application is a sufficiently equivalent mechanism for adding additional subject matter to avoid the loss of patent rights.

The submission of omitted page(s) or drawing(s) in a nonprovisional application and acceptance of the date of such submission as the application filing date is tantamount to simply filing a new application. Thus, applicants should consider filing a new application as an alternative to submitting a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) with any omitted page(s) or drawing(s), which is a cost-effective alternative in instances in which an nonprovisional application is deposited without filing fees. Likewise, in view of the relatively low filing fee for provisional applications, and the PTO's desire to minimize the processing of provisional applications, the PTO will not grant petitions under 37 CFR 1.182 to accept omitted page(s) or drawing(s) and accord an application filing date as of the date of such submission. Instead, the applicant should simply refile the complete provisional application.

Response to Comments

Thirteen comments were received in response to the Filing Date Notice. Nine comments expressly supported the proposed change, while the remaining four comments simply made additional comments or suggested additional changes, but did not oppose the proposed change. The written comments have been analyzed, and responses to the comments follow.

Comment (1): One comment suggested that the PTO should, by rulemaking, permit the addition of subject matter in a foreign application for which priority is claimed.

Response: Where an application includes in the papers deposited on filing with the application a certified copy of a foreign application for which priority is claimed, the PTO will grant a timely petition under 37 CFR 1.182 requesting that: (1) the corresponding sheets of drawings in the foreign priority application be accepted for any omitted sheets of drawings in the application, or (2) the foreign priority application be accepted as the application as filed, which may result in the treatment of the foreign priority application as an application filed in a non-English language (37 CFR 1.52(d)).

In instances in which the foreign priority application was not present among the papers deposited on filing with the application, any addition of subject matter from the foreign priority application into the application must be considered as new matter under 35 U.S.C. 132 (and, as such, will not be permitted by petition), unless the application-as-filed specifically incorporates the foreign priority application by reference.

Drawing figures do not require translation of the subject matter shown therein and individual drawing figures are sufficiently segregated that it is considered appropriate to permit, by petition under 37 CFR 1.182, the acceptance of the corresponding sheets of drawings in the foreign priority application for any omitted sheets of drawings in the application. The specification of a foreign priority application, however, is generally subject to translation and revision prior to its filing in the PTO as the specification of an application. As such, it is considered appropriate to permit, by petition under 37 CFR 1.182, the acceptance of a foreign priority application as the application as filed, but it is not considered acceptable to permit the acceptance of a translation of portions of the foreign priority application for omitted pages of the specification.

Finally, the occurrence of situations in which it is necessary for an applicant to request that the corresponding sheets of drawings in the foreign priority application be accepted for any omitted sheets of drawings in the application, or the foreign priority application be accepted as the application as filed is relatively rare. In addition, the treatment of these few applications on an *ad hoc* basis pursuant to 37 CFR 1.182 and 1.183 has proven acceptable.

Comment (2): One comment suggested that the PTO should consider requiring a declaration from the attorney averring that the omitted matter was inadvertently omitted.

Response: First, in view of a registered practitioner's responsibilities as set forth in 37 CFR Part 10, the PTO does not generally require verification of statements by registered practitioners. *See, e.g.*, 37 CFR 1.125 and 1.137. Second, as there is no apparent benefit to omitting material from an application as deposited in the PTO, there appears to be little justification for requiring even a statement that the omitted matter was inadvertently omitted.

Comment (3): One comment questioned whether the change would be applicable to applications filed under 37 CFR 1.60 or 1.62.

Response: The adopted procedure applies to applications filed under 37 CFR 1.53.

37 CFR 1.60 requires, *inter alia*, that the application be a true copy of the prior application (37 CFR 1.60(b)(2)), and a copy that omits pages of specification or sheets of drawings from the prior application is not a true copy of the prior application. As such, a copy that omits pages of specification or sheets of drawings from the prior application is an improper application under 37 CFR 1.60, and cannot be accorded a filing date as an application under 37 CFR 1.60 until the filing error is corrected.

The PTO considers 37 CFR 1.60 to be unnecessary in view of changes to 37 CFR 1.4(d), and a trap for the unwary. The PTO has previously proposed to eliminate 37 CFR 1.60 (*See* notice of proposed rulemaking entitled "Changes to Implement 20-Year Patent Term and Provisional Application" (20-Year Term Notice of Proposed Rulemaking) published in the *Federal Register* at 59 FR 63951 (December 12, 1994), and in the Patent and Trademark Office *Official Gazette* at 1170 *Off. Gaz. Pat. Office* 377 (January 3, 1995)), and will again propose to eliminate 37 CFR 1.60, as well as 37 CFR 1.62, in an impending rulemaking to implement the Administration's regulatory reform initiative.

A continuation or divisional application may be filed under 35 U.S.C. 111(a) using the procedures set forth in 37 CFR 1.53(b)(1), by providing a copy of the prior application, including a copy of the oath or declaration in such prior application, as filed. The patent statutes and rules of practice do not require that an oath or declaration include a recent date of execution, and the Examining Corps has been directed not to object to an oath or declaration as lacking either a recent date of execution or any date of execution. This change in examining practice will appear in the next revision of the MPEP. As is currently the situation under 37 CFR 1.60 and 1.62, the applicant's duty of candor and good faith including compliance with the duty of disclosure requirements of § 1.56 is continuous and applies to the continuation or divisional application, notwithstanding the lack of a newly executed oath or declaration.

37 CFR 1.60(b)(4) and 1.62(a) currently permit the filing of a continuation or divisional application by less than all of the inventors named in a prior application without a newly executed oath or declaration. The oath or declaration in an application filed under 37 CFR 1.53(b), however, must identify the inven-

torship of such application. Thus, unless it is necessary to file a continuation or divisional application under 37 CFR 1.60 to name less than all of the inventors named in a prior application, applicants are encouraged to file continuing applications under 37 CFR 1.53(b) (*i.e.*, omit any reference to 37 CFR 1.60 in the application papers) to avoid an inadvertent failure to comply with all of the requirements of 37 CFR 1.60.

An application under 37 CFR 1.62 uses the content of the prior application, and is itself only a request for an application under 37 CFR 1.62. As such, there is no concern that an application under 37 CFR 1.62 will be filed without all the pages of the specification or without all of the figures of the drawings.

Comment (4): One comment questioned whether a filing date would be accorded if the name of an inventor were omitted.

Response: 37 CFR 1.41 and 1.53 currently require that an application be filed in the name of the actual inventor or inventors, and this notice does not involve changes to the rules of practice. The PTO will propose to eliminate this requirement in 37 CFR 1.41 and 1.53 in the rulemaking to implement the Administration's regulatory reform initiative.

Comment (5): One comment suggested that the notices be mailed out as soon as possible to avoid a loss of rights for those applicants who require completion or refiling of the application. Another comment suggested that the decision as to whether an application is "incomplete" should be made by the Examining Corps, rather than on a formalistic basis by the Initial Application Examination Division.

Response: The efficient pre-examination processing of applications is in the mutual interest of the PTO and applicants. The PTO is currently in the process of modifying its pre-examination processing procedures to avoid any unnecessary delay. This new procedure will not impact the pre-examination processing of applications, in that the Initial Application Examination Division will mail a "Notice of Incomplete Application," "Notice of Omitted Items," and "Notice to File Missing Parts" under this new procedure at the time the "Notice of Incomplete Application" and "Notice to File Missing Parts" are currently mailed.

The adopted procedure replaces formalistic procedures with procedures based upon the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. Filing date issues are ultimately decided by the Office of Petitions in the Office of the Deputy Assistant Commissioner for Patent Policy and Projects (MPEP 1002.02(b)(35)) on the basis of whether and when the application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113, and not on the basis of who made the initial decision not to accord a filing date to the application.

It should be recognized that there is tension between the comments objecting to any review of the entitlement of an application to a filing date by the Initial Application Examination Division (arguing that this issue should be considered only by the Examining Corps) and the desire for speedy notification to the applicant that a portion of the application appears to have been omitted. To defer all review of the entitlement of an application to a filing date until the application is picked-up for examination would cause a significant delay in any such notification to the applicant.

Comment (6): One comment noted that 35 U.S.C. 111(b) does not require a claim for a provisional application. Several comments suggested that the PTO automatically treat any non-provisional application filed without at least one claim as a provisional application, if such application is otherwise entitled to a filing date as a provisional application.

Response: A provisional application does not require a claim to be entitled to a filing date. As discussed *supra*, an applicant in an application, other than for a design patent, filed under 35 U.S.C. 111(a) on or after June 8, 1995, without at least one claim has the alternative of filing a petition under 37 CFR 1.53(b)(2)(ii) to convert such application into an application under 35 U.S.C. 111(b). The PTO does not consider it appropriate to "automatically" consider an application filed under 35 U.S.C. 111(a) without a claim to be an application under 35 U.S.C. 111(b) (a provisional application), since the applicant may not desire an application under 35 U.S.C. 111(b), and may desire to file a claim to obtain an application filing date as of the date of submission of such claim.

Comment (7): One comment suggested that the MPEP should clearly indicate that applications filed without all the pages of specification or all the figures of drawings described in the specification cannot automatically be treated as defective under 35 U.S.C. 112, but must be considered for compliance with 35 U.S.C. 112 by the subject matter that is present in the application papers.

Response: In an effort to improve the examination of applications, chapter 2100 of the MPEP has been revised to set forth specific guidelines for rejections under 35 U.S.C. 101, 102, 103, and 112. MPEP 2161 *et seq.* set forth the guidelines for rejections under 35 U.S.C. 112, first and second paragraphs, and do not authorize a rejection under 35 U.S.C. 112 based merely upon the fact that pages of specification or figures of drawing were omitted.

Comment (8): One comment questioned whether the proposed procedure for the treatment of applications filed without all the pages of specification or all the figures of drawings described in the specification is applicable to provisional applications, noting that 35 U.S.C. 111(b) provides that a claim is not required in a provisional application.

Response: The adopted procedure applies to applications (both provisional and nonprovisional) filed under 37 CFR 1.53. The procedure recognizes that 35 U.S.C. 111(b) does not require a claim in a provisional application.

Comment (9): One comment suggested that the two-month period for taking action would be unfair in instances in which the PTO prepares and enters the notice into the Patent Application Locating and Monitoring (PALM) system but fails to mail the notice or mails the notice to an incorrect correspondence address.

Response: The "Notice of Omitted Items" is not an action within the meaning of 35 U.S.C. 133 to which a response is required to avoid abandonment. An applicant simply has the opportunity to file a petition, but need not take action, in response to a "Notice of Omitted Items." Thus, the timeliness of any such petition is governed by 37 CFR 1.181(f). 37 CFR 1.181(f) provides that any petition not filed within two months from the action complained of may be dismissed as untimely.

Establishing prior receipt in the PTO of the page(s) or drawing(s) at issue or submitting the omitted page(s) or drawing(s) and accepting the date of such submission as the application filing date would result in an addition to the papers constituting the original disclosure of the application, and submitting the omitted page(s) or drawing(s) and accepting the date of such submission as the application filing date would result in a change in application filing date. As a change in either the original disclosure or filing date of an application would interfere with the examination of the application for compliance with 35 U.S.C. 102, 103, and 112, the PTO will not forward an application in which a "Notice of Omitted Items" has been mailed for examination until it is apparent that the applicant has not responded to the "Notice of Omitted Items." Thus, a nonprovisional application will not be processed for examination, and the examination of the application will be delayed, until the expiration of two months from the mailing date of "Notice of Omitted Items." The two-month period set forth in 37 CFR 1.181(f) is considered an appropriate balance between providing an applicant sufficient time to take action in response to a "Notice of Omitted Items" and avoiding unnecessary delays in the examination of the application, which would be undesirable in view of 35 U.S.C. 154 as amended by Public Law 103-465. While an applicant willing to accept a nonprovisional application as deposited in the PTO need not respond to the "Notice of Omitted Items," the filing of an express communication to that effect would permit the PTO to proceed with the processing of the application for examination, and, as such, may reduce the delay in the examination of the application.

While a "Notice of Omitted Items" is not an action within the meaning of 35 U.S.C. 133, the principles regarding nonreceipt or delayed receipt of a "Notice of Omitted Items," due either to a failure on the part of the PTO to properly mail such notice or a failure on the part of the U.S. Postal Service to deliver such notice to the correspondence address in a timely manner, are applicable to the nonreceipt or delayed receipt of a "Notice of Omitted Items." Applicants are directed to the Notice entitled "Withdrawing the Holding of Abandonment When Office Actions Are Not Received," published in the PTO *Official Gazette* at 1156 *Off. Gaz. Pat. Office* 53 (November 16, 1993), for the evidence necessary to establish nonreceipt

of a "Notice of Omitted Items," and the Notice entitled ""Procedures For Restarting Response Periods," published in the PTO *Official Gazette* at 1160 *Off. Gaz. Pat. Office* 14 (March 1, 1994), for the evidence necessary to establish delayed receipt of a "Notice of Omitted Items."

Comment (10): One comment suggested that while the proposed procedure is an improvement, it still conflicts with 35 U.S.C. 112 and 113. The comment specifically argues that the sufficiency of an application is a matter for determination by an examiner skilled in the subject matter of the application, in that Congress did not intend that the sufficiency of an application be determined by the Initial Patent Examination Division.

Response: The adopted procedure will accord a filing date to any application that contains something that can be construed as a written description, any necessary drawing, and, in a nonprovisional application, at least one claim. This procedure is consistent with the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. 35 U.S.C. 113, second sentence, contemplates that drawings may be filed after the filing date of an application. 35 U.S.C. 113, however, provides that an "applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented," and 35 U.S.C. 111(a)(4) and 111(b)(4) each provide, in part, that the "filing date . . . shall be the date on which . . . any required drawing are received in the Patent and Trademark Office." As such, the PTO has the statutory authority, and responsibility, to determine whether a drawing is necessary under 35 U.S.C. 113 in an application filed without drawings prior to according a filing date to that application.

There is nothing in 35 U.S.C. 111, 112, or 113 that limits the authority of the Commissioner to delegate the determination of whether or when any application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. In any event, filing date issues are, as discussed *supra*, ultimately decided by Office of the Deputy Assistant Commissioner for Patent Policy and Projects on the basis of whether and when the application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113, and not on the basis of who made the initial decision not to accord a filing date to the application.

Comment (11): One comment suggested that the proposed procedure be adopted by rulemaking. Another comment suggested that the proposed procedure either be adopted by rulemaking or clearly set forth in the MPEP.

Response: 37 CFR 1.53(b)(1) provides that the "filing date of an application for patent filed under this section, except for a provisional application, is the date on which: a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." 37 CFR 1.53(b)(2) provides that the "filing date of a provisional application is the date on which: a specification as prescribed by 35 U.S.C. 112, first paragraph; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." Thus, no change to the rules of practice is necessary to adopt the procedure set forth in this notice.

It should be noted that the MPEP 608.01 sets forth the former procedure for treating an application filed without all of the pages of specification or filed under 35 U.S.C. 111(a) without at least one claim. Likewise, MPEP 608.02 sets forth the former procedure for treating an application filed without drawings or all of the figures of drawings.

The next revision of the MPEP will incorporate the change in procedure set forth in this notice.

June 5, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,272,402, Warden W. Mayes, PROCESS FOR REGENERATING FLUIDIZABLE PARTICULATE CRACKING CATALYSTS, Interference No. 103,564, final judgment adverse to the patentee rendered February 14, 1996, as to claims 1-44.

Patent No. 4,639,365, A. Dean Sherry, GADOLINIUM CHELATES AS NMR CONTRAST AGENTS, Interference No. 103,295, final judgment adverse to the patentee rendered February 6, 1996, as to claims 1-4.

Patent No. 4,771,054, John M. Domagala, Thomas F. Mich, Jeffrey B. Nichols, ANTIBACTERIAL AGENTS, Interference No. 103,333, final judgment adverse to the patentees rendered April 18, 1996, as to claims 1-3, 10-12.

Patent No. 4,875,924, Masato Mizutani, Masao Shiroshita, Masaharu Sakaki, Hiroki Okuda, Nobuaki Mito, CINNOLINE DERIVATIVE, PROCESS FOR PREPARING THE SAME AND HERBICIDAL COMPOSITION CONTAINING THE SAME, Interference No. 103,044, final judgment adverse to the patentees rendered January 26, 1996, as to claims 1-7.

Patent No. 4,896,939, Donald G. O'Brien, HYBRID FIBER OPTIC/ELECTRICAL CABLE AND CONNECTOR, Interference No. 102,721, final judgment adverse to the patentee rendered April 25, 1996, as to claims 1 and 2.

Patent No. 4,915,727, Masato Mizutani, Masao Shiroshita, Nobuaki Mito, Hiroki Okuda, Masaharu Sakaki, PLANT MALE STERILANT, Interference No. 103,043, final judgment adverse to the patentees rendered January 26, 1996, as to claims 1-7.

Patent No. 5,061,047, Madeline J. Bradshaw, Edward P. Raynes, SMECTIC LIQUID CRYSTAL DEVICES, Interference No. 103,213, final judgment adverse to the patentees rendered April 25, 1996, as to claims 1, 3, 4, 7, 8, 20-28.

Patent No. 5,190,741, Marie-France Moreau, Josette Michelot, Annie Veyre, Jean-Claude Madelmont, Denise Godeneche, Pierre Labarre, Daniel Parry, Gaston Meyniel, AGENTS FOR DIAGNOSING AND TREATING MELANOMAS, AROMATIC HALOGENATED DERIVATIVES USABLE AS SUCH AGENTS AND THEIR PREPARATION, Interference No. 103,545, final judgment adverse to the patentees rendered May 9, 1996, as to claims 1 and 2.

Patent No. 5,200,749, Philip S. Crosby, Ajay K. Luthra, FORMAT COVERTER ARCHITECTURE, Interference No. 103,581, final judgment adverse to the patentees rendered February 27, 1996, as to claims 1, 2, 4-6, 9-11, 14 and 15.

Patent No. 5,205,213, Michel Bresson, AXIALLY SYMMETRICAL GAPLESS LAYERED SLEEVE PRINTING BLANKET SYSTEM, Interference No. 103,411, final judgment adverse to the patentee rendered January 24, 1996, as to claims 1-13.

Patent No. 5,219,897, William M. Murray, DENTAL AND ORTHOPEDIC CEMENT METHOD AND PREFORMS, Interference No. 103,550, final judgment adverse to the patentee rendered April 18, 1996, as to claims 1-21.

Patent No. 5,228,056, Donald L. Schilling, SYNCHRONOUS SPREAD—SPECTRUM COMMUNICATIONS SYSTEM AND METHOD, Interference No. 103,480, final judgment adverse to the patentee rendered February 14, 1996, as to claims 31, 32 and 37.

Patent No. 5,236,971, William M. Murray, DENTAL AND ORTHOPEDIC CEMENT METHOD AND PREFORMS Interference No. 103,551, final judgment adverse to the patentee rendered April 18, 1996, as to claims 1-29.

Patent No. 5,390,075, John J. English, Robert D. Loy, Oswaldo A. Mantilla, Walter Melnychenko, Roger J. Stockholm, ELECTRONIC APPARATUS WITH FLEXIBLE CABLE INTERCONNECT HAVING INDEPENDENTLY MOVABLE

MEMBER SUPPORTED ON TAB PORTIONS, Interference No. 103,473, final judgment adverse to the patentees rendered March 6, 1996, as to claims 1-6.

OLIVIA M. DUVALL, *Sup'v Legal Instruments Examiner*
Board of Patent Appeals
& Interferences
(703) 308-9846

Patents Available For License or Sale

D. 328,985	PORTABLE LAP DESK
Contact:	Robert E. Massa 1535 South Memorial, Suite 102 Tulsa, Okla. 74112-7046 (voice): (918) 664-2525 (fax): (918) 664-2525
4,321,463	LOW FREQUENCY LASER FIBER-OPTIC DECTOR APPARATUS FOR MUSICAL INSTRUMENTS AND INTRUSION DETECTION
Contact:	Samuel J. Stecher, Jr. 4240 N. 81st Street Scottsdale, Ariz. 85251 (voice): (602) 423-8206
4,847,979	TOOL CHANGER HAVING A RETAINING MEANS ACTUATABLE DURING LOADING OF A BIT ALONG THE CENTRAL AXIS OF A POCKET
Contact:	Franklin D. Wolffe P.O. Box 12 Tyrone, Pa. 16686 (voice): (814) 684-4640 (fax): (814) 684-1061
4,932,117	THIN PANEL DRILLING METHOD AND APPARATUS
Contact:	Franklin D. Wolffe P.O. Box 12 Tyrone, Pa. 16686 (voice): (814) 684-4640 (fax): (814) 684-1061
4,984,352	THIN PANEL DRILLING METHOD AND APPARATUS
Contact:	Franklin D. Wolffe P.O. Box 12 Tyrone, Pa. 16686 (voice): (814) 684-4640 (fax): (814) 684-1061
5,147,160	THIN PANEL DRILLING METHOD AND APPARATUS
Contact:	Franklin D. Wolffe P.O. Box 12 Tyrone, Pa. 16686 (voice): (814) 684-4640 (fax): (814) 684-1061
5,231,571	PERSONAL FINANCIAL SYSTEM COMPUTER METHOD
Contact:	Mitchell S. Bigel Bell, Seltzer, Park & Gibson Post Office Drawer 34009 Charlotte, N.C. 28231 (voice): (919) 420-2200 (fax): (919) 881-3175
5,489,051	PAINTER'S POUCH
Contact:	Carl D. Robison 6702 East 17 St. Tulsa, Okla. 74112 (voice): (918) 835-9633
5,509,844	LEGLESS STORAGE AND PLAY TABLE FOR USE BY CHILDREN
Contact:	Robert P. Simpson Jaeckle, Fleischmann & Mugel Fleet Bank Building 12 Fountain Plaza Buffalo, N.Y. 14202-2292 (voice): (716) 856-0600 ext. 212

Certificate of Corrections For Week of July 9, 1996

B1 4,322,895
Re. 34,466
Re. 35,104
Re. 35,118
Re. 35,143
Re. 35,169
D. 360,761
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5,513,338
5,513,590
5,515,226

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
April 22-26, 1996

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
4-22	OPP	92,025	Lane Ltd. v. Jackson Int'l. Trading Co.	2(d)	Opposition Dismissed	"CAPTAIN BLACK" (and sailing ship design) [pipe tobacco]	"SMUGGLER" (and sailing ship design) [tobacco, matches, cigarette holders and cases, pipes, cigarette lighters and tobacco jars]		No
4-23	EX EX	74/405,921 74/405,922	American Needle	whether the designs sought to be registered as trademarks function as trademarks or, instead, function only as non-distinctive product ornamentation	Refusal Affirmed (in each case)		designs consisting of a series of crown panels that are distinguishable by color and/or by reason of the panels' being separate and joined to each other along a seam, as by sewing, to cooperatively define the crown [headwear]		No
4-23	EX	74/351,296	Gordon Daly	2(d)	Refusal Affirmed		OFCOURSE!" (and design) [sportswear, namely, golf shirts, golf gloves, fleece slacks and shorts]	"OF COURSE" (in stylized lettering) [footwear]	No
4-23	EX	74/452,456	Putman Publishing Co.	2(e)(1)	Refusal Affirmed		"FOOD & BEVERAGE ON-LINE" [a news and information service updated daily for the food processing industry, contained in a database]		No
4-24	EX	74/435,348	Chosun Brewery Co., Ltd.	2(e)(4)	Refusal Affirmed		"HITE" [beer]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
4-25	EX	74/425,770	Seattle's Best Coffee, Inc.	2(e)(2)	Refusal Affirmed		"SEATTLE'S BEST ESPRESSO" [coffee]		No
4-25	EX	74/390,323	Orange Communications, Inc.	whether the matter sought to be registered is capable of functioning as a trademark (and is therefore, registrable on the Supplemental Register)	Refusal Reversed (although applicant was required to submit an amended drawing)		the words "25¢ LONG DISTANCE 25¢" placed vertically inside a rectangular stripe on a pay telephone hand set, with the rectangular stripe and the hand set rendered in contrasting colors [coin operated pay telephones]		No
4-26	EX	74/226,078	Laser Engineering, Inc.	2(d)	Refusal Affirmed		"VECTOR" (and design) [medical equipment, namely, laparoscopic couplers]	"VECTOR" [medical ultrasound equipment for use in diagnosing and monitoring soft tissue conditions]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

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Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
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Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
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Box Reexam	Requests for Reexamination for *original* request papers *only*.
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Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
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Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
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Box EEO	Mail for the Office of Civil Rights.
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All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
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	Springfield: Illinois State Library	(217) 782-5659
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	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
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New Hampshire	Concord: New Hampshire State Library	Not Yet Operational
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
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	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
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	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	09/15/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/13/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/12/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	12/08/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	06/24/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	07/05/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	11/15/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	09/16/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	04/15/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	11/11/94
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	10/04/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	11/16/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/27/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	07/28/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	03/13/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	02/09/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/13/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of June 1, 1996

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/03/95	04/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	12/22/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/20/95	05/03/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	02/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/18/95	03/28/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/27/95	02/05/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/02/95	03/22/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/16/96	02/29/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/16/96	04/08/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	09/28/95	—0—
Renewals (All Classes)	03/13/96	—0—
Section 12(c) Publications (All Classes)	01/01/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JULY 9, 1996

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 5,012,350 (2950th)

TELEVISION LOCAL WIRELESS TRANSMISSION AND CONTROL

Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, and Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, assignors to Donald A. Streck, Ojai, and Jerry R. Iggulden, Newhall, both of Calif.

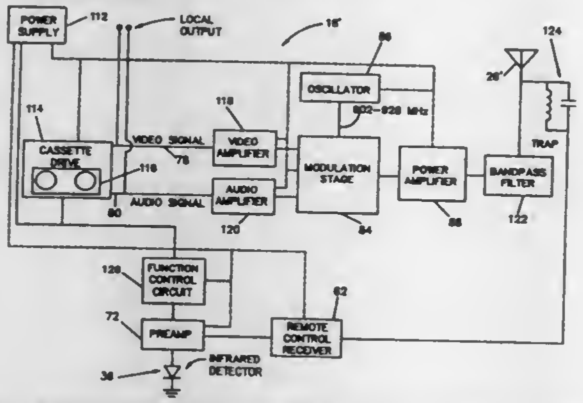
Reexamination Request No. 90/002,343, May 9, 1991.

Reexamination Certificate for Patent 5,012,350, issued Apr. 30, 1991, Ser. No. 457,574, Dec. 27, 1989.

Division of Ser. No. 96,929, Sep. 15, 1987, Pat. No. 4,916,532.

Int. Cl.^{6} H04N *5/76*

U.S. Cl. 358—335



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **4** and **10** are cancelled.

Claims **1**–**3** and **5**–**9** are determined to be patentable as amended.

1. A *local* wirelessly broadcasting video cassette recorder comprising:

a) video cassette drive means for playing a video cassette to produce a pure audio signal and a pure video signal therefrom;

b) video amplifier means for receiving and amplifying said pure video signal to produce an amplified video signal therefrom;

c) audio amplifier means for receiving and amplifying said pure audio signal to produce an amplified audio signal therefrom;

d) oscillator means for producing a carrier frequency in the 902–928 Mhz band;

e) modulation means connected to said video amplifier means, said audio amplifier means and said oscillator means for modulating said carrier frequency with said amplified video and audio signals to produce a broadcast signal;

f) power amplifier means connected to said modulation means for amplifying said broadcast signal to a power level sufficient for local broadcasting;

g) transmitting antenna means connected to said power amplifier means for transmitting said amplified broadcast signl; and,

h) power supply means operably connected for supplying power to said video cassette drive means, said video amplifier means, said audio amplifier means, said oscillator means, said modulation means and said power amplifier means;

i) function control circuit means operably connected for controlling said power supply and said video cassette drive means;

j) infra red detector means for detecting binary coded infra red energy directed thereon from a transmitter/controller to produce an electrical signal output;

k) preamplifier means connected between said function control circuit means and said infra red detector means for amplifying said electrical signal output by said infra red detector means to a usable level; and,

l) remote control receiver means connected between said transmitting antenna means and said preamplifier means for receiving and detecting control signals from said transmitting antenna means and inputting said control signals to said preamplifier means; wherein additionally,

m) said power supply means is operably connected for supplying power to said function control circuit means, said infra red detector means, said preamplifier means and said remote control receiver means.

REISSUES

JULY 9, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,291
APPARATUS FOR LAYING STRIP ON GLASS OR LIKE MATERIAL

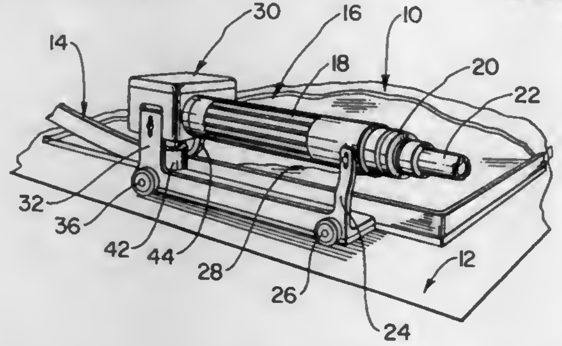
Luc Lafond, Toronto, Canada, assignor to Tremco, Inc., Beachwood, Ohio

Original No. 5,013,377, dated May 7, 1991, Ser. No. 409,717, Sep. 20, 1989. Application for reissue May 7, 1993, Ser. No. 59,072

Claims priority, application Canada, Sep. 23, 1988, 578349

Int. Cl.^{6} B32B *35/00*

U.S. Cl. 156—109 **40 Claims**



31. A tool for applying a strip of material to a surface of a member, adjacent to a peripheral edge thereof, said member supported on a work table, the tool comprising:

- *an elongated base member;*
- *means for slidably supporting said base member by said work table;*
- *guide means for guiding said base member along the peripheral edge of said member;*
- *a body supported on said base member, spaced therefrom for gripping by an operator, said body having an air inlet port that supplies air to said body, said supplied air aiding in the applying of said strip of material to said surface of said member;*
- *a housing associated with said body;*
- *means associated with said body for directing the adhesive strip onto the surface of the member.*

Re. 35,292
PROCESS FOR SEPARATING ORGANOMETALLIC COMPOUNDS AND/OR METAL CARBONYLS FROM THEIR SOLUTIONS IN ORGANIC MEDIA

Helmut Bahrmann, Hamminken-Brunen; Michael Haubs, Bad Kreuznach; Willi Kreuder, Mainz, and Thomas Muller, Dinslaken, all of, Germany, assignors to Hoechst Aktiengesellschaft, Oberhausen, Germany

Original No. 5,174,899, dated Dec. 29, 1992, Ser. No. 724,463, Jun. 26, 1991. Continuation of Ser. No. 452,517, Dec. 18, 1989, abandoned. Application for reissue Jan. 5, 1994, Ser. No. 178,641

Claims priority, application Germany, Dec. 20, 1988, 38 42 819.9

Int. Cl.^{6} B01D *61/14*

U.S. Cl. 210—644 **49 Claims**

1. A process for concentrating solutions of organometallic compounds and/or metal carbonyls in an organic media by ultrafiltration or dialysis, said process comprising contacting said solutions with a semi-permeable polyaramide membrane having a retention side and a permeation side opposite said retention side, said membrane being permeable only to said organic media.

Re. 35,293
SOLID GOLF BALL

Hidenori Hiraoka, Kobe, and Akihiko Hamada, Kakogawa, both of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Original No. 5,215,308, dated Jun. 1, 1993, Ser. No. 724,770, Jul. 2, 1991. Application for reissue Mar. 16, 1995, Ser. No. 405,189

Claims priority, application Japan, Jul. 13, 1990, 2-186289

Int. Cl.^{6} A63B *37/00;* **C08L** *9/00*

U.S. Cl. 473—372 **8 Claims**

1. A solid golf ball containing at least one rubber portion formed from a rubber composition comprising a base rubber, a co-crosslinking agent and an organic peroxide; an improvement being present in that said base rubber is a mixture of

(A) a solid polybutadiene rubber containing cis -1,4 bonds in an amount of at least 40%, and having a Moooney viscosity (ML_{1+4} 100° C.) of [45] *43* to 90 and a ratio of weight average molecular weight/number average molecular weight (Mx/Mn) of 4.0 or less; and

(B) either a liquid polybutadiene rubber or a liquid isoprene-butadiene copolymer rubber, or both.

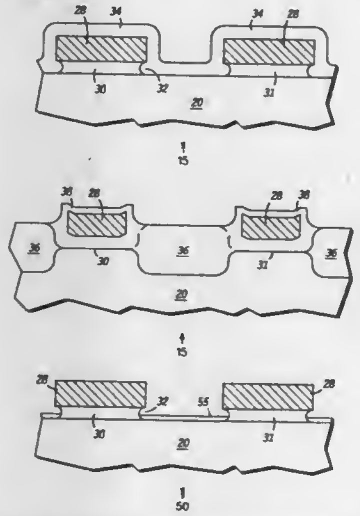
Re. 35,294
POLYSILICON ENCAPSULATED LOCALIZED OXIDATION OF SILICON

Barbara Vasquez, Chandler; Michael P. Masquelier, Phoenix, both of Ariz.; Scott S. Roth, and Wayne J. Ray, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 5,175,123, dated Dec. 29, 1992, Ser. No. 612,174, Nov. 13, 1990. Application for reissue May 17, 1994, Ser. No. 245,131

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—70 **15 Claims**



12. A method of fabricating isolation oxide layer, comprising the steps of:

- *providing a semiconductor substrate;*
- *forming a buffer layer on the substrate;*
- *forming an oxidation resistant layer on the buffer layer;*
- *removing selected portions of the oxidation resistant layer and the buffer layer to expose portions of the substrate;*
- *controlling an amount of oxide encroachment by forming an oxide layer on the exposed portions of the substrate and controlling the thickness of the oxide layer;*
- *conformally forming an oxidizable layer to overlie the oxide layer and the oxidation resistant layer; and*
- *oxidizing the oxidizable layer and the exposed portions of the substrate to form the isolation oxide layer.*

PLANT PATENTS

GRANTED JULY 9, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,600

FLORIBUNDA ROSE PLANT NAMED 'PROBERG'

Lilia M. Weatherly, Tasmania, Australia, assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.
Filed Aug. 7, 1995, Ser. No. 511,956
Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda rose class, substantially as shown and described.

9,601

'RED AND WHITE' POINSETTIA

Cleveland Ott, 677 Grater Ave., Graterford, Pa. 19426
Filed Dec. 1, 1994, Ser. No. 368,272
Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—86.1 **1 Claim**

1. A new and distinct Poinsettia plant substantially as shown and described, characterized by a stable and uniform coloration of distinct red bracts with distinct white mottling.

9,602

POINSETTIA PLANT '3-91'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.
Filed May 26, 1995, Ser. No. 452,278
Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—86.1 **1 Claim**

1. A new and distinct Poinsettia plant, substantially as herein shown and described, distinguished by its blushed red flower bracts and self-branching traits.

9,603

IMPATIENS PLANT NAMED 'SPARKLER ROSE'

Ellen F. Leue, West Chicago, Ill., assignor to Geo. J. Ball, Inc., West Chicago, Ill.
Filed May 19, 1995, Ser. No. 445,380
Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.6 **1 Claim**

1. A new and distinct cultivar of *Impatiens wallerana* plant named 'Sparkler Rose' substantially as herein shown and described, which:

(a) exhibits in abundance attractive bicolored blooms of rose and white,
(b) is early blooming,
(c) forms medium green foliage,
(d) exhibits a good basal-branching character, and
(e) exhibits a medium upright mounded growth habit.

9,604

NEOREGELIA PLANT NAMED 'NONIS'

Chester Skotak, Jr., Alajuela, Costa Rica, assignor to Dura Flor S.A., Alajuela, Costa Rica
Filed Apr. 14, 1995, Ser. No. 422,534
Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct cultivar or Neoregelia plant named 'Nonis,' as illustrated and described.

PATENTS

GRANTED July 9, 1996

ERRATA

For CLASS	See PATENT NO.
030–304	5,533,269
099–476	5,533,444
062–298	5,533,455
100–150	5,533,457
128–782	5,533,531
132–148	5,533,537
134–104	5,533,538
134–095	5,533,539
134–155	5,533,540
137–625	5,533,551
463–023	5,533,727
473–307	5,533,725
473–252	5,533,728
473–346	5,533,729
473–251	5,533,730
435–240	5,533,836
418–001	5,533,886
418–201	5,533,887
439–079	5,533,901
432–120	5,533,930
451–011	5,533,931
216–015	5,534,111
205–372	5,534,119
205–464	5,534,120
588–204	5,534,124
008–557	5,534,166
510–280	5,534,167
508–396	5,534,168
508–460	5,534,169
508–161	5,534,170
508–231	5,534,171
508–156	5,534,172
508–203	5,534,173
508–543	5,534,174
508–469	5,534,175
510–245	5,534,177

ERRATA–CONTINUED

For CLASS	See PATENT NO.
510–367	5,534,178
510–305	5,534,179
510–220	5,534,180
510–423	5,534,181
008–137	5,534,182
510–434	5,534,183
510–426	5,534,184
510–444	5,534,195
510–356	5,534,197
510–182	5,534,198
510–242	5,534,199
510–396	5,534,200
216–067	5,534,231
435–059	5,534,376
436–034	5,534,416
514–013	5,534,488
252–353	5,534,500
530–350	5,534,615
530–399	5,534,617
546–030	5,534,627
534–752	5,534,630
536–023	5,534,631
540–456	5,534,632
204–452	5,534,707
346–100	5,534,890
378–034	5,535,254

PATENTS

GRANTED JULY 9, 1996

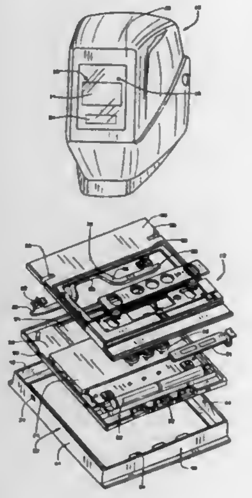
GENERAL AND MECHANICAL

5,533,206

WELDING HELMET WITH REMOVABLE ELECTRONIC QUICK CHANGE CARTRIDGE

Michael J. Petrie, Walker, and Daniel A. Pleune, Rockford, both of Mich., assignors to Jackson Products, Inc., Belmont, Mich.

Filed Aug. 23, 1995, Ser. No. 518,144
Int. Cl.^{6} A61F *9/06*
U.S. Cl. 2—8 **12 Claims**



1. A welding helmet, including:
a) an electronic quick change cartridge having a base and a cover, said cartridge including a liquid crystal display lens disposed between said base and said cover, said cartridge further having a plurality of slots on a side;
b) a spring bar positioned inside said cartridge having a U-shaped member with a pair of side projections extending therefrom, each of said projections having a tab on the end of said projection and further having a switch suspended from a support bracket between said U-shaped member and said tab; and
c) a cartridge housing in the form of a frame located inside of said helmet for retaining said cartridge within said helmet, said housing having a plurality of flanges on a side of said housing to insert into said slots on said cartridge, said housing further including a pair of slots, each of said slots located on opposite sides of said housing for receiving said tabs of said spring bar.

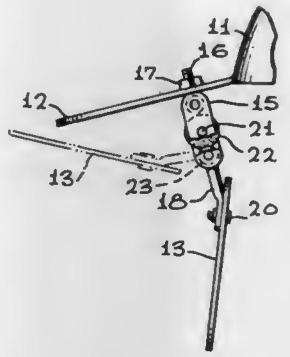
5,533,207

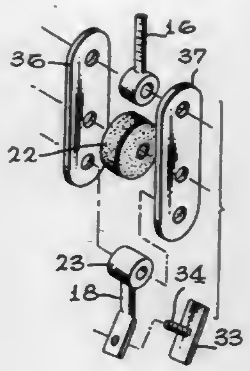
POSITIONABLE SUNGLASSES AND CAP COMBINATION

Euseblo M. Diaz, 6450 Balboa Blvd., Van Nuys, Calif. 91406

Filed Mar. 20, 1995, Ser. No. 406,537
Int. Cl.^{6} A42B *1/24*
U.S. Cl. 2—10 **4 Claims**

1. A headgear and eyeglass combination comprising:
headgear having a crown to be worn by a user and said crown having a forward facing, outwardly projecting bill having an upper surface and a lower surface;
an eyeglass article having a center portion separating eyeglass portions of transparent material;
an attachment device secured between said bill and said eyeglass center whereby said eyeglass article downwardly depends from said bill;
said eyeglass article having an operative position immediately ahead of the user's eyes and a non-operative position immediately adjacent with said bill lower surface;





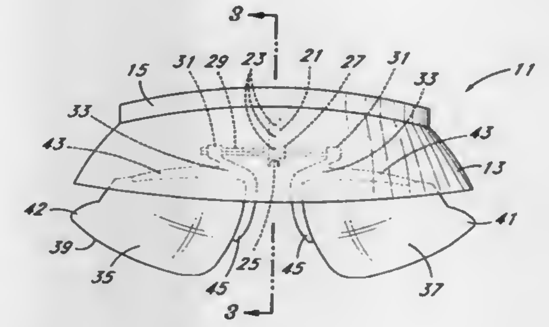
said attachment device having restrained pivot means for moving said eyeglass article between said operative and said non-operative positions;
said attachment device includes a first fastener means fixedly securing one end of said attachment device to said bill and a second fastener means fixedly securing the other end of said attachment device to said eyeglass article; and
said pivot means includes a compressable washer restraining movement between said attachment device and said eyeglass article.

5,533,208

FOLDING ADJUSTABLE GLASSES ON CAP PEAK

Lily Tonoyan, and Karen Minasian, both of 1600 Taft Ave., Apt. 506, Los Angeles, Calif. 90028

Filed May 17, 1995, Ser. No. 442,679
Int. Cl.^{6} A42B *1/06*
U.S. Cl. 2—10 **12 Claims**



6. An eye wear visor comprising:
a visor having a vertical curved wall and a sloping brim surface at the bottom of said curved wall, said brim surface having an underside, the structures of said visor having bilateral symmetry about a center line;
a first and a second lens
lens support means, connecting said first and said second lens and said underside of said brim, for positioning said first lens and said second lens closer to and farther from each other and for moving said first lens and said second lens along the center line of said visor.

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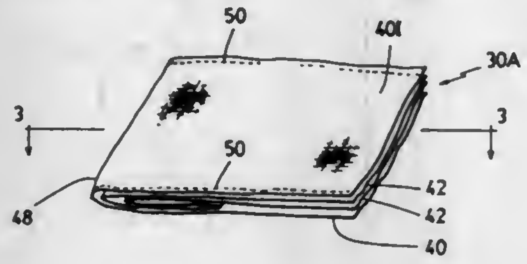
5,533,209
CONVERTIBLE WEARING APPAREL

Michael Davis, Toronto, Canada, assignor to Snugabye Inc., Canada

Filed Jun. 24, 1994, Ser. No. 265,358

Int. Cl.^{6} A41B *7/00;7/10;* **A41D** *10/00;11/00*

U.S. Cl. 2—60 **21 Claims**



1. An item of wearing apparel comprising a tubular cuff having a first end and a second end opposed thereto;
   - said cuff having a length extending between said ends and a circumference thantaround;
   - a pouch formed on the exterior of said cuff extending from said second end towards said first end over a first half of the circumference of said cuff;
   - said pouch and said first half of the circumference each comprising two layers of a first unitary piece of material folded at said second end;
   - said pouch being invertible over said second end to close said second end;
   - and wherein second half of said circumference comprises two layers of a second unitary piece of material folded at said second end.

5,533,210
COMPLETELY REYCLABLE JACKET MADE OF SYNTHETIC POLYMER MATERIAL

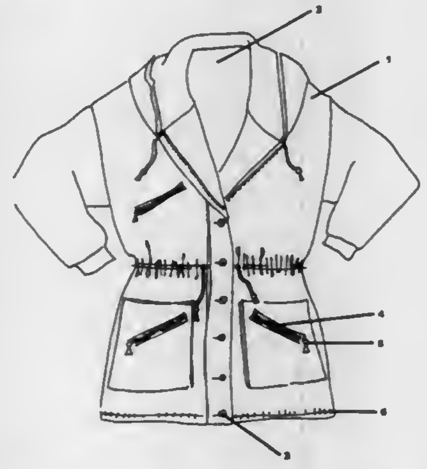
Eugeniusz Maderek, and Friedhelm Brandau, both of Wuppertal, Germany, assignors to Akzo Nobel N.V., Velperweg, Netherlands

Filed Jul. 11, 1994, Ser. No. 272,576

Claims priority, application Germany, Feb. 4, 1994, 94 01 905.3 U

Int. Cl.^{6} A41D *1/02*

U.S. Cl. 2—93 **18 Claims**



18. Completely recyclable jacket, said completely recyclable jacket being a textile jacket having a nonwoven filler layer and components, said nonwoven filler layer and components consisting essentially of sorted thermoplastic synthetic polymers which are mixable homogeneously with one another in a molten state.

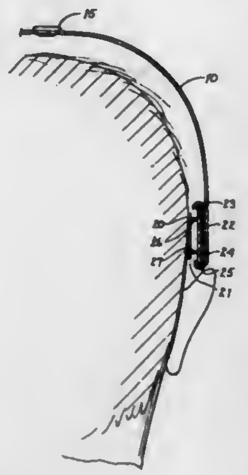
5,533,211
SLIDABLY REPOSITIONABLE HAT

Douglas W. Mehrens, 7865 E. Keim Dr., Scottsdale, Ariz. 85250

Filed Jun. 2, 1994, Ser. No. 253,128

Int. Cl.^{6} A42C *5/00*

U.S. Cl. 2—195.1 **4 Claims**



1. A hat comprising:
   - (a) a crown for covering at least a portion of a wearer's head and having an opening to receive a wearer's head;
   - (b) a headband positioned adjacent said opening for contacting a wearer's head and for supporting the crown;
   - (c) a sliding member secured to one of said headband and crown and positioned adjacent said opening;
   - (d) a track member secured to the other of said crown and headband, respectively, and slidably engaging said sliding member to permit relative sliding motion between said track member and sliding member and between said crown and a wearer's head; and
   - (e) a visor secured to said crown to permit the visor to be repositioned relative to a wearer's head while said headband remains stationary.

5,533,212
COMBINATION MOISTURE MANAGEMENT PANTY AND PANTY HOSE SYSTEM FOR WOMEN

Herbert L. Moretz, Davidson, N.C., and Daniel L. Brier, Key Largo, Fla., assignors to Intelpro Corporation, Lincolnton, N.C.

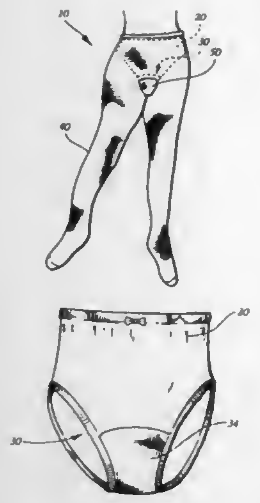
Filed Jun. 30, 1994, Ser. No. 269,642

The portion of the term of this patent subsequent to May 16, 2012, has been disclaimed.

Int. Cl.^{6} A41B *11/04;9/04*

U.S. Cl. 2—409 **12 Claims**

1. A combination moisture management panty and panty hose system for women, comprising:
   - (a) a panty including a moisture management panty shield for being positioned in the crotch area of the wearer during garment wear, said moisture management panty shield comprising:
     - i. a first fabric layer having a skin side surface including moisture wicking fibers for residing next to the skin during garment wear, and for wicking moisture outwardly away from the skin towards drier areas of the garment for evaporation;
     - ii. a second fabric layer residing adjacent to said first fabric layer on a surface thereof opposite the skin side surface of said first fabric layer, said second fabric layer including hydrophilic fibers for receiving moisture wicked outwardly by said first fabric layer to further move moisture away from the skin of the wearer;
     - iii. a third fabric layer comprising a moisture transport insert residing adjacent to the second fabric layer, and constructed of an integrally knit plaited bi-component fabric with wicking fibers residing primarily on a skin side surface thereof, and hydrophilic fibers residing primarily on a surface thereof opposite the skin side surface; and
   - (b) a pair of panty hose to be worn in combination with said panty, and including a moisture management crotch gusset for being position adjacent to said panty shield in the crotch area of the wearer, said crotch gusset constructed of an open mesh fabric for receiving moisture from said panty shield, and for facilitating the flow of air through said gusset into said panty shield to promote moisture evaporation from said panty shield and said gusset.



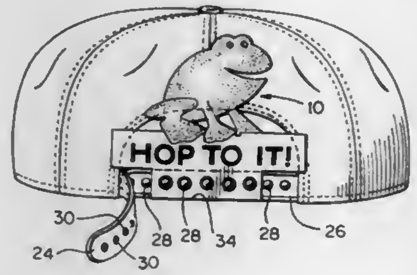
5,533,213
BASEBALL CAP SIZING STRAP ATTACHMENT

Jay E. Reiner, and Camille L. Reiner, both of 2002 NE. 120th Rd., N. Miami, Fla. 33181

Filed Nov. 9, 1994, Ser. No. 338,103

Int. Cl.^{6} A42B *1/24*

U.S. Cl. 2—195.2 **20 Claims**



13. In combination, a cap and a display attachment, said cap including a two piece sizing strap with one piece including a plurality of projections and the other piece including a plurality of openings, said display attachment including at least one aperture having a size greater than each of said plurality of projections and said at least one aperture fitting around at least one of said projections of said one piece and said other piece being secured to said one piece by said at least one of said projections passing first through said at least one aperture and then through said plurality of openings for securing said display attachment between said one piece and said other piece of said two piece sizing strap.

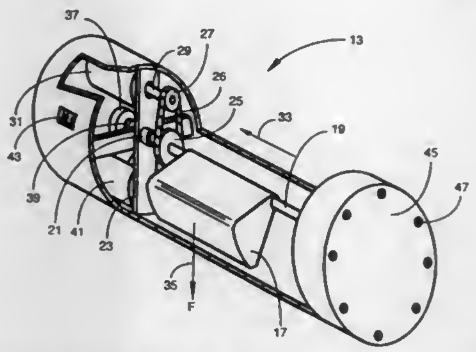
5,533,214
SHEET ROLL UP

Wayne B. Graham, 2325 Hartford Ct., El Dorado Hills, Calif. 95762

Continuation-in-part of Ser. No. 825,820, Jan. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 518,960, May 4, 1990, abandoned. This application Dec. 5, 1994, Ser. No. 350,382

Int. Cl.^{6} E04H *4/10*

U.S. Cl. 4—502 **10 Claims**



1. A powered drum assembly for rolling up a two dimensional sheet, said sheet being in contact with a substantially horizontal two dimensional surface, comprising:
   - a cylindrical frame having an axis of rotation for rolling up said two dimensional sheet;
   - a swing shaft rotatably mounted within said cylindrical frame, said swing shaft having an axis of rotation that is concentric with said axis of rotation of said cylindrical frame;
   - a pendulum located within said cylindrical frame and connected to said swing shaft such that said pendulum can rotate about said axis of said cylindrical frame, said pendulum providing a mass for rotation that is not located on said axis of said cylindrical frame;
   - said pendulum comprising a drive system which provides a source of rotary power;
   - a power transmission device coupled to said drive system and to said cylindrical frame, said power transmission device arranged to transmit said rotary power from said drive system to said cylindrical frame, wherein when a rotational moment is provided from said drive system, said cylindrical frame rotates due to the influence of gravity; and
   - a connector for attaching said two dimensional sheet to said cylindrical frame; and
   - wherein when said cylindrical frame rolls up said sheet, said cylindrical frame rolls horizontally on said sheet along said two dimensional surface as said cylindrical frame rolls up said sheet.

5,533,215
CHILD AND INFANT ENCLOSURE STRUCTURE

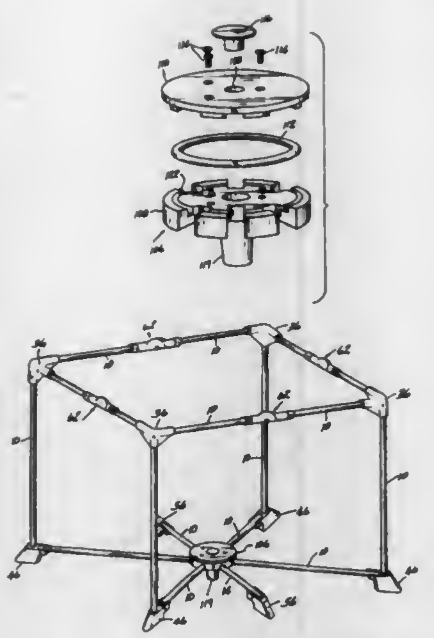
Adam G. Malofsky, 22 Summit Ridge Rd., Huntington, Conn. 06484; Bernard M. Malofsky, 12 Duncaster Rd., Bloomfield, Conn. 06002, and Paul R. Glassberg, 13 Chesterwoods Dr., Chester, N.J. 07930

Continuation-in-part of Ser. No. 307,924, Sep. 16, 1994. This application Aug. 9, 1995, Ser. No. 501,506

Int. Cl.^{6} A47D *13/06*

U.S. Cl. 5—99.1 **17 Claims**

1. A child enclosure structure comprising a base and a multiside enclosing frame wherein said frame comprises tubing sections made of lightweight, high modulus fiber-reinforced plastic matrix composite tubing having a weight of 0.25 pounds or less per lineal foot, a tubing diameter of 0.2 to 1.2 inches, a tubing thickness of 0.03 to 0.10 inches, a single fiber angle of 20° to 50°, and fabricated from a single tow or at least one sheet of fibers and wherein said plastic matrix is a thermoplastic resin or thermoset plastic resin with a minimum modulus of 250,000 psi; a minimum

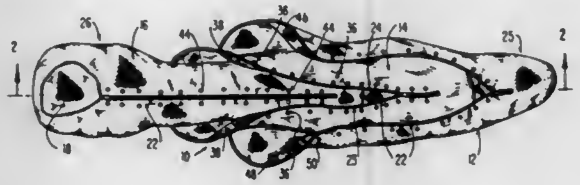


tensile strength of 6,000 psi; and a glass transition temperature of at least 50° C. and wherein said high modulus fiber reinforcement is selected from the group consisting of carbon fibers, aramid fibers, glass fibers, polyolefin fibers, boron fibers, and mixtures thereof.

5,533,216
MODULAR SLEEPING BAG

Howard F. Thler, Sherwood Court, P.O. Box 399, Alpine, N.J. 07602

Filed Aug. 23, 1994, Ser. No. 294,549
Int. Cl.^{6} A47C ***29/00***
U.S. Cl. 5—413 R **7 Claims**



1. A sleeping bag device for outdoor use comprising:

an inner bag and an outer bag, each bag having an outer surface, an inner surface, an open side defined by two adjacent edges, and a head opening, said inner surface defining an interior space for receiving a human body therein, said outer surface and said inner surface of each bag defining a volume therebetween, thermal insulating material disposed in and substantially filling said volume, and said outer bag being dimensioned for receiving therewithin said inner bag;

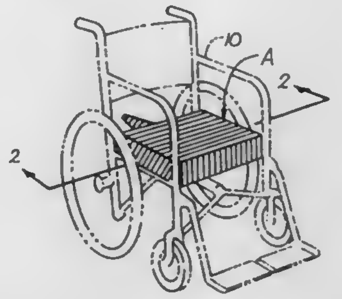
each bag including a first fastening means disposed proximate the two adjacent edges of the open side of each bag for closure of the open side;

each bag further including a second fastening means having a top and a bottom engagement surface disposed on said outer and inner surfaces proximate said two adjacent edges, the top and bottom engagement surfaces of corresponding second fastening means of each bag being selectively attachable to each other when said inner bag is positioned within the interior space of said outer bag.

5,533,217
PNEUMATIC WHEEL CHAIR CUSHION FOR REDUCING ISCHEMIC INJURY

Terry K. Holdredge, 346 Town Creek Dr., Anderson, S.C. 29621

Continuation of Ser. No. 29,032, Mar. 11, 1993, Pat. No. 5,379,471, which is a continuation-in-part of Ser. No. 647,031, Jan. 28, 1991, Pat. No. 5,193,237. This application Jan. 4, 1995, Ser. No. 368,375
Int. Cl.^{6} A47C ***27/08;27/10***
U.S. Cl. 5—453 **6 Claims**



1. A pneumatic cushion for reducing ischemic injury to a person supported thereon comprising:

a plurality of inflatable air sacks carried by a support which extends generally over a support area of said cushion;

a dynamic air distribution system for distributing air to a first plurality of said air sacks which are inflated during an inflation cycle and for periodically blocking the distribution of air to a second plurality of said air sacks which are deflated during a deflation cycle according to a predetermined sequence;

said air distribution system including an air blower for establishing an air flow into said air sacks, an air distributor connected to said air blower, and air conduits connected to said air distributor and to said air sacks;

said air distributor having a distributing position for distributing said air flow into said air conduits and said first plurality of air sacks during said inflation cycle;

said air distributor having a blocking position which interrupts said air flow to said second plurality of said air sacks during said deflation cycle; and

said air sacks being constructed from a material having a low air permeability which allows air escapement from said second plurality of said air sacks for deflation of said second plurality of air sacks during said deflation cycle, and said deflation occurs solely through said sack material when said air distributor is in said blocking position during said deflation cycle;

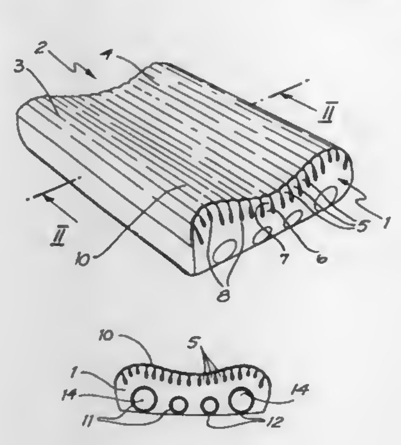
whereby said person is supported upon said air sacks in a manner that ischemic injury is reduced.

5,533,218
CUSHIONING DEVICES

Arthur J. Fahy, 2 Warren Road, Double Bay, Sydney, New South Wales, Australia

Filed Dec. 23, 1994, Ser. No. 363,407
Claims priority, application Australia, Jul. 15, 1994, PM6868; Aug. 24, 1994, PM7682; Oct. 28, 1994, PM9149
Int. Cl.^{6} A47G ***9/02***
U.S. Cl. 5—636 **14 Claims**

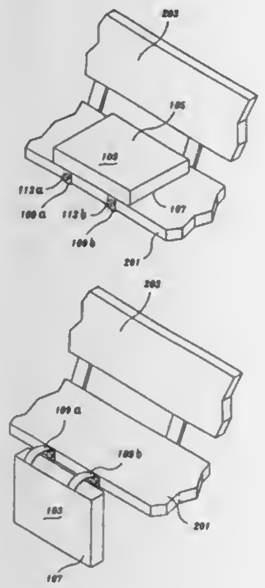
1. A cushioning device made of a resilient foamed plastic material, the cushioning device having a lower thickness and an upper thickness, the upper thickness being covered by a continuous, soft, thin, flexible layer, and there being parallel slots in the upper thickness, whereby the upper thickness is divided into ribs, and in which said layer is made of a material that is different from that of said ribs, is cemented to said ribs; and is resilient in its own plane.



5,533,219
STADIUM SEAT CUSHION

John D. Meyers, 5544 NE. Penrith Rd., Seattle, Wash. 98105

Filed Apr. 5, 1995, Ser. No. 417,217
Int. Cl.^{6} A47C ***16/00***
U.S. Cl. 5—653 **3 Claims**



1. A stadium seating system installed at a stadium comprising:

(a) a stadium seat fixedly secured to said stadium; and

(b) a seat cushion secured to said stadium seat, said seat cushion comprising

(i) a deformable body formed from a cushioning material; and

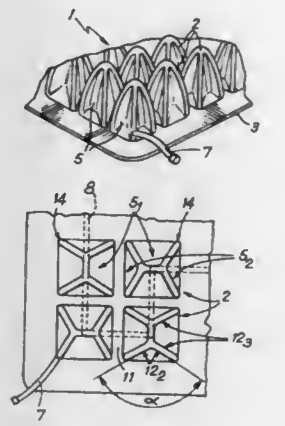
(ii) at least one securing strap fixedly attached to said body, said securing strap formed from a flexible material, said securing strap including a securing grommet,

wherein said seat cushion is secured to said stadium seat by said securing strap and said securing grommet by driving a securing bolt or pin through said securing grommet into said stadium seat whereby said securing strap, at the point of said securing grommet, fixedly attached to said stadium seat such that said body can be placed in a first position resting atop said seating surface of said stadium seat for the cushioning of a sitting spectator, wherein said stadium seat cushion is capable of being placed in a second position such that said body is disposed away from said seating surface of said stadium seat such that said body is hanging orthogonally in relation to said seating surface of said stadium seat.

5,533,220
INFLATABLE, "TELESCOPIC" CELLS FOR CUSHIONS AND MATTRESSES

Albert Sebag, and Paul Benguigui, both of Nimes, France, assignors to Askle, Nimes, France

Filed Jun. 20, 1995, Ser. No. 492,536
Claims priority, application European Pat. Off., Jan. 13, 1995, 95430001
Int. Cl.^{6} A47C ***27/08;27/10***
U.S. Cl. 5—654 **10 Claims**



1. Inflatable telescopic cells for cushion and mattress elements made up of a soleplate having a plane bottom support surface and a plurality of said cells extending perpendicularly from and fixed to said soleplate, the cells being disposed parallel to one another in a matrix that covers the surface of the element and being made of a flexible material constituting an airtight outer skin enclosing an internal volume within each cell, each cell communicating with the internal volume of at least one adjacent cell, said cells being chuck-shaped, having four external edges, and having four lateral surfaces which take up a recessed shape when in a rest position, and when a load is applied to said element by bearing against the ends of the cells which then compress vertically, said surfaces deform so as to come into contact and press against the surfaces of adjacent cells, wherein each cell has two opposite lateral surfaces each constituted by three vertical flats that, in the rest position, form two concave edges, while the other two lateral surfaces of the same cell are each constituted by two vertical flats that form a single concave edge in the middle, at least one of the three-flat lateral surfaces of each cell being disposed facing a two-flat lateral surface of an adjacent cell.

5,533,221
METHOD AND APPARATUS FOR BRIDGE CONSTRUCTION

Anton B. Majnaric, Copley, and William M. Bjerke, Hudson, both of Ohio, assignors to Majnaric Technologies, Inc., Copley, Ohio

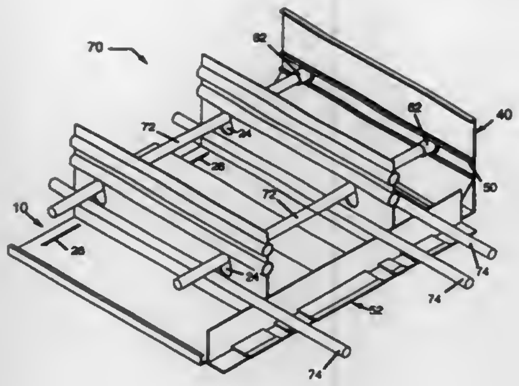
Filed Feb. 6, 1995, Ser. No. 383,882
Int. Cl.^{6} E01D ***21/00;*** **E04B** ***1/16***
U.S. Cl. 14—73 **15 Claims**

1. Apparatus for bridge construction, comprising:

a bottom form having first locking means at opposite lateral edges thereof for engaging a laterally adjacent bottom form, and having second locking means at longitudinal edges thereof for engaging a longitudinally adjacent bottom form;

a support rod laterally traversing and engaging said bottom form; and

a plurality of cables extending longitudinally of said bottom form, engaging said support rod and suspending said bottom form.



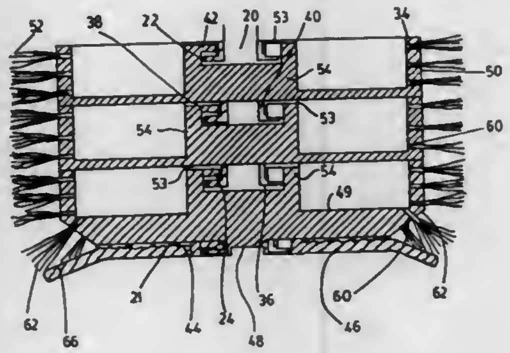
5,533,222
FLOOR AND BASEBOARD TREATMENT MACHINE

Anthony Lelkes, 21 Loganberry Cres., Willowdale, Ontario, Canada, and Larry Reid, 60 Cassandra Blvd., Unit #8, Don Mills, Ontario, Canada

Continuation-in-part of Ser. No. 412,783, Mar. 28, 1995, abandoned. This application Jun. 28, 1995, Ser. No. 495,874

Int. Cl.^{6} A46B *13/02;* **A47L** *11/16*

U.S. Cl. 15—4 **14 Claims**



1. A floor machine for treating a floor and vertical surface adjacent the floor comprising:

a rotatable floor and vertical surface treatment unit for treating said floor and said vertical surface adjacent the floor;

a drive shaft coincident with a central axis of the unit;

engagement means between the treatment unit and the drive shaft;

the treatment unit comprising:

a floor disc having an upper disc surface and a lower disc surface, a shallow cylindrical vertical wall being upstanding from the floor disc; a floor treatment pad being attached to the lower disc surface, the pad having an upper pad surface flush with said lower disc surface; and vertical surface cleaning means extending radially outwardly from said cylindrical vertical wall for cleaning said vertical surface adjacent the floor;

the engagement means between the drive shaft and the treatment unit comprising a plurality of drive shaft lugs on the drive shaft engaging a corresponding plurality of mating unit lugs on the treatment unit.

5,533,223
CLEANING SWEEPER HAVING AN ADHESIVE ROLLER

Huang C. Ho, P.O. Box 453, Taichung, Taiwan

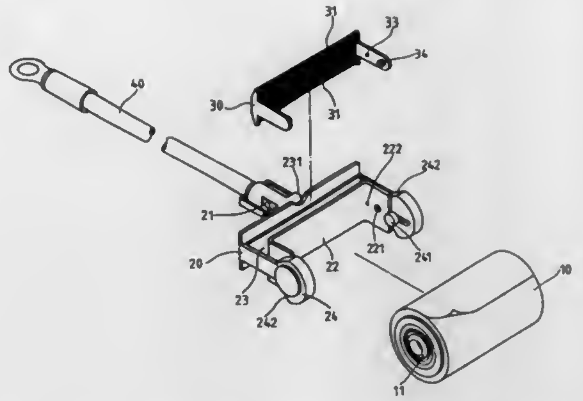
Filed May 8, 1995, Ser. No. 436,092

Int. Cl.^{6} A47L *25/00*

U.S. Cl. 15—104.002 **6 Claims**

1. A cleaning sweeper having an adhesive roller comprising:

an adhesive paper roll mounted on a reel;



a reel support frame of a U-shaped construction and comprising an elongated crown portion having a first end, a second end, and a coupling portion located between said first end and said second end, said reel support frame further comprising a first leg portion extending from said first end of said crown portion and a second leg portion extending from said second end of said crown portion, said first leg portion having a free end which is provided with a protective block fastened thereto, said second leg portion having a free end which is provided with a protective block fastened thereto, said reel being fastened pivotally at both ends thereof with said protective block of said first leg portion and with said protective block of said second leg portion, said reel support frame provided with a baffle located between said crown portion and said reel such that a receiving space is formed between said crown portion and said baffle, with said baffle being U-shaped in construction and comprising an elongated crown portion having a first end and a second end, said baffle further comprising a first leg portion extending from said first end of said crown portion of said baffle and a second leg portion extending from said second end of said crown portion of said baffle, with said first leg portion and said second leg portion of said baffle being provided respectively with a retaining hole and a locating hole;

a dual-directional paper cutter of a U-shaped construction and comprising an elongated crown portion having a cutting edge, a first end and a second end, said paper cutter further comprising a first leg portion extending from said first end of said crown portion of said cutter and a second leg portion extending from said second end of said crown portion of said cutter, with said first leg portion and said second leg portion of said paper cutter being provided respectively with a protuberance and a locating projection, said paper cutter fastened pivotally with said baffle such that said cutting edge of said paper cutter faces said adhesive paper roll; and

a handle attached with said reel support frame by said coupling portion.

5,533,224
FOAM PIG WITH SCRAPER STRIPS

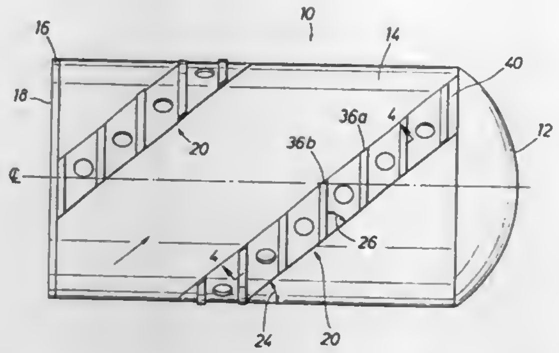
Kenneth M. Knapp, 4018 W. Main, Houston, Tex. 77027

Filed Apr. 12, 1995, Ser. No. 421,058

Int. Cl.^{6} B08B *9/04*

U.S. Cl. 15—104.61 **17 Claims**

1. A pipeline pig for cleaning the interior of a pipe comprising: a cylindrical pig body formed of a plastic foam having a specified density wherein the pig body incorporates a forward end and the opposite end thereof includes a back face of circular shape so that the pig is able to travel through a pipeline urged by fluid flow in the pipeline; at least one helical spiraled strip positioned about said cylindrical pig body to extend along the length thereof wherein the strip is an elongate flexible backing adhesively joined to said pig body and said backing is constructed with two edges to enable bonding to said pig body, and said strip backing is perforated to enhance bonding to said pig body and said strip incorporates a plurality of protruding ridges thereon and said ridges have exposed outer faces where said exposed outer faces are contacted against the inside wall of the pipe when the pig is moved along the pipeline and said ridges are constructed in sufficient number and spacing so that scraping occurs by said ridges and said ridges collectively remove deposits, condensation and other materials collecting on the wall of the pipe at the interior.



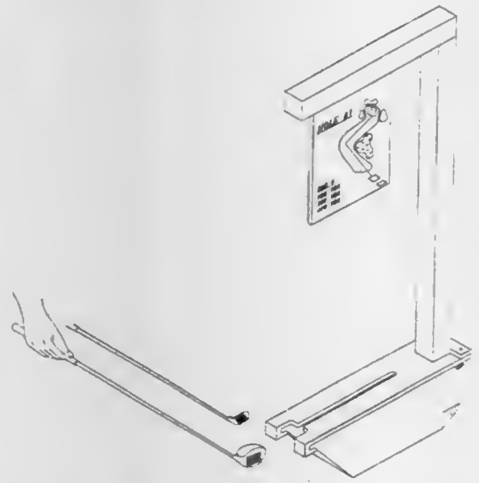
5,533,225
CLUB TUB - GOLF CLUB WASHER

Howard F. Ellis, 505 S. Fisk St., D14, Green Bay, Wis. 54303

Filed Jul. 31, 1995, Ser. No. 509,053

Int. Cl.^{6} A63B *57/00;47/04;* **A46B** *11/00*

U.S. Cl. 15—104.92 **5 Claims**



1. A golf club cleaning device for cleaning golf clubs, said device comprising:

an elongated tub having opposing side walls, a front wall, a rear wall, a bottom wall and an open top, said walls joined together to define a sump for holding a cleaning liquid, said front end wall being sloped at an angle to said bottom wall and having an opening therein, each side wall having a drain hole therethrough communicating with said sump, a pair of flanges extend outwardly from said rear wall to define a U-shaped channel, said channel adapted to engage a square post;

first, second and third brushes, each brush comprised of a base with a plurality of bristles extending therefrom, each base having a pair of slotted openings therein, said first brush mounted to said bottom wall and said second and third brushes mounted to a respective side wall;

an elongated lid removably connected to said top of said tub, said lid having an elongated groove therein opening at a first end of said lid, said lid opening in alignment with said tub opening and said lid having a slot at a second end thereof in alignment with said channel, said openings and said groove allowing club entry into said tub for engagement with said brushes;

a lockplate detachably connected to said lid by a pair of bolts and a pair of cotter pins, said lockplate and said second end of said lid together forming means for locking said device to said post.

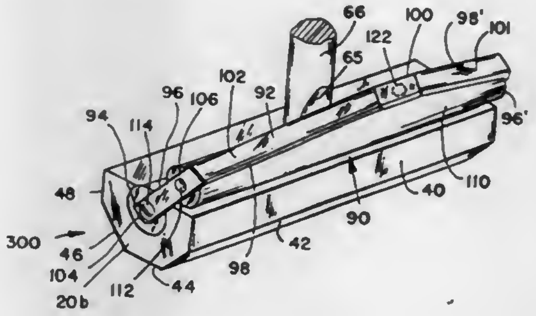
5,533,226
RECTANGULAR SPONGE MOP WITH WRINGER ASSEMBLY

Arthur K. Brown, Jr., 2036 Greenleaf Blvd., Elkhart, Ind. 46514

Division of Ser. No. 301,668, Sep. 7, 1994. This application Jun. 5, 1995, Ser. No. 465,529

Int. Cl.^{6} A47L *13/144*

U.S. Cl. 15—119.2 **2 Claims**



1. A mop comprising:

a sponge having a generally rectangular shape with a top surface separated from a bottom surface by a predetermined uniform thickness, said sponge having a first end separated from a second end by first and second parallel side surfaces, said top surface having a groove located along a plane parallel to said first and second side surfaces to create first and second lands, said sponge having first, second, third, fourth and fifth peripheral longitudinal working surfaces created by the removal of the intersecting corners between said parallel side surfaces and bottom surface, said working surfaces being substantially equal in width to provide symmetry for the sponge;

a cylindrical member having a first end and a second end, said cylindrical member being aligned in said groove of said sponge such that said first and second ends thereof are aligned with the first and second ends of said sponge;

a layer of adhesive located in said groove to attach said sponge to said cylindrical member;

a first handle attached to said cylindrical member;

a wringer assembly having a strap with a first end and a second end, said strap having a first side adjacent said first end and a second side adjacent said second end, said first side and second side being connected to a center section, said first and second sides each having first and second holes a fixed distances from first and second ends;

a roller secured to said strap by first means extending through said second holes in said first and second sides of said wringer assembly;

second means extending through said first holes in said first and second sides of said strap to secure said wringer assembly to said cylindrical member such that said roller is parallel to said cylindrical member, one of said first and second lands acting on and urging said roller into engagement with said first handle when said strap is in a first rest position, said strap being adapted to rotate in an arc to a second position to uniformly remove any liquid from said sponge where the other of said first and second lands act on and urge said roller into engagement with said first handle, said first, second, third, fourth and fifth peripheral longitudinal working surfaces aiding in the removal of liquid from the sponge on movement of said wringer assembly; and

a second handle attached to said center section of said strap, said second handle having a groove located adjacent said center section to divert any liquid away from the second handle that may be communicated from said sponge by way of said strap during movement of said wringer assembly in said arc.

5,533,227
TOOTHBRUSH

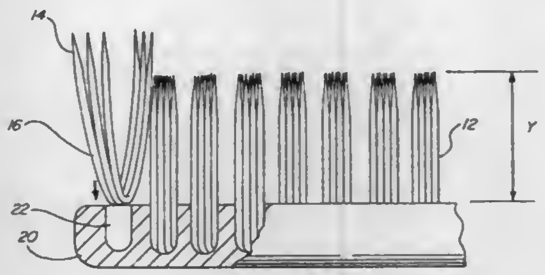
Ryu Ito, Kashiwa; Kenji Kaneko, Yokohama; Satoshi Hayashi, Omiya, and Akiko Terai, Odawara, all of, Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 388,906, Feb. 14, 1995, which is a continuation of Ser. No. 76,997, Jun. 15, 1993, abandoned. This application Jun. 23, 1995, Ser. No. 494,008

Claims priority, application Japan, Jun. 22, 1992, 4-048973; Nov. 6, 1992, 4-321364

Int. Cl.⁶ A46B *9/04*

U.S. Cl. 15—167.1 **6 Claims**



1. A toothbrush comprising:

fillings made of a synthetic filament material, each of said fillings having two end tips including a tapered section at each end tip and a non-tapered section interconnecting said respective end tips, said fillings being gathered together into a plurality of bundles, wherein said fillings are each formed at both tips thereof into a pointed tapered section, and each of said bundles of said fillings is doubled over at a central portion thereof; and

a handle provided at a distal end thereof with a filling setting base, said filling setting base being formed with filling setting holes in which a portion of said central portion of said bundles of said fillings are set so as to permit said end tips of each of said fillings to be outwardly projected therefrom, said filling setting holes being arranged in a plurality of rows in parallel to a longitudinal direction of said handle;

said pointed tapered end tip section of each of said fillings being formed with a length of 4 to 8 mm, said non-tapered section of each of the fillings being formed with a maximum diameter of 0.16 to 0.20 mm; and

said end tips being positioned at approximately the same distance from the handle filling setting base and each of the bundles being spaced to provide a gap between adjacent bundles;

each of said filling setting holes being formed with a diameter of 1.5 to 2.0 mm and an interval between the edges of said holes being 1.0 to 1.2 mm in the longitudinal direction of said handle.

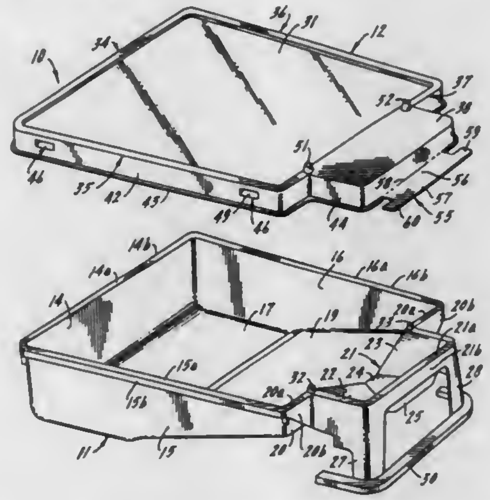
5,533,228
RESEALBLE PAINT TRAY

James J. Jarecki, and Bruce C. Polzin, both of Greendale, Wis., assignors to Newell Operating Company, Freeport, Ill.

Filed Aug. 29, 1994, Ser. No. 298,022

Int. Cl.⁶ B05C *21/00;* **B65D** *43/03*

U.S. Cl. 15—257.06 **13 Claims**



10. A two part, reseatable paint tray assembly for storing paint for extended periods of time without formation of skin, said paint tray assembly including

a paint tray having a front portion, a rear portion and side portions,

said paint tray having flange means extending substantially about its entire periphery,

said flange means including a generally downwardly directed wall throughout substantially the entire peripheral extent of the flange means,

a lid,

said lid being separate from the tray and having a contour which coincides with the contour of the paint tray,

said lid further having a rib extending substantially about its entire periphery,

said lid rib having a contour which coincides with the contour of the flange means on the tray,

said lid having a smooth uninterrupted surface in an enclosed area formed by the lid rib, and

means for locking the lid rib to the flange means of the tray, and thereby the lid to the tray, in sealing relationship at one location at least on each side portion of the tray assembly,

the lids of a plurality of lid assemblies being nestable one within another, and

The trays of a plurality of tray assemblies are nestable one within another,

the locking means includes inwardly projecting projections earned by the lid which engage the flange means of the side portions of the tray,

the locking means further including a planar projecting portion extending outwardly from a rear edge of the lid rib,

said planar projecting portion being bendable downwardly and inwardly into locking engagement with the rear portion of the tray.

5,533,229
DEVICE FOR REMOVING HAIR FROM HAIRBRUSHES

Winfried Hahn, Elzer Strasse 7, D-65555 Limburg, Germany

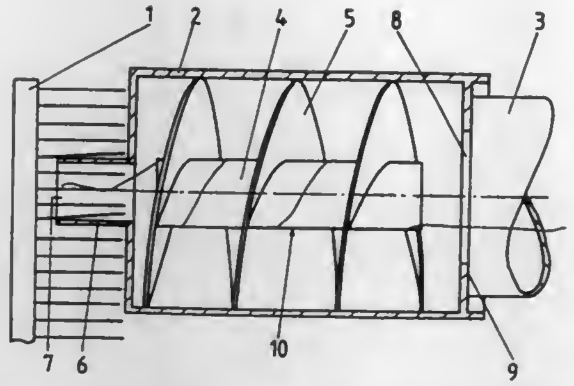
Filed Sep. 2, 1994, Ser. No. 300,712

Claims priority, application Germany, Sep. 8, 1993, 43 30 343.9

Int. Cl.⁶ A46B *17/06*

U.S. Cl. 15—310 **11 Claims**

1. A device for removing hair from hairbrushes, comprising a housing with an inlet opening and a suction outlet connectable to a suction device, and also with at least one deflector device disposed between the inlet opening and the suction outlet to block direct passage over the shortest route from the inlet opening to the suction outlet, said deflector device having a friction surface, with which contact is made by the hair during the sucking in of the hair by the device.



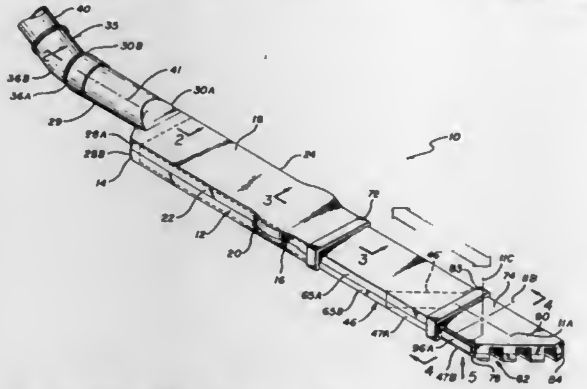
5,533,230
VACUUM CLEANER ATTACHMENT FITTING

Dawn V. Rouda, Lancaster, Pa., assignor to JMA & Associates, Inc., Indian Wells, Calif.

Filed May 25, 1995, Ser. No. 450,308

Int. Cl.⁶ A47L *9/02*

U.S. Cl. 15—339 **16 Claims**



1. A vacuum cleaner attachment fitting for cleaning a surface within a confined space, said attachment fitting comprising:

a first thin hollow rectangular member having a closed off first end and an open first end;

a hollow tubular fitting coupled to said first end for attaching to the vacuum hose of a vacuum cleaner;

a second thin hollow rectangular member having open first and second ends, and top, bottom and side walls, said first end of said second member slidably engaged with said second end of said first member in a telescoping manner, said second end of said second member having a plurality of vertical walls extending from said top wall to said bottom wall forming channels therebetween, said bottom wall slotted between said vertical walls.

5,533,231
CONCEALABLE CASTER OF BAGGAGE

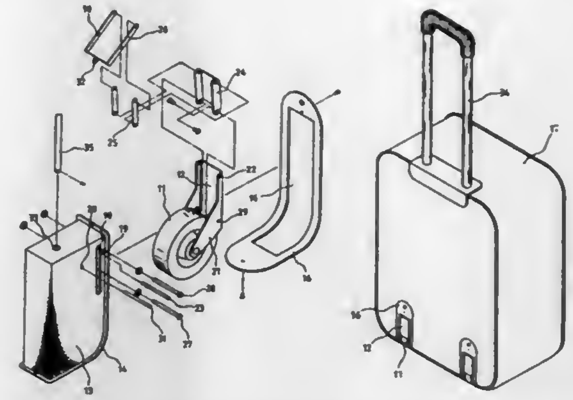
Yang-Fong Bai, 1F, 125-6, Sec. 1, San Min Rd., Taichung, Taiwan

Filed Sep. 12, 1994, Ser. No. 304,121

Int. Cl.⁶ B60B *33/06;* **B62B** *1/00*

U.S. Cl. 16—34 **2 Claims**

1. A conceal able baggage caster comprising a caster housing dimensioned to house therein a caster of a baggage and a caster frame on which said caster is mounted, said caster housing having an open outer side and an open bottom side which are provided respectively with a folded edge to facilitate said caster housing to be fastened to a bottom edge of said baggage in conjunction with an L-shaped fastening piece provided therein with a through slot dimensioned to permit said caster to move freely therethrough, said caster housing further provided respectively in a left side wall thereof and a right side wall thereof with an elongate slot, a pivoting hole and a locating hole, said caster frame having two lugs between which said caster is mounted, with said caster frame being pivoted to said caster housing which is further provided therein with an action plate, two guiding pieces and two levers, said action plate being pivoted to said lugs of said caster frame, said two guiding pieces being pivoted to a shaft slidable along said elongate slots such that said two guiding pieces actuate said action plate, said two levers being provided respectively with a central fulcrum point fastened by a bolt shaft to said locating holes of said caster housing, said two levers being further provided jointly with a pivoting point which is fastened pivotally with one end of an inner control rod of a drag frame of said baggage.



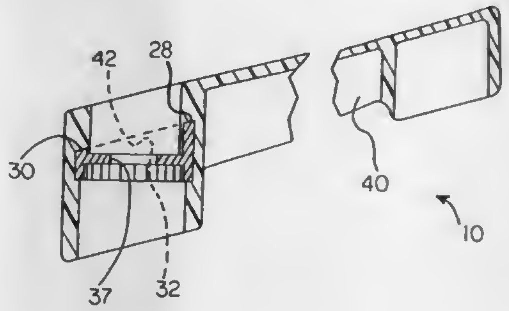
5,533,232
HAND LEVER ASSEMBLY

David C. Boyer, Millersburg, Pa., assignor to Alvord-Polk, Inc., Millersburg, Pa.

Filed Jun. 19, 1995, Ser. No. 491,737

Int. Cl.⁶ A47B *95/02*

U.S. Cl. 16—114 R **15 Claims**



1. A handle lever assembly for turning a rotary member, such as a spindle, axle or the like about an axis, the assembly comprising,

A) a metal insert having a generally cylindrical tubular body with an upper portion and a lower portion, the lower portion of the insert having a plurality of regularly spaced teeth for engaging complementary teeth on a rotary member, the upper portion defining an upper surface of the insert including a high point, a low point, a first surface extending around the body clockwise from the low point to the high point, and a second surface extending counterclockwise around the body from the low point to the high point, such surfaces each including a torque transfer surface; and

B) a plastic handle body molded around the insert, the handle body including a grip and a cylindrical base, the cylindrical base surrounding the insert body and including drive surfaces engaging the torque surfaces of the insert.

5,533,233
SPRING HINGE

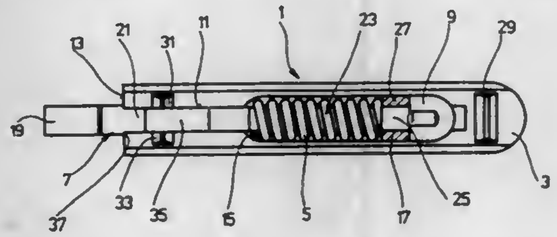
Reiner Wagner, Ispringen, and Otto Lehnert, Sinsheim, both of, Germany, assignors to OBE-Werk Ohnmacht & Baumgärtner GmbH & Co., KG, Ispringen, Germany

Filed Jul. 25, 1994, Ser. No. 279,774

Claims priority, application Germany, Apr. 30, 1994, 44 15 308.2

Int. Cl.⁶ G02C *5/22*

U.S. Cl. 16—228 **11 Claims**



1. A spring hinge for spectacles, comprising hinge means including a spring member; and a housing for receiving said hinge means, said housing having means for preloading and retaining said spring member in said housing, said preloading and retaining means comprising an abutment against which said spring member is supported,

wherein said abutment is defined by a portion of a wall of said housing having an increased thickness in comparison with a thickness of an adjacent wall portion of said housing wall,

wherein said hinge means include a hinge member forming with said spring member an integral structural component received in said housing, and

wherein said housing has projections which serve as welding studs, and said hinge member has a guide portion provided with a recess which, when said hinge member is received in said housing, is located in a region of said projections.

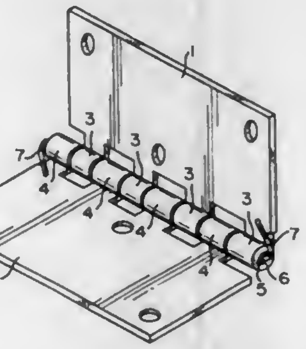
5,533,234
TORSION HINGE WITH TUBULAR PIVOT PIN

Donald R. Bizek, Woodridge, Ill., assignor to Stocker Hinge Manufacturing Company, Brookfield, Ill.

Filed Nov. 1, 1994, Ser. No. 332,070

Int. Cl.⁶ E05F *1/10*

U.S. Cl. 16—308 **9 Claims**



1. A hinge having two or more leaves and a tubular pivot pin, in which one or more torque rods, each having two ends, fit through the tubular pivot pin, with one end of each torque rod being restrained by one leaf or an adjacent component, and the other end of each torque rod being restrained by another leaf or adjacent component.

5,533,235
HOSE CLAMP DEVICE

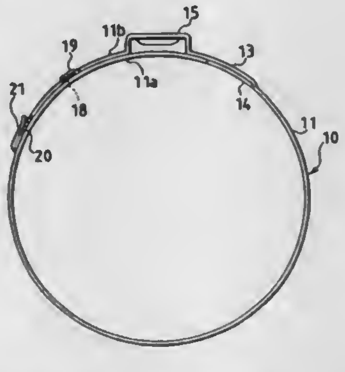
Yasuji Fukuda, Suwa, Japan, assignor to Kanesan Manufacturing Co., Ltd., Nagano-ken, Japan

Filed Mar. 8, 1995, Ser. No. 400,817

Claims priority, application Japan, Apr. 19, 1994, 6-005345

Int. Cl.⁶ B65D *63/00*

U.S. Cl. 24—20 R **2 Claims**



1. A hose clamp device made up of a metal strip member which is open at its both ends and formed in a ring shape with its both ends overlapping each other to define inner and outer end portions, said hose clamp device being fixed in place by use of a lock hole formed in said outer end portion and a first lock peg formed on said inner end portion, wherein:

an elongate notch extending along the lengthwise direction of said strip member is provided at the endmost section of said inner end portion of said strip member,

a step is provided at a lengthwise intermediate position on said outer end portion of said strip member, said step receiving the endmost section of said inner end portion, corresponding in thickness to said strip member, and being provided on the inner surface thereof with an elongate rib extending along the lengthwise direction of said strip member,

a clamper is provided on said outer end portion of said strip member, said clamper comprising a pair of upright pieces and a horizontal piece for connecting said upright pieces with each other,

an elongate rib is provided on said horizontal piece of said clamper, said elongate rib extending along the lengthwise direction of said strip member,

wherein said lock hole is in a substantially semicircular form, extends along the lengthwise direction of said strip member and includes a small tongue extending along the lengthwise direction of said strip member and in the clamping direction,

said first lock peg projects outwardly and includes an opening which directs reversely to the clamping direction,

wherein a plurality of lock holes are provided along the lengthwise direction of said strip member and at the required interval,

wherein the endmost section of said outer end portion of said strip member is provided with a tongue and said inner end portion of said strip member is provided with a second lock peg outwardly projecting within which said tongue is engaged, and

openings of said first and second lock pegs are directed in opposition to each other.

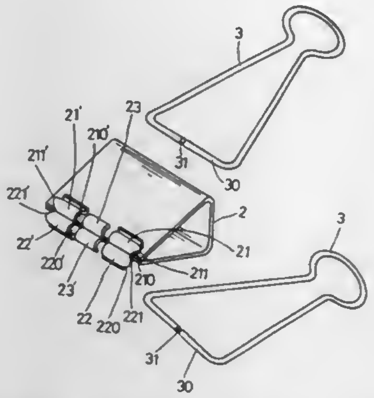
5,533,236
PAPER HOLDER

Liang-Chuan Tseng, Tainan, Taiwan, assignor to Chun-Hsiung Hsu, Tainan, Taiwan

Filed Aug. 8, 1995, Ser. No. 512,663

Int. Cl.⁶ B42F *1/00*

U.S. Cl. 24—67.5 **1 Claim**



1. A paper holder comprising a pincher and two press handles combined together, said pincher formed of a rectangular metal bent in a triangular cross-section and having its two ends in close contact with each other, each said end of said pincher having two elastic semicircular hinge hooks at both sides rolled outward and another semicircular hinge hook between said two elastic semicircular hinge hooks, each of said two elastic semicircular hinge hooks having a pointed projection at an outer end, each said press handle formed of a metal wire bent to have a triangular portion and a nearly circular portion extending from the triangular portion, said triangular portion having a bottom side formed with two ends of the metal wire separated with a small gap, said bottom sides of said two grip handles being forcefully pushed into said semicircular grooves of said semicircular hinge hooks of said pincher, with said triangular portions of said press handles resting on two outer surfaces of said pincher in a pinching position so that said two grip handles may be pressed down against each other letting the bottom sides of the pincher open outward for sheets of paper to be inserted and pinched therein after said press handles are released.

5,533,237
GROMMET FASTENER ASSEMBLY FOR AUTOMOBILES

Lawrence J. Higgins, Sterling Heights, Mich., assignor to Emhart, Inc., Newark, Del.

Filed Sep. 12, 1994, Ser. No. 304,446

Int. Cl.⁶ A44B *17/00;* **F16B** *19/00*

U.S. Cl. 24—289 **3 Claims**

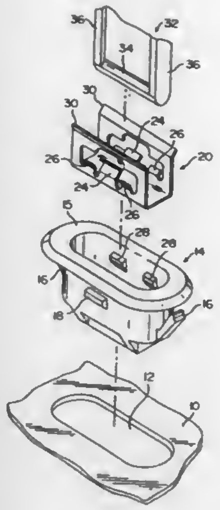
1. A fastener assembly for securing an interior panel associated with upholstering material to an exterior body panel of an automobile comprising,

an elongated member depending from said interior panel and having a retention nodule thereon,

a retainer member comprising a generally U-shaped spring metal member having a first pair of arm members shaped to cooperate with said retention nodule to thereby releasably secure said elongated member to said retainer member, and

a closed, cup-shaped grommet formed of a rigid non-porous seamless material and having a flange for mounting on the rim of an aperture in said exterior body panel of said automobile and further having exterior pliable leg members for engaging the underside of the rim of said aperture for effecting a snap-fit therewith, said grommet having generally the same peripheral dimension as said aperture in a plane coplanar with the plane of said aperture,

said grommet having interior tab means for securing said retainer member within the interior thereof, and said retainer member further having a second pair of arm members extending upwardly to engage said tab means, said grommet thereby forming a closed enclosure surrounding said retainer member, whereby said grommet acts as a seal against the passage of liquid into said interior panel of said automobile.



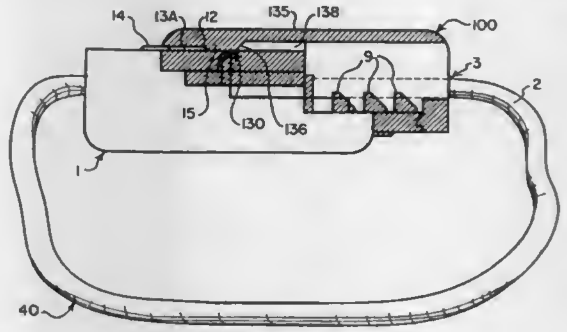
5,533,238
BREAKAWAY CORD CONNECTOR

James Say, 83 Swan Dr., Breckenridge, Colo. 80424

Filed Oct. 31, 1994, Ser. No. 331,695

Int. Cl.⁶ F16G *11/00*

U.S. Cl. 24—115 F **18 Claims**



1. A breakaway cord connector assembly comprising:

a pair of duplicate elongate self-mating bodies;

said bodies having a cord end and a mating end;

said cord end having a clamp means to secure a cord end co-axially with the body;

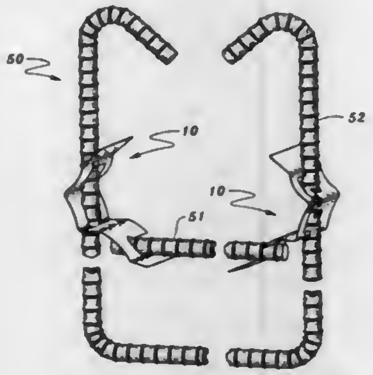
said mating end having a means to telescopingly mate with the duplicate body co-axially;

said mating end further comprising a catch means to releasably secure a mirrored retainer catch means on the duplicate body, whereby the assembly comprising the mated pair of bodies affixed to the cord ends of a loop functions to breakaway at a preset force on the loop; and

said means to telescopingly mate further comprises a self-mating mirrored tongue-in-groove design which mates with a duplicate member co-axially and 180° out of phase therewith.

5,533,239
ADJUSTABLE COMPOUND CABLE BEAM PROFILE CLIP

Allen M. Gall, 14926 Tokay Colony Rd., Lodi, Calif. 95240
Filed Dec. 27, 1994, Ser. No. 363,947
Int. Cl.^{6} E04C *5/16*
U.S. Cl. 24—339 **16 Claims**



1. An apertured clip for disposition upon a rebar stirrup for the receipt of a profile bar which clip comprises a resilient metal elongated strip having a top edge and a bottom edge, which strip is bent at various locations intermediate its ends to cause sections of the clip to lie one above the other in a spaced relationship,

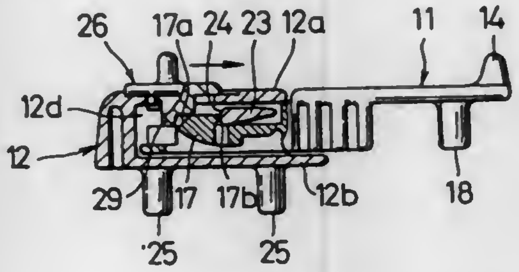
said apertures comprising:

a pair of connected elongated apertures each having unbroken walls normal to flat top and bottom surfaces, which walls serve as bearing surfaces at opposite sides of each of the two connected apertures for mounting of the clip on a support;

an edge slot in communication with a third elongated aperture, said third aperture has similar walls and serves to provide bearing surfaces for retention of a bar normally disposed with respect to a support.

5,533,240
LOCK FASTENER

Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Dec. 21, 1993, Ser. No. 170,795
Claims priority, application Japan, Dec. 22, 1992, 4-092326
Int. Cl.^{6} A41F *1/00*
U.S. Cl. 24—615 **3 Claims**



1. A lock fastener which comprises:

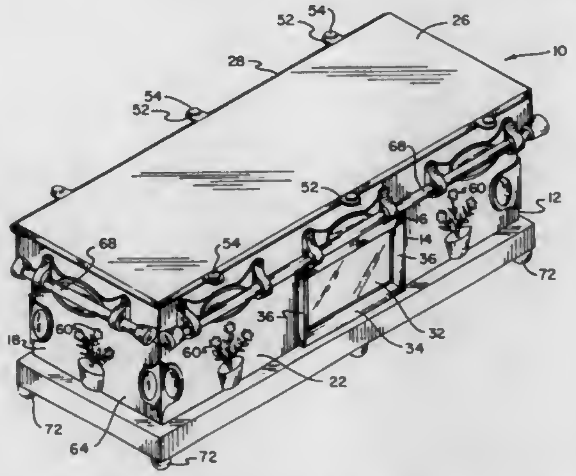
(a) a plug member having a resilient engaging tongue flexibly movable about a transverse axis defined at one of its ends and having a sloped guide surface and a locking recess formed in said tongue;

(b) a socket member having a guide chamber adapted to receive said engaging tongue, and a stationary anchoring bar extending transversely through said chamber and engageable with said locking recess to lock said plug member relative to said socket member; and

(c) an unlocking means slidably movable along a direction parallel to a direction of insertion of said plug member into said socket member, toward and away from said plug member and having a presser foot slidably engageable with said sloped guide surface of said engaging tongue, along the direction parallel to the direction of insertion of said plug member into said socket member, to deflect said tongue away from said stationary anchoring bar to disengage said locking recess from said stationary anchoring bar to unbuckle said plug member from said socket member.

5,533,241
FUNERAL BIERS WITH EXCHANGEABLE PICTURES AND ILLUMINATION DEVICES

Jerry M. McConnell, 260 Cherry St., Bluefield, W. Va. 24701
Filed Mar. 14, 1994, Ser. No. 209,238
Int. Cl.^{6} A61G *17/00*
U.S. Cl. 27—27 **1 Claim**



1. A new and improved funeral bier with exchangeable pictures and illumination, the bier being utilized to support a casket thereupon, the apparatus comprising, in combination:

a frame structure having shortened rectangular side walls parallel with each other, each side wall having an upper extent and a lower extent and lateral edges, elongated rectangular rear and front walls parallel with each other, the rear and front walls having upper extents, lower extents, and lateral edges, the rear and front walls being secured at their lateral edges to the lateral edges of the side walls in a rectangular configuration, a bottom wall in a rectangular configuration having sides, an upper extent, a lower extent, corners, a top, a bottom and lateral edges secured at its edges to the lower edges of the side walls and a planar lid having four sides in a rectangular configuration to permit a casket to be supported thereupon, the lid being pivotally secured to the upper edge of the rear wall for providing access to the interior of the frame structure;

a picture frame removably secured to the exterior face of the front wall with a transparent window supported therein adapted to receive a picture between the window and the front wall, the frame having a horizontal lower support, spaced vertical lateral supports, and the lack of a support across the top allowing for the ready removal of the window and a picture;

an illumination device having two outwardly extending bulb supports comprising a fluorescent bulb positioned between the upper edges of the vertical lateral supports of the picture frame and parallel with the horizontal lower support of the picture frame, the illumination device also including a front and side shield and supporting electrical components, the front shield being formed in an L-shaped configuration and an on/off switch for the bulb;

a plurality of raised casket stops comprising outwardly extending rods with upwardly extending projections on the outwardly extending rods on each side of the lid to preclude lateral shifting of a casket placed on the lid;

decorative means secured to the exterior surface of the front wall on opposite sides of the picture, the decorative means being in the form of metal flowers and flowerpots;

carpeting secured to the rear, front and side walls;

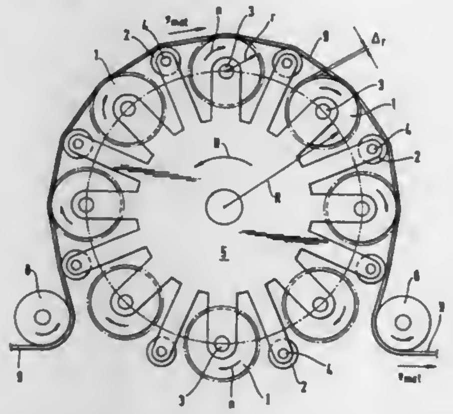
a railing for carrying purposes located horizontally along the upper extents of the side, rear and front walls;

six spherically-shaped casters located beneath each corner and along the sides of the bottom wall for facilitating the shifting thereof; and

a door on the rear wall to facilitate entry into the interior of the bier.

5,533,242
METHOD FOR THE NEEDLING OF MATERIAL WEBS

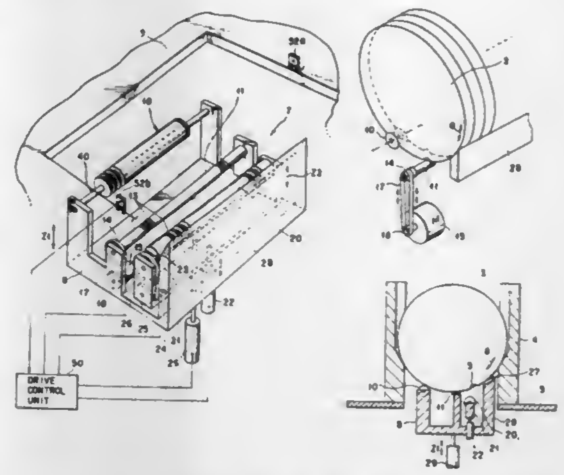
Hans J. Profé, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed Jun. 26, 1995, Ser. No. 496,072
Claims priority, application Germany, Jun. 30, 1994, 44 22 844.9
Int. Cl.^{6} D04H *18/00;1/46;3/10;* **D05C** *15/08*
U.S. Cl. 28—107 **12 Claims**



1. A method for the needling of a material web, comprising the step of guiding the material web at a predetermined speed over a plurality of needle rollers having needles, each having a butt and tip, rotating about longitudinal axes and arranged transversely to the direction of movement of the material web, covering part of a surface of each of the needle rollers with the material web, and setting a circumferential speed of the needle rollers relative to a speed of the material web such that that a desired amount of needling, with adjustable longitudinal stretching, is obtained.

5,533,243
NOTCH POSITION ALIGNING APPARATUS AND PROCESS FOR USING THE APPARATUS TO INDEPENDENTLY ALIGN INDIVIDUAL WAFERS IN A WAFER CASSETTE

Takanobu Asano, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, and Tokyo Electron Tohoku Limited, Esashi, both of, Japan
Filed Dec. 28, 1994, Ser. No. 365,429
Claims priority, application Japan, Dec. 28, 1993, 5-352038
Int. Cl.^{6} B23B *5/22;* **B65G** *47/24*
U.S. Cl. 29—25.01 **9 Claims**



1. A notch position aligning mechanism comprising:

a base which is vertically movable and which is inserted into a cassette through a lower opening of the cassette for storing a plurality of targets to be aligned having notches formed in edge portions of the targets;

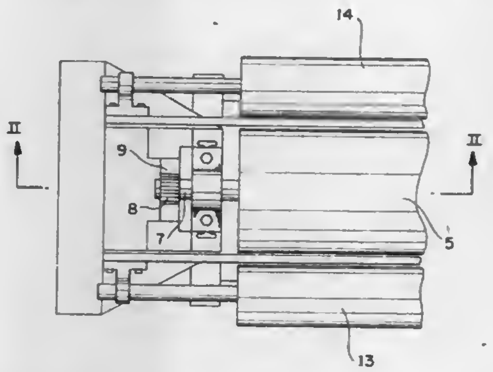
rotating/supporting means, including a first rotary member, driving means for rotating the first rotary member, and a second rotary member, for supporting and rotating the targets with the targets spaced from a portion of the cassette, the first rotary member being arranged on said base and having a plurality of fitting grooves which allow the notches of the targets to be fitted in the fitting grooves, the second rotary member being rotatable and arranged on said base; and

a support member, arranged on said base, for supporting the targets when the notches of the targets are fitted in the fitting grooves of the first rotary member, such that the targets are non-rotatable when the notches of the targets are fitted in the fitting grooves of the first rotary member,

wherein the second rotary member includes a rigid shaft fixed to said base and extending in a direction along which the targets are arranged in the cassette, the second member further including a plurality of idle pulleys, fitted over a full length of the rigid shaft, for supporting the targets, respectively, and the idle pulleys are individually rotated and stopped by rotation and stoppage of the targets which are allowed to be rotated by the first rotary member.

5,533,244
WOVEN BELT PAPER POLISHER

Michael Wadzinski, Menasha, Wis., assignor to Appleton Papers Inc., Appleton, Wis.
Filed Jun. 21, 1994, Ser. No. 263,199
Int. Cl.^{6} B24B *39/00;* **D21F** *3/08;* **D21G** *1/02*
U.S. Cl. 29—90.1 **25 Claims**



1. A method of polishing paper, comprising the steps of:

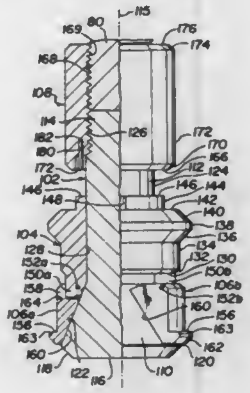
feeding a length of paper at a first speed around an arcuate portion of a cylindrical roll;

passing a polishing belt against the arcuate length of the paper at a second speed, the arcuate length of paper being pressed between the polishing belt and the cylindrical roll, wherein the first and second speeds are different;

polishing the paper with the polishing belt when the paper is in contact with the polishing belt during the step of passing, the paper moving relative to the polishing belt during the step of selectively controlling an amount of movement of the paper relative to the polishing belt in order to vary a degree of polishing of the paper being selectively variable during the step of controlling.

5,533,245
RELEASABLE VALVE SEAT REMOVAL TOOL

Eddie Stanton, 2025 Magill, Odessa, Tex. 79764
Filed Oct. 18, 1994, Ser. No. 324,785
Int. Cl.^{6} B23P *19/04*
U.S. Cl. 29—221.6 **8 Claims**



1. A releasible tool for removing a cylindrical member with a bore therethrough such as a valve seat, a pump liners, or a bushing from machines, pumps, or other devices in which it is used, the releasable tool comprising:

(a) a mandrel having a generally bell-shaped lower end and a shank portion;

(b) a platform having a central bore therethrough and an upwardly extending tapered surface, said platform being slidably mounted on said shank portion of said mandrel by placing said shank portion through said central bore of said platform;

(c) at least two jaw members pivotally mounted to said platform, whereby they can be pivotally deflected outward to an expanded position by said bell-shaped lower end of said mandrel when said platform slides down said shank portion of said mandrel; and

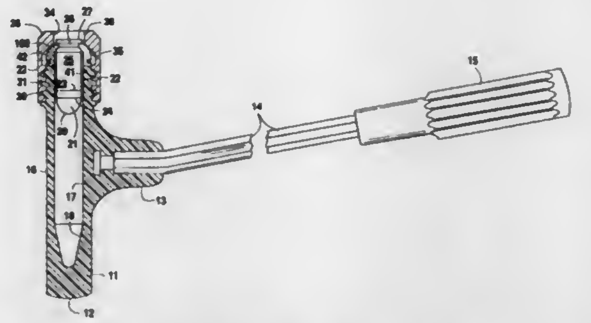
(d) an adaptor releasably connected to an upper end of said shank portion of said mandrel, said adaptor having a downwardly extending tapered surface corresponding to said upwardly extending tapered surface of said platform, whereby said upwardly and downwardly extending tapered surfaces can be engaged to form a releasable interference fit to grab and slide said platform upward on said shank portion, which moves said jaw members away from said bell-shaped lower end of said mandrel so that said jaw members can be deflected inward to a retracted position.

5,533,246
BULLET PULLER

Clifford L. Ashbrook, Spicewood, Tex., assignor to Quinetics Corporation
Continuation-in-part of Ser. No. 967,214, Oct. 27, 1992, Pat. No. 5,333,367. This application May 20, 1994, Ser. No. 246,810
The portion of the term of this patent subsequent to Oct. 27, 2012, has been disclaimed.
Int. Cl.^{6} B25B *27/14*
U.S. Cl. 29—275 **9 Claims**

1. A bullet puller comprising:

a carrier having an opening at its upper end adapted to receive a cartridge and a head at its lower end adapted to be struck against a hard surface;



an annular segmented support disposed about said upper end of said carrier for engaging the cartridge;

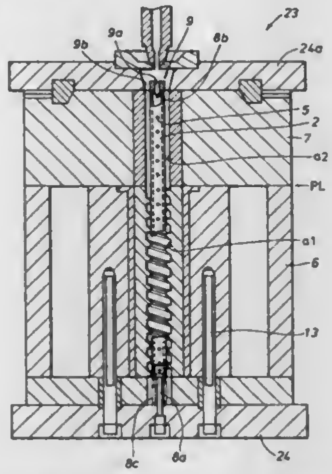
said annular segmented support comprising a plurality of adjacent segments flexibly connected together wherein said flexible connection maintains said plurality of segments in an expanded position but still permits the radially inward movement of said plurality of segments to a contracted position;

means movably mounted over said opening at said upper end of said carrier for forcing said plurality of segments radially inward; and

a handle connected at one end to said carrier for imparting motion to said carrier to strike it against said hard surface.

5,533,247
METHOD FOR FABRICATING A LEAD SCREW MADE OF SYNTHETIC RESIN MATERIAL AND HAVING A CORE TUBE THEREIN

Kiyoshi Ishii, Tokyo, and Mizubo Ishikawa, Kanagawa-ken, both of, Japan, assignors to Kabushiki Kaisha Mold Gijutsu Kenkyusho, and Minebea Co., Ltd., both of, Japan
Filed Sep. 14, 1994, Ser. No. 305,562
Claims priority, application Japan, Sep. 17, 1993, 265346
Int. Cl.^{6} B23P *17/00*
U.S. Cl. 29—527.4 **10 Claims**



1. A method for molding a lead screw comprising the steps of:

forming an array of holes in a wall of a core tube made of metal at portions matching in position with a thread crest of a prescribed screw thread;

preparing a die assembly provided with a cavity including a thread groove formed in a die surface thereof adapted to form said thread crest matching in position with said array of holes formed in said core tube;

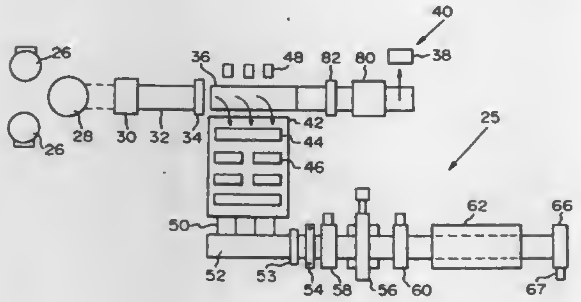
placing said core tube in said cavity of said die assembly with said array of holes of said core tube matched in position with said thread groove of said cavity;

injecting synthetic resin material axially into an internal bore of said core tube as a first flow and into an annular gap defined between an outer circumferential surface of said core tube and said die surface of said cavity as a second flow; and

removing the thus molded lead screw out of said die assembly.

5,533,248
METHOD OF STEEL PROCESSING USING AN INLINE GRINDER

George W. Tippins; John E. Thomas; William H. Tippins, all of Pittsburgh, and Ronald D. Gretz, Brackenridge, all of Pa., assignors to Tippins Incorporated, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 123,149, Sep. 20, 1993, which is a continuation of Ser. No. 881,615, May 12, 1992, Pat. No. 5,276,952. This application Jan. 11, 1995, Ser. No. 371,399
Int. Cl.^{6} B21B *1/00*
U.S. Cl. 29—527.7 **20 Claims**



1. A method of steel processing comprising the steps of:

a) continuously casting a strand;

b) cutting said strand into a plurality of slabs of predetermined lengths;

c) inspecting each slab to select some of the plurality of slabs which require surface conditioning;

d) surface conditioning the selected some of the plurality of slabs which require surface conditioning, said surface conditioning performed at a position inline with said caster;

e) feeding each slab into an inline heating furnace after said steps of inspecting and surface conditioning;

f) extracting each slab onto a continuous processing line including a hot rolling mill.

5,533,249
METHOD OF MAKING A TWO PIECE STATOR WITH MAGNETIC BOBBIN

Russell J. Wakeman, Canton, Mich., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.
Filed Apr. 27, 1995, Ser. No. 430,020
Int. Cl.^{6} H01F *41/02*
U.S. Cl. 29—605 **7 Claims**

1. A method of making a solenoid coil assembly comprising the steps of:

providing a bobbin having an essentially "L" shaped cross section;

mounting to the foot of the "L" shaped bobbin a pair of electrical terminals for connection with a separable electrical connector;

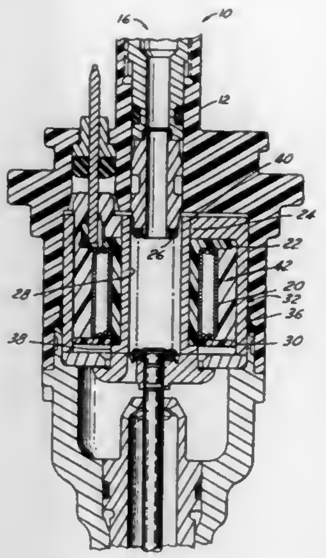
securing a washer member to the opposite end of the bobbin;

providing an inner pole disposed on the interior of said bobbin, said inner pole having a core and a flange;

mounting said bobbin over the inner pole core and in contact with the flange of the inner pole;

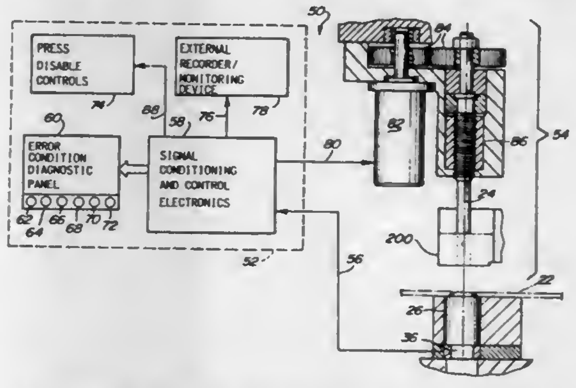
winding a plurality of layers of insulated coils fabricated from a continuous wire around said bobbin; and then

disposing an outer pole on the exterior of said bobbin such that it cooperates with the inner pole to form a stator assembly.



5,533,250
SELF-ADJUSTING HEAD FOR IMPACTING FASTENERS INTO A PANEL

Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.
Division of Ser. No. 198,367, Feb. 18, 1994, Pat. No. 5,487,215. This application May 24, 1995, Ser. No. 449,308
Int. Cl.^{6} B23P *21/00*
U.S. Cl. 29—702 **14 Claims**


PRESS DISABLE CONTROLS
EXTERNAL RECORDER/ MONITORING DEVICE
ERROR CONDITION DIAGNOSTIC PANEL
SIGNAL CONDITIONING AND CONTROL ELECTRONICS
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58
76
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1. A system for installing fasteners into a panel, comprising:

an installation apparatus for impacting against a fastener to to drive said fastener into said panel and join said fastener to said panel;

a sensor for sensing the force exerted by said installation apparatus when said installation apparatus installs said fastener;

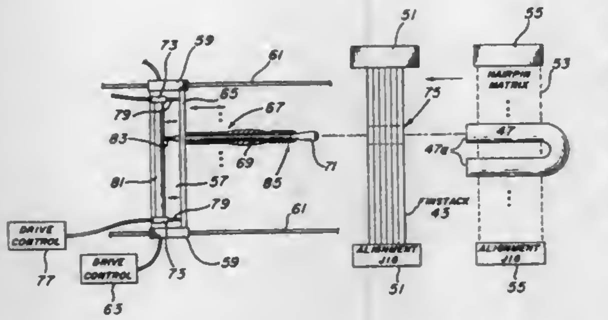
a comparator for comparing said exerted force to a predetermined force, said predetermined force being the force associated with proper installation of the fastener, said comparator generating a result;

a control device for controlling the installation apparatus in response to the result generated by said comparator.

5,533,251
AUTOMATIC HAIRPINLACING APPARATUS

Klaus-Dieter Vetter, 1755 Maple Ave., Croydon, Pa. 19020
Division of Ser. No. 63,535, May 18, 1993, Pat. No. 5,442,853. This application Jun. 1, 1995, Ser. No. 457,496
Int. Cl.^{6} B23P *15/26*
U.S. Cl. 29—727 **14 Claims**

1. An apparatus for automatic hairpin lacing of heat exchanger hairpins through fin stack holes, comprising:

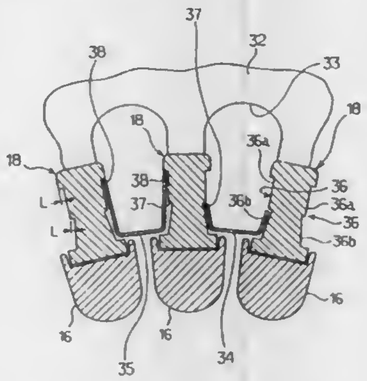


a first alignment jig for positioning a fin stack carrying a plurality of hairpin tube holes in a predetermined orientation and in alignment with a predetermined axis of movement;
a second alignment jig for positioning a matrix of hairpin tubes in an orientation for insertion through respective fin stack holes when a fin stack is held in said first alignment jig, said second alignment jig being removable to a first side of said first alignment jig;
a mounting block for holding a matrix of engaging devices in orientation for insertion through respective said fin stack holes, said mounting block being removable to a second side opposite said first side of said first alignment jig;
a plurality of engaging devices positioned to extend from said mounting block toward said first alignment jig to pass through said fin stack holes and to penetrate said hairpin tubes when said mounting block is moved to be immediately adjacent said first alignment jig;
a plurality of engagement activation devices, one carried by each engaging device, each said engagement activation device being selectively operable to activate the movement of said engaging device to engage said hairpin tube;
a first drive means for selectively moving said mounting block towards and away from said first alignment jig opposite side and thereby effecting the movement of said plurality of engaging devices; and
a second drive means for selectively operating said plurality of activation devices to effect said hairpin engagement.

5,533,252

SLOT INSULATOR GUIDE IN ASSEMBLY OF DYNAMOELECTRIC MACHINE AND COIL INSERTING APPARATUS PROVIDED THEREWITH

Tsutomu Kawamura, Yokkaichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 27, 1995, Ser. No. 394,819
Claims priority, application Japan, Sep. 29, 1994, 6-234773
Int. Cl.^{6} H02K *15/10*
U.S. Cl. 29—734 **5 Claims**

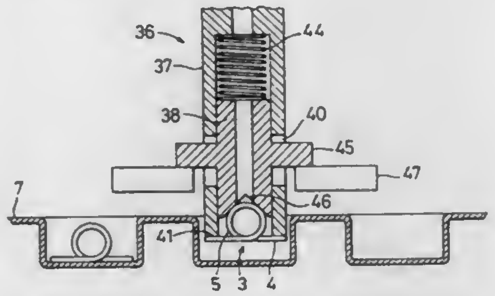


1. A slot insulator guide used with a coil inserting apparatus comprising a plurality of blades arranged in a space at a predetermined interval equal to a pitch of slots formed in a stator core of a dynamoelectric machine and each having a bottom and an open end and holding a coil, a plurality of pushers arranged so as to be reciprocally movable and so as to correspond to the blades respectively, the pushers being moved so that a layer insulator and a wedge are pushed into each slot, pusher driving means for moving the pushers, a stripper disposed to be reciprocally moved in a space encircled by the blades, and stripper driving means for moving the stripper so that the coil is pushed by the stripper from the blades into each slot, the slot insulator guide comprising:
(a) a guide face including a first and a second guide faces formed in each of sides thereof so as to be located at the bottom side of each slot and at the open end side of each slot respectively in the state that a plurality of the guides are disposed to correspond to the respective blades; and
(b) a first and a second engaging portion formed in each of the sides of the slot insulator guide so as to be located at the bottom side of each slot and so as to extend longitudinally of each slot;
wherein the layer insulator is held between the opposite first guide faces of the guide and the adjacent guide with both edges of the layer insulator being engaged with the first engaging portions of the guides and the adjacent guide respectively;
wherein the wedge is held between the opposite second guide faces of each guide and the adjacent guide with both edges thereof being engaged with the second engaging portions of the guide and the adjacent guide respectively; and
wherein the layer insulator and the wedge are guided by the respective first and second guide faces and the respective first and second engaging portions so as to be moved toward the slots of the stator core when the layer insulator and the wedge are pushed by the pushers.

5,533,253

APPARATUS AND METHOD FOR MOUNTING AN AIR-CORE COIL

Fumio Mifuji, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Sep. 20, 1994, Ser. No. 309,123
Int. Cl.^{6} H05K *13/00*
U.S. Cl. 29—741 **5 Claims**

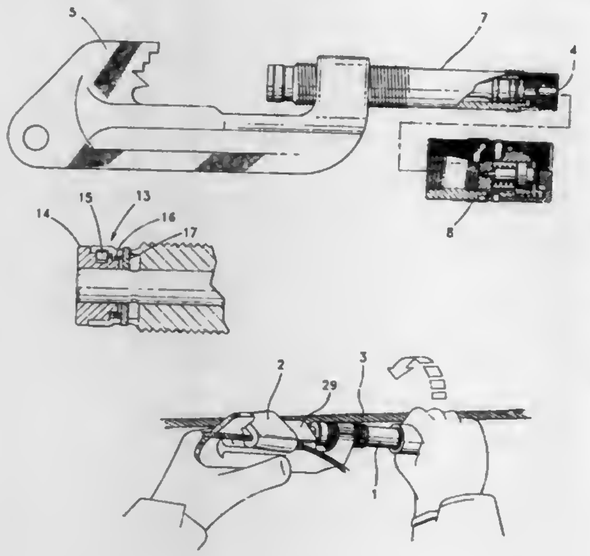


1. A method for mounting an air-core coil on a surface of a circuit board, wherein a portion of a coil turn of said air-core coil protrudes from both ends of said air-core coil to serve as terminals of said air-core coil, said method comprising:
sucking the air-core coil into a notch provided at an end of a suction nozzle,
abutting a reference surface with said terminals while the air-core coil is sucked into the notch, to regulate the angular position of said coil about the longitudinal axis of the air-core coil, and
thereafter, mounting the angularly positioned air-core coil on the surface of the circuit board.

5,533,254

TOOL FOR APPLYING WEDGE TYPE ELECTRICAL CONNECTORS TO THE CONDUCTORS OF ELECTRICAL DISTRIBUTION NETWORKS

Esdras Gallo, and Milton E. Diniz, both of Braganca, Brazil, assignors to The Whitaker Corporation, Wilmington, Del.
Continuation of Ser. No. 286,564, Aug. 5, 1994, abandoned. This application Aug. 9, 1995, Ser. No. 513,164
Claims priority, application Brazil, Aug. 13, 1993, 9303375
Int. Cl.^{6} H01R *43/26;* **B25C** *1/10;* **B21F** *15/06*
U.S. Cl. 29—750 **11 Claims**



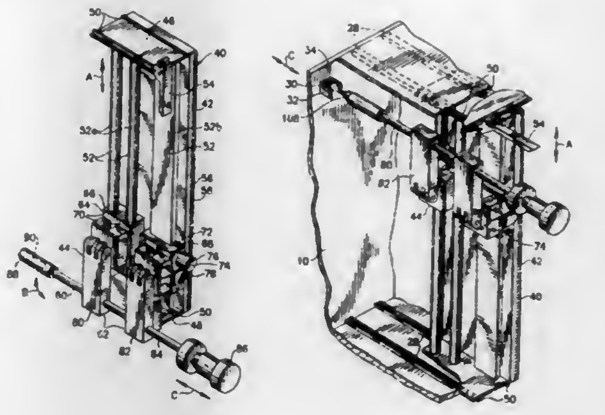
1. A tool for applying a wedge into an electrical connector, wherein the tool is fired by an expansion of gases from the detonation of a powder charge by a firing pin, the tool comprising:
an elongated, hollow body of a substantially cylindrical shape having a ram movably disposed to first and second positions, said second position comprising an outer operated position exterior of said elongated member;
a mechanical device provided on a front end of said elongated body which includes a spring biased member holding the ram at said second outer operated position after the wedge has been driven into the electrical connector by the detonation of said powder charge by said firing pin; and
said mechanical device comprises a cover, and a spring disposed adjacent to said cover.

5,533,255

TOOL FOR ON-SITE REPAIRING AND/OR REPLACING OF ELECTRICAL CONNECTORS

Michael N. Perugini, Monroe, and Thomas I. Crilly, III, Watertown, both of Conn., assignors to Burndy Corporation, Norwalk, Conn.
Filed Dec. 21, 1994, Ser. No. 361,235
Int. Cl.^{6} B23P *19/04;* **H01R** *43/00*
U.S. Cl. 29—758 **13 Claims**

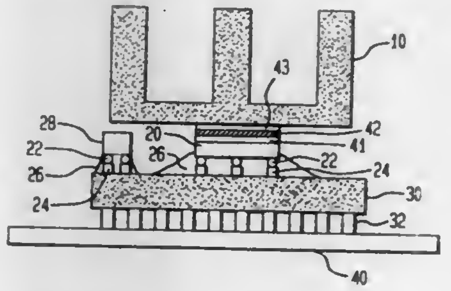
1. A tool for on-site repairing and replacing of electrical connectors or electrical contacts comprising:
a frame having first guides on two opposite ends for sliding in opposing second guides of a printed circuit board receiving cage; and
a positioner movably attached to the frame, the positioner having a first section for moving a working head connected to the first section in a first direction, a second section for moving the first section in a different second direction, and a third section for moving the first and second sections in a different third direction, wherein the first guides comprise a first set of rails located on exterior top and bottom sides of the frame.



5,533,256

METHOD FOR DIRECTLY JOINING A CHIP TO A HEAT SINK

Anson J. Call, Holmes; Stephen H. Meisner, Hudson; Frank L. Pompeo, Walden, and Jeffrey A. Zitz, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 279,734, Jul. 22, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 461,814
Int. Cl.^{6} H05K *3/34*
U.S. Cl. 29—840 **14 Claims**



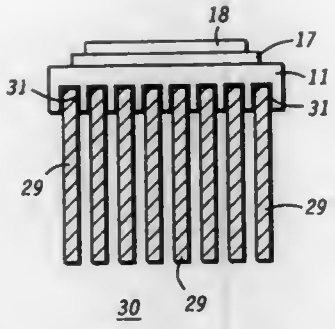
1. A method to provide a direct thermally conductive path between at least one chip and at least one heat sink, wherein said method comprises the steps of:
(a) interposing a double-sided thermally-conductive adhesive tape having a first surface and a second surface between said at least one chip and said at least one heat sink, wherein said first surface and said second surface are opposite each other,
(b) securing at least a portion of said at least first surface of said double-sided thermally-conductive adhesive tape to one surface of said chip, and
(c) securing at least a portion of said second surface to at least a portion of said heat sink, and thereby providing said direct thermally conductive path between at least one chip and at least one heat sink.

5,533,257

METHOD FOR FORMING A HEAT DISSIPATION APPARATUS

Guillermo Romero, and Joe L. Martinez, Jr., both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 24, 1994, Ser. No. 247,932
Int. Cl.^{6} B23P *15/26*
U.S. Cl. 29—890.03 **16 Claims**

1. A method for forming a heat dissipation apparatus, comprising the steps of:
forming a porous base structure having a first major surface and a second major surface, wherein the first major surface has at least one groove;



infiltrating the porous base structure with a conductive material; and

coupling at least one fin to the at least one groove of the first major surface.

5,533,258
PROCESS FOR THE MANUFACTURING OF A COOLING UNIT

Florian Rainer, and Ing N. Reheis, both of Tirol, Austria, assignors to Schwarzkopf Technologies Corp., New York, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,552
Claims priority, application Austria, Jan. 17, 1994, 66/94
Int. Cl.⁶ B23P *15/26*

U.S. Cl. 29—890.03 **8 Claims**

1. A process for the manufacture of a cooling unit comprised of at least one beat-resistant part made of material having a melting point above 1600° C., and at least one metallic coolant conduit joined with said part, said process comprising the steps of: bringing said beat-resistant part into contact with molten metal of said coolant conduit; introducing molten components of at least one metal of secondary groups IV and V of the periodic table within a zone of contact surface between said coolant conduit and said heat-resistant part; and cooling the metal of said coolant conduit to solidify said coolant conduit in a desired shape.

5,533,259
METHOD OF MAKING AN EVAPORATOR OR EVAPORATOR/CONDENSER

Gregory G. Hughes, Milwaukee; Leon A. Guntly, Racine, both of Wis.; John B. Welker, Granger, Ind.; David T. Hill; Jerome P. Henkes, both of Racine, Wis.; Michael J. Reinke, Franklin, and C. James Rogers, Racine, both of Wis., assignors to Modine Manufacturing Co., Racine, Wis.

Division of Ser. No. 850,338, Mar. 11, 1992, Pat. No. 5,251,965, which is a continuation-in-part of Ser. No. 620,729, Dec. 3, 1990, which is a division of Ser. No. 141,628, Jan. 7, 1988, Pat. No. 4,998,580, which is a continuation-in-part of Ser. No. 902,567, Sep. 5, 1986, which is a continuation-in-part of Ser. No. 783,087, Oct. 2, 1985, abandoned. This application Oct. 5, 1993, Ser. No. 131,665
Int. Cl.⁶ B23P *15/26*

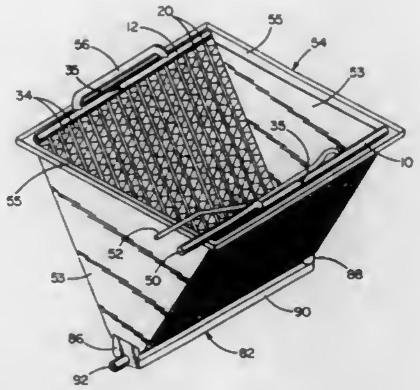
U.S. Cl. 29—890.043 **18 Claims**

1. A method of making an evaporator or evaporator/condenser comprising the steps of:

a) assembling parallel flattened tubes with internal webs extending between the interior of the side walls of the flattened tubes to spaced parallel headers with serpentine fins between the tubes;

b) subjecting the assemblage resulting from step a) to a bonding process to unite said headers, said tubes and said fins into a unitary assembly; and

c) thereafter bending the unitary assembly between said headers into a U or V-shaped configuration.

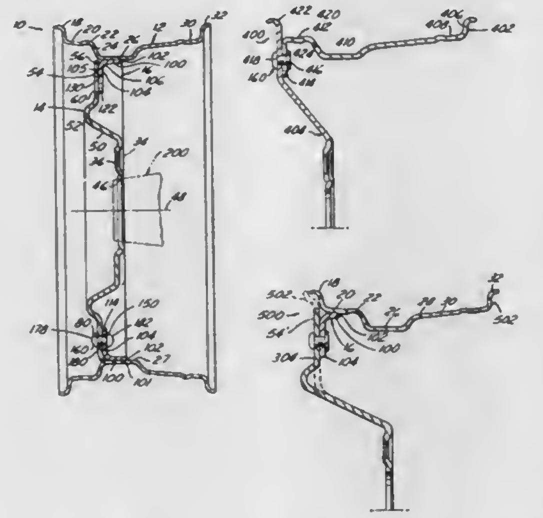


5,533,260
METHOD OF MANUFACTURING A VEHICLE WHEEL

Charles E. Kier, Jr., Lansing, Mich., assignor to Motor Wheel Corporation

Division of Ser. No. 31,272, Mar. 15, 1993, Pat. No. 5,380,071. This application Oct. 17, 1994, Ser. No. 324,335
Int. Cl.⁶ B23P *19/00*

U.S. Cl. 29—894.322 **13 Claims**



8. A method of constructing a multi-piece, non-take-apart vehicle wheel assembly of the type comprising a single piece drop-center-well rim having an inboard bead seat and an outboard bead seat for mounting of a pneumatic tire thereon, said rim having mounting flange means affixed thereto and extending radially inwardly of the rim, and a wheel mounting disc having a center pilot opening and a circle wheel mounting bolt holes encircling said center pilot opening for receiving wheel mounting fasteners for fixing said wheel to the wheel mounting structure of a vehicle, said disc having a generally radially extending annular rim mounting portion radially overlapping said rim mounting flange means in assembly therewith, said method comprising the steps of:

(1) finish forming said rim to final dimensions,

(2) finish forming said disc to final dimensions with said center pilot opening and bolt holes finished formed therein,

(3) fixturing said rim on an assembly apparatus to orient the average axis of the bead seats of said rim on a predetermined first axis of said apparatus,

(4) temporarily assembling said disc and rim by placing said disc loosely on said rim with said disc annular rim mounting portion overlapping radially said rim mounting flange means

(5) precision locating said disc relative to said rim by engaging a locating means of said apparatus in said disc bolt holes and/or center pilot opening to align the axis of the disc bolt holes and/or center pilot opening on a predetermined second axis of the apparatus by lateral bodily shifting of said disc relative to the rim to accomplish said alignment as necessary,

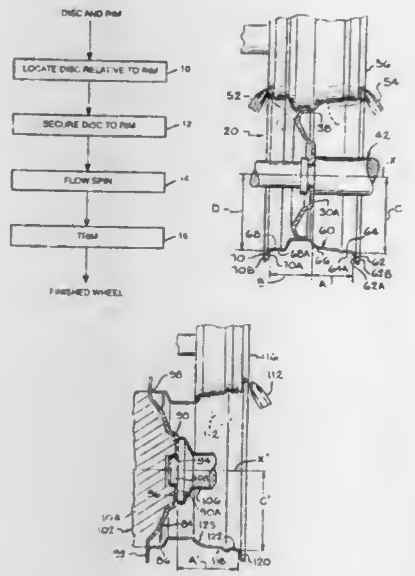
(6) and permanently assembling said disc and rim in permanent fixed relationship while located as established in Step (5) by permanently securing said disc and rim together in a non-take-apart mode whereby final permanent assembly of said disc and rim provides a final predetermined precision permanently fixed orientation of the axis of the center pilot opening of the disc and/or the axis of the circle of bolt holes of the disc relative to the average axis of the bead seats of the rim.

5,533,261
METHOD FOR PRODUCING A VEHICLE WHEEL

James H. Kemmerer, Sweet Springs, Mo., assignor to Hayes Wheels International, Inc., Romulus, Mich.

Filed Dec. 30, 1994, Ser. No. 368,167
Int. Cl.⁶ B23P *19/00*

U.S. Cl. 29—894.322 **6 Claims**



1. A method for forming a vehicle wheel comprising the steps of:

(a) providing a rim defining a rim axis and including at least an inboard portion and an outboard portion;

(b) providing a disc defining a disc axis and including at least an inner annular wheel mounting portion and an outer annular portion, the wheel mounting portion defining an inboard mounting surface and having a centrally located pilot hole formed therethrough;

(c) positioning the rim and disc together in generally coaxial relationship;

(d) simultaneously with step (c), joining the outer annular portion of the disc to the rim by welding to produce a partially-formed wheel assembly defining an axis;

(e) positioning a spinning tool of a flow spinning machine in contact with an inner surface of the partially-formed wheel assembly;

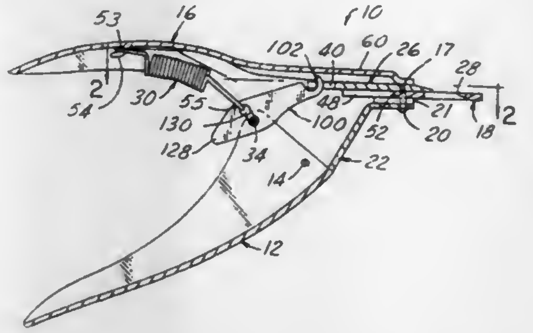
(f) operating the flow spinning machine whereby the spinning tool engages and forces the inner surface of the partially-formed wheel assembly against a back-up roller having a predetermined profile to form at least one of an inboard tire bead seat retaining flange and an outboard tire bead seat retaining flange of the wheel and to locate the at least one of the inboard tire bead seat retaining flange and the outboard tire bead seat retaining flange a predetermined lateral distance relative to the inboard mounting surface of the disc and in a parallel relationship therewith.

5,533,262
SINGLE CUT CLIPPER FOR NAILS

Richard N. Clark, 2455 E. West Maple Rd., P.O. Box 9027, Walled Lake, Mich. 48390-9027

Filed May 13, 1994, Ser. No. 242,465
Int. Cl.⁶ A45D *29/00*

U.S. Cl. 30—29 **17 Claims**



1. A cutting blade actuating link for releasably engaging push pull latch bar means disposed in the major plane of a thin flat planar cutting blade of a guillotine-type clipper, said link being adapted to be operably pivotally coupled to one of a pair of opposed clipper handles and to one end of a tension coil spring for operably driving via the push and pull latch bar means of the blade on a cutting stroke when the handles are squeezed together and for retracting the cutting blade when the handles are separated by the spring, said link comprising in its entirety a thin flat planar metallic body having an integral hook formation at one end adapted for insertion into the blade forward of the bar means, an integral finger tab extension formation at the end of said body opposite said hook end and aperture means formed through said body perpendicular to the major plane thereof and intermediate the opposite ends thereof adapted for receiving pivot connection means for the pivotal coupling of said link to one of said handles for bodily swinging movement in the major plane of said body and parallel to handle movement, said link hook formation comprising an inside peripheral edge concave surface on a radius of curvature in an incomplete circle disposed in the major plane of said body to thereby define a hook eye opening having a gap in an adjacent edge of said body defining a mouth entrance to said hook eye opening to thereby provide a hook inside forward end edge surface inclined generally at an acute angle relative to the longitudinal axis of said body, said hook eye opening being adapted for releasably sideways receiving via the hook mouth the bar means of the blade for blade actuating push-pull reciprocating operation therebetween, and wherein said hook has an outside peripheral forward end convex edge surface defined by a generally constant radius of curvature so as to cojointly form with said concave inside edge surface said hook formation at the end of said link with a slightly tapering thickness dimension in the major plane of said body progressively narrowing towards a free end of the hook at a rounded intersection of said inside and outside edge surfaces.

5,533,263
RAZORS

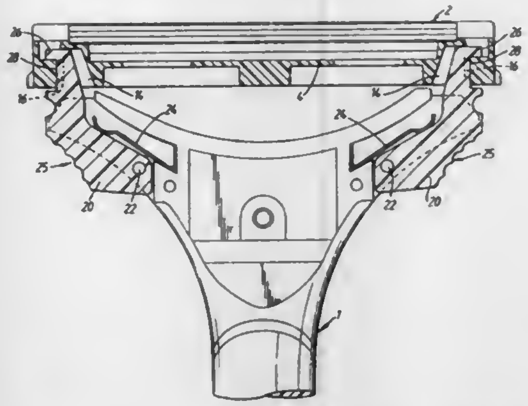
Bernard Gilder, Berkshire, United Kingdom, assignor to The Gillette Company, Boston, Mass.

Filed May 20, 1994, Ser. No. 244,039
Claims priority, application United Kingdom, Nov. 27, 1991, 9125261; Nov. 3, 1992, 9222984
Int. Cl.⁶ B26B *21/52*

U.S. Cl. 30—87 **6 Claims**

1. A safety razor comprising a blade unit having a top skin engaging surface,

a bottom surface spaced from and generally opposite to said top surface; and sidewalls connecting said top and bottom surfaces; and.



a handle supporting the blade unit for pivotal movement from a rest position, the handle being connected to the blade unit by a pair of opposed connecting pieces engaging the blade unit through the bottom thereof, at least one of said connecting pieces being urged resiliently into abutment with a cam face on the blade unit whereby to oppose displacement of the blade unit from the rest position and to apply a restoring force for returning the blade unit to the rest position, said handle having a pair of wings with tips forming the connecting pieces and biased apart by the wings; and

a socket extending into the bottom of said blade unit adjacent each of said sidewalls for receiving said connecting pieces,

wherein the wings (**20**) are hinged to the handle and acted upon by spring means (**24**) to urge the tips apart.

5,533,264

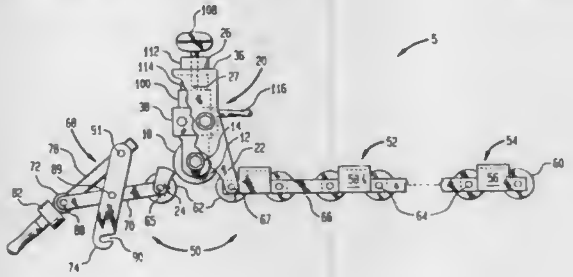
APPARATUS FOR STRIPPING CABLE

David Wheary, Somerset, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jul. 28, 1994, Ser. No. 281,969

Int. Cl.^{6} B26B *27/00*

U.S. Cl. 30—90.1 **18 Claims**



1. A cable stripper, comprising:

a cutting element;

a cutting element housing supporting said cutting element and permitting said cutting element to cut the surface of a cable;

a first hole disposed in said cutting element housing; a support block disposed within said cutting element housing;

a second hole disposed in said support block; and a third hole disposed in said support block which intersects with said second hole;

a cutting element guide having an opening of adjustable diameter for receiving a cable and which forms a loop around said cable; and

a cutting element adjustment assembly disposed within said support block, said cutting element adjustment assembly permitting variable adjustment of the depth and angle of said cutting element with respect to said cable while said cable stripper is installed on said cable and whereby a spiral cut can be made along the longitudinal axis of said cable permitting removal of the surface of said cable.

5,533,265

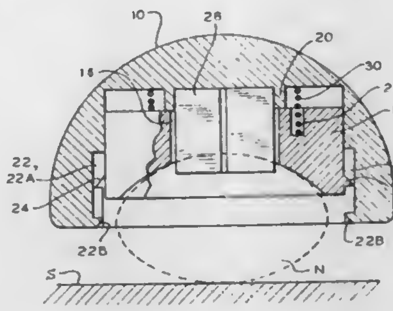
DEVICE FOR PIERCING A NUT

Shel L. Samuelson, 14 Lookout Dr., Ledgewood, N.J. 07852

Filed Jun. 9, 1995, Ser. No. 489,050

Int. Cl.^{6} A47J *43/26*

U.S. Cl. 30—120.2 **40 Claims**



1. A device for piercing a nut, comprising:

a cup-shaped member having a manually engageable, convex surface and a concave underside;

a cutter mounted on said concave underside of said member and pointing along a thrust direction; and

a retractable element mounted adjacent to said cutter to reciprocate along said thrust direction, said retractable element being operable to retract relative to said member to expose and give said cutter clearance for piercing said nut, said retractable element having an indented underside facing in said thrust direction for engaging and holding in place said nut.

5,533,266

HAIR CUTTING APPARATUS

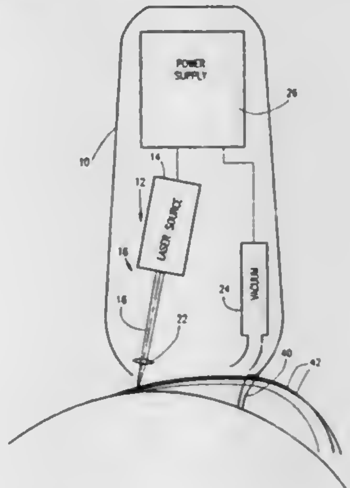
Elliot Kelman, 44 Western Avenue, London, United Kingdom

Continuation of Ser. No. 946,380, Jan. 8, 1993. This application Apr. 6, 1995, Ser. No. 417,884

Claims priority, application Israel, Mar. 12, 1991, 97531

Int. Cl.^{6} K61B *17/00*

U.S. Cl. 30—122 **13 Claims**



1. Hair cutting apparatus comprising:

a housing having an opening for hair, which is attached to the skin of a person, to be cut; and

a source of laser radiation producing a laser beam substantially parallel to the surface of the skin to which the hair is attached, the laser beam being arranged to impinge on the hair and to cut the hair at a point of impingement only, leaving a portion of the hair in a detached unburnt condition and a further portion of the hair in an attached unburnt condition at the surface of the skin.

5,533,267

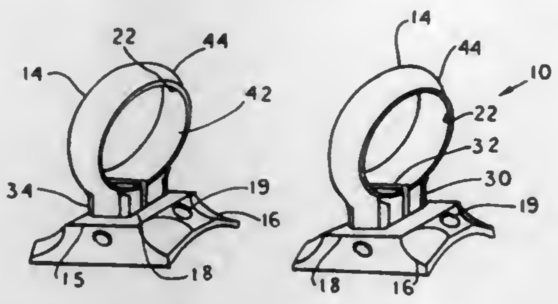
FLEXIBLE ONE-PIECE SCOPE RING

Sidney C. Haight, Jr., P.O. Box 247, Pittsfield, Pa. 16340

Filed Mar. 1, 1995, Ser. No. 396,767

Int. Cl.^{6} F41G *1/387*

U.S. Cl. 33—245 **3 Claims**



1. A scope mount for a gun comprises two clamping rings and two mounting blocks;

each of said mounting blocks having a top side and a bottom side;

a vertical bore extends through each of said mounting blocks from said top side to said bottom side;

a lateral threaded bore in each of said mounting block extending from side to side;

each said clamping rings comprises scope receiving ring members and studs are integrally attached to each said ring-member and extending radially therefrom;

a slot extending through said studs and through said ring member;

said ring members each being made of a material that is relatively flat on the inside having very thin edges;

said material of said ring member being about 0.045 inches thick at its center and tapering outward to said thin edges;

said ring member has a cross sectional shape flat on the inside and arcuate on the outside.

5,533,268

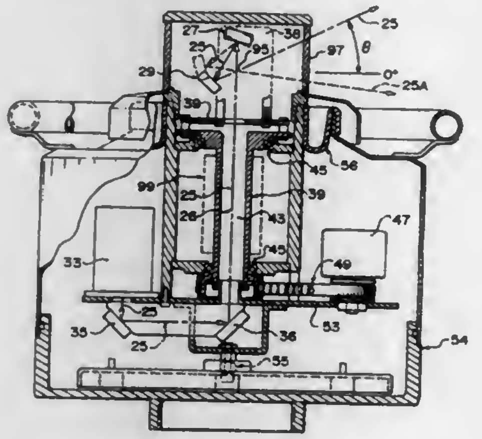
LASER DEFLECTION APPARATUS FOR LASER COMPASS

John Keightley, Langley, Canada, assignor to Miles D. Willetts, Surrey, England

Filed Aug. 8, 1994, Ser. No. 287,241

Int. Cl.^{6} G01C *5/00*

U.S. Cl. 33—290 **17 Claims**



1. A laser compass comprising:

a) a base;

b) a frame mounted to said base for rotation about an axis;

c) a motor mounted on said base and operatively associated with said frame for rotating said frame about said axis;

d) a laser mounted on said base for projecting a laser beam along said axis;

e) deflection means for redirecting said laser beam at an angle to said axis, said deflection means comprising:

  i. a first mirror on said axis pivotally mounted to said frame for deflecting said laser beam along a first line at a first angle to said axis;

  ii. a second mirror on said first line pivotally mounted to said frame for deflecting said laser beam along a second line at a second angle to said axis; and

f) mirror pivoting means for setting angles of said first and second mirrors relative to said axis, said mirror pivoting means comprising:

  i. a cam surface coupled to said second mirror for pivoting with said second mirror;

  ii. a first arm coupled to said first mirror for pivoting with said first mirror; and

  iii. bias means for biasing a cam-contacting surface on said first arm against said cam surface.

5,533,269

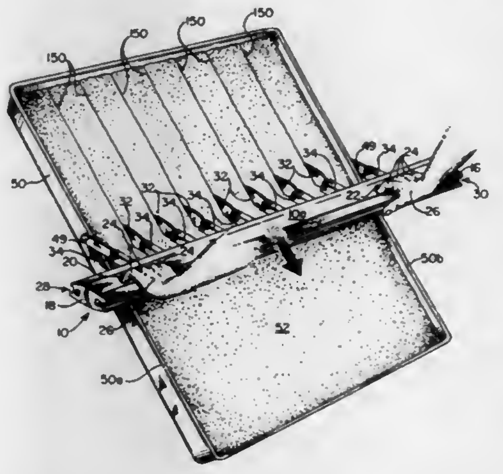
FOOD CUTTER

Bruce M. Pickens, and Julie D. Pickens, both of 404 Glenmeade Ct., Gretna, La. 70053

Filed Jan. 11, 1995, Ser. No. 371,424

Int. Cl.^{6} B26B *5/00*

U.S. Cl. 30—304 **20 Claims**



1. In a food cutting apparatus for cutting food contained in a rectangular pan, the food cutting apparatus having a plurality of food cutting blades connected to a holder for said blades, the improvement comprising:

a. an elongated, generally flat rectangular blade holder for holding said plurality of food cutting blades, said blade holder having

  i. two elongated parallel edges connected by two parallel ends aligned perpendicular to said two parallel edges, said two parallel ends being shorter in length than said two elongated parallel edges,

  ii. two openings therein for receipt of the fingers of the two hands of the user,

  iii. blade holding means in at least one of said two elongated edges for receiving and holding each of said plurality of food cutting blades, and

  iiii. indicia adjacent to at least one of the edges for positioning said cutting blades at a selected location,

b. a plurality of food cutting blades connectable to said blade holder, said food cutting blades having attachment means connected thereto for selective receipt in said blade holding means, and

c. two guide means connected to said blade holder for slidably contacting each of said two parallel edges of said pan.

5,533,270
METHOD AND APPARATUS FOR MEASURING STAIRS

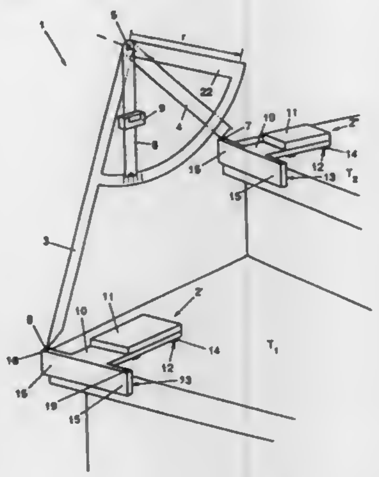
A. Th. van der Helden, Rotterdam, Netherlands, assignor to Thyssen de Reus B.V., Krimpen aan den Ijssel, Netherlands

Filed Nov. 2, 1994, Ser. No. 333,209

Claims priority, application Netherlands, Nov. 2, 1993, 9301887

Int. Cl.^{6} B43L *7/00*

U.S. Cl. 33—403 **22 Claims**



1. A method for measuring at least one step of a stair, wherein a riser and a tread of each separate stair step are determined, comprising the steps of:
providing at least two stair steps of the stair in a corresponding manner with a reference point;
placing two pins in two reference points, said two pins crossing in a junction such that of each pin a length between the reference point and the junction is known; and
measuring and recording an angle defined by the pins in a plane, each of the pins including a reference line, said reference line including a known angle, lying in the plane, with the vertical.

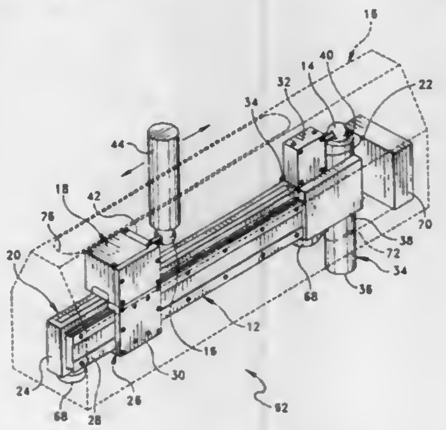
5,533,271
LONG RANGE SLIDING BALL BAR TEST GAGE

Robert P. Callaghan, Jr., 98 Beach St., Westerly, R.I. 02891

Filed Aug. 23, 1994, Ser. No. 294,564

Int. Cl.^{6} G01B *5/14;* **G01M** *19/00*

U.S. Cl. 33—502 **16 Claims**



1. A long-range linear test gage for testing the accuracy of a machine tool comprising:
a first reference element defining a first locus;
means for securing said first reference element so that said first locus is maintained in a fixed position with respect to said machine tools;
a second reference element defining a second locus;
means for securing said second reference element to an active element of said machine tool, said active element being operable for movement of said second locus along a predetermined trajectory;
a linear guide assembly comprising first and second guide portions which are slidably movable with respect to each other, said first reference element being secured to said first guide portion and said second reference element being secured to said second guide portion, said linear guide assembly permitting co-linear movement of said second locus with respect to said first locus over a distance of greater than one inch;
means for measuring a linear displacement between said first and second locus;
means for preventing rotation of said linear guide assembly;
said first reference element comprising a spberical ball attached to one end of said first guide portion, said means for securing said first reference element comprising a magnetic knuckle assembly having an upright body portion, said means for preventing rotation of said linear guide assembly comprising means for engaging said upright body portion of said magnetic knuckle assembly,
said means for engaging said body portion of said magnetic knuckle assembly comprising a pair of spaced parallel arms which engage opposite side surfaces of said body portion.

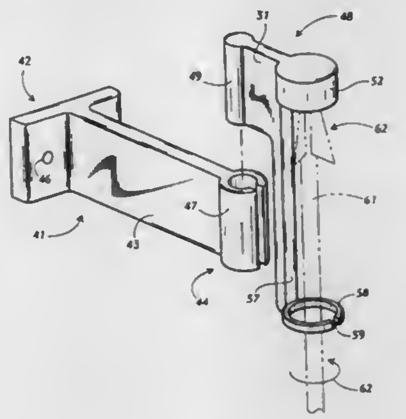
5,533,272
METHOD AND DEVICE FOR DETERMINING THE STRAIGHTNESS AND BALANCE OF AN ARROW

Johnny Bagwell, 380 Richardson Rd., Calhoun, Ga. 30701

Continuation-in-part of Ser. No. 103,590, Aug. 9, 1993, Pat. No. 5,435,071. This application Jan. 20, 1995, Ser. No. 375,719

Int. Cl.^{6} G01M *1/16*

U.S. Cl. 33—506 **22 Claims**



1. A method of determining the straightness and balance of an archery arrow having a longitudinal axis and a ferrous tip, said method comprising the steps of:
(a) providing a magnet positioned in a location that is elevated a distance at least equal to the length of an archery arrow for which straightness and balance is to be determined;
(b) providing a ring fixed below the magnet and positioned such that the shaft of an arrow suspended by its tip from the magnet passes through the ring;
(c) suspending the archery arrow by its ferrous tip from the elevated magnet;
(d) spinning the archery arrow about its longitudinal axis while the arrow is suspended from the elevated magnet; and
(e) observing the suspended spinning arrow relative to said fixed ring to detect lateral perturbations in the arrow's movement that are indicative of a warped or imbalanced arrow, whereby the straightness and balance of the arrow are determined quickly and accurately and the arrow can be discarded or repaired if imbalance or warp are indicated.

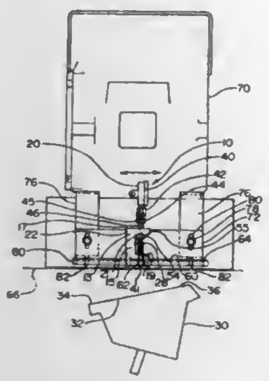
5,533,273
ANGLE MILLING INDICATOR

Gerald P. Lawson; Thomas A. Ryan, both of Winona, and Gary R. Puetz, Utica, all of Minn., assignors to DCM Tech, Inc., Winona, Minn.

Filed Jul. 5, 1994, Ser. No. 270,955

Int. Cl.^{6} B23Q *17/22*

U.S. Cl. 33—534 **16 Claims**



1. An apparatus for aligning a workpiece with a stationary cutting plane of a machine tool, the apparatus being mounted to the machine tool and further comprising:
a) a planar grooved slide plate having a groove, the slide plate being mounted to the machine tool such that the slide plate is parallel to the cutting plane;
b) mounting means for adjustably mounting the slide plate to the machine tool, said mounting means comprising a pair of mounting brackets;
c) a movable base connected to the machine tool by the slide plate; and
d) a spring-loaded dial indicator having an indicator rod extending therefrom and terminating in an indicator tip, and an indicating means in communication with said indicator rod, said dial indicator being mounted in the movable base and perpendicular to the cutting plane, said spring-loaded dial indicator being depressable to contact the workpiece positioned therebeneath; whereby the movable base may be moved back and forth in the groove of the slide plate across the workpiece from a front end of the workpiece to a rear end of the workpiece and a reading of the dial indicator may be taken at each end of the workpiece in response to movement of the indicator rod, to align the workpiece to the stationary cutting plane of the machine tool by reference to the dial indicator.

5,533,274
GAUGE TO MEASURE PROPER POSITIONING OF STARTER MOTORS ON ENGINES

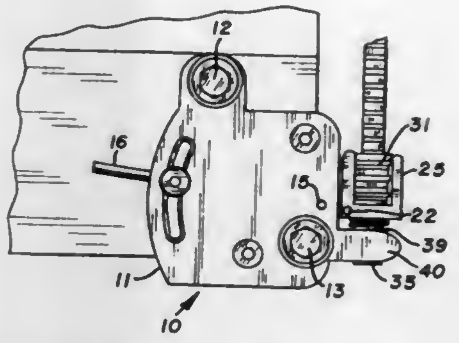
John Westling, 705 Highway 18, Princeton, Minn. 55371

Filed May 11, 1995, Ser. No. 439,292

Int. Cl.^{6} G01D *21/00*

U.S. Cl. 33—600 **4 Claims**

1. Gauge means for releasable attachment to internal combustion engines at the starter motor mounting point for determining proper positioning of starter motor housings relative to the engine flywheel on individual internal combustion engines, said gauge comprising:
(a) housing means with a base surface portion having a configuration defining a gauge mounting pad, means for attachment of said housing means to an internal combustion engine block at the mounting point for the engine starter motor housing;
(b) a pivot pin mounted within said housing means, an elongated lever arm having a bore formed therein for pivotal rotation about the axis of said pivot pin between the ends thereof to receive said pin to provide for pivotal movement of said lever



arm within said housing means, and with first and second individual segments of said elongated lever arm extending in opposed directions from said pivot pin receiving bore;
(c) a mounting yoke operatively coupled to said housing means and having a shaft mounted therein for receiving a reference pinion for rotation thereon;
(d) said mounting yoke being operatively coupled to the first individual segment of said elongated lever arm adjacent the end of said first arm segment;
(e) reference scale means securably positioned onto said housing means adjacent the end of said second individual segment of said elongated lever arm, said reference scale means being adapted to indicate the position of said yoke when said housing means is attached to an individual internal combustion engine and said yoke-mounted reference pinion is in proper driving engagement with the flywheel of the engine upon which said gauge means is mounted.

5,533,275
METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF CARGO WITHIN A CONTAINER

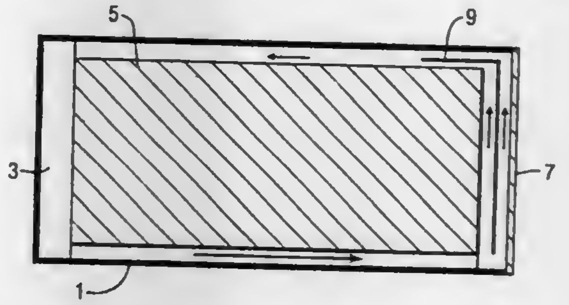
Arthur R. Lawton, Cambridge, United Kingdom, assignor to Synectic Technology, Inc., Littleton, Colo.

Filed Oct. 12, 1994, Ser. No. 322,105

Claims priority, application United Kingdom, Oct. 13, 1993, 9321090

Int. Cl.^{6} F26B *7/00;* **B60H** *1/32*

U.S. Cl. 34—433 **9 Claims**

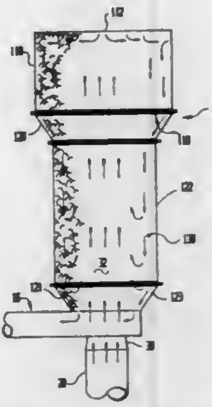


1. A method of controlling the temperatures of cargo in a container, wherein cooling air is circulated over the cargo, comprising the steps of directing cooling air beneath the cargo, then directing at least a portion of the cooling air between the cargo and a rear door or doors of the container, and then directing the portion of cooling air towards the front of the container over the top of the cargo, wherein the step of directing the portion of cooling air between the cargo and the rear door or doors at the rear of the container comprises separating the portion of cooling air into two streams by a removable air separator board having a first limb which is located over the top of the cargo, and a second limb extending approximately at right angles to the first limb and extending over substantially all of the area of the rear door or doors so that an internal stream flows between the cargo and the separator board and is separated from an external stream which flows

between the separator board and the rear door or doors which is subjected to warming from ambient air around the container.

5,533,276
FOUNTAIN DRYER UNIT

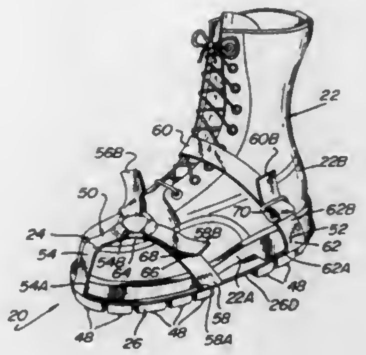
Arvel L. Vandergriff, Visalia, Calif., assignor to Vandesgriff, Inc., Visalia, Calif.
Filed Jul. 18, 1994, Ser. No. 276,348
Int. Cl.⁶ F26B *17/00*
U.S. Cl. 34—583 **10 Claims**

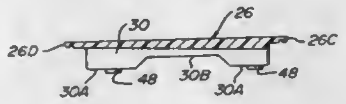


6. Structure for conditioning seed cotton including
- a) a source of a mixture of conditioning air and seed cotton, and
- b) a duct connecting said source to
- c) a vessel having a center, and
- d) walls;
- e) wherein the improvement comprises in combination with the above:
- f) said vessel being closed and having
  - i a closed top,
  - ii a bottom, and
  - iii an annular plenum around
  - iv an inlet in the bottom at the center of the vessel,
- g) a nozzle connecting the duct to the inlet, and
- h) an outlet duct connected to the plenum, so that there is an airflow from the nozzle in an upward direction to the closed top and then in a downward direction along the walls to the plenum.

5,533,277
FOOTWEAR WITH ADHERENT MATERIAL RELEASE GROOVES

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18969, and Jonathan M. Bell, 1500 Locust St. Apt. 3313, Philadelphia, Pa. 19102, assignors to Michael Bell, Warrington, Pa.
Filed Aug. 26, 1994, Ser. No. 296,829
Int. Cl.⁶ A43C *15/06*
U.S. Cl. 36—7.6 **23 Claims**

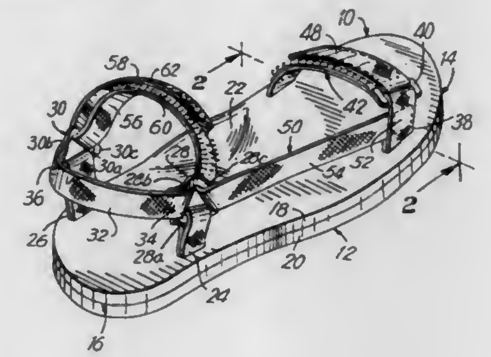




15. Footwear having a sole having a longitudinal axis, a medial side, a lateral side, a bottom side, a forefoot portion and a toe portion, said bottom side of said sole comprising a first group of cleats located in both of said toe portion and said forefoot portion, each of said cleats of said first group comprising an elongated member having a longitudinal axis, a substantially linear forward edge and a substantially linear rear edge extending generally parallel to said longitudinal axis of said cleat, said longitudinal axis of each of said cleats extending generally at an acute angle to said longitudinal axis of said sole, said cleats defining therebetween plural grooves, with said rear edge of one cleat and the forward edge of the immediately adjacent cleat forming respective ones of said grooves, each of said grooves having a medial side end and a lateral side end and being continuous in shape and flaring in size from said medial side of said sole to said lateral side of said sole, whereupon the size of said lateral end of each of said grooves is greater than the size of the medial end thereof, and wherein each of said grooves flares in depth from said medial side to said lateral side, whereupon the depth of said medial side of each of said grooves is less than the depth of said lateral side of each of said grooves.

5,533,278
SANDAL HAVING ADJUSTABLE STRAPS

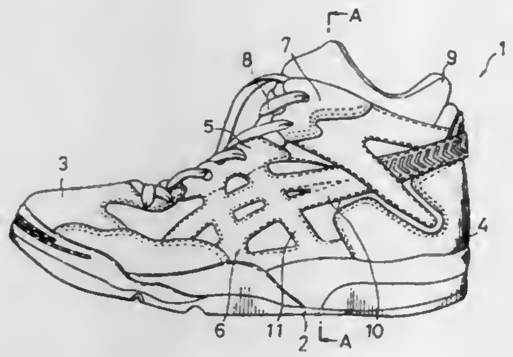
Michael Stein, Yardley, Pa., assignor to E. S. Originals, Inc., New York, N.Y.
Continuation of Ser. No. 168,426, Dec. 16, 1993, Pat. No. 5,438,767. This application May 3, 1995, Ser. No. 434,045
Int. Cl.⁶ A43B *3/12*
U.S. Cl. 36.00—11.500 **8 Claims**



1. A sandal, comprising:
- a sole extending along a longitudinal direction between a toe end region and a heel end region;
- a pair of heel posts spaced apart of each other along a transverse direction generally perpendicular to the longitudinal direction, each heel post having one end attached to the sole at the heel end region, and an opposite end attached to a heel cinch;
- a heel strap extending generally along the transverse direction at the heel end region between heel strap ends respectively attached to a respective heel cinch;
- a toe cinch attached to the sole at the toe end region;
- an adjustable toe strap having one toe strap end attached to the sole at the toe end region away from the toe cinch, and extending generally along the transverse direction through the toe cinch, and having an opposite toe strap end looped back against the toe strap; and
- an adjustable cinch strap constituting a single, unitary band having a length longer than the length of the sole along the longitudinal direction, said band having a longitudinal portion and a transverse instep portion, said longitudinal portion having one cinch strap end attached to the toe strap, said longitudinal portion extending generally along the longitudinal direction through the heel cinch on one of the heel posts, said transverse instep portion having a first section extending generally along the transverse direction through the heel cinch on the other of the heel posts, said transverse instep portion being folded to form a second section extending generally along the transverse direction and overlapping the first section to a variable extent along the transverse direction, said transverse instep portion forming a loop with the heel strap, said second section having an opposite cinch strap end movable relative to said one cinch strap end for simultaneously only adjusting the effective length of the longitudinal portion and the extent of the overlap of the first and second sections.

5,533,279
SHOE HAVING A SKELTON-SHAPED OUTER CARAPACE

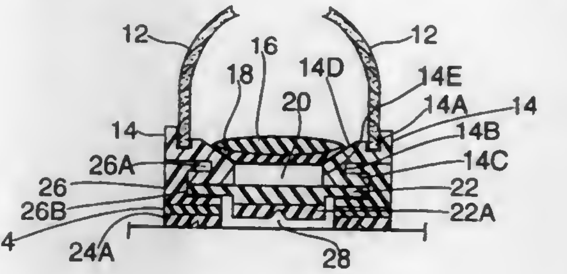
Shigeyuki Mitsui, Niigata, and Yoshiaki Hase, Kobe, both of, Japan, assignors to Asics Corporation, Japan
Continuation of Ser. No. 184,112, Jan. 21, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 465,743
Claims priority, application Japan, Jan. 29, 1993, 5-013881
Int. Cl.⁶ A43B *23/00;* **A43C** *11/00*
U.S. Cl. 36—50.1 **19 Claims**



1. A shoe having a skeleton-shaped outer carapace comprising:
- a sole;
- a hard and skeleton-shaped outer carapace portion fixed onto said sole for holding and protecting a foot, said outer carapace portion unitedly having a toe reinforcement portion, a heel reinforcement portion, an eyelet portion, a longitudinal reinforcement portion connecting said sole with said eyelet portion, and a lateral reinforcement portion connecting said sole with said heel reinforcement portion, said longitudinal reinforcement portion completely crossing said lateral reinforcement portion in such a manner that a cross-point thereof lies at a substantial center along a side portion of said shoe between opposite ends thereof thereby to form a skeleton in association with said toe reinforcement portion, said heel reinforcement portion and said eyelet portion, said skeleton defining at least four holes around said cross-point; and
- a soft inner carapace portion for directly contacting a foot, said inner carapace portion being contained in said outer carapace portion and fixed on said sole in at least one portion of a lower edge thereof, and said inner carapace portion being separated from said outer carapace portion at all portions of said inner carapace above said sole in such a manner that said inner carapace portion moves independently of said outer carapace portion.

5,533,280
FOOTWEAR WITH INTERCHANGEABLE COMPONENTS

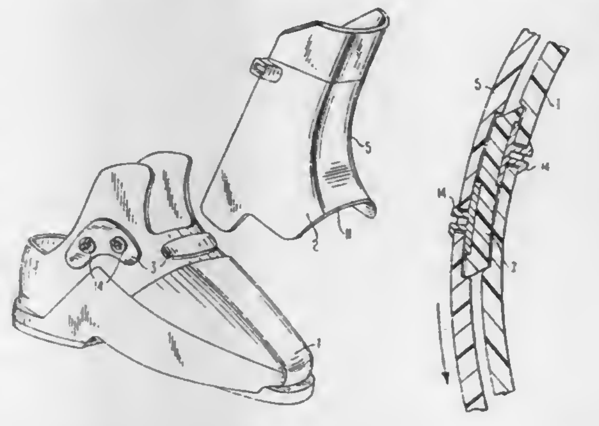
David Halliday, 469 Myrtle Ave., Brooklyn, N.Y. 11205
Filed Feb. 10, 1995, Ser. No. 386,938
Int. Cl.⁶ A43B *3/24*
U.S. Cl. 36—101.000 **10 Claims**



1. A footwear with interchangeable components, comprising:
- a) a base footing supporter:
- b) an interchangeable middle sole being removably mounted to the base footing supporter so that the interchangeable middle sole can be readily changed by user according to user preference;
- c) an interchangeable insole being removably mounted to the interchangeable middle sole so that the interchangeable insole can be readily changed by user according to user preference;
- d) an interchangeable base interlocker being removably mounted to the base footing supporter so that the interchangeable base interlocker can be readily changed by user accordingly to user preference;
- e) an interchangeable ridge connector being removably mounted to the interchangeable insole so that the interchangeable ridge connector can be readily changed by user according to user preference: and
- f) an interchangeable upper member being removably mounted to the interchangeable base interlocker so that the interchangeable upper member can be readily changed by user according to user preference.

5,533,281
ELASTOMERIC CONNECTING MEANS FOR FOOTWEAR

Roger J. Brown; Erik O. Giese, both of Aspen, and Michael D. Racosky, Boulder, all of Colo., assignors to Comfort Products, Ltd., Aspen, Colo.
Filed Jul. 5, 1994, Ser. No. 270,853
Int. Cl.⁶ A43B *5/04;5/16*
U.S. Cl. 36—118.2 **22 Claims**



1. The improvement in a boot having a first shoe shaped shell member with a heel, middle and front portion for receiving and

supporting an individual's foot along at least the bottom, sides and top front portions of the foot, a second member having a section overlapping the shell member with a surface of said second member facing a surface of said shell member, said second member extending upwardly from the shell member for covering a portion of the individual's leg and being pivotally connected to the shell member for pivoting movement thereon in response to pivoting of the individual's leg relative to the individual's foot; and attaching means for pivotally attaching the second member to the shell member; the improvement wherein said attaching means includes:

a) an elastomeric material disposed between said shell member and the overlapping section of said second member, said elastomeric material having opposite sides, with a first side facing said surface of said shell member and a second side facing said surface of said second member; and

b) connecting means for connecting said first side of said elastomeric material to said shell and said second side to said second member for movement of said first and second sides of the elastomeric material relative to each other in a direction extending along said surfaces of said shell member and said second member.

5,533,282
HARD PLATE OF EACH OF SPIKE SHOES FOR FIELD AND TRACK EVENTS

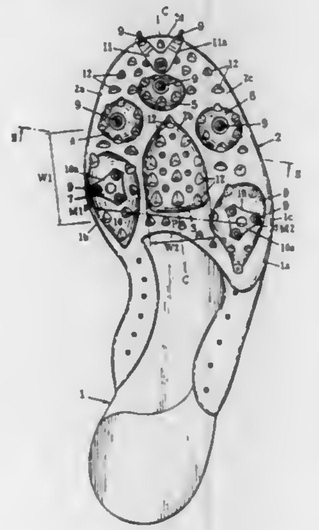
Akira Kataoka, Kobe; Hitoshi Mimura, Kakogawa; Manabu Kuramoto, and Ryuichi Tukita, both of Kobe, all of, Japan, assignors to ASICS Corporation, Hyogen-ken, Japan

Filed Feb. 13, 1995, Ser. No. 388,263

Claims priority, application Japan, Feb. 17, 1994, 6-059773

Int. Cl.⁶ A43B *5/00;5/06*

U.S. Cl. 36—129 **16 Claims**



1. A shoe part for a field and track shoe having a shoe sole comprising:

a hard plate for a forefoot portion of the shoe sole, said plate including a plurality of spikes and a plurality of shorter projections terminating short of said spikes on a surface side of said hard plate;

said hard plate including an elastic region projecting from adjacent surrounding surfaces of said hard plate and lying in a central region of said surface side of said hard plate so that said elastic region lands on a road surface, prior to said adjacent surrounding surfaces, on landing of said forefoot portion thereby to provide a repulsion force from the road surface.

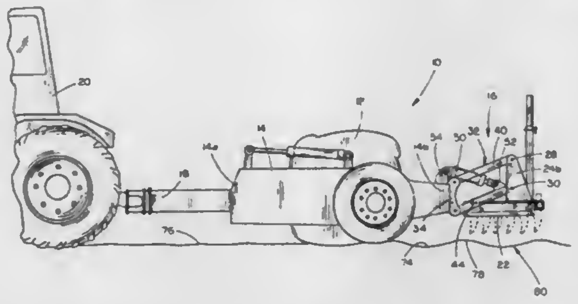
5,533,283
COMPACTION ROLLER ASSEMBLY AND GRADER

Scott R. Roth, 848 Hidden Hills Dr., Bellevue, Nebr. 668005

Filed Oct. 21, 1994, Ser. No. 327,390

Int. Cl.⁶ E01C *19/26*

U.S. Cl. 37—142.5 **17 Claims**



1. A compaction roller assembly, comprising:

a lobed, non-circular impact roller operably mounted on a draw frame to produce a compacted, corrugated ground surface;

a grader operably mounted and cantilevered from a rearward end of the draw frame, for leveling the corrugated ground surface produced by the impact roller;

said grader operably mounted between an engaged position in engagement with the ground, and a storage position above the ground;

a parallelogram linkage pivotally interconnecting the grader with the draw frame; and

means connected between the draw frame and grader for selectively pivoting the grader on the linkage between the engaged and storage position;

said grader including a pair of elongated blades mounted on a pair of frame members, said frame members diverging rearwardly from a forward apex;

each blade being mounted on one frame member and extending the length thereof such that said blades diverge from on another as they extend rearwardly from the frame apex;

each blade having a lower edge depending below the frame member to which the blade is attached; and

said blade lower edges lying in a generally horizontal plane.

5,533,284
EARTH-MOVING MACHINE WITH REVOLVING TOWER AND ADJUSTABLE COUNTERWEIGHT

Uwe Esch, Dortmund, Germany, assignor to O&K Orenstein & Koppel AG, Berlin, Germany

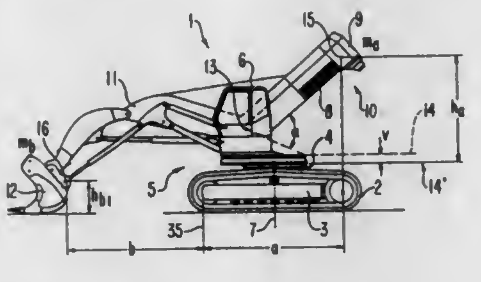
PCT No. PCT/EP93/02691, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO94/08101, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 1, 1993, Ser. No. 331,508

Claims priority, application Germany, Oct. 7, 1992, 42 33 730.5

Int. Cl.⁶ B66C *23/72*

U.S. Cl. 37—348 **20 Claims**



1. An earth-moving machine, comprising:

a bogie;

a superstructure supported on said bogie, and being divided into a stationary part, and a pivotable part pivotable about a horizontal axis relative to said stationary part;

a working attachment connected to said pivotable part; and

a counterweight attached to said pivotable part.

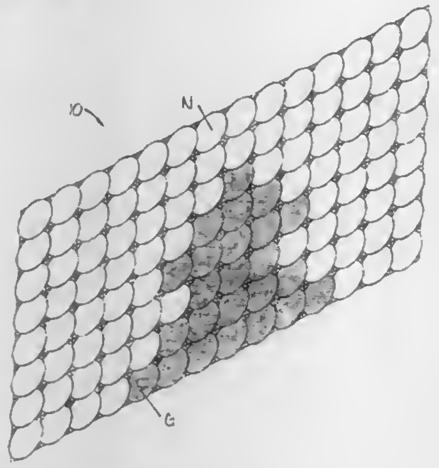
5,533,285
METHOD AND APPARATUS FOR BALLOON DISPLAYS

James A. Skistimas, Highland Village, Tex., and Christian M. Hoebener, Wichita, Kans., assignors to Continental American Corporation, Wichita, Kans.

Continuation-in-part of Ser. No. 190,444, Feb. 1, 1994. This application Aug. 12, 1994, Ser. No. 289,669

Int. Cl.⁶ G09F *7/00*

U.S. Cl. 40—584 **18 Claims**



1. A balloon display apparatus in combination with balloons, comprising:

a. a grid array comprised of at least one set of grid members, said set of grid members having a front side and a back side;

b. said grid members each shaped to form a compartment having depth for receipt of at least one inflated balloon, said balloon being deformably squeezed into said compartment;

c. said compartments having an interior side and an exterior side, said inflated balloon being maintained deformed and squeezed in said compartment by the pneumatic pressure within said inflated balloon exerted against said interior side of said compartment to create a balloon display; and

d. adjacent grid members meeting at an intersection.

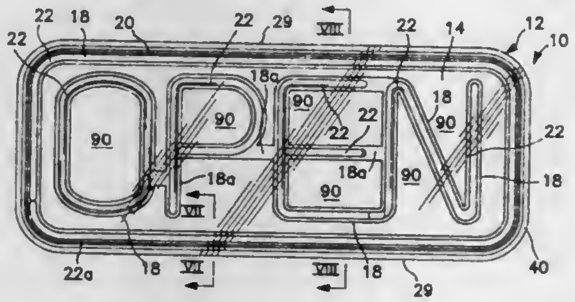
5,533,286
LUMINOUS ELECTRIC SIGN

Timothy R. Fallon, 15 Avain Trail, Columbia, S.C. 29206, and Walter K. Tanner, Jr., 604 Montgomery Dr., Chesnee, S.C. 29323

Filed Jun. 17, 1994, Ser. No. 262,007

Int. Cl.⁶ G09F *13/26*

U.S. Cl. 40—545 **4 Claims**



1. An electric luminous display unit for conveying visual information comprising:

a housing having a unitary opaque front portion of substantially rigid molded plastic, said housing having a substantially planar face portion, said substantially planar face portion having an elongated groove therein forming an outline for at least two characters and at least one transition area between said at least two characters, said groove recessed from said planar face portion;

one continuous inert gas-containing glass tubing located in said groove and extending therethrough, said glass tubing having the outline of said at least two characters and having at least one transition between said at least two characters, said glass tubing transition further including opaque portions that are non-planar with said glass tubing outline of said at least two characters;

fasteners retaining said tubing in said groove;

electrical circuitry located behind said planar face portion for supplying electrical energy to illuminate said tubing;

wherein said housing of the unit includes a rear portion of substantially rigid molded plastic forming with said front face portion a compartment to enclose said nonplanar opaque portions of the glass tubing therein, and said compartment further contains electrodes attached to ends of said glass tubing, an electrical transformer, and wiring connecting the electrical transformer to said electrodes;

whereby light from the tubing in the groove is directed forwardly of said planar face portion for viewing by the human eye.

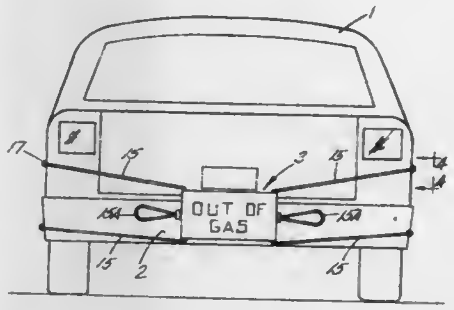
5,533,287
SIGN FOR STRANDED VEHICLES

Edwin L. Cole, P.O. Box 2135, Jasper, Oreg. 97438

Filed Feb. 6, 1995, Ser. No. 383,941

Int. Cl.⁶ G09F *21/04*

U.S. Cl. 40—591 **5 Claims**



1. A sign for temporary attachment to a vehicle, said sign comprising,

a framework including horizontal and vertical pairs of frame members, said pair of vertical frame members being of tubular construction,

elastic cords one each extending in an axial manner through each of said vertical frame members with each cord having a looped portion external of its respective vertical frame member, retainers in place on the cord ends,

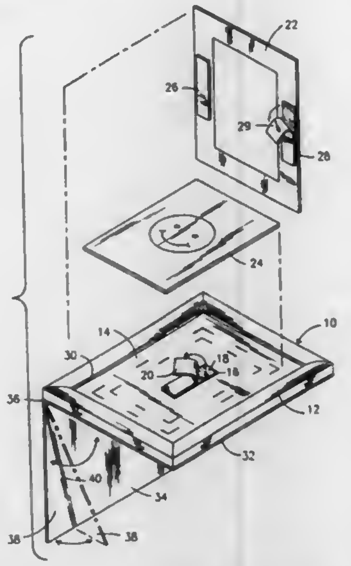
sheets carried by said framework each bearing printed words,

said elastic cords each extensible through said the pair of vertical frame members for attachment of the retainers to the vehicle,

locks each on a cord looped portion and limiting cord passage through each of said vertical frame members to permit adjustment of cord lengths for cord attachment in a snug manner to the vehicle.

5,533,288
QUICK MOUNT PICTURE FRAME

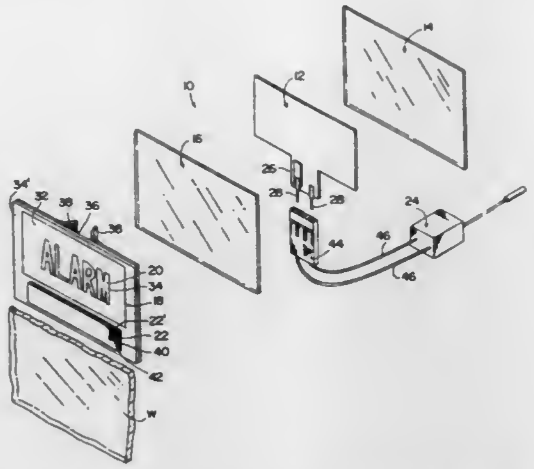
Gary F. Lambert, 834 Lincoln Blvd., Santa Monica, No. 3, Santa Monica, Calif. 90403
Filed Mar. 13, 1995, Ser. No. 402,932
Int. Cl.^{6} G09F *1/12*
U.S. Cl. 40—754 **9 Claims**



1. A quick mounting picture frame comprising.
- a block of foam having a planar upper surface for receiving a picture and a lower planar surface attached to a flat cardboard backing,
- a double sided adhesive tape attached on one side to the upper surface of the block of foam, and for attaching a second side to a back surface of the picture,
- a matte board having an inner opening dimension sufficient to display the picture and a pair of oppositely positioned double sided adhesive tape strips adhered to a lower surface of the matte board on a first side and to the planar upper surface of the block of foam on a second side,
- a decorative frame attached to and enclosing an outer edge of the block of foam,
- a recess along an inner edge of the decorative frame having a depth sufficient to receive a periphery of the matte board, and
- a means to support the picture frame incorporated within the flat cardboard backing.

5,533,289
ILLUMINATED SIGN

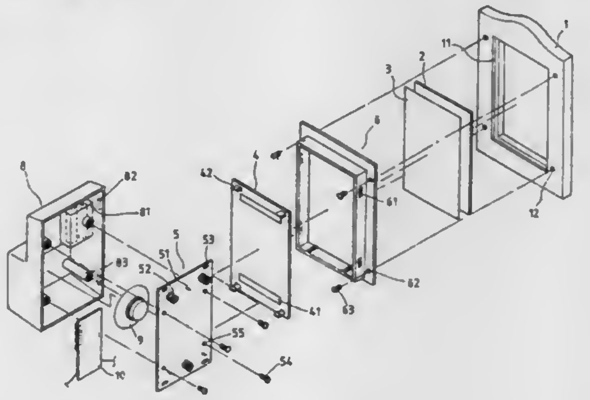
Peter Hoffman, West Palm Beach, Fla., assignor to I.D. Lite, Inc., West Palm Beach, Fla.
Continuation-in-part of Ser. No. 996,425, Dec. 23, 1992, Pat. No. 5,367,806, which is a division of Ser. No. 868,931, Apr. 16, 1992, Pat. No. 5,339,550. This application Apr. 4, 1994, Ser. No. 223,408
Int. Cl.^{6} G09F *13/22*
U.S. Cl. 40—544 **6 Claims**



1. An illuminate sign for being mounted to a support surface comprising
- a substantially planar back panel;
- a substantially planar electroluminescent lamp disposed over said back panel;
- a substantially planar, transparent disposed over said lamp in alignment with said back panel;
- indicia defined by illuminated sections of said lamp visible through said front panel, said back panel, said lamp, said front panel and said indicia together forming a sign assembly having a peripheral edge;
- an electrical conductor connected with said lamp and protruding beyond said peripheral edge;
- a power supply for supplying power to illuminate said lamp and including a housing for mounting said conductor to electrically couple said lamp to a source of power, said housing being flush and in abutment with said peripheral edge;
- a fixation surface on said having adhesive properties for securing said sign to a support surface.

5,533,290
PICTURE FRAME WITH SOUND PRODUCING MEANS

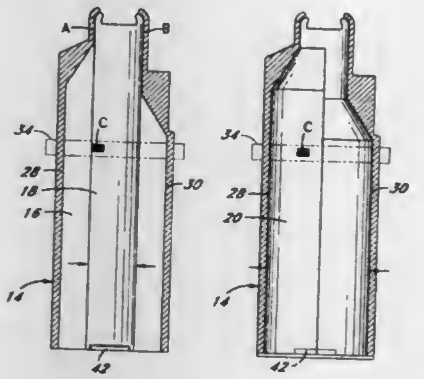
Tong Y. Lee, and Jack Kao, both of 8F-6, No.100, Sec.2, Hoping E. Rd., Taipei, Taiwan
Filed Nov. 29, 1993, Ser. No. 158,440
Int. Cl.^{6} G09F *1/12*
U.S. Cl. 40—717 **3 Claims**



3. A picture frame comprising:
- a frame body having an opening;
- a glass mounted within said opening;
- an open mounting frame fastened to said frame body to hold said glass within the frame body;
- a back cover fastened to said open mounting frame to hold a picture on said glass;
- a mounting plate attached to said back cover and retained between said back cover and said open mounting frame, said mounting plate comprising two opposite metal contacts and a plurality of spring elements projecting from a back side thereof;
- a back board attached to said open mounting frame and retained between said mounting plate and said open mounting frame and engaging said spring elements, said back board comprising conductive means;
- a sound producing circuit assembly comprised of a battery power supply and a speaker and fastened inside said back cover, said sound producing circuit assembly having two opposite terminals respectively connected to said two opposite metal contacts of said mounting plate; and
- wherein when said glass is pressed toward said back board, said back board is forced to compress said elements causing said conductive means to contact said metal contacts, and therefore said sound producing circuit assembly is triggered to produce sound.

5,533,291
FIREARM CAPABLE OF OPERATION WITH DIFFERENT CAPACITY MAGAZINES

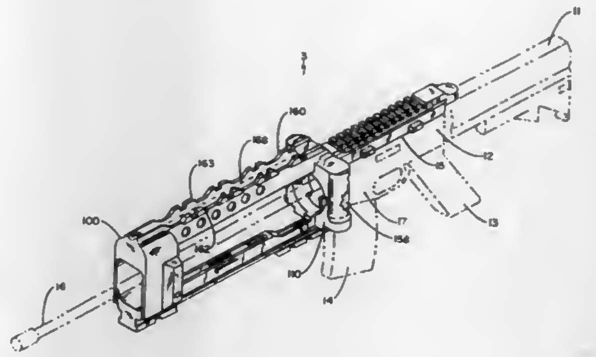
James W. Boland, Vista, Calif., assignor to Mitchell Arms Corp., Santa Ana, Calif.
Filed Jan. 9, 1995, Ser. No. 370,199
Int. Cl.^{6} F41A *9/68*
U.S. Cl. 42—7 **17 Claims**



1. A pistol which operates with either a narrow body magazine or with a wide body magazine, the pistol comprising:
- (a) a frame with an internal cavity, the internal cavity having two side walls, each side wall of the internal cavity having, proceeding from a bottom to a top of the internal cavity;
  - (i) a first straight side wall portion, the first straight side wall portion of each of the two side walls of the internal cavity being of unequal length, the first straight side wall portion being followed by,
  - (ii) a bevelled side wall portion, followed by,
  - (iii) a second straight side wall portion, and
- (b) a downardly projecting grip integral with the frame, and;
- (c) a slide mounted on the frame, whereby the pistol operates with either a narrow body magazine or a wide body magazine.

5,533,292
SELF-ALIGNING FLIP-UP SIGHT

Richard E. Swan, 171 W. St., East Bridgewater, Mass. 02333
Filed Mar. 18, 1994, Ser. No. 214,448
Int. Cl.^{6} F41G *1/08:1/14*
U.S. Cl. 42—100 **18 Claims**

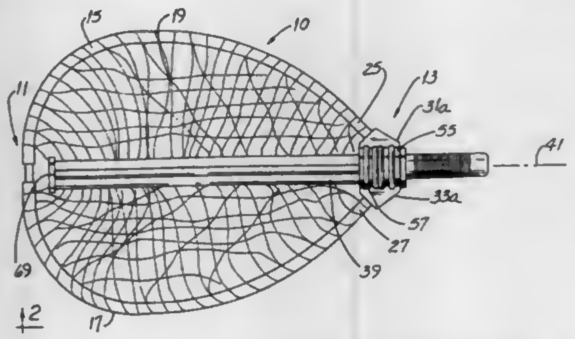


1. A self-aligning flip-up aiming sight attached to a firearm having forward and rearward portions, said firearm having minimally a receiver with a stock and barrel attached thereto, said barrel defining the forward portion of the firearm and said stock defining the rearward portion of the firearm, said firearm longitudinal axis being defined as horizontal and running from said stock through said receiver to said barrel, said receiver being comprised of an upper receiver and a lower receiver, said upper receiver having a forward portion, a top portion and a rearward portion, said barrel being joined to the forward portion of the upper receiver, said sight protruding generally vertically from the firearm when being used and horizontally folded down into the firearm's general contour when not in use, comprising:
- a base mounted on the rear of the receiver top portion, said base having a generally flat upper surface, a right side, a left side, front and rear, and two identical, vertical and parallel mounting tabs extending perpendicularly upward from the base upper surface, said tabs having rectangular shapes and lying in vertical parallel planes a predetermined distance apart and parallel to the base sides, said tabs each have a spring pin hole located in a forward lower quadrant with a common center and also a rotational spring pin hole located in a rearward upper quadrant also with a common center, said base front immediately forward, adjacent and between the tabs being raised forming an arc shaped section with a vertical height less than the vertical height of the tabs;
- a U-shaped alignment member attached to said base, said U-shaped alignment member having two vertical sides and a front face with a rectangular cutout having a remaining front top portion, each said vertical side having an inner surface, outer surface, rear, front, bottom and top, each said inner surface being defined as a facing surface of each said vertical side, said inner surfaces being in apposition in parallel planes, said vertical sides having a spring pin hole located in a forward lower quadrant with a common center and also a rotational spring pin hole located in a rearward upper quadrant also with a common center, said spring pin holes and rotational spring pin holes being located such that they share common centers with the spring pin and rotational spring pin holes in the mounting tabs, said remaining front top portion of the front cutout positioned nearly on the base front arc-shaped section;
- a spring pin inserted through both vertical sides of the U-shaped alignment member and the mounting tabs via the common center spring pin holes, whereby The U-shaped alignment member is attached to the mounting tabs by said spring pin installed through the common spring pin holes;
- a sight housing attached to said base, said sight housing having an upper section and a lower section, said upper section having an upper plate arrangement having two sides, a catch side and an adjustment side, and defining an upper aperture containing aiming means, said lower section having two opposing lower plate members positioned in vertical planes and defining a lower aperture, said lower plate members having a rotational spring pin hole formed therein with a common center, said lower aperture further bounded by two alignment surfaces, wherein in the sight protruding position, the sight housing lower aperture is positioned over the outer faces of the U-shaped alignment member such that the rotational spring pin holes in the plates share a common center with the rotational spring pin holes in the alignment plates of the U-shaped alignment member and the rotational spring pin holes in the mounting tabs; and

spring means in said sight housing adapted to urge said sight housing in a forward direction from a folded-down horizontal position to a generally upright position.

5,533,293
FISH LANDING NET WITH TELESCOPING HANDLE

George L. Boehm, 17990 N. 88th Ave., Peoria, Ariz. 84382
Continuation-in-part of Ser. No. 364,821, Dec. 27, 1994, abandoned. This application Jun. 14, 1995, Ser. No. 490,493
Int. Cl.⁶ A01K *77/00*
U.S. Cl. 43—12 **19 Claims**



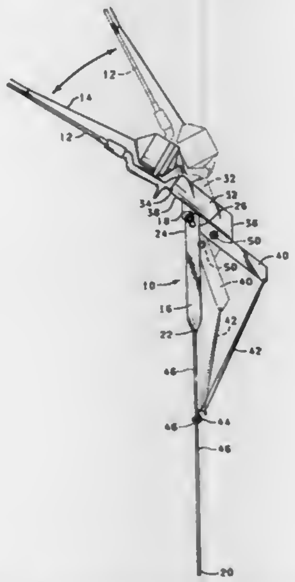
1. In a fish landing net including (a) a distal portion, (b) a proximal portion and (c) a handle at the proximal portion and extending along an axis, the improvement wherein:

the net includes first and second lock pieces and each lock piece substantially circumscribes the axis;

the handle is mounted for movement along the axis between an extended position and a telescoped position; and one of the lock pieces is rotatable about the axis and with respect to the handle when the handle is at the telescoped position.

5,533,294
FISHING ROD HOLDER

Thomas W. Coulter, 601 S. Vista La., Box 149, Edmond, Okla. 73034
Filed May 3, 1995, Ser. No. 433,720
Int. Cl.⁶ A01K *97/12*
U.S. Cl. 43—15 **4 Claims**



1. A holder for supporting a fishing rod having a handle, and swinging the fishing rod when the outer end of the rod is pulled by a fish, comprising:

a single flat bar having a forward edge, a rearward edge, an upper end and a lower end, the lower end being shaped to be pushed into the ground adjacent a body of water;

the upper end portion of said bar having a generally circular aperture therethrough and a rectangular slot therethrough extending upwardly and forwardly from said aperture;

a tubular member sized to receive the handle of the fishing rod therethrough; said tubular member having a forward end, a rearward end and a lower surface;

a second bar having a forward end and rearward end secured to the lower surface of the tubular member and protruding beyond the rearward end of the tubular member;

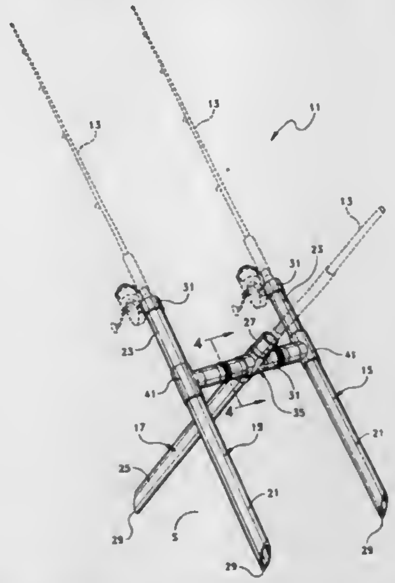
a square cross-sectional shaft extending from one side of the second mentioned bar sized to rotate in said circular aperture in one position and fit without rotation in said rectangular slot in a second position; and

a tension spring secured between the rearward end of said second bar and an intermediate portion of the single, flat bar; thereby

when said shaft extends through said rectangular slot, said spring will be under tension and a fishing rod extending into said tubular member will be in a first position, and when said shaft is moved into said circular aperture, the spring will retract, rotating the tubular member and the fishing rod about said shaft.

5,533,295
FISHING POLE HOLDER

Daniel Hochberger, 123 School St., Rehoboth, Mass. 02769
Filed Sep. 19, 1994, Ser. No. 308,370
Int. Cl.⁶ A01K *97/10*
U.S. Cl. 43—21.2 **19 Claims**



1. A fishing pole holder capable of holding at least one fishing pole in a generally upright and supported position, said holder comprising:

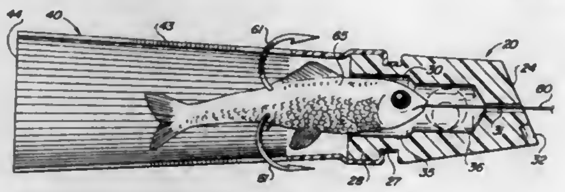
a first leg having a lower portion adapted to engage a surface and an upper portion having means for holding a fishing pole in a position in which the fishing pole is completely supported by said leg above said surface;

a second leg having an upper portion and a lower portion adapted to engage said surface; and

a connector for connecting said first and second legs to one another below their upper portions, said connector being constructed and arranged for enabling said second leg to rotate between a stowed position in which said second leg is generally parallel to said first leg and an operable position in which said first leg is generally inclined with respect to a horizontal plane and said second leg is oppositely inclined with respect to said first leg for stabilizing the first leg in an upright position suitable for holding a fishing pole.

5,533,296
FISHING LURE HEAD

Robert W. Jansen, 16115 SW. 117th Ave., Unit A-8, Miami, Fla. 33177-1614
Continuation-in-part of Ser. No. 92,827, Jul. 19, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 377,516
Int. Cl.⁶ A01K *85/00*
U.S. Cl. 43—42.36 **19 Claims**



19. A head fishing lure comprising:

a head having a proximal end and a distal end, said head being formed of a substantially strong, solid, yet lightweight material,

said head including a front face at said proximal end, a rear face at said distal end, and a surrounding side wall surface extending between said ends,

said surrounding side wall surface having a smaller exterior diameter at said proximal end and a larger exterior diameter at said distal end, thereby tapering said head between said ends,

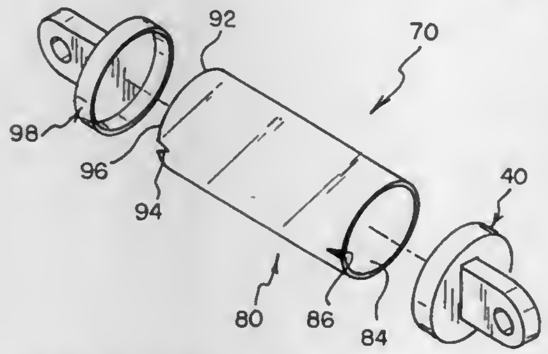
said head further including a surrounding channel disposed in said surrounding side wall surface at a point substantially adjacent to said distal end so as to define a lip at said distal end of said head,

an axial bore extending through said rear face of said head, said axial bore extending substantially into said head and being structured and disposed to receive a bait fish at least partially therein, and

a substantially small axial opening extending from said front face of said head to said axial bore in said head, said axial opening being structured and disposed to enable passage of a fishing line therethrough.

5,533,297
FISHING LURE CONTAINER

Robert D. Crosby, 70 E. Sunset Ave., Salt Lake City, Utah 84115
Filed Mar. 4, 1994, Ser. No. 205,786
Int. Cl.⁶ A01K *97/00*
U.S. Cl. 43—57.1 **2 Claims**



1. A fishing lure container for storing fishing lures with a leader line attached to prevent tangling with other lures, kinking of the leader line, or injury from exposed fishhooks, the fishing lure container comprising:

a tubular transparent envelope formed of rigid impact-resistant waterproof material, the envelope having a length-to-diameter ratio of at least one, the envelope also having one open end defining a mouth having a raised lip thereon wherethrough a fishing lure is passed whereby the lure is contained within the envelope, the lip having a longitudinal V-notch formed therein wherethrough the fishing lure leader line extends from the envelope, the extending leader line is wrapped around the outside of the envelope for non-kinking storage, the free end of the leader line optionally reentering the envelope through the V-notch for securement therein;

a closure formed of resilient waterproof material snappily removedly engagable with the lip of the tubular envelope such that when engaged the mouth of the tubular envelope said mouth is substantially blocked whereby a fishing lure placed inside the envelope is retained therein, the closure having a rim therearound engagable with the lip such that the fishing lure leader line passing through the V-notch is captivated therein, the closure also having a planar top with an integral planar tab projecting orthogonally therefrom, the tab having a lateral hole therethrough whereby the fishing lure container is hung on a peg or the like for storage, transport, and display;

wherein the other end of the envelope is open defining a second mouth having a raised second lip thereon wherethrough a second fishing lure is passed whereby the second lure is contained within the envelope, the raised second lip having a longitudinal V-notch formed therein wherethrough the leader line of the second fishing lure extends from the inside of the envelope, the extending leader line is wrapped around the outside of the envelope for non-kinking storage, the free end of the leader line optionally reentering the envelope through the V-notch for securement therein;

a second closure means removably engagable with the second lip of the tubular envelope, the second closure having a rim therearound engagable with the second lip such that a leader line passing through the V-notch is captivated therein; and

divider means in said envelope forming two separate compartments so tangling together of lures placed in the separate compartments is precluded, the divider means comprising a thin rigid card formed of waterproof material loosely disposed generally longitudinally within the tubular envelope, the card being positioned such that access to one of the compartments is exclusively through one mouth of the envelope while access to the other compartment is exclusively through the second mouth, the card also having integral opposing lateral ears extending generally orthogonally from each end thereof whereby the divider card is retained mostly stationary within the envelope when the envelope contains less than two lures.

5,533,298
PORTABLE ELECTRONIC INSECT-KILLING DEVICE

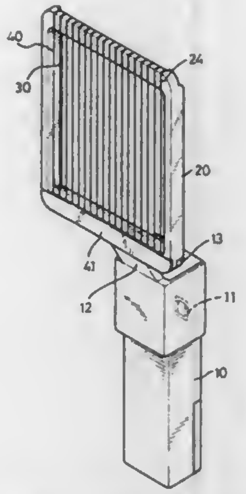
Hsi-Hsiung Teng, No. 115-3, Chien Kuo 1 Rd., Kaohsiung, Taiwan
Filed Aug. 25, 1994, Ser. No. 296,034
Int. Cl.⁶ A01M *1/22*
U.S. Cl. 43—112 **4 Claims**

1. A portable electronic insect-killing device comprising a handle, a support frame being made of insulating material, and a tube connecting said handle and said frame;

said handle having an internal chamber for receiving a relatively high power source from which a positive line of high voltage and a negative line extend, said positive line and said negative line being guided in said tube to said frame;

said frame having a first set of exposed conductive lines and a second set of exposed conductive lines disposed thereacross in a spaced, parallel and alternating relationship, said first set and said second set of lines being respectively electronically connected to said positive line and said negative line;

said first lines each including a first end independently engaged to an upper edge of said support frame and a second end engaged to a lower edge of said support frame yet connected to each other via a portion of said positive line;



said second lines each including a first end independently engaged to an upper edge of said support frame and a second end engaged to a lower edge of said support frame yet connected to each other via a portion of said negative line;

whereby said support frame defines a plurality of first grooves and second grooves with different lengths alternately defined on the lower edge thereof, each of said first grooves and second grooves terminated as a hole through said lower edge, each said first groove receiving a second end of a corresponding one of said first lines, each said second groove receiving a second end of a corresponding one of said second lines, each said hole allowing a second end of a corresponding one of said first and second lines to extend therethrough.

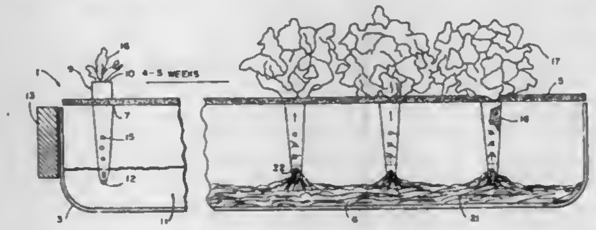
5,533,299
NON-CIRCULATING HYDRO'ONIC PLANT GROWING SYSTEM

Bernard A. Kratky, Hilo, Hi., assignor to University of Hawaii, Honolulu, Hi.

Division of Ser. No. 924,992, Aug. 5, 1992, Pat. No. 5,385,589. This application Dec. 16, 1994, Ser. No. 357,581

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 47—18 **5 Claims**



1. A non-circulating hydroponic plant-growing system, comprising a water impermeable container of selected dimensions having an open top and a closed bottom, a cover for the container with a selected number of spaced apertures at selected spacings, plural elongated reusable conical tubes with plural apertures at different levels from a lower narrow end towards an upper broader end of each tube, a growing medium for filling the tubes, seeds or seedlings for planting in the growing medium of a selected crop having a projected growing season till harvest in the medium, a predetermined amount of nutrient solution formed by mixing nutrients and water for adding to the container, said tubes being placed vertically in the apertures in the cover by suspending the upper ends of the tubes on the cover and the lower ends of the tubes in the solution above the bottom of the container to lift the nutrient solution to the seed or seedling by capillary action in the growing medium and cause roots of the seedling to grow downward through the medium and through the apertures, said water impermeable container having selected dimensions, said apertures having selected numbers and selected spacing and the predetermined amount of nutrient solution being selected to provide sufficient space and sufficient nutrient solution to sustain said desired crop for it's entire growing season without the need to replenish the solution in said container.

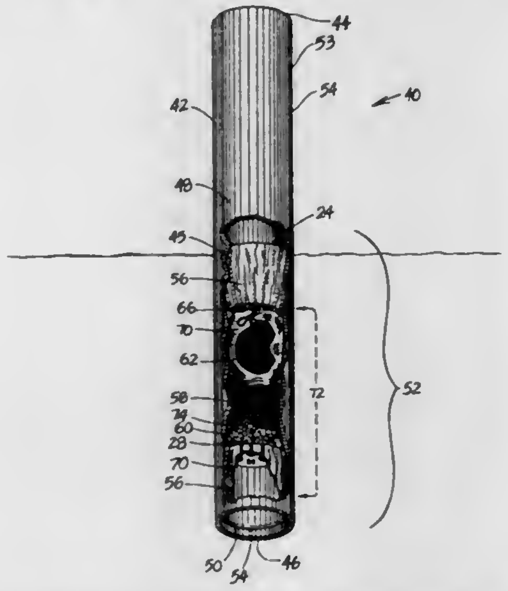
5,533,300
PLANT FEEDER AND METHOD FOR FEEDING PLANT ROOTS

Robert H. Kesler, Warsaw, Ind., assignor to Haimbaugh Enterprises, Inc., Warsaw, Ind.

Filed Dec. 30, 1993, Ser. No. 176,093

Int. Cl.^{6} A01G *29/00*

U.S. Cl. 47—48.5 **27 Claims**



1. A plant feeder comprising an elongated hollow housing having an above ground open end and a below ground open end, said housing being made of a bidegradable material, a water permeable plug positioned within said housing adjacent to said below ground open end defining with said housing a water reservoir comprising vacant space between said plug and said above ground open end and an above ground fill opening at said above ground open end, said housing having exterior walls generally impervious to water flow, whereby water flows from said water reservoir longitudinally through said housing and out said below ground open end, said plug having a percolation control therein which controls the rate of water flow through said housing, said housing having water soluble plant food therein, whereby water from said water reservoir and dissolved plant food may be percolated through said housing and be delivered to the roots of a plant at a desired feeding rate.

5,533,301
APPARATUS FOR PROVIDING A DECORATIVE COVER FOR A FLOWER POT USING A COLLAR

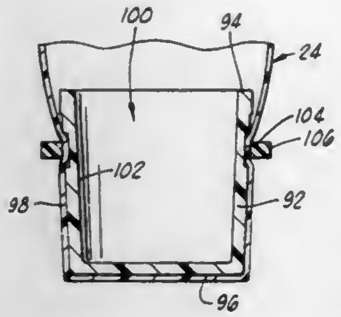
Donald E. Weder, Highland, Ill.; Franklin J. Craig, Valley Park, Mo.; William F. Straeter, Breese, and Joseph G. Straeter, Highland, both of Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Division of Ser. No. 43,506, Apr. 6, 1993, which is a division of Ser. No. 773,474, Oct. 9, 1991, Pat. No. 5,231,794, which is a division of Ser. No. 404,955, Sep. 18, 1989, Pat. No. 5,077,937, which is a continuation-in-part of Ser. No. 365,767, Jun. 13, 1989, abandoned, and Ser. No. 327,996, Mar. 21, 1989, Pat. No. 4,901,423, which is a continuation of Ser. No. 232,541, Aug. 11, 1988, Pat. No. 4,835,834, which is a continuation of Ser. No. 876,405, Jun. 20, 1986. This application Nov. 22, 1994, Ser. No. 343,696

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 47—72 **10 Claims**

1. A decorative flower pot assembly, comprising:



a flower pot having an upper end, an outer peripheral surface and an object opening sized and shaped to accommodate a floral grouping, the flower pot having snap means formed integrally with the flower pot;

a sheet of material disposed about the outer peripheral surface of the flower pot to provide a decorative cover about the flower pot; and

a collar adapted to mate with the snap means, the collar engaged against a portion of the sheet of material with the sheet of material disposed between the collar and the flower pot, the collar mated to the snap means such that the collar and the snap means cooperate to secure the sheet of material to the flower pot and such that the collar is interlocked with the snap means to secure the collar to the flower pot.

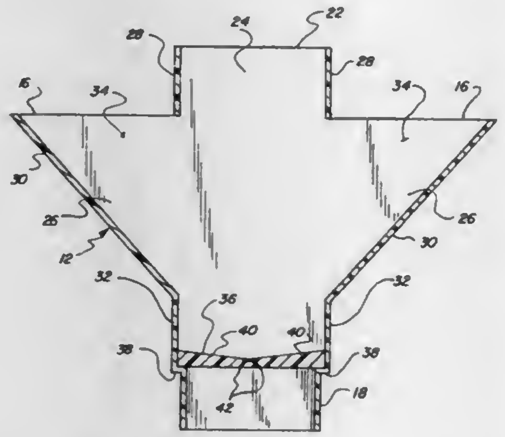
5,533,302
MODULAR PLANTING SYSTEM

Carroll L. Lynch; Robert E. Graven, and Robert L. Graven, all of P.O. Box 6732, Maryville, Tenn. 37802-6732

Filed Jul. 21, 1994, Ser. No. 278,247

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 47—82 **1 Claim**



1. A new modular planting system comprising:

at least one planting unit including a rectangular center column, a top end and a bottom end with at least one pair of rectangular lateral receptacles extending from opposed sides of said center column, a mounting flange extending downwardly from said center column, said mounting flange being receivable within another column of another planting unit so as to couple said planting unit to said another planting unit, said center column being substantially hollow with said lateral receptacles being in communication through said hollow center column, whereby a continuous volume of plant growing medium can extend from a first one of the lateral receptacles through said center column to a second one of the lateral receptacles, a soil retainer for each unit removably supported across a lowermost portion of said center column to accommodate the pair of lateral receptacles, said soil retainer including a drain hole extending therethrough, said soil retainer being shaped so as to define angled floor portions which cooperate to guide water and other fluid through said drain hole extending through said soil retainer, said planting unit including a front wall spaced from a rear wall, the front and rear walls being identical in shape and each including a rectangular portion having a pair of oppositely extending triangular wings fixedly secured to said rectangular portion, a pair of spaced upper side walls orthogonally extending between said rectangular portions of said front and rear walls, a pair of medial side walls orthogonally extending between said walls orthogonally extending between said rectangular portions of said front and rear walls; and,

a supporting structure means for supporting said modular planting system in a substantially vertical orientation.

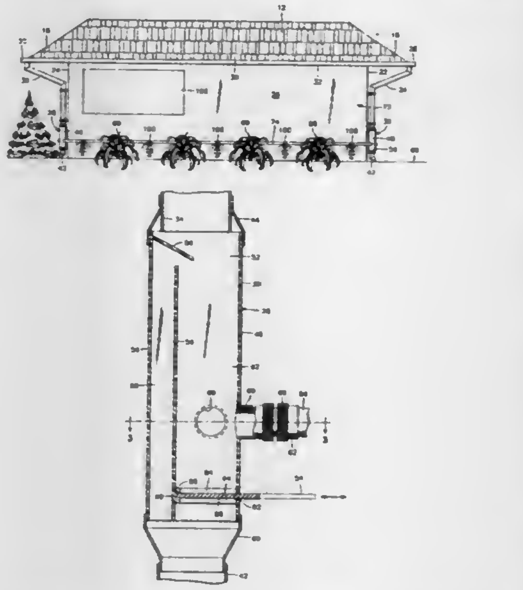
5,533,303
DOWNSPOUT WATER CONSERVATION DIVERSION ADAPTOR

Robert B. Harvey, 261 Hiatt La., Central Point, Oreg. 97502

Filed Apr. 18, 1995, Ser. No. 423,929

Int. Cl.^{6} E03B *3/02*

U.S. Cl. 52—16 **3 Claims**



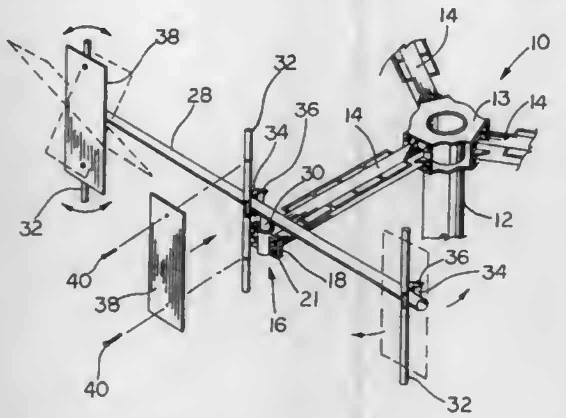
1. In combination, a building structure having a roof structure assembly thereover and gutter means including at least one downspout for collecting water draining from said roof assembly, said downspout including an upper end for receiving collected water from said gutter means and an open lower end for discharging therefrom, closure means for selectively closing said lower end, water discharge means above said closure means for discharging water from within said downspout above said closure means, elongated water conveying means extending generally horizontally along said building structure above ground level and provided with irrigation water outlet means spaced therealong, means communicating said water discharge means with said water conveying means, said downspout, above said lower end, defining a pair of side-by-side upwardly opening compartments, water diverter means operative to divert at least a majority of water flowing downward through said downspout above said compartments into one of said compartments, said closure means selectively closing the lower portion of said one compartment from said open lower end, the other of said compartments opening downwardly into said open lower end.

5,533,304
ADJUSTABLE ANTENNA SUPPORT

Myron C. Noble, Plymouth, Ind., assignor to Pi-Rod, Inc., Plymouth, Ind.

Filed Apr. 11, 1995, Ser. No. 420,030
Int. Cl.^{6} H01Q *1/12*

U.S. Cl. 52—40 **16 Claims**



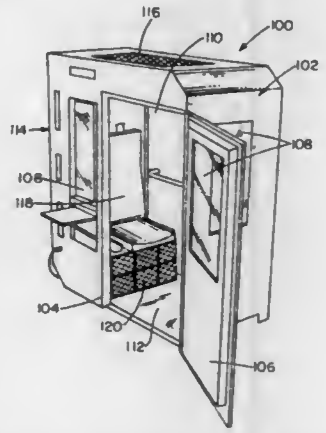
1. Antenna support structure comprising:
a mast;
an antenna support arm mounted on said mast and extending outwardly from said mast;
a cross member mounted on said support arm and carrying antenna mounting means for mounting an antenna on said cross member;
first pivot means pivotally mounting said cross member to said support arm and permitting said cross member to swing relative to said arm to permit one end of said cross member to swing toward said mast when the cross member is swing in one direction and the other end of the cross member to swing toward said mast when the cross member is swung in the other direction; and
second pivot means pivotally mounting said antenna mounting means on said cross member to permit said antenna mounting means to pivot about said cross member.

5,533,305
TREATMENT BOOTH FOR INFECTIOUS PATIENTS

James J. Bielecki, Blomingdale, N.J., assignor to Mark Solutions, Inc., Maywood, N.J.

Filed Aug. 30, 1994, Ser. No. 298,045
Int. Cl.^{6} E04H *1/12*

U.S. Cl. 52—79.1 **42 Claims**



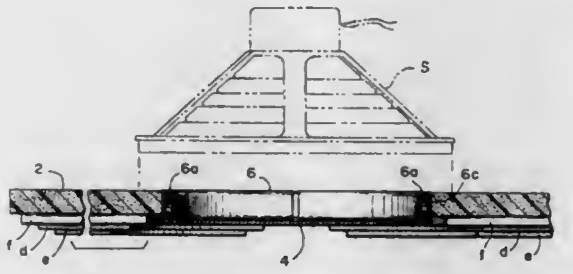
37. A treatment booth for confining a person having a communicable disease in an isolated environment, said booth comprising a housing having a floor for confining a person therein; a frame supporting said floor including a plurality of elongated U-shaped longitudinal members and a plurality of elongated U-shaped transverse members arranged in a grid, said longitudinal members having a plurality of spaced apart openings for receiving said transverse members therein, said openings comprising a rectangular opening and a pair of notches on either side of said rectangular opening, said transverse members having one portion received within said rectangular opening and another portion received within said notches wherein the upper surface of said longitudinal members is substantially flush with the upper surface of said transverse members for support of said floor thereacross; access means within said housing for ingress and egress of a person into and out of the interior of said housing; a seat within said housing for supporting a person having a position adjustable backrest; a locking assembly for releasably locking said backrest in a plurality of positions, said locking assembly including a tracking guide attached to said backrest comprising a U-shaped member having a rod for securing said backrest in one of said plurality of positions, and a locking bracket releasably engaging said tracking guide for securing said backrest in said plurality of positions, said locking bracket including an outer member, an inner member received within said outer member forming a channel therebetween receiving said rod of said tracking guide, a pivotable member overlying said channel, said pivotable member having a plurality of openings for receiving said rod for securing said backrest in one of said plurality of positions and a flange overlying a portion of said inner member, and securing means for releasably securing said flange to said portion of said inner member; treatment means within said housing for treating the contaminated environment within the interior of said housing resulting from the presence of a person therein having a communicable disease, said treatment means comprising a primary filter for treatment of contaminated air within said housing, a first frame overlying one surface of said primary filter having an opening in communication therewith for the flow of contaminated air therethrough, a prefilter overlying said opening within said first frame, and a second frame overlying one surface of said prefilter having an opening in communication therewith for the flow of contaminated air therethrough, said second frame having one portion releasably secured by a U-shaped member extending outwardly along one side of said first frame and another portion engaging a portion of said housing for releasably securing said second frame threat, whereby said primary filter and said prefilter are accessible for replacement upon removal of said first and second frames; and means within said housing for drawing contaminated air from within said housing through both said prefilter and said primary filter and discharging clean filtered air to the surrounding environment outside said housing.

5,533,306
CONSTRUCTION PANEL SECTIONS WITH CONCEALED OPEN REGIONS

Daniel L. Aspenson, W5718 Hypoint Dr., La Crosse, Wis. 54601

Continuation of Ser. No. 999,006, Dec. 31, 1992, abandoned. This application Mar. 29, 1994, Ser. No. 218,998
Int. Cl.^{6} E04B *1/82*

U.S. Cl. 52—144 **15 Claims**



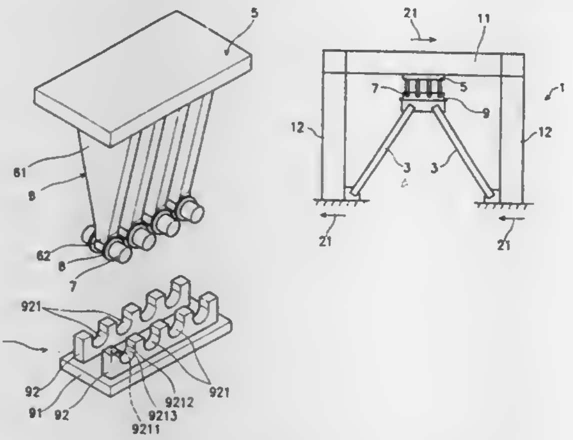
1. An acoustical panel section adapted for installation onto a suspended ceiling fitted with an audio speaker which communicates onto the panel section, said acoustical panel section consisting essentially of an acoustical ceiling tile having an internally disposed open region which when installed onto the suspended ceiling affords a mating passageway communicating onto the audio speaker, an internal sidewall bordering onto the open region, a fabric piece tautly covering the open region, securing means securely affixing the fabric piece onto the sidewall and a facial overcoating of paint overcoated onto the fabric piece.

5,533,307
SEISMIC ENERGY DISSIPATION DEVICE

Keh-Chyuan Tsai, and Jeng-Wei Li, both of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Nov. 29, 1994, Ser. No. 350,043
Int. Cl.^{6} E04H *9/02*

U.S. Cl. 52—167.3 **16 Claims**



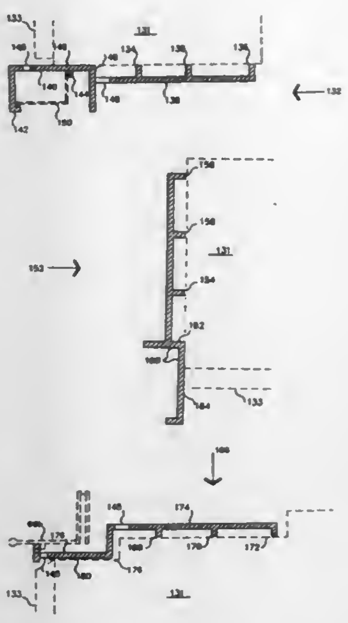
11. A device for dissipating seismic energy, comprising:
a first member;
a plurality of spaced tapered plate members each having a first end fixed to said first member and a second end, said second end being narrower than said first end;
a plurality of cylindrical members each connected to a respective one of said second ends of said tapered plate members; and
a base assembly having a plurality of spaced receiving means for receiving said cylindrical members, said receiving means being open on a side facing said first member to receive said cylindrical members.

5,533,308
STORM SHUTTER WINDOW FRAME SYSTEM

James Fullwood, Teguesta, Fla., assignor to Duraframe Window Shutter Systems, Inc., West Palm Beach, Fla.

Division of Ser. No. 328,197, Oct. 24, 1994, Pat. No. 5,465,537, which is a continuation of Ser. No. 148,792, Oct. 29, 1993, abandoned. This application Jul. 19, 1995, Ser. No. 504,754
Int. Cl.^{6} E06B *3/00*

U.S. Cl. 52—204.5 **13 Claims**



1. A portal frame structure for insert therein of a sliding glass door frame and a shutter comprising:
- (a) a pair of longitudinally displaced and vertically aligned portal jamb frames, each of said portal jamb frames having a plurality of portal jamb sections formed in a vertically directed side by side relation including a first cross-sectionally formed U-shaped jamb frame section, a second cross-sectionally formed U-shaped jamb frame section having a second jamb frame section leg member in commonality with said first jamb frame section, a third cross-sectionally formed U-shaped jamb frame section having a third jamb frame section leg member in commonality with said second jamb frame section, said first, second and third jamb frame sections being sandwiched between a building wall member and said sliding glass door frame, a fourth cross-sectionally formed substantially L-shaped jamb frame section secured to said third jamb frame section for providing a guide for said shutter;
- (b) at least one longitudinally directed portal sill frame having a plurality of portal sill frame sections formed in side by side relation including a first cross-sectionally formed U-shaped sill frame section, a second cross-sectionally formed U-shaped sill frame section having a second sill frame section leg member in commonality with said first sill frame section, a third cross-sectionally formed U-shaped sill frame section having a third sill frame section leg member in commonality with said second sill frame section, said first, second, and third sill sections being sandwiched between said building wall member and said sliding glass door frame, a fourth cross-sectionally formed substantially L-shaped sill frame section secured to said third sill frame section for providing a sill guide channel for insert of said shutter; and,
- (c) at least one longitudinally directed portal head frame having a plurality of portal head frame sections formed in side by side relation including a first cross-sectionally formed U-shaped head frame section a second cross-sectionally formed U-shaped head section having a second head frame section leg member in commonality with said first head frame section, a third cross-sectionally formed U-shaped head frame section having a third head frame section leg member in commonality with said second head frame section, said first, second and third head frame sections being sandwiched between said building wall and said sliding glass door frame, a fourth cross-sectionally formed substantially U-shaped head frame section secured to said third head frame section for providing a head guide channel for insert of said shutter therein.

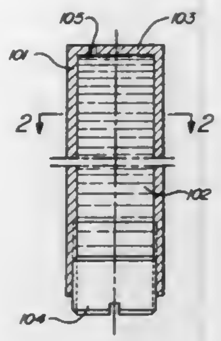
5,533,309
METHOD AND MEANS FOR ENHANCEMENT OF BEAM STIFFNESS

Evgeny I. Rivin, 30236 Southfield Rd., #249, Southfield, Mich. 48076

Filed Jan. 3, 1994, Ser. No. 176,247
Int. Cl.^{6} E04C *5/08*

U.S. Cl. 52—223.8 **19 Claims**

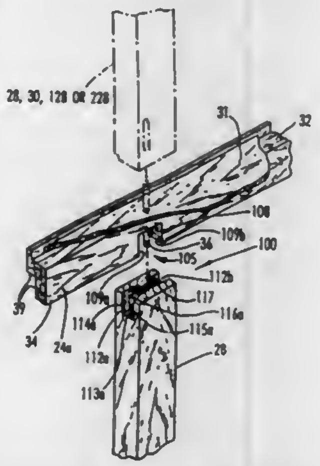
1. Structural component subjected to bending load and comprising an elongated tubular element having a closed internal cavity filled with a material exerting axial tensile force on said tubular element while being itself subjected to axial compression force as a result of transformation increasing the volume of said material.



5,533,310

FRAME STRUCTURE WITH LOAD-BEARING JOINTS

Edward Zamerovsky, 12 Geranium Rd., Levittown, Pa. 19057
Division of Ser. No. 180,480, Jan. 12, 1994, Pat. No. 5,469,678, which is a continuation of Ser. No. 539,124, Jun. 18, 1990, abandoned. This application May 31, 1995, Ser. No. 455,728
Int. Cl.⁶ E04B *1/19*
U.S. Cl. 52—263 **5 Claims**



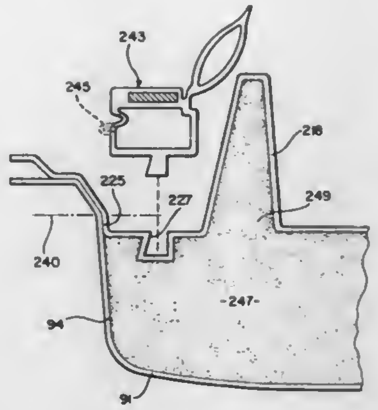
1. A junction of frame members for supporting a load comprising:
a) a vertical post member, the vertical post member having two dado cuts in an end thereof, wherein the end of the vertical post member has a generally H-shaped cross-section, and
b) a horizontal member having a dado cut in an intermediate section thereof, the dado cut of the horizontal member being shaped to mate with the H-shaped cross-section of the vertical post member,
wherein the horizontal member and the vertical post-member are engaged with each other.

5,533,311

THERMOFORMED PLASTIC REFRIGERATOR DOOR

Steven G. Tirrell, Dahinda; Theodore A. Becker, Oneida; Kenneth M. Hattori, Galesburg, all of Ill.; Samuel C. Crosby, Lilburn, and Michael C. Mayne, Conyers, both of Ga., assignors to Maytag Corporation, Newton, Iowa
Filed Sep. 30, 1994, Ser. No. 315,507
Int. Cl.⁶ E06B *5/00*
U.S. Cl. 52—309.9 **8 Claims**

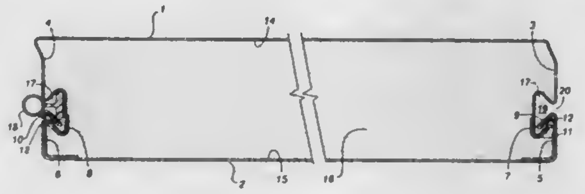
1. A unitary plastic refrigerator door comprising:
a thermoformed outer refrigerator door panel including an outer wall portion and an inwardly turned, annular sidewall portion; and
a thermoformed inner refrigerator door liner integrally formed with at least one dike portion and an annular flange portion positioned outwardly of said at least one dike portion, said annular flange portion including an inturned edge portion being joined with the annular sidewall portion of said outer refrigerator door panel along a seam located between said annular sidewall portion and said at least one dike portion, said seam extending substantially perpendicular to said outer wall portion of said outer refrigerator door panel,
wherein an internal chamber is defined between said outer door panel and said inner refrigerator door liner, said refrigerator door further including a filler material located throughout said internal chamber.



5,533,312

COMPOSITE PANEL HAVING INTERLOCKED SKINS AND A BONDED FOAM CORE

Arthur A. Mihalcheon, Edmonton, Canada, assignor to Steel-Craft Door Products Ltd., Alberta, Canada
Filed Nov. 30, 1994, Ser. No. 346,894
Int. Cl.⁶ E04C *2/292*
U.S. Cl. 52—309.9 **3 Claims**

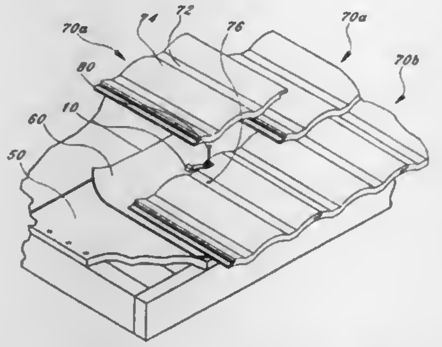


1. A unitary insulated panel having top and bottom sides and being of rectangular form, comprising:
inner and outer metal skins arranged in opposed and spaced apart relationship so that a space is formed between them, each skin having an inner face and top and bottom inwardly projecting flanges, the top flanges being opposed and forming the top side of the panel, the bottom flanges also being opposed and forming the bottom side of the panel;
each opposed pair of flanges forming oppositely directed hook means which overlap and engage to mechanically interlock the skins;
each pair of overlapping and engaged hook means combining to form a slot, extending longitudinally of the side of the panel, said slot having a relatively narrow mouth and a bulbous inner section so that an elongate strip of weather seal can be retained in the slot and protrude through the mouth thereof to seal against an abutting panel; and
a foam core, having been formed in situ within the space between the skins, said core filling the space and being bonded to the inner faces of the skins.

5,533,313

ROOF TILE ANCHORING CLIP

Robert D. Pike, 999 NW. 53rd Ct., Ft. Lauderdale, Fla. 33309, and David C. Struve, 2541 Calamondin Clr., Coconut Creek, Fla. 33063
Filed Aug. 3, 1994, Ser. No. 285,047
Int. Cl.⁶ E04D *1/34*
U.S. Cl. 52—712 **7 Claims**

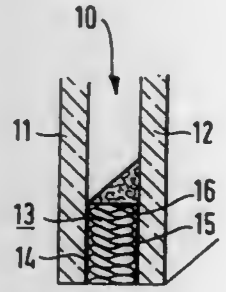


1. A roof tile anchoring clip for securing overlapping roof tiles to a roof structure, said roof tiles comprising a pan section defining a tile aperture, an arcuate raised section and a notched tile edge, said clip comprising:
an elongated retaining clip body, said clip body having a fastening end defining a fastening aperture and a tile retaining end defining a C-shaped means for engaging the notched tile edge, said clip body further having a curved mid-body portion comprising a continuous elongated arc formed between said fastening end and said tile retaining end for providing resilient variable resistance, said mid-body portion adapted to conform to the arcuate raised section, said mid-body portion adapted to extend from said pan section to at least an apex of said arcuate raised section;
wherein, in use, said mid-body portion acts as a resilient variable resistance arm that increases resistance as said roofing tiles are forced upward from said roof structure under wind-induced loading.

5,533,314

FRAMELESS INSULATING GLAZING UNIT AND A METHOD FOR THE PRODUCTION THEREOF

Heinz Kunert, Am Krieler Dom 23, 50935 Köln, Germany
PCT No. PCT/EP94/00069, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO94/16187, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 11, 1994, Ser. No. 302,790
Claims priority, application Germany, Jan. 11, 1993, 43 00 481.4
Int. Cl.⁶ E04C *2/54*
U.S. Cl. 52—788.1 **41 Claims**

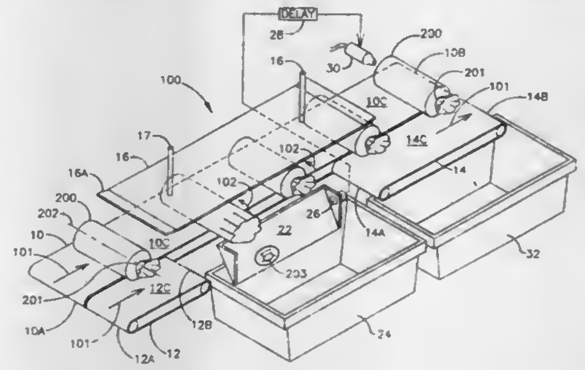


1. An insulating glazing unit comprising at least two panes arranged in parallelism to each other and connected together by a marginally surrounding spacer, characterized in that the spacer is constituted by a shaped body which possesses a plurality of elastic, flexurally rigid and mutually intersecting filaments, which extend transverse in relation to the plane of the panes and form a force transmitting buttressing means between the panes.

5,533,315

CLOSURE CHECKING APPARATUS FOR BAGGED GOODS

Aaldert C. Van Dam, and Kenneth C. Honings, both of Richmond, Va., assignors to Blueprint Automation, Inc., Richmond, Va.
Filed Sep. 1, 1995, Ser. No. 522,732
Int. Cl.⁶ B65B *57/04;* **B07C** *5/02*
U.S. Cl. 53—53 **15 Claims**



1. An apparatus for checking a closure on an end of a bag having loosely packed goods contained therein, comprising:
a first conveyor section for fully supporting said bag during movement on said first conveyor section;
a second conveyor section coupled to said first conveyor section for receiving said bag from said first conveyor section, said second conveyor section partially supporting said bag such that said end and a portion of said loosely packed goods contained in said bag are unsupported by said second conveyor section during movement on said second conveyor section;
a plate mounted above said second conveyor section for applying a downward pressure to said bag as said bag moves on said second conveyor section, wherein said portion of said goods fall out of said end if said closure is not secure; and
a detector arranged in relation to said second conveyor section for detection of said portion of said loosely packed goods falling out of said end when said closure is not secure, said detector providing a reject signal indicative of said detection.

5,533,316

APPARATUS FOR COMPRESSING AND POSITIONING THE SEALING COMPONENTS OF AN OPEN HEAD DRUM

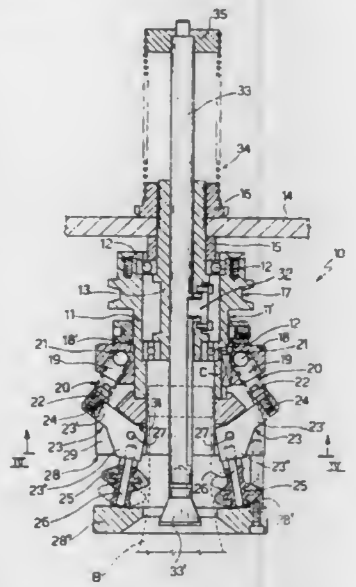
Gary L. Hornsby, Pinson, Ala., assignor to Self Industries, Inc., Birmingham, Ala.
Filed May 4, 1995, Ser. No. 434,784
Int. Cl.⁶ B65B *7/28;51/04*
U.S. Cl. 53—137.2 **31 Claims**

1. An apparatus for positioning and compressing the sealing components of an open-head drum having a detachable lid, said drum having an upper rolled rim and said lid having a perimeter and a mating groove positioned along said perimeter, said mating groove dimensioned to fit on said rim of said drum, said mating groove positioned on said rim, forming a juncture between said lid and said drum, said sealing components including a compressible gasket positioned between said mating groove of said lid and said rim of said drum, and a split closing ring having a first end and a second end, comprising:

(a) means for holding said split closing ring superjacent said drum and said lid;
(b) means for urging said lid downwardly such that said gasket is compressed;
(c) means for expanding said split closing ring; and
(d) means for sequentially urging said split closing ring, from said first end to said second end of said split closing ring, into a position circumscribing said juncture between said drum and said lid.

5,533,317
ROLLING HEAD FOR APPLYING SEALING CAPS ON BOTTLES IN GENERAL

Agostino Galandrino, Canelli, Italy, assignor to Robino & Galandrino S.p.A., Canelli, Italy
Filed Jul. 3, 1995, Ser. No. 498,269
Claims priority, application Italy, Jul. 8, 1994, TO94A0560
Int. Cl.^{6} B67B *3/18;* **B65B** *7/28*
U.S. Cl. 53—334 **11 Claims**

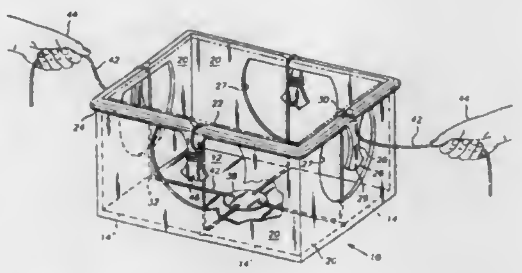


1. A rolling head for applying sealing caps on bottles in general, the rolling head comprising:
- a rotating body being rotatable about a longitudinal axis thereof;
- a contrast ring being slideably axially mounted on said rotating body;
- a cylindrical support being rigidly coupled to said rotating body;
- a plurality of rockers being pivoted to said cylindrical support;
- a plurality of presser rollers for elastically acting on a sealing cap, each presser roller being supported at an end of a respective rocker;
- a plurality of springs acting with an adjustable tension between said rockers and said contrast ring; and
- an abutment ring for fixing in position said contrast ring and adjusting the tension of said springs.

5,533,318
NEWSPAPER STORAGE AND BUNDLING SYSTEM

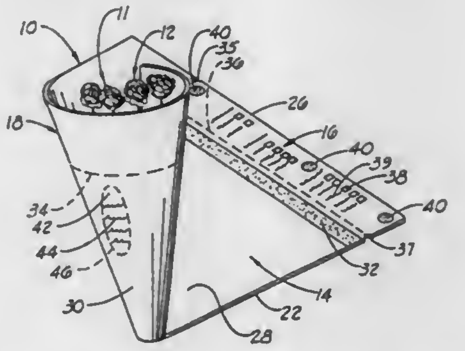
Marie R. O. Murat, 11 Powderhorn Rd., Patterson, N.Y. 12563
Filed Feb. 14, 1995, Ser. No. 388,481
Int. Cl.^{6} B65B *67/00*
U.S. Cl. 53—390 **8 Claims**

1. A newspaper storage and bundling system, for collecting newspapers and magazines which form a newspaper pile, comprising:
- a bin having a bottom panel, the bottom panel rectangular in shape and having four bottom edges, the bin having four side panels which extend perpendicularly upward from the bottom edges, the side panels attached to each other at right angles, the side panels and the bottom panel together defining a storage space;
- a lip connecting the four side panels, the lip extending on the side panels opposite the bottom panel;
- at least one opening positioned in at least one of the side panels so as to extend beneath the lip;
- four stationary reels, each of the reels extending downward from the lip in front of the at least one opening near the center of one of the side panels;
- at least one rope assembly, having a rope assembly spacer located on the bottom panel, and having four rope ends extending from the spacer, each rope end extending across the bottom panel, up the side walls, and wrapped around one of the reels.



5,533,319
METHOD OF WRAPPING A FLORAL GROUPING WITH A SHEET OF WRAPPING MATERIAL HAVING INFORMATION CHOICE BLOCKS

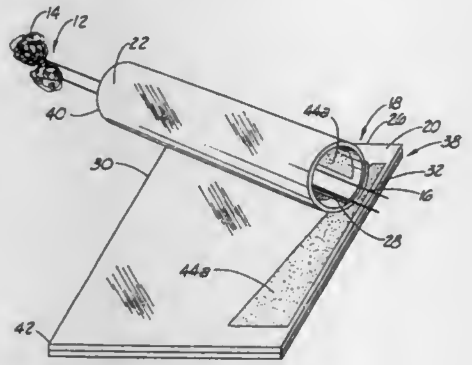
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International Inc.
Continuation of Ser. No. 68,482, May 28, 1993, Pat. No. 5,335,476, which is a continuation-in-part of Ser. No. 979,510, Nov. 19, 1992, abandoned, and a continuation-in-part of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Apr. 26, 1994, Ser. No. 234,198
Int. Cl.^{6} B65B *25/02;11/02;5/06;47/04*
U.S. Cl. 53—397 **43 Claims**



1. A method of wrapping objects, the steps of the method comprising:
- providing a sheet of material having a wrapping area and a label area, the label area having a plurality of choice blocks with an information area corresponding to each one of the choice blocks, the wrapping area having a bonding material disposed thereupon for securing the wrapping area around the objects;
- placing the objects upon a portion of the wrapping area; and
- wrapping the wrapping area of the sheet of material about the objects such that the bonding material engages the wrapping area to effect closure of the wrapping area around the objects and such that the choice blocks on the label area are viewable.

5,533,320
METHOD OF WRAPPING A FLORAL GROUPING WITH A WRAPPER HAVING VARYING ADHESION

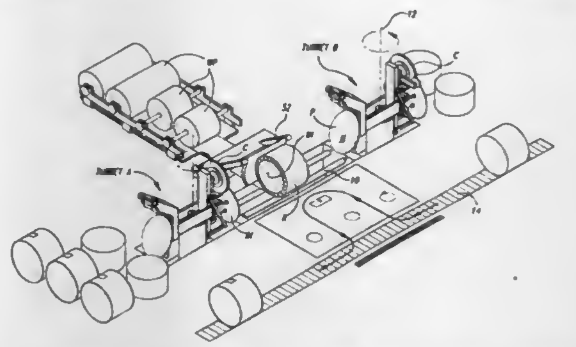
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Highland, Ill.
Continuation of Ser. No. 922,294, Jul. 30, 1992, Pat. No. 5,335,477, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Jun. 9, 1994, Ser. No. 255,629
Int. Cl.^{6} B65B *11/56;61/06*
U.S. Cl. 53—399 **21 Claims**



1. A wrapping method, comprising the steps of:
- providing a wrapping material, comprising:
  - a pad, comprising a plurality of sheets of material having a top sheet of material with a next sheet of material disposed thereunder and all other sheets of material in the pad being disposed under the next sheet of material, each sheet of material having an upper surface, a lower surface, and an outer periphery, each sheet of material having an adhesive disposed upon at least a portion of the upper surface of the sheet of material, the adhesive having portions of varying tack, the adhesive disposed upon each sheet of material such that at least one portion of the adhesive has a lesser tack while at least one other portion of the adhesive has a greater tack, the portion of the adhesive having a lesser tack having a greater releasability and the portion of the adhesive having a greater tack having a lesser releasability, the plurality of sheets of material connected together via the adhesive disposed thereon and the plurality of sheets of material cooperating to form the pad of sheets of material;
- providing a floral grouping having a flower portion and a stem portion;
- placing the floral grouping on the upper surface of the top sheet of material in the pad;
- wrapping the top sheet of material about the floral grouping forming a floral package comprising the sheet of material and the floral grouping contained therein; and
- disconnecting the sheet of material containing the floral grouping from the pad.

5,533,321
METHOD AND APPARATUS FOR WRAPPING, CRIMPING AND HEADING PAPER ROLLS AT A SINGLE STATION

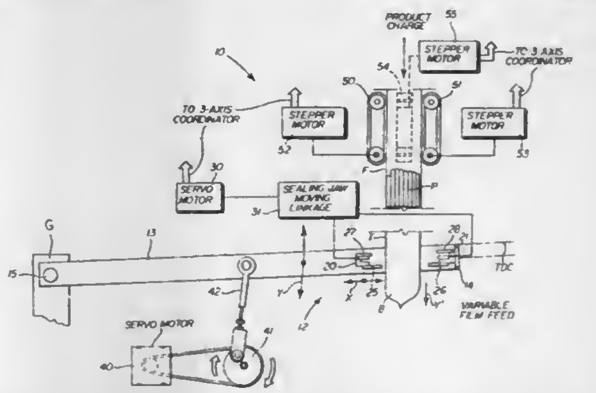
Steven C. Hooper, Hoquiam, and Jon E. Skjonsby, Aberdeen, both of Wash., assignors to Lamb-Grays Harbor Co., Hoquiam, Wash.
Filed Aug. 9, 1995, Ser. No. 512,818
Int. Cl.^{6} B65B *61/00*
U.S. Cl. 53—415 **12 Claims**



1. A single station crimping and heading apparatus for crimping and heading a roll of paper having a wrapper thereon, comprising:
- a set of rotatable rollers for supporting a wrapped roll of paper to be crimped and headed;
- turret mechanisms at opposite ends of said set of rollers;
- said turret mechanisms having two sides, a crimper on one side of said turret mechanism and a head applying device on the second side of said turret mechanism; and
- means for rotating said turret mechanisms for crimping when said one side faces said set of rollers and for applying a head to the end of the paper roll when said second side of said turret mechanism faces said set of rollers.

5,533,322
CONTINUOUS VERTICAL FORM-FILL-SEAL PACKAGING MACHINE WITH CONSTANT MOTION CARRIAGE

Forrest C. Bacon, Conyers, and Gary G. Highberger, Atlanta, both of Ga., assignors to Kliklok Corporation, Decatur, Ga.
Filed Mar. 11, 1994, Ser. No. 212,548
Int. Cl.^{6} B65B *9/00*
U.S. Cl. 53—451 **12 Claims**



1. A film feeding and sealing apparatus for use in packaging product in a bag formed from a continuous tube of film in a form, fill and seal packaging machine, comprising:
- means for feeding said film at a variable rate;
- a carriage;
- means for driving said carriage in a longitudinal direction along said tube in a substantially constant sine wave motion;
- sealing jaw means mounted on said carriage for movement between closed and open positions;

means mounted on said carriage and connecting to said sealing jaw means for selectively moving said sealing jaw means in a first direction toward the closed position for sealing, and moving said sealing jaw means in a second direction toward the open position to release the formed bag; and

control means for varying the movement of said film to track the driving of said sealing jaws in the longitudinal direction to coordinate the relative movement of said film/tube and said carriage for proper bag forming and sizing while maintaining the substantially constant sine wave motion of said carriage;

whereby said film feeding and said sealing is performed in a precise manner while minimizing the effects of inertia on said carriage and to maximize packaging machine speed.

5,533,323

METHOD AND A DEVICE FOR THE FORMATION OF TUBULAR OVERWRAPPINGS IN HEAT-SEALABLE MATERIAL

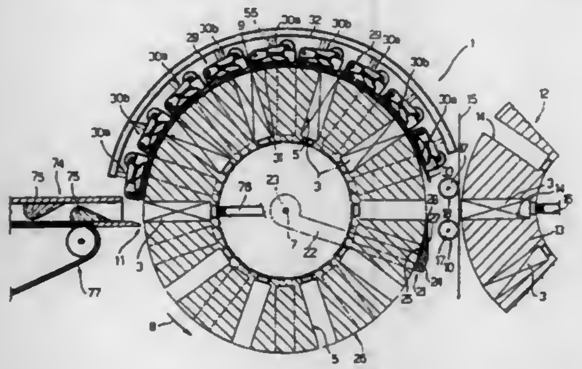
Roberto Osti, Zola Predosa, and Antonio Gamberini, Bologna, both of, Italy, assignors to G. D S.p.A., Bologna, Italy

Filed Nov. 19, 1993, Ser. No. 155,164

Claims priority, application Italy, Nov. 20, 1992, B092A0414

Int. Cl.^{6} B65B *11/00;49/00;11/28*

U.S. Cl. 53—466 **5 Claims**



1. A method for forming tubular overwrappings of heat-sealable material around respective commodities, comprising the steps of:

moving commodities in succession together with respective sheets of overwrapping material in a given feed direction along a conveying path extending between an infeed station and an outfeed station, said commodities remaining distributed at regular intervals along said path;

folding each sheet into a "U" formation around a respective commodity in such a way that a first and a second longitudinal flap of the sheet remain projecting laterally from the commodity, said first projecting longitudinal flap following the second in the feed direction;

folding each first flap against the face of the respective commodity when said commodity is disposed at a determined folding position with a first folding member;

moving said first folding member together with the respective commodity from said folding position generally in said feed direction while maintaining said first flap folded against the face of the respective commodity;

folding each second flap over the respective first flap at a position beyond the folding position in the feed direction with a second folding member;

subjecting each successive first flap to a static pressure directed toward the respective commodity;

moving said first folding member back to said first folding position;

subjecting each second flap to a static pressure directed toward the commodity and the first flap after the first flap is subjected to static pressure; and

securing each second flap to the respective first flap during a first heat seal operation to create a respective tubular overwrapping.

5,533,324

METHOD FOR LOADING LIQUIDS INTO CONTAINERS MADE OF RESINS

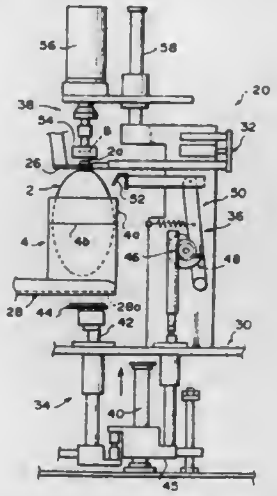
Masahiko Furukawa; Toshio Masuda, and Toru Kenmotsu, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1993, Ser. No. 126,656

Claims priority, application Japan, Oct. 12, 1992, 4-272945

Int. Cl.^{6} B65B *1/04;3/04;35/56*

U.S. Cl. 53—469 **7 Claims**



1. A method for loading liquid into containers made of a resin, comprising the steps of:

providing a plurality of case housings in succession;

providing a plurality of preformed resin film bags in succession, each of said preformed resin film bags having an opening and a bottom, said opening of each bag being independent of the bottom of the next succeeding bag before pouring said predetermined amount of liquid into said preformed bag;

holding a portion of a first bag from said plurality of bags, the portion surrounding the opening;

suspending said first bag in a first case housing configured to accommodate the bag therein;

pouring a predetermined amount of a liquid into said first bag suspended in said first case housing;

moving said first case housing upwardly against said first bag and beyond to attendantly push said first bag up a predetermined distance after completion of pouring the predetermined amount of liquid into said first bag, while the opening remains open, such that an appropriate amount of air remains in said first bag;

closing the opening of said first bag, and

repeating said method to fill subsequent preformed bags in subsequent containers.

5,533,325

ALL WHEEL HYDRAULIC DRIVE SYSTEM

Steve A. Sallstrom, Minnetonka; Gerald E. Goman, Bloomington, and Joel M. Dunlap, Eden Prairie, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Feb. 3, 1994, Ser. No. 192,022

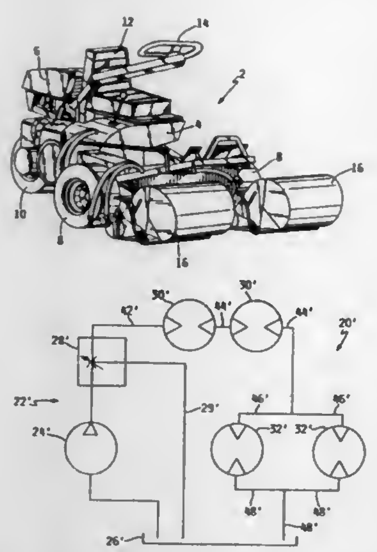
Int. Cl.^{6} A01D *34/44;34/62*

U.S. Cl. 56—7 **25 Claims**

1. A hydraulically driven riding mower having all wheel drive. which comprises:

(a) a frame having an engine;

(b) a plurality of ground engaging wheels attached to the frame for movably supporting the frame for movement over the ground, the wheels comprising a first pair of wheels carried adjacent a front end of the frame and a single rear wheel spaced on the frame from the front wheels and carried adjacent a rear end of the frame to provide a tricycle wheel configuration;



(c) a plurality of cutting units carried on the frame for mowing grass, wherein the cutting units may be engaged with the ground during a mowing operation and when so engaged have at least some of their weight carried by the ground and not the frame; and

(d) a hydraulic drive system for driving the ground engaging wheels of the frame, which drive system comprises:

(i) a source of pressurized fluid which provides a pressurized fluid flow that is available for driving the ground engaging wheels;

(ii) individual hydraulic drive motors operatively engaged to each of the ground engaging wheels of the frame; and

(iii) means for connecting the hydraulic motors to the source of pressurized fluid in the following manner:

the wheel drive motor for the rear wheel is connected in series to the fluid source and to the wheel drive motors for the front wheels in a manner that causes the pressurized fluid flow to pass substantially in its entirety through the wheel drive motor for the rear wheel to provide a maximum tractive effort on the rear wheel for a given pressurized fluid flow regardless of wheel slippage conditions on the front wheels; and

the wheel drive motors for the front wheels being connected to each other in parallel in a manner that causes the pressurized fluid flow to be split when passing through the wheel drive motors for the front wheels.

5,533,326

REEL MOWER

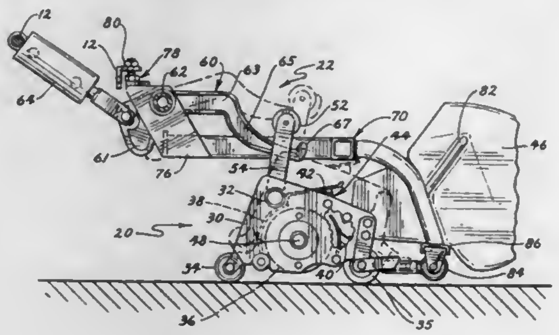
Gerald E. Goman, Bloomington; Malachy Fay, and Joel M. Dunlap, both of Eden Prairie, all of Minn., assignors to The Toro Company, Bloomington, Minn.

Filed Feb. 24, 1995, Ser. No. 394,100

Int. Cl.^{6} A01D *34/44*

U.S. Cl. 56—7 **13 Claims**

2. A turf mower having a cutting mode comprising:



(a) a traction vehicle;

(b) a reel-type cutting unit supported by a rear roller and a front roller and comprising a reel having a centerline; and

(c) a cutting unit suspension system connected to the traction vehicle and comprising a single cutting unit joint located forward of the front roller and below the reel centerline, wherein the cutting unit joint constitutes the sole load-carrying connection between the cutting unit suspension system and the cutting unit when the turf mower is in its cutting mode, and wherein the cutting unit joint permits rolling, yawing and pitching of the cutting unit relative to the cutting unit suspension system.

5,533,327

PREFORMING HEAD FOR MAKING ROPES AND CABLE ARMOR

Eckehard Albert, Berlin, Germany, assignor to Witels Apparate-Maschinen Albert GmbH & Co KG, Berlin, Germany

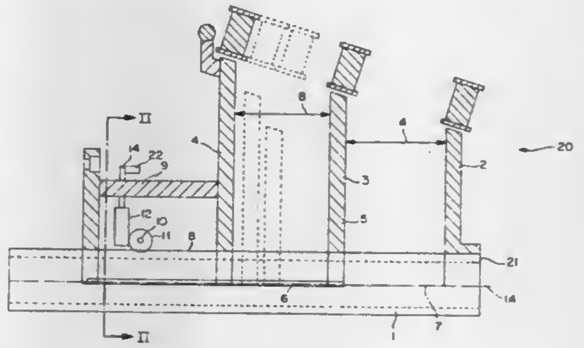
Filed Apr. 28, 1994, Ser. No. 234,569

Claims priority, application Germany, Apr. 29, 1993, 43 14 172.2

Int. Cl.^{6} D01H *13/26;* **D02G** *3/36*

U.S. Cl. 57—311 **9 Claims**

1. A preforming head for making ropes and cable armor, comprising: an axially-extending tube with an end;



a front preforming disk fixedly and coaxially mounted on said end;

a middle preforming disk and a rear preforming disk displaceably mounted on said tube, said middle disk having a diameter larger than the front disk and smaller than the rear disk; and

means for moving said middle and rear disks relative to said front disk and said tube so that a first distance, between the front disk and the middle disk, remains substantially equal to a second distance, between the middle disk and the rear disk. wherein said rear disk is moved twice as far as said middle disk, said means for moving comprising:

(i) a first gear rack fixedly attached to said tube;

(ii) a second gear rack movably connected to said tube and disposed parallel to said first gear rack, said middle disk being mounted on an end of said second gear rack closest to said front disk;

(iii) a gear engaging each of said first and second gear racks, the gears being rotatably supported on said rear disk;

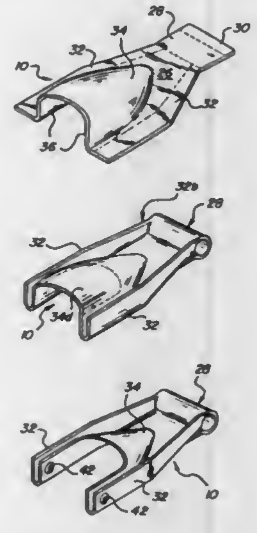
(iv) a transmission coupling said gears together; and

(v) drive means for rotating one of the gears.

5,533,328
METHOD OF FORMING A CLEVIS LINK

Mark Zmyslowski, Grosse Pointe Shores, and Erik W. Larson, Birmingham, both of Mich., assignors to Radar Industries, Inc., Roseville, Mich.

Division of Ser. No. 18,292, Feb. 16, 1993, Pat. No. 5,435,661.
This application Jul. 25, 1995, Ser. No. 507,004
Int. Cl.^{6} B21L *11/00;* **B60K** *11/00*
U.S. Cl. 59—15 **6 Claims**



1. A method of forming a stamped link from a single piece of sheet metal, said link having forward and rearward pivot axes at the forward and rearward ends of the link extending generally perpendicular to the lengthwise axis of the link, said method comprising the steps of:

forming a bubble between the longitudinal side edges of the piece extending from the forward end of the piece to a location spaced from the rearward end of the piece so as to form laterally spaced upwardly extending side walls proximate the forward end of the piece spaced inboard from the respective longitudinal side edges of the piece;

forming the rearward end of the piece into a curl to form a first bearing surface defining said rearward pivot axis;

bending the longitudinal side edges of the piece upwardly to form an edge flange positioned proximate the forward end of the piece outboard of each side wall; and

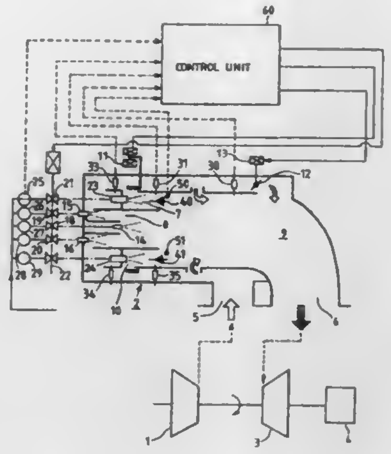
forming aligned holes in each edge flange and its associated side wall to form a second bearing surface defining said forward pivot axis.

5,533,329
CONTROL APPARATUS FOR AND CONTROL METHOD OF GAS TURBINE

Yoshishige Ohyama; Yutaka Nishimura, both of Katsuta; Yoshio Sato, Hitachi; Motohisa Nishihara, Katsuta; Shigeru Azuhata, Hitachi, and Kazuyuki Ito, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1994, Ser. No. 240,363
Claims priority, application Japan, May 17, 1993, 5-114959
Int. Cl.^{6} F02C *9/16;9/50*
U.S. Cl. 60—39.03 **13 Claims**

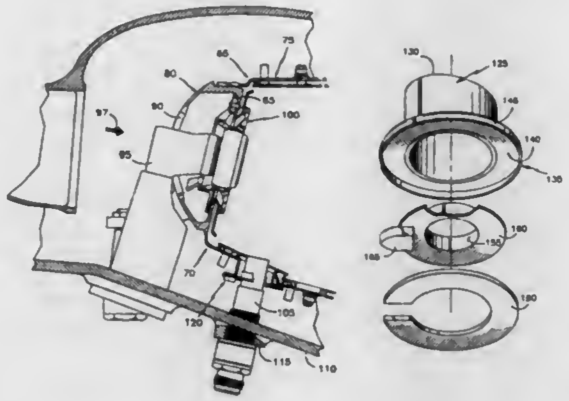
1. A control apparatus for a gas turbine having an air flow control valve for controlling a flow rate of combustion air in an air flow passage from a compressor to the gas turbine, comprising: at least an air velocity or flow sensor arranged upstream of said air flow control valve in the vicinity of said air flow control valve, and control means for controlling an opening of a fuel flow regulation valve and/or said air flow control valve on the basis of a signal from said air velocity or flow sensor, thereby to control an air fuel ratio in a combustion section of the gas turbine.



5,533,330
IGNITOR PLUG GUIDE FOR A GAS TURBINE ENGINE COMBUSTOR

John F. Mullooly, Stafford Springs; Franklin J. Davis, Glastonbury; Thomas J. Madden, Vernon, and Richard R. Wright, Willimantic, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1993, Ser. No. 172,968
Int. Cl.^{6} F02C *7/264;7/20*
U.S. Cl. 60—39.32 **6 Claims**



1. A guide for an ignitor plug employed in the combustor of a gas turbine engine, said guide comprising a generally cylindrical sleeve adapted for fixture to a wall of said combustor in registry with an aperture in said wall, said ignitor plug being received through said wall, said guide further comprising a bushing received within said sleeve, which engages, along an interior lateral surface thereof, an exterior lateral surface of said ignitor plug, said guide being characterized by:

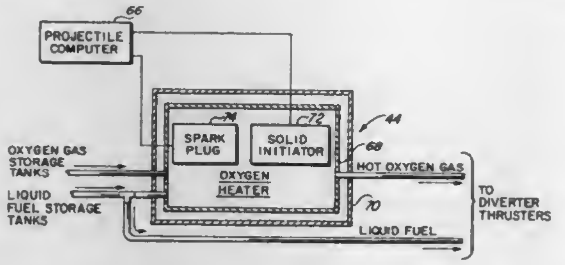
said sleeve terminating in a hollow, slotted and flanged base;

said bushing having a ranged base including a lug received within said slot in said flanged sleeve base to prevent relative rotation between said bushing and said sleeve and attendant damage to said ignitor plug therefrom.

5,533,331
SAFE PROPULSION SYSTEM FOR MISSILE DIVERT THRUSTERS AND ATTITUDE CONTROL THRUSTERS AND METHOD FOR USE OF SAME

John G. Campbell, Northridge, and Daniel W. Ruttle, Panorama City, both of Calif., assignors to Kaiser Marquardt, Inc., Foster City, Calif.

Filed May 25, 1994, Ser. No. 249,429
Int. Cl.^{6} F02K *9/42*
U.S. Cl. 60—204 **11 Claims**



1. A method of igniting fuel fluid in a propulsion system, comprising:

a) storing a supply of fuel fluid in a fuel storage tank;

b) storing a supply of oxidant fluid in an oxidant storage tank;

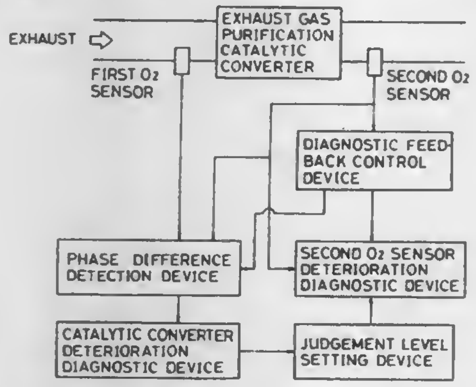
c) heating the oxidant fluid above the ignition temperature of the fuel fluid in an oxidant heater; and

d) supplying heated oxidant fluid from said oxidant heater and said fuel fluid from said fuel storage tank to a combustion chamber wherein said heated oxidant fluid and said fuel fluid impinge to thereby ignite the fuel fluid and produce thrust.

5,533,332
METHOD AND APPARATUS FOR SELF DIAGNOSIS OF AN INTERNAL COMBUSTION

Akira Uchikawa, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Sep. 1, 1994, Ser. No. 299,489
Claims priority, application Japan, Sep. 2, 1993, 5-215905
Int. Cl.^{6} F01N *3/20*
U.S. Cl. 60—274 **13 Claims**


EXHAUST
EXHAUST GAS PURIFICATION CATALYTIC CONVERTER
FIRST O2 SENSOR
SECOND O2 SENSOR
DIAGNOSTIC FEEDBACK CONTROL DEVICE
PHASE DIFFERENCE DETECTION DEVICE
SECOND O2 SENSOR DETERIORATION DIAGNOSTIC DEVICE
CATALYTIC CONVERTER DETERIORATION DIAGNOSTIC DEVICE
JUDGEMENT LEVEL SETTING DEVICE

1. An apparatus for self diagnosis of an internal combustion engine, said apparatus comprising;

first and second oxygen sensors with output values which vary depending on oxygen concentration in an exhaust gas, respectively provided upstream and downstream of an exhaust gas purification catalytic converter arranged in an exhaust passage of the engine,

diagnostic feedback control means for feedback control of a fuel supply quantity to the engine based only on an output value of the downstream second oxygen sensor, so that an-air-fuel ratio of an engine intake mixture approaches a target air-fuel ratio,

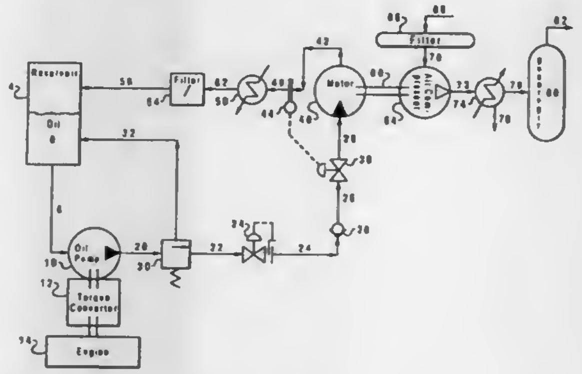
phase difference detection means for detecting a phase difference between the output value of the upstream first oxygen sensor and the output value of the downstream second oxygen sensor during feedback control by said diagnostic feedback control means, and

catalytic converter deterioration diagnosis means for diagnosing depending on the phase difference detected by said phase difference detection means, if there is a deterioration of the exhaust gas purification catalytic converter.

5,533,333
METHOD AND REGULATOR FOR REGULATING THE AIR PRESSURE OF A PRESSURIZED VESSEL

Gregory T. Pullar, Bellingham; Robin B. Christensen, Ferndale, and Lester J. Okonek, Bellingham, all of Wash., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 29, 1994, Ser. No. 236,597
Int. Cl.^{6} F16D *31/00;31/02;* **F15B** *11/08*
U.S. Cl. 60—327 **18 Claims**



1. A method of controlling the air pressure of compressed air in an air reservoir which serves as a source of motive compressed air for an air driven device, said method comprising:

supplying oil from an oil reservoir to an oil pump;

driving said oil pump by a prime mover to produce pump discharge pressurized oil;

applying said pump discharge pressurized oil to drive an oil driven motor comprising an output power shaft;

returning spent oil from said oil driven motor to said oil reservoir by use of a spent oil return line;

controlling and varying the rate of flow of said pump discharge pressurized oil to said oil driven motor by use of a flow controller;

sensing the pressure of said oil discharged into said oil return line from said oil driven motor;

based on said sensed pressure of said discharged oil, controlling the pressure of said pressurized oil of said pump discharge at varying rates of flow of said pressurized oil to said oil driven motor by use of a pressure controller to drive said oil driven motor at desired speed levels; and,

driving an air compressor by said output power shaft of said oil driven motor to provide compressor effluent compressed air to said air reservoir.

8. A regulator to control the air pressure of an air reservoir which serves as a source of motive compressed air for an air driven device, said regulator comprising:

an oil reservoir containing oil and comprising an oil outlet line;

an oil driven motor comprising an output power shaft and comprising a motor oil feed line;

an oil return line from said oil driven motor to said oil reservoir;

an oil pump having, as pump suction, oil from said oil outlet line of said oil reservoir, and having, as pump discharge, pressurized oil to said motor oil feed line;

a flow controller positioned in said motor oil feed line and adapted to vary and control the rate of flow of said pump discharge pressurized oil to said oil driven motor;

a pressure sensor located in said oil return line from said oil driven motor;

a pressure controller positioned in said motor oil feed line, said pressure controller being operably connected to said pressure sensor and, based on said pressure sensed by said pressure sensor, adapted to control the pressure of said pressurized oil of said pump discharge at varying rates of flow of said pressurized oil to said oil driven motor;

a check valve positioned in said motor oil feed line and adapted to prevent reverse flow of oil from said oil driven motor toward said oil pump; and,

an air compressor which is driven by said output power shaft of said oil driven motor and which provides effluent compressed air to said air reservoir.

5,533,334
PRESSURIZED FLUID SUPPLY SYSTEM

Masamitsu Takeuchi; Kazunori Ikei; Tadao Karakama; Mitsumasa Akashi; Teruo Akiyama; Jun Maruyama, and Keisuke Taka, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

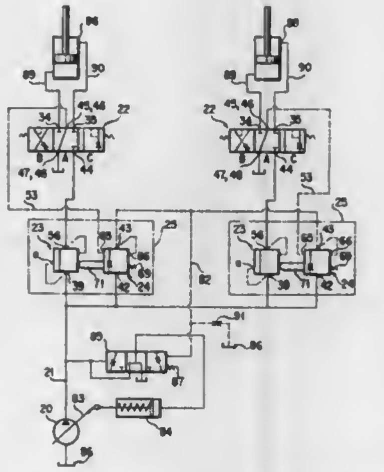
PCT No. PCT/JP93/00452, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/21446, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 8, 1993, Ser. No. 302,912

Claims priority, application Japan, Apr. 8, 1992, 4-29640 U; May 29, 1992, 4-161925; May 29, 1992, 4-161926

Int. Cl.^{6} F16D *31/02*

U.S. Cl. 60—426 **12 Claims**



4. A pressurized fluid supply system for distributing pressurized fluid from a pressurized fluid source to a first hydraulic load and to a second hydraulic load at first and second line pressures depending upon respective load pressures, the pressurized fluid supply system comprising:

first valve means for supplying said first line pressure to said first hydraulic load;

second valve means for supplying said second line pressure to said second hydraulic load;

first load pressure introducing means connected to said first hydraulic load for introducing a first load pressure;

second load pressure introducing means connected to said second hydraulic load for introducing a second load pressure;

first line pressure generating means disposed between said pressurized fluid source and said first valve means and connected to said first load pressure introducing means for generating a first line pressure on the basis of a supply pressure supplied from said pressurized fluid source and said first load pressure for supplying said first valve means with the first line pressure;

second line pressure generating means disposed between said pressurized fluid source and said second valve means and connected to said second load pressure introducing means for generating a second line pressure on the basis of a supply pressure supplied from said pressurized fluid source and said second load pressure for supplying said second valve means with the second line pressure; and

discharge pressure control means for controlling discharge pressure of said pressurized fluid source depending upon the first and second line pressures generated by said first and second line pressure generating means;

wherein said first and second line pressure generating means comprise pressure compensation valves, each pressure compensation valve having a check valve portion and a pressure reduction valve portion; and

wherein said pressure reduction valve portion of each of said pressure compensation valves comprises a load pressure feedback chamber and a supply pressure chamber opposing opposite ends of a pressure reduction valve body, and shifting said pressure reduction valve body depending upon the load pressure introduced via a corresponding one of said first and second load pressure introducing means for establishing and blocking communication between said supply pressure chamber and said pressurized fluid source to generate a pilot pressure to be supplied to said discharge pressure control means.

5,533,335
CAM DRIVING APPARATUS FOR A STIRLING CYCLE MODULE

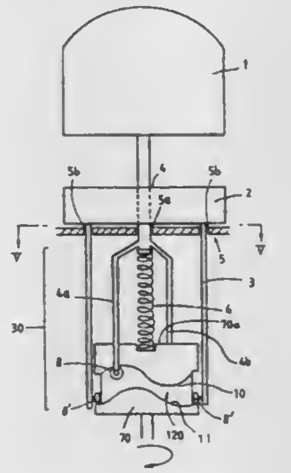
Dong-Koo Shin, Kyungki-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,607

Claims priority, application Rep. of Korea, Nov. 4, 1993, 23340/1993

Int. Cl.^{6} F02G *1/043*

U.S. Cl. 60—517 **4 Claims**



1. A cam driving apparatus for a Stirling cycle module, comprising:

displacer means, disposed inside a cylinder, for controlling a flow of active gas in a cylinder of a Stirling cycle module;

piston means, associated with the displacer, for controlling a flow of active gas in a cylinder of a Stirling cycle module;

a rotary cylindrical cam means with a single cam groove having varying with formed circumferentially thereon and having an upper cam curve profile formed by an upper edge of said groove and a lower cam curve profile formed by an lower edge of said groove, said groove having a predetermined depth;

displacer connecting rod means for drivingly connecting the cylindrical cam means and the displacer means, including displacer connecting rod bearings at driving ends thereof for engaging said upper cam curve profile; and

piston connecting rod means, drivingly connecting the cylindrical cam means and the piston means and including piston connecting rod bearing at driving ends thereof for engaging said lower cam curve profile.

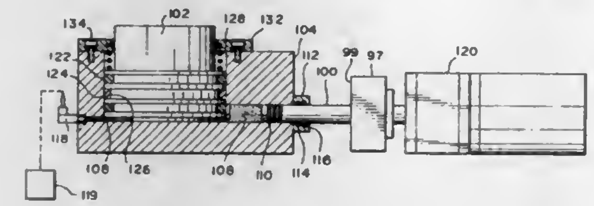
5,533,336
HYDROELECTRIC CYLINDER FOR IMPROVED POWER AMPLIFICATION AND CONTROL

Ho B. Kiat, and Tan H. Choy, both of Singapore, Singapore, assignors to Advanced Systems Automation Pte Ltd, Singapore, Singapore

Filed Mar. 17, 1994, Ser. No. 210,307

Int. Cl.^{6} F15B *7/00;* **B30B** *1/08*

U.S. Cl. 60—533 **8 Claims**



1. In a press for achieving enhanced control in power amplification including a computer, a programmable logic control, a servo motor controller, and at least a driver, said servo motor controller being coupled to said computer and said programmable logic control respectively, said servo motor controller being further coupled to said driver, said press comprising:

a cylinder having a first piston disposed therein, one end of said piston terminating in a fixed volume of hydraulic fluid, the other end of said piston terminating in a spring;

a motor coupled to a screw and nut for delivering force to at least a second piston disposed within said fixed volume; and

a sensor coupled to said fixed volume and said programmable logic control for delivering linear drive on the advance and return stroke of said first piston respectively.

5,533,337
FEED WATER SUPPLY SYSTEM OF POWER PLANT

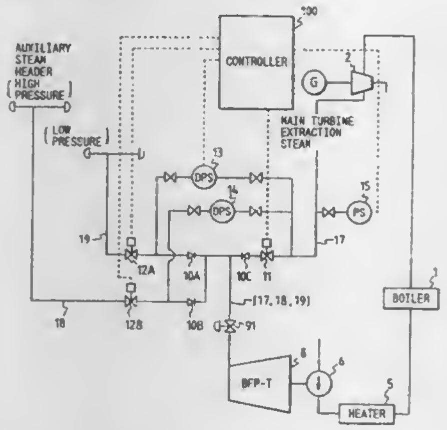
Yosio Kusayama, Naka-gun, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 279,119

Claims priority, application Japan, Jul. 23, 1993, 5-182425

Int. Cl.^{6} F01R *13/02*

U.S. Cl. 60—656 **3 Claims**



1. A feed water supply system for a power plant in which feed water is supplied into a steam generator to generate steam, the steam is fed to a main turbine to drive an electric generator, and a feed water pump for supplying feed water into the steam generator is arranged so as to be driven by a feed water pump turbine driven with steam, said feed water supply system comprising main turbine extraction steam pipings for passage of main turbine extraction steam, high pressure auxiliary steam pipings for passage of high pressure steam, and low pressure auxiliary steam pipings for passage of low pressure steam for steam supply for driving said feed water pump turbine, and means for switching the driving of said feed water pump turbine at a time of normal starting of the plant from said low pressure auxiliary steam pipings to said main turbine extraction steam pipings, and for switching the driving said feed water pump turbine at a time of rapid restarting of the plant after stopping of said electric generator from said high pressure auxiliary steam pipings to said main turbine extraction steam pipings.

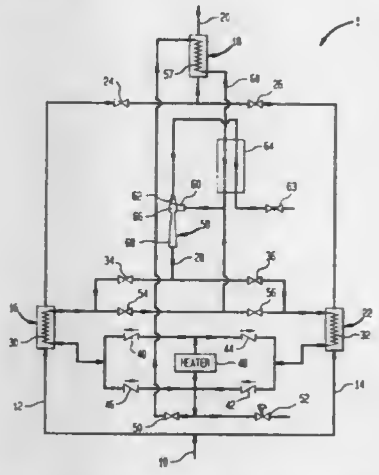
5,533,338
CRYOGENIC VAPOR RECOVERY PROCESS AND SYSTEM

Ron C. Lee, Bloomsbury; Michael D. Heil, Hoboken; Michael T. Downey, Bridgewater, and Michael J. Barrasso, Westfield, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Mar. 21, 1995, Ser. No. 407,818

Int. Cl.^{6} F25J *5/00*

U.S. Cl. 62—638 **20 Claims**



1. A cryogenic vapor recovery process for removing condensable vapors contained within a gas stream, said process comprising:

condensing said condensable vapors from said gas stream by indirectly exchanging heat from said gas stream to a refrigerant stream, thereby producing a refrigerated gas stream and a heated refrigerant stream;

indirectly exchanging further heat from at least part of said heated refrigerant stream to said refrigerated gas stream to form a cooled refrigerant stream from said heated refrigerant stream; and

producing said refrigerant stream by combining a cryogenic stream with at least part of said cooled refrigerant stream.

5,533,339
AIR SEPARATION

Stephen R. Clare, Bognor Regis; Paul Higginbotham, Guildford, and David M. Stuart, Thornton Hill, all of, United Kingdom, assignors to The BOC Group plc, Windlesham Surrey, England

Filed May 22, 1995, Ser. No. 445,632

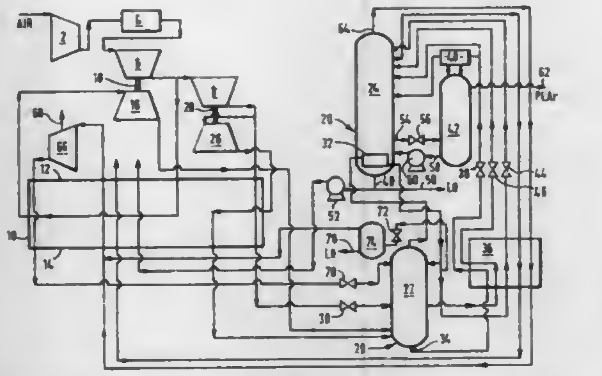
Claims priority, application United Kingdom, May 27, 1994, 9410686

Int. Cl.^{6} F25J *3/04*

U.S. Cl. 62—654 **9 Claims**

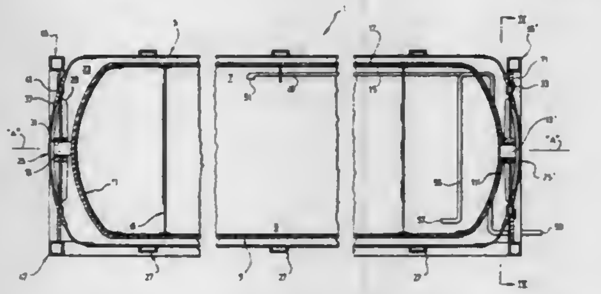
1. A method of separating air comprising:

compressing and purifying the air;



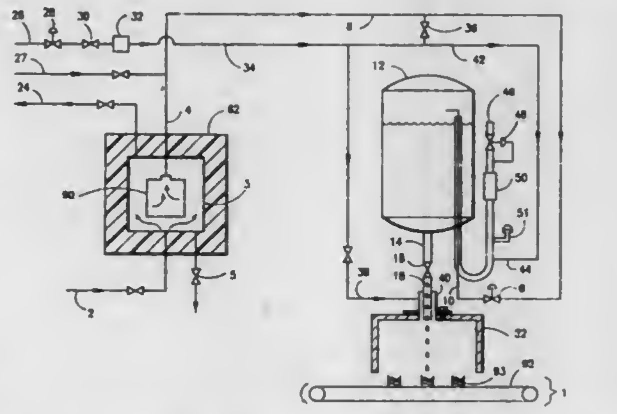
fractionating a first stream of the compressed purified air in a higher pressure column of a double rectification column comprising said higher pressure column and a lower pressure column;
condensing, by indirect heat exchange with oxygen-rich fluid separated in the lower pressure column, nitrogen vapour separated in the higher pressure column and employing a first stream of the resulting condensate as reflux in the higher pressure column and a second stream of the resulting condensate as reflux in the lower pressure rectification column;
withdrawing a proportion of oxygen-and/or nitrogen-rich products from the double rectification column in liquid state;
separating in an argon column a stream of argon-enriched fluid withdrawn from the lower pressure column so as to obtain argon-rich vapour;
condensing at least some of the said argon-rich vapour and employing at least some of the resulting argon-rich condensate in the argon column as reflux;
withdrawing an argon-rich product stream from the argon column; and
forming liquid nitrogen by warming in indirect heat exchange, a stream of nitrogen withdrawn from the double rectification column, compressing said warmed stream of nitrogen, cooling by indirect heat exchange the compressed stream of nitrogen, and reducing the pressure of the cooled, compressed stream of nitrogen.

5,533,340
DOUBLE-WALLED CONTAINER FOR TRANSPORTING AND STORING A LIQUIFIED GAS
Elie W. Shama; Bertrand Legrand, and Dominique Kluyskems, all of Quebec, Canada, assignors to Hydro-Quebec; Econoden Inc., both of Montreal, and FRE Composites Inc., Quebec, all of, Canada
Filed Apr. 12, 1994, Ser. No. 225,996
Int. Cl.^{6} F17C *1/00*
U.S. Cl. 62—45.1 **22 Claims**



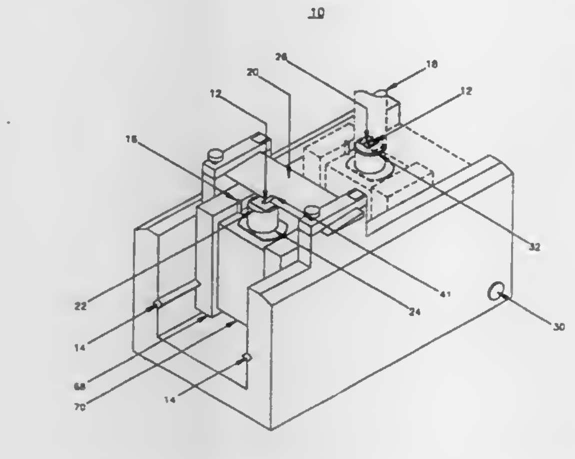
1. A double-walled container for transporting and storing a liquified gas at low temperature, said container comprising:
an inner liquified gas holding vessel having a longitudinal axis and a pair of opposite ends on said longitudinal axis;
an outer shell enclosing said inner vessel, said outer shell being coaxial with said vessel and of such a size as to provide a closed insulated space all around said inner vessel, said outer shell being made of a composite material containing fibers selected from the group consisting of glass fibers, carbon fibers and mixtures thereof, and having a pair of opposite ends on said longitudinal axis;
said inner vessel being suspended by its opposite ends within said outer shell, one of said opposite ends of said vessel being rigidly connected to the adjacent end of the shell while the other opposite end of said vessel is slidably connected to the other adjacent end of the shell so as to allow thermal expansion of said inner vessel and outer shell with respect to each other;
means at the opposite ends of said outer shell for supporting and handling said double-walled container;
a closable feeding pipe passing through said outer shell and said inner vessel for introducing liquified gas within said inner vessel; and
a closable exit pipe through said inner vessel and said outer shell for draining said liquified gas off from said inner vessel.

5,533,341
APPARATUS AND METHOD FOR PRODUCING AND INJECTING STERILE CRYOGENIC LIQUIDS
Pascal Schvester, Chicago, and Richard A. Sauer, Hinsdale, both of Ill., assignors to Air Liquide America Corporation, Houston, Tex.
Filed Jun. 7, 1995, Ser. No. 475,998
Int. Cl.^{6} F17C *7/02*
U.S. Cl. 62—50.1 **19 Claims**



1. An apparatus for producing and injecting a sterile cryogenic liquid, the apparatus comprising:
- (a) at least one purge-swept cryogenic liquid filter, each comprising:
  - (i) a filter housing,
  - (ii) a non-sterile cryogenic liquid inlet which accepts non-sterile cryogenic liquid from a source,
  - (iii) a non-sterile cryogenic liquid purge stream outlet,
  - (iv) a sterile cryogenic liquid outlet, the inlet and both outlets connected to the filter housing, and
  - (v) filter media having the capability to effectively sterilize cryogenic liquids, the filter media positioned within the housing to accept non-sterile cryogenic liquid and produce sterile cryogenic liquid;
- (b) at least one sterile cryogenic liquid accumulator having a sterile cryogenic liquid inlet which receives sterile cryogenic liquid from at least one filter via the sterile cryogenic liquid outlet, the sterile cryogenic liquid inlet having a first sterile cryogenic liquid passageway and a first sterile cryogenic gas passageway; and
- (c) the sterile cryogenic liquid accumulator comprising a sterile cryogenic liquid outlet for dispensing sterile cryogenic liquid, the sterile cryogenic liquid outlet having a second passageway for sterile cryogenic liquid and a second passageway for a sterile cryogenic gas, whereby sterile cryogenic gas may be delivered through the second sterile cryogenic gas passageway and substantially prevent contact of the sterile cryogenic liquid with a non-sterile atmosphere during dispensing of same.

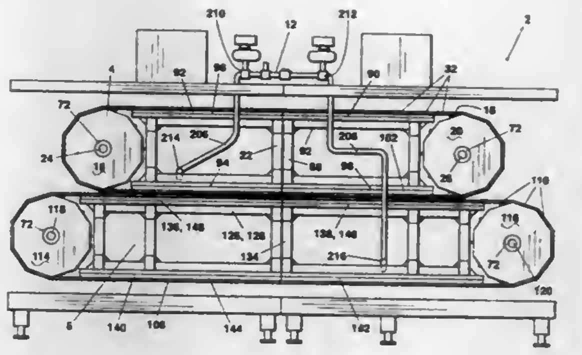
5,533,342
SEMI-AUTOMATED CRYOSTAT
Abe Gordon, 512 Warwick Ave., Teaneck, N.J. 07666
Filed Feb. 8, 1995, Ser. No. 386,814
Int. Cl.^{6} F25B *19/00;* F25C *5/02;* G01N *1/06;* B26D *7/08*
U.S. Cl. 62—51.1 **39 Claims**



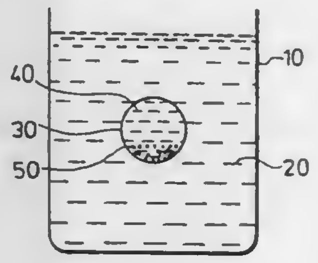
1. An integral apparatus for freezing a specimen and for cutting a section therefrom having a predefined Y-axis and Z-axis comprising:
a specimen block holder for holding said specimen;
a freezing plane orthogonal to the Z-axis for providing direct metal contact freezing of said specimen;
a microtome slidable in the Y-axis direction and including a knife positioned at parallel distance Z_3 in the Z-axis direction from said freezing plane;
Z-axis driving means for transferring said block holder from said freezing plane to a position displaced from said knife by a preselected section thickness along the Z-axis; and
Y-axis driving means for transporting said block holder in a Y-axis direction so that said knife cuts said section from said specimen having said preselected section thickness.

5,533,343
FREEZING SYSTEM
Mark W. Moshier, Fayetteville, Ark.; John C. Haley, Pittsburg, Mo.; Bobby Z. Haley, Fayetteville, and Stanley B. Andrews, Springdale, both of Ark., assignors to Tyson Holding Company, Springdale, Ark.
Continuation of Ser. No. 271,497, Jul. 7, 1994. This application Sep. 20, 1994, Ser. No. 309,263
Int. Cl.^{6} F25D *13/06;17/02;25/04*
U.S. Cl. 62—63 **30 Claims**

1. A method of freezing an individual, unpackaged, chicken breast fillet having a nonuniform original thickness profile, said method comprising the step of compressing said chicken breast fillet between a cooled first contacting surface and a cooled second contacting surface for a time effective for at least partially freezing said chicken breast fillet such that an at least partially frozen chicken breast fillet product is formed which has a substantially uniform thickness profile and does not substantially return to said nonuniform original thickness profile when thawed.

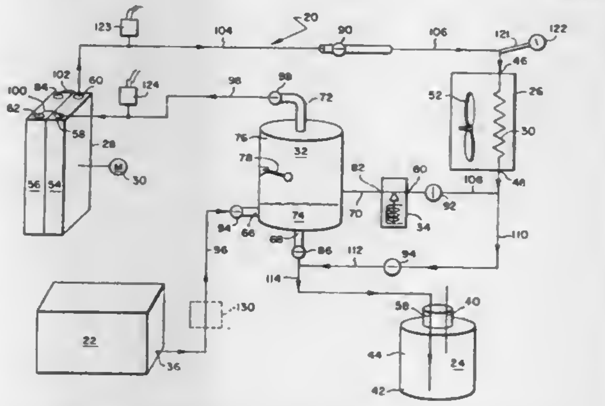


5,533,344
METHOD FOR RAPIDLY SOLIDIFYING WATER IN A CONTAINER
Shi-Chin Duh, 1F, No. 28, Lane 147, Sec. 1, Chi-Lund Rd., Taipei City, Taiwan
Filed Apr. 24, 1995, Ser. No. 427,435
Int. Cl.^{6} F25C *1/00*
U.S. Cl. 62—66 **3 Claims**



1. A method for rapidly solidifying water in a container, comprising the steps of:
disposing a predetermined amount of sand in said container which contains water; and
solidifying said water in said container.

5,533,345
REFRIGERANT RECOVERY SYSTEMS EMPLOYING SERIES/PARALLEL PUMPS
Robert J. Roth, La Crosse, Wis., assignor to American Standard Inc., Piscataway, N.J.
Filed Aug. 12, 1994, Ser. No. 289,828
Int. Cl.^{6} F25B *45/00*
U.S. Cl. 62—77 **11 Claims**



3. A method of transferring refrigerant from a first vessel to a second vessel comprising the steps of:

establishing and operating a first system configuration to transfer refrigerant from the first vessel to a transfer tank;

establishing and operating a second system configuration to produce a partial vacuum in the first vessel and thereby transfer refrigerant vapor to the transfer tank;

establishing and operating a third system configuration to transfer liquid refrigerant from the transfer tank to the second vessel; and

establishing and operating a fourth system configuration to condense vapor in the first vessel and to add the condensate therefrom to a liquid reservoir in the transfer tank.

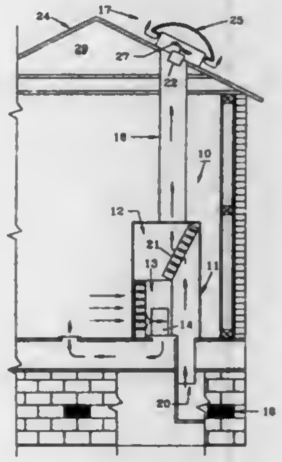
5,533,346
HEAT PUMP AND METHOD

John O. Freeman, Killen, Ala.; Richard H. Howse, Morehead, Ky., and Tim Reinhart, French Lick, Ind., assignors to Consolidated Technology Corp., Olive Hill, Ky.

Filed Jun. 1, 1994, Ser. No. 252,218

Int. Cl.⁶ F25D *17/06*

U.S. Cl. 62—89 **15 Claims**



1. A heat pump for heating and cooling of air within a building having a roof and a foundation, said heat pump being the interior, two compartment type wherein one compartment houses a condensor-evaporator which acts as a condensor during the cooling cycle and the other compartment housing a condensor-evaporator which acts as an evaporator during the cooling cycle, the improvement comprising: an exhaust conduit, said exhaust conduit in communication with said heat pump, an exhaust fan, said exhaust fan in fluid communication with said exhaust conduit, said exhaust fan positioned on said building roof whereby exhaust air will pass from said heat pump through said exhaust conduit.

5,533,347
METHOD OF REFRIGERATION CASE CONTROL

James H. Ott, Akron; Mark E. Anglin, Wadsworth, and James P. Henderson, Tallmadge, all of Ohio, assignors to Novar Electronics Corporation, Barberton, Ohio

Continuation-in-part of Ser. No. 173,614, Dec. 22, 1993, Pat. No. 5,460,008. This application Mar. 1, 1995, Ser. No. 396,698

Int. Cl.⁶ F25B *41/00*

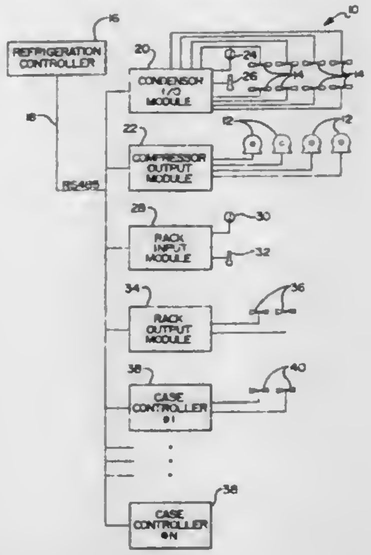
U.S. Cl. 62—115 **27 Claims**

1. A method of controlling a refrigeration case of a refrigeration system, the method comprising the steps of:

setting an expansion valve of a refrigeration case to a predetermined position;

moving the expansion valve of the refrigeration case out of the predetermined position;

sampling temperature readings from an evaporator coil of the refrigeration case;



calculating an adaptive proportional-integral-differential (PID) of the temperature of the evaporator coil for the refrigeration case; and

moving the expansion valve to a second position closer to the predetermined position based on the calculated proportional-integral-differential until the temperature of the evaporator coil for the refrigeration case is within a predetermined temperature range.

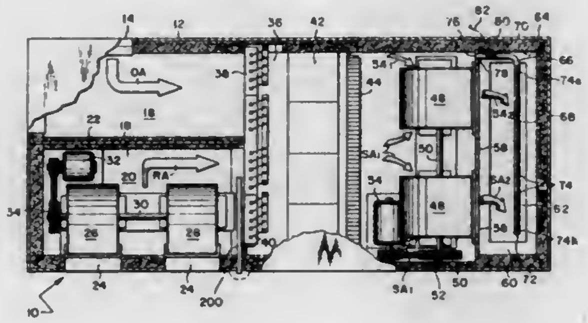
5,533,348
AVERAGE AIR TEMPERATURE SENSOR

Joe M. Baldwin, and Dale C. Cotton, both of Clarksville, Tenn., assignors to American Standard Inc., Piscataway, N.J.

Filed Aug. 26, 1994, Ser. No. 296,850

Int. Cl.⁶ F25B *49/02*

U.S. Cl. 62—129 **25 Claims**



1. In an air conditioning unit having a high pressure region and a low pressure region, a temperature sensor for sensing the average temperature of the air flow in the high pressure region, comprising:

a conveying device having structure defining an air passageway and spanning a substantial portion of the high pressure region, said structure defining a plurality of air inlets opening into said air passageway, the conveying device including an air outlet at a downstream end of said air passageway, the air outlet being fluidly coupled to the low pressure region; and

a sensor sensing air temperature disposed downstream of said air inlets and in a temperature sensing relationship to the conveying device such that the temperature of air flowing from said air inlets in said air passageway affects said air temperature sensor wherein the high pressure in the high pressure region induces a flow of air into the air inlets and through the air passageway to exhaust through the air outlet into the low pressure region.

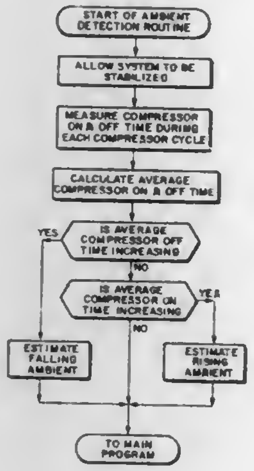
5,533,349
DETERMINATION OF AMBIENT AIR TEMPERATURE OUTSIDE OF AN APPLIANCE

Joseph R. Gromala, Roselle, and Yu T. Nguyen, Glendale Heights, both of Ill., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 16, 1994, Ser. No. 357,931

Int. Cl.⁶ G05D *23/00*

U.S. Cl. 62—129 **12 Claims**


START OF AMBIENT DETECTION ROUTINE
ALLOW SYSTEM TO BE STABILIZED
MEASURE COMPRESSOR ON & OFF TIME DURING EACH COMPRESSOR CYCLE
CALCULATE AVERAGE COMPRESSOR ON & OFF TIME
YES
IS AVERAGE COMPRESSOR OFF TIME INCREASING
NO
IS AVERAGE COMPRESSOR ON TIME INCREASING
YES
NO
ESTIMATE FALLING AMBIENT
ESTIMATE RISING AMBIENT
TO MAIN PROGRAM

1. A method of establishing a program for determining the ambient temperature of air in an area surrounding an appliance, including a cold producing element, said method comprising the steps of:

establishing a first interior temperature set point for said appliance;

establishing a first exterior ambient temperature for said appliance;

establishing a second exterior ambient temperature for said appliance;

measuring first, the on and off times of said cold producing element for said first internal temperature set point and said first external ambient temperature condition;

measuring second, the on and off times of said cold producing element for said second internal temperature set point and said first external ambient temperature condition;

measuring third, the on and off times of said cold producing element for said first internal temperature set point and said second external ambient temperature condition;

measuring fourth, the on and off times of said cold producing element for said second internal temperature set point and said second external ambient temperature condition;

calculating from said first, second, third and fourth measurements, the average on times of said cold producing element for each of said measurements;

calculating the average off times of said cold producing element from said first, second, third and fourth measurements for each of said measurements;

establishing a graph and supporting equations based on the above average calculated on and off times to facilitate the determination of ambient temperatures in environments where the exterior temperature is not controlled.

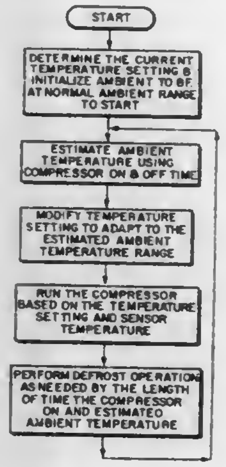
5,533,350
DEFROST CONTROL OF A REFRIGERATION SYSTEM UTILIZING AMBIENT AIR TEMPERATURE DETERMINATION

Joseph R. Gromala, Roselle, and Yu T. Nguyen, Glendale Heights, both of Ill., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 16, 1994, Ser. No. 357,928

Int. Cl.⁶ F25D *21/06*

U.S. Cl. 62—155 **7 Claims**


START
DETERMINE THE CURRENT TEMPERATURE SETTING & INITIALIZE AMBIENT TO BE AT NORMAL AMBIENT RANGE TO START
ESTIMATE AMBIENT TEMPERATURE USING COMPRESSOR ON & OFF TIME
MODIFY TEMPERATURE SETTING TO ADAPT TO THE ESTIMATED AMBIENT TEMPERATURE RANGE
RUN THE COMPRESSOR BASED ON THE TEMPERATURE SETTING AND SENSOR TEMPERATURE
PERFORM DEFROST OPERATION AS NEEDED BY THE LENGTH OF TIME THE COMPRESSOR ON AND ESTIMATED AMBIENT TEMPERATURE

1. A method of controlling frost build-up in an appliance including a cold producing element, and a microcontroller, said method comprising the steps of:

determining the current temperature setting of said appliance;

establishing an estimated external ambient temperature;

measuring the on times of said cold producing element;

measuring the off times of said cold producing element;

estimating the ambient temperature at said off time measurement and at said on time measurement of said cold producing element by utilizing information stored in said microcontroller;

operating said cold producing element in response to said temperature setting and temperature sensed within said appliance;

initiating a defrost operation for a length of time said cold producing element has been operated and said estimated ambient temperature.

5,533,351
AIR CONDITIONER

Kenji Miyata; Hideki Tsujii; Shinichi Oka; Masaaki Takegami; Takeo Ueno, and Tetsuya Suda, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Japan

PCT No. PCT/JP93/01693, § 371 Date Sep. 23, 1994, § 102(e) Date Sep. 23, 1994, PCT Pub. No. WO94/12834, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 17, 1993, Ser. No. 256,611

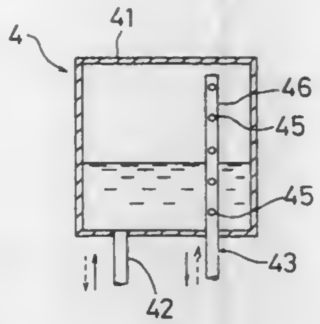
Claims priority, application Japan, Nov. 20, 1992, 4-312065; Mar. 24, 1993, 5-065064

Int. Cl.⁶ F25B *41/00;13/00*

U.S. Cl. 62—174 **17 Claims**

1. An air conditioner comprising a closed refrigerant circulating circuit (**1**) having a compressor (**21**), a thermal-source-side heat exchanger (**23**), an expansion mechanism (**25**) into which refrigerant flows in both directions and a used-side heat exchanger (**31**) which are connected in this order, and being reversibly operatable between a cooling operation cycle and a heating operation cycle,

wherein said refrigerant circulating circuit (**1**) is provided with a refrigerant regulator (**4**), between said expansion mechanism (**25**) and said used-side heat exchanger (**31**), for storing liquefied refrigerant and supplying to said used-side heat exchanger (**31**) refrigerant of a corresponding amount to a storage amount of the liquefied refrigerant in the cooling operation cycle and for storing liquefied refrigerant in the



heating operation cycle, wherein said refrigerant regulator (**4**) has a storage casing (**41**), a first flow pipe (**42**) which is connected at one end thereof to said thermal-source-side heat exchanger (**23**) via said expansion mechanism (**25**) and connected at the other end to said storage casing (**41**), and a second flow pipe (**43**) which is connected at one end thereof to said used-side heat exchanger (**31**) and led at the other end into said storage casing (**41**), and

there is formed in said second flow pipe (**43**) aperture means for passing liquefied refrigerant therethrough between the inside of said second flow pipe (**43**) and the inside of said storage casing (**41**) so as to increase an area passable for the liquefied refrigerant as the storage amount of the liquefied refrigerant increases.

5,533,352

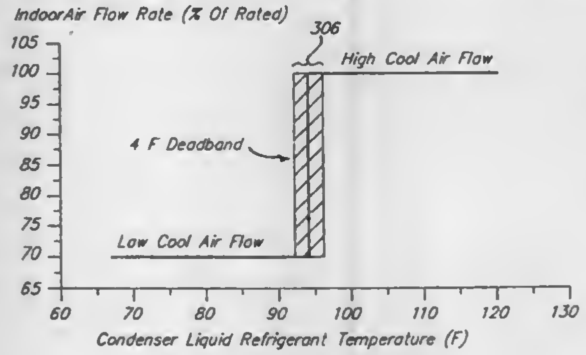
FORCED AIR HEAT EXCHANGING SYSTEM WITH VARIABLE FAN SPEED CONTROL

Vijay O. Bahel, Sidney; Hank E. Millet, Piqua; Mickey F. Hickey, Sidney; Hung M. Pham, Dayton; Gregory P. Herroon, Piqua; Gerald L. Greschl, Dayton, and Joseph B. Niemann, Troy, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Continuation-in-part of Ser. No. 259,396, Jun. 14, 1994, abandoned. This application Sep. 2, 1994, Ser. No. 300,799

Int. Cl.^{6} F25D *17/06*

U.S. Cl. 62—180 **30 Claims**



1. In a heat pump/air-conditioner system of the type having a compressor for delivering liquid refrigerant through an expansion orifice into an indoor heat exchanger, an optimized forced air heat exchanging system comprising:

a fan positioned in said heat pump/air-conditioner system to direct indoor airflow into heat exchange contact with said indoor heat exchanger, said fan having at least two speeds of operation;

a temperature sensor coupled to said heat pump system for sensing the temperature of the liquid refrigerant;

a control circuit coupled to said fan and to said temperature sensor for controlling the speed of the fan based on the temperature of the liquid refrigerant.

5,533,353

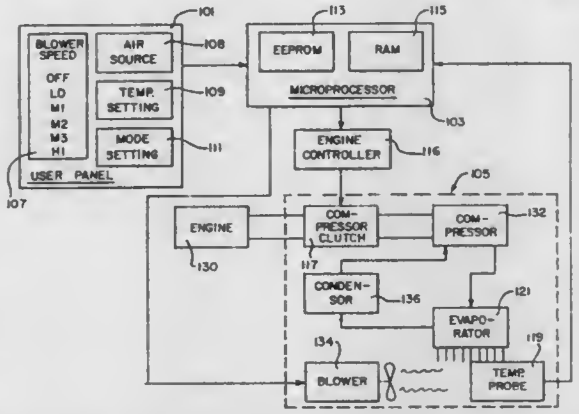
METHOD AND APPARATUS FOR CONTROLLING THE CLUTCH OF AN AIR CONDITIONER SYSTEM

Gary L. Baker, Carleton; Steven M. Jakubiec, Bloomfield; Brian E. Agar, Bloomfield Hills, all of Mich., and Erik Brom, Winona, Minn., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 16, 1994, Ser. No. 357,505

Int. Cl.^{6} F25D *21/04*

U.S. Cl. 62—227 **22 Claims**



1. A method of controlling a compressor clutch of an air conditioner system having an evaporator and a blower comprising the steps of:

monitoring a temperature at the evaporator;

determining an average minimum temperature based on the monitored temperature;

disengaging the clutch when the monitored temperature decreases to a first control temperature;

engaging the clutch when the monitored temperature increases to a second control temperature;

comparing the average minimum temperature to a first predetermined temperature; and

adjusting the first control temperature in response to the comparison between the minimum average temperature and the first predetermined temperature so as to maintain the average temperature within a particular range.

5,533,354

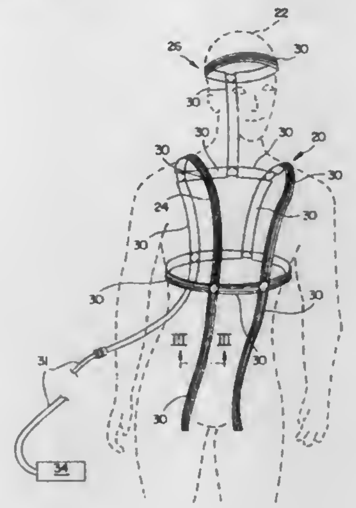
PERSONAL COMFORT APPARATUS

Fred L. Pirkle, Abington, Pa., assignor to Texan Corporation, Horsham, Pa.

Filed Sep. 20, 1994, Ser. No. 309,042

Int. Cl.^{6} F25D *23/12*

U.S. Cl. 62—259.3 **11 Claims**



1. A personal comfort apparatus comprising means for supplying a gas, and at least one section of tubing connected to said gas supplying means and having means comprising a plurality of perforations therein for the escape of gas from the interior of the tubing to the exterior thereof, and means formed as a unit with said tubing and providing a surface adjacent to the perforations, wherein the means for the escape of gas directs escaping gas toward the surface to produce a flow of gas over, and in contact with, the surface, whereby flow of ambient air is induced by the flow of gas over the surface.

5,533,355

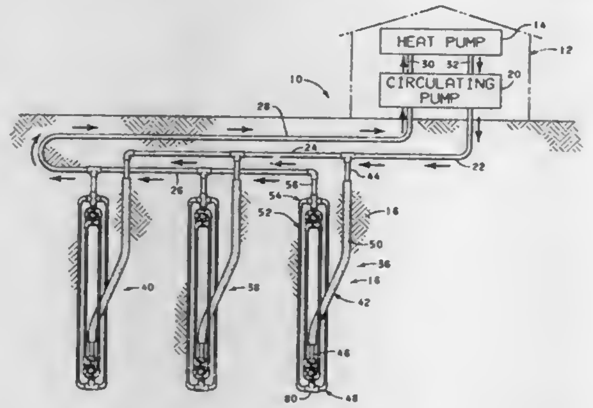
SUBTERRANEAN HEAT EXCHANGE UNITS COMPRISING MULTIPLE SECONDARY CONDUITS AND MULTI-TIERED INLET AND OUTLET MANIFOLDS

John P. Rawlings, Oklahoma City, Okla., assignor to Climate Master, Inc., Oklahoma City, Okla.

Filed Nov. 7, 1994, Ser. No. 335,567

Int. Cl.^{6} F24J *3/08;* **F28D** *20/00*

U.S. Cl. 62—260 **26 Claims**



13. A subterranean heat exchange unit adapted for connection between the supply and return headers of a conduit system which connects a subterranean heat exchanger with a ground source heat pump in a structure:

a first primary conduit having first and second ends, the first end connectable to the supply header for receiving heat transfer fluid therefrom;

a plurality of secondary conduits, each such secondary conduit having first and second ends;

a second primary conduit having first and second ends, the second end being connectable to the return header;

an inlet manifold comprising:

a first connecting member having an inlet connected to the second end of the first primary conduit, a first outlet connected to the first end of a first one of the plurality of secondary conduits, and a second outlet; and

an end member having an inlet connected to the second outlet of the first connecting member and a first outlet connected to the first end of a second one of the plurality of secondary conduits; and

an outlet manifold comprising:

an end member having a first inlet connected to the second end of the first one of the plurality of secondary conduits and an outlet; and

a first connecting member having a first inlet connected to the outlet of the end member, a second inlet connected to the second end of the second one of the plurality of secondary conduits, and an outlet connected to the first end of the second primary conduit.

23. A ground source heat pump system for a structure, the system comprising:

a heat pump assembly in the structure for adjusting the temperature of a fluid in the structure;

a subterranean heat exchanger;

a conduit system for circulating a heat transfer fluid between the heat pump assembly in the structure and the subterranean heat exchanger;

a pump for pumping the heat transfer fluid through the conduit system;

wherein the subterranean heat exchanger comprises a supply and return header and at least one heat exchange unit connected between the return and supply headers;

wherein each of the at least one heat exchange units comprises:

a first primary conduit having first and second ends, the first end connected to the supply header for receiving heat transfer fluid therefrom;

a plurality of secondary conduits, each such secondary conduit having first and second ends;

a second primary conduit having first and second ends, the second end being connected to the return header;

an inlet manifold comprising:

an end member having an inlet connected to the first primary conduit for receiving heat transfer fluid from the supply header, and wherein the end member further has two outlets, each such outlet connected to the first end of one of the plurality of secondary conduits; and

an outlet manifold comprising:

an end member having an outlet connected to the second primary conduit for returning fluid to the return header, and further having two inlets, each such inlet connected to the second end of one of the plurality of secondary conduits;

and wherein each of the heat exchange units further comprises:

at least one connecting member in the inlet manifold having an inlet connected either to the second end of the first primary conduit or to an outlet of another connecting member, and each connecting member has three outlets, one such outlet connected either to the inlet of the end member of the inlet manifold or to the inlet of another connecting member, each of the other two outlets of the connecting member being connected to the first end of one of the secondary conduits; and

at least one connecting member in the outlet manifold having three inlets, one such inlet connected either to the outlet of the end member or to the outlet of another connecting member, and wherein each of the other two inlets is connected to the second end of one of the plurality of secondary conduits, and

wherein each of the connecting members further has an outlet connected either to the first end of the second primary conduit or to the inlet of another connecting member.

5,533,356

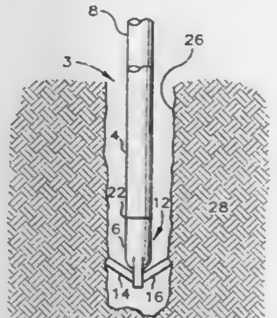
IN-GROUND CONDUIT SYSTEM FOR GEOTHERMAL APPLICATIONS

Jimmie G. DeMasters, Wylie, Tex., assignor to Phillips Patroleum Company, Bartlesville, Okla.

Filed Nov. 9, 1994, Ser. No. 336,447

Int. Cl.^{6} F25D *23/12*

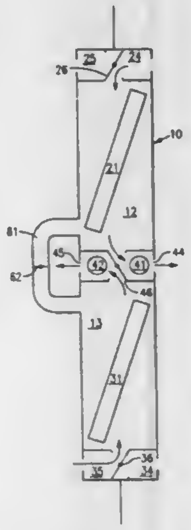
U.S. Cl. 62—260 **2 Claims**



1. An in-ground conduit system for a ground source heat pump comprising:
  at least one conduit loop having a first member having a first end and a second end, a second member having a first end and a second end, a U-shaped member having a vertex, a first end connected in fluid flow communication with said second end of said first member and a second end connected in fluid flow communication with said first end of said second member; and
  at least one wing member mounted on said conduit loop in the area of said vertex of said U-shaped member such that said wing member is oriented to contact the ground in such a way as to prevent upward movement of said conduit loop wherein said at least one wing member comprises a first wing member and a second wing member formed from a length of material having a first end portion and a second end portion wherein said length of material is crimped at a point between said first end portion and said second end portion and wherein the resulting crimped section is mounted in the area of the vertex of said U-shaped member such that said first end portion forms said first wing member and said second end portion forms said second wing member.

5,533,357
AIR CONDITIONING APPARATUS

Roger J. Voorhis, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Feb. 15, 1995, Ser. No. 393,147
Int. Cl.^{6} F25B *29/00*
U.S. Cl. 62—277 **5 Claims**

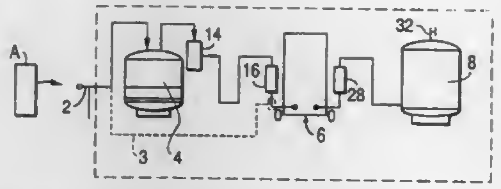


1. An apparatus (10) for conditioning the air of an enclosed space comprising:
  an air source vapor compression refrigeration system having
    a compressor (51),
    a condenser (31),
    an expansion device (22), and
    an evaporator (21),
  all interconnected in a closed refrigerant flow loop;
  an apparatus enclosure (11) having
    an upper section (12) containing said evaporator and having
      an upper inside air inlet (24) in upstream air flow relationship with said evaporator,
      an upper outside air inlet (25) in downstream air flow relationship with said evaporator, and
      an upper damper (26), proximate to and controlling the flow of air through said upper inside air inlet and said upper outside air inlet, having
        a first position in which said upper damper allows air flow only through said upper inside air inlet, and
        a second position in which said upper damper allows air flow only through said upper outside air inlet,
    a lower section (13) containing said condenser and having
      a lower inside air inlet (34) in upstream air flow relationship with said condenser,
      a lower outside air inlet (35) in downstream air flow relationship with said condenser, and
      a lower damper (36), proximate to and controlling the flow of air through said lower inside air inlet and said lower outside air inlet, having
        a first position in which said lower damper allows air flow only through said lower outside air inlet, and
        a second position in which said lower damper allows air flow only through said lower inside air inlet, and
    a middle section (14) containing
      a first air outlet (44) for supplying conditioned air to said space,
      a second air outlet (45) for discharging air to the outside,
      a first blower (41) in upstream air flow relationship with said first air outlet,
      a second blower (42) in upstream air flow relationship with said second air outlet, and
      a middle damper (46) having
        a first position in which said middle damper allows said first blower to move air from said upper section to said first air outlet and said second blower to move air from said lower section to said second air outlet,
        a second position in which said middle damper allows said first blower to move air from said lower section to said first air outlet and said second blower to move air from said upper section to said second air outlet, and
        a third position in which said middle damper allows said first blower to cause a flow of air from both said lower and said upper sections to said first air outlet; and
  means (53) for controlling said apparatus for operation in each of the following operating modes:
  a cooling mode in which said upper, lower and middle dampers are in their respective said first positions,
  a heating mode in which said upper, lower and middle dampers are in their respective said second positions:
  a defrost air duct (61) extending from said lower section to said upper section; and
  a defrost air duct damper (62) in said defrost air duct that has
    a first position in which said defrost air duct prevents air flow through said defrost air duct, and
    a second position in which said defrost air duct allows air flow through said defrost air duct;
and in which said control means further comprises means for configuring said apparatus for operation in an active defrost mode in which
  said upper damper and said lower damper are in their respective said first and second positions,
  said middle damper is in its said first position, and
  said active defrost duct damper is in its said second position.

5,533,358
REFRIGERANT RECOVERING SYSTEM

Thomas L. Crandall; Donald W. Strout, both of York, Pa., and Elgil Hansen, Sønderborg, Denmark, assignors to A'Gramkow A/S, Sonderborg, Denmark
Filed Mar. 1, 1994, Ser. No. 203,367
Int. Cl.^{6} F25B *45/00*
U.S. Cl. 62—292 **17 Claims**

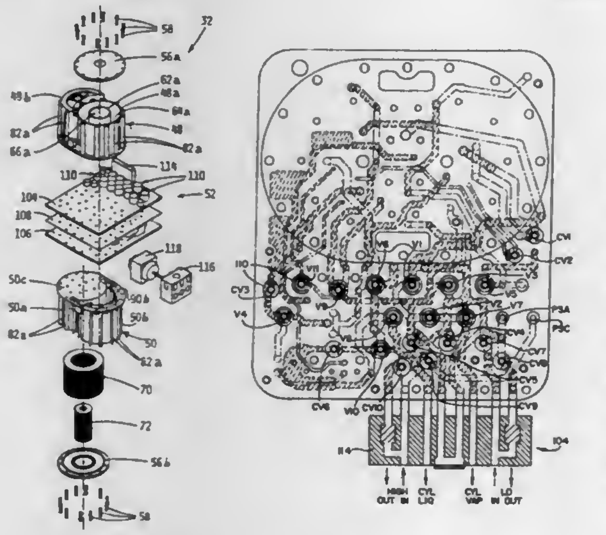
14. A system for recovering and refining refrigerants comprising a suction accumulator having an intake for such refrigerant in liquid or gaseous phase, a compressor having a suction side thereof connected to said suction accumulator, while a discharge side thereof is connected to a condenser which, in turn, delivers the condensed liquid gas to a collector tank, filter means for the removal of contaminants from said refrigerants being arranged in the connection between the suction accumulator and the collector tank, and wherein said suction accumulator includes means for



precleaning the intake refrigerant to remove contaminants therefrom by distillation, said means for precleaning providing an efficient distillation of the intake refrigerant from the beginning of the recuvery of said refrigerants.

5,533,359
APPARATUS FOR SERVICING REFRIGERATION SYSTEMS

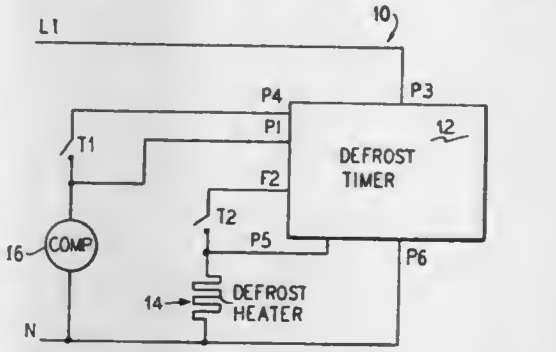
Robert L. Muston, and Mario Matkowitch, both of Victoria, Australia, assignors to Environmental Products Amalgamated Pty. Ltd., Australia
Continuation of Ser. No. 998,125, Dec. 19, 1992, Pat. No. 5,367,888, which is a continuation of Ser. No. 856,016, Mar. 23, 1992, abandoned. This application Apr. 6, 1994, Ser. No. 223,592
Claims priority, application Australia, Mar. 22, 1991, PK5224
Int. Cl.^{6} F25B *45/00*
U.S. Cl. 62—292 **3 Claims**



1. Apparatus for servicing a refrigeration system having a high pressure connection and a low pressure connection and utilizing a refrigerant containing an oil lubricant, said apparatus comprising, in combination: housing means defining an accumulator chamber, an oil separator chamber, and high and low pressure filter chambers; a compressor having a sump; control plate means operatively associated with said housing means and said compressor and defining a plurality of flow passages enabling selective flow communication between said chambers and compressor; means for connecting said control plate means in flow communication with the refrigeration system being serviced to facilitate passage of refrigerant from the refrigeration system to the low pressure filter chamber, said low pressure filter chamber being connected to said compressor to enable flow of refrigerant to a low pressure side of the compressor; said oil separator chamber being connected to a high pressure side of said compressor to receive pressurized refrigerant from the compressor, said oil separator chamber being connected to the sump of the compressor through valve means enabling return of oil from the oil separator chamber to said sump; and flow passage means between said sump and said accumulator chamber to enable passage of oil from said sump to said accumulator chamber when said oil separator chamber is under pressure and said valve means is opened, said accumulator chamber being connected to said sump through said low pressure filter chamber so that recovered oil from said sump passes to said low pressure filter chamber before passing to said accumulator chamber; and means for draining recovered oil from said accumulator chamber.

5,533,360
REFRIGERATION SYSTEM CONFIGURATION

Joseph M. Szynal, Laporte, and Ronald W. Guess, Scott Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Continuation of Ser. No. 172,929, Dec. 27, 1993, Pat. No. 5,369,962, which is a division of Ser. No. 978,275, Nov. 18, 1992, Pat. No. 5,363,669. This application Sep. 29, 1994, Ser. No. 312,067
Int. Cl.^{6} F25D *19/00*
U.S. Cl. 62—298 **6 Claims**

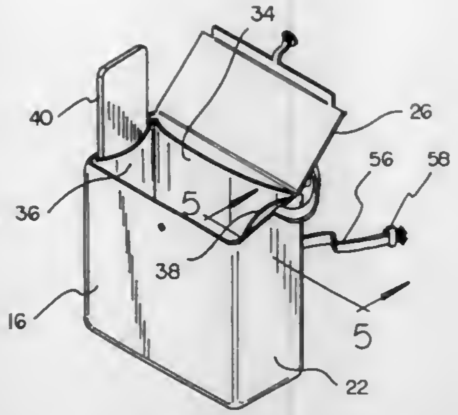


1. A defrost cycle controller for a refrigeration system having a compressor and a defrost heater, the defrost cycle controller comprising a circuit operatively configured to control operation of the compressor and the defrost heater and that can be used either as a variable timer controller, a real time controller or a cumulative run time controller, by selective connection of feedback signals provided to the circuit, the circuit including a relay and a programmable controller, the programmable controller operatively electrically connected to the relay, the programmable controller operatively electrically connected to the compressor and the defrost heater, the relay operatively electrically connected to the compressor and the defrost heater, the programmable controller operatively configured to control turn-on and turn-off of the compressor and the defrost heater by controlling operation of the relay and to respond to the feedback signals.

5,533,361
INSULATED GROCERY CART COOLER

Samuel J. Halpern, 19 Sylvan Way, Short Hills, N.J. 07078
Filed Dec. 22, 1994, Ser. No. 361,742
Int. Cl.^{6} B65D *23/08;* **F25D** *3/08*
U.S. Cl. 62—457.2 **5 Claims**

1. A insulated grocery cart cooler comprising:
  an insulated container means comprises a flexible container including a front web spaced from and parallel to a rear web, with a first lateral web spaced from and parallel to a rear web, with a first lateral web and a second lateral web extending substantially orthogonally between opposed vertical edges of the front and rear webs, a bottom web extending substantially orthogonally between lower horizontal edges of the front and rear webs and the lateral webs; a top web pivotally coupled along a longitudinal edge thereof to an upper edge of the rear web; a rear pocket web coupled to an interior surface of the rear web, with a first lateral pocket web and a second lateral pocket web being coupled to interior surfaces of the first lateral web and the second lateral web, respectively; and a



plurality of gel packs of flexible construction and containing a freezable gel, each of the gel packs being position within a individual pocket defined by the pocket webs so as to impart a cooling effect to an interior of the flexible container of the insulated container means;

a mounting means comprises a first hook coupled to an upper portion of the rear web proximal to a juncture of the top web and the upper edge of the rear web; and a second hook positioned in a substantially spaced and parallel orientation relative to the first hook and secured to the rear web proximal to the junction between the top web and the upper proximal to the junction between the top web and the upper edge of the rear web, the hooks being operable to engage a straight elongated handlebar of a shopping cart to support the insulated container means within an upper basket of the cart.

5,533,362

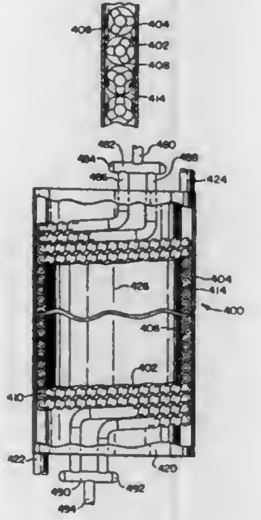
HEAT TRANSFER APPARATUS FOR HEAT PUMPS

F. Bert Cook, Columbus; Stephen E. Petty, Dublin; Howard C. Meacham, Jr., Upper Arlington; Richard N. Christensen, Columbus, and Kevin R. McGahey, Fairfax, all of Ohio, assignors to Columbia Gas of Ohio, Inc., Columbus, Ohio

Division of Ser. No. 768,772, Oct. 9, 1991, Pat. No. 5,339,654, which is a continuation-in-part of Ser. No. 478,269, Feb. 9, 1990, Pat. No. 5,067,330. This application Aug. 19, 1994, Ser. No. 292,843

Int. Cl.^{6} F25B *15/00*

U.S. Cl. 62—476 **20 Claims**



12. A tube-in-cylinder heat-transfer device comprising a tube wherein said tube is a twisted fluted tube having raised longitudinal helical crests on the exterior surface of said tube with corresponding interior helical troughs on the interior surface of said tube and longitudinal helical troughs adjacent to said exterior crests on said exterior surface of said tube with corresponding interior raised helical crests on said interior surface of said tube with said tube formed as a set of a plurality of coils about a coil center-line in a generally annular cylindrical composite form with the coils juxtaposed and contacting each other one to the next and contained within an annular cylinder with the axis of said coils being coextensive with said annular cylinder center-line and through which said annular cylinder flows a fluid through voids formed by said exterior surface of said tube and the interior annular cylinder walls, said voids existing 1) between contacting juxtaposed coils as a result of said troughs adjacent to said raised crests, said raised crests on one coil contacting the raised crests on an adjacent juxtaposed coil, 2) between said coils and said interior cylinder walls as a result of said troughs adjacent to said raised crests, said crests on said coils contacting said interior annular cylinder walls, and 3) between said coils and said interior cylinder walls as a result of the circular shape of said coil tube, said coils in contact with each other and said interior cylinder walls, said voids allowing said fluid to flow in cross-flow 1) around and between said juxtaposed coils in said troughs and voids adjacent to said crests; 2) over said coils and between said coils and said interior cylinder walls in said troughs and voids adjacent to said cylinder-wall contacting crests, 3) between said coils and said interior cylinder walls in said voids formed as a result of the circular shape of said tube coils in contact with each other and said interior cylinder walls, and 4) in an overall direction generally perpendicular to said coils and parallel to said coil center-line.

5,533,363

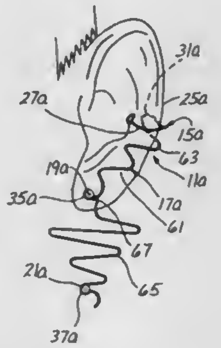
PIERCED EARRING CONVERTER

Sandra L. Callisto, 361 Cypress Dr., Laguna Beach, Calif. 92651

Filed Jan. 7, 1994, Ser. No. 178,932

Int. Cl.^{6} A44C *7/00*

U.S. Cl. 63—14.1 **8 Claims**



1. A pierced earring converter comprising:

a cuff formed into a portion of a loop and sized and configured to be worn on the cartilage of the ear along the side of the ear;

a hanger carried by the cuff and extending from the cuff, said hanger having a mounting aperture and including a wire-like segment, at least a portion of said wire-like segment forming at least a portion of a loop and said loop defining said mounting aperture; and

a mounting member snugly received in the mounting aperture of the hanger whereby the mounting member is mounted on the hanger, said mounting member being sized and configured to receive a post of a pierced ear earring whereby the pierced ear earring can be worn by a wearer who does not have pierced ears.

5,533,364

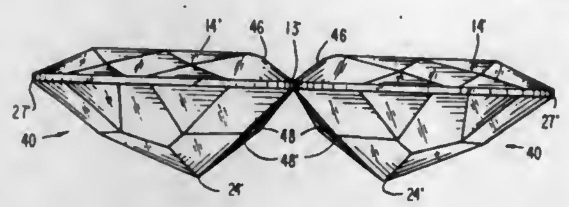
FACING MARQUIS HALVES TO FORM A MARQUIS STONE

Joseph Freilich, Jericho, N.Y., assignor to M. Fabrikant & Sons, Ltd., New York, N.Y.

Continuation-in-part of Ser. No. 163,941, Dec. 8, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,005

Int. Cl.^{6} A44C *17/00*

U.S. Cl. 63—32 **6 Claims**



1. A marquis appearing jewelry stone assembly which employs a pair of facing jewelry stones to produce a marquis appearing jewelry stone larger than either of the facing jewelry stones, said assembly comprising:

one of said pair of facing jewelry stones comprising a first half marquis jewelry stone having a matching edge at one end and an end point at an opposite end of said facing jewelry stones, the other of said pair of facing jewelry stones comprising a second half marquis stone having a matching edge at one end and an end point at an opposite end of said facing jewelry stones, each of said first and second half marquis stones comprising facing bezels and base pavilions, said facing bezel of said first half marquis stone facing said facing bezel of said second half marquis stone, said base pavilion of said first half marquis stone facing said base pavilion of said second half marquis stone, said first and second half marquis stones abutting each other along said matching edges to form a junction between said first and second half marquis stones, each of said base pavilions comprising a multi-faceted surface, wherein each of said first and second half marquis jewelry stones comprise a cullett apex, each of said half marquis stones having a length defined as the distance between said matching edge and said end point, said cullett apex located approximately 6/10– 7/10 of said length of the stone towards said matching edge from said end point.

5,533,365

DEVICE FOR CUTTING THREADS IN CIRCULAR STOCKING KNITTING MACHINES

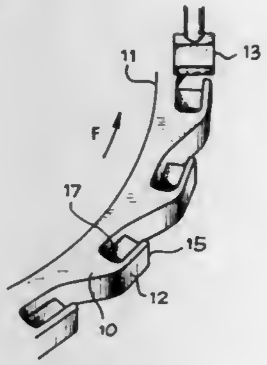
Fulvio Sangiacomo, Brescia, Italy, assignor to Sangiacomo S.p.A., Brescia, Italy

Filed Jul. 13, 1995, Ser. No. 502,189

Claims priority, application Italy, Jul. 14, 1994, BS94A0087

Int. Cl.^{6} D04B *35/00;35/34*

U.S. Cl. 66—145 R **2 Claims**



1. A device for cutting threads in a circular knitting machine comprising:

a circular saw having teeth;

said saw being fixed for rotation with a plate of the circular knitting machine;

each of said teeth of the saw having a front part for gripping and dragging one of the threads toward a fixed knife, acting as a counterblade, and an upper surface;

said fixed knife being positioned to touch said upper surface of said teeth of the saw;

said each of said teeth further comprising a notch between said front part and said upper surface forming a cutting zone and an area in which the thread is free of interception by said fixed knife; and

wherein said cutting zone interacts with the knife for cutting the thread at a distance from said front edge.

5,533,366

WARP KNITTING MACHINE HAVING AT LEAST ONE GUIDE BAR AND REPLACEMENT UNIT FOR SUCH A WARP KNITTING MACHINE

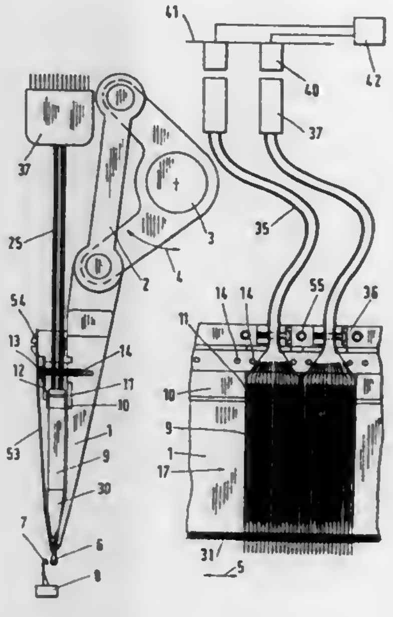
Kresimir Mista, Heusenstamm, and Hans J. Hohne, Hainburg, both of, Germany, assignors to Karl Mayer Textilmaschinenfabrik, Obertshausen, Germany

Filed May 24, 1995, Ser. No. 449,395

Claims priority, application Germany, May 28, 1994, 44 18 714.9

Int. Cl.^{6} D04B *27/24*

U.S. Cl. 66—205 **23 Claims**



1. A warp knitting machine comprising:

at least one guide bar;

a retaining device having a plurality of retaining segments releasably attached to the guide bar;

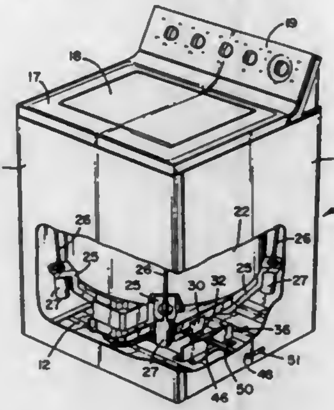
a plurality of subassemblies each having a plurality of strip-shaped piezoelectric bending transducers, each of the bending transducers having: (a) a group of control lines for controlling that one of the bending transducers, (b) a proximal end attached at said retaining device, and (c) a distal end having a guide;

a control device for transmitting control signals signifying displacement of the guides by one needle space; and

a plurality of connector contacts separately connected to different associated ones of the control lines of said bending transducers for releasably connecting to the control device and conveying said control signals to said control lines.

5,533,367
APPLIANCE SHIPPING RESTRAINT ASSEMBLY

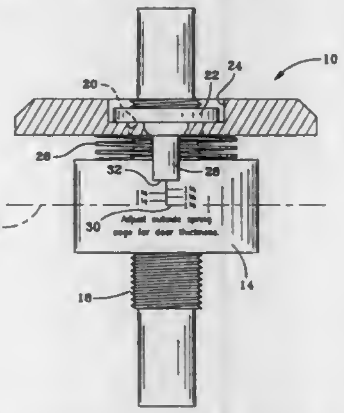
Michael A. Lybarger, and Stephen D. Beck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Apr. 26, 1995, Ser. No. 427,890
Int. Cl.^{6} D06F *35/00*
U.S. Cl. 68—3.00 R **8 Claims**



1. An appliance shipping restraint assembly, including;
an appliance housing having a base for support from a floor and lateral walls extending upward of said base;
an operational assembly mounted within said housing and normally moveable relative to said housing; said operational assembly including a platform spaced above said base and defining at least one pair of spaced apart, aligned openings;
said base defining at least one pair of spaced apart openings aligned with said at least one pair of platform openings; and
at least one elongated rod mounted in said at least one pair of platform openings and said at least one pair of base openings for restraining said operating assembly against excessive movement during shipment of said appliance;
said at least one rod being selectively moveable to release said operational assembly for normal movement relative to said housing.

5,533,368
MEANS FOR, AND A METHOD OF, ADJUSTING A CYLINDRICAL LOCKSET FOR DOOR THICKNESS-SIZING

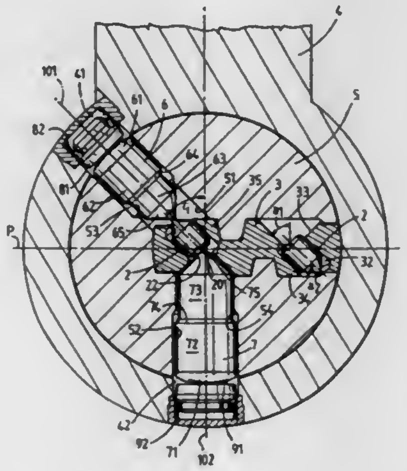
Bruce P. Eagan, Colorado Springs, Colo., assignor to Schlage Lock Company, San Francisco, Calif.
Filed Mar. 6, 1995, Ser. No. 399,252
Int. Cl.^{6} E05B *9/04*
U.S. Cl. 70—374 **5 Claims**



3. A method of adjusting a cylindrical lockset for door thickness-sizing, wherein the lockset has (1) a cylindrical lock chassis, (2) an apertured, spring cage, (3) a threaded shaft (a) extending from said chassis, and (b) in penetration of said cage, (4) means interposed between said chassis and said cage for urging said cage outwardly from said chassis, and (5) an adjustment nut (a) threadedly engaged with said shaft, and (b) confrontingly engaging said cage and retaining said cage on said shaft, and wherein said cage has a limb extending therefrom and overlying a given portion of said chassis, the method comprises the steps of:
inscribing door thickness-sizing indicia on said given portion of said chassis; and
threadedly adjusting a positioning of said nut on said shaft so as to (a) move said cage relative to said shaft, and (b) concomitantly, align a terminal end of said limb with a selected one of said indicia.

5,533,369
SAFETY LOCK AND FLAT KEY FOR SUCH A LOCK

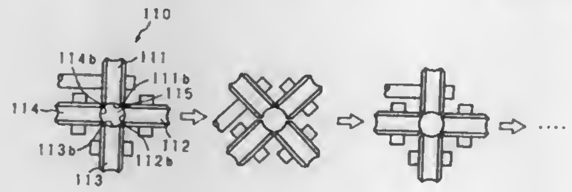
Luis Valdajos-Gallego, Fuenterrabia, Spain, assignor to Talleres de Escoriaza, S.A. (TESA), Irun, Spain
Filed May 4, 1994, Ser. No. 237,673
Claims priority, application France, May 5, 1993, 9305354
Int. Cl.^{6} E05B *27/00*
U.S. Cl. 70—493 **11 Claims**

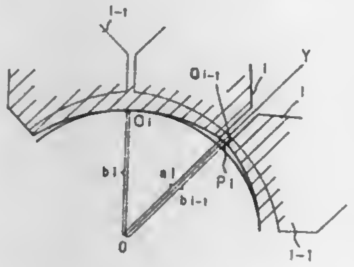


1. A safety lock and key comprising:
a cylindrical stator;
a rotor;
the rotor having a key channel for receiving a flat key;
at least one moving element comprising a cylindrical body and a tapered head being held in a housing within the key and engaging with a first moving rotor pin in the rotor aligned with a spring-loaded first moving stator pin in the stator;
each moving element being in a housing which opens through a first orifice formed through a first principal face of a shank of the key near a lateral extremity of the shank;
the housing having an inclination substantially equal to 45 degrees relative to a plane perpendicular to a longitudinal median plane of the shank parallel to the first principal face, so that a tapered head of each moving element engages with a tapered head of the first moving rotor pin aligned with the first moving stator pin such that a common centerline of the first moving rotor pin and the first moving stator pin passes through a center of rotation of the rotor;
the housing also opening from the shank through a second orifice in a tapered bore formed in a second principal face of the shank of the key so that a rear part of the cylindrical body of the moving element engages with a tapered head of a second moving rotor pin aligned with a second spring-loaded moving stator pin; and
a common centerline of the tapered bore and the second moving rotor pin is perpendicular to the longitudinal median plane of the shank and passes through the center of rotation of the rotor.

5,533,370
TUBE ROLLING METHOD AND APPARATUS

Kouichi Kuroda, Takatsuki; Youichi Imamura, Amagasaki; Kazuyuki Nakasuji, Nishinomiya, and Chihiro Hayashi, Takarazuka, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan
Filed Nov. 29, 1993, Ser. No. 158,276
Claims priority, application Japan, Nov. 30, 1992, 4-345468; Nov. 30, 1992, 4-345469; Nov. 9, 1993, 5-279944
Int. Cl.^{6} B21B *17/14;27/02*
U.S. Cl. 72—12.5 **28 Claims**





1. A tube rolling method, comprising the steps of:
disposing a plurality of stands along a longitudinal pass line, each stand having four rolls in tandem, wherein the rolls of a preceding stand and of a succeeding stand differ in phase by about 45 degrees relative to the pass line formed by the stands, and the rolls include roll grooves for forming a nearly circular caliber; and
continuously passing a tube in a cold state through said plurality of stands such that an outer diameter of the tube is rolled and reduced;
wherein the roll grooves satisfy the following conditions:

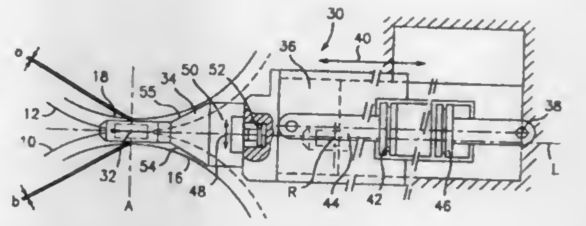
$$a_i > b_i$$

$$a_i < b_{i-1}$$

where a_i is a caliber radius of a roll groove edge of an i-th stand; b_i is a caliber radius of a roll groove center of the i-th stand; and b_{i-1} is a caliber radius of a roll groove center of an i−1-th stand.

5,533,371
MEASUREMENT DEVICE FOR ROLL GAP CONTROL AND PROCESS FOR ITS OPERATION

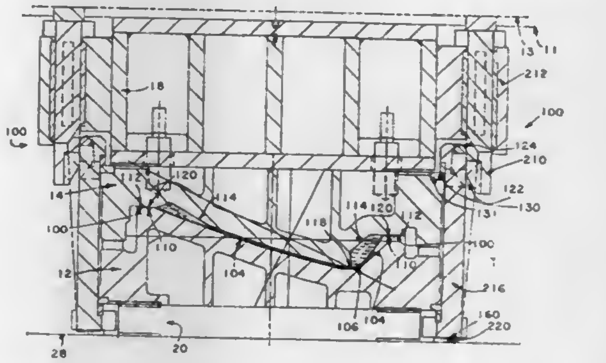
Bruno Frischknecht, Gwatt; Peter Messerli, Heinberg; Daniel Fankhauser; Rudolf Roder, both of Thun, and Rolf Eigel, Schwanden, all of, Switzerland, assignors to Lauener Engineering, Ltd., Gwatt, Switzerland
PCT No. PCT/CH92/00015, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO92/13658, PCT Pub. Date Aug. 20, 1992
PCT Filed Jan. 24, 1992, Ser. No. 949,521
Claims priority, application Switzerland, Feb. 1, 1991, 00315/91
Int. Cl.^{6} B21B *37/08*
U.S. Cl. 72—21.1 **17 Claims**



1. A rolling or continuous casting and rolling mill facility, comprising:
a roll set comprising working rolls defining a roll gap therebetween and support rolls, at least one of the working rolls and the support rolls having coaxial reduced diameter barrel portions defining measurement surfaces thereon;
measuring means for determining the roll gap by measuring a distance between the measurement surfaces, comprising a measurement head and a contact-free double sensor positioned on the measurement head;
means for moving the measurement head between a working position wherein the double sensor is positioned in a rolling plane drawn through axes of rotation of the working rolls and aligned with the measurement surfaces and a rest position wherein the measurement head and double sensor are withdrawn from the rolling plane; and
wherein the measurement head has substantially symmetrical chamfers for centering the measurement head relative to the measurement surfaces.

5,533,372
CONTROLLED MATERIAL FLOW HYDROFORMING

Ralph E. Roper, Indianapolis, Ind., and Gary A. Webb, West Bloomfield, Mich., assignors to AK Steel Corporation, Middletown, Ohio
Division of Ser. No. 919,968, Jul. 27, 1992, which is a continuation-in-part of Ser. No. 855,815, Mar. 23, 1992, Pat. No. 5,372,026, which is a continuation-in-part of Ser. No. 443,112, Nov. 29, 1989, Pat. No. 5,157,969. This application Aug. 24, 1994, Ser. No. 296,053
Int. Cl.^{6} B21D *26/02;37/14*
U.S. Cl. 72—60 **6 Claims**



1. A latching mechanism for use in hydraulic forming of a sheet of metal in a press including an upper and a lower die, said mechanism comprising:
a locking arm pivotally mounted to said press, said arm having a lip for gripping said upper die when said arm is pivoted to its locking position;
a latch having a lip for gripping said upper die;
means for engaging said latch so as to grip said upper die so as to prevent the upper die from separating once hydraulic pressure is applied to form the metal against the die shaped for the part to be produced; and
driver mounted on a vertically reciprocating member of said press wherein said driver causes said arm to pivot to its locked position when said driver is lowered, wherein said driver has an inclined surface which rides against an inclined surface on said arm when said driver is vertically lowered thereby tilting said arm to its locked position.

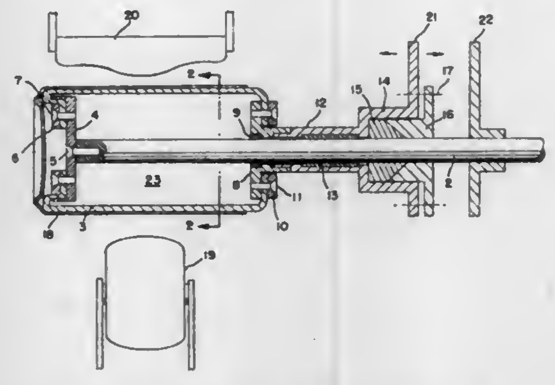
5,533,373
METHOD AND APPARATUS FOR MAKING SHAPED CANS

George Plester, Brussels, Belgium, assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 21, 1994, Ser. No. 309,688

Int. Cl.^{6} B21D *51/26*

U.S. Cl. 72—84 **11 Claims**



1. A method of shaping a can comprising the steps of:
a) providing a flexible-walled inflatable mandrel;
b) inserting the mandrel into a can body;
c) inflating the mandrel until the flexible walls thereof firmly grip inside surfaces of walls of the can body;
d) removing any external support of the can body so that the mandrel becomes the sole means of support thereof;
e) applying a forming tool to any selected surface portion of the entire can body to deflect the can body sidewalls in the selected portion inwardly into the mandrel thereby shaping the can body;
f) deflating the mandrel; and
g) withdrawing the mandrel from the shaped can body.

5,533,374
EDGING ROLL FOR ROLLING SHAPE

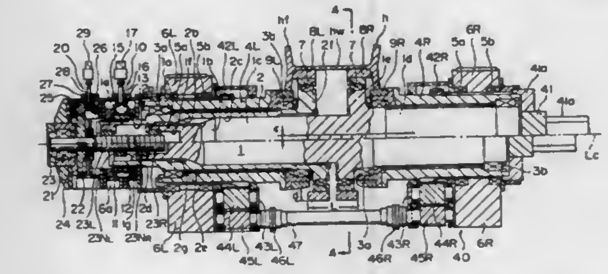
Tsuneo Seto; Atsushi Hatanaka; Harumi Egeyama; Hironori Miura; Kazuo Ohmori, all of Okayama, and Hirokazu Watari, Kobe, all of, Japan, assignors to Kawasaki Steel Corporation, and Kawasaki Jukogyo Kabushiki Kaisha, both of Kobe, Japan

Filed Apr. 22, 1994, Ser. No. 231,138

Claims priority, application Japan, Apr. 23, 1993, 5-097853; Nov. 30, 1993, 5-300661

Int. Cl.^{6} B21B *27/02*

U.S. Cl. 72—247 **6 Claims**



1. An edge roll for rolling a shape steel having a web and flanges, comprising:

a main shaft having a small-diameter shaft portion and an intermediate-diameter shaft portion which are formed at one side of a substantially axially-central portion of said shaft, a large-diameter shaft portion formed at an opposite side of said substantially axially-central portion, and an eccentric shaft portion formed at said substantially axially-central portion such that said eccentric shaft portion **15** eccentric with respect to a central axis of said shaft, said eccentric shaft portion having a diameter greater than that of said large-diameter shaft portion;

an eccentric sleeve axially and circumferentially slidably fitting on said small and intermediate diameter shaft portions of said main shaft, said eccentric sleeve having at one end an eccentric portion opposing said eccentric shaft portion of said main shaft and having the same configuration as said eccentric shaft portion;

a pair of web-restricting rollers carried by outer peripheral surfaces of said main shaft and said eccentric portion of said eccentric sleeve through respective bearings and arranged to restrict a web portion of a raw material;

a pair of flange rolling rolls carried by the outer peripheral surfaces of said main shaft and said eccentric sleeve through respective bearings and arranged to interpose said web-restricting rollers therebetween so as to roll a flange portion of said raw material;

a flange rolling roll drive means having a pair of gear transmission means each having a gear provided on a portion of each of a pair of flange rolling roll shafts and a pinion engaging with said gear, said pair of gear transmission means having the same gear ratio, a connection shaft for establishing a connection between said pair of pinions to transmit rotational torque from either pinion to the other pinion, and a rotation drive means for rotating either of said flange rolling rolls;

a roll height adjustment means for integrally rotating said main shaft and said eccentric sleeve; and

a roll-width adjustment means for synchronously moving said main shaft and said eccentric sleeve relative to each other in an axial direction through rotation of a rotational threaded shaft.

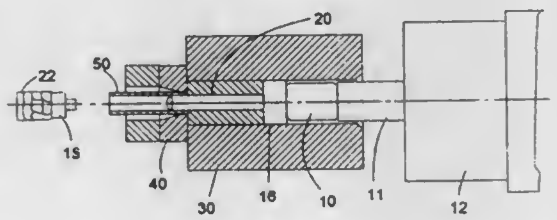
5,533,375
METHOD FOR MAKING SEAMLESS TUBES FROM HOLLOW BILLETS

Chin-Fu Chen, Da-Li; Wen-Hwa Lu, Shoel, and Shan-Chang Chueh, Taipei, all of, Talwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Talwan

Filed Jul. 14, 1994, Ser. No. 275,175

Int. Cl.^{6} B21C *23/00*

U.S. Cl. 72—254 **9 Claims**



1. A method for manufacturing seamless tubes from a hollow billet, said hollow billet having an inner surface, and said method comprising the steps of:

(a) obtaining an extrusion apparatus comprising:
  (I) a die, a billet container, and means for connecting said die to said billet container;
  (ii) an extrusion means which comprises a ram press, a piercer rod, and a ram stem, wherein said ram stem is connected to both said ram press and said piercer rod therebetween to effectuate simultaneous movement thereof, said extrusion means further comprises a moving means for moving said ram press;
  (iii) a ring-shaped piercer doughnut sleeved upon said piercer rod, said piercer doughnut has a greater overall dimension than said inner surface of said hollow billet;
  (iv) positioning means for placing said hollow billet between said extrusion means and said billet container; and
  (v) a de-oxide latch, which is a substantially circular latch disk with a rear side and a front side placed in front of said piercer rod and engageable therewith at said rear side of said latch disk, said latch disk is diametrically larger than said inner surface of said hollow billet so as to cause an outer layer of said inner surface of said hollow billet to be sheared off when said de-oxide latch is pushed through said inner surface of said hollow billet by said piercer rod;

(b) aligning said hollow billet between said extrusion means and said billet container;

(c) moving said ram press to push said hollow billet into said billet container and against said die;

(d) continuing moving said ram press so as to force said de-oxide latch to shear off said outer layer of said inner surface of said hollow billet; and

(e) further continuing moving said ram press so as to extrude said hollow billet through said die to form a seamless tube.

5,533,376
METHOD FOR PREPARING A TUBULAR BLANK HAVING A THICK WALL FOR A FOLLOWING CASCADE DRAWING OPERATION

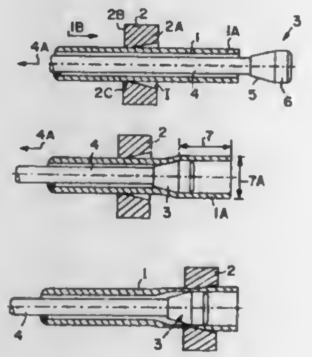
Walter Wetzels, and Rainer Hergemoeller, both of Aachen, Germany, assignors to Schumag AG, Aachen, Germany

Filed Aug. 19, 1994, Ser. No. 293,053

Claims priority, application Germany, Aug. 20, 1993, 43 28 002.1

Int. Cl.^{6} B21C *1/24*

U.S. Cl. 72—283 **17 Claims**



1. A method for reducing an initial wall thickness of a tubular blank (**1**) which thickness is too thick for a cascade or tandem drawing, to a reduced wall thickness that is sufficiently thin for said cascade or tandem drawing, comprising:

(a) radially distending one end (**1A**) of said tubular blank with a shackled or controllable mandrel (**3**) by pulling said mandrel through said one end (**1A**) of said tubular blank to form a distended section (**7**) next to said one end to provide a first wall thickness reduction,

(b) axially stretching said distended section (**7**) by a cooperative action between said shackled or controlled mandrel (**3**) and a draw plate (**2**) to impose an external stretching action on said tubular blank (**1**) by said draw plate for forming a stretched section (**12**) next to and along said one end to provide a second wall thickness reduction,

(c) passing said stretched section (**12**) through said draw plate with said stretched section (**12**) protruding from said draw plate in a drawing direction (PD), and

(d) drawing said tubular blank in said drawing direction (PD) through said draw plate over said shackled or controlled mandrel (**3**) which thereby distends said tubular blank (**1**) from the inside of said tubular blank (**1**) to provide said wall thickness that is sufficiently thin for said cascade or tandem drawing.

5,533,377
METHOD OF MAKING A MANDREL FOR BLIND RIVETS

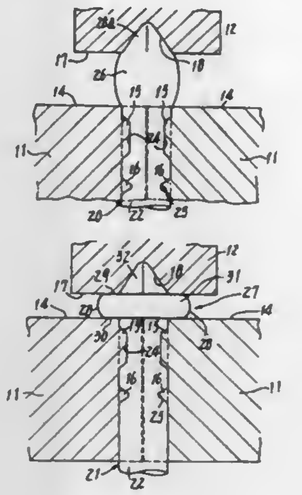
Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seisakusho, Osaka, Japan

Filed Aug. 1, 1994, Ser. No. 282,491

Claims priority, application Japan, Aug. 5, 1993, 5-214947

Int. Cl.^{6} B21F *5/00;* B21G *3/12*

U.S. Cl. 72—294 **2 Claims**



1. A method of making a mandrel for blind rivets comprising the steps:

preparing a metal rod including a cut tip as a starting material of the mandrel within a nail manufacturing apparatus using a pair of severing blades contained in the apparatus, the cut tip tapering off towards an upper extremity thereof;

holding in place the metal rod between a pair of split die segments with the metal rod having a swageable end and a predetermined length including the cut tip extending beyond an upper surface of the split die segments; and

a single pressing step which compresses the swageable end along an axial direction of the swageable end with a punch to form a head of the mandrel from the swageable end; and wherein

the punch has a substantially flat lower face and a recess formed therein having dimensions and a shape corresponding to the cut tip of the metal rod, with the recess tapering off towards an inner extremity thereof with the cut tip of the metal rod fitting in the recess so as to remain unchanged in shape; and

the compression of the swageable end of the rod having the cut tip received in the recess causes the swageable end to swell radially evenly relative to the cut tip and against the flat lower face to form the head having a flat flange from which the cut tip protrudes coaxial with a longitudinal axis of the metal rod.

5,533,378
VEHICLE HEADER ALIGNMENT APPARATUS

Harold W. Boeck, Algonac; David M. Wargnier, Sterling Heights, and Charles Baurhenn, Chesterfield, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

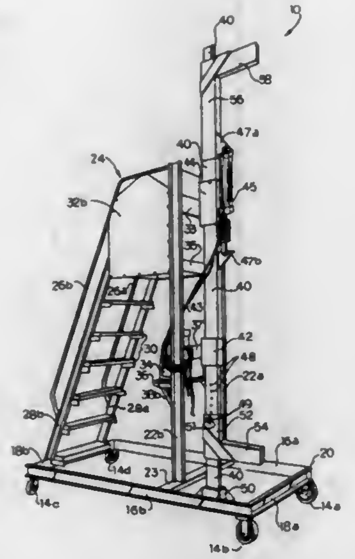
Filed Jun. 26, 1995, Ser. No. 494,426

Int. Cl.^{6} B21D *11/02*

U.S. Cl. 72—302 **9 Claims**

9. A header alignment apparatus for a vehicle having a bumper and a header, the header alignment apparatus having a contraction mode and an expansion mode, the header alignment apparatus comprising:

at least one stabilization pad for abutting against a flat surface, the at least one stabilization pad remaining on the flat surface during the expansion mode and disengaging from the flat surface during the contraction mode;



a substantially vertically upright extension pole attached to the at least one stabilization pad and having a plurality of bores extending therethrough, the vertically upright extension pole for moving upward during the contraction mode and remaining in a set position during the expansion mode;

an L-shaped upper actuator sleeve having a tubular portion through which the vertically upright extension pole extends and an upper actuator clamp portion, integrally formed therewith, for engaging the header, the L-shaped upper actuator sleeve movable in the axial direction of the vertically upright extension pole;

an L-shaped lower actuator sleeve having a tubular portion through which the vertically upright extension pole extends, at least one bore that extends therethrough in axial alignment with one of the plurality of bores of the vertically upright extension pole, and a lower actuator clamp integrally formed therewith, for engaging the bumper, the L-shaped lower actuator sleeve adjustably attached to the vertically upright extension pole and movable in the axial direction of the vertically upright extension pole;

a self-centering ram operably attached to the L-shaped upper actuator sleeve at a first end and operably attached to the vertically upright extension pole at a second end between the adjustable L-shaped lower actuator sleeve and the L-shaped upper actuator sleeve, the self-centering ram performing a simultaneous function of lowering the upper actuator clamp and raising the lower actuator clamp so that a force is exerted on the header tending to move it lower during the contraction mode, and alternatively performing a simultaneous function of raising the upper actuator clamp and lowering the lower actuator clamp so that a force is exerted on the header tending to move it higher during the expansion mode;

a pin for moving the L-shaped lower actuator sleeve axially along the vertically upright extension pole, the pin being inserted through the bore of the L-shaped lower actuator sleeve and one of the plurality of bores of the vertically upright extension pole;

a platform having at least one wheel attached thereto for transferring the vertically upright extension pole from location to location;

a first rectangular sleeve having the vertically upright extension pole inserted therethrough;

a second rectangular sleeve having the vertically upright extension pole inserted therethrough;

a ladder member attached to the first rectangular sleeve and the second rectangular sleeve at a first side and attached to the platform at a second side, the ladder member allowing a service technician to visually inspect the header for proper alignment; and

a remote toggle switch for allowing the service technician to operate the self-centering ram from a remote location.

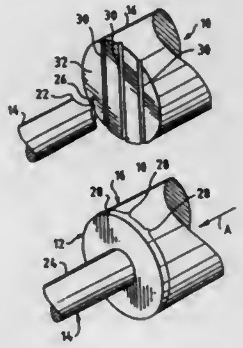
5,533,379
METHOD OF FORMING A HEAD ON A FASTENER

John Binder, Morton Grove; Henry W. Schniedermeier, Niles; Lawrence S. Shelton, Morton Grove; Henry A. Sygnator, Arlington Heights, and William L. Gabriel, Barrington, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 136,647, Oct. 14, 1993, Pat. No. 5,476,351. This application Jun. 7, 1995, Ser. No. 486,676

Int. Cl.^{6} B21G *3/12*

U.S. Cl. 72—316 **16 Claims**



1. A method of forming a head on an elongate member, comprising the steps of:

positioning an end portion of an elongate member at a predetermined location; and

exerting an axially compressive force against said end portion of said elongate member so as to radially outwardly expand a predetermined amount of material of said end portion of said elongate member and thereby form a head thereon which includes a plurality of ribs, all disposed parallel with respect to each other and with respect to a single diameter of said head and extending across said head, for controlling the flow of said material comprising said end portion of said elongate member in a predetermined direction parallel to said single diameter, and for accommodating said material comprising said end portion of said elongate member as said material comprising said end portion of said elongate member is expanded radially outwardly with respect to said elongate member of said fastener during said axial compression of said end portion of said elongate member and said formation of said head upon said elongate member such that said head has a predetermined configuration and wherein said head is substantially centered with respect to a longitudinal axis of said elongate member.

5,533,380
AUTOMATIC FORCE BALANCE CALIBRATION SYSTEM

Alice T. Ferris, Tabb, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 10, 1995, Ser. No. 438,409

Int. Cl.^{6} G01L *25/00*

U.S. Cl. 73—1 B **9 Claims**

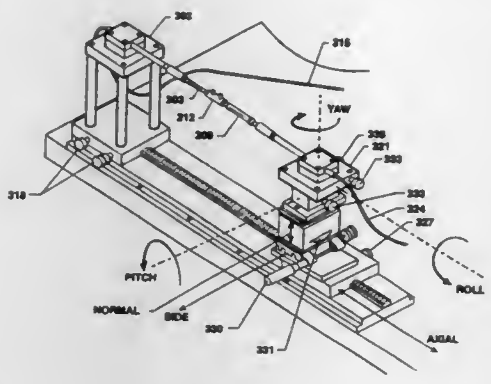
1. A device for automatically calibrating force balances comprising:

a lockable base;

a reference balance having an attachment end and an opposing test end, the reference balance connected at the attachment end to said base;

a means for rigidly attaching a test balance, said means connected to the test end of said reference balance; and

a means for simultaneously applying loads to the test end of said reference balance.



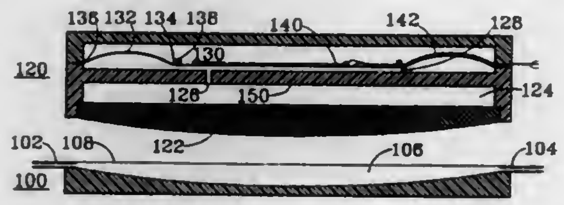
5,533,381
CONVERSION OF LIQUID VOLUME, DENSITY, AND VISCOSITY TO FREQUENCY SIGNALS

Joseph B. Seale, 36 Ledge La., Gorham, Me. 0408-1208

Filed Jun. 10, 1994, Ser. No. 258,198

Int. Cl.^{6} G01N *9/00;11/16;* G01F *1/76*

U.S. Cl. 73—19.03 **47 Claims**



1. A system for transforming a variable confined liquid volume into a variable electrical frequency response indicative of said liquid volume, said system comprising:

a. a housing including a cavity for receiving a liquid having a volume to be measured;

b. a deformable spring plate forming a part of a boundary of said cavity and confining vibrational movement of mass of said liquid, wherein a frequency of a vibration mode of said spring plate is sensitive to variations in inertia as a function of geometric variations of said confining; and

c. means coupled to said spring plate, said means for transforming characteristics of said vibration mode into electrical response characteristics indicative of said frequency of said vibration mode.

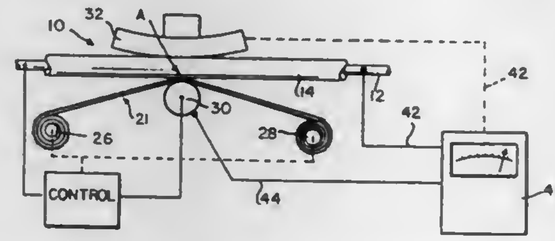
5,533,382
ABRASION TESTER

Thomas Clerkin, Athens, Ala., assignor to Wire Technologies, Inc., St. Louis, Mo.

Filed Jun. 6, 1995, Ser. No. 468,422

Int. Cl.^{6} G01N *3/56*

U.S. Cl. 73—7 **19 Claims**



1. An abrasion tester for testing the abrasion resistance of a non conductive material comprising:

a fixture for retaining a non-conductive material to be tested;

an abrasive strip of non-conductive material and a driver to move the abrasive strip along a first surface of the material to be tested at a point of abrasion;

first and second electrodes separated by the material to be tested and the abrasive strip at the abrasion point;

a measuring device for measuring the dielectric strength of said non-conductive materials between the first and second electrodes; and

a controller for stopping the driver when a predetermined dielectric strength is measured so as to determine abrasion resistance of the material to be tested as a function the initiation and termination of the driver.

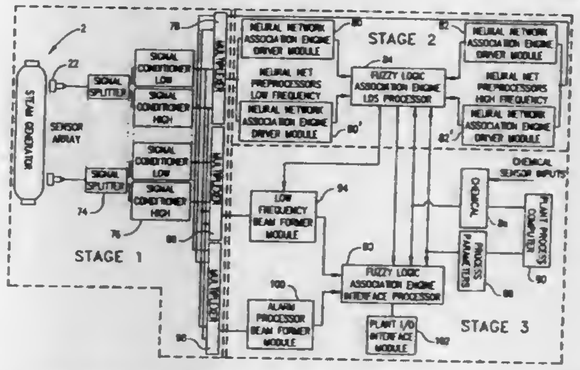
5,533,383
INTEGRATED ACOUSTIC LEAK DETECTION PROCESSING SYSTEM

David A. Greene; Rosemary A. Greene, both of San Jose, and Donald C. Gaubatz, Cupertino, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 18, 1994, Ser. No. 292,656

Int. Cl.^{6} G01M *3/24;* G21C *17/007*

U.S. Cl. 73—40.5 A **20 Claims**


2
22
STEAM GENERATOR
SENSOR ARRAY
SIGNAL SPLITTER
SIGNAL CONDITIONER LOW
SIGNAL CONDITIONER HIGH
SIGNAL SPLITTER
SIGNAL CONDITIONER LOW
SIGNAL CONDITIONER HIGH
74
76
78
STAGE 1
NEURAL NETWORK ASSOCIATION ENGINE DRIVER MODULE
NEURAL NET PREPROCESSORS LOW FREQUENCY
NEURAL NETWORK ASSOCIATION ENGINE DRIVER MODULE
STAGE 2
FUZZY LOGIC ASSOCIATION ENGINE LDS PROCESSOR
84
NEURAL NETWORK ASSOCIATION ENGINE DRIVER MODULE
NEURAL NET PREPROCESSORS HIGH FREQUENCY
NEURAL NETWORK ASSOCIATION ENGINE DRIVER MODULE
80'
82'
CHEMICAL SENSOR INPUTS
CHEMICAL
PLANT PROCESS COMPUTER
PROCESS PARAMETERS
LOW FREQUENCY BEAM FORMER MODULE
94
FUZZY LOGIC ASSOCIATION ENGINE INTERFACE PROCESSOR
100
ALARM PROCESSOR BEAM FORMER MODULE
PLANT I/O INTERFACE MODULE
102
90
STAGE 3

1. An apparatus for detecting an anomaly in a monitored volume, comprising:

a plurality of transducers coupled to a respective plurality of localized portions of said monitored volume, each of said transducers outputting a respective analog electrical signal having a low-frequency component which is a function of the vibrational displacement of said localized portions of said monitored volume;

means for converting said respective analog electrical signals into respective digital electrical signals;

means for multiplexing said respective digital electrical signals from said respective transducers; and

neural network processing means for recognizing a predetermined pattern in the digital electrical signals of any transducer having said predetermined pattern masked by background noise, said predetermined pattern reflecting a possible anomaly in said monitored volume.

5,533,384
APPARATUS FOR INSPECTING AN ENGINE VALVE SEAT

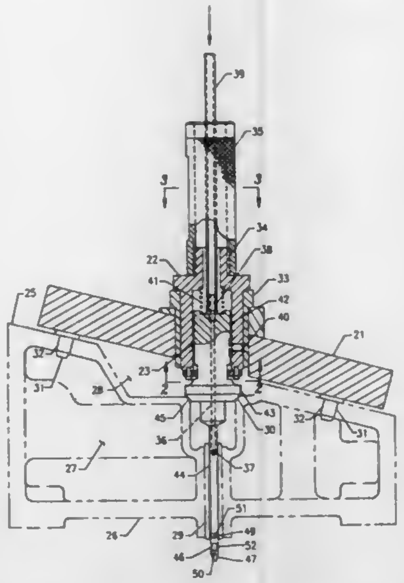
James H. Pierce, Commerce Township, and Robert J. Sayig, II, Livonia, both of Mich., assignors to Intra Corporation, Westland, Mich.

Filed Mar. 3, 1995, Ser. No. 398,559

Int. Cl.^{6} G01M *3/00*

U.S. Cl. 73—47 **11 Claims**

1. An apparatus for measuring a runout, ovality or concentricity of an engine valve seat with respect to a valve guide comprising: a datum plate for positioning an air gage head on an engine cylinder head or an engine block in a predetermined position relative to an engine valve seat and mounting an air gage body for rotating an air



gage head about an axis of said engine valve seat; an air gage body mounted for rotation in said datum plate, said air gage body having an aperture for receiving an upper portion of an air gage head; an air gage head, said air gage head having an upper portion mounted in said air gage body, an intermediate, tapered, outward extending portion for engaging a tapered engine valve seat, and a lower cylindrical portion for engaging a valve guide, said upper portion having an outer surface which allows said air gage head to be angularly displaced within said aperture of said air gage body, if during said rotation of said air gage head a measurement taken with said apparatus of runout, ovality or concentricity is within an established tolerance limit, said air gage head further having at least one aperture for discharging a jet of air; a cylindrical handle attached to a threaded upper portion of said air gage body for rotating said air gage body; a source of compressed air; a signal processing device operatively connected to said air gage head; and a display unit operatively connected to said signal processing device for displaying a measurement of the runout, ovality and concentricity of said engine valve seat when said air gage head is engaged with and rotated in said engine valve seat and said engine valve guide during said measurement of said runout, ovality or concentricity of said engine valve seat.

5,533,385

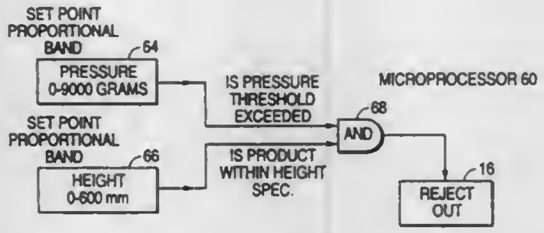
PACKAGE SEAL INTEGRITY TESTING DEVICE AND METHOD OF OPERATION THEREOF

William Frievalt, 6425 Shady Oaks La., Plano, Tex. 75093

Filed Feb. 6, 1995, Ser. No. 383,949

Int. Cl.^{6} G01M *3/36;3/02;* **B07C** *1/10*

U.S. Cl. 73—49.3 **39 Claims**



1. A process for testing seal quality and height of flexible packages containing stored products and fluid therein comprising:
  (a) positioning a package with initial height and width dimensions to be tested at a test station;
  (b) initially moving a loading device into contact with the flexible package in a direction which applies an increasing load to fluid within the package with the load applied to the package being sensed with a sensing device;
  (c) moving the loading device an initial distance in the same direction which causes the sensed load to equal a set load;
  (d) defining as a reference position of the loading device an actual position of the loading device when the set load is sensed by the sensing device;
  (e) stopping movement of the loading device when the set load has been sensed by the sensing device for a time interval sufficient to permit the package to expand at the test station which drops the load sensed by the sensing device below the set load;
  (f) moving the loading device an additional distance from the reference position in the same direction to further decrease the height of the package where the set load is applied to the package; and
  (g) accepting the package if the movement of the loading device the additional distance from the reference position causes the load sensed by the sensing device to at least equal the set load and the additional distance of movement from the reference position, which further decreased the height of the package, falls within a set range defining an acceptable minimum and maximum height of the package.

5,533,386

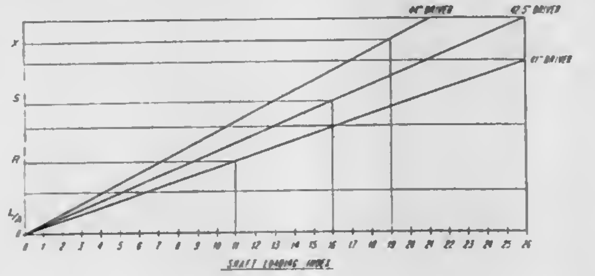
METHODS OF USING AN ACCELERATION RESPONSIVE DEVICE

Joseph H. Butler, Jr., Collierville, Tenn., assignor to Emhart Inc., Newark, Del.

Division of Ser. No. 290,668, Aug. 1, 1994. This application Jul. 20, 1995, Ser. No. 504,624

Int. Cl.^{6} A63B *53/10*

U.S. Cl. 73—65.01 **3 Claims**



1. A method of using an acceleration responsive device for providing an indication of the acceleration attained when the device is moved, which comprises the steps of: preparing a graph which has values appearing along the abscissa thereof relating to an indication of the acceleration attained by the moving device and has values appearing along the ordinate thereof representing the stiffnesses of implements which stiffnesses correlate to the indications of acceleration attained when the device is moved by a user thereof, plotting at least one line on the graph based on data showing the correlation between the various acceleration values and the stiffness values, moving the acceleration responsive device in a prescribed direction to obtain a reading indicative of the acceleration attained during the movement thereof, applying the reading to the acceleration values of the graph, visualizing a perpendicular line from the acceleration reading on the graph to an intersection with the plotted line, and visualizing a line perpendicular to the ordinate from the intersection of the plotted line to the ordinate to obtain a stiffness value reading representing the appropriate stiffness of the implement most suited for use by the user of the device.

5,533,387

METHOD OF EVALUATING SILICON WAFERS

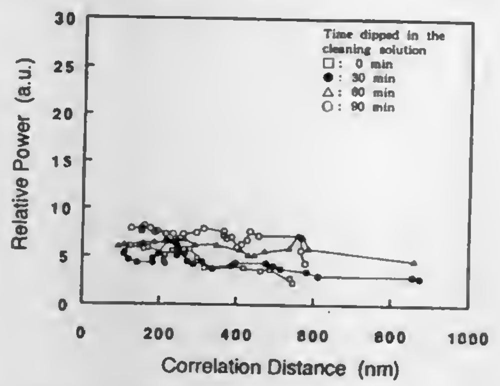
Ken Aihara, Annaka; Yutaka Kitagawara, Takasaki, and Takao Takenaka, Annaka, all of, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 528,007

Claims priority, application Japan, Sep. 16, 1994, 6-248458

Int. Cl.^{6} G01B *7/34*

U.S. Cl. 73—105 **3 Claims**



1. A method of evaluating silicon wafers which evaluates the crystal quality of silicon wafers by measuring the height x_i (i=1, 2, . . . , N) of a plurality of measuring points on the principal plane of a silicon wafer from a reference plane by means of an atomic force microscope (hereafter referred to as "AFM"), determining the autocorrelation function R_j represented by

$$R_j = \frac{1}{N-j} \sum_{i=1}^{N-j} (x_i - \bar{x})(x_{i+j} - \bar{x}) \quad (j = 0, 1, \ldots, N-1)$$

wherein $\bar{x}$ denotes:

$$\bar{x} = \sum_{i=1}^{N} \frac{x_i}{N}$$

selecting an arbitrary number of autocorrelation function R_j with large value from said autocorrelation function R_j, and analyzing the microroughness on said silicon wafer based on the distances between the point $R_{j=0}$ and said selected points R_j's with large value except for $R_{j=0}$.

5,533,388

APPARATUS FOR ELECTROMAGNETICALLY ISOLATING AN AUTOMOBILE

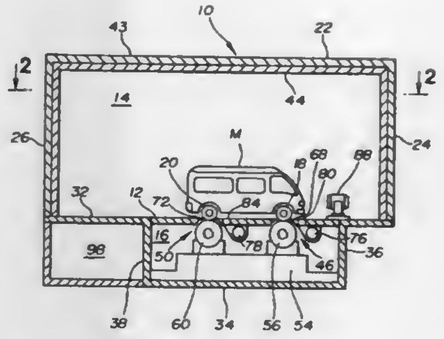
Akira Yamamoto; Masaaki Okabe; Yoshio Kaneko, and Keiichi Shiraishi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,651

Claims priority, application Japan, Feb. 23, 1994, 6-024605; Mar. 28, 1994, 6-056449

Int. Cl.^{6} G01M *17/00*

U.S. Cl. 73—117 **20 Claims**



1. An apparatus for electromagnetically isolating an automobile having road wheels from an environment surrounding the automobile, comprising:
  a first chamber for the automobile;
  a second chamber disposed adjacent said first chamber;
  means for shielding said first and second chambers from passing of electromagnetic wave between said first and second chambers and environments around said first and second chambers;
  a wall disposed between said first and second chambers to cover said second chamber;
  road simulator units mounted within said second chamber;
  dynamometer means mounted within said second chamber in driving relation with said road simulator units;
  blowers mounted within said second chamber;
  a controller disposed outside said first and second chambers to prevent electromagnetic wave from entering said first and second chambers;
  conductors connecting said controller with said dynamometer means and said controller with said blowers;
  first filters disposed in said conductors to filter electromagnetic noise propagated from said controller to said dynamometer means; and
  second filters disposed in said conductors to filter electromagnetic noise propagated from said controller to said blowers.

5,533,389

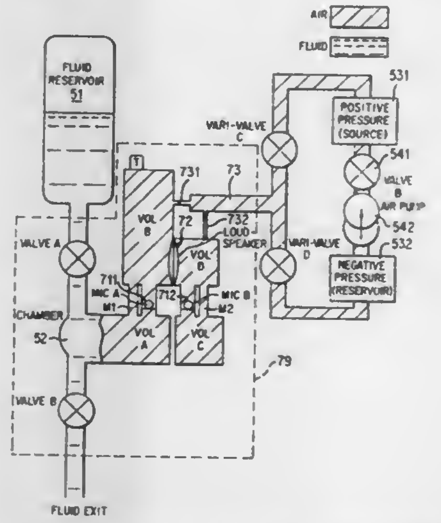
METHOD AND SYSTEM FOR MEASURING VOLUME AND CONTROLLING FLOW

Dean L. Kamen, Bedford, N.H.; Joseph B. Seale, Gorham, Me.; Joseph Briggs, Manchester, N.H., and Finn Arnold, Sutton, Mass., assignors to Deka Products Limited Partnership, Manchester, N.H.

Division of Ser. No. 792,877, Nov. 15, 1991, Pat. No. 5,349,852, which is a continuation-in-part of Ser. No. 615,612, Nov. 19, 1990, abandoned, Ser. No. 673,834, Mar. 22, 1991, abandoned, Ser. No. 674,813, Mar. 22, 1991, abandoned, and Ser. No. 614,806, Nov. 19, 1990, abandoned, each which is a continuation-in-part of Ser. No. 523,801, May 15, 1990, Pat. No. 5,088,515, said Ser. No. 614,806and Ser. No. 615,612, , each is a continuation-in-part of Ser. No. 345,387, May 1, 1989, Pat. No. 4,976,162, which is a continuation-in-part of Ser. No. 92,481, Sep. 3, 1987, Pat. No. 4,826,482, which is a continuation-in-part of Ser. No. 22,167, Mar. 5, 1987, Pat. No. 4,808,161, and Ser. No. 836,023, Mar. 4, 1986, Pat. No. 4,778,451. This application Sep. 15, 1994, Ser. No. 306,459

Int. Cl.^{6} G01F *17/00;3/36;1/66*

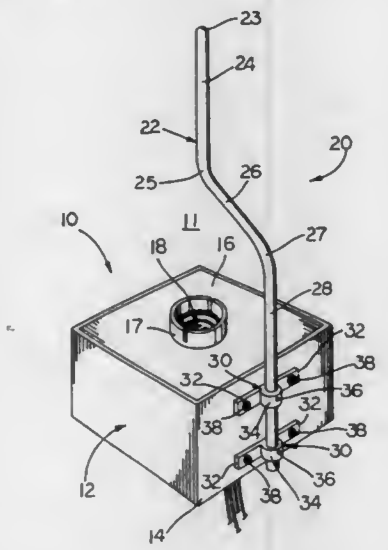
U.S. Cl. 73—149 **8 Claims**



1. A method, for measuring the flow rate of liquid through a line, comprising the steps of:

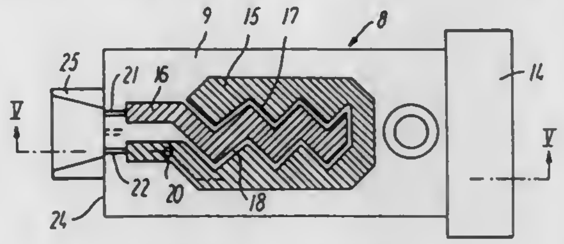
isolating in a chamber a section of the line from the pressure effects of liquid in the rest of the line;
associating with the chamber a resonatable mass of known acoustic characteristics so as to form an acoustic resonant system;
generating an electrical signal having a spectrum of frequencies;
converting the electrical signal into an acoustic response in the chamber;
determining, based on the amplitude and phase change of the acoustic response in relation to the electrical signal, whether a frequency in the spectrum causes the resonatable mass to resonate;
determining, based on a resonant frequency, the volume of liquid in the chamber; and
dispensing liquid from the chamber.

5,533,390
ANTI-PERCH ATTACHMENT FOR A SENSOR
Thaddeus M. Jones, 1302 High St., South Bend, Ind. 46601
Filed Mar. 15, 1995, Ser. No. 404,247
Int. Cl.^{6} G01D *11/00;* **A01K** *37/00;15/04*
U.S. Cl. 73—170.16 **12 Claims**



1. An attachment for a sensor, which includes a side wall, an end wall and an exposed sensing element mounted to said end wall, for preventing birds and animals from perching over said sensing element, said attachment comprising:
an elongated bent rod including proximal and distal end segments and an intermediate segment connected between said proximal and distal end segments, and means for mounting said proximal end segment to said side wall at a location laterally spaced from said sensing element,
said rod defining an open area adjacent said sensing element when said proximal end segment is mounted to said side wall wherein said distal end segment extends longitudinally over and is spaced from said sensing element, said intermediate segment is spaced diagonally from said sensing element, and said proximal end segment is spaced laterally from said sensing element.

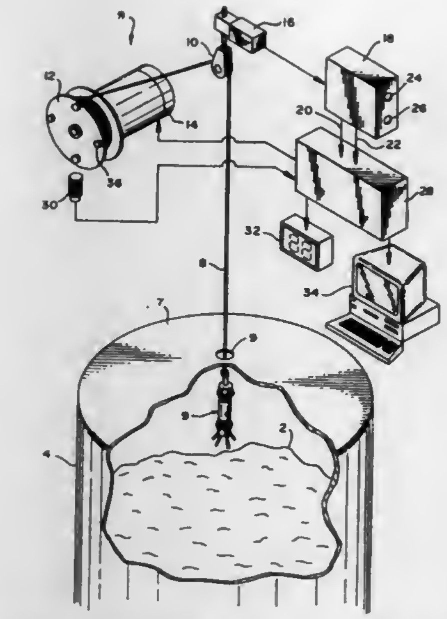
5,533,391
ELECTRIC RAIN SENSOR AND METHOD OF MANUFACTURING A SENSOR MEMBER THERETO
Claus B. Brade, Copenhagen, and Niels Bartholin, Brøndby Strand, both of, Denmark, assignors to V. Kann Rasmussen Industri A/S, Søborg, Denmark
PCT No. PCT/DK93/00222, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO94/01649, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 9, 1993, Ser. No. 362,477
Claims priority, application Denmark, Jul. 9, 1992, 0901/92
Int. Cl.^{6} G01W *1/14;* **E05F** *15/20*
U.S. Cl. 73—170.19 **12 Claims**



1. An electric rain sensor for mounting on the outside of the main frame (1) or on another stationary member of an openable window (1,2) of the type where opening and closing may be carried out by means of an electrical maneuvering device (3), said rain sensor comprising a sensing element (4) with two electrodes (15,16; 44,45) opposite one another in or on a substantially plane sensing surface (9,46) of an insulating holder (8,38), the distance between the electrodes (15,16; 44,45) being less than the size of a raindrop, means for applying a voltage between the electrodes (15,16; 44,45) and an electrical circuit connected to the electrodes for detecting a change in an electrical quantity caused by the presence of raindrops, a heating element (19,39) being mounted on the holder (8,38) for drying of the sensing surface (9,46), and the holder (8,38) being produced by molding of an electrically insulating thermoplastic, characterized in that the heating element (19,39), and supply lines (21–23; 41–43) therefor and for the electrodes (15,16; 44,45), are manufactured as inserts of the holder (8,38) by molding in an electrically conducting thermoplastic polymer into excavated recesses and/or grooves in the holder (8,38).

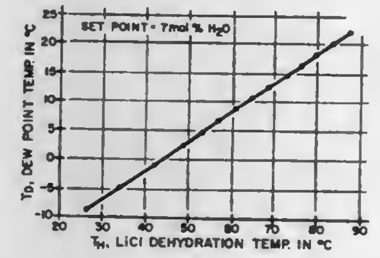
5,533,392
SYSTEM AND METHOD FOR SENSING MATERIAL LEVEL WITHIN A CONTAINER
Alan K. Kira, Honolulu, Hi., assignor to Tecnetics Industries, Inc., St. Paul, Minn.
Filed May 17, 1994, Ser. No. 243,887
Int. Cl.^{6} G01F *23/00*
U.S. Cl. 73—290 B **23 Claims**

1. A system for sensing the surface level of flowable material within a container, comprising:
a) a drop weight for being disposed in a standby position above the material and brought into contact with the surface level of the material;
b) a cable for suspending said drop weight above the material;
c) a rotatable spool to which said cable is wound and anchored;
d) a reversible motor coupled to said spool for rotating said spool such that said cable is drawn in or payed out for raising or lowering said drop weight above the material surface level;
e) a transducer operably associated with said cable for providing an output responsive to the strain on said cable;
f) a signal processor connected to said transducer for processing the transducer output and generating a first output signal responsive to said drop weight being supported by the material and a second signal responsive to a strain on said cable in excess of the weight exerted by the drop weight;
g) a pulse generator for generating a plurality of pulses the number of which is proportional to the amount of rotation of said spool;



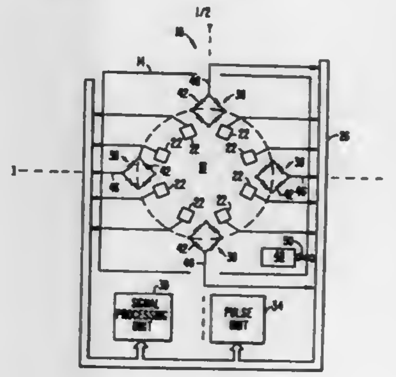
h) a programmable controller operably connected to said motor, said pulse generator and said signal processor;
i) said controller for driving said motor in a first direction to lower said drop weight toward the material surface, driving said motor in a second direction to raise said drop weight substantially the same distance after said signal processor has detected that said drop weight is being supported on the material surface, and for calculating the surface level of the material based on the number of plurality of pulses generated by said pulse generator during rotation of said spool in the first direction;
j) said controller for driving said motor in the first direction a predetermined amount of time in response to the second signal to thereby play out an amount of said cable to release the strain thereon; and
k) a display operably connected to said controller for displaying the calculated level of the material surface.

5,533,393
DETERMINATION OF DEW POINT OR ABSOLUTE HUMIDITY
Ulrich Bonne, Hopkins, Minn.; Nobuaki Honda, Yokohama, Japan; David Kubislak, Chanhassen, and Thomas R. Ohnstein, Roseville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 13, 1995, Ser. No. 372,577
Int. Cl.^{6} G01N *27/12;* **G01W** *1/00;* **H01L** *7/00*
U.S. Cl. 73—355.02 **37 Claims**



34. A method of humidity stabilizing an hygroscopic salt exposed to the atmosphere under conditions of high humidity comprising the step of retaining said hygroscopic salt as a separated incorporated salt in an host material selected from the group consisting of porous alumina, magnesia, zirconia, silicon films and hydrophilic polymer matrices which are substantially insoluble in an humidity induced water solution of the hygroscopic salt, said polymer matrices further being selected from a poly alcohol crosslinked by a carboxylic crosslinking agent; thereby yielding a host material which resists washout of said hygroscopic salt.

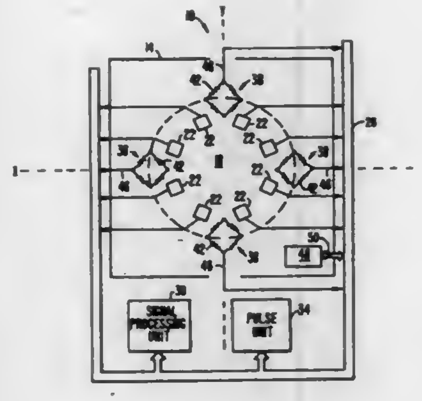
5,533,394
FERROELECTRIC THIN FILM TRAVELLING WAVE ROTATION SENSOR
Lawrence A. Wan, Malibu, Calif., assignor to BEI Electronics, Inc., San Francisco, Calif.
Division of Ser. No. 955,589, Oct. 5, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,095
Int. Cl.^{6} G01P *9/00*
U.S. Cl. 73—504.01 **21 Claims**



1. A rotation sensor comprising:
a diaphragm;
a plurality of electrodes disposed about the diaphragm;
a ground plane;
a ferroelectric material disposed in close proximity to and between the plurality of electrodes and the ground plane;
signal applying means, coupled to the plurality of electrodes, for applying a signal to the plurality of electrodes in a circular manner, thereby compressing and expanding the ferroelectric material and causing the diaphragm to flex in a circular manner, whereby an angular momentum of a travelling wave is created; and
deformation sensing means for sensing deformation of the diaphragm.

5,533,395
THIN FILM ROTATION SENSOR
Lawrence A. Wan, Malibu, Calif., assignor to BEI Electronics, Inc., San Francisco, Calif.
Continuation of Ser. No. 262,095, Jun. 20, 1994, which is a division of Ser. No. 955,589, Oct. 5, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 314,756
Int. Cl.^{6} G01P *9/00*
U.S. Cl. 73—504.01 **28 Claims**

1. An electrode structure for a rotation sensor comprising:
a diaphragm;
a plurality of electrodes disposed about the diaphragm;
signal applying means, coupled to the plurality of electrodes;
a material connected to said diaphragm which compresses or expands upon application of said electrical signals; and
the signal applying means comprising means for applying different phase electrical signals to adjacent pairs of the plurality of electrodes in a circular manner about the diaphragm.



5,533,396
VIBRATING GYROSCOPE

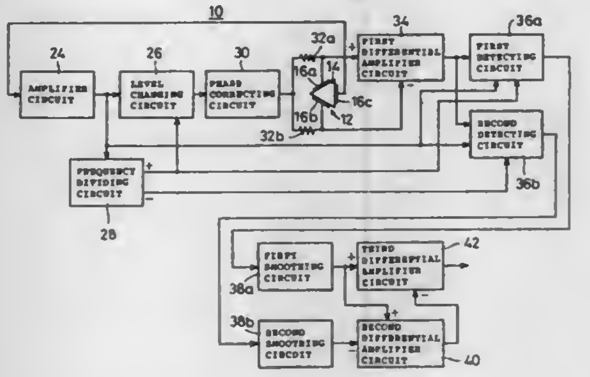
Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-Fu, Japan

Filed May 17, 1995, Ser. No. 443,193

Claims priority, application Japan, May 20, 1994, 6-131297

Int. Cl.^{6} G01P *15/14*

U.S. Cl. 73—504.12 **3 Claims**



1. A vibrating gyroscope comprising:
- a circuit for generating a driving signal whose amplitude changes at every specific period;
- a piezoelectric vibrator which bends and vibrates at a constant amplitude by said driving signal, and outputs two detecting signals having different magnitudes corresponding to a rotational angular velocity applied thereto;
- a first differential amplifier circuit for detecting a differential signal between said two detecting signals;
- a first detecting circuit for detecting an output signal of said first differential amplifier circuit;
- a first smoothing circuit for smoothing an output signal of said first detecting circuit;
- a second detecting circuit for detecting the output signal of said first differential amplifier circuit;
- a second smoothing circuit for smoothing an output signal of said second detecting circuit;
- a second differential amplifier circuit for detecting a differential signal between an output signal of said first smoothing circuit and an output signal of said second smoothing circuit; and
- a third differential amplifier circuit for detecting a differential signal between the output signal of said first smoothing circuit and an output signal of said second differential amplifier circuit; wherein
- said first detecting circuit and said second detecting circuit are operated separately and intermittently in association with said specific period of said driving signal.

5,533,397
VIBRATION-SENSING ELEMENT AND VIBRATION-SENSING GYRO USING THE SAME

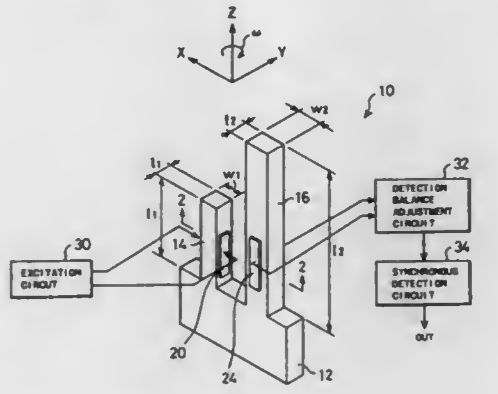
Nobuyoshi Sugitani, Toyota; Masayuki Okuwa, Nagoya; Takeshi Morikawa, Seto, and Yutaka Nonomura, Nagoya, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 26, 1994, Ser. No. 329,385

Claims priority, application Japan, Oct. 28, 1993, 5-294495

Int. Cl.^{6} G01P *9/04*

U.S. Cl. 73—504.16 **23 Claims**


Z
X
Y
10
t1
w2
w1
16
32
DETECTION BALANCE ADJUSTMENT CIRCUIT
30
EXCITATION CIRCUIT
14
l1
l2
34
SYNCHRONOUS DETECTION CIRCUIT
OUT
20
24
12

1. A vibration-sensing element comprising:
- a base;
- first and second tines projecting from said base, said first and second tines being fixed to said base and arranged in a plane so that, while said first tine vibrates, vibrations are propagated from said first tine to said second tine through said base;
- said first tine being formed to have a width w1 along an X axis of rectangular coordinate axis and arranged to allow vibrations along said X axis;
- said second tine being formed to have a thickness t2, different from said width w1, along a Y axis perpendicular to said X axis, and arranged to allow vibrations along said Y axis; and
- wherein a resonance frequency of said first tine along said X axis coincides with a resonance frequency of said second tine along said Y axis, and a value of a first ratio of the square root of said width w1 of said first tine to a length l1 of said first tine coincides with a value of a second ratio of the square root of the thickness t2 of said second tine to a length l2 of said second tine, the length of the first tine l1 being measured from a fulcrum of vibrations of said first tine along said X axis to a free end and the length l2 of the second tine being measured from a fulcrum of vibrations of said second tine along said Y axis to a free end.

5,533,398
METHOD AND APPARATUS FOR TESTING LEAD CONNECTIONS OF ELECTRONIC COMPONENTS

Keizoh Sakurai, Shiga-ken, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

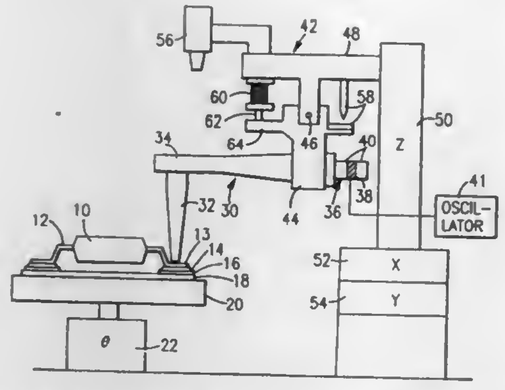
Filed May 12, 1994, Ser. No. 241,903

Claims priority, application Japan, May 13, 1993, 5-111304

Int. Cl.^{6} G01M *7/00;* **G01N** *3/48;3/32*

U.S. Cl. 73—573 **22 Claims**

1. A method for producing interconnect structures, comprising the steps of:
- connecting leads of a first material, of electronic components to conductors of substrates, by joints of a different second material which are strained when subjected to a shearing force;
- pressing the tip of a probe onto the surface of one of the leads;
- vibrating the probe in parallel with the surface of the lead to cause a sheering force;
- detecting a strain occurring in the joint in response to the vibration; and



- judging the quality of the lead connection based on the detected strain.

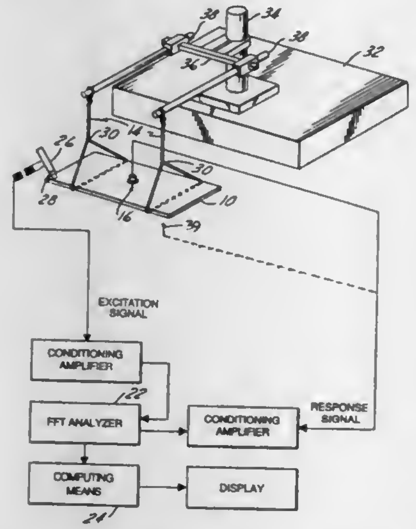
5,533,399
METHOD AND APPARATUS FOR NON-DESTRUCTIVE MEASUREMENT OF ELASTIC PROPERTIES OF STRUCTURAL MATERIALS

Ronald F. Gibson, and Emmanuel O. Ayorinde, both of Southfield, Mich., assignors to Wayne State University, Detroit, Mich.

Continuation of Ser. No. 953,896, Sep. 30, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 305,402

Int. Cl.^{6} G01H *13/00*

U.S. Cl. 73—579 **9 Claims**



1. A method for determining the elastic properties of either an isotropic or orthotropic structural material, where it is unknown before testing whether the structural material is isotropic or orthotropic, comprising the steps of:
- suspending a single plate alone of the material from a rigid support by a plurality of filaments having a low support stiffness and having minimal effect on motion of the material so that the only observations needed for determining the elastic properties are made from the single plate, absent any prior assumptions about elastic constants;
- providing a vibration sensor to detect a vibration response in the material;
- imparting an impulse to the material;
- generating a response signal proportionate to the response in the material to the impulse imparted;
- generating an excitation signal in proportion to the impulse;
- communicating the response signal to an analyzer for transforming the response signal into a frequency domain;
- deriving resonance frequencies and associated mode shape indices of the material;
- communicating the resonance frequencies and the mode shape indices to a computing means;
- computing and displaying four elastic constants (E_x, E_y, G_{xy}, and v_{xy}) using the computing means; and
- determining after the computing and displaying step that the material is orthotropic or isotropic by inspection of the four elastic constants.

5,533,400
PROCESS FOR THE EARLY DETECTION OF A CRACK IN A ROTATING SHAFT

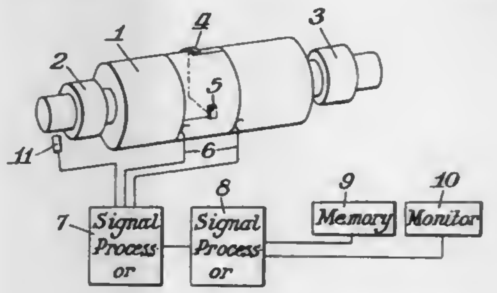
Robert Gasch, Berlin, Germany, and Mingfu Liao, Xian, China, assignors to Carl Schenck AG, Germany

Filed Sep. 9, 1993, Ser. No. 117,918

Claims priority, application Germany, Sep. 4, 1992, 42 29 340

Int. Cl.^{6} G01H *1/00*

U.S. Cl. 73—593 **2 Claims**



1. A process for the early detection of a crack in a rotating shaft, in which signals representative of flexural vibrations of the shaft are picked up as a function of rotational angle by means of vibration sensors in at least two radial directions, and the signals are transmitted to a signal processor which uses the signals to ascertain the harmonic vibration components with at least a single rotational frequency and then the processor forms at least a single rotational-frequent vibration orbit by means of a vectorial combination of the vibration components, the improvement comprising in that the signal processor vectorially decomposes at least the single rotational-frequent vibration orbit formed on the basis of the harmonic vibration components into a forward whirl turning in the same rotational direction as the shaft and into a backward whirl turning in the opposite direction to the rotation of the shaft and in that the backward whirl is compared with a reference base-line ascertained in one of the new and normal states.

5,533,401
MULTIZONE ULTRASONIC INSPECTION METHOD AND APPARATUS

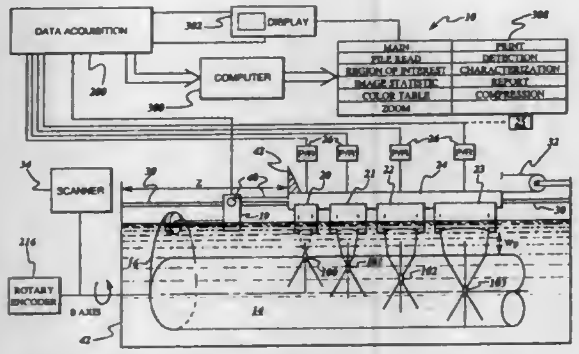
Robert S. Gilmore, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 12, 1994, Ser. No. 241,520

Int. Cl.^{6} G01N *29/10;29/26*

U.S. Cl. 73—622 **15 Claims**

1. A method for nondestructively examining an object having a longitudinal axis, the method comprising the steps of:
- a) immersing the object in a fluid;
- b) arranging a plurality of ultrasonic transducers, each having a focal zone of a different depth relative to said object such that said plurality of transducers are positioned to focus ultrasonic beams from said transducers beginning at an exterior surface of the object and at successively increasing depths into the object, wherein a focal zone of each transducer partially overlaps a focal zone of each transducer focused at adjacent depths;
- c) translating said plurality of ultrasonic transducers along the longitudinal axis of said object;



d) pulsing said ultrasonic transducers at a plurality of axially spaced-apart data positions to emit the ultrasonic beams at a uniform frequency throughout the entire volume of the object;
e) focusing the ultrasonic beams at progressively different depths throughout the object, the ultrasonic beams focused at the exterior surface of the object and focused successively in increasing depth within the object to form multiple prolate spherical focal zones oriented transversely to the longitudinal axis of the object, wherein a focal zone of each ultrasonic beam partially overlaps a focal zone of the ultrasonic beams focused at adjacent depths;
f) receiving echo signals from reflections of said ultrasonic beams from each of said plurality of transducers throughout the respective focal zones of the transducers at each of said plurality of data positions;
g) processing said echo signals to convert said signals into digital data in a format suitable for storing in a first readable memory medium;
h) further processing said digital data to generate an image of the object undergoing examination;
i) displaying said image of said object on a display means; and
j) storing data representing said image of said object in a second readable memory medium.

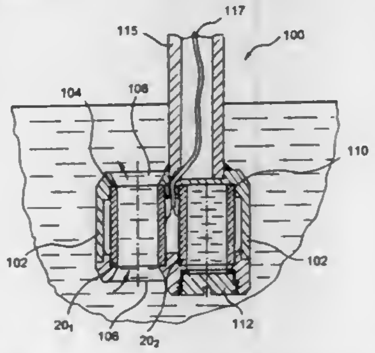
5,533,402
METHOD AND APPARATUS FOR MEASURING ACOUSTIC PARAMETERS IN LIQUIDS USING CYLINDRICAL ULTRASONIC STANDING WAVES

Armen Sarvazyan, East Brunswick, N.J., and Viktor Ponomarev, Rostov-on-Don, Russian Federation, assignors to Artann Corporation, Harvard, Me.

Filed May 11, 1994, Ser. No. 240,831

Int. Cl.⁶ G01H *5/00*

U.S. Cl. 73—645 **18 Claims**



1. Apparatus for measuring acoustic parameters of a fluid, the apparatus comprising:
at least one pair of tubular cells;
means for generating acoustic oscillations within the cells so as to produce a cylindrical mode of oscillation in at least one cell;
means for detecting cylindrical-mode oscillations in the cells; and
means for providing, based on the detected cylindrical-mode oscillations, an acoustic parameter measurement;
wherein the mode of oscillation is a cylindrical standing wave;
said apparatus further comprising:
a sealable chamber, housing a first tubular cell, for receiving a reference liquid;
a second chamber, housing a second tubular cell, having an inlet and an outlet defining a fluid pathway through the cell;
measurement means for measuring at least resonance frequency; and
control means, coupled to the feedback means and to the measurement means, for controlling the signal to maintain a cylindrical ultrasonic standing wave through each cell and performing at least one measurement thereon.

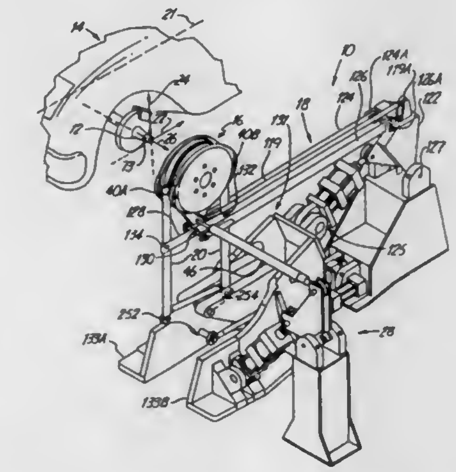
5,533,403
LOADING ASSEMBLY FOR A VEHICLE SPINDLE TEST FIXTURE

Steven R. Haeg, Shorewood; Paul J. Leska, Sr., Coon Rapids, and Ricky L. Zieman, Chaska, all of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Nov. 10, 1994, Ser. No. 337,610

Int. Cl.⁶ G01M *17/04*

U.S. Cl. 73—669 **22 Claims**



1. A loading apparatus used in a vehicle spindle test fixture to apply selected forces and moments to a vehicle spindle having a vehicle spindle axis, the loading apparatus comprising:
a first loading member securable to the vehicle spindle for receiving and transferring a braking moment to the vehicle spindle about the vehicle spindle axis, a first force parallel to a first axis that is perpendicular to the vehicle spindle axis, and a second force parallel to a second axis that is perpendicular to the first axis and the vehicle spindle axis;
a second loading member for receiving forces generally parallel to the vehicle spindle axis; and
means for joining the second loading member to the first loading member whereby the first loading member and the second loading member are directly coupled to each other, said means being rigid for forces applied to the second loading member parallel to the vehicle spindle axis in order to transfer said forces to the first loading member while allowing movement of the second loading member relative to the first loading member for braking moments applied to the first loading member and for longitudinal forces applied to the first loading member parallel to one of the two perpendicular axes.

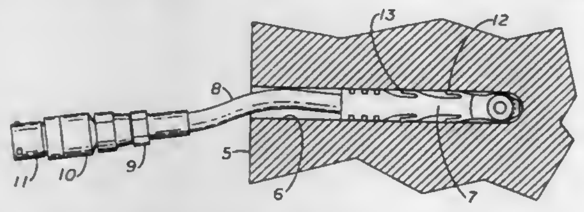
5,533,404
MOLD PRESSURE SENSOR BODY

Richard Wurst, Williamsburg, and Rodney J. Groleau, Traverse City, both of Mich., assignors to RJG Technologies, Inc., Traverse City, Mich.

Filed Dec. 9, 1994, Ser. No. 353,178

Int. Cl.⁶ G01L *5/00;* B29C *45/76*

U.S. Cl. 73—756 **22 Claims**



1. A plastic injection mold pressure sensor body having a sensing element, the sensing element having a preferred centerline, and at least one integral resilient appendage projecting from the sensor body in a direction transverse to the centerline, said appendage adapted to transversely urge said sensor body against a channel wall in a mold ejector plate.

5,533,405
SOUND COMPARISON DEVICE FOR A DRUM

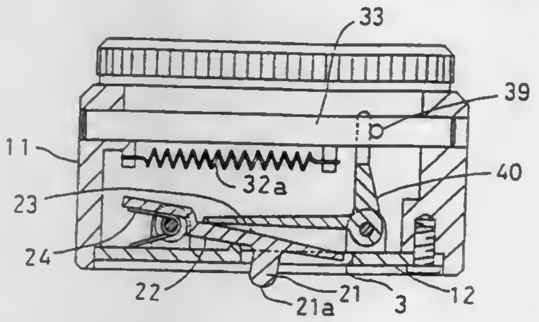
Yoshiki Hoshino, Aichi-Ken, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Nov. 10, 1993, Ser. No. 150,461

Claims priority, application Japan, Apr. 6, 1993, 5-23150 U

Int. Cl.⁶ G01L *5/04;* G01D *13/02*

U.S. Cl. 73—760 **6 Claims**



1. A sound comparison device for a drum, comprising:
a display;
a body supporting the display and having a bottom with a periphery, the periphery of the bottom of the body being adapted to contact a surface of a drum head of the drum, the drum head having a basic vibration number ratio; and
a drum head tension measurement element mounted on the body, the measurement element including
a measurement lever is pivotally mounted and has a tip thereon which protrudes a distance X from the bottom of the body, the distance X varying as the measurement lever pivots;
a swinging lever swingably supported on the body and having first and second mutually-connected arms the first and second arms being connected approximately perpendicular to one another, the first arm of the swinging lever being connected to the display, and the second arm contacting the measurement lever, such that, as the measurement lever pivots., the display displays a numerical value Y which corresponds to the distance X in accordance with $Y= K/X^{1:2}$, where K is a constant and Y is linearly related to the basic vibration number ratio of the drum head; and
means biasing the tip so as to press the tip against the drum head and sink the tip into the drum head to the distance X determined by the tension on the drum head and normally urging the measurement lever to pivot to cause the tip to protrude from the body.

5,533,406
VIRTUAL IMPACTOR

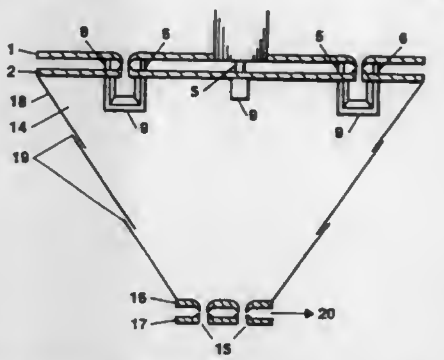
Hans-Ulrich Geise, Osterholz, Germany, assignor to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed Apr. 27, 1995, Ser. No. 429,832

Claims priority, application Germany, Apr. 29, 1994, 44 15 014.8

Int. Cl.⁶ G01N *1/00*

U.S. Cl. 73—863.22 **14 Claims**



1. A virtual impactor for enriching aerosol particles, comprising:
a generator plate having an inlet side and an outlet side;
a receptor plate disposed generally parallel with the generator plate, so as to define a space between the generator plate and the receptor plate, the receptor plate having an inlet side facing the outlet side of the generator plate, and an outlet side facing away from the generator plate;
a gas supply on the inlet side of the generator plate;
an impactor chamber on the outlet side of the receptor plate;
an outlet port in the impactor chamber;
an extractor for extracting gas from the said space between the plates; and
wherein the generator and receptor plates each include an inner portion and an outer portion arranged to form at least one nozzle in the shape of a slit in each plate, and wherein each slit is curved and forms a closed loop such that it encompasses its respective inner portion and is encompassed by its respective outer portion.

5,533,407
ASSEMBLY FOR TAKING LIQUID SAMPLES IN JUGS SEALED BY SCREW GAPS

Joseph Besnier, Acqueville, France, assignor to Compagnie Generale Des Matieres Nucleaires, Velizy-Villacoublay, France

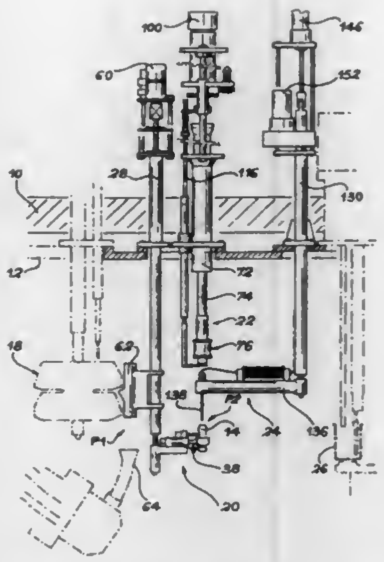
Filed Sep. 26, 1994, Ser. No. 312,287

Claims priority, application France, Oct. 14, 1993, 93 12216

Int. Cl.⁶ G01N *35/10;* B67B *7/18*

U.S. Cl. 73—864.25 **10 Claims**

1. Assembly for taking liquid samples from jugs sealed by screw caps comprising:
a module for gripping the jugs, the gripping module having a gripper which in use grippingly holds a jug substantially in line with respect to a vertical axis of the jug;
means for controlling opening and closing of the gripper;
means for controlling horizontal displacement of the gripper between a jug gripping station and a jug opening station;
a module for opening and closing the jugs, the opening and closing module including nippers, the nippers having a generally vertical axis, means for controlling tightening and loosening of the nippers, means for controlling rotation of the nippers, and means for controlling vertical displacement of the nippers; and



a module for sampling liquid including a suction endpiece, the suction endpiece having a substantially vertical axis, means for controlling horizontal displacement of said endpiece between a sampling position, in which the vertical axes of the nippers and the suction endpiece coincide, and a position for distribution of a sampled liquid into a receptacle, and means for controlling vertical displacement of the suction endpiece.

5,533,408
CLAMP-ON ULTRASONIC VOLUMETRIC FLOWMETER

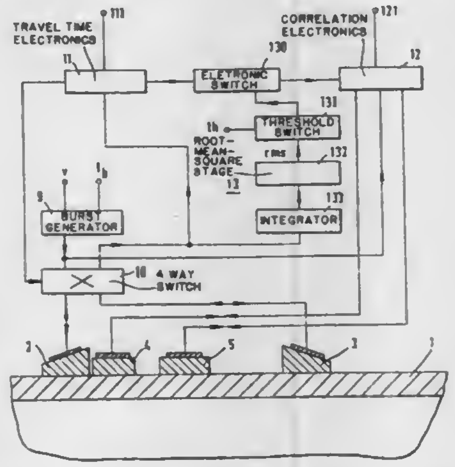
Daniel Oldenziel, La-Chaux-de-Fonds, Switzerland, and Marcel Griessmann, Mulhouse, France, assignors to Endress + Hauser Flowtec AG, Switzerland

Filed Dec. 22, 1994, Ser. No. 361,941

Claims priority, application European Pat. Off., Dec. 23, 1993, 93810901

Int. Cl.^{6} G01F *1/00*

U.S. Cl. 73—861.18 **6 Claims**



1. A clamp-on ultrasonic volumetric flowmeter comprising

a first pair of ultrasonic transducers

transducers operate alternately both as transmitting transducers and receiving transducers, and

disposed on the outside surface of a pipe carrying a fluid to be measured and separated by a given distance in a direction parallel to the axis of the pipe, such that the angle between the direction of the ultrasound generated by them and the axis of the pipe is different from 90°;

a second pair of ultrasonic transducers which are operated simultaneously as transmitting transducers or receiving transducers, and which are disposed on the outside surface of the pipe and are separated by a given distance in a direction parallel to the axis of the pipe, such that the angle between the direction of the ultrasound generated by them and the axis of the pipe is substantially equal to 90°; and

driver/evaluation electronics

which supply both ultrasonic transducers of the first pair with a pulse burst, measure the travel times of ultrasonic signals propagating between said ultrasonic transducers through the fluid in the downstream and upstream directions and reflected at the inside surface of the pipe opposite said ultrasonic transducers, and determine volumetric flow rate therefrom (=travel-time electronics), or

which supply the ultrasonic transducers of the second pair simultaneously with the pulse burst and, using correlation techniques, measure the time difference between signals reflected at foreign particles in the fluid and received in the intervals between the pulse burst by said ultrasonic transducers, and determine volumetric flow rate therefrom (=correlation electronics), and

which include threshold changeover electronics with a threshold switch

which switch the driver/evaluation electronics to the travel-time mode or the correlation mode in response to the output of the threshold switch,

said threshold switch being supplied with an adjustable threshold signal and a variation signal which is formed from a signal that was provided by one of the ultrasonic transducers of the first pair in the receive mode and then integrated.

5,533,409
TORQUE WRENCH WITH ANGULAR MOTION DETECTOR

David O. Crane, Lutterworth; Ian B. Golding, Rugby, and Robin Crann, Billesdon, all of, United Kingdom, assignors to Crane Electronics Limited, Hinckley, United Kingdom

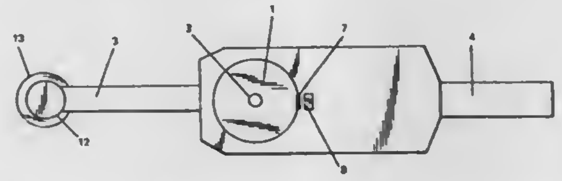
PCT No. PCT/GB93/02495, § 371 Date Jun. 21, 1995, § 102(e) Date Jun. 21, 1995, PCT Pub. No. WO94/14577, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 6, 1993, Ser. No. 464,653

Claims priority, application United Kingdom, Dec. 24, 1992, 9226996

Int. Cl.^{6} B25B *23/14*

U.S. Cl. 73—862.23 **6 Claims**



1. Apparatus for providing information relating to the angular movement of, and torque applied to, a threaded fastener comprising:

a torque wrench;

a torque sensor;

a flywheel rotatably mounted on the torque wrench;

means for connecting the torque wrench to the threaded fastener so that the flywheel axis lies in the same plane as the fastener axis;

sensor means associated with one or more peripheral indicia on the flywheel, for sensing the proximity of the indicia relative to a given point on the torque wrench to establish a pulse output when the flywheel is rotated;

a microprocessor for monitoring the pulse output to provide information relating to the angular movement of the torque wrench about the axis of the fastener, and for monitoring the output of the torque sensor to provide information about the applied torque; and

memory means for retaining the information so monitored.

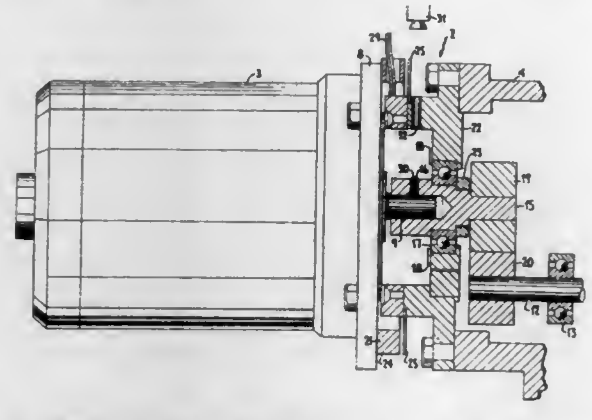
5,533,410
MOTOR POWER MEASURING CELL FOR MOTOR OPERATED VALVES

Christopher P. Smith, Acworth, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1993, Ser. No. 161,036

Int. Cl.^{6} G01L *3/02*

U.S. Cl. 73—862.193 **15 Claims**



1. Apparatus for measuring the torque acting on and the rotational speed of a drive shaft of an electric motor attached to a valve actuator comprising a motor power measuring cell positioned between and secured to the electric motor and the valve actuator, the motor power measuring cell being provided with a first measuring means for measuring the torque acting on the drive shaft and a second measuring means for measuring the rotational speed of the drive shaft.

5,533,411
METHOD AND APPARATUS FOR NONDESTRUCTIVE TESTING OF PHYSICAL CHARACTERISTICS OF A SPECIMEN USING ULTRASONIC WAVES

Masaichi Koiwa, Katsuta, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

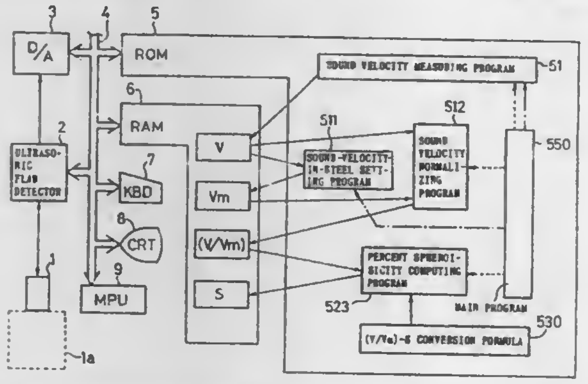
PCT No. PCT/JP93/00554, § 371 Date Feb. 23, 1994, § 102(e) Date Feb. 23, 1994, PCT Pub. No. WO94/00755, PCT Pub. Date Jan. 6, 1994

PCT Filed Apr. 28, 1993, Ser. No. 196,181

Claims priority, application Japan, Jun. 25, 1992, 4-191698; Jun. 29, 1992, 4-194834; Jun. 30, 1992, 4-196323

Int. Cl.^{6} G01N *29/08;29/18*

U.S. Cl. 73—598 **31 Claims**


3
4
5
D/A
ROM
SOUND VELOCITY MEASURING PROGRAM
51
6
RAM
511
512
2
ULTRASONIC FLAW DETECTOR
V
SOUND-VELOCITY-IN-STEEL SETTING PROGRAM
SOUND VELOCITY NORMALIZING PROGRAM
550
7
KBD
Vm
8
CRT
(V/Vm)
PERCENT SPHEROIDICITY COMPUTING PROGRAM
1
9
MPU
S
523
MAIN PROGRAM
530
(V/Vm)-S CONVERSION FORMULA
1a

1. In a method of ultrasonic measurement in which the velocity of propagation of an ultrasonic wave in a cast specimen is measured and a physical characteristic value of said specimen that has a physical correlation with said ultrasonic wave propagation velocity wave is determined, the improvement comprising the steps of:

determining a velocity ratio between the ultrasonic wave propagation velocity in said specimen and the velocity of ultrasonic wave propagation in a given metal that corresponds to said specimen; and

converting the velocity ratio into the physical characteristic value, thereby determining said physical characteristic value of said specimen.

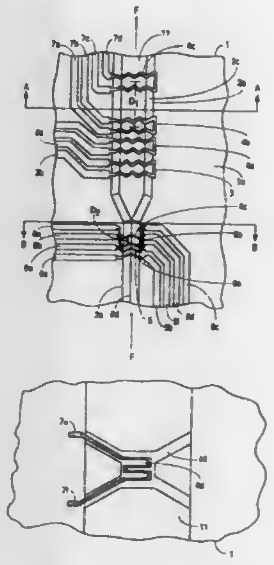
5,533,412
PULSED THERMAL FLOW SENSOR SYSTEM

John H. Jerman, Palo Alto, Calif.; Ronald E. Toth, Grayslake, Ill.; David A. Winchell, Fox Lake, Ill., and David W. Pennington, Fox Lake, Ill., assignors to IC Sensors, Inc., Milpitas, Calif., and Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 364,067, Dec. 27, 1994, abandoned, which is a continuation of Ser. No. 88,141, Jul. 7, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 479,247

Int. Cl.^{6} G01F *11/68*

U.S. Cl. 73—861.95 **7 Claims**



1. An apparatus for measuring fluid flow comprising:

a substrate defining in its principal surface a conduit for flow of a fluid;

a first heating element for heating said fluid being inside said conduit;

at least two spaced-apart sensors being inside said conduit and positioned downstream of said heating element with respect to a direction of the flow for sensing a temperature of the fluid; and

at least one additional heating element located on said principal surface and not in contact with said conduit, said additional heating element being electrically identical to said first heating element; and

means for connecting said first heating element and said additional heating element in a bridge circuit.

5,533,413

EQUIPMENT DIAGNOSIS SYSTEM

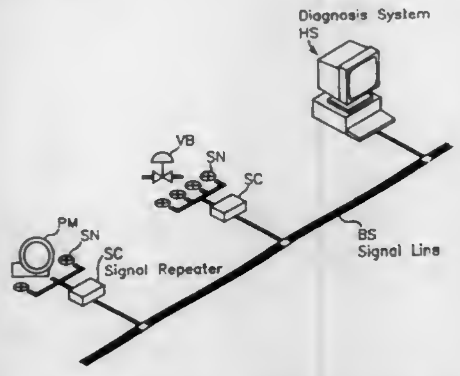
Yasunori Kobayashi; Shin Tanabe; Tatsuo Fukuda; Masazumi Miyazawa; Hideki Imai, and Moriyuki Wani, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, and Mitsubishi Chemical Corporation, both of Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 456,968

Claims priority, application Japan, Jun. 30, 1994, 6-149076; Mar. 22, 1995, 7-062286

Int. Cl.^{6} G01N *19/00*

U.S. Cl. 73—865.9 **8 Claims**



1. An equipment diagnosis system for managing equipment, comprising:

a deterioration model portion for modelling a deterioration state of a management target equipment and for outputting information of remaining life time of said management target equipment on basis of input information;

stress information supply means for supplying said deterioration model portion with at least information on stress applied to said management target equipment; and

simulation means which is supplied with remaining life time information from said deterioration model portion and for supplying said deterioration model portion with virtual stress information according to a selected plan, to perform simulation, whereby an operation state of said management target equipment is altered on basis of remaining life time information obtained by said simulation means.

5,533,414

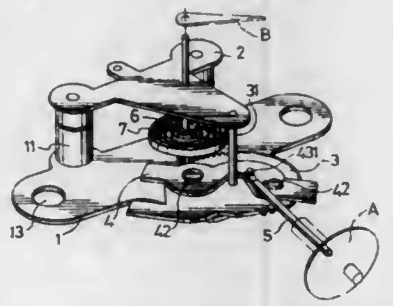
COUPLING DEVICE FOR COUPLING AN INDICATOR NEEDLE TO AN ACTUATING UNIT IN A PRESSURE GAUGE

Tien-Tsai Huang, No. 4-2,Lane 30, Wu-Chang St., Pan-Chiao City, Taipei Hsien, Taiwan

Filed May 22, 1995, Ser. No. 446,306

Int. Cl.^{6} G01L *19/00*

U.S. Cl. 73—866.1 **9 Claims**



1. A coupling device for a pressure gauge with an indicator needle and an actuating unit movable in response to pressure measured by the pressure gauge, said coupling device being adapted to be connected operatively to the indicator needle and the actuating unit and moving the indicator needle in accordance with movement of the actuating unit, said coupling device comprising:

a lower positioning plate;

an upper positioning plate connected spacedly to said lower positioning plate;

a sector gear disposed between said lower and upper positioning plates, said sector gear having a gear axle extending rotatably through said lower and upper positioning plates;

an adjustment plate disposed between said lower and upper positioning plates and mounted adjustably on a top side of said sector gear;

a push rod having a first end adapted to be in force-transmitting relationship with the actuating unit, and a second end connected to said adjustment plate;

a pinion disposed between said lower and upper positioning plates, said pinion meshing with said sector gear and having a pinion axle extending rotatably through said lower and upper positioning plates, the indicator needle to be mounted on a distal top end of said pinion axle above said upper positioning plate;

a support plate mounted on a bottom side of said lower positioning plate for supporting distal bottom ends of said gear axle and said pinion axle thereon; and

a spiral spring having an innermost end connected to said pinion axle and an outermost end connected to one of said lower and upper positioning plates, said spiral spring biasing said pinion axle to rotate the indicator needle to a starting position when the indicator needle is mounted on said pinion axle;

wherein said lower positioning plate is made of plastic, said bottom side of said lower positioning plate being formed with a plurality of resilient generally L-shaped hook projections for engaging the periphery of said support plate to mount said support plate on said lower positioning plate.

5,533,415

STARTER APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

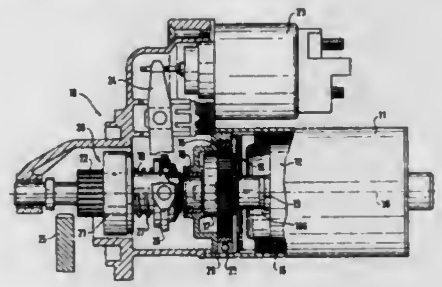
Manfred Ackermann, Oppenweiler; Ngoc-Thach Nguyen, Grossbottwar; Siegfried Schustek, Ditzingen, and Quang-Ngoc Tran, Stuttgart, all of, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

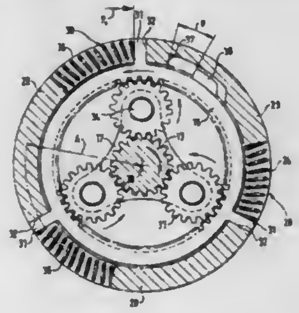
Filed Jan. 10, 1994, Ser. No. 179,324

Claims priority, application Germany, Feb. 2, 1993, 43 02 854.3

Int. Cl.^{6} F02N *15/06*

U.S. Cl. 74—7 E **21 Claims**





1. A starter apparatus comprising a starter motor provided with a drive shaft and having a stall torque; an axially shiftable starting gear engageable with a ring gear of an internal combustion engine; a drive train means for transferring rotary motion of said drive shaft of said starter motor to said starting gear, said drive train means having a torsional rigidity and including a plurality of parts from said starting gear to said drive shaft; a free wheel clutch coupled with said drive shaft of said starter motor; and a shock absorber spring means for damping torque shocks between said starting gear and said drive shaft occurring on rotation of said drive shaft, said shock absorber spring means being located in said drive train means between said starting gear and said drive shaft of the starter motor, wherein said shock absorber spring means is prestressed to provide a torque acting in a drive rotation direction equal to from 15 to 50% of said stall torque of said starter motor delivered to said starting gear, and wherein a ratio of a torsional rigidity of another drive train means equal to said drive train means without said shock absorber spring means and at said stall torque (Mk) to a torsional rigidity of said shock absorber spring means effective at said starting gear must be at least 4.

5,533,416

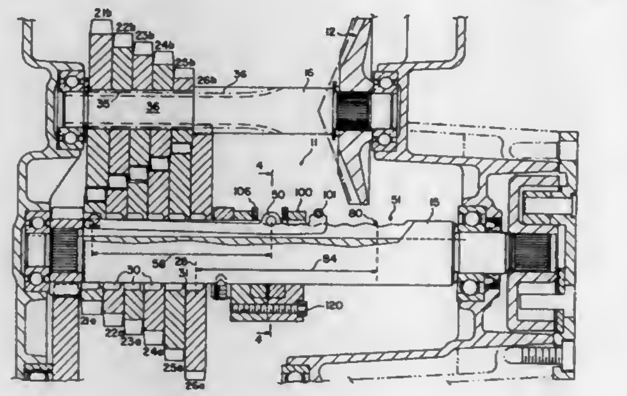
TRANSMISSION SHIFT KEY

Mike Weirich, Medina, and Kurt E. Vogt, Crestline, both of Ohio, assignors to MTD Products Inc., Cleveland, Ohio

Filed Jun. 16, 1994, Ser. No. 260,763

Int. Cl.^{6} F16H *3/08*

U.S. Cl. 74—366 **21 Claims**



1. An improved shift key mechanism for a transmission having a rotating shaft with at least one gear freely journalled thereon, the shaft having at least one longitudinal slot in its circumferential outer surface, a shift key being in the slot slidable therein for selectively connecting an individual gear to the shaft and the shift key being longitudinally movable in the slot by a shift collar, the improvement of a pivot, said pivot being connected to the shift key, and said pivot directly engaging the outer circumferential surface of the shaft to support the shift key above the bottom of the slot.

5,533,417

LEADSCREW ASSEMBLY

Gabor Devenyi, Pentang, Canada, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 12, 1993, Ser. No. 46,057

Int. Cl.^{6} F16H *25/22*

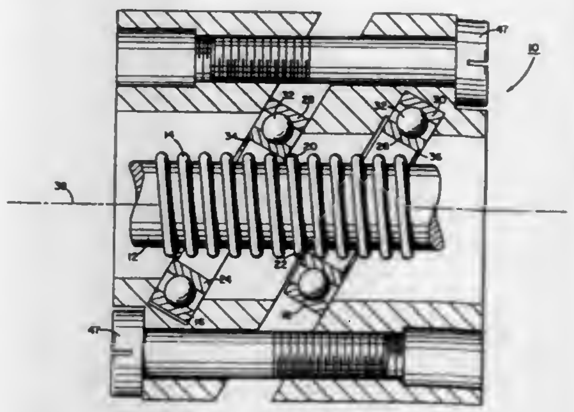
U.S. Cl. 74—424.8 R **27 Claims**

1. A leadscrew assembly comprising:

a leadscrew having an external thread;

at least one ball bearing, said ball bearing being of the type having inner race and outer race and being disposed such that a segment of the inner race contacts diametrically opposing portions of said leadscrew; and

a housing having means for retaining said ball bearings in a preselected position with respect to said leadscrew, wherein said retention means includes first and second slots.



5,533,418

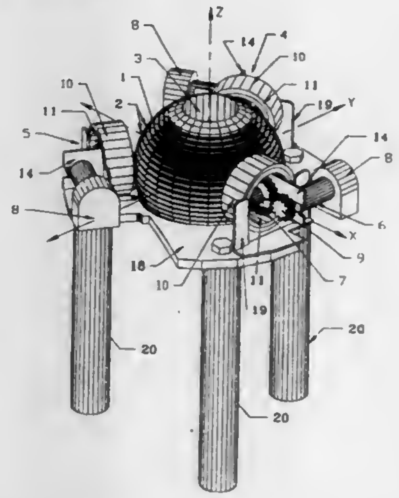
SPHERICAL ROBOTIC SHOULDER JOINT

Kung C. Wu, 6393 Los Robles Dr., El Paso, Tex. 79912, and Rex Melgoza, El Paso, Tex., assignors to Kung C. Wu, El Paso, Tex.

Filed Dec. 9, 1994, Ser. No. 353,460

Int. Cl.^{6} B25J *17/02*

U.S. Cl. 74—490.06 **20 Claims**



1. A spherical joint comprising:

a generally spherical member having a geometric center and an outer surface

three drive means, each of which contacts said outer surface at a respective contact point, wherein said contact points and said geometric center are located within and define a plane, and wherein said drive means impart movement to said outer surface, whereby said spherical member is capable of being rotated about any axis of rotation which lies within said plane.

5,533,419

CABLE LOCATOR/RETAINER

Felix Adler, Clinton Twp., Mich., assignor to Teleflex, Inc., Plymouth Meeting, Pa.

Filed Mar. 22, 1995, Ser. No. 408,898

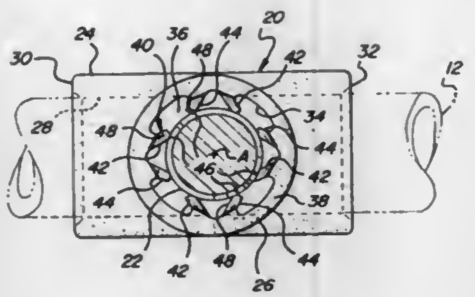
Int. Cl.^{6} F16C *1/10*

U.S. Cl. 74—502.4 **11 Claims**

1. In combination a threaded shaft (22) and a motion transmitting remote control assembly (10) of the type .for transmitting motion along a curved path, comprising;

a threaded shaft (22) having a helical thread defining a major crest diameter and a minor root diameter;

a flexible tubular conduit (12);



a flexible core element (**14**) slidably supported in said conduit (**12**);

a retainer (**20**) disposed about one of said conduit (**12**) and said core element (**14**) for attachment to said threaded shaft (**22**);

characterized by said retainer (**20**) including press fit gripping means (**40**) for surrounding said threaded shaft (**22**) and exerting a continuous inward clamping force on said helical thread of said threaded shaft (**22**) as said retainer (**20**) is forcibly pressed onto said threaded shaft (**22**) to permit rapid and secure engagement thereto; said press fit gripping means (**40**) including a plurality of elongated and resiliently deformable ribs (**42, 44**); said retainer (**20**) including an inner tubular sleeve (**24**) and an adjoining tubular socket (**26**) having an imaginary central axis (A); said socket (**26**) having a base (**36**) adjacent said sleeve (**24**) and a mouth (**38**) spaced therefrom; said ribs (**42, 44**) extending inwardly from said socket (**26**); said fibs (**42, 44**) extending generally parallel to said central axis (A); and said socket (**26**) including a generally cylindrical inner wall (**34**) centered about said central control axis (A); said ribs (**42, 44**) projecting inwardly from said inner wall (**34**) at angles askew to said central axis (A).

5,533,420

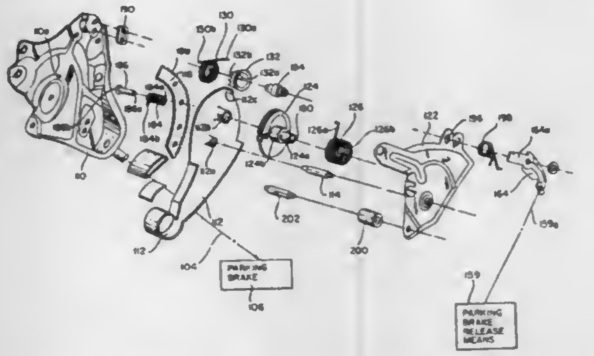
PARKING BRAKE SYSTEM INCLUDING AN INTERNAL CLUTCH SPRING

Randal J. Perisho, Moberly, Mo., assignor to Dura Automotive Holding, Inc., Troy, Mich.

Filed May 20, 1994, Ser. No. 246,628

Int. Cl.^{6} G05G *1/14*

U.S. Cl. 74—512 **9 Claims**



1. Parking brake apparatus adapted for connection with a vehicle having a parking brake operated by a cable, comprising:

(a) a mounting bracket (**110**) adapted for connection with the vehicle;

(b) an operating lever (**112**) pivotally connected with said mounting bracket for movement between brake-applied and brake-released positions relative to said mounting bracket;

(c) locking means (**118, 130, 132**) for releasably locking said lever in the brake-applied position; and

(d) connecting means connecting the parking brake cable with said lever, said connecting means including:

  (1) an annular cable track member (**124**) adapted for connection with the parking brake cable;

  (2) means connecting said cable track member for rotation about an axis parallel with the pivotal axis of said lever, said cable track member having a tubular hub portion (**124*a***) that is colinearly arranged relative to said axis of rotation;

  (3) cable-slack-removing spring means (**124**) normally biasing said cable track member in a cable-tensioning direction relative to said lever, thereby to take up slack in the cable;

  (4) internal spring clutch means normally connecting said cable track member with said lever, said spring clutch means including a helical clutch spring (**184**) extending concentrically within said tubular cable track hub portion, said clutch spring having at one end a plurality of helical turns that are normally biased radially outwardly into frictional engagement with the inner peripheral surface of said cable track hub portion, said clutch spring being connected at its other end with said lever; and

  (5) means (**110*a*, 186**) operable when said lever is in the brake-disengaged position for contracting said clutch spring turns radially inwardly to disengage said turns from said cable track hub portion, thereby to release said cable track member for rotation by said cable-slack-removing spring means in the cable slack removing direction.

5,533,421

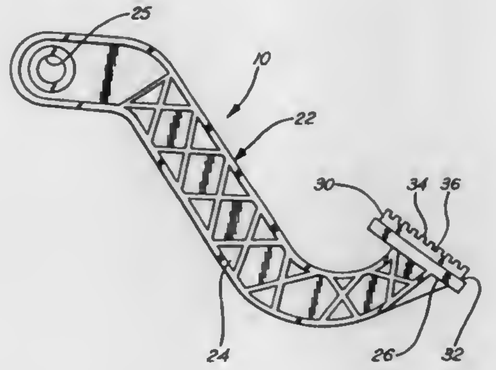
INTEGRATED PLASTIC BRAKE/CLUTCH PEDAL

Robert L. Damerow, Garden City, and David M. Zedan, Eastpointe, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 27, 1994, Ser. No. 364,866

Int. Cl.^{6} G05G *1/16*

U.S. Cl. 74—563 **1 Claim**



1. An integrated arm and pedal pad combination for use as a brake or clutch lever in an automotive vehicle, said arm being of integral, one-piece construction and made of a plastic material, said arm comprising an elongated lever body having an integral end portion formed to provide a pad holder, said pad holder having a pad-receiving recess, said pad being made of a plastic material which is softer than the plastic material of said arm, to provide frictional resistance and prevent a foot from slipping off, said pad being injection molded into said recess of said pad holder, the plastic materials of said arm and said pad being compatible and providing an integral bond between said pad and said pad holder when molded together as aforesaid, said arm being made of nylon reinforced with glass fibers, and said pad being made of a thermoplastic elastomer.

5,533,422

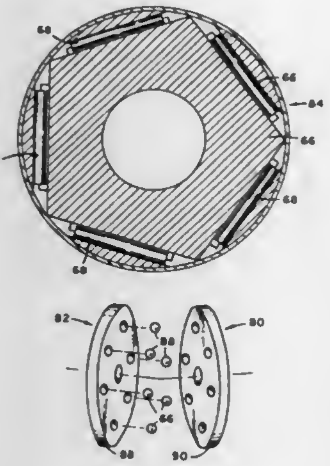
SYSTEM FOR ABSORBING TORSIONAL AND/OR BENDING VIBRATIONS

Frank H. Speckhart, 3411 Kingston Pike, Knoxville, Tenn. 37919

Filed Nov. 28, 1994, Ser. No. 345,935

Int. Cl.^{6} F16F *15/14*

U.S. Cl. 74—573 R **22 Claims**



13. A system for absorbing vibrations in a shaft which is drivingly rotated about an axis and wherein the shaft is exposed to torsional and bending disturbances during rotation and wherein each of the torsional and bending disturbances are substantially regularly spaced throughout each revolution of the shaft, the system comprising:

means defining at least one cavity of circular cross section and having walls, a radius and a center for rotating with a rotating shaft as the shaft rotates about its axis of shaft rotation, the at least one cavity being arranged in such a relation to the shaft so that one circular cross section can be taken through the at least one cavity which is arranged in a plane containing the axis of shaft rotation and another circular cross section can be taken through the at least one cavity in a plane which is oriented substantially perpendicular to the axis of shaft rotation;

a round rolling element having a radius and being positioned within the at least one cavity so as to be free to roll along the walls of the at least one cavity in a pendulum action in response to the torsional and bending disturbances to which the shaft is exposed; and

wherein the round rolling element is related to the at least one cavity and to either the torsional disturbances or the bending disturbances desired to be absorbed by the system in accordance with the equation:

$$N^2=r_w^2 r_3/[(r_g^2+r_w^2)(r_1-r_w)]$$

wherein N is within about ±15% of the number of torsional or bending disturbances per revolution of the shaft, r_w is the radius of the round rolling element as measured between its center and its point of contact with the walls of the at least one cavity, r_g is the radius of gyration of the round rolling element about its mass center, r_1 is the radius of the at least one cavity, and r_3 is the radial distance of the center of the at least one cavity from the axis of shaft rotation.

5,533,423

DIFFERENTIAL HOUSING FOR THE AXLE DRIVE OF A MOTOR VEHICLE

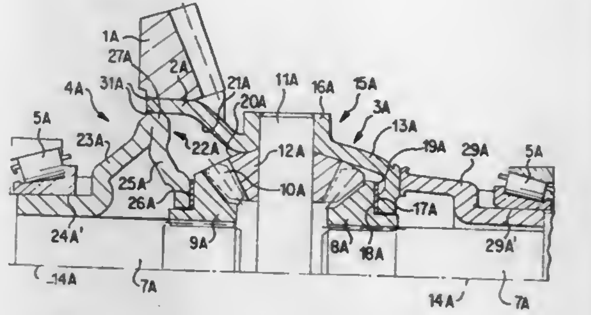
Heinz Stehle, Weissach, and Peter Hoebel, Neuhausen, both of, Germany, assignors to Dr. Ing.h.c.F. Porsche AG, Weissach, Germany

Filed May 9, 1994, Ser. No. 239,914

Claims priority, application Germany, May 21, 1993, 43 17 073.0

Int. Cl.^{6} F16H *57/02*

U.S. Cl. 74—606 R **17 Claims**



1. Differential housing and axle drive arrangement for the axle drive of a motor vehicle comprising:

a drive gear,

first and second rotationally symmetric stamped housing parts, impressed bearing projections for mounting a differential pin, and

axle drive shafts extending transversely with respect to the differential pin and having a rotational axis,

wherein the first housing part is made in the form of a bearing part provided with a jacket extending at a substantially continuous incline relative to the rotational axis and having a section with the impressed bearing projections for mounting the differential pin,

wherein the drive gear is mounted on a flange of the first housing part which surrounds an opening facing the second housing part,

and wherein said second housing part includes a cover for said opening with said second housing part inserted into said opening and said cover connected to a radially inwardly facing annular surface of the flange.

5,533,424

DIFFERENTIAL GEAR

Kenji Mimura, 29-1105, Wakabadai 4-chome, Asahi-ku, Yokohama, Kanagawa-ken, 241, Japan

Filed Apr. 21, 1994, Ser. No. 234,874

Claims priority, application Japan, Apr. 22, 1993, 5-096087; Sep. 10, 1993, 5-225920

Int. Cl.^{6} F16H *48/00*

U.S. Cl. 74—650 **2 Claims**

1. A differential limiting apparatus comprising:

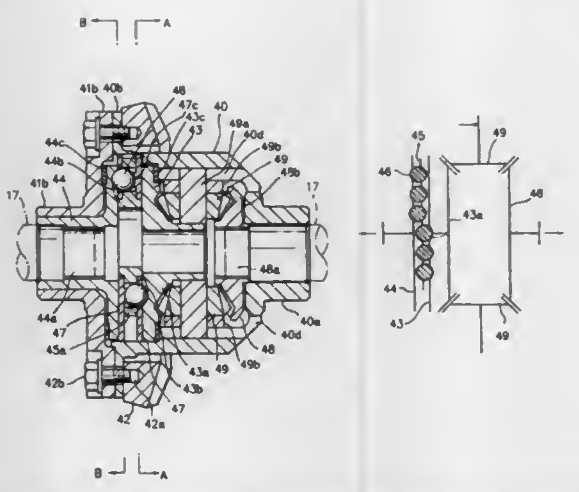
an input-side rotary body that rotates around a shaft center from an externally-input driving force,

an eccentric rotary body in rotatable form supported around a shaft offset to the shaft center of the input-side rotary body,

a pair of output-side rotary bodies arranged on the shaft center of the input-side rotary body facing both end faces of the eccentric rotary body,

a plurality of balls retained in numerous holes provided at equal intervals in the circumferential direction on both end faces of the eccentric rotary body, said balls being rotatable within each hole,

a guide section to support the balls retained by the eccentric rotary body from both end faces of the eccentric rotary body at a specified position in the circumferential direction of the eccentric rotary body,



a differential mechanism coupled to one output-side rotary body for coupling a rotation from the input driving force to said one output-side rotary body, and

numerous grooves on each output-side rotary body to rotate the eccentric rotary body in a specified direction with respect to a rotational difference between said output side rotary bodies, by guiding the balls protruded from both end faces of the eccentric rotary body when said one output-side rotary body rotates in the same direction at a different rotational speed through the differential limiting mechanism.

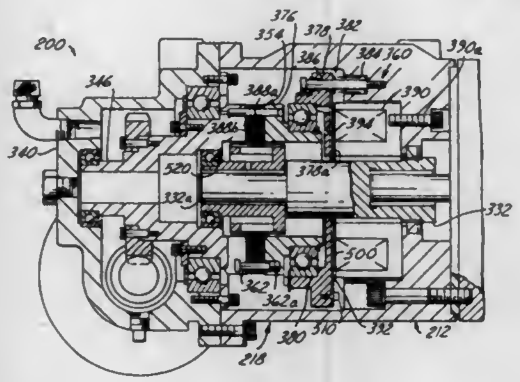
5,533,425
ELECTRICALLY ACTUATED DISC STACK HAVING LOW RESPONSE TIME DUE TO REDUCED RESIDUAL MAGNETISM FOR USE IN DRIVES, BRAKES AND COMBINATIONS THEREOF

Brian D. Mabee, Shelby Township, Mich., assignor to Easom Engineering and Manufacturing Corporation, Clinton Township, Mich.

Continuation-in-part of Ser. No. 993,307, Dec. 18, 1992, Pat. No. 5,389,049, said Ser. No. 993,307is a continuation-in-part of Ser. No. 846,546, Mar. 5, 1992, Pat. No. 5,242,039. This application Nov. 16, 1994, Ser. No. 340,220

Int. Cl.^{6} F16H *37/06;* **F16D** *67/06*

U.S. Cl. 74—661 **30 Claims**



10. A device selected from at least one of a clutch, a brake and a combination thereof, said device comprising:

a housing;
a first component connected with said housing;
a second component connected with said housing so as to be rotatable with respect to said first component;
a disc stack comprising:
  a first set of annular discs; and
  a second set of annular discs, said second set of annular discs being interleaved with said first set of annular discs in a prearranged order;
first connection means for connecting said first set of annular discs with said first component, wherein said first set of annular discs is nonrotatable with respect to said first component, wherein further said first set of annular discs is axially slidable with respect to said first component;
second connection means for connecting said second set of annular discs with said second component, wherein said second set of annular discs is nonrotatable with respect to said second component, wherein further said second set of annular discs is axially slidable with respect to said second component; and
biasing means connected with said housing for selectively biasing said first set of annular discs with respect to said second set of annular discs to thereby regulate relative rotation between said first component and said second component, wherein said biasing means comprises an electromagnetically actuated biasing means comprising:
  an armature plate having a coil face portion constructed of a magnetic material, said armature plate being slidably connected with said housing;
  a first thrust surface connected with said armature plate for abutably contacting a first side of said disc stack;
  a second thrust surface connected with said second component for abutably contacting a second side of said disc stack opposite with respect to said first side thereof;
spring biasing means connected with said housing for biasing said armature plate to thereby selectively bias said first thrust surface toward said disc stack to thereby selectively clamp said first and second annular discs together between said first and second thrust surfaces;
  electromagnetic coil mean s comprising an electromagnetic coil, said electromagnetic coil means being connected with said housing for magnetically attracting said coil face portion of said armature plate in response to energization of said electromagnetic coil, said electromagnetic coil having a magnetic circuit; and
  substantially non-magnetic material means located in said magnetic circuit of said electromagnetic coil means for reducing magnetic flux of said electromagnetic coil with respect to said clutch armature plate;

wherein energization of said electromagnetic coil magnetically attracts said clutch armature plate thereto against said biasing of said spring biasing means.

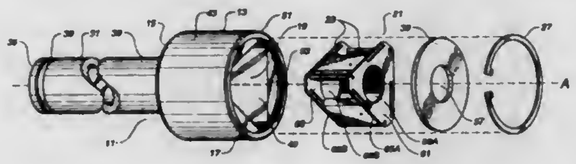
5,533,426
STUD REMOVAL AND FASTENING TOOL

Emmitt Morales, 5260 Stardust Dr., Beaumont, Tex. 77706

Filed Jan. 13, 1995, Ser. No. 372,609

Int. Cl.^{6} B25B *13/12*

U.S. Cl. 81—53.2 **9 Claims**



1. A tool for applying rotational force to a threaded member, comprising:

a socket having a surrounding wall defining an opening leading to a cavity with a plurality of inner side walls spaced about a longitudinal axis extending through said cavity, and having opposite ends with an opening at each end leading to said cavity;
a plurality of jaws equal in number to said plurality of inner side walls adapted to be located in said cavity;
each jaw of said plurality of jaws having opposite facing edges, an outer bearing surface, and an inner gripping surface with each said jaw wedge shaped in cross-section through said outer bearing and said inner gripping surfaces;

spaced apart opposite end wall members with aligned central apertures formed therethrough for slidably supporting said opposite edges of said jaws for movement between first and second positions along straight paths with each bearing surface engaging an inner side wall of said plurality of inner side walls of said socket when said jaws are located in said cavity with an opening formed between said inner gripping surfaces of said jaws for receiving said threaded member;
in said second positions of said jaws, an opening formed between said jaws being greater than another opening formed between said jaws when said jaws are in said first positions;
each of said opposite wall members having a plurality of guide surfaces on one side equal in number to the number of said jaws and located around said central opening;
each of said jaws further having a slide surface formed on said opposite facing edges;
means for securing said opposite wall members to opposite ends of said socket respectively with said guide surfaces facing inward such that a plurality of pairs of guide surfaces are formed with said jaws located between said wall members with said slide surfaces of each jaw engaging one of said pairs of guide surfaces for guiding said jaws for slidable movement along said straight path between said opposite wall members;
guide means for guiding said jaws for movement along said straight paths;
tension means for normally urging said jaws to said first positions and allowing said threaded member to be inserted between said jaws; and
means for holding said jaws in said cavity such that when said threaded member is located between said jaws, rotation of said socket in a given direction causes said side walls of said socket to apply rotational torque to said outer bearing surfaces of said jaws to cause said inner gripping surfaces of said jaws to grip and rotate said threaded member.

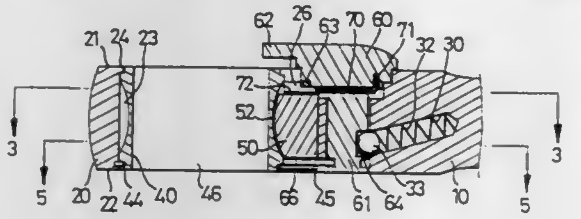
5,533,427
RATCHET WRENCH HAVING RATCHET TEETH OF HIGHER STRENGTH

Jessie Chow, No. 18 Hou Juan Road, Taichung, Taiwan

Filed Apr. 3, 1995, Ser. No. 415,428

Int. Cl.^{6} B25B *13/46*

U.S. Cl. 81—63.2 **7 Claims**



1. A ratchet wrench comprising:

a handle portion,
a head portion including a first cavity and a second cavity formed therein and partially overlapping each other.
a ratchet wheel rotatably engaged in said first cavity and including an outer peripheral surface having a curved and concave configuration and having a plurality of first teeth formed thereon, wherein said ratchet wheel rotates about an axis, said first teeth including a curved and concave configuration, said outer peripheral surface and said first teeth being curved radially inward, and toward said axis, and said curve having a tangent at the closest point to said axis being parallel to said axis
a pawl means engaged in said second cavity and including a plurality of second teeth for selectively engaging with said first teeth of said ratchet wheel so as to control rotational direction of said ratchet wheel, said second teeth including a curved and convex configuration and curved radially outward for engaging with said first teeth of curved and concave configuration so as to strengthen an engagement between said first teeth and said second teeth.

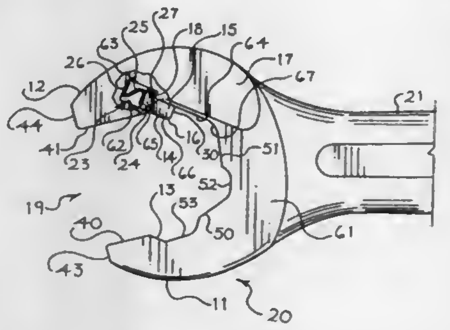
5,533,428
RATCHETABLE OPEN-ENDED WRENCH

William M. Pradelski, 11548 S. Brightway, Mokena, Ill. 60448

Filed Nov. 21, 1994, Ser. No. 343,238

Int. Cl.^{6} B25B *13/12*

U.S. Cl. 81—179 **17 Claims**



1. A ratchetable wrench comprising:

a first jaw having a first inside face and a first non-movable engaging surface;
a second jaw having a first inside face and no more than one slot;
a base area connecting said jaws;
a retractable jaw member linearly slidable within said slot, having a second engaging surface substantially parallel to said first engaging surface on said first jaw, said retractable jaw member projecting toward said base area;
said first and second engaging surfaces adapted to engage a rotatable element having a plurality of circumferentially disposed flat surfaces.

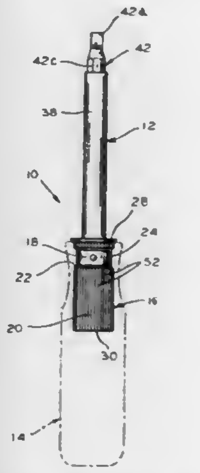
5,533,429
FASTENER DRIVING TOOL INSERT

Burton Kozak, 1300 N. Lake Shore Dr., #28C, Chicago, Ill. 60610

Filed Nov. 30, 1994, Ser. No. 347,508

Int. Cl.^{6} B25B *23/00*

U.S. Cl. 81—439 **12 Claims**



1. A hand tool for driving a fastener in a clockwise and/or counterclockwise direction, comprising:

means for matingly engaging said fastener for clockwise and/or counterclockwise driven movement in response to rotational movement of said fastener engaging means;

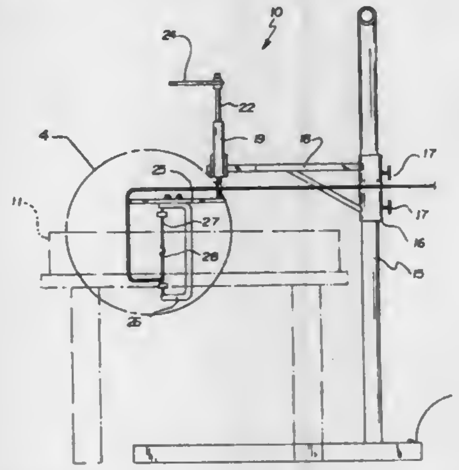
a handle for manually imparting rotational movement to said fastener engaging means to impart driven movement of said fastener in said clockwise and/or counterclockwise direction; and

means for releasably retaining said fastener engaging means in operative relationship with said handle, said retaining means comprising a generally cylindrical insert disposed within an opening in said handle and adapted for transmitting manually imparted rotational movement of said handle in a direct and positive manner to said fastener engaging means, said insert also including expandable/contractible spring means for releasably gripping said fastener engaging means;

said insert having an outer surface with a radial undercut spaced from a surface defining said opening in said handle, said radial undercut and said surface defining said opening in said handle together defining a confined and protected spring expansion chamber for housing and accommodating expansion of said expandable/contractible spring means therewithin, said insert also having an axially extending opening at one end and being closed at the other end to releasably receive said fastener engaging means so as to be isolated from engagement with said handle.

5,533,430
APPARATUS FOR ARCHERY TARGET FORMATION AND INSERT THEREFOR

William L. Buch, R.R. 1, Box 788, Sabinsville, Pa. 16943
Filed Aug. 11, 1994, Ser. No. 288,818
Int. Cl.⁶ B26D *3/06;7/10*
U.S. Cl. 83—171 **4 Claims**



1. An apparatus for forming a threaded groove in a target block bore, comprising:

at least one support post, said support post having a post sleeve, the sleeve being slidably directed along the support post, and fastening means for securing the post sleeve to the support post;

a support shaft orthogonally affixed to the post sleeve and extending therefrom;

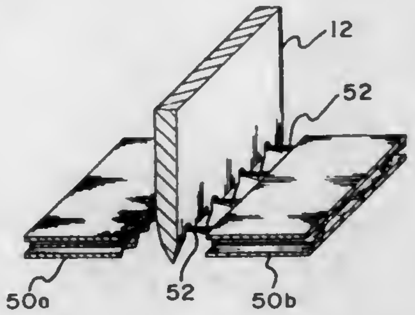
and

a guide sleeve fixedly and orthogonally secured to said support shaft spaced from said post sleeve, said guide sleeve having a guide sleeve bore with a rotation means directed therethrough, said rotation means mounting a support yoke having a cutting wire secured thereto, said cutting wire having a loop therein such that a rotation of the rotation means will effect vertical displacement thereof and will direct a helical groove into a target block as the support yoke is rotated within a target block;

said rotation means including a rod, said rod being slidably directed through said guide sleeve bore, a guide pin directed through the guide sleeve intersecting the guide sleeve bore, said rod having a helical groove with said guide pin being received within said helical groove such that upon rotation of the rod it effects rotation and vertical displacement relative to the guide sleeve within the guide sleeve bore.

5,533,431
CUTTING RULE

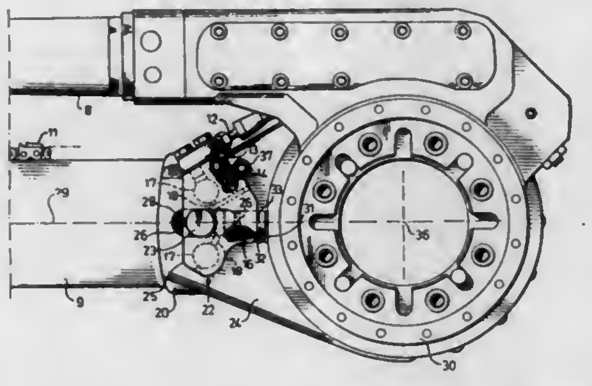
Robert A. Schickling, 727 E. Clements Bridge Rd., Runnemede, N.J. 08078
Filed Aug. 24, 1994, Ser. No. 294,914
Int. Cl.⁶ B26D *1/36;1/40*
U.S. Cl. 83—347 **5 Claims**



1. In a rotary die cutter for facilitating the separating of a cardboard sheet into separate pieces, said die cutter having a rotating die cylinder, a cutting rule mounted on said die cylinder and an anvil cylinder having a compressible material secured thereto, wherein the improvement comprises said cutting rule having a base section and a cutting section, said cutting section being integral with said base section and having a beveled side and a plurality of teeth, each of said teeth having a pair of beveled side faces on said beveled side of said cutting section, said cutting section further having a plurality of notches, each of said notches being formed in said beveled side faces of two adjacent teeth and being located entirely within said beveled side faces.

5,533,432
SAW ASSEMBLY

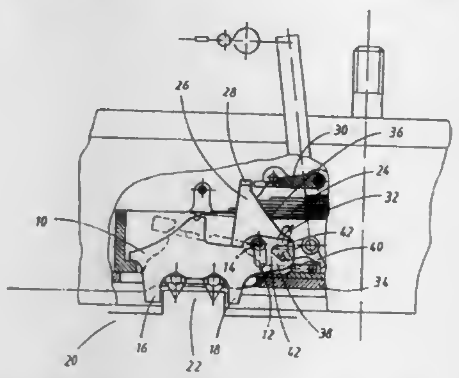
Rolf Örnberg, Malåa, Sweden, assignor to Hultdin Invest AB, Mala, Sweden
PCT No. PCT/SE92/00300, § 371 Date Nov. 8, 1994, § 102(e) Date Nov. 8, 1994, PCT Pub. No. WO92/23218, PCT Pub. Date Nov. 25, 1993
PCT Filed May 8, 1992, Ser. No. 335,840
Claims priority, application Sweden, Mar. 13, 1991, 9100756
Int. Cl.⁶ B27B *17/14*
U.S. Cl. 83—819 **5 Claims**



1. A saw assembly comprising a bar **(9)** mounted in a holder **(24)**, said holder **(24)** being pivotable about a shaft **(36)**; a saw chain **(11)** running around the bar **(9)**; a saw motor **(4)** driving the saw chain; a cylinder **(8)** to feed the bar **(9)** in and out during rotation about said shaft **(36)**; a hydraulic circuit system in which said saw motor **(4)** and said cylinder **(8)** for feeding in and out are included; a displaceable unit **(22)** including said bar **(9)** and mounted on said bar holder **(24)** to displace the bar **(9)** in relation to the bar holder **(24)** in a direction corresponding to a longitudinal centre line **(29)** of the bar **(9)** and which is perpendicular to an axis of rotation **(36)**; and a first hydraulic piston cylinder member **(16)** which is arranged to be activated by said hydraulic circuit system and displace the unit **(22)** in relation to the bar holder **(24)** so that during operation of the saw assembly the bar **(9)** in the unit **(22)** automatically stretches the saw chain **(11)**, characterized in that said displaceable unit **(22)** comprises a block element **(25)** arranged on the side of the bar holder **(24)** facing away from the bar **(9)**, and joined to an inner bar attachment **(20)** supporting the bar **(9)**, a small gap thus being formed between opposing surfaces of the bar holder **(24)** and block element **(25)**, that the first piston cylinder member **(16)** is arranged in the block element **(25)** with a piston rod **(32)** protruding therefrom to abut against a support surface **(31)** of the bar holder **(24)**, and that a second hydraulic piston cylinder member **(17)** is arranged in the block element **(25)**, parallel with said shaft **(36)**, a pair of piston rods **(35)** of the piston cylinder member being arranged to abut against the bar holder **(24)** with a predetermined total tension force in order, during normal operation, to fix a movable unit **(22)** to the bar holder **(24)** and eliminate the clearance produced by said gap, said tension being less than the stretching force created by the first piston cylinder member **(16)**, whereby the second piston cylinder member **(17)** is influenced by the pressure in said hydraulic circuit system.

5,533,433
LOCKING ASSEMBLY IN A LAUNCHER FOR MISSILES

Peter Giesenberg, Salem; Rolf Stadler, Überlingen, and Wilfried Lang, Koblenz, all of, Germany, assignors to Bodenseewerk Geratitechnik GmbH, Uberlingen/Bodensee, Germany
PCT No. PCT/EP93/02044, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO94/03364, PCT Pub. Date Feb. 17, 1994
PCT Filed Jul. 30, 1993, Ser. No. 379,623
Claims priority, application Germany, Aug. 3, 1992, 92103693 U
Int. Cl.⁶ F41F *3/04*
U.S. Cl. 89—1.806 **11 Claims**



1. A locking assembly in a launcher for missiles, comprising

(a) a pivotally mounted blocking latch, which is provided with two blocking lugs for extending over a shoe provided on the missile,

(b) a spring by which the blocking latch is biased toward a blocking position, in which the shoe of the missile is retainable by the blocking lugs,

(c) a locking lug provided on the blocking latch and a safety latch which is engaged by the locking lug in the blocking position, whereby if acceleration forces act on the blocking latch the blocking latch is retained in the blocking position, and

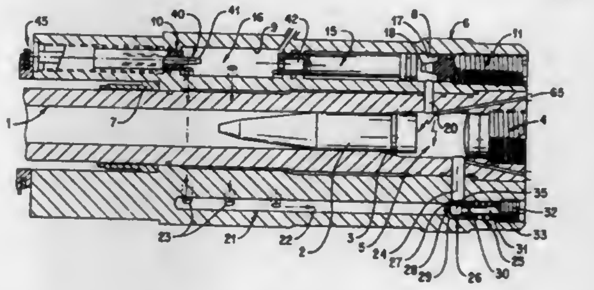
(d) a safety pin, which, in the blocking position of the blocking latch, can be pushed through a housing of the locking assembly and engaged by the blocking latch,

wherein

(e) a contact surface is provided in the blocking latch and extends into the path of the safety pin if the blocking latch is not in a correct blocking position.

5,533,434
METHOD AND SYSTEM FOR SUPPLYING A DEVICE WITH A VOLUME OF HYDRAULIC FLUID WHOSE PREDETERMINED VALUE ACCORDING TO OPERATING CONDITIONS

Michel Begneu, Bourges, France, assignor to Giat Industries, Versailles, France
PCT No. PCT/FR93/01071, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO94/10522, PCT Pub. Date May 11, 1994
PCT Filed Oct. 29, 1993, Ser. No. 256,227
Claims priority, application France, Nov. 2, 1992, 92 13100
Int. Cl.⁶ F41A *1/04*
U.S. Cl. 89—7 **9 Claims**



1. A system for supplying a device with a volume of hydraulic fluid having a predetermined value that is variable according to operating conditions, the system having a hydraulic jack comprised of a piston and a cylinder that define a variable-volume chamber connected to the device, means for supplying the chamber with fluid under pressure, means for controlling the movement of the piston, and means for damping the movement of the piston at the end of its travel, wherein the speed of the piston at the end of travel is variable and determined by an initial axial length of said chamber, the piston end-of-travel damping means comprises a tip mounted on a cylinder end of the cylinder that projects inside said chamber and a cavity of a corresponding shape and size formed on the piston and designed to receive the tip to brake and damp the movement of the piston by a hydraulic compression effect, and the system further comprises means for regulating the length of the tip projecting into said cavity as a function of the speed attained by the piston at the end of travel.

5,533,435
FLUID CYLINDER ASSEMBLY

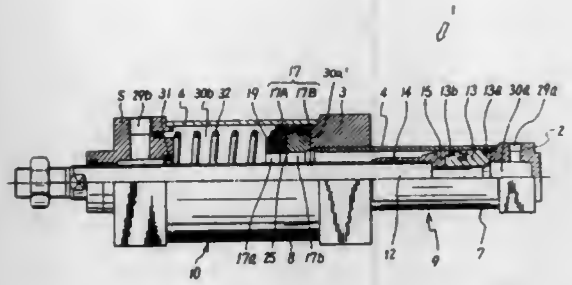
Kazushi Kita, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan
Filed Jul. 28, 1995, Ser. No. 508,527
Claims priority, application Japan, Aug. 22, 1994, 6-219508
Int. Cl.⁶ F15B *11/00;* **F01B** *7/00*
U.S. Cl. 91—519 **6 Claims**

1. A fluid cylinder assembly, comprising:

a first cylinder of a smaller diameter and a second cylinder of a larger diameter, connected with each other in a coaxially intercommunicating state through a joint member;

a piston rod commonly passed through said first and second cylinders;

a larger piston fitted in said second cylinder for sliding movements only in and along said second cylinder;



- a smaller piston mounted at one end of said piston rod for movements in and along said first and second cylinders over the entire stroke range of said piston rod, said smaller piston being adapted to move as a solitary body within said first cylinder in fluid-tight sliding contact therewith and to be coupled with said larger piston during movement within said second cylinder;
- a biasing means for urging said larger piston toward a return end position at the head end of said second cylinder;
- a coupling mechanism for coupling said smaller piston with said larger piston in a locked state during movement within said second cylinder; and
- a valve means adapted to open a chamber on the head side of said second cylinder to the atmosphere when said larger piston is located at said return end position and to shield said chamber from the atmosphere when the larger piston is moved away from the return position.

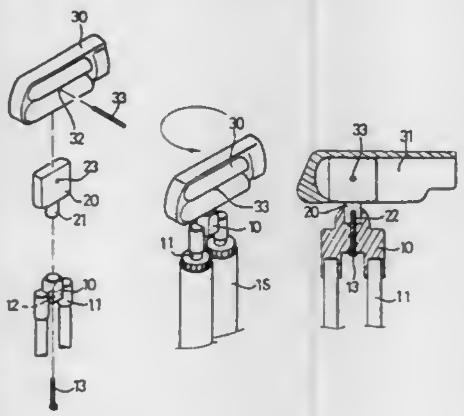
5,533,436
HAND AIR PUMP HAVING TWO ACTUATORS

Louis Chuang, 7th Floor-8, No. 20 Ta Lon Rd., Taichung, Taiwan

Filed May 15, 1995, Ser. No. 441,349

Int. Cl.^{6} F01B *19/00*

U.S. Cl. 92—146 **1 Claim**



1. An air pump comprising:
- two cylinders each including an operating rod slidably engaged therein, each of said operating rods including an upper end extended outward of its cylinder,
- a block secured to said upper ends of each of said operating rods for actuating said operating rods simultaneously, the block including a bore formed therein,
- a coupler rotatably engaged on top of said block and arranged to be rotated relative to said block,
- a fastening means rotatably engaged in said bore of said block and secured to said coupler so as to couple rotatably said coupler to said block and so as to allow said coupler to be rotated relative to said block, and
- a hand grip including a chamber formed therein for engaging with said coupler, said hand grip being pivotally coupled to said coupler at a pivot shaft, said pivot shaft being perpendicular to said fastening means so as to allow said hand grip to rotate to a folded position.

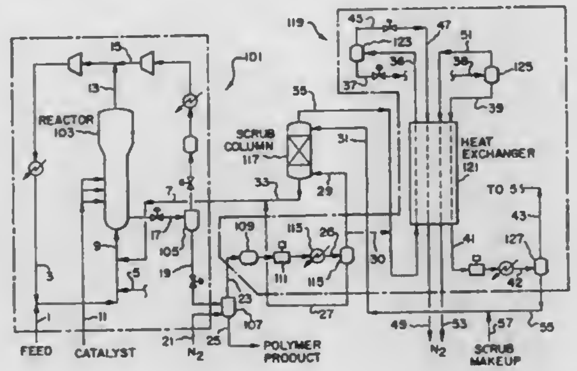
5,533,437
RECOVERY OF HYDROCARBONS FROM POLYALKENE PRODUCT PURGE GAS

Lee J. Howard, Allentown, and Howard C. Rowles, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 20, 1995, Ser. No. 375,881

Int. Cl.^{6} B01D *53/47;53/14*

U.S. Cl. 95—42 **23 Claims**



1. A method for the recovery of hydrocarbons from product purge gas (**23**) generated in the synthesis of a polyalkene product from a feed gas (**1**) comprising alkene monomer and one or more intermediate hydrocarbons in a polymerization reactor (**103**). wherein said product purge gas (**23**) is generated by purging said polyalkene product with an inert gas (**21**), and wherein said product purge gas (**23**) comprises said inert gas, unreacted alkene monomer, one or more heavy hydrocarbons formed as byproducts in said polymerization reactor, and one or more intermediate hydrocarbons having volatilities intermediate said alkene monomer and said one or more heavy hydrocarbons. said method comprising the steps of.
- (a) contacting said product purge gas (**23**) in a gas-liquid absorption zone (**117**) with a scrub liquid feed (**31**) comprising at least one of said one or more intermediate hydrocarbons, thereby absorbing at least a portion of said one or more heavy hydrocarbons in said scrub liquid (**31**);
- (b) withdrawing from said absorption zone (**117**) a vapor overhead (**35**) comprising said inert gas and at least a portion of said alkene monomer and an absorber bottoms scrub liquid (**33**) comprising at least a portion of said one or more heavy hydrocarbons;
- (c) recovering said alkene monomer from said vapor overhead (**35**); and
- (d) recycling at least a portion of said absorber bottoms scrub liquid (**33**) to said polymerization reactor (**103**).

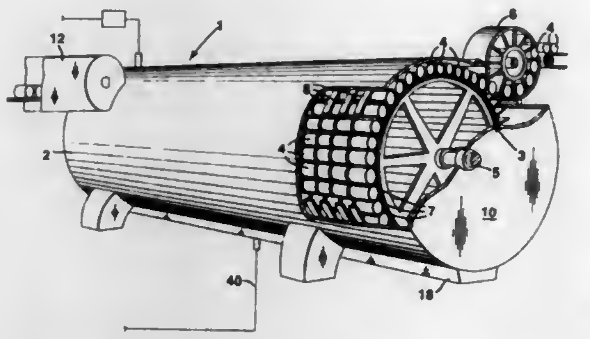
5,533,438
SPIRAL TEE FOR TIN FREE STEEL CONTAINERS

Joost Veltman, Aptos, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed May 31, 1995, Ser. No. 454,988

Int. Cl.^{6} A23L *3/06*

U.S. Cl. 99—360 **3 Claims**



1. An apparatus for processing filled containers, comprising:
- a vessel with a central cavity with a first end and a second end and a top and a bottom;
- an axle with a length extending from the first end of the central cavity to the second end of the central cavity;
- a reel connected to and extending along the length of the axle wherein the reel has an outer edges, which are parts of the reel displaced furthest from the axle, wherein the outer edges of the reel are able to rotate around the axle within the central cavity;
- means connected to the outer edges of the reel and extending along the length of the reel for pushing the containers around the reel as the reel is rotated; and
- a spiral piece on the inside of the central cavity around the reel. comprising:
- a first base rail formed from the material Nitronic-30; and
- a vertical rail perpendicular to the first hase rail and mechanically connected to the first base rail.

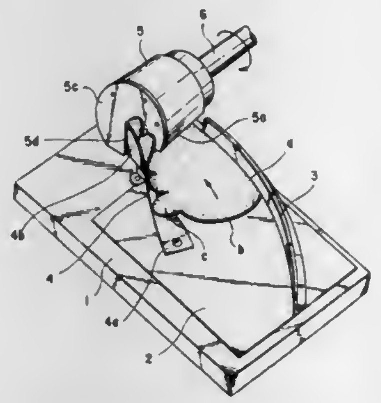
5,533,439
APPARATUS FOR PRODUCING FLAT-BOTTOMED EDIBLE CONTAINERS

Sadaharu Ito, 30-5, Saginomiya 1-chome, Nakano-ku, Japan

Division of Ser. No. 327,633. Oct. 24, 1994. This application May 9, 1995, Ser. No. 437,877

Int. Cl.^{6} A21D *13/08*

U.S. Cl. 99—383 **8 Claims**



1. An apparatus for producing a flat-bottomed, conically-shaped edible container from a pliable edible dough sheet having a pair of opposed side edges, arcuate upper and lower edges, and a plurality of tongue pieces integral with and positioned in side-by-side relationship about, said lower edge, said apparatus comprising:
- a horizontally planar work table;
- a conically shaped wrapping guide mounted to said work table for forming said dough sheet into a conical shape, said wrapping guide defining a horizontally elongate inlet opening between opposed ends thereof to allow said dough sheet to be fed into said wrapping guide so as to be conically wrapped thereby;
- an arcuately shaped guide plate mounted to said work table and extending rearwardly from a forward end of said inlet opening of said wrapping guide for guiding the arcuate upper edge of the dough sheet into said wrapping guide; and
- a bending plate extending rearwardly from a rearward end of said inlet opening and having a vertically oriented end connected to said wrapping guide, and a horizontally oriented end connected to said work table, said bending plate being curved between said vertically and horizontally oriented ends so as to sequentially bend the tongue pieces upwardly relative to the dough sheet and into overlapping relationship to one another in response to said dough sheet being fed into said wrapping guide to thereby form a flat bottom of the edible container.

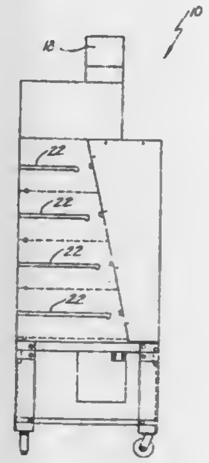
5,533,440
ROTISSERIE

Jeffery L. Sher, Mosman, Australia, assignor to Winmint Manufacturing Pty Limited, New South Wales, Australia

Filed Feb. 9, 1995, Ser. No. 386,471

Int. Cl.^{6} A47J *37/04*

U.S. Cl. 99—421 HH **20 Claims**



1. A rotisserie comprising:
- a cabinet;
- pairs of support arms located within said cabinet;
- a radiant plate supplying radiant heat inside said cabinet;
- a plurality of horizontally extending spits rotatably supported within said cabinet, each one of said respective spits being upwardly, forwardly staggered with respect to a spit therebelow, each spit being supported upon a pair of said support arms, each one of said support arms comprising a track along which opposed ends of each said spit may roll,
- food items mounted upon respective spits are adapted to receive radiant heat from said radiant plate located within said cabinet each said track being fixed to said cabinet.

5,533,441
APPARATUS FOR RAPIDLY COOLING LIQUID EGG

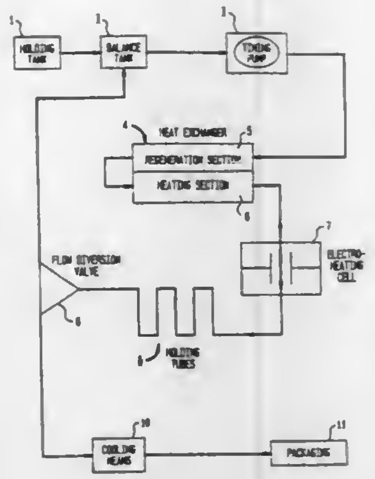
David Reznik, 2151 Barbara Dr., Palo Alto, Calif. 94303, and Aloysius Knipper, 227 Cupsaw Dr., Ringwood, N.J. 07456

Division of Ser. No. 192,457, Feb. 7, 1994, abandoned, which is a division of Ser. No. 862,198, Apr. 2, 1992, Pat. No. 5,290,583. This application Mar. 8, 1995, Ser. No. 401,029

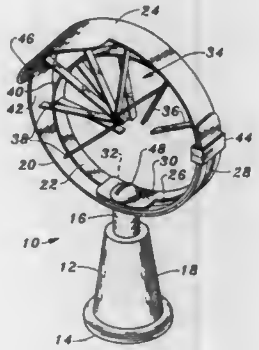
Int. Cl.^{6} A23B *5/00;5/05;* **A23L** *1/025;3/32*

U.S. Cl. 99—455 **4 Claims**

1. Apparatus for rapidly cooling hot pasteurized liquid egg comprising a first conduit for conveying a stream of hot pasteurized liquid egg from a pasteurizer to a mixing chamber; a mixing chamber for receiving hot pasteurized liquid egg from said pasteurizer and for mixing said hot pasteurized liquid egg with a stream of cold pasteurized liquid egg; and a second conduit for conveying a stream of cold pasteurized liquid egg to said mixing chamber where it is received and mixed with said hot pasteurized liquid egg.



5,533,442
AVOCADO PEELER AND SLICER
Chikara R. Tateno, 1815 Katrina Ct., Santa Cruz, Calif. 95062
Filed Nov. 21, 1995, Ser. No. 561,106
Int. Cl.^{6} A23N *3/00;* **A47J** *17/00;25/00*
U.S. Cl. 99—541 **11 Claims**



1. A tool for use on an avocado, for separating the meat of an avocado from its skin while simultaneously cutting the meat into separate slices, comprising:

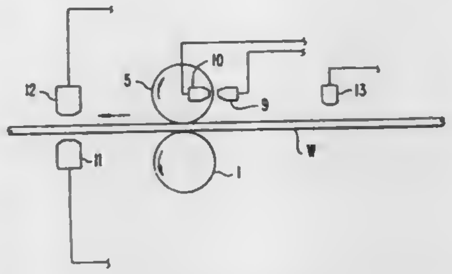
a handle having a first end and a second end;

cutting means mounted at one end of the handle; the cutting means including a pair of ring elements operably secured to the handle and extending away therefrom; the pair of ring elements comprising an inner ring and outer ring formed from a continuous band; the inner ring having an elongated guide slot operably positioned therein, and the outer ring having and elongated guide slot operably positioned therein and in operably alignment with the elongated guide slot of the inner ring and extending therethrough; the inner ring including a set element having a centrally positioned aperture therethrough adapted for releasably securing and receiving the second end of the handle;

a plurality of cutting blades operably positioned on an inner wall of the inner ring and a plurality of cutting blades operably positioned on an inner wall of the outer ring; and

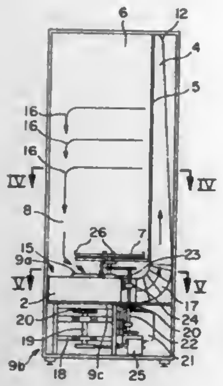
a fastening element slidably secured to the inner ring and the outer ring allowing for adjustments of the outer ring and the inner ring in relation to each other and to the second end of the handle.

5,533,443
METHOD FOR INFLUENCING THE THICKNESS AND GLOSS AND/OR SMOOTHNESS IN THE TREATMENT OF FIBER MATERIAL WEBS
Wolf G. Stotz, Ravensburg, and Josef Schneid, Vogt, both of, Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Germany
Filed Jun. 7, 1994, Ser. No. 255,015
Claims priority, application Germany, Jun. 24, 1993, 43 21 061.9
Int. Cl.^{6} D21G *1/00*
U.S. Cl. 100—38 **21 Claims**



1. Method for influencing at least one of a thickness, gloss and smoothness of a fiber material web in a press gap formed by first and second rolls, at least one of the rolls comprising an adjustable deflection roll including a flexible roll jacket and a plurality of support elements having a length less than and arranged along a length of the deflection roll for bracing the roll jacket when a pressing force is exerted against the web, the method comprising the steps of adjusting the web thickness over a width of the web by varying a pressure exerted by the support elements on the roll jacket, providing a plurality of independent pressing force correction sections associated with the support elements for generating the pressing forces exerted by the respective support elements over the length of the press gap so that they substantially do not mutually influence each other; influencing desired values of at least one of the gloss and the smoothness of the web over its width by changing a surface temperature of at least one of the first and second rolls over at least a portion of the length thereof; and substantially preventing changes in the pressing force resulting from localized changes of a diameter of at least one of the rolls caused by roll surface temperature changes by correspondingly varying with the correction sections the pressing forces exerted by the support elements positioned where roll surface temperature-induced roll diameter changes are to be prevented.

5,533,444
HIGH AIR VELOCITY CONVECTION OVEN
Thomas R. Parks, Sunnyvale, Calif., assignor to Food and Agrosystems, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 178,519, Jan. 7, 1994, abandoned. This application Feb. 7, 1995, Ser. No. 385,080
Int. Cl.^{6} A47J *27/00;37/00*
U.S. Cl. 99—476 **7 Claims**



1. A high air velocity convection cooking oven comprising:

a) a first chamber divided into a cooking compartment and a positive pressure plenum, said first chamber being divided by a slotted air distribution plate to separate said cooking compartment from said plenum, said distribution plate being removably supported within said first chamber, said distribution plate being slotted in oriented, vertical slots for distributing air from said plenum into said cooking compartment in high velocity, uniformly distributed air streams throughout said cooking compartment, said positive pressure plenum being designed with respect to the volume of said cooking compartment to establish a static pressure between said plenum and said cooking compartment along said distribution plate resulting in uniform, unidirectional, constant flow of high velocity heated air through said slots in said distribution plate and throughout said cooking compartment,

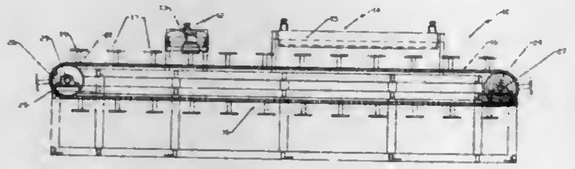
b) a second chamber adjacent to said first chamber, said second chamber having a blower unit and a heating unit, said second chamber being separated from said first chamber by a partial partition, said cooking compartment of said first chamber being connected for return air flow to said blower unit for input, said heating unit of said second chamber being connected to said plenum for supplying output high velocity heated air to said plenum,

c) a third chamber containing drive means connected to said second chamber, said third chamber being separated from said second chamber by a heat insulating partition,

d) and a rotatable turntable positioned in said first chamber, a motor for rotatably driving said rotatable turntable, said motor being in said third chamber, said turntable including a driven portion in the bottom of said second chamber and means extending vertically through said first chamber in the path of said uniform, unidirectional, constant flow of heated air through said slots in said distribution plate,

e) whereby said blower unit is driven by said drive means to pass air from said blower unit through said heating unit into said plenum and into said cooking compartment through said distribution plate and said air passes from said cooking compartment into said blower unit, said plenum unit being designed to maintain a positive pressure throughout said plenum and so as to discharge said high velocity, uniformly distributed heated air streams throughout said cooking compartment.

5,533,445
AUTOMATED PRINTING MACHINE AND PROCESS
Ralph J. Bill, 17622 Wrightwood La., Huntington Beach, Calif. 92649
Filed Sep. 19, 1995, Ser. No. 531,217
Int. Cl.^{6} B05C *17/04*
U.S. Cl. 101—123 **20 Claims**



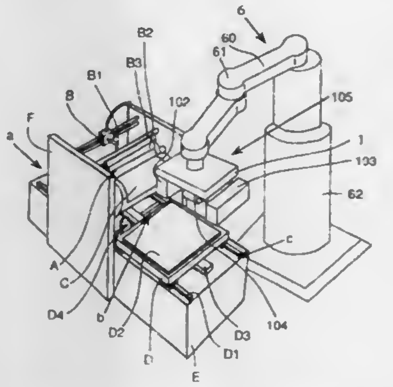
1. An automated printing machine, having an endless belt drive carrying workpieces through a printing station and a drying station, comprising, in combination:

said endless belt drive being a chain drive means having a plurality of interlocking plates thereon;

a plurality of pallets comprising an elevated printing surface secured to said chain drive means by an elongated body, each of the elongated bodies having first and second ends, with the first end secured to said chain drive means and the second end secured to said elevated printing surface, spaced from said chain drive means; and

a drive means, connected to a drive wheel sprocket for intermittently driving said chain drive means; said drive means including drive control means for positively indexing said drive control sprocket to accomplish the intermittent driving of said chain drive means without causing any hard stops.

5,533,446
THIN-FILM FORMING APPARATUS AND THIN-FILM FORMING METHOD
Yasuhiro Hashimura; Satoshi Noguchi; Kenichi Masaki, and Takahiro Akai, all of Kyoto, Japan, assignors to Nissha Printing Co., Ltd., Kyoto, Japan
Filed Aug. 30, 1994, Ser. No. 282,989
Claims priority, application Japan, Apr. 16, 1993, 5-113809; Apr. 16, 1993, 5-113810; Apr. 16, 1993, 5-113811
Int. Cl.^{6} B41F *27/06;27/12;3/38*
U.S. Cl. 101—150 **21 Claims**



1. A thin-film forming apparatus which includes a printing device having an intaglio roll having a plurality of ink cells, an ink supply means which includes a doctor blade and which fills ink into the ink cells, a printing roll with an elastic plate to which the ink of the intaglio roll is transferred wound around a barrel surface thereof, and a printing table which fixes a to-be-printed material to which the ink of the printing roll is transferred, comprising:

an articulated robot; and

an implementation means for printing preparatory works which is mounted to an arm of the articulated robot and which performs at least one operation among a mounting/dismounting operation of the elastic plate to/from the printing roll, an operation to wipe the barrel surface of the intaglio roll, and an operation to wipe the doctor blade;

wherein the implementation means for the printing preparatory works is an elastic plate automatic mounting/dismounting device which includes a fixed chuck means which is fixed at one end on a lower side of a hand body of a hand mounted to a tip of the arm of the articulated robot and which mountably and dismountably holds one end of the elastic plate, a stretching chuck means which is movably arranged at the other end of the lower side of the hand body opposite to the fixed chuck means and mountably and dismountably holds the other end of the elastic plate, and an elastic plate tension adjusting means which is fixed on the lower side of the hand body, and supports the stretching chuck means, and adjusts a distance between the fixed chuck means and the stretching chuck means, and

the articulated robot has a control device which controls an operation of the elastic plate automatic mounting/dismounting device.

5,533,447

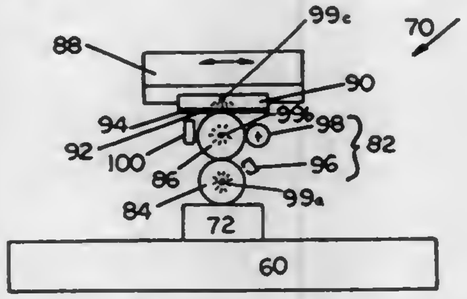
METHOD AND APPARATUS FOR PRINTING A COLOR FILTER INK PATTERN

Ronald E. Johnson, Tioga, Pa.; William E. Lock, Horseheads, and Robert D. Shoup, Hammondsport, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 3, 1993, Ser. No. 145,244

Int. Cl.^{6} B41M *1/20;1/34*

U.S. Cl. 101—211 **40 Claims**



1. A method of printing a multi-color ink pattern on a substrate surface which comprises the steps of arranging a series of surfaces in which each surface has a pattern that is unique to one of the colors in the multi-color pattern, supplying to each patterned surface a radiation-curable ink formulation having an appropriate colorant to form an ink pattern thereon, transferring individually the colored ink pattern from each patterned surface to a collector roll, forming a composite of the color patterns on the collector roll, increasing the cohesiveness of the ink sufficiently, while the ink pattern is on the collector roll, to permit complete transfer of the pattern directly to the substrate surface, and transferring the composite pattern in its entirety to the substrate surface.

5,533,448

DEVICE FOR CONTROLLING THE SHEET INLET WHEN STARTING UP A SHEET-PROCESSING PRINTING MACHINE

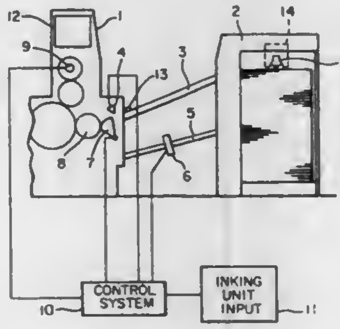
Horst Klingler, Mülheim, Germany, assignor to Man Roland Druckmaschinen AG, Germany

Filed Sep. 29, 1994, Ser. No. 315,118

Claims priority, application Germany, Sep. 29, 1993, 43 33 071.1

Int. Cl.^{6} B41F *15/02;31/15*

U.S. Cl. 101—233 **7 Claims**



1. A controller for controlling startup operations of a printing machine and a sheet feeder unit, the printing machine having a vibrating-type inking unit, at least one single-axis shaft and a pregripper, and the sheet feeder unit having a drive and position lays which feed sheets to the pregripper, the controller comprising: a sheet sensor for determining when a sheet is at the position lays; an angular sensor for determining the angular position of the single-axis shaft; an inking unit input for determining the operating mode of the vibrating-type inking unit; a control system responsive to the sheet sensor for holding the sheet at the position lays; the control system including memory containing the proper angle of the single-axis shaft based on the operating mode of the vibrating-type inking unit, means for operating the printing machine until the vibrating-type inking unit generates a stable ink distribution, a comparator for operating the printing machine until the proper angle equals the angular position of the single-axis shaft; and means for releasing the sheet at the position lays.

5,533,449

MOTOR-TYPE INK SENSOR

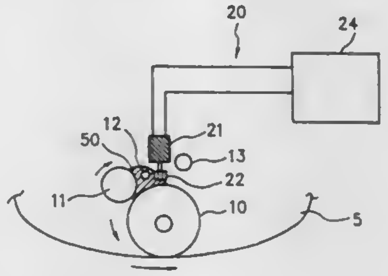
Takanori Hasegawa, and Hideo Shoji, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 362,278

Claims priority, application Japan, Dec. 27, 1993, 5-332391

Int. Cl.^{6} B41F *31/03*

U.S. Cl. 101—350 **7 Claims**



1. An ink sensor for detecting ink in an ink fountain formed in printing means of a printing apparatus, comprising,
an agitating portion disposed in the ink fountain,
a motor connected to the agitating portion for rotating the same,
power supply means electrically connected to the motor for rotating the motor,
means for providing a predetermined first electrical reference value, and
a comparing section electrically connected to the motor and the means for providing the predetermined first reference value, said comparing section receiving electricity supplied to the motor from the power supply means and the first reference value and comparing said electricity and said first reference value, said comparing section outputting an ink empty signal for the ink fountain when the electricity supplied to the motor is less than the first reference value.

5,533,450

INK FOUNTAIN APPARATUS FOR PRINTING PRESS

Tadashi Hachiya, Yokohama; Yukitoshi Takahashi, Kawasaki, and Yuji Kohara, Kodaira, all of, Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

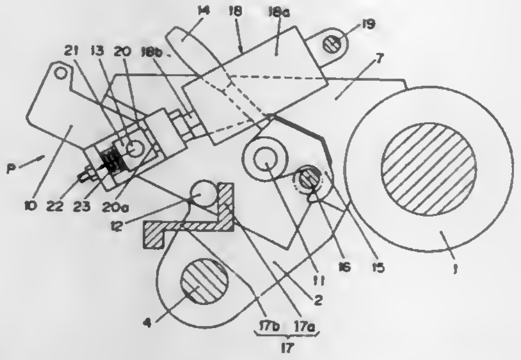
Filed Jul. 11, 1995, Ser. No. 500,756

Claims priority, application Japan, Nov. 28, 1994, 6-316008

Int. Cl.^{6} B41F *31/05*

U.S. Cl. 101—365 **5 Claims**

1. An ink fountain apparatus for a printing press comprising:
a frame;
an ink fountain roller rotatably mounted on said frame;
an inclined member which is swingable about an axis parallel with the rotational axis of the ink fountain roller for movement between a first position in which a forward edge of a sloping bottom surface of the inclined member is placed closely adjacent the peripheral surface of the ink fountain roller to produce a gap serving as an ink supply outlet forming an ink fountain, and a second position in which the forward edge of the sloping bottom surface of the inclined member separates from the peripheral surface of the ink fountain roller;



an ink supply adjusting member which is slidably guided on the sloping bottom surface of said inclined member with respect to the forward edge thereof to adjust the size of the ink supply outlet;
drive means connected to said inclined member via connection means to pivotally move said inclined member between the first position and the second position;
a stopper means including a limit stop fixedly secured to said frame and a pin movable with said inclined member cooperable with said limit stop for stopping said inclined member at the first position; and
a spring having a spring force smaller than a force produced by said drive means connecting said inclined member and said drive means and being operable to apply a pressure force between said pin on said inclined member against said limit stop when said inclined member is disposed in said first position.

5,533,451

IMAGE TRANSFER APPARATUS WITH TRANSFER DRUM CLAMPING MECHANISM

Masaaki Matsuo, and Takayuki Kimura, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

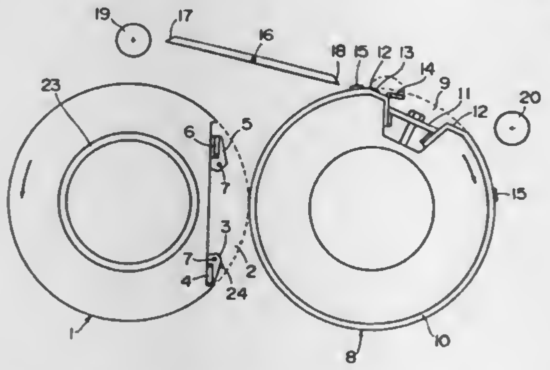
PCT No. PCT/JP93/00477, § 371 Date Oct. 27, 1919, § 102(e) Date Oct. 27, 1994, PCT Pub. No. WO93/21017, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 13, 1993, Ser. No. 157,202

Claims priority, application Japan, Apr. 13, 1992, 4-119674; Apr. 13, 1992, 4-119676

Int. Cl.^{6} B41F *1/28*

U.S. Cl. 101—415.1 **14 Claims**



1. An image transfer apparatus, comprising:
a platen;
a transfer cylinder located relative to said platen such that said platen and said transfer cylinder form a nip therebetween, whereby an image can be transferred from a photosensitive layer of an image-forming material on said platen to an image receptor on said transfer cylinder by introducing the image-forming material and the image receptor into said nip between said platen and said transfer cylinder by rotation of said platen and said transfer cylinder, said transfer cylinder having an outer surface and an axis having an axial direction;
a cut-off portion provided in said outer surface of said transfer cylinder;
a first image receptor attaching device comprising first holders and first holder seats for holding the entire length of a top end of the image receptor to said outer surface of said transfer cylinder, said first holders comprising at least two first holders provided along and separated from each other in said axial direction, and said first holder seats comprising at least two first holder seats provided along and separated from each other in said axial direction, wherein said first holder seats are separated from each other by gaps provided therebetween, and wherein said first holders and said first holder seats are disposed in said cut-off portion; and
a second image receptor attaching device comprising second holders and second holder seats for holding the entire length of a bottom end of the image receptor to said outer surface of said transfer cylinder;
wherein each of said first holders are communicated with a first common actuation shaft fcr simultaneous actuation.

5,533,452

METHOD OF PEELING A RELEASE FILM FROM A PHOTOSENSITIVE PLATE BLANK

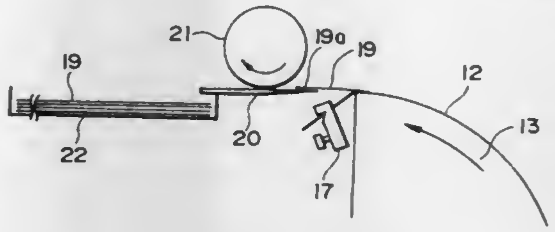
Akihiro Mouri, Kokubunji; Tsuyoshi Shibata, and Yuji Kondo, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 58,688, May 10, 1993, abandoned, which is a continuation of Ser. No. 792,698, Nov. 15, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,105

Claims priority, application Japan, Nov. 19, 1990, 2-313592

Int. Cl.^{6} B41N *1/14;* **G03C** *1/805*

U.S. Cl. 101—463.1 **16 Claims**



1. A printing method comprising the steps of:
providing a photosensitive printing plate blank comprising a polymerization layer between a support and a release film, and a plate cylinder, having a peripheral cut,
affixing the plate blank about the plate cylinder by fixing an end of the plate blank at the peripheral cut of the plate cylinder, so as to leave an end of the release film unfixed and separated from the fixed end of the plate blank, thereby facilitating peeling of the release film from the plate blank in a subsequent step,
forming a pattern of a polymerized part and an unpolymerized part in the polymerization layer,
peeling the release film apart from the plate blank affixed about the plate cylinder starting from the separated end of the release film, and removing the release film from the plate blank due to the rotating of the plate cylinder and peeling of the release film, thereby leaving a printing plate on the plate cylinder, and
performing printing by using the printing plate, while said printing plate is on the plate cylinder.

5,533,453

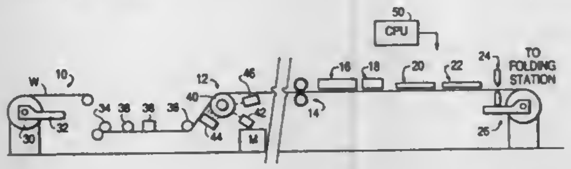
METHOD AND APPARATUS FOR AUTOMATIC NUMBERING OF FORMS ON A ROTARY PRINTING PRESS

Larry Wolfberg, Honolulu, Hi., and John Harper, Wichita, Kans., assignors to Advanced Licensing Limited Partnership, Fairfax, Va.

Continuation of Ser. No. 911,495, Jul. 10, 1992, abandoned, which is a division of Ser. No. 526,763, May 23, 1990, Pat. No. 5,178,063, which is a continuation of Ser. No. 281,062, Dec. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 942,324, Dec. 16, 1986, Pat. No. 4,827,315. This application Apr. 28, 1994, Ser. No. 235,143

Int. Cl.^{6} B41F *27/00*

U.S. Cl. 101—485 **34 Claims**



21. A method for printing sequential serialization data images in sequential business forms of variable length and comprising repeating fixed images, said method comprising:

(a) feeding printing material to an electronic printer;

(b) supplying to said electronic printer serialization data in electronic form;

(c) computer controlling said electronic printer to print serialization data images corresponding to said serialization data at selected locations on said printing material, by:

receiving in a central processing unit (CPU) print position data defining serialization data image print positions within each form, and form dimension data defining a dimension of each of the sequential business forms; and

determining with said CPU, from said print position data and form dimension data, a serialization data image printing repeat sequence used in said control of the electronic printer; and

(d) electronically scanning the serialization data images and said repeating fixed images in order to detect errors in the sequencing and positioning of said serialization data.

5,533,454

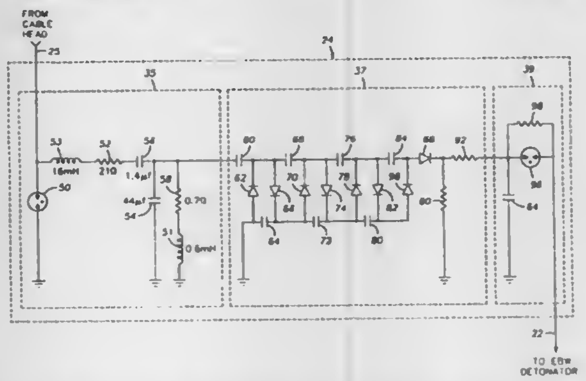
ALTERNATING CURRENT ACTIVATED FIRING CIRCUIT FOR EBW DETONATORS

James Ellis, and Alan W. Crawford, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 276,719, Jul. 18, 1994, abandoned. This application Sep. 18, 1995, Ser. No. 529,556

Int. Cl.^{6} F42C *19/12*

U.S. Cl. 102—202.1 **6 Claims**



4. A selective firing apparatus for activating a selected exploding bridgewire detonator in an assembly comprising a plurality of exploding bridgewire detonators, said selective firing apparatus comprising a plurality of firing circuits, each of said plurality of firing circuits connected to one of said plurality of detonators, each of said plurality of firing circuits comprising:

a bandpass filter tuned to a different preselected alternating current frequency, said filter connected to a source of detonating current;

a voltage multiplier connected to said bandpass filter; and

a discharge circuit connected to said voltage multiplier, said discharge circuit comprising a charging circuit and a threshold voltage switch, wherein said switch remains nonconductive until a voltage building in said charging circuit, resulting from output of said voltage multiplier, exceeds a predetermined threshold, whereupon said switch becomes conductive, enabling energy stored in said charging circuit to activate said selected detonator.

5,533,455

TAMPING TOOL ASSEMBLY

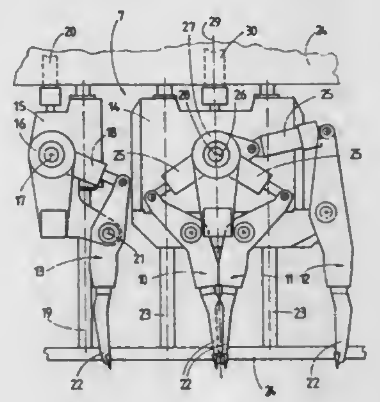
Josef Theurer, Vienna, and Friedrich Peitl, Linz, both of, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Filed Jul. 13, 1995, Ser. No. 501,853

Claims priority, application Austria, Aug. 9, 1994, 1550/94

Int. Cl.^{6} E01B *27/02*

U.S. Cl. 104—12 **6 Claims**



1. A tamping tool assembly for tamping ballast underneath no more than two successive ties of a railroad track, which essentially consists of

(a) two pairs of tamping tools succeeding each other in the direction of elongation of the railroad track, two proximal tamping tools of the pairs being adjacent each other and two distal tamping tools of the pairs being remote from each other and arranged at respective ends of the assembly in said direction,

(b) a first vertically adjustable tamping tool carrier,

(c) a first crank shaft mounted on the first tamping tool carrier,

(d) drive means connecting the two adjacent proximal tamping tools and one of the distal tamping tools to the first crank shaft for reciprocating the two adjacent proximal tamping tools and the one distal tamping tool in the direction of elongation of the railroad track,

(e) a first drive for vertically adjusting the first tamping tool carrier for immersing the two adjacent proximal tamping tools in the ballast between the two successive ties and the one distal tamping tool in the ballast adjacent one of the ties,

(f) a second vertically adjustable tamping tool carrier having an end face facing an end face of the first tamping tool carrier,

(g) a second crank shaft mounted on the second tamping tool carrier,

(h) drive means connecting the other distal tamping tool to the second crank shaft for reciprocating the other distal tamping tool in the direction of elongation of the railroad track,

(i) a vertical guide whereon the second tamping tool carrier is mounted for vertical adjustment, and

(j) a second drive for vertically adjusting the second tamping tool carrier independently of the first tamping tool carrier for immersing the other distal tamping tool in the ballast adjacent the other one of the successive ties.

5,533,456

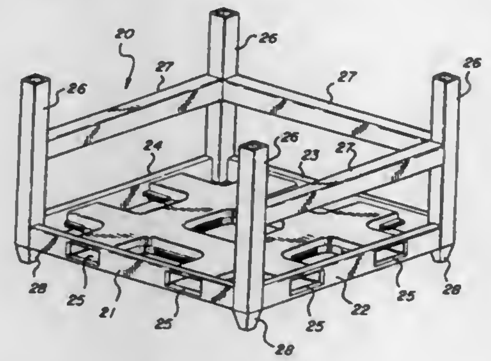
RACK BASE CONSTRUCTION AND METHOD OF MANUFACTURE

Michael E. Regina, Vestaburg, Mich., assignor to The Lobdell-Emery Manufacturing Company, Alma, Mich.

Filed May 4, 1994, Ser. No. 237,698

Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—51.1 **19 Claims**



1. A base construction comprising a pair of overlying frame members each of which is formed from a single, flat blank each of which has a first pair of spaced apart, parallel, substantially uniform length limbs and a second pair of spaced apart, parallel, substantially uniform length limbs extending at right angles to the first pair of limbs, each of said limbs having free ends and on its opposite sides a right angular flange, the flanges of the limbs of one of said frame members confronting and being secured to the flanges of the limbs of the other of said frame members whereby said frame members together form a hollow body of tic-tac-toe configuration and the overlying limbs form tunnels.

5,533,457

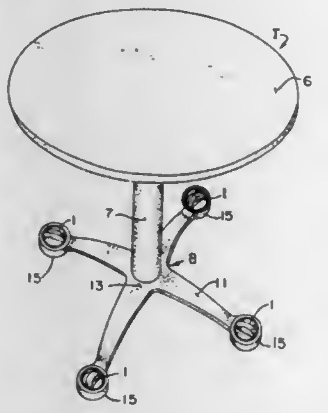
LEVELING MECHANISM ADJUSTABLE GLIDE

Lewis D. Cox, Knoxville, Tenn., assignor to Falcon Products, Inc., Newport, Tenn.

Filed Nov. 10, 1994, Ser. No. 337,060

Int. Cl.^{6} A47B *13/02*

U.S. Cl. 100—150 **19 Claims**



1. In a table support assembly to support a table top including at least one vertical column having a first end and a second end, the first end being attached to such table top, at least one generally horizontal support having a first end and a second end, the first end attached to the second end of the vertical column and having a foot at the second end of the horizontal support, the improvement comprising:

an integral foot having an upper and a lower cavity formed therein and a vertical bore formed therethrough, and

a glide assembly for permitting adjustment of said glide assembly from an upper side of the foot;

said glide assembly including a threaded stem extending through the vertical bore, said stem having a first end and a second end;

a glide positioned on a lower surface of the foot adjacent the lower cavity and attached to said first end of said stem, and

an adjusting knob positioned adjacent the upper cavity and attached to said second end of said stem, said adjusting knob being accessible along an upper side of said foot and adjustable by hand, said knob disposed to rotate said stem within said bore, thereby moving said glide relative to said lower cavity of said foot.

5,533,458

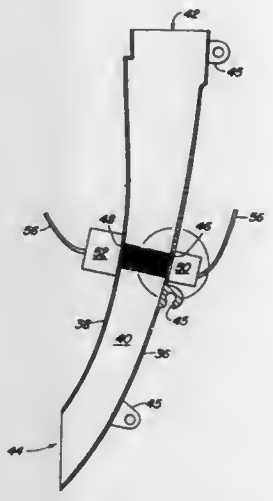
SEED TUBE FOR AN AGRICULTURAL SEEDING MACHINE

Norman R. Bergland; Donald R. Wisor, both of Moline, and Netza Portillo, Coal Valley, all of Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 14, 1995, Ser. No. 403,999

Int. Cl.^{6} B65B *57/18;* **H02K** *35/00*

U.S. Cl. 111—200 **8 Claims**



1. A seed tube for an agricultural seeding machine in which seeds are periodically released for deposit on the ground below, the seed tube comprising:

a tube having a front wall and a rear wall which are joined together by two sidewalls, the front wall having an inside surface and an outside surface, the tube having an open top for receiving seed and an open bottom for depositing seed;

the front wall is provided with a sensor aperture for receiving a non-invasive sensor for detecting seeds passing through the tube, the non-invasive sensor does not disrupt seeds as they flow through the tube;

the inner surface of the front wall immediately above the sensor aperture is provided with a ramp for directing seed falling through the tube inwardly away from the sensor aperture.

5,533,459

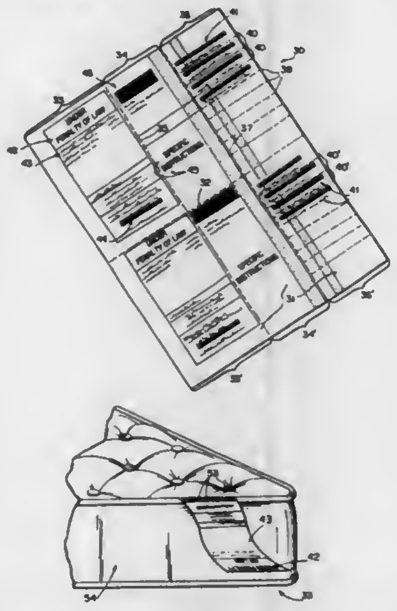
METHOD OF CONSTRUCTING BEDDING TAGS

Sharon M. Fontana, Northbrook, Ill., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jun. 29, 1994, Ser. No. 268,184

Int. Cl.^{6} D05B *97/00;* **B42D** *15/00*

U.S. Cl. 112—475.08 **18 Claims**



1. A method of constructing bedding tags using laser compatible and printable uniform material stock substrate sheets, automatic sewing machine sewability, press printability, and perfability, comprising the steps of:

(a) impregnating the substrate sheets with a tear resistant saturant such that the impregnated sheets have sufficient tear resistance to comply with requirements for a law tag on an upholstered furnishing;

(b) imaging first indicia with heat resistant ink on the stock including law tag indicia;

(c) automatically perting the stock to form at least first and second portions separated by a first perf line, the first portion including said law tag indicia;

(d) laser printing variable indicia on each stock sheet, including contents indicia on the first portion;

(e) after steps (a)–(c) ultimately separating the first portion from the second portion along the first perf line; and then

(f) sewing the first portion to bedding.

5,533,460

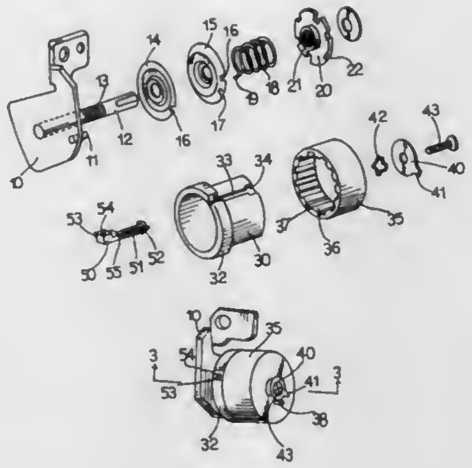
THREAD TENSION DEVICE WITH LATCH FOR A SEWING MACHINE

Hsien-Chang Tseng, 9th Floor, No. 13-4, Sec. 1, Da Ching Street, Taichung, Taiwan

Filed Oct. 12, 1995, Ser. No. 542,171

Int. Cl.^{6} O05B *47/02*

U.S. Cl. 112—254 **8 Claims**



1. A thread tension device for a sewing machine comprising:

a support for securing to the sewing machine, said support including a shaft extended therefrom and having an outer thread formed thereon,

a pair of discs engaged on said shaft for clamping a thread therebetween,

means for biasing said discs toward each other so as to clamp the thread in place,

a follower threadedly engaging with said outer thread of said shaft so as to allow said follower to move along said shaft when said follower rotates relative to said shaft,

a barrel rotatably engaged on said shaft and including a rib means for engaging with said follower so as to rotate said follower when said barrel is rotated, said barrel including an outer peripheral portion having a slot formed therein,

a cap rotatably engaged on said barrel, and

a latch means slidably engaged in said slot of said barrel for engaging said barrel with said cap so as to allow said barrel and said cap to rotate in concert when said latch means is engaged with said cap,

said barrel being allowed to rotate freely relative to said cap when said latch means is disengaged from said cap.

5,533,461

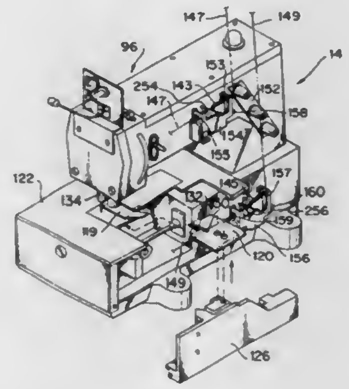
POCKET HEMMER HAVING A THREAD BREAK SENSOR

Glenn Wethington, Bowling Green; Jimmy D. Claiborne, Scottsville, and Mark R. Strain, Alvaton, all of Ky., assignors to Union Underwear Company, Inc., Bowling Green, Ky.

Division of Ser. No. 141,208, Oct. 26, 1993, Pat. No. 5,443,024. This application Feb. 10, 1995, Ser. No. 386,828

Int. Cl.^{6} D05B *69/36*

U.S. Cl. 112—278 **5 Claims**



1. Automatic sewing machine apparatus, comprising:

a sewing head;

thread break sensor means for monitoring dynamic reflection of thread moving to the sewing head;

means for mounting said thread break sensor on said sewing head; and

indicator means located on said mounting means and in operative communication with said thread break sensor means for providing a visual indication of a break in a moving thread being fed to the sewing head in response to said thread break sensor means.

5,533,462

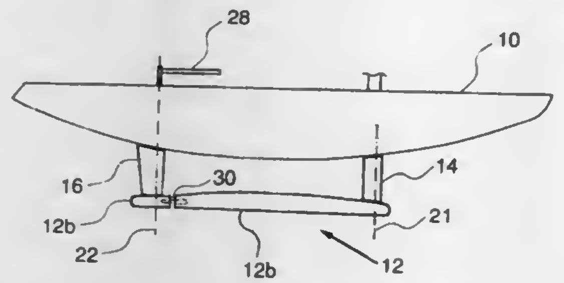
KEEL ARRANGEMENT FOR SAILBOAT HULL

Bruce L. Parsons, Portugal Cove, Canada, assignor to National Research Council of Canada, Ottawa, Canada

Filed Sep. 11, 1995, Ser. No. 526,287

Int. Cl.^{6} B63B *3/38*

U.S. Cl. 114—140 **5 Claims**



1. In a keel arrangement for a sailboat hull, said keel arrangement having;

an elongated ballast member spaced below said hull so as normally to extend horizontally and fore-and-aft under said hull,

a front foil and a rear foil depending respectively from a front and a rear portion of the hull, each foil having a lower end. which lower ends between them support said ballast member,

means for pivotally mounting at least the rear foil about an axis extending along said rear foil to allow it to act as a rudder;

the improvement comprising joint means connecting a main, front portion of said ballast member to a minor, rear portion thereof, said joint means allowing both longitudinal and rotational movement between said ballast member portions, whereby said foils can bend independently of each other.

5,533,463

HULL STRUCTURE OF NONMETALLIC MATERIAL

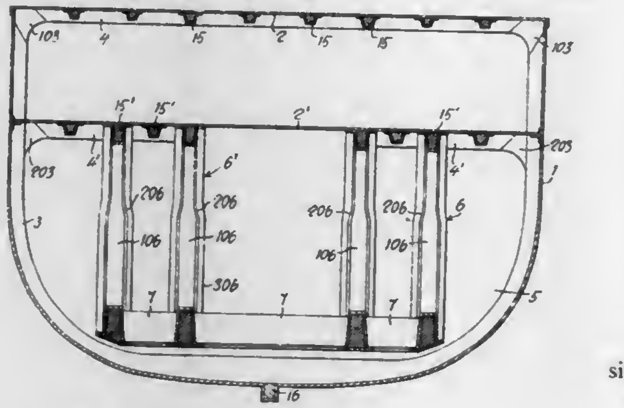
Giorgio Marchetti. and Giovanni Guzzo, both of Sarzana, Italy, assignors to Intermarine S.P.A., Sarzana, Italy

Filed Oct. 12, 1994, Ser. No. 321,809

Claims priority, application Italy, Oct. 13, 1993, GE93A0087

Int. Cl.^{6} B63B *5/24*

U.S. Cl. 114—357 **12 Claims**



1. A hull structure of reinforced plastics material comprising:

a one-piece shell having a longitudinal axis defining a longitudinal direction and a transverse direction perpendicular to the longitudinal axis;

an upper deck and an intermediate deck;

a plurality of transverse ribs distributed at spaced locations along the length of said shell, each said transverse rib being attached along a corresponding inner surface of a transverse section of said shell;

a plurality of upper transverse members extending directly underneath of said upper deck and attached thereto, and a plurality of intermediate transverse members extending directly underneath of said intermediate deck and attached thereto, each said upper and intermediate transverse member being attached to a corresponding said transverse rib so that the attached said transverse rib and transverse members form a single one-piece open frame;

upper longitudinal members attached to an underside of said upper deck and to ones of said plurality of upper transverse members, and intermediate longitudinal members attached to an underside of said intermediate deck and to ones of said plurality of intermediate transverse members;

a pair of transverse bulkheads provided in said shell;

a plurality of tanks for holding fluids, each said tank including a fore end and an aft end attached respectively to one of said bulkheads for mounting said tanks in a suspended position above a bottom of said shell;

at least two vertical intermediate walls located spaced from one another between said pair of bulkheads,

each said vertical intermediate wall being fixed to a respective said transverse rib attached to said shell and to said intermediate deck, and

each said vertical intermediate wall including a plurality of windows through which respective ones of said plurality of tanks extend, a bottom portion of each window forming an intermediate transverse rib which supports the respective said tank; and

a plurality of elastic suspensions provided between a respective intermediate transverse rib and said tank supported thereby.

5,533,464

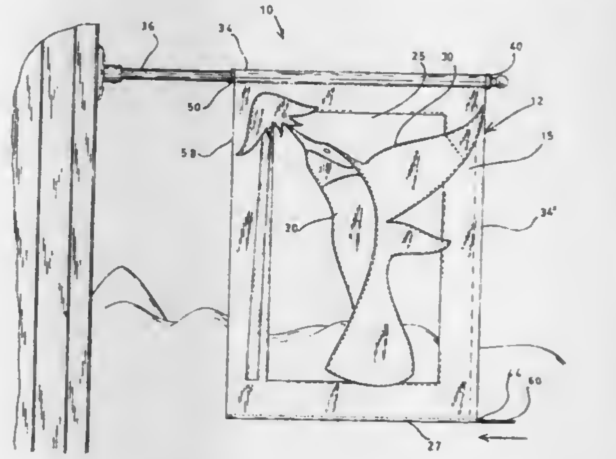
SILHOUETTE IMAGE FLAG WITH CUT-OUTS AND IMPROVED FLAG SUSPENDING ASSEMBLY

Alvin E. Todd, P O Box 924, Pigeon Forge, Tenn. 37868-0924

Filed Jun. 22, 1994, Ser. No. 263,525

Int. Cl.^{6} G09F *7/00;17/00*

U.S. Cl. 116—174 **1 Claim**



1. An ornamental flag assembly having an improved flag suspension assembly, said ornamental flag assembly comprising;

a planar flag member having a length, a width, an upper edge, a lower edge disposed oppositely from said upper edge, a substantially continuous border and an image therein, said image having a perimeter;

a cut-out area having a substantially large surface-area, said cut-out area being disposed within said substantially continuous border substantially about said perimeter wherein said perimeter of said image appears as a substantial silhouette of said image;

a first loop disposed along said upper edge of said planar flag member and receiving a flag pole, said first loop thereby allowing said planar flag member to swivel about said flag pole without wrapping around said flag pole;

a second loop disposed along said lower edge of said planar flag member, wherein said second loop is of a smaller diameter than said first loop;
an elongated dowel member, wherein said elongated dowel member is received within said second loop, said elongated dowel member thereby maintaining said lower edge in a straight manner and adding weight to said lower edge;
a grommet member for preventing said planar flag member from sliding upon said flag pole, said grommet member having an internal annular recess; and
an elastomeric O-ring received by said annular recess for supporting said grommet member, said elastomeric O-ring having an interior diameter slightly less than the exterior diameter of said flag pole such that said elastomeric O-ring engages said flag pole in a tight frictional fit, and further wherein said elastomeric O-ring is slidable along the length of said flag pole.

5,533,465

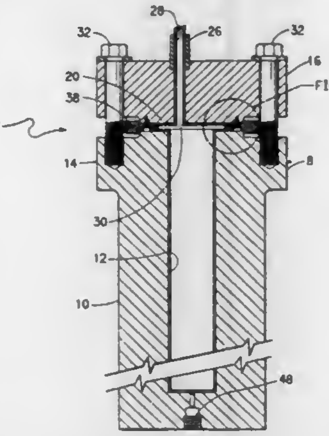
HYDROTHERMAL CRYSTALLIZATION VESSELS

August Ferretti, and Oral R. Van Buskirk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1995, Ser. No. 376,595

Int. Cl.^{6} C30B *7/10*

U.S. Cl. 117—224 **10 Claims**



2. A pressure vessel for hydrothermal crystal growth using a crystal growth media, comprising:
(a) a vessel base, including (i) a vessel body having a cavity with a cavity wall and a cavity outlet, and (ii) a cavity liner which is resistant to corrosion by the crystal growth media, having an outer wall in contact with and supported by the cavity wall, an inner wall defining a crystal growth chamber having a chamber outlet, and a flange positioned at the perimeter of the chamber outlet, said flange having a chamber seal surface around the perimeter of the chamber outlet and extending radially therefrom;
(b) a removable vessel cover including a cover plate for sealing to the flange, said cover plate being resistant to corrosion by the crystal growth media and having a cover area for covering the chamber outlet, the cover area having a cover seal surface which opposes the chamber seal surface when the cover plate is sealed to the flange;
(c) means for reversibly connecting the vessel cover to the vessel body such that the cover seal surface is positioned a selected distance from the chamber seal surface when the cover plate is sealed to the flange; and
(d) a compressible self-energizing ring having an uncompressed height greater than the selected distance prior to sealing the cover plate to the flange, said ring being shaped for positioning around the chamber outlet and between the chamber seal surface and the cover seal surface, such that when the cover plate is sealed to the flange, the ring is compressed between the cover seal surface and the chamber seal surface to a height equal to the selected distance, thereby providing a seal against fluid loss from the chamber and contamination to the chamber;
the surface of the ring being resistant to corrosion by the crystal growth media, and having a hardness lower than the hardness of the chamber seal surface and lower than the hardness of the cover seal surface, such that neither the chamber seal surface nor the cover seal surface is substantially deformed when the cover is sealed to the chamber outlet structure.

5,533,466

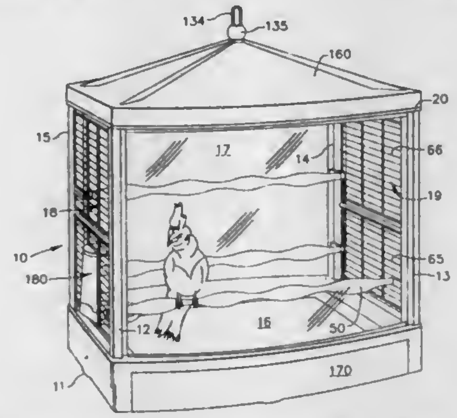
PET HABITAT WITH ENHANCED VIEWING

Louis M. Kohus, 6219 Woodlark Dr., Cincinnati, Ohio 45230; John C. Henning, 20 Applewood Dr., Fairfield, Ohio 45014; Chow-Chi Huang, 120 Carrington La. #312, Loveland, Ohio 45140, and Glen V. Walter, 8 Webb St., Middleton, Mass. 01949

Filed Jun. 20, 1994, Ser. No. 262,139

Int. Cl.^{6} A01K *31/06*

U.S. Cl. 119—459 **44 Claims**



39. A pet habitat for housing at least one pet animal in a manner whereby at least one substantially clear side wall section allows an unobstructed viewing of the pet animal, said pet habitat comprising:
(a) a base member having a bottom surface;
(b) at least two substantially vertical posts securely attached to the base member near its perimeter and further wherein each said at least two substantially vertical posts has an angled open channel extending vertically along a face thereof to receive an edge of the at least one substantially clear side wall section and to hold said at least one substantially clear side wall section in a bowed-shape for reduced glare and ready removal;
(c) a side wall barrier having the at least one substantially clear side wall section, said at least one substantially clear side wall section made of flexible polymeric material and removably mounted on adjacent substantially vertical posts by a spring-fit; and
(d) a top member dimensioned to overlie the substantially vertical posts and attached thereto.

5,533,467

BIRD FEEDING STATION

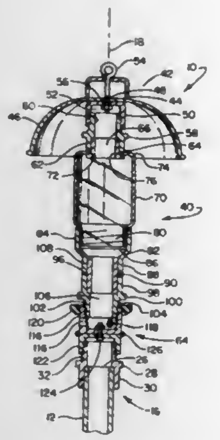
Frederick N. Lancia, 6100 Karrer Pl., Dublin, Ohio 43017

Filed Apr. 5, 1995, Ser. No. 417,099

Int. Cl.^{6} A01K *39/01*

U.S. Cl. 119—57.9 **19 Claims**

1. Bird feeding station apparatus, comprising:
a polymeric elongate cylindrical stanchion of predetermined diameter vertically extensible from a ground supportable lower region to an upper edge region;



station support means for supporting at least one bird feeding assembly by support from said stanchion upper edge region;
one first said bird feeding assembly supportable from said station support means being a feeding assembly comprising in sequence from top to bottom, a cap assembly with a downwardly extending female threaded coupling, a top male pipe adapter having an upwardly disposed threaded male coupling threadably, removably engageable with said cap assembly female threaded coupling and a downwardly extending first slip coupling portion with a downwardly disposed edge surmounting a cavity first opening, a transparent jar-shaped seed reservoir having a first end abuttably engaging said downward edge and a second opening aligned with and substantially co-extensive with said first opening, said reservoir having a second end oppositely disposed from said first end with a third opening, coupling means for connecting said seed reservoir first end with said first slip coupling downwardly disposed edge, a reducing coupling with a top portion of cross-sectional dimension for receiving and coupling to said reservoir second end and a downwardly depending bottom portion of cross-sectional dimension less than said top portion extending to a downwardly disposed annular edge, a bottom male pipe adapter having an upwardly extending second slip coupling portion with an upwardly disposed edge surmounting a cavity second opening coextensive with and adjacent said annular edge, having a downwardly disposed male coupling, said bottom male pipe adapter being connected with said reducing coupler, and a seed dispensing module threadably removably engageable with said bottom male pipe adapter threaded male coupling.

5,533,468

HOLLOW, PLASTIC HORSE STALL GATE

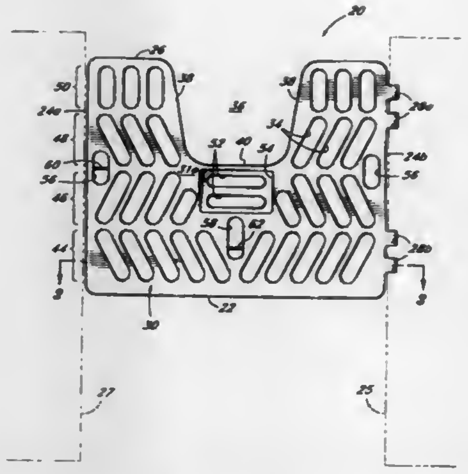
Gerald A. Sampson, Santa Fe Springs; Gordon J. Sanden, Huntington Beach, and Harold D. Sampson, Cypress, all of Calif., assignors to Allen United, Santa Fe Springs, Calif.

Filed Oct. 13, 1994, Ser. No. 322,283

Int. Cl.^{6} A01K *1/02;* E06B *3/00*

U.S. Cl. 119—524 **9 Claims**

1. A stall gate for animals, comprising:
a hollow rigid body formed in a single unitary member having:
a front face;
a rear face;
a peripheral border, said border defined by:
  a bottom edge;
  a first side edge;
  a second side edge generally parallel said first side edge; and
  an upper edge forming a centered animal neck access indent;
  said body being perforated with a plurality of ventilation slots extending from said front face to said rear face allowing air flow through a majority of the gate;
one of said side edges including means for hingedly securing the hollow rigid body to a frame; and



said hollow body being formed by a rotational molding process to form a stall gave fabricated from a rigid polymer.

5,533,469

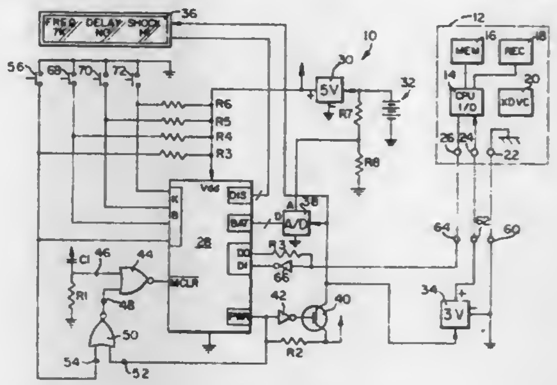
PROGRAMMING APPARATUS FOR PROGRAMMABLE ANIMAL CONTROL DEVICE

Scott F. Touchton, Malvern, Pa.; Donald L. Peinetti, Lakeside, Calif., and William J. Duffy, Jr., Downingtown, Pa., assignors to Invisible Fence Company, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 182,489, Jan. 14, 1994, Pat. No. 5,435,271, and Ser. No. 182,604, Jan. 14, 1994, Pat. No. 5,476,729, which is a continuation-in-part of Ser. No. 107,868, Aug. 18, 1993, Pat. No. 5,445,900, which is a continuation-in-part of Ser. No. 109,132, Aug. 19, 1993, Pat. No. 5,425,330, said Ser. No. 182,489. This application Aug. 24, 1994, Ser. No. 295,380

Int. Cl.^{6} A01K *3/00;15/00*

U.S. Cl. 119—721 **21 Claims**

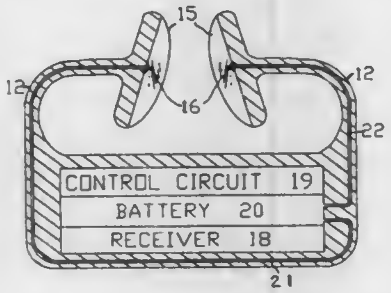


1. A programming apparatus for a programmable animal control device having a receiver for receiving a radio signal, a transducer for applying a stimulus to an animal in response to the radio signal, and a programmable controller responsive to selected control parameters for controlling operation of the animal control device, the programming apparatus comprising:
a) parameter control means for storing control parameters and for providing said stored control parameters to the programmable controller;
b) a data communication link between the parameter control means and the programmable controller to permit data communication and transfer of control parameters therebetween; and
c) parameter selection means for the parameter control means to enable the selection of control parameters, the parameter control means storing selected control parameters in response to the parameter selection means and being capable of providing the selected control parameters to the programmable con-

troller of the animal control device via the data communication link to control operation of the animal control device in accordance with the selected control parameters.

5,533,470
ELECTRONIC NOSE-CLIP WITH SOLAR CELL

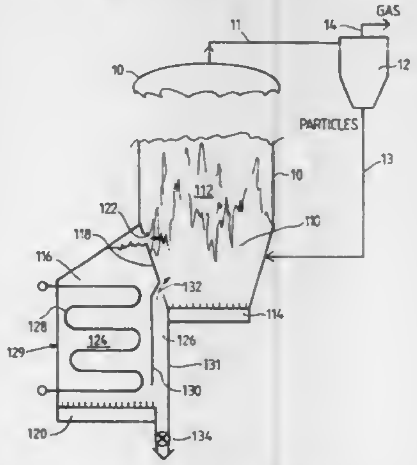
Andrew F. Rose, P.O. box 1751, Cody, Wyo. 82414
Continuation-in-part of Ser. No. 895,879, Jun. 9, 1992, Pat. No. 5,307,759, which is a continuation-in-part of Ser. No. 726,353, Jul. 5, 1991, abandoned. This application Apr. 26, 1994, Ser. No. 233,317
Int. Cl.⁶ A01K *3/00;15/04*
U.S. Cl. 119—721 **14 Claims**



1. An animal control apparatus for use with a transmitter comprising:
a nose-supported housing adapted to be attached to the nose of an animal;
a receiver contained within the housing, adapted to cooperate with the signal of such a transmitter, to produce a d.c. signal output;
stimulus means contained within the housing to apply a stimulus to the nose of the animal in response to the d.c. signal output of the receiver;
a battery contained within the housing, connected as a voltage source to the receiver and the stimulus means; and,
a solar cell affixed to the housing and connected with the battery.

5,533,471
FLUIDIZED BED REACTOR AND METHOD OF OPERATION THEREOF

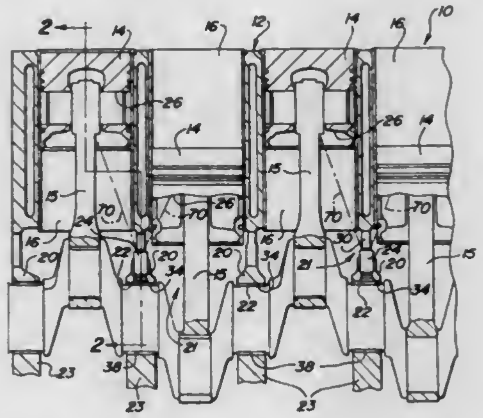
Timo Hyppänen, Karhula, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland
Filed Aug. 17, 1994, Ser. No. 291,461
Int. Cl.⁶ F22B *1/02*
U.S. Cl. 122—4 D **24 Claims**



1. A fluidized bed reactor system comprising:
a fluidized bed reaction chamber comprising a circulating fluidized bed, having a first grid for the introduction of fluidizing gas into said circulating fluidized bed;
a bubbling fluidized bed having a second grid for the introduction of fluidizing gas thereinto;
said second grid mounted at a position vertically below said first grid;
a first interconnection between said circulating fluidized bed and said bubbling bed providing for the passage of solids from said circulating bed to said bubbling bed, said first interconnection located above said first grid at a first position; and
a second interconnection between said circulating fluidized bed and said bubbling bed providing for the passage of solids from said bubbling bed to said fluidized bed, said second interconnection located below said first interconnection, but at the level of, or above, said first grid;
solids cooling means located in said bubbling bed for cooling the solids therein; and
a partition dividing said bubbling bed into first and second chambers, said first chamber in direct communication with said first interconnection, and said second chamber in direct communication with said second interconnection, said partition preventing short-circuiting of particles between said first and second interconnections.

5,533,472
OIL JET NOZZLE FOR AN INTERNAL COMBUSTION WITH RECIPROCATING PISTONS

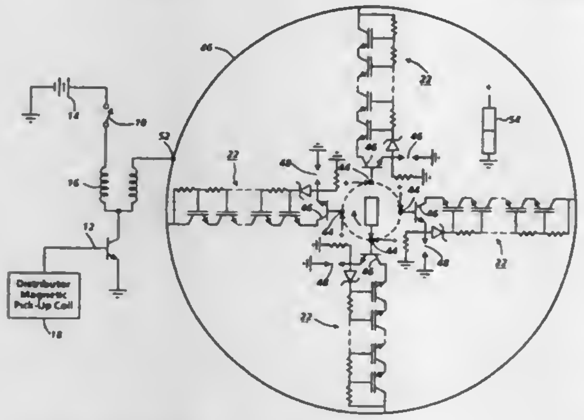
Richard H. Sands, Ontario, Canada; Jerry P. Harkey, Bloomfield Hills, and J. Gary Pace, Rochester, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Jul. 31, 1995, Ser. No. 509,379
Int. Cl.⁶ F01P *1/04*
U.S. Cl. 123—41.35 **9 Claims**



1. An oil jet type piston cooling arrangement for an internal combustion engine having an engine block defining two adjacent cylinders with a reciprocating piston in each cylinder, a crankshaft cavity located beneath the cylinders, a crankshaft with at least one bearing supported in the crankshaft cavity, the engine block forming a journal between the two adjacent cylinders for seating the crankshaft bearing, an oil gallery formed within the engine block for supplying lubricating oil to the journal and bearing, a groove formed in the engine block with at least a portion thereof connected to the crankshaft journal for receiving lubricating oil from the gallery, and a first passage formed in the engine block extending between the two adjacent cylinders substantially parallel to the crankshaft and being located above the crankshaft journal, and a second passage formed in the engine block extending between the groove and the first passage, the oil jet type piston cooling arrangement including a nozzle assembly comprising:
said nozzle assembly having an inlet end portion for receiving oil and an opposite outlet end portion for discharging oil, said nozzle being mounted in the second passage so that its inlet end portion adjacent the groove to receive oil from the journal and so that its outlet end portion opens to the first passage to produce streams of oil for squirting upwardly through the first passage and the cylinders against the underside of each of the adjacent pistons.

5,533,473
OPTICALLY SWITCHED HIGH VOLTAGE DISTRIBUTOR

Hugh P. Campbell, Gardena, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 19, 1995, Ser. No. 492,359
Int. Cl.⁶ F02P *7/02*
U.S. Cl. 123—146.50 A **6 Claims**

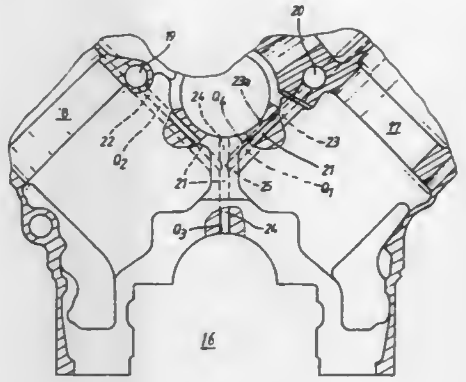


1. An optical distributor comprising:
a) a light source for emitting a light beam,
b) a rotatable light directing rotor,
c) a stationary circuit mounting plane with at least two spaced apart photo-diodes, and
d) said light source, rotatable light directing rotor, and circuit mounting plane being so constructed and arranged such that said rotatable light directing rotor receives light from said light source and directs the received light alternately to the at least two spaced photo-diodes.

5,533,474
LUBRICATING-OIL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

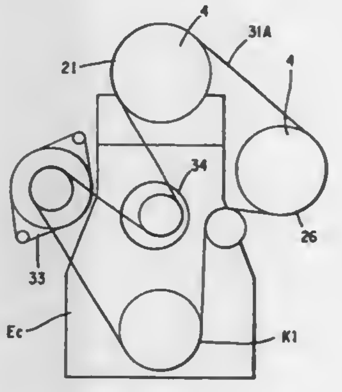
Ernst-Wilhelm Hufendiek, Stuttgart; Walter Kerschbaum, Fellbach, and Johannes Werner, Hamburg, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany
Filed Jan. 13, 1995, Ser. No. 372,788
Claims priority, application Germany, Jan. 14, 1994, 44 00 953.4
Int. Cl.⁶ F01M *11/02*
U.S. Cl. 123—196 AB **5 Claims**

1. A lubricating-oil device for an internal combustion engine having two cylinder banks and a lubricating-oil circuit with at least one main oil passage per cylinder bank and secondary oil passages leading to various engine lubrication points, said lubricating-oil device comprising a casing cover mounted on the front end of said internal combustion engine, a beat exchanger with an oil inlet and outlet disposed in said casing cover, an oil filter disposed on the outside of said casing cover and having an inlet in communication with the outlet of said heat exchanger, an oil supply passage extending in said casing cover transversely to the longitudinal axis of said engine, said oil supply passage being in communication with outlet of said oil filter and having end openings disposed over said main oil passages in said cylinder banks thereby interconnecting said main oil passages in said cylinder banks through said casing cover for supplying lubricating oil simultaneously to both main oil passages.



5,533,475
ENGINE AND GEAR DRIVE COMBINATION

Daniel Deane, Peterborough, Great Britain, assignor to Perkins Limited, Cambridgeshire, Great Britain
PCT No. PCT/GB93/00301, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/17226, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 12, 1993, Ser. No. 295,840
Claims priority, application United Kingdom, Feb. 24, 1992, 9203921
Int. Cl.⁶ F02B *77/00*
U.S. Cl. 123—198 C **29 Claims**



1. An engine and gear drive combination including a gear device for an engine component driven by a drive system from an engine drive shaft, said gear device being adapted for location in said drive system and means being provided to locate the gear device close to said component, the gear device comprising: an input element driven from the engine drive shaft and an output element coupled to a driven shaft of the component, wherein the gear device serves to step the drive speed between the input and output elements, wherein one of said input and output elements comprises a sunwheel assembly while the other comprises an annulus gear, said sunwheel assembly and said annulus gear being connected by planet gears mounted on a planet carrier, the planet carrier having a control means including a lever for providing angular adjustment between the sunwheel assembly and the annulus gear, wherein the lever is connected to the planet carrier and angular adjustment between the sunwheel assembly and the annulus gear is effected by movement of the lever in a direction normal to the axis of rotation of the planet carrier.

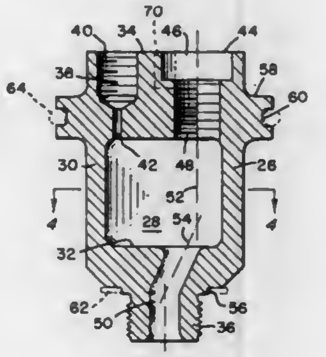
5,533,476
WALLED PRECOMBUSTION CHAMBER UNIT

Alan C. Anderson, Painted Post, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Jun. 14, 1995, Ser. No. 490,367

Int. Cl.^{6} F02B *19/12*

U.S. Cl. 123—267 **7 Claims**



1. A walled, precombustion chamber unit, comprising:
a body;
said body having (a) a substantially closed cell formed therewithin, (b) a nozzle depending therefrom, (c) means for admitting fuel into said cell, and (d) means for mounting an ignition device thereinto; and wherein
said nozzle is externally threaded;
said body comprises a circumferential wall, a bottom, and a top;
said wall, bottom and top enclose said cell;
said fuel admitting means comprises a first passageway formed through said top;
said mounting means comprises a second passageway formed through said top; and
said passageways are internally threaded.

5,533,477
APPARATUS FOR ASCERTAINING AN OPERATING STATE OF AN INJECTION PUMP

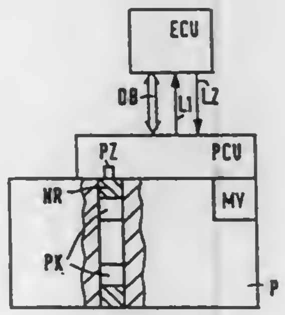
Manfred Weigl, Berg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 19, 1994, Ser. No. 308,128

Claims priority, application Germany, Sep. 17, 1993, 93 115 072.6

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—494 **10 Claims**



1. In an internal combustion engine having an injection pump with a filling ramp, a supply ramp, pump pistons traveling on the filling and supply ramps, and a magnet valve controlling the injection pump and having a closure defining a supply onset, an apparatus for ascertaining at least one actual operating state of the injection pump, comprising a structure-borne-sound transducer ascertaining the supply onset upon arrival of one of the pump pistons on the supply ramp as an actual operating state.

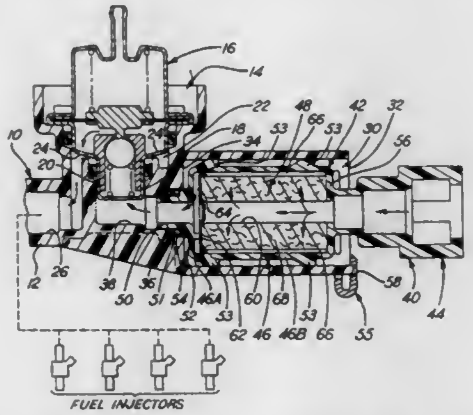
5,533,478
DISCRETE FILTER AND PRESSURE REGULATOR MOUNTING FOR A FUEL RAIL

Barry S. Robinson, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Apr. 13, 1994, Ser. No. 226,906

Int. Cl.^{6} F02M *37/04;* **B01D** *27/00*

U.S. Cl. 123—510 **8 Claims**



1. A fuel filter and pressure regulator assembly operatively connected to the inlet of a fuel rail for an internal combustion engine comprising:
a fuel pressure regulator;
a first socket means for supporting in fluid tight relationship said pressure regulator having an inlet and an outlet;
housing means having a fuel receiving inlet, a cylindrical socket in fluid communication with said inlet and an outlet for discharging fuel from said housing to the inlet of a fuel rail, said first socket means connected in fluid communication with said housing means;
filter housing means having an inlet and an outlet and disposed in said cylindrical socket;
a filter cartridge in said filter housing means for filtering foreign material from fuel before the fuel is discharged to said outlet of said filter housing, said cartridge having tubular filter media with an O.D. surface and an I.D. surface, said filter cartridge and said filter housing means are constructed and arranged such that fuel flow through said filter cartridge is constrained to flow from said inlet of said filter housing radially between said I.D. and said O.D. surfaces of said media and through said outlet of said filter housing; and
means for retaining said filter housing means in said cylindrical socket;
said inlet of said pressure regulator receiving all of the discharged fuel from said outlet of said filter housing means and said outlet of said pressure regulator in fluid communication with the inlet of the fuel rail.

5,533,479
METHOD AND SYSTEM FOR A FUEL TANK VENTILATION

Ernst Wild, Oberriexingen, and Werner Mezger, Eberstadt, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/01531, § 371 Date Aug. 18, 1995, § 102(e) Date Aug. 18, 1995, PCT Pub. No. WO95/17593, PCT Pub. Date Jun. 29, 1995

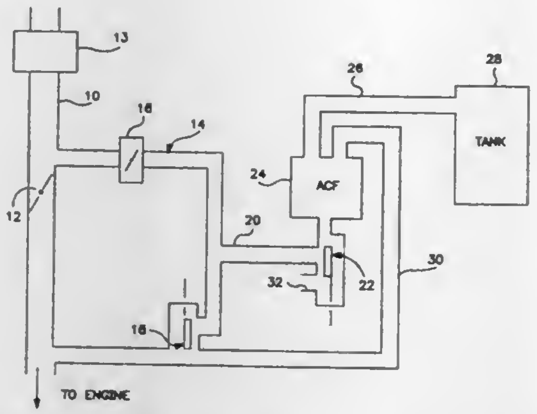
PCT Filed Dec. 20, 1994, Ser. No. 507,261

Claims priority, application Germany, Dec. 21, 1993, 43 43 654.4

Int. Cl.^{6} F02M *33/02*

U.S. Cl. 123—520 **8 Claims**

1. A method for the ventilation of a fuel tank of a motor vehicle having an internal combustion engine which has a suction pipe with an air meter and has a by-pass line which leads around a throttle member and an idling adjuster in said by-pass line which comprises directing fuel vapors from said fuel tank to an adsorption filter, controlling a scavenging air-flow from said by-pass to said adsorption filter, controlling a flow of fuel vapors from said adsorption filter to the atmosphere, controlling a flow of air via said by-pass line to said suction pipe downstream of said throttle member and controlling a scavenging air-flow from said adsorption filter to said by-pass line.



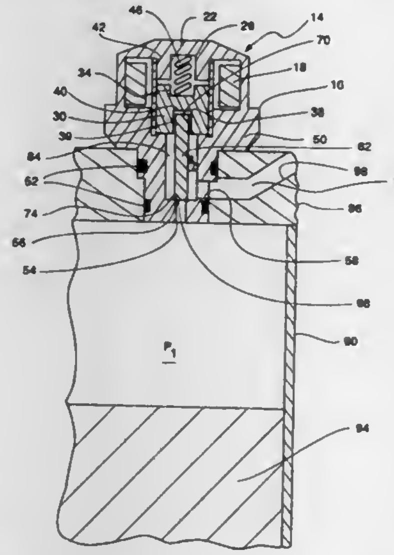
5,533,480
LOW FORCE ACTUATABLE FUEL INJECTOR

Peter E. Jenkins, Highlands Ranch, Colo., assignor to MTN International, LLC, Denver, Colo.

Filed Jun. 7, 1995, Ser. No. 484,167

Int. Cl.^{6} F02M *51/06*

U.S. Cl. 123—294 **43 Claims**



1. A fuel injector, comprising:
a fuel injector body comprising an inlet port fluidly interconnectable with at least a fuel supply, a reservoir fluidly interconnected with said inlet port, and a discharge port fluidly interconnected with said reservoir and fluidly interconnectable with a combustion chamber of an engine; and
a discharge control member movably interconnected with said fuel injector body and movable between first and second positions, wherein said discharge control member blocks said discharge port in said first position and is spaced from said discharge port in said second position, wherein said discharge control member comprises a first surface area disposed whereby a fluid pressure in said reservoir acts on said first surface area and biases said discharge control member toward said first position, wherein said discharge control member further comprises a second surface area which is disposed whereby a fluid pressure acting on said second surface area biases said discharge control member toward said second position, wherein said second surface area comprises an area of a second surface which interfaces with said discharge port when said discharge control member is in said first position, and wherein a magnitude of said first surface area and said second surface area are jointly selected whereby a force required to be exerted on and move said discharge control member from said first position to said second position is no more than about 10 pounds-force.

5,533,481
FUEL INJECTION SYSTEM

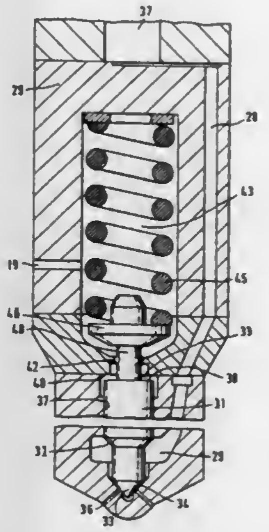
Maximilian Kronberger, Steyr, Austria, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 30, 1995, Ser. No. 452,755

Claims priority, application Germany, Jun. 21, 1994, 44 21 714.5

Int. Cl.^{6} F02B *3/00*

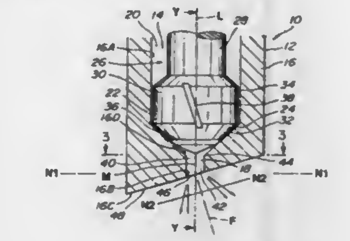
U.S. Cl. 123—299 **2 Claims**

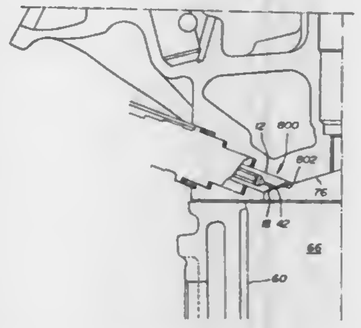


1. A fuel injection system comprising a fuel injection pump having a pump work chamber (**10**) and a fuel injection valve (**13**) which is supplied with fuel from the pump work chamber and brought to injection pressure, an electrically controlled valve (**24**), via which the pump work chamber (**10**) of the fuel injection pump communicates with a relief chamber (**17**) and in a closed position controls injection quantity and injection duration and interrupts an injection between a pre-injection and a main injection for the control of at least one injection opening (**36**), the injection valve (**13**) has a valve needle (**31**), which is acted upon in the opening direction by the fuel supplied from the pump work chamber (**10**) and is loaded in the closing direction by a spring (**45**), which is disposed in a fuel-filled chamber (**43**) which is relieved of high pressure, and the valve needle (**31**) on its side remote from the injection opening (**36**) defines a damping chamber (**39**) whose axial limiting wall constitutes a stop (**40**) for defining a stroke motion of the valve needle (**31**) and which communicates with the fuel-filled chamber (**43**) via a throttle opening, wherein the throttle opening is constituted by a connecting opening (**42**) between the damping chamber and the fuel-filled chamber and by a recess (**50**) on a pressure pin (**48**), which protrudes through said conecting opening into the fuel-filled chamber, is loaded by the spring, and is moved by the valve needle, wherein by means of said recess on the pressure pin, the cross section of the throttle opening (**54**) is large at the beginning of the valve needle stroke in the opening direction and is reduced in the course of the valve needle stroke motion.

5,533,482
FUEL INJECTION NOZZLE

Ken Naitoh, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 23, 1995, Ser. No. 447,459
Claims priority, application Japan, May 23, 1994, 6-107352
Int. Cl.^{6} F02M *61/18*
U.S. Cl. 123—305 **12 Claims**

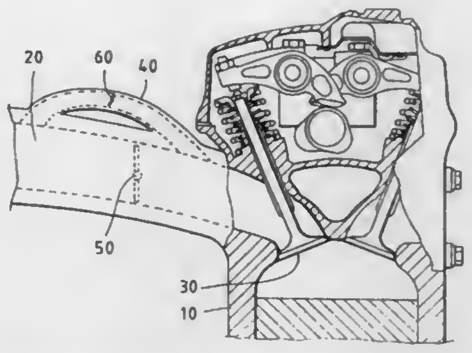




1. A fuel injection nozzle for spraying a swirl of fuel, said fuel injection nozzle comprising:
- a nozzle body having a bore, an orifice communicated with said bore, and a wall means defining said bore and said orifice, said bore having a first center axis, said orifice having a second center axis, an inlet open to said bore and an outlet open to outside said wall means;
- said wall means including a first circumferential edge portion defining said inlet of said orifice and a second circumferential edge portion defining said outlet of said orifice;
- a valve body axially movably disposed in said bore of said nozzle body; and
- a sprayed fuel body formed by fuel discharged from said orifice, said sprayed fuel body having a third center axis;
- wherein said first circumferential edge portion of said wall means is so arranged as to allow said first center axis to be positioned inside said inlet to thereby prevent the swirl of fuel from decreasing, and said second circumferential edge portion of said wall means is so contoured as to allow at least a portion of said second circumferential edge portion to be out of a plane normal to said second center axis to thereby provide said sprayed fuel body of a predetermined configuration in which said third center axis is positioned in a predetermined relation to said first center axis.

5,533,483
ENGINE AIR INTAKE SYSTEM HAVING A BYPASS CURRENT CONTROL VALVE

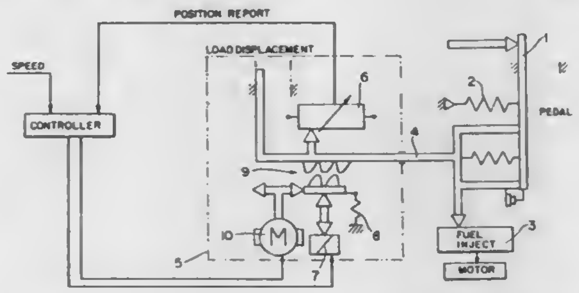
Tien-Ho Gau, and Yu-Yin Peng, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed May 4, 1995, Ser. No. 434,916
Int. Cl.^{6} F02B *15/00*
U.S. Cl. 123—308 **5 Claims**



1. An air-fuel mixture intake system of a cylinder of a four-stroke engine comprising
- a main air-fuel mixture duct which is located adjacent an air-fuel mixture intake valve of a combustion chamber of said cylinder and is provided with
- at least one bypass air-fuel mixture duct having a cross-sectional area smaller than a cross-sectional area of said main air-fuel mixture duct,
- said bypass duct having an inner end including an orifice in a wall of said main duct adjacent said air-fuel mixture intake valve, said inner end being angularly disposed to said main air-fuel duct to direct a flow of said air-fuel mixture toward said air-fuel mixture intake valve seat,
- said bypass air-fuel mixture duct provided therein with a control valve, said main air-fuel mixture duct provided therein with a throttle contiguous to said bypass air-fuel mixture duct,
- said throttle and said control valve being regulated by first accelerator linking device means for closing said throttle when said engine is operated at a lower load rate, and for opening said bypass air-fuel mixture duct when said throttle of said main air-fuel mixture duct is caused to close, so as to permit air-fuel mixture to flow through said bypass air-fuel mixture duct at an accelerating pace to bring about a strong turbulence in said combustion chamber to promote efficient and rapid combustion, and
- second accelerator linking device means for gradually opening said throttle of said main air-fuel mixture duct when said engine is operated at a load rate greater than said lower load rate so as to bring about an increase in air-fuel mixture intake volume of said engine.

5,533,484
SPEED CONTROL BY AN AUTOMATIC LOAD DISPLACEMENT DEVICE FOR AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Rolf Oppermann, Schwalbach; Wolfgang Sauerschell, Oberursel, and Jiri Martinovaski, Steinbach, all of, Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Germany
Filed Feb. 2, 1995, Ser. No. 383,760
Claims priority, application Germany, Feb. 3, 1994, 44 03 197.1
Int. Cl.^{6} F02D *31/00*
U.S. Cl. 123—358 **2 Claims**

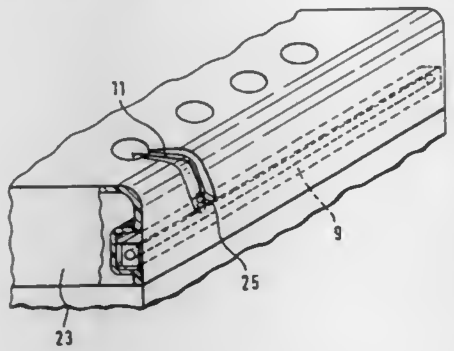


1. A load displacement device for a motor vehicle, the displacement device comprising
- a coupling gear wheel, a servomotor, a coupling lever, an electromagnet, a spring, and an actuator having a second gear wheel and a setting member for setting a flow of fuel;

- wherein said coupling gear wheel is driven by said servomotor and is held against said coupling lever, said coupling lever is swingable around an axis by said electromagnet against a force of said spring;
- in coupled condition of said gear wheel, said coupling gear wheel engages into said second gear wheel;
- said servomotor is operative in two directions of rotation;
- teeth of at least one of said gear wheels are developed asymmetrically in both directions of said at least one gear wheel in order to produce a flat engagement angle between teeth of said coupling gear wheel and said second gear wheel; and
- no tooth displacement forces which produce a swinging of said coupling lever into a disengaged position occur due to the engagement of the teeth of said gear wheels.

5,533,485
FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Bernhard Bronkal, Koengen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Jun. 2, 1995, Ser. No. 459,242
Claims priority, application Germany, Jun. 27, 1994, 9410232 U
Int. Cl.^{6} F02M *55/02*
U.S. Cl. 123—456 **10 Claims**

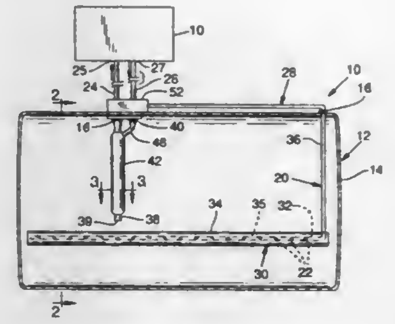


1. A fuel injection device for internal combustion engines comprising a high-pressure fuel pump (**1**) which pumps fuel out of a low-pressure space (**5**) into a high-pressure collecting space, said high-pressure collecting space is connected by high-pressure lines (**11**) to injection valves (**13**) that project into a combustion space of the internal combustion engine to be supplied, said high-pressure collecting space is formed by a distributor rail (**9**) resistant to high pressures which is integrated into a wall of a cylinder-head cover (**23**) arranged on the internal combustion engine.

5,533,486
FUEL SYSTEM FOR HEATING AND COOLING FUEL

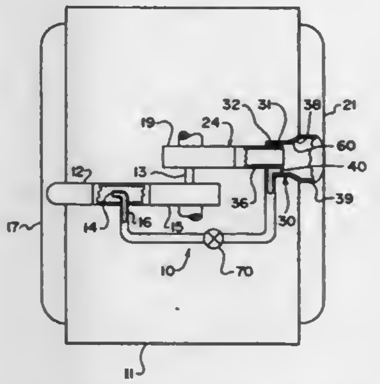
Ibrahim Qutub, Beaverton, Oreg., assignor to Freightliner Corporation, Portland, Oreg.
Filed Dec. 23, 1993, Ser. No. 173,667
Int. Cl.^{6} F02M *15/00*
U.S. Cl. 123—541 **30 Claims**

1. A fuel system for an engine of a motor vehicle comprising:
- a fuel tank;
- a fuel delivery flow path along which fuel from the fuel tank is delivered to an engine;
- a fuel return flow path along which unused fuel warmed by the engine is returned to the fuel tank; and
- a heat exchanger in the fuel tank and in the fuel return flow path for cooling fuel returning to the fuel tank, the heat exchanger in the fuel tank and in the fuel return flow path having a heat dissipation surface within the fuel tank against which fuel returning along the fuel return flow path is dispersed.



5,533,487
DYNAMIC ENHANCEMENT OF EGR FLOW IN AN INTERNAL COMBUSTION ENGINE

Fred L. Cailey, Batavia, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Jun. 23, 1994, Ser. No. 264,657
Int. Cl.^{6} F02M *25/07*; F02G *3/00*
U.S. Cl. 123—568 **9 Claims**

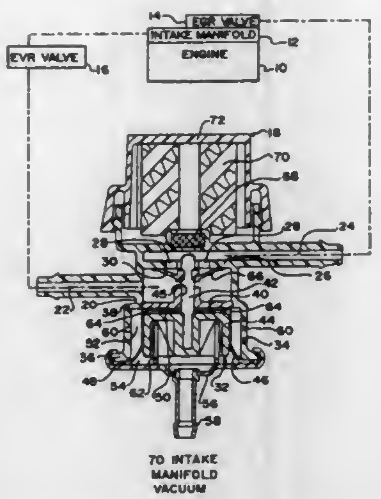


1. In an internal combustion engine having an intake tract having a direction of intake air flow, an exhaust tract having a direction of exhaust gas flow, and an exhaust gas recirculation system for recirculating a portion of the exhaust gas from said exhaust tract to said intake tract, said exhaust gas recirculation system comprising a tubular passage having an axis and having an EGR inlet fluidly connected to said engine exhaust tract, the improvement comprising said EGR inlet opening upstream in said exhaust tract, the axis of said tubular passage at said EGR inlet being parallel to the direction of flow therethrough, said exhaust tract having a wall and said EGR inlet being a NACA submerged intake duct disposed in the wall of the exhaust tract.

5,533,488
VACUUM SUSTAINING VALVE

John E. Cook, and Paul D. Perry, both of Chatham, Canada, assignors to Siemens Electric Ltd., Ontario, Canada
Filed Feb. 27, 1995, Ser. No. 391,393
Int. Cl.^{6} F02M *25/07*; G05D *16/06*
U.S. Cl. 123—568 **22 Claims**

1. A vacuum sustaining valve for temporarily sustaining at least some vacuum to a vacuum-actuated device when vacuum from a variable vacuum source falls below a predetermined value, said valve comprising:
- a housing comprising an inlet port adapted to be communicated to a variable vacuum source, an outlet port adapted to be communicated to a vacuum-actuated device, and a flow path through said housing between said ports;
- a check valve element that is disposed within said flow path and is selectively bodily positionable within said housing to a first position where it functions as a check to disallow vacuum



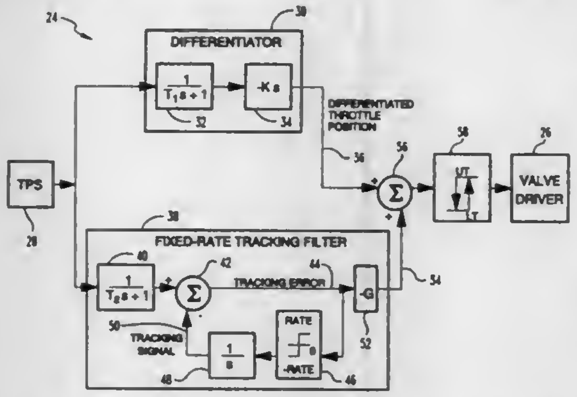
passage from said outlet port to said inlet port when the magnitude of vacuum at said outlet port exceeds that at said inlet port and to allow vacuum passage from said inlet port to said outlet port when the magnitude of vacuum at said inlet port exceeds that at said outlet port by an amount capable of operating the check valve element to allow such vacuum passage, and to a second position, spaced from said first position, where it allows bi-directional flow between said ports;

and actuator means responsive to the magnitude of vacuum of such a variable vacuum source for bodily positioning said check valve element to its first position when the magnitude of vacuum of such variable vacuum source is below a predetermined value and for bodily positioning said check valve element to its second position when the magnitude of vacuum of such variable vacuum source is above such predetermined value.

5,533,489
EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Vincent P. Socci, Vestal, N.Y.; Ross C. Berryhill, Nashville, Ind.; Eric K. Bradley, Columbus, Ind., and Charles R. Schenk, Columbus, Ind., assignors to Cummins Electronics Co., Columbus, Ind.

Filed Mar. 30, 1995, Ser. No. 413,374
Int. Cl.^{6} F02M *25/07;* H03K *5/08*
U.S. Cl. 123—571 35 Claims



11. An exhaust gas recirculation control system for an internal combustion engine, comprising:

an input port adapted to receive an input signal indicitive of an engine operating parameter;

a first signal processor operatively coupled to the input port and operable to produce a first signal processor output signal based upon a rate of change of the input signal;

a second signal processor operable to produce a tracking signal which tracks the input signal over time, the tracking signal not exceeding a predetermined maximum rate of change, and further operable to produce a second signal processor output signal equal to a difference between the input signal and the tracking signal; and

an output port operatively coupled to the first and second signal processor and to an exhaust gas recirculation valve and operable to apply a system output signal to the exhaust gas recirculation valve;

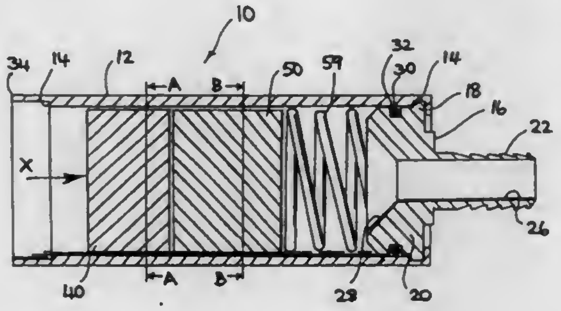
wherein the system output signal comprises a summation of the first signal processor output signal and the second signal processor output signal.

5,533,490
FUEL CONDITIONING DEVICE

Brian Pascall, 9, Woodlands Way, Southampton SO1 2TJ, England

PCT No. PCT/GB91/01584, § 371 Date May 12, 1993, § 102(e) Date May 12, 1993, PCT Pub. No. WO92/05359, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 16, 1991, Ser. No. 64,162
Claims priority, application United Kingdom, Sep. 15, 1990, 9020205
Int. Cl.^{6} F02B *75/12;* F02M *27/00*
U.S. Cl. 123—538 16 Claims



1. A fuel conditioning device comprising a housing having a fuel inlet and a fuel outlet, said housing defining a fuel flow path between said fuel inlet and said fuel outlet, and in the fuel flow path a tin alloy body and a magnet adjacent and downstream thereof; wherein the fuel flow path is so configured in the region of the magnet, and the magnet has pole faces which are so disposed in relation to the fuel flow path, that substantially all fuel therein is constrained to flow past the pole faces of the magnet between the pole faces of the magnet and the housing defining the fuel flow path.

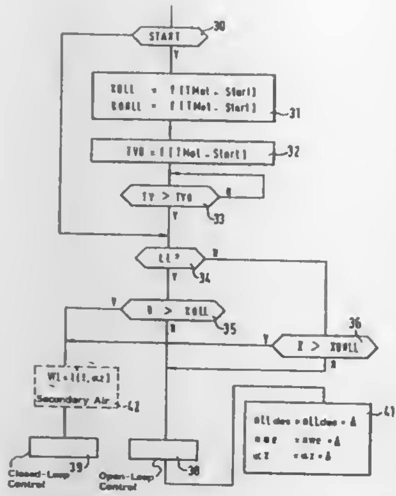
5,533,491
CONTROL SYSTEM FOR METERING FUEL TO AN INTERNAL COMBUSTION ENGINE

Jürgen Gras, Bietigheim-Bissingen; Siegfried Hertzler, Bolanden, and Jan-Tian Tjoa, Ludwigsburg, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 21, 1994, Ser. No. 341,595
Claims priority, application Germany, Mar. 19, 1993, 43 08 813.9
Int. Cl.^{6} F02D *41/00*
U.S. Cl. 123—676 12 Claims

1. A control system for metering fuel into an internal combustion engine in dependence upon engine temperature, said engine having an exhaust gas pipe and said control system comprising:

(a) an oxygen sensor mounted in said exhaust gas pipe to provide an output signal indicative of exhaust gas constituents;



(b) sensor means for detecting said preselected engine temperature;

(c) means for closed-loop controlling a metering of fuel in dependence upon said output signal of said oxygen sensor;

(d) switchover means for switching between open-loop operation and closed-loop operation after a predetermined time duration which becomes less with an increasing value of said engine temperature at engine start;

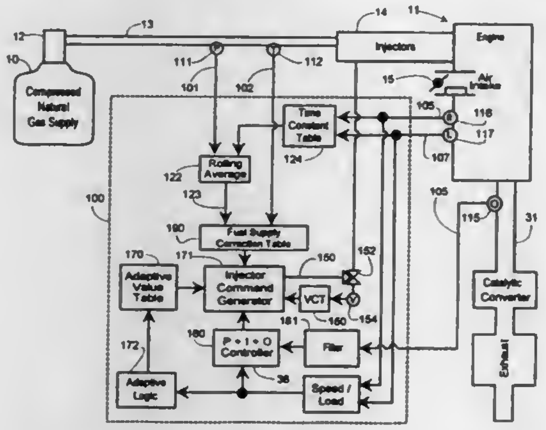
(e) means for determining said predetermined time duration as a function of said engine temperature at engine start; and,

(f) means for implementing said switchover to closed-loop operation when said predetermined time duration has elapsed.

5,533,492
GASEOUS FUEL INJECTION CONTROL SYSTEM USING AVERAGED FUEL PRESSURE COMPENSATION

Raymond L. Willey, Redford, and Ezio N. Vermiglio, Belleville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1994, Ser. No. 270,630
Int. Cl.^{6} F02D *41/14;41/34*
U.S. Cl. 123—681 8 Claims



1. The method of compensating for variations in the pressure at which a gaseous fuel is supplied to one or more fuel injectors in an internal combustion engine, said method comprising, in combination, the steps of:

supplying a timing signal to said fuel injectors for establishing variable duration intervals during which measured quantities of fuel are injected into said engine,

providing an actual pressure signal indicative of the current magnitude of said pressure at which said gaseous fuel is supplied to said injectors,

processing said actual pressure signal to derive therefrom a rolling average signal indicative of the average value of said actual pressure signal during a time delay duration,

repetitiously adjusting said time delay duration in response to variations in an indicia of the operating condition of said engine, and

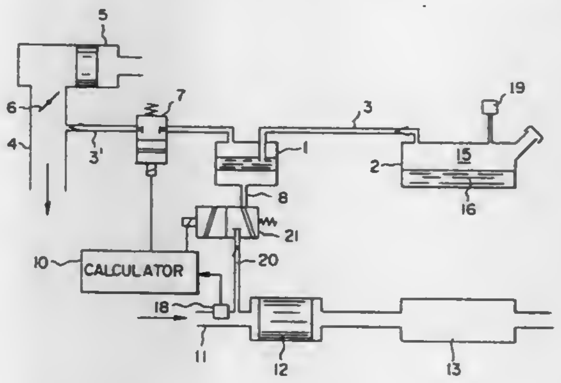
varying the duration of said variable duration intervals in response to changes in said rolling average pressure signal value.

5,533,493
METHOD AND DEVICE FOR VERIFYING THE OPERATING CONDITION OF A SYSTEM FOR RECOVERING VAPORS ORIGINATING FROM THE FUEL TANK OF A MOTOR VEHICLE

Alain A. Atanasyan, Tournefeuille, France, assignor to Siemens Automotive, S.A., Toulouse Cedex, France

PCT No. PCT/EP92/00463, § 371 Date Sep. 21, 1993, § 102(e) Date Sep. 21, 1993, PCT Pub. No. WO92/16735, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 3, 1992, Ser. No. 119,208
Claims priority, application France, Mar. 21, 1991, 91 03426
Int. Cl.^{6} F02M *25/08;25/07;* F02D *41/14*
U.S. Cl. 123—698 9 Claims



1. A method for verifying an operating condition of a system for recovering vapors originating from a fuel tank of a motor vehicle propelled by an internal combustion engine, wherein the system includes a vapor circuit, a filter cartridge for recovering the vapours, the filter cartridge being connected in the vapor circuit and communicating with the fuel tank, and a sensor for measuring a richness in oxygen in an exhaust gas of the engine, the method which comprises:

selectively connecting the filter cartridge to an intake port of the engine;

sweeping a stream of exhaust gas from the engine through the filter cartridge and supplying the stream of gas from the filter cartridge to the intake port;

detecting a richness in oxygen of an air/fuel mixture supplying the engine; and

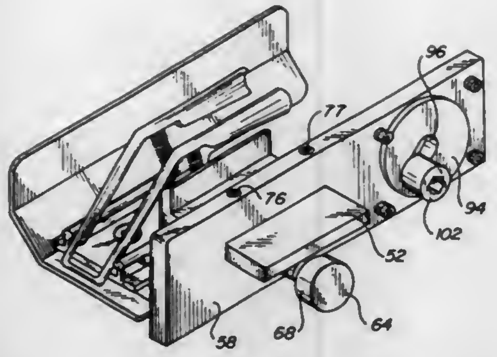
deducing that a break exists in the vapor circuit if the richness in oxygen detected by the sensor exceeds a predetermined threshold value.

5,533,494
ADJUSTABLE ARROW GRIP REST MOUNT

Edward Sacco, 2178 County Rte. 4, Central Square, N.Y. 13036

Filed Jun. 13, 1994, Ser. No. 258,947
Int. Cl.^{6} F41B *5/22*
U.S. Cl. 124—44.5 10 Claims

1. Apparatus for adjusting the position of an arrow rest relative to the handle of an archery bow having an integral arrow ledge and a bow string attached to said handle, said apparatus comprising:



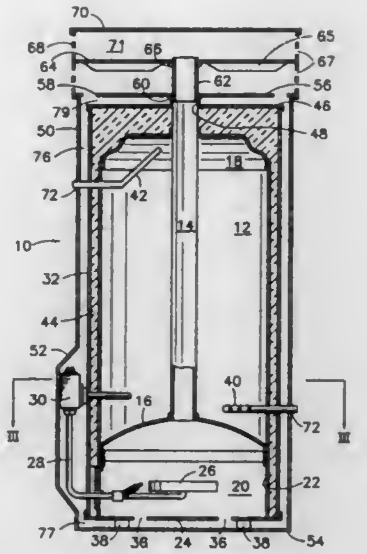
a) means for supporting said arrow rest in an upright, operable position adjacent said bow handle;
b) means for attaching said arrow rest supporting means to said bow handle said attaching means comprising a first elongated, planar plate having first and second, longitudinally spaced portions with said first portion being attached to said bow handle and said second portion being attached to said supporting means, said first positional adjusting means comprising a second planar plate fixedly attached to and laterally extending from said support means, and a first elongated slot formed in said second portion of said first elongated, planar plate, and wherein said second planar plate is inserted and slidable back and forth therein.

9. Apparatus for adjusting the position of an arrow rest relative to the handle of an archery bow having an integral arrow ledge and a bow string attached to said handle, said apparatus comprising:
a) means for supporting said arrow rest in an upright, operable position adjacent said bow handle;
b) means for attaching said arrow rest supporting means to said bow handle;
c) first positional adjusting means for interconnecting said attaching means and said support means in a position rearwardly of said arrow ledge toward said bow string, said first adjusting means being operable to vary the distance between said attaching means and said support means; and
d) second positional adjusting means operable to move said attaching means along a circular path about an axis lying transversely and laterally to said bow handle while maintaining said arrow rest in said upright, operable position.

5,533,495
BALANCED FLUE OUTDOOR WATER HEATER

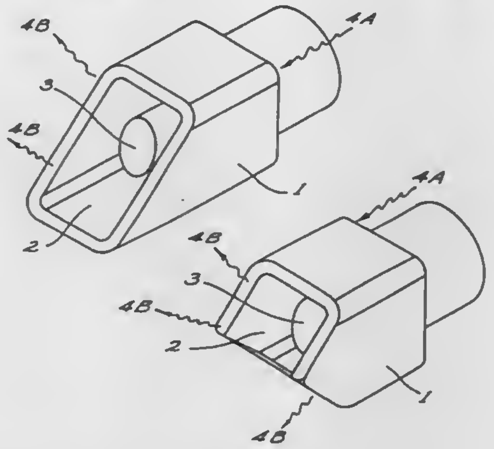
H. Jack Moore, Jr., Johnson City, Tenn., assignor to Southcorp Water Heaters USA, Inc., Johnson City, Tenn.
Filed Feb. 28, 1995, Ser. No. 395,759
Int. Cl.^{6} F24H *1/00*
U.S. Cl. 126—350 R **20 Claims**

1. An outside balanced flue water heater comprising:
a water tank;
a jacket surrounding the water tank;
a combustion chamber containing a burner positioned adjacent said water tank;
a flue extending from said combustion chamber through an upper portion of said water tank;
a water inlet and a water outlet connected to said water tank;
a substantially airtight exterior shell positioned around said jacket and forming a combustion air passageway between said jacket and said exterior shell, said combustion air passageway communicating with said combustion chamber to supply combustion air from said combustion air passageway to said combustion chamber;
means forming a combustion air inlet chamber positioned on top of said water tank and adapted to directly receive outside air, said combustion air inlet chamber communicating with said combustion air passageway; and
means forming a flue gas exhaust chamber positioned on top of said combustion air inlet chamber and adapted to receive flue gases from said flue and to directly exhaust flue gases, said flue gas exhaust chamber communicating with said flue.



5,533,496
ENDOSCOPIC TECHNIQUE PARTICULARLY SUITED FOR EXPLORATORY SURGERY

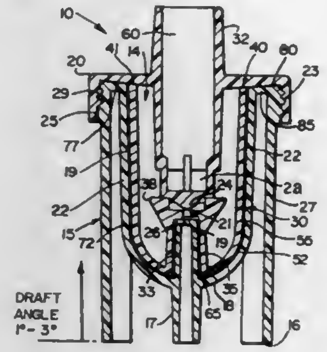
Marco A. M. De Faria-Correa, Rio Grande Do Sul, Brazil, and Julio Hochberg, Morgantown, W. Va., assignors to Very Inventive Physicians, Inc., Tucson, Ariz.
Filed Feb. 15, 1994, Ser. No. 196,712
Int. Cl.^{6} A61B *1/012*
U.S. Cl. 128—898 **18 Claims**



1. An exploratory surgery technique comprising the steps of:
a) creating an incision for access to a site of interest;
b) inserting an endoscope having a housing enclosing a viewing tip of said endoscope, said housing having a window member and an air-chamber between said viewing tip and said window member, through said incision;
c) maneuvering said window to a position proximate to said site of interest; and,
d) periodically cleaning said window member by wiping said window member against an internal organ.

5,533,497
SIDESTREAM AEROSOL GENERATOR AND METHOD IN VARIABLE POSITIONS

Steven L. Ryder, 1334 W. Woodcrest Ave., Fullerton, Calif. 92633
Filed Mar. 27, 1995, Ser. No. 410,876
Int. Cl.^{6} A61M *11/00*
U.S. Cl. 128—200.21 **15 Claims**

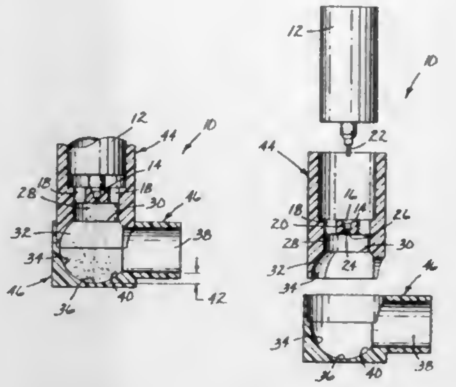


1. An apparatus for aspirating and aerosolizing a liquid in a flow of gas under pressure comprising: a housing defining a liquid reservoir with walls of a predefined three dimensional geometric shape, an aerosol outlet located at a first axial end of said reservoir and a gas nozzle formed at a second axial end of said reservoir, said nozzle having means for connecting to a pressurized gas source;
an internal component having an operative position and being formed of a substantially flat member having an axial dimension and shaped along same to conform substantially with said reservoir along a bisecting cross section thereof, said internal component having a cylindrical liquid conduit with a first axial end connected to said internal component and a second axial end distal therefrom, said liquid conduit surrounding said gas nozzle when in said operative position;
wherein said internal component and said cylindrical liquid conduit form a minimal capillary space between, respectfully, said walls of said liquid reservoir and said gas nozzle, said cylindrical liquid conduit having a liquid orifice at said second axial end, wherein said gas nozzle and said liquid orifice are in fluid communication with said minimal capillary space.

5,533,498
AEROSOL ACTUATOR HAVING A LINEARLY ARRANGED CANISTER RECEIVING CAVITY, VALVE STEM RECEPTACLE, ORIFICE, AND DEAGGLOMERATION CHAMBER

Constantinos Sioutas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 673,725, Mar. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 575,971, Aug. 31, 1990, Pat. No. 5,115,803. This application Jun. 2, 1992. Ser. No. 71,943
The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.
Int. Cl.^{6} A61M *11/26;* **B65D** *83/14*
U.S. Cl. 128—200.23 **2 Claims**

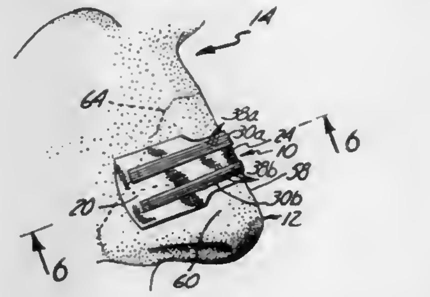
1. An aerosol actuator having a housing comprising a section defining a cavity adapted to receive an aerosol canister having a hollow valve stem, comprising:
a nozzle block having walls defining at least one bleed hole and walls defining a valve stem receptacle having a socket for receiving the hollow valve stem of the aerosol canister, the socket having walls defining an orifice having a longitudinal axis through the nozzle block;
walls defining a deagglomeration chamber in open communication with the orifice and having at least a partial arcuate surface generally opposite to the orifice and having a bottom point; and



walls defining an exit chamber in open communication with the deagglomeration chamber and having a longitudinal axis,
wherein:
the bleed hole communicates between the deagglomeration chamber and the cavity;
the orifice is in open communication along its axis with the deagglomeration chamber and the cavity; and
the walls defining the exit chamber intersect the arcuate surface such that there exists, in the plane of the axes of the exit chamber and the orifice, a portion of the arcuate surface between the bottom point of the arcuate surface and the walls of the exit chamber; and
the cross-sectional area of the exit chamber in the plane normal to its axis is less than the greatest cross-sectional area of the deagglomeration chamber in the plane normal to the axis of the orifice.

5,533,499
NASAL DILATOR

Bruce C. Johnson, St. Paul, Minn., assignor to Creative Integration & Design, Inc., St. Paul, Minn.
Continuation of Ser. No. 48,589, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 884,626, May 15, 1992, abandoned, which is a continuation of Ser. No. 712,508, Jun. 10, 1991, abandoned. This application Jan. 19, 1994, Ser. No. 183,916
Int. Cl.^{6} A61F *5/08;* **A61M** *29/00;15/08;* **A62B** *7/00*
U.S. Cl. 128—200.24 **32 Claims**



18. A nasal dilator capable of introducing separating stresses in nasal outer wall tissues, comprising:
a truss of a single body with a resilient member secured therein having a pair of spaced apart end surfaces which, if forced toward one another from initial positions to substantially reduce direct spacing therebetween by a spacing reduction force external to said truss, results in restoring forces in said truss tending to restore said direct spacing between said end surfaces; and
engagement means adhered to said end surfaces and capable of engaging exposed surfaces of nasal outer wall tissues sufficiently to remain so engaged against said restoring forces.

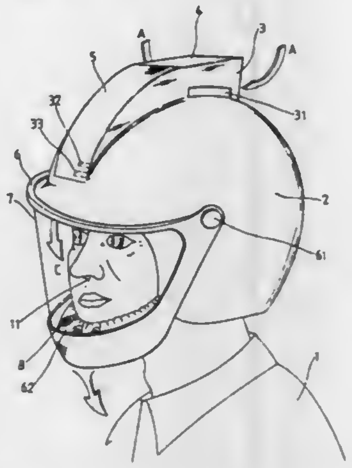
5,533,500
HELMET WITH AN AIR FILTERING DEVICE

Lin Her-Mou, FL.5, NO.6, Lane 394, Lung Chiang Rd., Taipei, Taiwan

Filed Mar. 4, 1992, Ser. No. 845,970

Int. Cl.^{6} A62B *7/10*

U.S. Cl. 128—201.25 1 Claim



1. A helmet with an air filtering device comprising:
- a body with a filtering device mounted on said body and a face mask arranged on a front side of said body;
- a lining fitted in said body and having an angular outlet;
- said filtering device being provided with two elongated slots and a connector for connecting with a flexible pipe, a filtering means, a battery case, a duct and a curved passage, said filtering means being composed of a fixing plate, a filtering layer, a fan with an inlet and an outlet, a seat and a motor installed on said seat;
- said face mask threadedly mounted on said body and having a mist-proof plate and a soft pad on a lower part so as to be in contact with the face of an user, said soft pad having a plurality of check valves each provided with an upper plate, a highly resilient rubber member engaged with said upper plate, and a lower plate closely connected with said upper plate.

5,533,501
NEBULISER

John S. H. Denyer, Sussex, England, assignor to Medic-Aid Limited, Sussex, England

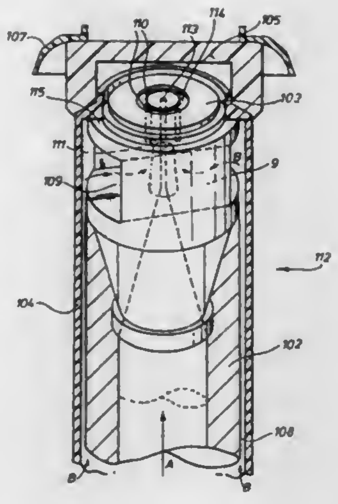
Filed Jun. 1, 1994, Ser. No. 251,922

Claims priority, application United Kingdom, Jun. 4, 1993, 9311614

Int. Cl.^{6} A61M *11/00;16/00*

U.S. Cl. 128—200.21 19 Claims

1. A nebuliser for atomising a substance to entrain it into a stream of gas, said nebuliser comprising:
- a casing,
- a nozzle head disposed within said casing and having at least one gas outlet and an open reservoir surrounding said at least one gas outlet and for receiving a substance to be atomised and from which the substance is atomised by a stream of gas passing through said gas outlet,
- at least two holes opening into the bottom of the reservoir through which the substance to be atomised is drawn by the stream of gas issuing from said at least one gas outlet;
- an airflow control device having a bridge bar which is mounted to intercept the gas issuing from said at least one gas outlet, said bridge bar being freely angularly displaceable with respect to the reservoir to deflect the stream of gas issuing from said at least one gas outlet across the open reservoir; and
- wherein the nozzle head includes a transverse gallery through which the substance to be atomized is supplied to said at least two holes.



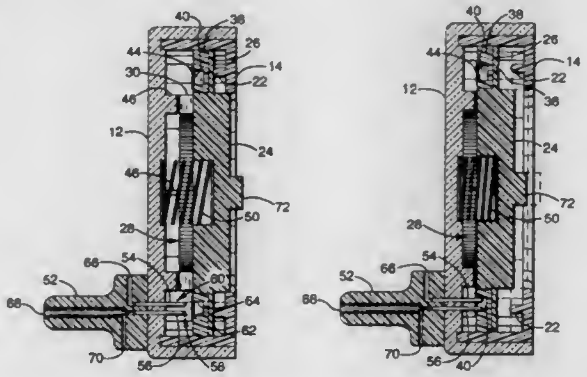
5,533,502
POWDER INHALER WITH AEROSOLIZATION OCCURRING WITHIN EACH INDIVIDUAL POWDER RECEPTACLE

Samuel D. Piper, Sacramento, Calif., assignor to Vortran Medical Technology, Inc., Sacramento, Calif.

Continuation of Ser. No. 70,111, May 28, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 341,706

Int. Cl.^{6} A61M *15/00;16/00;* B05D *7/14;* B65D *83/06*

U.S. Cl. 128—203.21 15 Claims



1. An apparatus for administering medicaments, comprising:
- (a) a housing;
- (b) a medicament carrier, said medicament carrier rotatably coupled to said housing;
- (c) a plurality of medicament receptacles, said medicament receptacles disposed in said medicament carrier, each said medicament receptacle comprising an aerosolization chamber;
- (d) seal means for sealing said each said medicament receptacle; and
- (e) means for aerosolizing medicament internal to a selected one of said medicament receptacles and delivering said aerosolized medicament to a patient, said means including an air inlet conduit and an aerosol outlet conduit, said conduits having a first position wherein said conduits are retracted in relation to said medicament receptacles, said conduits having a second position wherein said conduits extend through said sealing means into said aerosolization chamber in said selected one of said medicament receptacles, wherein medicament contained in said selected one of said medicament receptacles is aerosolized within said aerosolization chamber in said medicament receptacle by inhaled air flowing through said air inlet conduit and delivered to a patient through said aerosol outlet conduit.

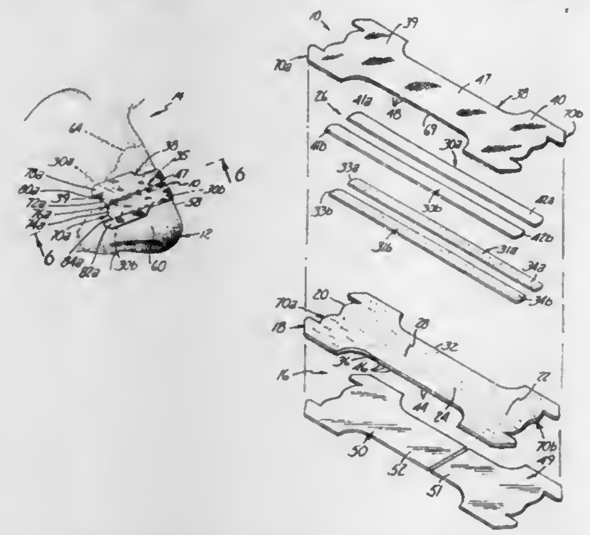
5,533,503
NASAL DILATOR

William J. Doubek, Circle Pines; Daniel E. Cohen, Eden Prairie, and Bruce C. Johnson, St. Paul, all of Minn., assignors to Creative Integration & Design, Inc., St. Paul, Minn.

Continuation of Ser. No. 50,554, Apr. 20, 1993, abandoned, and Ser. No. 183,916, Jan. 19, 1994, abandoned, which is a continuation of Ser. No. 48,589, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 884,626, May 15, 1992, abandoned, which is a continuation of Ser. No. 712,508, Jun. 10, 1991, abandoned, said Ser. No. 50,554is a continuation-in-part of Ser. No. 48,589, Apr. 16, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 314,547

Int. Cl.^{6} A61F *5/08;5/56;* A61M *15/08;* A62B *7/00*

U.S. Cl. 128—200.24 41 Claims



1. A nasal dilator for preventing outer wall tissue of nasal passages of a nose from drawing in during breathing, comprising:
- a truss member including:
  - a first end region adapted to engage the outer wall tissue of a first nasal passage;
  - a second end region adapted to engage the outer wall tissue of a second nasal passage;
  - an intermediate segment coupling the first end region to the second end region and configured to traverse a portion of a nose located between the first and second nasal passages; and
  - a resilient member extending along the truss member and having end portions that terminate at least at sections of end edges of the first and second end regions, the resilient member for acting to stabilize those outer wall tissues so engaged and thereby prevent such outer wall tissues of the first and second nasal passages from drawing in during breathing.

5,533,504
APPARATUS FOR CONTROLLING AIR FLOW THROUGH NASAL PASSAGES

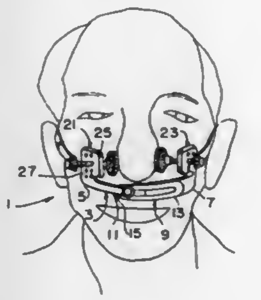
Louis Stamos, 506 Wafer Dr., Tarpon Springs, Fla. 34689

Filed Sep. 13, 1994, Ser. No. 304,931

Int. Cl.^{6} A62B *9/06*

U.S. Cl. 128—201.18 18 Claims

1. An apparatus, comprising a frame having first and second side plates, first and second central extensions extending respectively from the first and second side plates, the first and second extensions having slides for relatively sliding the extensions, and having a clamp connected to the extensions for clamping the extensions in a selected inter-relationship of the slides, first and second nose-engaging pads for engaging and compressing sides of a nose with the pads, and a strap connected to the plates for holding the plates on the face of a user.



5,533,505
DISPOSABLE INHALER

Göran Källstrand, Bjärred, and Per-Gunnar Nilsson, Malmö, both of, Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

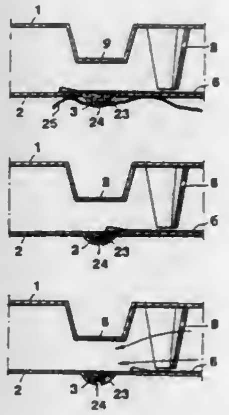
PCT No. PCT/EP93/00473, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/17728, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 3, 1993, Ser. No. 295,709

Claims priority, application European Pat. Off., Mar. 4, 1992, 92850046

Int. Cl.^{6} A61M *15/00;16/00;* B05D *7/14;* B65D *83/06*

U.S. Cl. 128—203.15 19 Claims



1. A disposable breath-actuated inhaler for delivering a dose of a finely divided powder to a patient comprising
- a housing defining a chamber, said chamber having an air inlet, an air outlet in fluid communication with the air inlet, and an air flow path extending between said inlet and said outlet
- a compartment, containing a dose of finely divided powder, located in a region of said chamber intermediate said inlet and said outlet, said compartment defining a volume to hold the dose and having an opening which exposes a surface of said dose to said air flow path, said compartment including a through-hole positioned beneath the finely divided powder, said through hole selectively opened to ambient air to allow ambient air to enter the compartment,
- a removable cover disposed sealingly over said opening in said compartment and confining the dose of finely divided powder within the compartment prior to delivery, and
- a constriction means in said air flow path adjacent the powder compartment positioned to induce sufficient turbulence in an air stream produced upon removal of said removable cover and subsequent inhalation to lift the powder out from the compartment and mix the powder into the air stream for delivery through the air outlet.

5,533,506

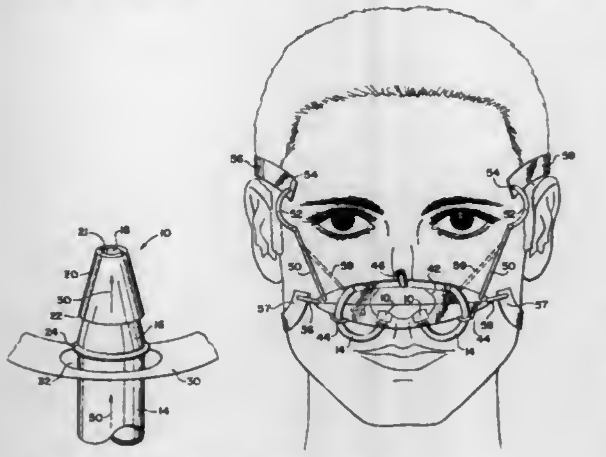
NASAL TUBE ASSEMBLY

Thomas J. Wood, Blackshear, Ga., assignor to Medlife, Inc., Charlotte, N.C.

Filed Jan. 13, 1995, Ser. No. 372,227

Int. Cl.^{6} A61M *15/08;16/00;11/00;* **A62B** *7/00*

U.S. Cl. 128—207.18 **5 Claims**



1. A nasal tube assembly comprising:

a tube tapered at one end and having an aperture defined at said tapered end;

a means removably associated with said tapered end for forming a seal when said tapered end is inserted into a nostril;

a support bar which comprises a generally flat strip of material having at least one slot defined therein, said slot having a width, said tube being slidable within said slot and having a degree of lateral movement therein due to the width of said slot; and

a means for preventing said tube from easily slipping through said slot comprising a washer sized to have a diameter larger than the width of said slot, said washer snugly engaging said tube, and being positioned between said tapered end of said tube and said support bar.

5,533,507

CONDENSED OXIMETER SYSTEM WITH NOISE REDUCTION SOFTWARE

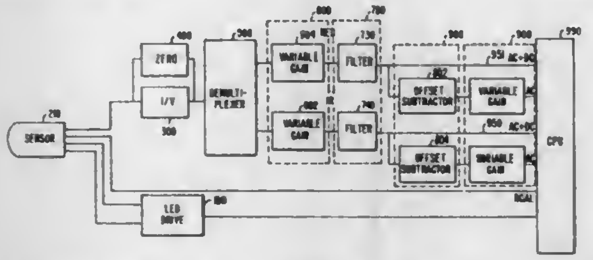
Robert S. Potratz, Lenexa, Kans., assignor to Nellcor, Inc., Pleasanton, Calif.

Continuation of Ser. No. 740,362, Aug. 5, 1991, Pat. No. 5,351,685. This application Apr. 8, 1994, Ser. No. 225,486

The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—633 **15 Claims**



1. A method for determining a parameter of blood, comprising the steps of:

emitting a first and second wavelength of light through a sample;

detecting said first and second wavelengths of light through said sample:

producing first and second analog signals responsive to the detection of said first and second wavelengths, respectively, said first and second analog signals being proportional to the intensity of said first and second wavelengths of light, respectively, said first analog signal having an AC and a DC component, and said second analog signal having an AC and a DC component;

separating said AC component of said first analog signal from said first analog signal to produce a first separated AC component, and separating said AC component of said second analog signal from said second analog signal to produce a second separated AC component;

computing the derivatives of said first and second separated AC components; and

computing said parameter of blood, said parameter of blood being dependent on the derivatives of said first and second separated AC components.

5,533,508

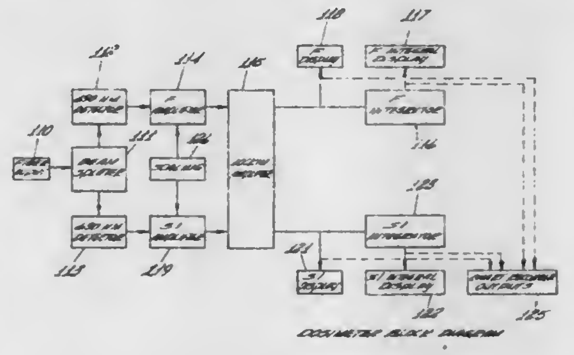
VIVO DOSIMETER FOR PHOTODYNAMIC THERAPY

Daniel R. Doiron, Santa Ynez, Calif., assignor to PDT Systems, Inc., Goleta, Calif.

Continuation of Ser. No. 786,036, Oct. 31, 1991, abandoned. This application Jan. 27, 1994, Ser. No. 188,946

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—634 **2 Claims**



1. A method for determining when a therapeutic dosage of treatment light has been delivered to photosensitive molecules within a diseased target tissue during phototherapy of the diseased target tissue comprising the steps of:

a) presenting a light probe having a non-invasive proximal end and an invasive distal end and a light conducting optical waveguide therebetween, the light probe being operable to receive light from a light source external thereto and incident upon the invasive distal end thereof and conducting the light to the non-invasive proximal end thereof; then

b) placing the invasive distal end of the light probe in optical communication with the diseased target tissue; and

c) presenting a light detector apparatus having a light input port adapted to receive light from the non-invasive proximal end of the light probe;

d) using said light apparatus for:

(i) separating light consisting of fluorescent light and space irradiance entering the light input port into fluorescent light and space irradiance; and

(ii) detecting the separated fluorescent light and space irradiance; and

(iii) measuring the fluorescent light; and

(iv) measuring the space irradiance; and

(v) dividing the measured fluorescent light by the measured space irradiance, the quotient being the ratio of fluorescent light to space irradiance; and

(vi) integrating the ratio with respect to time; then

e) irradiating the diseased target tissue with treatment light having a wavelength which is absorbed by the photosensitive molecules, and wherein a space irradiance portion of the treatment light delivered to the diseased target tissue enters the distal invasive tip of the light probe and wherein the absorption of treatment light by the photosensitive molecules causes at least a portion of the photosensitive molecules to emit fluorescent light; then

f) continuing irradiation of the target tissue until the integrated fluorescence reaches a predetermined value.

5,533,509

METHOD AND APPARATUS FOR NON-INVASIVE MEASUREMENT OF BLOOD SUGAR LEVEL

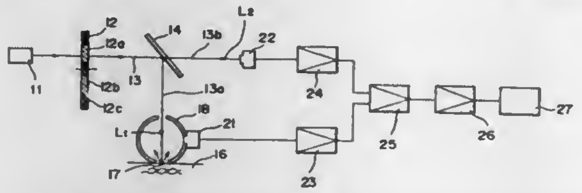
Katsue Koashi, Toyonaka, and Shigeo Minami, Ashiya, both of, Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

PCT No. PCT/JP93/01140, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO95/05120, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 12, 1993, Ser. No. 411,631

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—633 **5 Claims**



1. A method for non-invasive measurement of blood sugar levels comprising the steps of:

providing light which is intensity-modulated with a plurality of intensities as well as being wavelength-modulated;

applying the modulated light to an examined portion;

detecting an intensity of reflected light from said examined portion and an intensity of the incident light onto said examined portion for each intensity of said modulated light

detecting the ratio of an intensity of said reflected light and said incident light;

detecting the rate of change in said ratio with respect to the change in wavelength due to the wavelength modulation;

extracting a derivative spectrum of an absorbance spectrum of glucose in said examined portion.

5,533,510

REAL TIME ULTRASOUND ENDOCARDIAL DISPLACEMENT DISPLAY

Albert F. Koch, III, Newburyport, and David M. Prater, Melrose, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 308,718, Sep. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 275,554, Jul. 15, 1994, abandoned. This application Sep. 22, 1995, Ser. No. 532,264

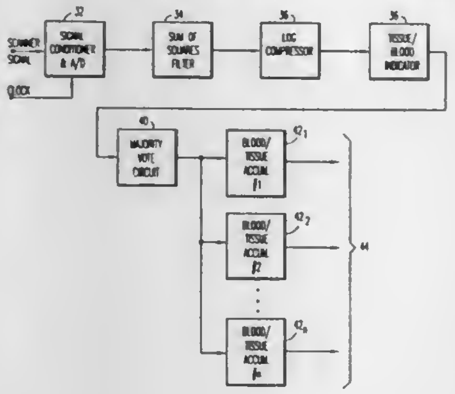
Int. Cl.^{6} H61B *8/00*

U.S. Cl. 128—660.07 **12 Claims**

1. An ultrasound display apparatus for providing a two-dimensional display of a fluid filled cavity and surrounding wall tissue, said apparatus including means for indicating wall tissue displacement on said display screen and comprising:

frame comparison means for determining which pixels change from one type pixel to another type pixel in a pair of succeeding image frames, and including pixel classification means for classifying pixels in each image frame into one of two types, i.e., tissue or fluid, to facilitate determination of pixel changes; and

mapping function assignment means for assigning to all changed classification pixels in a frame, a common mapping function which causes said changed classification pixels to be readily differentiated by a viewer of said display screen.



5,533,511

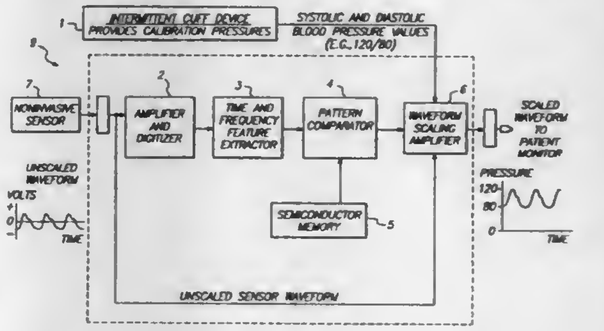
APPARATUS AND METHOD FOR NONINVASIVE BLOOD PRESSURE MEASUREMENT

William J. Kaspari, Portola Valley, and Roger A. Stern, Cupertino, both of Calif., assignors to Vital Insite, Incorporated, Portola Valley, Calif.

Filed Jan. 5, 1994, Ser. No. 177,448

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—672 **30 Claims**


1
INTERMITTENT CUFF DEVICE PROVIDES CALIBRATION PRESSURES
SYSTOLIC AND DIASTOLIC BLOOD PRESSURE VALUES (E.G.,120/80)
8
7
NONINVASIVE SENSOR
2
AMPLIFIER AND DIGITIZER
3
TIME AND FREQUENCY FEATURE EXTRACTOR
4
PATTERN COMPARATOR
6
WAVEFORM SCALING AMPLIFIER
SCALED WAVEFORM TO PATIENT MONITOR
UNSCALED WAVEFORM
VOLTS
+
0
−
TIME
SEMICONDUCTOR MEMORY
5
PRESSURE
120
80
0
TIME
UNSCALED SENSOR WAVEFORM

1. A blood pressure monitor for measuring a patient's blood pressure, comprising:

memory means for storing reference features representative of blood pressure from a population of reference patients;

means for periodically obtaining calibration blood pressure values from the patient, said calibration blood pressure values representing the patient's absolute blood pressure;

means for noninvasively obtaining blood pressure pulses from the patient;

processing means for processing said blood pressure pulses to obtain processed features representative of said blood pressure pulses;

comparing means for comparing said processed features with said reference features to provide comparison signals representative of the comparison of said processed features with said reference features; and

scaling means responsive to said calibration blood pressure values and said blood pressure pulses for scaling said comparison signals to provide the patient's true blood pressure.

5,533,512

METHOD AND APPARATUS FOR DETECTION OF VENOUS AIR EMBOLI

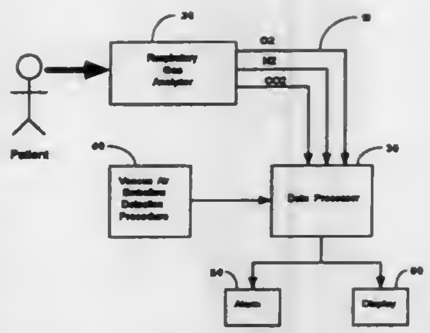
Mark A. Novotny, Westminster, Colo.; Thomas A. Boone, Laurel, Md.; Jeffrey D. Geisler, Salt Lake City, Utah; Garfield B. Russell, Mt. Gretna, and John M. Graybeal, Grantville, both of Pa., assignors to Ohmeda Inc., Liberty Corner, N.J.

Filed Mar. 18, 1994, Ser. No. 210,883

Int. Cl.^{6} A61B *5/08*

U.S. Cl. 128—719 **18 Claims**

1. An apparatus for detecting an air embolism comprising:



a respiratory gas nitrogen detector for detecting nitrogen in respiratory gases, said respiratory gas nitrogen detector having a signal output port which provides a nitrogen concentration signal representative of a concentration of the nitrogen detected in the respiratory gases; and

a processor having a signal input port connected to said respiratory gas nitrogen detector signal output port, said processor further comprising:

an historical data base of previously acquired nitrogen concentration signals;

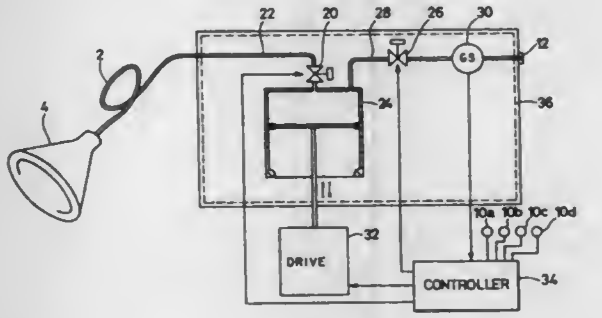
a threshold analyzer having an input which receives the previously acquired nitrogen concentration signals from said historical data base and an output which provides a nitrogen concentration baseline threshold value according to a predetermined analysis criteria;

a current data register which receives and stores a current nitrogen concentration signal from said respiratory gas nitrogen detector; and

a comparator which compares the current nitrogen concentration signal with the nitrogen concentration baseline threshold value derived from said historical data base and triggers a venous air embolism alarm signal if the current nitrogen concentration signal crosses within a predetermined time window.

5,533,513
EXPIRATION COLLECTOR

Hideo Ueda, Osaka; Mitsuo Hiromoto, Kyoto; Meng Gang, Kyoto, and Yutaka Yamasaki, Kyoto, all of, Japan, assignors to Kyoto Dai-Ichi Kagaku Co., Ltd., Kyoto, Japan
Filed Oct. 24, 1994, Ser. No. 327,908
Claims priority, application Japan, Oct. 25, 1993, 5-290133
Int. Cl.^{6} A61B *5/097*
U.S. Cl. 128—719 **6 Claims**



1. An expiration collector comprising:

an expiration measurer;

a non-airtight mask to be applied to a respiratory organ;

an expiration blowing part being provided on a forward end with said non-airtight mask;

an expiration suction passage connected to said expiration blowing part;

a collecting mechanism connected to said expiration suction passage and communicating with a base end portion of said expiration blowing part, and said collecting mechanism having a collecting vessel and a suction and discharge mechanism for collecting expiration in said collecting vessel and for transmitting said expiration being collected in said collecting vessel toward said expiration measurer;

an expiration transmission passage connected to said collecting vessel and said expiration measurer;

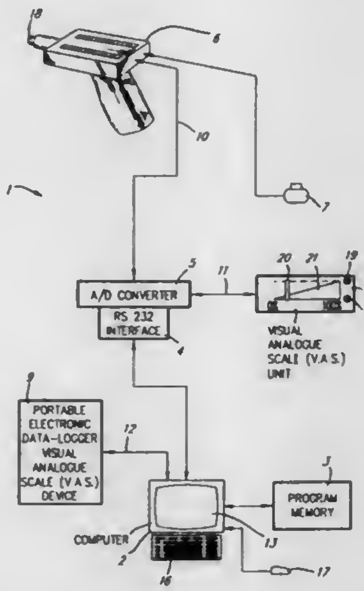
a passage switching mechanism for switching passages by a) a first switch means for, opening and closing said expiration suction passage from said expiration blowing part to said collecting vessel and b) a second switch means for opening and closing said expiration transmission passage from said collecting vessel toward said expiration measurer;

heating means for heating said expiration blowing part, said collecting mechanism, said expiration suction passage, said expiration transmission passage and said passage switching mechanism to a temperature exceeding a body temperature of a subject; and

a control part, connected to said first and second switch means and said collecting mechanism, for controlling said passage switching mechanism and said collecting mechanism a) by controlling said first switch means to open said expiration suction passage and by controlling said second switch means to close said expiration transmission passage in collection of expiration in said collecting vessel wherein said expiration is sucked into said collecting vessel over a period of a plurality of breaths and b) by controlling said first switch means to close said expiration suction passage and by controlling said second switch means to open said expiration transmission passage in transmission of said expiration wherein said expiration is discharged from said collecting vessel.

5,533,514
ALGOMETRY MANAGEMENT SYSTEM

Gilles Lavigne, Ville Mont-Royal, and Léo TenBokum, Montréal, both of, Canada, assignors to Université de Montréal, Montréal, Canada
Filed May 9, 1995, Ser. No. 437,701
Int. Cl.^{6} A61B *3/00*
U.S. Cl. 128—744 **22 Claims**


18
6
10
1
7
5
11
A/D CONVERTER
RS 232 INTERFACE
4
20
21
19
8
22
VISUAL ANALOGUE SCALE (V.A.S.) UNIT
9
PORTABLE ELECTRONIC DATA-LOGGER VISUAL ANALOGUE SCALE (V.A.S.) DEVICE
12
3
PROGRAM MEMORY
COMPUTER
2
13
16
17

1. An algometry management system, comprising:

means for selecting points of a patient's body on which pain sensitivity measurements are to be made by an operator;

means for determining a sequence of the selected points;

means for indicating to the operator, according to said sequence, each selected point of the patient's body on which a pain sensitivity measurement is to be made;

means for receiving the pain sensitivity measurement made by the operator on each point of said sequence indicated by said indicating means;

means for storing the received pain sensitivity measurement of each point of said sequence in a file associated with the patient;

means for asking the patient for a subjective indication of at least one sensation felt during each pain sensitivity measure; and

patient-operated means for producing a signal representative of said subjective indication, wherein said receiving means comprises means for receiving said subjective indication representative signal and said storing means comprises means for storing said subjective indication representative signal in the file of the patient, said patient-operated means including;

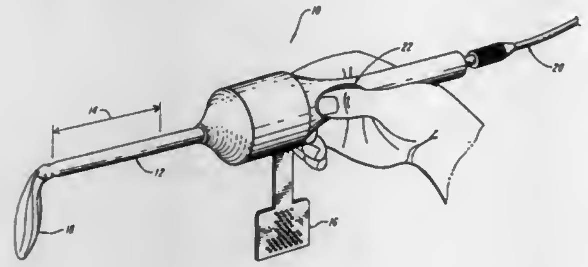
(a) a visual analog scale;

(b) cursor means displaceable along the visual analog scale to produce said subjective indication; and

(c) means for converting a resulting position of the cursor means along the visual analog scale into said subjective indication representative signal.

5,533,515
SOLID STATE SPHINCTER MYOMETERS

John A. Coller, Weston; Bruce Nappi, Newton, and Alan J. Lane, Waltham, all of Mass., assignors to Foster-Miller, Waltham, and Labey Clinic Medical Center, Burlington, both of Mass.
Filed Aug. 11, 1994, Ser. No. 289,083
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 128—748 **30 Claims**



1. A system for measuring constriction pressure within a body lumen, said system comprising:

an elongated cylindrical core member;

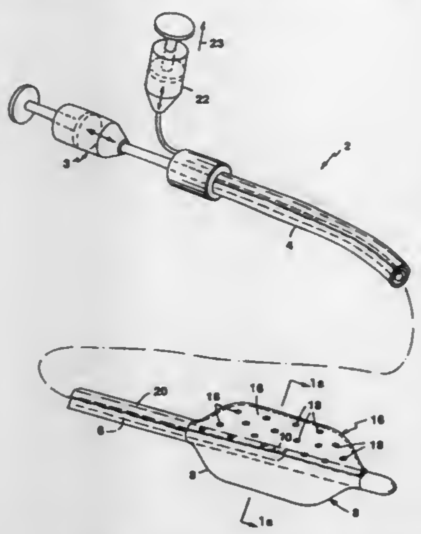
a first array of substantially parallel, electrically-conductive strips substantially conformed to at least a portion of said elongated cylindrical core member;

a second array of substantially parallel, electrically-conductive strips, disposed transverse to and in overlapping relationship with said first array of substantially parallel electrically conductive strips, and substantially conformed to at least said portion of said elongated core member, so as to provide with said first array a plurality of pressure transducer regions around the circumference and along the axis of said core member; and

means, disposed between said first and second arrays at said pressure transducer regions, for defining a predetermined, measurable parameter at each of said regions between the corresponding electrical conductive strips of the first and second arrays such that the parameter varies as a function of a force applied to each of said regions so that constriction pressure within a body lumen can be measured.

5,533,516
SAMPLE COLLECTION

Ronald A. Sahatjian, Lexington, Mass., assignor to Boston Scientific Corporation, Watertown, Mass.
Continuation of Ser. No. 175,949, Dec. 30, 1993, Pat. No. 5,409,012. This application Feb. 22, 1995, Ser. No. 392,101
Int. Cl.^{6} A61B *10/00*
U.S. Cl. 128—749 **18 Claims**



1. A kit for treating a patient by collecting and treating a cell sample from a desired location in the patient, comprising:

a sampling probe in the form of an elongate catheter having a proximal portion that remains outside the body and a distal portion that can be located at the desired location, said distal portion including an expandable member that can be selectively expanded to larger diameters and contracted to smaller diameter,

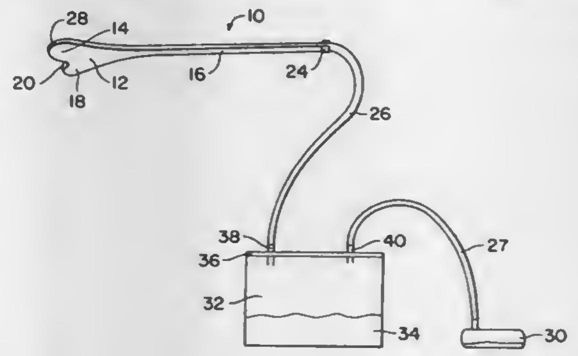
said expandable member including a membrane on at least a part of an outside surface of said expandable member, said membrane including openings that may receive said cell sample and which communicate with a suction device, controllable from proximal portions outside the body, for creating a suction force through said openings to draw said cell sample into said openings,

an apparatus for facilitating collection and treatment of said cell sample outside the body, and

a device for reintroducing said cell sample into the body.

5,533,517
CYTOLOGICAL SAMPLING METHOD AND DEVICE

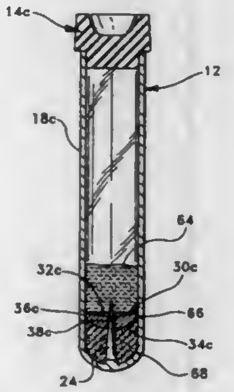
Ruth Michels, Grand Junction, Colo., assignor to St. Mary's Hospital and Medical Center, Inc., Grand Junction, Colo.
Division of Ser. No. 52,407, Apr. 23, 1993, Pat. No. 5,357,977. This application Oct. 12, 1994, Ser. No. 322,103
Int. Cl.^{6} A61B *10/00*
U.S. Cl. 128—758 **16 Claims**



1. A method for analyzing cytological material, comprising:
a) collecting cytological material from tissue selected from the group consisting of the ectocervix, the squamocolumnar junction, and the endocervix, wherein said collecting step includes fixing said cytological material substantially immediately by suctioning said cytological material directly into a container containing a sufficient amount of a fixative to fix said collected cytological material; and
b) analyzing said cytological material.

5,533,518
BLOOD COLLECTION ASSEMBLY INCLUDING MECHANICAL PHASE SEPARATING INSERT

Erwin A. Vogler, Newhill, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Apr. 22, 1994, Ser. No. 231,548
Int. Cl.⁶ A61J *1/00*
U.S. Cl. 128—760 **10 Claims**

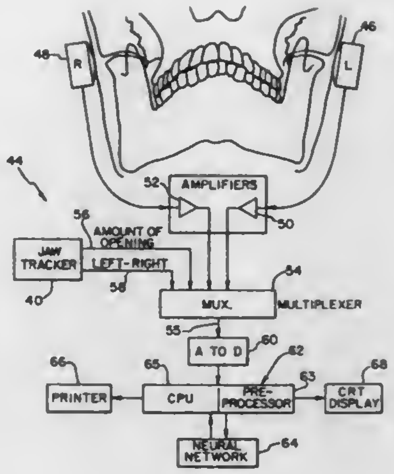


1. A blood collection assembly comprising:
a) a container having a bottom wall and a side wall unitary therewith, said side wall defining an open end,a and puncturable stopper in said open end, said bottom wall,side wall and stopper enclosing an interior volume;
b) mechanical means in said interior volume for separating liquid and solid blood phases, said means being immobilized to said side wall until released to descend during centrifugation; and
c) terminating means unitary with and projecting from a wall of said container for terminating descent of said mechanical means between said liquid and solid phases.

5,533,519
METHOD AND APPARATUS FOR DIAGNOSING JOINTS

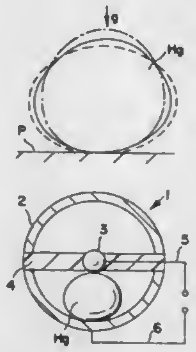
John C. Radke, 133 W. Henry Clay St., Whitefish Bay, Wis. 53127; Gregory J. Ryan, 4209 N. Murray St., Milwaukee, both of Wis. 53211, and Troy W. Hershberger, 1342 N. Shagbark, Warsaw, Ind. 46580
Division of Ser. No. 83,219, Jun. 24, 1993, Pat. No. 5,413,116. This application May 9, 1995, Ser. No. 437,704
Int. Cl.⁶ A61B *5/103*
U.S. Cl. 128—777 **20 Claims**

1. A system for diagnosing an implantable orthopedic device within a body, said system comprising:
a) sensor means for detecting a vibration pattern from the implantable orthopedic device;
b) preprocessor means for producing a predetermined set of data parameters in response to said sensor means which are descriptive of the vibration pattern; and
c) adaptive interpreter means for receiving said data parameters as input and providing an output which indicates at least one condition of the implantable orthopedic device.



5,533,520
ACTIVITY SENSOR, PARTICULARLY FOR HEART PACEMAKERS

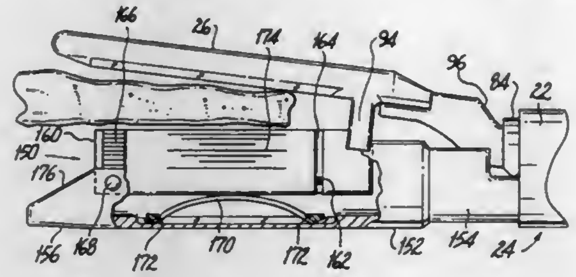
Bruno Inguaggiato, Milan, Italy, assignor to Sorin Biomedica, S.p.A., Saluggia, Italy
Continuation of Ser. No. 119,798, Sep. 10, 1993, abandoned, which is a continuation of Ser. No. 848,387, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 473,864, Feb. 5, 1990, abandoned. This application Jul. 10, 1995, Ser. No. 501,248
Claims priority, application Italy, Feb. 13, 1989, 67085/89
Int. Cl.⁶ A61B *5/10*
U.S. Cl. 128—782 **10 Claims**



1. A sensor for detecting activity of a patient wearing a pacemaker, comprising:
a) a mass of mercury positioned in an initial location, wherein said mass of mercury has an initial shape due to gravitation acting thereon, wherein said mass of mercury is in the range of about 20 micrograms to about 40 micrograms; and
b) a detector means configured for housing and positioning said mass of mercury, wherein said detector means is adapted for detecting changes in the shape of said mass of mercury from said initial shape due to activity of the patient irrespective of the direction in which forces act relative to the geometry of the sensor, and generating a signal indicative of said change, so that when a force in a direction is applied to said mass of mercury said detector means detects said change in shape from said initial shape as a result and in the direction of said applied force and said detector means generates said signal indicative of said change thereby detecting the activity of the patient.

5,533,521
INTERCHANGEABLE TISSUE MEASURING DEVICE

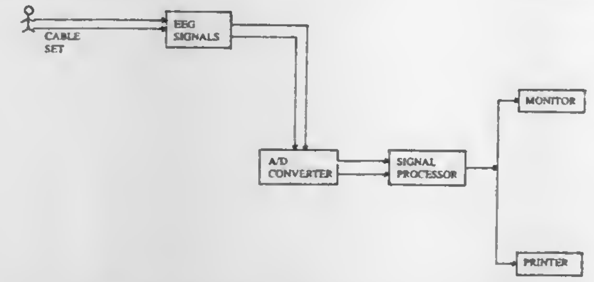
Richard N. Granger, Huntington, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 15, 1994, Ser. No. 276,121
Int. Cl.⁶ A61B *5/103*
U.S. Cl. 128—774 **23 Claims**



1. A tissue measuring cartridge for use with a surgical stapling device having an elongate portion, an anvil at a distal end thereof and an actuator, said cartridge comprising:
a) a housing member having a mounting portion which releasably attaches adjacent the distal end of the elongate portion;
b) a measuring block having a tissue engaging surface and being mounted within the housing member for movement from a first position to a second position, the second position corresponding to a thickness of tissue captured between the anvil and the tissue engaging surface of the measuring block; and
c) means for approximating said tissue engaging surface and the anvil to capture and measure tissue.

5,533,522
METHOD OF AND ARRANGEMENT FOR OPTIMIZING DISEASE DIAGNOSIS

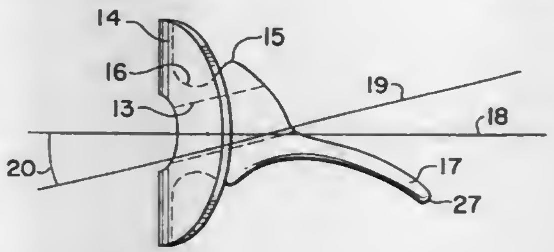
Genquan Feng, P.O. Box 1796, New York, N.Y. 10185-0016
Continuation-in-part of Ser. No. 822,525, Jan. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 397,695. Oct. 30, 1989, abandoned, and Ser. No. 794,502, Nov. 19, 1991, abandoned. This application Jan. 4, 1993. Ser. No. 9
The portion of the term of this patent subsequent to Apr. 4, 2015, has been disclaimed.
Int. Cl.⁶ A61B *5/0476*
U.S. Cl. 128—731 **2 Claims**



1. A method of optimizing the diagnosis of a condition of a patient tested, comprising the steps of:
(a) acquiring electroencephalogram (analog signals) from the patient;
(b) mathematically determining a plurality of functions descriptive of the patient from the signals;
(c) establishing a set of indices for each function, each index having two states, each indicative of the condition of the patient;
(d) recognizing the state of each index for each function;
(e) generating an integrated pattern of the states of the indices from a plurality of the functions;
(f) storing a collection of index patterns, each containing a multitude of patterns of the states of indices for a multitude of patients whose condition is known;
(g) matching the generated integrated pattern against the stored collection of index patterns to obtain a plurality of raw scores;
(h) inputting the critical diagnostic factors, which effect the diagnosis of brain diseases into the device;
(i) establishing a set of weights for each of the critical diagnostic factors which effect the diagnosis of brain diseases, according to the importance of such factors;
(j) weighting the raw scores to obtain weighted scores; and
(k) presenting an optimized diagnosis based on the weighted scores.

5,533,523
MEDICAL MOUTHPIECE

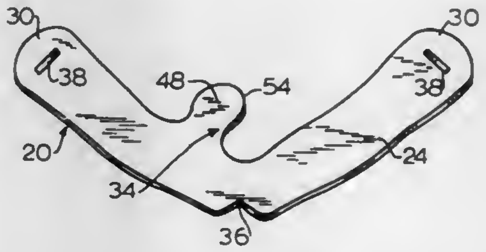
Robert Bass, Jr., 35 Rosewood Dr., Jacksonville Beach, Fla. 32250, and James G. Barsamian, 1996 Raley Creek Dr. West, Jacksonville, Fla. 32225
Filed May 16, 1995, Ser. No. 442,197
Int. Cl.⁶ A61C *5/14*
U.S. Cl. 128—859 **10 Claims**



1. A mouthpiece to facilitate the introduction of a medical instrument into the esophagus of a patient, the mouthpiece comprising a hollow tubular structure with an outer convex flange to fit over the lip of the patient and an inner flange to fit inside the incisor teeth of the patient, an annular hollow-tubular connecting bridge member adapted to receive the biting action of said incisor teeth, said hollow being centrally located and extending from the outside of said outer flange to the inside of said inner flange, and an inwardly extending, downwardly curving elongated plate attached to the lower portion of said inner flange and adapted to lie above and to depress the patient's tongue.

5,533,524
MOUTHGUARD HAVING AN EXTRA-ORAL PORTION AND AN INTRA-ORAL PORTION

Sue A. F. Minneman, 6250-202 St. Regis Cir., Raleigh, N.C. 27606
Division of Ser. No. 253,099, Jun. 2, 1994, Pat. No. 5,469,865. This application Sep. 12, 1995, Ser. No. 527,105
Int. Cl.⁶ A61C *5/14*
U.S. Cl. 128—859 **5 Claims**



1. A mouthguard for a patient, comprising a single planar piece of compressible flexible material, said piece comprising an intra-oral portion and an extra-oral portion said intra-oral portion comprising one curved arm and the extra-oral portion comprising two

curved arms which extend in mirror image on either side of a line in the center of said extra-oral portion, said extra-oral portion having a W-shaped edge with a central indentation to allow flexibility of the mouthguard, wherein one arm of said extra-oral portion is generally curved around said curved arm of said intra-oral portion, wherein said arm of said intra-oral portion is of a size enabling said arm of said intra-oral portion to fit in the mouth of said patient, and the arm of said intra-oral portion is separated from the extra-oral portion by side indentation, wherein when said mouthguard is placed in the mouth of the patient, the side indentation receives a corner of the mouth and the extra-oral portions extend along the cheeks of the patient on each side of the patient's face.

5,533,525

Patent Not Issued For This Number

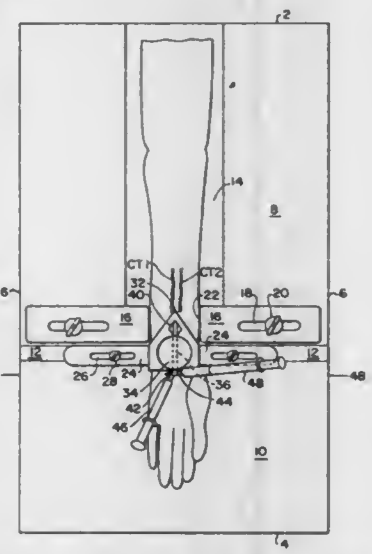
5,533,526
METHOD AND APPARATUS FOR NON-SURGICAL TREATMENT OF CARPAL TUNNEL SYNDROME

Larry H. Goldberg, Philadelphia, Pa., assignor to Goldberg's United Service Company, North Versailles, Pa.

Division of Ser. No. 83,748, Jun. 28, 1993, Pat. No. 5,425,707. This application Feb. 23, 1995, Ser. No. 392,500

Int. Cl.⁶ A61F *5/37;5/00*

U.S. Cl. 128—878 **9 Claims**



1. An apparatus for supporting and securing a patient's arm in palmar position during treatment of carpal tunnel syndrome comprising:

a substantially rigid, rectangular, planar base adapted to support a human arm, said base having top and bottom surfaces, said top surface defined by distal and proximal ends and two side ends, said top surface proximal end further including an upper planar surface having formed therein an arm support member and a distal end lower planar surface, said upper and lower planar surfaces being separated by a wrist flexion curb;

a pair of substantially rigid forearm brackets detachably secured to said top surface at or near said upper surface proximal end and positioned on opposite sides of said support member, said brackets adapted to secure a first portion of said arm within said support member;

a planar wrist bracket detachably secured to said upper planar surface between said proximal and distal ends at or near said wrist flexion curb and extending across said support member, said wrist bracket adapted to compressively secure a second portion of said arm within said support member; and

a needle guide within said wrist bracket, said needle guide comprising a centering printer, a viewing aperture and a needle conduit, said conduit comprising a needle entrance, a needle channel and a needle exit.

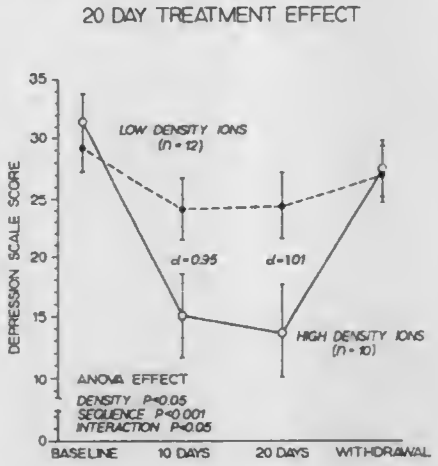
5,533,527
TREATMENT METHOD FOR DEPRESSIVE AND NEUROVEGETATIVE DISORDERS

Michael Terman, New York, N.Y., assignor to Columbia University, New York, N.Y.

Filed Apr. 20, 1994, Ser. No. 230,127

Int. Cl.⁶ A61M *21/00*

U.S. Cl. 128—898 **13 Claims**



1. A method of achieving a therapeutic effect in a human subject experiencing at least one of depressive and neurovegetative symptoms comprising the steps of:

producing negative ions by an ion generator of a density of at least 5.0×10^5 ions/cm^3 to establish a high density negative ion environment sufficient to evoke a therapeutic response in which at least one of the frequency and severity of symptoms is clinically significantly reduced; and

exposing the subject while in proximity to said ion generator to the environment of negative ions produced by said generator for about 30 minutes a day over a period of successive days sufficiently long to therapeutically effect the symptoms in a positive manner.

5,533,528
METHOD AND APPARATUS FOR ELEVATING TOBACCO TEMPERATURE

Ronald Wallace, Cheltenham; Henry Goldberg, Caulfield South; James Mitchell, Knoxfield, and Harald Grosser, Boronia, all of, Australia, assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 30, 1993, Ser. No. 175,990

Claims priority, application Australia, Dec. 31, 1992, PL6631

Int. Cl.⁶ A24B *3/18*

U.S. Cl. 131—304 **52 Claims**

1. An apparatus for preparing tobacco comprising:

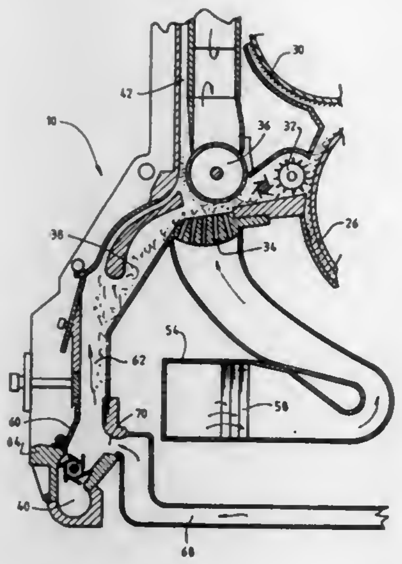
means for supplying tobacco;

means for separating supplied tobacco into fibers;

means for conveying the separated tobacco fibers to a tobacco rod former;

a heat source for heating the separated tobacco fibers prior to said conveying means conveying the separated tobacco fibers to the rod former;

a flotation chamber in fluid communication with said supplying means and said conveying means;



means for winnowing undesired components from the separated tobacco fibers in said flotation chamber before the undesired components are conveyed to the rod former; and

first ducting for directing heated air from said heat source to said flotation chamber to heat tobacco fibers therein.

5,533,529
METHOD AND DEVICE FOR ARTIFICIALLY INCREASING HAIR

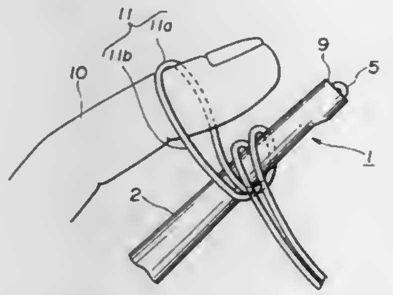
Kunio Ohno, 8-5, Senju-tatsuta-cho, Adachi-ku, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 356,963

Claims priority, application Japan, Dec. 17, 1993, 5-353082

Int. Cl.⁶ A45D *24/00*

U.S. Cl. 132—200 **5 Claims**



1. A hair-increasing method for fastening a false hair to a natural hair, said method comprising:

winding said false hair around a guide rod having a slide pin provided at its leading end with a catch member to form a preliminary knot of the false hair around said guide rod;

holding said natural hair with said catch member to thus connect said natural hair with said guide rod;

transferring said preliminary knot along said guide rod and from said guide rod to said natural hair; and

pulling both said false hair and said natural hair with a finger, while holding said natural hair with said guide rod so as to tension said natural hair, and thereby tightening said knot in said false hair onto said natural hair.

5,533,530
TOBACCO RECONSTITUTION PROCESS

Harvey J. Young, Advance; Thomas W. Brown, Clemmons; Sara W. Devine, Pfafftown, and Thomas A. Perfetti, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 1, 1994, Ser. No. 299,870

Int. Cl.⁶ A24B *3/14*

U.S. Cl. 131—370 **8 Claims**

1. A process for providing a reconstituted tobacco material having an aerosol precursor material incorporated therein, the process comprising the steps of:

(a) providing an extracted tobacco material;

(b) heating the aerosol precursor material to about 40° to 200° C.;

(c) forming the extracted tobacco material into a predetermined shape using a papermaking process, the formed extracted tobacco material having a moisture content of at least about 50 percent by weight; and

(d) contacting the formed extracted tobacco material with an aerosol precursor material applied as an aqueous mixture with a ratio of liquid having aqueous character to aerosol precursor material of about 25 to 75 percent by weight, to incorporate the aerosol precursor material therein.

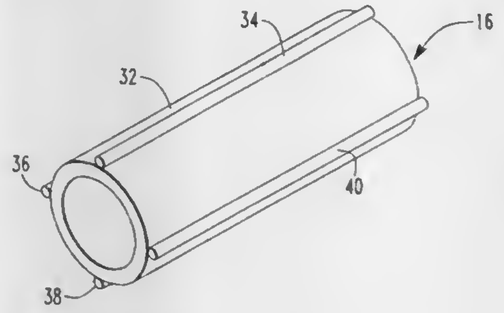
5,533,531
ELECTRONICALLY ALIGNED MAN-MACHINE INTERFACE

Glenn R. Edwards; Stuart J. Rothenberg, both of Palo Alto, and Mark L. Oberman, Sunnyvale, all of Calif., assignors to Greenleaf Medical Systems, Palo Alto, Calif.

Filed Aug. 22, 1994, Ser. No. 294,073

Int. Cl.⁶ A61B *5/00*

U.S. Cl. 128—782 **14 Claims**



1. An apparatus for measuring movement in a human body joint having first and second axes of movement, said apparatus comprising:

garment means configured to be worn about the joint;

first sensor means having two substantially nonparallel sense axes and carried by said garment means so as to be positioned proximate to the joint's first axis of movement, said first sensor producing first and second output signals;

second sensor means having two substantially nonparallel sense axes and carried by said garment means so as to be positioned proximate to the joint's second axis of movement, said second sensor producing third and fourth output signals; and

means for electrically combining said first and second output signals so that the combined output of said first sensor means is responsive to substantially only movement occurring along said first axis and for electrically combining said third and fourth output signals so that the combined output of said second sensor means is responsive to substantially only movement occurring along said second axis.

5,533,532
PERMANENT WAVE COMPOSITIONS AND METHODS

Geoffrey R. Hawkins, Langhorne, Pa., and Marvin E. Goldberg, Marlboro, N.J., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Filed Jun. 26, 1995, Ser. No. 494,504
Int. Cl.^{6} A45D *7/04*

U.S. Cl. 132—204 **17 Claims**

1. A method for permanent waving human hair comprising the steps of:

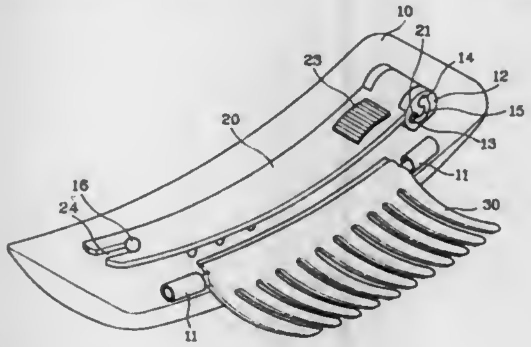
(a) applying to hair fibers arranged in a predetermined configuration a permanent wave composition having a pH of 6.5 to 7.0 comprising 12–18% by weight of a cysteamine reducing agent selected from the group consisting of cysteamine, cysteamine salt, and mixtures thereof in an aqueous carrier,
(b) applying heat to the hair treated with the composition of (a) for 15 to 45 minutes,
(c) rinsing the hair with water, and
(d) applying hydrogen peroxide to the hair fibers for a period of time sufficient to cause the sulfur to sulfur bonds to reform.

5,533,533
FOLDABLE HAIR CLIP WITH A COMB

Yeh. S. Shing, No. 119-3, Sec. 3, Pa-Te Rd., Taipei, Taiwan

Filed Jan. 18, 1995, Ser. No. 375,401
Int. Cl.^{6} A45D *8/28*

U.S. Cl. 132—279 **3 Claims**



1. A foldable hair clip with a comb comprising:

a clip plate, being a curved piece, said clip plate having an inner surface which is provided with a pair of comb pivot seats, a pair of clip strip seats near one end thereof and a stud button near another end, said pair of clip strip seats being provided to allow a clip strip to be pivotally affixed thereto;

said clip strip, being a curved piece, having a pivot on one end thereof pivotally affixed to said clip strip seats, a notch on the other end mating said stud button provided on said clip plate so as allow said clip strip to be clamped to said stud button, and an inner surface which is provided with a plurality of teeth;

a comb, being thin comb piece, said comb having two symmetrical short pins on two ends, respectively, thereof, said symmetrical short pins being pivotably fit into said comb pivot seats, respectively;

whereby said comb is initially folded against said clip plate via a cooperative action between said symmetrical short pins and said comb pivot seats so as to allow said foldable hair clip with a comb to be used as a hair clip, and when said foldable hair clip with a comb is to be used as a comb, a user will unclamp said notch from stud button and unfold said comb;

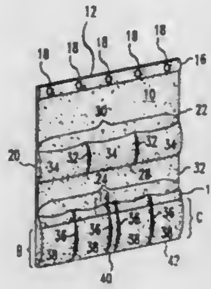
further wherein said clip strip seats are provided with two pairs of positioning holes, each pair of said positioning holes being dimensioned to receive said pivot of said clip strip, and a sliding groove which is provided between said pair of positioning holes to allow said pivot to move therealong; said pairs of positioning holes being formed at different distances from said clip strip such that when said pivot is received by one pair of said positioning holes, said clip strip will be firmly clamped by said stud button, and said clip strip will be released from said stud button and is free to pivot when said pivot is received by another pair of said positioning holes.

5,533,534
TOWEL SHOWER ORGANIZER

Carolyn Cariello, and Frank Cariello, both of 41 Dow Ave., Red Bank, N.J. 07701

Filed Dec. 27, 1994, Ser. No. 364,540
Int. Cl.^{6} A45D *40/00;* **A47F** *7/08*

U.S. Cl. 132—286 **10 Claims**



1. A shower organizer for holding shampoo, conditioner and like toiletries for shower and bathtub usage comprising: a sheet of toweling material having a front surface and a rear surface; a multiplicity of compartments formed in said front surface; and means for removably coupling said sheet to a shower curtain rod or shower door bar, with said rear surface being adjacent to said rod or bar in use, and therein said sheet of toweling material is selected of a material to be self-drying, washable, driable and mildew-resistant; and wherein a bottom of said toweling sheet is folded forward and upward upon itself a distance of substantially 8 inches to form a first fold having opposite side edges, an upper edge, a bottom edge and top and bottom layers, and wherein stitching is included along said opposite side edges to form a lower pocket equaling the width of said toweling sheet, and with the entire length of said upper edge being open.

5,533,535
POCKETABLE FOLDING UMBRELLA

Chung-Kuang Lin, and Jung-Jen Chant, both of Taipei Hsien, Taiwan, assignors to Fu Tai Umbrella Works, Ltd., Taipei Hsien, Taiwan

Filed May 11, 1995, Ser. No. 439,509
Int. Cl.^{6} A45B *11/00*

U.S. Cl. 135—20.1 **5 Claims**

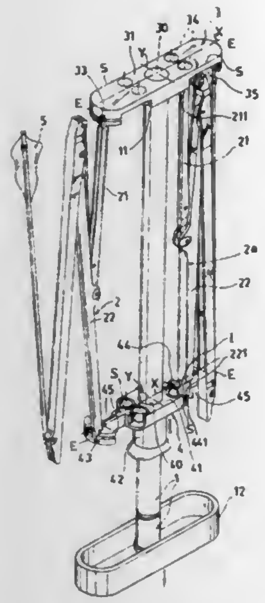
1. A folding umbrella comprising:

a telescopic central shaft (**1**);

a slim upper notch (**3**) formed as a generally rectangular shape defining two opposite extremity portions on a long axis (X) and two opposite flat-side portions on a short axis (Y) perpendicular to the long axis (X), and secured on an upper portion of said central shaft (**1**);

a slim lower runner (**4**) formed as a generally rectangular shape defining two opposite extremity portions on a long axis (X) and two opposite flat-side portions on a short axis (Y) perpendicular to the long axis (X), and slidably held on said central shaft (**1**);

a plurality of extremity rib means (**2**) disposed on two opposite extremity portions of said upper notch (**3**) and said lower runner (**4**), each said extremity rib means (**2**) having at least a top rib (**21**) and a stretcher rib (**22**) pivotally connected with said top rib (**21**), said top rib (**21**) and stretcher rib (**22**) radially pivotally secured to said upper notch (**3**) and said lower runner (**4**);



a plurality of flat-side rib means (**2**a) disposed on two opposite flat side portions of said upper notch (**3**) and said lower runner (**4**), each said flat-side rib means (**2**a) having at least a top rib (**21**) and a stretcher rib (**22**) pivotally connected with said top rib (**21**), said top rib (**21**) and said stretcher rib (**22**) on said flat-side rib means (**2**a) universally pivotally secured to each said flat-side portion of said upper notch (3) and said lower runner (**4**); and

an umbrella cloth (**5**) radially secured with said plurality of extremity rib means (2) and said flat-side rib means (**2**a) on said cloth (**5**) having a plurality of sectors (**50**) divided on said cloth (**5**) with each said sector (**50**) defined between every two neighboring rib means (**2**, **2**a);

whereby upon unfolding of said rib means (**2**, **2**a) of the umbrella, said extremity rib means (**2**) is radially extended for pulling said umbrella cloth (**5**) and said flat-side rib means (**2**a) for outwardly biasing said flat-side rib means (**2**a) for opening the umbrella; and upon folding of the rib means (**2**, **2**a), said flat-side rib means (**2**a) is retracted to each said flat side portion of said upper notch (3) and said lower runner (4) for minimizing a folding volume;

said slim upper notch (3) including: an upper slim plate (**31**) generally rectangular shaped defining said long axis (X) between two extremity portions (E) disposed on two opposite ends of the slim plate (**31**) and said short axis (Y) between two flat side portions (S) of the slim plate (**31**) and perpendicular to the long axis (X), a central recess (**30**) recessed in a central portion of the slim plate (**31**) engaged on an upper portion (**11**) of the central shaft (**1**) for securing the upper notch (**3**) on the upper portion (**11**) of the central shaft (**1**), a plurality of pivoting means (**33**) formed on two opposite extremity portions (E) of the slim plate (**31**) for radially pivotally securing a plurality of said top ribs (**21**) of the extremity rib means (**2**), a plurality of biasing means (**34**) formed on two opposite flat side portions (S) of the slim plate (**31**) and disposed around the central recess (**30**) for universally pivotally securing a plurality of said top ribs (**21**) of the flat-side rib means (**2**a), and a plurality of cavities (**35**) recessed in the flat side portions (S) of the slim plate (**31**) each said cavity (**35**) adjacent to each said biasing means (**34**) for storing each said flat-side rib means (**2**a) after being folded; and

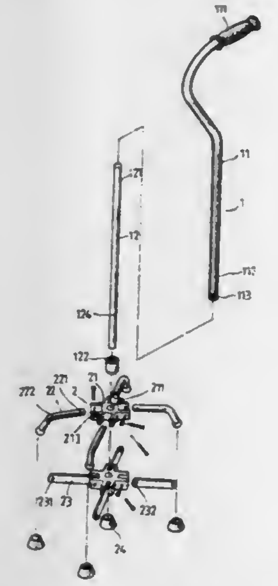
said slim lower runner (**4**) including: a lower slim plate (**41**) generally rectangular shaped defining said long axis (X) between two extremity portions (E) disposed on two opposite ends of the lower slim plate (**41**) and said short axis (Y) between two flat side portions (S) of the lower slim plate (**41**) and perpendicular to the long axis (X), a sleeve portion (**42**) perpendicularly secured with the slim plate (**41**) having a central hole (**40**) formed through the sleeve portion (**42**) slidably held on the central shaft (**1**), a plurality of pivoting means (**43**) formed on two opposite extremity portions (E) of the lower slim plate (**41**) for radially pivotally securing a plurality of said stretcher ribs (**22**) of the extremity rib means (**2**), a plurality of biasing means (**44**) formed on two opposite flat side portions (S) of the lower slim plate (**41**) and disposed around the central hole (**40**) for universally pivotally securing a plurality of said stretcher ribs (**22**) of the flat-side rib means (**2**a), and a plurality of cutouts (**45**) notched in the lower flat side portions (S) of the slim plate (**41**) each said cutout (**45**) adjacent to each said biasing means (**44**) for storing each said flat-side rib means (**2**a) after being folded.

5,533,536
ADJUSTABLE CANE FOR PHYSICAL THERAPY

John Hong, No. 33, Alley 2, Lane 185, Sec. 2, Fu Chiang Rd., Yung Kang City, Tainan Hsien, Taiwan

Filed Mar. 9, 1995, Ser. No. 401,238
Int. Cl.^{6} A45B *1/00*

U.S. Cl. 135—65 **1 Claim**



1. An adjustable cane for physical therapy, comprising:

a longitudinally extended tubular member having opposing first and second ends, said first end having a plurality of longitudinally spaced first apertures formed therein;

a handle coupled to said second end of said tubular member;

a longitudinally extended rod member having a first end telescopically disposed within said first end of said tubular member, said first end of said rod member having a protuberance extending therefrom and adapted for releasable engagement with a selected one of said plurality of longitudinally spaced first apertures formed in said tubular member to provide a length adjustment of the cane, said rod member having a second end with a plurality of second apertures formed therein and extending from said second end of said rod member in longitudinally spaced relationship; and.

base unit means retractably coupled to said second end of said rod member for providing an adjustable support base for the cane, said base unit means including:

a. a first block affixed to said second end of said rod member;
b. a second block having a central through bore for slidingly receiving said rod member therein, said second block having a opening formed through an outer wall thereof in open communication with said through bore and adapted for alignment with a selected one of said plurality of second apertures;
c. a plurality of leg members, each of said plurality of leg members having a proximal end pivotally coupled to said second block and extend radially therefrom;
d. a plurality of link members, each of said link members having one end pivotally coupled to said first block and an

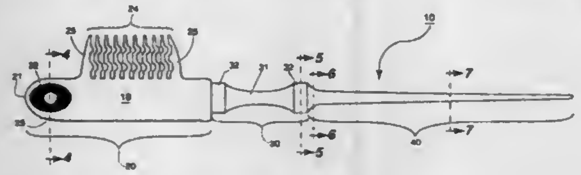
opposing second end pivotally coupled to a respective one of said plurality of leg members adjacent a distal end thereof; and

e. a pin member extending through said opening formed in said second block and a selected one of said second apertures to adjust a radial distance between respective distal ends of said plurality of leg members.

5,533,537
HAIR COLORING APPLICATOR

Esther Mourad, 250 S. President St., Apt. 303, Baltimore, Md. 21202

Filed May 30, 1995, Ser. No. 453,650
Int. Cl.⁶ A45D ***24/00***
U.S. Cl. 132—148 **21 Claims**



1. An applicator, comprising:

an elongated member having first and second longitudinally opposite end sections separated by an intermediate section, and a longitudinal axis extending through said first and said second end sections;

said intermediate section terminated by a guard interposed between said first end section and said second end section;

said first end section providing a cross-sectional dimension extending orthogonally to said longitudinal axis, said cross-sectional dimension exhibiting a continuous taper extending from a first proximal end adjacent to said intermediate section to a first distal end terminating in a point with said taper providing a continuously decreasing cross-section to said first end section along a length of said first end section from a first proximal end adjacent to said guard to a point terminating a first distal end of said first end section, said length being greater than a greatest value of said cross-sectional dimension;

said second end section having first and second opposite major surfaces extending between said intermediate section and a second distal end terminating said second end section, said first and said second major surfaces being bounded on transversely opposite sides of said longitudinal axis by first and second edges;

a blind receptacle open to and formed within said second distal end;

said first edge being serrated; and

said second edge bearing a plurality of tines forming a comb.

5,533,538
APPARATUS FOR CLEANING ARTICLES UTILIZING SUPERCRITICAL AND NEAR SUPERCRITICAL FLUIDS

Mary C. Marshall, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

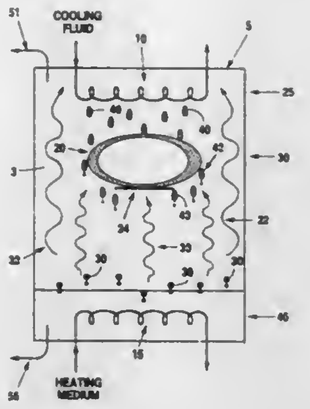
Division of Ser. No. 906,557, Jun. 30, 1992, Pat. No. 5,401,322. This application Dec. 1, 1994, Ser. No. 348,035
Int. Cl.⁶ B08B ***3/10***
U.S. Cl. 134—104.4 **11 Claims**

1. An apparatus for removing contaminants from an article with a supercritical fluid, comprising:

(a) a pressure vessel having a cooling zone, heating zone and a cleaning zone;

(b) a support means positioned in the cleaning zone for supporting the article to be cleaned;

(c) a heating means positioned to heat the supercritical fluid in the heating zone to cause it to flow by convection through the cleaning zone and into the cooling zone;



(d) a cooling means positioned to cool the supercritical fluid in the cooling zone to cause it to flow by convection through the cleaning zone and into the heating zone; and

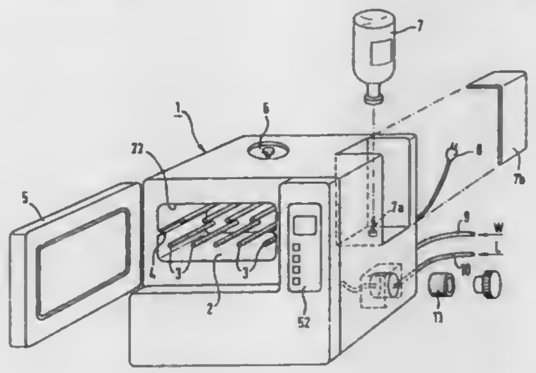
(e) recovery means positioned to recover contaminants.

5,533,539
APPARATUS FOR INTENSIVE CLEANING OF MEDICAL ARTICLES

Ralf Sutter, Weinheim; Lutz Beerstecher, Bensheim; David Hruza, Bad Waldsee; Raimund Stetter-Alle, Ulm, and Karl Trackl, Langenau, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 13, 1994, Ser. No. 274,325

Claims priority, application Germany, Jul. 15, 1993, 43 23 816.5; European Pat. Off., Apr. 26, 1994, 94106516
Int. Cl.⁶ B08B ***3/02***
U.S. Cl. 134—95.2 **20 Claims**

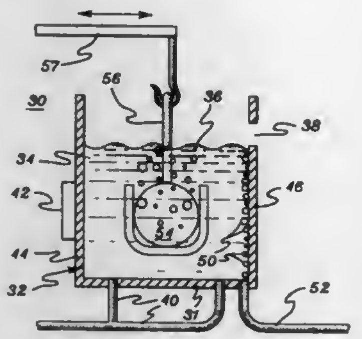


1. In an apparatus for cleaning medical articles including dental instruments, said apparatus including a cassette accepting the articles, a chamber for receiving the cassette and being closable pressure-tight, said cassette containing adapters for holding the articles with a plurality of nozzles in the cassette being connected to a delivery line and being directed onto each of the articles end being arranged around the article for delivering cleaning fluid for treatment on the exterior surface of each Of the articles via said nozzles, the improvements comprising means for supplying the fluid in a pulsating fashion with pulse, pauses, means for introducing gas under high pressure in a pulsating fashion into the delivery line of the cleaning fluid to the nozzles during pulse pauses of the fluid delivery.

5,533,540
APPARATUS FOR UNIFORM CLEANING OF WAFERS USING MEGASONIC ENERGY

David Stanasolovich, Montgomery, N.Y.; William A. Syverson, Colchester, Vt., and Ronald A. Warren, Troy, N.Y., assignors to Inernational Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 276,684, Jul. 18, 1994, Pat. No. 5,427,622, which is a continuation of Ser. No. 20,037, Feb. 12, 1993, abandoned. This application Jan. 10, 1995, Ser. No. 370,714
Int. Cl.⁶ B08B ***3/10***
U.S. Cl. 134—155 **14 Claims**



1. A sonic cleaning/etching apparatus comprising:

a recirculation tank for holding a cleaning liquid, said tank having at least one sidewall and a bottom structure;

sonic transducer means associated with said tank for projecting sonic energy into said liquid held within said tank; and

anti-reflection means, disposed within said tank in close association with one of said at least one sidewall and said bottom structure, for minimizing reflection of megasonic energy off the associated at least one sidewall or bottom structure, wherein said anti-reflection means inhibits the creation of standing waves within said cleaning liquid held within said tank, said anti-reflection means including means for producing gas bubbles within said cleaning liquid held within said tank along said associated at least one sidewall or bottom structure.

5,533,541
AUTOMATIC UMBRELLA WITH MULTIPLE OPERATION MODES

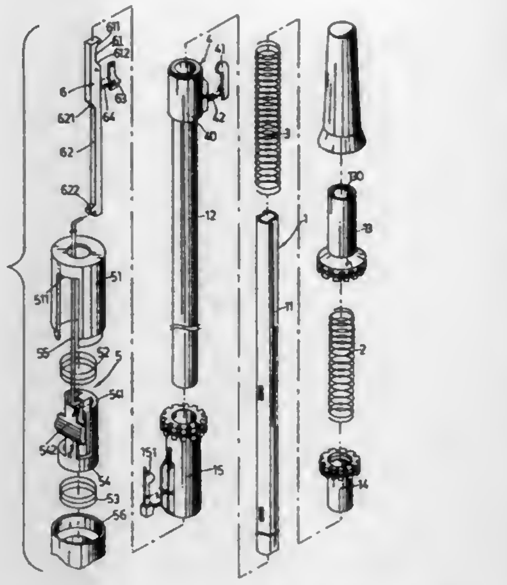
Jonathan Cheng, 5F., No. 10, Lane 169. Sec 1,Ta-an Rd., and Luk Chou, No. 1, Alley 9, Lane 250. Sec 2, Cheng Gung Rd., Nei Hu Area., both of Taipei, Taiwan

Filed May 16, 1995, Ser. No. 442,096
Int. Cl.⁶ A45B ***25/14***
U.S. Cl. 135—22 **4 Claims**

1. An umbrella operable either automatically or manually comprising:

a frame unit, said frame unit comprising an umbrella shaft, which consists of an upper shaft and a bottom shaft telescopically movable in and out of said upper shaft, an inside cap, a top runner, a bottom runner, an open control spring, a collapse control spring, and a rib and stretcher assembly, wherein said inside cap is mounted around a top end of said upper shaft and defining a longitudinal open chamber, said top runner is movably mounted around said upper shaft so as to move axially along said upper shaft between said inside cap and said bottom shaft, said open control spring is mounted around said upper shaft, said open control spring having a top end received in the longitudinal open chamber and a bottom end stopped against said top runner, said collapse control spring mounted around said upper shaft and extending between said top runner and said bottom shaft,

a locating device fixedly secured to said bottom shaft at a top end thereof, comprising a split ring base fixedly mounted around the top end of said bottom shaft and stopped against



said collapse control spring, a spring-biased hook pivoted to said base and urged against said umbrella shaft by the spring bias;

a handle and control device fastened to said umbrella shaft at a bottom end thereof, said handle and control device comprising a handle, a socket, and a control block mounted within said socket and supported between a first return spring and a second return spring, said control block comprising a base and a unitary push plate, said push plate being stopped outside a window on said socket; and

a release control device mounted within said bottom shaft and connected to said control block of said handle and control device by a wire rod and driven by said push plate, said release control device comprising a first control section, a second control section, and a detent, said first control section comprising a first top actuating surface sloping outwardly upwards and a first bottom actuating surface sloping outwardly downwards, said second control section comprising a second top actuating surface sloping outwardly upwards and a second bottom actuating surface sloping outwardly downwards, said detent being pivoted to said release control device between said first control section and said second control section;

wherein said open control spring is compressed to preserve energy for opening the umbrella when the umbrella is collapsed, said collapse control spring is compressed and retained in the compressed position by means of the hook of said locating device and the operation of the detent of said release control device to preserve energy for collapsing the umbrella when the umbrella is opened, whereby, by moving the push plate of said control block upwards or downwards, said release control device automatically opens or closes the umbrella and by moving said bottom runner along the umbrella shaft, the umbrella can be operated manually.

5,533,542
DEVICE FOR CAMOUFLAGING MILITARY EQUIPMENT

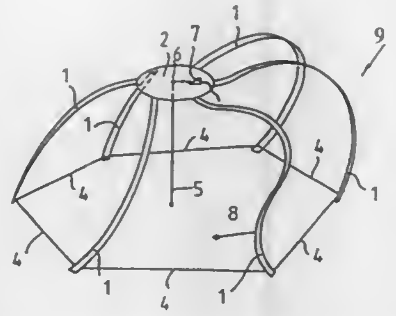
Volker Haager, Ramperstorffergasse 46, A-1050 Vienna, Austria

PCT No. PCT/AT92/00122, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/08440, PCT Pub. Date Apr. 29, 1993

PCT Filed Sep. 28, 1992, Ser. No. 211,733

Claims priority, application Austria, Oct. 18, 1991, 2082/91
Int. Cl.⁶ E04H ***15/40***
U.S. Cl. 135—125 **8 Claims**

1. A camouflage device for military equipment, comprising:



- a disk-shaped connecting element adapted to be disposed above said equipment;
- a multiplicity of elongated supporting lugs, each of said lugs having an upper end connected to said connecting element and a lower end, said supporting lugs being plastically deformable so as to be bent selectively inwardly and outwardly; and
- different camouflage nets secured to opposite sides of said connecting element and to said supporting lugs to impart different appearances to said device depending upon which of said camouflage nets is visible.

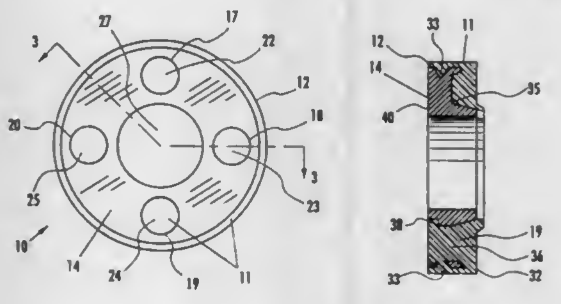
5,533,543
POPPET SEAT FOR AIR REGULATING DEVICES

Roberto Semeia, San Salvatore di Cogorno, Italy, assignor to Johnson Worldwide Associates, Inc., Sturtevant, Wis.

Filed Jan. 19, 1995, Ser. No. 374,963

Int. Cl.^{6} F16L ***55/18***

U.S. Cl. 137—15 **12 Claims**



1. A method for manufacturing a valve seat of the type including an annular base having an outer annular periphery, a central aperture extending from an upper surface to a lower surface and an elastomeric seating material affixed to the base, the method comprising the steps of:

- forming at least one aperture in the base extending from the upper surface adjacent to the central aperture;
- forming an annular groove in the base, the annular groove extending into communication with the at least one aperture, at least a portion of the groove being in generally opposing relation with respect to the upper surface; and
- securing the seating material to the base by molding the seating material onto the base such that the seating material at least partially contacts the upper surface and the outer annular periphery, flows through the at least one aperture, and contacts the portion of the groove.

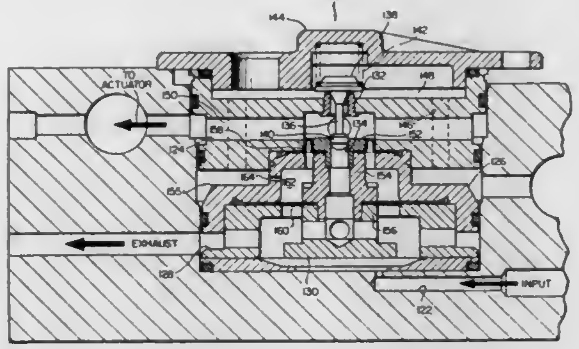
5,533,544
SUPPLY BIASED PNEUMATIC PRESSURE RELAY

Stanley R. Good, and Barry L. Gaarder, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Division of Ser. No. 114,955, Aug. 31, 1993, Pat. No. 5,439,021, which is a continuation-in-part of Ser. No. 942,758, Sep. 9, 1992, abandoned. This application May 31, 1995, Ser. No. 456,243

Int. Cl.^{6} G05D ***16/06***

U.S. Cl. 137—85 **4 Claims**



1. A supply biased pneumatic pressure relay for fluid control comprising:

- a housing including a supply pressure inlet, a variable pressure control inlet, an actuator pressure outlet, and an exhaust outlet;
- a supply port communicating said supply pressure inlet to said actuator pressure outlet;
- an exhaust port communicating said actuator pressure outlet to said exhaust outlet;
- an input diaphragm coupled to said variable pressure control inlet, and respective valve plugs engageably contacting said supply port and said exhaust port and coupled to said input diaphragm for providing a variable pressure at said actuator pressure outlet in response to variable pressure at said variable pressure control inlet by controlling the opening and closing of the supply port and exhaust port;
- supply bias diaphragm means including a pair of diaphragms mounted intermediate said respective valve plugs and said input diaphragm, said pair of diaphragms defining a supply bias cavity therebetween; and
- flow means communicating said supply pressure inlet to said supply bias cavity for biasing said relay to form an initial pressure at said actuator pressure outlet commensurate with the variable pressure at said variable pressure control inlet based on the supply pressure at said supply pressure inlet.

5,533,545
DRAIN SYSTEM

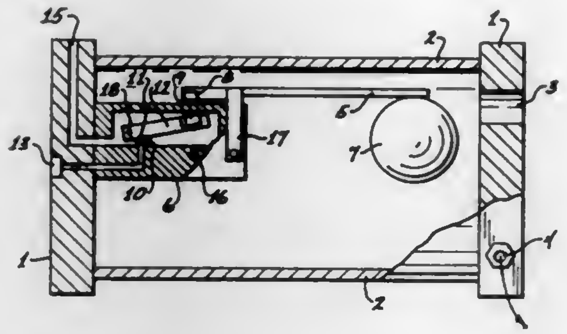
Larry P. Robinson, Depew, N.Y., assignor to Air System Products, Inc., Lancaster, N.Y.

Filed Jul. 18, 1995, Ser. No. 504,058

Int. Cl.^{6} F16K ***31/34***

U.S. Cl. 137—195 **6 Claims**

1. An automatic liquid drain system comprising in combination a liquid reservoir, air exit means, a lever arm, a float air control means and a valve housing, said lever arm, said air control means and said valve housing all located entirely within said reservoir, said lever arm having a fulcrum attached to said valve housing, said lever arm having said float attached on one of its terminal ends and a metallic component on an opposite terminal-end, said metallic component adjacent and above said valve housing, said valve housing having means in cooperation with said float means and said metallic component to open and close an air hole of said air control means, said float movable with a varying liquid level in said reservoir, said float in an upper position having means to permit air to enter said valve housing via an air supply inlet, said air control means comprising an air hole located in air flow connection from said valve housing to said air exit means, said air control means also comprising a valve lever therein having a magnet adjacent a first valve lever end portion and a seal on a second valve lever end portion, said seal having means to open and seal said air hole upon attraction of said magnet to said metallic component.



5,533,546
ASSEMBLY FOR PREVENTION OF BACKFLOW IN VALVES

Lloyd J. Dixon, Brisbane, Australia, assignor to Valvtec Pty Limited, Queensland, Australia

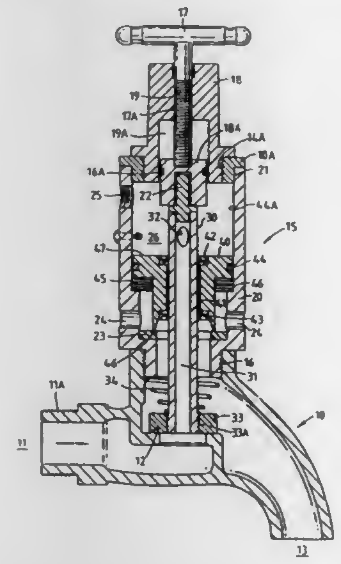
PCT No. PCT/AU92/00082, § 371 Date Aug. 25, 1993, § 102(e) Date Aug. 25, 1993, PCT Pub. No. WO92/14954, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 26, 1992, Ser. No. 107,770

Claims priority, application Australia, Feb. 26, 1991, PK4822

Int. Cl.^{6} F16K ***24/00;*** **E03C** ***1/10***

U.S. Cl. 137—218 **20 Claims**



1. A valve assembly suitable for backflow prevention in a stop cock having an inlet, a stop cock seat and an outlet and attachable thereto, the valve assembly including:

- a valve body having at least one opening and also including a valve chamber and a valve seat; a balance tube in the valve body communicating with the valve chamber and having one end engageable with the stop cock seat in use for sealing against the stop cock seat for prevention of flow of fluid from inlet to outlet, wherein the balance tube is free to move against the stop cock seat under the influence of gravity;
- a piston within the valve body and engageable with the valve seat; and
- biasing means operable to unseat the piston from the valve seat to enable the outlet to communicate with the valve body opening.

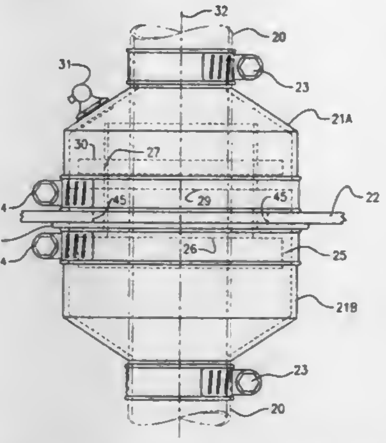
5,533,547
BULKHEAD ENTRY FILLING

Robert W. Arn, Jacksonville, Fla., assignor to Petroleum Containment, Inc., Jacksonville, Fla.

Filed Sep. 1, 1995, Ser. No. 523,080

Int. Cl.^{6} F16L ***5/00***

U.S. Cl. 137—360 **20 Claims**



1. A fitting for sealing the intersection of a pipe passing through a wall comprising a threaded adapter, an adapter gasket, an O-ring support, and a nut threadedly joined together to form an adapter assembly designed to fit concentrically around said pipe where it passes through said wall; two generally hemispherical resilient covers adapted to enclose the portions of said adapter assembly on each side of said wall, and hose clamps at each end of each said hemispherical cover, one of said hemispherical covers having a pressure grease fitting thereon to allow the space between said covers and said adapter assembly to be filled with pressurized grease.

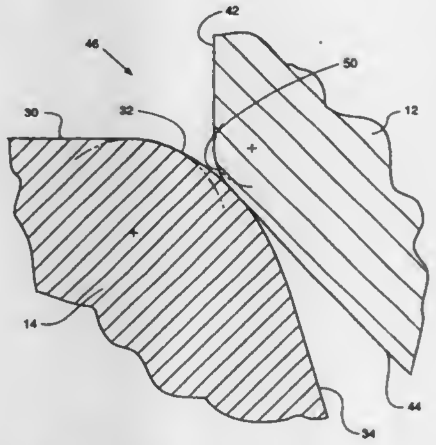
5,533,548
VALVING INTERFACE FOR A POPPET VALVE

Shannon G. Grant, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed May 18, 1995, Ser. No. 443,619

Int. Cl.^{6} F16K ***15/02;25/00***

U.S. Cl. 137—540 **13 Claims**



1. A valving interface for a poppet valve, comprising:

- a housing having a first bore, a smaller second bore at one end thereof with an angled surface extending outwardly from the smaller second bore towards the first bore to define a valve seat;
- a poppet slidably disposed in the first bore of the housing and having an end portion with an end surface, an angled surface generally adjacent the end surface, and a spiral convex contoured surface disposed between the end surface and the angled surface.

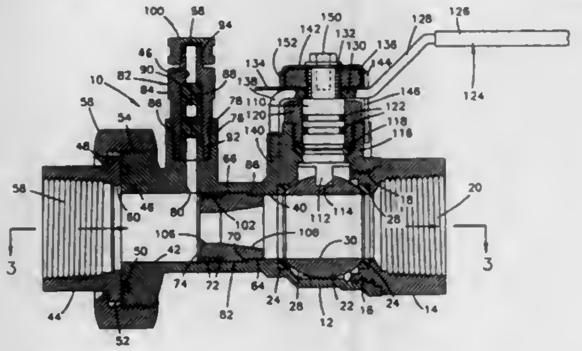
5,533,549
BALL VALVE WITH INTEGRATED REMOVABLE FLOW VENTURI, FLOW BALANCING MEANS, AND PIPE UNION MEANS

John C. Sherman, Highland, Mich., assignor to Hydronic Components, Inc., Madison Heights, Mich.

Filed Jan. 26, 1995, Ser. No. 378,776

Int. Cl.⁶ G01F *1/44*

U.S. Cl. 137—557 **4 Claims**



1. In a valve assembly, the combination comprising:
(a) an elongated valve body (**12**) having an inlet end and an elongated inlet bore (**40,42**);
(b) a flow venturi (**62**) removably mounted in said elongated inlet bore (**40,42**), and having an inlet end with an entrance throat passage (**106**) and an outlet end with an exit passage **108**;
(c) a union tailpiece (**44**) detachably mounted on the inlet end of the valve body (**12**), by a union nut (**56**), and having an inlet port (**58**) formed therein;
(d) said elongated valve body (**12**) having a ball valve chamber (**26**) formed therein, adjacent the venturi exit passage (**108**);
(e) a quarter-turn ball valve (**22**) rotatably mounted in said ball valve chamber (**26**) for controlling the flow of fluid through the valve body (**12**);
(f) a valve body nut (**14**) detachably mounted on the valve body (**12**), adjacent the ball valve chamber (**26**), and having an outlet port (**20**) formed therein;
(g) a first pressure/temperature readout port (**82**) detachably mounted on said valve body (**12**);
(h) a first readout passage (**80**) formed in the valve body (**12**) and communicating said first pressure/ temperature readout port (**82**) with said elongated inlet bore (**42**) adjacent the inlet end of the venturi (**62**);
(i) a second pressure/temperature readout port (**82***a*) detachably mounted on said valve body (**12**);
(j) a second readout passage (**80***a*) formed in the valve body (**12**) and communicating said second pressure/ temperature readout port (**82***a*) with passage means (**102,104**) in the venturi (**62**) which communicate with the venturi entrance throat passage (**106**);
(k) control lever means (**124**) attached to said ball valve (**22**) for rotating the ball valve (**22**) between open and closed positions; and,
(l) said pressure/temperature readout ports (**82,82***a*) being adapted to allow pressure and temperature detecting instruments to be inserted throughout to provide the pressure and temperature differences of fluid flowing into the venturi (**62**) and the fluid flowing through the entrance throat passage (**106**) of the venturi (**62**), for determining the rate of flow of fluid through the ball valve (**22**) for setting the ball valve (**22**) in a selected open position.

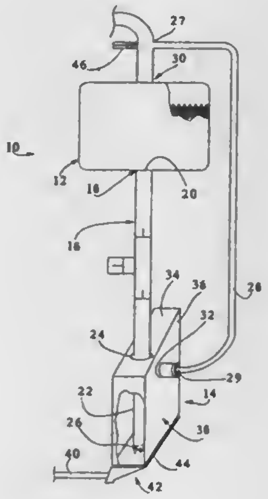
5,533,550
TANK VENTING APPARATUS FOR A PACKAGING MACHINE

Rickard Franke, Dalby, Sweden; Per Brandstrom, Lake Zurich, Ill.; Yutaka Kaneko, Wheeling, Ill., and Bengt Andersson, Buffalo Grove, Ill., assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Sep. 30, 1994, Ser. No. 315,958

Int. Cl.⁶ B65B *3/00*

U.S. Cl. 141—51 **3 Claims**



1. A packaging machine comprising:
- a product tank adapted to receive and dispense a fluid material, the product tank having a vent opening in fluid communication with head space in the product tank, the pressure of the head space being about atmospheric pressure;
- a clean cover;
- a filling tube extending from and in fluid communication with the product tank at a first end, the filling tube having a second end having a nozzle for dispensing the fluid material flowing from the product tank through the filling tube during production;
- a cleaning box surrounding the second end of the filling tube, the cleaning box having an opening adapted to receive the second end of the filling tube, a carton opening adapted to alternately receive the clean cover and at least one carton, and a vent opening;
- a vent pipe connecting the vent opening of the cleaning box to the vent opening of the product tank;
- a carton lifter for lifting the at least one carton into the cleaning box to a position proximate the second end of the filling tube for filling with the fluid material, air displaced by lifting the at least one carton into the cleaning box being directed through the vent pipe and into the product tank to reduce any underpressure in the head space of the product tank to thereby maintain the pressure of the head space at about atmospheric pressure and facilitate rapid filling of the cartons with the fluid material from the fill tank.

5,533,551
PRESSURE REGULATING SERVOVALVE

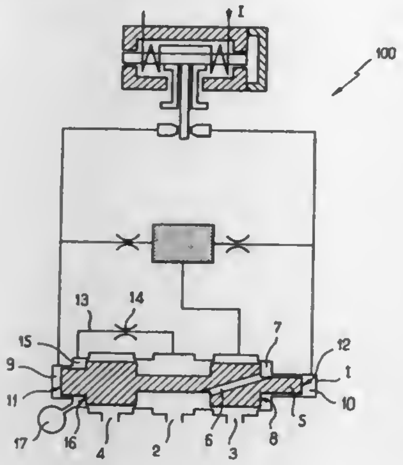
Raymond Grancher, Bonneval, France, assignor to L'Hydraulique Chateaudun, France

Filed Jan. 18, 1995, Ser. No. 375,411

Claims priority, application France, Jan. 21, 1994, 94 00649

Int. Cl.⁶ F15B *13/043*

U.S. Cl. 137—625.62 **8 Claims**



1. Pressure-regulating servovalve comprising a distributor body having an output port, a feed port and a return port, and a slider adapted to slide inside the distributor body between a first position isolating the output port from the feed and return ports, a second position connecting the output port to the feed port and a third position connecting the output port to the return port, the slider co-operating with the distributor body to define two pilot chambers fed with a pilot fluid from a pilot unit and an output chamber connected to the output port by an output passage, the servovalve including a damper chamber in the distributor body including mechanical means for reducing its hydraulic stiffness and connected to the output port via a damper passage including a calibrated orifice.

5,533,552
BOTTLE FILLING MACHINE AND A CLEANSING SYSTEM ACCESSORY INCLUDING AN OPERATOR THEREFOR

Egon N. Ahlers, Neutraubling, Germany, assignor to Krones AG, Neutraubling, Germany

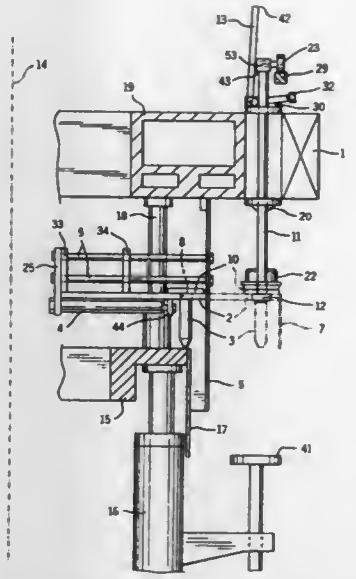
Filed Dec. 20, 1994, Ser. No. 359,420

Claims priority, application Germany, Dec. 23, 1993, 93 19 866.3

Int. Cl.⁶ B67C *3/00;3/22*

U.S. Cl. 141—144 **15 Claims**

1. A container filling machine comprising:
- a generally circular storage tank (**19**) having radially outwardly facing periphery that is concentric to a vertical axis (**14**),
- a turntable (**15**) supporting the tank for the turntable and tank to rotate about said vertical axis,
- a plurality of container filling units (**1**) mounted to and equiangularly spaced apart around the periphery of the tank,
- a vertically extending generally circular barrier wall (**5**) mounted for rotating with the tank and the container filling units thereon, the barrier wall is positioned radially inwardly of the filling units on the tank,
- guide structures (**9,36**) corresponding in number with the number of filling units (**1**) fixedly mounted in the space in the machine circumscribed by the barrier wall, each guide structure having a cup support (**2,37**) and a closure cup (**3**) mounted thereon for the support to be advanced on the guide structure from a parked position radially inwardly of the barrier wall (**5**) through an opening in the barrier wall and radially outwardly of the barrier wall to an active position for the cups to couple to the filling units, respectively,
- an actuator operative to advance said cup support to active position and to retract said closure cup support to parked position, and
- a cover (**7**) moved to close the opening in the barrier wall (**5**) in response to the support (**2,37**) becoming fully retracted.



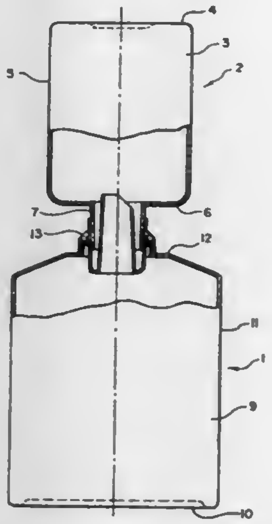
5,533,553
CONTAINER SET COMPRISING AT LEAST TWO CONTAINERS

Steen Vesborg, Gentofte, Denmark, assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Jan. 26, 1994, Ser. No. 186,722

Int. Cl.⁶ B65B *1/04;3/04*

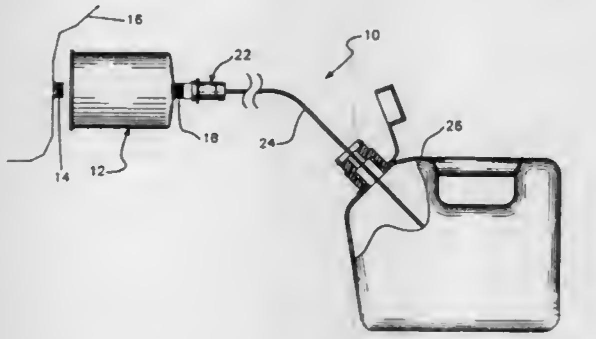
U.S. Cl. 141—319 **13 Claims**



1. A container set comprising at least two containers, where a first container is adapted to be reused by way of being refilled with the contents of a second container containing a product of a volume not exceeding the volume of the first container, each of said containers comprising mouth parts with an opening portion allowing free passage of the contents when said containers are used, wherein the first and the second container comprise guide means allowing a coupling together of said containers to a position, in which said containers are mutually immovable at least in the radial direction and in which the opening portions allow a free

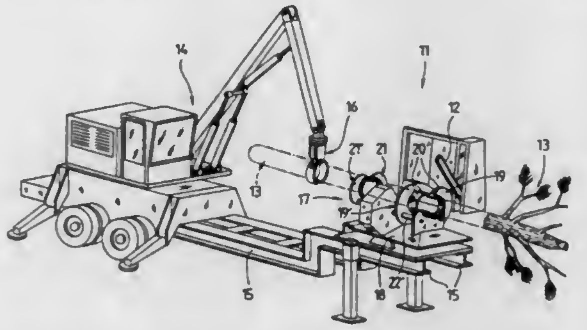
passage of the contents from the first container into the second container, the mouth parts of said first and second coupled containers comprising cooperating fastening means, guide means and anti-leak seal means wherein said cooperating fastening means comprise detachably fastening the first and second containers to one another in their coupled position and said cooperating anti-leak means comprise cooperating sealing faces wherein at least one of the sealing faces is a tapered face thereby preventing the contents from leaking into the surroundings at least during passage of said contents from the second container to said first container.

5,533,554
ENGINE OIL DRAINING SYSTEM
Michael E. Young, 42 Euclid Ave., San Leandro, Calif. 94577
Filed May 22, 1995, Ser. No. 446,458
Int. Cl.⁶ B65B *1/04;3/00;* **B67C** *3/00*
U.S. Cl. 141—383.000 **2 Claims**



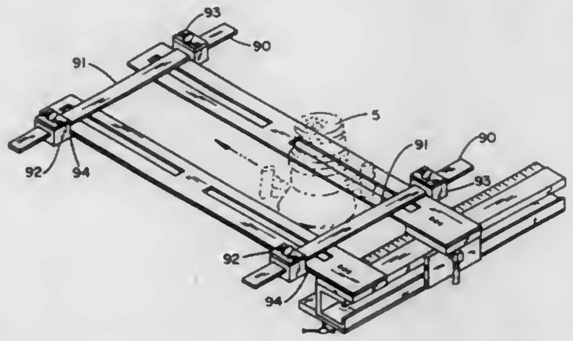
1. An engine oil draining system comprising:
an oil filter adapted to be coupled to an oil filter fitting of an engine,
the oil filter includes an exterior casing; a center tube concentrically positioned within the exterior casing, the center tube including interior threads which are adapted to couple with an oil filter fitting of an engine, the center tube including apertures directed therethrough; and a cylindrical filter concentrically positioned about the center tube so as to filter oil directed radially of the center tube through the apertures in the center tube,
a threaded fluid tap extends through the exterior casing and into contiguous fluid communication with the center tube,
a coupling means for coupling a drain conduit into fluid communication with the threaded fluid tap comprising a coupling tube having a first set of interior threads adapted to be mated with exterior threads of the threaded fluid tap; an abutment plate extending transversely across an interior of the coupling tube and including a center aperture; and a tapered compression fitting received within the center aperture of the abutment plate; a seal adapted to be concentrically positioned about a fluid conduit, the seal being positioned within the coupling tube so as to abuttingly engage a portion of the tapered compression fitting; and a threaded boss including a central aperture directed therethrough permitting projection of the fluid conduit through the central aperture such that the threaded boss can be concentrically positioned thereabout, the threaded boss abutting the compression fitting and including exterior threads threadably engaged with a second set of interior threads formed along an interior surface of the coupling tube so as to permit axial advancing of the tapered compression fitting into the center aperture of the abutment plate to cause a radial compression of the tapered compression fitting to form a seal about an exterior of the fluid conduit, and
the oil filter further includes a closure cap including a circular sealing disk, the closure cap being coupled to the threaded fluid tap.

5,533,555
DELIMBING APPARATUS HAVING SELECTIVE CLOSABLE GUIDE ARMS
Thomas H. Hudson, 2688 Virginia Dr., Hueytown, Ala. 35023
Continuation-in-part of Ser. No. 47,912, Apr. 19, 1993, Pat. No. 5,293,914. This application Mar. 14, 1995, Ser. No. 403,298
Int. Cl.⁶ B27L *1/00;* **A01G** *23/00*
U.S. Cl. 144—24.13 **13 Claims**



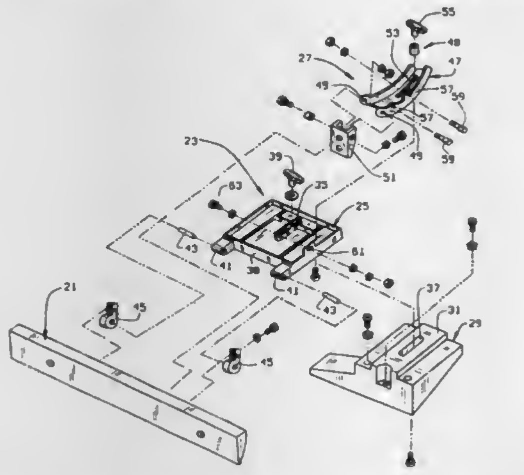
9. Apparatus for delimbing felled trees, comprising:
(a) a pair of stripping arms and a pair of guide arms arranged in spaced relation along a longitudinal axis and mounted to a common pivotal frame for concomitant movement therewith responsive to the movement of a tree substantially along said axis, each pair being mounted for pivotal movement about parallel axes such that each arm of said pair moves between a closed position proximal the other arm of said pair and an open position distal the other arm of said pair;
(b) hydraulic means for selectively moving said arms of said pair to said open and closed positions; and
(c) valve means for controlling said hydraulic means such that said guide arms may be selectively maintained in an open position while said stripping arms are moved to a closed position as a tree is moved therethrough such that deviations of said tree from said longitudinal axis are accommodated by movement of said frame without binding of said tree between said guide arms and said stripping arms.

5,533,556
ROUTER GUIDE APPARATUS
David Whitney, 34 Woodland Rd., Rochester, Mass. 02770
Filed Feb. 3, 1995, Ser. No. 383,307
Int. Cl.⁶ B27M *3/00;* **B27C** *5/00*
U.S. Cl. 144—144.52 **20 Claims**



1. In combination with a router attached to a router plate, an adjustable double fence router guide apparatus for guiding said router on a horizontally-oriented workpiece having an upper surface and an undersurface, comprising:
a horizontal, fence track attached to said workpiece, said fence track having two fence mounts each adapted to pivotally attach a fence to said fence track, one said mount being a fixed mount in a fixed position on said fence track and the other said mount being a movable mount on said fence track relative to said fixed fence mount;
a horizontal, fixed fence positioned on said workpiece upper surface, said fixed fence defining one side of a workpiece cut and being pivotally attached to said fence track fixed mount;
a horizontal, movable fence positioned on said workpiece upper surface parallel to said fixed fence, said movable fence defining another side of a workpiece cut and being pivotally attached to said fence track movable mount; and
two horizontal, adjustable, router stops, positioned over said workpiece, attached to said fence track.

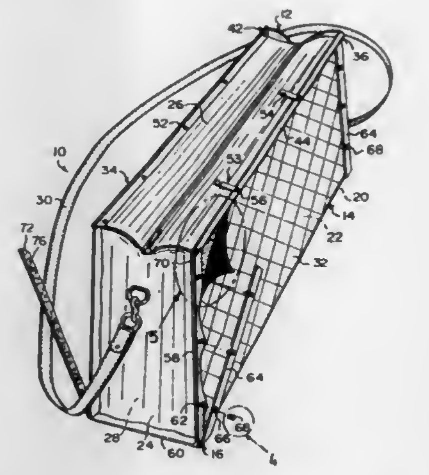
5,533,557
JOINTER/PLANER MACHINE
Frederick B. Jedlicka, Jerseyville, Ill., and Frank J. Tomiser, Jr, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 10, 1995, Ser. No. 370,662
Int. Cl.⁶ B27C *1/14;1/12*
U.S. Cl. 144—253.8 **16 Claims**



1. An adjustable worktable fence for a jointer/planer machine, comprising:
an elongated worktable including a rotating cutter mounted in alignment with and positioned below a transverse slot in the elongated table;
an adjustable worktable fence extending generally longitudinally along the elongated worktable in generally transverse relationship to the rotating cutter operating below the transverse slot in the elongated worktable;
transverse fence adjusting means mounted to said adjustable worktable fence and to said elongated table for slidable adjustable movement of said adjustable worktable fence in generally transverse relationship to said rotating cutter, said transverse fence adjusting means being pivotally mounted to said adjustable worktable fence; and
bevel fence adjusting means mounted to said transverse fence adjusting means while also being independently pivotally mounted to said adjustable worktable fence for independent bevel adjustment of said adjustable worktable fence relative to said rotating cutter.

5,533,558
CREATIVE PURSE WITH INTERCHANGEABLE DECORATIVE COVERING
Sheri Carey, and Thomas F. Carey, 375 Pine Needles La., both of Southern Pines, N.C. 28387-6910
Filed Apr. 3, 1995, Ser. No. 415,513
Int. Cl.⁶ A45C *3/08;13/02;13/08*
U.S. Cl. 150—105 **6 Claims**

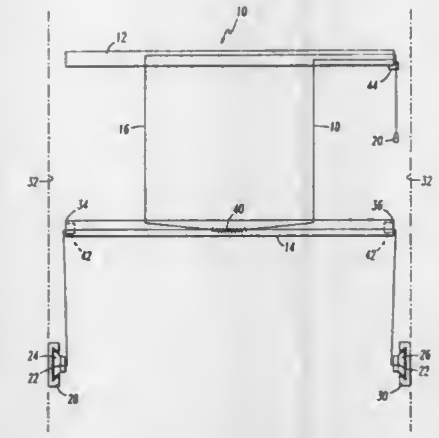
1. A creative purse comprising:



a) a bag body comprising a front panel, a bottom panel, a rear panel, a pair of side gussets, and a top access panel forming at least one compartment in said bag body for storing small articles therein;
b) a separable decorative covering comprising a one piece thin flexible sheet sized and shaped to extend over and cover said front panel, said bottom panel, and said rear panel of said bag body;
c) means for securing said separable decorative covering to said bag body in a releasable manner, so that the appearance of said bag body can be changed at will when the need arises, said securing means including a first clamp member extending the full length across a top edge of said front panel of said bag body spring biased closed to retain a first end of said separable decorative covering and a second clamp member extending the full length across a top edge of said rear panel of said bag body spring biased to retain a second end of said separable decorative covering thereto; and
d) said first and second clamp members each including a first elongated leaf having a first set of staggered barrels, means for affixing said first elongated leaf a adjacent a top edge of said front/rear panel in a stationary manner, a second elongated leaf having a second set of staggered barrels, an elongated pintle extending through and interconnecting said first set of staggered barrels with said second set of staggered barrels, so that said second elongated leaf can pivot thereon, and spring located on said pintle to normally keep said second elongated leaf down in a closed position clamping the first and second ends of said decorative covering between the first and second elongated leafs of said first and second clamp members, respectively.

5,533,559
WINDOW SHADE ASSEMBLY WITH HOLD DOWN
Ren Judkins, 46 Newgate Rd., Pittsburgh, Pa. 15202
Filed Feb. 6, 1995, Ser. No. 383,879
Int. Cl.⁶ E06B *3/94*
U.S. Cl. 160—84.06 **20 Claims**

1. A window shade assembly comprising:
a headrail;
a bottomrail spaced from said headrail and being movable toward or away from said headrail;
window shade material provided between and lying in a plane between said headrail and said bottomrail;
at least one cord traveling through said headrail and through said bottomrail, wherein a first end of said at least one cord is accessible to an operator;
a pair of transfer plates, each such transfer plate being connected to a second end of said at least one cord;
means for retaining said transfer plates in a fixed position relative to said headrail and for releasing said transfer plates from said fixed position;



wherein said bottomrail is raisable and lowerable relative to said headrail by retaining said transfer plates in said fixed position and manually moving said bottomrail; and

wherein said bottomrail is also raisable and lowerable relative to said headrail by releasing said transfer plates from said fixed position and drawing said at least one cord into and out of said headrail.

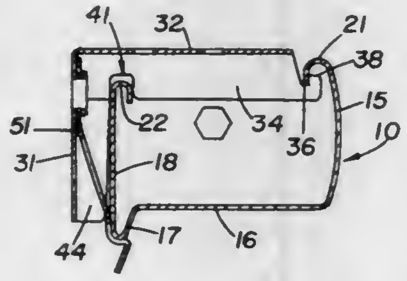
5,533,560
VENETIAN BLIND HEADRAIL AND MOUNTING BRACKET SYSTEM

John E. Morris, Lake Mills, Wis., assignor to Springs Window Fashions Division, Inc., Middleton, Wis.

Filed Oct. 11, 1994, Ser. No. 321,962

Int. Cl.⁶ E06B *9/38*

U.S. Cl. 160—178.1 **15 Claims**



1. A venetian blind headrail and bracket system comprising,

(a) an elongate headrail including a bottom wall, light block panel means extending downwardly and rearwardly along a rear edge of the bottom wall, a rear wall, and a front wall, the front wall having a rearwardly and downwardly extending front upper rim and the rear wall having a forwardly and downwardly extending rear upper rim, the rear upper rim having an upper surface spaced a preselected distance from a lower edge of the light block panel means,

(b) at least one mounting bracket, each mounting bracket including a rear plate and an upper plate extending forwardly from an upper edge of the rear plate, the bracket having upwardly opening front notch means located forwardly of a front edge of the upper plate for receiving a lower edge of the front upper rim, a depending flange on the upper plate having a downwardly opening rear notch means spaced rearwardly of the front notch means for receiving the rear upper rim, the downwardly opening rear notch means having a base edge and opposed rear and front edges, support means on the mounting bracket including a ledge portion spaced below the base edge of the rear notch means a distance greater than said preselected distance and such that the ledge portion can engage the lower edge of the light block panel means to support the headrail in a mounted position on the bracket with a clearance between the rear upper rim and the base edge of the rear notch means, the rear upper rim having an outer width measured perpendicular to the rear wall, the front edge of the rear notch means being spaced from the opposed rear edge of the rear notch means a distance sufficiently less than the outer width of the rear upper rim to have an interference fit therewith when the headrail is in the mounted position on the bracket.

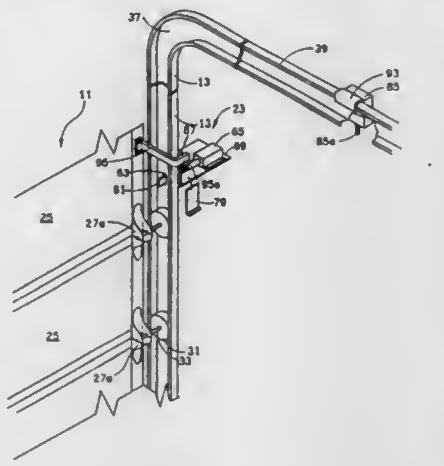
5,533,561
GARAGE DOOR SECURITY SYSTEM

L. Langstroth Forehand, IV, 848 Harding St., Escondido, Calif. 92027

Continuation of Ser. No. 705,290, May 24, 1992, abandoned. This application Nov. 12, 1992, Ser. No. 976,002

Int. Cl.⁶ E05F *15/00*

U.S. Cl. 160—188 **6 Claims**



1. An automatically operable garage door installation incorporating a security system to guard against unauthorized entry, which installation comprises:

a multi-sectional garage door for closing the vehicle entrance into an area in a structure large enough to accommodate an automotive vehicle, which door includes a plurality of generally similar horizontally extending panels, which panels are hinged together along the upper and/or lower edges thereof to constitute a solid barrier to entry through said entrance,

said door being supported via a plurality of rotatable rollers mounted on shafts generally extending from locations near the lateral edges of said door,

a pair of flanking, longitudinally extending, supporting tracks which have trackways wherein said rollers are received, said tracks being located so as to guide said door for travel to and from between a vertical position where said entrance is closed and an upper horizontal position where said entrance is sufficiently open to allow a vehicle to be driven therethrough, one of said tracks having at least a first aperture in a sidewall thereof;

a detent

a bracket mounting said detent for movement between a first position across said track and into said aperture and to a retracted position;

a spring biasing said detent toward said first position;

electromagnetic means for moving said detent to said retracted position;

a door-operating mechanism which includes an electric drive motor for moving said door between said upper open position and said lower closed position;

means for energizing said electromagnetic means whenever electrical power is supplied to said electric motor through said first electric circuit means to thereby cause said detent to be withdrawn from said trackway to said retracted position;

said means for energizing including two limit switches which are located along said track and which are operable to remove electrical power from said electromagnetic means upon said door reaching about either its fully open position or its fully closed position, whereby said spring biases said detent to said first position when the door reaches its fully closed position thereby preventing unauthorized opening of the door because any significant upward movement of said door causes a roller in said trackway to engage said detent which physically obstructs its passage so that any further upward opening movement of the door is not possible.

5,533,562
METHOD AND SYSTEM FOR SEMILIQUID DIE CASTING HIGH PERFORMANCE MECHANICAL COMPONENTS FROM RHEOCAST INGOTS

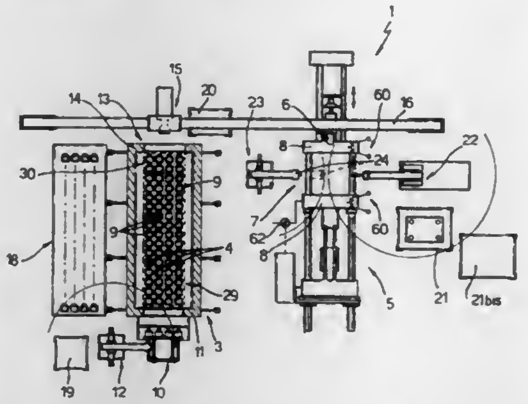
Renzo Moschini, Senigallia, and Stefano Poggi, Bolognese, both of, Italy, assignors to Weber S.r.l., Turin, Italy

Filed Sep. 29, 1994, Ser. No. 315,236

Claims priority, application Italy, Sep. 29, 1993, TO93A0709

Int. Cl.⁶ B22D *27/08;17/08*

U.S. Cl. 164—71.1 **11 Claims**



1. A method of semiliquid die casting a metal alloy comprising:

placing a rheocast ingot of the metal alloy in a container;

preheating the metal alloy ingot to a semiliquid state in a forced-convection-heated furnace;

withdrawing the container and the preheated metal alloy contained therein from the furnace;

immersing a thermocouple in the metal alloy during transfer of the container from the furnace thereby determining whether the metal alloy is within an acceptable temperature range, said acceptable temperature range being dependent upon the composition of the metal alloy and ranging from a minimum permissible injection temperature at which the ingot begins to be visibly incapable of maintaining its shape to a maximum permissible injection temperature at which the metal alloy has an apparent viscosity such that the metal alloy may fill a mold under laminar flow conditions; and

transferring the metal alloy from the container into an injection chamber operatively connected to the mold when the metal alloy is within the acceptable temperature range and rejecting the metal alloy when the metal alloy is not within the acceptable temperature range.

7. A system for semiliquid die casting a metal alloy comprising:

a tunnel furnace for preheating the ingots to a temperature within the solidification range of said metal alloy;

a plurality of containers for holding the ingots;

a first robotic handling device operatively associated with a loading station located at a first end of the tunnel furnace whereby said first robotic handling device places each ingot into a respective container and loads a side-by-side plurality of the ingots and respective containers on the loading station;

said loading station having means for simultaneously inserting said side-by-side plurality of ingots and respective containers into the furnace;

conveying means for conveying said side-by-side plurality of ingots and respective containers from said first end of said furnace to a second end of said furnace opposite said first end;

an unloading station located at the second end of the furnace; said unloading station having a limit stop for aligning said side-by-side plurality of ingots and respective containers;

a die casting machine comprising an injection chamber for receiving the preheated ingots one at a time and a mold having at least two half molds movable in relation to each other;

a second robotic handling device operatively associated with said unloading station, said die casting machine and a rejection bin; whereby said second robotic handling device removes said side-by-side plurality of ingots and respective containers located on said unloading station one ingot and respective container at a time and selectively transfers said one ingot of said side-by-side plurality from said respective container to the injection chamber of the die casting machine when the one ingot is within an acceptable temperature range and to said rejection bin when the one ingot is not within said acceptable temperature range; and

a thermocouple which is immersed in the one ingot of said side-by-side plurality during transfer by the second robotic handling device whereby the temperature of the one ingot is determined prior to completion of the transfer of the one ingot.

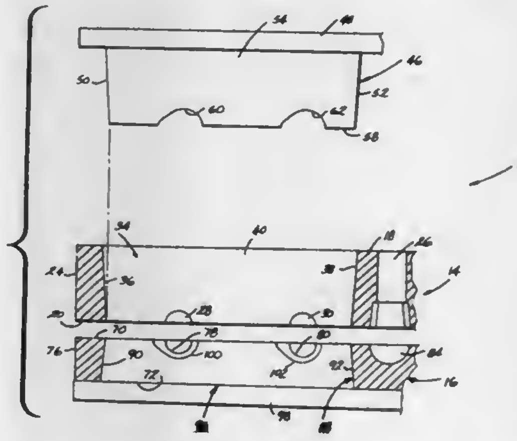
5,533,563
MOLD AND METHOD FOR MAKING VARIABLE HARDNESS CASTINGS

Lawrence J. Lee, Sr., 17497 N. Fruitport Rd., Spring Lake, Mich. 49456

Filed Mar. 30, 1995, Ser. No. 413,513

Int. Cl.⁶ B22D *15/00*

U.S. Cl. 164—127 **20 Claims**



1. A mold assembly for producing a molded article comprising:

a cope having an exterior surface and a mold joint surface;

a drag having an exterior surface and a mold joint surface;

a mold cavity defined by at least a portion of the mold joint surfaces of the cope and drag when said mold joint surfaces abut one another;

at least one chill aperture formed in one of the cope and drag, the at least one aperture extending from the exterior surface to a point adjacent to at least a portion of the mold cavity and being defined by at least one tapered sidewall so that the aperture adjacent the exterior surface is greater than that adjacent the mold cavity;

a chill member support plate; and

at least one chill member depending from the chill member support plate and having a molding edge and at least one tapered sidewall extending from the molding edge toward the support plate, the at least one tapered sidewall of the at least one chill member cooperating with the at least one tapered sidewall of the at least one chill aperture so that the at least one chill member is slidably receivable into the at least one chill aperture so that the molding edge is positioned adjacent the mold cavity and slidably removable from the at least one chill aperture prior to shakeout of the molded article from the mold cavity.

5,533,564

DIE CASTING FOUNDRY MACHINE ADAPTED IN PARTICULAR TO THE PRODUCTION OF METAL PARTS IN SMALL AND MEDIUM SERIES

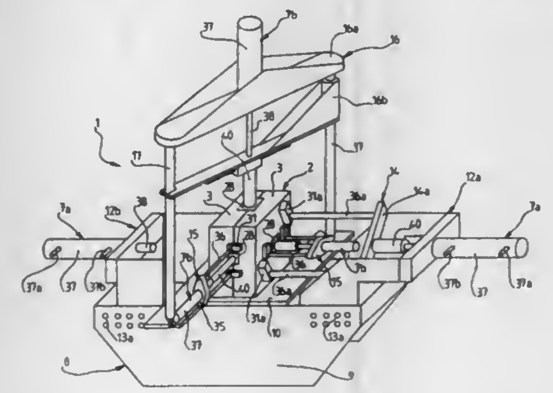
Marcel P. G. Alberola, Aulnay Sous Bois; René G. M. Marchal de Corny, Paris, and Georges M. Alexandre, Menestreau En villette, all of, France, assignors to Alu Livry, Livry Gargan, France

Filed Dec. 2, 1994, Ser. No. 352,861

Claims priority, application France, Dec. 3, 1993, 93 14 550

Int. Cl.^{6} B22D *17/26;33/04*

U.S. Cl. 164—342 **14 Claims**



1. A die casting machine for the production of metal parts, comprising:

- at least two die cheek parts for receiving molten materials, wherein the die cheek parts form a cavity;
- a framework having a supporting wall for supporting the die cheek parts;
- at least one cheek-moving jack having means for supporting and displacing the die cheek parts, which permits removal of the metal parts;
- at least one removable coupling member, wherein an end of the coupling member is removable and directly supported by a die cheek part and the other end is removably connected to the cheek-moving jack;
- at least one cheek-moving jack carrier mounted on said framework;
- at least one hollow-formation reservation member for insertion into the cavity;
- at least one reservation member-moving jack having means for supporting and displacing the hollow-formation reservation member; and
- at least one removable reservation member-moving jack carrier, wherein an end of the latter is removably and directly supported by one of the die cheek parts.

5,533,565

MOLD OSCILLATION DEVICE CAPABLE OF AUTOMATICALLY ADJUSTING AN OSCILLATION OF A MOLD USED IN A CONTINUOUS CASTING MACHINE

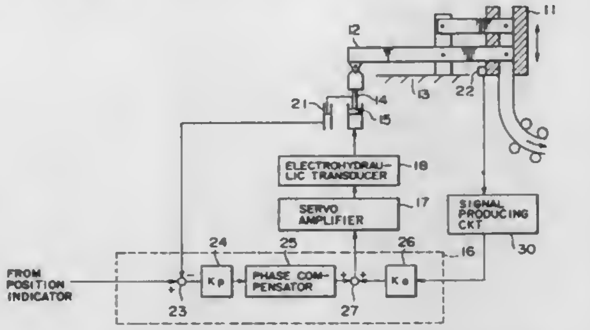
Kazuho Kodaira, Kanagawa; Yasuhito Itoh, and Tetsuya Watanabe, both of Ehime, all of, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 24, 1995, Ser. No. 377,244

Claims priority, application Japan, Feb. 4, 1994, 6-012349

Int. Cl.^{6} B22D *11/04;46/00;11/16;* **B22C** *19/04*

U.S. Cl. 164—416 **10 Claims**



1. A mold oscillation device for oscillating a mold used in a continuous casting machine, said mold oscillation device comprising:

- oscillation detecting means operatively coupled to said mold for detecting oscillation to produce an oscillation detection signal having a waveform related to said oscillation:
- signal producing means connected to said oscillation detecting means and responsive to said oscillation detection signal for judging said waveform and for selecting an adjustment level with reference to said waveform to produce an adjusting signal representative of said adjustment level; and
- control means connected to said mold and said signal producing means for controlling said oscillation with reference to said adjusting signal.

5,533,566

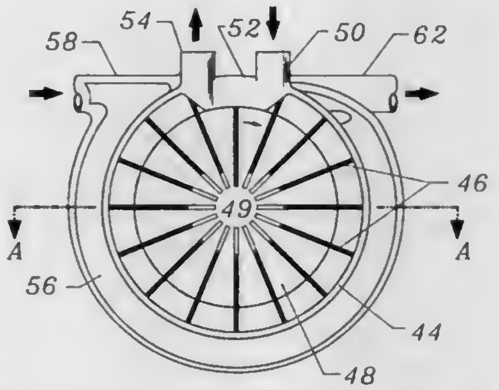
CONSTANT VOLUME REGENERATIVE HEAT EXCHANGER

Solomon S. Fineblum, 268 Greystone La., Rochester, N.Y. 14618

Continuation-in-part of Ser. No. 838,502, Feb. 18, 1992, abandoned. This application Sep. 30, 1992, Ser. No. 950,861

Int. Cl.^{6} F01C *21/04*

U.S. Cl. 165—1 **3 Claims**



1. The method of operating a regenerative, constant volume heat exchanger comprising the steps of establishing a first fluid flow to be treated having a given mean operating temperature, the flow of the first fluid being in a first direction at substantially a constant flow rate into a moving constant volume space, said first fluid being a compressible fluid; establishing a counter flow of a second fluid, said second fluid being a compressible fluid, having a different mean operating temperature than that of the first fluid and flowing in a direction substantially opposite the direction of flow of the first fluid; and maintaining the two fluid flow in heat transfer relationship through a substantial part of their flow paths to effect transfer of heat from one of the fluids to the other with an accompanying change in pressure of the first fluid and further including the step of isolating the input of the fluid from its output.

5,533,567

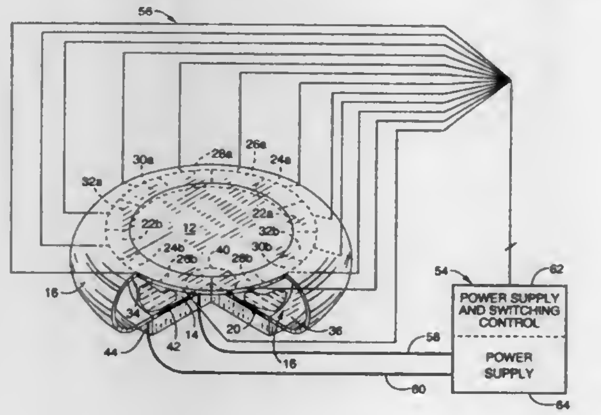
METHOD AND APPARATUS FOR UNIFORM HEATING AND COOLING

Maurice H. P. M. Van Putten, Ithaca, N.Y., and Andrew G. Felce, London, England, assignors to The Regents of The University of California, Oakland, Calif.

Filed Dec. 14, 1994, Ser. No. 356,447

Int. Cl.^{6} F28F *13/06*

U.S. Cl. 165—1 **54 Claims**



1. A method for uniformly heating or cooling a plate, comprising the steps of mediating homogeneous heat transfer between the plate and a heating or cooling source through an electrically and thermally conductive fluid forced into convection using Lorentz forces, said forced convection including azimuthal motion associated with a rotational orientation of the fluid generally perpendicular to the plate, rolling motion associated with a rotational orientation of the fluid generally parallel to the plate, and rotation of the rotational orientation associated with the rolling motion over all angles with respect to an axis generally perpendicular to the plate.

5. A uniform heat transfer apparatus, comprising:

- (a) upper and lower spaced-apart plates, said lower plate including a centrally positioned electrode;
- (b) a rim extending circumferentially around said plates, said rim including an upper inner surface and a lower inner surface, said rim and said plates defining an enclosed chamber;
- (c) an electrically and thermally conducting fluid contained within said chamber;
- (d) a plurality of opposing segmented ring electrodes positioned circumferentially around said upper plate and adjacent to said upper inner surface of said rim;
- (e) means positioned adjacent to said lower plate for inducing a magnetic field within said chamber; and
- (f) heat transfer means for transferring heat between said lower plate and said fluid.

5,533,568

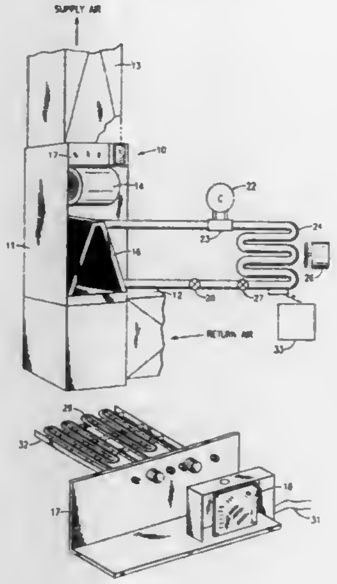
MANAGING SUPPLEMENTARY HEAT DURING DEFROST ON HEAT PUMPS

Don A. Schuster, Martinsville; Hongmei Liang; Larry J. Burkhart, both of Indianapolis, and Gary D. Wedlake, Huntington, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 335,677, Nov. 8, 1994. This application Jul. 11, 1995, Ser. No. 501,252

Int. Cl.^{6} F25B *29/00*

U.S. Cl. 165—1 **16 Claims**



1. A method of controlling a current defrost cycle for an outdoor coil of a heat pump system, the heat pump system having a plurality of supplemental heating elements for heating an air stream passing from an indoor coil to an air supply duct during defrost operation, wherein an initial quantity of supplemental heating elements energized is a function of a most recent previous defrost cycle, comprising the steps of:

- energizing the initial quantity of supplemental heating elements upon initiation of a defrost cycle;
- determining whether the initial quantity of supplemental heating elements provided is excessive;
- holding the heat pump on during an overshoot condition to allow completion of the defrost cycle;
- deactivating at least one of the supplemental heating elements if the initial quantity of supplemental heating elements being provided is excessive;
- determining whether the initial quantity of supplemental heating elements provided is insufficient;
- activating, if the initial quantity of supplemental heating elements being provided is insufficient, at least one additional supplemental heating element if said element is available; and
- retaining information as to an initial quantity of supplemental heating elements to be activated for a following defrost cycle, wherein said initial quantity of supplemental heating elements to be activated for a following defrost cycle is equal to a number of supplemental heating elements activated upon termination of the current defrost cycle.

5,533,569

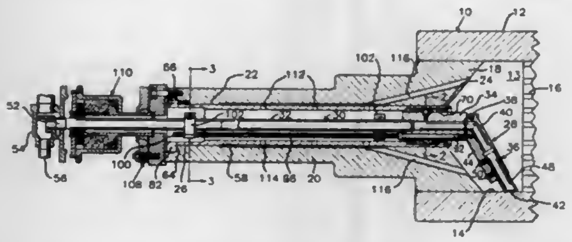
STATIONARY SYPHON SYSTEM FOR ROTATING HEAT EXCHANGER ROLLS

John C. Reibel, Portage, Mich., and Uwe Schindhelm, Neuhaus-Schierschnitz, Germany, assignors to The Johnson Corporation, Three Rivers, Mich., and Maschinenfabrik Friese GmbH & Co. Kg., Germany

Filed Apr. 24, 1995, Ser. No. 426,964

Int. Cl.^{6} F28D ***11/02***

U.S. Cl. 165—90 **15 Claims**



1. In a stationary syphon system for rotating heat exchanger rolls having an axis of rotation, an end, an interior chamber, an inner surface, a head sealing the roll end and a tubular journal concentric to the axis of rotation attached to the head having a bore having an inner end in communication with the roll interior chamber and an outer end, the syphon system including a journal conduit concentrically located within the journal bore having an inner end extending into the roll interior chamber and an outer end extending from the journal bore outer end, a pick-up conduit having an upper end in communication with the journal conduit inner end and a lower end located adjacent the lowermost portion of the roll interior chamber inner surface, a disposal fitting in communication with the journal conduit outer end for removing liquid from the journal conduit, and removable sealing structure mounted on the journal sealing the journal bore outer end, the journal conduit outer end sealingly extending through the removable sealing structure, the improvement comprising, a removable cylindrical tube within the journal bore having an inner end closely received within the journal bore adjacent the roll head, the journal conduit extending through said tube, an annular bearing interposed between the journal conduit inner end and said tube inner end to prevent radial displacement of the journal conduit inner end with respect to the roll axis of rotation, and a fastener interposed between said tube and the journal to prevent axial displacement therebetween.

5,533,570

APPARATUS FOR DOWNHOLE INJECTION AND MIXING OF FLUIDS INTO A CEMENT SLURRY

Steven G. Strelch; Ronald J. Crook, both of Duncan, Okla., and Richard R. Jones, Allen, Tex., assignors to Halliburton Company, Duncan, Okla., and Atlantic Richfield Company, Plano, Tex.

Filed Jan. 13, 1995, Ser. No. 372,546

Int. Cl.^{6} E21B ***27/02***

U.S. Cl. 166—153 **20 Claims**

1. An apparatus for injecting fluid into a wellbore, said apparatus comprising:

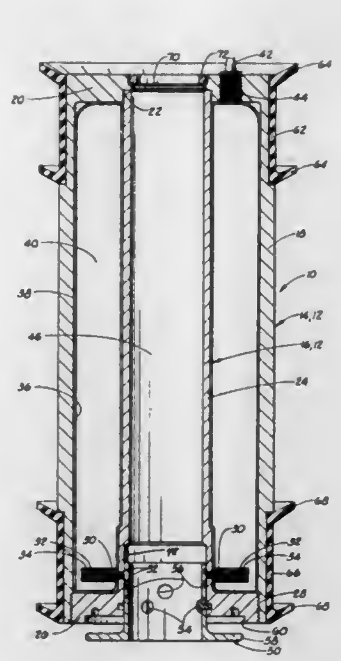
housing means for defining a chamber therein and a port in communication with said chamber, said chamber being adapted for holding a first fluid therein;

wherein said housing means is characterized by a housing of a plug which may be pumped down the wellbore;

valve means for opening said port such that said first fluid is free to flow out of said chamber through said port in response to a flow of a second fluid thereby;

wherein said housing defines a flow passage through which said second fluid may be flowed, said first fluid flows into said flow passage when said port is opened by said valve means; and

wherein a portion of said valve means extends below said housing means such that when said valve means engages a surface therebelow, said valve means is forced upwardly to open said port.



5,533,571

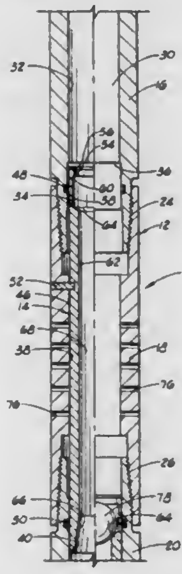
SURFACE SWITCHABLE DOWN-JET/SIDE-JET APPARATUS

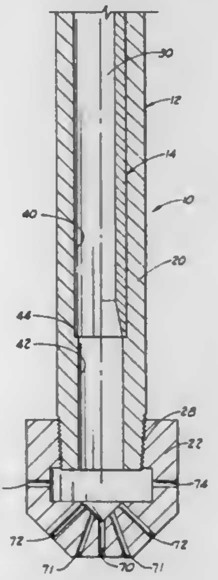
Jim B. Surjaatmadja, Duncan, Okla.; Kenneth D. Brune, Odessa, Tex., and Ken B. Kabinoff, Bakersfield, Calif., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1994, Ser. No. 250,412

Int. Cl.^{6} E21B ***21/00;34/14***

U.S. Cl. 166—222 **6 Claims**





1. A fluid jetting apparatus for use in a well, said apparatus comprising:

housing means for attaching to a tubing string, said housing means defining a central opening, a substantially longitudinal port and a substantially transverse port therein;

valve means disposed in said housing means for covering said transverse port when in a first position, such that fluid pumped into said central opening of said housing means is directed through said longitudinal port, and for placing said transverse port in communication with said central opening when in a second position, said valve means being characterized by a valve sleeve slidably disposed in said central opening of said housing means and said valve sleeve having a seating surface thereon; and

actuation means for actuating said valve means from said first position to said second position and closing said longitudinal port such that fluid pumped into said central opening of said housing means is directed through said transverse port, said actuation means being characterized by a ball adapted for sealing engagement with said seating surface on said valve sleeve;

wherein, said valve sleeve further comprises means for retaining said ball after engagement thereof with said seating surface.

5,533,572

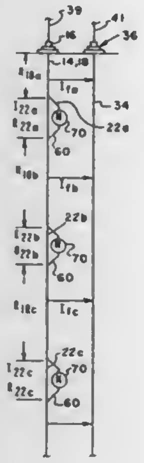
SYSTEM AND METHOD FOR MEASURING CORROSION IN WELL TUBING

Jerry L. Brady; Stephen Gerlek, both of Anchorage; David L. Lagerlef, Eagle River, all of Ak., and Raymond Wydrinski, Lewisville, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 263,594, Jun. 22, 1994, and Ser. No. 276,976, Jul. 19, 1994. This application Jan. 10, 1995, Ser. No. 370,689

Int. Cl.^{6} E21B ***47/00***

U.S. Cl. 166—250.05 **32 Claims**



1. A method for detecting corrosion in a tubing extending within a wellbore comprising the steps of:

(a) imposing a predetermined voltage potential between spaced apart contactors in contact with said tubing at a first interval in said tubing;

(b) measuring the current flow through said tubing at said first interval between said contactors;

(c) calculating the resistance of said tubing at said first interval between said contactors;

(d) imposing a predetermined voltage potential across said tubing at a second interval in said tubing spaced from said first interval and between spaced apart contactors;

(e) measuring the current flow through said tubing at said second interval between said contactors and calculating the resistance of said tubing at said second interval between said contactors;

(f) connecting a current source to said tubing and measuring the voltage drop between said contactors at said first interval in said tubing and said second interval in said tubing and determining current flow at said first interval and said second interval based on the measured voltage drop and the known resistance of the tubing at said first interval and said second interval and noting the difference between current flows at said first interval and said second interval; and

(g) at a later time, repeating step (f) to determine the difference in current flows at said first interval and said second interval and comparing such differences in current flows to detect corrosion in said tubing between said first interval and said second interval.

5,533,573

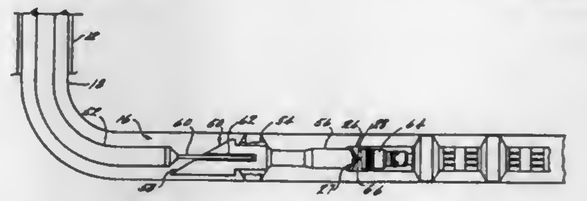
METHOD FOR COMPLETING MULTI-LATERAL WELLS AND MAINTAINING SELECTIVE RE-ENTRY INTO LATERALS

Henry J. Jordan, Jr., Conroe; Robert J. McNair, The Woodlands; Alan B. Emerson; Brian S. Kennedy, both of Houston, and Patrick J. Zimmerman, The Woodlands, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 188,998, Jan. 26, 1994, Pat. No. 5,474,131, which is a continuation-in-part of Ser. No. 76,391, Jun. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 926,451, Aug. 7, 1992, Pat. No. 5,311,936. This application Mar. 2, 1995, Ser. No. 397,332

Int. Cl.^{6} E21B ***33/10***

U.S. Cl. 166—313 **21 Claims**



1. A method for completing multilateral wells wherein a primary well communicates with at least a first and a second lateral well extending from said primary well, said first lateral well being downhole from said second lateral well, comprising the steps of:

(a) completing said first lateral with a first completion string, said first completion string including a first orientation device;

(b) running an assembly into said primary well, said assembly including a diverter and said assembly terminating at a second orientation device for mating with said first orientation device; and

(c) completing said second lateral well with a second completion string which is diverted by said diverter into said second lateral well.

5,533,574

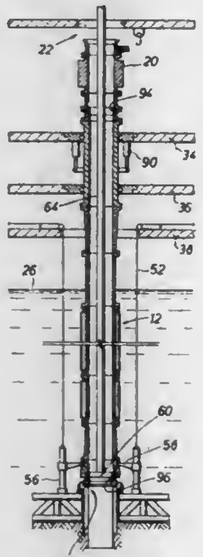
DUAL CONCENTRIC STRING HIGH PRESSURE RISER

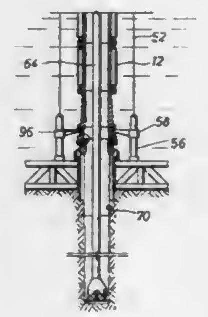
Romulo Gonzalez, Slidell, La., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 167,100, Dec. 20, 1993, abandoned. This application Jul. 3, 1995, Ser. No. 498,121

Int. Cl.^{6} E21B ***7/12***

U.S. Cl. 166—358 **17 Claims**

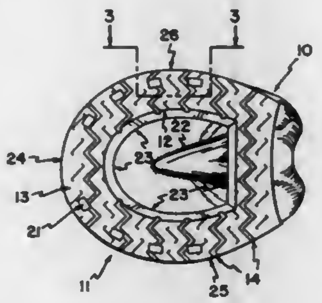




1. A riser system for use in drilling and producing a deepwater well through a subsea wellhead, comprising:

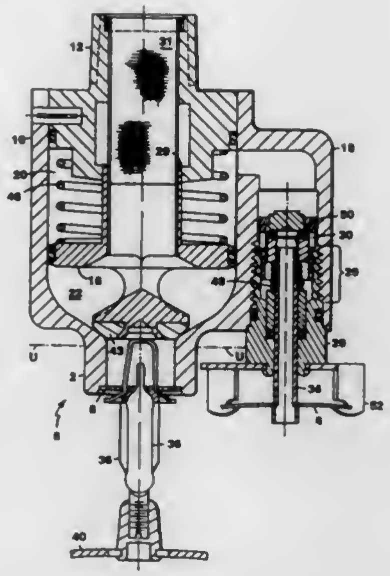
A) a dual string concentric high pressure riser system for drilling operations, comprising:
  1) a retrievable outer riser extending from the surface and sealingly connected to the subsea wellhead for use alone in drilling an initial, low pressure interval;
  2) a retrievable inner riser in communication with the well and extending from the surface downwardly to the subsea wellhead inside the outer riser for use in drilling intervals of potentially high pressure; and
  3) a surface BOP providing well control at the top of the inner riser; and
B) a production riser system comprising:
  1) an independent production riser;
  2) a connection for accepting the independent production riser at the subsea wellhead after retrieving the inner and outer risers; and
  3) Christmas-tree at the top of the independent production riser providing a surface completion for the well.

5,533,575
ELASTOMERIC SHOE FOR ATTACHMENT TO AN EQUIDAE HOOF
David W. Brown, 9801 Spring Rd., Eden Prairie, Minn. 55347
Filed Sep. 28, 1994, Ser. No. 314,609
Int. Cl.^{6} A01L ***5/00;1/00***
U.S. Cl. 168—4 **20 Claims**



1. A lightweight horseshoe of elastomeric material for nailing to a hoof of a horse comprising:
  (a) a peripheral configuration corresponding to the peripheral configuration of the sole of a horse hoof and a cross-section of substantially uniform thickness;
  (b) a hoof engaging surface and an oppositely disposed resilient tread; and
  (c) a nail holding ply therein; wherein said horseshoe is a single unit cut from a tire.

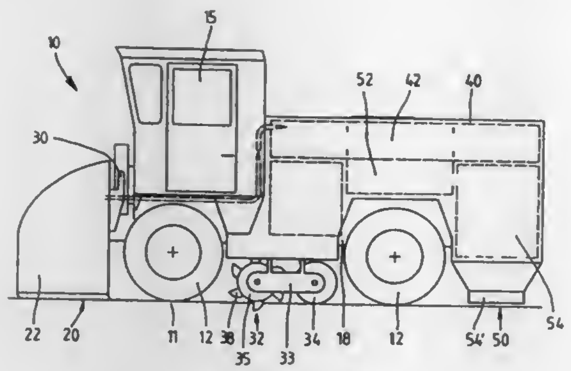
5,533,576
AUTOMATIC ON-OFF FIRE PROTECTION SPRINKLER
James W. Mears, Warwick, R.I., assignor to Grinnell Corporation, Cranston, R.I.
Filed Aug. 1, 1994, Ser. No. 283,784
Int. Cl.^{6} A62C ***35/68***
U.S. Cl. 169—90 **10 Clalms**



1. A fire protection sprinkler device for a fire protection system adapted to be coupled to a pressurized fire extinguishing fluid supply line and positioned generally above a predetermined area to be protected against damage by fire, said sprinkler device comprising:
  a sprinkler body having an inlet portion adapted for coupling to the fluid supply line, a primary outlet portion and a secondary outlet portion, said sprinkler body defines a main fluid flow passageway between said inlet portion and said primary outlet portion,
  a divider element within said sprinkler body defining a bias chamber in communication with said secondary outlet portion and an outlet chamber in communication with said primary outlet portion, said divider element having a first "off" position preventing fluid from exiting said outlet chamber and a second "on" position allowing fluid flow from said outlet chamber to be distributed over the predetermined area to be protected,
  a pilot valve assembly forming an integral part of said secondary outlet portion and including at least one outlet passage, said pilot valve assembly adapted for movement between an open position and a closed position to control flow of fluid in a secondary fluid flow passageway from said bias chamber to said secondary outlet portion and through said outlet passage,
  said pilot valve assembly including a thermally responsive bimetal snap disc having a selected thermal responsive characteristic and disposed in a position generally below a main portion of said body for exposure to heat from all regions of the predetermined area to be protected by said sprinkler device, said snap disc, in moving to an "off" position, moves said pilot valve assembly to said closed position and thereby prevents fluid flow through said secondary passageway and, in moving to an "on" position, moves said pilot valve assembly to said open position and thereby allows fluid flow through said secondary passageway,
  a thermally responsive element mounted adjacent to said primary outlet portion and acting in combination with a primary seal to normally block said primary outlet, and
  said divider element includes a main biasing spring for biasing said divider element toward said first position and a secondary seal for substantially reducing fluid flow through said primary outlet portion in the absence of said primary seal, said divider element defining a region of restricted clearance relative to the body of the sprinkler device, said region of restricted clearance permitting said inlet portion and said secondary outlet to be in fluid communication when said pilot valve assembly is in said open position.

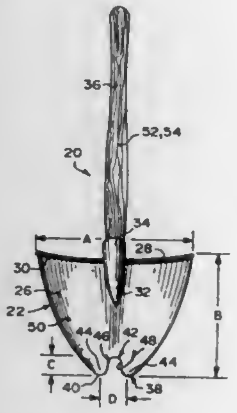
5,533,577
MAINTENANCE VEHICLE FOR SERVICING A SPORTS FACILITY, AND A METHOD OF USING THE MAINTENANCE VEHICLE
John Jucker, Seestrasse 289, CH-8810 Horgen, Switzerland
Filed Jun. 7, 1994, Ser. No. 255,227
Claims priority, application Switzerland, Dec. 10, 1993, 03683/93
Int. Cl.^{6} A01B ***45/00***
U.S. Cl. 172—21 **13 Claims**

1. A maintenance vehicle for removing water from a natural sports grass playing field of a sports facility, comprising in combination:



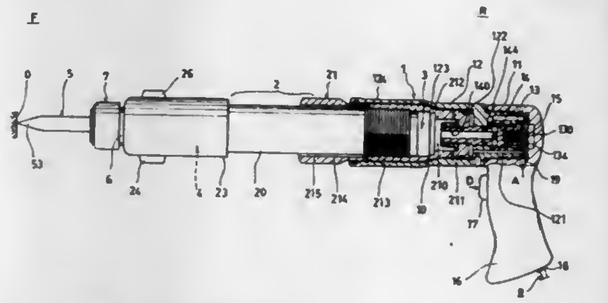
  a) a wheeled vehicle having a frame;
  b) a water-collecting device mounted on said frame for removing water from the surface of the playing field;
  c) a mechanical aerator means mounted on said frame a finite distance from said water-collecting device for aerating and loosening the portion of the ground from which water has been removed by creating small grooves or rows of openings in the surface of the ground to cause any residual water on the ground to enter the grooves or rows of openings to orient the surface of the water below an upper surface of the ground so that grass blades above the surface of the ground will be free of contact with the residual water to thereby enhance a drying of the grass blades; and
  d) means for independently adjustably moving said mechanical aerator means and said water-collecting device toward and away from the surface of the ground.

5,533,578
TWO POINTED SHOVEL
Edward C. Powell, 1510 Austin St., College Station, Tex. 77845
Filed Aug. 26, 1994, Ser. No. 296,948
Int. Cl.^{6} A01B ***1/02***
U.S. Cl. 172—378 **1 Claim**



1. A two pointed shovel comprising:
  a) a shovel blade having front and rear faces laterally and longitudinally curved to produce a depression in the front face;
  b) a turned step on a top edge of said shovel blade;
  c) a frog centrally mounted transversely to said turned step on the top edge of said shovel blade;
  d) a socket formed in said frog;
  e) an elongated handle extending rearwardly from said socket; and
  f) means bifurcated at a bottom edge of said shovel blade, for digging into and scraping the ground, so as to make said shovel blade more stable and less susceptible to rolling from side to side, said bifurcated means consisting of a pair of prongs, the side edges of said shovel being continuous and terminating in said prongs forming an indentation of shallow depth of about three quarters of an inch from the tips of said prongs and a width between said tips of said prongs of about three inches and cutting edges lining said indentation for cutting cleanly through a root when the root is encountered while digging into the ground, said shovel blade being thereby more efficient to use in removing various objects from the ground while digging, said shovel blade including said bifurcated means being fabricated out of a single piece of durable non-corrosive material.

5,533,579
SHOCK PREVENTIVE PNEUMATIC TOOL AS AUTOMATICALLY SHUT OFF UNDER NO LOAD CONDITION
Eric Chu, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan
Filed Oct. 31, 1994, Ser. No. 331,707
Int. Cl.^{6} E21B ***5/00***
U.S. Cl. 173—17 **5 Claims**

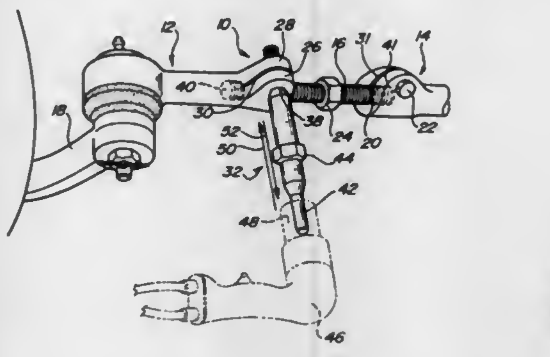


1. A pneumatic tool comprising:
  a main cylinder (1) having a grip portion (16) secured thereto and an operating lever (17) for opening or closing a compressed air into said main cylinder (1);
  a barrel member (2) having a rear end thereof resiliently secured to the main cylinder (1);
  an automatically closed throttle valve (14) resiliently mounted in said main cylinder (1) by a restoring spring (15) for closing said throttle valve (14) normally for stopping the supply of a compressed air;
  an oscillating valve (3) mounted in a rear portion of said barrel member (2) for controlling the compressed air for reciprocatively moving a piston means (4) in said barrel member (2) for pounding a tool unit (5) secured to a front end portion of said barrel member (2) by a tool connector (7);
  said barrel member (2) operatively opening said automatically closed throttle valve (14) when said tool unit (5) is contacted with a working object to retract said tool unit (5) and said barrel member (2) for directing the compressed air into said barrel member (2) as controlled by said oscillating valve (3) for reciprocating said piston means (4) for pounding said tool unit (5) on said working object, and whereby upon an empty percussion of said tool unit (5) under no load condition, said barrel member (2) will not be retracted by the working object and said throttle valve (14) will be forwardly restored and closed for interrupting the compressed air for stopping the pounding of said tool unit (5) for preventing vibration shock caused by said tool unit (5); and
  said main cylinder (1) including: a rear housing portion (11) secured with said grip portion (16) having said operating lever (17) pivotally mounted in the grip portion (16) for controlling on and off of a compressed air supply directed into a main air inlet port (19) of the main cylinder (1) through an inlet air adapter (18) and a main inlet air hose portion (80); a bell member (12) generally cylindrical shaped having a rear connector (121) secured in the rear housing portion (11), a contracted bell portion (122) protruding forwardly from the rear connector (121) to connect a truncated-cone bell portion (123) diverging forwardly from the contracted bell portion

(122), and a divergent bell portion (124) secured to the truncated-cone bell portion (123) having an inside diameter of the divergent bell portion (124) larger than that of the contracted bell portion (122); a valve socket (13) of said automatically-closed throttle valve (14) having a rear retainer disk (130) fixed in the rear housing portion (11) for retaining said restoring spring (15) for tensioning the throttle valve (14), a valve seat (131) having packing ring embedded thereon formed in the rear connector (121) of the bell member (12) for seating a valve plug (143) of the throttle valve (14), a valve inlet port (132) formed in a front portion of the valve socket (13) adjacent to a valve opening (144) formed in a valve stem (141) of the throttle valve (14), a spring chamber (133) recessed in a rear portion of the plug (143) for retaining the restoring spring (15) and a venting hole (134) formed in the valve socket (13) and communicating with an air-venting passage (121*a*) formed through the rear connector (121) for breathing air in the spring chamber (133) with an outer environment around the main cylinder (1); and the automatically-closed throttle valve (14) having the valve stem (141) defining central air passage (140) through the valve stem (141) and secured with a rear cap portion (211) of a rear barrel cap (21) of the barrel member (2), with the barrel member (2) and the throttle valve (14) normally restored forwardly by the restoring spring (15) for closing the plug (143) of the throttle valve (14) on the seat (131) of the valve socket (13) for closing the valve opening (144) and the valve inlet port (132) for stopping flow of compressed air into the barrel member (2) and the oscillating valve (3).

5,533,580
TIE ROD LOOSENING TOOL FOR USE WITH A TIE ROD ASSEMBLY

Donald G. Reaves, 2641 Eaton Rapids Rd., Lansing, Mich. 48910
Division of Ser. No. 227,594, Apr. 14, 1994, Pat. No. 5,443,564. This application May 25, 1995, Ser. No. 449,994
Int. Cl.⁶ F16B *35/00*
U.S. Cl. 173—114 **2 Claims**



1. A tie rod loosening tool for use with a tie rod assembly, the tie rod assembly including an outer tie rod having an internally threaded receiving aperture, an inner tie rod and a threaded adjustment sleeve extending from the inner tie rod which is received within the outer tie rod in proximity to the receiving aperture, a standard threaded bolt engaging the threaded receiving aperture and being removable therefrom prior to application of said loosening tool, said loosening tool comprising:

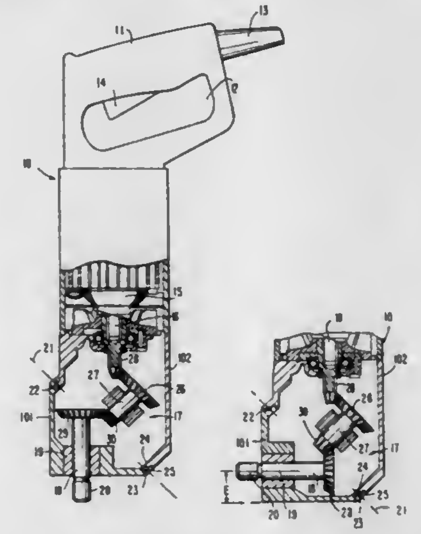
an elongated tool body having a substantially cylindrical shape and including a main body portion, a first threaded end portion which threadably engages within the outer tie rod aperture, said first threaded end is shorter in length than said main body portion, and a second tool bit receiving end portion which is also shorter in length than said main body portion and which extends from a second end of said main body portion, said tool bit receiving end portion having at least the length of said first threaded end and a substantially smooth finish which is insertable within an engaging portion of a power tool; and

said main body portion being of a first diameter and said first and second end portions each being of a second diameter smaller than said first diameter and connected to said main body portion by a conically flared intermediate portion;

said loosening tool transferring a series of axially directed impact forces from said power tool to the inner and outer tie rods and the adjustment sleeve of the tie rod assembly to forcibly loosen corrosive buildup between the adjustment sleeve and the inner and outer tie rods.

5,533,581
ELECTRIC HAND TOOL, IN PARTICULAR DRILL

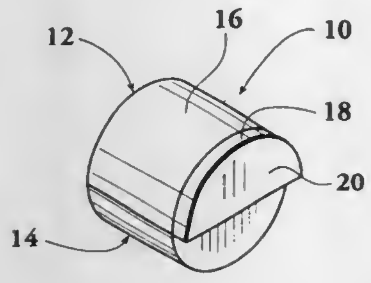
Walter Barth, Leinfelden-Echterdingen; Rudolf Fuchs, Neuhausen; Frank Langenfelder, Heilbronn, all of, Germany, and David M. Martinez, New Bern, N.C., assignors to Robert Bosch GmbH, Stuttgart, Germany
PCT No. PCT/DE92/00360, § 371 Date May 17, 1993, § 102(e) Date May 17, 1993, PCT Pub. No. WO92/20491, PCT Pub. Date Nov. 26, 1992
PCT Filed May 2, 1992, Ser. No. 971,865
Claims priority, application Germany, May 18, 1991, 41 16 343.5
Int. Cl.⁶ B23Q *5/10;* **B25F** *5/00*
U.S. Cl. 173—216 **7 Claims**



1. An electric hand tool, comprising a housing having a housing axis, an electric motor received in said housing and having a motor shaft parallel to said housing axis; a work spindle driven by said electric motor and having spindle end projecting out of said housing; a transmission gearing located between said electric motor and said work spindle so that said work spindle is driven by said electric motor via said transmission gearing; a bearing provided for said work spindle, said housing being divided along a dividing line into a front housing part which contains said bearing for said work spindle and a rear housing part which contains said electric motor and are rotatable relative to one another so that said work spindle extending in said front housing part can occupy a plurality of angles relative to said motor shaft and said housing axis; a manually operating catch lock for stopping said housing parts in a selected angular position relative to one another, said transmission being formed so that a torsionally rigid transmission of force from said motor shaft of said electric motor to said work spindle is provided in said transmission gearing in every angular position of said housing parts relative to one another; an intermediate flange arranged in the region of said dividing plane between said two housing parts and rotatably supported at said front housing part and connected with said rear housing part, said dividing plane being located so that a rotational axis of said intermediate flange encloses an angle of 90° relative to an axis of said motor shaft; a clamping plate which is fastened at said front housing part; and two axial bearings arranged one after the other in the axial direction of said intermediate flange and clamping said intermediate flange therebetween, one of said axial bearings being supported in said front housing part while another of said axial bearings is supported at said clamping plate, said intermediate flange being screwed to said rear housing part.

5,533,582
DRILL BIT CUTTING ELEMENT

Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Baker Hughes, Inc., Houston, Tex.
Filed Dec. 19, 1994, Ser. No. 359,187
Int. Cl.⁶ E21B *10/46*
U.S. Cl. 175—430 **22 Claims**



1. A cutting element for an earth boring drill bit comprising:

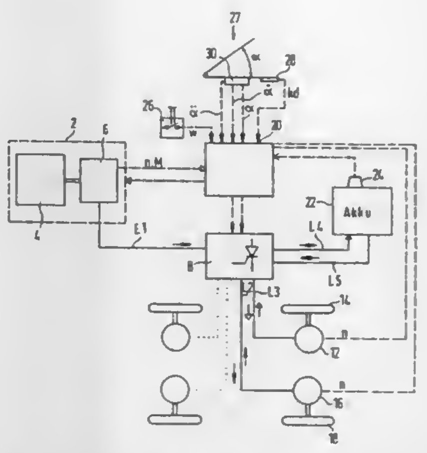
a backing formed from a cemented metal carbide and having a substantially semicylindrical shape which includes a generally longitudinal substantially planar surface;

a cutter mounted on one end of the backing, said cutter comprising a substrate having a PCD layer formed thereon; and

a substantially semicylindrical base which includes a generally longitudinal substantially planar surface, said base being mounted on the backing by a bonding layer formed between said substantially planar surfaces.

5,533,583
NON-TRACKBOUND VEHICLE WITH AN ELECTRODYNAMIC CONVERTER AND A THROTTLE

Uwe Adler, Schweinfurt; Hans-Jürgen Drexl, Schonungen; Dieter Lutz, Schweinfurt; Franz Nagler, Ottendorf; Martin Ochs; Stefan Schiebold, both of Schweinfurt; Hans-Joachim Schmidt-Brücken, Geldersheim; Wolfgang Thieler, Hassfurt; Michael Wagner, Niederwerrn; Holger Westendorf, Hambach, and Rainer Wychnanek, Madenhausen, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
PCT No. PCT/DE92/00834, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994, PCT Pub. No. WO93/07020, PCT Pub. Date Apr. 15, 1993
PCT Filed Sep. 30, 1992, Ser. No. 211,141
Claims priority, application Germany, Oct. 4, 1991, 41 33 014.5
Int. Cl.⁶ B60K *1/04*
U.S. Cl. 80—65.4 **15 Claims**



1. A vehicle comprising:

an internal combustion engine having a throttle;

a plurality of wheels;

an electric motor drivingly coupled to at least one of said wheels;

generating means coupled to said internal combustion engine, for generating electrical current;

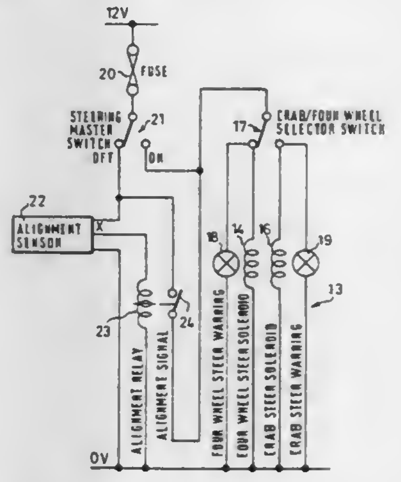
control means coupled to said generating means for receiving a driving signal indicative of throttle position and at least one of throttle movement speed and throttle acceleration rate, said control means processing the driving signal to generate first and second control signals;

energy distributing means operatively coupled to said control means, said generating means, and said electric motor, said energy distributing means being adapted to receive electrical current from said generating means and to regulate current flow to said electric motor in accordance with at least one of said control signals; and

energy storage means coupled to said electric motor and to said energy distributing means, wherein said energy distributing means is responsive to said first control signal to supply energy from said energy storage means to said electric motor, and wherein said internal combustion engine is responsive to said second control signal to operate at an output corresponding to a new throttle position.

5,533,584
VEHICLE WITH FRONT AND REAR STEERING

Thomas R. Johnson, Lakeside, United Kingdom, assignor to Caterpillar Inc., Peoria, Ill.
PCT No. PCT/GB93/00101, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO93/13972, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 18, 1993, Ser. No. 256,614
Claims priority, application United Kingdom, Jan. 17, 1992, 9200966
Int. Cl.⁶ B62D *5/06*
U.S. Cl. 180—415 **7 Claims**



1. A vehicle comprising:

a front steering mechanism (1*a*) and a rear steering mechanism (1*b*), each steering mechanism having an operating range including a straight-ahead condition;

a steering control system (**13**) operatively connected to the front and rear steering mechanisms (**1***a*,**1***b*), the control system (**13**) having a first mode in which both steering mechanisms operate and a second mode in which only one steering mechanism (**1***a*) operates;

alignment sensing means (**22**) for sensing whether the other steering mechanism (**1***b*) is in its straight-ahead condition;

first switching means (**21**) for switching the control system (**13**) from one mode to the other; and

second switching means (**24**) switchable between a first state for preventing the change from the first mode to the second mode and a second state for permitting the change;

the alignment sensing means (**22**) being operatively connected to the second switching means (**21**) so that, when the first switching means (**21**) is operated to switch the control system (**13**) from the first mode to the second mode, the second switching means (**24**) is in the first state so long as the other steering mechanism (**1***b*) is out of its straight-ahead condition and is in the second state when the other steering mechanism (**1***b*) is in its straight-ahead condition;

characterised in that the alignment sensing means (**22**) is activated by the operation of the first switching means (**21**) to switch the control system (**13**) from the first mode to the second mode.

5,533,585

DEVICE FOR ADJUSTING A DRIVING CHAIN IN A SNOWMOBILE

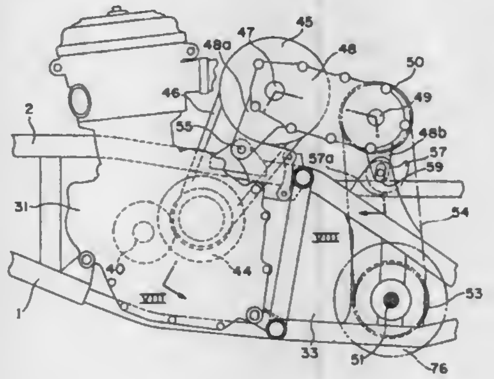
Shizuo Kawano, and Tadaaki Nagata, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,007

Claims priority, application Japan, Nov. 29, 1993, 5-298408

Int. Cl.^{6} B62M *27/02*

U.S. Cl. 180—190 **20 Claims**



1. A driving device for a snowmobile comprising:

an engine;

an idle shaft having a sprocket secured thereto;

a belt converter for transmitting an output of the engine to the idle shaft;

a crawler belt having a drive shaft, the drive shaft being in a fixed position relative to the engine;

a chain stretched between the sprocket secured to the idle shaft and a sprocket secured to the drive shaft of the crawler belt; and

an adjuster for adjusting in position said idle shaft around an axis within a region surrounded by a belt of said belt converter, the idle shaft and sprocket being movable away from the drive shaft of the crawler belt by the adjuster to thereby increase tension in the chain.

5,533,586

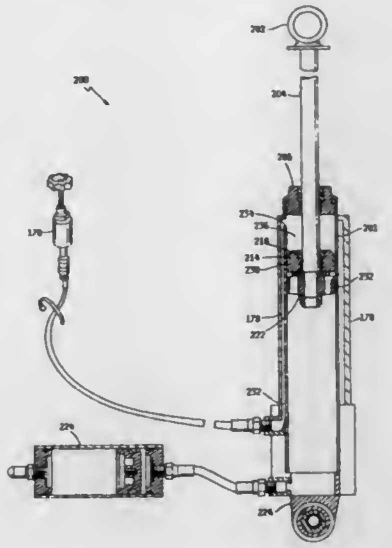
ADJUSTABLE SUSPENSION SYSTEM

Kevin D. Thompson, Thief River Falls, Minn., assignor to Arctco, Inc., Thief River Falls, Minn.

Continuation of Ser. No. 189,885, Feb. 1, 1994, abandoned. This application Sep. 28, 1995, Ser. No. 535,777

Int. Cl.^{6} B60G *17/08*

U.S. Cl. 180—193 **8 Claims**



7. An adjustable shock absorbing mechanism comprising:

1) a tubular body having a base end and a distal end, said tubular body closed at said base end by a base end cap and closed at said distal end by a rod end cap, including
   aa) a base aperture near the base end of the tubular body for the transfer of hydraulic fluid into and out of the tubular body;
   bb) said rod end cap including an aperture therethrough; and
   cc) a porthole near the distal end of the tubular body for the transfer of hydraulic fluid out of and into the tubular body;

2) a first piston within said tubular body, said first piston defining an aperture for the passage of hydraulic fluid therethrough during shock absorbing movement of said first piston;

3) a first hydraulic fluid chamber defined by said tubular body, a movable sealing piston within the tubular body, and said base end cap;

4) a longitudinal rod passing through the aperture in said rod end cap and connected to said first piston;

5) said movable sealing piston defining an aperture with the longitudinal rod passing therethrough, and said movable sealing piston located between said first piston and said rod end cap; and

6) a second hydraulic fluid chamber defined by said tubular body, said movable sealing piston, and said rod end cap;

7) a suspension adjustor connected to said porthole of the tubular body to allow controlled transfer of hydraulic fluid into and out of said second hydraulic fluid chamber to accomplish longitudinal displacement of the movable sealing piston; and

8) a reservoir connected to the base aperture to allow transfer of hydraulic fluid out of and into said first hydraulic fluid chamber;

wherein when hydraulic fluid is transferred from said suspension adjustor through said porthole into said second hydraulic fluid chamber, said movable sealing piston is moved in a direction away from said rod end cap and hydraulic fluid is transferred from said first hydraulic chamber into the reservoir thus moving said movable sealing piston and said first piston toward said base end cap and shortening the length of said adjustable shock absorbing mechanism between said distal end and said base end; and wherein when hydraulic fluid is allowed by said suspension adjustor to be transferred from said second hydraulic fluid chamber through the porthole into the suspension adjustor, said movable sealing piston is moved in a direction toward the rod end cap and hydraulic fluid is transferred from the reservoir thus moving said first piston and said movable sealing piston toward said rod end cap and extending the length of said adjustable shock absorbing mechanism between said distal end and said base end.

5,533,587

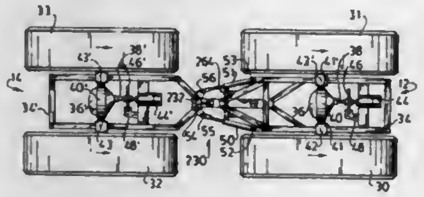
TRACK VEHICLES & POWER DRIVE APPARATUS FOR MOTIVATING TRACKED VEHICLES

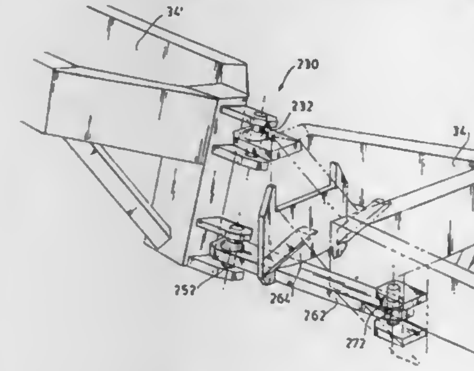
Paul W. Dow, and Steven S. Dow, both of Byron, N.Y., assignors to Byron Enterprises, Inc., Byron, N.Y.

Division of Ser. No. 143,556, Oct. 26, 1993, Pat. No. 5,373,909. This application Jun. 27, 1994, Ser. No. 265,866

Int. Cl.^{6} B62D *55/00*

U.S. Cl. 180—235 **13 Claims**





1. An articulated tracked vehicle, comprising:

a) a front and a rear chassis, each having a centerline;

b) an articulating joint connecting said front and rear chassis;

c) means for steering said front chassis with respect to said rear chassis;

d) an engine mounted on one of said chassis;

e) hydraulic pump means operatively connected to said engine;

f) front and rear differentials disposed on said front and rear chassis, respectively, each differential having a power input shaft and a pair of opposed power output shafts having fixed outer sleeves, said sleeves being rigidly attached to said respective chassis;

g) front and rear hydraulic motors disposed on said power input shafts of said front and rear differentials and operatively provided with pressurized hydraulic fluid from said hydraulic pump means;

h) means for braking by arresting the rotation of each of said power input shafts; and

i) four substantially identical tracked power units disposed respectively on said opposed power output shafts and fixed sleeves of said front and rear differentials, wherein each of said four tracked power units comprises:
   1. a housing capable of supporting said unit and disposed longitudinally in said unit, said housing comprising:
      A. a first lateral bore near a first end of said housing;
      B. a first fixed axle laterally disposed on said housing near a second end thereof, and extending beyond opposite sides of said housing;
      C. a second lateral bore at a longitudinally central location of said unit; and
      D. a second fixed axle laterally disposed on opposite sides of said housing at a longitudinally central location of said unit, and extending laterally beyond the sides of said housing;
   2. a rotatable axle disposed in said first lateral bore and extending beyond said opposite sides of said housing;
   3. a chain drive transmission disposed within said housing comprising:
      A. a drive sprocket, the axis of rotation of which is disposed on the centerline of said second lateral bore;
      B. a driven sprocket fixed on said rotatable axle; and
      C. a drive chain operationally connecting said drive sprocket and said driven sprocket;
   4. first and second toothed drive wheels coaxially disposed and fixed on said rotatable axle on opposite sides of said housing;
   5. first and second idler wheels disposed on said first fixed axle on opposite sides of said housing; and
   6. an endless track disposed with an inner surface thereof in contact with said toothed drive wheels and said idler wheels, and having lugs formed on a portion of said inner surface, said lugs being spaced to mesh with said toothed drive wheels, whereby said endless track is caused to rotate in response to power applied to said power shaft.

5,533,588

MECHANICAL ACCELERATION SENSOR

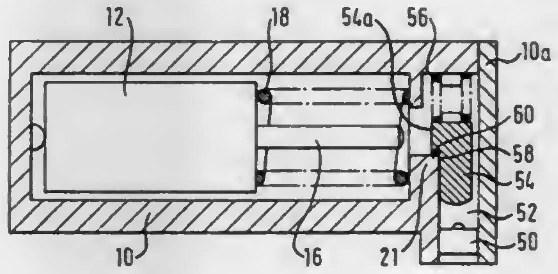
Helmut Maiwald, Alfdorf, and Klaus Böhmler, Schwäbisch Gmünd, both of, Germany, assignors to TRW Repa GmbH, Alfdorf, Germany

Filed Oct. 14, 1994, Ser. No. 323,342

Claims priority, application Germany, Oct. 15, 1993, 43 35 250.2; European Pat. Off., Nov. 19, 1993, 93118650

Int. Cl.^{6} F42C *1/04;* **B60R** *21/32*

U.S. Cl. 180—282 **3 Claims**



1. An inertial sensor for activating a vehicular passenger restraining system, comprising:

a housing;

an impact igniter mounted in said housing;

a striking pin displaceably mounted in said housing for activation of said impact igniter;

a pressure spring disposed between said housing and said striking pin, said pressure spring preloading said striking pin in a direction towards said impact igniter;

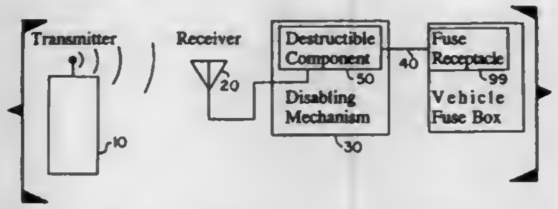
a sensor body supported in said housing for a sliding translational movement in a direction transverse to the displacement direction of said striking pin, said sensor body having a rest position spaced apart from said striking pin and an activating position impacting said striking pin, said sensor body being movable under the action of inertial forces from the rest position to the activating position;

a return spring disposed between said sensor body and said housing, said return spring preloading said sensor body towards the rest position;

and holding means for holding said striking pin in a readiness position spaced from said impact igniter as long as said sensor body has not reached said activating position;

said holding means having a holding effect which is overcome by a momentum accumulated in the sensor body during its travel from the rest position into the activating position when said momentum exceeds a predetermined threshold.

5,533,589
SIGNAL RESPONSIVE VEHICLE DISABLING SYSTEM
W. Larry Critzer, Jacksonville, Fla., assignor to Rick P. Lucas, and Allan D. Terry, both of Jacksonville, Fla.
Filed Apr. 10, 1995, Ser. No. 419,025
Int. Cl.^{6} B60R *25/00*
U.S. Cl. 180—287 **15 Claims**



1. A remote signal responsive vehicle disabling system for disabling a vehicle in response to a remotely transmitted activation signal, said vehicle having one or more necessary operative electrical circuits and one or more fuse receptacles electrically connected in said one or more electrical circuits, said system comprising:

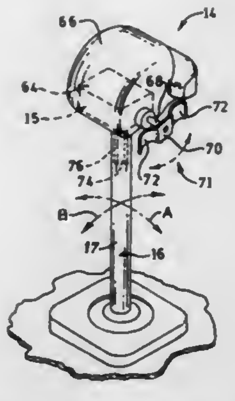
(A) separate transmitter means to transmit an activation signal comprising an activation number and a password;

(B) activation signal receiver means mountable within the vehicle to receive said activation signal and activate vehicle disabling mechanism means to disable the vehicle in response to said activation signal by interrupting said one or more operative electrical circuits of said vehicle, said disabling mechanism means comprising a destructible component which is destroyed upon activation;

(C) external leads for connecting said disabling mechanism means to said one or more fuse receptacles of said one or more operative electrical circuits of said vehicle, whereby said one or more operative electrical circuits is routed through said disabling mechanism means and operates uninterrupted until said disabling mechanism means is activated to destroy said destructible component, thereby interrupting said one or more operative electrical circuits; and

(D) a reset mechanism which must be reset to allow operation of said one or more operative electrical circuits after said one or more operative electrical circuits has been interrupted and said destructive component has been replaced.

5,533,590
STEERING SWITCH INTEGRAL WITH AN IMPLEMENT CONTROL LEVEL
Mark A. Steffen, Goodfield; Lynn A. Sutton, Kewanee, both of Ill.; Gregory K. Stuckey, Knightdale, N.C., and Rex N. Johnsen, Princeton, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation of Ser. No. 100,782, Aug. 2, 1993, abandoned.
This application Mar. 16, 1995, Ser. No. 405,568
Int. Cl.^{6} B62D *1/14*
U.S. Cl. 180—332 **4 Claims**



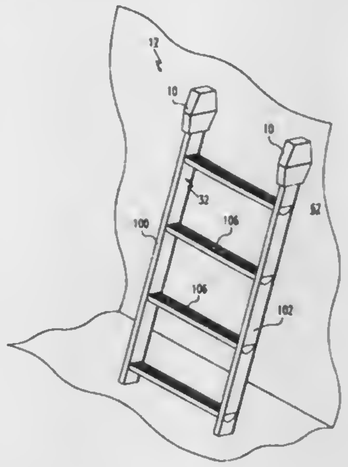
1. A control arrangement for a vehicle having a primary pair of steerable wheels, a secondary pair of steerable wheels, and a work implement connected to said vehicle, said control arrangement comprising:

first means for controllably steering said primary pair of steerable wheels, said first means including a steering wheel;

second means for controllably changing the angle of orientation of said secondary pair of steerable wheels independently of and simultaneously with the steering of said primary pair of steerable wheels, said second means being remotely positioned from said first steering means; and

an implement control lever for controlling the movement of said work implement, said second means being associated with said implement control lever.

5,533,591
LADDER RAIL CAP
Stanley A. Kiska, Durham, N.C., assignor to Werner Co., Greenville, Pa.
Filed Mar. 7, 1995, Ser. No. 399,834
Int. Cl.^{6} E06C *7/48*
U.S. Cl. 182—108 **13 Claims**



1. A ladder comprising:

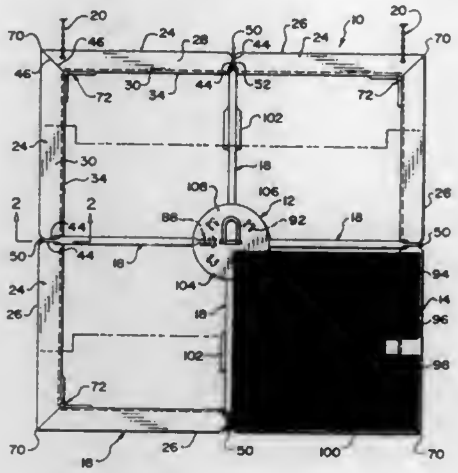
a first side rail having a top and an end cap attached to the top of the first side rail, said first side rail defining a rail envelope;

a second side rail having a top adjacent and in parallel to the first side rail, said second side rail and an end cap attached to the top of the second side rail, said second side rail defining a rail envelope;

at least a first rung connected to the first side rail and second side rail; and

a ladder rail cap disposed on each side rail, each ladder rail cap comprising a shell, said shell having an inner surface defining a chamber and a clip attached to the inner surface, said top of each side rail disposed in said respective chamber and, said respective end cap mating with said respective clip of said respective ladder rail cap.

5,533,592
EXPANDABLE SCAFFOLD FOR HOPPER
Laurent J. Lamoureux, Box 8, Group 25, R.R. #2, Ste. Anne, Manitoba, Canada
Filed Nov. 28, 1994, Ser. No. 348,842
Int. Cl.^{6} E04G *3/10*
U.S. Cl. 182—128 **20 Claims**



1. An expandable scaffold of the type for use with a hopper having a narrow opening in the top and which opens out into a larger area inside wherein the scaffold comprises:

attachment means for attaching the scaffold at a top end to a hoist or crane or the like for raising and lowering the scaffold;

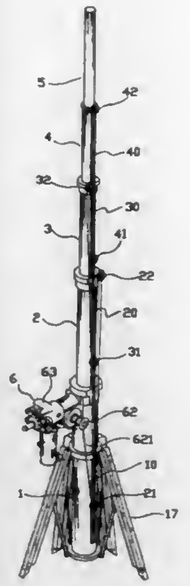
an articulated frame including a plurality of bars joined together by a first pivot connection means such that pivoting of the bars may occur about a vertical axis, and by a second pivot connection means such that pivoting of the bars may occur about an axis inclined between the vertical and horizontal axes, wherein the articulated frame may be oriented in a first position such that the bars are arranged in a vertical orientation and a second position such that the bars are arranged in a horizontal position;

folding means connected to the attachment means at one end and to the second pivot connection means on the articulated frame at an other end arranged such that the folding means when actuated move the articulated frame between the first and second positions;

scaffold flooring mounted on the articulated frame for supporting an individual;

a plurality of suspension means each being removably and reengagebly connected at one end to the narrow opening of the vessel and each being connected at the other end near one of the first pivot connection means on the articulated frame.

5,533,593
MOBILE LIFTER
Andy C.-P. Huang, No. 2-2, Alley 1, Fu Hsing Sub-ward, Tung Hsiao Chen, Miao Li Hsien, Taiwan
Filed Oct. 12, 1994, Ser. No. 321,528
Int. Cl.^{6} E04G *1/22*
U.S. Cl. 182—141 **3 Claims**



1. A mobile lifter comprising:

a cylindrical casing supported on a stand, having a longitudinal slot;

a first inner tube moved in and out of said cylindrical casing, having a longitudinal slot corresponding to the longitudinal slot on said cylindrical casing and a bottom pulley and a top pulley disposed near two opposite ends thereof;

a second inner tube moved in and out of said first inner tube, having a longitudinal slot corresponding to the longitudinal slot on said first inner tube and a bottom pulley and a top pulley disposed near two opposite ends thereof;

a third inner tube moved in and out of said second inner tube, having a longitudinal slot corresponding to the longitudinal slot on said second inner tube and a bottom pulley and a top pulley disposed near two opposite ends thereof;

a fourth inner tube moved in and out of said third inner tube, having a bottom end disposed inside said third inner tube;

a winch wound round with a cable, said cable having one end fixed to and wound round said winch and an opposite end inserted in proper order through the bottom pulley and top pulley of said first inner tube, the bottom pulley and top pulley of said second inner tube, the bottom pulley and top pulley of said third inner tube and then fixed to the bottom end of said fourth inner tube; and

a driving mechanism mounted on said cylindrical casing on the outside and controlled to turn said winch, said driving mechanism comprising a cylindrical housing covered with a cover and having a side hole, a ring cap mounted within said side hole, and axle disposed in said side hole and having one end extended out of said ring cap and coupled to said winch, a driving gear fixedly mounted around said axle, a transmission shaft disposed in said cylindrical housing and having an outer thread at one end meshed with said driving gear and a toothed block at an opposite end, a first T-shaped clutch member mounted around said transmission shaft and retained in place by a clamp, a gear wheel mounted around said first T-shaped clutch member, a ring-shaped pressure plate and a pair of spring discs mounted around said first T-shaped clutch member and retained in place by a nut to hold down said gear wheel, said gear wheel and said ring-shaped pressure plate having ball holes respectively aligned to hold steel balls, a second T-shaped clutch member mounted around said transmission shaft and partially extended out of a through hole in the center of said cover and having a recessed coupling portion on the inside enraged with said toothed block of said transmission shaft, a reversible motor having a mounting frame fastened to said housing and an output shaft mounted with a driven gear, and a driven screw rod turned by said driven gear to rotate said gear wheel;

wherein when said winch is turned by said driving mechanism in one direction to take up said cable, said inner tubes are pulled out of one another out of said cylindrical casing; when said winch is turned by said driving mechanism in the reversed direction to let off said cable, said inner tubes are moved one inside another inside said cylindrical casing.

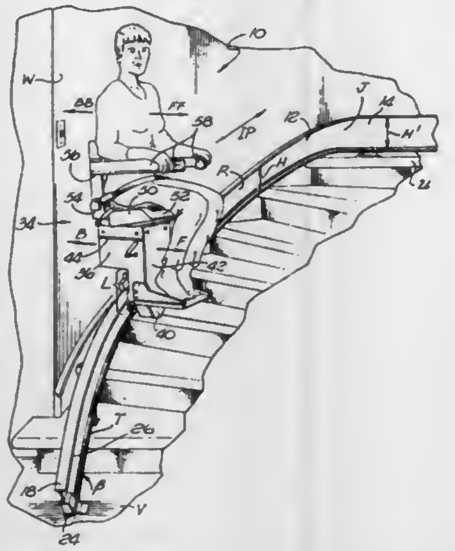
5,533,594
CHAIRLIFT WITH POSITIONING CARRIAGE AND SWIVEL MECHANISM WITH SAFETY INTERLOCK

Jules M. Tremblay, Sunland, Calif.; David C. Balmer, Brampton, and Helmut Ruff, Kitchener, both of, Canada, assignors to Ricon Corporation, Pacoima, Calif.

Filed Jun. 7, 1994, Ser. No. 255,337

Int. Cl.^{6} B66B *9/08*

U.S. Cl. 187—201 **21 Claims**



1. A chairlift providing a seat for transporting a passenger along a rail inclined at a substantially uniformly angle, the chairlift comprising:

a chair assembly including a base housing a motor unit;

a carriage substantially supporting said chair assembly in a substantially upright position for movement along said rail, said carriage including a positioning structure for positioning said carriage and said chair assembly in a spatial relationship for accommodating said angle; and

a locking plate locking said support bracket to said base in said selected position, said support bracket providing a first serrated surface engageable with a second serrated surface provided on said locking plate.

5,533,595
TRACTION-TYPE ELEVATOR

Eiji Narumi, Tokyo, and Masao Iwasa, Ichikawa, both of, Japan, assignors to Otis Elevator Company, Farmington, Conn.

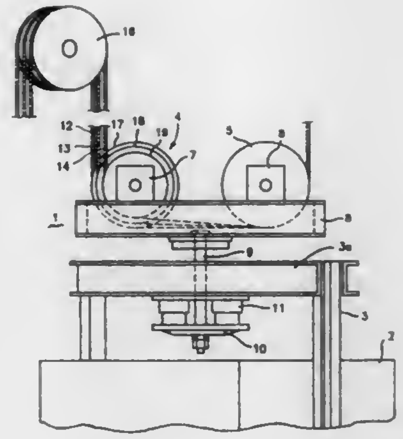
Filed Aug. 15. 1994, Ser. No. 290,199

Claims priority, application Japan, Aug. 18, 1993, 5-203515

Int. Cl.^{6} B66B *11/08*

U.S. Cl. 187—266 **6 Claims**

1. In a traction-type elevator comprising a driving sheave positioned at a top of a shaft for ascent and descent, a plurality of cage sheaves attached to an upper section of the cage and inclined in relation to the driving sheave, and multiple ropes wound around outer surfaces of the cage sheaves and an outer surface of the driving sheave; characterized in that the outer surface of one cage sheave is parallel to the outer surface of the driving sheave, that the one cage sheave is divided into multiple sheave pieces according to the multiple ropes, and that at least two of the multiple sheave pieces have different diameters.



5,533,596
HYDRAULIC, ADJUSTABLE VIBRATION DAMPER FOR MOTOR VEHICLES

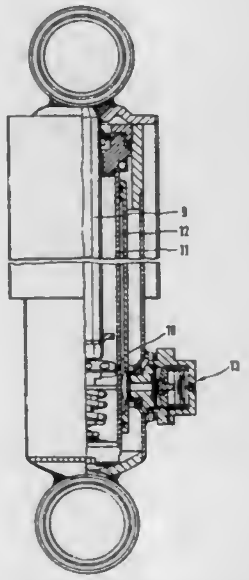
Andree Patzenhauer, Eitorf-Lindscheld; Winfried Geilhausen, Windeck-Leuscheld, and Rolf Schneider, Windeck-Werfen, all of, Germany, assignors to Fichtel & Sachs AG, Eitorf, Germany

Filed Jan. 18, 1995, Ser. No. 374,923

Claims priority, application Germany, Jan. 19, 1994, 44 01 393.0

Int. Cl.^{6} B60G *17/08;13/08;* **F16F** *9/46*

U.S. Cl. 188—299 **7 Claims**



1. An adjustable vibration damper for damping vibrations of a suspension of a motor vehicle, said damper comprising:

a cylinder;

damping fluid disposed within said cylinder;

a piston rod protecting into said cylinder, said piston rod being movable axially within said cylinder;

a damping piston disposed on said piston rod, said damping piston dividing said cylinder into a first chamber and a second chamber;

means for providing fluid communication between said first chamber and said second chamber;

valve means for regulating flow of damping fluid through said means for providing fluid communication, said valve means comprising:

displaceable member means, said displaceable member means being movable in a first direction from a first substantially open position to a second substantially closed position to at least substantially close said means for providing fluid communication and said displaceable member means being movable from the second substantially closed position to the first substantially open position in a second direction to at least substantially open said means for providing fluid communication;

means for applying a first force to said displaceable member means to move said displaceable member means in said first direction;

spring means for providing a spring force in opposition to said first force, said spring means operatively applying said spring force to said means for applying said first force to oppose said first force over at least a portion of the distance between said first substantially open position and said second substantially closed position;

said means for applying said first force being pressure controlled by a pressure medium, and said means for applying said first force comprises:

means for providing said pressure medium into said valve means;

means for receiving pressure from said pressure medium and transmitting said pressure to said displaceable member means as said first force;

said spring means, said means for receiving and transmitting pressure, and said displaceable member means being braced against one another over said at least a portion of the distance between said first and second positions and interacting with one another over said at least a portion of the distance;

said spring means contacting and applying said spring force to at least one of:

said means for receiving and transmitting pressure; and

said displaceable member means with said displaceable member means applying said spring force to said means for receiving and transmitting pressure;

said valve means of said means for providing fluid communication comprising first valve means;

said damping piston comprising passage means for providing fluid communication between said first and second chambers;

said passage means comprising second valve means for damping flow of fluid through said damping piston;

said means for providing fluid communication comprising fluid bypass means for bypassing fluid around said damping piston, said means for bypassing fluid being disposed in parallel with said passage means;

said displaceable member means being movable in said second direction in response to a second force applied to said displaceable member means by the damping fluid flowing within said fluid bypass;

said pressure medium comprising pressurized fluid acting on said means for receiving and transmitting pressure;

said fluid bypass having a cross section;

said cross section being increased upon movement of said displaceable member means in said second direction and decreased upon movement of said displaceable member means in said first direction;

said spring means controlling said cross section via said displaceable member means;

said first valve means additionally comprising a valve seat;

said spring means being disposed a distance from said valve seat;

said spring means comprising a spring plate;

said displaceable member means being movable a first distance in said first direction to contact said spring plate;

said displaceable member means and said spring plate being movable beyond said first distance in said first direction to press said spring plate in contact with said valve seat;

said spring plate comprising:

a first orifice therethrough, said first orifice being closeable by said displaceable member means contacting said spring plate; and

a second orifice therethrough, said second orifice being blocked upon said displaceable member means pressing said spring plate into contact with said valve seat;

said displaceable member means, in said first position, permitting substantially unobstructed flow of damping fluid through said fluid bypass via each of said first and second orifices;

said displaceable member means, when in contact with said spring plate and when said spring plate is out of contact with said valve seat, permitting flow of damping fluid through said second orifice; and

said displaceable member means, in said second position, comprising said displaceable member means and said spring plate being in contact with said valve seat, to maximally obstruct flow of damping fluid through said fluid bypass.

5,533,597
SUSPENSION CONTROL DEVICE

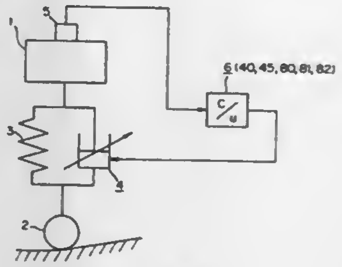
Takashi Nezu, Tokyo; Kenjiro Matsumoto, Kawasaki; Takao Kohara; Hiroshi Sakai, both of Tokyo, and Masaaki Uchiyama, Yokohama, all of, Japan, assignors to Tokico Ltd., Kanagawa-ken, Japan

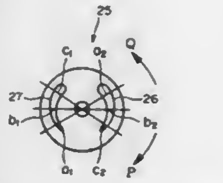
Continuation of Ser. No. 254,489, Jun. 6, 1994, abandoned, which is a continuation of Ser. No. 7,576, Jan. 22, 1993, abandoned. This application Jul. 26, 1995, Ser. No. 506,756

Claims priority, application Japan, Feb. 3, 1992, 4-017915; Jan. 8, 1993, 5-002148

Int. Cl.^{6} F16F *9/46;* **B60G** *17/06*

U.S. Cl. 188—319 **16 Claims**





1. A suspension control device for a vehicle comprising:

a variable damping coefficient shock absorber provided between a body of the vehicle and a wheel of the vehicle, the variable damping coefficient shock absorber further comprising:

a cylinder for containing a fluid therein;

a piston slidably disposed in the cylinder and dividing the interior space of the cylinder into two chambers;

a first communication passage through which the fluid of the first chamber, compressed by the piston, flows during extension of said shock absorber;

a second communication passage through which the fluid of the second chamber, compressed by the piston, flows during compression of said shock absorber;

means for varying the effective cross section of said first communication passage, wherein the damping coefficient of the shock absorber is varied between a large value and a small value in accordance with the extension of said shock absorber;

an actuator operatively connected to said means for varying the effective cross section of said first communication passage for effectively varying the cross section of said first communication passage;

a vertical absolute velocity detecting means for detecting the vertical absolute velocity of said body of the vehicle; and

a controller outputting a control signal to said actuator of said shock absorber for varying said damping coefficient of said shock absorber in response to said vertical absolute velocity of said body of the vehicle, whereby, when it is judged that the body is moving in the upward direction on the basis of the vertical absolute velocity, said control signal causes the actuator to decrease the cross section of said first communication passage for increasing the damping coefficient of said shock absorber during extension in relation to an increase in the vertical absolute velocity and said control signal causes the actuator to increase the cross section of said first communication passage for decreasing the damping coefficient of said shock absorber during extension in relation to a decrease in the vertical absolute velocity so that the damping coefficient during extension has a value approximately equal to the product of at least the vertical absolute velocity and a control gain, and, when it is judged that the body is moving in the downward direction on the basis of the vertical absolute velocity, said control signal causes the actuator to maintain the damping coefficient of said shock absorber during extension at a small value.

5,533,598

HYDRAULIC SHOCK ABSORBER FOR MOTOR VEHICLES

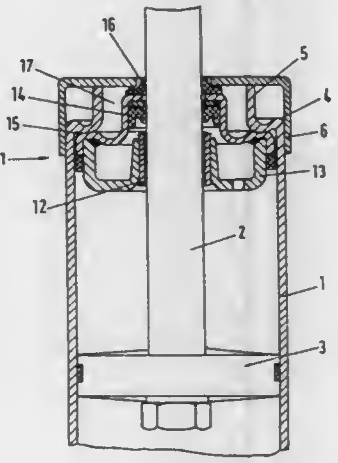
Adolf Adrian, Ennepetal, and Rolf Angermann, Herdecke, both of, Germany, assignors to August Bilstein GmbH & Co. KG, Ennepetal, Germany

Filed Dec. 7, 1994, Ser. No. 350,792

Claims priority, application Germany, Dec. 18, 1993, 43 45 116.0

Int. Cl.⁶ F16F *9/36*

U.S. Cl. 188—322.17 **13 Claims**



1. A hydraulic dashpot for motor vehicles, comprising: a fluid-filled shock-absorbing cylinder having a top surface and parallel side walls; a piston traveling back and forth inside said shock-absorbing cylinder on an end of a piston rod; said piston rod extending through a centering component at one end of said shock-absorbing cylinder, said shock-absorbing cylinder having an edge crimped around said centering component; an impact-absorbing cap having an inside surface and an outside surface and resting against an end of said shock-absorbing cylinder, said crimped edge forming a neck at the end of said shock-absorbing cylinder that said impact-absorbing cap rests against, said cap being a point of impact resisting axial shock forces, said top surface and parallel side walls of said shock-absorbing cylinder having direct abutting contact with said inside surface of said impact-absorbing cap.

5,533,599

HYDRAULIC BICYCLE BRAKE

Sandor Sule, Huttenlebenweg 42, CH-8240 Thayngen, Switzerland

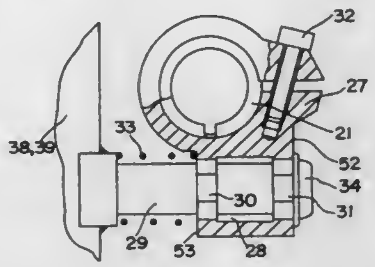
PCT No. PCT/CH93/00088, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/21057, PCT Pub. Date Oct. 28, 1993

PCT Filed Mar. 31, 1993, Ser. No. 196,142

Claims priority, application Switzerland, Apr. 14, 1992, 01 222/92

Int. Cl.⁶ B60T *11/00*

U.S. Cl. 188—344 **17 Claims**



1. A bicycle brake for use with a bicycle having a wheel with the rim, comprising at least one master cylinder, a hand lever connected to said master cylinder, at least one brake cylinder connected with said master cylinder by a hydraulic fluid line, a brake shoe connected to said brake cylinder and positioned near said wheel, and a support, wherein said brake cylinder is connected with said support and said support includes means for tilting said brake cylinder away from said wheel, wherein said brake is adapted to be attached to a fork tube of a bicycle via said support, and said brake further includes a support bolt having an axis, wherein said support bolt is attached to and extends from said fork tube, and wherein said support is axially displaceable on said support bolt, said means for tilting comprising said support and said support bolt being formed such that at an axial displacement over a certain length by said support on said support bolt, said support can be turned around said axis of said support bolt.

5,533,600

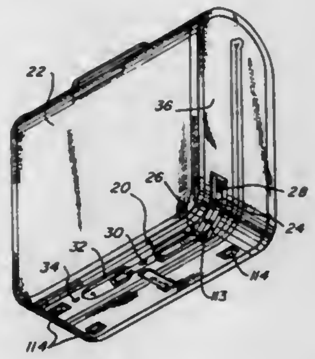
RECESSED MULTIPURPOSE GARMENT BAG HOOK

Clemens Van Himbeeck, Maarkedal, and Johan Vanderwee, Middelkerke, both of, Belgium, assignors to Samsonite Corporation, Denver, Colo.

Filed Apr. 14, 1994, Ser. No. 227,550

Int. Cl.⁶ A45C *13/22;13/28*

U.S. Cl. 190—18 R **15 Claims**



1. In a garment bag having an upper end wall from which the garment bag may be suspended when used, a recessed hook assembly comprising:

a housing connected to the upper end wall, the housing defining a recess, and the housing comprising a convex curved surface facing out of the recess;

a hook, dimensionally corresponding to and positionable substantially entirely within the recess, adapted for suspending the garment bag during use and having a curved portion comprising a concave curved surface corresponding generally to the convex curved surface of the housing;

an elongated flexible member connected at one end thereof to the hook;

a retraction mechanism connected to the upper end wall and to which another end of the elongated flexible member is connected, the retraction mechanism applying a retraction force biasing the elongated flexible member toward the retraction mechanism;

projections extending outwardly from the housing and substantially perpendicularly from the upper end wall on opposite sides of the recess; and

wherein the convex curved surface of the housing fits concentrically within the concave curved surface of the hook when the hook is positioned in the recess.

5,533,601

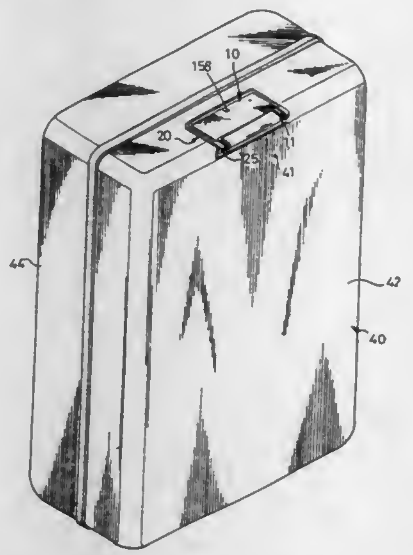
HIDDEN TYPE RETRACTABLE HANDLE ASSEMBLY FOR A SUITCASE

King-sheng Wang, No. 17, Lane 116, Ta An Gan Rd., Tachia Chen, Taichung Hsien, Taiwan

Filed Jul. 13, 1995, Ser. No. 502,193

Int. Cl.⁶ A45C *5/00;13/22*

U.S. Cl. 190—115 **2 Claims**



1. A handle assembly for a suitcase (**40**) which comprises first and second half bodies (**42**) and (**44**) each having a top wall and a side wall, an opening (**46**) defined in the top wall of said first half body (**42**), and two snapping bosses (**41**) formed on an upper portion of the side wall of said first half body (**42**), said handle assembly comprising:

a bracket (**30**) fixedly mounted on the top wall of said first half body (**42**) and having an underside received in said opening (**46**), two holes (**32**) each defined in the underside of said bracket (**30**) and each communicating with said opening (**46**);

a hidden base (**20**) fixedly received in said bracket (**30**) and having first and second elongated sides, two opposite short sides and an underside, two legs (**28**) each formed on the underside of said hidden base (**20**) and each respectively extending through a corresponding one of said two holes (**32**) and each having a wedge-shaped block (**282**) laterally protruding outwardly therefrom, two passages (**281**) each vertically defined in a corresponding one of said two legs (**28**), a recess (**21**) defined in said hidden base (**20**) between said first and second elongated sides thereof and between said two opposite short sides thereof and communicating with each of said two passages (**281**), two hook portions (**25**) each laterally formed on the first elongated side of said hidden base (**20**) and each securely snapping on the upper portion of the side wall of said first half body (**42**), two pivot axles (**27**) each formed on a corresponding one of said two hook portions (**25**) and facing with each other, two cavities (**211**) each defined in a corresponding one of the two opposite short sides of said hidden base (**20**) and each communicating with said recess (**21**);

two outer tubes (**50**) each having an upper end which is securely mounted around a corresponding one of said two legs (**28**) and is rested on the underside of said bracket (**30**) and has a wedge-shaped cavity (**502**) defined therein for fixedly receiving associated said wedge-shaped block (**282**) therein;

two inner tubes (**51**) each slidably mounted in a corresponding one of said two outer tubes (**50**) and each having an upper end extending through a corresponding one of said two passages (**281**) to be slidably received in said recess (**21**);

a handle portion (**52**) received in said recess (**21**) and having two distal ends each fixedly mounted on the upper end of a corresponding one of said two inner tubes (**51**); and

a cap (**10**) pivotally mounted on said hidden base (**20**) for enclosing said recess (**21**) and having first and second elongated sides and two opposite short sides, two ears (**11**) each laterally formed on the first elongated side of said cap (**10**) and each having a socket (**112**) horizontally defined therein for receiving a corresponding one of said two pivot axles (**27**) such that said cap (**10**) is pivotally engaged with said hidden base (**20**) about said two pivot axles (**27**), two snapping blocks (**13**) each laterally formed on a corresponding one of the two opposite short sides of said cap (**10**) and each detachably received in a corresponding one of said two cavities (**211**) of said hidden base (**20**), and two retaining bores (**17**) each defined in said cap (**10**) and each detachably receiving a corresponding one of said two snapping bosses (**41**) therein.

5,533,602

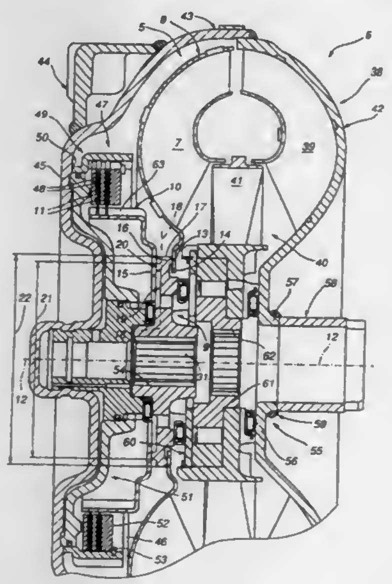
TURBINE WHEEL OF A HYDRODYNAMIC CONVERTER

Otto Wörner, Reutlingen; Rudolf Reinhardt, Esslingen, and Heinz Schultz, Hochdorf, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Dec. 27, 1994, Ser. No. 364,182

Int. Cl.⁶ F16H *45/02;* **B23K** *20/12*

U.S. Cl. 192—3.29 **16 Claims**



1. Hydrodynamic torque converter comprising:

a lockup clutch,

an outer shell holding turbine blades,

a hub non-rotatably joining the outer shell with a turbine wheel shaft, and a disk support non-rotatably joining clutch disks of the lockup clutch with the outer shell,

wherein said hub includes a radial flange which is connected on one axially facing side with the outer shell by a first friction weld connection and is connected at an opposite axial facing side with the disk support by a second friction weld connection, and

wherein the hub is provided with form-fitting surfaces at its side facing the disk support for accommodating rotational drive of the hub by means of counter-form-fitting surfaces of a receiving device of a friction welding machine which grips the hub and is rotationally driven.

5,533,603

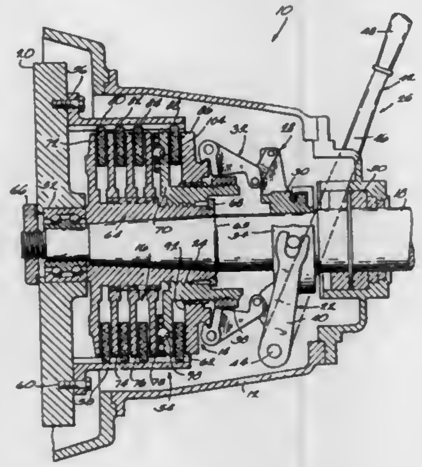
INTERNALLY-ACTUATING AND SELF-ADJUSTING PTO CLUTCH ASSEMBLY

Joseph C. Terranova, New Berlin, and Daniel J. Nemecek, Waukesha, both of Wis., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Mar. 8, 1995, Ser. No. 399,068

Int. Cl.^{6} F16D *13/04*

U.S. Cl. 192—35 **22 Claims**



1. A power-take-off clutch assembly, comprising:

(A) a rotating drive element;

(B) a rotatable driven element;

(C) a primary clutch including
  (1) an input element coupled to said drive element, and
  (2) an output element coupled to said driven element;

(D) a secondary clutch which is coaxial with said primary clutch, said secondary clutch being externally actuated and including
  (1) an input element coupled to said drive element, and
  (2) an output element;

(E) a primary clutch actuator which is coupled to said output element of said secondary clutch and which is responsive to engagement of said secondary clutch to engage said primary clutch under power of said drive element, thereby coupling said driven element to said drive element; and

(F) a bearing assembly disposed between said primary clutch actuator and said primary clutch and operable to prevent clutch self-locking.

5,533,604

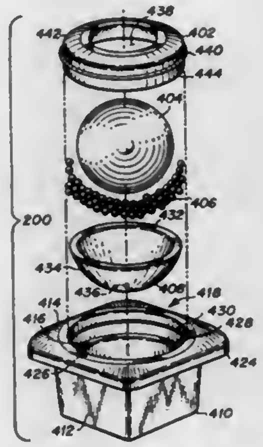
BALL TRANSFER CUBE

Dennis M. Brierton, 1678 Langport Dr., Sunnyvale, Calif. 94087

Filed Oct. 6, 1995, Ser. No. 540,067

Int. Cl.^{6} B65G *13/00*

U.S. Cl. 193—35 MD **24 Claims**



1. A ball transfer cube for insertion into a grating for conveying a load, comprising:
- a hollow housing having a lateral prismatic outer-surface, a lateral cylindrical inner-surface, a polygonal shoulder coupled to said lateral prismatic outer-surface at a top of the hollow housing, a circular depression within said lateral cylindrical inner-surface near said top of the hollow housing, and a semi-spherical concave base with a first centralized hole;
- a semi-spherical bearing race coupled to said semi-spherical concave base of tile hollow housing and having a second centralized hole;
- a plurality of small ball bearings coupled to the semi-spherical bearing race;
- a main ball bearing coupled to the plurality of small ball bearings; and
- a cylindrical cap having a third central opening for exposing the main ball bearing above a top surface of the cylindrical cap and a circular ridge around a lateral cylindrical outer-surface of the cylindrical cap coupled to said circular depression in the hollow housing for holding the main ball bearing, the plurality of small ball bearings, and the semi-spherical bearing race within the hollow housing.

5,533,605

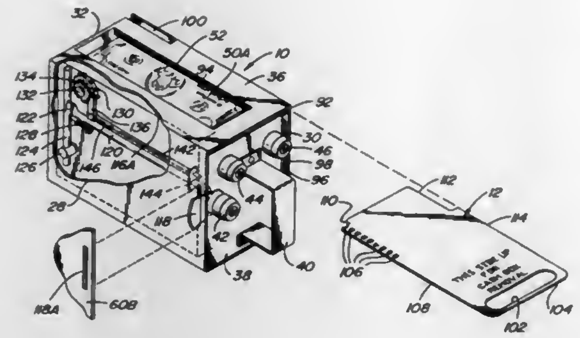
PAPER CURRENCY HANDLING APPARATUS INCLUDING A CASH BOX SECUREMENT AND ACCESS DEVICE

David S. Mays, and Robert E. Blevins, both of Mentor, Ohio, assignors to Diversified Technologies, Inc., North Las Vegas, Nev.

Filed Jun. 1, 1995, Ser. No. 456,366

Int. Cl.^{6} G07F *7/04*

U.S. Cl. 194—206 **18 Claims**



1. A secure currency stacker box for releasable mounting to paper currency handling apparatus, the paper currency handling apparatus including note acceptor means for validating a paper currency banknote inserted therein, and located within a openable cover for carrying the validated banknote into said stacker box, said stacker box being arranged to securely store a stack of paper currency banknotes therein and comprising a hollow member having a wall with an entrance window located therein through which a validated banknote is introduced by the punch plate of the apparatus, releasable securement means for releasably securing said box to the apparatus, and a releasably securable security plate, said security plate being arranged for disposition in a first orientation to be slid into said box to a sealing position to completely close said window, said security plate cooperating with said releasable securement means when said box is mounted in the apparatus to enable said box to be removed from the apparatus, with said security plate remaining in place completely closing said window, said security plate also being arranged for disposition in a second orientation when said box is secured to the apparatus to completely close said window while enabling the openable cover of the apparatus to be opened to provide access to the means for carrying the validated banknote into said stacker box.

5,533,606

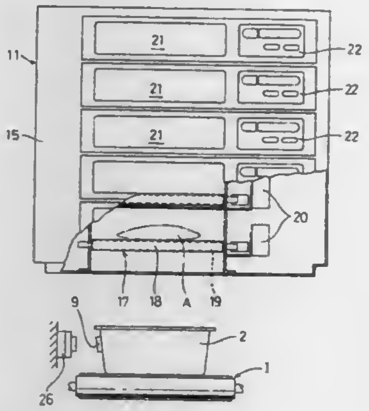
APPARATUS FOR STORING AND TRANSPORTING DRUGS

Shoji Yuyama, 3-8, Hohnan-cho Nishi 4-chome, Toyonaka-shi, Osaka, Japan

Filed Sep. 13, 1994, Ser. No. 305,052

Int. Cl.^{6} B65G *37/00*

U.S. Cl. 198—349 **1 Claim**



1. An apparatus for storing and transporting drugs comprising a case having a drug discharge opening, a plurality of storage/delivery means mounted in said case for storing drugs and discharging them toward said drug discharge opening, said case further having a plurality of drug inlets corresponding to said respective storage/delivery means, driving means for said storage/delivery means, displays provided near said respective drug inlets and drivingly associated with said driving means, a plurality of buckets each bearing specific identification data and adapted to run along a passage connected to said drug discharge opening formed in said case, and a detector for detecting the identification data of said each bucket to send signals for driving said driving means for said each storage/delivery means.

5,533,607

ARTICLE HANDLING APPARATUS

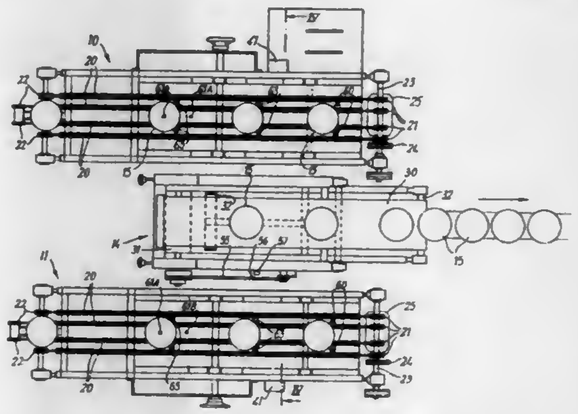
David K. Hulse, and William C. Barnett, both of Stoke-On-Trent, England, assignors to Royal Doulton (UK) Limited, Stoke-on-Trent, England

Filed Mar. 22, 1995, Ser. No. 408,908

Claims priority, application United Kingdom, Mar. 24, 1994, 9405820

Int. Cl.^{6} B65G *47/68*

U.S. Cl. 198—448 **33 Claims**



4. Apparatus for transferring articles from a plurality of input lines to a single independently driven output line, the apparatus including means for lifting articles from each input line in turn and transferring such articles to said output line and means for controlling deposit of said articles on said output line dependent on the rate of movement of the output line, whereby articles transferred from said input lines are placed on said output line in equi-spaced relation.

5,533,608

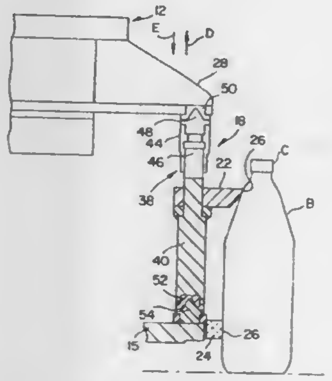
QUICK-CHANGE CENTER STAR ASSEMBLY FOR A CAPPING MACHINE

Edgar E. Adams, Fountain City; Darwin L. Ellis, and Gerald E. Steile, both of Richmond, all of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 3, 1994, Ser. No. 333,738

Int. Cl.^{6} B65G *29/00*

U.S. Cl. 198—478.1 **9 Claims**



1. A capping machine for securing closures on containers having a center star assembly which can be quickly removed and replaced with another center star assembly substantially without the use of fasteners comprising:
- a rotary table;
- a turret hub;
- a center star assembly for receiving a plurality of containers and transporting said containers beneath said turret hub during capping; and

connecting means for retaining said center star assembly to said turret bub and said rotary table and for enabling rotation of said center star assembly with said rotary table and said turret hub during capping of said containers.

5,533,609

FOOT WIPING APPARATUS FOR CERAMIC WARE

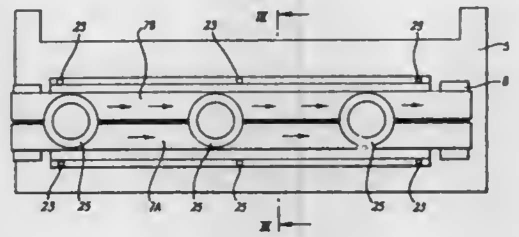
David K. Hulse, Stoke-on-Trent, England, assignor to Royal Doulton (UK) Limited, Stroke-on-Trent, England

Filed Mar. 22, 1995, Ser. No. 408,339

Claims priority, application United Kingdom, Mar. 24, 1994, 9405819

Int. Cl.^{6} B65G *47/24*

U.S. Cl. 198—415 **6 Claims**



1. Apparatus for foot cleaning of articles of ceramic ware comprising conveyor means including a pair of belt members independently movable in the same direction at different speeds, the belt members being tilted transversely relative to one another such that their adjacent edges are lower than their outer edges, the surfaces of said belt members being adapted to remove glaze medium from the foot portions of the articles of ware transported on the belt members, and the apparatus including means for removing from the belt members glaze medium transferred to them from the said articles.

5,533,610

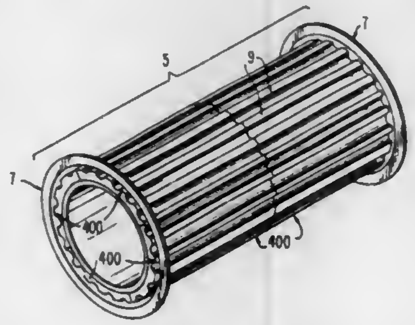
APPARATUS AND METHOD FOR FORMING COMBINED FILTER TIPPED CIGARETTES

Martin T. Garthaffner, Midlothian, and Ronald D. Honaker, Powhatan, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 943,298, Sep. 10, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,180

Int. Cl.^{6} B65G *47/26*

U.S. Cl. 198—458 **20 Claims**



1. A rotatable spreader drum comprising:

a plurality of cigarette component holding channels, each channel comprising two sections;

axial movement limiting means at each end of each of said cigarette component holding channels; and

means for inducing axial motion in opposite directions of each section.

5,533,611

FOLDING PACKAGE FOR SURGICAL PRODUCTS

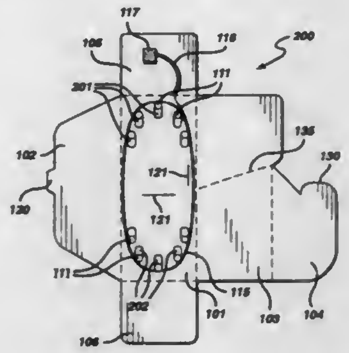
Marcos A. Bordighon, Centro, and Jose L. L. Januzelli, Sao Dimas, both of, Brazil, assignors to Ethicon, Inc., Somerville, N.J.

Filed May 5, 1994, Ser. No. 238,554

Claims priority, application Brazil, May 5, 1993, 19301757

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 206—63.3 **6 Claims**



1. A folding package for surgical products (**100**,**200**), particularly adapted for retaining a surgical suture (**115**,**116**), characterized by comprising:

first and second elongated retaining panels (**101**,**102**) foldingly joined to each other by their longitudinal edges, the suture (**115**,**116**) being wound in a non-crossed manner over the first retaining panel (**1010**);

a first auxiliary retaining panel (**105**) foldingly joined to a transverse edge of the fist retaining panel (**101**);

a first elongated locking panel (**103**), the longitudinal edge of which is foldingly joined to the longitudinal edge of the first retaining panel (**101**) opposite the second retaining panel (**102**), the first locking panel (**103**) baving a substantially transverse weakened line (**135**) and,

bores (**201**, **202**) in the first retaining panel (**101**), which are arranged along substantially semicircular paths, through which pins (**111**) that facilitate the winding of the suture (**115**,**116**) can pass.

3. A folding package for surgical products (**100**,**200**), particularly adapted for retaining a surgical suture (**115**,**116**), characterized by comprising:

first and second retaining panels (**101**,**102**) foldingly joined to each other by their edges, the suture (**115**,**116**) being wound in a non-crossed manner over the first retaining panel (**1010**:

a first locking panel (**103**), the edge of which is foldingly joined to the edge of the first retaining panel (**101**) opposite the second retaining panel (**102**); and

a locking device of the tongue-slot type (**130**,**131**), the slot (**131**) being disposed in a transversely median position of the first retaining panel (**1010** and,

a second locking panel (**104**) foldingly joined to the longitudinal edge of the first locking panel (**103**); the tongue (**130**) of the locking device being disposed at the free edge of this second locking panel (**104**) substantially parallel to the longitudinal edges of the retaining panels (**101**, **102**) and of the first locking panel (**103**) wherein the slot (**131**) being transversely disposed with respect to the longitudinal axis of the first retaining panel (**101**).

5. A folding package for surgical products (**100**,**200**), particularly adapted for retaining a surgical suture (**115**,**116**), characterized by comprising:

first and second retaining panels (**101**,**102**) foldingly joined to each other by their edges, the first retaining panel (**101**) having bores (**201**,**202**) arranged along substantially semicircular paths, through which pins (**111**) that facilitate the winding of the suture (**115**,**116**) in a non-crossed manner can pass;

first and second locking panels (**103**,**104**) foldingly joined to each other, the first locking panel (**103**) being rectangular and foldingly joined by its longitudinal edge to the longitudinal edge of the first retaining panel (**101**) opposite the second retaining panel (**102**); and

a locking device of the tongue-slot type (**130**,**131**), the respective slot (**131**) being disposed in a transversely median position in tbe first retaining panel (**101**), and the respective tongue (**130**) being disposed at the free edge of the second locking panel (**104**) substantially parallel to the longitudinal edge of the retaining panels (**101**,**102**) and of the first locking panel (**103**).

5,533,612

HINGE-LID PACK FOR CIGARETTES

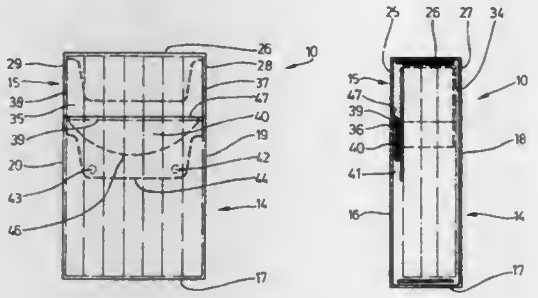
Heinz Focke, Verden, Germany, assignor to FOCKE & CO. (GmbH & Co.), Verden, Germany

Filed Dec. 12, 1994, Ser. No. 354,762

Claims priority, application Germany, Dec. 16, 1993, 43 42 836.3

Int. Cl.^{6} B65D *85/10*

U.S. Cl. 206—268 **8 Claims**



1. A hinge-lid pack for cigarettes, comprising:

a) a box part (**14**) comprising a pack front wall (**16**), a pack rear wall (**18**), a pack bottom wall (**17**), and two narrow pack side walls (**19**, **20**);

b) a lid (**15**) comprising a lid front wall (**25**), a lid rear wall (**27**), a lid top wall, and two lid side walls (**28**, **29**),

c) wherein, for opening and closing the lid (**15**), the lid rear wall (**27**) is pivotably connected to the pack rear wall (**18**);

d) a collar (**35**) comprising a collar front wall (**36**) and two collar side tabs (**37**, **38**), and being located in the box part (**14**),

e) wherein the collar (**35**) has an upper portion which projects from an upper, transversely directed closing edge (**39**) of the pack front wall (**16**) and which is surrounded by the lid (**15**) in a closed position of the lid (**15**); and

f) an insertion flap (**40**) formed as a downward continuation of the lid front wall (**25**) so that the insertion flap (**40**) adjoins the lid front wall (**25**) in one piece,

g) wherein the insertion flap (**40**) rests entirely between the collar front wall (**36**) and the pack front wall (**16**) in the closed position of the lid (**15**) such that the insertion flap (**40**) is covered by the pack front wall (**16**) on an outside, and by the collar front wall (**36**) on the inside,

h) wherein the insertion flap (**40**) has a smaller width than the adjoining lid front wall (**25**) and the collar front wall (**36**), and

i) wherein the insertion flap (**40**) is set back into the box part (**14**) by pressure deformation relative to the lid front wall (**25**) thereby forming a lower, transversely directed lid edge (**47**) such that, in the closed position, there is a continuous transition between the lid front wall (**25**) and the pack front wall (**16**), and the lid edge (**47**) adjoins said closing edge (**39**).

5,533,613

CIGARETTE PACKET

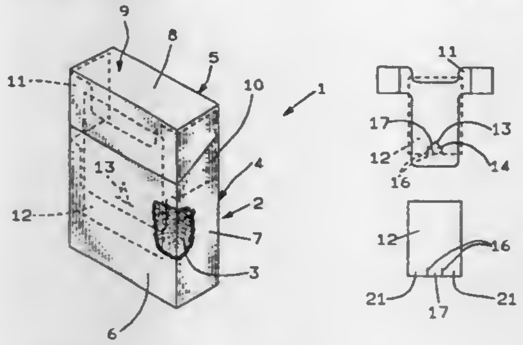
Alessandro Minarelli, Bazzano (Bologna), and Marco Brizzi, Zola Predosa (Bologna), both of, Italy, assignors to G. D S.p.A., Bologna, Italy

Filed Jan. 20, 1995, Ser. No. 375,948

Claims priority, application Italy, Jan. 20, 1994, BO94A0012

Int. Cl.^{6} B65D *85/10*

U.S. Cl. 206—268 **6 Claims**



1. A parallelepiped-shaped cigarette packet having a bottom, a top, a front, a back, and left and right side walls, said pack being elongated along a longitudinal axis extending in a top to bottom direction,

said packet comprising:

a container oox;

an inner wrapping enveloping a group of cigarettes and disposed within said box;

a frame sleeved within said box between said box and said inner wrapping; and

a leaflet or coupon interposed within said box between said frame and said inner wrapping;

said leaflet or coupon and said frame each having two opposite faces;

at least one of said leaflet or coupon and frame being provided with at least one slot extending widthwise of said packet;

at least the other of said leaflet or coupon and frame being provided with a tongue having a length extending longitudinally of said packet;

each said tongue being received through a corresponding said slot so that said tongue throughout the length thereof is disposed against an opposite face of the respective said at least one of said leaflet or coupon and frame relative to the remainder of said at least other of said leaflet or coupon and frame.

5,533,614

DISPLAY HOLDER FOR OPTICALLY READ DISCS

Joshua J. Walker, 2590 S. Fillmore St., Denver, Colo. 80210

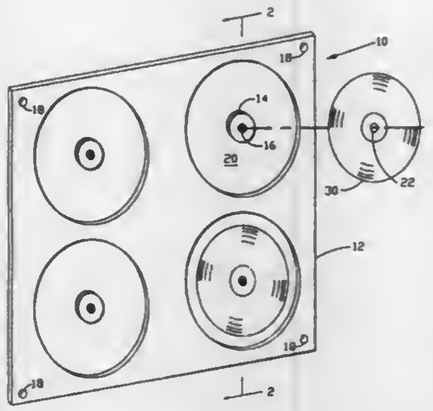
Filed Aug. 23, 1994, Ser. No. 294,756

Int. Cl.^{6} B65D *85/57;* **A47G** *29/00*

U.S. Cl. 206—308.1 **5 Claims**

1. An open-faced compact disc display rack comprising a substantially flat and rigid support panel, said panel having a forward surface and a substantially planar rearward surface, said forward surface including one or more recessed areas, said forward surface having a projection extending from each said recessed area, said projections each including a clasping means, each clasping means removely receiving a compact disc within its corresponding recessed area against its corresponding projection to define a completely spaced relationship of said compact disc with said support panel, each received compact disc being in a plane substantially parallel to the forward surface of its corresponding recessed area, said support panel having through holes to allow mounting of the panel to a wall.

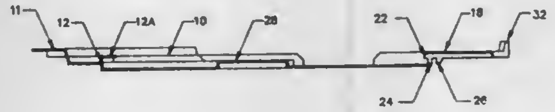
3. A wall hanging display for compact discs, the display comprising an integrally molded panel having a forward surface and a substantially planar rearward surface, the display including:



(a) at least one recessed area in the forward surface of said integrally molded panel for receiving a compact disc,
(b) a clasping means affixed within each recessed area, each said clasping means being adapted to clasp the central aperture of a compact disc,
(c) each said clasping means projecting from the forward surface of its corresponding recessed area,
(d) wherein each said clasping means removably holds a compact disc within its corresponding recessed area in a completely spaced relationship with said panel, each compact disc being substantially parallel to the forward surface of its recessed area, and
(e) said panel having through holes to allow mounting of the panel to a wall.

5,533,615
DISC STORAGE CASE

William G. McCamy, 4353 Highbourne Dr., Marietta, Ga. 30066
Filed Dec. 30, 1994, Ser. No. 366,625
Int. Cl.^{6} B65D *85/57*
U.S. Cl. 206—308.1 **11 Claims**



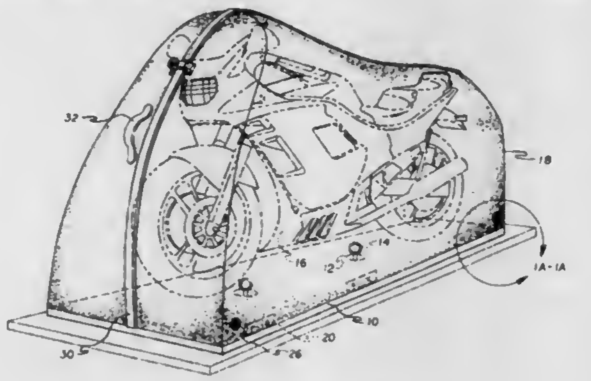
1. A holder for removably storing a disc, comprising:
a container having top, bottom, left and right sides, a top planar surface and a bottom planar surface, said top planar surface having a recessed receptacle defined therein capable of receiving a disc-shaped object;
a first retention means associated within said top planar surface for retaining said disc, comprising at least one lip projecting from said top planar surface partially over said recess and extending partially around the circumference of said receptacle;
a second retention means proximate to said receptacle for retaining said disc comprising,
  a button having generally fiat top and bottom surfaces, a front edge protruding over said recess and a rear edge, and a stop extending downward from said button bottom surface; and
  a flexible tab extending downwardly from said bottom surface of said button and attached to said planar surface.

8. A holder for removably storing a disc, comprising:
a container having top, bottom, left and right sides, a top planar surface and a bottom planar surface, said top planar surface having a recessed receptacle defined therein capable of receiving a disc-shaped object;
a first retention means associated within said top planar surface for retaining said disc, comprising at least one lip projecting from said top planar surface partially over said recess and extending partially around the circumference of said receptacle;
a second retention means proximate to said receptacle for retaining said disc comprising,
  a button having generally fiat top and bottom surfaces, a front edge protruding over said recess and a rear edge, and a stop extending upward from said top planar surface, said stop capable of preventing over-flexion of said button; and
  a flexible tab extending downwardly from said bottom surface of said button and attached to said planar surface.

9. A holder for storing a disc, comprising:
a planar surface having a recessed receptacle defined therein capable of receiving a disc-shaped object and a projection extending upwardly from said planar surface capable of supporting said disc in said receptacle;
a first retention means associated within said planar surface for retaining said disc, comprising a pair of lips projecting from said planar surface partially over said recess and extending partially around the circumference of said receptacle;
a second retention means proximate to said receptacle for retaining said disc in conjunction with said first retention means comprising,
a button having generally flat top and bottom surfaces, a front edge partially protruding over the edge of said receptacle and a rear edge,
a flexible tab extending downwardly from said bottom surface of said button and attached to said planar surface, said tab permitting said button to pivot, and
and a stop comprising a post extending downward from said bottom surface toward said planar surface for preventing overflexion of said flexible tab.

5,533,616
CASE FOR MOTOR BIKE

Catherine B. Crowfoot, Box 155, Preston, Md. 21655
Filed Jan. 20, 1995, Ser. No. 375,725
Int. Cl.^{6} B65D *81/18;85/68*
U.S. Cl. 206—335 **11 Claims**



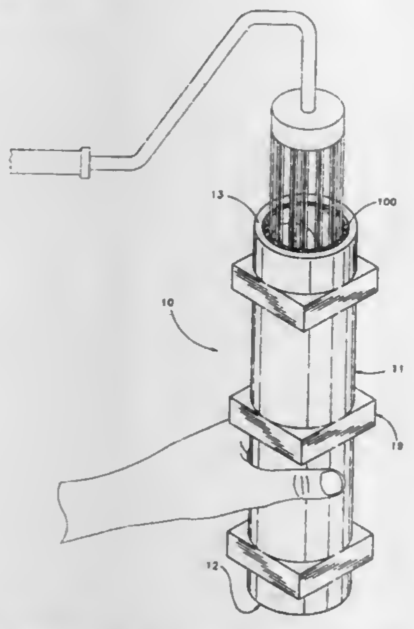
1. A case for encasing a motorcycle comprising:
a base;
a first housing having a peripheral edge;
a first hinge pivotally connecting said first housing to said base;
a second housing having a peripheral edge;
a second hinge pivotally connecting said second housing to said base;
said first and second housings having at least one vent hole with a filter disposed therein, said first and second housings movable between an opened and a closed position, wherein, when in said closed position, said first and said second housings abut one another along said peripheral edges, respectively, said first and second housings and said base defining an enclosed volume.

7. A case for encasing a motorcycle comprising:
a base;
a first housing having a peripheral edge;

a first hinge pivotally connecting said first housing to said base;
a second housing having a peripheral edge;
a second hinge pivotally connecting said second housing to said base;
said first and second housings having at least one vent hole with a filter disposed therein, said first and second housings being movable between an opened and a closed position, wherein, when in said closed position, said first and said second housings abut one another along said peripheral edges, respectively, said first and second housings and said base defining an enclosed volume;
said base having at least one aperture.

5,533,617
PAINT ROLLER SLEEVE STORAGE CONTAINER

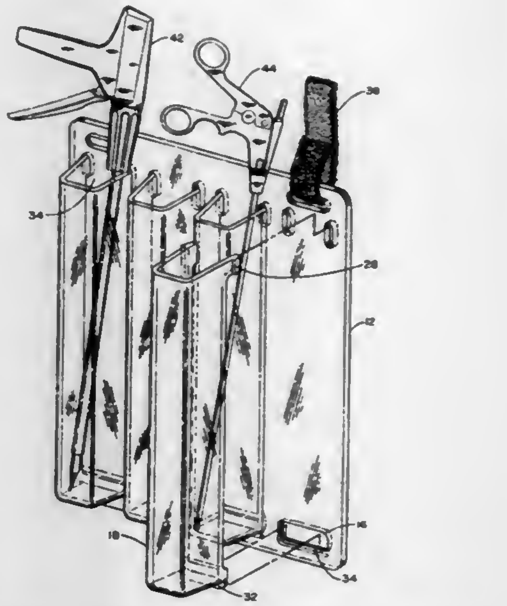
Valerie R. Von Flatern, 603 Grattan St., Chicopee, Mass. 01020
Filed Oct. 31, 1994, Ser. No. 332,132
Int. Cl.^{6} B65D *83/10*
U.S. Cl. 206—361 **4 Claims**



1. A storage container, for a paint roller sleeve, comprising:
(a) a flexible resilient tubular housing for removably storing the sleeve therein;
(b) the tubular housing comprising:
  a sealed end on the tubular housing;
  an open end distal the sealed end;
  a chamber in the tubular housing to receive the sleeve;
  an inner wall on the tubular housing;
  a plurality of sleeve retaining bosses on the inner wall;
  at least one circumferential paint wiping ridge on the inner wall; and
  an outer wall on the tubular housing;
(c) at least one anti-rotational stacking member attached to the outer wall; and
(d) a sealing cap removably attached to the open end of the tubular housing.

5,533,618
SURGICAL HOLSTER

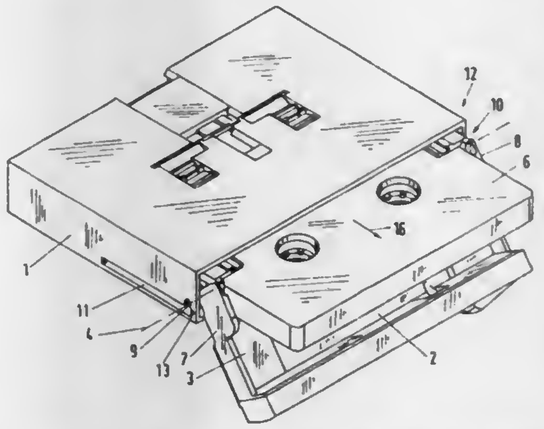
Robert F. Pickels, Jr., 4621 E. Seneca Ave., Sherrill, N.Y. 13461
Filed Oct. 11, 1994, Ser. No. 321,412
Int. Cl.^{6} B65D *83/10*
U.S. Cl. 206—363 **3 Claims**



1. A reusable surgical device suitable for carrying elongated surgical instruments which comprises a backing plate having a plurality of elongated detachable receptacle members contained on said backing plate in fixed engagement,
  wherein said backing plate contains a plurality of slots through the thickness of said backing plate and wherein each of said receptacle members contains a plurality of locking tabs configured to fit into said slots in locking engagement, said receptacle members having an opening defined by a pair of substantially vertical edges, said receptacle members further having an open top and a closed bottom, with said vertical edges abutting against the surface of said backing plate.
  and where said receptacle members and said backing plate together define a plurality of enclosed elongated chambers having an open top that removably receive surgical instruments.

5,533,619
CONTAINER FOR A MAGNETIC TAPE CASSETTE

Christiane Ziegler, Waldachtal, Germany, assignor to fischerwerks Artur Ficher GmbH & Co., Waldachtal, Germany
Filed Nov. 7, 1994, Ser. No. 335,152
Claims priority, application Germany, Nov. 19, 1993, 9317730 U
Int. Cl.^{6} B65D *85/672*
U.S. Cl. 206—387.12 **5 Claims**



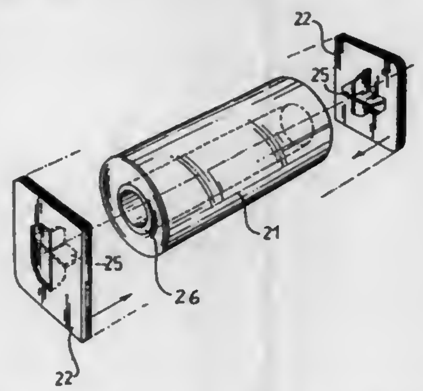
1. A container for a magnetic tape cassette, said container comprising a housing (1) and a slider (2) having means for accommodating a magnetic tape cassette, said housing (1) having means (15) for partially displacing said slider from said housing (1) into a

removal position of said slider (2) in which said magnetic tape cassette is removable from said slider (2) and means for locking said slider (2) in said housing in a storage position of said slider, said slider including a base plate (5) comprising a non-pivotable rear base plate (23) and a pivotable part (3) having a transverse pivot axis (4) arranged above and spaced from the base plate (5) and said slider (2) being provided with a gap (21) in the base plate (5) located between the pivotable part (3) and the non-pivotable rear base plate (23); and means (9,10; 15) for pivoting said pivotable part (3) downwardly about said transverse pivot axis (4) when said slider (2) is moved into said removal position;

wherein said means (9,10; 15) for pivoting said pivotable part (3) downwardly comprises a peg (9,10) projecting outwardly from the pivotable part (3) of the slider (2) at least on one side of the pivotable part and a guide cam (11,12) formed laterally in at least one side of said housing (1), said guide cam (11,12) and said peg (9,10) being located so that said peg (9,10) engages in said guide cam and so that in the removal position of said slider the peg (9,10) of said pivotable part (3) is pressed on said housing (1) so as to pivot the pivotable part (3) downward.

5,533,620
FOLDABLE ELEMENT FOR USE IN A CASE HOUSING A ROLL OF PHOTOSENSITIVE MATERIAL

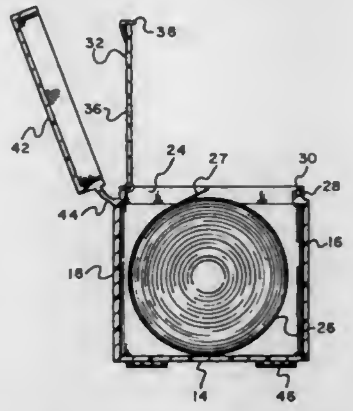
Franco Torterolo, Altare, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 2, 1994, Ser. No. 236,397
Claims priority, application European Pat. Off., May 10, 1993, 93107554
Int. Cl.⁶ B65D *85/672*
U.S. Cl. 206—408 **11 Claims**



1. A foldable element for use in a case for a roll of photosensitive material, said element characterized by comprising a flat base (2), a folding area defined by folding lines (7) dividing the base (2) into a first portion and a second portion (5, 6), a first flap and a second flap (8, 9) formed in the first and second portions (5, 6) respectively by means of respective first and second cutting lines (11, 13) and first and second folding segments (10, 12), the first and second folding segments (10, 12) forming angles of 70°–110° with each other and passing through respective first and second reference points (A, B) symmetrically positioned on the first and second portions (5, 6) with respect to the folding lines (7), a first slit (14) opened in the first flap (8) along a line passing through the first reference point (A) and perpendicular to the first folding segment (10), a second slit (15) opened in the second flap (9) along a line passing through the second reference point (B) and perpendicular to the second folding segment (12), a third slit (16) opened in the second portion (6) of the base (2) along a line passing through the second reference point (B) and parallel to the first folding segment (10), the second slit and the third slit (15, 16) being adjacent and open one to the other at the second reference point (B), the first slit (14) intersecting the first cutting line (11) but not the first folding segment (10), the second slit (15) not intersecting the second cutting line (13).

5,533,621
CONTAINER FOR A ROLL OF WOUND MATERIAL

Edward Schoal, Jr., 329 Summit Ave., Westville, N.J. 08093
Filed May 11, 1995, Ser. No. 439,161
Int. Cl.⁶ A47K *10/32*
U.S. Cl. 206—409 **9 Claims**

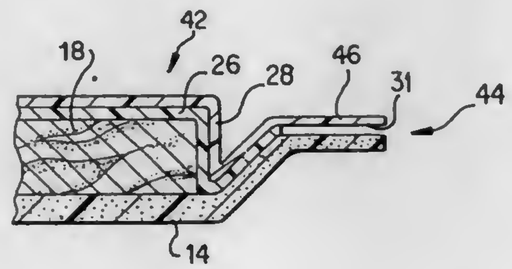


1. A container for housing a roll of wound material therein and for facilitating the dispensing of an individual sheet from the roll comprising:

a main rectangular body having a bottom, a front wall, a rear wall, a pair of opposing end walls and an open top, said front wall, rear wall, end walls and said bottom defining an open space for receiving a roll of wound material therein;
a lip extending upwardly from said front, rear and end walls;
a lid means having a longitudinal slot formed therethrough, said lid means being hingedly connected to said rear wall and being adapted to releasably engage said front wall, and
cover means hingedly connected to said outer surface of one of said front and rear walls along substantially the entire length thereof for covering said top of said main body and said lid means, said cover means being sized to frictionally engage the outer surface of said upwardly extending lip.

5,533,622
PEELABLE BARRIER LAYER VSP PACKAGE, AND METHOD FOR MAKING SAME

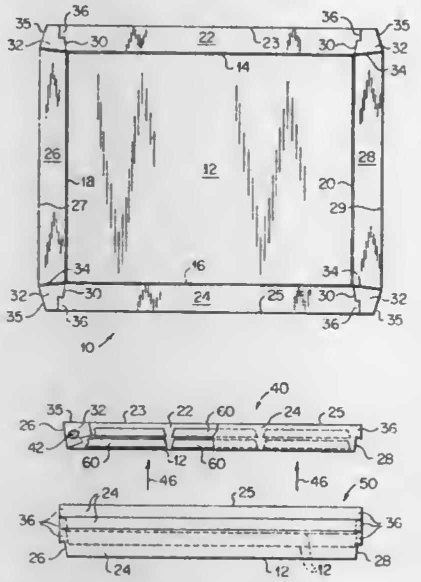
Henry W. Stockley, III, and Joseph E. Owensby, both of Spartanburg, S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.
Division of Ser. No. 189,528, Jan. 31, 1994, Pat. No. 5,402,622. This application Mar. 6, 1995, Ser. No. 371,633
Int. Cl.⁶ B65D *73/00*
U.S. Cl. 206—484 **18 Claims**



1. A package comprising:
a product;
a bottom web supporting the product, the bottom web comprising a sealing layer; and
a composite film enclosing the product and comprising a non-barrier layer and a peelable barrier layer, wherein the non-barrier layer is sealed to the sealing layer of the bottom web and has a cut-back portion, and the peelable barrier layer has a portion which extends beyond the cutback portion of the non-barrier layer and thereby defines a pull tab for peeling the peelable barrier layer from the non-barrier layer.

5,533,623
NESTABLE TRAY WITH DESTACKING FEATURE

Edward F. Fischer, Old Tappan, N.J., assignor to Oak Tree Packaging Corporation, Montvale, N.J.
Filed Jun. 30, 1995, Ser. No. 491,344
Int. Cl.⁶ B65D *21/02*
U.S. Cl. 206—518 **12 Claims**

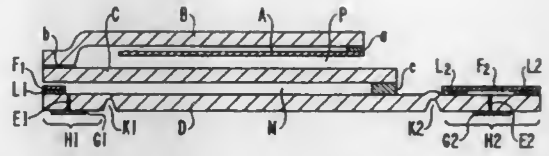


1. A blank for a nestable tray, said blank including a bottom panel having peripheral edges thereof defined by a plurality of peripheral fold lines, a plurality of side panels each having a base edge and a free edge, said side panels having their base edge attached to said bottom panel along respective ones of said peripheral fold lines. adjacent ones of said side panels being separated from each other by respective cut lines extending outwardly from said bottom panel, one panel of said adjacent ones of said side panels including an attachment flap connected thereto along a fold line extension, and said other panel of adjacent ones of said side panels including an extension tab extending coplanar therewith and along a respective free edge thereof, said extension tab being separated from said attachment flap by a respective one of said cut lines.

5,533,624
PACKAGING BAG, PREFERABLY FOR PERILOUS SAMPLES, AND METHOD FOR PRODUCING THE PACKAGING BAG

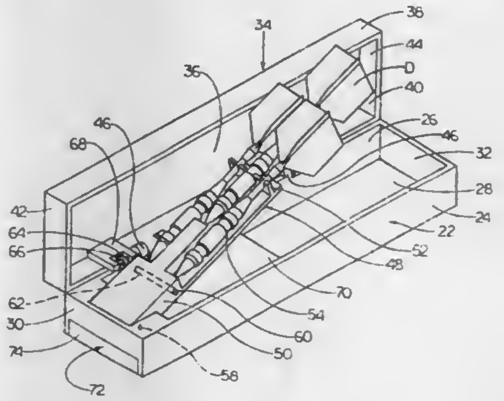
Jan Söderholm, Luntmakargatan 71, S-113 51 Stockholm, and Hugo Cedraeus, Grönviksvägen 187, S-161 42 Bromma, both of, Sweden
PCT No. PCT/SE92/00605, § 371 Date Mar. 7, 1994, § 102(e) Date Mar. 7, 1994, PCT Pub. No. WO93/04946, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 2, 1992, Ser. No. 204,279
Claims priority, application Sweden, Sep. 6, 1991, 9102569
Int. Cl.⁶ B65D *85/00*
U.S. Cl. 206—524.3 **48 Claims**

1. A package, such as for perilous samples, comprising a compartmented package body having an intermediate layer and first and second layers disposed to opposite sides of said intermediate layer, respectively, with a first compartment disposed between said first layer and said intermediate layer and a second compartment disposed between said second layer and said intermediate layer, said first layer and at least one of said intermediate layer and said second layer including shock-absorbing material, and each compartment having an opening, the respective compartment openings being disposed at opposite ends of the package body, and first and second flaps disposed at the opposite ends of the package body for sealing the openings of said first and second compartments, respectively, said first and second flaps each being provided with a layer of pressure-sensitive adhesive covered by a removable protective layer and each having a slot which is covered with a tear strip which can be torn off to open the corresponding compartment.



5,533,625
CONTAINER WITH INTERNAL LIFT MECHANISM

Dennis L. Mikkelsen, 17538 Second Pl. NE., Seattle, Wash. 98155
Filed Aug. 17, 1994, Ser. No. 292,069
Int. Cl.⁶ B65D *79/00*
U.S. Cl. 206—565 **13 Claims**



1. A container for storing objects comprising:
(a) a housing;
(b) a lid pivotally attached to said housing;
(c) a tray pivotally attached within said housing, said tray having means for removably securing objects thereon; and
(d) a lift mechanism coupled between said tray and said lid for lifting at least a portion of said tray upon opening of said lid, said lift mechanism including:
  (i) a lift arm secured to said lid; and
  (ii) a lift member pivotally coupled to said lift arm and slidably coupled to said tray.

5,533,626
METHOD OF DEPRESSING NON-SULFIDE SILICATE GANGUE MINERALS

D. R. Nagaraj, Stamford; Samuel S. Wang, Cheshire; James S. Lee, Sandy Hook, and Lino G. Magliocco, Shelton, all of Conn., assignors to Cytec Technology Corp., Wilmington, Del.
Filed Jun. 7, 1995, Ser. No. 475,160
Int. Cl.⁶ B03D *1/016;1/02*
U.S. Cl. 209—167 **20 Claims**

1. A method which comprises beneficiating value sulfide minerals from ores with selective rejection of non-sulfide silicate gangue minerals by:

a. providing an aqueous pulp slurry of finely-divided, liberation-sized ore particles which contain said value sulfide minerals and said non-sulfide silicate gangue minerals;

b. conditioning said pulp slurry with an effective amount of non-sulfide silicate gangue mineral depressant, a value sulfide mineral collector and a frothing agent, respectively, said depressant comprising a mixture of a polysaccharide and a polymer comprising:

(i) x units of the formula:

$$+X+$$

(ii) y units of the formula:

$$+Y+$$

(iii) z units of the formula:

$$+Z+$$

wherein X is the polymerization residue of an acrylamide monomer or mixture of such acrylamide monomers, Y is a hydroxy group containing polymer unit derived from a monoethylenically unsaturated monomer, Z is an anionic group containing polymer unit derived from a monoethylenically unsaturated monomer, x represents a residual mole percent fraction of over about 35%, y is a mole percent fraction ranging from about 1 to about 50% and z is a mole percent fraction ranging from about 0 to about 50%;

c. subjecting the conditioned pulp slurry to froth flotation and collecting the value sulfide mineral having a reduced content of non-sulfide silicate gangue minerals.

5,533,627

DEVICE FOR FEEDING AND STORING VALUABLE DOCUMENTS

Leif Nordqvist, Åkersberga, Sweden, assignor to Cash Guard AB, Stockholm, Sweden

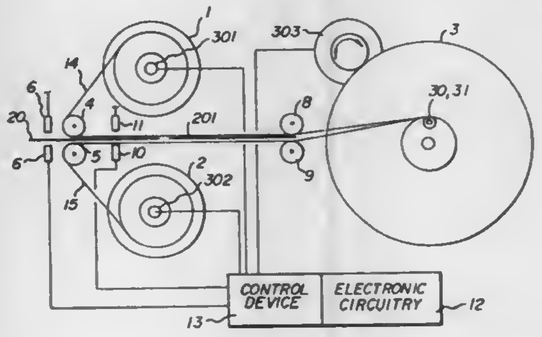
PCT No. PCT/SE92/00773, § 371 Date Sep. 13, 1994, § 102(e) Date Sep. 13, 1994, PCT Pub. No. WO93/10511, PCT Pub. Date May 27, 1993

PCT Filed Nov. 10, 1992, Ser. No. 244,224

Claims priority, application Sweden, Nov. 21, 1991, 9103447

Int. Cl.^{6} B07C *5/00*

U.S. Cl. 209—534 **6 Claims**



1. A device used in a cash-register system for handling documents of a same value comprising:

an opening which is used for feeding in and feeding out of documents;

two single film collecting spools about which an associated continuous film is respectively wound and unwound, said continuous films coming together adjacent said opening;

a double film collecting spool whereby documents fed in between said continuous films at said opening are (a) stored in consecutive order between said continuous films by being wound around said double film collecting spool when said single film collecting spools and said double film collecting spool are operated in a feed in direction, and (b) fed out in reverse order at the opening from between said continuous films by unwinding of said double film collecting spool when said single film collecting spools and said double film collecting spool are operated in a feed out direction;

a motor means for selectively operating said single film collecting spools and said double film collecting spool in the feed in and feed out directions;

a first detection means located adjacent said opening for detecting the presence of a document fed in at said opening and fed out at said opening;

a second detection means for checking each document fed in between said continuous films and for causing a fed in document to be fed out where that document fails to meet a check, said second detection means being located between said first detection means and said double film collecting spool;

a control means connected to said motor means and said first detection means for controlling a feeding out of a desired number of the documents located between said continuous films; and

a circuitry means connected to said first detecting means for computing a new total of documents in the device after each feed in and feed out of documents.

5,533,628

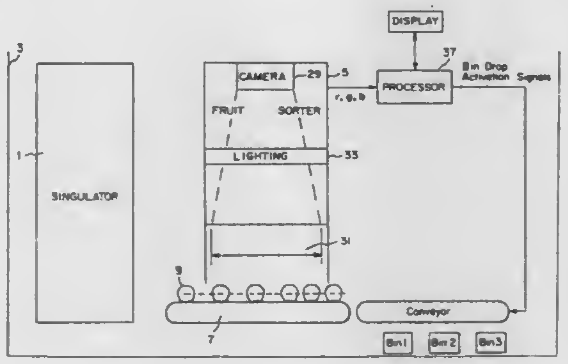
METHOD AND APPARATUS FOR SORTING OBJECTS BY COLOR INCLUDING STABLE COLOR TRANSFORMATION

Yang Tao, Woodstock, Va., assignor to Agri Tech Incorporated, Va.

Continuation-in-part of Ser. No. 846,236, Mar. 6, 1992, Pat. No. 5,339,963. This application Aug. 19, 1994, Ser. No. 293,431

Int. Cl.^{6} B07C *5/342*

U.S. Cl. 209—580 **20 Claims**



1. A system for sorting objects by color comprising:

a camera responsive to an object to be imaged to produce color signals;

a processor responsive to said color signals to execute a transformation of said color signals to a hue value for said object said hue value combining a measure of color and a measure of intensity of said color;

a plurality of color standard references representing an anticipated range of colors of said objects, each of said color standard references when imaged producing color signals from said camera;

a memory to store hue values for said color standard references;

a control system responsive to said hue values of said objects to be sorted to sort said objects into user defined categories, said categories being defined by ranges of hue values around said hue values of said color standard references.

5,533,629

VORTEX PNEUMATIC CLASSIFIER

Mitsuhiro Ito; Takamiki Tamashige, both of Chiba-ken, and Satoru Fujii, Yamaguchi-ken, all of, Japan, assignors to Onodo Cement Co., Ltd, Japan

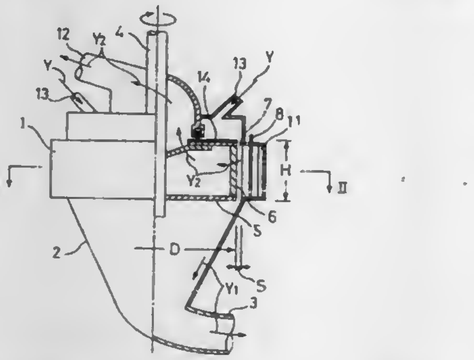
PCT No. PCT/JP94/00502, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO94/22599, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 29, 1994, Ser. No. 313,263

Claims priority, application Japan, Mar. 31, 1993, 5-074670; Dec. 28, 1993, 5-336492; Dec. 28, 1993, 5-336493

Int. Cl.^{6} B04B *5/12*

U.S. Cl. 209—714 **19 Claims**



1. A vortex pneumatic classifier comprising: a rotor, a plurality of vortex flow adjusting vanes provided on said rotor, a classifying chamber defined around said vortex flow adjusting vanes, and guide vanes radially opposing said vortex flow adjusting vanes on an opposite side of said classifying chamber. wherein a pitch (P) of said vortex flow adjusting vanes is determined in relation to a classifying particle diameter (Dp(th)) so as to meet the condition of

$$P \leqq 1.04 \times Dp(th)^{0.365}$$

5,533,630

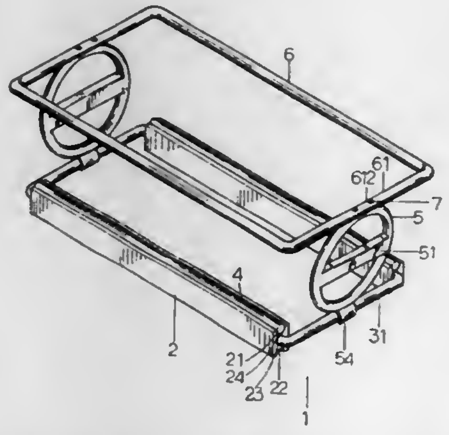
COMPACT DISK ASSEMBLY RACK

Hui-Huang Chen, No. 105-1, Chang Shul Road, Kun Lun Village, Pu Yen County, Changhua, Taiwan

Filed Mar. 15, 1995, Ser. No. 404,611

Int. Cl.^{6} A47F *7/00*

U.S. Cl. 211—40 **1 Claim**



1. A compact disk assembly rack structure comprising:

two elongated strips having suitable elasticity, each of said strips having an upper groove and a lower groove of a suitable depth respectively formed in an upper side and a lower side thereof, said upper groove extending longitudinally downward to form a circular portion with a narrow gap formed therebetween;

a rectangular lower frame bent from a circular rod and having two narrow portions respectively formed at suitable positions of two shorter sides thereof; two circular rods formed of plastic material;

two support frames which are generally annular in shape, each of said support frames having a horizontal bar across a central hollow portion thereof, a top side of each of said support frame parallel to said horizontal bar being configured to be a flat surface having a plurality of screw holes therein, and a clamp being disposed at a bottom side of each of said support frame opposite to said level surface;

a rectangular upper frame bent from a circular rod and larger than said lower frame, two shorter sides of said upper frame each having a flat surface formed at a bottom side thereof, and a plurality of screw holes being formed in said shorter sides of said upper frame opposite to said flat surfaces of said upper frame,

wherein

each of the two longer sides of said lower frame is respectively fitted into said upper groove of each of said strips and squeezed past said gap into said circular portion below to be positioned therein; said two rods are respectively fitted into said upper grooves of said strips; said clamp of each of said support frames is fastened onto each of said narrow portions of said two shorter sides of said lower frame; said flat surfaces of said upper frame are flushed against said flat surfaces of said support frames and said upper frame and said support frames are fastened together by means of screws passing through said screw holes in said shorter sides of said upper frame and said screw holes in said flat surfaces of said support frames.

5,533,631

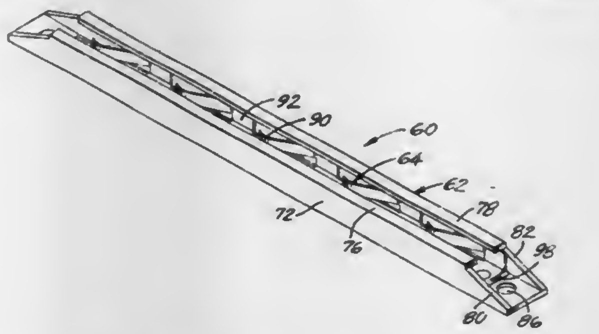
COMPOSITE PRINTED CIRCUIT CARD GUIDE AND HOLDING DEVICE

Richard J. Marchetti, Milford, Del., assignor to Unitrack Industries, Inc., Milford, Del.

Filed Oct. 12, 1994, Ser. No. 321,740

Int. Cl.^{6} A47G *19/08*

U.S. Cl. 211—41 **8 Claims**



1. A composite printed circuit card guide and holding device including an elongated, rigid U-shaped support member having a planar base with a longitudinal axis, two spaced apart upstanding arm members extending from said base, and flanges extending toward one another from locations on each upstanding arm spaced from said base, said flanges being spaced from one another a sufficient distance to enable passage therethrough of the printed circuit card, and printed circuit card engaging means slidably received within said rigid U-shaped support member, said printed circuit card engaging means including an elongated base supported on the base of the rigid U-shaped support member and a plurality of opposed, cantilevered, flexible spring fingers extending toward one another from said base and between the arms of the rigid U-shaped support member to resiliently engage and hold said printed circuit card, wherein:

said elongated, rigid U-shaped support member includes at least one slot disposed in the base adjacent at least one end of said elongated, rigid U-shaped support member, said slot having a longitudinal axis substantially orthogonal to the longitudinal axis of said base, and wherein said printed circuit card engaging means includes at least one tab extending from at least one end of said elongated base of said circuit card engaging means, said tab being disposed in said slot thereby inhibiting movement of said printed circuit card engaging means relative to said elongated, rigid U-shaped support member, and facilitating smooth sliding entry of a printed circuit card into the card guide and holding device.

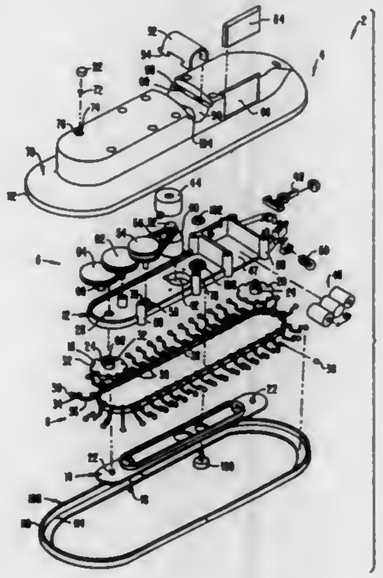
5,533,632
MOTORIZED ACCESSORY HOLDER AND METHOD OF USING SAME

Liliana M. Patterson, 4031 W. Lakeshore Dr., San Ramon, Calif. 94583, and Kenneth A. Tarlow, Corte Madera, Calif., assignors to Liliana M. Patterson, San Ramon, Calif.

Filed Aug. 23, 1994, Ser. No. 294,900

Int. Cl.^{6} A47F *3/08;3/11;5/025;5/02*

U.S. Cl. 211—122 **27 Claims**



1. A motorized accessory holder comprising:
a body having an upper member and a lower member, the lower member defining a continously circumferential track;
a belt assembly supported by the body, the belt assembly including a continuous loop belt and support arms having inner ends supported and driven by the belt and outer ends supported by the track;
a drive assembly housed within the body, the drive assembly comprising:
an energy source;
a motor coupled to the energy source; and
a drive train drivingly coupling the motor to the belt so the belt moves along an endless loop path with the outer ends of the support arms supported by the track; and
accessory supports removably secured to and hanging from the support arms, the accessory supports adapted to support at least one chosen accessory therefrom.

5,533,633
CONTAINER CLOSURE ASSEMBLY

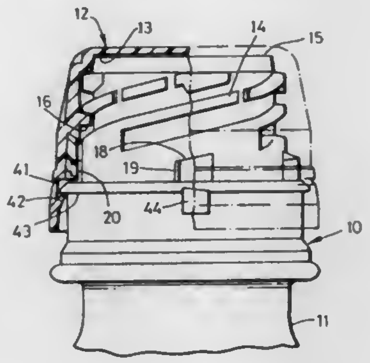
Roger M. King, Latimer Bucks, United Kingdom, assignor to Beeson and Sons Limited, United Kingdom

Filed Aug. 10, 1994, Ser. No. 288,075

Claims priority, application United Kingdom, Aug. 13, 1993, 9316834

Int. Cl.^{6} B65D *41/36*

U.S. Cl. 215—252 **20 Claims**



1. A container closure assembly for storing fluids under pressure, said assembly comprising:
a container neck;
a closure for said neck;
a first screw thread on one of said neck and closure;
a second screw thread on another of said neck and closure; said second screw thread being engageable with said first screw thread;
means for forming a seal between said neck and closure when said closure is screwed down on said neck;
mutually engageable elements on said neck and closure to block or restrict rotation of said closure in an unscrewing direction beyond an intermediate position when said closure is under an axial pressure in a direction emerging from said container neck;
wherein said neck and closure are constructed and arranged to provide a vent for venting fluid from said container neck at least when said closure is in said intermediate position; and
wherein the first screw thread comprises a plurality of first thread segments and the second screw thread comprises a plurality of second thread segments that are movable along a continuous helical thread path defined between axially adjacent first thread segments, and at least one of said plurality of said second thread segments simultaneously overlaps portions of two axially adjacent first thread segments along at least part of said continuous helical thread path, whereby the closure can be moved from a fully released to a fully closed position on the neck by a single smooth rotation through 360° or less.

5,533,634
QUANTUM CHROMELESS LITHOGRAPHY

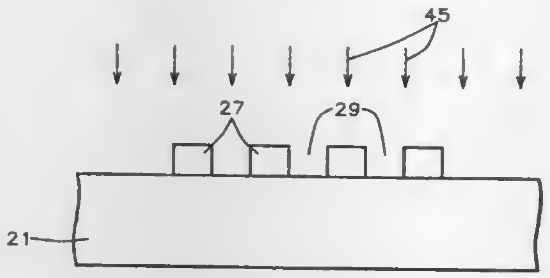
Hong-Tsz Pan, Chang-hua; Ming-Tzong Yang, and Shyi-Long Shy, both of Hsinchu, all of, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Sep. 1, 1994, Ser. No. 299,458

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—12 **28 Claims**

1. A method of forming a quantum phase shift mask, comprising the steps of:
providing a transparent substrate;
forming a layer of etching stopper material on said transparent layer;
forming a layer of phase shifting material on said layer of etching stopper material;



forming a layer of anti-static material on said layer of phase shifting material;
forming a layer of photoresist on said layer of anti-static material;
forming a photoresist feature pattern in said photoresist layer by means of exposing said photoresist using electron beam techniques and developing said photoresist, wherein said feature pattern is comprised of alternating areas of photoresist material adjacent to areas of no photoresist material;
etching a phase shifting feature pattern in said phase shifting layer using said photoresist feature pattern as an etching mask, wherein said phase shifting feature pattern is comprised of alternating areas of phase shifting material adjacent to areas of no phase shifting material; and
stripping said photoresist material.

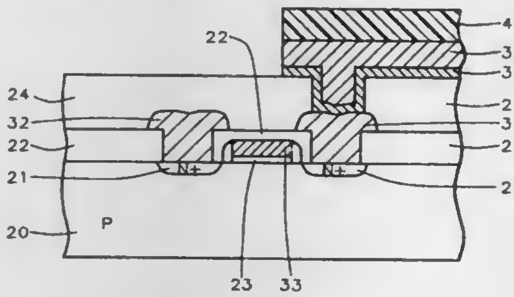
5,533,635
METHOD OF WAFER CLEANING AFTER METAL ETCH

Chiu-Kwan Man, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Pte. Ltd., Singapore, Singapore

Filed Oct. 11, 1994, Ser. No. 320,894

Int. Cl.^{6} H01L *21/3065*

U.S. Cl. 216—67 **16 Claims**



1. A method for cleaning chlorine from semiconductor integrated circuit wafers, comprising the steps of:
providing a semiconductor integrated circuit wafer;
providing a dielectric layer on said integrated circuit wafer;
providing a layer of metal on said dielectric layer;
providing a patterned layer of photoresist on said metal layer;
forming a patterned layer of metal covered by said patterned layer of photoresist by etching said metal not covered by said patterned layer of photoresist using a chlorine specie etchant, thereby forming residual chlorine;
baking said residual chlorine by exposing said patterned layer of metal covered by said patterned layer of photoresist to a first atmosphere at a temperature of between about 150° C. and 250° C. for a bake time with no plasma discharge present thereby converting said residual chlorine to a stable polymer; and
stripping said photoresist and said baked residual chlorine using a CF_4 and O_2 plasma for a first time, followed by an O_2 strip for a second time, followed by rinsing in de-ionized water at a first temperature for a third time, followed by an organic cleaning cycle.

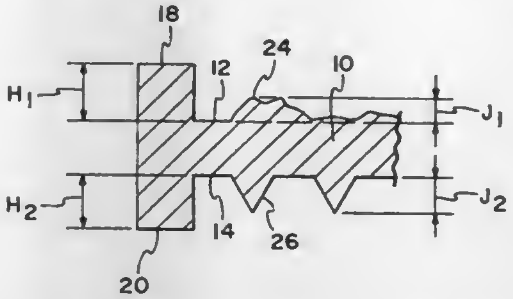
5,533,636
REVERSIBLE ESCUTCHEON

Kenneth H. Reiker, 269 Country Club Dr., Shalimar, Fla. 32579

Filed Mar. 28, 1995, Ser. No. 413,214

Int. Cl.^{6} B65D *6/28*

U.S. Cl. 220—3.8 **15 Claims**



1. A one-piece reversible escutcheon for a ceiling fixture, comprising:
a) a base portion having first and second generally opposed surfaces;
b) a first raised edge member extending around at least a portion of the perimeter of said base portion and projecting transversely to said first surface;
c) a second raised edge member extending around at least a portion of the perimeter of said base portion and projecting transversely to said second surface;
d) said first surface and said second surface including indicia of different design;
e) said base portion defining a hole in at least one of said first and second surfaces, said hole being configured for receiving a portion of a ceiling fixture;
f) a first escutcheon face including said first surface extending over at least a portion of the planar area defined within said first raised edge member;
g) a second escutcheon face including said second surface extending over at least a portion of the planar area defined within said second raised edge member and;
h) each one of said first and second edge members being selectively mountable adjacent to a ceiling, wherein when one of said first and second escutcheon faces is substantially exposed, the other one of said first and second escutcheon faces is substantially hidden, during use.

5,533,637
WEATHERPROOF ELECTRICAL ENCLOSURE

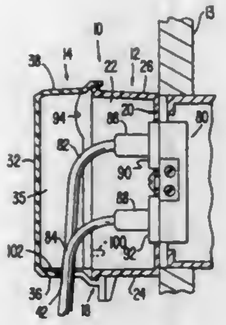
Howard M. Williams, Jr., Emmaus, Pa., assignor to Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 375,950, Jan. 20, 1995, Pat. No. 5,456,377, which is a continuation of Ser. No. 91,563, Jul. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 867,470, Apr. 13, 1992, Pat. No. 5,228,584. This application Jun. 7, 1995, Ser. No. 479,767

Int. Cl.^{6} H02G *3/14*

U.S. Cl. 220—3.8 **7 Claims**

1. An electrical enclosure for covering a portion of an electrical cord and its plug which is received in an electrical receptacle, the combination comprising:
a cover having top, bottom and two side walls, and a front wall defining a first cavity therein, said cover bottom wall having at least one cord recess therein adapted to receive an electrical cord therein;
a base having top, bottom and two side walls, and a rear wall defining a second cavity therein, said rear wall having an outlet aperture and a mounting hole therein for securing said rear wall of said base to the receptacle; and
pivot means, coupled to said cover and base, for pivotally coupling said cover and base,



said walls on said cover and base having substantially the same depth with said at least one cord recess being spaced from said rear wall of said base so that the electrical cord of the plug does not bend towards said rear wall by said base.

5,533,638

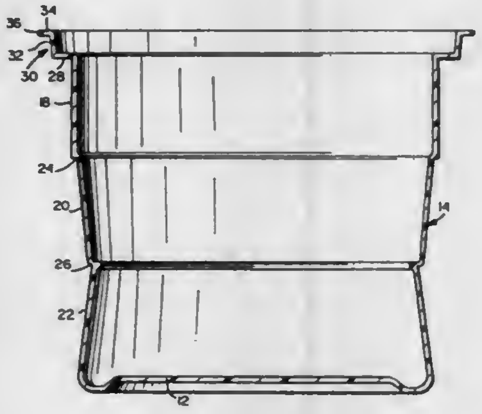
REUSABLE AND RE-COLLAPSIBLE CONTAINER AND ASSOCIATED CAP

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Continuation of Ser. No. 227,545, Apr. 14, 1994, Pat. No. 5,392,941, which is a continuation-in-part of Ser. No. 47,185, Apr. 16, 1993, Pat. No. 5,417,337, which is a continuation-in-part of Ser. No. 12,122, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 789,838, Nov. 12, 1991, Pat. No. 5,226,551. This application Dec. 28, 1994, Ser. No. 365,408

Int. Cl.^{6} B61D *6/12*

U.S. Cl. 220—8 **5 Claims**



1. A reusable collapsible container comprising:

a bottom wall and a relatively flexible, peripheral side wall extending upwardly from said bottom wall, said side wall movable between axially extended and collapsed positions and, in the extended position, having lower and upper relatively thicker side wall portions and at least one intermediate relatively thinner side wall portion; and wherein said upper, lower and at least one intermediate side wall portion are shaped and arranged such that in said collapsed position, said lower side wall portion is partially telescoped within said upper side wall portion with said at least one intermediate portion reverse folded therebetween, and with an uppermost edge of said lower side wall portion radially spaced away from said upper side wall portion, and wherein the radial spacing is determined as a function of the thickness of the upper side wall portion.

5,533,639

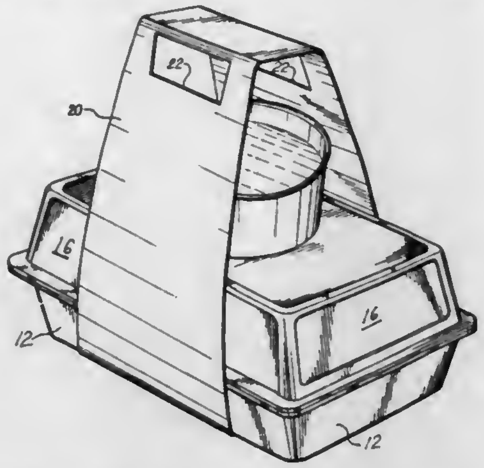
COMESTIBLE AND LIQUID CONTAINER CARRIER

William H. Myers, 29702 Avante, Laguna Niguel, Calif. 92677

Filed Apr. 18, 1995, Ser. No. 423,936

Int. Cl.^{6} B65D *21/02*

U.S. Cl. 220—23.8 **10 Claims**



1. A comestible and liquid container carrier comprising:

a unitary base having a primary depression and at least one secondary depression, there further being a lid for said secondary depression;

a carrying band dimensioned and configured to cradle said base, said band including first and second generally vertical surfaces having apertures therein defining a handle;

means defining a hinge between said secondary depression and said lid;

wherein said lid may be pivoted about said hinge between an open position and a closed position, said lid and said second depression defining a compartment.

5,533,640

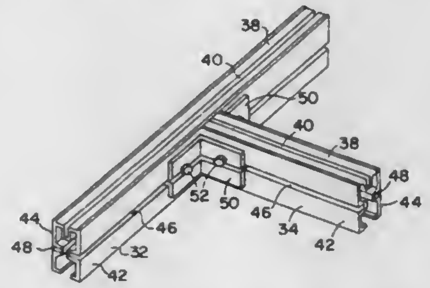
FLOATING ROOF

Ronald P. Jolly, Magnolia, Tex., assignor to HMT, Inc., Houston, Tex.

Filed May 14, 1993, Ser. No. 62,006

Int. Cl.^{6} B65D *88/34;* **E04C** *2/42*

U.S. Cl. 220—216 **24 Claims**



1. A storage tank for a liquid product, comprising the combination of a generally cylindrical tank containing a liquid product and a generally circular roof floating on the liquid product within the tank, the floating roof having a frame including a plurality of elongated girders, at least some of the plurality of elongated girders having grooved slots therein along substantial portions of the lengths thereof, the grooved slots each having opposite, parallel surfaces with spaced-apart parallel grooves in each of the opposite, parallel surfaces, and at least some of the grooved slots receiving terminal ends of threaded fasteners therein, the terminal ends having threads engaging the spaced-apart parallel grooves in each of the opposite, parallel surfaces of the grooved slot to secure the terminal end therein.

5,533,641

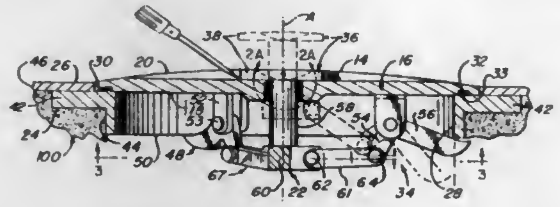
LOCKING COVER ASSEMBLY

Toby Argandona, 21221 Running Branch Rd., Diamond Bar, Calif. 91765

Filed Oct. 12, 1993, Ser. No. 133,889

Int. Cl.^{6} B65D *45/28*

U.S. Cl. 220—323 **28 Claims**



1. A cover assembly comprising:

a cover including a cover member having inner and outer sides, and a cover locking mechanism on said cover member,

a base member having inner and outer sides, and an opening through said base sides, and wherein

said cover member is movable to and from a closed position on said base member,

said cover locking mechanism comprises (a) cover locking means on the inner side of said cover member operable between a cover locking state and a cover unlocking state such that operation of said locking means to its cover locking state while said cover member occupies its closed position locks the cover member in said closed position on said base, and operation of said locking means to its cover unlocking state releases the cover member to open, and (b) lock actuating means accessible at the outer side of and extending through said cover member for operating said locking means between said locking and unlocking states,

said cover member has a planar seating surface on the inner side of the cover member and said base has a planar seating surface on the outer side of said base about said opening, which seating surfaces abut one another about said opening when said cover occupies its closed position,

one of said seating surfaces has an annular seal ring groove which opens toward the other seating surface in surrounding relation to said opening when said cover occupies its closed position and a seal ring in said groove, and

the other seating surface engages said one seating surface at radially opposite sides of said groove and has an upstanding annular rib which projects into said groove and engages said seal ring when said cover occupies its closed position.

5,533,642

BIOLOGICAL SPECIMEN CASSETTE

André Lafond, St-Hilaire, and Gérard Laliberte, Beloeil, both of, Canada, assignors to 2986647 Canada Inc., St. Hilaire, Canada

Filed Jun. 15, 1994, Ser. No. 260,139

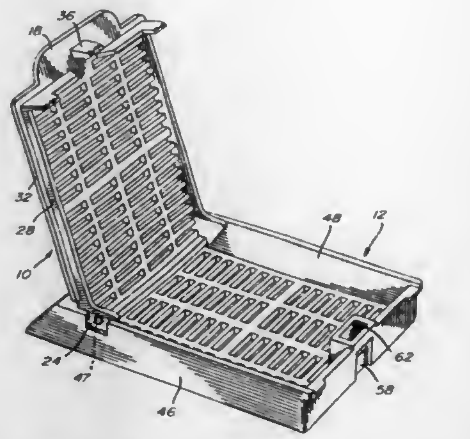
Int. Cl.^{6} B65D *45/16*

U.S. Cl. 220—326 **10 Claims**

1. A biological specimen cassette comprising:

a base having a perforated bottom wall, opposite side walls, front and rear walls; said rear wall having first lid connecting means; said side walls having second lid connecting means adjacent said front wall; and

a lid having a perforated top face, said top face including an integral tab formed at one end thereof; said lid defining first base engaging means extending from and below said one end of said top face for engaging said first lid connecting means of said rear wall and providing first pivotal movement of said lid relative to said base to open said lid so that a specimen may be placed in said base; said lid defining second base engaging means at an opposite end thereof for engaging said second lid connecting means of said base to secure, in a first instance, the lid to the base after a specimen is placed therein and, in a second instance, to provide a second pivotal movement of said lid relative to said base for subsequent removal of the specimen from said base, said second base engaging means including downwardly extending integral portions at opposite sides of said lid; said portions extending within said base when said lid is secured to said base in said first instance.



5,533,643

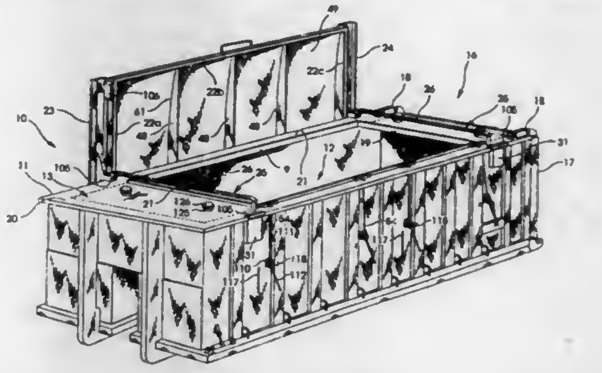
WASTE HANDLING CONTAINER WITH SLIDING LID

Kent Kruzick, Winamac, Ind., assignor to Galbreath, Inc., Winamac, Ind.

Continuation-in-part of Ser. No. 877,401, May 1, 1992, Pat. No. 5,251,775. This application Aug. 31, 1993, Ser. No. 114,678

Int. Cl.^{6} B65D *43/20*

U.S. Cl. 220—331 **32 Claims**



1. A waste handling container, comprising:

a container having sides, a top and an upwardly facing opening in the top;

a lid having a width and being sized to cover and seal shut the opening;

a pair of guide rails mounted to the top of said container;

at least one guide channel mounted to the top of said container;

a plurality of rollers mounted to said lid, said rollers being sized, configured and positioned to ride upon and follow said guide rails;

at least one follower roller mounted to said lid to one of the inside and the outside of said plurality of rollers, said follower roller being sized, configured and positioned to follow and stay operably engaged with said at least one guide channel; and,

wherein said guide rails and plurality of rollers and at least one guide channel and at least one follower roller all mutually coact to permit said lid to be moved between a closed and clamped position wherein said lid is positioned over and tightly clamped to said container to seal shut the opening and a closed and unclamped position wherein said lid is positioned over the opening but is free to be slid laterally along said guide rails, and between the closed and unclamped position and an open position wherein said lid is positioned away from the opening along one side of said container.

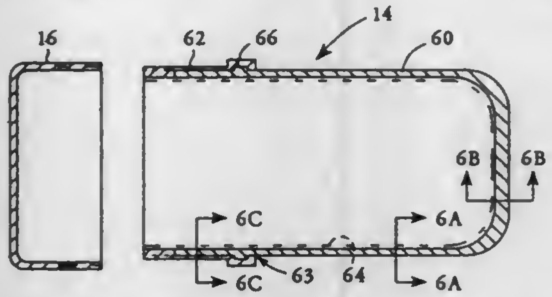
5,533,644
HYBRID CENTRIFUGE CONTAINER

Stefan J. Glen, Grants Pass, Oreg., and Bradley D. Carstens, Mountain View, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 917,708, Jul. 17, 1992, abandoned, which is a division of Ser. No. 780,656, Oct. 21, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 331,277

Int. Cl.^{6} B65D *90/04*

U.S. Cl. 220—414 **7 Claims**



1. A centrifuge container comprising: a plurality of layers of fiber material wound helically and circumferentially about an axis, defining a receptacle capable of resisting deformation due to hydrodynamic pressures associated with centrifugation of liquids contained therein, said receptacle having a closed end, an open end and a cylindrical wall extending between said open and closed ends;

- a metal neck having two opposed ends, each defining an aperture with said open end of said receptacle fitting into and contained within one aperture, forming an interface between said metal neck and said cylindrical wall; and
- Means, permanently coupled to said receptacle, for preventing uncoiling of said plurality of layers of fiber material during centrifugation,
- said preventing means includes a layer of double-helically wound fiber orientated to form a 30° angle with respect to said axis along a portion of said receptacle coextensive with said metal neck.

5,533,645
SPLIT DOOR FOR VENDING MACHINE

Francis A. Wittern, Jr., Des Moines; Gary L. Walke, Bondurant, and Joseph F. Nerly, Des Moines, all of Iowa, assignors to Fawn Engineering Corporation, Des Moines, Iowa

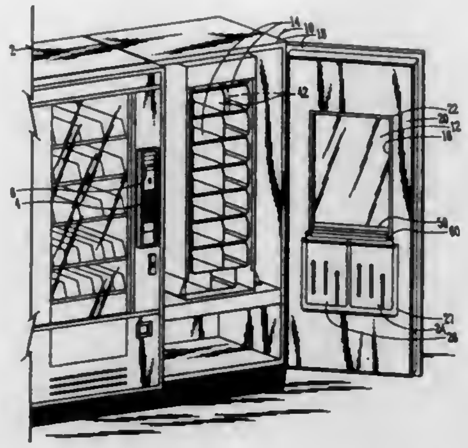
Filed Nov. 1, 1994, Ser. No. 332,911

Int. Cl.^{6} G07F *11/00*

U.S. Cl. 221—76 **14 Claims**

1. A vending machine having a housing, at least one interior generally horizontal support member for supporting a vendable item, the support member being moveable to a position directly in front of an exterior opening in the housing, a door vertically slidable between a closed position covering the exterior opening and blocking access to the support member and an open position allowing a customer access to the support member, the improvement comprising:

- a wall dividing the support member into two sections, each section capable of supporting a vendable item;
- a shield member supported in a frame mounted to the housing below the opening in the housing and slideably between a normal position substantially below the opening and a blocking position over at least a portion of the opening blocking access to at least a portion of the support member; and



- a releasable connection between the door and the shield member, the connection in a normal state locking the door and the shield member together if the door is raised from its closed position so that vertical movement of the door results in vertical movement of the shield member, the connection in a released state allowing vertical movement of the door without corresponding vertical movement of the shield member.

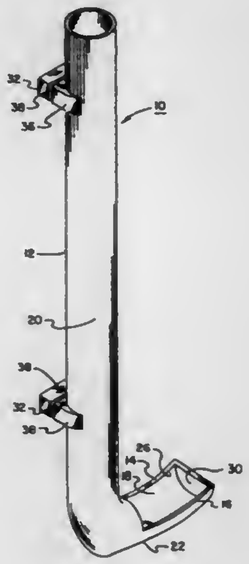
5,533,646
GOLF CART BALL DISPENSER

Charles N. Dildine, 100 Sunset Cove, Niceville, Fla. 32578

Filed Aug. 3, 1994, Ser. No. 285,149

Int. Cl.^{6} G07F *11/04*

U.S. Cl. 221—185 **4 Claims**



1. A golf cart ball dispenser comprising, in combination:

- a rigid tube having an interior diameter of about $1\frac{13}{16}$ inches and having an exterior diameter of about $1\frac{15}{16}$ inches, the tube having an upper linear extent of about eight inches, the tube having a lower curved portion, the curved portion having a radius of curvature of about six inches with the center of curvature located laterally offset from an intermediate portion of the upper linear extent, the curved portion having an opening on an upper portion thereof, the opening being of a length greater than $1\frac{13}{16}$ inches and a width greater than $1\frac{13}{16}$ inches;
- an end cap at an end of the curved portion remote from the upper linear extent to retain golf balls in said curved portion,
- coupling components including spaced brackets having first interior parts secured with respect to the upper linear extent of the tube and having separable exterior parts, the interior parts and the exterior parts having horizontally aligned apertures; and
- threaded bolts positionable through the apertures of the exterior parts and adapted to be removably coupled to the interior parts for coupling therebetween.

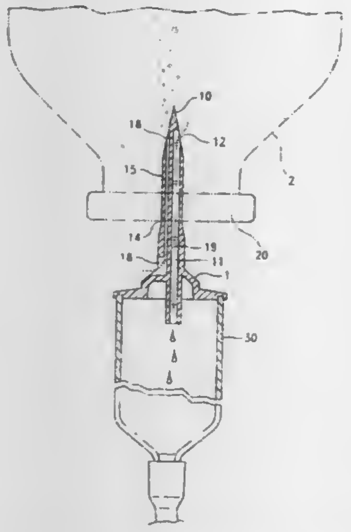
5,533,647
SPIKE MEANS WITH AIR PASSAGE FOR DRIP CHAMBER DEVICE

Chen Long-Hsiung, 5F, No. 91-3, Chung Cheng Rd., Sec. 1, Taipei, Taiwan

Filed Oct. 24, 1995, Ser. No. 547,360

Int. Cl.^{6} B67D *5/00*

U.S. Cl. 222—83 **1 Claim**



1. A spike means for a drip chamber having a cylindrical plug rod at one end for piercing a rubber stopper of an infusion bottle for guiding out a solution from said infusion bottle to a drip chamber, wherein said cylindrical plug rod comprises a pointed tip, an air outlet and two solution inlets on said pointed tip, an air inlet remote from said pointed tip, a sloping stop edge around a periphery between said air inlet and said air outlet for stopping at said rubber stopper of said infusion bottle for permitting said air inlet to be maintained outside said infusion bottle, an air passage connected between said air inlet and said air outlet for permitting outside air to be guided into said infusion bottle, and a solution passage for guiding said solution from said infusion bottle to an inside of said drip chamber through said solution inlets.

5,533,648
PORTABLE STORAGE AND DISPENSING SYSTEM

Joseph R. Read, Chesterfield, and Michael S. Windham, O'Fallon, both of Mo., assignors to Novus International, Inc., St. Louis, Mo.

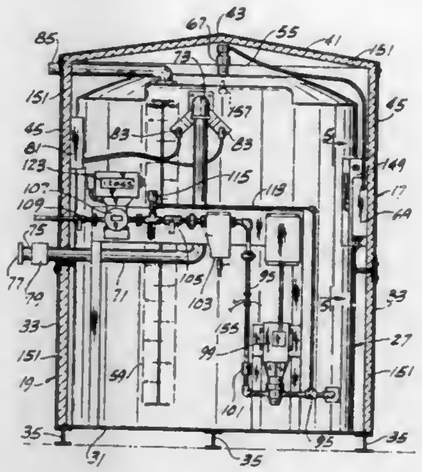
Filed Jan. 10, 1994, Ser. No. 179,482

Int. Cl.^{6} B67D *1/16*

U.S. Cl. 222—108 **23 Claims**

1. A storage and dispensing system for a liquid chemical, comprising

- a portable enclosure having a leakproof lower part forming a liquid chemical containment structure with a floor and a side wall formation extending up from the floor, and an upper part over the liquid chemical containment structure attached to the side wall formation of the liquid chemical containment structure,
- an opening in the upper part of the enclosure providing access to the interior of the enclosure,



- a closure for the opening movable between open and closed positions,
- a tank inside the enclosure for holding a supply of liquid chemical, said tank having a height substantially greater than the height of the side wall formation of said liquid chemical containment structure,
- an infeed line for flow of liquid chemical into the tank,
- an outfeed line for discharge of liquid chemical from the tank, and
- a liquid chemical transfer device and associated equipment inside the enclosure situated at a side of the tank on the inside of said liquid chemical containment structure for transferring liquid chemical from the tank via said outfeed line, said enclosure being of sufficient size to permit a person to service the liquid chemical transfer device and said associated equipment while inside the enclosure at a location adjacent the liquid chemical transfer device.

5,533,649
CLOSURE FOR CONTAINER

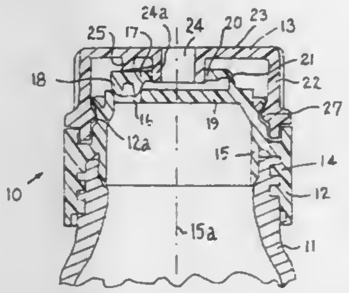
Alfred E. F. Von Schuckmann, Kevelaer, Germany, assignor to Courtaulds Packaging Limited, Colchester, Great Britain

Filed Dec. 20, 1994, Ser. No. 356,271

Claims priority, application United Kingdom, Jun. 25, 1992, 9213534

Int. Cl.^{6} B67D *5/33*

U.S. Cl. 222—153.14 **15 Claims**



1. A dispensing closure device for sealing engagement over the mouth of a container which, in use, contains a fluid to be dispensed, the closure device comprising a body which has an orifice through which the fluid may flow, a stopper positioned externally of the orifice, and an apertured cap which is movable relative to the body from a closed position to an open position, said stopper being positioned and dimensioned relative to the orifice so as to be operable to open and close the orifice, the cap having closure means which, in the closed position of the cap, retains the stopper in a closed position in sealing engagement with the orifice to prevent fluid being dispensed through the orifice, and which, in the open position of the cap, is positioned to enable displacement of

the stopper out of a position obturating the orifice, so that fluid can be dispensed through the orifice, on increasing the fluid pressure within the container above a predetermined pressure, wherein the stopper is mounted on the body, and having biasing means resiliently biasing the stopper towards a position in which it does not stop the orifice and said closure means comprises cam means for acting on the stopper during movement of the cap into its closed position to urge the stopper into its orifice sealing position in opposition to the resilient biasing of said biasing means.

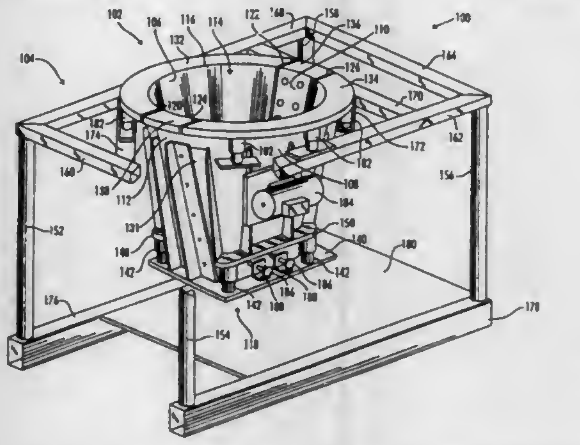
5,533,650

IMPROVED HOPPER WITH MOVING WALL AND METHOD OF MAKING AND USING THE SAME

Peter E. Conrad, Freemont, and Timothy W. Saunders, Belmont, both of Calif., assignors to Stamet, Inc., Los Angeles, Calif.

Filed Jul. 21, 1993, Ser. No. 95,282
Int. Cl.^{6} B65G *65/40*

U.S. Cl. 222—161 **31 Claims**



1. A hopper for controlling the flow of particulate material, said hopper comprising:
- a housing having a first wall and a generally rigid second wall supported for movement relative to the first wall in at least the vertical direction, said first and second walls being supported such that, at any given moment, at least one location on the first wall is in a common horizontal plane with at least one location on the second wall, said housing defining an open interior between the first and second walls, an inlet through which particulate material flows into the housing interior and an outlet through which particulate material flows out of the housing interior; and
- means, operatively coupled to said second wall, for moving said entire second wall relative to said first wall in at least said vertical direction.

5,533,651

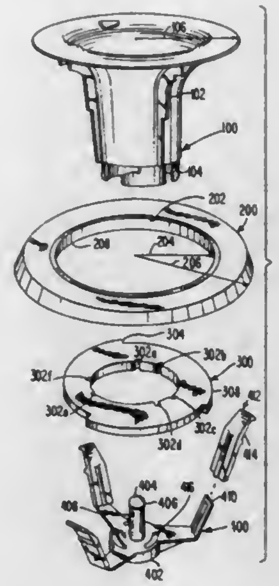
UNIVERSAL ADAPTER FOR LIQUID DISPENSERS

John W. Eddy, 6581 Valley Dr., Riverside, Calif. 92505; David F. Hutchinson, 601 Potrero Grande Dr., Monterey Park, Calif. 91755-7407, and Kelly S. Needham, Sr., 6045 Avenida Barcelona, Yorba Linda, Calif. 92687

Filed Dec. 12, 1994, Ser. No. 353,889
Int. Cl.^{6} B65B *3/04*

U.S. Cl. 222—185.1 **14 Claims**

1. An apparatus for adapting a liquid dispenser to accept a liquid container, regardless of the container's closure, comprising:
- support means for receiving and supporting the liquid container;
- dispensing means for accepting the closure of the liquid container;
- cooperating cam and cam follower connection means for joining the support means and the dispensing means in a manner which allows them to be easily connected and disconnected by turning the support means less than a full rotation; and
- a detent for releasably engaging after the cam follower has traversed the cam to releasably prevent the cam follower from oppositely traversing said cam.



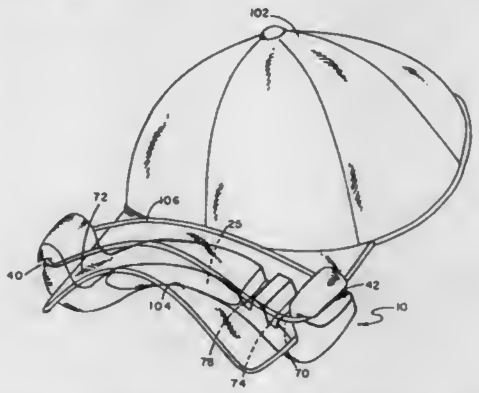
5,533,652

CAP BRIM SHAPING, TRANSPORT, STORAGE AND DISPLAY DEVICE

Gregg M. Levin, Boston, Mass., assignor to Perfect Curve, Inc., Boston, Mass.

Filed Nov. 28, 1994, Ser. No. 345,475
Int. Cl.^{6} D06C *15/00;* **A42C** *1/00;* **A41F** *1/00*

U.S. Cl. 223—84 **7 Claims**



1. A device for bowing the brim of a cap, said brim having a first side, a second side, a top and a width with the distance between said first side and said second side being the width of said brim, comprising:
- a body having a laterally disposed central portion, said central portion having a first end, a second end, a top side, a bottom side, a front side, and a rear side, said central portion being arched upwardly, said top side having a crown portion centrally defined thereon, said bottom side forming an arch, said top side of said first end forming a first shoulder, said top side of said second end forming a second shoulder, said first end extending upwardly to form a first retention arm, said second end extending upwardly to form a second retention arm, said first and second retention arms each having a top, an inner side and an outer side;
- a first receipt area defined at the junction at said first end of said central portion of said first shoulder and said first retention arm, and a second receipt area defined at the junction at said second end of said central portion of said second shoulder and said second retention arm, the distance between said first and second receipt areas being less than the width of said brim;
- a first catch means disposed on said outer side of said first retention arm and a second catch means defined on said outer side of said second retention arm;
- retention means connecting said first and second catch means from said first retention arm to said second retention arm; and
- said device in its use mode having said first and second sides of said brim positioned, respectively, in said first and second receipt areas of said device with said retention means extending over said brim exerting downward pressure on said top of said brim, forcing said first and second sides of said brim outward respectively against said first and second retention arms to force said brim into a bowed state.

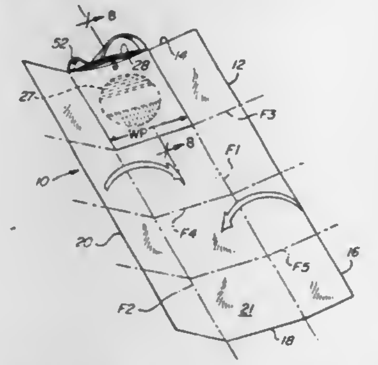
5,533,653

COMBINATION TOTEBAG AND TOWEL HAVING AN ADVERTISING MEDIUM AND METHOD OF MAKING THE SAME

Mark S. Kaufman, 200 Ingelside Dr., Stamford, Conn. 06903

Filed May 20, 1994, Ser. No. 247,042
Int. Cl.^{6} A45C *15/00;* **A45F** *4/00*

U.S. Cl. 224—577 **24 Claims**



9. A combination totebag and mat comprising:
- a sheet of readily foldable material sized to define a mat the mat having an upper edge and a lower edge, a front side and a back side;
- a plurality of panels, each panel having an upper edge a lower edge and at least two side edges and having dimensions substantially smaller than the dimensions of the sheet, the plurality of panels comprising at least a first panel and a second panel, the first panel attached to the back side of the mat along at least two of the at least two side edges of the first panel and positioned such that the upper edge of the first panel is substantially adjacent to the upper edge of the sheet and the lower edge of the sheet extends below the lower edge of the first panel, and the second panel, attached to the first panel and positioned such that the upper edge of the second panel is substantially adjacent to the upper edge of the first panel, so as to form a pocket therebetween, the pocket being open along the upper edge of the first and second panels; and
- whereby when the pocket is inverted, the mat is substantially enclosed within the pocket of the totebag.

5,533,654

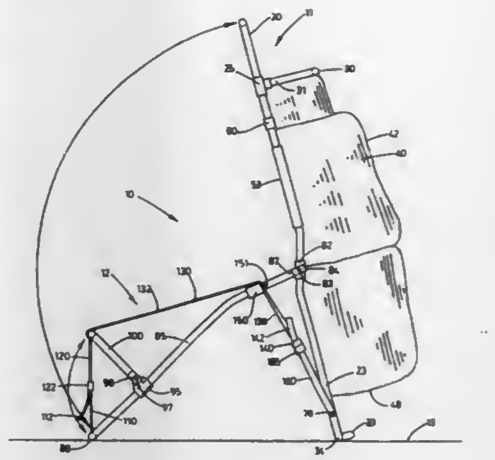
SUPPORT APPARATUS

Anton G. Holty, 3850 Klahanie Dr. SE #19-102, Issaquab, Wash. 98027; Frederick J. Wilson, and Edward D. Sozinho, both of P.O. Box 27047, Fresno, Calif. 93729-7047

Filed Jan. 21, 1994, Ser. No. 184,834
Int. Cl.^{6} A45F *4/02*

U.S. Cl. 224—155 **5 Claims**

1. A support apparatus comprising:



A. a backpack having a primary frame with lower support portions disposed for rested engagement with a surface of support with the backpack disposed in upright relation;

B. a secondary frame mounted on the primary frame of the backpack for movement between a first attitude adjacent to said primary frame and a second attitude extending outwardly from the primary frame and having a surface disposed in said second attitude for rested engagement with a surface of support in spaced relation to the lower support portions of the primary frame so as to provide substantially stable support for the backpack in a substantially upright attitude;

C. a tertiary frame mounted on the secondary frame for movement between a first position, disposed in a substantially collapsed position adjacent to the secondary frame, and a second position extending outwardly from the secondary frame; and

D. a flexible panel mounted on the tertiary frame and adapted to be extended over and supported on the secondary frame in said second attitude to deploy the flexible panel in a support position for the receipt of a second work object in rested relation thereon, the flexible panel having a pair of straps adapted to be secured on the secondary frame to retain the flexible panel in said support position, a strap assembly adapted to interconnect the tertiary frame and the secondary frame to apply tension to the flexible panel to retain said flexible panel in said support position and second strap assemblies individually adapted to be connected to each of the straps of the flexible panel and mounted on the primary frame to apply tension to the flexible panel to retain said flexible panel in said support position.

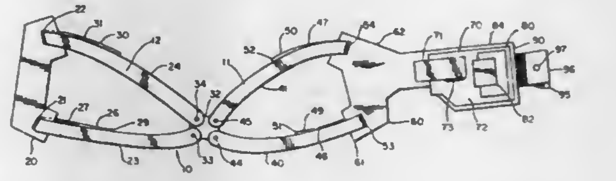
5,533,655

POCKET LIBERATOR HOLSTER SYSTEM

Elder F. Duque, 43-49 10th St., 3rd Fl., Long Island City, N.Y. 11101

Filed Sep. 23, 1994, Ser. No. 312,060
Int. Cl.^{6} A45F *5/00;* **F41C** *33/02*

U.S. Cl. 224—602 **5 Claims**



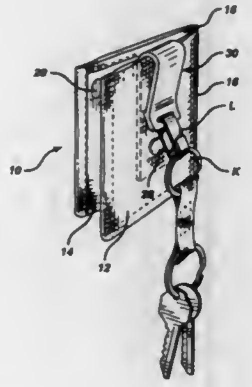
1. A pocket liberator, comprising:
- a right shoulder support, said right shoulder support having a right under arm bottom panel with apertures, a plurality of straps each having first and second opposite ends, each aperture receiving a first end of one of said straps, each strap

having attachment means entirely covering one side of each strap for releasably and adjustably supporting said right panel;
- a left shoulder support, said left shoulder support having a Y-shaped under arm holster panel with a plurality of pockets and upper end portions, each upper end portion having an aperture receiving first end of one of said straps, each strap having attachment means entirely covering one side of each strap for releasably and adjustably supporting said Y-shaped holster panel, said attachment means providing unlimited adjustability;
- yoke means secured to the second ends of each strap whereby said supports are positionable around a user's shoulders with each strap encircling respective shoulders and said right shoulder support is adjustable with respect to said left shoulder support; and,
- belt loop means secured to said Y-shaped holster panel for attaching said left shoulder support to a user's belt, said belt loop means having an attachment made of elastic material.

5,533,656
COMBINATION WALLET WITH REMOVEABLE CLIP

Jeffrey P. Bonaldi, 269 Monmouth Ave., New Milford, N.J. 07646

Filed Sep. 27, 1994, Ser. No. 313,448
Int. Cl.^{6} A45F *5/02*
U.S. Cl. 224—667 34 Claims

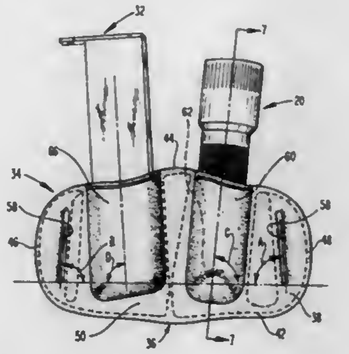


1. A clip constructed to be removably mounted to a pocket-like container, the clip comprising:
- a back portion, the back portion comprising:
  - a stiff upper end having a stabilizing portion,
  - a lower end having a snap closure, the snap closure integrally molded to the back portion;
- a front portion, the front portion comprising:
  - a bend,
  - a barb, the barb formed at a backside of the bend and facing the upper end of the stabilizing portion to resist movement of material from the upper end of the stabilizing portion to the lower end of the back portion,
  - retaining means, the retaining means extending from the bend in a direction away from the back portion, and having an aperture formed therethrough for releasably receiving other objects; and
- a resilient transition, the resilient transition connecting the back portion with the front portion and providing sufficient resilience to urge the bend portion toward the back portion for the barb to engage the material disposed between the back portion and the barb.

5,533,657
FIREARM ACCESSORY CONCEALMENT HOLDER

Mitchell S. Rosen, 1220 Black Brook Rd., Dunbarton, N.H. 03045, and Dean Speir, 74 Main St., Westhampton Beach, N.Y. 11978-2691

Filed Feb. 22, 1994, Ser. No. 200,069
Int. Cl.^{6} A45F *5/00*
U.S. Cl. 224—673 19 Claims

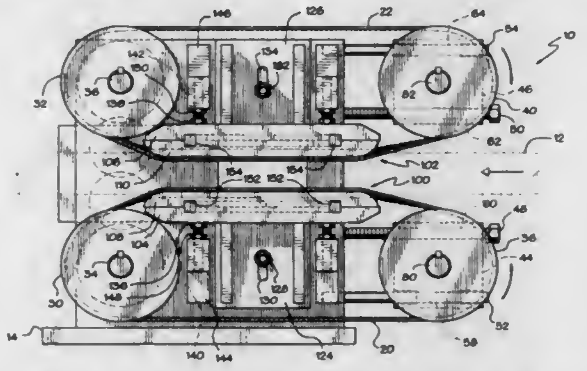


1. A holder for retaining a flashlight having a predetermined cross-section which facilitates concealed carry on a belt of a wearer, comprising:
- a. a backing portion, having upper, left and right lateral sides, and a rear face for placement against the wearer;
- b. at least one belt retainer for threading of a belt therethrough, coupled to the backing portion; and
- c. a first pouch portion, coupled to the backing portion and canted toward the wearer, for forming therebetween a first pouch contoured to the cross-section of the flashlight for retention of a flashlight of the type having a biased actuation switch on one end thereof, at least one of the backing portion and the first pouch portion having a limiting portion constructed for defining clearance between the actuation switch and the first pouch portion.

5,533,658
APPARATUS HAVING REPLACEABLE SHOES FOR POSITIONING AND GRIPPING TUBING

Robert B. Benedict, Dayton, and Terry L. Kiger, Kettering, both of Ohio, assignors to Production Tube, Inc., Dayton, Ohio

Filed Nov. 10, 1994, Ser. No. 336,998
Int. Cl.^{6} B65H *51/04*
U.S. Cl. 226—172 16 Claims



1. An apparatus for positioning and gripping tubing or bar stock comprising:
- a frame;
- a pair of juxtaposed, inwardly facing guides, adjustably mounted on the frame;
- a pulley rotatably mounted on the frame at each end of each guide;
- an endless, flexible guide belt surrounding each guide and being mounted on the pulleys;
- a removable shoe removably mounted on each guide;
- a motor for driving the pulleys so that the guide belts are rotated;

wherein tubing or bar stock inserted into one end of the apparatus is positioned and gripped by frictional engagement with the guide belts, and both the guides and the removable shoes are adjustable to accommodate tubing or bar stock having different outside diameters.

5,533,659
DUST REMOVAL SYSTEM

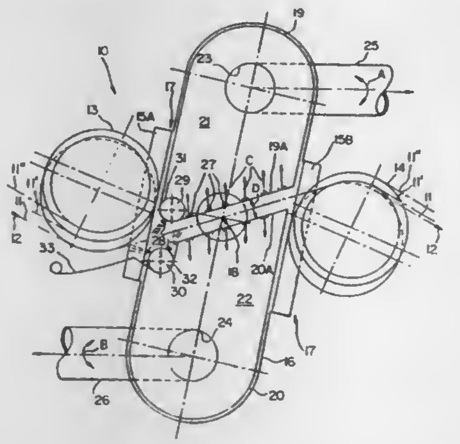
Walter G. Meyer, Boll, Germany, assignor to Beloit Technologies, Inc., Wilmington, Del.

PCT No. PCT/US92/07583, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO93/06035, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 9, 1992, Ser. No. 190,172

Claims priority, application Germany, Sep. 14, 1992, 9111448 U

Int. Cl.^{6} B65H *20/00*
U.S. Cl. 226—189 8 Claims



1. Apparatus for adjusting the relative lateral positions of a plurality of co-traveling cut webs (**11**), and removing particulate matter therefrom, the apparatus including at least two web guide rollers (**13,14**), characterized in that:
- the apparatus includes a pair of opposed, parallel plates (**19A,20A**), each of which is provided with a plurality of openings (**27**) therethrough, the plates arranged with the openings adjacent a portion of the web path of travel on either side of the web, for receiving particulate matter through the openings from the surfaces of the traveling webs, and disposed intermediate the at least two web guide rollers (**13,14**);
- the at least two web guide rollers (**13,14**) are arranged one behind the other in the direction of web travel (**12**) and are bowed convexly (**13**) and concavely (**14**), respectively, for adjusting and maintaining the lateral positions of the cut webs relative to one another;
- the apparatus includes two hollow profile bodies (**19,20**), each hollow profile body disposed about a corresponding plate (**19A,20A**) on either side of the traveling webs in substantially opposed array, the two hollow profile bodies for maintaining sub-atmospheric air pressure therewithin to urge particular matter from the webs and through the plate openings into the two hollow profile bodies;
- the two hollow profile bodies are structurally linked in a carrier arrangement on which the at least two web guide rollers (**13,14**) are mounted.

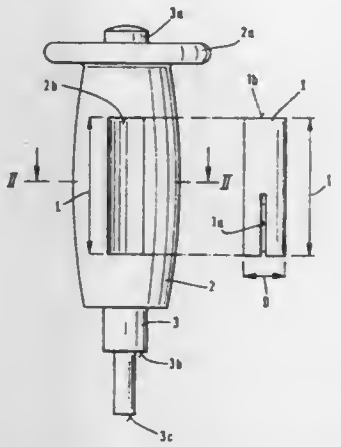
5,533,660
EXPANSION DOWEL AND EXPANSION DOWEL SETTING TOOL

Peter Meier, Lüchingen, Switzerland, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 23, 1995, Ser. No. 393,299

Claims priority, application Germany, Feb. 28, 1994, 44 06 423.3

Int. Cl.^{6} B25C *7/00*
U.S. Cl. 227—147 4 Claims



1. Expansion dowel and expansion dowel setting tool wherein said expansion dowel comprises an axially extending sleeve having a cylindrically-shaped outside surface, said setting tool comprises an axially extending handle part (**2**) having an outside surface and an axially extending striking part (**3**) mounted in said handle part, wherein the improvement comprises at least one axially extending recess (**2*b***) having a concave-shaped base located in the outside surface of said handle part, said recess has an axial length (L), said sleeve has an axial length (1), the axial length (1) of said sleeve is substantially equal to the axial length (L) of said recess, said outside surface of said sleeve has a diameter (D) and the concave-shaped base of said recess (**2*b***) has a radius (R) substantially equal to half of the diameter (D) of the outside surface of said sleeve.

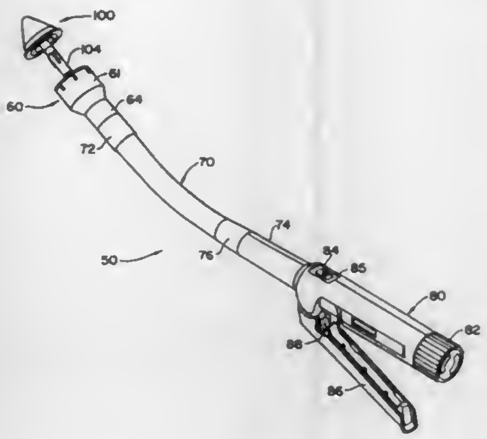
5,533,661
SEALING MEANS FOR ENDOSCOPIC SURGICAL ANASTOMOSIS STAPLING INSTRUMENT

Lauren O. Main, Loveland, and Richard L. Grant, Cincinnati, both of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 263,914, Jun. 22, 1994, abandoned, which is a division of Ser. No. 180,942, Jan. 12, 1994, Pat. No. 5,350,104, which is a continuation of Ser. No. 976,787, Nov. 16, 1992, Pat. No. 5,333,773, which is a continuation-in-part of Ser. No. 938,982, Sep. 1, 1992, Pat. No. 5,205,459, which is a division of Ser. No. 749,393, Aug. 23, 1991, abandoned. This application Jan. 25, 1995, Ser. No. 378,857

Int. Cl.^{6} A61B *17/068*
U.S. Cl. 227—176.1 4 Claims

1. A surgical stapling instrument for applying one or more surgical staples to tissue, comprising:
- a stapling head assembly including a staple holder for receiving one or more surgical staples, an anvil for clamping the tissue against said staple holder, and driver means for driving the staples from said staple holder;
- an actuator handle assembly for actuating said staple driver;
- a shaft assembly with a generally hollow interior and including a support shaft for mounting said stapling head assembly on said actuator handle assembly;
- a tension member contained within said support shaft for transmitting tension from said actuator handle assembly to said anvil to resist the forces exerted on said anvil when the staples are formed;



a compression member contained within said support shaft for transmitting a compressive force from said actuator handle assembly to advance said staple driver to drive the staples from said staple holder into the tissue and to form the staples against said anvil; and

further containing a shrink wrap plastic seal placed around said shaft assembly, said shrink wrap plastic seal overlapping said shaft assembly and said actuator handle assembly such that said shrink wrap plastic seal prevents the passage of compressed air from the outside to the inside of said shaft assembly for a length of said shaft assembly and for a length of said actuator handle assembly which is overlapped by said shrink wrap plastic seal.

5,533,662

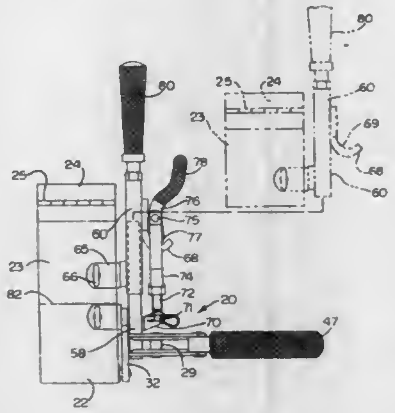
EXOTHERMIC WELDING APPARATUS

Curtis R. Stidham, Parma; Robert McPherson, Jr., Aurora, and Richard E. Singer, Beachwood, all of Ohio, assignors to Erico International Corp., Soloon, Ohio

Filed Jan. 31, 1995, Ser. No. 381,205

Int. Cl.^{6} B23K *23/00*

U.S. Cl. 228—33 **21 Claims**



1. Exothermic welding apparatus having a toggle frame comprising respective frame members for holding separable mold parts for opening and closing said members being interconnected at a hinge pivot, means on said members releasably holding a mold part, a post extending from one of said members parallel to the axis of the hinge pivot, a crucible support mounted on said post for movement therealong, means on said crucible support releasably holding a crucible, and means to urge said crucible support and thus said crucible toward the mold parts.

5,533,663

SOLDER WAVE MEASUREMENT DEVICE

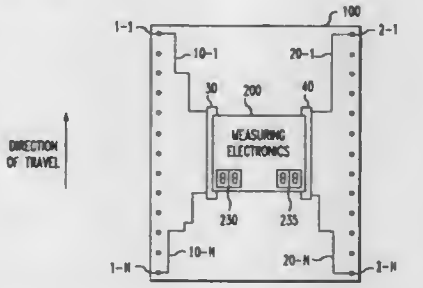
Anthony L. Massini, Jr., Palm Harbor, and Roy D. Shepard, Largo, both of Fla., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 21, 1994, Ser. No. 342,561

The portion of the term of this patent subsequent to Nov. 21, 2014, has been disclaimed.

Int. Cl.^{6} H05K *3/34;* **B23K** *3/06*

U.S. Cl. 228—103 **12 Claims**



1. Solder wave measuring apparatus, comprising:

a plurality of linear arrays of electrical contacts; and

measuring circuitry coupled to the plurality of linear arrays of electrical contacts for determining the number of electrical contacts in each array that are in contact with a solder wave, where the measured numbers represent a contact-area of the solder wave.

5,533,664

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

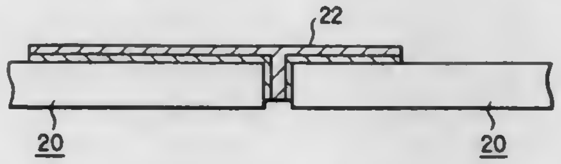
Mamoru Sasaki; Chiaki Takubo, both of Yokohama, and Yoichi Hiruta, Kashiwa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 6, 1994, Ser. No. 301,014

Claims priority, application Japan, Sep. 7, 1993, 5-221606

Int. Cl.^{6} B23K *31/02*

U.S. Cl. 228—180.1 **11 Claims**



3. A method of manufacturing a semiconductor device including a plurality of semiconductor chips, comprising the steps of:

providing each chip with a connecting electrode extending from an upper surface to a side surface of said each chip; and

bonding the connecting electrodes of adjacent chips to each other at the upper surface and the side surface of said adjacent chips.

5,533,665

METHOD OF MAKING A PRINTED CIRCUIT BOARD WITH ADAPTOR PINS

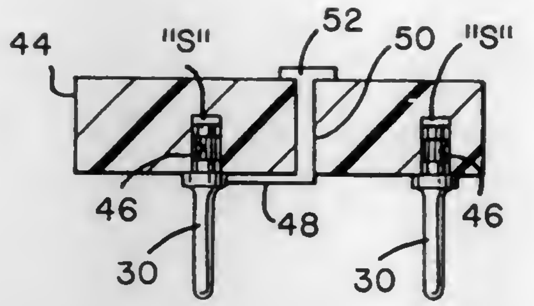
William Y. Sinclair, Frenchtown, and James P. Walter, Bloomsbury, both of N.J., assignors to Aries Electronics, Inc., Frenchtown, N.J.

Continuation of Ser. No. 199,764, Feb. 18, 1994, Pat. No. 5,410,452. This application Dec. 21, 1994, Ser. No. 360,403

Int. Cl.^{6} H05K *3/34*

U.S. Cl. 228—180.1 **4 Claims**

1. A method of making a printed circuit board with adaptor pins for connection to external circuitry comprising the steps of:



providing a planar circuit board having a printed circuit pattern on one side thereof for mounting of electrical components, and a printed circuit on the opposite side thereof, with said printed circuit pattern and said printed circuit being electrically interconnected;

forming a plurality of holes in said opposite side of the planar circuit board, each said hole having a depth less than the thickness of said planar printed circuit board, and each said hole being at the distal end of a lead of said printed circuit provided on the opposite side of said planar circuit board;

placing solder paste in each said hole in the planar circuit board;

inserting one end of an elongated, electrically-conductive adaptor pin into each said hole in the planar circuit board, said one end of each adaptor pin having an enlarged portion for effecting an interference fit with its respective hole, with the opposite end of each said adaptor pin extending externally of the planar circuit board for connection to external circuitry, each said adaptor pin further including an enlarged cross-sectional solder portion intermediate said enlarged portion and the external opposite end thereof, with said enlarged cross-sectional solder portion of each adaptor pin limiting the extent of penetration of said adaptor pin into the respective hole of the planar circuit board, and with the solder paste in each hole being forced by the adaptor pin to flow along the side walls of the respective hole and to engage the distal end of a lead of the printed circuit; and

heating said assembly of the planar circuit board and the adaptor pins to effect soldered connections between the adaptor pins and the respective leads of the printed circuit.

5,533,666

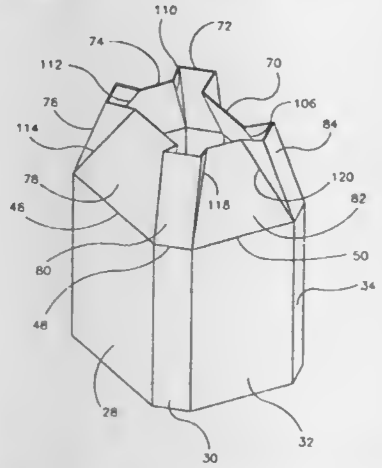
OCTAGONAL BOX STRUCTURE

Arthur H. Cromwell, Columbus, Ohio, assignor to Willamette Industries Inc., Portland, Oreg.

Filed Jun. 12, 1995, Ser. No. 489,433

Int. Cl.^{6} B65D *5/08*

U.S. Cl. 229—109 **5 Claims**



1. An octagonal box structure formed from a planar blank of material comprising, in combination,

a) four pair of upstanding side wall panels integrally connected together along horizontally spaced, vertical score hinge lines defining the width of each of said side wall panels to form an enclosed box structure, two pairs of said side wall panels having a substantially equal width relative to one another which is between about 20 to 40 percent of at least the smaller width dimension of the remaining two pairs of side wall panels;

b) eight closure flaps integrally connected to one another and each depending from one of said side panels along a common horizontal score hinge line for folding inwardly about said common horizontal score hinge line, each of said closure flaps including a free edge and a width dimension co-extensive with the width dimension of a corresponding side panel as defined by an extension of said vertical score hinge lines, four of said eight closure flaps being provided with a pair of score hinge lines extending diagonally from an adjacent corner of said box and terminating at the free edge of a respective one of said four closure flaps, each of said diagonal score lines defining an angle of about 20 to 25 degrees relative to an adjacent one of said extensions of said vertical score hinge lines; wherein each of said four closure flaps carrying said diagonally extending score hinge lines fold inwardly in partially overlapping relationship upon itself and with each immediately adjacent closure flap to close an end of said box structure.

5,533,667

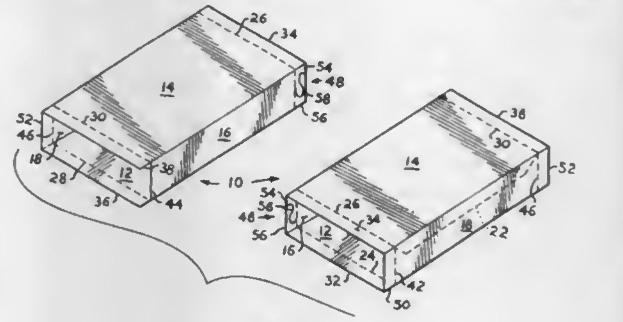
SEPARABLE MODULAR CONTAINERS

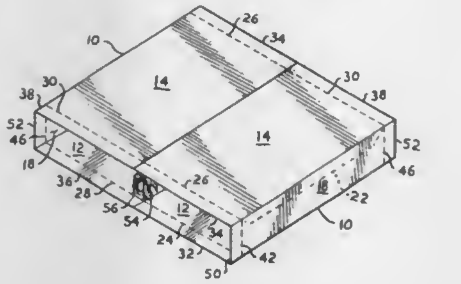
Gregory Gale, Napa, Calif., assignor to PERF-PAK, Napa, Calif.

Filed Sep. 22, 1995, Ser. No. 532,939

Int. Cl.^{6} B65D *5/42*

U.S. Cl. 229—120.01 **19 Claims**





1. A pair of selectively joinable and separable modular containers, comprising:

a first box and an identical second box each adapted for lateral loading and each formed of a single blank of sheet material and each having a generally rectangular parallelepiped configuration;

each said box including a bottom panel, an opposite top panel, a first side panel, and an opposite second side panel, with said top panel of each said box having a closure edge with a closure panel extending therefrom and respectively secured to said second side panel of each said box;

said bottom panel and said top panel of each said box each including a first end and an opposite second end, with each

said end of each said top panel and each said bottom panel having a major end flap extending therefrom;
said first side panel and said second side panel of each said box each including a first end and an opposite second end, with at least one said end of each said side panel including a minor end flap extending therefrom, and;
at least one said minor end flap of said first side panel of each said box comprising a separable selectively connectable connector flap having an inwardly foldable portion and a separate selectively outwardly foldable portion, with each said selectively outwardly foldable portion adapted to secure said first box selectively to said second box with said first side panel of each said box disposed immediately adjacent one another, with said selectively outwardly foldable portion of said connector flap of said first box being selectively secured beneath each said major end flap of each said second end of said top panel and said bottom panel of said second box, and said selectively outwardly foldable portion of said connector flap of said second box being selectively secured beneath each said major end flap of each said second end of said top panel and said bottom panel of said first box so that said first box and said second box are selectively and separably secured to one another at each said end of each said side panel, whereby;
each said box is selectively secured to one another by means of securing said outwardly foldable portion of said connector flap of said second box beneath each said major end flap of each said second end of said top panel and said bottom panel of said first box, said first and said second box are filled as desired, and said outwardly foldable portion of said connector flap of said first box is secured beneath each said major end flap of each said second end of said top panel and said bottom panel of said second box to form a pair of separable modular containers selectively and separably joined at each said opposite end of each said first side panel of each said box by means of each said selectively outwardly folding portion of each said connector flap.

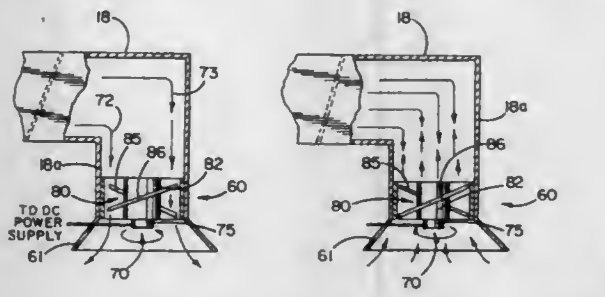
5,533,668
REMOTELY ACTIVATED OPPOSING/AIDING AIR FLOW CONTROL REGISTER

Evans W. Erikson, Belvidere, Ill., assignor to Hampton Electronics, Rockford, Ill.

Continuation-in-part of Ser. No. 269,103, Jun. 30, 1994, Pat. No. 5,413,278. This application May 1, 1995, Ser. No. 432,609

Int. Cl.^{6} F24F *11/053*

U.S. Cl. 236—49.3 **3 Claims**



1. A bi-directional airflow controllable system for controlling flow of air through an air circulating system to at least one zone an air temperature of which is to be controlled, said bi-directional air flow controllable system comprising:
a bi-directional fan control means to power a motor driven fan in one direction to oppose air flow when more air is being provided than is needed to control air temperature in said zone,
said bi-directional fan control means providing power to said motor driven fan in an opposite direction to reverse fan rotation and thereby aid the flow of air when more air is needed to control temperature in said zone than is being provided.

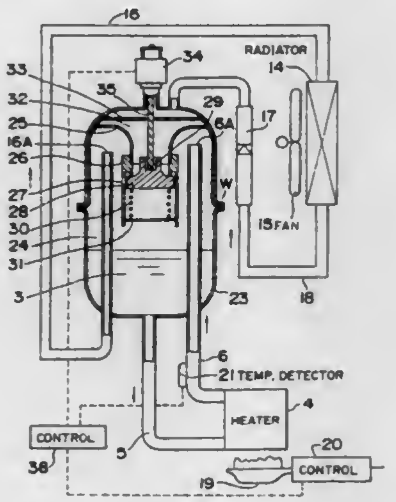
5,533,669
HEAT TRANSFER APPARATUS

Katsuzo Kokawa, Nara-Ken; Katsuhiko Yamamoto, Nabari; Tatsuki Sakurabu, Nara; Satoshi Imabayashi, Yamatokoriyama, and Muneo Tao, both of Yamatokoriyama, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1994, Ser. No. 335,403

Int. Cl.^{6} F24D *7/00*

U.S. Cl. 237—1 SL **10 Claims**



2. A heat transfer apparatus having a heating circuit and a heat release circuit comprising:
a refrigerant heater;
a single container disposed above said refrigerant heater;
a partitioning plate accommodated in said container for separating an inside of said container into a gas-liquid separating chamber and a liquid-receiving chamber;
a valve body for selectively opening and closing an opening defined in said partitioning plate;
a driving means for driving said valve body;
a radiator spaced from said container;
a first communication means for communicating said refrigerant heater and said gas-liquid separating chamber;
a second communication means for communicating said gas-liquid separating chamber, said radiator, and said liquid-receiving chamber;
said refrigerant heater, said gas-liquid separating chamber, and said first communication means constituting said heating circuit; and
said gas-liquid separating chamber, said radiator, said liquid-receiving chamber, said valve body, and said second communication means constituting said heat release circuit.

5,533,670
RAIL JOINT FOR EXPANSION BETWEEN RAILS WITH INVERTED T-SHAPED BASE HOLDER

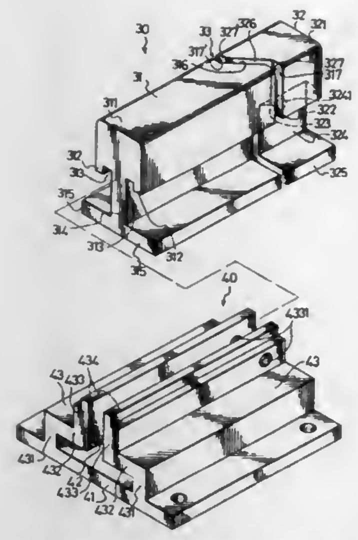
Chi-Shiang Chen, No. 15, Chung-Shan Rd., Su-Ao Chen, I-Lan Hsien, Taiwan

Filed Apr. 5, 1995, Ser. No. 416,982

Int. Cl.^{6} E01B *11/02;11/42*

U.S. Cl. 238—187 **4 Claims**

1. A rail joint interconnecting two successive rail bars of a railroad track, said rail bars having adjacent end portions, said rail joint comprising:
longitudinally aligned first and second guide rails, each having a mounting end secured to the end portion of a respective one of the rail bars, a distal end opposite to said mounting end and spaced from said distal end of the other one of said guide rails by an expansible space, and a downwardly and longitudinally extending dovetail projection shaped as an inverted T-shaped plate, said dovetail projection having an upright web portion



and two horizontal base portions, each of which extends transversely and outwardly from a respective one of two sides of a lower end of said web portion; and
an integral connector fixed on the railroad track and formed with an upwardly opening and longitudinally extending dovetail groove that is inverted T-shaped and fittingly receives said dovetail projections of said first and second guide rails therein so as to maintain alignment of said first and second guide rails, said connector having a base plate which is fixed on the railroad track and which carries said base portions of said dovetail projections thereon, and two longitudinally extending bent clamp plates which project upwardly from said base plate, are spaced from each other and confine said dovetail groove therebetween, said clamp plates having vertical lower portions to flank said base portions of said dovetail projections, horizontal middle portions which extend respectively from upper ends of said lower portions and toward each other to cover said base portions, and vertical upper portions which extend respectively upwardly from distal ends of said middle portions to flank said web portion of said dovetail projections;
only one of said first and second guide rails being fastened to said connector, said upper portions of said clamp plates having an aligned pair of holes formed respectively therethrough, said connector further having a pin which extends fittingly through said holes and through said web portion of said dovetail projection of said one of said first and second guide rails to fasten said one of said first and second guide rails to said connector.

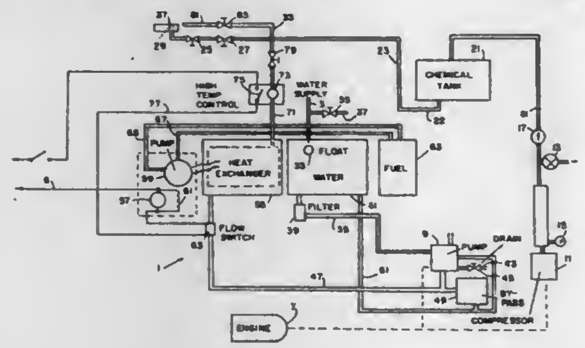
5,533,671
HIGH PRESSURE HOT WATER CHEMICAL WASHER

Ronald W. Baer, Denver, Colo., assignor to Unique Industries, Inc., Denver, Colo.

Filed Aug. 3, 1993, Ser. No. 101,301

Int. Cl.^{6} B05B *7/16;7/26*

U.S. Cl. 239—10 **5 Claims**



1. A high pressure hot water acid injection washer, comprising an engine, a water pump connected to the engine, a compressor connected to the engine, a water intake connected to the pump, a water filter connected to the intake, a water supply connected to the filter for supplying water through the filter to the pump, a drain connected to the pump for draining water from the pump, a pressurized water flow line connected to the pump, a bypass connected to the flow line and connected to the water supply for returning water from the pump to the water supply, a flow switch connected to the flow line for sensing flow of water in the flow line, a heat exchanger connected to the flow line for receiving water flowing through the pressurized water flow line and the flow switch, a fuel source, a fuel pump and a burner connected to the fuel source and connected to the flow switch for operating the pump and burner when the flow switch senses flow of water to the heat exchanger, a high pressure hot water delivery line connected to the heat exchanger, a temperature control connected to the delivery line and connected to the fuel pump and burner for permitting operation of the pump and burner until a predetermined high temperature is sensed in the delivery line, a hot water pressure relief valve connected to the high pressure hot water delivery line, a high pressure hot water delivery hose connected to the delivery line, a nozzle connected to the hot water hose for releasing a hot water stream, wherein the hot water pressure relief valve is provided for releasing water above a predetermined pressure in the hot water delivery line before reaching the water delivery hose, wherein the filter is provided for supplying clean water to the pump, and wherein the flow switch is provided for permitting operation of the fuel pump and burner only when water is flowing from the pump to the heat exchanger.

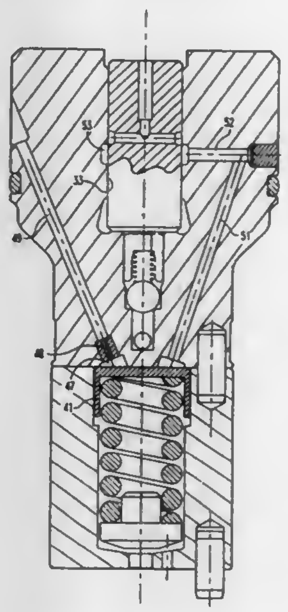
5,533,672
DUAL EVENT NOZZLE FOR LOW OPENING AND HIGH CLOSING PRESSURE INJECTOR

Lester L. Peters, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 6, 1994, Ser. No. 301,345

Int. Cl.^{6} F02M *47/02*

U.S. Cl. 239—88 **18 Claims**

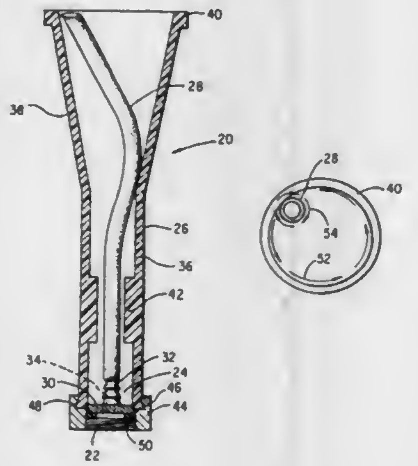


1. A fuel injector assembly comprising:
an injector body;
a metering plunger in a bore in the body and cooperable with an end of the bore to form an injection fuel chamber in the bore;
a timing plunger in the bore and cooperable with the metering plunger to define a timing fuel chamber in the bore, the plungers being movable in the bore and relative to each other

to enable varying the position and volume, respectively, of the timing fuel chamber in the bore;
an injector port at an end of the body for injection of fuel from the injector into an internal combustion engine cylinder;
a passageway in the body for communicating injection fuel from the injection fuel chamber to the injection port;
an injector valve in the body and normally closing the passageway and having a first spring seat;
a spring seat piston in the body and having a second spring seat;
a valve closing spring normally compressed between the spring seats and holding the injector valve closed in the passageway;
the spring seat piston being movable in the body toward and away from the valve to thereby increase and decrease the compression force of the spring on the valve; and
a timing spill passageway communicating between the metering plunger and the spring seat piston to load the piston with force derived from timing spill fuel pressure and further compress the spring and increase the valve closing force on the injector valve.

5,533,673
NOZZLE SYSTEM IMPARTING COMPOUND MOTION

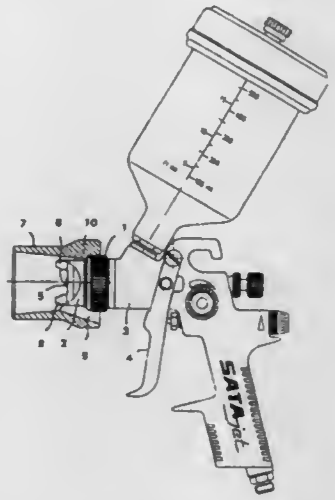
Timothy J. Wilson, Ellicott City, and Steven E. Jones, Pasadena, both of Md., assignors to Jet Blast Products Corp., Baltimore, Md.
Filed Oct. 31, 1994, Ser. No. 332,547
Int. Cl.⁶ B05B *3/06*
U.S. Cl. 239—227 **8 Claims**



1. A nozzle system comprising:
a nozzle for receiving a fluid;
a flexible hose connected to said nozzle and in fluid communication therewith; and
a shell having an interior surface, said shell surrounding said nozzle and said hose and having a substantially linear portion and a flared portion, said hose engaging said interior surface of said shell during discharge of the fluid such that said hose moves along said interior surface in an orbital path whereby the fluid is discharged with an orbital motion:
wherein said hose is fixedly connected to said nozzle such that said hose rotates about its own longitudinal axis as it moves along said interior surface of said shell.

5,533,674
DRYING NOZZLE

Wolfgang Feyrer, Herzogenrath, and Ewald Schmon, Metzingen, both of, Germany, assignors to Herberts GmbH, Wuppertal, Germany
Filed Jun. 30, 1994, Ser. No. 269,108
Claims priority, application Germany, Jul. 1, 1993, 43 21 940.3
Int. Cl.⁶ B05B *1/28*
U.S. Cl. 239—288.5 **18 Claims**

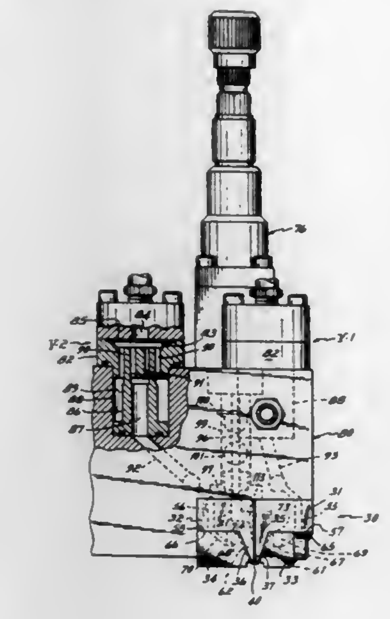


1. A drying nozzle comprising a tube adapted to be mounted on a nozzle head of a spray gun, the tube containing inlet slits for ambient air entering one tube end which taper in a direction of the interior of the tube, the tube expanding toward the other tube end, upon mounting the tube on the nozzle head the narrowest region of the tube between the tapering region of the inlet slits and the expanding region of the tube lying directly behind an air outlet opening when seen in direction of flow of the air passing out of the air outlet opening of the nozzle head, whereby upon supplying compressed air in the center of the tubular body a negative pressure in the tube interior is produced and as a result of which ambient air is drawn into one tube end and passes out of the other tube end together with the compressed air.

5,533,675
APPARATUS FOR APPLYING DISCRETE COATINGS

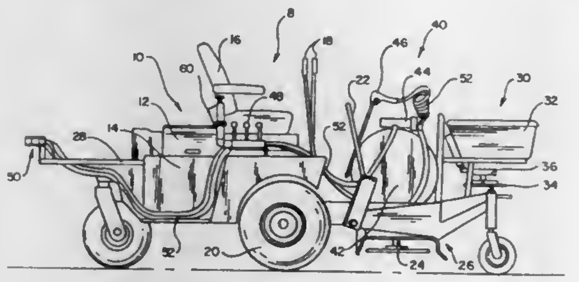
Jurgen Benecke, Brandenburger; Arthur Cieplik, Luneburg, and Thomas Burmester, Bleckede, all of, Germany, assignors to Nordson Corporation, Westlake, Ohio
Division of Ser. No. 224,426, Apr. 8, 1994, Pat. No. 5,423,935, which is a continuation of Ser. No. 910,781, Jul. 8, 1992, abandoned. This application May 25, 1995, Ser. No. 450,234
Int. Cl.⁶ B05B *7/16;7/00*
U.S. Cl. 239—413 **20 Claims**

1. Apparatus for producing a coating for noncontact application to a substrate, said apparatus comprising:
a slot nozzle having an elongated slot outlet through which a coating material can be extruded for deposition on a substrate spaced from said slot nozzle;
at least one elongated air slot proximate said slot outlet for impinging at least one air flow onto a coating material exuding from said slot outlet; and
means for starting the flow of air prior to extrusion of coating material from said slot outlet
said flow of air producing a discrete coating which when deposited on a substrate has square, sharp leading and trailing edges.



5,533,676
MULTI-PURPOSE LAWN CARE MACHINE

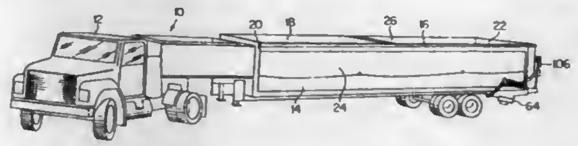
Rick A. Conley, 10041 Harriott Rd., Marysville, Ohio 43040
Filed Nov. 25, 1994, Ser. No. 344,998
Int. Cl.⁶ A01D *34/00;* **A01C** *19/04*
U.S. Cl. 239—663 **15 Claims**



9. A multi-purpose lawn care machine comprising:
an engine-powered riding mower unit having at least one horizontally rotating lawn-cutting blade and a deck housing element positioned generally above the cutting blade in blade-supporting relation; and
a fertilization unit having a granular materials storage bin means mounted on said mower unit deck housing element and having a selectively operated dispenser means which impels granular materials received from said storage bin means away from said deck housing element
wherein said engine-driven mower unit comprises a tractor having an engine, a fuel tank, and traction wheels, and a front deck having a front deck housing element and one or more grass cutting rotating blades, said front deck being pivotally attached to said tractor, and said tractor having an operator-seat mounted in front of the engine and fuel tank in order for the operator to be positioned to overlook the front deck.

5,533,677
METHOD AND APPARATUS FOR SPREADING MATERIAL

Kent McCaffrey, P.O. Box 70, Stanley, Va. 22851
Continuation of Ser. No. 118,755, Sep. 10, 1993, abandoned. This application Sep. 21, 1995, Ser. No. 531,915
Int. Cl.⁶ A01C *19/00*
U.S. Cl. 239—677 **19 Claims**



1. Apparatus for spreading material as a ground cover for the floor of a facility comprising:
a container for said material to be spread, said container comprising an open top for receiving said material, a front wall, a rear wall, a left side wall, a right side wall, and a bottom, said left and right side walls being defined as corresponding to an American style left-hand wheel drive system where said left side corresponds to a driver's side, said container having a centerline extending from said front wall to said rear wall;
first means adjacent said container bottom for moving said material along said container bottom in a direction from said front wall toward said rear wall;
at least two openings provided in said container adjacent said container bottom and adjacent or in said rear wall for permitting said material to be discharged from said container, said at least two openings being disposed so as to have a first opening disposed to the left of said centerline and a second opening disposed to the right of said centerline;
second means adjacent said container bottom and said rear wall for moving said material toward said openings;
a first material spreader located outside of said container and disposed to the left of said centerline for receiving material discharged from said first opening;
a second material spreader located outside of said container and disposed to an right of a centerline for receiving material discharged from said second opening;
means for rotating said first and second material spreaders in such a manner as to spread said material in a pattern outwardly of said side walls and rearwardly of said rear wall, said pattern being of essentially even depth of material covering essentially the entire floor of said facility in a single pass, said first material spreader being rotated about an essentially vertical axis in a counter-clockwise direction and said second material spreader being rotated about an essentially vertical axis in a clockwise direction;
transport means on which said apparatus is mounted for moving said apparatus into and out of said facility; and
hydraulic means for controlling the relative speeds of movement of said transport means moving said apparatus out of said facility and said second means for moving said material with the speed of rotation of said first and second spreaders so as to spread an even layer of said material in said facility.

5,533,678
METHOD FOR THE PRODUCTION OF CARBONATES BY WET GRINDING

Dieter Strauch, Zofingen, and Peter Belger, Muehlethal, both of, Switzerland, assignors to Pluess-Staufer AG, Oftringen, Switzerland
Filed Jan. 5, 1994, Ser. No. 177,060
Claims priority, application Germany, Jan. 19, 1993, 43 01 257.4
Int. Cl.⁶ B02C *23/18*
U.S. Cl. 241—16 **11 Claims**

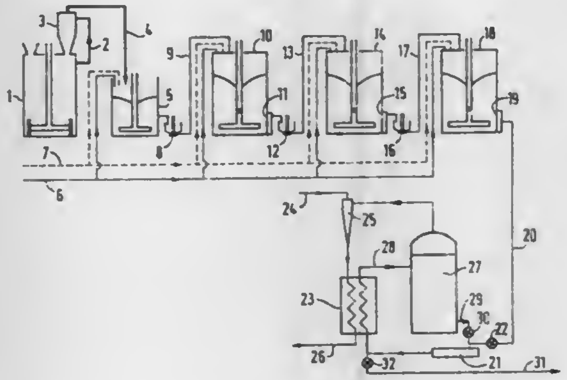
1. In a method for the production of a carbonate product, with a desired high BET/N_2 specific surface area of at least 20 m^2/g which includes preparing a suspension including the product and

wet grinding the product in the suspension in an agitating ball mill, the improvement comprising repeating the step of wet grinding of the entire product in the suspension leaving the mill until the product has the desired specific surface area and limiting a product solids concentration in the suspension during all wet grinding steps to no more than 24% by weight.

5,533,679

GRINDING ALKALINE EARTH METAL PIGMENTS

Christopher R. L. Golley, St. Austell, United Kingdom, assignor to ECC International Limited, United Kingdom
Filed Mar. 10, 1994, Ser. No. 209,006
Claims priority, application United Kingdom, Mar. 12, 1993, 9305087
Int. Cl.^{6} B02C *23/18*
U.S. Cl. 241—17 **16 Claims**

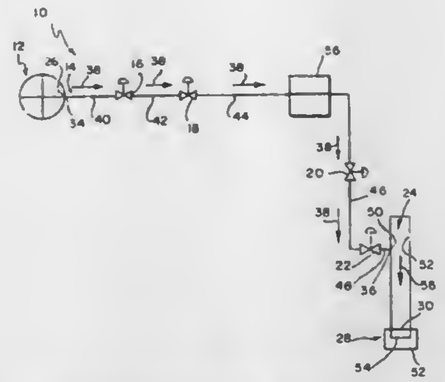


1. A process for producing a finely ground alkaline earth metal pigment comprising the steps of:
(a) preparing an aqueous suspension comprising from 40 to 70% by weight of a particulate alkaline earth metal compound;
(b) subjecting the suspension formed in step (a) to attrition grinding with a particulate grinding medium under conditions such as to yield a product having a particle size distribution such that at least 90% by weight of the particles have an equivalent spherical diameter smaller than 2 µm; and
(c) allowing water to evaporate from the suspension under the action of heat contained in the suspension until the percentage by weight of dry alkaline earth metal compound in the suspension is at least 70% by weight.

5,533,680

PROCESS TO GRIND THERMOSET OR THERMOPLASTIC MATERIALS

Bobby D. LaGrone, Vicksburg, Miss., assignor to U.S. Rubber Reclaiming, Inc., Vicksburg, Miss.
Filed Dec. 28, 1994, Ser. No. 364,955
Int. Cl.^{6} B02C *19/00*
U.S. Cl. 241—23 **21 Claims**

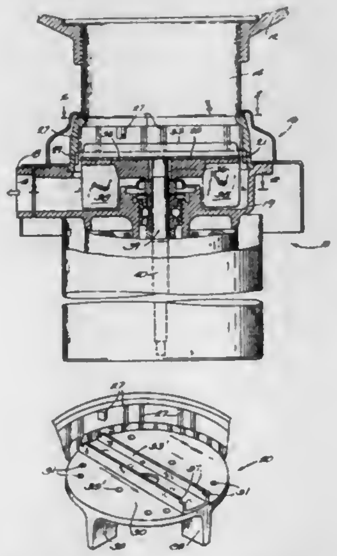


1. A system for the treatment of thermoset and thermoplastic materials to form a substantially embrittled product, the system comprising
a naturally occurring CO_2 gas well having a well head,
a pressure-reduction conduit comprising an inlet coupled to the well head, an outlet, and a passageway communicating with the inlet and the outlet,
means for regulating flow of the CO_2 gas through the passageway from the inlet to the outlet so that the CO_2 gas is converted from a high pressure to a substantially lower pressure,
means for transforming the lower pressure CO_2 gas to dry ice snow, said transforming means being coupled to the outlet of the pressure-reduction conduit, and
means for contacting the materials with the dry ice snow so that the materials are cooled to a reduced temperature and form a substantially embrittled product.

5,533,681

MEDICAL WASTE GRINDER

Wayne C. Riley, Sturtevant, Wis., assignor to Emerson Electric Co., Racine, Wis.
Continuation-in-part of Ser. No. 64,490, May 19, 1993, Pat. No. 5,340,036. This application Aug. 24, 1994, Ser. No. 295,528
Int. Cl.^{6} B02C *18/40;18/42*
U.S. Cl. 241—56 **7 Claims**

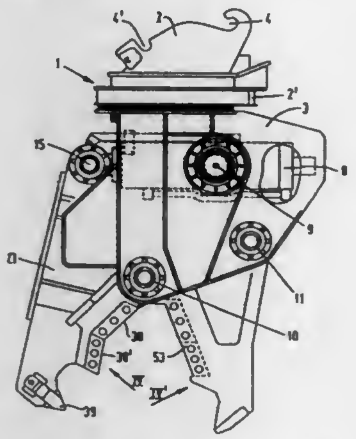


1. A grinder for dry waste materials comprising:
a vertically-oriented, cylindrically-shaped housing having an opening at its upper end for receiving materials to be comminuted,
said housing being divided into upper and lower chambers by means of a rotatable, disk-shaped shredder element,
said shredder element having a pair of parallel upwardly-extending impeller blades each extending across the width of its upper surface to define an unobstructed channel across the diameter of said element,
stationary blades uniformly spaced around the inner perimeter of said upper portion of said housing,
said lower housing having a discharge outlet for discharge therefrom of comminuted materials,
said shredder element having downwardly extending blades on its lower surface, said blades having an area adapted to sweep said lower housing and expel comminuted materials therefrom outwardly through said discharge opening,
said shredder element being connected by a central shaft to a means to rotate said element whereby said grinder is effective in comminuting solid dry waste materials and expelling them through said discharge opening in the absence of a flushing liquid.

5,533,682

DEVICE FOR CRUSHING AND/OR CUTTING MATERIAL

Gertrudis M. G. de Gier, Velddriel; Adrianus M. C. M. van Doornmalen, Ammerzoden, and Hendrikus T. J. J. Wingens, Schayk, all of, Netherlands, assignors to Methold 's-Hertogenbosch B.V., 's-Hertogenbosch, Netherlands
Filed Aug. 31, 1994, Ser. No. 299,178
Claims priority, application Netherlands, Sep. 2, 1993, 9301517; European Pat. Off., Apr. 20, 1994, 94201084
Int. Cl.^{6} B02C *1/06;21/02*
U.S. Cl. 241—101.73 **20 Claims**

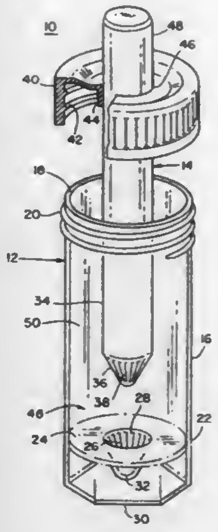


1. A device for size reduction of material, said device being provided with a frame having coupling means by which said frame can be coupled to a jib; a first jaw occupying a fixed position with respect to the frame during operation, and connected to the frame; a second jaw connected to the frame and cooperating with said first jaw, said second jaw being pivotable about a first pivot pin with respect to the frame by means of a setting cylinder in a direction towards the first jaw and in a direction away from the first jaw; said first jaw being detachably connected to the frame by means of said first pivot pin and a second pin spaced from said first pivot pin; and wherein the second jaw is detachably connected to the frame by said first pivot pin and a third pin coupling the second jaw to the setting cylinder.

5,533,683

TISSUE GRINDING SYSTEM

John E. Fay, and Michael Faulkner, both of Leominster, Mass., assignors to Biomedical Polymers, Inc., Leominster, Mass.
Continuation of Ser. No. 165,098, Dec. 9, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 359,958
Int. Cl.^{6} B02C *1/00;19/08*
U.S. Cl. 241—169 **35 Claims**

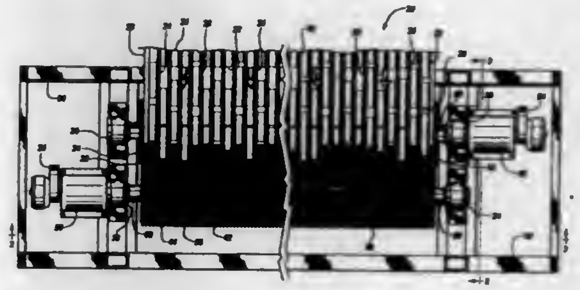


1. A tissue grinding system comprising:
a container having an open top portion, a bottom portion having an interior first grinding surface and a wall portion interconnecting said top portion and bottom portion for defining a hollow interior collection chamber;
a grinder receivable in said top portion of said container and having a second grinding surface engageable with said first grinding surface including an actuator portion extending beyond said top portion, said grinder having an X-shaped cross-section providing an enlarged overflow volume within said collection chamber to accommodate excess specimen without overflow or leakage; and
a closure device sealingly engageable with said grinder and with said open top portion of said container to seal said collection chamber, said collection chamber located between said first grinding surface and said top portion;
such that the combination of said collection chamber, said grinder and said closure device act as a tissue grinding system.

5,533,684

WOOD CHIP STRAND SPLITTER

Joseph B. Bielagus, Tualatin, Oreg., assignor to Beloit Technologies, Inc., Wilmington, Del.
Filed Oct. 17, 1994, Ser. No. 323,553
Int. Cl.^{6} B02C *1/08;7/04;* **B27C** *1/00*
U.S. Cl. 241—222 **4 Claims**



1. An apparatus for splitting wood chips comprising:
a frame;
a first cylindrical roll rotatively mounted to the frame, wherein portions of the first roll define a plurality of axially spaced circumferentially extending grooves, and wherein adjacent grooves define radially protruding ridges; and
a second cylindrical roll rotatively mounted to the frame, wherein portions of the second roll define a plurality of axially spaced circumferentially extending grooves, and wherein adjacent grooves define radially protruding ridges, and wherein the second roll is mounted in spaced parallel relation to the first roll such that the ridges of the first roll interdigitate with the ridges of the second roll so that the ridges of the first roll are closely spaced from the grooves of the second roll but do not touch, and the ridges of the second roll are closely spaced from the grooves of the first roll but do not touch, such that rotation of the first roll and second roll toward one another causes the splitting without slicing of infed wood chips having substantially aligned wood grain.

5,533,685
CENTRIFUGAL IMPACT CRUSHER

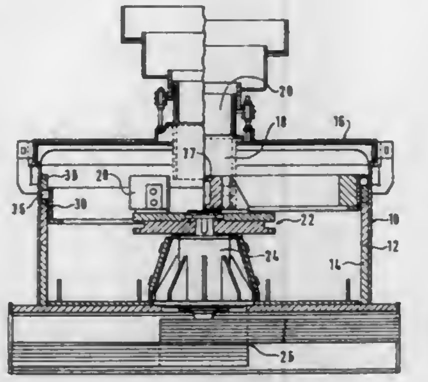
Jean-Marie Heck, Grivegnee, Belgium, assignor to Magotteaux International, Chevremont, Belgium

Filed Dec. 14, 1994, Ser. No. 355,523

Claims priority, application Belgium, Dec. 14, 1993, 09301387

Int. Cl.^{6} B02C *19/00*

U.S. Cl. 241—275 **6 Claims**



1. A centrifugal impact crusher comprising:
- a cylindrical housing with a removable closure cover;
- a central device for feeding material to be crushed through the cover;
- a turntable supported by a vertical bearing and associated with means for turning the table about the central axis of the crusher;
- a series of ejectors fixed to the turntable;
- a lining, having an upper horizontal edge, aligned with the internal wall of the housing; and
- an anvil ring having an inner and an outer surface, and further comprising a series of anvils aligned with said inner surface and a series of flat polygonal blocks coupled to said outer surface, wherein the flat polygonal blocks rest on the upper horizontal edge of the lining of the housing and support the anvil ring.

5,533,686
METHODS AND APPARATUS FOR THE WINDING OF FILAMENTS

Armin Wirz, Ossingen, and Peter Busenhart, Wiesendangen, both of, Switzerland, assignors to Maschinenfabrik Rieter AG, Switzerland

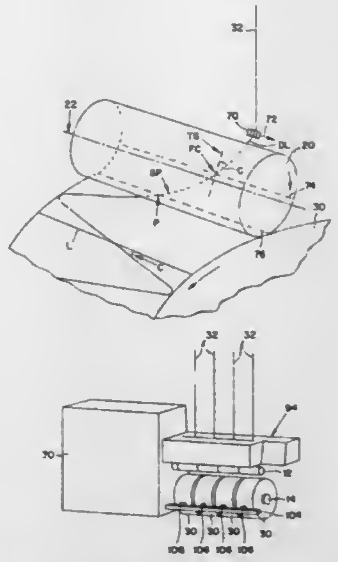
Filed Nov. 15, 1993, Ser. No. 151,888

Int. Cl.^{6} B65H *54/14*

U.S. Cl. 242—18 A **24 Claims**

1. A method of determining thread-winding parameters for reducing the rate at which deviations from a cylindrical shape are formed in thread packages being wound, comprising the steps of successively forming thread packages by laying thread upon a driven rotary chuck while pressing a driven rotating contact roller against the package such that a circumferential force is transmitted between the contact roller and the package, inspecting each package for deviations from a cylindrical shape, and changing at least one winding parameter between the forming of successive packages to promote the generation of slippage at an interface between the contact roller and package, the amount of promoted slippage being changed as successive packages are formed to change the rate at which said deviations are formed.

24. A winding machine for winding thread onto a package, comprising:
- a chuck for supporting a thread package;
- first drive means for driving said chuck into rotation about a longitudinal chuck axis;
- a contact roller for contacting the circumference of a thread package on said chuck and for guiding thread toward said package;



- second drive means for driving said contact roller into rotation about a longitudinal roller axis;
- a traverse device disposed upstream of said contact roller with respect to the direction of thread travel for traversing the thread transversely of said direction of travel;
- first control means for adjustably controlling the circumferential force applied between said contact roller and a package on said chuck while holding the contact roller at a predetermined speed of rotation;
- second control means for adjustably controlling the contact pressure between said contact roller and said package; and
- third control means for adjustably controlling the traversing speed of said traverse device for varying the cross winding angle of the thread on said package.

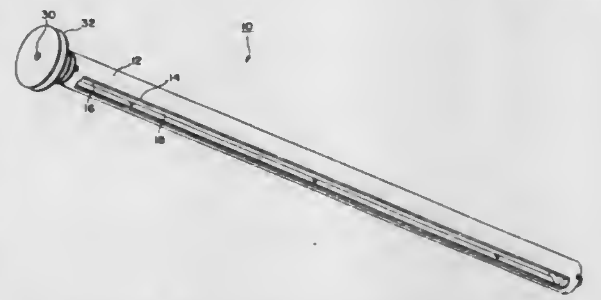
5,533,687
LOW TORQUE MEDIA TAKE-UP DEVICE

William W. Tice, Nashua, N.H., assignor to Miles Inc., Wilmington, Mass.

Filed Nov. 23, 1993, Ser. No. 156,076

Int. Cl.^{6} G03B *17/26;* **B65H** *18/10;75/48*

U.S. Cl. 242—348.1 **10 Claims**



1. A take-up roller for winding a continuous recording medium, comprising:
- an outer hollow cylindrical tube having a longitudinal slot and an inner hollow cylindrical tube having a longitudinal slot, said inner hollow cylindrical tube mounted concentrically within said outer hollow cylindrical tube;
- drive means for rotationally driving said outer hollow cylindrical tube about a rotational axis; and,
- clutch means for allowing relative rotation between said outer and inner hollow cylindrical tubes in one direction about the rotational axis during rotation of said outer hollow cylindrical tube by said drive means and for preventing relative rotation between said outer and inner hollow cylindrical tubes in an opposite direction about the rotational axis.

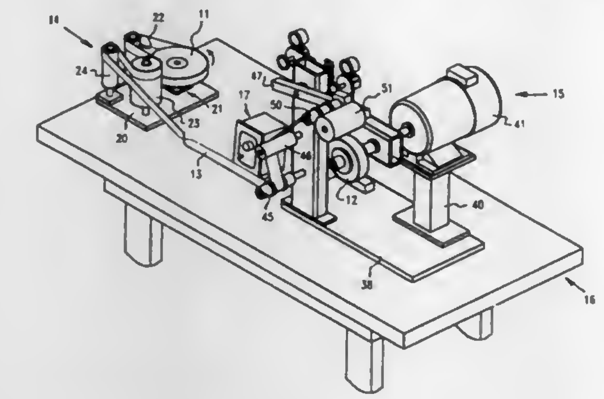
5,533,688
ROLL REWINDER APPARATUS

William Pace, 849 160th St., Hammond, Wis. 54015

Filed Aug. 30, 1994, Ser. No. 298,007

Int. Cl.^{6} B65H *23/198*

U.S. Cl. 242—413.2 **10 Claims**



1. An apparatus for rewinding flexible elongated material from one roll onto another roll, comprising:
- (a) an unwind station comprising a holder for a first roll of wound material and first, second and third rotatable guides disposed at predetermined with respect to said holder;
- (b) a wind station comprising a frame, a first air guide and a first guide connected to said frame and a holder, connected to said frame for a second roll of wound material, said at least one wind station guide being disposed at a predetermined position with respect to said wind station holder and to said unwind station guide, said wind and unwind stations holders and guides having cylindrical configurations with a shaft and a head, and all of said holders being rotatable, said wind station further comprising a second air guide and a second guide;
- (c) means to drive said wind station holder, whereby material extending from said unwind station holder travels around said unwind guide, around said wind station guide and is rewound onto said wind station holder; and
- (d) a speed regulator for regulating the speed of travel of material from said unwind station holder to said wind station holder, said speed regulator comprising an arm pivotally connected to said frame at one end thereof via a pivot shaft, at least one guide disposed at a second end thereof for contact with the second roll of material, a rheostat connected to said frame and to said arm, and an electronic controller connected to said rheostat and to said drive means, whereby the angular position of said arm is a function of the diameter of said second roll and wherein the increase in said angular position is detected by said rheostat, transmitted to said controller and results in decreasing the speed of said drive means, said wind station second air guide and said second guide being disposed on said arm.

5,533,689
BANDAGE WINDING MACHINE

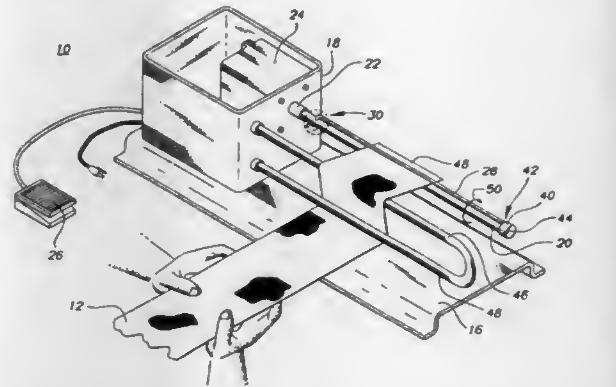
Michael G. Chalfant, 37 Crestland Ter., Doylestown, Pa. 18901

Filed Jun. 9, 1994, Ser. No. 257,541

Int. Cl.^{6} B65H *18/10*

U.S. Cl. 242—532.5 **15 Claims**

1. A winding device comprising:
- a shaft;
- a driver connected to said shaft for rotating said shaft;
- a moveable clamping bar affixed at a first end to and rotating with said shaft, wherein said first end of said clamping bar is affixed to said shaft through an opening through said shaft, said clamping bar having a section extending through said opening, and another section extending substantially parallel to said shaft;



- a clamp for coupling the other end of said clamping bar with said shaft; and
- wherein said clamp comprises a removeable end cap fitting over both said shaft and said clamping bar.

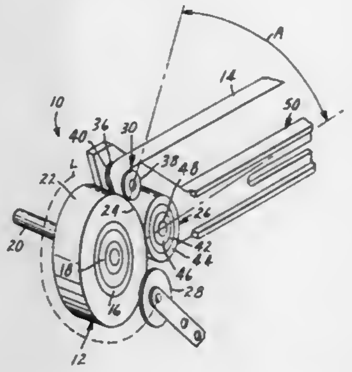
5,533,690
STRAND ALIGNMENT DEVICES FOR HIGH SPEED WINDING OF MAGNETIC TAPE

Robert J. Kline, Stillwater; Thomas E. Larsen, St. Paul; Mark A. Schiesl, Hutchinson, and Bruce E. Tait, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1994, Ser. No. 252,837

Int. Cl.^{6} B65H *18/26*

U.S. Cl. 242—547 **17 Claims**

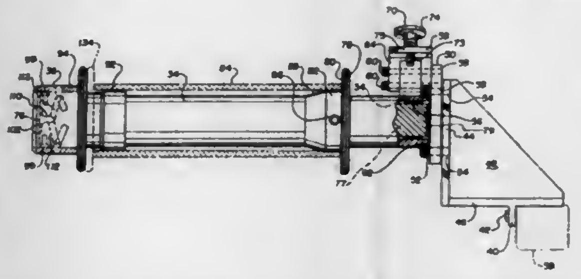


1. A magnetic tape winding apparatus for winding a length of magnetic tape in concentric strands on a flangeless hub to form a pancake, the apparatus comprising:
- means for mounting the hub on the apparatus;
- means for rotating the mounting means and the hub while magnetic tape is wound on the hub to form a roll;
- means for removing air from between strands of tape as the strands are wound onto previous strands on the hub, wherein the removing air means is separate from the rotating means; and
- means for laterally aligning the strands of tape as the strands are wound onto the hub comprising means for pre-aligning the strands located to contact the tape that is wrapped on the hub, wherein the pre-aligning means comprises a pre-wrap guide roller comprising a central portion and first and second end flanges, wherein the central portion comprises first and second cylindrical sections located between the first and second end flanges, wherein the first cylindrical section is adjacent the first flange and has a larger diameter than the second cylindrical section such that in operation, the tape wraps around the pre-wrap guide roller to steer the tape toward the first flange to provide a precise locating reference surface for the tape.

5,533,691
MANDREL WITH TWIST LOCK APPARATUS

Kevin J. Doyle, and Gary N. Eastlund, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 18, 1994, Ser. No. 292,734
Int. Cl.^{6} B65H ***16/04;18/04***
U.S. Cl. 242—597.4 22 Claims

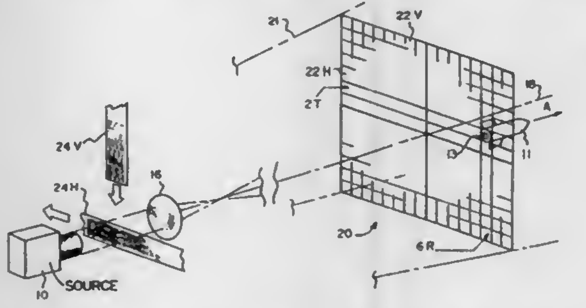


5. A locking device for use with a rotatable mandrel, the mandrel having a cylindrical exterior surface, a supported inward end, and an outward end designed to receive the core of a roll of material, the material to be wound onto and unwound from the core as desired, comprising:
locking hub means for compressively engaging and locking said core, said hub means having
  (i) an interior cylindrical surface adapted to slidingly engage said exterior surface of the mandrel proximate the outward end of the mandrel,
  (ii) at least one locking means coupled to the interior surface of the hub means for locking the hub means to the mandrel, and
  (iii) an engaging surface to engage the end of said core; and
groove means formed in a generally spiral shape in said exterior surface of the mandrel proximate the outward end thereof for cooperatively lockingly engaging said at least one engaging means to hold the core in place on the mandrel, wherein the spiral extends through an arc of no more than 180 degrees.

5,533,692
BEAMRIDER GUIDANCE SYSTEM USING DIGITAL PHASE MODULATION ENCODING

Allen C. Layton, Winter Garden, Fla., assignor to Oerlikon-Contraves AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 7,751, Jan. 30, 1979, Pat. No. 4,299,360. This application Oct. 28, 1981, Ser. No. 316,151
Int. Cl.^{6} F41G ***7/24***
U.S. Cl. 244—3.13 22 Claims

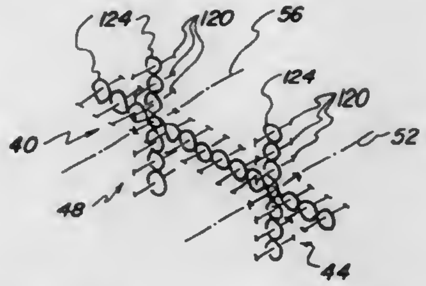


1. An encoding mask for use in conjunction with an electromagnetic beam of radiation for spatially encoding the beam as the mask is moved through the beam at a constant, predetermined speed to thereby facilitate the locating of an object in space, comprising a surface having a series of adjacent regions defining frames, each of said regions being defined by one or more sets of spaced apart cyclically recurring bands effective to vary a detectable beam parameter, the spacing between adjacent bands of a set being preselected to produce a predetermined beam modulation frequency as the surface is moved through the beam, the adjacent bands of one set of bands within a frame being shifted in position from the adjacent bands of at least one other set of bands within the same frame to thereby spatially modulate the beam at two phases of said frequency, at least, as a frame is moved through the beam.

5,533,693
THREE DIMENSIONAL WOVEN FABRIC CONNECTOR

Dale Abildskov, late of Salt Lake City, Utah, assignor to EDO Corporation, New York, N.Y.

Division of Ser. No. 687,956, Dec. 31, 1984, Pat. No. 4,782,864. This application Nov. 16, 1987, Ser. No. 121,075
Int. Cl.^{6} B64C ***1/06***
U.S. Cl. 244—131 11 Claims

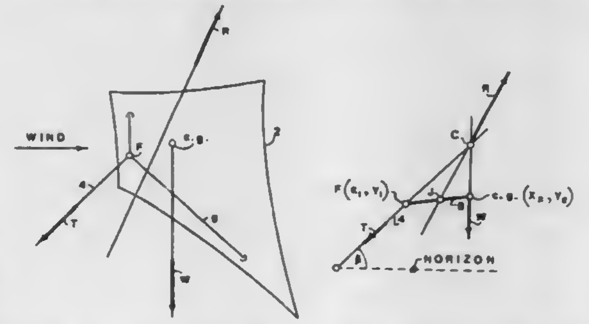


1. A fabric joint for providing three-dimensional structural support for at least two intersecting structural members comprising
  a first section of fabric for attachment to one of the structural members and composed of fiber bundles interwoven together as warp and weft,
  a second section of fabric for attachment to the other of the structural members and also composed of fiber bundles interwoven together as warp and weft, and interwoven with said first section along an intersection of the two sections, with at least one fiber bundle of the warp, located at the intersection, being common to the two sections, wherein at least some of the fiber bundles of the weft of the first section extend through the intersection to form at least some of the fiber bundles of the weft of the second section, and
wherein the second section extends outwardly in one direction from the intersection which is between the side edges of the first section.

5,533,694
METHOD FOR LOCATING THE RESULTANT OF WIND EFFECTS ON TETHERED AIRCRAFT

Howard G. Carpenter, 7667 Kelley Dr., Apt. 13, Stockton, Calif. 95207

Filed Mar. 8, 1994, Ser. No. 207,595
Int. Cl.^{6} A63H ***27/08;*** **B64C** ***31/06***
U.S. Cl. 244—153 R 14 Claims

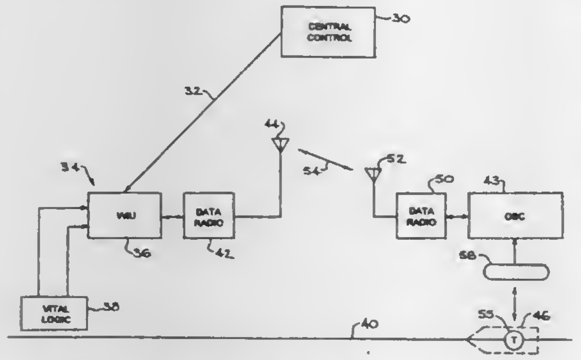


1. A method for the determination of the location, relative to the structure of a tethered aircraft, of the line-of-action of the wind-resultant force of the lifting and dragging wind forces on said tethered aircraft flying in stall in force equilibrium, with said aircraft having the tether fastened to said aircraft at a previously sited towing-point comprising the steps of:
  (a) while said tethered aircraft is on the ground;
    the center-of-gravity relative to said structure of said tethered aircraft is located, and
    the weight of said tethered aircraft is measured and recorded, and
    the length of the line-segment that extends from said center-of-gravity to said towing-point is measured and recorded, and
  (b) while said tethered aircraft flys in stall in force equilibrium in a steady wind;
    the slope of said line-segment is measured and recorded, and, proximally to the end of said tether that is fastened to said tethered aircraft at said towing-point,
    the tether-tension is measured and recorded, and
    the tether-inclination angle is measured and recorded, and
  (c) calculator means for locating coordinate points, relative to said structure, are operated on the records of said weight, said length, said slope, said tether-tension, and said tether-inclination to locate a plurality of said points on said line-of-action of said wind-resultant force, and
  (d) the located said points are placed on or within said structure of said tethered aircraft, through which said points said line-of-action of said wind-resultant force is marked on or within said structure
Whereby a property of said tethered aircraft, said location of said wind-resultant force on or within said structure, is known; once marked, whatever the angle of attack, said location remains fixed relative to said structure, however, within range, the site of said towing-point or the weight distribution is altered.

5,533,695
INCREMENTAL TRAIN CONTROL SYSTEM

Robert E. Heggestad, Raytown, and Donald B. Schaefer, Jr., Blue Springs, both of Mo., assignors to Harmon Industries, Inc., Blue Springs, Mo.

Filed Aug. 19, 1994, Ser. No. 293,064
Int. Cl.^{6} B61L ***3/20***
U.S. Cl. 246—62 23 Claims

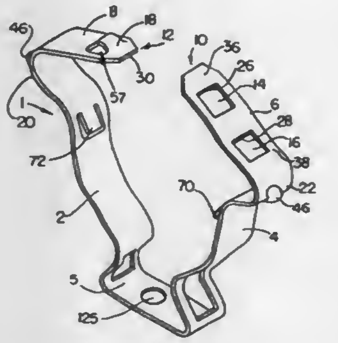


1. A method of controlling the movement of a train along a railroad track comprising the steps of:
  providing a plurality of wayside control units spaced along a route to be traveled by a train, each of which has responsibility for the control of a train in a corresponding local area of the route and monitors track availability and signal status information in its local area,
  maintaining a data base at each wayside control unit that comprises fixed data defining an operational profile of the associated local area,
  in a local area through which a train is passing, transmitting the fixed data for that area and dynamic data bearing said information by radio from the associated wayside unit to a receiver on board the train, and
  determining the proper train control instructions from the received fixed and dynamic data.

5,533,696
CONDUIT CLIP

Raymond S. Laughlin, Cuyahoga Falls, and Kenneth A. Golonka, Sr., Richmond Heights, both of Ohio, assignors to Erico International Corp., Solon, Ohio

Continuation-in-part of Ser. No. 725,585, Jul. 3, 1991, abandoned. This application Jun. 11, 1992, Ser. No. 896,837
Int. Cl.^{6} F16C ***3/08***
U.S. Cl. 248—74.2 14 Claims

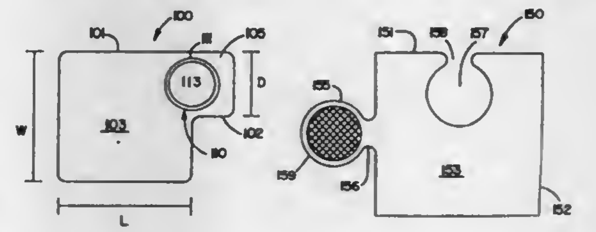


1. A spring metal conduit clamp of a certain thickness for circumscribing and supporting conduit, said clamp comprising interlocking elongate feet each having longitudinal sides, said feet merging into resilient legs and being compressible toward each other, at least one of said feet having outwardly extending detent means for engaging the other of said feet in interlocking relationship; said detent means having a width extending transversely of the foot between the two sides, said width being greater than the thickness of the clamp, another of said feet including an aperture between the longitudinal sides accommodating said detent means as said feet are compressed toward each other and having a transverse linear edge for interlocking with the width of said detent means when said feet are released.

5,533,697
MOUSE PAD WITH BEVERAGE HOLDER

James R. Fletcher, 3330 Vagabond La., Plymouth, Minn. 55447, and Mark A. Krull, 7932 Somerset Rd., Woodbury, Minn. 55125, assignors to Mark A. Krull, Northfield, Minn., and James R. Fletcher, Richmond, Va.

Filed Nov. 9, 1994, Ser. No. 336,499
Int. Cl.^{6} A47B ***91/00***
U.S. Cl. 248—146 25 Claims



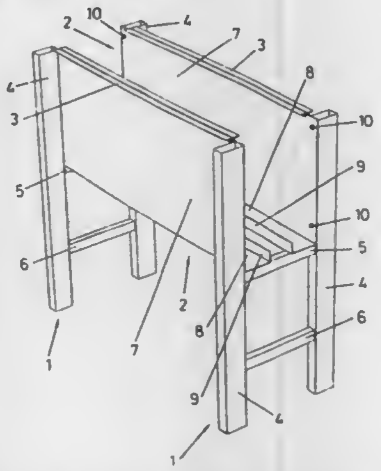
1. A mouse pad, comprising a generally rectangular sheet of mouse pad material having associated therewith a retaining means for retaining a beverage container, wherein said generally rectangular sheet also has a notch formed therein and a projection extending therefrom, and said projection has at least one dimension greater than three and one-half inches, and said notch is substantially similar in size and configuration to said projection.

14. An apparatus designed to facilitate operation of a computer mouse and intermittent storage of a beverage container, comprising:

a mouse pad having a perimeter and designed to rest upon a support surface; and

a beverage container retaining means secured within the perimeter of said mouse pad, for retaining the beverage container relative to said mouse pad.

5,533,698
SUPPORTING DEVICE, ESPECIALLY CONCEIVED FOR FISH BOWLS
Jose Puig-Sureda Font, L'Ametlla del Valles (Barcelona), Spain, assignor to Occoris, S.A., Cardedeu (Barcelona), Spain
Filed Nov. 2, 1994, Ser. No. 333,476
Claims priority, application Spain, Nov. 5, 1993, P9302317
Int. Cl.⁶ A47G *23/02*
U.S. Cl. 248—152 **10 Claims**



1. A supporting device for a fish tank, comprising:

first and second opposed leg structures each having two upright legs, said legs being connected by a first crossbar;

first and second plates each having an upper edge, said first and second leg structure being connected together by said first and second plates; and

two elongated profiles, each of said profiles comprising a flat upper surface to support the fish tank and a bottom surface including means for pivotally mounting said profile on said upper edge of said plates;

whereby said profiles adapt to any bending in the fish tank by pivoting transversely to their length while supporting the fish tank along their length.

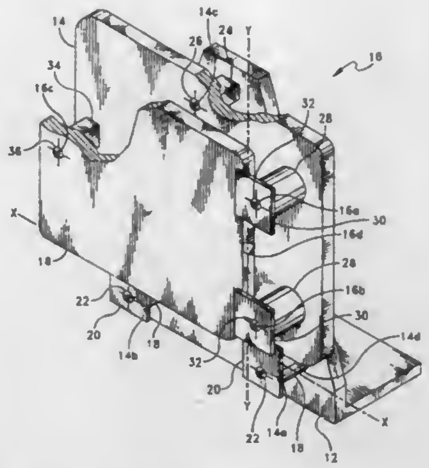
5,533,699
ADJUSTABLE TWO-AXIS INSTRUMENT MOUNT
William H. Nedderman, Jr., Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 5, 1994, Ser. No. 349,656
Int. Cl.⁶ E04G *3/00*
U.S. Cl. 248—278.1 **9 Claims**

1. A two-axis adjustable mount comprising:

a base plate;

an intermediate plate;

at least two first hinge point mounts for fixedly attaching the intermediate plate to the base plate, the first hinge point mounts allowing rotation of the intermediate plate relative to the base plate about an axis X—X, the first hinge point mounts being located along the axis X—X;



a first adjustable mount located a distance away from and transverse to said axis X—X for adjustably securing the intermediate plate to the base plate, whereby a distance between the intermediate plate and the base plate measured at the first adjustable mount may be adjusted, the adjustment of the distance between the intermediate plate and the base plate causing the rotation of the intermediate plate about the axis X—X;

each of the first hinge point mounts further comprising a first flexible plate removably affixed between the base plate and the intermediate plate, said first flexible plate bending in response to the rotation of the intermediate plate about the axis X—X;

an instrument mount plate for securing an instrument thereto;

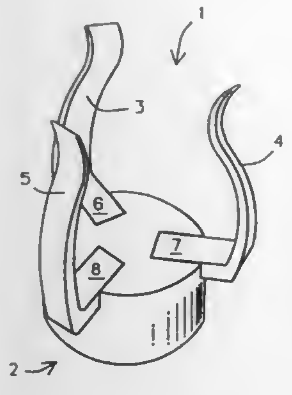
at least two second hinge point mounts for fixedly attaching the instrument mount plate to the intermediate plate, the second hinge point mounts allowing rotation of the instrument mount plate relative to the intermediate plate about an axis Y—Y, the axis Y—Y being perpendicular to the axis X—X, the second hinge point mounts being located along the axis Y—Y;

a second adjustable mount located a distance away from and transverse to said axis Y—Y for adjustably securing the instrument mount plate to the intermediate plate, whereby a distance between the instrument mount plate and the intermediate plate measured at the second adjustable mount may be adjusted, the adjustment of the distance between the instrument mount plate and the intermediate plate causing the rotation of the instrument mount plate about the axis Y—Y; and

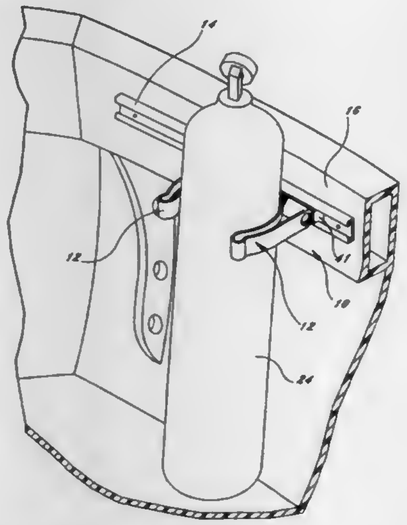
each of the second hinge point mounts further comprising a second flexible plate removably affixed between the intermediate plate and the instrument mount plate, said second flexible plate bending in response to the rotation of the instrument mount plate about the axis Y—Y.

5,533,700
HOLDER FOR A CONTAINER
Dennis Porter, 3036 Karen Ave., Long Beach, Calif. 90808
Filed Feb. 16, 1995, Ser. No. 389,255
Int. Cl.⁶ A47K *1/08*
U.S. Cl. 248—311.2 **8 Claims**

1. A holder for a container, said holder comprising a base and two or more fingers, said fingers each baving a bottom end and a top end, each said bottom end being fixedly attached with respect to said base and said fingers extending upwardly from a position outwardly beyond said base and wherein said fingers curve outwardly at or near their top ends and wherein said base extends substantially below the bottom ends of said fingers and wherein said base is adapted to be inserted in a receptacle and hold said fingers upright.



5,533,701
FOLDABLE STABILIZING BRACKET FOR COMPRESSED AIR TANKS
Robert D. Trank, 331 SE. 8th St., Pompano beach, Fla. 33060
Filed Dec. 8, 1994, Ser. No. 351,689
Int. Cl.⁶ A47G *1/10*
U.S. Cl. 248—316.4 **6 Claims**



1. A bracket assembly for stabilizing a cylindrical compressed air tank in a vertical position, said bracket comprising:

a mounting track having a channel disposed therein longitudinally;

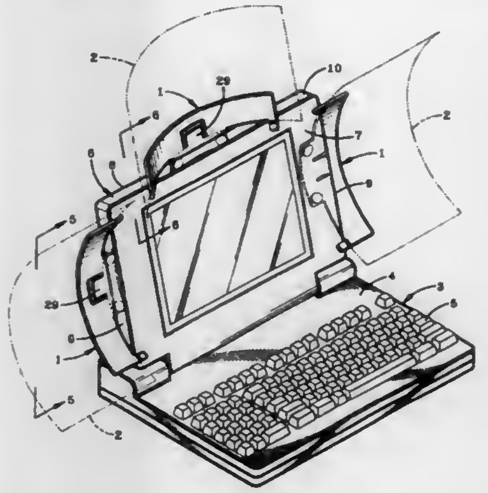
means connectable to said mounting track for attaching said mounting track to a surface; and

a bracket connected to said mounting track, said bracket including a pair of arms, each of which is movable from a first position substantially perpendicular to said mounting track and a second position substantially orthogonal to said mounting track and to said arm first position, said pair of arms spaced apart in a predetermined distance to substantially engage a portion of the cylindrical compressed air tank in order to hold the cylindrical compressed air tank in a predetermined position relative to said mounting track, said bracket arms are movable from said first position to allow stabilizing engagement with a compressed air tank to said second, non-extending position;

said bracket of two identical components, each forming substantially half of said bracket and each separable from each other, said bracket component having a rigid, elongated brace, said brace including a means for attaching said brace to said mounting track, said brace including an interlocking means for interlocking one of said braces forming a bracket component to another identical brace having interlocking means, each of said bracket identical components including one of said arms for encompassing a portion of the circumference of said cylindrical compressed air tank; and

each bracket component having a hinge joint connecting said brace and said arm to allow pivotal movement of said arms relative to said brace.

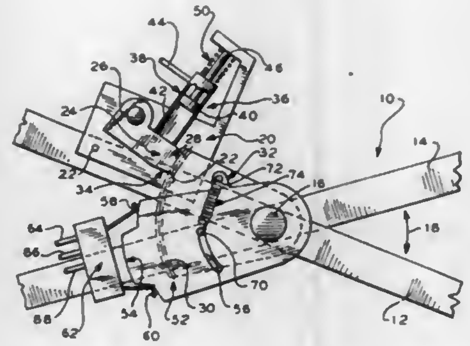
5,533,702
COMBINATION COMPUTER AND REMOVABLE PAPER HOLDER
Richard C. Koch, RSM, Calif., assignor to Alpha Enterprises, Inc., North Canton, Ohio
Filed May 12, 1994, Ser. No. 241,616
Int. Cl.⁶ B41J *11/02*
U.S. Cl. 248—442.2 **6 Claims**



1. In combination, a computer and a holder removably mounted on the computer for releasably holding a sheet of paper adjacent said computer; said holder including a flexible flat body bendable between its flat configuration for storage and a bowed configuration for attachment to the computer; first means formed on the body for trapping an edge of the computer therebetween when the body is in the bowed configuration, said first means being a pair of spaced legs and a flange extending along a side of the computer and the flange extending along an opposite side of the computer to bow the body into its bowed configuration and trap said body on said computer, and second means formed on the body for retaining the sheet of paper on said body, when said body is in its bowed configuration on the computer.

5,533,703
SPRUNG VEHICLE SEAT
Johann Grassl, Pittersberg, and Dietmar Herbert, Amberg, both of, Germany, assignors to Grammer AG, Amberg, Germany
Filed Oct. 13, 1994, Ser. No. 322,220
Claims priority, application Germany, Oct. 13, 1993, 43 35 199.9
Int. Cl.⁶ F16M *13/00*
U.S. Cl. 248—550 **9 Claims**

1. A sprung vehicle seat comprising: a scissor support assembly having first and second scissor members pivotable about a common pivot axis, a gas spring for adjusting the support assembly, a first valve means connected to the gas spring for beight adjustment of the seat, a second valve means connected to the gas spring for adjustment of the height of the seat in dependence on weight, a coupling for providing the connection of the second valve means to the second scissor member, the coupling having a segment member which is pivotable about said pivot axis and which has an arcuate tooth portion, and a pivot arm with a tooth configuration adapted to be brought into meshing engagement with said tooth portion, means pivotably connecting the pivot arm to the first scissor



member, a drive means connected to the first valve means and operable to actuate the pivot arm, a rocker member pivotably arranged at said pivot axis movable relative to the segment member for actuation of the second valve means, a limiting means for limiting movement of the rocker member relative to the segment member, and a first spring means operatively disposed between the segment member and the rocker member.

5,533,704
HOLDER FOR AN ELECTRIC MOTOR, ESPECIALLY FOR A FAN OF A HEATER OF AIR CONDITIONER

Claus-Dieter Fischinger, Calw-Heumaden; Adem Hlzli, Stuttgart; Wolfgang Rose, Weissach, and Heinrich Waldmann, Stuttgart, all of, Germany, assignors to Behr GmbH & Co., Stuttgart, Germany

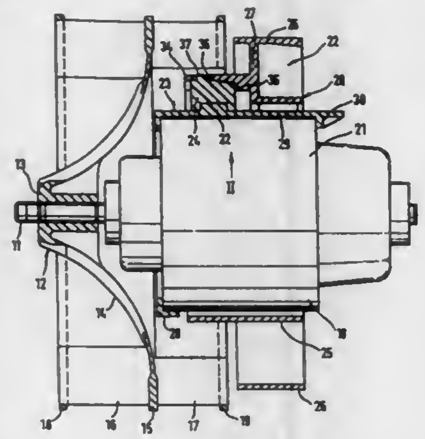
Filed Sep. 6, 1994, Ser. No. 301,049

Claims priority, application Germany, Sep. 3, 1993, 43 29 804.4

Int. Cl.^{6} F16M *13/00*

U.S. Cl. 248—603 **20 Claims**

1. A mounting for an electric motor, particularly for an electric motor for a fan wheel of a heating or air-conditioning system of a motor vehicle, having a plurality of support elements made of a rubber-elastic material which are disposed distributed along the circumference of a pole ring of the electric motor, wherein the support elements are arranged between a motor mount and an adapter, which adapter can be attached to an electric motor by axially sliding the adapter over the pole ring so that it is fixed in at least the axial direction by abutment between one end of the pole ring and an annular stop of the adapter, and wherein the support elements are positively connected with the motor mount at least in the axial direction.



5,533,705
DRIVE FOR DEODORANT APPARATUS

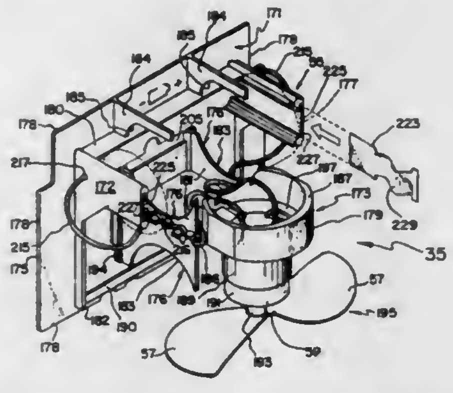
Arnold H. Zlotnik, Pittsburgh; John A. Austin, Bakerstown, and Milton Zlotnik, West Homestead, all of Pa., assignors to Pestco, Inc., Pittsburgh, Pa.

Division of Ser. No. 370,540, Jan. 9, 1995. This application Jun. 6, 1995, Ser. No. 471,960

Int. Cl.^{6} F16M *11/00*

U.S. Cl. 248—645 **10 Claims**

1. For combination in a frame for receiving the housing of a deodorant cabinet, a drive for producing an air stream including a socket assembly having back-to-back mounted sockets for receiving motors of different dimensions and reversible means for mounting said socket assembly selectively for combination in said frame with either socket positioned to receive its corresponding motor fixedly for producing an air stream.



5,533,706
VALVE ARRANGEMENT

Eskil Aurell, Växjö , Sweden, assignor to ABB Fiakt AB, Nacka, Sweden

PCT No. PCT/SE92/00453, § 371 Date Feb. 10, 1994, § 102(e) Date Feb. 10, 1994, PCT Pub. No. WO93/01433, PCT Pub. Date Jan. 21, 1993

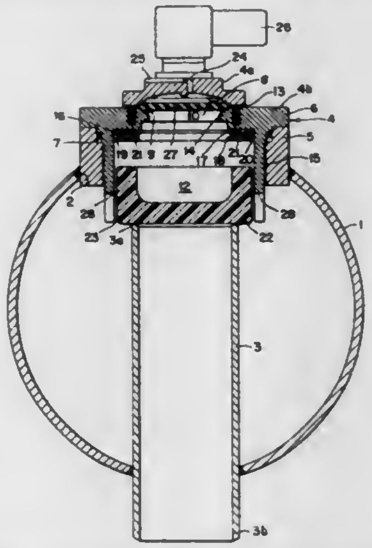
PCT Filed Jun. 23, 1992, Ser. No. 178,266

Claims priority, application Sweden, Jul. 4, 1991, 9102082

Int. Cl.^{6} F16K *31/122*

U.S. Cl. 251—44 **13 Claims**

1. Valve arrangement mounted within a hole provided in an air tank containing compressed air to clean filtering elements cooperatively associated therewith, the air tank having an interior into which extends a pressure tube having one end positioned in the interior of the air tank to define a valve seat and an opposite end in communication with the filtering elements, the valve arrangement comprising a valve housing having a circular cylindrical portion in which is formed a valve chamber that extends through said hold and into said tank, said valve housing having a control valve seating surface, said valve chamber having an outlet through which compressed air flows out of the valve chamber, said control valve housing including a control valve movable between an open position in which the control valve is spaced from the control valve seating surface to allow compressed air to flow out of the valve chamber by way of the outlet and a closed position in which the control valve is in contact with the control valve seating surface to prevent compressed air from flowing out of the outlet of the valve chamber, and a vlave member which is freely displaceable within the circular cylindrical portion of the valve housing based on the pressure within the valve chamber, the valve member being a piston which is movable between a closing position in which the piston is adapted to engage the valve seat to prevent the flow of compressed air into the pressure tube when the control valve is in the closed position and an opening position in which the piston is adapted to be spaced from the valve seat to permit the flow of compressed air into the pressure tube when the control valve is in the open position to clean said filtering elements, said piston being surrounded by and guided solely by the circular cylindrical portion of the valve housing as the piston moves between the closing and opening positions, said valve chamber having an inlet through which compressed air flows into the valve chamber, said inlet of the valve chamber being defined by an annular gap between the piston and the circular cylindrical portion of the valve housing which communicates air pressure into said valve chamber to maintain the valve member in the closing position when the control valve is in the closed position.



5,533,707
CHECK VALVE WITH INTERNAL LONGITUDINALLY DISPLACEABLE SLEEVE VALVE

Daryl S. Beesley, South Lyon, Mich., assignor to Flexon, Inc., Ferndale, Mich.

Filed Mar. 9, 1995, Ser. No. 401,187

Int. Cl.^{6} F16K *31/02*

U.S. Cl. 251—129.15 **21 Claims**

10. A check valve for selectively preventing and allowing flow of fluid from an inlet to an outlet comprising:

an elongated passage having a cylindrical sidewall, a first end and a second end, said cylindrical sidewall having at least one aperture adjacent said second end;

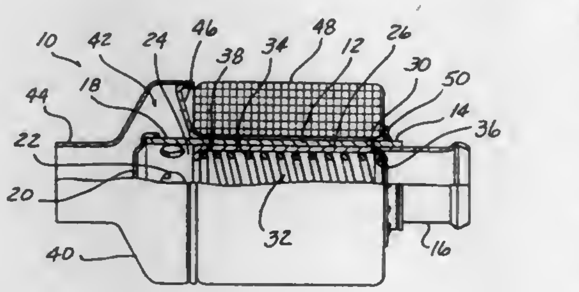
an inlet connector connected to said first end of said passage, said inlet connector in cooperation with said passage defining a first valve stop and a first spring seat;

an end cap connected to said second end of said passage, said end cap closing said second end of said passage and in cooperation with said passage defining a second valve stop;

a hollow inner sleeve valve having a longitudinal passage therethrough and slidably received within said elongated passage for longitudinal movement therein between a first position and a second position, said first position preventing fluid flow through said at least one aperture and said second position allowing fluid flow through said at least one aperture, a second spring seat connected to said sleeve valve;

a valve return spring disposed within said passage having a first end abutting against said first spring seat and a second end abutting against said second spring seat for normally urging said sleeve valve toward one of said first and second positions; and

a solenoid disposed with windings around said passage for urging said sleeve valve toward the other of said first and second positions against the urging of said spring in response to current flow through said solenoid.



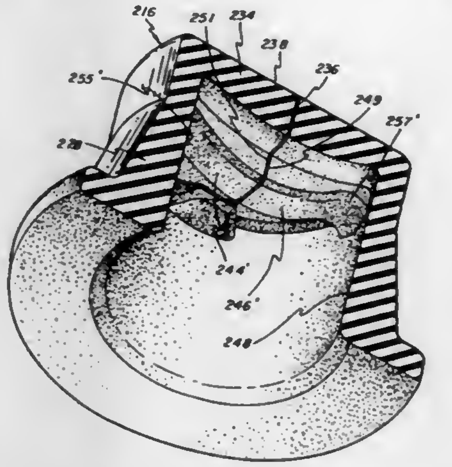
5,533,708
MEDICAL COUPLING SITE VALVE BODY

Gordon E. Atkinson, and Thomas J. Solomon, both of Centerville, Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Continuation-in-part of Ser. No. 153,998, Nov. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 44,830, Apr. 12, 1993, Pat. No. 5,295,657, which is a division of Ser. No. 893,813, Jun. 4, 1992, Pat. No. 5,251,873. This application Jan. 26, 1995, Ser. No. 378,506

Int. Cl.^{6} F16L *37/28*

U.S. Cl. 251—149.1 **34 Claims**



1. A medical coupling site for use with a male luer, said coupling site comprising:

an elastomeric valve element including a tubular valve body defining first and second valve element ends, and a diaphragm extending across said first valve element end;

said valve body including a cylindrical inner wall defining a luer receiving cavity between said diaphragm and said second valve element end for receiving a male luer inserted through said diaphragm; and

said valve body further including an outer wall whereby a valve body wall thickness is defined between said inner and outer walls;

said outer wall defining an outwardly tapered portion tapered outwardly in a direction from said first valve element end toward said second valve element end whereby said valve body wall thickness progressively increases in said direction from said first valve element end toward said second valve element end.

5,533,709
WOODWORKING PRESS

Russell Tarbell, R.R.1, 84A, Hogansburg, N.Y. 13655

Filed Sep. 8, 1995, Ser. No. 526,043

Int. Cl.^{6} B66F *3/08*

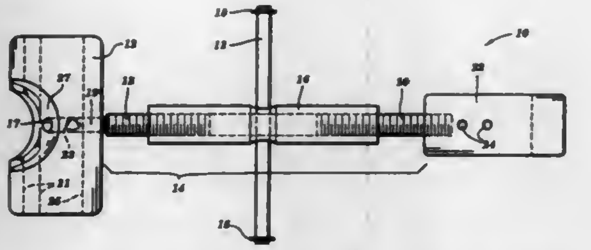
U.S. Cl. 254—13 **13 Claims**

1. A woodworking press comprising:

a first end including means for releasably attaching said press to a fixed element;

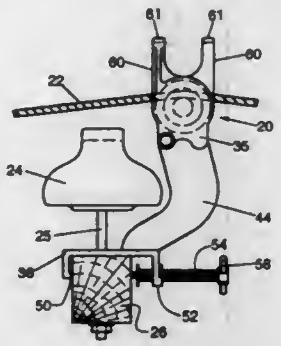
a linear translation mechanism connected to said first end; and

a reversible head connected to said translation mechanism, said head including a first relieved surface for mating with a first



wood joint structure and at least another relieved structure for mating with a second wood joint structure.

5,533,710
CABLE STRINGING ROLLER DEVICE
Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182
Filed Mar. 10, 1995, Ser. No. 402,122
Int. Cl.⁶ E21C *29/16*
U.S. Cl. 254—134.3 PA **11 Claims**



1. A cable stringing roller device for temporarily supporting cable on a cross member of a pole during installation of the cable onto an insulator, said device comprising:

roller means for supporting the cable;

bracket means for supporting said roller means and for containing the cable, said bracket means having upwardly projecting portions disposed on opposite ends of said roller and terminating in inwardly projecting fingers spaced from one another;

support means connecting said bracket means to a clamping means adapted to clamp to said pole cross member adjacent to an insulator on the cross member and said clamping means having releasable means to allow the bracket and roller means to be shifted away from the cross member to lower the cable onto the insulator.

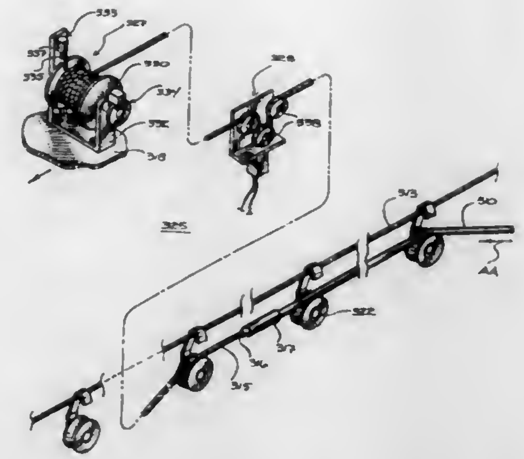
5,533,711
APPARATUS AND METHOD FOR PULLING CABLE
John W. Pickrell, Scottsdale, Ariz., assignor to J.P. Patent Holdings, L.L.C., Scottsdale, Ariz.
Continuation-in-part of Ser. No. 853,514, Mar. 18, 1992, Pat. No. 5,324,006, which is a division of Ser. No. 532,793, Jun. 4, 1990, Pat. No. 5,152,506. This application May 5, 1994, Ser. No. 238,327
Int. Cl.⁶ B66D *1/58*
U.S. Cl. 254—273 **6 Claims**

1. A drive out controller apparatus for use with a pulling vehicle to prevent subjecting a cable to a tension force greater than a predetermined value, said apparatus comprising:

a tension relief mechanism mountable on said vehicle, and having a locked state and an unlocked state, said tension relief mechanism including:

a spool rotatably mountable on said pulling vehicle, said spool rotatable by a pulling force generated by pulling said cable;

a stop mechanism coupled to said spool for preventing rotation of said spool with said tension relief mechanism in said

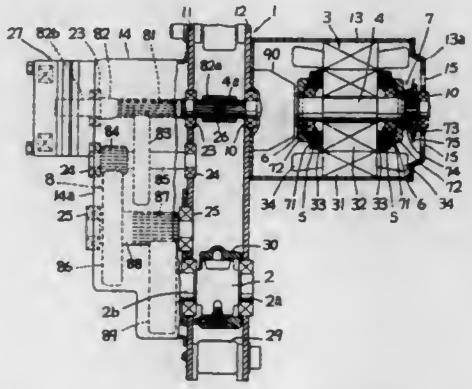


locked state and permitting rotation of said spool with said spool in said unlocked state; and

a brake coupled to said spool for subjecting said spool to a drag in the unlocked state; a tensometer engaging said cable for gauging the tension placed thereon, and generating a signal indicating a tension force value; and

a control system for switching said tension relief mechanism to said unlocked state upon receiving a signal from said tensometer indicating a predetermined tension value has been reached.

5,533,712
ELECTRIC HOIST AND TRACTION APPARATUS
Masaru Fujikawa; Kazunori Tsuda, and Muneobu Honda, all of Sayama, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan
Filed Dec. 3, 1993, Ser. No. 160,788
Claims priority, application Japan, Dec. 18, 1992, 4-339243; Dec. 28, 1992, 4-347657
Int. Cl.⁶ B66D *1/00*
U.S. Cl. 254—362 **2 Claims**



1. An electric hoist and traction apparatus comprising:

a motor having a stator and a rotor, said rotor having end rings at its axial opposite ends;

a motor shaft to be driven by said rotor;

a load sheave driven in association with said motor shaft;

an overload prevention device forming a driving connection between said motor shaft and said rotor for preventing a further hoisting operation when an overload is applied to said load sheave, said overload prevention device comprising:

(i) hubs secured to said end rings at axial outside portions thereof, said hubs each having a bearing holding portion and a friction receiving surface;

(ii) biasing members each having an end face facing said friction receiving surface of said each hub, said biasing members being supported on said motor shaft so that said

biasing members cannot rotate relative to said motor shaft but can move axially in relation to said motor shaft;

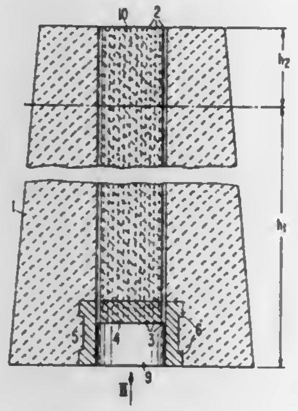
(iii) friction plates interposed between said friction receiving surfaces of said hubs and said biasing members;

(iv) at least one load setting and adjusting member disposed outside said biasing member and threadedly engaged to said motor shaft to be axially movable;

(v) elastic members interposed between said at least one load setting and adjusting member and said biasing members; and

(vi) bearings interposed between said bearing holding portions of said hubs and said motor shaft, said rotor being supported on said motor shaft via said bearings at axially outside positions of said rotor so as to be rotatable relative to said motor shaft.

5,533,713
GAS AND/OR SOLID MATERIAL BLASTING DEVICE FOR A METALLURGICAL VESSEL AND METHOD OF MANUFACTURE THEREOF
Alois Angeler, Mühlheim an der Ruhr; Harald Kaune, Krefeld, and Theo Scheuten, Duisburg-Huckingen, all of, Germany, assignors to Didier-Werke AG, Wiesbaden, Germany
Filed Feb. 14, 1995, Ser. No. 388,577
Claims priority, application Germany, Apr. 2, 1994, 44 11 538.5
Int. Cl.⁶ C21C *5/48*
U.S. Cl. 266—218 **26 Claims**



1. A blasting device to be used to introduce a material into a metallurgical vessel, said device comprising:

a metal apertured plate having therein a plurality of receiving bores;

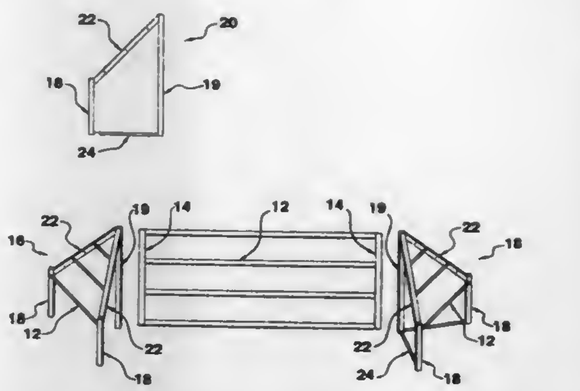
a plurality of blasting tubes arranged in a tube bundle, with ends of said tubes being inserted into respective said receiving bores with a press fit therebetween, said tube bundle enclosing and defining an internal space within said tube bundle;

a prefabricated ceramic internal member positioned in and filling said space, said internal member having an outer boundary not extending outwardly beyond a boundary of said tube bundle; and

a blasting brick surrounding said tube bundle and said internal member, said blasting brick comprising ceramic material molded and pressed around said tube bundle and said internal member, said internal member and said blasting brick being separate but joined members.

5,533,714
MODULAR FENCE APPARATUS
Ross St. John, Government Road & William Street, Collacott Subdivision, Yorton, SK, Canada
Filed Dec. 27, 1994, Ser. No. 364,822
Int. Cl.⁶ E04H *17/16*
U.S. Cl. 256—26 **14 Claims**

1. A modular fencing apparatus comprising:



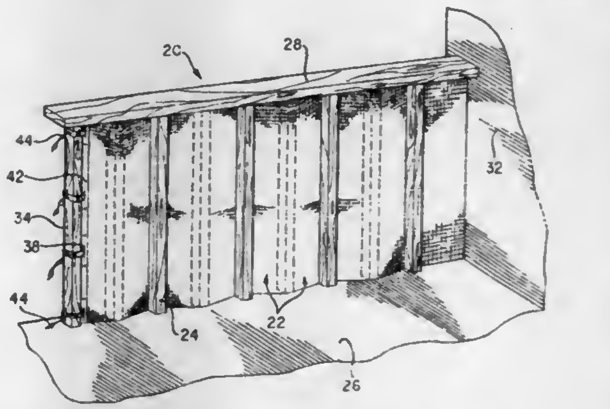
a) a panel assembly having a plurality of longitudinal span members spacedly disposed substantially parallel to each other, the ends of each span member being attached to respective panel ends to thus define a substantially planar surface;

(b) a corner assembly having an inner support post of one length and two outer support posts of equal length and of different length from said inner support post, two longitudinal panel mount elements each one connecting the top of the inner support post with the top of a corresponding outer support post, to create a predetermined angle, and a plurality of longitudinal span members spacedly disposed and extending between said panel mounts so that a substantially triangular planar surface inclined at said predetermined angle is formed; and

(c) fastener means to securely fasten said panel ends to said panel mounts;

whereby a fence enclosure can be constructed from a plurality of said panel assemblies fastened to a corresponding plurality of corner assemblies.

5,533,715
CHILD'S SAFETY BARRIER FOR RAILING SYSTEMS
Tamara H. Dandrea, 5996 Wescott Hills Way, Alexandria, Va. 22315
Filed Aug. 19, 1994, Ser. No. 293,070
Int. Cl.⁶ A47C *21/08;* E04H *17/00*
U.S. Cl. 256—45 **16 Claims**



1. A safety barrier, in combination, with a railing system having a horizontal bar supported by a plurality of spaced, vertical balusters, arranged adjacently and anchored to a floor, further supported by a pair of vertical end structures, comprising:

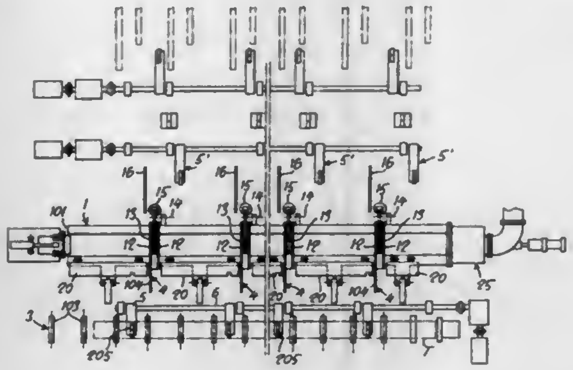
a) a scrim of material comprising a polyester web coated with poly-vinyl-chloride in primary form plasticized of sufficient size to guard a space between said vertical end structures and a vertical space substantially equal to the height of said balusters

b) said scrim woven through the interval spacing separating said balusters to substantially cover the space between said vertical end structures and the vertical space between the horizontal bar and floor and

c) means for joining said scrim vertically to said end structures so that said scrim is secured horizontally, whereby a child is prevented from entrapment or penetration through said railing system.

5,533,716
METHOD AND DEVICE FOR QUENCHING, PARTICULARLY FOR STEEL TUBES OR SIMILAR

Stefano Deplano; Eugenio Melis, and Roberto Millone, all of Genoa, Italy, assignors to Iritecna Societa per l'Implantistica Industriale e l'Assetto del Territorio p.A., Genoa, Italy
Filed Jan. 3, 1995, Ser. No. 367,817
Claims priority, application Italy, Jan. 5, 1994, GE94A0001
Int. Cl.^{6} C21D *1/62*
U.S. Cl. 266—114 **12 Claims**

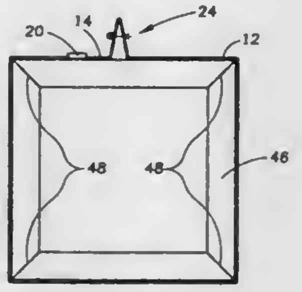


1. A device for quenching at least a tube part of a tube with a flow of a cooling liquid comprising:
an elongate container in which the tube part to be quenched is located, said container being horizontally disposed and including
  a longitudinal axis which is horizontal,
  a flow means for generating a flow of the cooling liquid circumferentially and completely about an outer surface of the tube part in said container,
  a discharge outlet at an axial end of said container through which the cooling liquid introduced into said container by said flow means is discharged from said container, said discharge outlet generating a flow component in an axial direction for the flow generated by said flow means circumferentially about the outer surface of the tube part,
  a hatch which closes said discharge aperture, and
  a hatch moving means for moving said hatch between a closed position where said discharge outlet is closed and an opened position where flow through said discharge outlet is permitted;
an introducing means for introducing the tube part to be quenched into said container, said introducing means including
  a feed chute slightly inclined from horizontal on which the tube part rolls by gravity into said container, said feed chute having an entry end,
  members adjacent the entry end of said feed chute on which said tube part rests, said members being positioned to align a longitudinal tube axis of the tube part exactly parallel with the longitudinal axis of said container, and
  a lowering means to lower said members simultaneously whereby said tube part is vertically lowered onto said feed chute with the longitudinal tube axis thereof exactly parallel to the longitudinal axis of said container; and
a removing means for removing the tube part from said container after quenching.

5,533,717
ADJUSTABLE CLAMPING STRAP

Americo Del Raso, 21858 River Oaks Dr. Apt. 3F, Rocky River, Ohio 44116
Filed Jul. 5, 1994, Ser. No. 270,685
Int. Cl.^{6} B25B *1/20*
U.S. Cl. 269—42 **10 Claims**

1. An adjustable strapping clamp comprising:

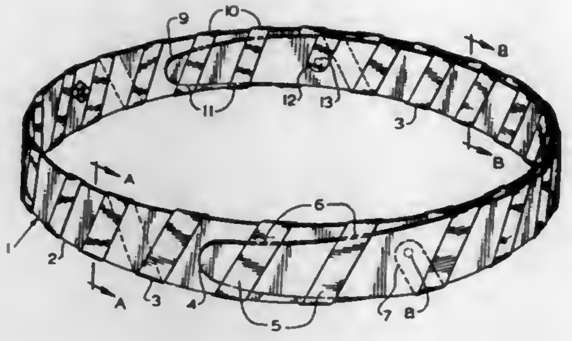


an adjustable connector receiving means comprising:
  a generally rectilinear shape;
  a first end; and
  a second end;
a first elongated strap;
a second elongated strap;
the first end adapted to receive a first connecting end of the first elongated strap;
the second end adapted to receive a second connecting end of the second elongated strap;
the first elongated strap affixed to the connector receiving means at the first connecting end by a plurality of rivets passing through the connector receiving means and the first elongated strap;
the first elongated strap having a first securing end;
the second connecting end of the second elongated strap affixed to the connector receiving means at the second end;
the second elongated strap affixed to the connector receiving means at the second connecting end by a plurality of rivets passing through the connector receiving means and the second elongated strap;
the second elongated strap having a strap receiving and locking means, comprising a pair of "D" affixed at a second securing end for receiving the free end of the first elongated strap;
the connecting receiver means is folded at an acute angle along a midpoint of a transverse axis forming a pair of legs causing the first end and the second end to become more proximate as the acute angle of the fold approaches zero degrees;
the pair of legs having ends, distal the fold, having an arcuate shape substantially parallel to the surface of the elongated strap connected thereto; and
means, extending through the legs, for adjustably changing the angle of the connector receiving means.

5,533,718
WORKPIECE HOLDER

Stephen B. Gray, 1115 19th St. #10, Santa Monica, Calif. 90403
Continuation of Ser. No. 72,978, Jun. 4, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,856
Int. Cl.^{6} B23Q *3/00*
U.S. Cl. 269—296 **6 Claims**

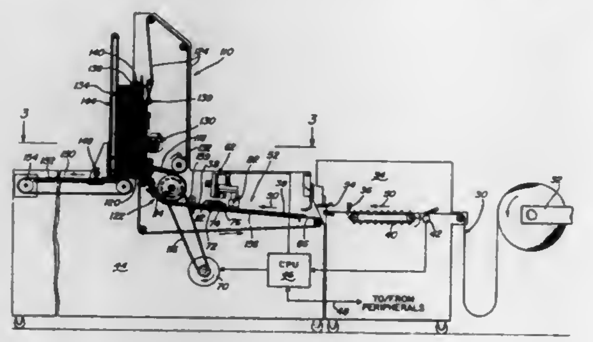
1. A workpiece holder which is supported by a work surface and which in turn supports rigid, round or oval workpieces which have a range of perimeters and which are planar or have a shallow bowl shape, said workpiece holder comprising
(a) a flexible strip whose relaxed shape is straight, said strip having a length, thickness and composition chosen to allow it to be bent into a variety of circles or ovals whose perimeters approximate said range of workpiece perimeters,
(b) said thickness and composition further chosen so that said strip will maintain its shape while withstanding compressive forces across its width,

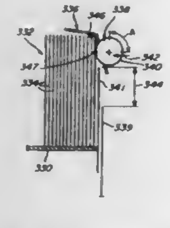


(c) said strip also having an upper edge which in use is proximate to said workpiece and a lower edge which is when in use is proximate to said work surface,
(d) said strip also having a width greater than any nonplanarity of said workpieces so that said workpieces are supported free of contact with said work surface,
(e) said strip being wrapped with an elastic band, said band composition chosen to have high friction when in contact with a material of said workpieces, a material of said work surface, and said composition of said strip,
(f) said band wrapping having the form of a multiple turn helix in which each turn crosses an inner flat surface of said strip, said upper edge of said strip, an outer flat surface of said strip, and said lower edge of said strip, so that in use said band is in contact with both said workpiece and said work surface, and so that said friction between said band and said workpiece will prevent unwanted motion of said workpiece, said strip, and said work surface.

5,533,719
STACKER JAM DETECTOR

H. W. Crowley, Newton; John W. Clifford, Ashland, both of Mass.; Thomas Connolly, Nashua, N.H.; John R. Fairhurst, Lawrence, Mass.; Bruce Taylor, Manchester, N.H., and John M. Fiske, Medford, Mass., assignors to Roll Systems, Inc., Burlington, Mass.
Continuation-in-part of Ser. No. 874,046, Apr. 27, 1992, Pat. No. 5,366,212. This application Jan. 13, 1994, Ser. No. 180,642
Int. Cl.^{6} B65H *33/04;43/00*
U.S. Cl. 270—52.09 **10 Claims**



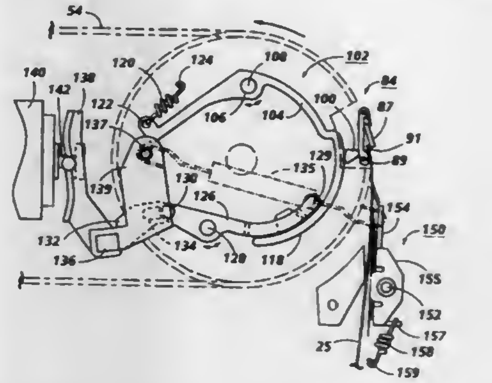


1. A detector for sensing proper delivery of sheets to a delivery location, comprising:
a source of sheets that directs sheets downstream to a delivery location;
a sheet sent signal generator that transmits a sheet sent signal in response to transferral of each of the sheets from the source downstream;
a moving sensing surface located at the delivery location that engages each of the sheets as each of the sheets is transferred to the delivery location, movement of sheets causing movement of the moving sensing surface;
a pulse generator that generates a predetermined number of pulses in response to a corresponding predetermined amount of movement of the moving sensing surface; and
a detection logic that counts a number of pulses generated by the pulse generator with respect to each of the sheet sent signals wherein the logic indicates one of at least a jam condition and a sheet delivered condition in response to a predetermined count of pulses.

7. A method for detecting proper delivery of sheets to a delivery location comprising the steps of:
transferring sheets from a source downstream to a delivery location;
generating a sent sheet signal at the source as each of the sheets is transferred downstream;
sensing movement of each of the sheets as each of the sheets moves to the delivery location;
generating pulses, each of the pulses, corresponding to a length of movement of the sheet at the delivery location;
counting a number of pulses generated relative to each of sheet sent signal; and
generating at least one of a sheet delivered signal and a sheet not delivered signal in response to a predetermined number of pulses counted by the step of counting.

5,533,720
SHEET CONTROL BAFFLE FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

David K. Ahl, Rochester; Roger M. Swanson, Fairport; James D. Apolito, and Walter F. Wafler, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 29, 1994, Ser. No. 268,142
Int. Cl.^{6} B65H *5/00*
U.S. Cl. 271—225 **15 Claims**

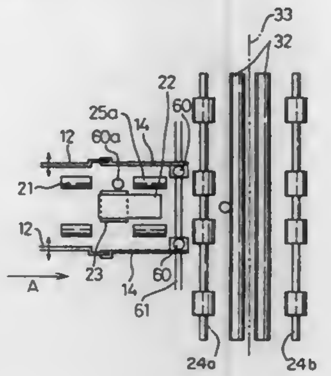


1. An apparatus for advancing a sheet in a predetermined path, comprising:
a gripper releasably grasping a lead edge of the sheet;
a curved surface located adjacent the predetermined path, the gripper initially grasping the lead edge of the sheet along the curved surface;
a baffle for feeding the sheet into the gripper, said baffle including a plurality of sheet directing members, each sheet directing member having a first facet and a second facet, said second facet of the sheet directing members extending from said first facet for deflecting the lead edge of the sheet being advanced into said gripper, wherein said plurality of sheet directing members are closely spaced and span a large enough area so that the lead edge of the sheet is directed along the predetermined path;
at least one of said plurality of sheet directing members further comprises a third facet for further deflecting the lead edge of the sheet; and

the sheet initially comes into contact with a two faceted sheet directing member and finally a three faceted sheet directing member as the sheet is advanced into said gripper.

5,533,721
SUPPLY/CONVEYANCE MECHANISM FOR SHEETS OF PAPER

Yoshihiro Takashimizu, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 22, 1994, Ser. No. 293,592
Claims priority, application Japan, Nov. 5, 1993, 5-277045
Int. Cl.⁶ B65H *3/06*
U.S. Cl. 271—109 **14 Claims**

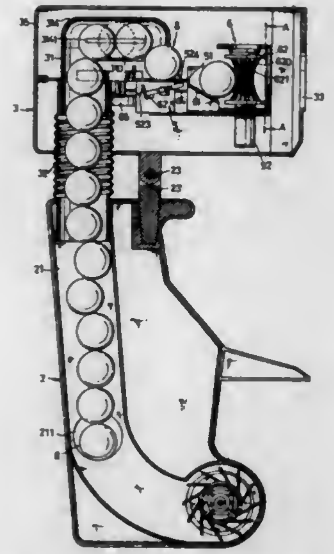


1. A supply/conveyance mechanism for sheets of paper comprising:

a hopper for accommodating a stack of plural sheets;
conveyance means for picking up the sheets from said hopper and conveying said sheets, in individual succession, in an advancing direction along a path;
first and second detectors transversely spaced for detecting a leading edge of a sheet being conveyed;
first and second guide plates provided in said hopper for guiding respective, opposite sides of said stacked sheets, said first guide plate being slidable in a horizontal direction perpendicular to the advancing direction and
said first and second guide plates being respectively connected with said first and second detectors, so that said first detector is also slidable in the horizontal direction together with said first guide plate.

5,533,722
TABLE TENNIS TRAINING SYSTEM

Tzu-Hao Lu, No. 45-20, Tzu Yu Road, Yu Che Li, Ma Do Chen, Tainan Hsien, Taiwan
Filed May 31, 1994, Ser. No. 251,214
Int. Cl.⁶ A63B *39/00*
U.S. Cl. 273—30 **2 Claims**

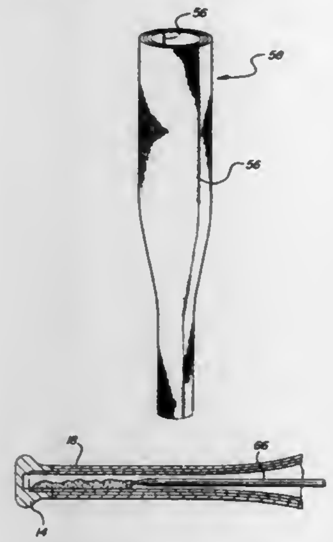


1. A table tennis training system comprising a pitching machine for throwing table tennis balls one after another toward a player at a predetermined frequency, and a cage disposed around said pitching machine for collecting table tennis balls and automatically guiding table tennis balls into said pitching machine, said pitching machine comprising:

a machine base having a top opening and a bottom, a vertical ball channel extending downward from said top opening, a ball inlet for receiving table tennis balls from said cage and for guiding table tennis balls into said ball channel, and a blowing fan installed in said bottom of said machine base and in said vertical ball channel for blowing table tennis balls contained in said vertical ball channel through said vertical ball channel and out of said top opening of said machine base;
a shooting box mounted above and on said machine base, said shooting box having a ball feeding mechanism, a pitching mechanism, a storage chamber with an input port and an output port, a front side with a firing hole, and a connecting pipe connecting said top opening of said machine base to said input port; and
supporting structure arranged between said machine base and said shooting box for supporting said shooting box and permitting movement of said shooting box horizontally and vertically relative to said machine base;
said ball feeding mechanism for receiving table tennis balls from said storage chamber and transporting table tennis balls to a firing position, said ball feeding mechanism including a receptacle connected to said output port of said storage chamber, an electromagnetic device, and a rocker arm controlled by said electromagnetic device for pushing a table tennis ball out of said receptacle into said firing position; said receptacle comprising a first end with a first slot, a second end with a second slot and a center with a retaining hole, said retaining hole receiving a table tennis ball from said storage chamber; said rocker including a first end with a first actuating rod, a second end with a second actuating rod, and an extension rod with a magnet perpendicularly extending from said second end thereof; said second actuating rod received in said first slot of said receptacle for holding a table tennis ball in said retaining hole of said receptacle when said electromagnetic device is inactive, and said first actuating rod entering said second slot of said receptacle for forcing the table tennis ball out of said retaining hole of said receptacle into said firing position when said electromagnetic device is activated and attracts said magnet of said extension rod; and
said pitching mechanism including a reversible motor, an eccentric shaft and a link connecting said motor and said eccentric shaft for moving said eccentric shaft between a left limit position and a right limit position and throwing a table tennis ball from said firing position out of said firing hole of said shooting box, said pitching mechanism further including a slope for guiding a table tennis ball from said receptacle to said firing position, two rotary members disposed at opposite sides of said firing position, and two unidirectional motors for rotating said rotary members and throwing a table tennis ball from said firing position out of said firing hole, said rotary members respectively covered with a rubber coveting having a plurality of longitudinal ribs;
wherein said electromagnetic device is intermittently activated at a predetermined frequency for periodically supplying a tennis ball to said pitching mechanism, said pitching mechanism is moved to any position between said left and right limited positions, and said unidirectional motors are rotated simultaneously or alternatively at same or different speeds for throwing a table tennis ball out of said firing hole.

5,533,723
COMPOSITE BASEBALL BAT WITH CAVITIED CORE

Charles S. Baum, Traverse City, Mich., assignor to The Baum Research & Development Company, Traverse City, Mich.
Division of Ser. No. 262,432, Jun. 20, 1994, Pat. No. 5,458,330, which is a continuation-in-part of Ser. No. 137,694, Oct. 15, 1993, Pat. No. 5,460,369, which is a continuation of Ser. No. 883,263, May 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 518,782, May 4, 1990, Pat. No. 5,114,144. This application Jul. 20, 1995, Ser. No. 504,567
Int. Cl.⁶ A63B *59/06*
U.S. Cl. 273—72 R **15 Claims**

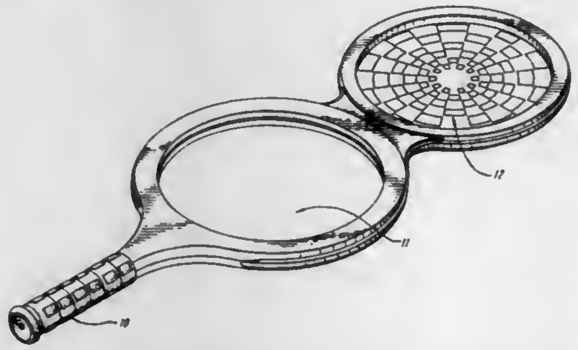


1. A method of forming a baseball bat comprising:

forming a tube comprising an outer layer of wood veneer overlying an inner layer of fiber reinforced resin, the two layers being impregnated and adhered to one another by said resin;
curing said resin; and
forming a self-forming plastic core within said tube by a foam in place method.

5,533,724
SPORT RACKETS

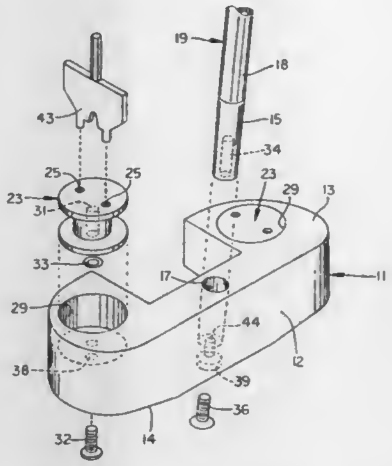
Chung-Hing Chol, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Limited, Hong Kong
Filed Jul. 18, 1994, Ser. No. 276,241
Int. Cl.⁶ A63B *49/02*
U.S. Cl. 273—73 C **9 Claims**



1. A sports racket having a hand holdable shaft with a longitudinal axis, and two different generally circular playing surfaces, each playing surface having a top and bottom edge, wherein the top edge of one playing surface is adjacent to the bottom edge of the second playing surface and with their centres in line with the longitudinal axis.

5,533,725
GOLF PUTTER

Walker Reynolds, Jr., 14 Rendalia Rd., Anniston, Ala. 36201
Continuation-in-part of Ser. No. 241,278, May 11, 1994, Pat. No. 5,388,827. This application Feb. 13, 1995, Ser. No. 387,175
Int. Cl.⁶ A63B *53/02;53/04*
U.S. Cl. 473—307 **21 Claims**



12. A golf putter comprising in combination:

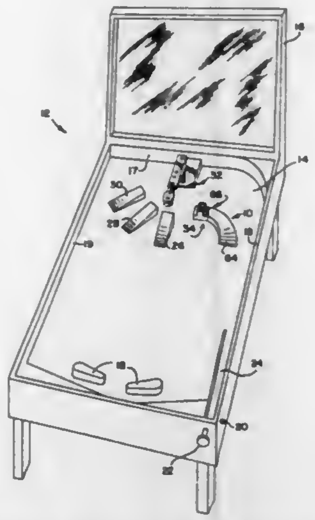
a) a shaft having a handle and a distal end, said distal end being tubular;
b) a ferrule member rigidly attached to said distal end, extending longitudinally beyond said distal end;
c) a head having a striking face and an upper surface perpendicular to said striking face, said upper surface having a bore formed therein, oblique to the surface thereof and parallel to said striking face, of a dimension adapted to receive said ferrule member, said upper surface of said head further having recesses for receiving removable weights;
d) removable weights contained within said recesses which can be selectively exchanged with cooperatively formed weights to adjust the overall weight of said putter, said weights have a generally spool-shaped body, a flat top portion, and a flat bottom portion with a threaded center bore for receiving a retaining member therein;
e) means for engaging said ferrule member within said bore for releasably securing the same to said head; and
f) securing means for detachably retaining said weights in said recesses.

5,533,726
MAGNETIC CRANE FOR A PINBALL GAME

Dennis P. Nordman, Des Plaines, and Winston H. Schilling, Park Ridge, both of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.
Filed May 20, 1994, Ser. No. 247,088
Int. Cl.⁶ A63F *7/30*
U.S. Cl. 273—119 R **10 Claims**

1. In combination, a play feature for transporting a ferromagnetic ball and an inclined playfield for supporting the ball, the combination comprising:

(a) an inclined playfield;
(b) a ball elevator secured to the playfield for receiving a ball from the playfield and lifting it to a ball discharge position;



(c) an arm rotatable above the playfield having an electromagnet mounted thereon for removing the ball from said elevator and transporting it to a player selected position above the playfield; and

(d) means for controlling movement of said arm over said playfield and for discharging the ball from said electromagnet at a selectable position on the playfield.

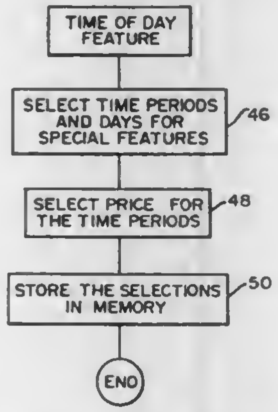
5,533,727
AUDIT AND PRICING SYSTEM FOR COIN-OPERATED GAMES

Lawrence E. DeMar, Chicago, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.

Continuation of Ser. No. 63,866, May 19, 1993, abandoned, which is a continuation of Ser. No. 776,088, Oct. 11, 1991, Pat. No. 5,257,179. This application Sep. 27, 1994, Ser. No. 312,709

Int. Cl.^{6} A63F *9/00;9/22;* **G06F** *17/00*

U.S. Cl. 463—23 **2 Claims**


TIME OF DAY FEATURE
SELECT TIME PERIODS AND DAYS FOR SPECIAL FEATURES
46
SELECT PRICE FOR THE TIME PERIODS
48
STORE THE SELECTIONS IN MEMORY
50
END

1. A stand-alone, coin-operated amusement game including a microprocessor for controlling the game responsive to player inputs and game rules stored in read only memory, comprising:

a) a clock for generating the current time and date;

b) memory means in which game play statistics are stored;

c) said microprocessor including means, responsive to said clock, for:

(i) computing both game play statistics and peak and off peak time periods of play;

(ii) altering at least one of the game parameters selected from the group consisting of: price per game, game difficulty, game award levels and sound volume; by increasing at least one of said game parameters during computed peak play periods and decreasing at least one of said game parameters during computed off peak play periods, to maximize game revenue.

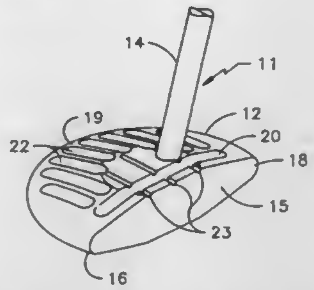
5,533,728
MALLET AND BLADE PUTTER HEADS

Richard J. Peboski, 133 Maplewood Dr., Bolingbrook, Ill. 60440, and Joseph A. Pessetti, 2910 N. Maple, Franklin Park, both of Ill. 60131

Filed May 30, 1995, Ser. No. 453,178

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—252 **2 Claims**



1. A mallet head for a golf putter device having a center body member of semi-cylindrical shape having a round portion and a flat portion, spaced elongated apertures formed through said putter head in a direction perpendicular to the flat portion of said center body member to provide a head of controlled weight, a rectangular shaped side member comprising a ball striking surface, a machined aperture formed parallel to said side member and said flat portion to provide a spacing between said side member and said center member, said side member providing flexure as said putter head strikes a ball which geometrically tends to cradle and guide the ball in the line directed, and alignment grooves formed on said center body member and said side member and transverse to said ball striking surface to provide an aligning reference for the user of said putter head.

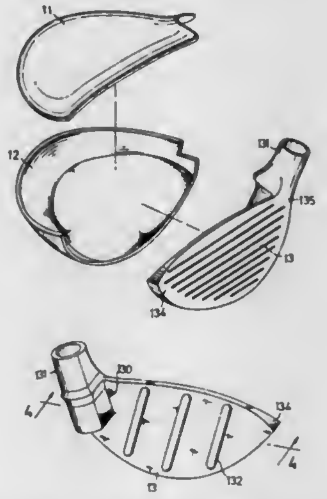
5,533,729
GOLF CLUB HEAD

Paul Leu, No. 41, Lane 115, Shui Yuan Rd., Fong Yen City, Taichung Hsien, Taiwan

Filed Mar. 31, 1995, Ser. No. 414,786

Int. Cl.^{6} A63B *53/04*

U.S. Cl. 473—346 **1 Claim**



1. A golf club head comprising a titanium top cover, a titanium bottom shell, and a titanium face plate; said top cover, said bottom shell and said face plate respectively welded together; said face plate having a heel at one end, a toe at another end, a middle between said heel and said toe, a top, a bottom, a back with plurality of reinforcing parallel ribs raised from said back and extending in a direction from said top to said bottom, and a neck integrally formed with said face plate at said heel thereof, said neck arranged along said back and extending from below and to above said top at an angle for holding a club shaft; said toe having a thickness greater than a thickness of said middle for balancing said toe and said neck about said middle.

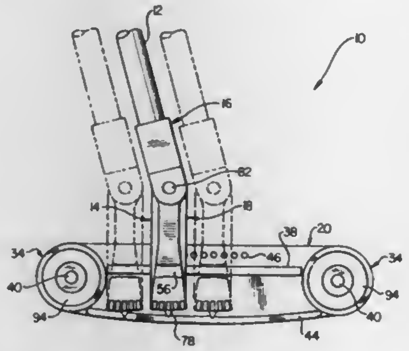
5,533,730
ADJUSTABLE GOLF PUTTER

John A. Ruvang, 2018 Grenoble Dr., Carrollton, Tex. 75007

Filed Oct. 19, 1995, Ser. No. 545,250

Int. Cl.^{6} A63B *53/04;53/02*

U.S. Cl. 473—251 **20 Claims**



15. A golf club, comprising:

a shaft;

a hosel major, said hosel major being rigidly attached to said shaft and having a first spaced series of projections formed thereon;

a hosel minor adjacent said hosel major, said hosel minor being pivotably attached to said hosel major and having second and third spaced series of projections formed thereon, said second spaced series of projections complimentarily engaging said first spaced series of projections to prevent pivotal movement of said hosel minor relative to said hosel major;

two weight assemblies;

two face plates, each of said face plates having a fourth spaced series of projections formed on an inside surface thereof, one of said fourth spaced series of projections complimentarily engaging said third spaced series of projections, said face plates being disposed so that said inside surfaces are in a facing, spaced apart relationship; and

two fasteners clamping said hosel major, said hosel minor, and said two weight assemblies intermediate said two face plates.

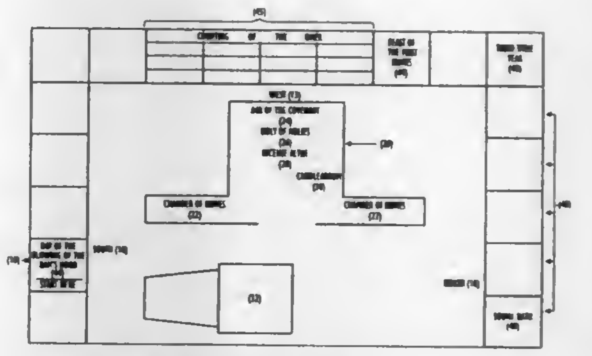
5,533,731
EDUCATIONAL DEVICE EMPLOYING GAME SITUATION

Stephen Koenig, 11207 Watermill La., Silver Spring, Md. 20902

Filed Jan. 18, 1995, Ser. No. 374,369

Int. Cl.^{6} A63F *3/00*

U.S. Cl. 273—243 **17 Claims**



1. A board game apparatus comprising:

(A) A rectangular game board, including
  (i) a perimeter and a playing path divided into a plurality of spaces with topics relating to principles in the Books of Leviticus and Numbers and other Biblical books; and
  (ii) a central area representing the Temple, an Altar, and Temple Courtyard;

(B) A dual aspect chance device;

(C) A plurality of card decks, including
  (i) A plurality of Revelation Cards having Biblical era activities resulting in some cases in further game processes;
  (ii) A plurality of Abomination Cards having Biblical era activities resulting in some cases in further game processes;
  (iii) A plurality of Sacrifice Cards having a pictorial representation of various sacrificial animals; and
  (iv) A plurality of Animal Part Cards having a pictorial representation of the proper method of sacrifice;

(D) A plurality of token firepans used to mark the position of players on the board;

(E) A three dimensional representation of an Altar;

(F) A free standing "Table of Sacrifices"; and

(G) An instruction manual.

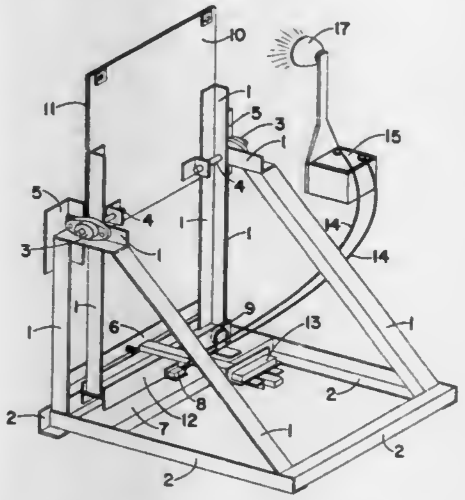
5,533,732
INSTANT RESPONSE TARGET SYSTEM

James A. Leinen, Sr.; Carolyn Leinen; James A. Leinen, Jr., and Tammy M. Leinen, all of N5392 County Rd. J, Tigerton, Wis. 54486

Filed Jul. 6, 1995, Ser. No. 499,106

Int. Cl.^{6} F41J *5/18*

U.S. Cl. 273—375 **1 Claim**



1. An instant response target system which comprises:

a) a support frame and a base frame;

b) two pillow blocks with bearings and bearing shields carried on said support frame;

c) a return spring and support carried on said support frame;

d) a bracket carried on said base frame;

e) an electrical snap switch and counter weight stop carried on said bracket connected to said base frame;

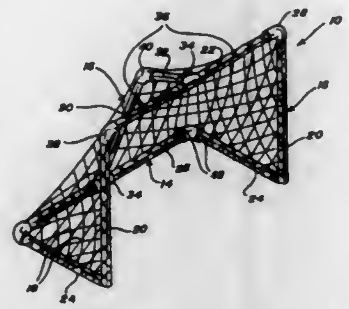
f) an impact plate, target, counter weight, and counter weight adjuster are carried by said two pillow blocks with bearings and two steel pins which are carried on the support frame; and

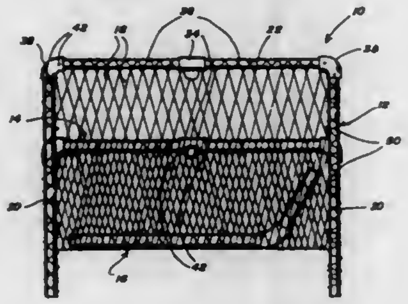
g) a light and a battery which are independent of the instant response target, the light energized through wires that connect the electrical snap switch which is carried on the bracket, wherein energizing of the light occurs by a bullet impact on the target forcing the counter weight with counter weight adjuster off the pressure release snap switch, thereby closing a circuit through the wires connecting the battery, the switch and the light, followed by the counter weight with counter weight adjuster contacting the return spring which returns the counter weight and counter weight adjuster against the counter weight stop and snap switch, opening the circuit, turning the light off.

5,533,733

SPORTS GOAL

Ronald J. Dirnbeck, 1700 Flamingo, Florissant, Mo. 63031
Filed Sep. 7, 1995, Ser. No. 524,532
Int. Cl.^{6} A63B *63/00*
U.S. Cl. 273—400 **8 Claims**



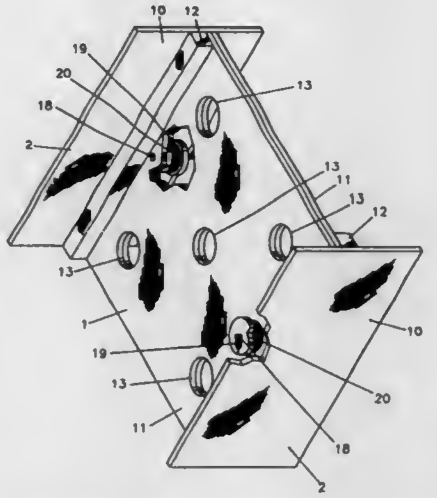


1. A sports goal comprising
a first U-shaped, open ended frame, said first frame having a pair of legs extending to free ends forming goal post uprights and a bite forming a goal crossbar,
a second U-shaped, open ended frame, said second frame having a pair of legs extending to free ends forming side rails and a bite forming a bottom rail, said free ends of said legs of the first and second frames connected on a common axis whereby said U-shaped frames can rotate into a position substantially parallel to each other,
a center brace having a longer first leg and a shorter second leg forming a dogleg, said first and second legs extending to free ends, said free ends of said first and second legs of the center brace received in couplings provided on the bite of the first and second U-shaped frames, said center brace dimensioned so that the first U-shaped frame is held in an erect position with respect to the second U-shaped frame when the free ends of the first and second legs of the center brace are received in said couplings, said free ends of the first and second legs of the center brace being readily removable from said couplings,
a net attached to the first and second U-shaped frames and draped over the center brace for enclosing the space defined by the U-shaped frames and center brace when the goal is in erect position.

5,533,734

WASHER GAME

Richard W. Husk, 7020 Savannah Dr., Newburgh, Ind. 47630
Filed Sep. 11, 1995, Ser. No. 526,367
Int. Cl.^{6} A63B *67/06*
U.S. Cl. 273—402 **2 Claims**

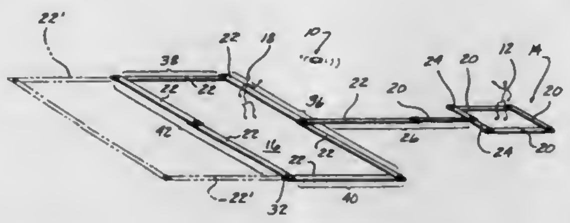


1. A board and washer game comprising two game board assemblies, each of said assemblies including:
a first board having a plurality of washer clearance holes, a bolt protruding upwardly from the board surface, and a bolt clearance hole;
a backboard:
a joist connecting said first board and said backboard;
a plurality of washers;
said washers having aperture means to position said washers around said bolts;
whereby said two game board assemblies can be fired together to form a single structure for transport and storage by inserting the bolts of said first and second game board assemblies through the bolt clearance holes of said second and first game board assemblies, respectively.

5,533,735

DUELING DISC GAME

Peter J. Denney, 552 Third St., Ann Arbor, Mich. 48103
Filed Jun. 29, 1995, Ser. No. 496,495
Int. Cl.^{6} A63B *71/02*
U.S. Cl. 273—411 **13 Claims**



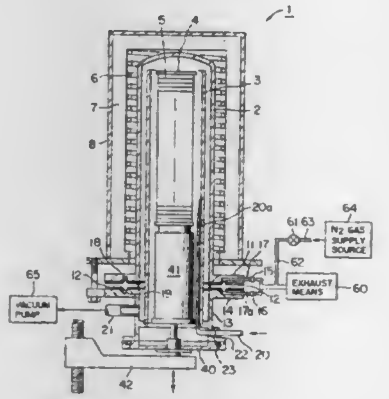
1. A method of playing a game between first and second players comprising the steps of:
forming a throwing area having a front boundary;
forming a target area with a front boundary line having a variably selectible length between opposed ends, and a pair of spaced side lines, the side lines having an identical variably selectible length extending from opposite ends of the front boundary line;
providing first and second groups of elongated, planar members, the members in the first group having a different length than the members in the second group;

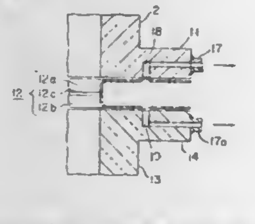
providing means for removably attaching the first and second groups of members to a playing surface to form the throwing area and a target area;
attaching at least one of the members of the first and second groups of members at a first end to a central portion of the front boundary line of the throwing area and at a second end to a central portion of the front boundary line of the target area to space the throwing area from the target area;
attaching at least two members of the first and second groups of members to each extend oppositely from the second end of the at least one member extending between the throwing area and the target area, the at least two members forming the front boundary line of the target area;
attaching at least one member of the first and second groups of members to extend angularly from outer ends of each of the members forming the front boundary line of the target area to form the pair of side lines;
selectively attaching additional members of the first and second groups of members to at least one of the members extending between the throwing area and the target area, to the members forming the front boundary of the target area, and to the members forming the pair of side lines to vary at least one of the size of the target area and the spacing between the throwing area and the target area;
the first player standing in the throwing area and hurling a projectile to land in the target area without being caught by the second player; and
the second player standing in the target area and attempting to catch the projectile within the target area before the projectile lands within the target area.

5,533,736

THERMAL PROCESSING APPARATUS

Kenichi Yamaga, Sagamihara, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Tokyo, and Tokyo Electron Tohoku Kabushiki Kaisha, Iwate-Ken, both of, Japan
Filed May 28, 1993, Ser. No. 68,703
Claims priority, application Japan, Jun. 1, 1992, 4-165337
Int. Cl.^{6} F16J *15/48*
U.S. Cl. 277—3 **10 Claims**



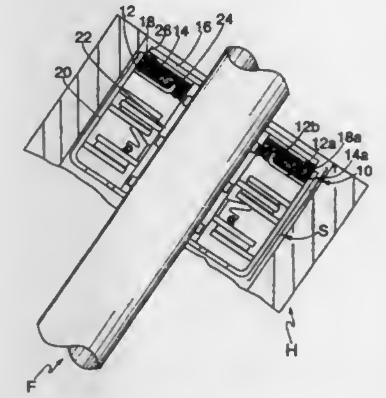


1. A thermal processing apparatus having a sealing portion, comprising:
an annular groove portion having an opening portion, formed in a sealing surface of a sealing portion of a processing vessel, wherein an interior of the processing vessel is kept in a prescribed atmosphere;
an exhaust means connected to said annular groove portion; and
a thin annular plate removably arranged adjacent the sealing surface in such a manner that it is sucked against a periphery of said opening portion of said annular groove portion by evacuation of said annular groove portion to a reduced pressure by the exhaust means, wherein said thin annular plate includes a first thin annular plate in contact with a first annular groove portion, and a second thin annular plate in contact with a second annular groove portion, and wherein inner peripheral edges of said first thin annular plate and said second thin annular plate are connected together in a gas-tight manner along a circular periphery thereof and opposite edges thereof are left unconnected.

5,533,737

SEALS WITH PARTICLE EXCLUSION MEANS

Richard Borowski, Fairport, N.Y., assignor to Garlock Inc., New York, N.Y.
Filed Oct. 21, 1994, Ser. No. 327,169
Int. Cl.^{6} F16J *15/453*
U.S. Cl. 277—23 **7 Claims**



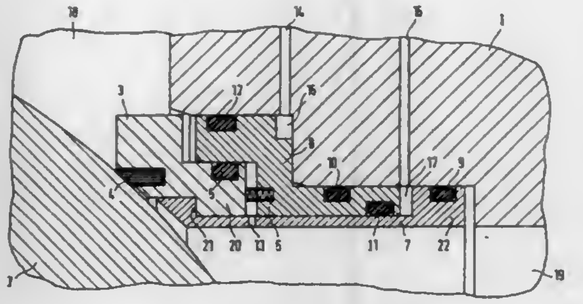
1. A particle exclusion assembly intended to protect a sealing assembly and to operate in an inclined position, said particle exclusion assembly having relatively rotatable radially inner and outer walls and further including
a. an axially outer baffle member attached to said outer wall and extending radially inwardly from said attachment to an inner end spaced from said inner wall;
b. an axially inner baffle plate attached to an axially inner end of said inner wall, and extending radially outwardly to an outer end spaced from said outer wall to provide a narrow annular opening between said outer end and said outer wall and
c. a rotary, controlled porosity open-celled element substantially filling a cavity formed between said inner and outer baffles and said inner and outer walls;
and characterized in that said inner end of said outer baffle member is vertically higher than the lowest arc portion of said narrow annular opening between said outer end and said outer wall when installed in said inclined position.

5,533,738

PRESSURE CONTROLLED APPARATUS FOR SEALING SHUTOFF DEVICES LOCATED IN PIPELINES

Michael Hoffmann, Berlin, Germany, assignor to Borsig Kugelhahn GmbH, Germany
Filed Jun. 30, 1995, Ser. No. 497,151
Claims priority, application Germany, Jul. 1, 1994, 44 23 801.0
Int. Cl.^{6} F16J *15/46;* F16K *15/06*
U.S. Cl. 277—027 **9 Claims**

1. An apparatus for sealing shut-off devices located in pipelines for transporting liquids or gases comprising: a sealing arrangement for sealing the shut-off device against a casing, the sealing arrange-



ment having a gasket engageable against a circumferential surface of the shut-off device, a seating ring supporting the gasket, a first and a second chamber in connecting relationship with a controllable pressure medium allowing the gasket to be selectively raised from the circumferential surface and forced against the circumferential surface, the sealing arrangement having a driving member positively connected to the seating ring, an intermediate piston displaceably positioned adjacent the driving member, the first chamber positioned between the driving member and the intermediate piston, the second chamber positioned between the intermediate piston and the casing, and spring elements positioned between the seating ring and the intermediate piston biased in the pressing direction.

5,533,739

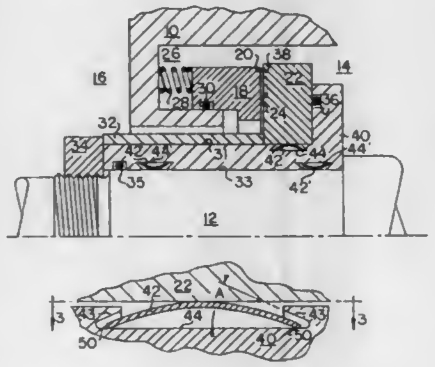
NON-CONTACTING SEAL WITH CENTERING SPRING MOUNTED IN DOVETAILED GROOVED

Josef Sedy, Mount Prospect, Ill., assignor to Durametallic Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 896,647, Jun. 10, 1992, abandoned. This application Feb. 25, 1994, Ser. No. 202,689

Int. Cl.⁶ F16J *15/34*

U.S. Cl. 277—81 R **15 Claims**



1. A device for sealing a fluid within a space between a housing and a rotatable shaft projecting along a central axis, said device comprising:
- a first seal ring mounted on said shaft for rotation therewith and having a back surface and a planar front sealing surface;
- a second seal ring being axially moveable and substantially coaxial with said first seal ring and having a planar sealing surface defining a clearance with said planar front sealing surface of said first seal ring, said second seal ring being acted upon by said fluid to close said clearance;
- resilient means for biasing said second seal ring towards said first seal ring to close said clearance;
- at least one of said sealing surfaces having a plurality of grooves formed therein for introducing said fluid between said planar sealing surfaces to thereby urge said sealing surfaces away from each other;
- a shaft sleeve coupled to said shaft and said first seal ring for rotation therewith, said shaft sleeve including a radially inner annular surface having at least one annular recess adjacent and surrounding said shaft;
- said at least one annular recess including a bottom surface and two slanted side surfaces which cooperate to define an axial width that decreases in a direction extending from said bottom surface toward said radially inner annular surface;
- a centering strip disposed within said recess and retained by said slanted side surfaces for resiliently contacting said shaft to position said shaft sleeve concentrically around said shaft; and
- each said slanted side surface extending at an acute angle from said bottom surface in a range of about 30 to 70 degrees relative thereto.

5,533,740

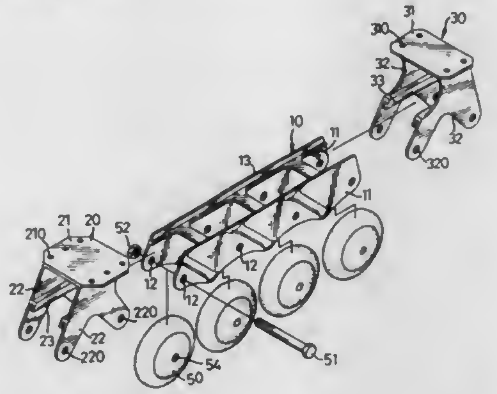
IN-LINE ROLLER SKATE

Dong-ping Lin, Taoyuan Hsien, Taiwan, assignor to Polygon Industries Corporation, Taipei, Taiwan

Filed Aug. 24, 1995, Ser. No. 518,813

Int. Cl.⁶ A63C *17/06*

U.S. Cl. 280—11.22 **2 Claims**



1. An in-line roller skate comprising:
- a box-like channel piece with two sideplates, said sideplates having a plurality of transverse holes defined therethrough;
- a plurality of wheels each with a bore therethrough rotatably disposed in-line between said sideplates;
- a front bracket and a rear bracket each having a flat portion for fixing to footwear and two legs extending downwardly therefrom for slidingly mounting to the box-like channel piece, each leg defining a plurality of holes; and
- a plurality of securing elements extending through respective holes of the front bracket and the rear bracket, the holes in the sideplates and the bores of the wheels in turn to affix the front bracket and rear bracket and the wheels to the box-like channel piece.

5,533,741

BICYLCE WITH A DOUBLE POWER TRAIN

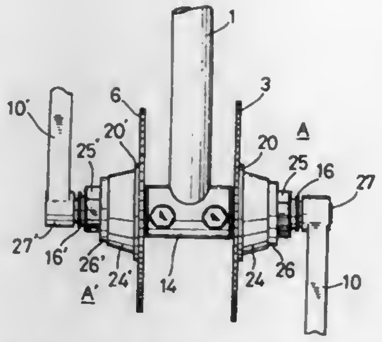
Fumitaka Matsuo, Ouda-cho, Japan, assignor to Matsuo Denshi Kabushiki Kaisha, Nara, Japan

Filed May 22, 1995, Ser. No. 445,972

Claims priority, application Japan, May 24, 1994, 5-005669 U

Int. Cl.⁶ B62M *9/00*

U.S. Cl. 280—238 **13 Claims**



1. A bicycle comprising:
- a first power train for propelling said bicycle forward;
- said first power train including a driving crank axle, a first driving-side sprocket wheel, and means for rotatably mounting said first driving-side sprocket wheel to said driving crank axle;
- said first power train further including a driven crank axle, a first driven-side sprocket wheel, a ratchet means for ratchetably coupling said first driven-side sprocket wheel to said driven crank axle, and a first endless chain wound around said first driving-side sprocket wheel and said first driven-side sprocket wheel;
- a second power train for propelling said bicycle forward and backward; and
- mode setting means for setting each of said first and second power trains from a withdrawn mode into an operative mode and vice versa, whereby said bicycle is usable for different purposes.

5,533,742

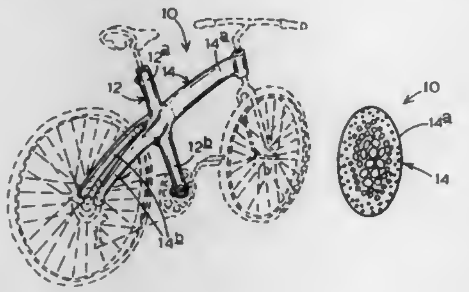
ALL-TERRAIN BICYCLE FRAME

Stephen Peart, Los Gatos, Calif., assignor to Axis Bicycle Incorporated, Campbell, Calif.

Filed Aug. 6, 1991, Ser. No. 740,940

Int. Cl.⁶ B62K *3/02;19/16*

U.S. Cl. 280—281.1 **3 Claims**



1. An injection-molded, single-piece, structural-foam plastic bicycle frame comprising
- a central, elongate generally upright rider load-bearing stem, including an upper stem portion adapted to receive a bicycle seat, and a lower stem portion adapted to receive drive sprocket and pedal structure, and
- cantilever structure joined to and extending from opposite sides of said stem in the region of proximal adjacency of said stem portions in a gently curving, downwardly facing reverse bend which leads toward opposite, free ends in the structure, said cantilever structure cooperating with said stem to receive therefrom the full load of any rider borne by the stem.

5,533,743

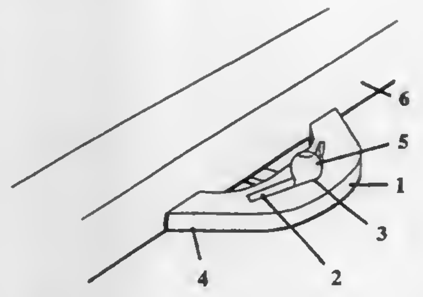
TOW BALL AND SHIN PROTECTOR

Louis Bello, 248 Manassas Dr., Manassas Pk., Va. 22111

Filed Oct. 3, 1994, Ser. No. 328,273

Int. Cl.⁶ B60R *21/34*

U.S. Cl. 280—507 **1 Claim**



1. A shock absorbing device comprising a body, an expandable opening in the body capable of fitting over a tow ball of a vehicle, and protrusions extending away from the body toward the vehicle which will exert pressure against nearby parts of the vehicle, wherein the body extends beyond the tow bar's outer perimeters thereby providing protection to passersby against accidental injury, enhanced visibility, and protective covering for the tow ball.

5,533,744

SKI BRAKE SPUR

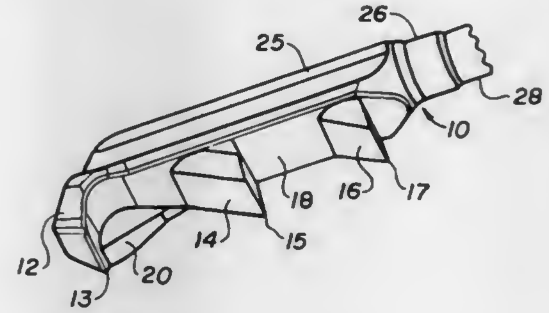
Alfred Boehm, Polling; Werner Messerschmidt, Garmisch-Partenkirchen, and Gerhard Sedlmair, Farchant, all of, Germany, assignors to Marker Deutschland GmbH, Germany

Filed Jul. 27, 1994, Ser. No. 281,222

Claims priority, application Germany, Jul. 27, 1993, 43 25 175.7

Int. Cl.⁶ A63C *7/10*

U.S. Cl. 280—605 **12 Claims**



1. A brake spur for improving the braking action of a ski brake arm, said brake spur having a longitudinal axis and comprising:
- a base portion having a free end and an attachment end, said attachment end comprising a connecting means for connecting said brake spur to said brake arm;
- gripping means integrally attached to the free end of said base portion, and extending in a direction transverse to the longitudinal axis of said brake spur, said gripping means including a first brake edge; and
- a plurality of shaped body portions integrated with a surface of said base portion between said free end and said attachment end, and extending in a direction transverse to the longitudinal axis of said brake spur, wherein each said shaped body portion includes a first surface sloping towards said base portion and a second surface at a right angle to said base portion and forming an intersection with said first surface, said intersection defining a second brake edge, wherein said plurality of shaped body portions are arranged longitudinally between the free end and the attachment end, each of the second brake edges of the shaped body portions arranged one behind the other and having decreasing distances from the surface of the base portion as the distance of the respective shaped body portions from the gripping means increases; and longitudinally extending limiting wall between said gripping means and the surface of the base portion.

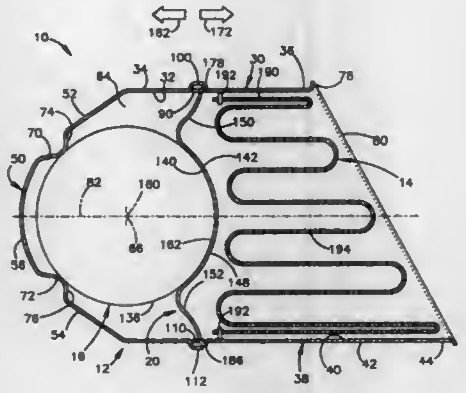
5,533,745
AIR BAG MODULE

Jeffrey A. Jenkins, Shelby Township, and John W. Wiers, Romeo, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jan. 10, 1995, Ser. No. 370,788

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—728.2 **19 Claims**



1. A vehicle safety apparatus comprising:
- a housing having a plurality of walls defining a chamber in said housing, said plurality of walls including first and second opposite side walls and a central wall extending between and interconnecting said first and second side walls, said first and second side walls having portions at least partially defining a deployment opening in said housing opposite said central wall;
- an inflatable vehicle occupant restraint in said chamber in said housing between said central wall and said deployment opening;
- an inflator in said housing at a location between said inflatable restraint and said central wall; and
- a spring clip in said housing at a location between said inflator and said inflatable restraint, said spring clip having a first end portion having a snap together fastenerless connection with said first side wall of said housing and a second end portion having a snap together fastenerless connection with said second side wall of said housing and a central portion in abutting engagement with said inflator, said spring clip biasing and holding said inflator against said central wall of said housing.

5,533,746
TETHERED COVER FOR A PANEL OPENING IN AN AIR BAG INFLATOR SYSTEM

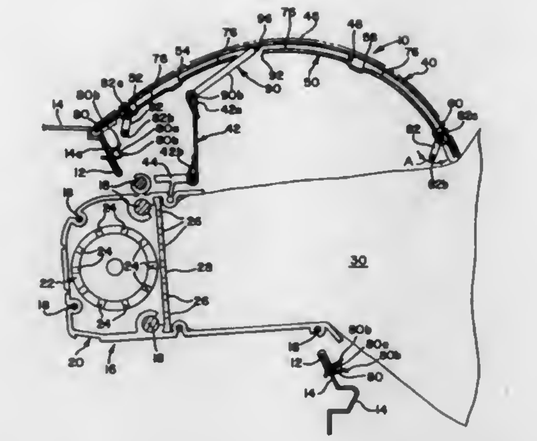
Timothy J. Whited, Auburn Hills, Mich., assignor to Morton International, Inc., Chicago, Ill.

Filed Jan. 18, 1995, Ser. No. 374,930

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—728.2 **27 Claims**

1. A cover for covering an opening in a panel adjacent to an air bag inflator system, comprising:
- an inner metal substrate on an inside of said cover normally closing said panel opening until forced to open by pressure from an inflating air bag upon deployment thereof to move outwardly through said opening;
- an outer substrate attached to said inner substrate for supporting an outer face of said cover generally matching said panel; and
- at least one cover attachment element formed of rigid metal extending along a horizontally extending edge of said cover and having at least one first portion disposed between said substrates and at least one second portion exposed to face a first edge of said opening for engagement with fastening means thereon for mounting said cover in a closed position over said opening.



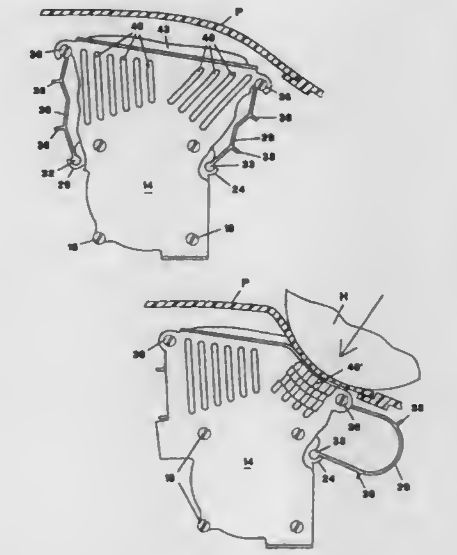
5,533,747
AIRBAG MODULE WITH COLLAPSIBLE SIDE WALL

Larry D. Rose, Layton, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Jun. 15, 1995, Ser. No. 490,975

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—728.2 **18 Claims**



1. In a motor vehicle airbag module including an inflator housing and a trough-shaped reaction canister having first and second substantially rectangular side walls joined by first and second end walls to define an open mouth, said reaction canister being adapted to enclose an airbag inflatable with gas from said inflator housing, the improvement wherein at least one of said side walls is deformable and comprises:
- a first edge rotatably engageable with said inflator housing; and
- a second edge bounding said open mouth and rotatably engageable with said first and second end walls, whereby a compressive impact to said second edge will deformably collapse said one side wall, accompanied by rotation of said first and second edges.

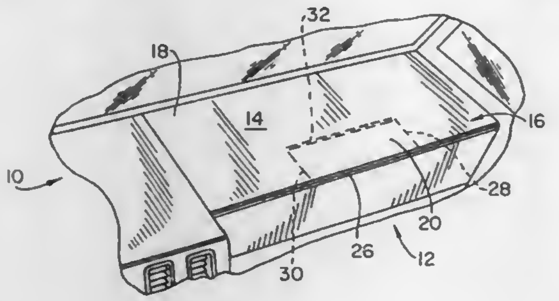
5,533,748
INVISIBLE INSTRUMENT PANEL OR DASHBOARD AIRBAG COVER DOOR

W. Gary Wirt, Clinton Township, and Patrick G. Jarboe, Shelby Township, both of Mich., assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 348,057, Dec. 1, 1994. This application May 23, 1995, Ser. No. 448,185

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—728.3 **13 Claims**



1. A low pressure insert injection molded automotive trim panel having an airbag deployment cover door permitting egress of an airbag therethrough from an airbag module as a result of force exerted on said deployment door by said airbag inflating against said deployment door, said trim panel comprising:
- (a) an injection molded thermoplastic resin substrate member, said substrate member having molded therein a plurality of tear propagation lines and a hinge means forming an outline of an airbag deployment cover door;
- (b) an outer trim layer overlaying said substrate member and forming a finish surface of said panel; and
- (c) a foam layer intermediate said substrate member and said trim layer;

said injection molded substrate member having been formed in a low pressure insert injection molding process which includes heating a thermoplastic material to a suitable melting temperature and injecting the resultant of melted material into a mold at a low pressure of about 400 to about 600 psi whereby the tear propagation lines and hinge means forming the outline of the airbag deployment door cover are not visible to an observer of the outer trim layer forming the finish surface of said panel.

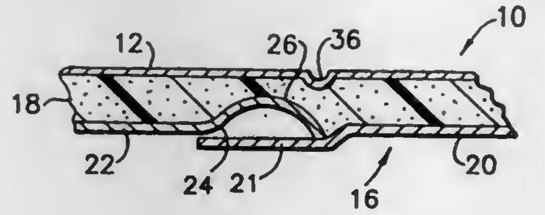
5,533,749
APPARATUS FOR IMPROVED DETACHMENT OF THE DEPLOYMENT DOOR OF AN AIRBAG ASSEMBLY

Timothy J. Leonard, Stuttgart, Germany, and Daniel W. Anderson, South Weber, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Sep. 7, 1995, Ser. No. 524,896

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—728.3 **18 Claims**



1. In a vehicle airbag installation wherein a panel has a front surface layer exposed to a passenger compartment in the vehicle and a rear surface substrate with a foam core therebetween, said rear surface substrate having an airbag module positioned behind it, and wherein the panel has at least one tear region therein associated with a deployment door which is integral with the panel and wherein during deployment of an airbag from the airbag module located rearwardly from the deployment door, the deployment door becomes at least partially detached at the tear region from the remaining area of the panel for providing a doorway outlet through the panel for accommodating the passage of an inflating airbag during deployment of the airbag into the passenger compartment;
- apparatus for detaching the deployment door at the tear region comprising:
- at least one tear means having a distal end thereon,
- said distal end of said tear means extending from the rear surface substrate and being an extension of said rear surface of said panel prior to the deployment of said door,
- said distal end of said tear means having a cutter including a rounded end on said distal end wherein said rounded end is configured as a rounded bump extending toward the tear region and the front surface of the panel generally convexly outwardly on an outer surface of said rounded bump and generally concavely outwardly on an inner surface of said rounded bump.

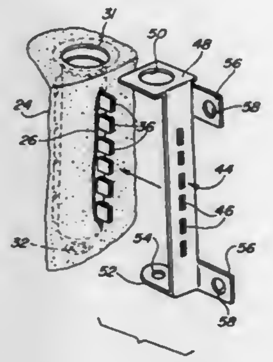
5,533,750
SIMPLIFIED INFLATABLE RESTRAINT MODULE

James P. Karlow, Milford; James M. Kumkoski, Clarkston; Mohamed Boumarafi, Rochester Hills, and Jonathan P. Hurford, Lake Orion, all of Mich., assignors to Takata, Inc., Auburn Hills, Mich.

Filed Jun. 1, 1995, Ser. No. 456,568

Int. Cl.⁶ B60R *21/18*

U.S. Cl. 280—730.2 **15 Claims**



1. An inflatable restraint module comprising:
- an air cushion defining an interior volume and defining an elongated slit extending along an axis with slots formed though said air cushion adjacent both sides of said slit, and an aperture generally aligned with said axis at an end of said slit,
- a generally cylindrical retainer bracket defining a hollow interior with an opened end and further defining a plurality of projecting tab fingers, said air cushion slit allowing said retainer bracket to be inserted within said air cushion interior volume and said air cushion slots cooperating with said tab fingers to allow said tab fingers to extend through said slots thereby closing said air cushion slit said tab fingers extending exteriorly of said air cushion interior volume with said air cushion aperture oriented to overly said retainer bracket end,
- a mounting bracket having a series of slots configured to receive said retainer bracket tab fingers and having opposing end flanges with at least one of said flanges having an aperture, said end flanges oriented to overly and embrace said retainer bracket whereby said retainer bracket fingers may be deformed to retain in an assembled condition said air cushion, said retainer bracket, and said mounting bracket, and
- a cylindrical inflator received by said retainer bracket interior by passing through said air cushion aperture and said mounting bracket aperture.

5,533,751

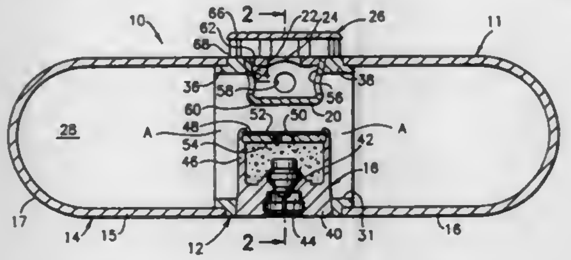
HYBRID INFLATOR WITH ELONGATED HOUSING AND CENTER DISCHARGE

Leland B. Kort, Lakewood, Colo.; Walter A. Moore, Ogden, Utah; Randall J. Clark, Pleasant View, Utah; Kelly B. Johnson, Layton, Utah; L. John Pierotti, Huntsville, Utah, and Brett Hussey, Bountiful, Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation of Ser. No. 394,254, Feb. 22, 1995, abandoned. This application Apr. 17, 1995, Ser. No. 423,261

Int. Cl.⁶ B60R *21/26*

U.S. Cl. 280—737 **26 Claims**



1. A hybrid inflator for an inflatable restraint system, comprising:

A) an elongated housing having a center frame having a circumferential sidewall defining a longitudinal opening therethrough and first and second elongated tubular end caps, each end cap having an open and a closed end, the open ends of the end caps respectively secured to the center frame such that the center frame and end caps together define the outer surface of the housing and a chamber storing a pressurized inert gas;

B) at least one unit mounted through the circumferential sidewall of the center frame generally centrally in the elongated housing, the at least one unit including a unit containing a heat producing material, the unit containing the heat producing material configured and adapted to expose the heat producing material and products of combustion thereof directly to the stored gas after ignition of the heat producing material, means for igniting the heat producing material, and the at least one unit defining a rupturably-sealed outlet orifice through which inflation gas is delivered from the chamber upon operation of the hybrid inflator.

5,533,752

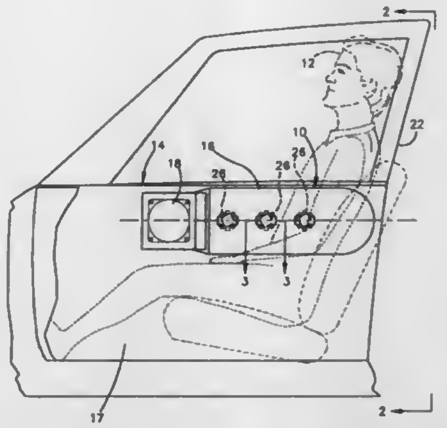
APPARATUS FOR RESTRAINING MOVEMENT OF AN OCCUPANT OF A VEHICLE

Louis R. Brown, Oxford, and Charles F. Steffens, Jr., Washington, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Nov. 8, 1994, Ser. No. 336,380

Int. Cl.⁶ B60R *21/30*

U.S. Cl. 280—739 **21 Claims**



1. An apparatus for use in restraining movement of an occupant of a vehicle, said apparatus comprising:

an air bag inflatable from a deflated condition to an expanded condition extending adjacent to the occupant of the vehicle; and

vent valve means connected in fluid communication with said air bag for venting fluid from said air bag, said vent valve means being operable between a closed condition and an open condition enabling fluid to flow from the air bag through said vent valve means;

said vent valve means including a valve element and a base having surface means for defining an opening through which fluid flows from said air bag when said vent valve means is in the open condition, said valve element having a first portion which blocks fluid flow through the opening in said base when said vent valve means is in the closed condition and a second portion which retains said first portion of said valve element in said first position relative to said base when said vent valve means is in the closed condition, said second portion of said valve element being plastically deformable from a first configuration to a second configuration upon movement of said first portion of said valve element under the influence of fluid pressure in said air bag from said first position to a second position relative to said base and operation of said vent valve means from the closed condition to the open condition, said second portion of said valve element remaining in the second configuration and supporting said first portion of said valve element in said second position relative to said base after fluid pressure in the air bag has been reduced to a fluid pressure which is insufficient to deform said second portion of said valve element plastically from the first configuration to the second configuration.

5,533,753

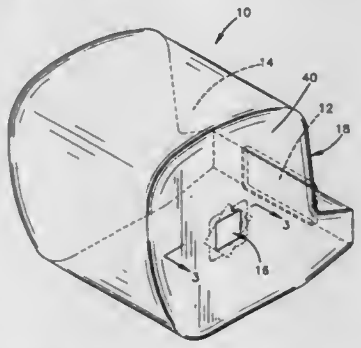
APPARATUS FOR RESTRAINING A VEHICLE OCCUPANT AND METHOD OF MAKING THE APPARATUS

Michelle M. Abraham, Macomb, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Feb. 3, 1995, Ser. No. 382,868

Int. Cl.⁶ B60R *21/30*

U.S. Cl. 280—739 **9 Claims**



1. An inflatable air bag for, when inflated, restraining a vehicle occupant, said air bag comprising:

air bag material having an outer surface and an inner surface, said inner surface defining a chamber into which inflation fluid is directed to inflate said air bag;

said air bag including a first opening through which inflation fluid is directed into said chamber;

said air bag material including at least one flap portion which is folded over and onto one of said inner and outer surfaces to define at least in part a second opening for venting inflation fluid from said chamber, said second opening being spaced apart from said first opening; and

securing means for fixedly securing said at least one flap portion to said one of said inner and outer surfaces of said air bag material.

5,533,754

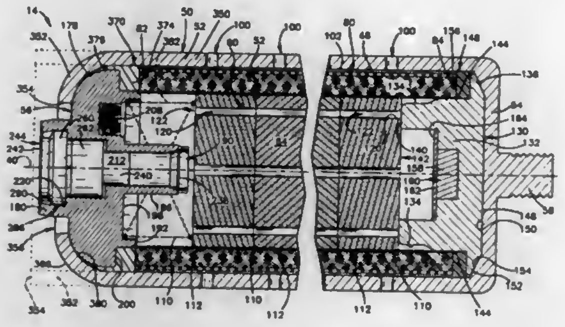
AIR BAG INFLATOR

Michael C. Riley, Gilbert, Ariz., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed May 31, 1995, Ser. No. 456,028

Int. Cl.⁶ B60R *21/28*

U.S. Cl. 280—741 **9 Claims**



1. Apparatus comprising:

a housing containing a source of fluid;

an actuatable initiator comprising means for initiating a flow of said fluid from said housing when said initiator is actuated;

a closure cap comprising means for closing an end portion of said housing, said closure cap having inner surface portions formed of a metal material; and

a retainer comprising means for supporting said initiator on said closure cap, said retainer having outer surface portions formed of a metal material;

said inner surface portions of said closure cap and said outer surface portions of said retainer extending circumferentially around an axis and being pressed radially against each other so as to comprise sealing means for blocking said fluid from exiting said housing between said retainer and said closure cap;

said outer surface portions of said retainer including a cylindrical surface and a frusto-conical surface, said frusto-conical surface extending radially inward from said cylindrical surface and being inclined at an angle from a plane perpendicular to said axis, said angle being within the range of approximately 20° to approximately 40°.

5,533,755

STRUCTURALLY EFFICIENT INFLATABLE PROTECTIVE DEVICE

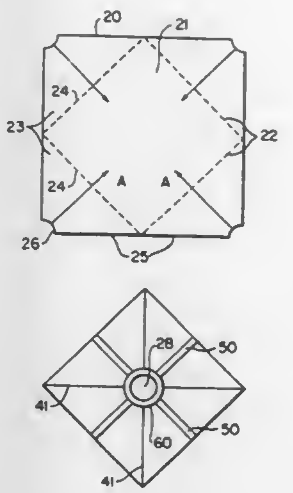
James M. Nelsen, Tijeras; Larry D. Whinery, Albuquerque; Kenneth W. Gwinn, Cedar Crest; Donald D. McBride, Albuquerque; Daniel A. Luna, Los Lunas, all of N.M.; Joseph P. Holder, and Richard J. Bliton, both of Greensboro, N.C., assignors to Sandia Corp./Precision Fabrics Grp., Inc., N.C.

Continuation of Ser. No. 82,471, Jun. 28, 1993, Pat. No. 5,482,317. This application Dec. 9, 1994, Ser. No. 355,241

Int. Cl.⁶ B60R *21/16*

U.S. Cl. 280—743.1 **19 Claims**

1. An inflatable protective cushion comprising a sheet made of a woven material defined by four or fewer fold lines and a plurality of flap portions, each flap portion having a base edge corresponding to a fold line and at least two side edges each extending outwardly from the base edge and ultimately converging to meet each other, the flap portions being folded at the fold lines with each of the flap portions substantially converged to form an apex above the sheet and being joined at corresponding side edges to define an inflatable chamber, wherein the side edges are either substantially perpendicular or substantially parallel to the warp direction of the woven material.



5,533,756

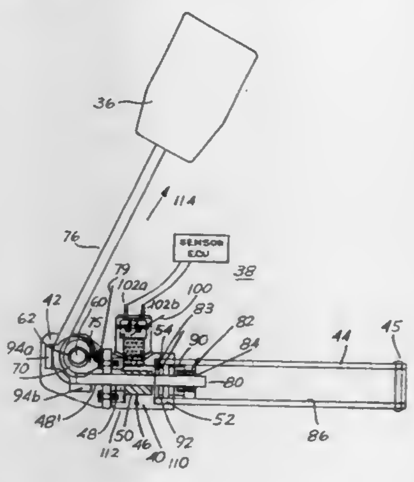
SEAT BELT RETRACTOR WITH ENERGY ABSORBING LOCK WHEELS

Niels Dybro, Utica, and Harold J. Miller, III, Troy, both of Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 286,069, Aug. 4, 1994, abandoned. This application Dec. 21, 1994, Ser. No. 362,077

Int. Cl.⁶ B60R *22/36*

U.S. Cl. 280—806 **18 Claims**



1. A safety restraint system comprising:

belt system means for restraining an occupant comprising:

a safety belt;

retractor means for protracting and retracting the safety belt;

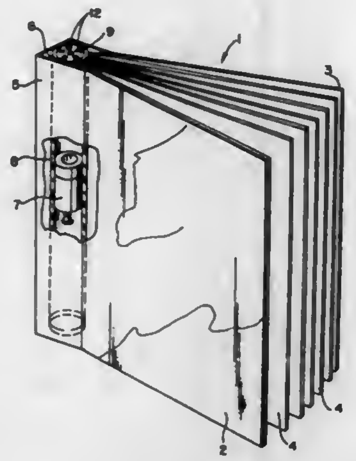
shoulder belt support means for supporting the shoulder belt portion of the safety belt;

pretensioner means for providing subsequent to activation, a residual preload force in the safety belt in excess of a first low limit value of about 50 pounds;

load limiting means for limiting the loads imparted by the shoulder belt portion to an occupant, operative after the preload acts on the shoulder belt portion, including first means for introducing a predetermined amount of slack in the shoulder belt when the belt tension is above a second low limit value and for preventing such slack introduction when belt tension is lower than such low limit value.

5,533,757
CHILDREN'S BOOK HAVING NOISE MAKING CAPABILITY

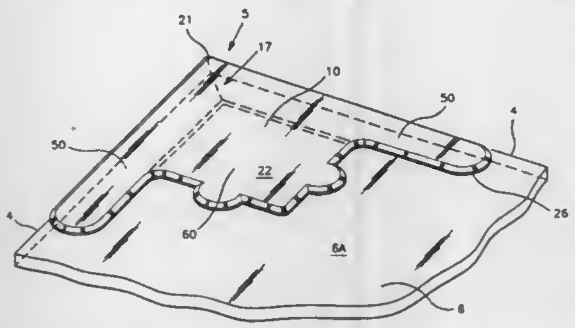
Michael Morris, Weston, Conn., assignor to Joshua Morris Publishing, Inc., Westport, Conn.
Filed Apr. 28, 1995, Ser. No. 430,987
Int. Cl.^{6} A63H *5/00;33/38;* **B42D** *1/00*
U.S. Cl. 281—15.1 **13 Claims**



1. A sound producing book comprising: a multiplicity of pages; a front cover; a back cover, said pages and covers being bound along one side thereof to a binding member, said binding member including a conduit therethrough; and a sound producing member slidably contained in said conduit and capable of sliding within the conduit under the force of gravity to produce sound.

5,533,758
BOOK COVER CORNER GUARD

Kenneth R. Lee, 2332 Sable Tree Cir., Tustin, Calif. 92680
Filed Apr. 18, 1995, Ser. No. 423,773
Int. Cl.^{6} B42D *1/00*
U.S. Cl. 281—20 **17 Claims**



1. A book cover corner guard for reinforcing a corner of a book cover of a book, the guard comprising:

a guard body aligned with an outer surface of the book corner, and providing a bottom surface contacting the book cover and a top surface facing outwardly from the book cover; wherein the bottom surface, is coated with an adhesive for adhering the body to the outer surface;

on the guard body, a first and second mutually orthogonal fold lines intersecting to form

a guard corner aligned with the book cover corner, the fold lines including a means for fold enablement;

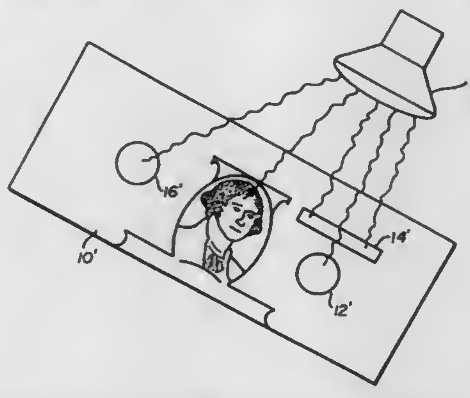
attached contiguously to and extending laterally from the fold lines respectively, a first and a second fold-over tabs, foldable along the fold lines to extend respectively over corner edges of the book cover;

a first and second fixed edge tab portions of the body, the tab portions aligned in mutual orthogonal juxtaposition, each of the tabs abutting one of the fold lines;

a central portion of the guard body contiguous with the two fixed edge tab portions and extending therebetween, the fixed edge tab portions and the central portion, together, adhered to the outer surface of the book cover.

5,533,759
METHOD OF CURRENCY OR DOCUMENT VALIDATION BY USE OF A TEMPERATURE SENSITIVE MAGNETIC PATTERN

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 13, 1994, Ser. No. 305,227
Int. Cl.^{6} B42D *15/00*
U.S. Cl. 283—70 **6 Claims**



1. A method for determining the validity of a valuable document, said method comprising the steps of:

a) printing a region of said document with an ink containing a magnetic pigment having a Curie temperature below 130° C.;

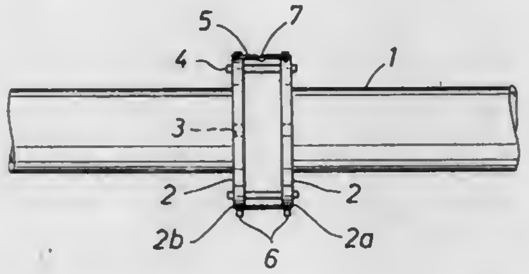
b) magnetizing said region with a known magnetic pattern by means of an applied magnetic field;

c) heating said region to a temperature of at least 130° C. with a source of heat; and

d) viewing said document by placing a viewing device responsive to a magnetic field over said document to determine if said magnetic pattern has been destroyed by said heating of said region to at least 130°C.

5,533,760
METHOD AND DEVICE FOR CONTAINING FLUIDS

James G. Welsh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Jun. 23, 1994, Ser. No. 264,824
Int. Cl.^{6} F16L *55/00*
U.S. Cl. 285—14 **8 Claims**



1. An apparatus for containing fluid about sections of joined fluid vessels comprising:

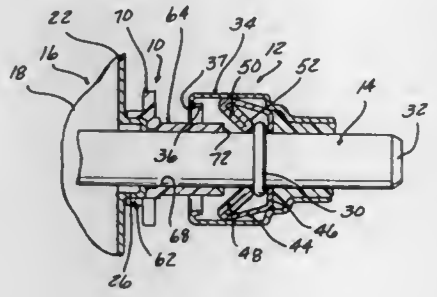
A vessel wrapping, said wrapping substantially enclosing the area between said vessel sections so that substances carried by said vessel are contained by said wrapping upon separation of said sections;

a means for securing said vessel wrapping to said sections of joined vessel, and

a portal for removing substances contained by said vessel wrapping, said portal being fixed to said vessel wrapping and wherein said portal is sealable by a fastener selected from the group consisting of zippers, hook and loop fasteners, and membranes.

5,533,761
QUICK CONNECTOR RELEASE MEMBER

James E. Ostrander, Waterford, and Gary O. Klinger, Warren, both of Mich., assignors to ITT Corporation, New York, N.Y.
Filed Oct. 26, 1994, Ser. No. 329,491
Int. Cl.^{6} F16L *35/00*
U.S. Cl. 285—38 **18 Claims**



1. A quick-type fluid connector apparatus comprising:

a component having an end wall;

a fitting extending outward from the end wall of the component, the fitting having an annular flange spaced from an outer end, the annular flange spaced from the end wall of the component;

a housing having an open tubular end and a bore extending from the open end band an intermediate shoulder in said bore;

the fitting insertable into the open end of the bore in the housing;

a retainer mounted in the bore in the housing and means including said intermediate shoulder for retaining the retainer in said housing bore, the retainer having a plurality of circumferentially spaced, deflectable legs with outer ends spaced from said intermediate shoulder in the bore to form an opening for receiving the annular flange on the fitting therein in locking engagement with the outer ends of the deflectable legs, an inner diameter between opposed outer ends of the deflectable legs being a first nominal diameter less than an outer diameter of the annular flange on the fitting;

release means, separably and slidably mounted on the fitting between the end wall of the component and the open end of the housing, for effecting disengagement of the housing from the fitting upon axial sliding movement of the release means through the housing into engagement with the retainer, the release means including:

a body having first and second end portions;

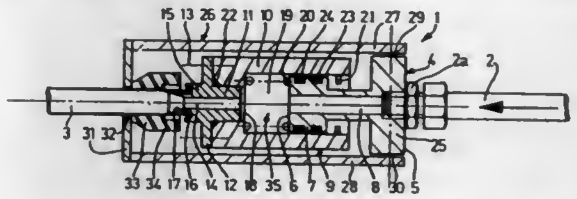
a through bore extending through each of the first and second end portions;

break means, formed longitudinally end to end in and through the first and second end portions of the body, for enabling the body to be snapped over the fitting; and

retainer leg engagement surface means, formed on the second end portion of the body, and engagable with the deflectable legs of the retainer upon axial movement of the release means into the bore in the housing to radially outwardly deflect the deflectable legs a sufficient distance to enable the annular flange on the fitting to be disengaged from the retainer and separated from the housing.

5,533,762
ASSEMBLY DEVICE OF AN ELEMENT ON A PART PRESENTING A FLUID CHANNEL

Henri Carmona, Domène, France, assignor to Assistance Proto Industrie France, Meylan, France
Filed Feb. 15, 1995, Ser. No. 381,993
Claims priority, application France, Jul. 9, 1993, 93 08524
Int. Cl.^{6} F16L *17/02*
U.S. Cl. 285—101 **15 Claims**



1. An assembly device for connecting a first element to a tubular part equipped with a fluid channel, the assembly device comprising:

a second element axially slidingly mounted relative to the first element and sealing means for sealing the second element to said first element,

a first axial through passage arranged in the second element,

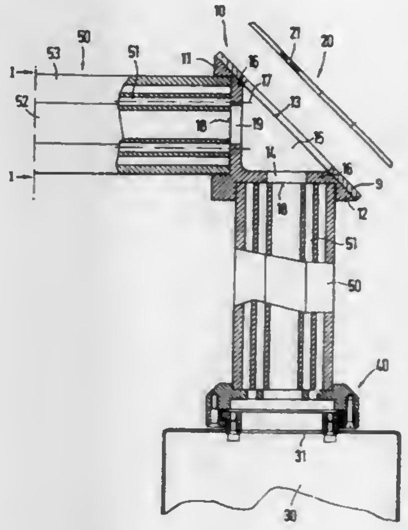
coupling means, having a holding part for connecting mechanically the first element to the tubular part in a predetermined axial position, with in which the second element presses axially around an opening of the fluid channel of the tubular part, allowing communication of the channel with the first axial passage,

a first seal fitted in axial abutment between the second element and the tubular part,

and an internal space extending in the axial direction between opposite faces respectively of the first and second elements, the fluid flowing through the space which is in communication with the first axial passage of the second element.

5,533,763
ELBOW WITH ACCESS OPENING

Markus Neuhof, Ehringshausen, Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Germany
Filed Sep. 14, 1994, Ser. No. 306,507
Claims priority, application Germany, Sep. 14, 1993, 43 31 125.3
Int. Cl.^{6} F16L *43/00*
U.S. Cl. 285—127 **11 Claims**



1. In an elbow for a suspension device supporting a control element, wherein the elbow comprises two support arm fastening

walls oriented at an angle to each other on which two support arms, which are embodied as hollow profiled sections, can be fastened,

the improvement comprising:

the support arm fastening walls (**11**, **12**) connected to each other in one piece by a plurality of lateral walls which terminate flush with the free ends of the support arm fastening walls (**11**, **12**) and form an assembly chamber (**15**) behind said support arm fastening walls (**11**, **12**) which is accessible through an opening (**13**),

the surfaces of the support arm fastening walls (**11**, **12**) facing away from each other each forming at least one receptacle (**18**) for installing the support arms (**50**), said at least one receptacle (**18**) having a shape suitable for receiving said support arm (**50**) having an essentially oval cross section,

each of said support arm fastening walls (**11**, **12**) forming at least one cable feed-through element (**14**,**19**) at least in the area of the receptacles (**18**), and

each of said-support arm fastening walls (**11**, **12**) forming at least one fastening receiver (**17**) aligned with a corresponding longitudinally oriented screw conduit (**51**) formed by said support arms (**50**).

5,533,764

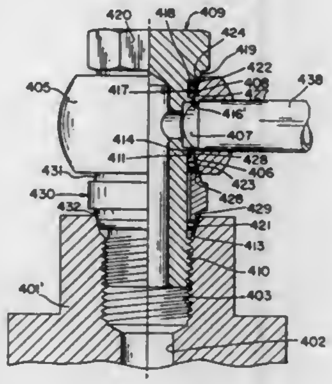
TRANSVERSE HYDRAULIC COUPLING WITH LIPPED PORT

Nigel D. L. Williamson, Fort Wayne, Ind., assignor to NWD International, Inc., Morencie, Mich.

Continuation-in-part of Ser. No. 782,409, Oct. 25, 1991, abandoned. This application Apr. 25, 1994, Ser. No. 232,734

Int. Cl.^{6} F16L *5/02*

U.S. Cl. 285—212 **14 Claims**



1. A hydraulic coupling comprising:

a port including an opening, a portion defining a passageway in communication with said opening, an internally threaded portion in communication with said passageway, and a lip extending from said port;

conduit means for providing fluid communication between said port and a tube located transversely in relation to said port, said conduit means including a conduit body defining an axial chamber, said conduit means also including an extension defining a channel transversely located in relation to said axial chamber, said channel and said passageway being in fluid communication, said conduit means further including an inner surface which sealingly contacts said lip of said port;

a connector for sealingly securing said conduit means to said port, said connector extending through said conduit means, said connector including an axial bore, said connector having a smaller diameter than said axial chamber, said connector also including a rim which sealingly contacts said conduit means, said connector further including an externally threaded portion adapted to engage said internally threaded portion of said port and by threaded engagement force said lip into sealing contact with said inner surface of said conduit means and force said rim into sealing contact with said conduit means, said connector defining a seating portion distinct from said externally threaded portion; and

a sealing ring disposed in a pocket defined by said seating portion of said connector, said conduit means, and said port.

5,533,765

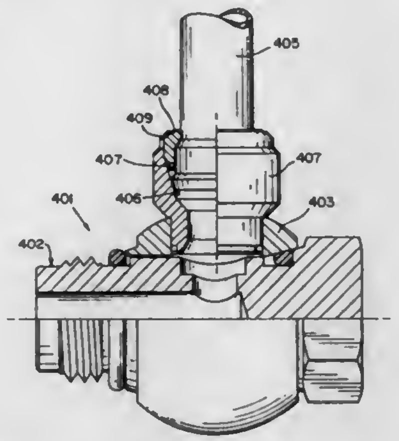
CRIMPED TUBE-TO-PORT HYDRAULIC FITTINGS

Nigel D. L. Williamson, Fort Wayne, Ind., and Warren J. Nichols, Adrian, Mich., assignors to NWD International, Inc., Morenci, Mich.

Continuation-in-part of Ser. No. 230,972, Apr. 21, 1994, which is a continuation-in-part of Ser. No. 782,409, Oct. 25, 1991, abandoned. This application Jul. 1, 1994, Ser. No. 269,841

Int. Cl.^{6} F16L *13/14*

U.S. Cl. 285—212 **19 Claims**



1. A hydraulic coupling comprising:

a port including an opening, a portion defining a passageway in communication with said opening, a collar disposed around said opening, and a tapered surface connecting said passageway and said opening;

a tube in fluid communication with said port, said tube including a lip at the end of said tube facing said port; and

a compression ring disposed about said tube, said compression ring being made of a metallic material, said collar being deformed into said compression ring to sealingly bias said lip against said tapered surface of said port.

5,533,766

FUEL TANK LOCK SYSTEM FOR A GASOLINE TANK FILLER NECK OF A MOTOR VEHICLE

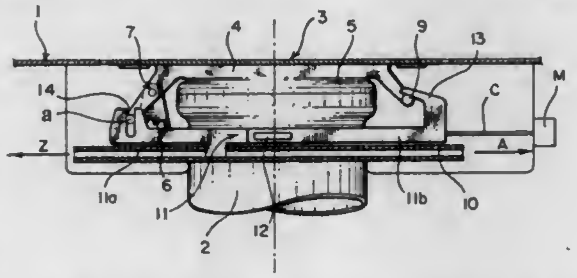
Manfred Färber, Wielenbach, Germany, assignor to Webasto Karosseriesysteme GmbH, Germany

Filed Dec. 15, 1993, Ser. No. 167,352

Claims priority, application Germany, Dec. 15, 1992, 42 42 228.0

Int. Cl.^{6} B65D *45/00*

U.S. Cl. 292—144 **14 Claims**



1. Fuel tank lock system for a filler neck of a gasoline tank of a motor vehicle extending to an area near the periphery of a motor

vehicle body, comprising a tank cap for sealingly closing a filling opening of the filler neck, a pivotable cover which is mounted for movement between a first position coveting the area near the periphery of the vehicle body in which the filler neck is disposed and a second position providing access to said area, and a locking member for releasably securing the pivotable cover in said first position; wherein the tank cap and the tank cover are formed into a tank cap and cover unit in which they are connected for simultaneous movement together, said unit being pivotable about an axis of rotation located on a first side of said filler neck; wherein said locking member is located on a second opposite side of said filler neck from said pivot axis; and wherein drive means are provided for both releasing said locking member and removing said tank cap from the filler neck while moving said pivotable cover from said said first position to said second position and for both securing said locking member and replacing said tank cap on the filler neck while moving said pivotable cover from said second position to said first position.

5,533,767

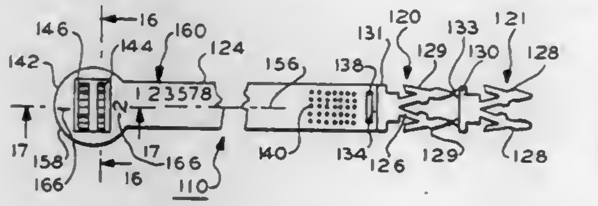
SEAL

George Georgopoulos, Pine Brook, and George A. Lundberg, Jr., Kinnelon, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Continuation-in-part of Ser. No. 72,501, Jun. 4, 1993, Pat. No. 5,441,316. This application Dec. 16, 1994, Ser. No. 357,873

Int. Cl.^{6} B65D *27/30*

U.S. Cl. 292—320 **16 Claims**



1. A seal construction comprising:

a socket member having first and second cavities each having at least one locking recess, each cavity having a separate corresponding locking device receiving opening in the socket member;

a locking device including first and second locking members, each locking member for insertion through an opening into the corresponding cavity for locking that locking member to said socket member in that cavity; and

strap means coupling the locking device to the socket member for locking an article to said strap means when said locking device is locked to said socket member.

5,533,768

ERGONOMIC SHOVEL

David Mitchell, 7948 Foucher, Montreal, Quebec, Canada

Filed Sep. 13, 1994, Ser. No. 304,937

Int. Cl.^{6} B25G *1/02;* **E01H** *5/02*

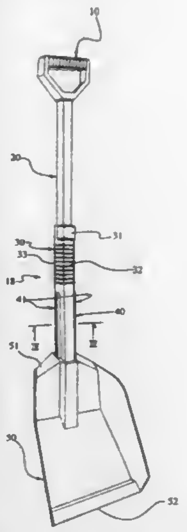
U.S. Cl. 294—54.5 **7 Claims**

1. A shovel comprising:

a blade having a front edge and a rear portion;

a handle having a front surface, a back surface and two opposite ends, one of said ends being fastened to the rear portion of said blade, said handle having a portion adjacent to said one end which is made flexible so as to permit flexion of said handle to a given extent exclusively in a plane perpendicular to said front edge of said blade;

wherein said portion of the handle that is flexible consists of a hollow piece of plastic material of given resiliency, having two opposite ends and two opposite sides, each of said sides having a fin extending longitudinally along said portion so as to permit flexion exclusively a plane perpendicular to said front edge of said



blade, one of said ends of said hollow piece being fastened to said handle, the other one of said ends of said hollow piece being fastened to said rear portion of said blade;

whereby, in use, when a user lifts a load with a given force and said load is greater than anticipated, said flexible portion will permit the user to adjust the force required to lift said load, thereby permitting said user to adjust smoothly to a new load and help prevent the risk of injury when lifting a load of unknown weight.

5,533,769

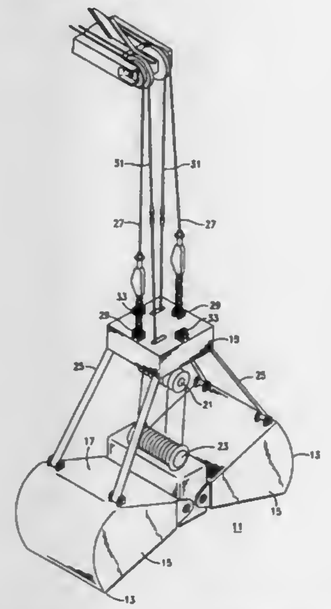
REORIENTING APPARATUS FOR A CLAMSHELL BUCKET

Enoki Masamitsu, San Mateo, Calif., assignor to Paceco Corp., San Mateo, Calif.

Filed Jun. 24, 1994, Ser. No. 265,574

Int. Cl.^{6} B66C *3/02*

U.S. Cl. 294—68.23 **2 Claims**



1. Reorienting apparatus for a clamshell bucket in which the headblock sheaves of the closing mechanism remain in fixed orientation of the headblocks during reorientation of the bucket, comprising

a pair of clamshell bucket scoops having open faces and closed rear walls, said scoops being disposed in opposed abutting relation when said bucket is closed, said scoops being pivotably secured to a headblock having a fixed sheaves portion of a bucket closing mechanism secured thereto, the rotational axes of said fixed sheaves lying parallel to a plane formed by the abutting open faces of said scoops when said bucket is closed,

a movable sheaves portion of said closing mechanism secured between the pair of scoops, said headblock being suspended by a pair of hold ropes secured to a first pair of attachment points disposed on opposite sides of said headblock and lying on an axis disposed both midlength of and perpendicular to said rotational axes of said fixed sheaves,

said bucket closing mechanism being actuated by a pair of closing ropes reeved between said fixed and movable sheaves portions,

a second pair of attachment points for said hold ropes formed on said headblock and disposed on opposite sides of said headblock and lying on an axis disposed equidistant between and perpendicular to an axis which runs through said first attachment points, said clamshell bucket scoops being rotated 90 degrees around the vertical axis thereof by detaching said hold ropes from said first pair of attachment points and connecting them to said second pair of attachments points.

5,533,770

HIGH-STRENGTH SOLID WHEELS AND TIRES FOR RAILROAD TRACTION VEHICLES AND CARS

Horst Clausmeyer, Dinslaken; Dieter Hoffmann, Hamminkeln, and Wolfgang Weber, Oberhausen, all of, Germany, assignors to MAN Gutehoffnungshütte Aktiengesellschaft, Oberhausen, Germany

PCT No. PCT/EP93/02561, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO94/09171, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 22, 1993, Ser. No. 244,703

Claims priority, application Germany, Oct. 10, 1992, 42 34 192.2

Int. Cl.^{6} B60B *17/00*

U.S. Cl. 295—1 **3 Claims**

1. High-strength solid wheels and tires of forged and rolled alloyed steel, quenched and tempered, for railroad traction vehicles and cars, said steel comprising, in percent by mass, of

carbon:	0.380–0.420
silicon:	≦0.250
manganese:	0.400–0.600
phosphorus:	≦0.012
sulfur:	≦0.005
chromium:	1.000–1.500
molybdenum:	0.300–0.600
nickel:	0.700–1.200
aluminum:	0.015–0.040
nitrogen	≦0.008.

5,533,771

MULTIPLE PURPOSE TRUCK TAILGATE APPARATUS

Shepard Taylor, and Seabrook Taylor, both of Rte. 2, Box 1070, Gresham, S.C. 29546

Filed Jan. 5, 1995, Ser. No. 368,851

Int. Cl.^{6} B62D *33/02*

U.S. Cl. 296—26 **5 Claims**

1. A multiple purpose truck tailgate apparatus for a pickup truck of the type having a bed and a tailgate pivotally mounted to the bed, said apparatus comprising:

a) a first panel member including a pair of side rails, at least two crossbars spaced apart and connected between said side rails, and a mesh plate having two longitudinal spaced apart slots mounted onto said side rails and said crossbars;

b) sliding mounting means for mounting said first panel member in a sliding manner to the bed of the truck, so that when the tailgate is opened said first panel member can be extended therefrom, said sliding mounting means including a pair of mounting brackets attached to the bed of the pickup truck, a pair of slider guide rails, each said slider guide rail slide fits longitudinally through each said mounting bracket, and a pair of lock bolts each threaded transversely into one said mounting bracket to retain said slider guide rail in a stationary position;

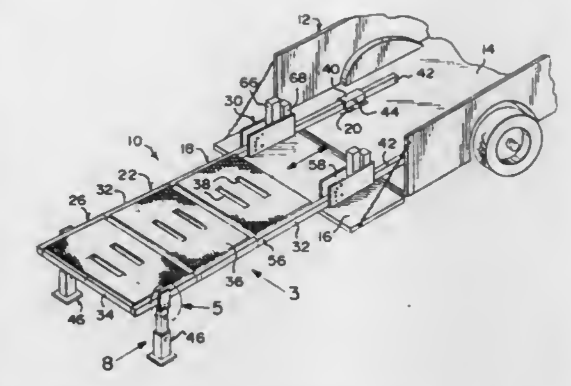
c) a second panel member including a pair of side rails, at least two crossbars spaced apart and connected between said side rails, and a mesh plate having two longitudinal spaced apart slots mounted onto said side rails and said crossbars;

d) first coupling means for coupling said second panel member against a free end of said first panel member;

e) a third panel member including a pair of side rails, at least two crossbars spaced apart and connected between said side rails, and a mesh plate having two longitudinal spaced apart slots mounted onto said side rails and said crossbars;

f) second coupling means for coupling said third panel member against a free end of said second panel member; and

g) means for pivoting said first panel member on said sliding mounting means, so that said first panel member with said second panel member and said third panel member attached thereto can be positioned at various angles at the opened tailgate, to be used for different tasks.



5,533,772

ASHTRAY AND CONTAINER HOLDER FOR MOTOR VEHICLES

Jan Volkers, Neuss; Volkhard Wick, Leichlingen und, and Volker Dabringhaus, Wuppertal, all of, Germany, assignors to Gebr. Happich GmbH, Germany

Filed May 6, 1994, Ser. No. 239,398

Claims priority, application Germany, May 11, 1993, 43 15 584.7

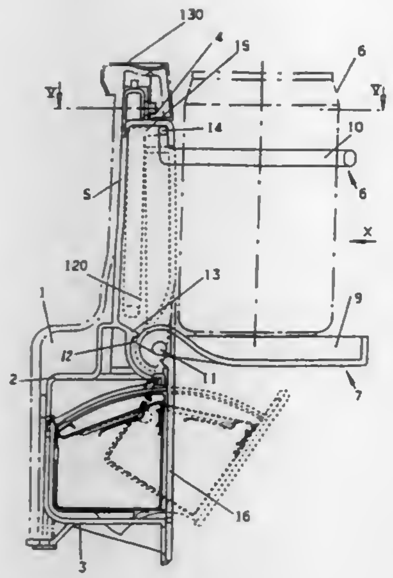
Int. Cl.^{6} A47K *1/08*

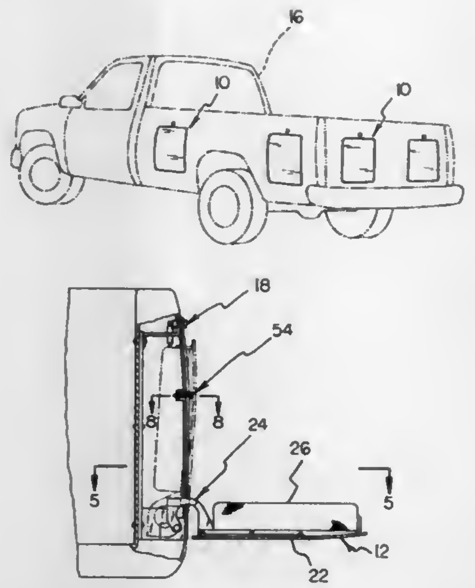
U.S. Cl. 296—37.9 **14 Claims**

1. An ashtray and container holding for use in a motor vehicle comprising

an ashtray housing comprised of a plastic injection molding, an ashtray cup supported in the housing to be movable out of the housing for access to the cup and into the housing for storage;

a holder for a container supported on the housing, and the ashtray and the container holder are a single unit; the container holder comprises a support movable to a position where it supports the container and a holding element located above the support and movable to a position for at least partially surrounding the container for holding the container on the support; and the container holder includes an additional housing part developed integrally with and of the same material as the ashtray housing.





5,533,773

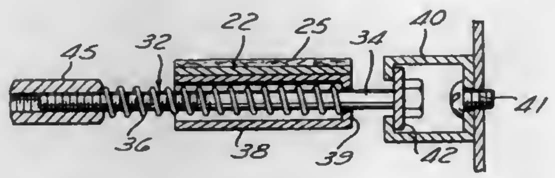
SELF-TENSIONING TAILGATE BARRIER

Nicolas P. Lessick, 230 Avenida Cabrillo, San Clemente, Calif. 92672

Filed Mar. 20, 1995, Ser. No. 407,164

Int. Cl.^{6} B62D *33/033*

U.S. Cl. 296—52 **16 Claims**



1. A tailgate barrier to be suspended between the sidewalls of a pickup truck, the tailgate barrier comprising:

a flexible barrier having a pair of side edges;

an elongate stiffener attached to each of the respective side edges;

at least two connecting members movably attaching each of the stiffeners to the truck sidewalls, the connecting members allowing horizontal movement of the barrier; and

a biasing member attached to each connecting member to urge the respective stiffener toward the respective truck sidewall;

further including a pair of tracks attached to the respective truck sidewalls, and wherein the connecting members are slidably attached to the respective vertical tracks, allowing vertical movement of the barrier.

5,533,774

VEHICLE EXTERIOR BODY PANEL SEAT

James C. Cavanaugh, P.O. Box 1774, York Beach, Me. 03910

Filed Apr. 3, 1995, Ser. No. 415,246

Int. Cl.^{6} B60N *1/00*

U.S. Cl. 296—66 **4 Claims**

1. A vehicle exterior body panel seat comprising:

a vehicle having an exterior body panel, the body panel having an aperture directed therethrough;

a seat means mounted within the aperture extending through the exterior body panel of the vehicle;

a latch means mounted relative to the vehicle for retaining the seat means in a closed configuration which can be selectively actuated to permit pivoting of the seat means into a horizontal open configuration, whereby an individual can be supported relative to the exterior body panel of the vehicle;

wherein the seat means comprises an exterior seal panel; a hinge means pivotally mounting the exterior seat panel within the aperture of the body panel for permitting pivotal movement of the exterior seat panel between a vertical position and a horizontal position, and a seat pad mounted to an interior surface of the exterior seat panel;

wherein the hinge means comprises a pair of seat brackets mounted to the interior surface of the exterior seat panel; a pair of mounting brackets secured to the vehicle so as to reside within the body panel proximal to the aperture extending therethrough; and a pivot pin extending through the mounting brackets and the seat brackets so as to pivotally couple the seat means relative to the vehicle;

wherein the hinge means further comprises a seat bracket abutment plate and a mounting bracket abutment plate which cooperatively engage to preclude rotation of the seat means beyond the horizontal position;

wherein the latch means comprises an exterior button movably mounted relative to the body panel for axial reciprocation along a longitudinal axis directed therethrough; an actuating plate extending from and interior surface of the exterior button, the actuating plate having an angled slot formed therein and oriented at an oblique angle relative to the longitudinal axis of the exterior button; a latch plunger movably mounted relative to the body panel so as to be axially reciprocal along a longitudinal line directed through the latch plunger and oriented substantially orthogonally relative to the longitudinal axis of the exterior button; a spring interposed between the latch plunger and the actuating plate and operating to bias the latch plunger towards the seat means: a catch plate extending from the seat means and including a detent notch into which the latch plunger can project so as to retain the exterior seat panel of the seat means in the closed configuration; and a pin coupling the latch plunger to the actuating plate which extends through the angled slot thereof such that a depression of the exterior button will effect retraction of the latch plunger against a force of the spring to remove the latch plunger from the detent notch of the seat means such that the seat means can be pivoted into the horizontal position.

5,533,775
RESTRAINING SYSTEM FOR FOLDABLE REAR-SEAT BACK RESTS IN MOTOR VEHICLES

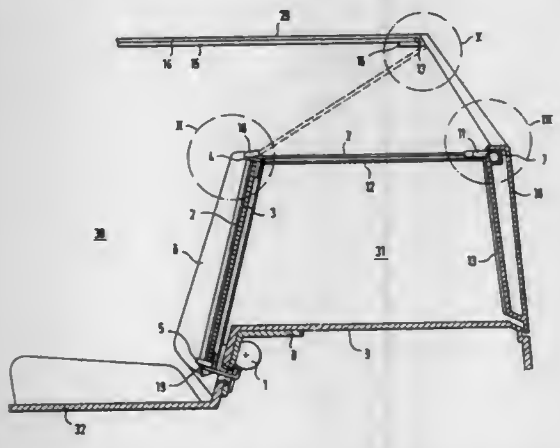
Uwe Cyliax, Marktheidenfelder Str. 2, DE-97842 Karbach, Germany

Filed Aug. 24, 1994, Ser. No. 295,941

Claims priority, application Germany, Aug. 26, 1993, 43 28 788.3

Int. Cl.^{6} B60N *2/20;2/42*

U.S. Cl. 296—68.1 **23 Claims**



1. A restraining system for foldable rear-seat back rests in motor vehicles having a vertical longitudinal center plane comprising a belt which runs from the upper region of a rear-seat back rest and removably attaches to the inside of a rear flap with at least one attachment device.

5,533,776
SUN VISOR FOR MOTOR VEHICLES

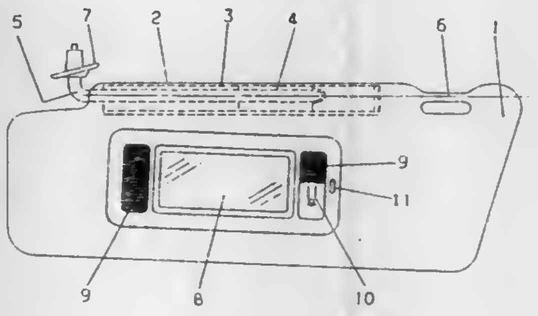
Marc Agro, Saint Avold, France; Wolfgang Auer, Nagold, Germany; Gerard Hilt, Henriville, France; Henning Peters, Pfalzgrafenweiler, and Sabine Rust, Aidlingen, both of, Germany, assignors to Gebr. Happich GmbH, Germany

Filed Aug. 25, 1994, Ser. No. 295,618

Claims priority, application Germany, Aug. 27, 1993, 43 28 890.1

Int. Cl.^{6} B60R *1/12*

U.S. Cl. 296—97.9 **12 Claims**



1. A sun visor for motor vehicles, comprising:

(a) an electrically conductive shaft having a longitudinal leg and an angled leg, each leg having respective first and second ends, the shaft having an internal bore which extends from the first end of the angled leg to the second end of the longitudinal leg;

(b) a sun visor body;

(c) means for mounting the sun visor body on the shaft along the longitudinal leg thereof such as to enable the sun visor body to rotate on the longitudinal leg and to move longitudinally with respect to the shaft between a first position and a second position;

(d) at least one illuminating means mounted on the sun-visor body;

(e) first electrically conductive means disposed within the bore of the shaft such as to be electrically insulated from the shaft and extending from the second end of the angled leg to the first end of the longitudinal leg;

(f) holding means connected to the sun visor body at an end thereof adjacent to the first end of the longitudinal leg of the shaft;

(g) contact and detent means supported by the holding means for establishing electrical contact with the first electrically conducting means and the longitudinal leg of the shaft and for securing the shaft from longitudinal movement when the sun visor body is in the first position; and

(h) second electrically conductive means for electrically connecting the contact and detent means to the illuminating device.

5,533,777
ACTUATION MECHANISM FOR A TOP AND A TOP RECEPTACLE COVER OF A MOTOR VEHICLE

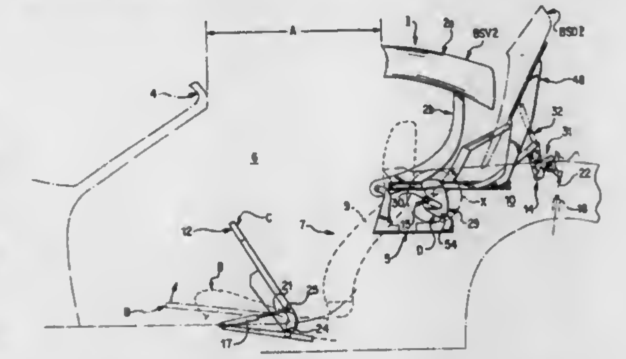
Klaus Kleemann, Birkenfeld; Herbert May, Neudenau; Matthias Aydt, Eberdingen; Kurt Pfertner, Winsheim; Alexander Zeissner, Illingen, and Peter Thomas, Tiefenbronn, all of, Germany, assignors to Dr. Ing. h.c.f. Porsche AG, Germany

Filed Oct. 24, 1994, Ser. No. 328,757

Claims priority, application Germany, Oct. 23, 1993, 43 36 278.8

Int. Cl.^{6} B60J *7/12*

U.S. Cl. 296—117 **26 Claims**



1. An actuation mechanism for a top and a top receptacle cover of a motor vehicle for moving from a driver's seat position, the top receptacle cover between a closed position and an open position and the top between a second operating position and a third operating position, comprising a pivotable actuating lever and a displacement device operatively associated therewith, wherein the actuating lever and displacement device are configured and so operatively connected su that, by pivoting the actuating lever in a first direction, the top receptacle cover is moved from a closed position into an open position by the displacement device cooperating therewith, a first coupling element operatively connected with the displacement device takes up a receiving position in which a second coupling element provided on the top engages the first coupling element when the top is in the second operating position, such that, by repeated pivoting of the actuating lever into a second, reverse direction, an engaged coupling moves the top receptacle cover and the top together downwardly into the closed position and the third operating position, respectively.

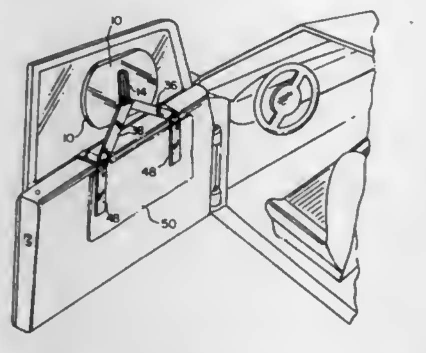
5,533,778
PROJECTILE RESISTANT WINDOW SHIELD

Ronald J. Sheridan, 1890 Tropic St., Titusville, Fla. 32796

Filed Dec. 17, 1993, Ser. No. 168,227

Int. Cl.^{6} B60J *1/17*

U.S. Cl. 296—152 **3 Claims**



1. A window shield for mounting on the inside of a side window of a vehicle door to protect persons in a vehicle from injury from projectiles comprising:

a transparent projectile resistant window shield of a size to substantially cover the inside of a vehicle side window;

an adjustable support means for attaching said window shield to a vehicle door window frame, said vehicle door window frame having a window sill to which said adjustable support means connects wherein said adjustable support means comprises:

a vertical bracket means mounted on said window shield, where said vertical bracket means has a vertical longitudinal slot, and a captured stud slidable in said. longitudinal slot; and,

an adjustable inverted V-shaped bracket connected to said vertical bracket means by said captured stud, and having a pair of inverted U-shaped brackets for connecting to said window sill.

5,533,779
VEHICLE BODY

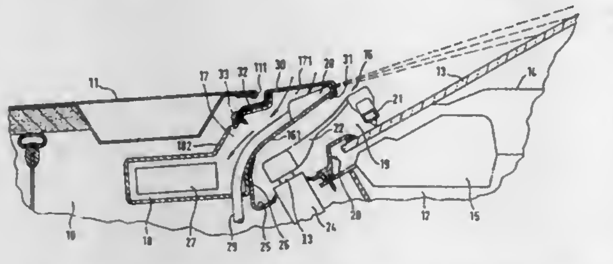
Anton Epple, Rottenburg; Martin Pfeiffer, Stuttgart; Martin Kruse, Bondorf, and Wolfgang Volz, Magstadt, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Nov. 14, 1994, Ser. No. 340,309

Claims priority, application Germany, Nov. 12, 1993, 43 38 685.7

Int. Cl.^{6} B60J *1/20*

U.S. Cl. 296—192 **10 Claims**



1. A vehicle body having an engine hood, a front-end engine compartment arranged to be covered by the engine hood, a passenger cell adjoining the engine compartment and closed off towards the engine hood by a windshield, and an opening extending over the entire width of the vehicle body from a rear edge of the engine hood facing the windshield up to the windshield, which opening is divided into a water-inlet region with a water channel arranged thereunderneath for water running off the windshield, and an air-inlet region for an air-supply device for the passenger cell, wherein the air-inlet region is comprised of an air-water channel having an air inlet and a connection for an air-supply apparatus, the air-water channel is secured in the engine compartment at a distance from the windshield such that, on a side opposite the windshield, a first air-water channel wall bounds a wiper recess accommodating wiper arms with wiper blades in a storage position thereof, an opening of which constitutes the water-inlet region and the bottom of which forms the water channel, and washer jets are arranged on the first air-water channel wall at least near to an upper and thereof between the windshield and the air inlet of the air-water channel.

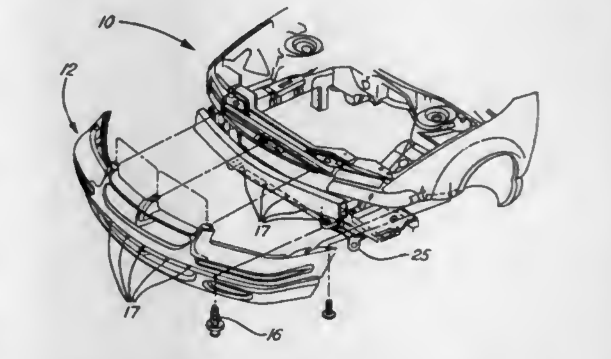
5,533,780
FRONT CROSSMEMBER ASSEMBLY FOR A MOTOR VEHICLE

Pamela E. Larson, New Baltimore, and John D. Nulty, South Lyon, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 8, 1994, Ser. No. 353,646

Int. Cl.^{6} B60K *11/04*

U.S. Cl. 296—194 **9 Claims**



1. A front crossmember assembly for a motor vehicle body and side rails including a radiator, an engine, a cooling module, front fascia, a splash shield, and a front recovery bracket, said crossmember assembly comprising an inverted U-shaped body section having closed ends and a flange formed on the peripheral edges thereof, and attachment means operatively connected to said closed ends adapted to secure said crossmember assembly to said side rails, a plurality of openings formed through said flange, and fastening means for securing said front recovery bracket, said front fascia, and said splash shield thereto.

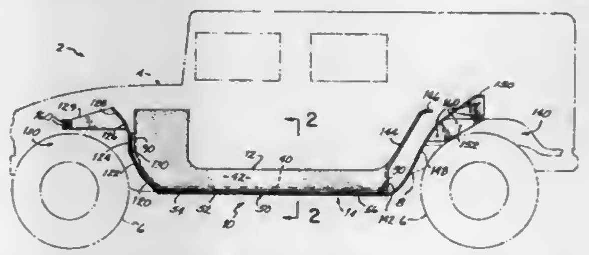
5,533,781
ARMORING ASSEMBLY

Charles A. Williams, Cincinnati, Ohio, assignor to O'Gara-Hess & Eisenbardt Armoring Co., Inc., Fairfield, Ohio

Filed Jun. 20, 1994, Ser. No. 262,768

Int. Cl.^{6} B62D *23/00;* **F41H** *7/04*

U.S. Cl. 296—204 **21 Claims**

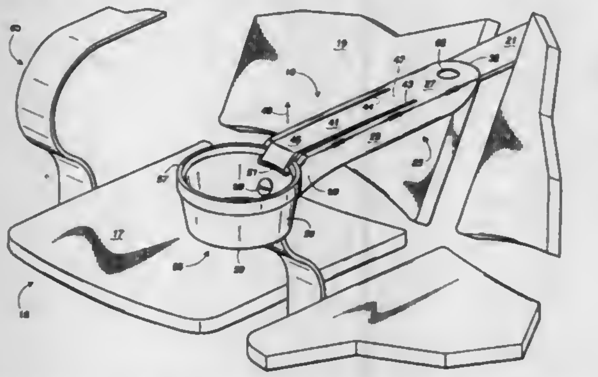


1. In a land vehicle with a floor having upper and lower floor surfaces and having at least one wall connected to said floor, extending upwardly therefrom and having an inner wall surface, blast pressure and shrapnel fragment defeating structure for said vehicle comprising:

fibrous material bonded to said upper surface of said floor and said inner surface of said wall;
a ballistic panel/blast shield disposed below said lower surface of said floor and spaced therefrom so as to form an air gap therebetween;
fasteners securing said panel to said vehicle; and
resilient material disposed between said panel and vehicle in the area of said fasteners.

5,533,782
DEVICE FOR STORING AND DISPLAYING MATERIALS ON A STADIUM ARMREST

Mark L. Goldman, 1009 Ferncliff Rd. NE., Atlanta, Ga. 30324
Filed Mar. 23, 1995, Ser. No. 409,018
Int. Cl.^{6} A47C *7/68*
U.S. Cl. 297—188.18 6 Claims

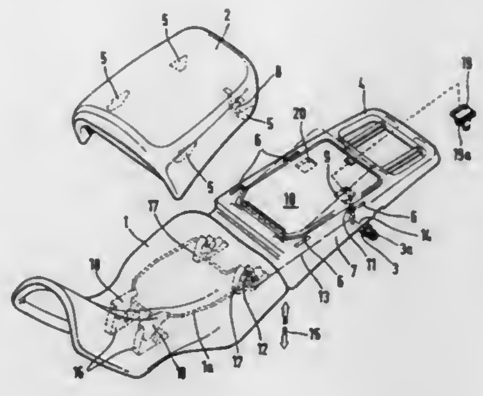


4. A bracket for retaining and displaying flat informational literature and advertising material on a seat armrest, having a top armrest surface, a bottom armrest surface and two side armrest surfaces, said bracket comprising:
a. a bottom bracket surface;
b. a top bracket surface;
c. attachment means for attaching said bottom bracket surface in juxtaposition with the top armrest surface;
d. a resilient flap for releasably holding the flat informational literature and advertising material in position on said bracket, said resilient flap being formed between two substantially parallel slots in said top bracket surface and having a first end connected to said bracket and a second free end opposite said first end; and
e. a tab for facilitating lifting said flap to release the informational literature and advertising material, said tab formed at said second free end of said flap by an interconnection of said slots.

5,533,783
DIVIDED SEAT FOR A MOTOR VEHICLE

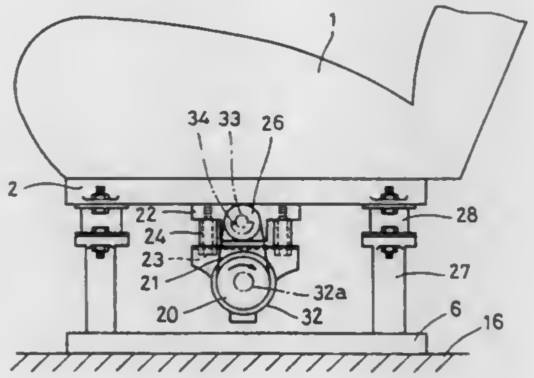
Thomas Harms, Allershausen, and Karl-Heinz Abe, Woerthsee, both of, Germany, assignors to Bayerische Motoren Werke AG, Munich, Germany
Filed Aug. 31, 1994, Ser. No. 297,927
Claims priority, application Germany, Sep. 6, 1993, 43 30 120.7
Int. Cl.^{6} B62J *1/14*
U.S. Cl. 297—195.13 16 Claims

1. Divided seat mounted on a motorcycle having a vehicle body, comprising:
a first seat part for a driver and a second seat part for a passenger, said first and second seat parts being made separate from one another and each seat part being mountable on and removable from the vehicle body; and
a central lock mounted on the motorcycle for operating a separate lock for each seat part to individually lock each of said first and second seat parts to the vehicle body.



5,533,784
APPARATUS FOR VIBRATING SEATS

Masahiro Fukuoka, Aichi, Japan, assignor to Fukuoka Kagaku Ltd., Aichi, Japan
Division of Ser. No. 987,481, Dec. 4, 1992, Pat. No. 5,348,370. This application Jan. 31, 1994, Ser. No. 190,333
Int. Cl.^{6} A47C *31/00*
U.S. Cl. 297—217.1 1 Claim

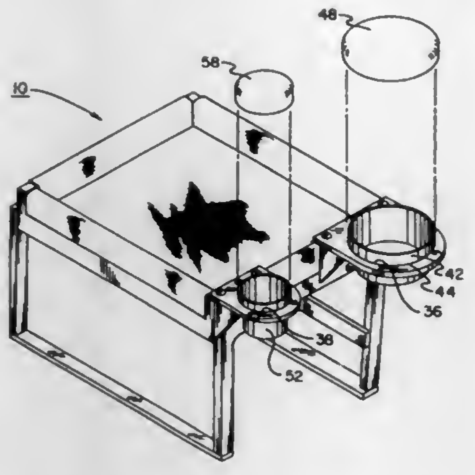


1. An apparatus for vibrating a seat comprising a driver's seat: means for vibrating said driver's seat; and means for turning said means for vibrating the driver's seat on and off,
wherein said means for vibrating said driver's seat comprises a vibrating motor elastically connected to said driver's seat, a power transmission shaft and a belt operably connecting an output shaft of said vibrating motor and said power transmission shaft, and
wherein said means for vibrating said driver's seat further comprises an eccentric load mounted on said power transmission shaft and extending along a length thereof:
a pulley base mounted beneath a seat base attached beneath said driver's seat, said power transmission shaft being operably coupled to walls of said pulley base, wherein said vibrating motor is mounted beneath said pulley base; and
a plurality of elastic insulator means, coupled to said pulley base and said vibrating motor, for receiving vibration of said vibrating motor.

5,533,785
SMALL PET CAR SEAT

Donald D. Gould, P.O. Box 260, Henderson, N.Y. 13650
Filed Jun. 20, 1995, Ser. No. 492,457
Int. Cl.^{6} A47C *1/08*
U.S. Cl. 297—250.1 1 Claim

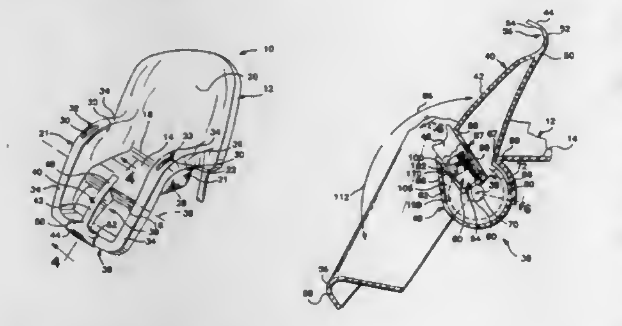
1. A new and improved small pet car seat comprising, in combination:



a planar support plate in a planar horizontal orientation and rectangular configuration having upstanding long side walls and having upstanding front and rear walls in a box-like configuration;
a pair of forwardly extending support plates, each having an interior linear edge coupled to a front edge of one of the long walls at an upper extent thereof, each of the support plates having a semi-circular front edge, one of the plates being a large plate having a large aperture therethrough and the other plate being a small plate having a small aperture therethrough;
a large dish with a circular cross section and a stepped central region positioned within the large aperture;
a large lid positionable over an open upper edge of the large dish;
a small dish with a circular cross section and a stepped central region positioned within the small aperture;
a small lid positionable over an open upper edge of the small dish;
downwardly extending legs coupled at their upper edges to a lower surface of the planar support plate, the legs including forward legs in a vertical orientation and rearward legs at an angle with respect to the forward legs and positionable against a back portion of a car seat; and
a liner positioned upon the upper surface of the planar support plate for the comfort of an animal when located therein.

5,533,786
CHILD RESTRAINT APPARATUS FOR A CHILD SEAT

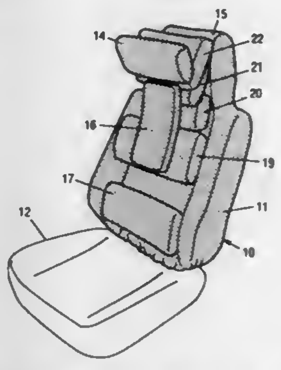
Richard E. Cone, II, Athens, Ohio, assignor to Cosco, Inc., Columbus, Ind.
Filed Nov. 4, 1994, Ser. No. 334,750
Int. Cl.^{6} B60N *2/26*
U.S. Cl. 297—256.15 61 Claims



26. A child seat comprising
a shell formed to include a seat back, a seat bottom below the seat back, the seat bottom having a front edge, and an exterior surface below the front edge defining a foot rest having a convex cross means-receiving surface,
restraining means appended to the front edge of the seat bottom for preventing a child on the seat bottom from moving away from the seat back and past the front edge when the restraining means is in a child-restraining position above the seat bottom, the restraining means being mounted to swing between a down-out-of-the-way position below the seat bottom and the child-restraining position above the seat bottom, the restraining means including cross means for restraining a child at a plurality of transverse points opposite the seat back, the cross means being arranged to lie above the seat bottom opposing the seat back when the restraining means is in the child-restraining position, the cross means including nesting means for mating against the cross means-receiving surface when the restraining means is in the down-out-of-the-way position.

5,533,787
ADD-ON ADJUSTABLE BACK SUPPORT FOR CAR SEAT

Kun Xiang, 110 Pacific Ave., #239, San Francisco, Calif. 94111
Filed Mar. 25, 1994, Ser. No. 218,338
Int. Cl.^{6} A47C *7/42*
U.S. Cl. 297—284.5 2 Claims

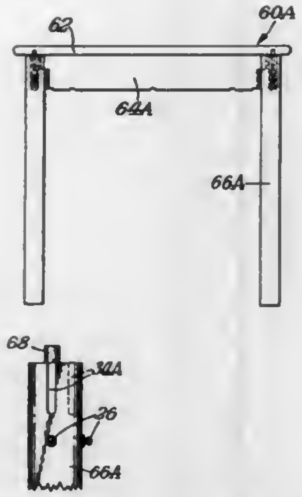


2. An adjustable back support device for fitting onto a seat having a supporting surface, comprising:
a fastening-loop fabric sheet adapted to cover said supporting surface,
a plurality of cushions each having a fastening-loop fabric shell, and
a fastening-hook fabric sheet disposed on each of said cushions for fastening said cushions to each other and anywhere on said fastening-loop fabric sheet,
whereby said cushions are positionable for supporting different portions of a user seated on said seat, and are easily repositionable for obtaining a desired fit.

5,533,788
READY-TO-ASSEMBLE FURNITURE WITH IMPROVED FASTENING MEANS

John R. Nottingham; John W. Spirk, both of Moreland Hills; Jeffery M. Kalman, Cleveland Heights; Robert G. Taylor, Strongsville; Roland A. Stenta, Shaker Heights, and Emily P. Stenta, Cincinnati, all of Ohio, assignors to Galsten Trading, Inc., Cleveland, Ohio
Division of Ser. No. 794,410, Nov. 19, 1991, Pat. No. 5,332,289, which is a continuation-in-part of Ser. No. 531,878, May 31, 1990, Pat. No. 5,088,180. This application Jul. 25, 1994, Ser. No. 279,930
Int. Cl.^{6} A47C *4/03*
U.S. Cl. 29.7—440.1 14 Claims

1. An assembly of structural elements aligned substantially perpendicular to each other, comprising:
(a) a first structural element having within a surface thereof at least one elongated slot, said slot having a width, length and depth and defining an axis along its length;



(b) a first fastener means attached to the surface of the first structural element along the axis and aligned with the elongated slot;

(c) a second structural element;

(d) at least one elongated dowel extending from a surface of the second structural element, said elongated dowel having a width substantially equal to the width of the elongated slot, a height less than or substantially equal to the depth of the elongated slot, and a length substantially greater than its width, said dowel defining an axis along its length;

(e) a second fastener means which is capable of engagement with the first fastener means attached to the surface of the second structural element along the axis defined by the elongated dowel and positioned at a spaced distance from the dowel

wherein the first and second structural elements are solidly but removably fastened together by sliding movement of one structural element relative to the other structural element such that the elongated dowel slides into and along the elongated slot and the first fastener means engages the second fastener means.

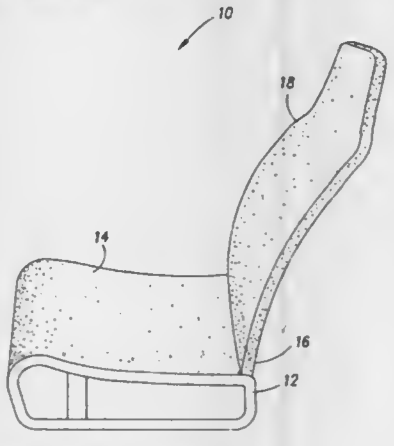
5,533,789
SEATING STRUCTURE

George C. McLarty, III, Greenville; Anthony R. Waldrop, Easley, and Kathryn T. Anderson, Greenville, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 10, 1994, Ser. No. 337,260

Int. Cl.^{6} A47C *7/02*

U.S. Cl. 297—452.64 **5 Claims**



1. A seating structure, comprising:

a seating frame;

a seating support web disposed in stretched relation across the seating frame;

a back frame extending generally vertically with respect to the seating frame; and

a back support web disposed in stretched relation across the back frame, wherein at least one of the seating support web or the back support web comprises a warp knit weft-insertion fabric having an elastomeric monofilament yarn in the warp forming a performance side, an elastomeric wrapped filament yam in the weft forming an aesthetic surface and a knit filament yam tying the warp and the weft together wherein the warp knit weft-insertion fabric exhibits a substantially linear stress strain relationship in the warp direction of between about 2 and about 4 pounds force per percent elongation from initiation of loading to failure when measured for tensile strength in the warp direction according to ASTM method D-5034 and wherein the warp knit weft-insertion fabric exhibits a two-stage stress strain relationship in the weft direction such that the fabric undergoes elongation of between about 25 percent and about 65 percent from initiation of loading up to an applied stress of about 10 pounds force and substantially linear elongation in the range of between about 2 and about 4 pounds force per percent elongation with applied stress from about 10 pounds force to failure when measured for tensile strength in the weft direction according to ASTM method D-5034.

5,533,790
FLOOR MILLING MACHINES

Raymond F. Weiland, 63 Astley Street, Lower Templestowe, Victoria 3107, Australia, assignor to Raymond F. Weiland, and Pamela Weiland, both of Lower Templestowe, Australia

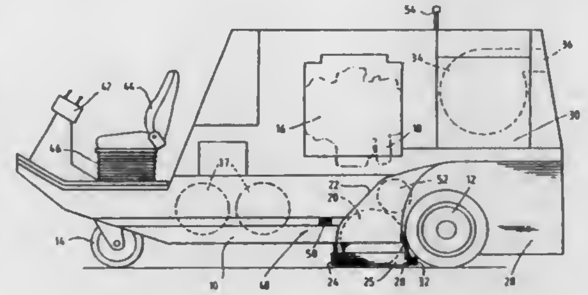
PCT No. PCT/AU92/00569, § 371 Date Jul. 11, 1994, § 102(e) Date Jul. 11, 1994, PCT Pub. No. WO93/08003, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 22, 1992, Ser. No. 232,107

Claims priority, application Australia, Oct. 22, 1991, PK9046

Int. Cl.^{6} E01C *23/088;23/12*

U.S. Cl. 299—1.5 **29 Claims**



1. A floor milling machine for taking up floor tiles from a tiled floor surface inside a building comprising:

a chassis structure supported by a plurality of ground-engaging wheels;

rotatable milling means mounted on the chassis structure for engagement with a tiled floor surface to take up tiles from the floor surface;

height adjustment means to adjust the level of one or more of the ground-engaging wheels relative to the milling means;

control means for controlling the height adjustment means; and

ultrasonic detection means to sense information about the tiled floor surface beneath the machine;

the control means being adapted to control the height adjustment means in response to signals from the detection means, whereby a layer of tiles of a particular thickness can be removed by the milling means.

5,533,791
BRUSH MAKING MACHINE

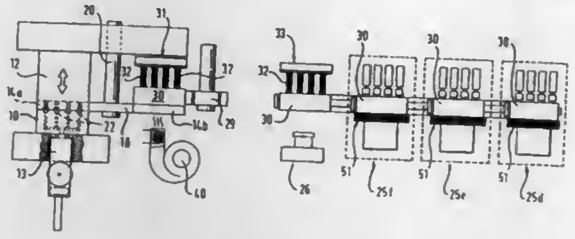
Bart G. Boucherie, Izegem, Belgium, assignor to G.B. Boucherie N.V., Izegem, Belgium

Filed Apr. 28, 1995, Ser. No. 431,322

Claims priority, application United Kingdom, May 9, 1994, 9409147

Int. Cl.^{6} A46D *3/04*

U.S. Cl. 300—4 **15 Claims**



1. A brush making machine comprising a mold for injection molding of brush bodies having tufts of bristles embedded in the molding material, said mold comprising a mold part having a cavity defining surface portion with tuft insertion holes therein arranged in a pattern corresponding to a desired tuft pattern of the brush to be produced, and a tuft feeder being provided for introducing tufts of bristles into said holes so that the bristles project into said cavity, said tuft feeder comprising a plurality of tuft picking stations, each tuft picking station having an associated bristle container containing different pre-finished bristles in a parallel packed relationship and an associated tuft picker with a set of tuft picking tubes, and a plurality of tuft carriers movable between said tuft picking stations for carrying to said mold tufts of bristles picked out from said bristle containers by said tuft picking tubes.

5,533,792
METHOD AND DEVICE FOR MANUFACTURING BRUSHES

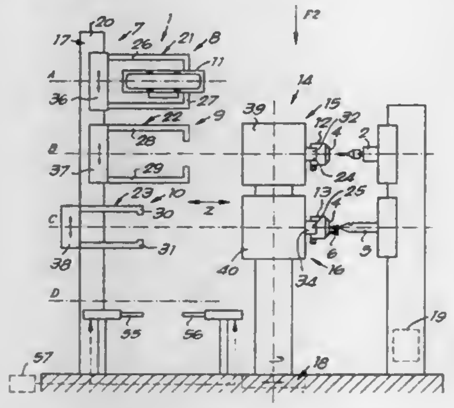
Leonel Boucheric, Izegem, Belgium, assignor to Firma G.B. Boucherie, Naamloze Vennootschap, Stuivenbergstraat, Belgium

Filed Feb. 1, 1995, Ser. No. 382,174

Claims priority, application Belgium, Feb. 1, 1994, 09400110

Int. Cl.^{6} A46D *3/08*

U.S. Cl. 300—11 **17 Claims**



1. A method for manufacturing brushes comprising:

providing a boring tool and a filling tool for making openings in brush bodies and providing brush bristles in these openings at respective workstations, providing at least three brush body holders for carrying said brush bodies, presenting two of said at least three brush body holders carrying respective brush bodies to the boring tool and the filling tool respectively during a work cycle while another of said at least three brush body holders alternately carries off a filled brush body and supplies an empty brush body, and automatically carrying said three brush body holders to the next work station according to a closed circuit at the end of each work cycle.

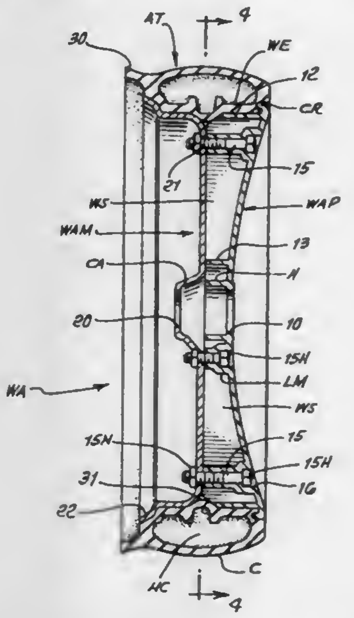
5,533,793
AGRICULTURAL TIRES AND WHEEL ASSEMBLIES THEREFORE

Perry Walker, Dunlap, Ill., assignor to Gleason Corporation, Los Angeles, Calif.

Continuation of Ser. No. 406,045, Mar. 17, 1995. This application May 1, 1995, Ser. No. 431,860

Int. Cl.^{6} B60B *3/08*

U.S. Cl. 301—64.4 **16 Claims**



1. An agricultural wheel assembly for use with agricultural row crop planting machinery and grain drills, said wheel assembly comprising

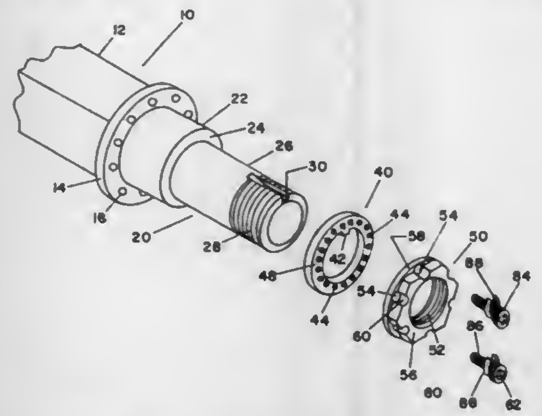
a molded plastic wheel half and a metal wheel half adapted to be assembled and secured in a side by side relationship,

said plastic wheel half having a shallow cup wheel half on one side thereof for substantially eliminating soil build up on said one side of said wheel half and a central opening having a hub means extending axially outwardly from the other side of said wheel half a preselected distance for forming a substantially full length wheel bearing support, said other side of said plastic wheel half having a tire mounting peripheral lip extending radially outwardly thereof for clinching engagement with the outer sidewall of a tire base mounted on said wheel half and a concentric tire mounting ring molded adjacent said lip and extending a preselected axial distance outwardly thereof for receiving and mounting a tire base thereon, webbing means extending radially between said hub means and said tire mounting ring for strengthening said plastic wheel half for transferring any load shock from said tire mounting ring to said hub means,

said metal wheel half having one side formed with a substantially deep cup configuration on one side thereof and substantially flat configuration on the opposite side thereof for abutting engagement with said webbing means of said plastic wheel half when said wheel halves are assembled and secured in a side by side relationship, said metal wheel half including integrally formed, centrally apertured hub extending axially outwardly of said flat side to be coaxial with said plastic hub means when mounted and secured in a side by side relationship with said plastic wheel half, said metal wheel half having sidewalls extending radially outwardly and being defined to closely mate with the configuration of a tire base mountable on said metal sidewalls on said secured wheel halves, and releasable fastening means secured to said wheelhalves in a manner to prevent wheel movement under side loads subjected to the wheel assembly.

5,533,794
HUB LOCK

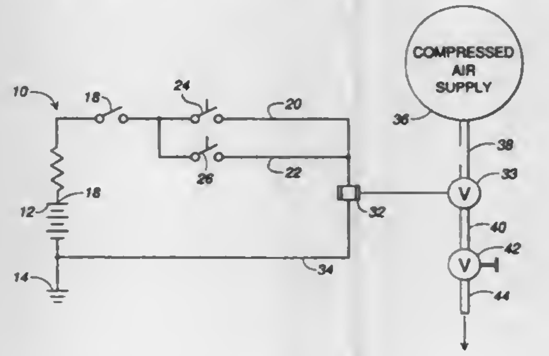
James E. Faison, 1113 A Thicket Ct., Columbus, Ind. 47201
Filed Jun. 24, 1994, Ser. No. 264,902
Int. Cl.⁶ B60B *27/00*
U.S. Cl. 301—105.1 **20 Claims**



1. A locking device for holding a hub bearing on a spindle, the spindle having a keyway and threads formed thereon comprising:
- a) a washer having a key for aligning with said keyway of the spindle and further including threaded apertures positioned circumferentially about said washer for receiving a bolt; and
- b) a nut for interfacing with threads of the spindle and further including holes for aligning with said threaded apertures and for receiving a pair of bolts for fastening said washer and said nut.

5,533,795
BRAKE SAFETY SYSTEM FOR VEHICLES WITH SEAT AND DOOR CONTROL

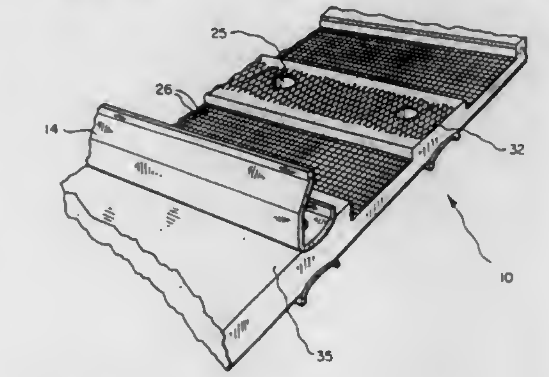
Louie J. Brooks, 1142 Littlevine Church Rd., Villa Rica, Ga. 30180
Continuation of Ser. No. 287,929, Aug. 9, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 536,176
Int. Cl.⁶ B60T *7/14*
U.S. Cl. 303—6.1 **16 Claims**



1. A safety system for comprising:
a truck which has an operator's seat and an operator's door,
a source of electricity having a positive and a negative;
an ignition switch having a positive and a negative connected to the respective positive and negative of the source;
a pressure operated seat switch with a first electrical circuit including said seat switch leading from the one side of the source;
a door switch electronically connected in a second parallel circuit to the said one side of said electrical source;
a source of fluid pressure for operating a parking brake on said truck,
a manual parking brake release valve,
an electrical control means for operating said parking brake;
release valve means for controlling the fluid pressure in response to operation of said electrical means whereby whenever the seat switch and the door switch are open the parking brake is set and applied to prevent the truck from movement so that whenever the operator of the truck leaves the seat and opens the door, the parking brake prevents the movement of the truck until the system is returned to normal and brake released by either the closing of the door or the proper pressure in the seat from the presence of the operator.

5,533,796
BELT CONSTRUCTION FOR VEHICLE ENDLESS TRACK

Micheal G. Beeley, Logan, Utah, assignor to LMC Operating Corp., Logan, Utah
Filed Aug. 15, 1994, Ser. No. 290,612
Int. Cl.⁶ B62D *55/24*
U.S. Cl. 305—188 **4 Claims**

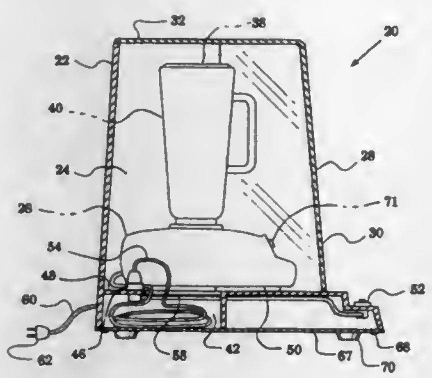


1. An flexible vehicle track assembly, comprising:
an endless strip of flexible plastic material reinforced by a multiplicity of strands of fiber embedded therein;
cleat assemblies affixed to the belt at intervals therealong, each including at least one cleat mounting bolt acting within an associated bolt hole provided through the belt; wherein
at least a fraction of the multiplicity of reinforcing strands is provided embedded within each portion of the belt carrying said bolt hole, said strands being placed in a pattern surrounding said bolt hole and each being directed a substantial angle to the longitudinal direction of the belt, said angle being substantially less than 90°.

5,533,797
KITCHEN, BAR AND RESTAURANT APPLIANCE HOUSING

Barry S. Gelber, P.O. Box 5883, Newport Beach, Calif. 92662
Filed Sep. 14, 1994, Ser. No. 306,103
Int. Cl.⁶ A47F *3/00*
U.S. Cl. 312—138.1 **16 Claims**

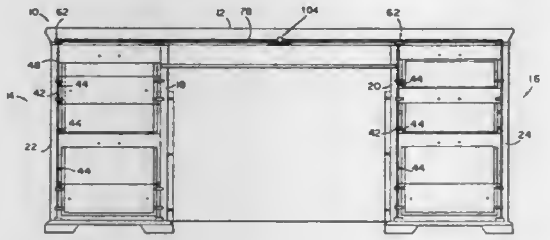
1. Housing apparatus, comprising:
an enclosure defining a compartment with an open front and top for receiving an appliance;
a translucent cover configured to close said compartment open front and top and rotatably mounted to said enclosure on an inclined hinge line, gravity thereby urging said cover toward a closed position abutting said enclosure;
an electrical receptacle in said compartment for receiving an electrical cord of the appliance;

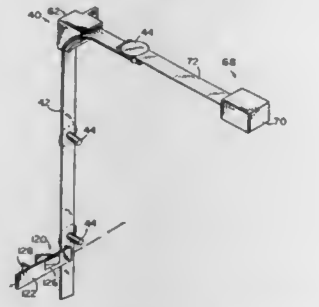


an electrical housing cord connected to said receptacle;
a first chamber, below said compartment, configured to receive therein excess length of the appliance cord, and a second chamber, below said compartment, configured to receive therein excess length of the housing cord; and
a slot providing communication between said compartment and said first chamber for passing excess length of the appliance cord therethrough.

5,533,798
LOCK SYSTEM FOR CASEGOODS

Thomas G. Feldpausch, Hastings; Phillip D. Carino, Grand Rapids; Frederick S. Faiks, Greenville; David M. DeBoer; Samuel J. Ellison, both of Grand Rapids, and Daniel N. Siegrist, Kentwood, all of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.
Filed Oct. 15, 1993, Ser. No. 138,638
Int. Cl.⁶ E05B *65/46*
U.S. Cl. 312—219 **45 Claims**

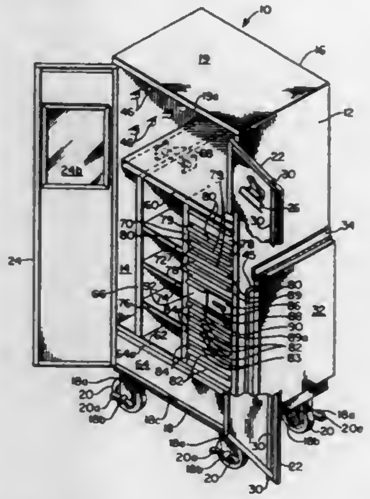




1. A lock for an article of furniture having openable members such as drawers and doors, said system comprising:
an elongated lock member having a laterally flexible, longitudinally non-stretchable construction which permits longitudinally spaced apart portions thereof to be oriented at an angle to each other, thereby adapting said lock member to be routed through an associated article of furniture;
a plurality of lock studs positioned in spaced relationship on said lock member, and extending outwardly from a surface of said lock member;
a lock actuator operatively connected to said lock member, and moving said lock member between locked and unlocked positions; and
a plurality of catches, each being adapted to be operably connected to an openable member of the associated article of furniture and wherein said catches are engaged by said lock studs when the lock member is in the locked position.

5,533,799
SPRAY PAINTER'S CABINET

Edward L. Nickolaus, Jr., 2333 Country Club Dr., Laplace, La. 70068-1820
Filed Feb. 6, 1995, Ser. No. 384,025
Int. Cl.⁶ A47B *46/00;49/00;97/00*
U.S. Cl. 312—249.12 **10 Claims**



1. A cabinet for storing spray painting supplies and equipment comprising a box-like body having
- a. two rectangular vertical parallel sidewalls rigidly connected to a vertical rectangular backwall,
- b. a rectangular horizontal bottom rigidly connected to the bottom of said two rectangular vertical parallel sidewalls and said vertical rectangular backwall,
- c. a rectangular horizontal top rigidly connected to the top of said two rectangular vertical parallel sidewalls and said vertical rectangular backwall,
- d. door means rotatably connected to one of said two rectangular sidewalls for selective parallel alignment with said rectangular backwall to enclose a portion of the inside of said box-like body,
- e. at least one upper shelf rigidly connected to an inside surface of each of said two sidewalls and to an inside surface of said backwall, said shelf being aligned parallel to said rectangular horizontal top,
- f. a plurality of slot means for holding paint spray guns connected to inside surfaces said side walls between said shelf and said rectangular horizontal top for holding spray paint guns,
- g. a plurality of slidable pull-out drawers located between said two parallel sidewalls and adjacent to one of said two sidewalls,
- h. at least one air-tight drawer connected to the inside of one of said sidewalls beneath said shelf for storing air sensitive respirators,
- i. said cabinet having vertical space means therein for hanging clothes comprising a vertical rectangular panel located between and parallel to said vertical sidewalls connected perpendicularly to said upper shelf beneath said upper shelf adjacent to one of said sidewalls to define said vertical space between said vertical panel and said one of said sidewalls for hanging clothes,
- j. a horizontal rod connected to said vertical panel and said one of said sidewalls for receipt and hanging of clothes thereon,
- k. a flat, generally rectangular foldable table connected to an outside surface of one of said sidewalls, said foldable table

being connected to said outside of one of said walls by hinge means, said foldable table having support means connected thereto for selectively supporting said table in a horizontal position perpendicular to said sidewall to which said table is rotatably connected, and

l. a plurality of flat, rectangular shelves located beneath said upper shelf.

5,533,800

PROCEDURE AND APPARATUS FOR DETECTING VISCOSITY CHANGE OF A MEDIUM AGITATED BY A MAGNETIC STIRRER

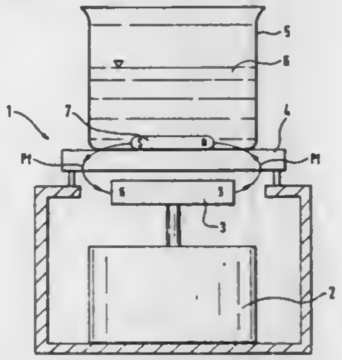
René Stiegelmann, Staufen; Erhard Eble, Bad Krozingen-Tunsel, and Helmut Siegel, Bad Krozingen, all of, Germany, assignors to Janke & Kunkel GmbH & Co. KG IKA-Labortechnik, Staufen, Germany

Filed Nov. 9, 1994, Ser. No. 336,448

Claims priority, application Germany, Nov. 19, 1993, 43 39 328.4

Int. Cl.^{6} B01F *13/08*

U.S. Cl. 366—142 **13 Claims**



1. A procedure for detection of a change in viscosity of a medium (6) stirred in a container (5) by means of a magnetic stirrer (1), comprising rotating a stirring magnet (7) in the medium (6) by means of a drive motor (2) which drives a magnet (3) that is rotated underneath the container (5) and is magnetically coupled with the stirring magnet (7), holding the speed of rotation of the drive motor (2) constant by means of regulation, and during changes in load on the magnet (3) detecting and displaying changes in the regulation.

5,533,801

ELECTRICALLY OPERATED HAND MIXER INCLUDING AN ATTACHMENT

Vicente Safont; Jose Millan, both of Barcelona; Antonio Rebordosa, Manresa, and Alejandro Hernandez, Santa Oliva, all of, Spain, assignors to Braun Aktiengesellschaft, Kronberg, Germany

Filed Apr. 24, 1995, Ser. No. 428,778

Claims priority, application Germany, Apr. 25, 1994, 44 14 415.6

Int. Cl.^{6} B01F *7/16*

U.S. Cl. 366—249 **10 Claims**

1. An attachment for an electrically operated hand mixer having at least a first drive shaft adapted for detachable coupling with various processing tools, the first drive shaft including a first toothing, the attachment comprising:

a bowl;

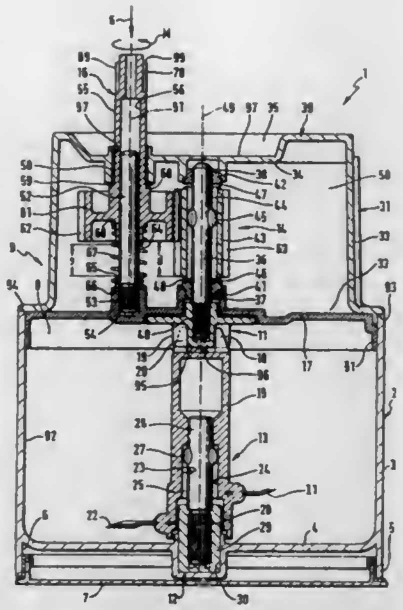
a lid closable on the bowl;

an output shaft with a free end and a lower end, the free end of the output shaft extending upwardly through the lid and adapted to be non-rotatably coupled with the first drive shaft of the hand mixer when the hand mixer is placed on the lid, the output shaft providing a matching second toothing which mates with the first toothing on the first drive shaft, and the non-rotatable coupling being established by engagement of the first toothing provided on the first drive shaft of the hand mixer with the matching second toothing provided on the free end of the output shaft;

a spring coupled between the output shaft and the lid, wherein the output shaft is axially displaceable into the lid in opposition to the force of the spring during coupling action of the hand mixer and the attachment;

a blade assembly in the bowl for chopping foods; and

a second shaft rotatably coupled to the output shaft so that rotation of the output shaft causes the second shaft to rotate, the second shaft including a coupling which transfers rotation of the second shaft to the blade assembly.



5,533,802

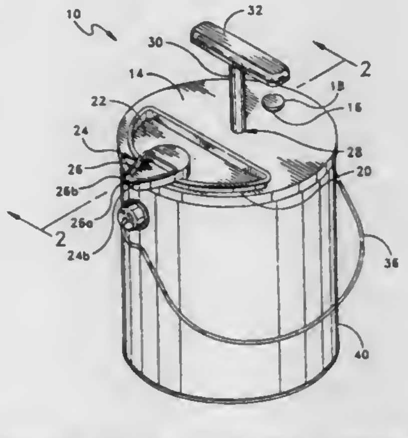
PAINT CAN ACCESSORY

Richard S. Garganese, 40 Celestia Ct., North Kingstown, R.I. 02852

Filed Mar. 6, 1995, Ser. No. 398,672

Int. Cl.^{6} B01F *7/16*

U.S. Cl. 366—256 **11 Claims**



1. A multi-purpose accessory used with a container for protecting a container sealing groove, mixing liquid in said container, replacing an original container lid, permitting access to liquid in the container, pouring liquid from the container, said accessory comprising:

a substantially circular main body having a first aperture, a second aperture, a third aperture, and a circumferential trough in its underside and about its periphery; said trough being capable of sealingly covering a container sealing groove;

a resealable plug engageable with said first aperture;

an insert releasably engageable with said second aperture; said insert having a pouring spout therein;

a cap releasably engageable with said pouring spout;

a mixing shaft slidably engaged with said third aperture; said mixing shaft having a first end positioned above said main body and a second end positioned below said main body;

an agitator plate affixed to said first end;

a handle affixed to said second end; and

whereby said handle is actuated up and down to slide said shaft within said third aperture to actuate said agitator plate up and down to mix liquid in a container upon which the multipurpose accessory is affixed.

5,533,803

MAGNETIC STIRRING APPARATUS WITH CONTACTLESS COUPLING BETWEEN STIRRING SHAFT AND STIRRING TOOL

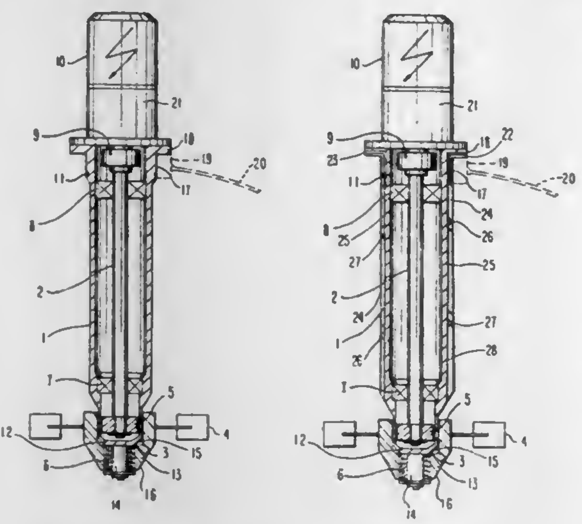
Hans P. Meier, Jona, Switzerland, assignor to MAVAG Verfahrenstechnik AG, Altendorf, Switzerland

Continuation-in-part of Ser. No. 129,421, Sep. 30, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 335,078

Claims priority, application Germany, Oct. 1, 1992, 42 32 935.3

Int. Cl.^{6} B01F *13/08*

U.S. Cl. 366—273 **6 Claims**



1. A magnetic stirring apparatus, comprising a vessel; a stirring shaft having a substantially vertical axis, and an upper and a lower end; a drive connected with said upper end of said stirring shaft so as to drive said stirring shaft; a stirring tool located in the region of said lower end of said stirring shaft; a contactlessly operating coupling for transmitting a driving movement from said stirring shaft downwardly to said stirring tool, said contactlessly operating coupling being arranged between said stirring shaft and said stirring tool; a pipe inside which the stirring shaft is arranged, said pipe having a lower end formed as a cup-shaped gap pipe, said stirring shaft extending into said gap pipe and being provided with a magnetic disc, means for mounting the apparatus on said vessel so that said stirring shaft and said stirring tool extend downwardly into said vessel; bearing means rotatably by holding said stirring shaft in said pipe and including two bearings axially spaced from one another, said two bearings being located inside said vessel; and further bearing means arranged inside said vessel and rotatably holding said stirring tool on said pipe.

5,533,804

PROCESS FOR PREPARING A STOCK SOLUTION COMPOSITION FOR A MEDICAL TREATMENT, AND A SOFT BAG HAVING A MAGNETIC STIRRER TO BE USED IN THE PREPARATION OF SAID STOCK SOLUTION COMPOSITION

Ake Larsson, Tokyo, and Kiyoshi Uno, Shiga, both of, Japan, assignors to Gambro KK, Japan

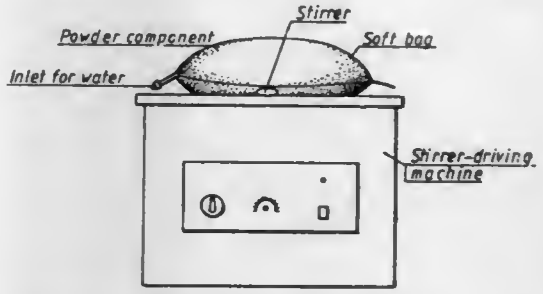
PCT No. PCT/SE93/00191, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/18805, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 5, 1993, Ser. No. 307,653

Claims priority, application Japan, Mar. 19, 1992, 3-063695

Int. Cl.^{6} B01F *13/08;* **A61J** *1/10;1/14*

U.S. Cl. 366—274 **11 Claims**



1. A process for the preparation of a stock solution for use in dialysis, hemodialysis, hemofiltration, or hemodiafiltration comprising: providing a container which is a soft flexible bag, said bag containing components of said stock solution useful in dialysis, hemodialysis, hemofiltration or hemodiafiltration, said components being in the form of a powder, providing a magnetic stirrer within said bag, supplying a predetermined amount of water into said bag, placing said bag in direct contact with a source of a magnetic field, and dissolving said powder in said water within said flexible bag at a temperature of about room temperature or above, to provide a stock solution at a predetermined concentration by stirring said powder and said water together by the application of said magnetic field to said magnetic stirrer, said powder being dissolved and stirred without said bag being placed in any other container.

5,533,805

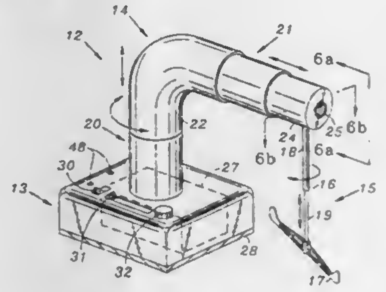
FREE-STANDING STIRRER APPLIANCE

SaraLynn Mandel, P.O. Box 1209, El Granada, Calif. 94018

Filed Apr. 27, 1995, Ser. No. 429,797

Int. Cl.^{6} B01F *7/20*

U.S. Cl. 366—285 **17 Claims**



1. An appliance for use in stirring food in a utensil during food preparation, said appliance comprising:

a) a free-standing base defining a perimeter;

b) a support affixed to said base, said support comprising an upwardly extending portion and a portion extending in a transverse direction relative to said upwardly extending portion, said support being selectively extendible and contractible in both the upward and transverse directions;

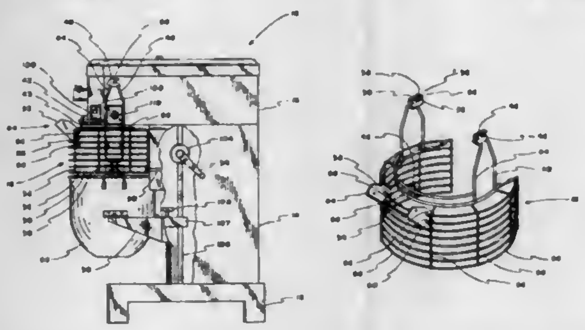
c) means in said support for removably receiving a downwardly directed stirrer element for stirring food in the utensil; and

d) a motor operatively connected with said receiving means.

5,533,806
GUARD FOR INDUSTRIAL SIZE FOOD MIXER

Loren Veltrop, Deerfield; Joel G. Friedl, Bloomingdale, and Roberto Nevarez, Kirkland, all of Ill., assignors to Middleby Marshall Inc., Elgin, Ill.

Filed May 19, 1995, Ser. No. 444,549
Int. Cl.^{6} B01F *15/00*
U.S. Cl. 366—347 16 Claims

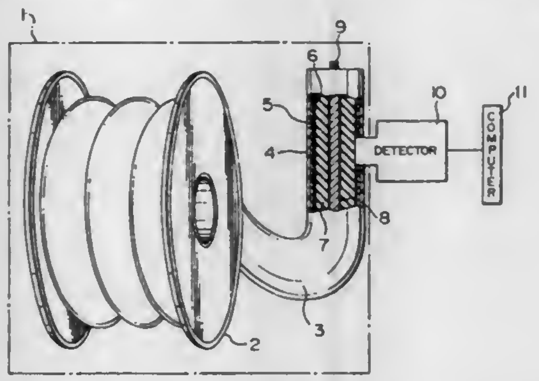


1. A guard system for preventing a person from putting his hand into a mixing bowl on an industrial sized food mixer having a mixing tool fitting into the mixing bowl, said guard system comprising a guard basket shaped to enclose substantially all open space between said mixer and said mixing bowl and in an area giving access to the mixer tool, said guard basket having oppositely disposed handle means raising above the basket, a pair of latch means attached to upper ends of said handle means, and hinge pin means on opposite sides of said mixer for receiving said latch means, said guard basket swinging on said hinge pin means between an out of the way location and a space enclosing operating position.

5,533,807
MEASUREMENT OF CROSSLINKING BY-PRODUCTS IN CROSSLINKED POLYETHYLENE

Soli S. Bamji, Gloucester, and A. T. Bulinski, Orleans, both of, Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Oct. 14, 1994, Ser. No. 323,108
Int. Cl.^{6} G01N *25/00;* G21H *3/02*
U.S. Cl. 374—45 7 Claims



1. A method of measuring the concentration of crosslinking by-products in crosslinked polyethylene comprising heating the polyethylene to a sufficiently high temperature to cause thermoluminescence of the crosslinking by-products; and measuring the intensity of the thermoluminescence to obtain an indication of the concentration of the crosslinking by-products and hence the ultimate strength of the polyethylene.

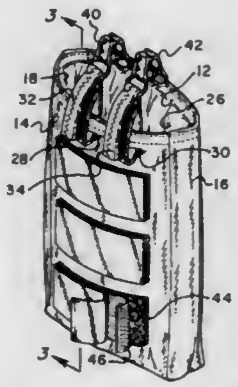
5,533,808

Patent Not Issued For This Number

5,533,809
REMOTE CONTROL CADDY

Mary J. Gorman, 116 Garfield Ave., Cherry Hill, N.J. 08002

Filed Mar. 16, 1995, Ser. No. 404,951
Int. Cl.^{6} B65D *33/14*
U.S. Cl. 383—11 6 Claims



1. A remote control caddy for supporting a remote control unit therein comprising:

an enclosure means including a front wall, a rear wall, a pair of opposing side walls, a bottom wall and an open top end, said walls defining a cavity for receiving said remote control unit through said open top end;

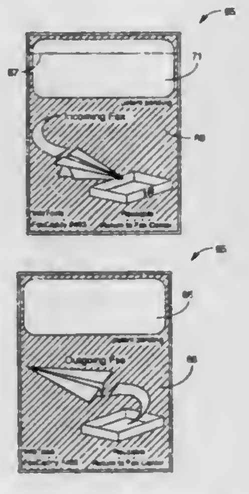
liner means being secured to the interior of each of said walls for protecting said remote control unit against mechanical shock, and

means for releasably securing said remote control caddy to a piece of furniture, said securing means including a pair of spring clips secured to and extending above the top of said rear wall.

5,533,810
DOCUMENT CARRIER

Daniel L. Jensen, 3751 Norris Canyon Rd., San Ramon, Calif. 94583

Filed Jul. 7, 1994, Ser. No. 272,671
Int. Cl.^{6} B65D *33/04*
U.S. Cl. 383—66 19 Claims



1. A substantially rectangular document carrier of length L and width W, comprising:

a first layer of film; and

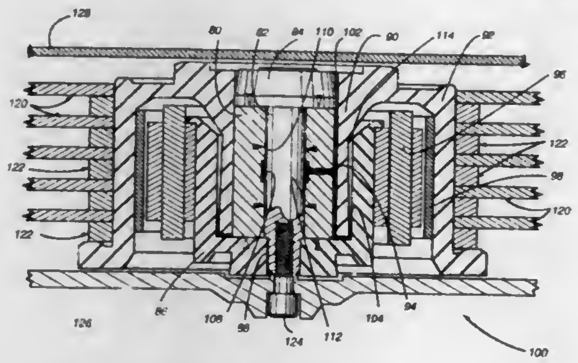
a second layer of film joined to the first layer along all four edges, forming an enclosure having first and second exposed sides, the second layer having a permanent slit opening across the width W within one third of length L from one closed end;

wherein both the first and second layers are substantially opaque excepting a transparent region through each layer within one third of length L from one closed end, and wherein the first and second exposed sides are distinguished from one another by being of different color.

5,533,811
HYDRODYNAMIC BEARING HAVING INVERTED SURFACE TENSION SEALS

Ewaryst Z. Polch, Monument; Carl D. Williams, and Jackie Cordova, both of Colorado Springs, all of Colo., assignors to Quantum Corporation, Milpitas, Calif.

Filed Feb. 14, 1995, Ser. No. 388,380
Int. Cl.^{6} F16C *33/72*
U.S. Cl. 384—107 54 Claims



1. A hydrodynamic bearing comprising:

a longitudinally extending sleeve;

an elongated shaft having first and second ends thereof, said sleeve axially surrounding said shaft for rotation relative thereto;

a first thrust plate coupled to said first end of said shaft;

a second thrust plate coupled to said second end of said shaft;

a lubricant disposed between said shaft and said sleeve and between said first and second thrust plates and said sleeve;

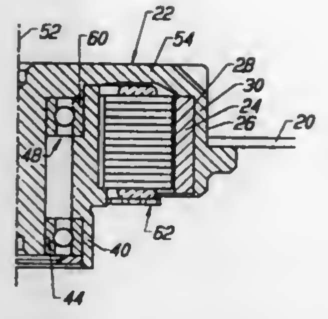
said first thrust plate extending radially outward adjoining a corresponding first end of said sleeve forming a gap for containing said lubricant therebetween, said first thrust plate further extending axially inward toward a center of said bearing along an outer surface of said sleeve defining a surface tension seal forming gap therebetween, said lubricant disposed within said surface tension seal forming gap providing a surface tension seal.

5,533,812
SINGLE PLATE HYDRODYNAMIC BEARING WITH SELF-BALANCING FLUID LEVEL

Hans Leuthold; David J. Jennings, both of Santa Cruz; Gunter Heine, Aptos, and Lakshman Nagarathnam, Capitola, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 22, 1994, Ser. No. 279,199
Int. Cl.^{6} F16C *32/06*
U.S. Cl. 384—112 19 Claims

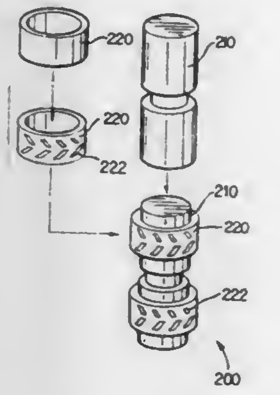
1. An improved spindle comprising an electromagnetic motor and a bearing system, said bearing system comprising a sleeve and a shaft fitted into an axial bore or bushing of said sleeve, said shaft and said bushing rotating freely relative to each other, said shaft defining together with said bushing a journal bearing; said shaft further supporting an annular thrust plate, said thrust plate extending into a recess formed by an axial face stepped into said sleeve and a counterplate parallel to said thrust plate and attached to said sleeve, and said axial face defining together with the adjacent thrust plate surface a first thrust bearing, and the gap between said thrust plate and said counterplate forming a second thrust bearing, both thrust bearings opposing each other; said counterplate defining a bore concentric to said shaft, said shaft ending within said bore of said counterplate, said bore in said counterplate being closed off by a shield on the side opposing an end of said shaft, thus creating a fluid filled bearing system which is open only on one end; said first thrust bearing and said second thrust bearing creating together a pressure difference pumping fluid towards the open end of said bearing system, said journal bearing creating a pressure difference pumping fluid towards the closed end of said bearing system, the combined net fluid flow in said bearing system becoming substantially zero under steady state conditions.



5,533,813
DYNAMIC AIR PRESSURE BEARING

Hiroshi Makino, and Teiji Sata, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1994, Ser. No. 320,271
Claims priority, application Japan, Feb. 28, 1994, 6-029989
Int. Cl.^{6} F16C *33/20*
U.S. Cl. 384—115 6 Claims



1. A dynamic air pressure bearing comprising:

a shaft having a shaft main body and bearing member laminated around an outer peripheral portion of said shaft main body, said shaft main body being formed of a plastic material, and said bearing member being formed from one of a ceramic material and a metal material and having an elastic modulus higher than that of said shaft main body; and

a sleeve fitted around an outer peripheral side of said shaft with a gap such that said sleeve is spaced from said shaft and rotated relative to said shaft;

wherein at least one of said shaft and said sleeve includes grooves for generating dynamic air pressure.

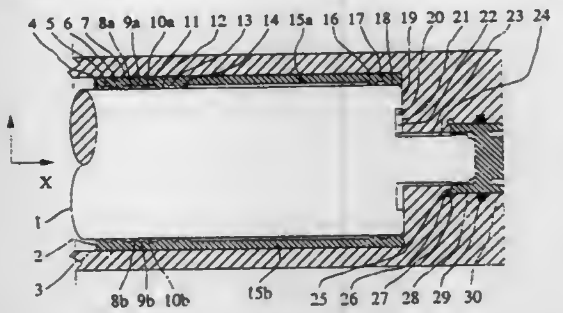
5,533,814
LOW PROFILE SELF-COMPENSATED HYDROSTATIC THRUST BEARING

Alexander H. Slocum, Concord, N.H., assignor to AESOP, Inc., Concord, N.H.

Filed May 4, 1994, Ser. No. 237,853

Int. Cl.^{6} F16C *32/06*

U.S. Cl. 384—123 **9 Claims**



1. A spindle having a shaft mounted within a hydrostatic bearing having an end surface for resisting axial thrust force upon the end surface, the hydrostatic bearing being a fluid-controlled self-compensating bearing mounted circumferentially about the shaft near the end surface, the bearing being mounted upon an axially extending member one end of which serves as part of the end surface of fie shaft and the other end of which serves as a reverse thrust surface, a fluid supply groove extending radially across said reverse thrust end surface an opening extending axially between the reverse thrust end surface and the end surface of the shaft, and connecting with the groove, a source of pressurized fluid, and means for connecting the source with the groove to flow fluid therealong and through the opening, thereby opposing the thrust force with pressure proportional to the axial position of the shaft and related to the degree of fluid compensation in the bearing.

5,533,815
BEARING ARRANGEMENT FOR A DEVICE COMPRISING TWO ROTATING COMPONENTS

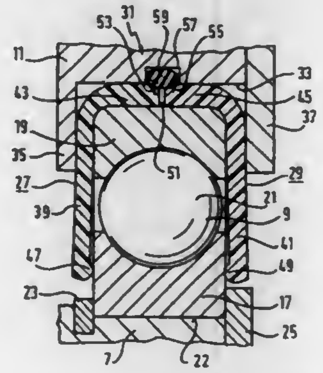
Bernhard Schierling, Kürnach; Hilmar Göbel, Grafenrheinfeld, and Cora Carlson, Hambach, all of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Aug. 19, 1993, Ser. No. 109,364

Claims priority, application Germany, Aug. 20, 1992, 42 27 533.4; Aug. 12, 1993, 43 27 079.4

Int. Cl.^{6} F16F *15/30*

U.S. Cl. 384—482 **28 Claims**



1. A dual-mass flywheel comprising a first flywheel rotatable about an axis of rotation, a second flywheel rotatable relative to the first flywheel over a limited angle of rotation around the axis of rotation, torsional damping means elastically connecting the first flywheel to the second flywheel, and a bearing assembly between the first and second flywheels, the bearing assembly having:

- an inner bearing seat operationally fixedly connected to one of the flywheels,
- an outer bearing seat coaxial with the inner bearing seat and operationally fixedly connected to the other of the two flywheels,
- a cageless ball bearing arranged radially between the inner and outer bearing seats and guiding the flywheels radially and axially in relation to each other, said bearing having a circumferentially continuous inner bearing race guided on the inner bearing seat, an outer bearing race split radially along a parting line and guided on the outer bearing seat and a plurality of balls substantially filling circumferentially the space between the bearing races, and
- an annularly closed sealing and insulating ring arrangement including a central ring region arranged radially between the outer bearing race and the outer bearing seat and ring arms that are arranged axially on both sides of the ball bearing to project radially from the central ring region and of which each one rests stationarily on a respective lateral face of the outer bearing race and in a sliding manner on a respective lateral face of the inner bearing race, the sealing and insulating ring arrangement being formed of two parts having an annular juncture located radially outwardly of the outer bearing race, and the sealing and insulating ring arrangement further including sealing means for sealing the juncture and including one of an elastic sealing ring, overlapping sealing faces on the two parts, and a circumferentially continuous sealing seam formed between the two parts by plastic deformation of at least one of the parts.

5,533,816
THERMAL RECORDING METHOD AND RECORDING APPARATUS USING THE SAME

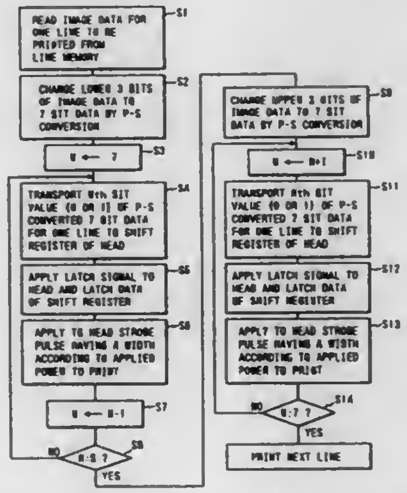
Keiichi Ikeda, Yokohama, and Yoshiyuki Mizoguchi, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,034, May 24, 1993, abandoned, which is a continuation of Ser. No. 899,941, Jun. 17, 1992, abandoned, which is a continuation of Ser. No. 456,484, Dec. 26, 1989, abandoned. This application May 23, 1994, Ser. No. 247,396

Claims priority, application Japan, Dec. 23, 1988, 63-323681; Dec. 21, 1989, 1-329571

Int. Cl.^{6} B41J *2/36*

U.S. Cl. 400—120.07 **33 Claims**


READ IMAGE DATA FOR ONE LINE TO BE PRINTED FROM LINE MEMORY
S1
CHANGE LOWER 3 BITS OF IMAGE DATA TO 7 BIT DATA BY P-S CONVERSION
S2
N ← 7
S3
TRANSPORT Nth BIT VALUE (0 OR 1) OF P-S CONVERTED 7 BIT DATA FOR ONE LINE TO SHIFT REGISTER OF HEAD
S4
APPLY LATCH SIGNAL TO HEAD AND LATCH DATA OF SHIFT REGISTER
S5
APPLY TO HEAD STROBE PULSE HAVING A WIDTH ACCORDING TO APPLIED POWER TO PRINT
S6
N ← N-1
S7
NO
N:0 ?
S8
YES
CHANGE UPPER 3 BITS OF IMAGE DATA TO 7 BIT DATA BY P-S CONVERSION
S9
N ← N+1
S10
TRANSPORT Nth BIT VALUE (0 OR 1) OF P-S CONVERTED 7 BIT DATA FOR ONE LINE TO SHIFT REGISTER OF HEAD
S11
APPLY LATCH SIGNAL TO HEAD AND LATCH DATA OF SHIFT REGISTER
S12
APPLY TO HEAD STROBE PULSE HAVING A WIDTH ACCORDING TO APPLIED POWER TO PRINT
S13
NO
N:7 ?
S14
YES
PRINT NEXT LINE

1. A recording method for recording at a desired image density by controlling energization of a recording element of a recording head in accordance with a gradation of a recording image, said method comprising the steps of:

- dividing image data having a plurality of arrays of bits exhibiting the gradation into a first array of bits and a second array of

  bits, both said first array of bits and said second array of bits having continuous bits in said plurality of arrays of bits;
- converting said first array of bits to a first array of drive data;
- converting said second array of bits into a second array of drive data, said first array of drive data and said second array of drive data each having a plurality of bits indicating a number of energization of the recording element of said recording head, said first array of drive data and said second array of drive data being arrays of serial data continuing from a lower bit to an upper bit;
- a first driving step of driving said recording head sequentially from the lower bit to the upper bit of said first array of drive data with a pulse having a first pulse width corresponding to said first array of drive data; and
- a second driving step of driving said recording head sequentially from the lower bit to the upper bit of said second array of drive data with a pulse having a second pulse width corresponding to said second array of drive data.

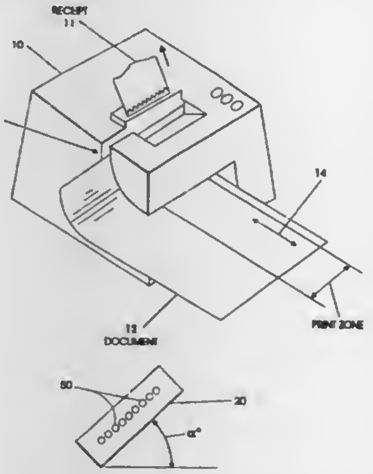
5,533,817
BIAXIAL PRINTER

Richard H. Harris, Raleigh; Michael J. Kinney, Cary, and Kevin H. Vorhees, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1995, Ser. No. 444,474

Int. Cl.^{6} B41J *2/255*

U.S. Cl. 400—124.28 **6 Claims**



1. A printer comprising:

- a print head having a column of printing elements positioned at an angle between zero and ninety degrees relative to a permitted line of motion of said print head;
- first motor operable for positioning said print head along said permitted line of motion of said print head;
- second motor operable for positioning a first print receivable medium along a line of motion relative to said print head, wherein said line of motion of said first print receivable medium is normal to said permitted line of motion of said print head;
- a sensor operable for detecting an insertion into said printer of a second print receivable medium;
- a third motor operable for positioning said second print receivable medium along said line of motion relative to said print head, wherein said line of motion of said second print receivable medium is normal to said permitted line of motion of said print head;
- a processor operable for sending (1) first signals translated through a first buffer to said first motor for controlling said first motor, (2) second signals translated through a second buffer to said second motor for controlling said second motor, (3) third signals translated through a third buffer to said third motor for controlling said third motor, and (4) fourth signals translated through a fourth buffer to said print head for printing images, said processor operable for receiving signals translated through a fifth buffer from said sensor, said processor including a means adaptable for receiving data signals from a host computer corresponding to said images to be printed by said print head and converting said data signals to predetermined dot patterns,
- wherein upon (1) no detection of said second print receivable medium by said sensor, and (2) receipt of said data signals, said processor is operable to control portrait mode printing of said images on said first print receivable medium by controlling positioning of said print head along said permitted line of motion of said print head,
- wherein upon (1) detection of said second print receivable medium by said sensor, and (2) receipt of said data signals, said processor is operable to control landscape mode printing of said images on said second print receivable medium by controlling positioning of said second print receivable medium along said line of motion of said second print receivable medium and by maintaining a stationary position of said print head during printing of each line of said images on said second print receivable medium.

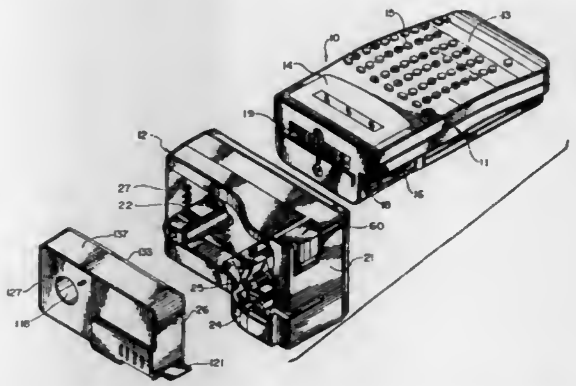
5,533,818
TAPE CARTRIDGE FOR A PRINTING DEVICE

Casey K. Bahrabadi, Phoenix, Ariz., assignor to Kroy, Inc., Scottsdale, Ariz.

Division of Ser. No. 164,358, Dec. 9, 1993, Pat. No. 5,411,339. This application Jan. 17, 1995, Ser. No. 373,637

Int. Cl.^{6} B41J *35/28*

U.S. Cl. 400—208 **21 Claims**



1. A cartridge for operative insertion into and use with a thermal printing device of the type having:

- a cartridge receiving cavity having a cartridge receiving surface portion and a plurality of first switch receiving openings in said cartridge receiving surface portion;
- a print assembly comprising a print head and a platen roller, said print head and said platen roller extending into said cavity and at least one being movable relative to the other between a print position in which said print head and platen roller are moved toward engagement with one another and a nonprint position in which said print head and platen roller are moved away from engagement with one another;
- a switch assembly comprising a switch mounting member mounted in a fixed position relative to said cartridge receiving surface portion and carrying a plurality of depressible switches each having a plunger member moveable between an extended position and a depressed position wherein said plunger members extend through corresponding said first switch receiving openings, outwardly from said cartridge receiving surface portion and into said cartridge receiving cavity when in their extended positions and do not extend outwardly from said cartridge receiving surface portion when in their depressed position, said cartridge being insertable into said cartridge receiving cavity and comprising:

- a cartridge housing having a cartridge surface portion for positioning adjacent to said cartridge receiving surface portion when the cartridge is inserted into the cartridge receiving cavity;
- a spool of image receiving tape contained within said housing; and
- at least one second switch receiving opening in said cartridge surface portion and aligned with one of said first switch receiving openings to allow the plunger member corresponding to said one first switch receiving opening to extend through said at least one second switch receiving opening to its extended position when said cartridge is inserted into the cartridge receiving cavity, each of said plurality of switches being in one of an on position or off position when its plunger member is in its extended position and being in the other of said on position or said off position when its plunger member is in its depressed position.

5,533,819
CHARACTER BY CHARACTER THERMAL RECORDING DEVICE WITH INK SHEET FEED CONTROL

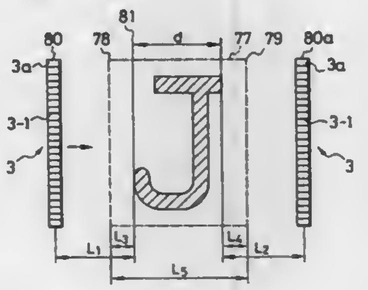
Youichi Watanabe, Machida, and Toshihide Wada, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 180,773, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 845,834, Mar. 6, 1992, abandoned, which is a continuation of Ser. No. 477,111, Feb. 7, 1990, abandoned, which is a continuation of Ser. No. 94,757, Sep. 10, 1987, abandoned. This application Feb. 16, 1995, Ser. No. 390,814

Claims priority, application Japan, Feb. 12, 1986, 61-215156; Aug. 4, 1987, 62-193761

Int. Cl.^{6} B41J *33/36*

U.S. Cl. 400—226 **21 Claims**



1. A thermal recording apparatus for recording on a recording medium by using an ink sheet having an ink, said apparatus comprising:

- a carriage for moving a thermal head having a heat generating element and the ink sheet in a direction across a conveyance direction of said recording medium;
- a conveying mechanism for conveying said ink sheet along an ink sheet conveying route in a first direction and also in a second direction opposite to said first direction, said first direction being a conveyance direction of said ink sheet during recording of a pluality of characters on a line by heating of said heat generating element;
- a head actuator for driving said thermal head to a down position and to an up position, wherein said thermal head is in contact with said ink sheet when in the down position and is spaced apart from said ink sheet when in the up position;
- a head actuator control unit for controlling said head actuator so that said thermal head is driven to the down position before each of the plurality of characters on a line is recorded, and so that said thermal head is driven to the up position after each said character is recorded;
- an ink sheet conveyance control unit for controlling the conveying mechanism so that, in the recording of each of the plurality of characters on a line, said ink sheet is conveyed in said first direction while said carriage is accelerated from a stopped condition to a predetermined speed from a side of a region where said heat generating element is heated, is moved at said predetermined speed to record one character, is decelerated from said predetermined speed and is stopped, and said ink sheet is conveyed in said second direction a distance given by ($L_1+L_2-\alpha$) after said carriage is stopped,

where L_1 is a distance from a point where the acceleration of said carriage starts to a point where the heat generating element is heated to record one character, L_2 is a distance from a point where the heating of said heat generating element is finished to a point where said carriage is stopped, and α is a distance representing an amount of adjustment of the conveyance of said ink sheet so as to prevent overlap between a region of said ink sheet already used for recording of one character and a region of said ink sheet to be used for subsequent recording; and

- a slackness absorbing portion for absorbing a slackness of said ink sheet, said slackness occurring when said ink sheet is caused to be conveyed in said second direction, said slackness absorbing portion being provided in the ink sheet conveying route upstream of said recording area determined with respect to said conveying direction of said ink sheet.

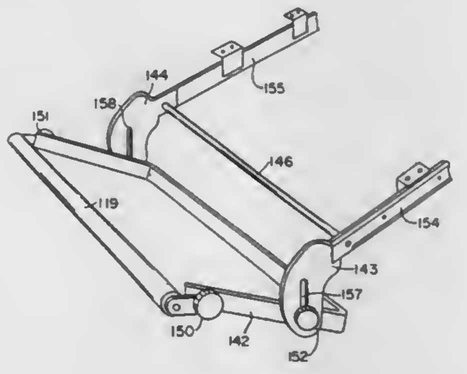
5,533,820
KEYBOARD POSITIONING SYSTEM

Frederic C. Ambrose, 142 The Channel, Brewster, Mass. 02631

Continuation of Ser. No. 306,989, Sep. 16, 1994, abandoned, which is a continuation of Ser. No. 94,109, Jul. 28, 1993, Pat. No. 5,405,204. This application Nov. 2, 1995, Ser. No. 551,543

Int. Cl.^{6} B41J *5/16*

U.S. Cl. 400—472 **7 Claims**



1. A device for mounting a keyboard to a base, the keyboard having a front surface and a top surface, the device comprises:

(a) first and second bracket member engagable with the base;

(b) a support tray comprising a front portion, a rear portion, and a support surface, said support surface being engagable with the keyboard, said rear portion being in closer proximity to the base than said front portion when said support tray is engaged with the base, said support tray being connected to said first and second bracket members and disposed such that said rear portion is disposed below said front portion; and

(c) a palm rest, said palm rest being movably mounted on said support tray from a position at least substantially adjacent the front surface of the keyboard to a position above the top surface of the keyboard while said rear portion of said support tray is below said front portion of said support tray.

5,533,821
CURL CORRECTION APPARATUS

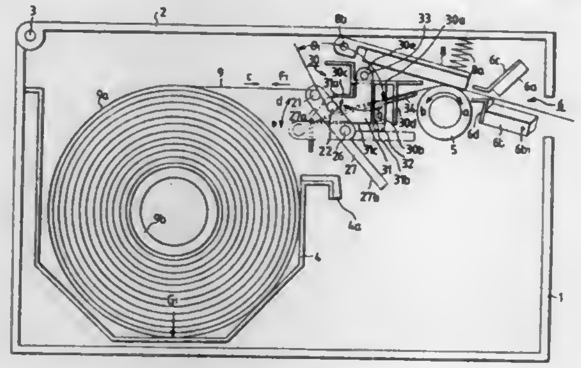
Takashi Awai, and Keizo Sasai, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 123,206, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 794,838, Nov. 21, 1991, abandoned, which is a continuation of Ser. No. 445,993, Dec. 4, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 487,912

Claims priority, application Japan, Dec. 5, 1988, 63-305951; Dec. 8, 1988, 63-308815; Jul. 27, 1989, 1-192631; Jul. 27, 1989, 1-192632

Int. Cl.^{6} B41J *15/16*

U.S. Cl. 400—619 **65 Claims**



1. A recording apparatus comprising:

- hold means for holding a sheet in a rolled state;
- transport means for transporting the sheet in a direction drawing out from the rolled sheet held by said hold means;
- a convey path where the sheet conveyed by said transport means passes, and a lid for opening said convey path;
- recording means for recording an image on the sheet transported by said transport means;
- a first guide member and a second guide member for correcting a curl of the sheet transported from said transport means by bending and guiding the sheet in an opposite direction to a curled direction;
- support means for supporting said first guide member around a rotational axis so that said first guide member can move in a direction to strengthen or weaken the curl correcting operation; and
- urge means for urging said support means to be moved in the direction strengthening the curl correcting operation,
- wherein said first guide means generates the curl correcting operation corresponding to the diameter of rolled sheet, by guiding the sheet at a position where the transporting force applied to the sheet by said transport means, a tension force of the sheet generated by a friction force between the rolled sheet and said hold means resisting the transport force, and an urge force by said urge means are balanced, and
- wherein one of said first guide member and said second guide member is disposed on the main body, and the other is disposed on said lid.

5,533,822
RECORDING APPARATUS WITH EASILY ASSEMBLABLE ROLLER

Isao Tsukada, Kawasaki; Manabu Kanazawa, Yokohama, and Shoushi Kikkawa, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

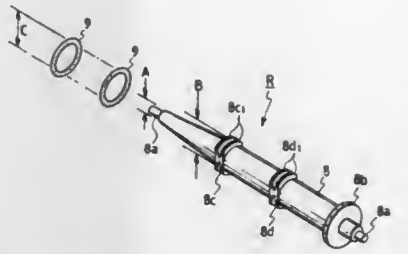
Continuation of Ser. No. 978,504, Nov. 18, 1992, abandoned. This application Mar. 13, 1995, Ser. No. 402,981

Claims priority, application Japan, Nov. 20, 1991, 3-329742

Int. Cl.^{6} B41J *13/02*

U.S. Cl. 400—641 **44 Claims**

1. A recording medium conveying mechanism comprising:



- a shaft member having bearing portions at both ends thereof, said shaft member being rotatably supported at the bearing portions;
- a plurality of elastic members for contacting and conveying a recording medium, each of said elastic members having a ring-like shape;
- a plurality of holding portions provided at predetermined positions of said shaft member to hold said elastic members; and
- a tapered portion provided on said shaft member between at least one of said bearing portions and at least one of said holding portions which is closest to the at least one of said bearing portions, said tapered portion being formed such that a diameter of said shaft member decreases from said at least one holding portion to said at least one bearing portion,
- wherein each of at least all of said plurality of holding portions but a holding portion most remote from said tapered portion comprises a pair of flange portions spaced in an axial direction of said shaft member, a perimeter of each of said flange portions in a plane substantially perpendicular to the axial direction being constituted by two opposed arcuate portions joined by two opposed straight portions, and a recess portion disposed between said pair of flange portions, said recess portion holding one of said elastic members so that said one elastic member is capable of contacting the recording medium.

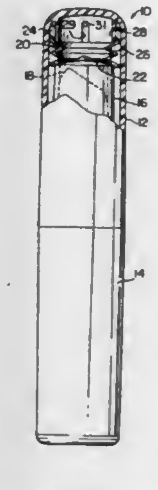
5,533,823
SEALED COMETIC DISPENSER

Robert L. Pierpont, Meriden; John F. Cortes, Northford; Michael J. Fabrisi, Naugatuck, and Kenneth F. Ryder, Prospect, all of Conn., assignors to Rexam Cosmetic Packaging Inc., Torrington, Conn.

Filed Mar. 29, 1995, Ser. No. 412,891

Int. Cl.^{6} A45D *40/00*

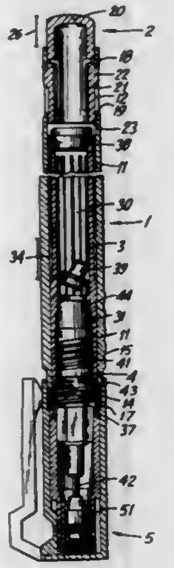
U.S. Cl. 401—98 **8 Claims**



1. A cosmetic dispenser assembly, comprising:

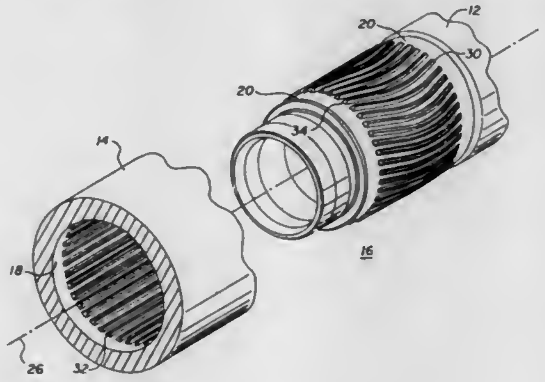
- a base defining a hollow chamber for receiving a cosmetic substance, and including an edge defining the periphery of an opening for accessing the cosmetic substance;
- a cover adapted for attachment to the base and defining a hollow interior receiving at least a portion of the base and covering the opening to the cosmetic substance upon attachment of the cover to the base; and
- a sealing member defining a flange mounted within the hollow interior of the cover, a peripheral sealing surface, and at least one infolded portion connected between the flange and the sealing surface, the at least one infolded portion and sealing surface being movable to an extended position upon removal of the cover from the base and to a retracted position with the sealing surface in peripheral engagement with the edge of the opening upon attachment of the cover to the base, the at least one infolded portion being formed of a flexible material for pressing the sealing surface into peripheral engagement with the edge defining the opening and effecting a fluid-tight seal along the peripheral edge to thereby seal the cosmetic substance received within the hollow chamber.

5,533,824
WRITING OR DRAFTING INSTRUMENT WITH EXCHANGEABLE WRITING MEDIUM CONTAINER
Thomas Heidenreiter, and Ute Schmidbauer, both of Nürnberg, Germany, assignors to J. S. Staedtler GmbH & Co., Nürnberg, Germany
Filed Jul. 19, 1994, Ser. No. 277,252
Claims priority, application Germany, Jul. 20, 1993, 43 24 113.1
Int. Cl.^{6} B43K *5/14;7/02;8/18*
U.S. Cl. 401—133 **9 Claims**



1. A writing or drafting instrument comprising a tubular shaft having an axis and an interior, a writing medium container in the form of an exchangeable cartridge, a push member axially movably mounted in the shaft, wherein the cartridge is held in the shaft by one of a clamping action and a positive locking action, wherein the push member and the shaft form a structural group in which the push member and shaft are movable relative to each other, wherein the push member has means for acting on the cartridge at least during ejection thereof, further comprising a writing tip forming a structural unit with the cartridge, the writing tip being exchangeably fastened in the cartridge, the cartridge having a filling space, wherein the shaft has a shaft wall, the shaft wall having at least one opening, the opening forming the two stops for limiting the axial movement of the push member, wherein the shaft comprises at least one shaft web and the cartridge comprises at least one securing web, and wherein the shaft web and the securing web form a locking means against relative rotation of the shaft and the cartridge, further comprising a clamping zone between the shaft and the cartridge, the clamping zone having an axial length, the push member being movable along an axial path of movement, wherein the axial length of the clamping zone is greater than the axial path of movement of the push member.

5,533,825
PARABOLICALLY HELICAL SPLINE SHAFT COUPLING
Timothy D. Stone, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Nov. 14, 1994, Ser. No. 339,389
Int. Cl.^{6} F16D *1/00;* **F16H** *1/08*
U.S. Cl. 403—359 **10 Claims**



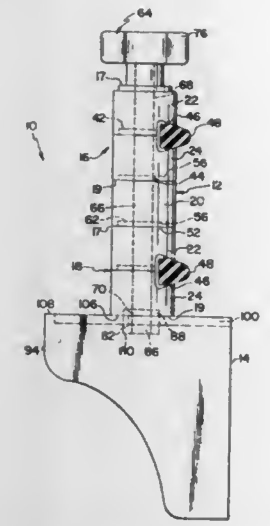
1. A coupling comprising:
splined together first and second parallel shafts,
first and second cylindrical surfaces located on the first and second parallel shafts respectively,
each of said shafts having a shaft axis,
- a plurality of curved splines generally circumferentially disposed on one of said cylindrical surfaces,

said curved splines having a varying pitch so as to be curved with respect to the respective shaft axis, and
- a plurality of straight splines generally circumferentially disposed on the other of said cylindrical surfaces, the splines of the respective cylindrical surfaces engage each other.

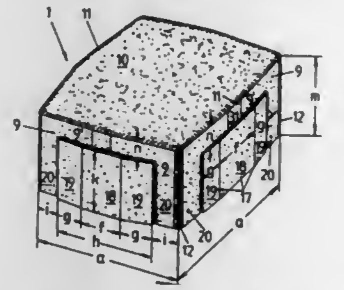
5,533,826
CLAMPING ARRANGEMENT FOR SECURING GUIDE RAILS WITH RESPECT TO A CONVEYOR SYSTEM
James W. Cairns, Westchester, Pa., assignor to Nolu Plastics, Inc., Aston, Pa.
Filed Nov. 10, 1994, Ser. No. 338,275
Int. Cl.^{6} F16B *7/04*
U.S. Cl. 403—389 **14 Claims**

1. A clamping arrangement for adjustably securing guide rails of a conveyor system to support structure thereof, said clamping arrangement comprising:
- a support bracket, and
- a clamping assembly comprising:
- at least one clamp sub-assembly having distal and proximal ends, each clamp sub-assembly including first and second clamp components, each of said clamp components having a proximal end, a distal end and a bore defined between said ends thereof, said distal end of said first clamp component facing said proximal end of said second clamp component, said bores being axially aligned, said first clamp component including a cut-out defined in a circumferential wall thereof at the distal end thereof, said second clamp component including a cut-out defined in a circumferential wall thereof at said proximal end thereof, said cut-outs cooperating to define a guide rail receiving channel for frictionally engaging and holding a guide rail therein,
- a rod having at least a portion of a length thereof defining screw threads, said rod being disposed through said aligned bores and having first and second ends extending beyond said proximal and distal ends of said at least one clamp sub-assembly, respectively,
- a control knob coupled to said first end of said rod and having a seating surface constructed and arranged to operatively engage said proximal end of said at least one clamp sub-assembly, and

locking structure threadedly coupled to said second end of said rod,
said support bracket including a mounting portion constructed and arranged to be mounted on a portion of the conveyor system and a receiving portion constructed and arranged to extend generally transversely from said mounting portion, said receiving portion including a receiving channel,
said locking structure cooperating with said receiving channel so as to adjustably mount said clamping assembly with respect to said support bracket,
whereby, when tightening said control knob so that said seating surface operatively abuts said proximal end of said at least one clamp sub-assembly, said locking structure lockingly engages surfaces defining said receiving channel, and said distal end of said at least one clamp sub-assembly operatively abuts a surface of said receiving portion so as to lock said clamping assembly to said support bracket.



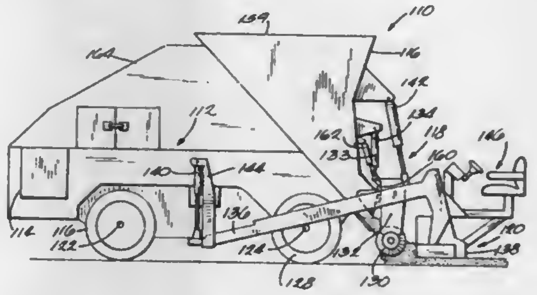
5,533,827
PAVING STONE CONSTRUCTION SET
René Scheiwiller, Postfach 266, 6052, Hergiswil, Switzerland
Filed Nov. 9, 1993, Ser. No. 146,173
Claims priority, application Germany, Mar. 11, 1992, 42 07 735.4
Int. Cl.^{6} E01C *5/06*
U.S. Cl. 404—38 **14 Claims**



1. A concrete paving stone adapted to be disposed in circular and elongate paving configurations, the paving stone including side walls and a substantially planar upper face, each of the side walls being an arched side wall and including an elevated face at a center region thereof which comprises an abutting surface and two associated wedge surfaces adjoining the abutting surface on both sides thereof, the associated wedge surfaces extending from the abutting surface to an associated arched side wall, the elevated face further extending across a substantial portion of a length of the associated arched side wall and being effective for creating a fixed abutment between an adjoining elevated face of an arched side wall of an adjoining paving stone in a paving configuration, whereby, in a tilted positioning of the paving stone with respect to the adjoining paving stone in the paving configuration, one of the two wedge surfaces is effective for creating a fixed abutment with an adjoining one of wedge surfaces of the adjoining paving stone.

5,533,828
METHOD AND APPARATUS FOR DISCHARGING PAVING MATERIALS ON TOP OF DISTRIBUTING AUGER
Thomas R. Campbell, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.
Continuation-in-part of Ser. No. 314,348, Sep. 29, 1994. This application Feb. 16, 1995, Ser. No. 389,257
Int. Cl.^{6} F01C *19/18*
U.S. Cl. 404—75 **14 Claims**

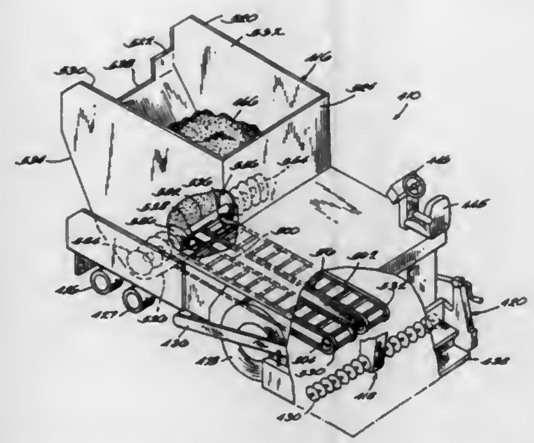
8. A method comprising:



(A) storing paving materials in a gravity feed hopper mounted at the rear of a mobile chassis; then
(B) discharging said paving materials from a discharge device directly on top of a distributing auger extending transversely across said mobile chassis; then
(C) distributing said paving materials onto a surface to be paved using said distributing auger; and then
(D) working said paving materials into a mat,
wherein said paving materials stored in said gravity feed hopper are fed to said discharge device without employing any internal conveyors and without the aid of any external conveyors.

5,533,829
PAVING MACHINE WITH MIXING DEVICE AND DISCHARGE CONVEYOR ASSEMBLY FOR REMIXING SEGREGATED PAVING MATERIALS
Thomas R. Campbell, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.
Continuation-in-part of Ser. No. 314,348, Sep. 29, 1994, and Ser. No. 389,257, Feb. 16, 1995. This application May 2, 1995, Ser. No. 433,863
Int. Cl.^{6} E01C *19/18*
U.S. Cl. 404—81 **10 Claims**

1. A paving machine comprising:
A. a portable chassis having front and rear ends;
B. a gravity feed hopper located near the front end of said chassis, said gravity feed hopper having (1) an upper inlet, (2) front and rear walls, (3) side walls, (4) a transverse central portion and (5) a floor connecting said front and rear walls to



one another and having a lower discharge opening formed therein at a location between said front and rear walls;

C. a distributing auger mounted on said chassis near said rear end thereof and extending transversely across said chassis, for remixing segregated paving materials and distributing paving materials immediately adjacent a previously paved road segment;

D. a remixing device which conveys paving materials transversely from said side walls toward said lower discharge opening while remixing said materials, said remixing device including a variable-pitch screw auger with i) a first flight section and ii) a second flight section, said second flight section being located transversely between said lower discharge opening and said first flight section, the pitch of said first flight section being lower than the pitch of said second flight section so that volumes bounded by flights of said second flight section are greater than volumes bounded by flights of said first flight section, so as to enable finer paving materials, located in said transverse central portion to enter void spaces in volumes bounded by flights of said second flight section and combine with coarser paving material, thereby remixing segregated paving materials; and

E. a discharge conveyor assembly extending longitudinally and horizontally from said lower discharge opening of said gravity feed hopper to said distributing auger, said discharge conveyor assembly including a pair of parallel drag slat conveyors, each of said pair of parallel drag slat conveyors including a discharge end located directly above said distributing auger for discharging paving materials directly on top of said distributing auger, thereby remixing segregated paving materials.

5,533,830
FLOAT FINISH MACHINE

Luiji Barichello, Modena, Italy, assignor to Barikell S.r.l., Modena, Italy

PCT No. PCT/EP93/00308, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/16251, PCT Pub. Date Aug. 19, 1993

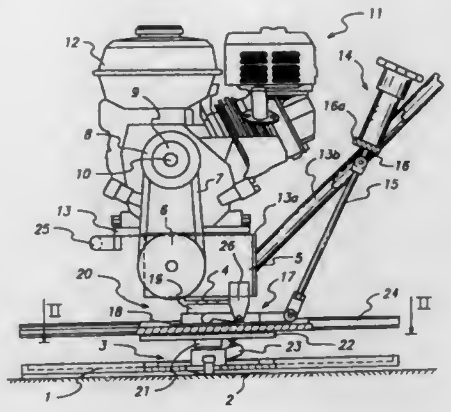
PCT Filed Feb. 9, 1993, Ser. No. 256,893

Claims priority, application Italy, Feb. 13, 1992, MO92A0020

Int. Cl.^{6} E01C *19/22*

U.S. Cl. 404—96 **15 Claims**

1. A float finish machine for floating floors, comprising a rotor including a disk, disposed substantially parallel to the floor, the disk being provided with radial slots each accommodating a trowel blade, each trowel blade being angularly adjustable with respect to a plane of the rotor about an axis disposed substantially parallel to the floor, the disk being coupled with a shaft having its axis disposed substantially perpendicular to the floor, with an idle spacing element, having a hub coupled rotatably with the rotor, said idle spacing element having an outer diameter greater than the outer diameter of the disk positioned upon the shaft, being free to rotate about the axis of the shaft.



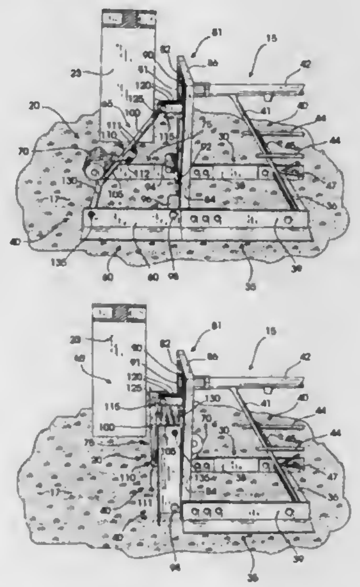
5,533,831
OBSTACLE BYPASS SYSTEM FOR CONCRETE FINISHING TOOLS

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 903,936, Jun. 26, 1992, Pat. No. 5,288,166. This application Apr. 22, 1994, Ser. No. 231,404

Int. Cl.^{6} E01C *19/38*

U.S. Cl. 404—114 **15 Claims**



1. A concrete finishing tool that selectively bypasses obstacles during concrete finishing, said tool comprising:

elongated finishing means for contacting and finishing plastic concrete, said finishing means comprising at least one wing selectively disposed either in a deployed position for finishing concrete or in a retracted position out of contact with said concrete for clearing obstacles; and,

linkage means for moving said wing between said deployed and retracted positions, said linkage means moving overcenter to yieldably lock said wing, and said linkage means comprising:

first and second rigid, elongated links that are pivoted together to establish an intermediate pivot point;

each of said first and second links having a predetermined length;

one of said links pivoted to said finishing means and the other is pivoted to said wing; and,

whereby the effective length of said linkage means varies between an additive length approximately equal to the sum of the length of said first and second links when the wing is deployed and a subtractive length approximately equal to the difference in the length of said first and second links when the wing is retracted.

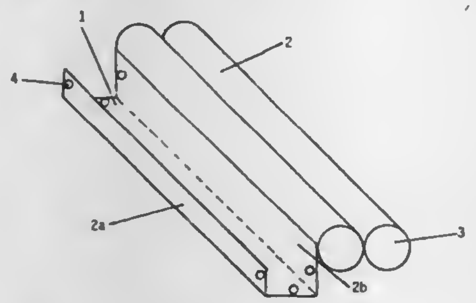
5,533,832
OIL SPILL CONTAINMENT AND RECOVERY SYSTEM

Howard W. Dugger, French Settlement, La., assignor to Warren E. Dugger, Severna Park, Md.

Filed Jun. 9, 1992, Ser. No. 896,101

Int. Cl.^{6} E02B *15/04*

U.S. Cl. 405—63 **7 Claims**



1. An improved method for containing and recovering petroleum spilled from a transport vessel or an exploration rig onto a body of water comprising the steps of circumventing the spilled petroleum with a continuous, floating containment boundary and pumping the petroleum from the water within the containment boundary wherein the improvement comprises a series of containment float/recovery trough sections consisting of an outer (relative to the spilled petroleum) float portion and an inner trough portion, said trough portions of which are interconnected to form a continuous trough for collecting the spilled petroleum, wherein the petroleum pumped from within the containment boundary is drawn from the continuous trough to a separation tank wherein the petroleum separates from any water having mixed therewith, and the separated petroleum is transferred to a storage tank.

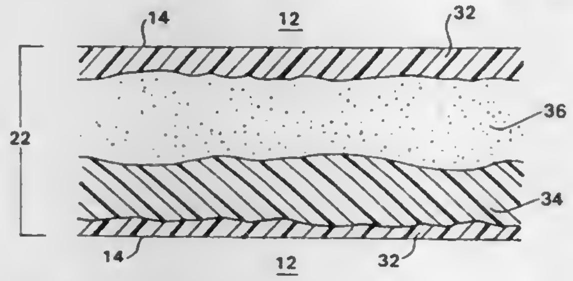
5,533,833
BULK BACKFILL IN SITU LINER FOR HARD ROCK ENVIRONMENT

John A. Lombardi, Boulder, Colo., assignor to John Lombardi, Boulder, Colo.

Filed Jun. 3, 1994, Ser. No. 253,979

Int. Cl.^{6} B09B *1/00*

U.S. Cl. 405—128 **6 Claims**



1. An impermeable in situ liner in combination with an underground hard rock structure for use in solution controlled stope leaching and solution controlled autoclaving of ores in the hard rock, said combination comprising:

a hard rock wall structure including substantially vertical and substantially horizontal channels of 6 inches to 4 feet in width cut into the hard rock, so as to completely surround a volume of hard rock containing the ores, said vertical channels having a dip greater than 55°, and said horizontal channels having a dip less than 30°, and

an impermeable backfill comprising sand-sodium silicate filling said channels to form a completely enclosed in situ liner.

5,533,834
PIPELAY STINGER

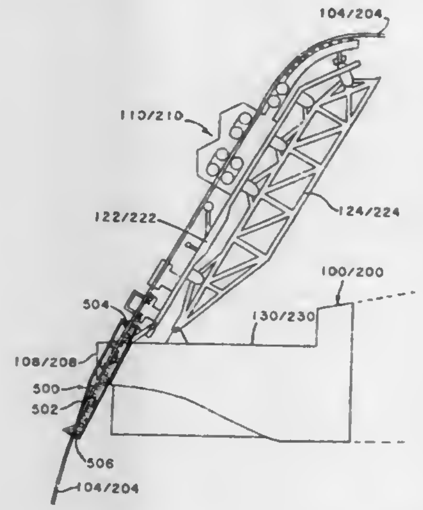
Carlos E. Recalde, Irvine, Calif., assignor to Stena Offshore Limited, Westhill, United Kingdom

Filed Jul. 22, 1994, Ser. No. 211,249

Claims priority, application United Kingdom, Sep. 25, 1991, 9120432

Int. Cl.^{6} F16L *1/04*; B63B *35/04*

U.S. Cl. 405—168.3 **36 Claims**



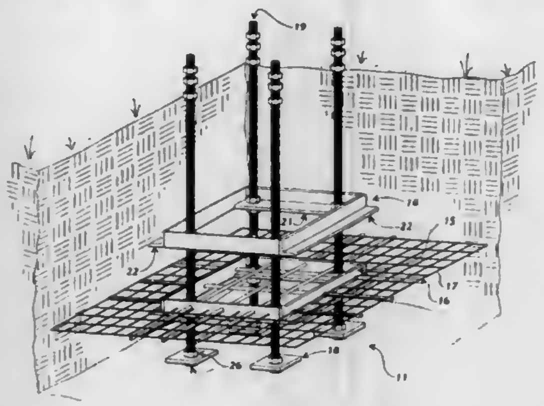
1. A reel pipelaying vessel comprising at least one reel for selectively spooling and de-spooling a length of pipe thereon, radius control means for imparting a substantially uniform radius of curvature to said length of pipe at least during de-spooling of said pipe from said reel in pipelaying operation of said vessel, and pipe straightening means downstream of said radius control means in the direction of de-spooling of said length of pipe from said reel in pipelaying operation of said vessel, wherein said radius control means and said pipe straightening means are both mounted on a common support means, said common support means being coupled to the remainder of said vessel in a manner allowing said common support means to be controllably inclined with respect to a nominal or actual horizontal, characterised in that said vessel includes a pipelay stinger means extending sternwards of said vessel and being located downstream of said radius control means and said straightening means in the direction of de-spooling of said length of pipe from said reel in pipelaying operation of said vessel, said pipelay stinger means being arranged to increase the launch angle of said length of pipe, relative to said nominal or actual horizontal, from said vessel in pipelaying operation of said vessel.

17. A method of operating a reel pipelaying ship which includes radius control means and pipe straightening means both mounted on a common support means which may be controllably inclined with respect to a nominal or actual horizontal in order to increase the launch angle of a length of pipe laid by said vessel, relative to said nominal or actual horizontal, in pipelaying operation thereof, said method being characterised in the steps of providing a pipelay stinger means extending sternwards of said vessel, and laying said length of pipe by way of said pipelay stinger means, having arranged said pipelay stinger means to increase said launch angle relative to said nominal or actual horizontal.

19. A curved pipelay stinger means characterised in that said curved pipelay stinger means is formed as a cantilever mounting an endless pipe conveyor means disposed along the length of said cantilever to present pipe-supporting contact points therealong which collectively define the curve of said curved pipelay stinger means.

5,533,835
RAILROAD CROSSING SIGNAL FOUNDATION AND METHOD OF PRODUCING AND ERECTING THE SAME

A. M. Angelette, 4160 Ewing Rd., Austell, Ga. 30001
Filed Feb. 6, 1995, Ser. No. 383,944
Int. Cl.^{6} E02D *5/74;5/10;5/34*
U.S. Cl. 405—229 **12 Claims**



1. A method of constructing a railroad crossing signal foundation comprising the steps of:
- (a) digging a hole in the ground adjacent a railroad crossing;
- (b) mounting a metallic anchoring and reinforcing framework having guide rods and an upper frame member adjustably mounted to the guide rods along the length of the guide rods in the hole with the guide rods extending uprightly;
- (c) adjustably moving the upper frame member to define a concrete fill plane; and
- (d) pouring concrete into the hole to the fill plane to substantially embed the framework in the concrete leaving a portion of the guide rods extending above the fill plane exposed to which a railroad crossing signal or signal support may be mounted upon setting of the concrete.

5,533,836
COMPOSITIONS AND METHODS FOR STIMULATING THE GROWTH OF OSTEOBLASTS

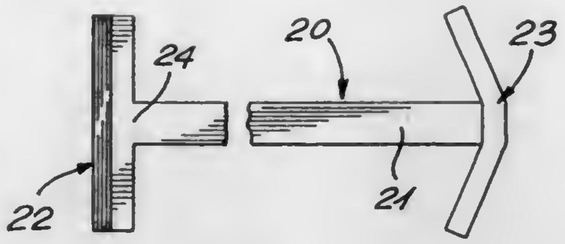
Emma E. Moore, Seattle, Wash., assignor to ZymoGenetics, Inc., Seattle, Wash.
Continuation of Ser. No. 38,325, Mar. 29, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 408,331
Int. Cl.^{6} C12N *5/02;5/08*
U.S. Cl. 435—240.31 **15 Claims**

1. A method for stimulating the in vitro growth of osteoblast cells comprising:
- applying to the cells a composition comprising platelet-derived growth factor (PDGF) in combination with vitamin D in an amount sufficient to stimulate osteoblast growth at least 50% as measured by incorporation of ^{3}H-thymidine, as compared to cells grown in the presence of PDGF and absence of vitamin D.

5,533,837
ANCHOR FOR RETAINING WALL FORMED OF SUPERIMPOSED CONCRETE BLOCKS

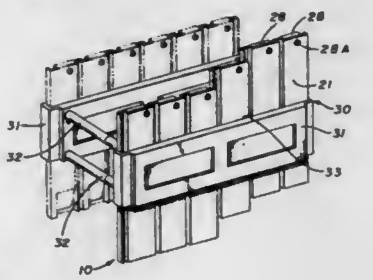
Horacio Correia, 1675 Rougemont, Canada, and Charles Ciccarello, 8750 San Francisco, both of, Brossard, Quebec, Canada
Filed Feb. 22, 1994, Ser. No. 199,787
Int. Cl.^{6} E02D *29/02*
U.S. Cl. 405—262 **5 Claims**

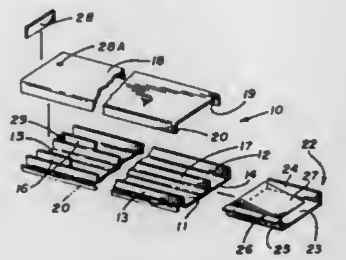
1. An anchor adapted for providing retention strength to a retaining wall formed of a plurality of superimposed blocks having opposed faces adapted to lie one on top of another, at least a top one of said faces of at least some of said blocks having a longitudinal channel therein disposed spaced from a rear wall thereof and extending along a longitudinal axis of said block, a transverse groove in said top face extending from said longitudinal groove to said rear wall, said anchor having an elongated stem section, a flange hook end at an end of said stem section adapted for engagement in said longitudinal channel against a rear side wall of said channel, and an opposed anchor end for engagement with back-fill material disposed behind said retaining wall, said stem having a cross-section dimensioned to extend through said transverse groove in an unobstructing manner when said blocks are disposed one on top of another, said anchor end being constituted by a transverse rectangular flange formed at an opposed end of said stem section and having opposed arms extending on a respective side of said stem section, said arms being angulated toward said hook end of said anchor, said transverse flange having a retention face extending transversely to said stem, said transverse flange extending upwardly at said opposed end in an opposite direction to said hook end which is disposed at an angle to said stem section downwardly for abutment against said rear side wall of said longitudinal channel.



5,533,838
MODULAR TRENCH BOX SHEETING

Robert Kundel, P.O. Box 4210, Warren, Ohio 44482
Filed Apr. 13, 1995, Ser. No. 421,516
Int. Cl.^{6} E21D *5/00;5/06*
U.S. Cl. 405—282 **7 Claims**



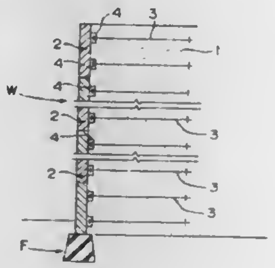


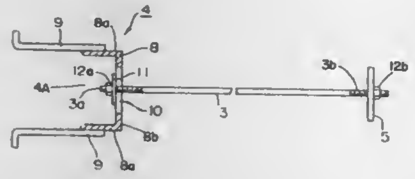
1. A apparatus for constructing modular trench box sheeting panels comprising; elongated panel sections, each of said panel sections having oppositely disposed upstanding longitudinally extending sides, a plurality of reinforcing plates extending from one of said panels, said elongated panel elements secured to one another and to said reinforcing plates in transverse offset overlapping relationship defining oppositely disposed panel engagement channels between said respective upstanding sides, and said channels are open along their longitudinal length in opposing directions

to one another, a ground engaging panel portion secured to one end of said elongated panels, said ground engaging portion comprising a base panel having oppositely disposed upstanding sidewalls, a taper portion on said base spaced inwardly from one of said sidewalls and inwardly from its free end thereof, a pounding plate secured to the panel portions end's reinforcing plates, and means for engaging said sheeting panel.

5,533,839
WALL SURFACE STRUCTURE OF REINFORCED EARTH STRUCTURE

Shunsuke Shimada, Tokyo, Japan, assignor to Kyokado Engineering Co., Ltd., Tokyo, Japan
Filed Oct. 31, 1994, Ser. No. 332,358
Claims priority, application Japan, Feb. 17, 1994, 6-020099
Int. Cl.^{6} E02D *29/02*
U.S. Cl. 405—284 **7 Claims**



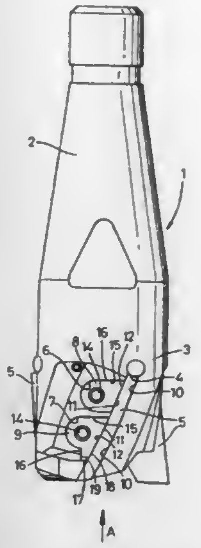


1. An improvement in revetments comprising identical interlocking building blocks aligned in horizontal rows and vertical columns, each building block having a front face and a back face, and means to secure adjustable anchor means to each said back face of each said building block, wherein said means to secure said adjustable anchor means to the back face of said building block comprises: a U-shaped bracket having leg portions and a connecting web portion, said leg portions being integrally secured to said back face of said building block, and said web portion having formed therein a vertical slot; said leg portions, said web portion, and said back face forming an enclosure having open ends sufficient to permit a tool therein; said adjustable anchor means having a first threaded end which is received in and which passes through said vertical slot; a load distribution washer plate received over said first threaded end; and a first threaded nut threaded over said first threaded end to complete a lost motion coupling between said U-shaped bracket and said adjustable anchor means.

5,533,840
ROTARY METAL CUTTING TOOL

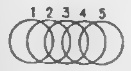
Paul A. Reynolds, Billesdon, England, assignor to Hydra Tools International PLC, Sheffield, United Kingdom
Filed Mar. 8, 1994, Ser. No. 207,429
Claims priority, application United Kingdom, Mar. 9, 1993, 93048387
Int. Cl.^{6} B23B *27/16;27/08*
U.S. Cl. 407—41 **8 Claims**

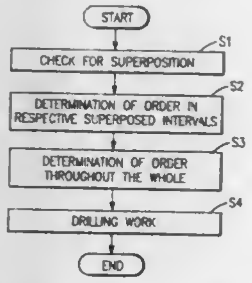
1. A rotary metal cutting tool comprising a substantially cylindrical elongate body having a longitudinally extending axis of rotation; a shank provided at one end of said body, which shank is adapted, in use, to be clamped in a machine tool; a cutting head provided at the other end of said body; at least one channel provided in said head to receive a cutter blade twisted to helical form and having a smooth seating face and an opposed, smooth helical clamping face; a seating surface provided by said channel which channel seating surface is complementary to, and engageable by said seating face of said blade; a recess in said body; a clamping cotter located in said recess; a clamping face provided on said clamping cotter which cotter clamping face conforms to helical curvature and engages said clamping face of said blade; means to urge said clamping cotter into wedge clamping engagement with said blade; at least one flat provided on each of said recess and said clamping cotter, wherein said clamping cotter is relatively non-rotationally engaged against said recess to prevent cotter rotation; and said clamping cotter having an extension of its clamping surface, said extension being of such length that said extension terminates with a lower end face of said cutting head.



5,533,841
APPARATUS AND METHOD OF DRILLING

Kazuo Iwano, Yokohama; Shinji Misono, Tokyo, and Shu Tezuka, Yokohama, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 300,509, Sep. 2, 1994, abandoned. This application Dec. 23, 1994, Ser. No. 363,671
Claims priority, application Japan, Sep. 10, 1993, 5-226034; Sep. 5, 1994, 6-211049
Int. Cl.^{6} B23B *35/00;39/08*
U.S. Cl. 408—1 R **9 Claims**




START
S1
CHECK FOR SUPERPOSITION
S2
DETERMINATION OF ORDER IN RESPECTIVE SUPERPOSED INTERVALS
S3
DETERMINATION OF ORDER THROUGHOUT THE WHOLE
S4
DRILLING WORK
END

6. A method for drilling a plurality of holes which are concatenated along a line so that a drill bit receives uniform stress along said line, comprising the steps of:
- defining a plurality of concatenated holes to be made along a line;
- defining a first hole at one end of said line;

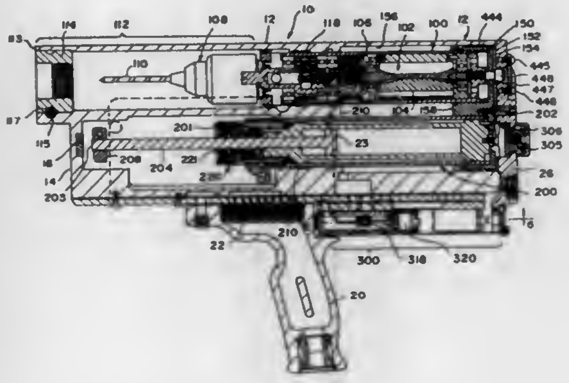
defining a second hole at the other end of said line;
defining via a binary vector the order of holes to be made between said first hole and said second hole;
converting said binary vector indicative of said order by a conversion matrix, where every corresponding partial matrix is regular, to obtain a binary vector indicative of positions of said holes; and
driving said drill bit in an order determined on the basis of said binary vectors indicative of said order and said positions.

7. A computer program product for operating a computer system used to control a drill bit, said computer program product comprising:
a computer readable medium;
first program instruction means, recorded on said medium, for instructing a computer processor to define a plurality of concatenated holes to be made along a line;
second program instruction means, recorded on said medium, for instructing a computer processor to define a first hole at one end of said line;
third program instruction means, recorded on said medium, for instructing a computer processor to define a second hole at the other end of said line;
fourth program instruction means, recorded on said medium, for instructing a computer processor to define via a binary vector the order of holes to be made between said first hole and said second hole;
fifth program instruction means, recorded on said medium, for instructing a computer processor to convert said vector indicative of said order by a conversion matrix, where every corresponding partial matrix is regular, to obtain a binary vector indicative of positions of said holes; and
sixth program instruction means, recorded on said medium, for instructing a computer processor to control said drill bit so that said holes are drilled in an order determined on the basis of said binary vectors indicative of said order and said positions.

5,533,842

PORTABLE PECK FEED DRILLING SYSTEM

Chris Lyle, Plainwell, Mich., and Edwin J. Deremo, Lexington, S.C., assignors to Cooper Industries, Inc., Houston, Tex.
Continuation of Ser. No. 839,974, Feb. 21, 1992, abandoned.
This application Nov. 29, 1994, Ser. No. 346,326
Int. Cl.⁶ B23B *47/22*
U.S. Cl. 408—17 **26 Claims**

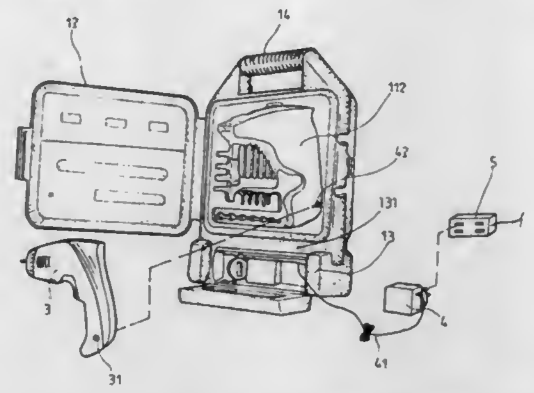


1. A peck feed drill, comprising:
a housing having a bore therein;
an advancing and retracting motor gear quill disposed to be extended from said bore;
a feed control system for regulating the advancement and retraction of said motor quill;
a piston assembly disposed in said bore and constructed and arranged to simultaneously advance and retract both said motor gear quill and said feed control system.

5,533,843

ELECTRIC HAND DRILL SET

Lee Hsin-Chih Chung, No. 21-8 Shang-Tso-Wu, Chung-Li City, Taoyuan Hsien, Taiwan
Filed Sep. 19, 1994, Ser. No. 305,988
Int. Cl.⁶ B23B *45/02;* **A45C** *11/26*
U.S. Cl. 408—241 R **17 Claims**

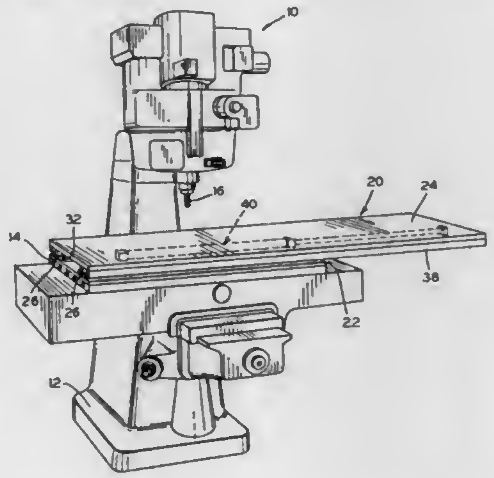


1. An electric hand drill set comprising a case having a casing closeable by cover means to define therein a first interior space and a second interior space, a hand drill being received and removably held within the first interior space, a power converting and supplying device being received and removably held within the second interior space, the power converting and supplying device comprising an extension cord adapted to connect to an external power source, the hand drill comprising a rechargeable battery set for powering the hand drill which is electrically connectable to and thus chargeable by the power converting and supplying device and the charging being indicated by a charging indicator, the cover means comprising a window formed thereon, opposing the charging indicator to allow user to monitor the charging of the battery set.

5,533,844

TRAVELLING PLATEN WITH EXTENDED AXIS

Donald A. Ekleberry, 24018 S. Center Rd., Frankfor, Ill. 60423
Filed Nov. 15, 1994, Ser. No. 339,562
Int. Cl.⁶ B23C *9/00;* **B25H** *1/00*
U.S. Cl. 409—159 **8 Claims**



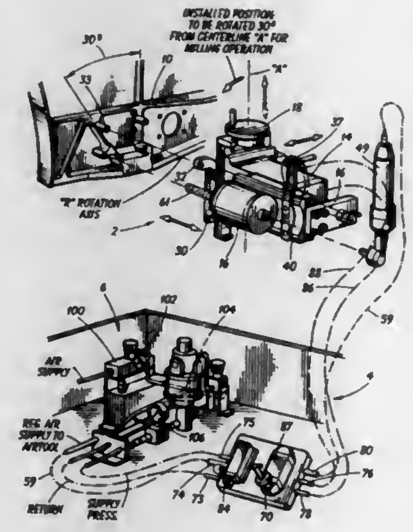
1. A travelling platen for attachment to a machine tool comprising:
a planar lower base plate having an upper surface;
means for attaching said base plate to the machine tool;
a planar upper tooling plate having an upper surface and a lower surface and extending a greater length than the length of said base plate;

linear bearings interposed between said lower and upper plates to provide relative linear motion therebetween, said linear bearings including cooperating rail and bearing block members, the rail members extending from the lower surface of said upper plate, and the bearing block members extending from the other of said base plate; and
stop means to selectively prevent relative reciprocal linear movement between said lower plate and said upper plate.

5,533,845

MILLING MACHINE

John A. Glover, P.O. Box 210187, Dallas, Tex. 75211
Filed May 17, 1994, Ser. No. 245,353
Int. Cl.⁶ B23C *1/20;* **B23B** *45/14*
U.S. Cl. 409—175 **7 Claims**

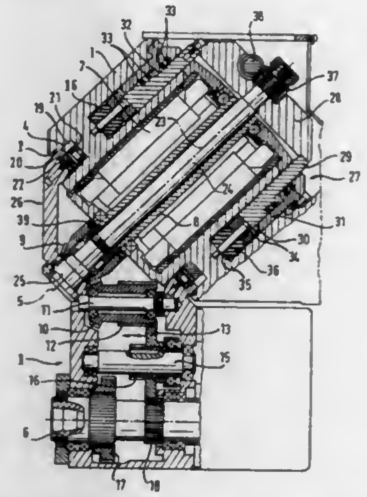


1. A portable milling tool comprising:
a frame defining a subframe, where said subframe is attachable to a given workpiece;
a cutting head assembly movably disposed with respect to said workpiece about an x and y axis, whew said assembly includes a housing and a rotatable cutting head and an external drive receptacle;
means to move said curing head assembly along a z axis between a first position above said workpiece to a second position in
contacting relation with said workpiece, including means to induce a selected pressure therebetween, where said means comprises a piston slidably and sealingly disposed within a bore defined in said housing and reciprocal between said first and second positions where said piston is coupled to said cutting head;
detachable power means engageable with said external drive and operable to induce rotation of said cutting head, where said power means is operable off of a low pressure air supply;
means to orient said cutting head assembly about said x and y axis; arid
a control mechanism comprising a housing defining a first and a second passageway divided by a restriction barrier, where said first fluid passageway is coupled in fluid communication to said pressurization means and said second fluid passageway is coupled in fluid communication to said bore.

5,533,846

UNIVERSAL MILLING AND DRILLING MACHINE

Alfred Geissler, Pfronten, Germany, assignor to Deckel Maho GmbH, Germany
Filed Jan. 25, 1995, Ser. No. 377,701
Claims priority, application Germany, Jan. 25, 1994, 44 02 084.8
Int. Cl.⁶ B23C *1/12*
U.S. Cl. 409—201 **23 Claims**



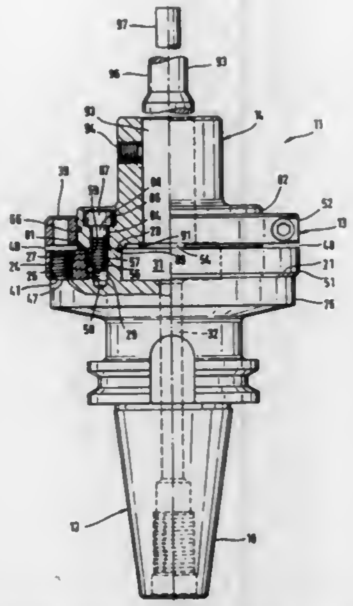
1. A universal milling and drilling machine comprising:
a workpiece table mounted on a support;
a machine stand with a support housing mounted on it in operative relationship with said workpiece table;
a swivel head being turnable, at a support housing front wall inclined by 45° with respect to the vertical plane, around a rotation axis perpendicular to said support housing front wall;
a work spindle rotatably arranged in a milling head, the rotation axis of said work spindle being inclined by 45° with respect to the rotation axis of said swivel head; and
a drive motor having a drive shaft which is selectively coupled to said work spindle through a bevel gear transmission and a shift transmission;
said from wall of said support housing being downwardly inclined; and
said swivel head being combined with said milling head to form a swivel milling head in which said shift transmission, driven by said bevel gear transmission, for said single work spindle is arranged.

5,533,847

ALIGNMENT ADAPTER

Andreas Basteck, Am Oberen Scholberg 6, 71686 Remseck, Germany
Filed Jan. 23, 1995, Ser. No. 376,500
Claims priority, application Germany, Feb. 16, 1994, 44 04 725.8
Int. Cl.⁶ B23C *5/16;* **B23B** *29/034;31/36*
U.S. Cl. 409—234 **18 Claims**

1. Apparatus for compensating for axiality faults in tool holders, comprising:
a shank part having a circular cylindrical external surface coaxial to reference surfaces of said shank part, and a first radial surface,
an adapter device having a tool mounting for a tool, a second radial surface lying opposite said first radial surface of said shank part, a circular cylindrical external surface coaxial to said tool, and axially parallel screws arranged to pull said adapter device against said shank part, and
a compensator ring having a first circular cylindrical coaxial internal surface seated with play on said circular cylindrical external surface of said shank part and rotatable thereon, a

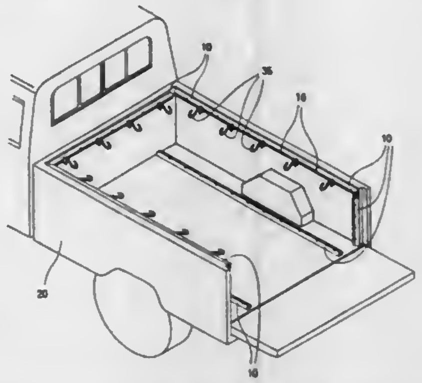


second circular cylindrical internal surface lying with play on said circular cylindrical external surface of said adapter device, a screw device by which coaxiality of said adapter device relative to said shank part can be at least partly influenced, and a securing device that secures said compensator ring against axial movement relative to said shank part,

said compensator ring also having a first, non-continuous radial slot that forms first and second ring portions having said first and second circular cylindrical coaxial internal surfaces respectively thereon and two ring segments, one ring segment having a second radial slot that is bridged over by a screw device that lies at least substantially in a radial plane.

5,533,848
PAYLOAD TIE-DOWN SYSTEM

Oliver M. Davis, 7757 Jamestown, Fishers, Ind. 46038
Filed Jan. 3, 1995, Ser. No. 367,899
Int. Cl.⁶ B60P *7/08*
U.S. Cl. 410—105 **15 Claims**



1. Payload tie-down system for a transportation device, comprising:

an elongated generally half-round rod track having a planar rear surface, a curved front surface, a generally rectangular cross-section slot, a generally rectangular cross-section channel, and a plurality of circular cross-section notches, said slot disposed longitudinally and symmetrically within said track and adjacent and open to said front surface so that wider sides of said slot are normal to said rear surface, said channel disposed longitudinally and symmetrically within said track, interposed between said slot and said rear surface, and adjacent and open to said slot so that wider sides of said channel are parallel to said rear surface, and said notches disposed adjacent to said front surface and said slot so that axes of said notches are parallel to said rear surface and normal to a longitudinal axis of said track;

means for attaching said track to the transportation device so that said rear surface is proximate to the transportation device;

a channel plate slidably disposed within said channel;

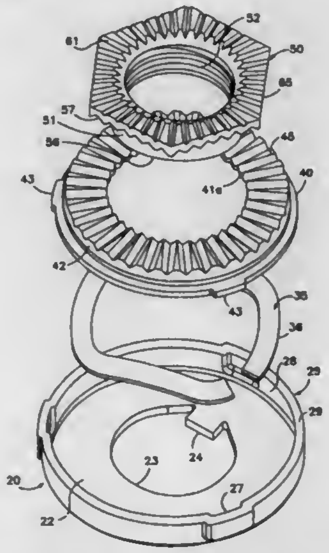
a slot plate having a retainer hole, attached to said channel plate and slidably disposed within said slot, said retainer hole having approximately the same radius as the radius of one of said notches and disposed normally through said slot plate so that said retainer hole is capable of alignment with one of said notches;

retainer means, removably disposed through said retainer hole and one of said notches, for preventing relative sliding movement of said slot plate with respect to said track; and

strap attachment means, attached to said retainer means.

5,533,849
SELF-LOCKING NUT FOR A WHEEL BEARING

Robert A. Burdick, Burbank, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.
Filed Jul. 15, 1994, Ser. No. 275,834
Int. Cl.⁶ F16B *39/10;39/24*
U.S. Cl. 411—120 **4 Claims**



1. A self-locking nut for application to a shaft having a thread and an axially extending spline groove along its thread, said self-locking nut having a central axis, and comprising:

a thrust washer having a central opening to pass said shaft, a spline tang extending into said opening for engagement in said spline groove, an abutment face and an oppositely facing bearing face, a peripheral shoulder with an internal peripheral wall to form a cup-like cavity, a plurality of axially-extending retention grooves in said wall, and an upper edge spaced from said bearing face;

bias means;

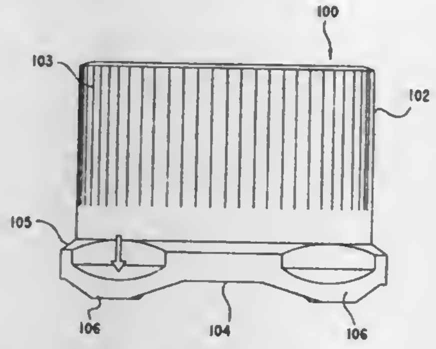
a lock ring axially movable in said cavity having a central opening, a plurality of retention tangs so disposed and arranged as slidably to fit in said retention grooves, said upper edge being shaped to interfere with the removal of said retention tangs from said thrust washer, a bias face against which said bias means bears, and a plurality of radially extending lock grooves on a face oppositely directed from said bias face;

said bias means being disposed between said bias face and said bearing face to bias them apart;

a nut having an array of torque transmitting surfaces, a depending neck passing through the opening in the lock ring, a plurality of radially extending locking grooves on the lock ring facing the locking grooves on the lock ring, an internal thread for engagement with the thread on the shaft, and a bearing face adapted to be brought to bear against the bearing face of the thrust washer to exert an axial force to hold the self-locking nut firmly against a body beyond which said shaft projects, an end of said neck being shaped to form said bearing face, together with an outward deformation so proportioned as to prevent removal of the nut from the lock ring.

5,533,850
WELDING NUT

Tsuyoshi Ishihara, Yashio; Hideyori Sakuragi; Kazuo Imanishi, both of Atsugi, and Haruhiko Ishikawa, Yokohama, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama
Filed Nov. 21, 1994, Ser. No. 345,414
Claims priority, application Japan, Dec. 21, 1993, 5-073079 U; Jan. 28, 1994, 6-026302
Int. Cl.⁶ F16B *37/00;37/06*
U.S. Cl. 411—171 **8 Claims**



1. A welding nut, comprising:

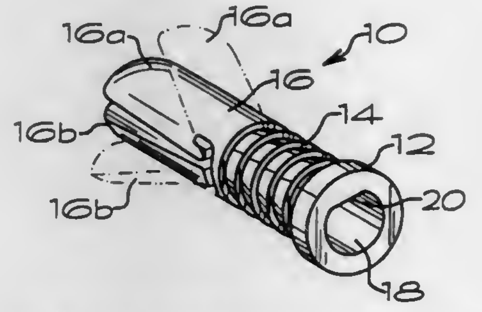
a cylindrical main body having a bearing surface end and an axial screw hole;

a flange set around an edge of said bearing surface end; and

axially extending protrusions for resistance welding formed by pressing parts of said flange in a direction towards said bearing surface end, said protrusions extending beyond the edge of said bearing surface end, wherein a bearing surface of said bearing surface end is a planar surface.

5,533,851
HOLLOW WALL ANCHOR

Lee Remmers, Ocala, Fla., assignor to Clairson, Inc., Newark, Del.
Filed Sep. 30, 1994, Ser. No. 315,908
Int. Cl.⁶ F16B *13/06;21/00*
U.S. Cl. 411—344 **6 Claims**



1. A wall anchor for installation in a hole drilled in a wall comprising:

a head;

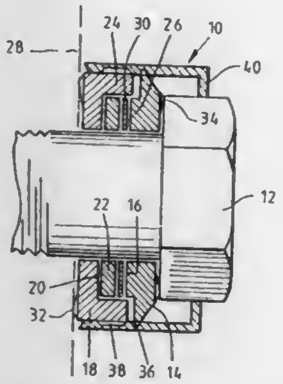
a barrel having one end attached to the head and an opposite end attached to a pair of parallel fingers, each of said fingers having one end pivotally attached to the barrel and having opposite ends free from connection whereby said fingers can be spread apart by driving a pin therethrough;

said head and said barrel having aligned circumferential bores extending longitudinally therethrough, said at least one of said bores of said head or said barrel having a flat portion along one arcuate segment; and,

said head having an outer diameter greater than an outer diameter of said barrel.

5,533,852
FASTENER BEARING ASSEMBLY

Norman L. Matthews, Level R1, 1 Haverlock Street, West Perth, Australia
Filed Jun. 29, 1994, Ser. No. 232,024
Claims priority, application Australia, Nov. 1, 1991, 9267; Nov. 11, 1991, 9419
Int. Cl.⁶ F16B *37/00;43/00*
U.S. Cl. 411—534 **11 Claims**



1. A fastener bearing assembly for reducing the turning friction between a head of a fastener and an object to be fastened by the fastener, the assembly comprising:

a first part having a first pressure transmitting surface;

a second part having a second pressure transmitting surface, and adapted to rotatably receive said first pressure transmitting surface of the first part in facing relation thereto;

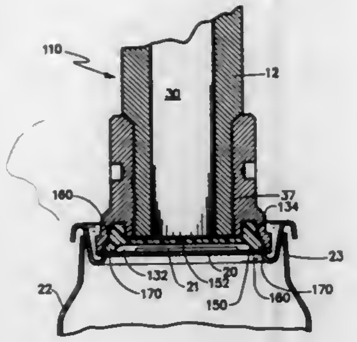
a solid dry lubricant material having a low coefficient of friction provided to reduce friction between said first and second pressure transmitting surfaces whereby, in use, said first part can rotate with the head of the fastener and said second part can be held stationary relative to the fastened object so that said dry lubricant material can act as a bearing between the head of the fastener and the fastened object; and

containment means provided in connection with said first and/or second parts for containing said solid dry lubricant material therein whereby, in use, said solid dry lubricant material is capable of withstanding substantial compressive loads without being extruded from between the first and second parts.

5,533,853
APPARATUS AND METHOD FOR EJECTING WORKPIECES FROM FORMING MACHINES

Samuel C. Wu, Lakewood, Colo., assignor to Glenn Bott, Arvada, Colo.
Filed May 19, 1994, Ser. No. 246,329
Int. Cl.⁶ B21D *51/00*
U.S. Cl. 413—31 **36 Claims**

1. In a machine adapted to perform a machining function on a workpiece wherein said machine has a forming station including at least one forming roller and wherein said machine has a positioning mechanism operative to advance so as to move said workpiece



into an engaged position in said forming station wherein the machining function can be performed thereon and to retract whereby said workpiece can be ejected from said forming station, an improvement comprising a chuck element mountable to said machine and having a forming surface cooperative with said forming roller to perform the machining function and including a compressible, polymer-based resilient element mounted to said chuck element and positioned so that when said workpiece is in the engaged position, a portion of said workpiece engages said resilient element such that said resilient element is collapsed whereby, when said positioning mechanism retracts, said resilient element exerts a restorative force on said workpiece thereby to eject said workpiece from the forming station.

5,533,854
APPARATUS FOR THE HANDLING OF BLANK STACKS HAVING A BAND

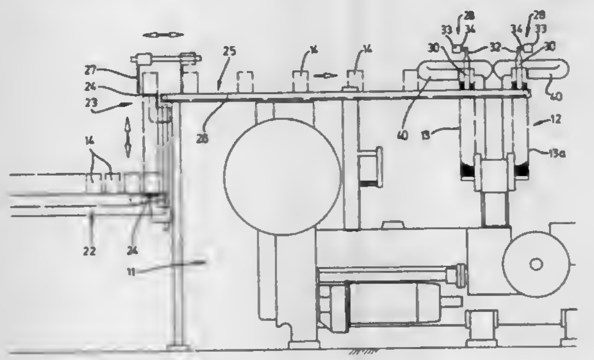
Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Jan. 21, 1994, Ser. No. 184,530

Claims priority, application Germany, Jan. 20, 1993, 43 01 169.1

Int. Cl.⁶ B65B *67/00*

U.S. Cl. 414—412 **16 Claims**



1. An apparatus including a blank magazine of a packaging machine for transporting blank stacks (**14**), each surrounded by a band (**15**), downstream in a transport direction along a path of movement for transfer to said blank magazine (**12**) of said packaging machine, said apparatus comprising:

a) upstream of the magazine, a belt conveyor (**25**) on which the blank stacks (**14**) are conveyed at a distance from one another, transversely to a longitudinal dimension of the stacks,

b) the magazine (**12**) being disposed laterally adjacent to and below a conveying plane of the belt conveyor (**25**);

c) means for pushing off the individual blank stacks (**14**) in a direction transverse to a conveyance direction of the belt conveyor (**25**), i.e. in the direction of the longitudinal dimension of the blank stacks (**14**), up to a position above the magazine (**12**); and

d) between the belt conveyor (**25**) and the magazine (**12**), a stationary severing knife (**35**) past which the blank stacks (**14**) are pushed off from the conveyor belt, and which severs each band.

5,533,855
BALE TRANSPORTER

David Mitchell, Church Farm, Winfarthing, Diss, Norfolk IP22 2ED, United Kingdom

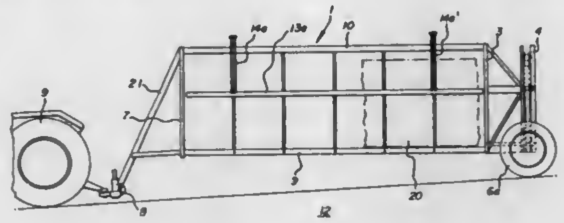
PCT No. PCT/GB92/01696, § 371 Date Aug. 16, 1994, § 102(e) Date Aug. 16, 1994, PCT Pub. No. WO93/05642, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 16, 1992, Ser. No. 204,314

Claims priority, application United Kingdom, Sep. 16, 1991, 9119750

Int. Cl.⁶ A01D *90/08*

U.S. Cl. 414—470 **27 Claims**



1. A bale transporter capable of self-loading and unloading of bales having a front end and a rear end, the bale transporter comprising:

an end frame at the rear end of the bale transporter;

a longitudinally extending support having a front end and a rear end, and being provided with a support surface, the rear end of the support being pivotally mounted to the end frame about a rear pivot point and the front end of the support being pivotally mounted to a rotatable coupling point at the front end of the bale transporter at a front pivot point, the front end of the bale transporter being coupled at the rotatable coupling point to means for supplying power and drive, whereby the support is laterally rotatable in two opposing directions about an axis between the front pivot point and the rear pivot point from a first central transportation position, in which the support is able to support a bale during transportation, to two second loading/unloading positions in which a bale may be loaded onto or unloaded from the support surface; and

loading means capable of clamping a bale on the ground to the support when it is in the second position, of holding the bale in position on the support when the support is in the first position, and of releasing the bale when the bale is unloaded from the support in the second position.

5,533,856
COMBINED LOADED SELF-LEVELING AND IMPLEMENT TILT LINKAGES FOR EFFECTING TRUE LEVEL AND ENHANCED ROLL BACK AND DUMP CHARACTERISTICS THROUGHOUT LIFT RANGE OF LOADER

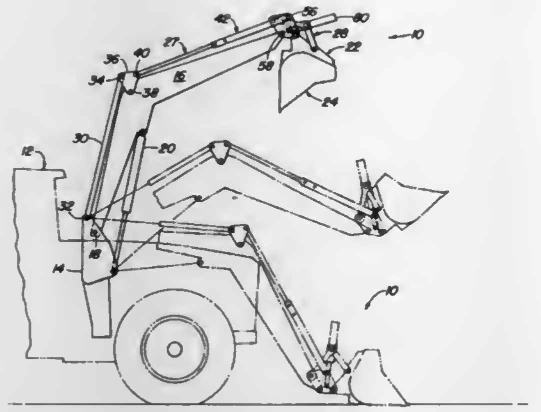
Henry Friesen, Niagara Falls, and Ken K. Oka, St. Catharines, both of, Canada, assignors to Deere & Company, Moline, Ill.

Filed May 22, 1995, Ser. No. 445,807

Int. Cl.⁶ E02F *3/42*

U.S. Cl. 414—711 **7 Claims**

1. In a front-end loader including a pair of loader arms respectively pivotally coupled to a pair of masts for swinging vertically, a hydraulic lift cylinder connected between each mast and an adjacent arm for selectively raising and lowering the arm, an implement attached to forward ends of the arms for being raised and lowered together with the arms, a linkage train coupled between each mast and one of a bracket or carrier holder associated with the implement for maintaining the implement in a near level condition as the arms move between lowered and raised positions, said linkage train including leveling and tilt linkages and a tilt cylinder operable for selectively pivoting the implement to various attitudes relative to the horizontal, the improvement comprising: each linkage train including, as viewed from one side, a plate means having lower central, forward, upper central and rear points of connection arranged generally in the pattern of a parallelogram; a first pivot pin means at said lower central point of connection being pivotally coupled to the forward end of one of said pair arms; a second pivot pin means at the forward point of connection being pivotally coupled to a lower rear location of said one of said bracket or carrier holder; a third pivot pin means at the upper central point of connection-Being pivotally coupled to a forward end of a leveling link of said leveling linkage; a fourth pivot pin means at the rear point of connection being pivotally coupled to a rear end of said tilt linkage; a fifth pivot pin means coupling a forward end of said tilt linkage to said one of the bracket or carrier holder; and the hydraulic cylinder being connected between said plate means and tilt linkage.



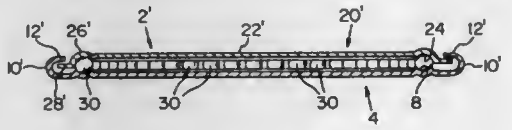
5,533,857
TURNTABLE FOR MANIPULATING PAPER ROLLS

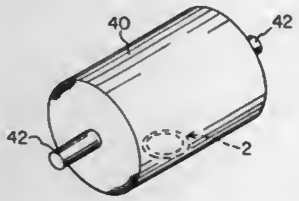
Rock A. Ferrone, 1885 Main St., Pittsburgh, Pa. 15215

Continuation-in-part of Ser. No. 35,442, Mar. 23, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,374

Int. Cl.⁶ A47B *11/00*

U.S. Cl. 414—757 **17 Claims**





1. A low-profile turntable for manipulating paper rolls comprising:

a stationary base plate having at least one lower bearing raceway portion therein, and an upwardly extending, continuous, annular peripheral edge at a radially outermost portion of said base plate, said peripheral edge having an inwardly formed, continuous, annular peripheral lip thereon at an uppermost portion of said peripheral edge;

a rotatable upper plate having an upper bearing raceway portion therein for each said lower bearing raceway portion which combines to form a bearing raceway, said upper plate having an outwardly extending, continuous, annular peripheral edge positioned beneath said peripheral lip of said base;

a plurality of ball bearings rotatably positioned in each said bearing raceway to permit said upper plate to rotate relative to said stationary base plate when a paper roll is positioned on said upper plate; and

a bearing retainer plate positioned between said base plate and said upper plate to keep said ball bearings in said bearing raceways.

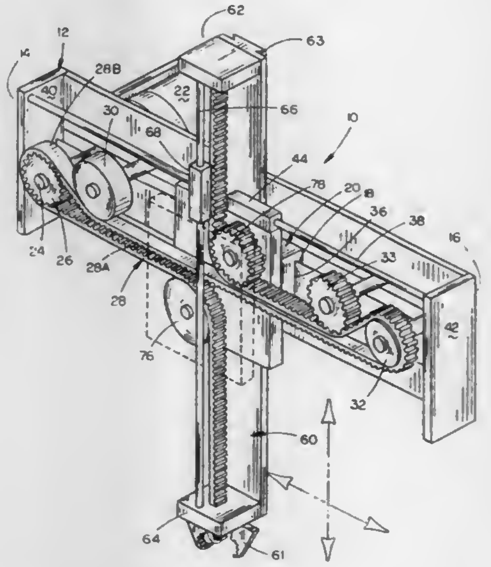
5,533,858
TWO-AXIS CARTESIAN ROBOT

Larry J. Costa, 54201 Ash Rd., Osceola, Ind. 46561

Continuation-in-part of Ser. No. 343,136, Nov. 22, 1994, Pat. No. 5,476,358, which is a continuation of Ser. No. 887,317, May 22, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 398,911

Int. Cl.⁶ B25J *9/00*

U.S. Cl. 414—751 **7 Claims**



1. A two-axis Cartesian robot, comprising:

a first elongated and horizontally disposed support means having first and second ends;

said first support means having a first belt pulley rotatably mounted thereon adjacent its said first end;

said first support means having a first idler pulley mounted thereon adjacent said second end thereof;

a first carriage longitudinally horizontally movably mounted on said first support means;

said first carriage having second and third idler pulleys rotatably mounted thereon;

a first brake means mounted on said first carriage for selectively preventing longitudinal movement of said first carriage with respect to said first support means;

a second elongated and vertically disposed support means operatively vertically movably mounted on said first carriage and having its longitudinal axis disposed in a direction transverse to the longitudinal axis of said first support means;

said second support means having upper and lower ends;

a second brake means interconnecting said first carriage and said second support means for selectively preventing the movement of said second support means with respect to said first carriage;

a reversible drive motor mounted on said first support means adjacent the said first end thereof and being operatively connected to said first belt pulley;

an elongated flexible belt means for selectively moving said first carriage with respect to said first support means and for vertically moving said second support means with respect to said first carriage;

said belt means extending upwardly from a fixed connection adjacent said lower end of said second support means, thence around said second idler pulley, thence towards said first end of said first support means, thence around said belt pulley, thence towards said second end of said first support means, thence beneath and around said first idler pulley, thence beneath said third idler pulley, thence upwardly to a fixed connection adjacent the upper end of said second support means;

a first workpiece handling apparatus operatively secured to said second support means;

and control means for controlling the operation of said drive motor means, said first brake means and said second brake means.

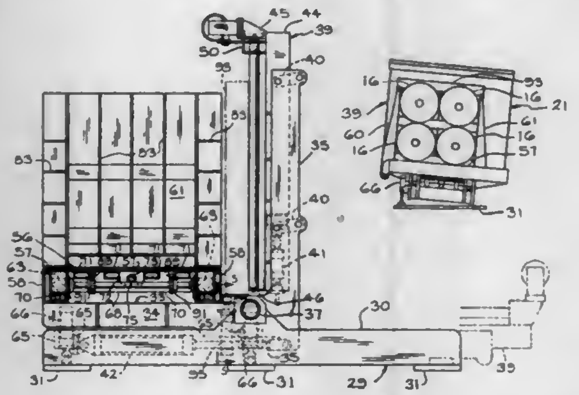
5,533,859
ROLL HANDLING APPARATUS

Earl E. McHenry, Blissfield, Mich., assignor to Automatic Handling, Inc., Erie, Mich.

Filed Jun. 17, 1994, Ser. No. 261,711

Int. Cl.^{6} B25J *5/00*

U.S. Cl. 414—772 **24 Claims**



13. A tiltable upender assembly comprising a frame, a deck assembly having front, rear and opposing sides, opposed gates positioned adjacent said opposing sides of said deck assembly, a rear carrier assembly positioned adjacent said rear side and extending generally perpendicularly to said deck assembly, a cylinder operatively connected to said deck assembly to rotate said deck assembly and said rear carrier 90 degrees relative to said frame about a first axis, and a tilting cylinder operatively connected to said deck to tilt said deck assembly about a second axis, wherein the second axis is substantially perpendicular to said first axis.

5,533,860
ROTATABLE STACKING CHAMBER IN A RIGHT-ANGLE FEEDER FOR PRINTED PRODUCTS

Hagen Gämmerler, D-82057 Icking, Ichoring 44, Germany

Filed Aug. 24, 1994, Ser. No. 294,985

Claims priority, application Germany, Aug. 25, 1993, 43 28 604.6

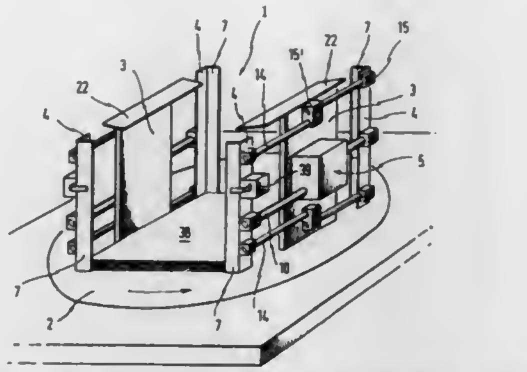
Int. Cl.^{6} B65H *31/34;31/24;31/20*

U.S. Cl. 414—789 **11 Claims**

1. A rotatable stacking chamber for printed products, comprising:

a) a stacking table;

b) a pair of longitudinal facing walls on said stacking table, at least one of said walls being transversely movable relative to said table;



c) a pair of transverse facing walls on said stacking table, at least one of said walls being longitudinally movable relative to said table;

d) means for removing at least one of said longitudinal and transverse walls for discharging printed products stacked between said walls; and

e) a controllable actuator means for moving said at least one of said longitudinal and transverse walls, said actuator means comprising an actuator motor and gear drive, and a spindle connected to said at least one of said transverse walls, said gear having teeth including a worm gear wheel which coacts with said spindle: said actuator motor being arranged in the middle of one of said longitudinal walls and being coupled to said spindle for moving said at least one transverse wall; whereby said longitudinal facing walls and said transverse facing walls form a stacking chamber.

5,533,861
APPARATUS FOR AND METHOD OF PALLETIZING UNIT LOADS

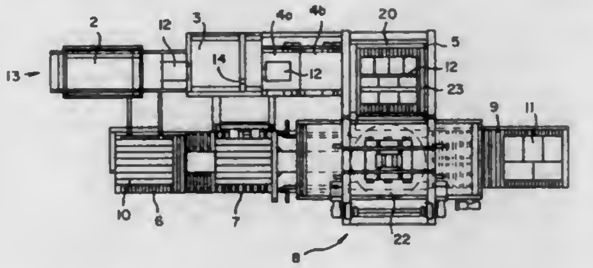
Olaf Klüpfel, Ahlen-Vorhelm, Germany, assignor to Maschinenfabrik Möllers GmbH u. Co., Beckum, Germany

Filed Feb. 9, 1995, Ser. No. 386,234

Claims priority, application Germany, Feb. 9, 1994, 44 04 017.2

Int. Cl.^{6} B65G *57/03;57/24*

U.S. Cl. 414—794.2 **7 Claims**



6. An apparatus for palletizing unit loads for forming a stack of unit loads, said apparatus comprising:

a unit load feeder;

an intermittent conveyor for separating the unit loads into groups of a predetermined number of unit loads;

an input roller conveyor having a plurality of driven rollers and a waiting area, said unit load feeder, said intermittent conveyor and said input roller conveyor being displaceable in a same direction;

guide means displaceable between rollers of said input roller conveyor for displacing the unit loads from a driven roller region of said input roller conveyor to said waiting area, said guide means comprising a plurality of guide elements adapted to be lifted above and sank beneath an upper surface level of said rollers of said input roller conveyor, said guide elements having a stepped upper surface having at least two unit load support surfaces, and said support surfaces being located above said upper surface level of said rollers in a completely lifted position of said guide means;

a stacker for forming stacks of the unit loads and located adjacent to and sidewise of said input roller conveyor; and

sliding means for shifting a unit load layer formed in said waiting area of said input roller conveyor onto said stacker;

wherein said driven rollers of said input roller conveyor are each covered with a freely rotatable tubular sheath.

5,533,862
BLOWER HAVING PROPELLER FAN POSITIONED AXIALLY AND RADIALLY WITH RESPECT TO A SURROUNDING SHROUD FOR QUIETER FAN OPERATION

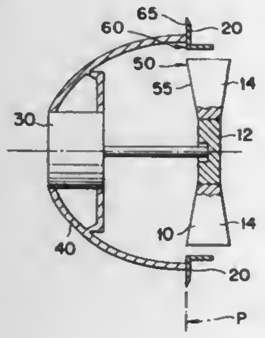
Seung-Taeg Jung, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 22, 1994, Ser. No. 264,077

Claims priority, application Rep. of Korea, Apr. 18, 1994, 1994-8100

Int. Cl.^{6} F04D *19/00*

U.S. Cl. 415—220 **4 Claims**



1. A low-noise air blower comprising:

a propeller fan rotatable about an axis for creating an air stream and including an array of radially projecting blades, each blade including an upstream side; and

a stationary bell mouth coaxially encircling an outer periphery of said array of blades, said bell mouth including an upstream side;

radially outer ends of said upstream sides of said blades being coplanar with a radially inner end of said upstream side of said bell mouth;

said bell mouth including an inner diameter Db, and said array of blades defining an outer diameter Df; a ratio of Db/Df being 1.15±0.02.

5,533,863
SELF POSITIONING NUT

Gerald E. Tornquist, 1053 E. Sandpiper, Tempe, Ariz. 85283, and Paul E. Hruska, 417 S. Melissa Dr., Gilbert, Ariz. 85224

Filed Mar. 26, 1993, Ser. No. 38,593

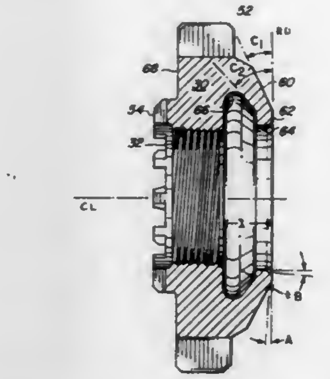
Int. Cl.^{6} F16B *29/00*

U.S. Cl. 415—229 **16 Claims**

1. A nut for applying a compressive force to one or more components mounted on a shaft, having a centerline defining an axial direction, to position the components against a fixed surface, comprising:

an annular member having means for coupling the annular member to said shaft on the inner diameter of said annular member; and

a compliant member integral with said annular member and having a first surface for transmitting said compressive force to said components, said compliant member having a conical portion extending axially from said annular member to said first surface, said conical portion also extending inward from



said annular member to a second surface concentric with said annular member and which is configured to deflect inward to contact said shaft when said first surface is transmitting said compressive force, whereby said nut is centered to said shaft.

5,533,864
TURBINE COOLING BLADE HAVING INNER HOLLOW STRUCTURE WITH IMPROVED COOLING

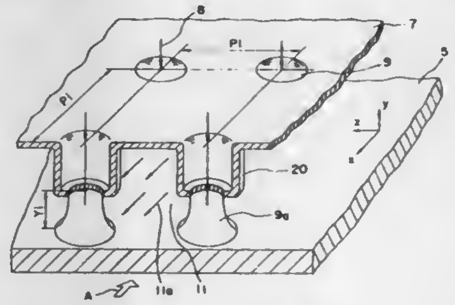
Hideo Nomoto, Chigasaki; Takanari Okamura, and Shoko Ito, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

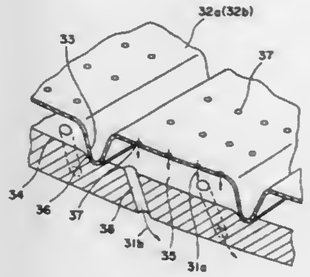
Filed Nov. 17, 1994, Ser. No. 343,956

Claims priority, application Japan, Nov. 22, 1993, 5-292116

Int. Cl.^{6} F01D *5/18*

U.S. Cl. 416—96 A **9 Claims**





1. A turbine cooling blade comprising:

a blade body having a structure defining an inner hollow portion;

an insert core member fitted into the inner hollow portion of the blade body with a space therebetween; and

a plurality of projections formed to said insert core member so as to project towards an inner surface of the blade body, said projections being formed with impingement holes through which cooling air flows from an inside of the insert core member towards the space between the insert core member and the blade body, each of said projections having a cylindrical outer appearance provided with an impingement hole.

5. A turbine cooling blade comprising:

a blade body having a structure defining an inner hollow portion;

an insert core member adapted to be fitted into the inner hollow portion of the blade body with a space therebetween and formed with a number of impingement holes;

- a plurality of partitioning members partitioning the space into a plurality of sectioned chambers between the insert core member and an inner surface of the blade body, said partitioning members extending in a span direction of the blade body;
- a film cooling means formed of a number of film cooling holes formed so as to penetrate the blade body from the sectioned chambers to an outer atmosphere side of the blade body to cover with cooling air substantially an entire outer surface portion of the blade body,
- wherein at least one impingement hole is formed to each one of the sectioned chambers and at least one film cooling hole is formed to each one of the sectioned chambers, and wherein cooling air flows from an inside of the insert core towards the sectioned chambers through the impingement holes to thereby perform film cooling of the entire outer surface of the blade body and regulate inner pressures of the respective sectioned chambers,
- wherein said partitioning members are formed on one of said insert core member and said blade body as projections so as to project from the one of said insert core member and said blade body toward an inner surface of an other of said insert core member and said blade body and abut at projected end portions thereof against the inner surface of the other of said insert core member and said blade body blade body; and
- a plurality of recessed portions formed on said other of said insert core member and said blade body and to which projected end portions of said projections are respectively fitted.

5,533,865
WIND TURBINE

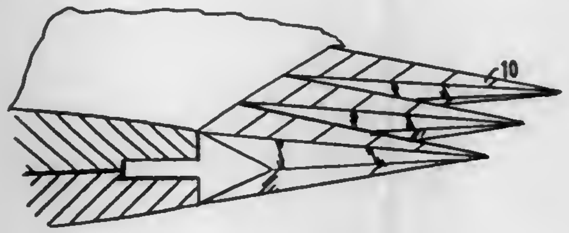
Antonius G. M. Dassen, Vollenhove, and Franklin Hagg, Alkmaar, both of, Netherlands, assignors to Stork Product Engineering B.V., Netherlands

Filed Oct. 6, 1994, Ser. No. 319,107

Claims priority, application Netherlands, Nov. 4, 1993, 9301910

Int. Cl.⁶ F04D *29/38*

U.S. Cl. 416—228 **19 Claims**



1. A wind turbine comprising a rotor having a plurality of blades which each have a front edge and a rear edge, wherein the rear edge has a saw-tooth form having a plurality of saw teeth over at least a part thereof and wherein the saw teeth have a hexagonal cross section.

5,533,866
PRESSURIZED AIR SYSTEM

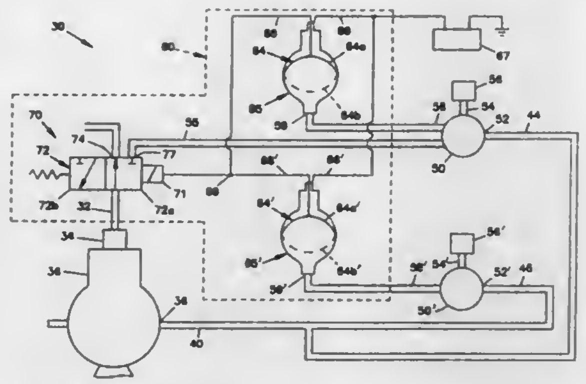
Michael R. Malecha, Lonsdale, Minn., assignor to Air-Lite Transport, Inc., Hudson, Wis.

Filed Jun. 6, 1994, Ser. No. 254,862

Int. Cl.⁶ F04B *49/06*

U.S. Cl. 417—44.9 **17 Claims**

1. A pressurized air system of the type having an air compressor which provides compressed air to at least one reservoir when the air compressor is actuated, and wherein the reservoir delivers compressed air to a set of air-actuated components, wherein the improvement comprises a control system for controlling the air compressor, the control system comprising:



- a. an actuator operatively connected to the air compressor, said actuator actuating the air compressor to compress air and supply compressed air to the reservoir when air pressure in the air reservoir decreases to at least a predetermined minimum, and said actuator disengaging the air compressor to stop compressing air when air pressure in the air reservoir increases to at least a predetermined maximum;
- b. a controller operatively connected to said actuator for providing a control signal to said actuator, the control signal indicative of air pressure in the air reservoir;
- c. said actuator including:
  - i. a valve having a first position and a second position with said actuator actuating the air compressor when said valve is in said first position and said actuator disengaging the air compressor when said valve is in said second position;
  - ii. a valve air inlet connected to the reservoir; and
  - iii. an electric valve setter for moving said valve to the first position and the second position, said electric valve setter responsive to the control signal.

5,533,867
METHOD AND HYDROSTATIC DRIVE SYSTEM FOR OPERATING AN ADJUSTABLE HYDROSTATIC PUMP

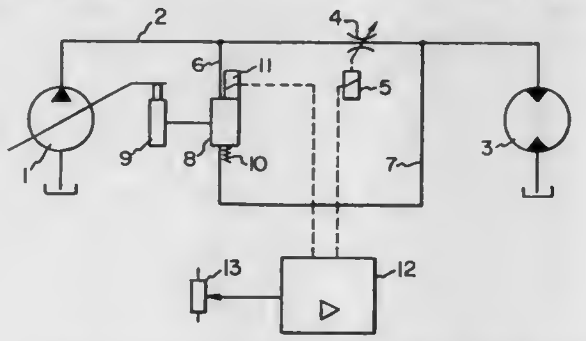
Hilmar Strenzke, Aschaffenburg, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Apr. 26, 1994, Ser. No. 233,072

Claims priority, application Germany, Apr. 26, 1993, 43 13 597.8

Int. Cl.⁶ F04B *49/08*

U.S. Cl. 417—53 **10 Claims**



1. A method for operating an adjustable hydrostatic pump having an outlet in a drive system for a hydraulic energy consuming device having an inlet, said drive system includes a hydraulic fluid delivery line connecting said outlet of said pump and said inlet of said hydraulic energy consuming device, a throttle having an adjustable opening located in said hydraulic fluid delivery line between said outlet of said pump and said inlet of said hydraulic energy consuming device to create a pressure difference in said hydraulic fluid delivery line between said outlet of said pump and said inlet of said hydraulic energy consuming device, a load-sensing controller connected to said hydraulic fluid delivery line on opposite sides of said throttle and means operatively connected with said load-sensing controller for adjusting the delivery pressure of said pump, said method including measuring said pressure drop in said hydraulic fluid delivery line at said throttle, communicating said measured pressure drop to said load-sensing controller and controlling said means for adjusting the delivery pressure of said pump to adjust the displacement of said pump in accordance with said load-sensing controller to a value at which the delivery pressure of said pump exceeds the pressure at said hydraulic energy consuming device by a pressure difference determined by the size of the opening of said throttle, wherein the movement speed of said hydraulic energy consuming device is a set value and coordinating the pressure difference, Δp, and the size of the opening of said throttle in combination such that fine control of said hydraulic energy consuming device is obtained at low movement speeds with minimal loss of power of said hydraulic energy consuming device at high movement speeds.

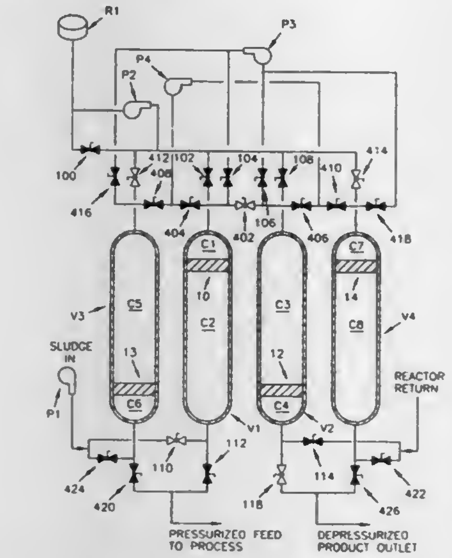
5,533,868
APPARATUS AND METHOD FOR BATCH-WIRE CONTINUOUS PUMPING

Alexander G. Fassbender, West Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Feb. 24, 1995, Ser. No. 394,085

Int. Cl.⁶ F04B *9/08*

U.S. Cl. 417—53 **10 Claims**



1. A feedstock fluid and product fluid system permitting operation of a process at a substantially constant process operating pressure, said system comprising:

- (a) at least one pressure vessel having a separator defining a first chamber and a second chamber within said pressure vessel, said separator slideably sealing the first and second chambers;
- (b) a feedstock pump for admitting a high volume flow low differential pressure charge of a feedstock fluid, that is substantially incompressible, into the second chamber;
- (c) a pressurizer for admitting a low volume flow high pressure differential charge of a product into the first chamber and for pressurizing to a pressure substantially equivalent to a process operating pressure;
- (d) a circulating pump for moving feedstock to the process and moving product from the process at the process operating pressure;
- (e) first valves for isolating the at least one pressure vessel and the pressurizer from the process, from the feedstock pump and from the circulating pump thereby permitting the pressure vessel to be pressurized to the process operating pressure; and
- (f) second valves for permitting flow of feedstock through the process from the second chamber of the pressure vessel and permitting flow of product either back to the first chamber of the pressure vessel or back to the second pressure vessel.

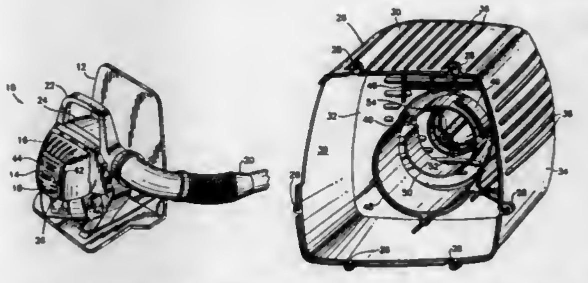
5,533,869
POWER TOOL EXHAUST COOLING SYSTEM

Daniel A. Garrison, and Jeffrey S. Franke, both of Charlotte, N.C., assignors to Homelite, Inc., Charlotte, N.C.

Filed Nov. 28, 1994, Ser. No. 345,480

Int. Cl.⁶ F04B *53/16;* **F01P** *7/02*

U.S. Cl. 417—234 **26 Claims**



1. In a housing for a power tool, the power tool having an internal combustion engine with a flywheel rotor and a muffler, the improvement comprising:

- the housing including a first integral inwardly extending air channeling wall section located within an interior area of the housing that is suitably sized and shaped to surround a substantial portion of a side perimeter of the rotor and form a channeling air flow path, the path including a straight and direct section extending from the rotor to an outlet of the muffler.

5,533,870
PISTON TYPE COMPRESSOR

Kenji Takenaka; Keiichi Kato, and Chuichi Kawamura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

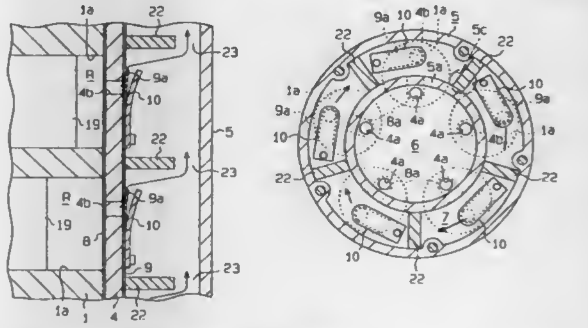
PCT No. PCT/JP93/01649, § 371 Date Jul. 12, 1994, § 102(e) Date Jul. 12, 1994, PCT Pub. No. WO94/11635, PCT Pub. Date May 26, 1994

PCT Filed Nov. 11, 1993, Ser. No. 256,429

Claims priority, application Japan, Nov. 13, 1992, 4-304199

Int. Cl.⁶ F04B *1/12*

U.S. Cl. 417—269 **13 Claims**



1. A piston type compressor comprising:

- a cylinder block having a plurality of cylinder bores formed therein;
- a housing secured to said cylinder block, said housing having a center portion and a peripheral portion surrounding the center portion, wherein said center portion includes a suction chamber with an inlet port for receiving uncompressed refrigerant gas and said peripheral portion includes a discharge chamber with an outlet port for receiving and discharging compressed refrigerant gas;
- a valve plate disposed between said cylinder block and said housing, said valve plate including a plurality of suction holes for connecting said cylinder bores to said suction chamber, a plurality of suction valves for controlling the opening and closing of said suction holes, a plurality of discharge holes for connecting said cylinder bores to said discharge chamber, a

plurality of discharge valves for controlling the opening and closing of said discharge holes, and a surface facing said discharge chamber;

said cylinder bores and said discharge holes being arranged at a predetermined interval around a center axis of said cylinder block, and wherein said discharge valves are arranged in a circumferential array about said valve plate surface constructed in relation to each of said discharge holes for directing when said discharge holes are open compressed refrigerant gas from each of said discharge holes circumferentially in the same direction toward said outlet port;

a plurality of pistons reciprocatable each in a respective one of said cylinder bores for causing said refrigerant gas to open said suction valves and flow through said suction holes into said cylinder bores from said suction chamber, and for compressing said refrigerant gas to cause said gas to open said discharge valves and flow through said discharge holes into said discharge chamber from said cylinder bores; and

a plurality of shielding members provided in said discharge chamber in association with said discharge valves, the shielding members guiding the refrigerant gas discharged from any one of said plurality of discharge holes around so as not to cause vibration by striking said discharge valves associated with the remaining discharge holes.

5,533,871

SINGLE-HEADED-PISTON-TYPE SWASH-PLATE COMPRESSOR HAVING PULSATION DAMPING SYSTEM

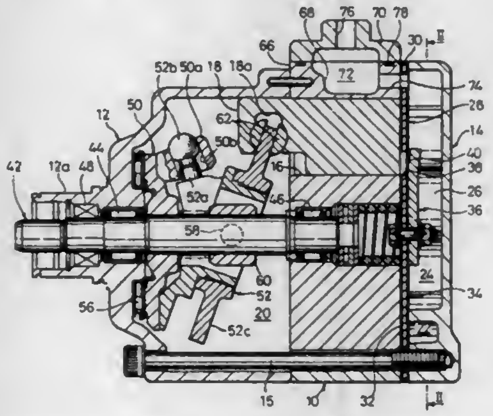
Kenji Takenaka; Hiroaki Kayukawa; Kazushige Murao, and Osamu Hiramatsu, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 27, 1994, Ser. No. 364,717

Claims priority, application Japan, Dec. 27, 1993, 5-330394

Int. Cl.^{6} F04B *25/04*

U.S. Cl. 417—269 **4 Claims**



1. A single-headed-piston-type swash-plate compressor comprising:

a cylinder block having cylinder bores formed therein;

a plurality of pistons slidably received in the cylinder bores of said cylinder block, respectively;

a first housing associated with an end side of said cylinder block so as to form a crank chamber therebetween;

a second housing associated with the other end side of said cylinder block so as to form an annular suction chamber and a central discharge chamber therebetween, said suction and discharge chambers being partitioned by an annular wall portion projected from an inner wall of said second housing such that said annular suction chamber surrounds said central discharge chamber;

a drive shaft rotatably provided in and extended through said crank chamber; and

a conversion mechanism provided on said drive shaft within said crank chamber for converting a rotating movement of said drive shaft means into a reciprocating movement of each piston in the corresponding cylinder bore such that a suction stroke and a discharge stroke are alternately executed therein, a fluid being introduced from said suction chamber into said cylinder bore during the suction stroke and, during the compression stroke, the introduced fluid being compressed and discharged from said cylinder bore into said discharge chamber,

wherein said cylinder block is provided with a portion extended radially and outwardly from a side thereof, said portion having a damping chamber formed therein, and

wherein the discharge chamber has an elongated portion extended radially and outwardly therefrom, said elongated portion being in communication with said damping chamber through a small passage formed in the extended portion of said cylinder block.

5,533,872

RECIPROCATING PISTON COMPRESSOR

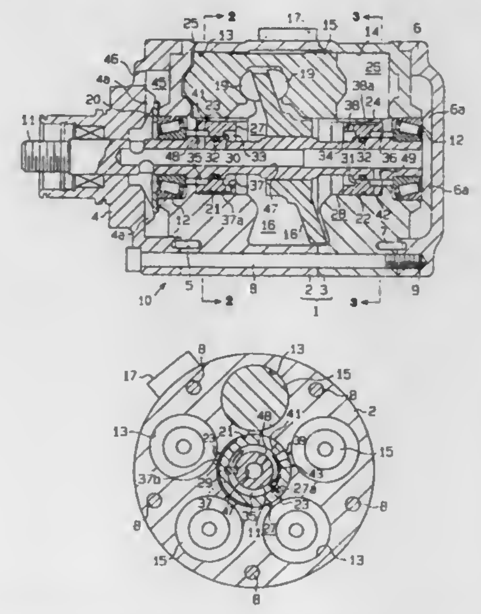
Toshiro Fujii; Kazuaki Iwama; Yuichi Kato, and Katsuya Ohyama, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 5, 1995, Ser. No. 463,206

Claims priority, application Japan, Jun. 7, 1994, 6-125450

Int. Cl.^{6} F04B *27/08*

U.S. Cl. 417—269 **20 Claims**



1. A compressor having a drive plate mounted on a rotary shaft for an integral rotation in a predetermined direction about an axis of the rotary shaft, and a piston coupled to the drive plate and disposed in a cylinder bore, the rotation of the rotary shaft being converted to a reciprocating movement of the piston between a top dead point and a bottom dead point in a cylinder bore to compress gas, wherein the gas is supplied from a suction chamber to the cylinder bore during a suction stroke in which the piston is driven from the top dead point to the bottom dead point, and wherein the compressed gas is discharged from the cylinder bore to the discharge chamber during compression and discharge strokes in which the piston is driven from the bottom dead point to the top dead point, said compressor comprising:

a rotary valve supported on the rotary shaft for an integral rotation;

said rotary valve having a suction passage and a discharge passage, said suction passage connecting the cylinder bore with the suction chamber according to the rotation of the rotary valve when the piston is in the suction stroke, said discharge passage connecting the cylinder bore with the discharge chamber according to the rotation of the rotary valve when the piston is in the discharge stroke; and

a discharge valve mounted on the rotary valve, said discharge valve selectively opening and closing the discharge passage according to the difference between the pressures in the cylinder bore and in the discharge chamber.

5,533,873

INDUCTION REGULATOR VALVE FOR ROTARY COMPRESSORS

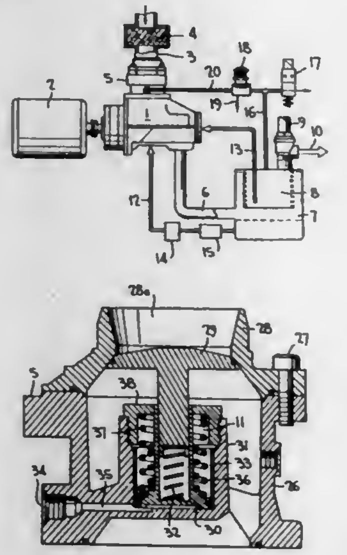
Gerhard Kindl, Vienna, Australia, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, vienna, Austria

Filed Jul. 28, 1995, Ser. No. 508,891

Claims priority, application Australia, Jul. 29, 1994, A-1506.94

Int. Cl.^{6} F04B *49/00*

U.S. Cl. 417—295 **12 Claims**



1. An induction regulator valve for installation in the induction manifold of a rotary compressor and operable by a pneumatic actuator, comprising:

a closure member for regulating fluid flow through the valve;

a displaceable adjusting member accommodating sad closure member and responsive to a pressurized medium to determine an operating position of the closure member that can lie between a closed position and an open position; and

spring means operable to oppose the action of said pressurized medium on an adjusting member, said spring means having a varying stiffness that is less when the operating position of said closure member is closer to its open position than when said closure member is closer to its closed position.

5,533,874

STAND FOR A PUMP

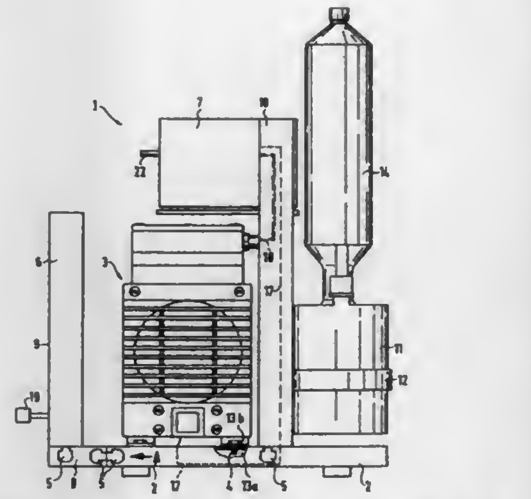
Erwin Hauser, Emmendingen-Kollmarsreute, Germany, assignor to KNF Neuberger GmbH, Freiburg-Munzingen, Germany

Filed Oct. 31, 1994, Ser. No. 332,019

Claims priority, application Germany, Nov. 3, 1993, 93 16 757 U

Int. Cl.^{6} F04B *17/00;* **F16M** *1/00*

U.S. Cl. 417—360 **10 Claims**



1. A pump stand for a pump, comprising a supporting plate for mounting thereon a pump and at least one accessory unit, said supporting plate comprising a base plate (2) provided with a plurality of push-in connections (5) for fastening at least one of a control unit (6) and a vacuum controller (7) to the base plate (2) and a holding arm (**10**) connectable to said base plate (**2**) by push-in connections, for fastening at least one of a trap (**11**) and an exhaust vapor condenser (**14**) to the base plate.

5,533,875

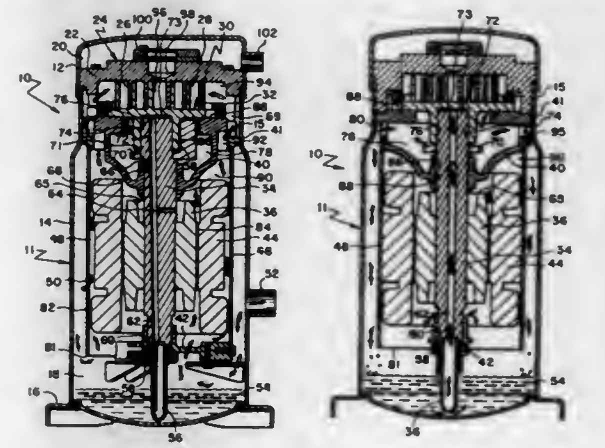
SCROLL COMPRESSOR HAVING A FRAME AND OPEN SLEEVE FOR CONTROLLING GAS AND LUBRICANT FLOW

Daniel R. Crum; Bill P. Simmons, both of La Crosse; Arlo F. Teegarden, Stoddard; Jerry A. Rood, and Peter A. Kotlarek, both of Onalaska, all of Wis., assignors to American Standard Inc., Piscataway, N.J.

Filed Apr. 7, 1995, Ser. No. 418,340

Int. Cl.^{6} F04B *17/00*

U.S. Cl. 417—368 **28 Claims**



1. A gas compressor of the scroll type comprising:

a shell, said shell defining a suction pressure portion and a discharge pressure portion, said suction pressure portion defining an oil sump;

a first scroll member, said first scroll member having a scroll wrap;

a second scroll member, said second scroll member having a scroll wrap, the scroll wrap of said second scroll member being in an interleaved relationship with the scroll wrap of said first scroll member, said second scroll member being mounted in said shell for orbital motion with respect to said first scroll member and said first and said second scroll members comprising a compression mechanism;

a motor mounted in said suction pressure portion of said shell for driving said second scroll member;

an open-ended sleeve fixedly mounted in said shell, said motor being mounted in said sleeve and cooperating therewith to define a first portion of a flow path for suction gas to said compression mechanism, suction gas being initially delivered into said suction pressure portion of said shell exterior of said sleeve; and

a frame fixedly mounted in said shell, said frame defining a cavity in flow communication with said sump through an oil return path which is exterior of said sleeve and into which suction gas is initially delivered into said suction portion of said shell, said frame, in cooperation with the interior of said sleeve, defining a second portion of said flow path for suction gas and isolating said flow path for suction gas from said cavity and from said oil return path.

5,533,876

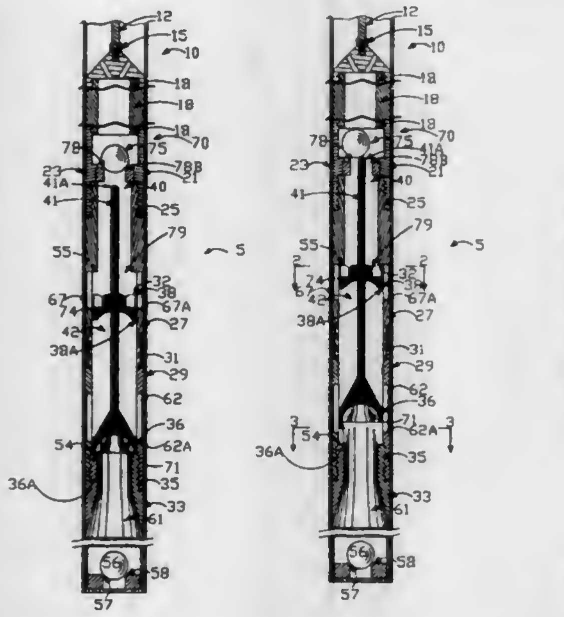
PUMP BARREL SEAL ASSEMBLY INCLUDING SEAL/ ACTUATOR ELEMENT

Joe A. Nelson, II, 6111 Allentown, Spring, Tex. 77389

Filed Apr. 5, 1995, Ser. No. 416,627

Int. Cl.⁶ F04B *53/12*

U.S. Cl. 417—456 **50 Claims**



1. A ball and valve seat assembly comprising:

(a) a hollow tubular member having an internal cross-sectional area;

(b) a valve seat mounted within the tubular member, having a seating passage with a seating cross-sectional area;

(c) a ball positioned within the tubular member above the valve seat;

(d) a piston movably mounted within the tubular member below the valve seat, comprising an actuator for engaging the ball through the passage while the ball is seated on the seat, and comprising a sealing member with a sealing area for sealing the tubular member below the valve seat across the entire internal cross-sectional area of the tubular member, wherein the sealing is greater than the seating cross-sectional area;

wherein the ball and valve seat is closed by the ball being seated on the valve seat, and opened by an increase in fluid pressure below the piston acting upon the sealing area causing the piston to rise and engage the ball with the actuator and thereby unseat the ball.

5,533,877

HOSE FASTENING ARRANGEMENT FOR ROLLER PUMPS

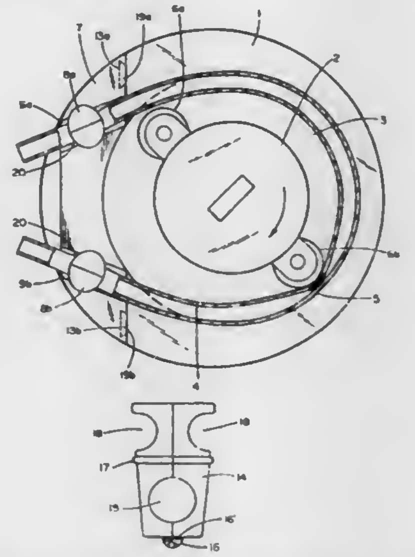
Günter Friedmann, Übersee; Helmut Wiehan, Freising, and Erwin Knott, Poing, all of, Germany, assignors to Stockert Instrumente GmbH, Munich, Germany

Filed Feb. 15, 1995, Ser. No. 388,805

Claims priority, application European Pat. Off., Feb. 16, 1994, 94102333

Int. Cl.⁶ F04B *43/08*

U.S. Cl. 417—477.1 **8 Claims**



1. A hose fastening arrangement for roller pump of a heart-lung machine, wherein a pump head is comprised of a pump stator and pump rotor, including a hose fastening means for the fastening of a hose piece which is introduced into the pump head of the roller pump, wherein grooves are provided on the hose fastening means for fastening the hose fastening means to the pump head, and protuberances are formed on the pump stator of the roller pump which are insertable into and slidable in said grooves, such that the hose fastening means is detachable from the pump head of the roller pump.

5,533,878

SQUEEZE TYPE PUMP

Noboru Iwata, Hashima, Japan, assignor to Daiichi Techno Co., Ltd., Gifu-Ken, Japan

Filed Mar. 2, 1995, Ser. No. 407,481

Claims priority, application Japan, May 11, 1994, 6-097707

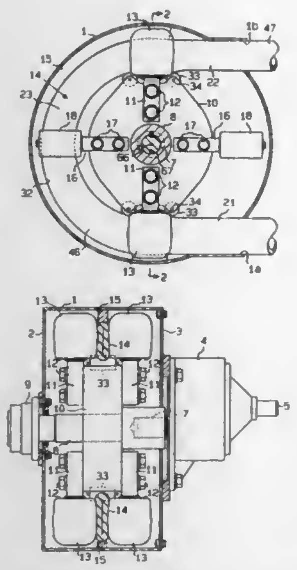
Int. Cl.⁶ F04B *43/08*

U.S. Cl. 417—477.3 **15 Claims**

1. A squeeze pump having an elastic tube which is disposed between an inlet and an outlet of a cylindrical drum and extends along an inner peripheral surface of the drum, and a plurality of pressing rollers spaced by a predetermined angle and rotatable about an axis of said drum, said pressing rollers being arranged to press the tube, whereby said tube is deformed into a flat shape with two bent portions to transfer a slurry within the tube, said squeeze pump comprising:

said tube including a large diameter passageway disposed in said inlet, a small diameter passageway disposed in said outlet and a tapered passageway continuously extending from said large diameter passageway to said small diameter passageway, wherein said passageways have a common center;

each of said pressing rollers have a roller axis extending along the entire length of the pressing roller, said pressing roller further including a large diameter portion formed at the middle of the roller axis, two small diameter portions respectively formed at ends of the roller axis and two tapered portions respectively extending from the large diameter portion to the small diameter portions, said pressing rollers being disposed in pairs, wherein each of said pairs comprises opposing pressing rollers with said tube positioned therebetween;



said large diameter portion of said pressing rollers being arranged to move along a first predetermined path to press the common center of the passageways;

each of said small diameter portions of said pressing rollers being arranged to move along a second predetermined path to press the associated bent portion; and

a support member disposed between the inner peripheral surface of the drum and the tube and extending along the tube, for supporting at least one of the bent portions of the tube when the tube is pressed by the pressing roller, said support member having a high portion provided adjacent to the outlet, a low portion provided adjacent to the inlet and a middle portion continuously extending from the high portion to the low portion.

5,533,879

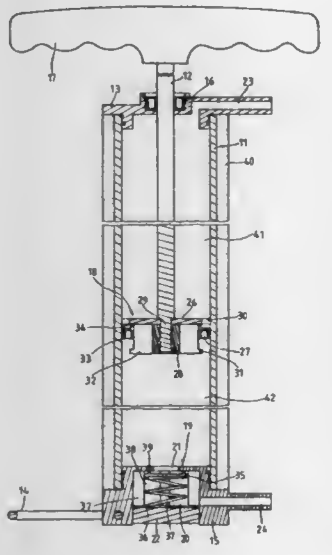
MANUAL DRIVEN VALVED PISTON RECIPROCATING LIQUID PUMP

Kuo N. Chen, 1F, 125-6, Sec: 1, San Min Rd., Taichung, Taiwan

Filed Apr. 10, 1995, Ser. No. 419,466

Int. Cl.⁶ F04B *53/12*

U.S. Cl. 417—553 **1 Claim**



1. A manual valved piston reciprocating liquid pump comprising:

a cylinder of a hollow construction and provided at a top thereof with a top seat and at a bottom thereof with a bottom seat having therein a receiving space, said cylinder further provided therein an upper compartment and a lower compartment, said cylinder still further provided peripherally with an insulation layer;

a piston rod held securely by said top seat of said cylinder such that an upper end of said piston rod is fastened with a handle, and that a lower portion of said piston rod is located in said upper compartment of said cylinder and is provided at a bottom thereof with a one-way piston valve device capable of creating a vacuum in said upper compartment of said cylinder;

a one-way valve device disposed in said receiving space of said bottom seat;

a liquid inlet located at one side of a top end of said cylinder and communicating with said upper compartment of said cylinder, said liquid inlet being engageable at an outer end thereof with an extension hose, said liquid inlet provided at an inner end thereof with a check valve capable of preventing liquid held in said upper compartment from flowing back into said liquid inlet when said one-way piston valve device is actuated to move upwards; and

a liquid outlet located at one side of a bottom end of said cylinder and communicating with said lower compartment of said cylinder, said liquid outlet being engageable at an outer end thereof with an extension hose;

wherein said one-way piston valve device comprises:

a slotted ring fastened to a lower end portion of said piston rod such that said slotted ring is peripherally and snugly in contact with an inner wall surface of said cylinder, said slotted ring further provided peripherally with a plurality of slots;

a slidable seal located under said slotted ring such that said slidable seal is peripherally in contact with said inner wall surface of said cylinder, said slidable seal provided on an upper edge thereof with a circular projection; and

a guide body fastened to said lower end portion of said piston rod such that said guide body is located radially within said slidable seal, said guide body provided peripherally at a bottom thereof with a plurality of projections spaced equidistantly, said guide body further provided longitudinally with a plurality of guide slots;

wherein said one-way valve device comprises:

a gate piece having a periphery fastened slidably on a plurality of ribs arranged circularly on an inner wall of said receiving space of said bottom seat, said gate piece further having peripherally on an upper surface thereof a circular protruded edge; and

a biasing means disposed in said receiving space such that said gate piece is urged by an upper end of said biasing means, and that a lower end of said biasing means is urged by a plug disposed at a bottom of said receiving space.

5,533,880

MOLDING APPARATUS HAVING A MOVABLE DIE AND A COUNTER ROLL

Yuzo Hayakawa, Takarazuka; Tsuneo Hirai, Tsuzuki-gun, and Tsutao Katayama, Takatsuki, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 849,662, Mar. 10, 1992, Pat. No. 5,352,110. This application Jul. 8, 1994, Ser. No. 271,053

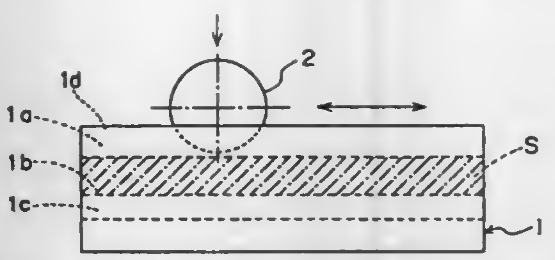
Claims priority, application Japan, Mar. 12, 1991, 3-047020

Int. Cl.⁶ B29C *70/14;* B30B *3/00*

U.S. Cl. 425—328 **4 Claims**

1. A molding apparatus for molding a resinous material, which is reinforced with reinforcement fibers and has a starting shape and thickness, into a fiber-reinforced resin article having a final shape and thickness, said apparatus comprising:

a shaping unit including a movable die having a flat die surface, and a counter roll spaced from said movable die at an initial distance;

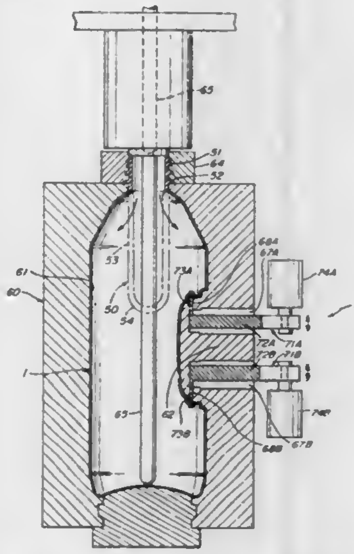


driving means for rotating said counter roll at a variable speed and for providing a reciprocating movement of said movable die relative to said counter roll; and
pressing means for stepwise moving said counter roll toward said movable die for stepwise decreasing the initial distance between said movable die and said counter roll, to thereby apply a stepwise increase in pressure to the resinous material contained in the movable die each time the resinous material is passed beneath said counter roll by the reciprocating movement of said movable die, until the final shape and thickness are attained in the resinous material.

5,533,881
APPARATUS FOR FORMING A STRAIN-HARDENABLE THERMOPLASTIC CONTAINER

Wayne N. Collette, Merrimack, and Suppayan M. Krishnakumar, Nashua, both of N.H., assignors to Continental PET Technologies, Inc., Florence, Ky.

Division of Ser. No. 160,963, Dec. 2, 1993, Pat. No. 5,469,612.
This application Aug. 28, 1995, Ser. No. 520,261
Int. Cl.^{6} B29C *49/20*
U.S. Cl. 425—525 7 Claims



1. A stretch blow mold for forming a strain-hardenable thermoplastic container with a handle recess comprising:
a stretch blow mold having a cavity for forming a stretch blow-molded strain-oriented container from a strain-hardenable thermoplastic material, the cavity having a body-forming portion including at least one aperture; and
an extendable projection movable in the aperture from a first retracted portion substantially flush with the body-forming portion of the blow mold cavity, to a second position extending inwardly into the blow mold cavity to form a partial recess in the container when the thermoplastic material is stretch blow molded over the projection at a forming temperature above the glass transition temperature T_g of the thermoplastic material, the depth of the partial recess being limited by the strain-hardening of the thermoplastic material during stretch blow molding, and to a third position extending further inwardly into the blow mold cavity for mechanically extending the depth of the partial recess to form a handle recess.

5,533,882
HOT RUNNER VALVE GATED SYSTEM

Dieter Gessner, Karben, and Martin Osterode, Runsel, both of, Germany, assignors to Husky Injection Molding Systems Ltd., Canada

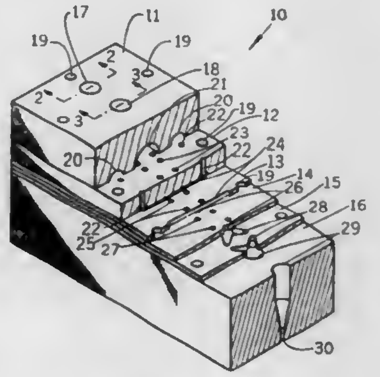
Filed Nov. 29, 1994, Ser. No. 346,376
Int. Cl.^{6} B29C *45/23*
U.S. Cl. 425—564 22 Claims

1. A hot runner valve gated system which directs melt from a melt channel to a mold cavity, comprising:
at least one housing adapted to be positioned in a mold plate, the housing including a gate orifice adapted to be positioned adjacent the mold cavity and a channel means extending therethrough and in communication with said melt channel for directing melt to the orifice;
a reciprocal valve stem positioned within the housing;
means for reciprocating the valve stem positioned adjacent the housing for opening and closing the gate orifice: and
means for maintaining the means for reciprocating in a substantially cooled state, said means for maintaining including a sleeve adjacent the means for reciprocating, wherein said housing is positioned coaxially within said sleeve, and wherein said sleeve has at least one opening therein and including an attachment between the means for reciprocating and the valve stem extending through said opening in the sleeve.

5,533,883
SPIN PACK FOR SPINNING SYNTHETIC POLYMERIC FIBERS

John A. Hodan, Arden, and Otto M. Ilg, Asheville, both of N.C., assignors to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 968,557, Oct. 29, 1992, abandoned.
This application Oct. 18, 1993, Ser. No. 138,907
Int. Cl.^{6} D01D *5/30;4/06*
U.S. Cl. 425—131.5 6 Claims

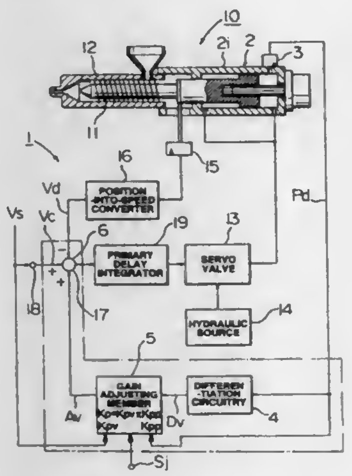


1. A spin pack for spinning synthetic fibers from two or more liquid polymer streams comprising:
means for supplying at least two polymer streams to said spin pack, said supply means being in an upstream location in said spin pack; a spinneret having an upstream side with backholes present therein and a downstream side with extrusion orifices present therein, said spinneret being the downstream terminus of said spin pack; and
disposed between said supply means and said spinneret such that fluid flow is enabled from said supply means to said spinneret, at least one flow distribution plate set comprising:
a) at least one patterned plate having edges which define a substantially regular two-dimensional geometric shape, a substantially planar upstream surface, a substantially planar downstream surface and at least one flow distribution pattern stenciled therein by cutting through, said flow distribution pattern connecting said upstream surface with said downstream surface; and
b) for each patterned plate, at least one boundary plate stacked sealingly adjacent thereto and having edges which define a substantially regular geometric shape, a substantially planar upstream surface and a substantially planar downstream surface, said boundary plate having cut-through holes connecting said upstream surface with said downstream surface to form at least one flow-through channel to allow fluid flow through said patterned plate and otherwise being substantially solid with solid portions where said patterned plate is cut through to accomplish fluid flow in a direction transverse to the flow in said flow-through channel,
said flow distribution plate sets defining discrete separate flow paths such that each liquid polymer stream flows as a discrete stream through each flow distribution plate set to said backholes without mixing with another discrete stream.

5,533,884
SPEED CONTROL UNIT FOR AN INJECTION MOLDING MACHINE

Nobuyuki Nakamura, and Tsuyoshi Arai, both of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-Ken, Japan

Filed Oct. 4, 1994, Ser. No. 317,352
Int. Cl.^{6} B29C *45/77*
U.S. Cl. 425—145 6 Claims

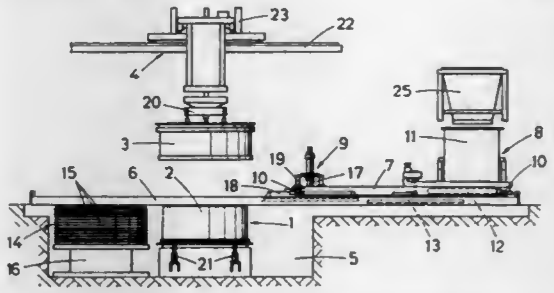


1. A speed control unit for an injection molding machine, said speed control unit being devised for injection speed feedback control of an injection screw in response to a deviation of a speed measurement of said screw from a command value of speed, comprising a pressure sensing means to detect a load pressure of said screw, a differentiation circuit to differentiate a pressure measurement obtained from the pressure sensing means, a gain adjusting means to provide a correction value to a deviation detecting means through gain adjustment of a differentiated value of said pressure measurement from the differentiation circuit, a correcting device including said deviation detection means, said deviation detecting means correcting the command value of speed of said screw after the correction value from the gain adjusting means has been provided, and a control member including primary delay integrator coupled to an output of said deviation detecting means.

5,533,885
APPARATUS FOR MANUFACTURING ANNULAR OR TUBULAR WORKPIECES FROM CONCRETE

Johann Schlüsselbauer, Obergmain 2, A-4674 Altenhof am Hausruck, Austria

Filed Oct. 12, 1994, Ser. No. 322,077
Claims priority, application Austria, Oct. 21, 1993, 2120/93
Int. Cl.^{6} B28B *3/02;13/02;21/10*
U.S. Cl. 425—185 4 Claims



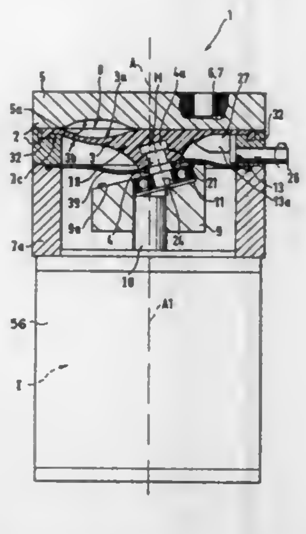
1. In an apparatus for manufacturing open-ended hollow workpieces from concrete, comprising
molding means, which have a vertical axis and comprise a core and a shell, which surrounds and is radially spaced from said core and defines with said core an open-topped mold cavity,
feeding and distributing means, which extend above said molding means and are guided to be radially displaceable relative to said molding means and adapted to dispense concrete into said mold cavity, and
a molding press, which extends above said molding means and comprises a vertical ram that is adapted to carry at its bottom end a molding ring for closing said mold cavity at its top, which press is radially displaceable relative to said molding means,
the improvement residing in that
a carriage is provided, which extends above said molding means and is guided to be radially reciprocable in a predetermined direction relative to said molding means, and
said feeding and distributing means and said molding press are mounted on said carriage and are arranged one behind the other in said predetermined direction.

5,533,886
MEMBRANE PUMP AND METHOD OF OPERATING THE SAME

Richard Von Der Heyde, Vogtsburg; Erich Becker, Bad Krozingen, and Heinz Riedlinger, Freiburg, all of, Germany, assignors to KNF Neuberger GmbH, Freiburg-Munzingen, Germany

Filed Dec. 22, 1993, Ser. No. 171,647
Claims priority, application Germany, Dec. 31, 1992, 42 44 619.8
Int. Cl.^{6} F04B *43/12;* **F04C** *5/00*
U.S. Cl. 418—1 47 Claims

1. A method of operating a pump having a pumping chamber bounded in part by a membranous wall having a central axis and a thickened central region, said method comprising the steps of:
admitting a flowable medium into said chamber at a first location;
discharging said medium from said chamber at a second location;
maintaining a seal between said locations and partway across said chamber by holding a first segment of said membranous wall substantially stationary and using said first segment as part of said seal; and
directing said medium from said first location to said second location by successively displacing successive second segments of said membranous wall, as considered in a direction from said first location towards said second location, by successively deflecting successive Segments of Said thick-

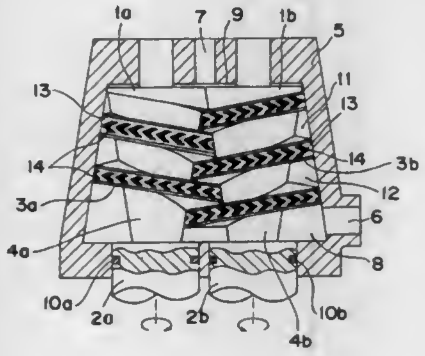


ened central region of said membranous wall along a circumferential path substantially centered about said central axis of said membranous wall.

5,533,887

FLUID ROTARY APPARATUS HAVING TAPERED ROTORS

Teruo Maruyama, Hirakata, and Yoshikazu Abe, Neyagawa, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan
Filed Apr. 26, 1994, Ser. No. 233,273
Claims priority, application Japan, Apr. 27, 1993, 5-100910
Int. Cl.^{6} F01C *1/16*
U.S. Cl. 418—201.3 **1 Claim**

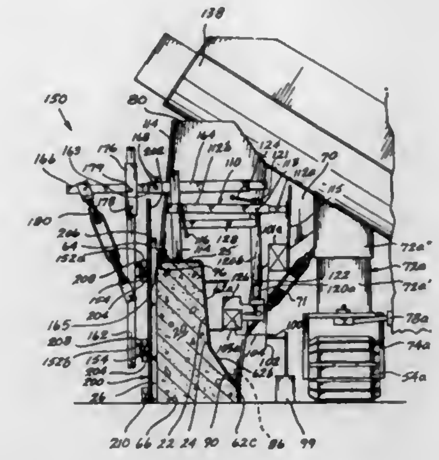


1. A fluid rotary apparatus comprising:
- a casing having a suction hole, a discharging hole, and an inner tapered surface;
- a plurality of screw rotors having thread grooves and being rotatably supported within the casing to be rotated synchronously in mesh with each other, an outer peripheral surface of each of the plurality of screw rotors having a flat surface approaching or sliding in contact with the inner tapered surface of the casing; and
- a driving device for rotating the rotors, whereby fluid is drawn through the suction hole, compressed, and discharged through the discharging hole by utilization of a change of volume of a space defined by the plurality of screw rotors and the casing;
- wherein a band-like chip seal is provided at the flat surface of each rotor; and
- wherein the chip seal has dynamic pressure notches at its surface to produce dynamic pressure from viscous fluid.

5,533,888

APPARATUS FOR FORMING CONCRETE BARRIERS

John F. Belarde, 6327 - 114th Ave. SE., Renton, Wash. 98056
Continuation-in-part of Ser. No. 900,704, Jun. 17, 1992, Pat. No. 5,290,492, which is a division of Ser. No. 571,458, Aug. 21, 1990, Pat. No. 5,173,309. This application Feb. 28, 1994, Ser. No. 203,630
Int. Cl.^{6} B28B *1/08;13/04*
U.S. Cl. 425—64 **29 Claims**



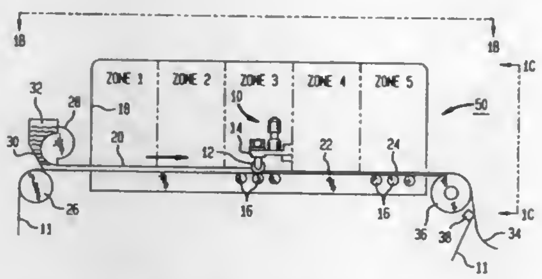
29. A device for slip forming a concrete structure along a substantially horizontal path, the device coatting with first and second forms which extend along the path to support, and define the configuration of both sides of, the structure, the first and second forms each having an inner surface which engages a side of the structure, the first and second forms including a pattern comprising concave or convex portions which extend other than parallel to the path, the first and second forms including rigid walls to support the pattern, the device comprising:
- a frame;
- drive means coupled to said frame for moving said frame along the substantially horizontal path; and
- support means coupled to said frame for supporting said first and second forms relative to one another as said drive means moves said frame along said path so as to cause said first and second forms to coact with one another and enclose an area that defines the cross-sectional shape of a concrete structure to be formed by said device, wherein said support means comprises slide means for slidingly engaging and supporting an outer surface of said first and second forms as said slide means is caused to move along said path by said drive means, wherein said slide means comprises at least one rail which extends parallel to the path to slidingly engage the outer surface of the form; a plurality of supports which extend transversely to, and are attached to, said at least one rail; and a support assembly attached to said plurality of supports for coupling said plurality of supports with said frame and for adjusting the position of said plurality of supports relative to said frame.

5,533,889

APPARATUS FOR IN-SITU GREEN SHEET SLITTING

Lorenzo Scalia, Hopewell Junction, and Barry D. Sewing, Beacon, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 298,480, Aug. 29, 1994. This application Jun. 5, 1995, Ser. No. 462,349
Int. Cl.^{6} B28B *11/14*
U.S. Cl. 425—315 **9 Claims**

1. An apparatus for slitting ceramic green sheets comprising,
- (a) a slitting mechanism having at least one slitting wheel,
- (b) moving means for bringing at least one layer of ceramic green sheet underneath said at least one slitting wheel, and

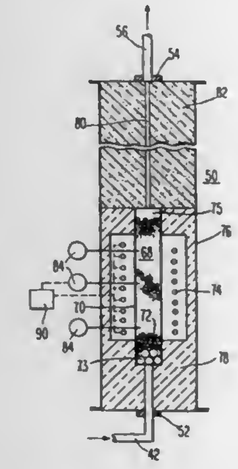


wherein at least a portion of said at least one layer of ceramic green sheet is slit by said at least one slitting wheel, and, wherein said slitting mechanism is inside an oven and secured thereto.

5,533,890

METHOD AND APPARATUS FOR CONTROL OF FUGITIVE VOC EMISSIONS

Mark R. Holst, Concord; Richard J. Martin, Sunnyvale; John D. Stilger, San Jose, and Samson C. Yee, Fremont, all of Calif., assignors to Thermatrix, Inc., San Jose, Calif.
Continuation of Ser. No. 992,405, Dec. 17, 1992, abandoned. This application Feb. 23, 1995, Ser. No. 393,023
Int. Cl.^{6} F23D *3/40*
U.S. Cl. 431—5 **46 Claims**

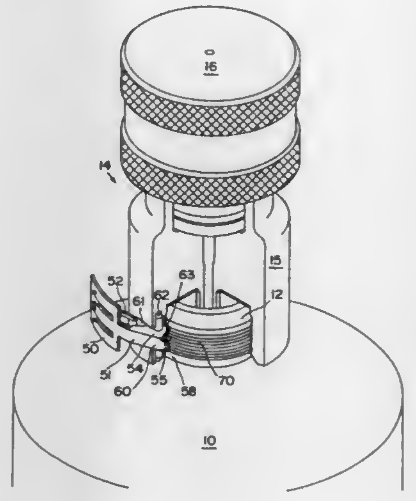


1. An apparatus for abating gaseous VOC leaks consisting essentially of:
- a collection header connected to one or more sources of VOC's;
- a flameless combustor having:
  - (a) an inlet for receiving VOC's from the collection header;
  - (b) an outlet for reaction gaseous products; and
  - (c) a VOC oxidation section located between the inlet and the outlet including a matrix bed of heat resistant material, provided that said heat resistant material does not include oxidative catalytic material;
- a convective quench section located between the portion of the oxidation section that is heated by the heater and the outlet, said convective quench section comprising a bed of heat resistant material, said convective quench section having a higher heat conductivity to the surrounding environment than the VOC oxidation section;
- a knock-out pot located between the collection header and the flameless combustor;
- a flame arrestor located between the collection header and the flameless combustor;
- one or more temperature sensors for sensing the temperature of the matrix bed within the oxidation section;
- an electric heater for heating at least a portion of the oxidation section including a portion of the matrix bed of heat resistant material to a temperature exceeding the decomposition temperature of the VOC's; and
- a means for creating a flow of about 1 standard cubic feet per minute or less from the one or more sources of VOC's to the inlet of the flameless combustor and subsequently through the flameless combustor.

5,533,891

LOCKING MECHANISM FOR HAND TORCH REGULATORS

David S. Pearl, II, and Frank G. Smith, both of Fort Lauderdale, Fla., assignors to Uniweld Products, Inc., Fort Lauderdale, Fla.
Filed Jan. 11, 1995, Ser. No. 371,504
Int. Cl.^{6} F23D *11/36*
U.S. Cl. 431—154 **11 Claims**



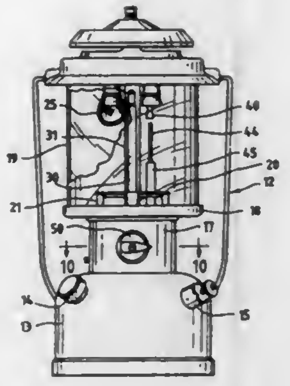
1. A gas burner comprising a source of gas having a threaded outlet connection valve and a gas valve coupled to said outlet connection valve, said gas valve comprising a base portion having locking means contacting the threads of said threaded outlet connection valve so as to prevent rotation of said gas valve in a direction which loosens said gas valve from said connection valve.

5,533,892

LIQUID FUEL LANTERN WITH ELECTRONIC IGNITION

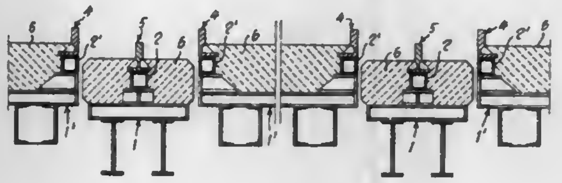
Norris R. Long, Wichita, Kans., assignor to The coleman Company, Inc., Wichita, Kans.
Continuation-in-part of Ser. No. 74,133, Jun. 9, 1993, Pat. No. 5,336,084. This application Jul. 28, 1994, Ser. No. 281,743
Int. Cl.^{6} F23Q *3/00*
U.S. Cl. 431—264 **6 Claims**

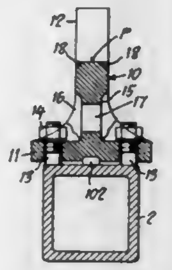
1. A liquid fuel lantern comprising:
- a fuel tank for storing liquid fuel,
- a burner assembly mounted above the fuel tank, the burner assembly including at least one outlet tube having an end adapted to support a mantle,
- a fuel tube extending from the fuel tank into the burner assembly for conveying fuel into the burner assembly,
- a pilot tube extending from the burner assembly and having an end which is positioned adjacent said end of the outlet tube, and
- ignition means adjacent said end of the pilot tube for igniting fuel which flows from said end of the pilot tube.



5,533,893
WALKING-BEAM FURNACE FOR THE ACCELERATED HEATING OF BILLETS OR THE LIKE

Alfredo Barelli, and Stefano DePlano, both of Genoa, Italy, assignors to Iritecna Societa per l'Implantistica Industriale e l'Assetto del Territorio P.A., Genoa, Italy
Filed Feb. 2, 1994, Ser. No. 190,490
Claims priority, application Italy, Feb. 3, 1993, GE93A0005
Int. Cl.⁶ F27D *3/00*
U.S. Cl. 432—122 11 Claims

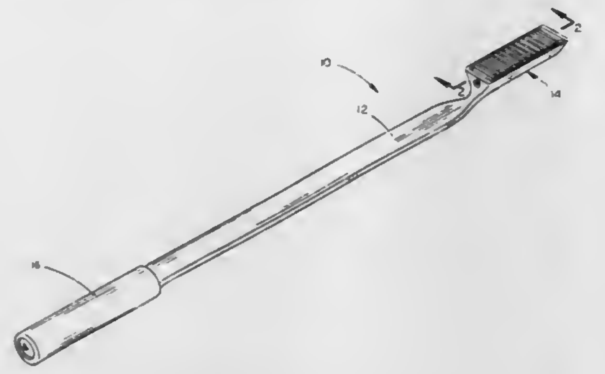




1. Walking-beam furnace for the accelerated heating of billets or the like comprising mobile beams and fixed beams, said mobile beams and fixed beams having upper surfaces made up of billet-tipping ridges (5,4) having profiles which interact during operation so as to cause rotation of the billets about their longitudinal axis as they advance through the furnace, characterized in that the billet-tipping ridges (4,5) of the fixed beams (1') and of the mobile beams (1) consist of a plurality of modular elements (7,8,9,10) in the form of billet-tipping ridge segments which are mutually aligned along the length of the beams (1,1') by means of studs (13) and provided with thermal expansion joints therebetween; said ridge segments being removably fixed on the top of the beam by means of studs (13), being fixed on tubular beams in the form of square tubes which form the pipes through which the assailant fluid passes and which are provided on the top of the structure of the beam, and being provided with complementary reciprocal positioning means.

5,533,894
EQUINE DENTAL FLOAT

R. Scott Capps, Clatonia, Nebr., assignor to World Wide Equine, Waverly, Nebr.
Continuation-in-part of Ser. No. 12,756, Sep. 8, 1993, Pat. No. Des. 357,317. This application Aug. 31, 1994, Ser. No. 298,849
Int. Cl.⁶ A61D *5/00*
U.S. Cl. 433—1 7 Claims



1. A filing apparatus, comprising:

a handle having a file head mounted on one end thereof;

said file head including a trough having forward and rearward end walls, opposing longitudinal side walls, a bottom, an open upper end and an interior cavity bounded by the end walls, side walls and bottom;

a plurality of individual cutting teeth removably mounted in said trough cavity with a cutting edge of each tooth projecting upwardly beyond upper edges of the side walls and end walls to form a filing surface;

each said tooth including a plate member having a forward face, rearward face, and a plurality of side walls extending between the forward and rearward faces to form a tooth thickness, the juncture of each side wall with the forward face forming said cutting edge on each side wall forward edge;

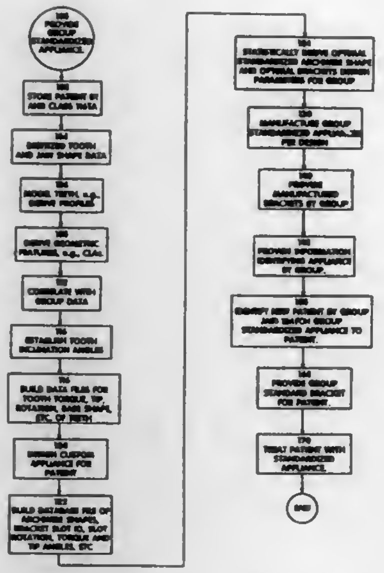
said trough side walls and bottom being configured to receive said teeth and prevent rotation of said teeth on a pin while permitting independent removal of individual teeth vertically from the trough;

mounting means for removably mounting each tooth with one of said plurality of cutting edges projecting upwardly out of said cavity.

5,533,895
ORTHODONTIC APPLIANCE AND GROUP STANDARDIZED BRACKETS THEREFOR AND METHODS OF MAKING, ASSEMBLING AND USING APPLIANCE TO STRAIGHTEN TEETH

Craig A. Andreiko, Alta Loma, and Mark A. Payne, Whittier, both of Calif., assignors to Ormco Corporation, Glendora, Calif.
Continuation-in-part of Ser. No. 141,376, Oct. 22, 1993, Pat. No. 5,395,238, and Ser. No. 973,973, Nov. 9, 1993, Pat. No. 5,431,562, which is a continuation-in-part of Ser. No. 775,589, Oct. 15, 1991, abandoned, and Ser. No. 875,663, Apr. 29, 1992, abandoned, which is a continuation of Ser. No. 467,162, Jan. 19, 1990, Pat. No. 5,139,419, said Ser. No. 141,376is a continuation of Ser. No. 775,589, Oct. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 467,162. This application Aug. 4, 1994, Ser. No. 285,942
Int. Cl.⁶ A61C *7/00*
U.S. Cl. 433—24 109 Claims

1. A method of fabricating standardized orthodontic appliances for patients of a defined group of patients having similar dental anatomy, the method comprising the steps of:



for each of a plurality of individual patients, including patients who are members of the defined group, designing, with a specially programmed digital computer, a custom orthodontic appliance, the designing step including the substeps of:

digitizing tooth shape data of each of a plurality of the teeth of the individual patient for each of a plurality of patients,

calculating finish positions ideal for the teeth of the individual patient by processing the digitized data,

designing, from the calculated finish positions and tooth shape data, a custom orthodontic appliance for moving the teeth of the individual patient to the calculated finish positions, and

for individual patients who are members of the defined group, generating a digitized record of geometric parameters of the designed custom orthodontic appliance; then,

in a programmed digital computer, statistically processing data of the geometric parameters from the digitized records for patients of the defined group and generating therefrom a group standardized design of an orthodontic appliance suitable for straightening the teeth of patients of the defined group;

fabricating a standardized orthodontic appliance in accordance with the group standardized design; and

producing a record of information sufficient to effectively identify the fabricated standardized orthodontic appliance as being specifically suitable for straightening the teeth of patients of the defined group.

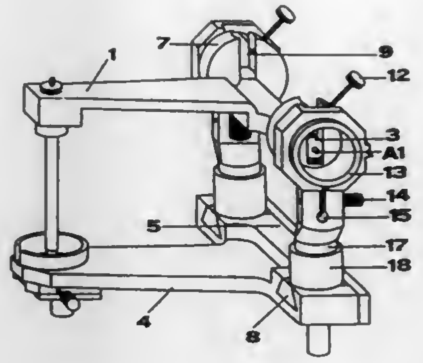
5,533,896
ARTICULATING DEVICE WITH AUTOMATIC ADAPTATION

Edmondo Federici, Via G. Ciaralli 26, 00156 Rome, Italy
Filed Jan. 28, 1994, Ser. No. 182,193
Claims priority, application Italy, Jun. 17, 1992, RM92A0460
Int. Cl.⁶ A61C *11/00*
U.S. Cl. 433—64 16 Claims

1. An articulating device with automatic adaptation, comprising:

an upper branch, wherein a transversal axis is defined between opposite ends of the upper branch, and wherein a first ball and a second ball are provided along the transversal axis for simulating condyles;

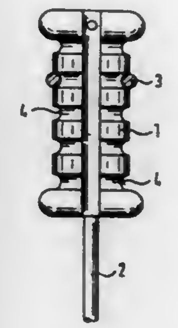
a lower branch including a transversal element at one end thereof, wherein the transversal element defines a first undercut cavity at a first side of the transversal element and a second undercut cavity at a second side of the transversal element, wherein the first and second undercut cavities are located so as to simulate an intercondylar distance;



a first vertical branch extending between the upper branch and the lower branch, and a second vertical branch extending between the upper branch and the lower branch, wherein the first vertical branch is placed in the first undercut cavity, and the second vertical branch is placed in the second undercut cavity, wherein the first and second undercut cavities are oriented so as to allow separate insertion of the first and second vertical branches, respectively, wherein a top of the first vertical branch includes a first mechanism for simulating a glenoid cavity and a top of the second vertical branch includes a second mechanism for simulating a glenoid cavity, wherein the first mechanism is adjustable about the transversal axis and about a first vertical axis and the second mechanism is adjustable about the transversal axis and about a second vertical axis, wherein the first mechanism of the first vertical branch is rotatable around the transversal axis, and may be blocked, by striction, by means of a first pin extending into a first fissure of the first vertical branch, and wherein the second mechanism of the second vertical branch is rotatable around the transversal axis, and may be blocked, by striction, by means of a second pin extending into a second fissure of the second vertical branch.

5,533,897
INSTRUMENT FOR PREPARING THE ROOT-CANAL

Edward Zdarsky, Palm Beach, Fla., assignor to Vereinigte Dentalwerke Antaeos Beutelrock Zipperer Zdarsky Ehrler, Munich, Germany
Filed May 13, 1994, Ser. No. 243,484
Int. Cl.⁶ A61C *5/02*
U.S. Cl. 433—102 4 Claims



1. A dental root-canal preparing instrument comprising a grip and a tool contained therein, and further comprising a displaceable element which can be shifted in a direction parallel to a grip axis into one of plural discrete positions on the grip, wherein the displaceable element is at least one elastic ring and further including annular channels formed in the grip at discrete positions, said at least one ring being received in said channels.

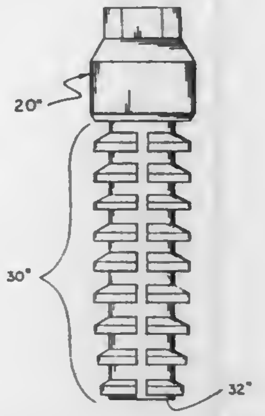
5,533,898
DENTAL IMPLANT DEVICE

Raul Mena, 201 N. University Dr. Suite 101, Plantation, Fla. 33324

Continuation of Ser. No. 154,367, Nov. 18, 1993, Pat. No. 5,376,004. This application Nov. 3, 1994, Ser. No. 333,808

Int. Cl.⁶ A61C *8/00*

U.S. Cl. 433—173 **6 Claims**



1. A dental implant device. comprising:

A. form implant means adapted to be permanently implanted in a user's jaw bone having an anchorage section and an engagement section and said anchorage section includes a shaft having means for engaging to said bone. and said engagement section being integrally built on said anchorage section and further including a cylindrical portion adjacent to said anchorage section, said cylindrical portion having a diameter that is larger than the diameter of said shaft and coaxially disposed with respect thereto, an inwardly beveled portion that includes first and second ends, said first end having the same diameter as said cylindrical portion and being adjacent to and coaxially disposed with respect to said cylindrical portion and a multi-face portion coaxially adjacent to and connected to said second end of said beveled portion; and

B. abutment means removably mounted to said form implant means.

5,533,899
MOTORCYCLE TRAINER

Jerry Young, 8701 Bel Air Ct., Westminster, Calif. 92683

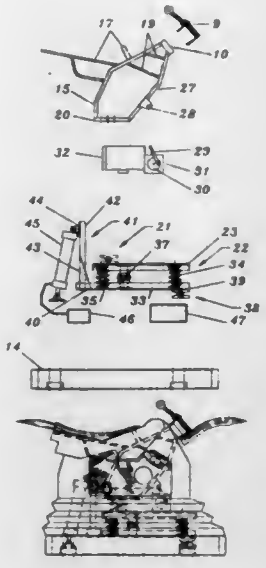
Filed Jun. 1, 1995, Ser. No. 457,980

Int. Cl.⁶ A63G *31/02;* A63B *21/00;* G09B *9/04*

U.S. Cl. 434—61 **9 Claims**

1. A device for training motor cross motorcycle riders comprising:

a. a body formed of plastic having a seat attached;
b. a frame having a handlebar assembly attached and a pair of foot pads wherein the body is attached to the frame;
c. the frame pivotally mounted to an upper spring plate by means of a pair of pillow blocks;
d. the upper spring plate attached to a lower spring plate by means of a universal joint and a plurality of springs;
e. the lower spring plate pivotally mounted on a pair of plate pillow blocks which are mounted to a base plate;
f. an eccentric motor mounted on the upper spring plate and attached to the frame by means of an eccentric lever wherein when the eccentric motor is activated the eccentric lever produces vertical motion of the frame about the pillow blocks;
g. a fluid pressure device attached to the lower spring plate and to the base plate wherein when the fluid pressure device is activated the fluid pressure device produces sudden vertical motion of the lower spring plate; and
h. the base plate is attached to a floor structure.



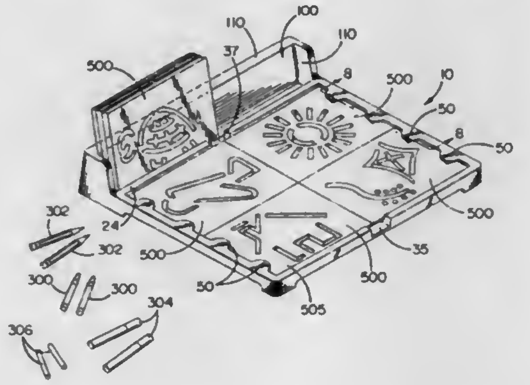
5,533,900
STENCIL HOLDER AND KIT AND METHOD OF MAKING AN IMAGE

Robert S. Volk, Easton, Pa., assignor to Binney & Smith Inc., Easton, Pa.

Filed Dec. 13, 1993, Ser. No. 165,721

Int. Cl.⁶ G09B *11/04*

U.S. Cl. 434—87 **84 Claims**



30. A method of making an image on a piece of paper, said method comprising:

providing a stencil set, said stencil set comprising a stencil holder and at least two stencils, said stencil holder comprising: (a) a platform adaptable to include a writing surface; and (b) securing means associated with said platform, wherein said securing means are adapted to detachably secure at least two stencils to said platform, said securing means comprising a retaining wall extending in a direction generally perpendicular to the platform, wherein said securing means are adapted to allow a user to select any one of said stencils to be removed from said platform while allowing a second stencil to remain secured to said platform, wherein the stencil holder further comprises at least one covering tab attached to said retaining wall;

securing at least two stencils to said platform by placing said stencils in a position such that said securing means secures said stencils; and

making a stencil tracing using said stencil set.

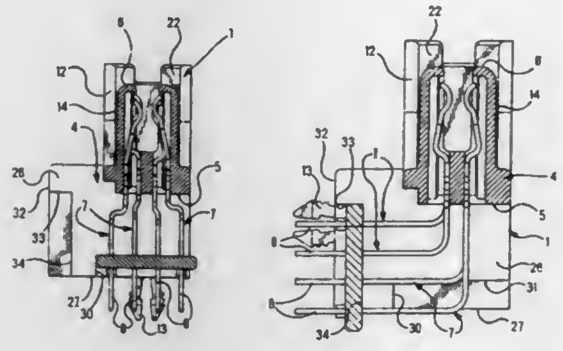
5,533,901
ELECTRICAL CONNECTOR WITH CONTACT ALIGNMENT MEMBER

James A. Hunt, Harrisburg; Martha L. Rupert, Hummelstown; David L. Brockway, Mechanicsburg; Douglas G. Fisher, Boiling Springs; Ronald J. Baker, and David M. Swartz, both of York, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed May 23, 1995, Ser. No. 449,607

Int. Cl.⁶ H01R *9/09;* H05K *1/00*

U.S. Cl. 439—79 **3 Claims**



1. An electrical connector comprising:

an insulating housing, a mating face on the housing, multiple electrical contacts in the housing, terminals on the contacts projecting from the housing for connection with a circuit board on which the housing is mounted, and an insulating alignment member biasing the terminals into spaced apart alignment, and further wherein,

a recessed lip is along a first recess in the housing behind the mating face, a second recessed lip is along a second recess in the housing, the second lip extends perpendicular to the first lip, the alignment member fits alternatively in the first recess or in the second recess and against the corresponding first lip or the corresponding second lip, when the terminals extend respectively in a first direction from the housing or in a second direction perpendicular to the first direction.

5,533,902
POCKET PANEL EDUCATIONAL OR DIAGNOSTIC TOOL

Sally E. Miller, 3000 E. Sunrise Blvd. 17c, Ft. Lauderdale, Fla. 33304

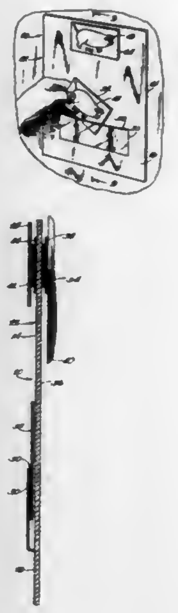
Filed Apr. 11, 1994, Ser. No. 226,065

Int. Cl.⁶ G09B *21/00*

U.S. Cl. 434—112 **22 Claims**

1. An instructional or diagnostic tool comprising:

(A) a board comprising a panel, said panel having a front face presenting a work area;
(B) a target card bearing a character;
(C) a device via which said target card is removably and selectively mounted on a first designated portion of said work area; and
(D) a transparent pocket, mounted on a second designated portion of said work area, for receiving sorting cards bearing characters which match the character borne by said target card.



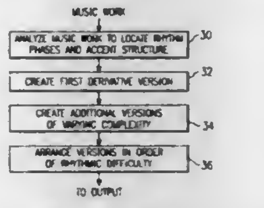
5,533,903
METHOD AND SYSTEM FOR MUSIC TRAINING

Stephen E. Kennedy, 3009 Maple Ave., Suite 510, Dallas, Tex. 75201

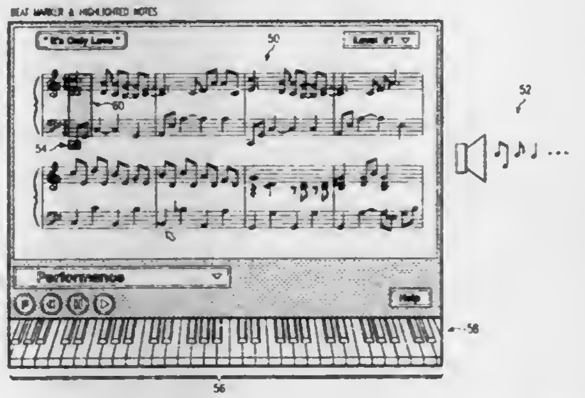
Filed Jun. 6, 1994, Ser. No. 254,403

Int. Cl.⁶ G09B *5/00*

U.S. Cl. 434—307 R **10 Claims**



MUSIC WORK
ANALYZE MUSIC WORK TO LOCATE RHYTHM PHASES AND ACCENT STRUCTURE
30
CREATE FIRST DERIVATIVE VERSION
32
CREATE ADDITIONAL VERSIONS OF VARYING COMPLEXITY
34
ARRANGE VERSIONS IN ORDER OF RHYTHMIC DIFFICULTY
36
TO OUTPUT



1. A method, using a computer, of training a student to play a music work on a music instrument, the music work having an identifiable rhythm structure, comprising the steps of:

processing the music work to generate a series of simplifications of the work, each of the simplifications maintaining an identifiable rhythm structure and varying in performance difficulty;

generating a music score for each simplification and arranging the music scores in predetermined order;

generating an animated movie comprising at least one of the music scores and an associated audio reproduction of the music score, together with a graphic device that highlights an identifiable rhythm structure common to the series of simplifications; and

presenting the animated movie to the student.

9. Computer system for use in music training by a student desiring to play a music work on a music instrument, the music work having an identifiable rhythm structure and being decomposable into a plurality of variations each maintaining the identifiable rhythm structure, comprising:

- a processor;
- a display;
- an audio subsystem; and
- storage means for storing program control means operative under the control of the processor for (i) processing the music to generate a music score for each of a plurality of variations of progressively increasing performance difficulty (ii) arranging the music scores of the variations in a predetermined order, (iii) generating an animated movie comprising at least one of the music scores and an audio reproduction of the music score, and (iv) presenting the animated movie to the student using the display and the audio subsystem.

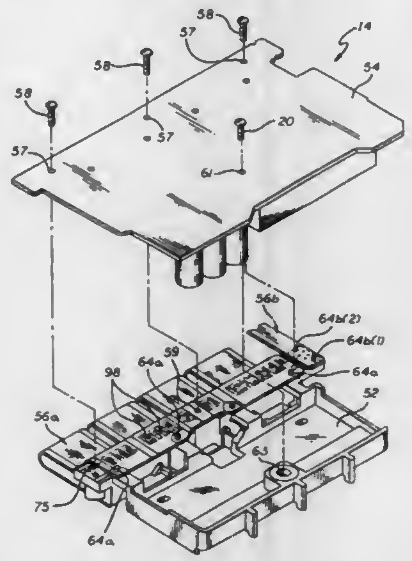
5,533,904
ELECTRICAL INTERCONNECT SYSTEM FOR MULTIPLE FLEXIBLE CIRCUITS

Gary M. Nobel; Arthur K. Wilson, both of San Diego; Patricia S. Brown, Encinitas, and Jason R. Arbeiter, Poway, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 56,692, Apr. 30, 1993, Pat. No. 5,372,512. This application Apr. 28, 1994, Ser. No. 234,810

Int. Cl.⁶ H01R *9/09*

U.S. Cl. 439—67 **19 Claims**



1. An improved interconnect system for an inkjet printer comprising:

- a first unitary flexible circuit having a first contact means for providing a first electrical interconnection;
- a second unitary flexible circuit having a second contact means for providing a second electrical interconnection;
- third contact means for engaging said first contact means;
- fourth contact means for engaging said second contact means;
- fifth means for supporting said third contact means and said fourth contact means;
- sixth means for aligning said first unitary flexible circuit relative to said fifth means whereby said first contact means is aligned relative to said third contact means;
- seventh means for aligning said second unitary flexible circuit relative to said fifth means whereby said second contact means is aligned relative to said fourth contact means; and
- eighth means for retaining said first flexible circuit and said second flexible circuit in engagement with said fifth means for supporting said third contact means and said fourth contact means, wherein the eighth means includes an unitary rigid support means for supporting said first and second flexible circuits in a non-overlapping manner on said eighth means.

5,533,905
UNIT INTEGRATED SYSTEM AND CONNECTOR

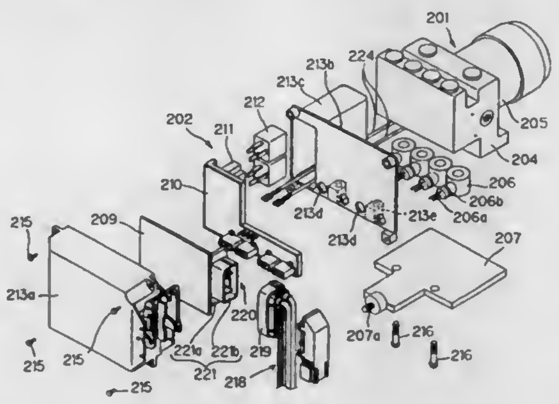
Masahide Hio; Takao Nozaki, both of Yokkaichi; Hitoshi Hashiba, Osaka; Isao Isshiki, Osaka; Yoshiharu Nakai, Osaka; Seiji Ueda, Osaka, and Itaru Wada, Osaka, all of, Japan, assignors to Sumitomo Wiring Systems, Ltd., and Sumitomo Electric Industries, Ltd., both of, Japan

Filed Jul. 28, 1994, Ser. No. 282,053

Claims priority, application Japan, Jul. 29, 1993, 5-208423; Jul. 30, 1993, 5-208656; Jul. 30, 1993, 5-208713; Jul. 30, 1993, 5-208841; Jul. 30, 1993, 5-208845; Jul. 30, 1993, 5-208851; Aug. 2, 1993, 5-211007; Aug. 3, 1993, 5-212227; Aug. 3, 1993, 5-212242; Aug. 4, 1993, 5-213388; Aug. 4, 1993, 5-213390

Int. Cl.⁶ H05K *5/06*

U.S. Cl. 439—76.2 **7 Claims**



1. A connector for a device connecting an actuator for a hydraulic unit and an electronic control having a control circuit to the exterior of said device, said hydraulic unit and said electronic control being integrated, said connector comprising

- a first terminal group for a large current in electrical contact with a power line whereby power is supplied to said actuator,
- said second terminal group for a small current which is smaller than said large current, said second terminal group electrically connected to components of said electronic control,
- a connector housing comprising a base plate carrying said first terminal group and said second terminal group, and a tubular housing body enclosing said first terminal group and said second terminal group,
- a junction block, said first terminal group being connected to said actuator through said junction block, and said second terminal group being connected to said components through said junction block without electrical contact with said junction block.

5,533,906
MEMORY CARD CONNECTOR

Hiroshi Abe, Yokohama, Japan, assignor to Hon Hai Precision Industry Co., Ltd., Taipei Hsien, Taiwan

Filed Aug. 31, 1994, Ser. No. 299,482

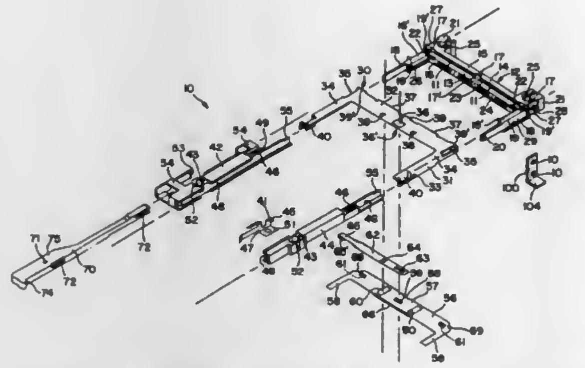
Claims priority, application Japan, Sep. 27, 1993, 5-240152; Sep. 28, 1993, 5-052460 U

Int. Cl.⁶ H01R *13/62*

U.S. Cl. 439—159 **16 Claims**

1. A memory card connector for use with a memory card comprising:

- an insulative housing including a main body and two engaging arms integrally extending rearward from two opposite ends thereof;



- a plurality of contacts positioned in the main body of the housing for coupling a plurality of corresponding contacts of the memory card;
- a securing plate including an elongated base and two legs integrally extending rearward from two opposite ends thereof;
- a pair of spaced insulative guiding arms respectively attached to the corresponding legs of the securing plate, thus the securing plate being the only support to secure said guiding arms in position;
- a sliding plate positioned above the housing and a front end portion of the guiding arms and below the securing plate, and being moveable in a front-to-end direction;
- an eject lever sandwiched between the securing plate and the sliding plate and pivotally retained around a pivoting point;
- a pushing bar movably positioned beside one of the guiding arms, a front end of the pushing bar engaging a distal end of the lever, and another end of said lever opposite to said distal end engaging the sliding plate, so that when the pushing bar is moved forwardly, the sliding plate can be moved rearward by means of rotation of the lever connected therebetween to eject the inserted memory card out of said memory card connector wherein the securing plate, the lever, the sliding plate, two guiding arms and the pushing bar can be pre-assembled as a unit, and to fasten to the housing to form the final connector without any screwing or riveting operation.

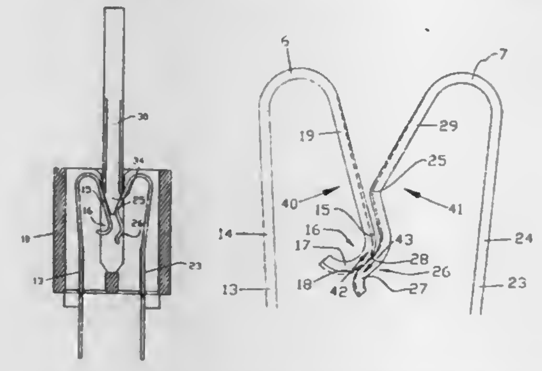
5,533,907
ELECTRONIC MODULE SOCKET WITH SELF-CLEANING SHORTING CONTACTS

Charles A. Kozel, McHenry, and Nels G. Pearson, Buffalo Grove, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed May 27, 1994, Ser. No. 250,279

Int. Cl.⁶ H01R *29/00*

U.S. Cl. 439—188 **15 Claims**



1. An electronic module socket for interconnecting an electronic module to a circuit board, the electronic module socket comprising:

- an elongated insulative housing including, an elongated central cavity for receiving an electronic module having;
- a plurality of opposed contacts located along both sides of said central cavity configured to establish electrical contact with said electronic module upon insertion of said electronic module within said central cavity;
- first and second contacts being correspondingly and nonuniformly shaped in order to provide a short out connection area; and
- wherein self-cleaning of said short out connection area occurs as said first and second contacts move directly towards one another.

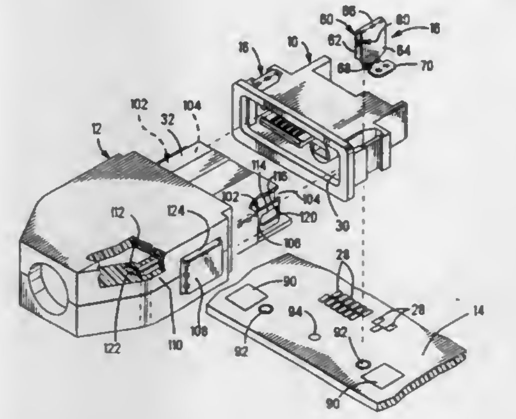
5,533,908
LATCH AND MOUNTING MEMBER FOR A SURFACE MOUNTED ELECTRICAL CONNECTOR

Randall R. Henry, Harrisburg; William P. Moyer, Middletown, and David A. Skotek, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 31, 1994, Ser. No. 298,872

Int. Cl.⁶ H01R *13/62*

U.S. Cl. 439—329 **12 Claims**



1. In an electrical connector having an insulating housing containing a plurality of contacts for mating with and electrically engaging other contacts of a mating electrical connector, said plurality of contacts having leads arranged to electrically engage contact pads on a surface of a circuit board, said housing having a first opening for receiving a portion of said mating connector during said mating, a first side wall along one side thereof, and a second opening through said housing adjacent said first side wall in communication with said first opening,

- a first securing member for attaching said connector to said surface of said circuit board and for engaging said mating connector during said mating to hold said connector and said mating connector in mated engagement, comprising:
  - (a) a body having a first portion extending into said second opening;
  - (b) a mounting foot attached to said body arranged to be in mounted engagement with said surface of said circuit board; and
  - (c) a latch projection extending from said first portion into said first opening and arranged so that during said mating said latch projection effects said holding engagement with said mating connector.

5,533,909
SCREW CLAMP TYPE CONNECTOR WITH TERMINAL PROTECTING PLATE

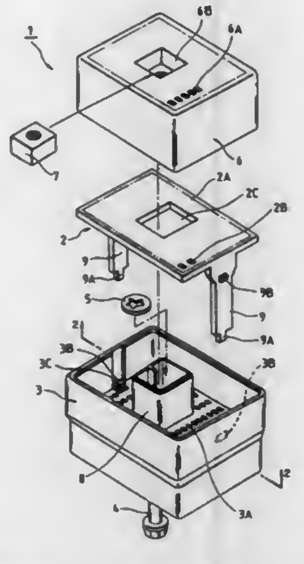
Takayoshi Endo; Sakai Yagi, and Toru Nagano, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 398,508

Claims priority, application Japan, Mar. 8, 1994, 6-037208

Int. Cl.^{6} H01R *13/621*

U.S. Cl. 439—381 **14 Claims**



1. A screw clamp type connector with a terminal protecting plate, comprising:

a first connector housing having housing indicator holes;

a male terminal fitted in said first connector housing;

a terminal protecting plate fitted in said first connector housing for protecting a leading end of said male terminal, said terminal protecting plate having terminal support holes bored through a plane section of said terminal protecting plate in such a manner as to make said terminal support holes correspond in position to said leading end of said male terminal;

a second connector housing;

a female terminal fitted in said second connector housing;

a simple clamp bolt passed through centers of said first and second connector housings so as to mate said first and second connector housings together by clamping; and

a pair of housing indicators erected upright on an underside of said terminal protecting plate, said housing indicators being caused to stick out of said respective housing indicator holes when both said first and second connector housings are mated together.

5,533,910
ELECTRICAL CONNECTOR

Andr´´ Körner, and Reinhard Wostmann, Lippstadt, both of, Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany

Filed Oct. 25, 1994, Ser. No. 328,699

Claims priority, application Germany, Nov. 24, 1993, 43 40 032.9

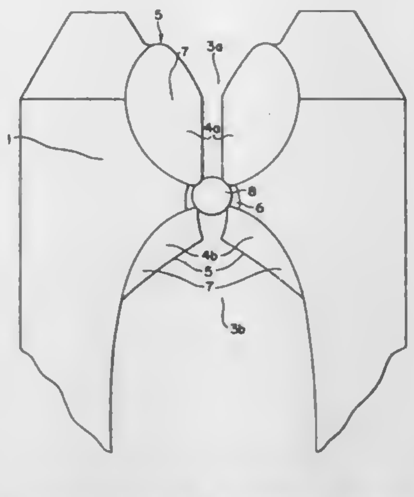
Int. Cl.^{6} H01R *4/24*

U.S. Cl. 439—395 **11 Claims**

1. An electrical connector comprising:

a connecting lug formed as a tongue-shaped metal plate which has a substantially elongated slit-shaped recess for receiving a wire;

wherein the connecting lug has at least two stampings made thereon in an area of the slit-shaped recess each of said two stampings defining a slit area of reduced width said two stampings being spaced from one another along said slit-shaped recess to define an intermediate space in said slit-shaped recess between said stampings of reduced width for holding a wire therebetween.



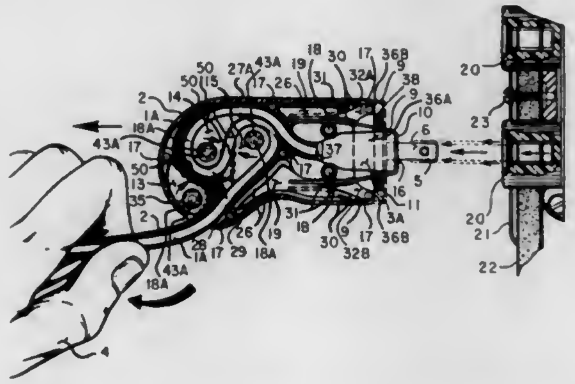
5,533,911
ELECTRICAL CORD TO PLUG TENSION RELIEF ADAPTER AND WIRE

Zedrick T. Elam, 115-38 197th St., St. Albans, N.Y. 11412

Continuation-in-part of Ser. No. 317,131, Aug. 10, 1994, abandoned. This application Sep. 25, 1995, Ser. No. 533,441

Int. Cl.^{6} H01R *13/58*

U.S. Cl. 439—459 **11 Claims**



1. An electrical cord to plug tension relief adaptor and wire saver/protector comprising:

a housing having a first half and a second half releasably connected with each other, said first and second halves having a front, a back, opposite sides, an internal chamber, and edge surrounding said internal chamber, and an exterior, one of said halves having an alignment lip disposed along said edge for enabling the alignment of said halves for coupling;

a tension relief mechanism disposed within the internal chamber of said halves of said housing, said tension relief mechanism for receiving the electrical cord and preventing disconnection between the electrical cord and plug caused by increased tension/stress at a point of connection between the electrical cord and plug, said tension relief mechanism comprising:

a plurality of support posts disposed in one of said two halves of said housing;

a plurality of female receiving slots disposed directly opposite said plurality of support posts in the other of said two halves of said housing;

pivot means coupled to said plurality of support posts and said plurality of female receiving slots; and

a plurality of cams pivotally mounted on said pivot means, each of said plurality of cams having a top, a bottom, an outer edge, and an axial through hole for receiving said pivot means and enabling the rotation of said cams about said pivot means; and

securing means releasably coupled to said housing for securing the plug and electrical cord within said housing.

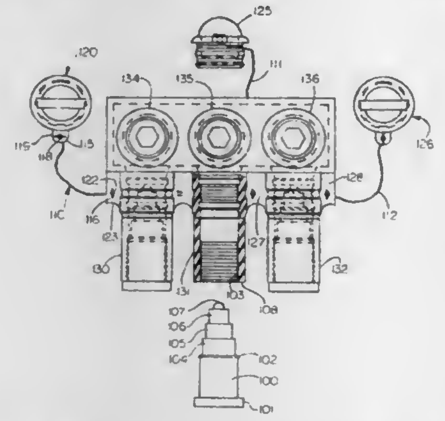
5,533,912
SUBMERSIBLE ELECTRICAL SET SCREW CONNECTOR

David R. Fillinger, Cincinnati, Ohio, and Jeffrey D. Chruch, Pinehurst, N.C., assignors to Erico International Corp., Solon, Ohio

Filed Jan. 23, 1995, Ser. No. 376,868

Int. Cl.^{6} H01R *13/52*

U.S. Cl. 439—521 **16 Claims**



1. A submersible electrical set screw connector comprising a metal conductive block, a plurality of blind conductor holes in said block, each adapted to receive a conductor, and a transversely extending set screw for each conductor hole adapted to be clamped down on the respective conductor received in the respective blind hole in said block to secure said conductor to said block and form an electrical connection, a molded waterproof case for said block, said molded waterproof case including tubular grommet receiving extensions at each blind conductor hole, said case also having cylindrical projecting ports corresponding to and in axial alignment with each set screw in said block, each cylindrical projecting port having a cylindrical interior and an axially projecting face, a waterproof plug for each cylindrical projecting port, each plug including a radial tab projecting radially of said axially projecting face, and a flexible tether securing said tab to said molded waterproof case.

5,533,913
ELECTRICAL CONNECTOR INCLUDING MOLDED PLASTIC BODY

William J. Boehm, and Gunter E. Dinkel, both of Hamilton, Ohio, assignors to Connector Manufacturing Company, Hamilton, Ohio

Filed Jun. 17, 1994, Ser. No. 261,665

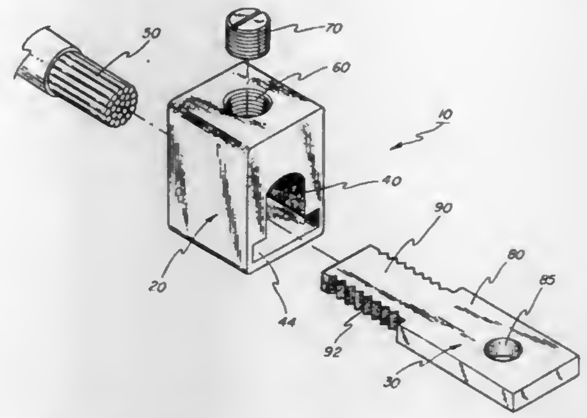
Int. Cl.^{6} H01R *4/36*

U.S. Cl. 439—810 **7 Claims**

1. An electrical connector for terminating the end of an electrically conductive wire comprising:

a body member constructed of an electrically insulating material not having an electrically conductive coating and having formed therein a first opening for receiving the electrically conductive wire and a second threaded opening for receiving a set screw which, when tightened, secures the electrically conductive wire in said first opening, and

an elongated, electrically conductive strip of metal having a first end thereof which extends into said opening in said body member and which has an upper surface for engaging the electrically conductive wire, and a second end thereof that includes a lower surface for electrically engaging a mounting surface.



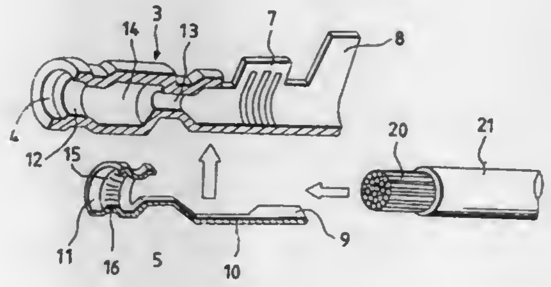
5,533,914
ELECTRICAL CONNECTION TERMINAL

Yoshitsugu Sawada, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,494

Int. Cl.^{6} H01R *13/187*

U.S. Cl. 439—843 **4 Claims**



1. An electrical connection terminal comprising:

a terminal body including:

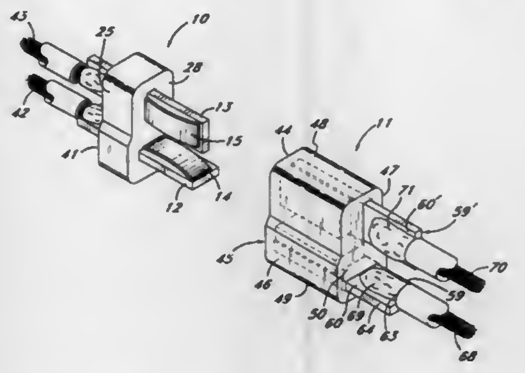
- a through hole passing through a terminal body in an axis direction of the terminal body;
- a conductor clamping portion and a covering clamping portion which are formed integrally at a rear end portion thereof through a retaining step portion, and extend in the axial direction; and

a resilient contact member of an annular shape which is retained in said through hole along an axis, and the resilient contact member contacting an outer peripheral surface of a male contact portion at its surface, said resilient contact member being made of a material having an electrical conductivity which is not less than an electrical conductivity of the terminal body, and the resilient contact member having an integral clamping piece which extends through a through hole in said retaining step portion to said conductor clamping portion,

wherein said covering clamping portion fixedly clamps a conductor covering, and said conductor clamping portion fixedly clamps a conductor and said intergral clamping piece together.

5,533,915
ELECTRICAL CONNECTOR ASSEMBLY

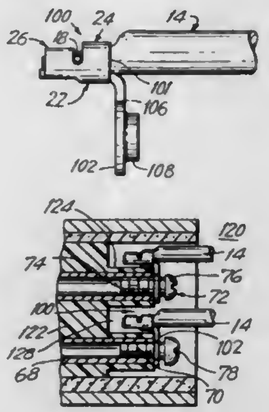
William S. Deans, 7628 Jackson St., Paramount, Calif. 90723
Filed Sep. 23, 1993, Ser. No. 125,308
Int. Cl.^{6} H01R *13/17*
U.S. Cl. 439—678 **10 Claims**



1. An electrical connector assembly including a male connector and a female connector, said assembly being capable of carrying a large amount of current between the male and female connectors, said connector comprising:
- a female connector body having a connector face, a top, a bottom, a first side, a second side and a back, said female connector body having a first generally rectangular opening extending inwardly from the connector face, said generally rectangular opening having a bottom, a first side, a second side, and a top, said generally rectangular opening extending to the back of the connector body and having a height between the top and bottom of the opening;
- a female connector pin held in the female connector body, said female connector pin being an elongated, generally rectangular, bar having a top, a bottom, a first side, a second side, a forward end, a rearward end, and a thickness, said bar being supported in the generally rectangular opening so that the forward end is recessed from the face of the female connector body and the rearward end extends past the back of the connector body, and the thickness of the connector pin is substantially less than the height of the generally rectangular opening so that there is a connector opening above the top of the connector pin beneath the top of the generally rectangular opening;
- a male connector body having a connector face, a top, a bottom, a first side, a second side and a back, said male connector body having a first generally rectangular opening extending inwardly from the connector face, said generally rectangular opening having a bottom, a first side, a second side, and a top, said generally rectangular opening extending to the back of the male connector body and having a height between the top and bottom of the opening to provide a male connector pin opening;
- a male connector pin held in the male connector body, said male connector pin being an elongated, generally rectangular, bar having a top, a bottom, a first side, a second side, a forward end, a rearward end, and a thickness, said bar being supported in the generally rectangular opening so that the forward end extends outwardly from the face of the male connector body to provide an extended length and the rearward end extends past the back of the connector body, and a central portion within said male connector body, and the thickness of the connector pin is slightly less than the height of the generally rectangular opening so that there is room for a leaf spring above the top of the connector pin along its central portion beneath the top of the generally rectangular opening; and
- a generally rectangular, thin leaf spring having a curved portion overlying the extended length of the male connector pin and a straight portion overlying the central portion of said male connector pin and said thin leaf spring being positioned so that when the male connector pin is inserted in the female connector opening, the spring connector abuts and is deflected by the top of the generally rectangular opening of the female connector body whereby the bottom of the male connector pin is pressed against the top of the female connector pin when the male connector pin is inserted into the female connector opening to provide an excellent electrical path between the male and female connector pins.

5,533,916
REVERSE WIRE TERMINATION DEVICE

Walter Newman, Bayside, and Paul Endres, Glen Oaks, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Jan. 19, 1994, Ser. No. 184,424
Int. Cl.^{6} H01R *4/30*
U.S. Cl. 439—801 **3 Claims**



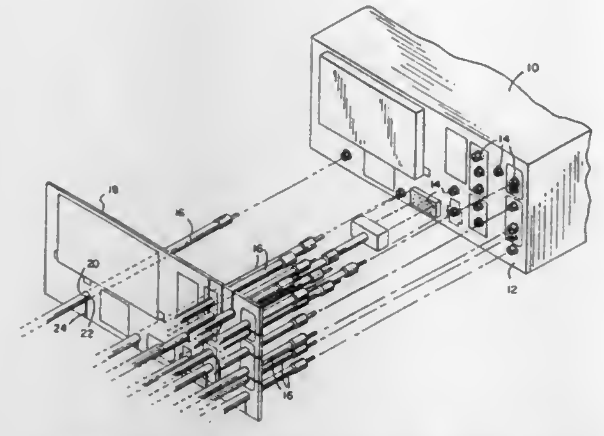
1. An electrical contact positioning system comprising:
- an elongate electrical contact having a first end to engage an electrical device to be powered and a second end; said second end having an aperture therein to receive a threaded fastener therein to position said first end in contact with an electrical device to be powered;
- a threaded fastener having an elongate threaded body with an enlarged head at one end and a free second end;
- a conductor termination device for attachment to the free end of an elongate insulated conductor having a central conducting means surrounded by insulation comprising;
- crimp barrel means having a first end and a second end and extending along a longitudinal axis; said first end of said crimp barrel means positioned adjacent the free end of an elongate insulated conductor and adapted to be crimped to said free end of said conductor; and
- lug means coupled to said second end of said crimp barrel means and extending away from said crimp barrel means second end to a free end, said lug means being in a plane perpendicular to the longitudinal axis for said longitudinal axis of said crimp barrel means; said lug means having a threaded aperture therein to receive the free second end of said threaded fastener whereby the position of said electrical contact can be adjusted with respect to said conductor termination device.

5,533,917
CABLE COORDINATING APPARATUS AND METHOD

David P. Schmitz, 19045 Lothmoor Dr. Upper, Brookfield, Wis. 54301
Filed Jul. 19, 1994, Ser. No. 277,178
Int. Cl.^{6} H01R *9/22*
U.S. Cl. 439—894 **10 Claims**

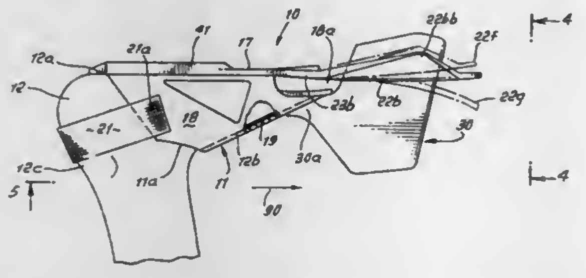
1. A card for indicating the relative positions of conductors to be connected to an appliance, said card comprising:
- a panel element independent of the appliance and representing a duplicate image of a portion of the appliance to which the conductors are to be connected, said panel element including a plurality of openings provided therein, each of said openings being formed to frictionally retain one of the conductors at a location on said panel element corresponding to the exact location of the conductor when connected to the appliance

wherein said panel element includes an alarm means for sensing heat and fire.



5,533,918
SURFER'S FIN

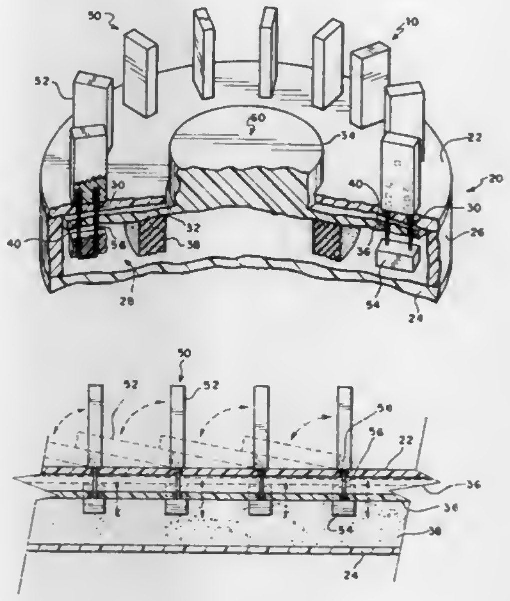
Stan A. Sanders, 420 29th St., Hermosa, Calif. 90530, assignor to Stan A. Sanders, and William F. Melstrell, both of Mangattan, Calif.
Filed Jan. 4, 1995, Ser. No. 368,540
Int. Cl.^{6} A63B *31/08*
U.S. Cl. 444—64 **5 Claims**



1. In a swim fin unit for use on the foot of a swimmer, the combination, comprising
- a) a body defining a foot receptacle, that opens endwise forwardly,
- b) first fin means integral with and extending generally rearwardly of the body to be flexed upwardly and downwardly rearwardly of said body, by water pressure,
- c) and second fin means integral with and extending generally vertically rearwardly relative to said body,
- d) said first fin means defining a first plane and said second fin means defining a second plane,
- e) said first and second planes intersecting in generally perpendicular relation,
- f) said first and second fin means having cantilever connection relative to said body,
- g) said first fin means including two horizontally spaced sections between which said second means extends, there being a forwardly extending and rearwardly open gap between said sections, said second fin means extending vertically in said gap, said second fin means being sidewardly flexible in said gap as limited by the width of said gap,
- h) said sections having upwardly bodily deflected positions characterized in that the second fin means is sidewardly deflectable beneath said sections and gap,
- i) said sections having upwardly angled stabilizing edge wings spaced from said gap.

5,533,919
TOPPLING TOY

Laverne R. Peterson, P.O. Box 401, Breesport, N.Y. 14816
Filed Oct. 16, 1995, Ser. No. 543,753
Int. Cl.^{6} A63H *33/00*
U.S. Cl. 446—2 **6 Claims**



1. A toppling toy for amusement comprising:
- a plurality of toppling units, each toppling unit further comprising a toppling member, a ballast member, and a flexible member flexibly connecting said toppling member to said ballast member,
- a housing, having walls defining a top wall for support of said plurality of toppling units and further defining a cavity beneath said top wall, said top wall further defining a plurality of apertures, each of said plurality of apertures for close passage of said flexible member and said each aperture dimensioned to prevent passage of said toppling member, and a plurality of said toppling member being arranged upon said top wall and spaced apart such a distance as to permit a falling toppling member within a row of toppling members to engage an adjacent upright toppling member and cause it to tip over, and each of said ballast members being housed within said cavity; and,
- resetting means, including a plate for selective contact with each said ballast member provided intermediate said top wall and each said ballast member, said plate defining a plurality of holes, each of said plurality of holes for close passage of said flexible member, each of said plurality of holes dimensioned to prevent passage of said ballast member, and each of said plurality of holes positioned in registry with each of said plurality of apertures, each said flexible member passing through a respective one of said plurality of holes and a respective one of each said plurality of apertures, whereby movement of said plate to its extreme position away from said top wall causes each said flexible member to become taut thereby forcing each said toppling member into an upright position;

and a resilient member biasing said plate toward said top wall.

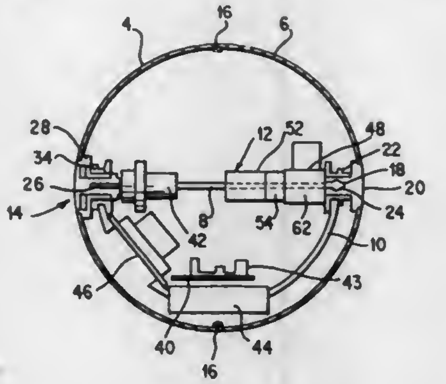
5,533,920
SELF-PROPELLED MUSICAL TOY BALL

Abraham A. Arad, Westport, Conn.; Anne Pitrone, New York, N.Y., and Robert W. Jeffway, Jr., Leeds, Mass., assignors to Toy Biz, Inc., New York, N.Y.

Filed Feb. 13, 1995, Ser. No. 387,128

Int. Cl.^{6} A63H *5/00;29/00*

U.S. Cl. 446—409 **8 Claims**



1. A toy comprising a self-propelled musical toy ball including:
- a pair of hemispheres having peripheral edges defining a plane for engaging said hemispheres and which are interengaged to form a generally hollow sphere having an axis of rotation;
- a shaft positioned within said hollow sphere and extending substantially through the axis of rotation of said sphere, said shaft being rigidly connected to at least one of said hemispheres;
- a housing rotatably supported on said shaft, said housing supporting an electronic circuit board interconnecting elements of a circuit, said circuit comprising power means energizing said circuit, integrated circuit means providing a plurality of operational modes and sound sequences to said energized circuit, drive means for rotating said shaft in response to said energized circuit, transducer means for playing a sound sequence responsive to said operational modes, means for temporarily disengaging and re-engaging said drive means in response to said operational modes and switch means for selectively activating said circuit.

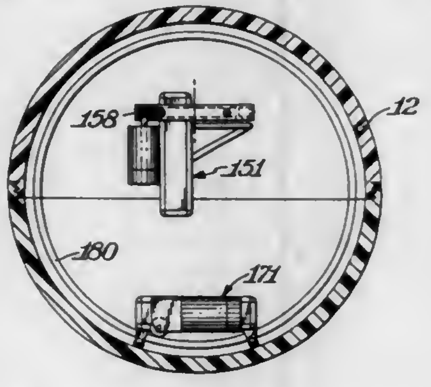
5,533,921
REMOTE CONTROLLED MOVABLE BALL AMUSEMENT DEVICE

William T. Wilkinson, P.O. Box 73, Salem, N.J. 08079

Division of Ser. No. 233,451, Apr. 26, 1994, Pat. No. 5,439,408. This application May 17, 1995, Ser. No. 442,891

Int. Cl.^{6} A63H *5/00;30/04;29/00*

U.S. Cl. 446—409 **10 Claims**



1. A remote controlled movable ball amusement device comprising a sphere, said sphere being hollow and having an internal surface and an outer surface, a first endless track mounted to said internal surface, a first propulsion mechanism movably mounted in said first track, a second endless track mounted to said internal surface, a second propulsion mechanism movably mounted in said second track, said propulsion mechanisms jointly forming a mass within said sphere, each of said propulsion mechanisms including a drive unit and a receiver, a remote transmitter for sending signals to each of said receivers of said propulsion mechanisms, each of said receivers actuating its respective drive unit in response to said signals being received, and said propulsion mechanisms being operative independently of each other to permit a user to vary the movement of said sphere in accordance with the actuation of said propulsion mechanism to shift the center of gravity of said mass as said propulsion mechanisms move in their tracks.

5,533,922
METHOD AND APPARATUS FOR PRETREATING ELECTRONIC COMPONENT MANUFACTURING FRAME

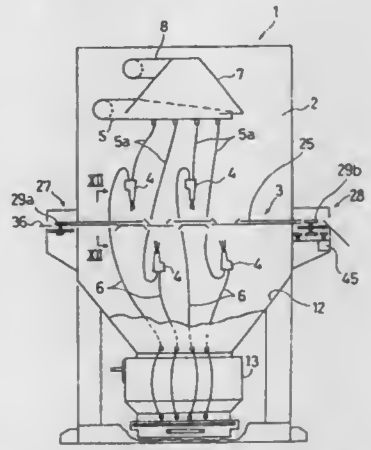
Eikichi Yamaharu, 15-10, Kourigaoka 8-chome, Hirakata-shi, Osaka, Japan

Filed Mar. 18, 1994, Ser. No. 214,698

Claims priority, application Japan, Mar. 22, 1993, 5-062227

Int. Cl.^{6} B24C *1/00;3/08*

U.S. Cl. 451—38 **12 Claims**



1. A method for pretreating an electronic component manufacturing frame which is prepared by punching, the method comprising blasting abrasive particles entrained in a high speed air stream toward the frame, the abrasive particles having an average diameter of no more than 200 micrometers.

5,533,923
CHEMICAL-MECHANICAL POLISHING PAD PROVIDING POLISHING UNFORMITY

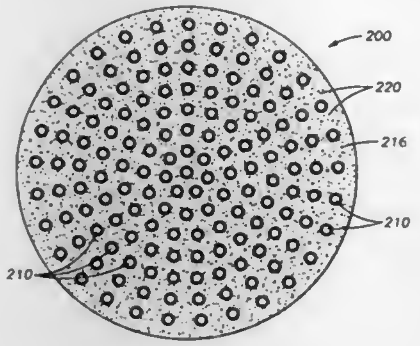
Shamouil Shamouilian, San Jose, and Daniel O. Clark, Pleasanton, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 10, 1995, Ser. No. 419,573

Int. Cl.^{6} B24B *1/00;* **B23D** *11/00*

U.S. Cl. 451—41 **43 Claims**

1. A structure useful as a polishing pad for chemical-mechanical polishing, comprising:
- (a) a plurality of conduits; and
- (b) a matrix of material in contact with and supporting said conduits and shaped to form a polishing pad;
- wherein, said conduits are constructed from a first material which is different from a second material used as said support matrix, wherein said conduits are positioned within said support matrix in a manner such that longitudinal centerlines of said conduits form an angle principally ranging from about 60° to about 120° with the working surface of said polishing pad.



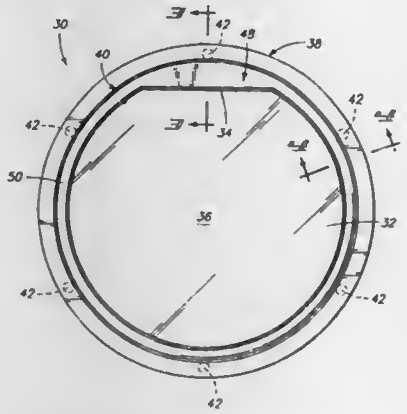
5,533,924
POLISHING APPARATUS, A POLISHING WAFER CARRIER APPARATUS, A REPLACABLE COMPONENT FOR A PARTICULAR POLISHING APPARATUS AND A PROCESS OF POLISHING WAFERS

Hugh Stroupe; Sujit Sharan, and Gurtej S. Sandhu, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 1, 1994, Ser. No. 299,506

Int. Cl.^{6} B24B *5/00*

U.S. Cl. 451—286 **23 Claims**



11. A wafer polishing apparatus comprising:
- a rotatable polishing platen;
- a polishing pad received outwardly of the polishing platen;
- a wafer carrier head, the wafer carrier head being mounted for selective rotation relative to the polishing platen; the wafer carrier head including a wafer carrier apparatus for use in polishing a semiconductor wafer having a particular orientation edge discontinuity shape, the wafer carrier apparatus comprising:
- a base support mounted to rotate with the carrier head; and
- a wafer carrier ring separately rotatably received relative to the base support, the wafer carrier ring having an internal periphery which is sized and shaped to receive the particular semiconductor wafer for which the apparatus is adapted, the wafer carrier ring internal periphery including a portion which is sized and shaped to mate with the particular orientation edge discontinuity shape.

5,533,925
STRUCTURE OF DRIVE SECTION OF POWER TOOL

Hiroshi Sato, Fuchu, Japan, assignor to Ryobi Limited, Hiroshima-ken, Japan

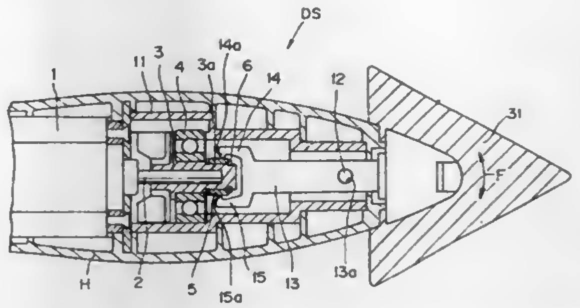
Filed Feb. 4, 1994, Ser. No. 192,037

Claims priority, application Japan, Feb. 5, 1993, 5-003017 U

Int. Cl.^{6} B24B *23/04*

U.S. Cl. 451—344 **12 Claims**

1. Structure of drive section of a power tool for giving a swinging motion to a tool such as a sander, which comprises:



- an output shaft portion of a motor having a rotational axis and an eccentric portion deviating from said rotational axis;
- a vibratory arm capable of vibrating about a vibrating axis and holding said tool at its one end, said vibrating axis being perpendicular to said rotational axis; and
- connecting section of the other end of said vibratory arm with said eccentric portion formed in shape of two crotches, said eccentric portion and said vibratory arm being connected to each other in such a manner that said eccentric portion is inserted between said two crotches of said vibratory arm, thereby rotational movement of said output shaft portion of said motor being converted into vibrational movement of said vibratory arm, said connecting section having a first contact portion formed on the outer circumferential surface of said eccentric portion and second contact portions respectively formed on the inside surface of each of said two crotches, and at least one of said first contact portion and each of said second contact portions comprising a curved surface of which a contour curves on a plane perpendicular to said vibrating axis.

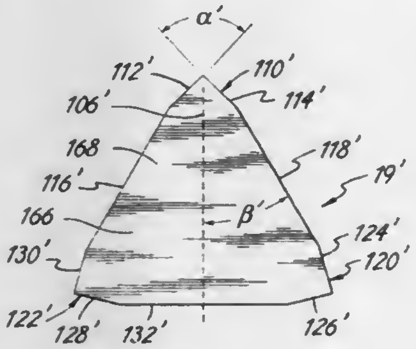
5,533,926
SANDPAPER PAD AND PAD SUPPORT FOR A DETAIL SANDER

John E. Nemazi, Bloomfield Hills, Mich., assignor to Ryobi North America, Easley, S.C.

Continuation-in-part of Ser. No. 240,386, May 10, 1994, Pat. No. 5,437,571, which is a continuation of Ser. No. 940,979, Sep. 4, 1992, and a continuation of Ser. No. 7,338, Apr. 20, 1993, Pat. No. Des. 355,105. This application Feb. 6, 1995, Ser. No. 384,149

Int. Cl.^{6} B24D *17/00*

U.S. Cl. 451—490 **10 Claims**

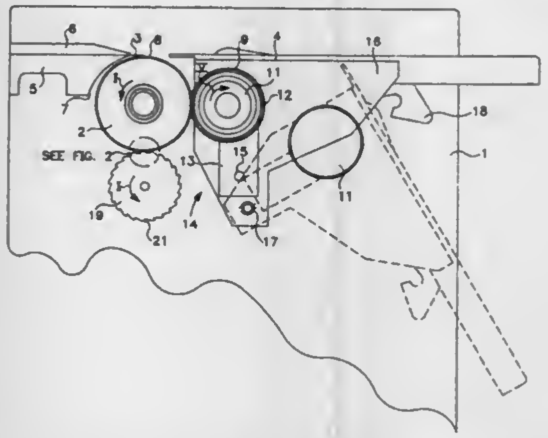


1. An abrasive pad support for attachment to a detail sander, said abrasive pad support comprising:
- a member having a planar surface generally symmetrical about a longitudinal center line and having an outer peripheral edge forming a forward most tip region having two facet edges creating a substantially 90° corner and a pair of straight side edges extending rearwardly from the tip region, each straight side edge being outwardly inclined from the pad support center line 10–30 degrees.

5,533,927

SKINNING AND TRIMMING MACHINE

Alfred Schill, Merkurstrasse 8, 77694 Kehl, Germany
PCT No. PCT/DE92/00532, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO93/00014, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 26, 1992, Ser. No. 167,972
Claims priority, application Germany, Jun. 27, 1991, 41 21 282.7
Int. Cl.⁶ A22B *5/16*
U.S. Cl. 452—127 **15 Claims**



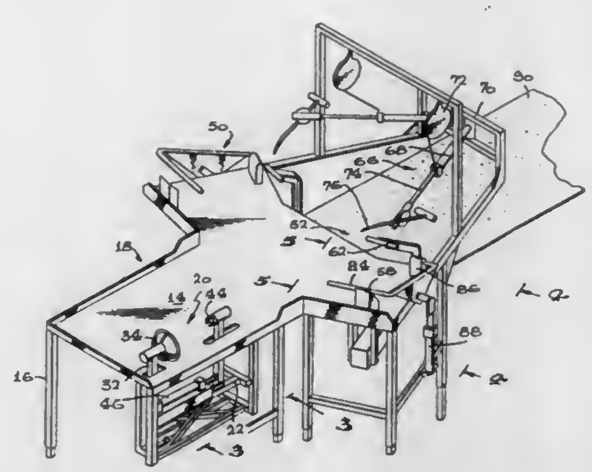
1. A meat skinning and trimming machine having a tabletop (4) supported by a machine housing (1) for feeding the meat to be skinned, a traction roller (2) associated with the tabletop (4), whose surface has a longitudinal toothing (8) extending crosswise to the running direction (I) of the roller for transporting the meat; a cutting blade (3) extending tangentially to the traction roller (2) and oriented opposite the meat transport direction; a blade bar (5) supporting the cutting blade (3) and having a hollow surface (7) associated with the traction roller surface at a specific distance therefrom that serves to guide the skin transport; a cleaning roller (11) whose surface has a longitudinal toothing (9) that corresponds to the toothing (8) of the traction roller and that meshes with the toothing of the traction roller (2); annular grooves (12) provided on the surface of the roller (11); a cleaning comb (14) honing teeth (13) engage said annular grooves to clean the cleaning roller surface and; a stripping roller (19) disposed parallel to the traction roller (2) and cooperating with said traction roller, and having the same direction (I) of rotation as said transaction roller, said stripping roller being positioned near the traction roller (2), honing sharp-edged beads provided on the surface thereon, said sharp-edged beads (21) having a sawtooth-shaped cross-section with a steep front edge pointing in the direction (I) of rotation, a short tangential radial edge, and a read edge extending less steeply.

5,533,928

ANIMAL HEAD PROCESSING APPARATUS

Ralph K. Karubina, Los Angeles, Calif., and Thomas G. Surman, Westpoint, Nebr., assignors to Kentmaster Mfg. Co., Inc., Monrovia, Calif.
Filed Feb. 27, 1995, Ser. No. 395,418
Int. Cl.⁶ A22C *17/04*
U.S. Cl. 452—135 **20 Claims**

1. An animal head processing apparatus comprising:
- a table along which a detached animal head may be moved for processing;
- a nose cup, means for rotatably mounting said nose cup;
- crown engagement means, means for rotatably mounting said crown engagement means;
- means for moving said crown engagement means toward and away from said nose cup so that an animal head can be engaged therebetween;

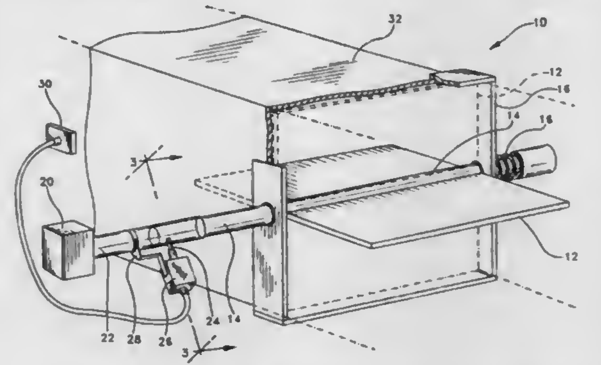


- a platform, both said nose cup and said crown engagement means being mounted on said platform, said platform being movably mounted with respect to said table so that said platform can be moved up and down with respect to said table and said nose cup and said crown engagement means can be moved up and down from a position adjacent said table where an animal head can be engaged between said nose cup and said crown engagement means while resting on said table to a position above said table where said rotatable nose cup and said rotatable crown engagement means support the animal head above said table for rotatable positioning of said head free of said table for acting thereon.

5,533,929

REMOTELY TRIPPABLE AND RESETTABLE DAMPER

Russell G. Attridge, Jr., 6 Horse Hollow Rd., Locust Valley, N.Y. 11560
Filed Dec. 29, 1993, Ser. No. 174,976
Int. Cl.⁶ F16K *17/40*
U.S. Cl. 454—369 **25 Claims**



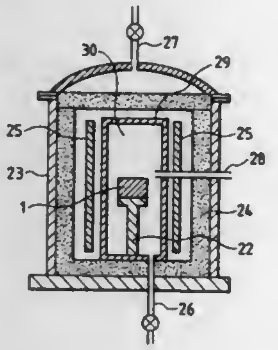
1. A remotely trippable and resettable damper for installation in a system of ducts, comprising:
- a damper blade assembly having at least one damper blade operable between an open position and a closed position and a shaft rotatably supported by said damper and connected to said blade whereby rotation of said shaft moves said blade between said open and closed positions, said shaft being biased to drive said blade to said closed position;
- remotely operable control means releasably connected to said damper blade assembly for moving said damper blade between said open and closed positions and for holding said damper blade in said open position during normal operating conditions;
- a power-actuated unit for disengaging said damper blade assembly from said control means;
- means for remotely re-engaging said damper blade assembly to said control means following a tripping of said damper; and

- a remotely locatable sensor for sensing an environmental condition in said system, said sensor operatively connected to said power-actuated unit to provide said power-actuated unit with a signal in response to said condition whereby said damper blade assembly is disengaged from said control means allowing said damper blade to be driven to said closed position.

5,533,930

APPARATUS FOR PRODUCING A SILICON NITRIDE SINTERED BODY

Yasushi Tsuzuki; Shin-ichi Yamagata, and Akira Yamakawa, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Division of Ser. No. 78,084, Jun. 18, 1993. This application Mar. 29, 1994, Ser. No. 219,719
Claims priority, application Japan, Jun. 18, 1992, 4-184416; Jun. 18, 1992, 4-184417
Int. Cl.⁶ F27B *7/28*
U.S. Cl. 432—120 **9 Claims**



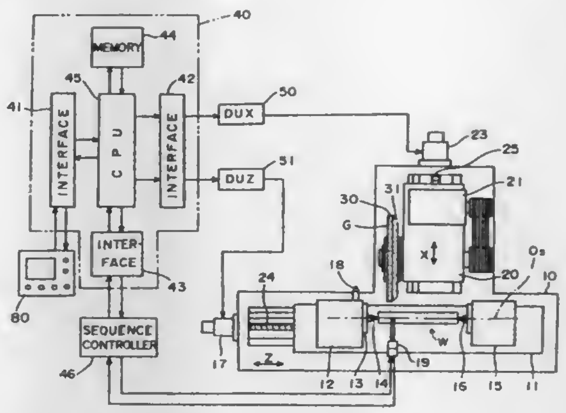
1. An apparatus for producing a silicon nitride sintered body comprising:
- a furnace including a heater source;
- a furnace core chamber defined by at least one partition inside said furnace to prevent an atmosphere containing more than about 30 ppm of carbon monoxide from contacting said silicon nitride sintered body, at least an inner surface of said partition comprising a carbon-free heat-proof material which prevents formation of carbon monoxide gas in an atmosphere in contact with said silicon nitride sintered body during sintering; and
- a gas supplying pipe for supplying an N_2 gas or an inactive gas including an N_2 gas into said furnace core.

5,533,931

METHOD AND MACHINE FOR GRINDING A WORKPIECE

Tomoyasu Imai, Kariya, and Ryohei Mukai, Nagoya, both of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan
Continuation of Ser. No. 128,715, Sep. 30, 1993, abandoned. This application Sep. 20, 1995, Ser. No. 531,058
Claims priority, application Japan, Sep. 30, 1992, 4-262140
Int. Cl.⁶ B24B *49/00*
U.S. Cl. 451—11 **12 Claims**

9. A machine for grinding a cylindrical surface of a workpiece with a grinding wheel having a first grinding surface parallel to the rotational axis of the workpiece and a second grinding surface successive to the first grinding surface and inclined with respect to the rotational axis of the workpiece, said machine including a workpiece support table rotatably carrying said workpiece, a wheel head rotatably carrying said grinding wheel, a feed mechanism connected to said table and said wheel head to effect relative movement between said table and said wheel head in radial and axial directions of the workpiece, and a control mechanism controlling said feed mechanism so that during relative movement between said table and said wheel head in the axial direction of said workpiece, the second grinding surface roughly grinds the cylindrical surface and at the same time, the first grinding surface finely grinds the roughly ground portion of the cylindrical surface, said machine further comprising:

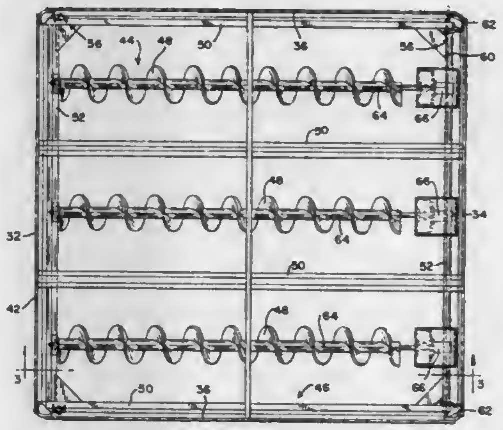


- a mechanism selecting an angle to be formed between said second grinding surface and the rotational axis of said workpiece depending upon the diameter of the cylindrical surface of said workpiece to be ground; and
- a mechanism forming the selected angle between said second grinding surface and the rotational axis of said workpiece while maintaining said first grinding surface parallel with the rotational axis of said workpiece; wherein said selecting mechanism selects the angle formed between said second grinding surface and the rotational axis of said workpiece so as to be made smaller with an increase in the diameter of said workpiece and said angle being such that the grinding resistance is miminized.

5,533,932

METHOD AND APPARATUS FOR COMPACTING COTTON WITHIN BASKET

Michael J. Covington, LaGrange, and Kevin S. Richman, Darien, both of Ill., assignors to Case Corporation, Racine, Wis.
Filed Feb. 24, 1995, Ser. No. 394,137
Int. Cl.⁶ A01D *46/08*
U.S. Cl. 460—119 **29 Claims**



13. A cotton harvester having a mobile fore-and-aft extending frame, duct structure for blowing harvested cotton materials into a cotton basket adapted to receive and hold the harvested cotton materials, said basket including a floor, a top wall, with opposed side walls and front and back walls that extend upwardly from the floor and are rigidly joined to the top wall, and a cotton compact-

ing assembly for compacting the harvested cotton materials within said basket, said compacting assembly comprising:

a frame assembly including a plurality of fore-and-aft rigid frame members that are rigidly connected to each other by a series of transverse members, said frame assembly being mounted within said basket for vertical movement between a retracted position and an extended position; and

a plurality of rotatable augers carried on and movable with the frame assembly for imparting movement to the cotton materials received in said basket.

5,533,933

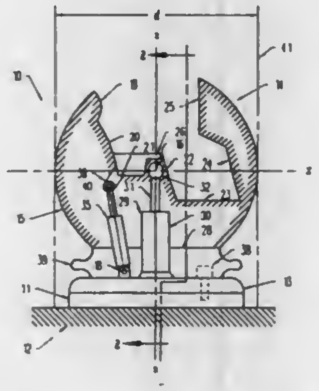
ARCADE AMUSEMENT RIDE MOTION SIMULATOR SYSTEM

Kenneth D. Garnjost, Buffalo, and James C. Stegner, Stow, both of N.Y., assignors to Moog Inc., East Aurora, N.Y.

Continuation of Ser. No. 148,633, Nov. 5, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,231

Int. Cl.^{6} A63G *31/16*

U.S. Cl. 472—60 **15 Claims**



1. In a motion simulator intended for essentially unsupervised use, the improvement which comprises:

a base;

a capsule having a smooth outer surface configured as a portion of a sphere;

said capsule being capable of at least one of roll, pitch and yaw angular motions about a pivot point at the center of said sphere;

extensible guide means having one end mounted on said base and having a distal end arranged proximate said pivot point for constraining said pivot point to move upwardly and downwardly along a vertical axis relative to said base;

bearing means operatively arranged within said capsule between said guide means distal end and said capsule to permit such angular motions of said capsule; and

at least one actuator arranged to move said capsule in one of such four possible degrees of freedom;

said capsule being configured such that no possible motion of said capsule in any of said four degrees of freedom will cause any portion of said capsule to move outside of a motion envelope formed by an imaginary vertical cylinder having a diameter substantially equal to that of said spherical surface.

5,533,934

CHILD SAFETY SWING FOR PLAYGROUND SWING

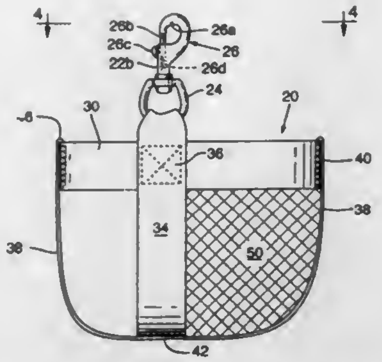
Rene M. Miller, 11446 NE. Fremont Ct., Portland, Oreg. 97220

Filed Dec. 13, 1993, Ser. No. 166,508

Int. Cl.^{6} A63G *9/00*

U.S. Cl. 472—118 **14 Claims**

1. A method of converting a playground swing into a child safety seat swing, the playground swing including a belt seat depending from a swing set structure by a pair of chains, the method comprising the steps:



providing a structure defining a child receiving cavity and including at least a waist belt defining an upper opening of said cavity; and

attaching said structure to said pair of chains to establish vertical support for said structure and to position within said child receiving cavity said belt seat and allow a child to sit within said cavity restrained from falling forward or backward by way of said waist belt.

5,533,935

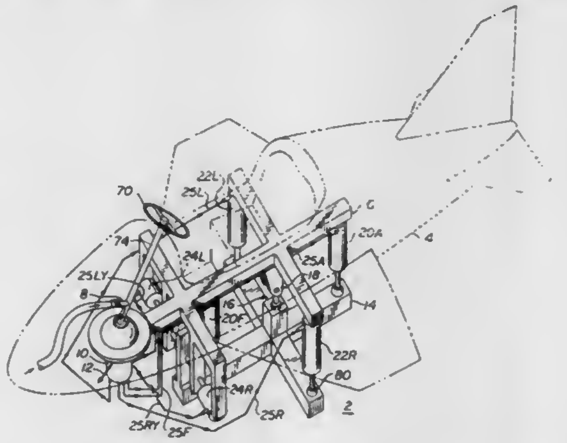
TOY MOTION SIMULATOR

Howard B. Kast, 7351 Cinnamon Woods Dr., West Chester, Ohio 45069

Filed Dec. 6, 1994, Ser. No. 350,333

Int. Cl.^{6} A63G *31/16*

U.S. Cl. 472—130 **18 Claims**



1. A motion simulating apparatus for imparting motion to an operator, said apparatus comprising:

a frame means for holding and supporting the operator,

a pivotable suspension means for pivotably suspending said frame means relative to a fixed base,

an actuating means for operably connecting said frame means to said base and imparting pitch and roll to said frame means relative to said base,

said actuating means having separate hydraulic pitch and roll actuators,

a hydraulic control valve means to proportionally direct hydraulic fluid to said hydraulic pitch and roll actuators, and

said valve means including a fluid nozzle means for directing hydraulic fluid to pitch and roll receiving chambers from said fluid nozzle means wherein each of said pitch and roll receiving chambers is in fluid communication with a corresponding one of said hydraulic pitch and roll actuators respectively, and

said fluid nozzle means is pivotably mounted with respect to said receiving chambers so as to be able to proportionally direct hydraulic fluid flow between said receiving chambers.

5,533,936

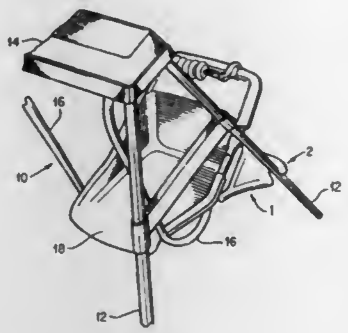
SWING WITH A STABILIZER AND THE STABILIZER THEREOF

Christine E. Julien, Reading, and Peter R. Tuckey, Birdsboro, both of Pa., assignors to Graco Childrens Products, Inc., Elverson, Pa.

Filed Jul. 8, 1994, Ser. No. 272,348

Int. Cl.^{6} A63G *9/00*

U.S. Cl. 472—118 **14 Claims**



1. A swing assembly comprising:

a seat;

at least one hanger connected to said seat;

at least one leg operatively connected to said hanger to support said hanger and said seat, said hanger being swingably connected relative to said leg; and

a stabilizer having at least one connector operatively connected to said seat, and an engaging portion for connecting to said leg to immobilize said seat,

wherein said connector enables said stabilizer to move relative to said seat between an active position where said engaging portion is able to connect to said leg, and an inactive position where said engaging portion is unable to connect to said leg.

5,533,937

BICYCLE DERAILLEUR

Sam H. Patterson; John D. Cheever, and Michael W. Larson, all of Chicago, Ill., assignors to SRAM Corporation, Chicago, Ill.

Filed Feb. 6, 1995, Ser. No. 384,013

Int. Cl.^{6} F16H *9/06*

U.S. Cl. 474—80 **50 Claims**

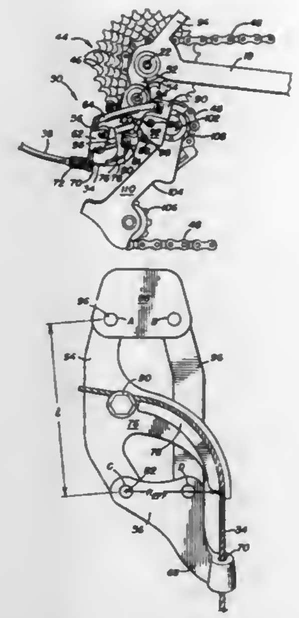
1. A bicycle derailleur for positioning a chain on sprockets of a multiple-sprocket freewheel in response to displacement of a control cable, comprising:

a p-knuckle;

a b-knuckle affixed to a bicycle frame, said b-knuckle being operatively connected to said p-knuckle;

an actuation regulator operatively connected to said p-knuckle to control the actuation ratio of the derailleur, said actuation regulator having an actuation ratio no greater than 1.5:1 over the range of motion of said p-knuckle; and

a control cable operatively connected to said actuation regulator.



5,533,938

POCKET CHAIN WHEEL

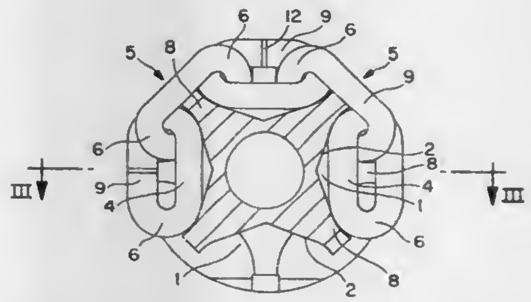
Hans H. Dalferth, Aalen, Germany, assignor to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen-Unterkochen, Germany

Filed May 24, 1995, Ser. No. 449,230

Claims priority, application Germany, Jun. 1, 1994, 44 20 344.6

Int. Cl.^{6} F16H *55/30*

U.S. Cl. 474—164 **4 Claims**



1. A pocket chain wheel having two groups of pockets for chain links passing the wheel at a tilt, said groups of pockets being arranged side by side in a view perpendicular to the wheel axis, in which the pockets of the one group are offset relative to the pockets of the other group, in the peripheral direction of the wheel, by half a pocket pitch respectively, and in which the pockets exhibit bases, for supporting the legs facing the wheel axis, and bearing surfaces, formed by webs, for supporting those legs of the chain links which are facing away from the wheel axis, wherein the bases (2) of the pockets (1) are shaped such that those legs (4) of the chain links (5) which face the wheel axis (3) are supported, within the pockets (1), only in the curved regions of the transition of the nose ends (6) of the chain links (5) into their legs (4) facing the wheel axis (3).

5,533,939

DIGGING CHAIN

J. Scott Martin, and James L. Carothers, both of Perry, Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Nov. 18, 1994, Ser. No. 344,654

Int. Cl.^{6} E02F *3/08*

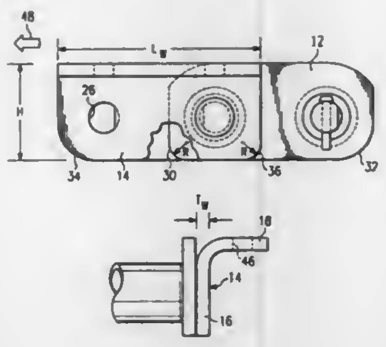
U.S. Cl. 474—206 **10 Claims**

1. A chain assembly for use with a cutting element, comprising:

a pair of facing inner side bars of predetermined height, the inner side bars having a leading inner end of a first radius and a trailing inner end of a second radius, the first radius being smaller than the second radius;

a pair of outside members of predetermined height, the outside members having a leading inner end of third predetermined radius and a trailing inner end of fourth predetermined radius, the fourth predetermined radius being smaller than the third predetermined radius, the pair of outside members having a mounting portion to mount a cutting element thereon;

a pair of rollers positioned between said facing inner side bars; a pin connecting one of said rollers to said pair of facing inner side bars and to said pair of outside members.



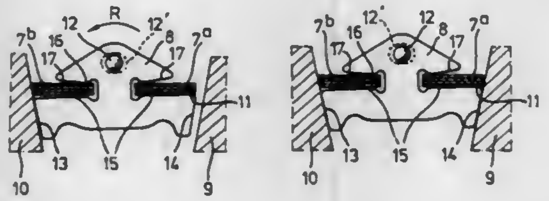
5,533,940
DRIVE BELT

Paulus M. Smeets, Tilburg, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Continuation of Ser. No. 248,264, May 24, 1994, Pat. No. 5,439,422. This application May 8, 1995, Ser. No. 436,152

Int. Cl.^{6} F16G *1/20*

U.S. Cl. 474—242 **4 Claims**



1. A drive belt, comprising:

an endless carrier means;

a first element positioned transversely on said endless carrier means;

said first element being rotatable relative to said endless carrier means in a plane orthogonal to the longitudinal direction of said carrier means;

said first element further comprising a bearing surface having a first contact point and a top surface having a second contact point, the shortest distance between said second contact point and said bearing surface exceeding the thickness of said carrier means by a length B, and said first and second contact points disposed to engage opposite sides of said carrier means when said first element rotates, thereby impeding excessive rotation of said first element;

said first and second contact points defining the hypotenuse of a right triangle having its right angle vertex in the plane of said bearing surface, the distance between said right angle vertex and said first contact point defining a length A; and

the dimensions of said first element and said cattier means being chosen such that the arctangent of the quotient B/A is a non-zero value smaller than 1 degree.

5,533,941
BELT AND METHOD OF MANUFACTURE

William D. Heim, Easton, Pa., assignor to Belting Industries Co., Inc., Kenilworth, N.J.

Filed Feb. 16, 1995, Ser. No. 389,415

Int. Cl.^{6} F16G *1/04*

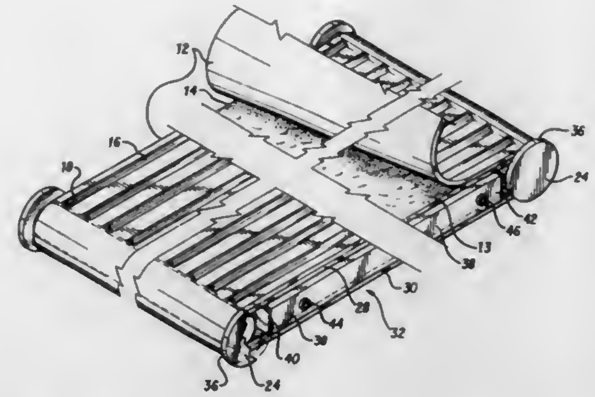
U.S. Cl. 474—267 **17 Claims**

1. A method for manufacturing a belt loop with a molded profile comprising the steps of:

weaving an endless fabric sleeve;

cutting said sleeve to a predetermined length;

repeatedly dipping said sleeve in a solution of thermoplastic synthetic material dissolved in a solvent;



heat fusing a sheet of synthetic material to form an endless sleeve of synthetic material having an inner circumference;

placing said fabric sleeve underneath and within said inner circumference of said sleeve of synthetic material;

tensioning said synthetic material sleeve and said fabric sleeve around a plurality of flanged guide rollers, said tensioning forming an elongated oval from said sleeves, with sides of said oval opposing one another;

placing molds on opposing roller tracks;

placing said synthetic material sleeve, said fabric sleeve, and said rollers between said molds, with said rollers engaging said roller tracks;

placing a platen between said opposing sides of said oval, said platen having ends;

applying a vulcanizing press to said sleeves, said rollers, said tracks, and said platen for a predetermined length of time at a predetermined temperature;

turning said sleeves on said rollers until an unmolded portion of said sleeves is advanced away from said rollers;

stretching said sleeves to a final length;

again applying a vulcanizing press to said sleeves, said rollers, said tracks, and said platen for a second predetermined length of time at a second predetermined temperature.

5,533,942
SPEED CHANGE GEARS ADOPTING INTERNAL-MESHING PLANETARY GEAR CONSTRUCTION

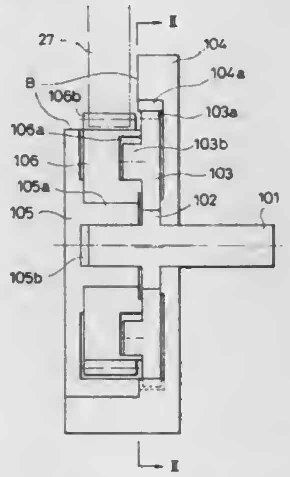
Sueo Fukaya, Ohbu, Japan, assignor to Sumitomo Heavy Industries Ltd., Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 219,938

Claims priority, application Japan, Apr. 5, 1993, 5-077992

Int. Cl.^{6} F16H *1/32*

U.S. Cl. 475—178 **3 Claims**



1. Speed change gears adopting an internal-meshing planetary gear construction, comprising a first shaft, an eccentric element with which said first shaft is provided, an external gear which is arranged on an outer periphery of said eccentric element, an internal gear which internally meshes with said external gear, means for absorbing rocking of said external gear, and a second shaft which is connected to said external gear through the absorption means, wherein:

a plurality of inner pins in a circular cylindrical shape are formed on said external gear so as to protrude at points on a circumference which is coaxial with said first shaft;

said second shaft is formed in a ring shape, and is assembled coaxially with said first shaft;

the ring-shaped second shaft is formed with inner pin holes into which said plurality of inner pins are loosely fitted, respectively, and it is also formed with external teeth surrounding an outer peripheral part of the ring; and

power transmission with a mating machine which is opposite to said speed change gears is permitted through said external teeth formed at the outer periphery of said ring.

5,533,943
PLANETARY GEAR DEVICE INCLUDING PLANETARY GEARS EACH HAVING INTEGRALLY FORMED LARGE AND SMALL PINIONS

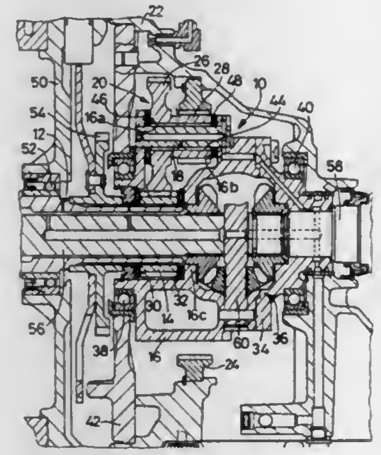
Eiji Ichioka; Kinya Yoshii; Takeharu Koide; Mitsuhiro Umeyama, all of Toyota; Makoto Funahashi, Susono; Takashi Shimizu, Toyota; Yoshihiko Sasaki, Okazaki, and Masahiro Hasebe, Anjo, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Aisin Aw Co., Ltd., Anjo, both of, Japan

Filed Apr. 6, 1995, Ser. No. 417,782

Claims priority, application Japan, Apr. 25, 1994, 6-086133

Int. Cl.^{6} F16H *37/08*

U.S. Cl. 475—198 **8 Claims**



1. A planetary gear device including a first gear, a second gear, a carrier, and a plurality of composite planetary gears each having a large-diameter pinion and a small-diameter pinion that are formed integrally with each other and arranged in an axial direction thereof, said composite planetary gears being mounted rotatably on respective pinion shafts such that said composite planetary gears are axially movable over predetermined distances due to axial plays, said pinion shafts being supported by said carrier such that said pinion shafts are disposed around an axis of said carrier, said large-diameter pinions and said small-diameter pinions of said composite planetary gears meshing with said first and second gears, respectively, each of said first and second gears and said large-diameter and small-diameter pinions consisting of a helical gear whose teeth have a helix angle with respect to an axis thereof, wherein the improvement comprises:

said large-diameter and small-diameter pinions having the same direction of helix and the same amount of lead.

5,533,944
DIFFERENTIAL WITH OUTWARDLY DIRECTED PLANETARY GEAR SEPARATING FORCES

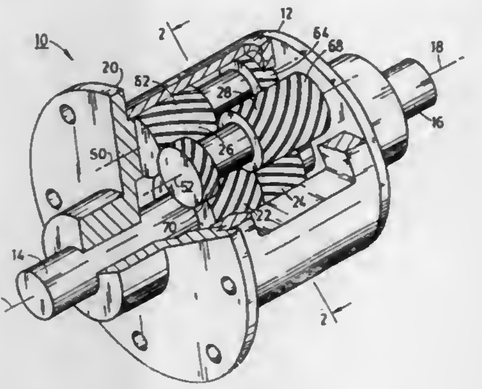
Shiro Ichiki, Ogawa, Japan, and Thomas B. Ryan, Webster, N.Y., assignors to Zexel Torsen Inc., Rochester, N.Y.

PCT No. PCT/US93/08280, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO94/10479, PCT Pub. Date May 11, 1995

Continuation of Ser. No. 969,727, Oct. 30, 1992, Pat. No. 5,244,440. This PCT application Sep. 2, 1993, Ser. No. 495,417

Int. Cl.^{6} F16H *1/42*

U.S. Cl. 475—252 **11 Claims**



1. A parallel axis gear differential comprising:

a housing rotatable by drive torque about a common axis of a pair of output shafts;

a pair of first and second side gears positioned within said housing and adapted to receive respective ends of said output shafts for rotation therewith about said common axis;

at least one pair of first and second planet gears positioned within said housing for rotation about respective axes that extend parallel to said common axis;

said first planet gear including first and second gear sections separated by a stem that straddles said first side gear;

said first gear section having a first point of meshing engagement with said second side gear and said second gear section having a second point of meshing engagement with said second planet gear;

a line of centers extending through both said common axis and the axis of said first planet gear in a transverse plane normal to said common axis;

a radial line extending through both said common axis and said second point of meshing engagement of said first planet gear projected into said transverse plane;

an angle "theta" formed between said line of centers and said radial line; and

an average transverse pressure angle "phi$_t$" between mating gear tooth surfaces at said first and second points of meshing engagement being determined in accordance with the following inequality:

$$\mathrm{TAN}(\mathrm{phi}_t) \geqq \frac{\mathrm{COS(theta)}}{1+\mathrm{SIN(theta)}} .$$

5,533,945
FIVE-SPEED AUTOMATIC TRANSMISSION

Berthold Martin, Shelby Township, and Howard L. Benford, Bloumfield Hills, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

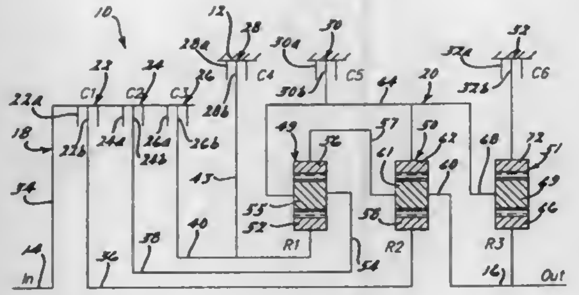
Filed Jul. 6, 1994, Ser. No. 271,313

Int. Cl.^{6} F16H *3/62*

U.S. Cl. 475—276 **18 Claims**

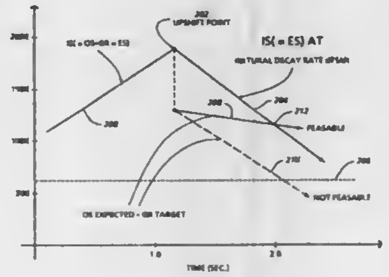
1. A five-speed automatic transmission for a vehicle comprising:

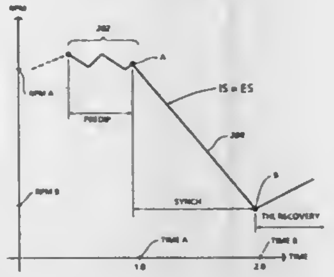
a transmission housing;



an input member;
an output member;
a plurality of planetary gearsets for changing a ratio of torque between said input member and said output member, said planetary gearsets comprising solely a first planetary gearset, a second planetary gearset axially spaced from said first planetary gearset and a third planetary gearset axially spaced from said second planetary gearset; and
a plurality of clutch assemblies to selectively couple said input member to predetermined gears of said planetary gearsets and a plurality of brake assemblies to selectively couple predetermined gears of said planetary gearsets to the transmission housing; and
means for allowing said output member and a planetary carrier from one of said planetary gearsets and an annulus gear from another of said planetary gearsets and a sun gear from yet another of said planetary gearsets to rotate at the same velocity and direction.

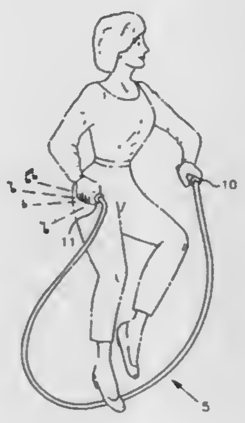
5,533,946
ENGINE DECELERATION DETERMINATION METHOD/ SYSTEM FOR UPDATING A CONTROL PARAMETER
Ronald K. Markyvech, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Apr. 8, 1994, Ser. No. 225,271
Int. Cl.⁶ F16H *63/40;61/04;* B60K *41/06*
U.S. Cl. 477—78 **8 Claims**





1. A control system for determining an updated value of a control parameter ($dES/dt_{UPDATED}$) indicative of the rate of change of rotational speed (ES) of a vehicular internal combustion engine (E) in a vehicular automated mechanical transmission system during conditions of reduced fueling of the engine, said transmission system comprising a fuel throttle-controlled engine (E), an operator-set fuel throttle device (P), a multiple-speed change-gear mechanical transmission (**10**) having an input shaft (**16**) and an output shaft (**90**) adapted to drive vehicular drivewheels, said input shaft drivingly connected to said engine by a master friction clutch (C) and a control unit (**106**) for receiving input signals, including an input signal (ES, IS) indicative of input shaft or engine rotational speed and an input signal (THL) indicative of operator's setting of the throttle device and for processing said signals in accordance with predetermined logic rules to determine control parameters and to issue command output signals to transmission system actuators, including means for controlling fueling of the engine and means (**70**) for controlling shifting of the transmission, said transmission system performing dynamic upshifts from an engaged ratio into a target gear ratio in a sequence of operations, all without disengagement of the master clutch and regardless of operator's setting of the throttle device, said dynamic upshifts comprising:
(a) a predip operation wherein fueling of the engine is manipulated to allow disengagement of the engaged gear ratio;
(b) after confirmation of disengagement of the engaged gear ratio, a synchronizing operation wherein fueling of the engine is reduced, allowing engine rotational speed to decrease toward the synchronous speed for engagement of the target ratio ($ES=IS=OS * GR_T$); and
(c) after achieving substantial synchronous rotational speed of said engine and causing engagement of said target gear ratio, a throttle recovery operation wherein fueling of the engine is caused to be controlled by sensed operator setting of said throttling device; said control system characterized by:
means for, during the predip operation, sensing engine speed;
means for sensing initiation of said synchronizing operation, and upon sensing initiation of said synchronizing operation, means for causing sensed engine speed to equal engine speed initial (RPM_A), and means for starting a timing sequence;
means for sensing initiation of the throttle recovery operation, and upon sensing initiation of said throttle recovery operation, means for causing engine speed to equal engine speed final (RPM_B), means for sensing elapsed time from starting of said timing sequence; and
means for determining the updated value of the control parameter as a function of the difference between engine speed final and engine speed initial and of the elapsed time.

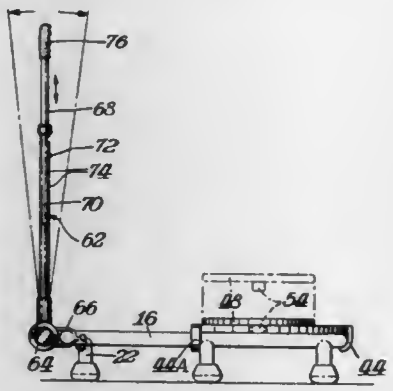
5,533,947
MUSICAL BEAT JUMP-ROPE
Roger R. Tomlinson, and Laura J. Baptista, both of 4575 Amberwood, La Palma, Calif. 90623
Filed Oct. 31, 1994, Ser. No. 331,941
Int. Cl.⁶ A63B *21/00*
U.S. Cl. 482—6 **5 Claims**



1. A musical jump-rope comprising:
a pair of jump-rope handles attached to opposing ends of a flexible rope, the rope having a length sufficient for rotating around a persons' body as a half-loop, while holding the handles;

one of the handles providing an interior space containing an electric circuit including a sensing means responsive to motion of the one of the handles, and further including a storage means for storing at least one song; each swing of the jump-rope causing the sensing means to cause the circuit to emit at least one audible note of the song in sequence with each turn of the jump-rope;
the sensing means providing a first and a second electrodes in operative relationship, the first electrode being an electrically conductive stationary wire in the shape of at least one part of a loop, the second electrode being an electrically conductive linear spring positioned nominally at the center of the loop shape, the second electrode constructed so as to bend under inertial forces delivered thereto as a result of jumping rope so that periodic contact between the electrodes results.

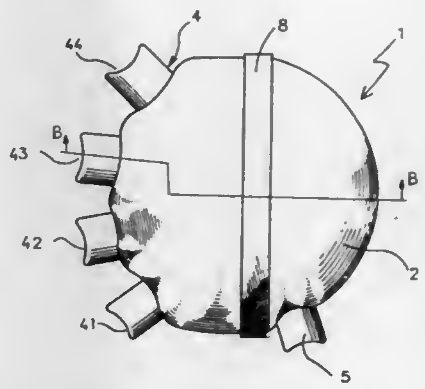
5,533,948
COMBINATION EXERCISE DEVICE
William T. Wilkinson, Severnside Farm, 300 Kyle Rd., Crownsville, Md. 21032-0572
Continuation-in-part of Ser. No. 986,487, Dec. 7, 1992, abandoned, and a continuation-in-part of Ser. No. 55,750, May 3, 1993, abandoned, and a continuation-in-part of Ser. No. 56,930, May 5, 1993, Pat. No. 5,284,461. This application Nov. 15, 1993, Ser. No. 151,957
Int. Cl.⁶ A63B *21/08*
U.S. Cl. 482—27 **20 Claims**



1. A combination exercise device comprising (a) a trampoline, said trampoline comprising a peripheral frame, a spring member secured by resilient mounting structure to said frame, said spring member being disposed within and spaced from said frame, said spring member having an upper jumping surface upon which a user may jump, feet mounted to said frame for elevating said spring member, and (b) a step, said step having a horizontal rigid platform upon which a user may repeatedly step on and off in an aerobic exercise, and mounting elements mounting said platform to said trampoline directly over about at least one-half of said upper jumping surface of said spring member inwardly of said resilient mounting structure whereby the user may selectively use said device in a trampoline and/or stepping exercise mode.

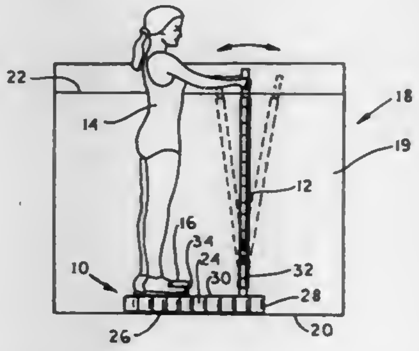
5,533,949
HAND-MUSCLE DEVELOPER WITH MUSIC PRODUCING MEANS
Chyh-Wen Hwang, No. 124, Chung Hsing Rd., Hsin Feng Hsieng, Hsinchu Hsien, Taiwan
Filed Dec. 27, 1994, Ser. No. 364,814
Int. Cl.⁶ A63B *23/16*
U.S. Cl. 482—47 **5 Claims**

1. A hand-muscle developer comprising:
a casing having at least one melody key chamber, and a tuning key chamber;



a hand strap configured to fit the dimensions and contours of the hand, said strap fixed to the outside of said casing;
a music IC circuit board mounted inside said casing;
a speaker mounted on said casing and electrically connected to said music IC circuit board;
a battery power supply installed in said casing and electrically connected to said music IC circuit board;
at least one melody key slidably mounted in said at least one melody key chamber such that, when fully depressed, electrical contact is made with said at least one melody key chamber triggering said IC circuit board to produce a specific tone through said speaker; and
a tuning means slidably mounted in said tuning key chamber for tuning the tones triggered by said melody keys.

5,533,950
ATTACHING SURFACE FOR AQUATIC EXERCISE DEVICES AND USERS
Kenneth Lochbaum, 3002 E. 38th St., Erie, Pa. 16510-2924
Filed Dec. 28, 1994, Ser. No. 365,498
Int. Cl.⁶ A63B *22/00*
U.S. Cl. 482—51 **26 Claims**



1. An aquatic exercise base for use in a body of water having a bottom comprising:
a base having a top surface, a bottom surface and an outer surface;
said top surface having a plurality of apertures formed therein and extending into said base for receiving and, releasably securing a post whereby said post may be releasably secured to said base;
said outer surface forming a side wall extending around said base;
said bottom surface of said base being supported on a bottom of a body of water; and,
a mounting means affixed to said bottom surface to releasably secure said base to a bottom of a body of water.

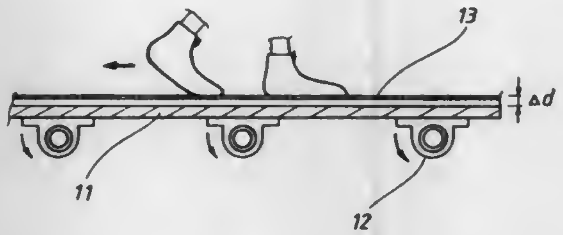
5,533,951
EQUILIBRIUM BREAKING TYPE LOAD CARRYING MEANS FOR USE IN A TREADMILL

Chun-Hsiung Chang, No. 5-4. Lane 201, Chung-Hua Rd., Pa-Te Hsiang, T'ao-Yuan Hsien, Taiwan

Filed Jan. 11, 1995, Ser. No. 371,416

Int. Cl.^{6} A63B ***22/02***

U.S. Cl. 482—54 **11 Claims**



1. An equilibrium breaking type load carrying means adapted to be attached to supporting rails of a treadmill, comprising:
a running belt having an upper foot surface;
a running board locating underneath said foot surface of said running belt;
a from roller and a rear roller commonly supporting said running belt and attached to said supporting rails of said treadmill; and
at least one motion generating device attached to said supporting rails of said treadmill underneath said foot surface of said running belt, said at least one motion generating device permitting free movement of said running belt and generating a reciprocal relative motion between said running board and said running belt and perpendicular to said running belt while said running belt moves with an external load thereon for reducing friction between said running belt and said running board.

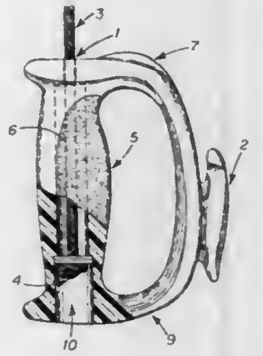
5,533,952
HAND GRIP ASSEMBLY FOR CROSS-COUNTRY EXERCISER OR SIMILARLY-GRIPPED EXERCISE EQUIPMENT

Christopher R. Schaber, 15 Haywood Ct., Ft. Thomas, Ky. 41075

Filed Oct. 31, 1995, Ser. No. 551,042

Int. Cl.^{6} A63B ***22/00;5/20***

U.S. Cl. 482—70 **1 Claim**



1. An improved handgrip assembly for an exercise machine having a cord tension means, said handgrip assembly comprising: a generally D-shaped handle having a gripping portion and a curved non-gripping portion, said gripping portion having an axial bore for the reception of said cord means; means within said bore for anchoring an end of said cord means; and anchor means located on the curved portion which engages a length of said cord means to effectively change the length of said cord means.

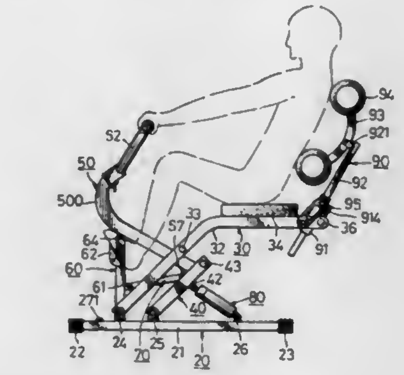
5,533,953
RIDING-TYPE EXERCISER

Gin-Fun Lui, No. 7, Lane 1139, Chia-Hou Rd., Hou-Li Hsiang, and Richard Liao, No. 263, Tzu-Te Rd., Ta-Li City, both of Taichung Hsien, Taiwan

Filed Sep. 15, 1995, Ser. No. 528,670

Int. Cl.^{6} A63B ***69/06***

U.S. Cl. 482—96 **8 Claims**



1. A riding-type exerciser, comprising:
a base frame having a front end and a rear end;
a seat unit including an elongated seat frame with a rear portion and a front portion that extends downwardly from said rear portion and that has a distal end which is mounted pivotally on said base frame adjacent said front end of said base frame, said seat unit further including a seat member mounted on said rear portion of said seat frame;
an elongated support unit having a top portion and a bottom portion which is mounted pivotally on said base frame between said front portion of said seat frame and said rear end of said base frame;
a pull unit including an elongated pull beam having a front portion and a rear portion that is mounted pivotally to said front portion of said seat frame and to said top portion of said support unit, and a handlebar mounted on said front portion of said pull beam;
a pedal unit including a support beam having a lower end mounted pivotally on said base frame adjacent said front end of said base frame, and a pair of pedal plates mounted on two sides of said support beam;
an elongated linking member having a first end connected pivotally to said rear portion of said pull beam and a second end connected pivotally to said support beam; and
a resistance cylinder having a cylinder body and a piston shaft extending retractably into said cylinder body, one of said cylinder body and said piston shaft being mounted pivotally on said base frame adjacent said rear end of said base frame, the other one of said cylinder body and said piston shaft being mounted pivotally to said support unit.

5,533,954
ONE-PIECE CORRUGATED TRAY

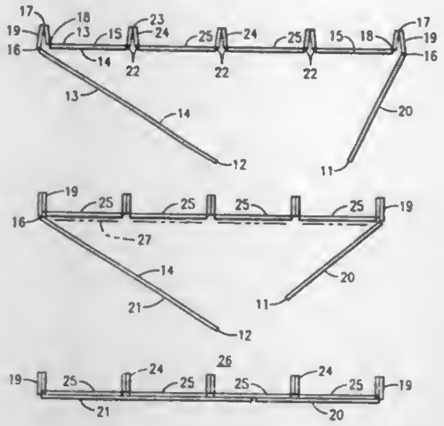
Alan R. Zogg, R.R. #3, Box 174, Greene, N.Y. 13778

Filed Oct. 27, 1994, Ser. No. 330,210

Int. Cl.^{6} B31B ***1/178***

U.S. Cl. 493—310 **6 Claims**

1. Method of forming a tray from a single blank of sheet material having an upper liner, a lower liner, and a filler sandwiched between said liners, and said sheet material having a predetermined thickness, and said blank having an end edge; the method comprising the steps of:
forming at least one divider wall adjacent a floor portion by slit scoring said sheet material through said lower liner and said sheet material but leaving said upper liner intact at two parallel slit lines with said divider wall being defined therebetween and said floor portion being separated by said parallel slit lines from said wall portion; slit scoring said sheet material through said upper liner and said filler but leaving said lower liner intact at a slit score line midway between said parallel slit lines;
folding said blank upwards at said parallel slit lines and folding said blank downwards at said slit score line to form a double thickness wall with said floor portion extending from each side thereof;
forming at least one end wall by slit scoring said sheet material through said upper liner and said filler but leaving said lower liner intact at a first slit line spaced from said end edge and at a second slit line spaced from said first slit line on a position remote from said end edge; slit scoring said sheet material through said lower liner and said filler but leaving said upper liner intact at a third slit line spaced from said second slit line on the side remote from said end edge; and
folding said blank upwards at said third slit line and downwards at said second slit line to form a double thickness wall as said end wall and then folding said blank downwards at said first slit line such that said end panel lies beneath and reinforces said floor portion.



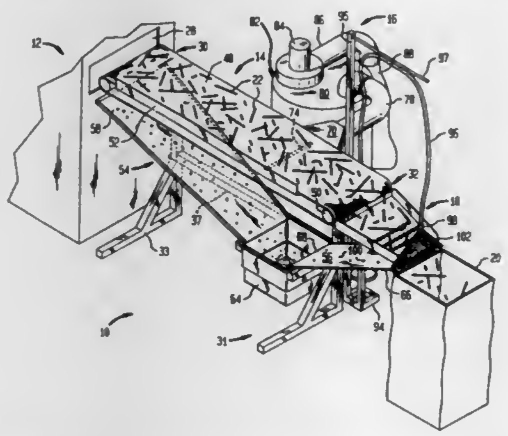
5,533,955
APPARATUS FOR FORMING LOOSE FILL PACKING MATERIAL

Ronald Cann; Steve Cann, both of Pompano Beach; Robert Lee, Parkland, and Kevin J. Haggerty, Parkland, all of Fla., assignors to Ecotone of Broward, Inc., Boca Raton, Fla.

Filed Jan. 21, 1994, Ser. No. 184,557

Int. Cl.^{6} B07B ***1/14;*** **B05D** ***3/12***

U.S. Cl. 493—342 **14 Claims**



10. The method of forming strips of material suitable for use in packing, comprising:
transmitting material strips formed from sections of sheet material atop a perforated belt;
moving the material strips past a collection device located beneath the perforated belt;
collecting dust, dirt and the like which falls by gravity through the perforated belt in the course of movement of the material strips above the collection device;
applying a suction to the material strips during movement of the material strips over. the collection device to remove any remaining dust, dirt and the like therefrom.

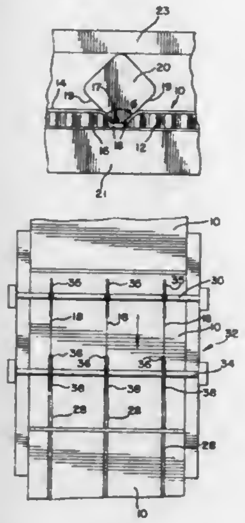
5,533,956
METHOD AND APPARATUS FOR MANUFACTURING ARTICLES EMPLOYING FOLDED HONEYCOMB PANELS

Dale W. Komarek, Arlington Heights, Ill.; Paul Moser, Milford, Conn., and George T. Wroblewski, Sr., Monee, Ill., assignors to Hexacomb Corporation, Lincolnshire, Ill.

Continuation of Ser. No. 253,428, Jun. 2, 1994, abandoned, which is a continuation of Ser. No. 840,768, Feb. 24, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 467,932

Int. Cl.^{6} B65H ***45/28***

U.S. Cl. 493—355 **20 Claims**



1. A method of forming a fold in a honeycomb panel along a predetermined line, the method comprising the steps of:
a) cutting a slit into the honeycomb panel along the predetermined line; and
b) crushing portions of the honeycomb panel along the predetermined line to crush the honeycomb panel to form a trough, the crushed portions of the honeycomb panel forming a hinge whereby the honeycomb panel is foldable along the hinge.

5,533,957
METHOD OF TISSUE RETROPERFUSION

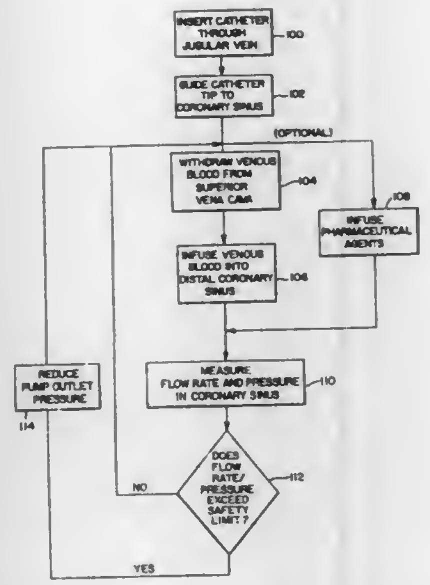
Gabriel S. Aldea, Chestnut Hill, Mass., assignor to Trustees of Boston University, Boston, Mass.

Division of Ser. No. 238,860, May 6, 1994. This application May 18, 1995, Ser. No. 444,049

Int. Cl.^{6} A61N ***1/362***

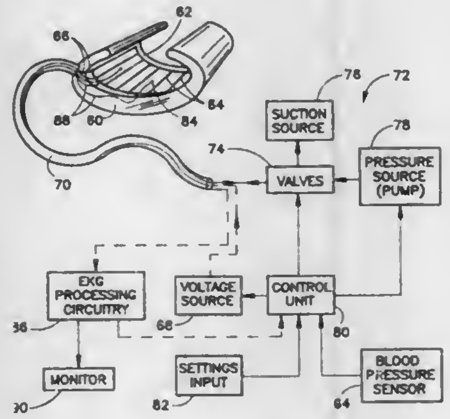
U.S. Cl. 600—16 **11 Claims**

1. A method for retroperfusion of tissue having a defined systemic vein, said vein draining blood from said tissue through a venous junction coupling said vein to the greater circulatory system comprising the steps of:
inserting a non-occluding catheter having a non-occluding infusion tip through a percutaneous venous entry;
guiding said infusion tip into said vein, such that when retroperfusing the tissue, said tip extends within said vein to a depth in a range of about 2 to 4 inches (5.08 to 10.16 cm) from said venous junction; and


INSERT CATHETER THROUGH JUGULAR VEIN
100
GUIDE CATHETER TIP TO CORONARY SINUS
102
(OPTIONAL)
WITHDRAW VENOUS BLOOD FROM SUPERIOR VENA CAVA
104
108
INFUSE PHARMACEUTICAL AGENTS
INFUSE VENOUS BLOOD INTO DISTAL CORONARY SINUS
106
REDUCE PUMP OUTLET PRESSURE
114
MEASURE FLOW RATE AND PRESSURE IN CORONARY SINUS
110
DOES FLOW RATE/ PRESSURE EXCEED SAFETY LIMIT ?
112
NO
YES

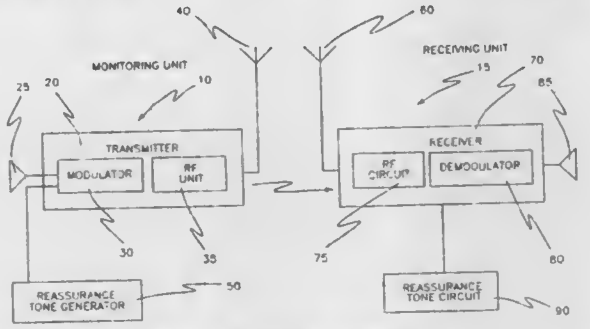
retroperfusing the tissue by delivering a non-synchronized retroperfusate flow of fluid at a rate in a range of about 5 to 50 mil./min. and at a pressure less than about 15 mm Hg.

5,533,958
INTRAPERICARDIAL ASSIST DEVICE AND ASSOCIATED METHOD
Peter J. Wilk, 185 West end Ave., New York, N.Y.
Continuation-in-part of Ser. No. 78,567, Jun. 17, 1993, Pat. No. 5,385,528. This application Aug. 5, 1994, Ser. No. 286,817
Int. Cl.^{6} A61B *17/12*
U.S. Cl. 600—18 **19 Claims**



1. An intrapericardial assist device comprising:
an electrode carrier having a surface for contacting a patient's heart in an intrapericardial space;
electrical contact means disposed on said surface for conducting electrical energy to the heart upon an insertion of said electrode carrier into the intrapericardial space;
means operatively connected to said contact means for supplying electrical energy to said contact means; and
means connected to said electrode carrier for maintaining said surface in contact with the patient's heart,
said electrode carrier being a collapsible member which has a configuration of a slotted cuff in an expanded configuration, said electrode carrier having a predetermined size and shape in said expanded configuration so that said electrode carrier is disposable in the intrapericardial space in juxtaposition to the patient's heart.

5,533,959
WIRELESS REMOTE MONITORS EMPLOYING REASSURANCE TONES
Perran V. L. Newman, Cambridge, England; Niel P. Zeller, and Dwight D. Ifland, both of Littleton, Colo., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Feb. 22, 1994, Ser. No. 199,943
Int. Cl.^{6} C08B *23/00*
U.S. Cl. 600—28 **19 Claims**

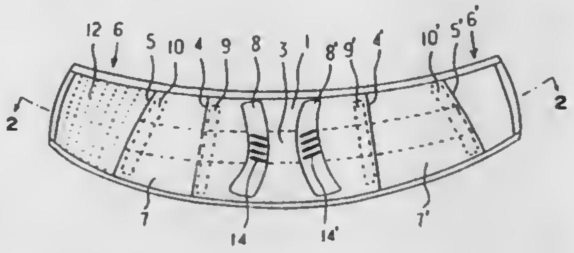


1. A wireless monitoring system comprising:
a transmitter including an audio pickup device for monitoring ambient sounds and means for transmitting said ambient sounds,
a tone generator for causing said transmitter to transmit an occasional audible reassurance tone,
a receiver tuned to receive the ambient sounds monitored by said transmitter, and said receiver including means for receiving said reassurance tone, and
means associated with said receiver for selectively controlling the monitoring of said reassurance tone while continuing to monitor said ambient sounds.

5,533,960

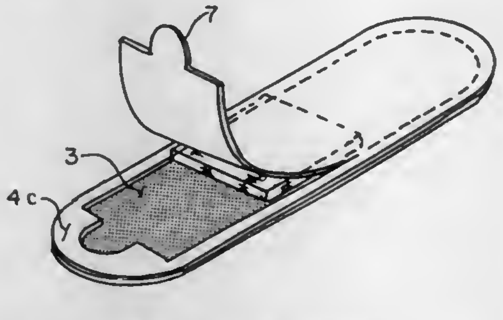
Patent Not Issued For This Number

5,533,961
LUMBAR SUPPORT GARMENTS
Tetsuya Iwata, Kyoto-fu, Japan, assignor to Wacoal Corp., Kyoto, Japan
Filed Jul. 13, 1994, Ser. No. 274,262
Claims priority, application Japan, Jul. 28, 1993, 5-186283; Mar. 18, 1994, 6-048688
Int. Cl.^{6} A61F *5/00*
U.S. Cl. 602—19 **11 Claims**



1. A lumbar support garment for surrounding at least the lumbar region of a wearer of the garment, comprising:
(a) a main cloth, comprising a single-sheet of cloth made of stretchable fabric, or comprising a face cloth and lining cloth made of stretchable knit fabric, said main cloth extending in use from the lumbar region of the wearer's back, around the wearer's sides, to at least the sides of the wearer's abdomen; said main cloth further comprising seam parts which in use extend vertically in the vicinity of the area of the wearer's sides or seam parts which extend in use at least from the area of the wearer's waist sides and slant downwards toward the front of the garment; said main cloth further comprising darts formed at the seam parts to provide a vertical cross-sectional form of convex shape with respect to the skin side of the garment;
(b) a stretchable auxiliary belt, made of a stretchable knit fabric narrower than the main cloth, extending in use from the lumbar region of the wearer's back at least to the wearer's side regions, the auxiliary belt having right and left hand ends secured to the main cloth; and
(c) first and second longitudinal sheet-form support bones, made of an elastomer resin or amorphous resin, located in the vicinity of the portions of the main cloth which in use are in contact with the user's right and left latissimus dorsi muscle and gluteus maximus muscle respectively, the first and second bones being secured on the outermost surface of the main cloth or to at least one selected from the group consisting of the face and the lining cloth in the space between the face cloth and the lining cloth, the first and second bones having complementary longitudinally curved shapes in the medial to lateral direction to support and follow the contour of the user's right and left latissimus dorsi muscle and gluteus maximus muscle respectively.

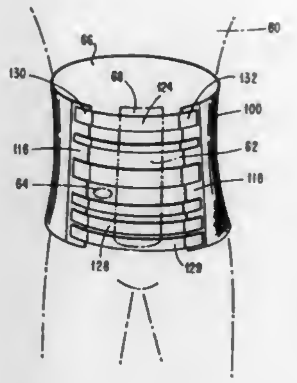
5,533,962
RINGLESS ADHESIVE BANDAGE
Shadi Peterman, and Douglas Peterman, both of 12192 Fox Point Dr., Maryland Heights, Mo. 63043
Filed May 12, 1995, Ser. No. 439,852
Int. Cl.^{6} A61F *5/00*
U.S. Cl. 602—54 **9 Claims**



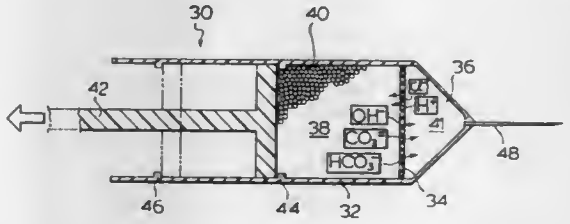
1. An improved adhesive bandage comprising:
a bandage main body having an upper surface with a periphery and an inner portion in which
  a. a peripherally-raised, non-adhesive, thin-layer substantially defines the periphery portion of the upper surface; and
  b. an adhesive-coated recessed surface substantially defines the inner portion of the upper surface; said adhesive-coated recessed surface being substantially surrounded by, said peripherally-raised, thin-layer perifery portion;
  said peripherally-raised non-adhesive thin-layer serving to inhibit the formation of a dirt ring which would otherwise remain when the adhesive bandage is removed from human skin.

5,533,963
DRESSING HOLDER
Robert L. Hall, 2001 Laurel Ave., Suite 204, Knoxville, Tenn. 37916
Filed Jan. 3, 1995, Ser. No. 367,935
Int. Cl.^{6} A61F *5/00*
U.S. Cl. 602—75 **10 Claims**

1. A dressing binder adapted to hold an abdominal dressing in position over a wound of a patient, the patient having a back, abdomen and a flank located at each right and left side thereof, said dressing binder comprising: a back panel constructed from an imperforate partially elastic material and sized to extend across the back and each flank of a patient, leaving at least part of the abdomen of the patient with the dressing exposed, the back panel having a pair of spaced apart vertical edges with the exposed part of the abdomen being located between the vertical edges, the vertical edges having adjacent surfaces for facing away from the patient while wearing the binder and a vertical height; one of a hook and loop tape fastener extending vertically along each surface of each the vertical edges; a plurality of elastic straps having widths, a total of widths of the straps being less than the vertical height of the vertical edges, each strap having opposite ends and a tab of the other of the hook and loop tape fastener affixed thereto for adjustably, selectively and removably attaching each end of each strap to the vertical edges of the back panel, the straps spanning the exposed part of the abdomen and being spaced from each other so that at least part of the abdomen remains exposed to accommodate intestinal ostomies, bags, drains and devices exiting the abdomen adjacent the dressing.



5,533,964
APPARATUS FOR REMOVAL OF EXCESS HYDROGEN IONS FROM HUMANS
Mitchell L. Halperin, North York, and Surinder Cheema-Dhadli, Mississauga, both of, Canada, assignors to Rossmark Medical Publishers Inc., Ontario, Canada
Filed Feb. 17, 1994, Ser. No. 197,949
Int. Cl.^{6} A61M *37/00*
U.S. Cl. 604—4 **12 Claims**



1. A kit for reducing hydrogen ions in a patient's body fluid. said kit including,
a buffering compound comprising Ag_2CO_3 in solid form for bonding with free cloride ions naturally present in said body fluid and substituting therefor buffering ions selected from the group consisting of carbonate ions and bicarbonate ions, and
means for selectively permitting ion flow between the patient's body fluid and said buffering compound while preventing movement of said buffering compound into said patient,
wherein in use, said buffering ions bond with said hydrogen ions to produce water and carbon dioxide molecules.

5,533,965

Patent Not Issued For This Number

5,533,966

TAMPON APPLICATOR, ESPECIALLY FOR FEMININE HYGIENE

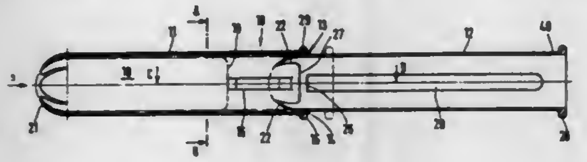
Hans W. Schoelling, Ennepetal, Germany, assignor to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 647,878, Jan. 30, 1991, abandoned. This application Jun. 7, 1994, Ser. No. 255,837

Claims priority, application Germany, Feb. 1, 1990, 40 02 975.1

Int. Cl.^{6} A61F *13/32*

U.S. Cl. 604—18 **10 Claims**



1. Tampon applicator, especially for feminine hygiene, comprising:

a cylindrical outer sleeve having an outer sleeve inside diameter and a rear end;

a cylindrical inner sleeve having an interior and an outside and defining a longitudinal axis for the tampon applicator with an outside diameter smaller than the outer sleeve inside diameter, the inner sleeve being mounted coaxially displaceably in the outer sleeve and being equipped with an axial longitudinal slot having a front end, said slot being closed at each of a longitudinal front and rear end of the inner sleeve;

elastic lips tapering in a forward direction from roots at a front end of the outer sleeve and of the inner sleeve, the lips curving inward toward a center longitudinal axis of the tampon applicator;

a tampon which is surrounded coaxially by the inner sleeve;

a grip at the rear end of the inner sleeve for grasping the inner sleeve and pulling it out almost completely from the rear end of the outer sleeve, and at least one detent element is arranged on the outside of the rear end of the inner sleeve at an axial distance from the grip;

a tongue-shaped elastic tampon catch which is connected integrally to the outer sleeve adjacent its rear end and projects through the longitudinal slot of the inner sleeve into its interior and which, when the inner sleeve is being pulled out of the rear end of the outer sleeve, transfers the tampon into the outer sleeve;

wherein (1) at least a part of the outer sleeve is equipped with the tampon catch, (2) the inner sleeve and said part of the outer sleeve which is equipped with the tampon catch are integrally formed from plastic and are connected to one another by means of at least one predetermined breaking point between a rear end of the said part of the outer sleeve and the front end of the inner sleeve, (3) the tampon catch is aligned radially with the longitudinal slot in the inner sleeve, (4) said at least one predetermined breaking point consists of plastic skin which extends from the rear end of the outer sleeve to the front end of the inner sleeve in a region between the roots of the lips of the inner sleeve and the front end of the longitudinal slot, and (5) said detent element is capable of engaging a radially inwardly projecting residual edge formed upon destruction of said at least one predetermined breaking point at the rear end of the outer sleeve to restrict movement of the inner sleeve into the outer sleeve.

5,533,967

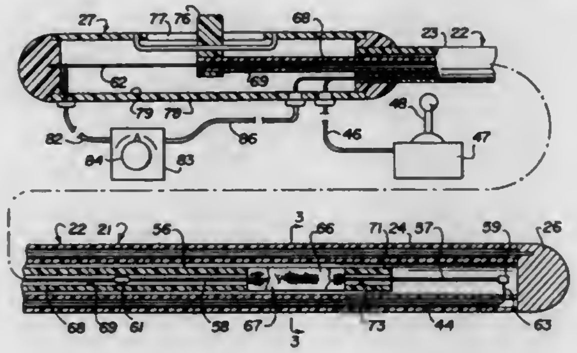
STEERABLE CATHETER WITH ADJUSTABLE BEND LOCATION AND METHOD

Mir A. Imran, Palo Alto, Calif., assignor to Cardiac Pathways Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 134,487, Oct. 12, 1993, Pat. No. 5,389,073, which is a continuation of Ser. No. 983,962, Dec. 1, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 382,621

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—95 **2 Claims**



1. A steerable catheter for use in a vessel of a patient having an adjustable bend location comprising a flexible elongate tubular member having proximal and distal extremities, a control mechanism secured to the proximal extremity, means having first and second ends disposed within the flexible elongate tubular member for providing stiffness in the distal extremity of the flexible elongate tubular member, said means for providing stiffness including means coupled to the control mechanism for adjusting the location for permitting a bend between the first and second ends while retaining stiffness on opposite sides of the bend making it possible to select while the steerable catheter is in use in the vessel of the patient the location in the distal extremity where bending is to occur to thereby adjust the length of the flexible elongate member which extends beyond the bend.

5,533,968

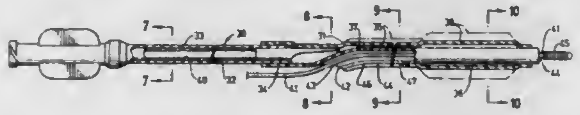
LOW PROFILE CATHETER WITH EXPANDABLE OUTER TUBULAR MEMBER

Ketan P. Muni, San Jose, and Motasim M. Sirhan, Newark, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 921,304, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 758,630, Sep. 12, 1991, abandoned, and a continuation-in-part of Ser. No. 155,084, Nov. 19, 1993, abandoned, which is a continuation of Ser. No. 853,039, Mar. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 700,617, May 15, 1991, abandoned. This application May 27, 1994, Ser. No. 250,809

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **27 Claims**



1. An intraluminal catheter comprising:

a) an elongated catheter shaft having proximal and distal shaft portions and a first tubular member in the distal shaft portion which elastically expands substantially at least in part upon inflation to a pressure within a first pressure range and expands very little in a second higher pressure range, which contracts by elastic recoil upon deflation to a deflated diameter much smaller than the inflated diameter, and which defines at least in part an expandable inflation lumen extending through the distal shaft portion; and

b) an inflatable member on the distal shaft portion having an interior in fluid communication with the expandable inflation lumen.

5,533,969

BALLOON CATHETER WITH PRESSURE INDICATOR

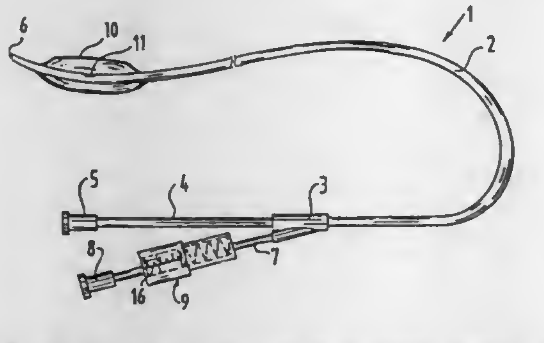
Martien Mulder, Roden, Netherlands, assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jul. 18, 1994, Ser. No. 276,525

Claims priority, application Netherlands, Jul. 29, 1993, 9301329

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—100 **16 Claims**



1. A balloon catheter comprising an elongated catheter body having a distal end and a proximal end, said catheter body defining a lumen and a connector carried on the proximal end in communication with said lumen; a balloon attached adjacent to said distal catheter body end with said balloon being in communication with said lumen; a pressure gauge connected with said lumen in which said pressure gauge comprises an elongated housing carrying a spring and a numerical scale and having an inlet and an outlet spaced from each other; a piston in said housing movable against said spring by the pressure to be measured, in which said piston and scale work together to indicate a quantitative pressure reading.

5,533,970

RETRACTABLE NEEDLE SYRINGE

Howard S. Berger, Hackensack; Robert B. Odell, Franklin Lakes, and Sandor Gyure, West Orange, all of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 28, 1994, Ser. No. 314,030

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—110 **21 Claims**

1. A retractable needle syringe comprising:

an elongate barrel having an inside surface defining a chamber, an open proximal end and a distal end;

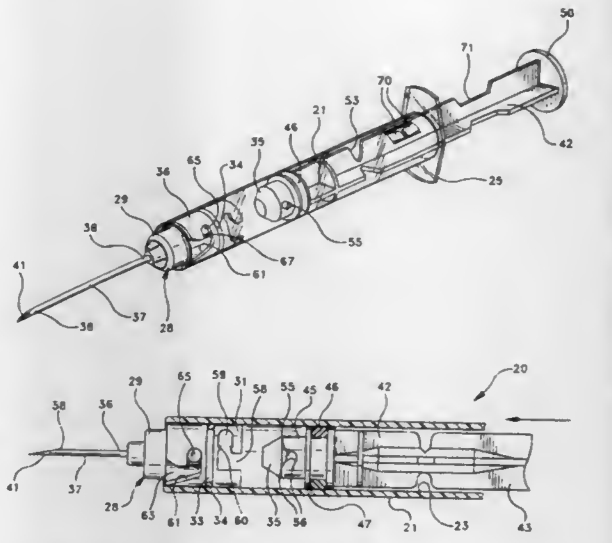
an elongate plunger slidably positioned in fluid-tight engagement with said inside surface of said barrel, said plunger having a distal end, a proximal end extending outwardly from said open end of said barrel, and a radially directed projection on said distal end of said plunger;

a movable needle carrier positioned in fluid-tight engagement with said inside surface of said barrel at said distal end of said barrel, said carrier having an outside surface, a distal end, a proximal end, and a passageway therethrough in fluid communication with said chamber;

said proximal end of said carrier including an open-ended groove, said groove sized and shaped to receive said plunger projection, said groove having an axial portion and a circumferential portion; said plunger being movable axially, distally and proximally, so that said plunger projection can enter and exit said axial portion of said groove, rotation of said plunger with respect to said carrier causes said projection to containing said projection so that said plunger can apply axially directed force and rotationally directed force to said carrier;

a needle cannula projecting outwardly from said distal end of said carrier, said cannula having a distal end, a proximal end and lumen therethrough in fluid communication with said passageway;

control means for helping to prevent movement of said carrier with respect to said barrel during normal use of said syringe while said control means is in a first locked position, and for allowing said carrier to be moved proximally into said chamber through forces applied to said plunger while said control means is in a second unlocked position, transition between said first locked position and said second unlocked position and withdrawing said cannula into said barrel bring accomplished by at least two motions of said plunger with respect to said barrel while said distal end of said plunger engages said carrier, said first motion being rotational to rotate said carrier with respect to said barrel through an acute angular rotation followed by a second axial motion proximally directed to move said carrier into said barrel far enough so that said distal end of said cannula does not extend beyond said distal end of said barrel.



5,533,971

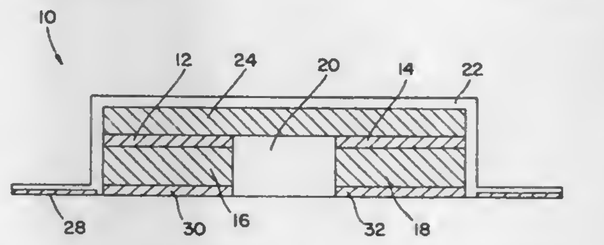
REDUCTION OF SKIN IRRITATION DURING ELECTROTRANSPORT

Joseph B. Phipps, Plymouth, Minn., assignor to Alza Corporation, Palo Alto, Calif.

Filed Sep. 3, 1993, Ser. No. 116,660

Int. Cl.^{6} A61N *1/30*

U.S. Cl. 604—20 **15 Claims**



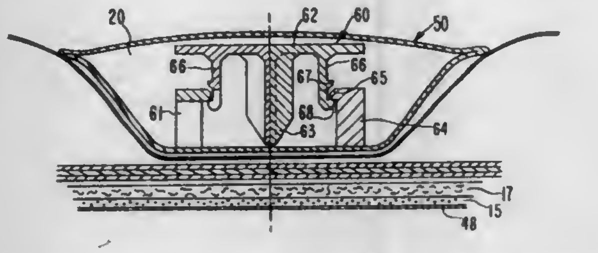
1. In a method of operating an electrotransport delivery device which delivers an agent by electrotransport under the influence of an electric current through a skin site, the device comprising an anodic electrode assembly, a cathodic electrode assembly, a source of electrical power electrically connected to the electrode assemblies and an agent reservoir in at least one of the electrode assemblies;

the improvement whereby electrotransport-induced irritation of the skin site can be reduced or avoided; which improvement comprises:

- a) monitoring potassium concentration in the cathodic electrode assembly during electrotransport agent delivery; and
- b) reducing the electric current flowing through the skin site when the potassium concentration reaches a value which corresponds to a predetermined potassium efflux level associated with electrotransport-induced irritation of the skin.

5,533,972
IONTOPHORETIC DELIVERY DEVICE AND METHOD OF HYDRATING SAME

J. Richard Gyory, San Jose, and John R. Peery, Stanford, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Division of Ser. No. 892,554, Jun. 1, 1992, Pat. No. 5,310,404. This application Sep. 30, 1993, Ser. No. 129,519
Int. Cl.^{6} A61N *1/30*
U.S. Cl. 604—20 **21 Claims**



1. A substantially non-hydrated hydratable reservoir and a sealed liquid-containing container for hydrating the reservoir in an iontophoretic delivery device, the container comprising:

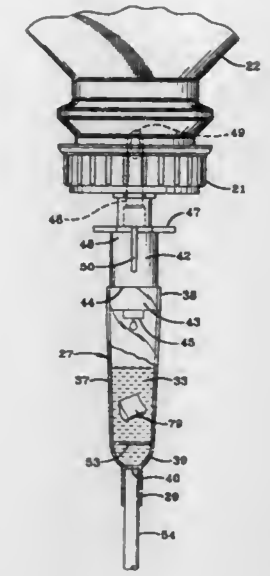
- a) a flexible container wall; and
- b) a punch within the container, the punch having a blade for cutting a wall of the sealed container when the punch is activated in order to release the liquid from the sealed container into the non-hydrated reservoir, the punch also having a punch stand for holding the blade in a non-activated position and for providing a predetermined resistance to activation of the blade.

5,533,973
ALTERATION OF NUTRITIONAL PRODUCT DURING ENTERAL TUBE FEEDING

Carl J. Piontek, Powell; Terrence B. Mazer, Reynoldsburg; Joseph E. Walton, Westerville, and Ronita K. Geckle, Columbus, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jan. 13, 1995, Ser. No. 372,624
Int. Cl.^{6} A61M *37/00*
U.S. Cl. 604—83 **26 Claims**

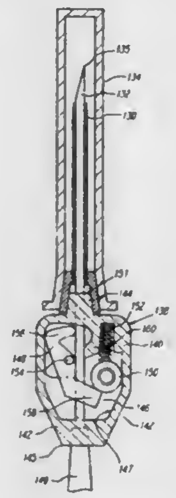
1. An apparatus for modifying a liquid enteral nutritional product during the feeding thereof comprising:

- a formulation chamber having an inlet and an outlet, the inlet being located at the top of the formulation chamber and the outlet being located at the bottom of the formulation chamber with the inlet connected to a supply container of a liquid enteral nutritional product having viscosity in the range of about 5 to about 300 centipoises so as to receive said product thereof,
- at least one dose unit of a beneficial agent in at least a dosage amount being disposed within the formulation chamber so as to be wetted by or immersed in the liquid enteral nutritional product traversing therethrough from the inlet to the outlet of the formulation chamber, each at least one beneficial agent in the dose unit being selected from the group consisting of: nutrients; medicaments; probiotics; and diagnostic agents; and chemically and physiologically compatible combinations thereof; each dose unit of beneficial agent disposed in the formulation chamber being not in controlled release form and being a means for providing and dispensing the beneficial agent into said liquid enteral nutritional product when the dose unit is physically contacted thereby during the feeding thereof into the gastrointestinal tract of a patient over a time period of less than 2 hours; and
- fluid communication means capable of operatively connecting the outlet of the formulation chamber to a device which feeds the liquid enteral nutritional product into the gastrointestinal tract of a patient.



5,533,974
LOCKING SAFETY COVER FOR SHARP INSTRUMENTS

Rodolfo Gaba, Simi Valley, Calif., assignor to Devon Industries, Inc., Chatsworth, Calif.
Continuation-in-part of Ser. No. 94,842, Jul. 20, 1993, Pat. No. 5,417,659. This application Jan. 23, 1995, Ser. No. 376,399
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—110 **12 Claims**

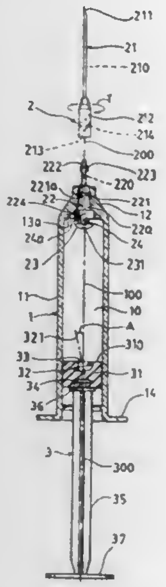


1. A safety device for a needle, comprising:

- a housing having a thin, flat profile, a first opening and a second opening;
- a cam pivotably mounted within the housing and displaceable to open and close off the first opening;
- a spring within the housing; and
- a gripper wheel within the housing between the spring and the cam.

5,533,975
SAFETY SYRINGE WITH RELIABLY EXTERNALLY CONNECTABLE AND INTERNALLY RETRACTABLE SELF-BIASED NEEDLE

Wen-Chin Lu, 5 Floor-8, No. 33, Chien-Kuo N. Road, Sec. 2, Taipei, Taiwan
Filed Oct. 6, 1995, Ser. No. 540,340
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—110 **1 Claim**



1. A safety syringe comprising:

- a syringe means including: a syringe cylinder for filling liquid medicine therein, a syringe axis longitudinally defined in a central portion of the syringe cylinder, a sleeve portion formed in a front portion of the cylinder contracted and tapered forwardly from the cylinder, and a shoulder portion formed in a front portion of the cylinder between the syringe cylinder and the sleeve portion;
- a hollow needle assembly including a hollow needle portion detachably connected with a shank portion secured in the sleeve portion of said syringe means, and a needle head portion connected to the shank portion by a hollow neck portion, a central injection hole formed in said needle head portion, and a venting slot formed in the neck portion, said central injection hole and said venting slot communicating with a central through hole longitudinally formed through the shank portion and communicating with the needle hole formed in said hollow needle portion when coupling the hollow needle portion on said shank portion, and a needle axis defined in a central portion of the hollow needle assembly and normally aligned with the syringe axis when mounting the needle assembly on the syringe means for normally injection use; and
- a plunger means including: a plunger reciprocatively held in the syringe cylinder, a biasing socket recessed rearwardly from a plunger front surface of the plunger having a longitudinal axis defined at a center of the biasing socket to be deviated from the syringe axis with an acute angle, a guiding port converging rearwardly from the plunger front surface for communicating with the biasing socket for slidably guiding the needle head portion rearwardly through the guiding port to be engaged into the biasing socket for biasing the hollow needle portion obliquely when retracting the needle assembly within the syringe cylinder, and a plunger rod connected with the plunger;
- said sleeve portion including: a sheath opening formed in a front end portion of the sleeve portion, a ring groove annularly recessed in an inside wall of the sheath opening, a truncated-cone-shaped socket tapered forwardly from a cylindrical socket recessed forwardly from the shoulder portion of the syringe means and communicating with the sheath opening, with the cylindrical socket having an inside diameter larger than an inside diameter of a rear end portion of the truncated-cone-shaped socket, and the sheath opening having an inside diameter equal to an inside diameter of a front end portion of the truncated-cone-shaped socket for forming a tapered through hole in the sleeve portion as gradationally tapered forwardly from the shoulder portion in the syringe means, the cylindrical socket, the truncated-cone-shaped socket, the ringe groove and the sheath opening; and
- said hollow needle portion having a coupling sheath formed on a rear portion of the hollow needle portion having a stem socket recessed inwardly forwardly to communicate with the needle hole longitudinally formed through the hollow needle portion and a female groove spirally recessed in the stem socket; said shank portion having a hollow truncated-cone-portion engageable with the truncated-cone-shaped socket in the sleeve portion, a packing ring secured to a front portion of the truncated cone portion and engageable with the ring groove in the sleeve portion for retaining a front portion of the shank portion in said sleeve portion, a hollow stem portion protruding forwardly from the truncated cone portion having at least a male projection circumferentially formed on the stem portion to be engageable with the female groove recessed in the coupling sheath of the hollow needle portion for detachably coupling the hollow needle portion on the shank portion secured on the syringe means from outside the syringe cylinder and an enlarged cylindrical portion formed on a rear end portion of the shank portion engageable with the cylindrical socket in the sleeve portion;

the improvement which comprises:

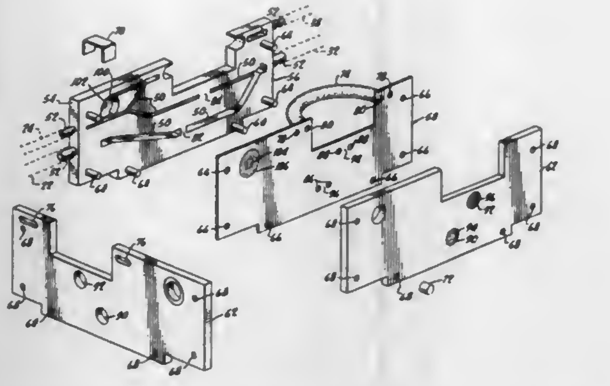
- said shoulder portion of said syringe means having a shallow cylindrical recess recessed forwardly from said shoulder portion to be communicated with said cylindrical socket of said sleeve portion, said shallow cylindrical recess having two wedged extensions unsymmetrically disposed on said shallow cylindrical recess, with each said wedged extension having a tip portion tapered rearwardly; and
- said enlarged cylindrical portion of said shank portion of said hollow needle assembly having a pair of bars diametrically formed on said enlarged cylindrical portion and engageable with one said wedged extension on said shallow cylindrical recess, whereby upon engagement of said bars of said shank portion with one said wedged extension of said sleeve portion, said shank portion will not be rotated in said sleeve portion for a reliable coupling of said hollow needle portion on said shank portion.

5,533,976
REUSABLE CARTRIDGE ASSEMBLY FOR A PHACO MACHINE

Edward R. Zaleski, Santa Ana, and Mark S. Cole, Trabuco Canyon, both of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Jul. 15, 1994, Ser. No. 276,085
Int. Cl.^{6} A61M *1/00*
U.S. Cl. 604—153 **30 Claims**

1. A reusable cartridge assembly for a phaco machine, said reusable cartridge assembly comprising:

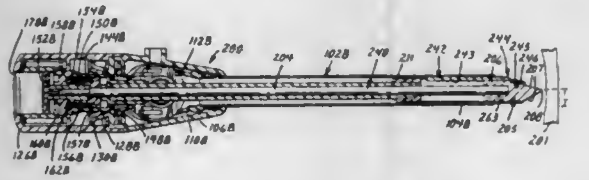
- a first plate having means for defining a plurality of flow channels therein;
- a sealing gasket including sheet means for sealing against said first plate to prevent fluid from leaving said flow channels, and tube means, communicating with said sealing gasket and protruding from the sheet means, for enabling engagement between said tube means and a pump head in order to circulate fluid through the flow channels; and



second plate means for supplying a sealing pressure between the sheet means and the first plate.

5,533,977
TROCAR

Gerald L. Metcalf, Burnsville; Bradley C. Poff, White Bear Lake, both of Minn., and John M. Barker, Ventura, Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.
Continuation of Ser. No. 182,537, Jan. 13, 1994, abandoned, which is a continuation of Ser. No. 958,964, Oct. 9, 1992, abandoned. This application Mar. 7, 1995, Ser. No. 400,460
Int. Cl.^{6} A61M *5/178;25/00*
U.S. Cl. 604—164 **17 Claims**

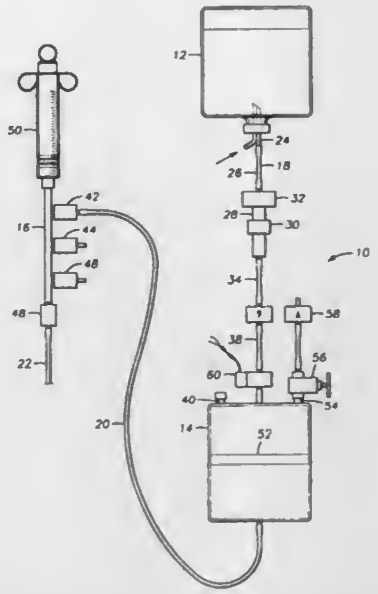


1. A trocar for placement in the lumen of a cannula to facilitate insertion of the cannula through tissue defining a body cavity, the cannula having a distal end,

said trocar comprising:
a handle,
an elongate obturator extending from said handle and defining a longitudinal axis, said obturator comprising cutting surfaces for cutting the tissue defining the body cavity,
a trigger having portions adapted to project beyond the distal end of the cannula, said trigger having a plurality of tissue cams, each tissue cam comprising an inner surface and an outer, substantially planar surface situated at an angle relative to said longitudinal axis, and a distal end portion that is arcuate about an axis normal to the outer surface,
wherein each of said distal end portions has a distal most point,
said distal end portions of said tissue cams intersect at edge portions, and
said distal most points of said distal end portions are spaced distally from said edge portions.

5,533,978
METHOD AND APPARATUS FOR UNINTERRUPTED DELIVERY OF RADIOGRAPHIC DYE

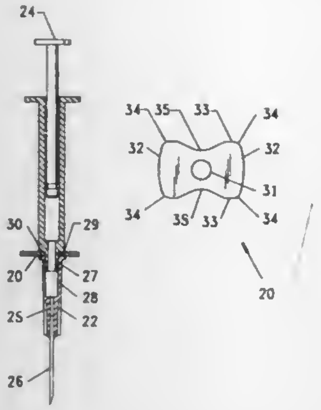
Paul S. Teirstein, 402 Coast Blvd., South, La Jolla, Calif. 92037
Filed Nov. 7, 1994, Ser. No. 336,252
Int. Cl.^{6} A61M *5/178*
U.S. Cl. 604—183 **13 Claims**



1. A fluid delivery system, comprising:
a fluid reservoir, said fluid reservoir having an outlet;
a first air vent in fluid flow communication with said reservoir;
a deformable fluid holding chamber, said holding chamber having an inlet and an outlet;
a fluid shut off valve in said holding chamber for shutting off said outlet of said chamber when said chamber becomes empty;
a first tubular conduit connecting said outlet of said reservoir in flow communication with said inlet of said holding chamber;
a disconnect fitting connected in said first conduit between said outlet of said reservoir and said inlet of said holding chamber, said disconnect fitting having an integral automatic flow stop device for automatically stopping fluid flow out of said reservoir upon disconnection of said fitting;
a first one way valve connected in said first conduit between said disconnect fitting and said inlet of said holding chamber, said first one way valve permitting flow only from said reservoir to said holding chamber;
a second air vent in fluid flow communication with said holding chamber;
a second one way valve connected in fluid flow communication with said second air vent, said second one way valve permitting flow only from said holding chamber to the atmosphere;
a fluid manifold, said manifold having an inlet and an outlet;
a second tubular conduit connecting said outlet of said holding chamber in flow communication with said inlet of said manifold; and
a fluid pumping device in fluid flow communication with said manifold for drawing fluid into said manifold through said manifold inlet, and for dispensing fluid from said manifold through said manifold outlet.

5,533,979
HYPODERMIC NEEDLE STEADY REST AND REMOVAL TOOL

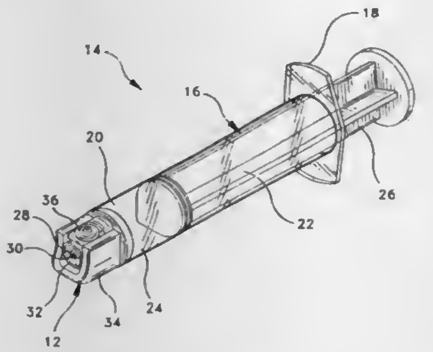
Hossein Nabai, 14555 Levan Rd., Suite 410, Livonia, Mich. 48154, and Homayoon Rahbari, 1314 N. Macomb St., P.O. Box 57, Monroe, Mich. 48161-0057
Filed Mar. 1, 1994, Ser. No. 204,058
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—187 **9 Claims**



1. In combination, a syringe, said syringe having a cylindrical body portion and a tapered end portion; a needle removably mounted on said tapered end portion of said syringe; and a thin, generally rectangular, flat, blade shaped steady rest and needle removal tool slideably mounted on said tapered end portion of said syringe between said needle and said body portion of said syringe, said thin blade shaped tool being normal to an axis of said body of syringe and such that an edge of said tool as a steady rest and to align said needle having an aperture in the center thereof for slideably mounting said tool on said tapered end portion of said syringe, adjacent said needle, said tool having at least one side extending outwardly from said cylindrical body of said syringe which facilitates a one-handed pushing of said needle away from said end of said syringe by pressing fingers of a hand which holds said syringe in an axial direction against said outward extending side of said blade shaped tool, at least one of said sides being arcuate and extending outwardly from said cylindrical body portion of said syringe by an amount which is sufficient for supporting an edge of said rectangular shaped tool on a patient to align and steady said needle mounted on the end of said syringe with an injection site of said patient.

5,533,980
PROTECTIVE CAP ASSEMBLY FOR A MEDICAL DEVICE PASSAGEWAY

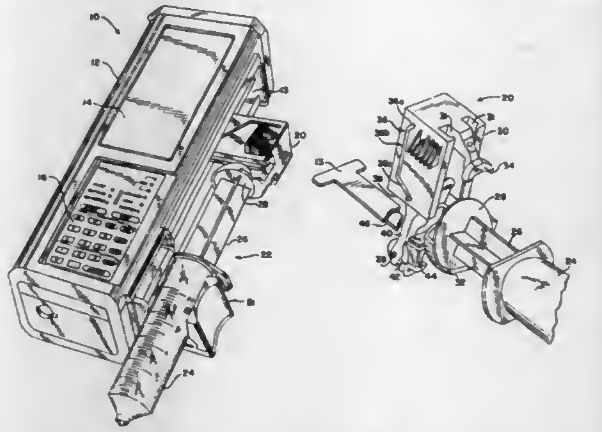
Niall Sweeney, Rutherford; Richard J. Caizza, Barry Lakes, both of N.J.; Marian H. Gravel, Highland, N.Y., and Bronwen L. Walters, Lyndhurst, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Aug. 30, 1994, Ser. No. 298,248
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—192 **28 Claims**



1. In combination with a medical device having a passageway defining an axis, a protective cap assembly for selectively covering the passageway of said medical device, comprising:
a mounting fitting placeable on said medical device, said mounting fitting having opposed proximal and distal ends;
at least one side wall projecting transversely from said distal end of said mounting fitting;
a cap slidably and pivotably engaged with said side wall, said cap slidable along the sidewall in a direction parallel to the axis of the passageway between a first position where said cap is spaced from said passageway of said medical device and a second position where said cap is pivoted by a user to protectively cover said passageway.

5,533,981
SYRINGE INFUSION PUMP HAVING A SYRINGE PLUNGER SENSOR

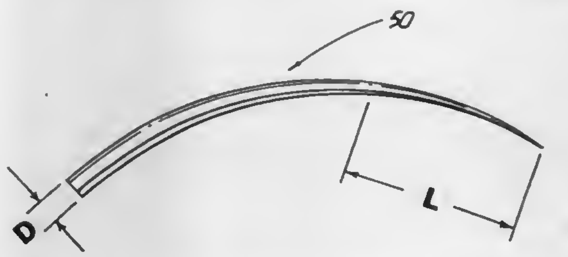
Marc Mandro, Bow, and Jean Bellerose, Manchester, both of N.H., assignors to Baxter International Inc., Deerfield, Ill.
Filed Oct. 6, 1994, Ser. No. 319,277
Int. Cl.^{6} A61M *31/00*
U.S. Cl. 604—208 **17 Claims**



1. An infusion pump for dispensing fluid from a syringe, the syringe having a barrel with a plunger slidably inserted into the barrel, the infusion pump comprising:
a housing which supports the barrel;
a syringe driver in movable contact with the housing, the syringe driver abutting the plunger to slide the plunger into the barrel;
means connected to the housing and the syringe driver for sensing both the position of the plunger relative to the barrel and the abutment of the syringe driver with the plunger, the means comprising a single sensor; and
a control circuit electrically connected to the means for sensing to control the movement of the syringe driver.

5,533,982
HEAT TREATED STAINLESS STEEL NEEDLES

Said Rizk, Monroe; William O. Powers, North Haven, and W. Scott Samsel, Bristol, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Division of Ser. No. 132,008, Oct. 5, 1993, Pat. No. 5,411,613. This application Feb. 15, 1995, Ser. No. 390,338
Int. Cl.^{6} A61M *5/00;5/31*
U.S. Cl. 604—239 **4 Claims**



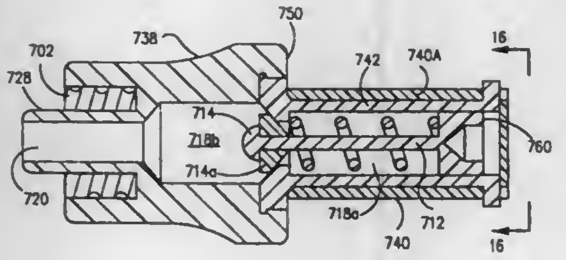
1. A curved siliconized surgical needle having a diameter of about 11 to about 13 mm, and a taper cut configuration with a needle taper to needle diameter ratio of about 6:1 to about 16:1,
said needle having a silicon-containing coating and a needle penetration force less than about 35 grams force;
said needle being curved; and
said needle being made of a stainless steel selected item the group consisting of:
an alloy comprising about 11 to about 12.5 weight percent chromium, about 7.5 to about 9.5 weight percent nickel, about 0.8 to about 1.4 weight percent titanium, about 0.5 to about

0.6 weight percent molybdenum, about 1.5 to about 2.5 weight percent copper, about 0.04 to about 0.06 weight percent carbon, about 0.4 to about 0.6 percent weight percent manganese, about 0.4 to about 0.6 weight percent silicon, up to about 0.04 weight percent phosphorous, about 0.02 to about 0.04 weight percent sulfur, about 0.1 to about 0.5 weight percent niobium, with the remainder consisting essentially of iron and having about 75 to about 100 g.cm 2 degree offset yield bend moment and

an alloy comprising about 11.5 to about 12.5 weight percent chromium, about 8.5 to about 9.5 weight percent nickel, about 0.8 to about 1.0 weight percent titanium, about 3.5 to about 4.5 weight percent molybdenum, about 0.5 to about 2.5 weight percent copper, up to about 0.02 weight percent carbon, up to about 0.5 weight percent manganese, up to about 0.5 weight percent silicon, up to about 0.02 weight percent sulfur, with the remainder consisting essentially of iron and having about 100 to about 125 g.cm. 2 degree offset yield bend moment.

5,533,983
VALVED MEDICAL CONNECTOR

Michael L. Haining, 6731 Ashmore, Houston, Tex. 77069
Continuation-in-part of Ser. No. 218,380, Mar. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 157,306, Nov. 25, 1993, Pat. No. 5,401,245. This application Dec. 6, 1994, Ser. No. 350,418
Int. Cl.^{6} A61M *5/00;25/00;* **F16K** *51/00*
U.S. Cl. 604—249 **3 Claims**



1. A medical connector comprising:

(a) a cylindrical body having an upper cavity and a lower cavity, said upper cavity having a valve seat at one end;

(b) a valve stem slidably mounted within said upper cavity having a plug on one end adapted to sealably fit into said seat;

(d) a spring mounted about said stem to bias said plug against said seat thereby closing said valve;

(e) an actuator means on said stem at the end opposite said plug for moving said stem against said spring bias to move said plug away from said seat thereby opening said valve;

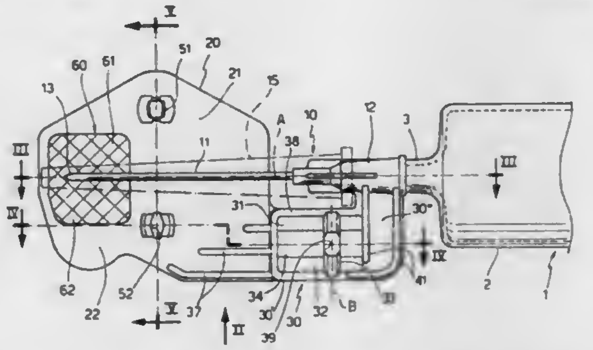
(f) a cylindrical extension axially mounted on the lower end of said body defining an annular space between the outer surface of said extension and the inner surface of said lower cavity;

(g) internal threads on the inner surface of said lower cavity for engagement with a male luer connector; and

(h) a rubber cover over said upper body covering said actuator means.

5,533,984
PROTECTION DEVICE FOR A BODY-PENETRATING SYRINGE NEEDLE

Corrado Jr Parmigiani, Correggio, Italy, assignor to C.G.M. S.P.A., Reggio Emilia, Italy
Filed Jun. 14, 1995, Ser. No. 490,528
Claims priority, application Italy, Jun. 23, 1994, RE94A0047
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—263 **12 Claims**



1. A device for protecting a body-penetrating syringe needle, said needle having a tube fixed to a hollow support member connectable to a cylindrical body of the syringe, the device comprising:

a plate-like front element provided adjacent but not constrained to the needle tube and foldable on itself substantially about a first folding axis substantially parallel and relatively close to the tube, the front element having two fins; and

means for constraining the needle support member to said front element such that the front element is rotatable substantially about a second folding axis transverse to a longitudinal axis of the tube;

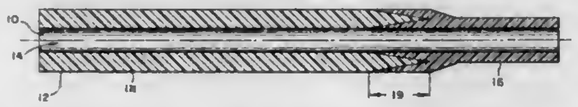
the device being able to assume a first operating configuration in which the front element is folded on itself about the first axis with the two fins mutually facing and in contact with each other and with the front portion of the tube enclosed between the two fins, a point of the needle not projecting from being enclosed by the front element;

the device being able to assume a second operating configuration in which, by rotating the front element relative to the needle about said second axis, the tube projects forward of said front element;

the front element being sufficiently rigid to avoid deformation during normal use of the needle which would result in the point of the needle projecting externally from the element when the device is in the first operating configuration.

5,533,985
TUBING

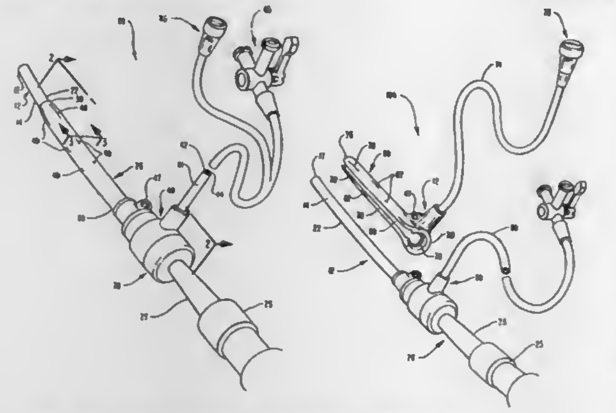
James C. Wang, 15 Massasoit Ave., Norton, Mass. 02766
Filed Apr. 20, 1994, Ser. No. 230,333
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—264 **26 Claims**



1. An elongated tube having an annular wall with an outer surface and an inner surface which inner surface defines a central passageway of a uniform size, said tube comprising a first section comprised of a first material, a second section comprised of a second material, the first and second materials being of different stiffness, and an intermediate section joining the first section and the second section, the intermediate section being a transition section in which the wall of the tube gradually changes from the first material of the first section to the second material of the second section to form a continuous unbroken tube of differential stiffness without abrupt joints, the materials of the first section and the second section naturally adhering to each other and being gradually combined in the transition section to form a wedge structure in which the first material extends into the second material within the transition section so that the second material surrounds the wedge structure of the first material and is between the wedge structure and both the inner surface and the outer surface of the wall.

5,533,986
CATHETER APPARATUS WITH MEANS FOR SUBCUTANEOUS DELIVERY OF ANESTHETIC AGENT OR OTHER FLUID MEDICAMENT

Jim Mottola; Arlin D. Nelson, both of South Jordan, and Chris Durham, Salt Lake City, all of Utah, assignors to Merit Medical Systems, Inc., South Jordan, Utah
Continuation-in-part of Ser. No. 198,625, Feb. 18, 1994, Pat. No. 5,405,334. This application Apr. 6, 1995, Ser. No. 417,824
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—264 **20 Claims**



1. An indwelling catheter apparatus comprising:

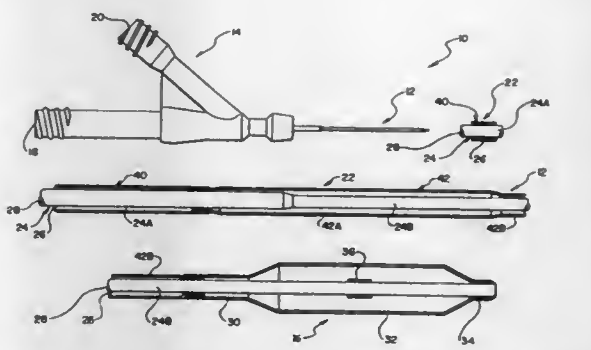
catheter means for insertion through subcutaneous tissue, said catheter means comprising an indwelling cannula adapted for insertion through subcutaneous tissue into a patient's body, and having an indwelling distal end and a proximal hub end adapted for securement outside of the body; and

sheath means for placement over and around at least a portion of said cannula and into but essentially not beyond the subcutaneous tissue after the cannula is inserted, and for delivering fluid medicament to essentially only the subcutaneous tissue surrounding said cannula, said sheath means including a plurality of delivery holes, each of said delivery holes providing a fluid communication path between the sheath means and the surrounding subcutaneous tissue for said fluid medicament.

5,533,987
DILATATION CATHETER WITH POLYMIDE ENCASED STAINLESS STEEL BRAID PROXIMAL SHAFT

James R. Pray, New Hope; Richard G. Cornelius, Golden Valley, both of Minn., and Michelle Arney, Menlo Park, Calif., assignors to Scimed Lifesystems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 108,679, Oct. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 867,164, Apr. 9, 1992, Pat. No. 5,338,295. This application Nov. 22, 1995, Ser. No. 563,888
Int. Cl.^{6} A61M *25/00*
U.S. Cl. 604—280 **6 Claims**

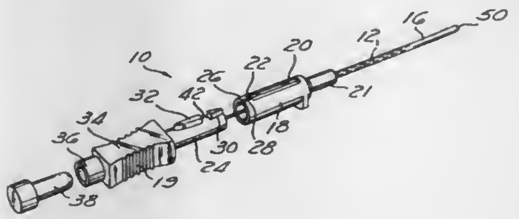
1. A catheter for insertion into a body and having proximal and distal ends, the distal end preceding and the proximal end trailing when said catheter is inserted into the body, said catheter comprising:

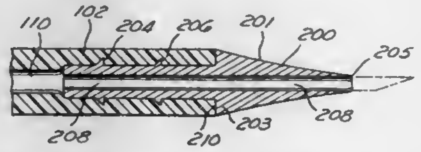


a tubular shaft having an exterior surface facing the body when inserted into the body, the tubular shaft having a proximal tube section and a distal tube section, the proximal tube section further having proximal and distal ends, the proximal tube section comprising a polymer encased tubular braid of stainless steel, the polymer encasement for the braid comprising at least one layer of polyimide, the braid having a weave which increases in pick count from the proximal end to the distal end of the proximal tube section such that the stiffness of the proximal tube section decreases from the proximal end to the distal end thereof.

5,533,988
OVER-THE-NEEDLE CATHETER

Charles W. Dickerson, Tustin; Richard A. Overton, Santa Ana, and Ronald B. Luther, Newport Beach, all of Calif., assignors to Luther Medical Products, Inc., Tustin, Calif.
Continuation-in-part of Ser. No. 254,133, Jun. 6, 1994. This application Aug. 23, 1994, Ser. No. 294,634
Int. Cl.^{6} A61M *25/16*
U.S. Cl. 604—282 **4 Claims**





1. An over the needle catheter insertable into an anatomical structure utilizing an introducer, said catheter comprising:

a) an elongate flexible catheter body having a distal end;

b) an abutment member formed proximate the distal end of said catheter body so as to abut a portion of the introducer to prevent the catheter body from collapsing during insertion of the catheter body;

c) a catheter tip formed of a more rigid material than said catheter body for mitigating collapsing of the catheter body, said catheter body having an inner diameter and an outer diameter, said catheter tip comprising:

  i) a generally frusto-conical member comprising:

    (A) a base having a diameter approximate to the outer diameter of the catheter body;

    (B) a bore having a diameter approximate to the inner diameter of the catheter body;

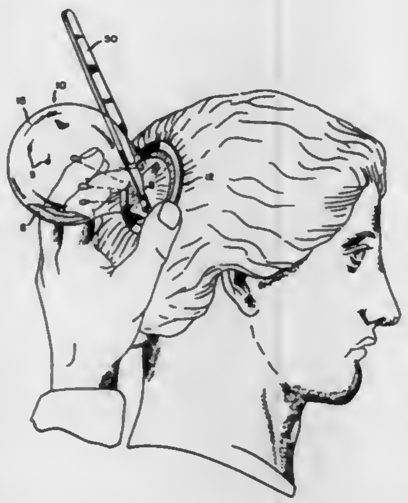
    (C) a tip having a diameter approximate the diameter of said bore;

  ii) a shaft extending from the base of said frusto-conical member and co-axial therewith, said shaft having a diameter greater than the inner diameter of the catheter and less than the outer diameter thereof, said shaft having a bore extending co-linear to the bore of said frusto-conical member;

iii) at least one barb formed upon said shaft to anchor said shaft to said catheter; and

d) wherein said abutment member and said catheter tip cooperate to facilitate insertion of the catheter body into an anatomical structure in a manner which inhibits collapsing of the catheter body.

5,533,989
FLUID SHIELD
Daniel O. Sokoloff, 1000 45th St., West Palm Beach, Fla. 33407
Continuation of Ser. No. 679,434, Apr. 2, 1991, Pat. No. 5,248,307. This application Sep. 28, 1993, Ser. No. 127,974
The portion of the term of this patent subsequent to Sep. 28, 2010, has been disclaimed.
Int. Cl.^{6} A61M *1/00*
U.S. Cl. 604—327 **8 Claims**

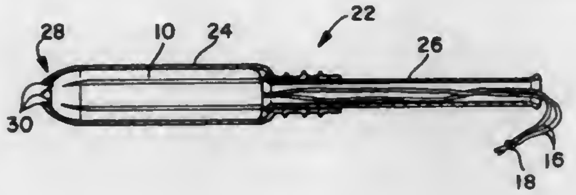


1. A fluid shield for use during a medical procedure in rupturing a pressurized, fluid-containing anatomical structure to allow a user to visually observe the rupturing process, thereby improving the rupturing process and thereby protecting the user from fluid sprayed by the ruptured anatomical structure during the medical procedure, said fluid shield comprising:

a shield body having an interior for receiving fluids from the pressurized anatomical structure, said shield body having a rim defining an opening to said interior, said rim shield body having a contact surface for engaging a body surface around said structure, said shield body being constructed of a material having sufficient plasticity to extend substantially transversely from said opening in any direction when empty but penetrable by a surgical instrument for accessing and incising said structure and sufficiently flexible to enable the user to manipulate the anatomical structure with the shield, whereby said shield body retards spray of said fluids when said structure is ruptured during the medical procedure, the procedure including penetration of the shield body by a surgical instrument to form an aperture;

said shield body being constructed of a material having sufficient transparency to allow visual observation of said structure by the user through said shield body, thereby improving the rupturing process and thereby protecting the user from the fluids sprayed during the medical procedure.

5,533,990
TAMPON EXHIBITING LOW FRICTIONAL DRAG
Richard S. Yeo, Dunwoody, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sep. 23, 1994, Ser. No. 311,692
Int. Cl.^{6} A61F *13/20*
U.S. Cl. 604—363 **19 Claims**

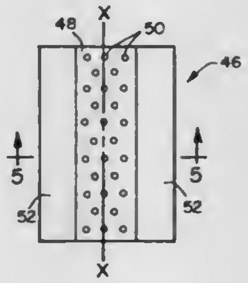


1. A tampon exhibiting low frictional drag comprising:

a) a compressed absorbent; and

b) a cover surrounding at least a portion of said absorbent, said cover being treated with an aqueous solution having a viscosity of at least 50 cps at a temperature of about 25° C., said solution including a lubricant and polyvinyl alcohol, said polyvinyl alcohol preventing said lubricant from migrating away from said cover.

5,533,991
BODYSIDE COVER FOR AN ABSORBENT ARTICLE
Robert E. Kirby; Howard A. Whitehead, both of Appleton, Wis.; Mary C. Wanek; David K. Osteen, both of Marietta, Ga., and Kenneth Y. Wang, Westchester, Pa., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Division of Ser. No. 68,806, May 28, 1993, Pat. No. 5,415,640, which is a continuation of Ser. No. 731,583, Jul. 17, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 258,809
Int. Cl.^{6} A61F *13/15*
U.S. Cl. 604—383 **23 Claims**

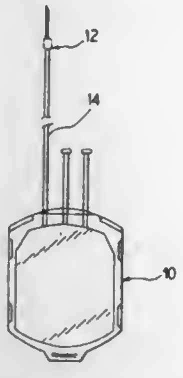


1. A bodyside cover for an absorbent article comprising:

a) a first material containing a plurality of apertures formed therethrough, said first material being positioned along the longitudinal central axis of said absorbent article and constituting a primary fluid-receiving region of said cover; and

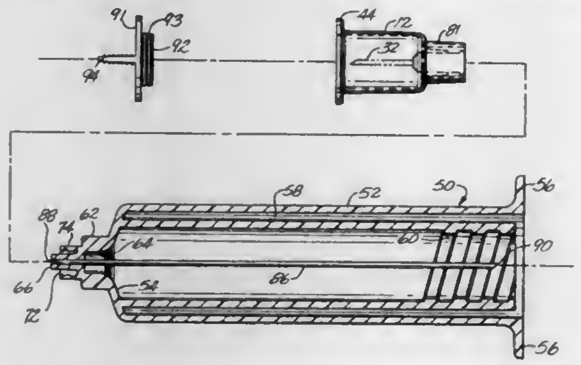
b) a nonperforated nonwoven web attached to said first material and being situated away from the principal point of discharge of body fluid onto said absorbent article, said nonwoven web constituting a secondary fluid-receiving region of said cover, and said nonwoven web having a rewet value which is greater than a rewet value of said first material.

5,533,992
MATERIAL FOR MEDICAL GRADE PRODUCTS AND PRODUCTS MADE THEREFROM
Indrajit Patel, 1115 Riverwood Dr., Algonquin, Ill. 60102; Harold Bowerman, 2240 Shanondale Dr., Libertyville, Ill. 60048; Larry Rosenbaum, 855 Kristin St., Gurnee, Ill. 60031; Rich Mennenoh, 3917 Orleans, McHenry, Ill. 60050, and Pat Ryan, 968 Boxwood, Crystal Lake, Ill. 60014
Continuation-in-part of Ser. No. 636,337, Dec. 31, 1990, abandoned. This application Jan. 30, 1992, Ser. No. 828,436
Int. Cl.^{6} A61F *1/00*
U.S. Cl. 604—403 **32 Claims**



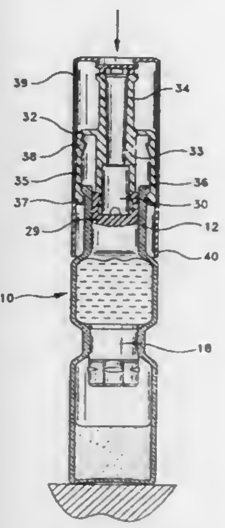
1. A medical grade tubing comprising a blend of a thermoplastic polyurethane blend and polyester that is extruded to create the medical grade tubing, the medical grade tubing being autoclavable and RF sealable, the thermoplastic polyurethane blend being chosen from the group consisting of: polypropylene, ethylene vinyl acetate, and polyurethane;polypropylene, styrene-ethylene-butylene-styrene, and polyurethane; polyester, a thermoplastic copolyester elastomer, and polyurethane; polypropylene, styrene-ethylene-butylene-styrene, polyester, and polyurethane: and ethylenevinyl acetate, polyester, and polyurethane.

5,533,993
MEDICATION INJECTOR WITH PROTECTED CANNULA AND Y-SITE LOCKOUT
Gunther L. Maier, Yorba Linda, Calif., assignor to International Medication Systems, Limited, South El Monte, Calif.
Continuation of Ser. No. 317,689, Oct. 5, 1994, abandoned. This application Oct. 13, 1995, Ser. No. 543,150
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 604—411 **15 Claims**



1. A medication injector for use with an inlet port having an imperforate closure for a conduit connected to and extending away from a container for liquid intended for intravenous administration, the injector including a boss carrying a cannula with a scarf at one end spaced from the boss, the cannula scarf being adapted to puncture the imperforate closure of the inlet port, an elongated and generally cylindrical sheath having a first open end surrounding the cannula and extending beyond the scarf end of the cannula at the first open end of the sheath, the distance from the scarf end of the cannula to the open end of the sheath being less than that of the internal diameter of the sheath around the scarf end of the cannula, the sheath being affixed to the boss, the internal diameter of the first open end of the sheath being less than about 16 millimeters to protect the user from inadvertent puncture of the hands and fingers by the scarf; and an outwardly extending annular flange on the sheath at and around the said open end, the flange being constructed and arranged to have an outside diameter of at least 20 millimeters so as to engage a tubular portion adjacent an injection port of a Y-site of an intravenous administration set and thereby prevent the scarf end of the cannula from puncturing the injection port of the Y-site, the boss having a bore extending through it in communication with the cannula, and the boss having a fitting in the shape of a Luer-Lock connector disposed around the bore and being adapted to make a releasable fluidtight seal with a mating Luer-Lock connector connected to a source of medication to be introduced through the cannula to the inlet port of the container.

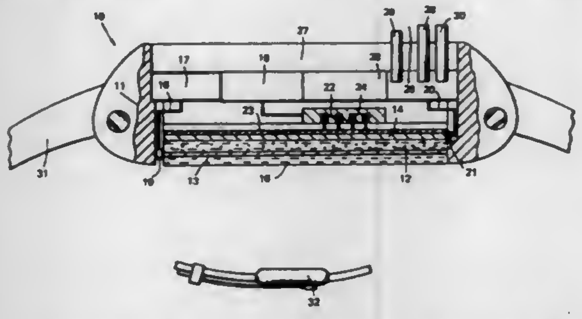
5,533,994
STORAGE AND TRANSFER BOTTLE DESIGNED FOR STORING TWO COMPONENTS OF A MEDICAMENTAL SUBSTANCE
Gabriel Meyer, Vesenaz, Switzerland, assignor to Becton Dickinson France S.A., Le Pont de Claix, France
Continuation of Ser. No. 566,422, Aug. 29, 1990, abandoned. This application Oct. 18, 1993, Ser. No. 138,877
Claims priority, application Switzerland, Dec. 27, 1988, 04805/88; Oct. 30, 1989, 03920/89
Int. Cl.^{6} A61J *1/00*
U.S. Cl. 604—416 **18 Claims**



1. A double compartmented storage and transfer bottle for storing two components of a medicinal substance, namely a solid substance and a solvent, and for transferring said substance directly or after mixture with another substance to another container, said bottle comprising a tapered open neck and stopper means engaged in said neck for displacement between a first, storage, position in which the stopper means constitutes and impermeable stopper and a second, utility, position, characterized in that the stopper means capsule of a comprises a flexible elastomeric stopper defining a central cavity and a radial canal opening into the central cavity, a capsule mounted to the neck and axially displaceable between the storage position and the utility position, said stopper being mounted to said capsule, the capsule further including a connection device for connecting the bottle to a vessel, the bottle including a body defining first and second compartments, and a displaceable second stopper engaging said bottle body and providing a displaceable seat between said first and second compartments.

5,533,995
PASSIVE TRANSDERMAL DEVICE WITH CONTROLLED DRUG DELIVERY

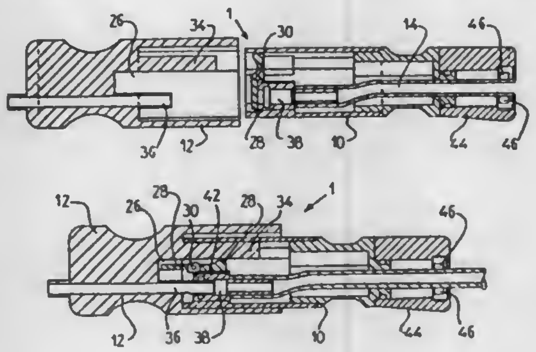
John Corish, and Owen I. Corrigan, both of Dublin, Ireland, assignors to Elan Corporation, plc, Westmeath, Ireland
PCT No. PCT/IE92/00021, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/09842, PCT Pub. Date May 27, 1993
PCT Filed Nov. 10, 1992, Ser. No. 244,094
Claims priority, application Ireland, Nov. 13, 1991, 3941/91
Int. Cl.^{6} A61K *9/22*
U.S. Cl. 604—890.1 **41 Claims**



1. A transdermal device for the controlled administration of a drug to the skin, which comprises a reservoir for the drug, an electric circuit comprising an electrode system of at least two electrodes in which at least one of the electrodes is permeable to the drug, which electrode system has means for electrolytically transporting the drug in a controlled manner within the device by a potential difference applied to the electrodes, the drug passing through the at least one drug permeable electrode of the electrode system, wherein the electrodes are disposed internally of the device such that the skin does not form a part of the electric circuit, means for securing the device in contact with the external skin of a patient, the drug being actively transported from the reservoir in the direction of the skin for transport therethrough, by energising the electrodes.

5,533,996
TRANSFER SET CONNECTOR WITH PERMANENT, INTEGRAL CAM OPENING CLOSURE AND A METHOD OF USING THE SAME

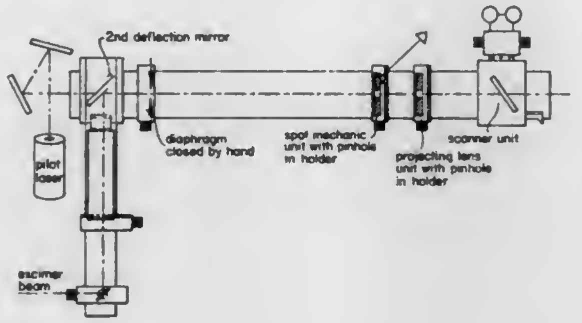
Randy Murphey, Kenosha, Wis.; Marc Bellotti, Libertyville, Ill.; Ying-Cheng Lo, Green Oaks, Ill., and Scott Edwards, Libertyville, Ill., assignors to Baxter International, Inc., Deerfield, Ill.
Filed Aug. 24, 1994, Ser. No. 295,112
Int. Cl.^{6} A61M *5/14*
U.S. Cl. 604—283 **20 Claims**



1. A connector assembly comprising:
a male component connected to a first length of tubing; and
a female component having a first end and a second end defining an interior wherein the female component is connected to a second length of tubing at the first end and further wherein the female component selectively mates with the male component from the second end providing communication between the first length of tubing and the second length of tubing, the female component having a hinged closure proximate the second end providing selective access to the interior of the female component wherein the hinged closure is rotatable about an axis perpendicular to a length of the female component and extending through the hinged closure.

5,533,997
APPARATUS AND METHOD FOR PERFORMING PRESBYOPIA CORRECTIVE SURGERY

Luis A. Ruiz, 9ª No. 83-15, 4th Floor, Santafé de Bogotá, Colombia
Filed Jun. 29, 1994, Ser. No. 268,182
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—5 **30 Claims**

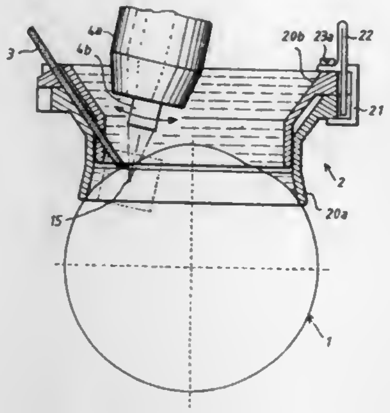

2nd deflection mirror
pilot laser
diaphragm closed by hand
spot mechanic unit with pinhole in holder
projecting lens unit with pinhole in holder
scanner unit
excimer beam

1. A process for surgically correcting presbyopia, comprising:
anesthetizing a patient;
resecting at least a portion of a cornea of an eye of the patient to expose a corneal stroma;
ablating an annular portion of the corneal stroma using radiation from a laser beam, wherein during the ablating step, a central optic zone of the corneal stroma is left unablated; and
repositioning the portion of the cornea onto the eye, wherein a central corneal curvature change is induced to thereby correct presbyopia in the patient.

5,533,998
APPARATUS AND METHOD FOR LASER CYCLO-PHOTOCOAGULATION

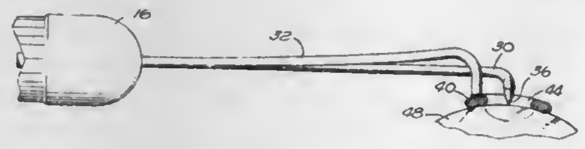
Manfred Freese, Richmond Hill, Canada; Peter Reimer, Ellwangen, and Theo Lasser, Oberkochen, both of, Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Germany
Filed Dec. 12, 1994, Ser. No. 354,404
Claims priority, application Germany, Dec. 21, 1993, 43 43 699.4; Aug. 30, 1994, 44 30 720.9
Int. Cl.^{6} A61N *5/06*
U.S. Cl. 606—4 **16 Claims**

1. Apparatus for laser cyclo-photocoagulation comprising:
fiber applicator means (**3**, **33**, **40**) for applying laser radiation for cyclo-photocoagulation, an ultrasonic head (**4***b*, **40***b*) of an ultrasonic biomicroscope for monitoring said laser cyclo-photocoagulation,
holding means for holding said fiber applicator means and said ultrasonic head in a defined relative orientation to each other, so that a treatment site for laser cyclo-photocoagulation and said fiber applicator means (**3**, **33**, **40**) lie in an observation plane of said ultrasonic biomicroscope in any possible irradiation position,
and display means (**12**) connected with said ultrasonic biomicroscope for displaying a visual representation of said treatment site.



5,533,999
METHOD AND APPARATUS FOR MODIFICATIONS OF VISUAL ACUITY BY THERMAL MEANS

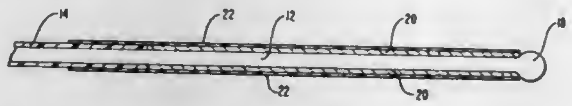
Larry Hood, Laguna Hills, Calif., and Antonio Mendez, Mexicali, Mexico, assignors to Refractec, Inc., Laguna Niguel, Calif.
Continuation of Ser. No. 111,296, Aug. 23, 1993. This application Sep. 5, 1995, Ser. No. 523,591
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—5 **5 Claims**



1. A method for reshaping a cornea of a patient, comprising the steps of:
a) electrically grounding the patient;
b) placing an electrode in contact with the cornea; and.
c) sending a current through said electrode and into the cornea so that a local area of the cornea is heated and denatured.

5,534,000
LASER FIBER APPARATUS HAVING A CONTACT TIP AND ADJACENT DIFFUSER ELEMENT AND SURGICAL METHODS FOR USING SAME

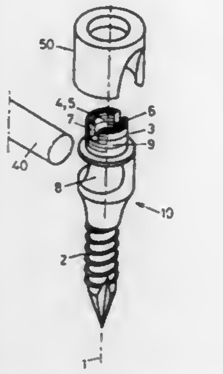
Johnny M. Bruce, Magnolia, Tex., assignor to Endeavor Surgical Products, Inc., The Woodlands, Tex.
Filed Mar. 17, 1994, Ser. No. 210,171
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—15 **19 Claims**



10. A laser fiber assembly for use in performing laser surgical procedures, comprising:
an optical fiber, said optical fiber having an input end and an output end;
connector means for coupling the input end of said optical fiber to a laser source;
tip means at the output end of said optical fiber for direct ablation of tissue with which said tip means may be brought in contact while emitting laser energy;
a cylindrical diffuser element affixed to the optical fiber in order to emit laser energy in a diffused pattern when said fiber is energized with laser energy and when the tip means is not in contact with tissue.

5,534,001
OSTEOSYNTHETIC FIXATION ELEMENT AND MANIPULATION DEVICE

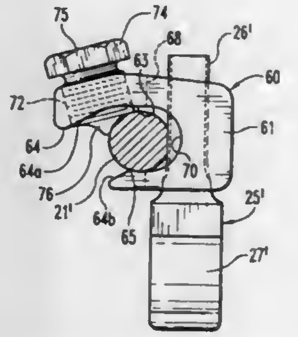
Johannes F. Schlapfer, Glarus; Robert Frigg, Davos Platz; Thomas Amrein, Horw; Daniel Recher, Hollstein, all of, Switzerland, and Linda Trebing, Devon, Pa., assignors to Synthes (U.S.A.), Paoli, Pa.
PCT No. PCT/CH93/00118, § 371 Date Jul. 15, 1994, § 102(e) Date Jul. 15, 1994, PCT Pub. No. WO93/21803, PCT Pub. Date Nov. 11, 1993
PCT Filed May 11, 1993, Ser. No. 117,044
Int. Cl.^{6} A61B *17/56*
U.S. Cl. 606—61 **15 Claims**



1. An osteosynthetic fixation element comprising a shaft having a longitudinal axis, a lower section for attachment to a bone, an upper section having a penetration channel running transversely to said axis to receive a longitudinal support, and a locking part to secure a longitudinal support in said channel, said upper section being threaded to receive said locking part, said upper section further comprising a mechanism for receiving a manipulation device, said mechanism not interfering with said penetration channel and allowing a releasable and a rotational and tension stable connection with said manipulation device.

5,534,002
SPINAL FIXATION SYSTEM

David L. Brumfield, South Haven, Miss.; M. Neil Anderson, Memphis, Tenn., and Eduardo R. Luque, Mexico City, Mexico, assignors to Danek Medical, Inc., Memphis, Tenn.
Division of Ser. No. 278, Jan. 4, 1993. This application Jun. 7, 1995, Ser. No. 478,901
Int. Cl.^{6} A61B *17/70*
U.S. Cl. 606—61 **15 Claims**



1. A spinal implant system for correcting spinal deformities and abnormalities, comprising:
an elongated spinal rod configured to be implanted adjacent the spinal column of a patient spanning across several vertebral levels;
a number of fixation elements for engaging vertebra at a number of vertebral levels, each of said number of fixation elements

having a vertebra engaging portion and an elongated stem extending from said vertebra engaging portion, said stem of each of said number of fixation elements including opposite flat surfaces extending along the length of said stem, thereby increasing the area of contact between said stem and said rod, and between said stem and said connector body when said stem is clamped within said stem channel;

a number of rod connector means for connecting each of said fixation elements to said spinal rod, each of said rod connector means including

- a connector having a body defining a rod bore adapted to receive said spinal rod therethrough, a stem channel adapted to receive said stem therethrough, and a threaded bore;
- a threaded set screw adapted to be received within said threaded bore,
- wherein said stem channel has a length through said body and said rod bore intersects said stem channel along a portion of said length to permit contact between said rod and said stem when the rod is received within said rod bore and the stem is received within said stem channel,
- wherein said body defines a channel opening extending to said stem channel and sized to permit passage of said stem through said channel opening to said stem channel when said rod is received within said rod bore, and
- further wherein, said threaded bore intersects said bore to permit contact between said set screw and said rod when the set screw is threaded into the threaded bore, whereby said stem and said rod are in clamped engagement when said set screw is threaded into said threaded bore to restrain relative movement between said rod and said fixation element.

5,534,003

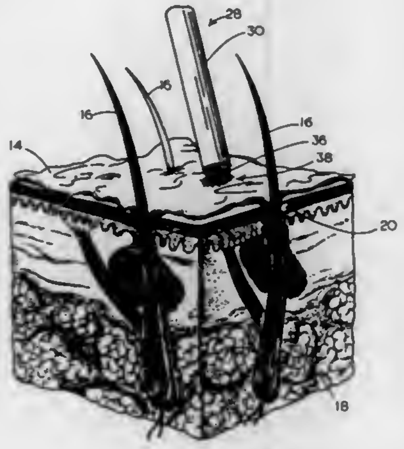
METHOD OF REMOVING HAIR FROM A LOCALIZED AREA OF SKIN BY SURFACE ELECTROLYSIS

H. Lee Cole, 160 S. May St., Southern Pines, N.C. 28387

Filed Jan. 9, 1995, Ser. No. 370,017

Int. Cl.^{6} A61B *17/38;17/41*

U.S. Cl. 606—36 **15 Claims**



1. A non-invasive method of treating hair on a person's skin by skin surface electrolysis, comprising the steps of:

(a) selecting a localized treatment area of skin from which hair is to be removed;

(b) engaging a ground terminal of an electrolysis device with the person;

(c) touching an electrified probe terminal of the electrolysis device directly to the surface of the skin within the localized treatment area without in any way penetrating the skin's surface;

(d) conducting a DC electric current from the electrified probe terminal into and through the skin and hair follicles of the localized treatment area; and

(e) producing sodium hydroxide in the hair follicles by ionizing water and sodium chloride in the presence of the DC electric current, causing the germ cells of the hair follicles to die, and resulting in the hair follicles decomposing.

5,534,004

DEVICE FOR PREVENTIVE SUPPORT OF THE FEMUR

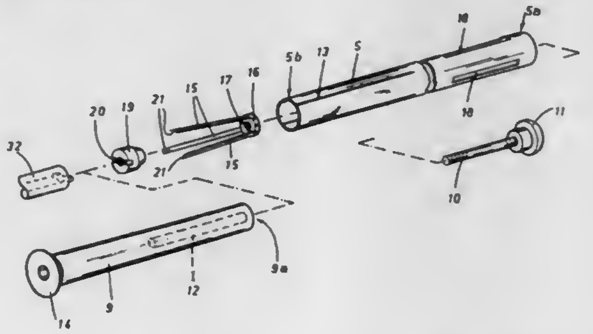
Massimo Santangelo, Via Collegio di Spagna, 23, 40054 Bologna, Italy

Filed Jul. 6, 1994, Ser. No. 271,024

Claims priority, application European Pat. Off., Jul. 23, 1993, 93830328

Int. Cl.^{6} A61B *17/78*

U.S. Cl. 606—68 **5 Claims**



1. A device for preventive support of a proximal extremity of a femoral bone consisting of a ball associated with a neck portion extending along a first axis disposed at an angle relative to a rectilinear second axis substantially coinciding with a femoral diaphysis to which the neck portion is attached, the device comprising:

- a tubular element having first and second ends fashioned from biocompatible material, and stably insertable into a blind socket created in the femoral bone parallel with and in a region of the first axis;
- first and second locking means fashioned from biocompatible material, the first locking means designed to effect a partial variation in an external shape of the tubular element and said second locking means connected to the tubular element for expanding to engage the femoral bone, the first and second locking means thereby securing the tubular element stably against a bone surface of the blind socket thereby establishing a load-bearing axis that bridges the first axis and the second axis, the second locking means further including a set of elongated prongs, each prong being integrally connected at one end to a ring inserted into the tubular element, the first locking means further including a rotatable tapered expansion pin, inserted coaxially into the tubular element to assume a position interposed between the first end of the tubular element and the second locking means, the second locking means being positioned internally within the tubular element its ring being connected to a screw which is positioned near the second end of the tubular element, the screw further having a cap which closes an opening in the second end of the tubular element and which secures the screw against axial movement through the tubular element, the tapered pin having a threaded bore for receiving the screw.

5,534,005

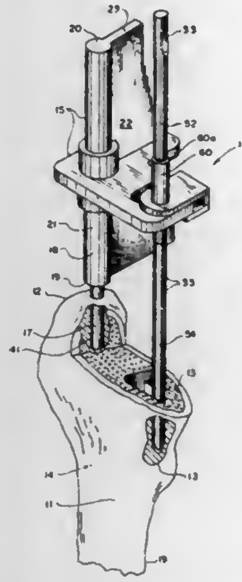
SURGICAL MILLING SYSTEM

Leonard J. Tokish, Jr., Cordova, Tenn.; Thomas W. Fallin, Champaign, Ill., and Jeff Schryver, Cordova, Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.

Filed Oct. 5, 1994, Ser. No. 318,477

Int. Cl.^{6} A61B *17/56*

U.S. Cl. 606—80 **12 Claims**



6. An in-situ surgical orthopedic milling apparatus comprising:

a) an instrument frame having upper and lower end portions;

b) a plurality of templates having a corresponding plurality of respective patterns that constrain cutting instrument movement;

c) a cutting device for cutting bone tissue within the intramedullary canal of a patient's bone;

d) a stabilizer for controlling or maintaining an orthogonal relationship between the cutting tool and the top, bottom, or the periphery or the template;

e) indexing means for affixing a selected template to the instrument frame at a selected elevational position to define an operative position;

f) the pattern of at least some of the templates comprising a rail portion that limits travel of the cutter beyond an area defined by the pattern so that inadvertent excessive cutting is prevented; and

g) means for supporting the instrument frame in-situ upon a patient's bone to be milled during surgery.

5,534,006

KNOCKOUT TOOL FOR JOINT PROSTHESES

Zsolt Szabo, München, and Georg Seeberger, Pähl, both of, Germany, assignors to Zsolt SZABO, Munich, Germany

Filed Sep. 27, 1994, Ser. No. 313,462

Claims priority, application Germany, Sep. 27, 1993, 43 32 872.5

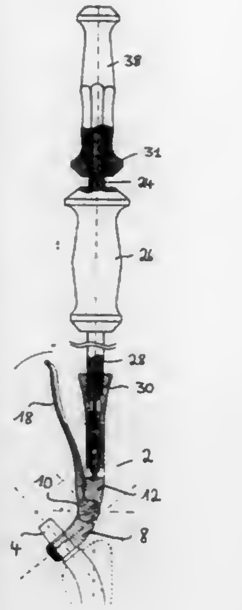
Int. Cl.^{6} A61B *17/92*

U.S. Cl. 606—100 **13 Claims**

1. A knockout tool for joint prostheses, the knockout tool adapted for gripping a prosthesis shaft (4), the knockout tool comprising:

- a curved tool head (2), the tool head having a passage (6) therethrough for receiving the prosthesis shaft; and
- a locking device (8, 10, 12) to releasably block the prosthesis shaft within the passage, the locking device further comprising a blocking member (8) engaging the passage, the blocking member having a position adjustable in an axial direction transverse to a length of the prosthesis shaft by actuator means disposed within the tool head for adjusting a position of the blocking member, the actuator means including actuators axially displaceable within the tool head;

whereby a force transmitted axially along said actuators adjusts the position of the blocking member.



5,534,007

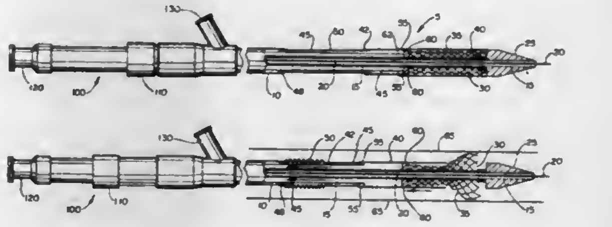
STENT DEPLOYMENT CATHETER WITH COLLAPSIBLE SHEATH

Jon P. St. Germain, Elk River, and Scott A. Olson, Zimmerman, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed May 18, 1995, Ser. No. 444,822

Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—108 **40 Claims**



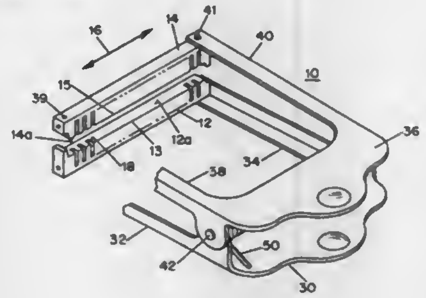
1. A stent delivery system comprising:

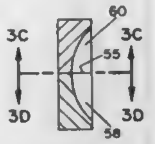
- a catheter with a distal end and a proximal end;
- a stent concentrically arranged around the catheter near the distal end;
- a proximal outer sheath covering a portion of the catheter, wherein at least a portion of the distal end of the catheter is left exposed by the proximal outer sheath;
- a retractable distal sheath surrounding at least a portion of the stent;
- a pull back means having a distal end connected to the retractable distal sheath for retraction of the retractable distal sheath, and
- a collapsible sheath concentrically arranged around the catheter, attached to the proximal outer sheath and located between the retractable distal sheath and the proximal outer sheath;

whereby when the pull back means is retracted proximally the distal sheath is retracted, causing the collapsible sheath to collapse and freeing the stent for delivery.

5,534,008
SUTURING GUIDE AND CLAMP

Ione Acksel, 1267 Carlls Straight Path, Dix Hills, N.Y. 11746
Filed Sep. 28, 1994, Ser. No. 314,216
Int. Cl.^{6} A61B *11/00*
U.S. Cl. 606—148 **16 Claims**





1. A suturing guide for surgical use, comprising:

a first guide section including a first surface suitable for placement adjacent to a first side of a body portion, the first surface having a plurality of spaced openings each extending to an edge of the first surface and suitable for passage of a suturing needle, and wherein each of said spaced openings in the first surface is the terminus of a curved opening formed in the first guide section and adapted to guide the positioning of a curved needle;

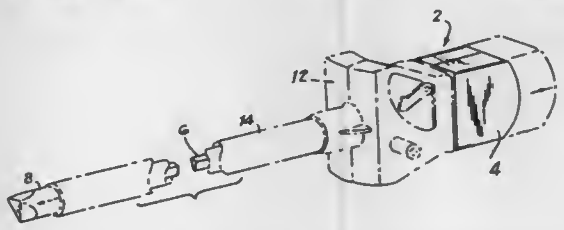
a second guide section including a second surface suitable for placement adjacent to a second side of said body portion in spaced opposed relation to the first guide section, the second surface having a plurality of spaced openings each extending to an edge of the second surface and alignable with a respective one of said spaced openings in said first surface;

a support assembly fastened to the first and second guide sections and arranged to enable the guide sections to be respectively positioned adjacent to said first and second sides of said body portion with the spaced openings of the first and second guide sections in spaced opposed alignment; and

a positioning device mechanically coupled to the support assembly and arranged to retractably urge the first and second surfaces into positions adjacent to opposite sides of said body portion.

5,534,009
TROCAR ASSEMBLY WITH ROTATABLE TIP

Jack R. Lander, Danbury, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Continuation of Ser. No. 401,496, Aug. 29, 1989, abandoned, which is a continuation of Ser. No. 108,153, Oct. 13, 1987, abandoned. This application Jan. 25, 1993, Ser. No. 8,419
Int. Cl.^{6} A61B *17/34*
U.S. Cl. 606—185 **13 Claims**



1. A trocar assembly for piercing a body cavity which comprises:

hand gripping means dimensioned and configured to be held firmly between the palm and fingers of the user;

a trocar obturator having a front end portion and a rear end portion;

means for mounting said rear end portion of said trocar obturator on said hand gripping means;

a body piercing tip mounted on the front end portion of said trocar obturator and adapted for piercing a wall portion of the body cavity upon application of a predetermined force;

means to permit said body piercing tip to rotate independently of said hand gripping means such that when said hand gripping means is held firmly between the palm and the fingers of the user and said piercing tip is positioned against a body portion, and said piercing tip is thrust through the wall of the body cavity, said piercing tip is held in fixed position by the wall of the body cavity while said hand gripping means is permitted to rotate independent of said piercing tip;

an enlongated trocar tube dimensioned and configured for reception of said trocar obturator;

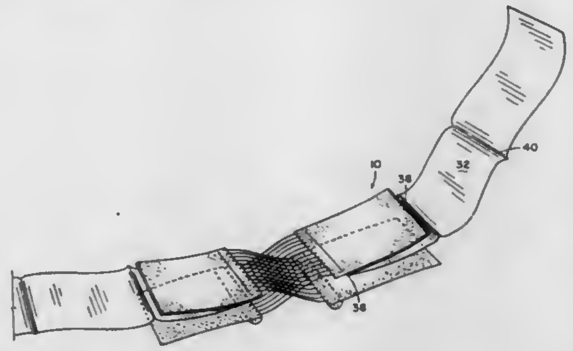
said obturator mounting means includes a retaining head mounted on the rear end of the obturator, the retaining head being rotably and securely mounted in a socket formed in the hand grip portion;

said retaining head is disposed co-axially to the obturator and includes a frusto-conically shaped end portion, the socket of the hand grip portion having a shape conforming to that of the retaining head end portion to closely receive and retain the end portion;

said frusto-conically shaped end portion has a cross-section which widens in a direction rearwardly from the rear end of the obturator.

5,534,010
CLOSURE FOR A SKIN WOUND OR INCISION

Meldon L. Peterson, 912 SW. 11th St. #1, Newport, Oreg. 97365
PCT No. PCT/US92/09246, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO93/08748, PCT Pub. Date May 13, 1993
PCT Filed Oct. 29, 1992, Ser. No. 302,711
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—215 **10 Claims**



1. A sutureless closure for a generally elongate wound or incision comprising:

a first strip of tap having an exposed upper nonadhesive surface and having a lower surface coated with adhesive adapted to adhere to skin adjacent the lengthwise extending edges of the wound;

a second strip of adhesive tape adapted to adhere to skin adjacent the lengthwise extending edges of the wound on the opposite side of said wound from said first strip;

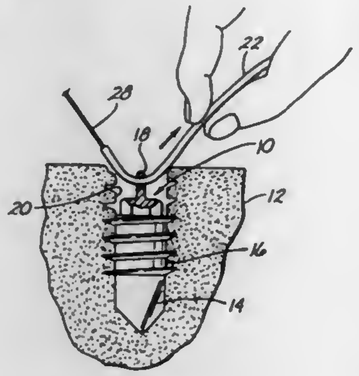
a third strip of adhesive tape adapted to adhere to the exposed surface of said first adhesive tape;

a plurality of filaments having a first end coupled to an end of said first tape and a second end coupled to an end of said third tape, said filaments being slidingly received over structure defined on said second strip; and

means for frictionally engaging the skin closely adjacent the opposing ends of said first and second tapes when said closure is in use whereby tension in the filaments draws tissue between said engaging means into a slight mound, said engaging means comprising an elongate polyamide member mounted on each of said tapes normal to the longitudinal axis thereof.

5,534,011
METHOD AND APPARATUS FOR THREADING A SUTURE ANCHOR

George R. Greene, Jr., Costa Mesa, and Rodney Brenneman, Laguna Beach, both of Calif., assignors to Vesica Medical, Inc., San Clemente, Calif.
Filed Oct. 27, 1994, Ser. No. 330,343
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—232 **12 Claims**



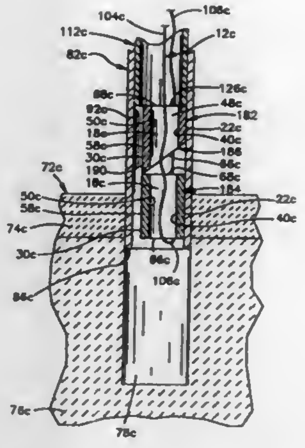
5. A method for threading a suture having a first end and a following portion through an eyelet of a suture anchor, comprising the steps of:

(a) providing a suture anchor with an eyelet and an elongate, flexible, elastomeric, hollow tube having an open end, at least a portion of the tube having been installed in the eyelet;
(b) driving the suture anchor into a bone mass so as to leave the eyelet and the tube exposed;
(c) pushing the first end of the suture into the open end of the tube;
(d) removing the tube from the eyelet so as to pull the first end of the suture and the following portion of the suture through the eyelet; and
(e) removing the suture from the tube.

5,534,012
METHOD AND APPARATUS FOR ANCHORING A SUTURE

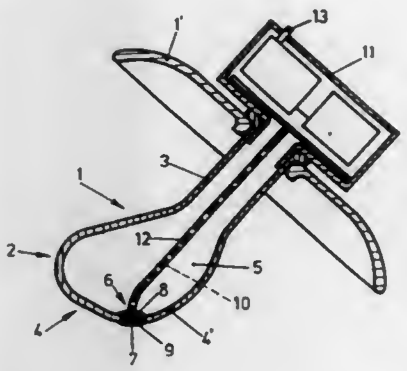
Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401
Division of Ser. No. 291,970, Aug. 17, 1994, which is a continuation-in-part of Ser. No. 62,295, May 14, 1993, Pat. No. 5,403,348, and a continuation-in-part of Ser. No. 207,297, Mar. 7, 1994, Pat. No. 5,464,426. This application May 26, 1995, Ser. No. 451,865
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—232 **33 Claims**

1. An apparatus which is at least partially received in body tissue, said apparatus comprising a first anchor section, a second anchor section, a connector integrally formed as one piece with and extending between said first and second anchor sections, said connector having a cross sectional area which is substantially less than a cross sectional area of said first anchor section and a cross sectional area of said second anchor section, and a suture adapted to extend into the body tissue and at least part way through said first and second anchor sections, said suture being tensionable with said first and second anchor sections at least partially in the body tissue to deform said connector section and move said first anchor section relative to said second anchor section from a first position in which a central axis of said first anchor section is disposed in a first orientation relative to a central axis of said second anchor section to a second position in which the central axis of said first anchor section is disposed in a second orientation relative to a central axis of said second anchor section.



5,534,013
PACIFIER THERMOMETER

Heidi Zeindler, Ebikon, Switzerland, assignor to Zewa AG, Switzerland
Filed Oct. 28, 1994, Ser. No. 331,089
Claims priority, application Switzerland, Apr. 6, 1994, 999/94
Int. Cl.^{6} A61J *17/00;* G01K *7/02*
U.S. Cl. 606—234 **5 Claims**



1. A pacifier thermometer of the type having a lip-shield, a rubber nipple mounted in a central opening of said lip-shield and projecting therefrom, a temperature sensor arranged inside of said nipple to measure temperature values and an electronic device for storing calculating and displaying the measured temperature values, said electronic device being connected to said temperature sensor by electrical conductors passing through said nipple, wherein the temperature sensor is arranged on a metallic anchoring element provided on the inner side of the nipple, said anchoring element being connected through the nipple wall to a flat metallic counterelement mounted on the outer side of the nipple wall, both said anchoring element and said counterelement being affixed together through the nipple wall.

5,534,014

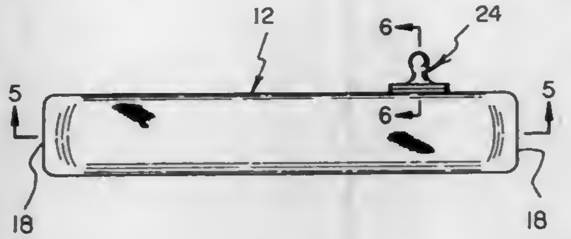
PILLOW PACIFIER

Kevin D. Demeritt, and Debra E. Demeritt, both of 11114 Black Forest Way, Gaithersburg, Md. 20879

Filed Sep. 2, 1994, Ser. No. 299,960

Int. Cl.^{6} A61J *17/00*

U.S. Cl. 606—236 **14 Claims**



1. A pillow pacifier comprising:
an elongated main body formed from an elongated cylindrical foam member encapsulated within an outer casing having tapered ends;
a mounting boss fixedly secured to the outer casing; and,
a pacifier removably coupled to the mounting boss on a side of said main body, wherein said main body is operable to satisfy an infant's desire to grasp objects while the pacifier is operable to satisfy an infant's desire to bite and feed.

5,534,015

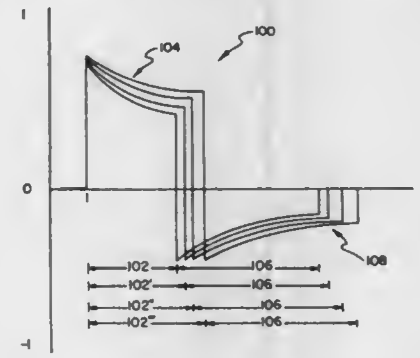
METHOD AND APPARATUS FOR GENERATING BIPHASIC WAVEFORMS IN AN IMPLANTABLE DEFIBRILLATOR

Mark W. Kroll, Minnetonka, and James E. Brewer, Maplewood, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Continuation-in-part of Ser. No. 132,634, Oct. 6, 1993, and Ser. No. 835,836, Feb. 19, 1992, Pat. No. 5,431,686, and Ser. No. 246,007, May 19, 1994. This application Oct. 11, 1994, Ser. No. 321,540

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—7 **30 Claims**



17. An improved implantable defibrillator system for producing a biphasic capacitive-discharge countershock to be delivered through at least two electrodes adapted for implantation in a human patient, the implantable defibrillator system being a self-contained human implantable housing containing a waveform-generating capacitor means for storing an electrical charge, means for charging the waveform-generating capacitor means, and means for selectively discharging the electrical charge in the waveform-generating capacitor means as a biphasic countershock to be delivered through the at least two electrodes in response to a means for sensing of a cardiac dysrhythmia in the human patient, the improvement comprising:
the means for selectively discharging including:
means for controlling a first duration of a first phase of the biphasic countershock such that the discharge of the electrical charge is of a first polarity and the first duration is variable; and
means for controlling a second duration of a second phase of the biphasic countershock such that the discharge of the electrical charge is of a second polarity that is opposite from the first polarity and the second duration is fixed.

5,534,016

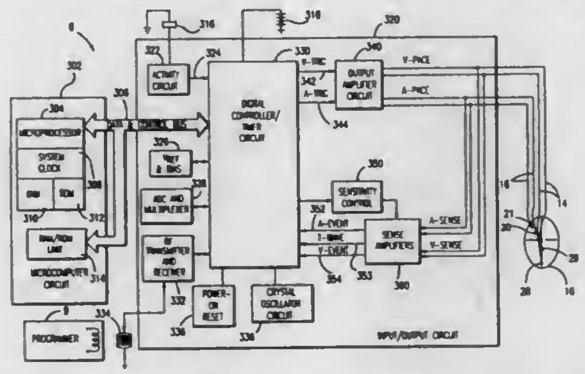
DUAL CHAMBER PACING SYSTEM AND METHOD UTILIZING DETECTION OF VENTRICULAR FUSION FOR ADJUSTMENT OF THE ATRIAL-VENTRICULAR DELAY AS THERAPY FOR HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY

Willem Boute, Dieren, Netherlands, assignor to Vitatron Medical, B.V., Dieren, Netherlands

Filed Feb. 21, 1995, Ser. No. 395,372

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—9 **18 Claims**



1. A dual chamber pacemaker system, having atrial sense means for sensing atrial signals from a patient, ventricular sense means for sensing ventricular signals from a patient, ventricular pace means for generating and delivering ventricular pace pulses to said patient's right ventricle, and sync control means for controlling said pace means to generate and deliver a ventricular pace pulse at a controlled AV escape interval following a sensed atrial signal, said sync control means having AV_{esc} means for setting said AV escape interval, said AV_{esc} means comprising:
fusion means for detecting the occurrence of a fusion beat and the value AV_{fus} of the AV escape interval corresponding to which a said fusion beat is detected, and program means for changing said AV escape interval so as to maintain said AV_{esc} within a small range of values no greater than said value of AV_{fus}, whereby pace pulses are delivered at an AV escape interval no greater than said AV_{fus}.

5,534,017

DUAL CHAMBER PACEMAKER SYSTEM WITH IMPROVED RESPONSE TO RETROGRADE CONDUCTION

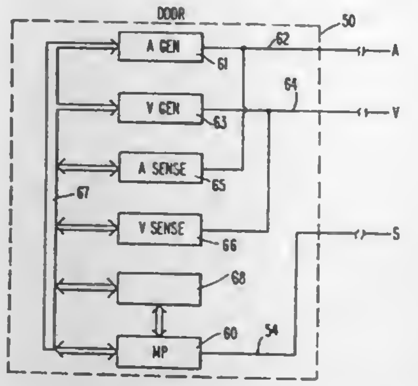
Frits M. van Krieken, and Gustaaf A. P. Stoop, both of Dieren, Netherlands, assignors to Vitatron Medical, B.V., Dieren, Netherlands

Filed Dec. 2, 1994, Ser. No. 348,317

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—14 **12 Claims**

1. A dual chamber pacemaker having atrial sense means for sensing signals from a patient's atrium, sinus interval means for determining an interval (A—A Int) representative of the patient's underlying sinus rate, ventricular pace means for generating pace pulses for delivery to the patient's ventricle, control means for controlling the timing of said pace pulses, and interpretation means for interpreting when a said atrial sense can be tracked and when a said atrial sense indicates RC, said control means further comprising tracking means for controlling said pace means to generate pace pulses in tracking relation to sensed atrial signals when said interpreting means interprets that they can be tracked, and asynchronous means for controlling said pace means to deliver at least one asynchronous pulse following an atrial sense interpreted as indicating RC, said asynchronous means further having timing means for controlling said pace means to deliver said at least one pulse at a time more than said sinus interval following said indicating atrial sense.



5,534,018

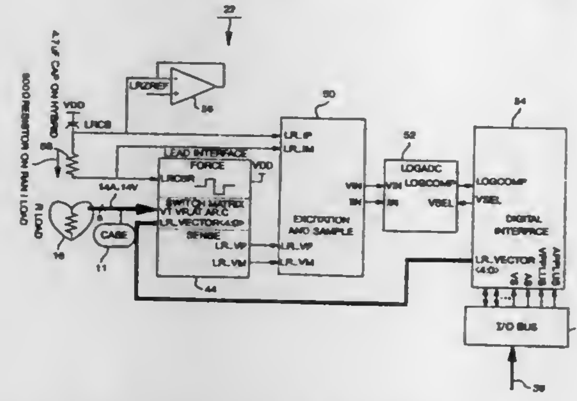
AUTOMATIC LEAD RECOGNITION FOR IMPLANTABLE MEDICAL DEVICE

John D. Wahlstrand, Shoreview; Daniel J. Baxter, St. Paul; R. Michael Ecker, Anoka; Daniel R. Greeninger, Coon Rapids, and Charles G. Yerich, Fridley, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 30, 1994, Ser. No. 346,661

Int. Cl.^{6} A61N *1/00;1/362*

U.S. Cl. 607—27 **2 Claims**



1. A body-implantable cardiac pacemaker system, comprising:
an electronic circuit, wherein said electronic circuit comprises:
an excitation circuit coupled to at least one conductor, for applying a sub-threshold symmetrical and bi-phasic voltage pulse along a current path;
an impedance measurement circuit, coupled to said at least one conductor and to a second electrode, adapted to measure impedance along said current path during application of said sub-threshold voltage pulse;
a comparison circuit, coupled to said impedance measurement circuit and adapted to determine whether said measured impedance lies within a predetermined impedance range, indicating availability of said current path for cardiac pacing;
a hermetic enclosure for housing said electronic circuit;
a flexible, elongate pacing/sensing lead having at least one conductor therein extending between proximal and distal ends of said lead, said at least one conductor being coupled at said proximal end to said electronic circuit in said hermetic enclosure and coupled near said distal end to a first conductive electrode adapted to be disposed in electrical contact with patient's cardiac tissue;
a second electrode, electrically coupled to said electronic circuit in said hermetic enclosure, such that said current path is established extending from said electronic circuit, along said at least one lead to said electrode, through a portion of said patient's body tissue to said second electrode and back to said electronic circuit;
Wherein said impedance measurement circuit further comprises:
a sampling circuit for obtaining a sample of voltage between said first and second electrodes during said application of said excitation pulse and for obtaining a sample of current between said first and second electrodes during said application of said excitation pulse;
an analog-to-digital converter for deriving a digital voltage value corresponding to a logarithm of said sampled voltage and a digital current value corresponding to the logarithm of said sampled current; and
an impedance computation circuit for deriving from said digital voltage and current values a digital impedance value corresponding to the logarithm of the impedance between said first and second electrodes during application of said excitation pulse, wherein said voltage pulse is bi-phasic and on the order of 0.26 volts, peak to peak.

5,534,019

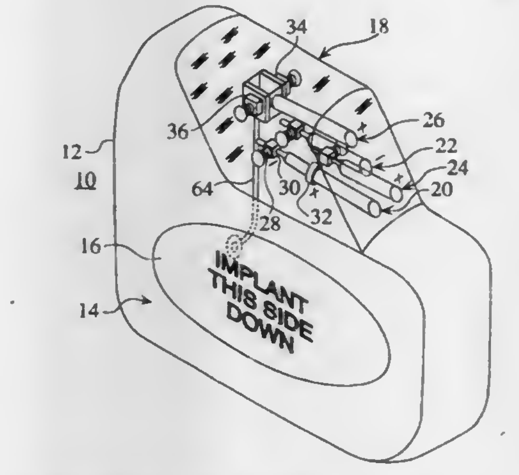
CARDIAC DEFIBRILLATOR WITH CASE THAT CAN BE ELECTRICALLY ACTIVE OR INACTIVE

Paul M. Paspa, Santa Clara, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Dec. 9, 1994, Ser. No. 353,422

Int. Cl.^{6} A61N *1/375*

U.S. Cl. 607—38 **20 Claims**



1. An implantable cardiac stimulator comprising:
a pulse generator case having an electrically conductive portion;
pulse generator circuitry housed in said case;
a header attached to said case, said header including at least first and second connector cavities;
said first connector cavity having a first conductive element electrically coupled to said pulse generator circuitry; and
said second connector cavity having an entrance end and a perimeter, and having a first conductive element located at a first distance from said entrance end and at a first position on said perimeter and electrically coupled to said pulse generator circuitry, and having a second conductive element electrically connected to said electrically conductive portion of said case and located at a second position on said perimeter circumferentially spaced from said first position.

5,534,020

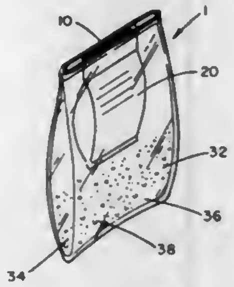
INSTANT REUSABLE COMPRESS

Henry H. Cheney, III, 19 Charles St., Braintree, Mass. 02184, and Michael Vecchione, 106 Banwell La., Mt. Laurel, N.J. 08054

Continuation-in-part of Ser. No. 185,378, Jan. 24, 1994, abandoned. This application Jun. 28, 1995, Ser. No. 495,829

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—108 **12 Claims**



1. An instant reusable cold gel compress used for cooling a human or animal body part comprising:

- a durable flexible outer container;
- an interior breakable envelope contained within said flexible outer container;
- water contained within said interior envelope;
- a water soluble acrylic polymer contained within said flexible outer container;
- an inorganic salt with a negative heat of solution contained within said flexible outer container;
- wherein when said interior envelope is broken thereby releasing water into said flexible outer container, said water will dissolve said inorganic salt and hydrate said water soluble acrylic polymer, thereby forming a gel while cooling said gel.

5,534,021

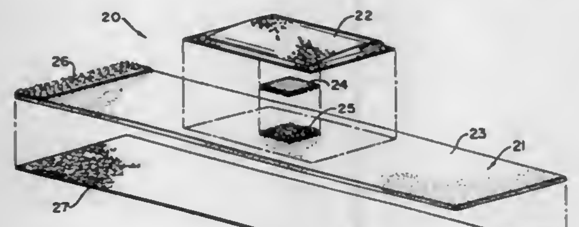
HEATING PAD FOR PROVIDING HEAT THERAPY

Israel Dvoretzky, 39 Gateway, Hamden, Conn. 06514, and John F. Kuleza, 235 Wethersfield Rd., Berlin, Conn. 06037

Filed Sep. 1, 1994, Ser. No. 299,449

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—112 **18 Claims**



1. A universally employable delivery system for providing heat therapy to any desired location on the body of a user, said system comprising:

- A. a carrier
  - a. constructed for being easily, securely mounted in any desired position or location on an individual, and
  - b. having a cutout zone dimensioned for receiving a heat generating pad in peripheral surrounding interengagement therewith;
- B. a heat generating pad incorporating heat producing means contained therein and constructed for delivering the desired level of heat upon activation;
- C. holding means cooperatively associated with the carrier and the heat generating pad for securely maintaining the beat generating pad in secure, mounted, cooperative engagement with the cutout zone of the carrier; and
- D. mounting means cooperatively associated with the carrier for enabling the carrier to be securely mounted in any desired position on the body of the user for delivering the desired heat therapy to any particular site;

whereby a universally employable heat therapy delivery system is attained which is capable of being placed in any desired location on the body of a user for providing the desired level of heat directly to the desired location.

5,534,022

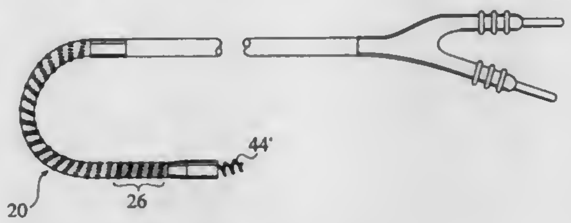
LEAD HAVING AN INTEGRATED DEFIBRILLATION/ SENSING ELECTRODE

Drew A. Hoffmann, Los Gatos, and M. Elizabeth Bush, Fremont, both of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Filed Nov. 22, 1994, Ser. No. 343,293

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—122 **32 Claims**



1. A body implantable lead comprising:

- an elongated insulated lead body;
- a first defibrillation electrode having first and second ends;
- a connector at a proximal end of said lead body for connection of said lead with a defibrillator;
- a conductor mounted in said lead body and attached to said defibrillation electrode, forming a defibrillation electrode attachment, and to said connector; and
- said defibrillation electrode having an increased surface area portion thereon to form an effective sensing electrode region, wherein said increased surface area portion covers less than the entirety of said first defibrillation electrode.

5,534,023

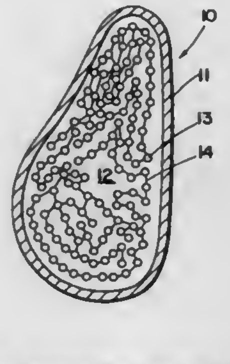
FLUID FILLED PROSTHESIS EXCLUDING GAS-FILLED BEADS

Julian L. Henley, 330 Orchard St., New Haven, Conn. 06511-4417

Continuation of Ser. No. 998,530, Dec. 29, 1992, abandoned. This application Apr. 11, 1994, Ser. No. 225,507

Int. Cl.^{6} A61F *2/12*

U.S. Cl. 623—8 **2 Claims**



1. A prosthesis for implantation beneath the skin of a patient thereafter to be surrounded by tissue, said prosthesis comprising:

- (a) an elastomeric outer shell; and
- (b) a filler enclosed by said elastomeric outer shell and wherein said filler further comprises, in combination, a fluid and a string comprising a plurality of interconnected beads, each bead of said plurality of interconnected beads comprising a gas filled chamber and wherein each said bead is free of gaseous communication with any other said bead.

5,534,024

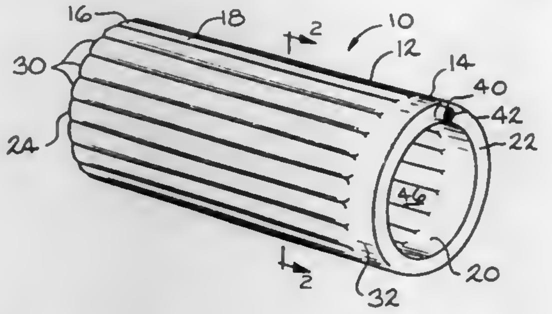
INTRALUMINAL STENTING GRAFT

Russell L. Rogers, Munith, and Rodney E. Turk, W. Bloomfield, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Nov. 4, 1994, Ser. No. 334,524

Int. Cl.^{6} A61F *2/06;* A61M *29/02*

U.S. Cl. 623—1 **6 Claims**



1. An intraluminal stenting graft for implantation in a blood vessel, comprising:

- a collapsible tube member having a first end and a second end;
- an outer layer and an inner layer extending between said ends, said outer layer being more flexible than said inner layer, said outer layer being joined to said inner layer to form a plurality of cylinders longitudinally extending between said first end and said second end, said plurality of cylinders being positioned adjacent one another to form said tube member, said plurality of cylinders providing structural support to said tube member;
- first and second end walls extending between said outer layer and said inner layer at said first and second ends, respectively, one of said end walls including an opening for receiving a fluid; and
- a valve positioned in said opening to allow for introduction of said fluid into said tube member and to prevent escape of said fluid from said tube member.

5,534,025

VASCULAR BIOARTIFICIAL ORGAN

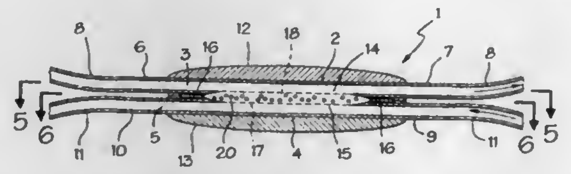
Francis Moussy, Edmonton, Canada, assignor to The Governors of the University of Alberta, Edmonton, Canada

Filed Jun. 8, 1994, Ser. No. 257,120

Claims priority, application United Kingdom, Jun. 8, 1993, 9311784

Int. Cl.^{6} A61F *2/04*

U.S. Cl. 623—11 **9 Claims**



1. A bioartificial device for replacing or supplementing the function of a mammalian organ, comprising a first fluid conduit having inlet means and outlet means for connection into a first blood stream and having a wall portion comprising a first semi-permeable membrane;

- a second fluid conduit having inlet means and outlet means for connection into a second blood stream and having a wall portion comprising a second semi-permeable membrane;
- first and second support members for sealingly securing said first and second fluid conduits together with said semi-permeable membranes opposed and spaced apart to form a chamber therebetween for receiving cells or tissue of the organ to be replaced or supplemented; and
- a gasket arranged between said first and second support members and surrounding the chamber.

5,534,026

PREPARATION OF INEXPENSIVE, HIV-FREE HUMAN SKIN ALLOGRAFT

Ernest K. Mauders, Hummelstown; Andrea M. Koegel, Middletown, and Donald R. Mackay, Hershey, all of Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Apr. 2, 1992, Ser. No. 862,141

Int. Cl.^{6} A61F *2/10*

U.S. Cl. 623—15 **5 Claims**

1. The method of preparing and storing a biologically sterile and virus-free skin allograft, comprising the steps of:

- a) harvesting human skin from a donor to form a sheet of human skin allograft;
- b) placing the sheet of skin allograft in contact with saline solution;
- c) placing the sheet of skin allograft in a closed container;
- d) exposing the closed container and confined sheet of skin allograft to a source of gamma radiation in an amount sufficient to sterilize the sheet of skin allograft and deactivate viruses in the sheet of skin allograft and render the skin allograft non-viable, and then removing the closed container and sheet of skin allograft from the source of irradiation; and
- e) storing the closed container and confined sheet of skin allograft at a temperature above freezing without degradation of the sheet of skin allograft while maintaining sterility and vital deactivation of the sheet of skin allograft.

5,534,027

METHOD FOR PROVIDING A BARRIER TO THE ADVANCEMENT OF WEAR DEBRIS IN AN ORTHOPAEDIC IMPLANT ASSEMBLY

Robert A. Hodorek, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

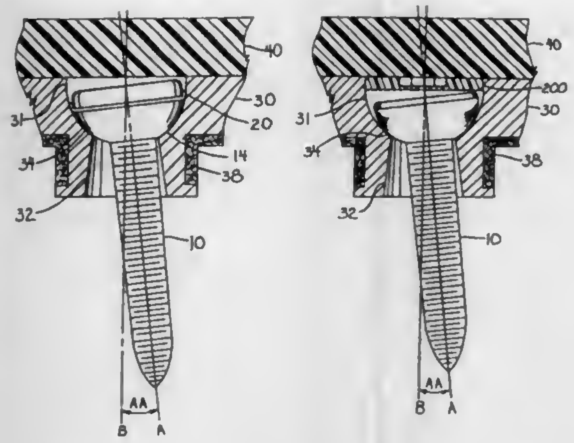
Division of Ser. No. 80,265, Jun. 21, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 342,279

Int. Cl.^{6} A61F *2/28;* A61B *17/86*

U.S. Cl. 623—16 **4 Claims**

3. A method of providing a barrier to the advancement of wear debris in an orthopaedic implant assembly comprising the following steps:

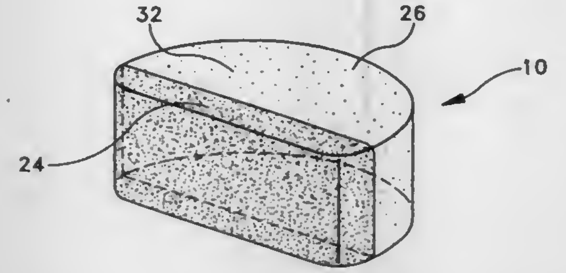
- a) first locating a base member having at least one hole therein against a bone surface;
- b) then inserting a securing member through the at least one hole to secure the base member to the bone and sealing the at least one hole; and
- c) subsequently positioning an additional member onto the base member such that the additional member covers the at least one hole; whereby the step of sealing the at least one hole provides a barrier to the advancement of wear debris from passing through the at least one hole, and wherein the step of sealing the at least one hole is achieved by providing the securing member with an enlarged head for seating against a complementary head receiving surface in the at least one hole and providing a sealing washer between the head and the



complementary head receiving surface to seal the at least one hole, and wherein the method further includes the step of providing the head of the securing member with an arcuate undersurface and further providing the complementary head receiving surface with an arcuate surface, wherein the securing member can be inserted in a selectively variable angled orientation with respect to the at least one hole while still maintaining the sealing of the at least one hole.

5,534,028
HYDROGEL INTERVERTEBRAL DISC NUCLEUS WITH DIMINISHED LATERAL BULGING

Qi-Bin Bao, and Paul A. Higham, both of New York, N.Y., assignors to Howmedica, Inc., New York, N.Y.
Filed Apr. 20, 1993, Ser. No. 49,820
Int. Cl.^{6} A61F *2/44*
U.S. Cl. 623—17 **4 Claims**

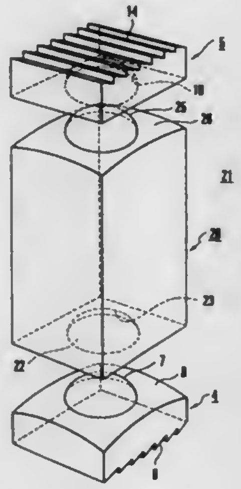


1. A prosthetic nucleus for implanting into a disc space after removal of a degenerated or damaged nucleus of an intervertebral disc, said prosthetic nucleus comprising:

a biologically compatible hydrogel material having, when fully hydrated, a size and shape generally conforming to a natural nucleus or to the shape of a cavity created after removal of the degenerated or damaged nucleus; a water content of from about 30% to about 90%; and a compressive strength of about 4 MNm^{-2} or greater; and said prosthetic nucleus having a prosthetic nucleus periphery wherein at least part of the prosthetic nucleus periphery exhibits diminished lateral bulging in comparison to other parts of the prosthetic nucleus periphery, wherein said nucleus has a modulus within the range from about 0.1 to about 1.5 MPa, wherein said nucleus has a softest part, and wherein the modulus of the nucleus varies such that at least part of the prosthetic nucleus periphery has a modulus of at least about 10% more than the softest part of the nucleus, wherein the nucleus has an anterior periphery and a posterior periphery, and at least part of the posterior periphery has a modulus of at least about 10% more than the modulus of at least part of the anterior periphery.

5,534,029
ARTICULATED VERTEBRAL BODY SPACER

Toshio Shima, Kanagawa, Japan, assignor to Yumiko Shima, Kanagawa, Japan
Filed Dec. 1, 1993, Ser. No. 160,487
Claims priority, application Japan, Dec. 14, 1992, 4-352925
Int. Cl.^{6} A61F *2/44;* **A61B** *17/56*
U.S. Cl. 623—17 **4 Claims**



1. An articulated vertebral body spacer comprising: upper and lower joint pieces to be inserted between vertebras, and at least one intermediate vertebral body interposed between said upper and lower joint pieces, said spacer defining first and rear sides,

said lower joint piece including a convex portion formed on a central portion of an upper surface thereof and having a convex sliding contact surface, a stopper surface surrounding the convex portion, and a plurality of projections provided on a lower surface of the lower joint piece,

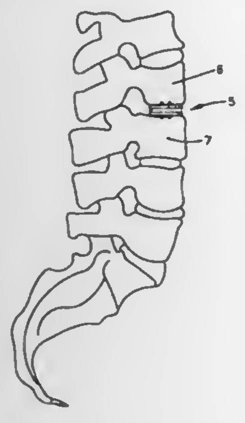
said upper joint piece including a concave portion formed on a central portion of a lower surface thereof and having a concave sliding contact surface, an abutment surface which surrounds the concave portion, and a plurality of projections provided on an upper surface of the upper joint piece, and

said intermediate vertebral body including a concave portion formed on a central portion of a lower surface thereof and having a concave sliding contact surface which is in sliding contact with the convex sliding contact surface of said lower joint piece, an abutment surface surrounding the concave portion and abutting against the stopper surface of said lower joint piece, a convex portion formed on a central portion of an upper surface of said intermediate vertebral body and having a convex surface which is in sliding contact with the concave sliding contact surface of said upper joint piece, and a stopper surface surrounding the convex portion and abutting against the abutment surface of said upper joint piece,

wherein the stopper surface of said lower joint piece and the abutment surface of said intermediate vertebral body and between the abutment surface of said upper joint piece and the stopper surface of said intermediate vertebral body define gaps such that said gaps formed in said front side are larger than said gaps formed in said rear side.

5,534,030
SPINE DISC

Richard R. Navarro, Strongsville; Carl R. McMillin, Brecksville, and Karl B. Zimmers, Ravenna, all of Ohio, assignors to AcroMed Corporation, Cleveland, Ohio
Continuation of Ser. No. 15,613, Feb. 9, 1993, abandoned. This application Apr. 25, 1994, Ser. No. 232,861
Int. Cl.^{6} A61F *2/44*
U.S. Cl. 623—17 **18 Claims**



1. A spinal disc prosthesis to replace a damaged spinal disc comprising:

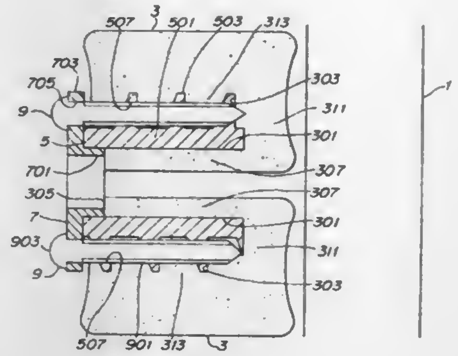
an upper rigid plate;

a lower rigid plate;

an elastomeric core interposed between said plates and adhered to said plates, said elastomeric core comprising an upper portion extending from said upper plate toward said lower plate, said upper portion of said core having an outer peripheral surface extending from said upper plate and substantially perpendicular to said upper plate, a lower portion extending from said lower plate toward said upper plate, said lower portion of said core having an outer peripheral surface extending from said lower plate and substantially perpendicular to said lower plate, and an intermediate portion extending between said upper and lower portions, said intermediate portion having a concave outer peripheral surface extending between said outer peripheral surfaces of said upper and lower portions of said core and defining a groove extending around said core and located between said upper and lower portions of said core.

5,534,031
PROSTHESIS FOR SPANNING A SPACE FORMED UPON REMOVAL OF AN INTERVERTEBRAL DISK

Hiromi Matsuzaki; Satoshi Ojima, and Masashi Nakamura, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 9,916, Nov. 27, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 306,430
Claims priority, application Japan, Jan. 28, 1992, 4-38566
Int. Cl.^{6} A61F *2/44*
U.S. Cl. 623—17 **10 Claims**



5. An assembly comprising:

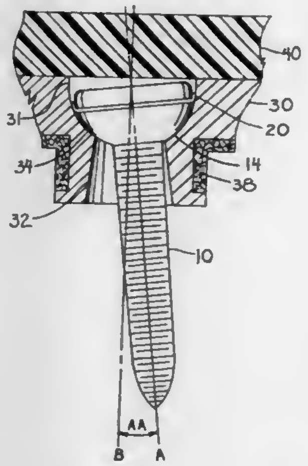
an artificial vertebra spacer for being embedded in and bridging a space between two adjacent vertebrae which are positioned above and below a removed intervertebral disk, said artificial vertebra spacer comprising a hollow cylindrical member and a helical screw thread disposed integrally on and extending helically around said hollow cylindrical member;

an annular plate having a tubular member fitted in an axial end of said artificial vertebra spacer, and a circular flange extending radially outwardly from said tubular member; and

at least one screw for fastening said circular flange to said helical screw thread when said artificial vertebra spacer is embedded in the vertebrae, wherein said circular flange comprises an outside diameter substantially equal to an outside diameter of said helical screw thread.

5,534,032
ORTHOPAEDIC IMPLANT ASSEMBLY

Robert A. Hodorek, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Continuation of Ser. No. 80,265, Jun. 21, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 350,932
Int. Cl.^{6} A61F *2/30*
U.S. Cl. 623—18 **10 Claims**



1. An orthopaedic implant assembly including a screw and a sealing washer assembled thereto, wherein the screw includes an enlarged head with an elongated shaft extending therefrom, the head having a top portion, and a bottom shaft interconnecting portion with a midportion therebetween, and wherein the midportion of the head includes a groove thereabout spaced away from the shaft for receiving the sealing washer therein, and wherein the assembly further includes a base member for positioning against a bone surface, the base member having a screw hole therein for receiving the screw and the washer, and wherein the midportion of the head includes an arcuate undersurface including the groove which surrounds the head, the screw hole includes a complementary arcuate surface to enable the screw to be inserted in a selectively variable angled orientation with respect to the screw hole while the washer provides a sealing contact between the head of the screw and the base member, and wherein the assembly further includes a prosthetic articulating surface which is affixed onto the base member and over the screw hole and screw head.

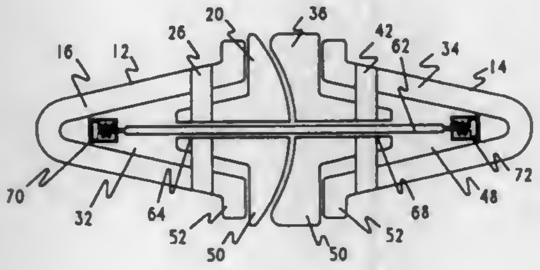
5,534,033
ORTHOPEDIC PROSTHETIC IMPLANTS WITH PYROLYTIC CARBON OR CERAMIC ARTICULATING SURFACES

Charles L. Simpson, Austin, Tex., assignor to CarboMedics, Inc., Austin, Tex.

Filed Jun. 5, 1995, Ser. No. 462,955

Int. Cl.^{6} A61F *2/30*

U.S. Cl. 623—18 **9 Claims**



1. An orthopedic prosthetic implant comprising
a first implant part, said first implant part having
- a first shell having an exterior surface adapted to lie adjacent bone and an interior surface defining a cavity, said cavity having an opening therein defined by an edge;
- first articulating means comprised essentially of ceramic or carbon, said articulating means having a curved surface for slidingly engaging an opposing surface and having a shaft extending through said opening and into said cavity of said shell; and
- a layer of elastomeric adhesive connecting said shell and said articulating means;

a second implant part, said second implant part having a second articulating means adapted to slidingly engage said first articulating means, and

ligament means connecting said first and second implant parts.

5,534,034
PROSTHETIC POLYURETHANE LINER AND SLEEVE FOR AMPUTEES

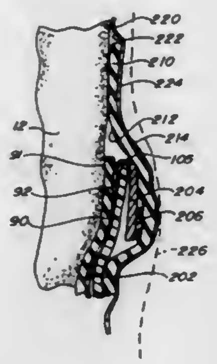
Carl A. Caspers, 510-8 25th Ave. North, St. Cloud, Minn. 56301

Continuation-in-part of Ser. No. 959,523, Oct. 13, 1991, Pat. No. 5,258,037, which is a continuation of Ser. No. 552,445, Jul. 13, 1990, abandoned. This application Nov. 1, 1993, Ser. No. 146,600

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.^{6} A61F *2/78*

U.S. Cl. 623—32 **22 Claims**



1. A prosthesis for an amputee who has a residual limb, the prosthesis comprising:
- (a) an artificial limb having a socket with a volume and shape to receive a substantial portion of the residual limb with a space therebetween;
- (b) a nonfoamed, nonporous polyurethane liner with a cavity with a volume and shape for receiving a substantial portion of the residual limb and fitting in the space between the socket and the residual limb with the liner donned on the residual limb; and
- (c) a nonfoamed, nonporous polyurethane suspension sleeve open therethrough for rolling over and covering the socket of the artificial limb and a portion of the amputee's residual limb to flexibly secure the residual limb to the artificial limb.

5,534,035
LEATHER TREATMENT COMPOSITIONS

Adrian S. Allen, Skipton, and Finlay D. Aiston, Huddersfield, both of, United Kingdom, assignors to Allied Colloids Limited, England

Filed Aug. 18, 1993, Ser. No. 108,197

Claims priority, application United Kingdom, Aug. 18, 1992, 9217547

Int. Cl.^{6} C14C *9/00*

U.S. Cl. 8—94.21 **20 Claims**

1. In a method of rendering leather water repellent by treating the leather with an aqueous solution or dispersion of a co-polymer which contains fatty $C_{8\text{-}24}$ alkyl groups and free carboxylic acid groups and which is formed by co-polymerizing ethylenically unsaturated monomers which provide the $C_{8\text{-}24}$ alkyl groups and the free carboxylic acid groups, the improvement consisting in using as the co-polymer a co-polymer which has a free carboxylic acid content such that the co-polymer has a carboxylic acid equivalent weight of 100 to 1,000 and which has at least 20%, by weight of the co-polymer, of fatty $C_{8\text{-}24}$ alkyl groups having an average chain length of at least twelve carbon atoms and which has been made by co-polymerizing monomers which comprise ethylenically unsaturated di-carboxylic monomer and at least about one mole ethylenically unsaturated mono-functional monomer per mole di-carboxylic monomer, and wherein the ethylenically unsaturated dicarboxylic monomer includes ethylenically unsaturated dicarboxylic ester monomer which provides essentially all the fatty $C_{8\text{-}24}$ alkyl groups in the polymer and which is selected from $C_{8\text{-}24}$ mono- and di-alkyl esters of ethylenically unsaturated di-carboxylic acid.

5,534,036
KERATINOUS FIBER DYEING METHODS AND COMPOSITIONS WHICH CONTAIN SULFATED METHAPHENYLENEDIAMINE COUPLERS IN COMBINATION WITH OXIDATION DYE PRECURSORS

Alex Junino, Livry-Gargan; Alain Lagrange, Chatou, and Alain Genet, Aulnay-sous-Bois, all of, France, assignors to L'Oreal, Paris, France

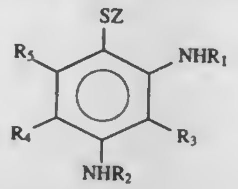
Continuation of Ser. No. 130,902, Oct. 4, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 357,745

Claims priority, application France, Oct. 2, 1992, 92 11711

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—411 **11 Claims**

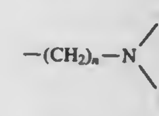
1. A composition for dyeing human hair comprising, in a vehicle suitable for dyeing said human hair,
- (a) at least one coupler comprising a sulfated metaphenylenediamine having the formula



(I)

wherein

Z represents C_1–C_{18} alkyl, aralkyl wherein the alkyl moiety has 1–6 carbon atoms, C_1–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, aryl, C_1–C_4 fluoroalkyl, aminoalkyl having the formula



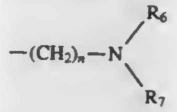
$$-(CH_2)_n-N\begin{matrix} R_6 \\ R_7 \end{matrix}$$

wherein n is a whole number ranging from 1 to 6 and R_6 and R_7, each independently, represent hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl or C_1–C_6 acyl;

R_1 and R_2, each independently, represent hydrogen, C_1–C_6 alkyl, C_1–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, C_1–C_6 monocarbamylalkyl, C_1–C_6 dialkylcarbamyl, C_1–C_6 aminoalkyl, acylamino (C_1–C_4) alkyl, carb(C_2–C_6)alkoxy(C_1–C_4)alkyl, carbamyl, mono(C_{1-6})alkyl carbamyl or C_1–C_4 fluoroalkyl;

R_3 represents hydrogen or C_1–C_4 alkyl;

R_4 represents hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 hydroxyalkyl, halogen or —SZ' wherein Z' represents dodecyl; hexadecyl; aralkyl wherein the alkyl moiety has 1–6 carbon atoms; C_1–C_6 monohydroxyalkyl; C_2–C_6 polyhydroxyalkyl; aryl; C_1–C_4 fluoroalkyl; amino alkyl having the formula



$$-(CH_2)_n-N\begin{matrix} R_6 \\ R_7 \end{matrix}$$

wherein n is a whole number ranging from 1 to 6 and R_6 and R_7 each independently represent hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl or C_1–C_6 acyl; and

R_5 represents hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 hydroxyalkyl, halogen or —SZ wherein Z has the meaning given above;

with the proviso that at least one of R_3, R_4 and R_5 is other than hydrogen;

or an acid addition salt of said sulfated metaphenylenediamine of formula (I), or both said sulfated metaphenylenediamine of formula (I) and said acid addition salt thereof;

said sulfated metaphenylenediamine or said acid addition salt thereof, or both, being present in an amount ranging from 0.05 to 3.5 percent by weight based on the total weight of said composition; and
- (b) at least one of an ortho or para oxidation dye precursor present in an amount effective to dye said human hair by oxidative condensation reaction between said precursor and said coupler.

5,534,037
DYE COMPOSITION FOR KERATINIC FIBRES CONTAINING SULFURED METAPHENYLENEDIAMINES, DYEING PROCESS AND NEW SULFURED METAPHENYLENEDIAMINES AND PREPARATION METHOD THEREOF

Alex Junino, Livry-Gargan; Alain Genet, Aulnay-sous-Bois, and Alain Lagrange, Chatou, all of, France, assignors to L'Oreal, Paris, France

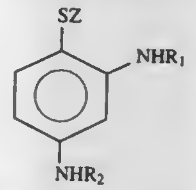
Continuation of Ser. No. 133,051, Oct. 13, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 456,814

Claims priority, application France, Feb. 14, 1992, 92 01704; Feb. 14, 1992, 92 01705

Int. Cl.^{6} A61K *7/13*

U.S. Cl. 8—411 **26 Claims**

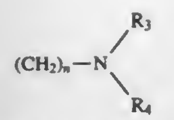
1. A composition for dyeing human hair comprising, in a vehicle suitable for dyeing said human hair,
- (a) at least one coupler comprising a sulfur-containing metaphenylenediamine having the formula



(I)

wherein

Z represents C_1–C_{18} alkyl, aralkyl wherein the alkyl moiety has 1–6 carbon atoms, C_1–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, aryl, aminoalkyl having the formula


(II)

$$(CH_2)_n-N(R_3)(R_4)$$

wherein n is an integer ranging from 1 to 6 and R_3 and R_4, each independently, represent hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl or C_2–C_6 acyl;

R_1 and R_2, each independently, represent hydrogen, C_1–C_6 alkyl, C_1–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, C_1–C_6 monocarbamylalkyl, C_1–C_6 dicarbamylalkyl, C_1–C_6 aminoalkyl, C_2–C_6 acyl, C_2–C_6 carbalkoxy, carbamyl or mono(C_1–C_6)alkyl carbamyl, with the proviso that R_1 and R_2 do not simultaneously represent hydrogen when Z represents alkyl or hydroxyalkyl; or

an acid addition salt of said sulfur-containing metaphenylenediamine of formula (I);

said sulfur-containing meta-phenylenediamine being present in an amount ranging from 0.05 to 3.5 percent by weight based on the total weight of said composition; and

(b) at least one of an ortho or para oxidation dye precursor present in an amount effective to dye said human hair by oxidative condensation reaction between said precursor and said coupler.

5,534,038

TINTING HYDROGEL MATERIALS WITH VAT DYES

John M. Evans, Fremont, Calif., assignor to Pilkington Barnes Hind, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 258,566, Jun. 10, 1994, abandoned. This application May 19, 1995, Ser. No. 446,559

Int. Cl.^{6} D06P *3/36;5/00;* **C09B** *9/00*

U.S. Cl. 8—507 **15 Claims**

1. A method for the manufacture of tinted hydrogel materials which method comprises:

(a) dissolving a leuco sulfate ester of a vat dye in a composition comprising a compatible hydrophilic ethylenically unsaturated monomer or mixture of monomers to form a monomer solution;

(b) adding an oxidizing initiator to the monomer solution produced in (a) above;

(c) oxidizing said leuco sulfate ester of the vat dye in the monomer solution to an insoluble vat dye; and

(d) polymerizing the monomer composition produced in (c) above by exposing the monomer composition to polymerization conditions.

5,534,039

ORGANOMETALLIC COMPLEX-ANTIOXIDANT COMBINATIONS, AND CONCENTRATES AND DIESEL FUELS CONTAINING SAME

Nai Z. Huang, Mayfield Hts.; Daniel T. Daly, Shaker Hts.; Frederick W. Koch, Willoughby Hills; Stephen H. Stoldt, Concord Township, and Reed H. Walsh, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 699,423, May 13, 1991, Pat. No. 5,344,467. This application Jun. 24, 1994, Ser. No. 265,490

Int. Cl.^{6} C10L *1/30;1/14*

U.S. Cl. 44—367 **27 Claims**

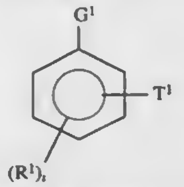
1. A composition for use in a diesel fuel wherein the diesel fuel is used to operate a diesel engine equipped with an exhaust system particulate trap, said composition comprising:

(A) at least one organometallic complex; and

(B) at least one antioxidant;

said organometallic complex (A) being obtainable by contacting component (i) with component (ii);

component (i) being at least one aromatic difunctional compound represented by the general formula


(XLV)

wherein in Formula (XLV), R^1 is a hydrocarbyl group, i is a number from zero to 4, T^1 is in the ortho- or meta-position relative to G^1, and G^1, and T^1 are independently OH, NH_2, NR_2, COOR

and

component (ii) comprising at least one metal reactant, the metal in said metal reactant being capable of forming a complex with component (i), said metal being capable of reducing the ignition temperature of exhaust particles collected in said trap, said metal being other than B, Ti, Zr, Mn, Mo, or a rare-earth metal.

5,534,040

PARTIAL OXIDATION OF PARTIALLY LIQUIFIED PLASTIC MATERIALS

Motasimur R. Khan, Wappinger Falls; Christine C. Albert, Peekskill, and Stephen J. DeCanio, Montgomery, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 130,921, Oct. 4, 1993, abandoned. This application Mar. 31, 1995, Ser. No. 415,153

Int. Cl.^{6} C10J *3/46*

U.S. Cl. 48—197 R **12 Claims**

1. A partial oxidation process comprising:

(1) granulating solid organic plastic material in the form of sheets, extruded shapes, moldings, reinforced plastics, laminates and foamed plastics, said plastic material containing inorganic filler or reinforcement material;

(2) partially liquefying the granulated plastic material from (1) by heating in a closed autoclave at a temperature in the range of about 400° F. to 495° F. and a pressure in the range of about 150 psig to 750 psig while said plastic material is in contact with a pumpable hydrocarbonaceous liquid solvent in the amount of about 1 to 5 parts by wt. of said hydrocarbonaceous liquid per part by weight of plastic material; wherein said heating is continued until a pumpable slurry is produced which when cooled to room temperature and pressure comprises the following ingredients in weight percent:

a. solubilized plastic	20 to 30,
b. unsolubilized plastic	5 to 15,
c. hydrocarbonaceous liquid solvent	45 to 55,
d. separated inorganic material	1 to 15,
e. unseparated inorganic material	5 to 15;

(3) separating said separated inorganic material (2) (d) from the remainder of said slurry in (2); and

(4) forwarding the remainder of said slurry after separation in (3) to a partial oxidation zone, and reacting by partial oxidation with a free-oxygen containing gas in the presence of a temperature moderator the remainder of said slurry to produce raw synthesis gas, fuel gas, or reducing gas, and a substantially non-toxic non-leachable slag.

5,534,041

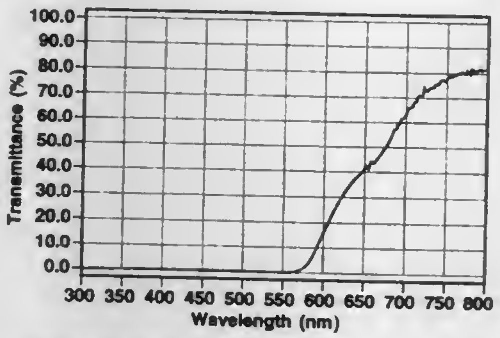
METHOD OF MAKING LASER EYEWEAR PROTECTION

Thomas G. Havens, Painted Post; David J. Kerko, Corning, and JoAnn Morrell, Horseheads, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 7, 1994, Ser. No. 334,929

Int. Cl.^{6} C03C *15/00*

U.S. Cl. 65—30.1 **8 Claims**



1. A method for making a glass article that is non-photochromic, that contains a silver halide in the composition, and that has at least one surface that is exposed to ultraviolet radiation and, optionally, to radiation having a wavelength up to 550 nm, which is opaque to such radiation but is transparent to visible radiation having a wavelength longer than the radiation within the region of opacity, said method comprising exposing the entire surface of said article to a hydrogen-containing atmosphere in a heat treating chamber operating at a temperature of at least 375° C., but not higher than 500° C., for a period of at least four hours to produce an integral reduced layer in the entire surface of the article having a depth effective to prevent the transmission of ultraviolet radiation and, optionally, radiation having a wavelength up to 550 nm through said article, and maintaining the integral layer on the entire surface of the article in that reduced state, thereby rendering the article non-photochromic.

5,534,042

METHOD AND APPARATUS FOR COMPOSTING ORGANIC MATTERS HAVING HIGH WATER CONTENT

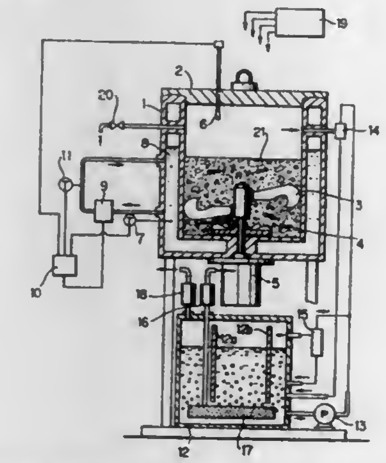
Yuji Tsuchida, Tokyo, Japan, assignor to Kabushiki Kaisha Environmental Engineering Laboratory, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,095

Claims priority, application Japan, Apr. 4, 1994, 6-065931

Int. Cl.^{6} C05F *9/04*

U.S. Cl. 71—9 **2 Claims**



1. A method for forming a compost product from organic matter having a high water content, comprising the steps of:

(1) holding organic matter containing a large amount of water in a treatment tank for not less than one hour and not more than three hours, while providing a supply of air, heating from ordinary temperature to not more than 60° C. and agitating and grinding the organic matter, so that the organic matter is reduced to a rice porridge state and aerobic fermentation occurs, and extracting generated gas and water vapor to the outside of the treatment tank, thereby dehydrating and drying the organic matter to form a fermentation and decomposition product having a water content of not more than 65%;

(2) holding the fermentation and decomposition product for not less than one hour and not more than six hours at a temperature of not less than 60° C. and not more than 100° C. to thermally decompose the fermentation and decomposition product, and extracting generated gas and water vapor to the outside of the treatment tank, thereby dehydrating and drying the fermentation and decomposition product to form a thermal decomposition product having a water content of not more than 45%; and

(3) drying the thermal decomposition product for not less than one hour and not more than six hours at a temperature of not less than 100° C. and not more than 135° C. to sterilize the thermal decomposition product, and extracting generated gas and water vapor to the outside of the treatment tank, thereby dehydrating and drying the thermal decomposition product to form the compost product having a water content of not more than 30%.

5,534,043

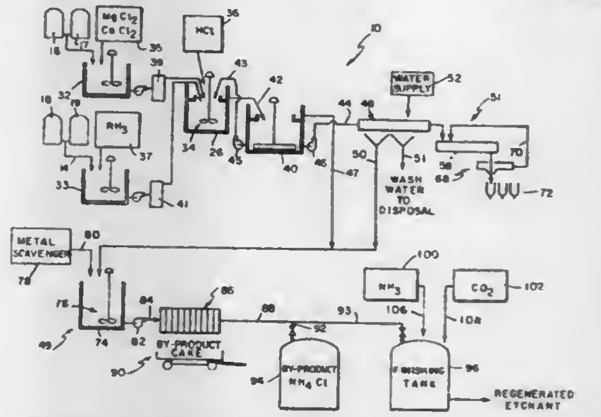
MICRONUTRIENT SUPPLEMENT

Frederick A. Steward, Pittsburgh, Pa., assignor to Heritage Environmental Services, Inc., Indianapolis, Ind.

Division of Ser. No. 214,804, Mar. 15, 1994. This application May 26, 1995, Ser. No. 451,188

Int. Cl.^{6} C05D *9/02*

U.S. Cl. 71—32 **4 Claims**



1. A fertilizer composition comprising a plant nutrient blend of sources of bioavailable nitrogen, phosphorus, potassium, and, as a source of bioavailable copper, a compound of the formula $Cu(OH)_xCl_{(2-x)}$, wherein x is greater than 0 and less than or equal to 2.0.

5,534,044

SELF-LUBRICATING ALUMINUM METAL-MATRIX COMPOSITES

Somuri V. Prasad, Dayton, and Karl R. Mecklenburg, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 28, 1994, Ser. No. 348,687

Int. Cl.^{6} C22C *29/00*

U.S. Cl. 75—231 **6 Claims**

1. A self-lubricating aluminum alloy bearing material composition which consists essentially of about 0.5 to 25 volume percent of hard ceramic particles and about 1 to 7 volume percent of at least

one solid lubricant of the general formula MX_2, wherein M is molybdenum, tungsten or niobium and X is selenium or tellurium, balance an aluminum alloy.

5,534,045
WATER-ATOMIZED IRON POWDER AND METHOD

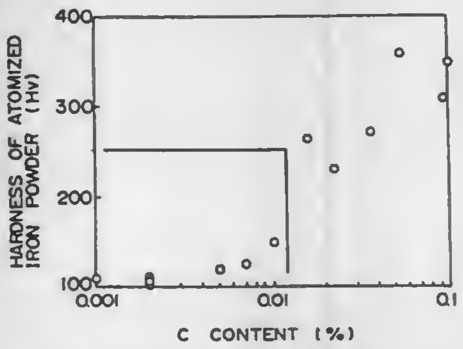
Kuniaki Ogura; Hiroyuki Ishikawa; Yoshiaki Maeda, and Kouichi Komamura, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 243,997, May 18, 1994, Pat. No. 5,462,577. This application May 15, 1995, Ser. No. 440,913

Claims priority, application Japan, May 18, 1993, 5-115523; Aug. 6, 1993, 5-196170; Oct. 14, 1993, 5-256807

Int. Cl.^{6} C22C *29/00*

U.S. Cl. 75—243 **5 Claims**



1. Iron powder for powder metallurgy consisting essentially of a water atomized, non-heat treated iron powder containing C: 0.01 wt % or less, Mn: 0.30 wt % or less, Ni: 0.30 wt % or less, Cr: 0.30 wt % or less, Mo: about 5.0 wt % or less, Nb: about 0.20 wt % or less, a total of P and S: 0.05 wt % or less as impurities, at least one additional element that is more easily oxidizable than iron and wherein the balance is substantially Fe, wherein those of said particles having a particle size from about 75 μm to about 106 μm, include a portion having a coefficient of particle cross-sectional configuration of about 2.5 or less and are present in a numerical amount of about 10% or more,

said powder including particles having a particle size of about 45 μm or less present in an amount of about 20 wt % or more, and having a particle cross section hardness of from about Hv 80 or higher to about 250 or lower,

said powder further having a particle surface covered with at least one oxide which is reducible in a sintering atmosphere, and said surface having an oxygen content of about 1.0 wt % or less.

5,534,046
PROCESS FOR PRODUCING MOLTEN PIG IRON OR MOLTEN STEEL PRE-PRODUCTS

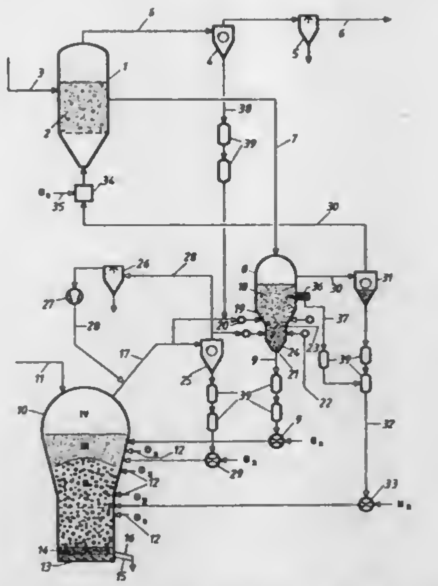
Werner Kepplinger, Leonding; Panajiotis Matzawrakos; Johannes Schenk, both of Linz; Dieter Siuka, Neuhofen, and Christian Böhm, Wels, all of, Austria, assignors to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria, and Research Institute of Industrial Science & Technology, Incorporated Foundation, Pohang, Rep. of Korea

Division of Ser. No. 139,528, Oct. 20, 1993. This application Jun. 5, 1995, Ser. No. 461,710

Claims priority, application Austria, Oct. 22, 1992, 2096/92

Int. Cl.^{6} C21B *13/14*

U.S. Cl. 75—446 **9 Claims**



1. In a process for producing molten pig iron or liquid steel pre-products from charging substances formed of iron ores and fluxes and at least partially including fines, by providing at least one reduction zone, directly reducing said charging substances to sponge iron in said at least one reduction zone by the fluidized layer method, providing a melting-gasifying zone containing a fluidized bed and a fixed bed, melting said sponge iron in said melting-gasifying zone under supply of carbon carriers and oxygen-containing gas to produce a reducing gas, introducing said reducing gas into said at least one reduction zone and reacting said reducing gas in said at least one reduction zone to obtain export gas, withdrawing said export gas and supplying said export gas to a consumer, the improvement comprising the steps of:

providing a preheating zone;

preheating at least one of fine ores and ore dusts in said preheating zone by the fluidized layer method so as to obtain preheated charging substances;

completely reducing said preheated charging substances to a major extent in said at least one reduction zone arranged to follow said preheating zone; and

charging at least a more finely particulate fraction of said charging substances by forced conveyance into at least one of said fluidized bed and said fixed bed of said melting-gasifying zone.

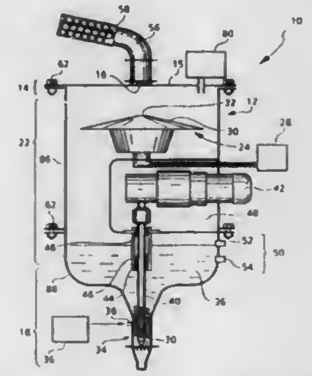
5,534,047
VERTICAL CONTINUOUS POLYMER CONCRETE DEGASSING APPARATUS AND METHOD

Jerry A. Gisko, 3725 S. East Ave., Berwyn, Ill. 60402-0515, and Larry J. Farrel, 675 Grove Ter., Elk Grove, Ill. 60007

Continuation of Ser. No. 929,753, Aug. 12, 1992, Pat. No. 5,332,423. This application Jul. 22, 1994, Ser. No. 279,508

Int. Cl.^{6} B01D *19/00*

U.S. Cl. 95—24 **15 Claims**



1. A vertical continuous polymer concrete degassing apparatus for degassing a mix of polymeric binding agent including at least one member selected from the group consisting essentially of filler material and fiber, said apparatus comprising:

a vacuum chamber;

means for adjusting the pressure in said vacuum chamber;

said vacuum chamber having an upper inlet zone including an inlet port, a lower discharge zone including a discharge port, and an intermediate zone therebetween;

means adjacent to said inlet port and open to the atmosphere for guiding the mix toward said inlet port;

means positioned in said intermediate zone of said vacuum chamber for receiving, distributing and expediting the degassification of the falling mix entering said vacuum chamber through said upper inlet port; and

a vacuum seal provided by the mix entering said inlet port and by the degassed mix exiting said discharge port.

5,534,048
TIN COATING COMPOSITION AND METHOD

James H. Dailey, Kendellville, Ind.; John R. Morgan, Southfield, and Karim I. Saad, Rochester Hills, both of Mich., assignors to Novamax Technologies, Inc., Ontario, Canada

Division of Ser. No. 217,378, Mar. 24, 1994. This application Jun. 7, 1995, Ser. No. 483,956

Int. Cl.^{6} C23C *18/31*

U.S. Cl. 106—1.22 **8 Claims**

1. An aqueous electroless alkaline pH tin coating composition comprised of a source of tin ions and an effective sludge controlling amount of a sludge control agent that is an organic chelating composition wherein the composition components are comprised as follows:

tin ions (calculated as sodium stannate) from about 1–600 grams per liter;

organic chelating agent from about 1–100 grams per liter;

organic polyhydroxy material from about 1–300 grams per liter; and

molybdenum ions from about 0.1–100 grams per liter.

5,534,049
FLEXOGRAPHIC PRINTING INK

Eva Wallström, Copenhagen; Peter B. Lund, Frederiksberg, and Arne Helgesen, Roskilde, all of, Denmark, assignors to Girobank A?S, Denmark

Continuation of Ser. No. 199,224, May 9, 1994, abandoned. This application May 9, 1995, Ser. No. 437,518

Claims priority, application Denmark, Sep. 3, 1991, 1542/91

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—22 R **20 Claims**

1. A flexographic printing ink comprising a solvent, a colourant, a binder and a wax, wherein

the solvent is essentially water;

the colourant is a water-soluble dye or a mixture of such dyes dissolved in the solvent;

the binder is selected from (meth)acrylic resins dispersed in the solvent at a pH above 7; and

the wax is selected from the group consisting of polyolefin waxes, paraffin waxes, and mixed polyolefin and paraffin waxes dispersed in the solvent, and

wherein the flexographic printing ink includes greater than 50% by weight water.

5,534,050
THERMAL INK JET COMPOSITION

Kurt B. Gundlach, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1995, Ser. No. 450,075

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—20 R **16 Claims**

1. An ink jet printing composition containing a liquid vehicle and a colorant and a surfactant comprising 0.3 to 0.6 wt. % acetylenic polyalkylene oxide and 1 to 4 wt % quasisurfactant penetrant based on the wt. of said composition.

5,534,051
SPECIFIC DYE SET FOR THERMAL INK-JET PRINTING

Hiang P. Lauw, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 11, 1995, Ser. No. 500,759

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—22 R **20 Claims**

1. A set of thermal ink-jet inks for thermal ink-jet priming including a cyan ink containing cyan dye and the balance vehicle, said vehicle comprising at least one inorganic salt ranging from about 3 to 11 wt % of said cyan ink and said cyan dye comprising Direct Blue 199 anionic dye associated with tetramethylammonium cation,

wherein said association of said tetramethylammonium cation with said Direct Blue 199 anionic dye serves to reduce crusting of said cyan ink and to maintain solubility of said Direct Blue 199 anionic dye in the presence of said at least one inorganic salt in said vehicle.

5,534,052
POLYMERIC DYESTUFFS AND THEIR USE IN INKS FOR INK JET PRINTING PROCESSES

Winfried Mennicke, Leverkusen, and Karin Hassenrück, Düsseldorf, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 29, 1994, Ser. No. 346,062

Claims priority, application Germany, Dec. 6, 1993, 43 41 455.9

Int. Cl.^{6} C09D *11/02;* C09B *69/10*

U.S. Cl. 106—22 D **11 Claims**

1. A polymeric dyestuff obtainable by reaction of

A) Polyamidoamines having an average molecular weight, determined as the weight-average, of 260 to 10,000, which in turn are obtainable by reaction of reactants consisting essentially of

at least one aliphatic polyamine (I) which contain at least two primary amino groups and at least one secondary amino group,

optionally a diamine (II),

at least one dicarboxylic acid (e) from the group consisting of aliphatic saturated C_2–C_{12}-dicarboxylic acids, aromatic dicarboxylic acids or functional derivatives thereof,

optionally a ω-C_3–C_8-amino-carboxylic acid or a lactam thereof with the proviso that the molar ratio of the sum of primary and secondary amino groups contained in (I) and optionally in II to the carboxyl groups or to the functionally derivated carboxyl groups in (α) is greater than 1, with

B) a dyestuff which contains, per molecule, at least one group which is reactive towards primary and secondary amino groups,

the molar ratio of the sum of primary and secondary amino groups contained in A) to B) being 1 to 15.

5,534,053
COMPOSITION FOR REDUCING OR ELIMINATING STATIC CHARGE IN ADHESIVE FILM

Charles C. Payne, Aurora, and David A. Grattan, LaGrange, both of Ill., assignors to Rodel, Inc., Newark, Del.

Continuation-in-part of Ser. No. 3,524, Jan. 12, 1993, abandoned. This application Jun. 23, 1994, Ser. No. 264,289

Int. Cl.^{6} C08J *3/03;* C08L *93/04*

U.S. Cl. 106—236 **15 Claims**

1. An improved fixturing adhesive composition for producing fixturing adhesive films with reduced static charge comprising:

(a) a solvent carrier having a boiling point no greater than 200° F. under a vacuum of 25 inches of mercury, wherein the solvent carrier is selected from the group consisting of aliphatic esters containing 4–8 carbon atoms;

(b) a fixturing adhesive soluble in the solvent carrier, wherein the fixturing adhesive is a rosin-based material selected from the group consisting of pentaerythtitol ester of a hydrogenated wood rosin, and glycerol ester of a partially hydrogenated wood rosin; and

(c) an antistatic agent.

5,534,054
SILICON TETRAHYDRAZIDE FOR PURIFICATION OF DNA

Daniel L. Woodard, Raleigh, and Adriann J. Howard, Durham, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 785,837, Oct. 31, 1991, Pat. No. 5,329,000. This application Mar. 9, 1994, Ser. No. 209,083

Int. Cl.^{6} C01B *21/068;* **C07H** *21/04;* **C12P** *19/34*

U.S. Cl. 106—287.11 **4 Claims**

1. A kit for purifying DNA comprising a silicon tetrahydrazide compound produced by reacting silicon tetrachloride with hydrazine to completion and a binding solution selected from the group consisting of a chaotrope-free and alcohol-free binding buffer and water.

5,534,055
PROCESS FOR ALPHA-PHASE METAL PHTHALOCYANINE PIGMENTS

Herman Gerson, New York, N.Y., and Abdul Sattar, Mt. Pleasant, S.C., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1994, Ser. No. 295,342

Int. Cl.^{6} C09B *67/50*

U.S. Cl. 106—413 **20 Claims**

1. A process for preparing alpha-phase metal phthalocyanine pigments from crude metal phthalocyanine pigments comprising

(a) acid pasting or acid swelling a crude metal phthalocyanine pigment by
   (i) treating said crude pigment with 4 to 15 parts by weight, relative to the crude metal phthalocyanine pigment, of an aqueous solution of a mineral acid containing 60% to 98% by weight of the mineral acid to form an acidic solution or suspension of protonated pigment,
   (ii) adding the acidic solution or suspension of protonated pigment to 15 to 40 parts by weight, relative to the acidic solution, of a liquid in which the pigment is substantially insoluble, thereby precipitating the pigment, and
   (iii) collecting and drying the precipitated metal phthalocyanine pigment;

(b) dry milling the precipitated metal phthalocyanine pigment in the presence of 5 to 50 parts by weight of a stabilizer per 100 parts by weight of the crude metal phthalocyanine pigment until the average particle size is reduced to less than 0.5 μm;

(c) finishing the milled metal phthalocyanine pigment by thoroughly mixing said milled metal phthalocyanine pigment with a finishing solvent mixture comprising 3 to 6 parts by weight, relative to the crude metal phthalocyanine pigment, of water and 0.4 to 1.0 parts by weight, relative to the crude metal phthalocyanine pigment, of an organic solvent, optionally in the presence of 0 to 45 parts by weight of a stabilizer per 100 parts by weight of the crude metal phthalocyanine pigment, with the proviso that the total amount of stabilizer used in steps (b) and (c) ranges from 5 to 50 parts by weight per 100 parts by weight of the crude metal phthalocyanine pigment; and

(d) isolating the alpha-phase metal phthalocyanine pigment.

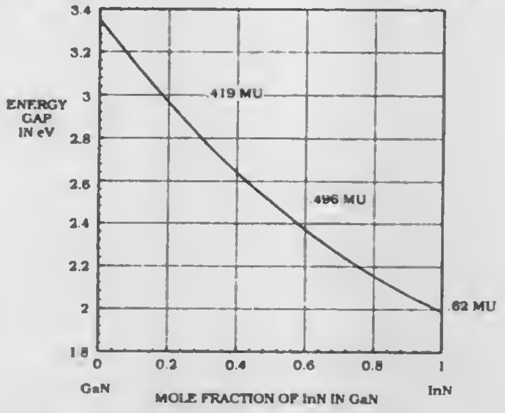
5,534,056
COMPOSITE MEDIA WITH SELECTABLE RADIATION-TRANSMISSION PROPERTIES

Manfred R. Kuehnle, Waldesruh, P.O. Box 1020, Rte. 103A, New London, N.H. 03257, and Hermann Statz, Wayland, Mass., assignors to Manfred R. Kuehnle, New London, N.H.

Filed Oct. 28, 1993, Ser. No. 144,249

Int. Cl.^{6} C08K *3/00*

U.S. Cl. 106—455 **41 Claims**



1. An electromagnetic radiation-absorptive material for blocking passage of selected radiation within a spectral band, the material comprising:

a. a carrier material having a refractive index; and

b. dispersed therein, a particulate material having substantially uniform particle size and exhibiting an absorption cross-section greater than 1 in the spectral band, the particulate material having a refractive index differing from that of the carrier and being present in sufficient volumetric density to substantially block passage of the selected radiation.

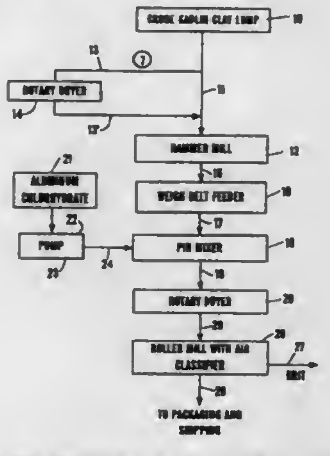
5,534,057
PROCESS FOR TREATING KAOLIN CLAYS FOR PITCH CONTROL AND THE TREATED CLAYS

John M. M. Harrison, Dry Branch; Gary M. Freeman; Carl J. Marshall, Jr., both of Macon, all of Ga.; James C. Marvin, Aiken, S.C., and Albert F. Lareau, Gray, Ga., assignors to J. M. Huber Corporation, Edison, N.J.

Filed Jan. 13, 1995, Ser. No. 372,081

Int. Cl.^{6} C09C *1/42*

U.S. Cl. 106—486 **27 Claims**



1. A process for preparing a chemically treated kaolin clay having a fine particle size suitable for use as a pitch control or anionic trash removal agent in papermaking processes comprising:

(a) providing a fine particle crude kaolin clay in lump form;

(b) comminuting the clay to reduce the particle size of said clay;

(c) thoroughly mixing the clay with a sufficient amount of aluminum chlorhydrate effective to increase the clay's zeta potential to a desired level for pitch control and with sufficient water to increase the moisture level of the clay to an optimum range of values;

(d) removing moisture in excess of that suitable for shipping or necessary to comply with product specifications;

(e) further pulverizing the treated clay to a controlled degree of fineness; and

(f) removing undesirable coarse particles from the dried and pulverized clay employing separation means, such that a level of the coarse particles remain in the product.

5,534,058
STRUCTURAL PRODUCTS MANUFACTURED FROM FLY ASH

William M. Strabala, Arvada, Colo., assignor to Midway Environmental Associates, Inc., Arvada, Colo.

Filed Jan. 27, 1995, Ser. No. 379,949

Int. Cl.^{6} C04B *12/00;14/04*

U.S. Cl. 106—708 **16 Claims**

1. An article of manufacture, comprising a substantially homogenous blend of:

(a) from about 70 to about 85 weight percent Class C fly ash or a mixture of Class c fly ash and Class F fly ash;

(b) from about 15 to about 30 weight percent cellulose-based material;

(c) an adhesive binder; and

(d) up to about 35 weight percent of an inert filler based on the total weight of said fly ash, said cellulose-based material, said adhesive binder and said inert filler;

wherein said article has a density of at least about 60 lb/ft^3.

5,534,059
MACHINABLE PLASTER

Salvatore C. Immordino, Jr., Streamwood, Ill., assignor to United States Gypsum Co., Chicago, Ill.

Filed Mar. 20, 1995, Ser. No. 372,484

Int. Cl.^{6} C04B *11/00*

U.S. Cl. 106—778 **11 Claims**

1. A gypsum composition for machinable plaster comprising a mixture of 50 to 90 percent by weight of calcium sulfate hemihydrate, 1 to 5 percent by weight of a starch, and 5 to 25 percent by weight of a free flowing, water redispersable powder polymer binder wherein the composition forms a machinable cast that is dimensionally stable from room temperature through 250° F. and able to hold a sharp edge and smooth contour and wherein the machinable cast comprises hydrated calcium sulfate crystals and wherein the powder binder coats the crystals and interlocks the crystals together.

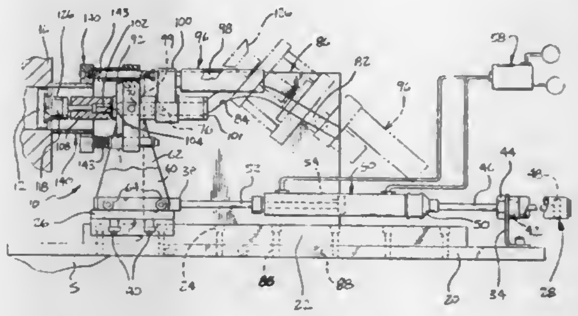
5,534,060
SPIN CUP AND SPIN CUP DRIVE FOR APPLYING VISCOUS MATERIALS

Raymond C. Johnson, Oxford, Mich., assignor to Schenck Turner Inc., Orion, Mich.

Filed Nov. 28, 1994, Ser. No. 345,580

Int. Cl.^{6} B05C *5/00*

U.S. Cl. 118—55 **16 Claims**



1. A spin unit for receiving a quantity of viscous material and for spinning a material distribution member to apply a layer of viscous material onto the wall defining an opening in a workpiece so that a device having an outer periphery sized to fit into said opening can be installed into the opening with the viscous material disposed between the outer periphery thereof and the wall defining said opening, said spin unit comprising a spin cup drive member rotatable about a longitudinal axis, said spin cup drive member having a head portion with an outer end, said head portion of said spin cup drive member having a centralized reservoir in the outer end thereof defined by a confining wall which extends axially from the head portion, said confining wall having a restricted outer opening to define an axial entrance to said reservoir so that viscous material can be supplied into said reservoir, said confining wall having at least one material discharge opening therein sized to normally block the flow of said viscous material therethrough under static conditions and sized to allow the viscous material to flow therethrough in response to centrifugal forces experienced by said material when said spin unit is rotatably driven at selected angular velocities, said confining wall being a truncated conical wall and the truncated end of said conical wall defines said axial entrance leading into said reservoir, said conical wall being configured so as to retain said viscous material in said reservoir until said reservoir and viscous material therein are rotated with sufficient angular velocity and the centrifugal force on said viscous material forces the viscous material to flow through said material discharge opening.

5,534,061
APPARATUS FOR WAXING SNOWBOARDS, SKIS AND THE LIKE

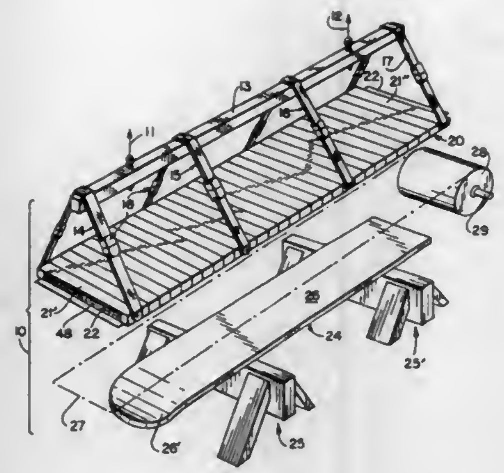
Brian Fitzburgh, 2965 Waverly Dr. #2, Los Angeles, Calif. 90039

Continuation-in-part of Ser. No. 307,298, Sep. 16, 1994, abandoned. This application Jul. 14, 1995, Ser. No. 502,802

Int. Cl.^{6} B05C *21/00*

U.S. Cl. 118—59 **25 Claims**

1. A device for applying wax to the entire surface of a snowboard or ski in a single operation, comprising an elongate mutually articulated plurality of transversely extending members, each of which members is of generally rectangular section defined by an upper surface vertically spaced from a lower surface, and an elongate flexible heating means carried by and secured only to the lower surfaces of said members and providing the only means of



articulating connection between adjacent members of said plurality, the weight of said members in relation to the flexibility of said heating means being such that, upon application of the heating means of said device to an upwardly convex elongate work surface, said members will gravitationally self-adapt said flexible heating means to the convex workpiece surface.

5,534,062

OIL RESERVOIR

Keith Dawson, Bacup, and Robert Hayhurst, Bury, both of, Great Britain, assignors to W. L. Gore & Associates (UK) Ltd., London, United Kingdom

PCT No. PCT/GB93/00563, § 371 Date Jan. 11, 1995, § 102(e) Date Jan. 11, 1995, PCT Pub. No. WO93/20483, PCT Pub. Date Oct. 14, 1993

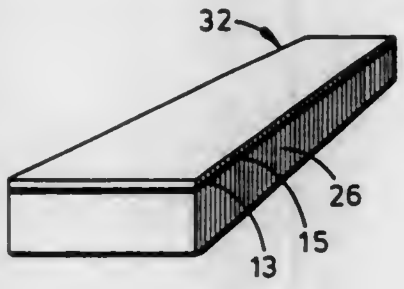
PCT Filed Mar. 19, 1993, Ser. No. 318,644

Claims priority, application United Kingdom, Apr. 7, 1992, 9207571

Int. Cl.^{6} B05C *11/00*

U.S. Cl. 118—60 **6 Claims**

1. An oil supply device for supplying oil to a roll of an image



reproduction machine, which consists of

an oil reservoir formed of an open-cell melamine foam which is free of any reinforcing layer internally within the foam; and

a layer of oil permeation control material extending over the reservoir for controlling supply of oil from the reservoir to the roll, said oil permeation control material being formed of porous polytetrafluoroethylene (PTFE), produced by fusing particles of granular PTFE such as to form a porous integral network of interconnected particles.

5,534,063

APPARATUS FOR REMOVING IMAGE FORMING SUBSTANCE FROM SHEET AND SHEET PROCESSING APPARATUS

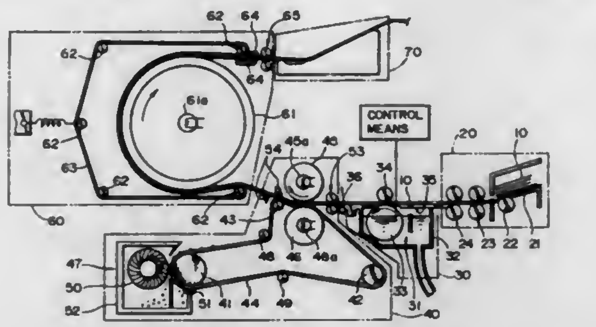
Tooru Maruyama, Fujisawa; Iwao Takahashi, Yokosuka; Masatoshi Saito; Shigeru Fujita, both of Tokyo; Hisao Watanabe; Taro Terashi, both of Sagamihara; Tomoaki Sugawara, Warabi; Masaru Shinkai, Yokohama; Toshiyuki Kawanishi, and Masato Igarashi, both of Numazu, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 21, 1994, Ser. No. 277,267

Claims priority, application Japan, Jul. 21, 1993, 5-201172; Jul. 21, 1993, 5-201173; Jul. 21, 1993, 5-201174; Jul. 21, 1993, 5-201175; Jul. 21, 1993, 5-201176; Jul. 21, 1993, 5-201178; Jul. 21, 1993, 5-201179

Int. Cl.^{6} B05C *1/00*

U.S. Cl. 118—60 **17 Claims**



1. An apparatus for removing an image forming substance stably cohered to a surface of a sheet, comprising:

liquid supplying means for supplying a predetermined amount of a liquid to the sheet carrying the image forming substance;

conveying means for conveying the sheet supplied with the liquid along a transport path by nipping said sheet in a thickwise direction of said sheet;

removing means for removing the image forming substance from the sheet being conveyed by said conveying means, and further comprising drying means for drying the sheet from which the image forming substance has been removed by said removing means, wherein said drying means comprises heating means for heating the sheet, and a pressing member for pressing the sheet against said heating means and moving said sheet,

wherein said liquid supplying means comprises a liquid supply member movable while retaining the liquid on a surface thereof, wherein said liquid supply member comprises a rotatable applicator roller and a sheet regulator roller, wherein said applicator roller and said sheet regulator roller are spaced apart from each other by a predetermined gap, and wherein said predetermined gap is greater than a thickness of the sheet which has been increased due to infiltration of the liquid.

5,534,064

SUPPLYING METHOD OF POWDER PAINTS TO COATERS AND POWDER COATING MACHINE CAPABLE OF PULVERIZING POWDER PAINT PELLETS INTO A SPRAYABLE POWDER

Koichi Tsutsui, Kyoto, Japan, and Samuel A. Rhue, Rocky River, Ohio, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 123,469, Sep. 20, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,776

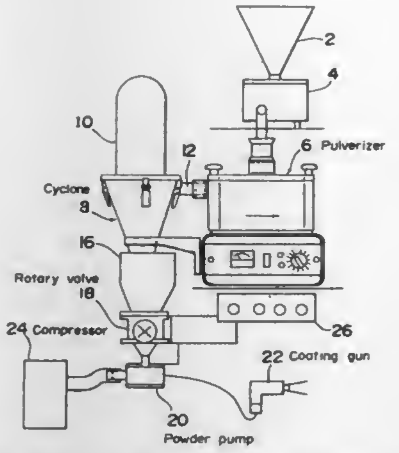
Int. Cl.^{6} B05B *7/14*

U.S. Cl. 118—308. **20 Claims**

1. A powder coating machine for pulverizing paint pellets into a sprayable powder comprising:

supply means for supplying paint pellets;

feeding supply means for feeding said paint pellets from said supply means;



pulverizing means for pulverizing said paint pellets from said feeding means into powder;

classifying means for receiving and for classifying said powder from the pulverizing means into over-size particles and sprayable powder particles;

collection means for collecting and storing said sprayable powder particles from said classifying means;

powder coating means; and

transporting means for transporting said sprayable powder particles from said collection means to said powder coating means.

5,534,065

COATING APPARATUS

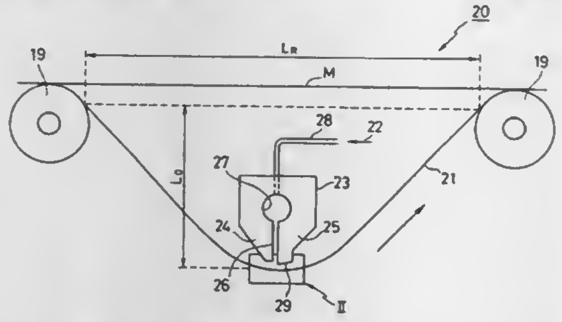
Junichi Masukawa; Nobuyuki Isshiki; Nobunori Ohji, all of Tokyo; Eiten Chin, and Toshiharu Numata, both of Ichigaimachi, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 23, 1994, Ser. No. 294,741

Claims priority, application Japan, Aug. 23, 1993, 5-227856; May 6, 1994, 6-116056

Int. Cl.^{6} B05C *3/02*

U.S. Cl. 118—410 **4 Claims**



1. A coating apparatus comprising;

an upstream lip and a downstream lip defining a slot between said lips through which a coating liquid can be extruded; and

a pair of guide rollers disposed on opposite side of said lips for guiding a support to move past said lips in a downstream direction such that the coating liquid can be applied thereto,

wherein said downstream lip has a coating operation surface facing and curved toward said support and said coating operation surface having a shape expressed by a cubic function

$$y=ax^3+bx^2+cx$$

in coordinates with an origin set at an upstream end of said downstream lip, the x axis taken to be parallel to a tangent to a peripheral surface of said pair guide rollers with the downstream direction being a positive direction, and the y axis taken to be perpendicular to the x axis with a direction opposite to a direction of extrusion of the coating liquid from said slot being a positive direction, wherein constants a, b and c are set as

$$a=\frac{P_1}{\rho V^2-T}\left(\frac{1}{6l_1}\right)$$

$$b=\frac{P_1}{\rho V^2-T}\left(-\frac{1}{2}\right).$$

$$c=\frac{P_1}{\rho V^2-T}\left(\frac{1}{4}(l_l-l_b-l_s)+\frac{1}{12L_R}(l_l+l_b+l_s)(l_l+2(l_b+l_s))\right)$$

where P_1 represents a maximum pressure of the coating liquid at an outlet of said slot, ρ represents a nominal surface density of said support, V represents a running speed of said support, T represents a tension of said support, l_1 represents a length of said coating operation surface, l_s represents a width of said slot, l_b represents a bead length of the coating liquid extruded into between the lip surface of the upstream lip and the support, and L_R represents a distance between said rollers.

5,534,066

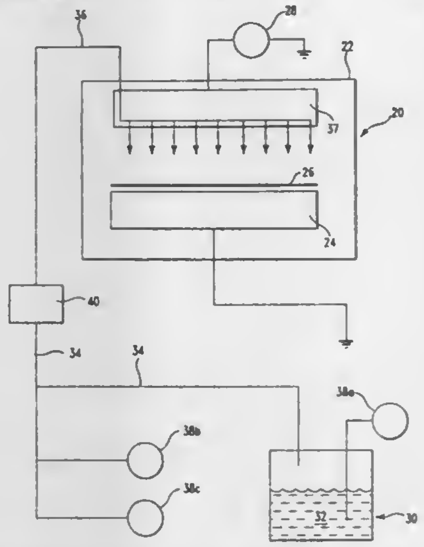
FLUID DELIVERY APPARATUS HAVING AN INFRARED FEEDLINE SENSOR

James A. O'Neill, New City; Michael L. Passow, Pleasant Valley; Tina J. Cotler, Newburgh; Jonathan D. Chapple-Sokol, Poughkeepsie; Richard A. Conti, Mount Kisco, and Jyothi Singh, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1993, Ser. No. 143,228

Int. Cl.^{6} B05C *5/00*

U.S. Cl. 118—663 **15 Claims**



1. An apparatus for processing a layer of material on a workpiece comprising:

a source of reactant fluid;

a reaction chamber including means for supporting said workpiece;

fluid delivery means for feeding an input fluid into said reaction chamber, said input fluid being utilized to process said material, said fluid delivery means including a first conduit in fluid communication with said source of reactant fluid and a second conduit in fluid communication with said reaction chamber; and

an infrared sensor serially connected between and in fluid communication with said first and second conduits for sensing the concentration of a component of said input fluid, said infrared sensor including an infrared light source and an infrared light detector, said infrared light source being positioned to direct a beam of infrared light at said infrared light detector through said input fluid, said infrared light detector including means for producing an electrical output signal indicative of the amount of infrared light received by said detector,

wherein said infrared light source emits light having a wavelength in a predetermined range of infrared wavelengths, and, wherein said infrared sensor includes means for focusing said beam of infrared light on said detector,

wherein said infrared sensor includes means for modulating said beam of infrared light and means for demodulating said electrical output signal, and wherein said means for modulating said beam of infrared light is an optical chopper positioned in the path of said beam and said means for demodulating said electrical output signal is a lock-in amplifier, said lock-in amplifier including means for monitoring the frequency of said optical chopper and being responsive to said monitoring means and said electrical output for producing a demodulated electrical output signal, and

wherein said optical chopper is a rotating element positioned in the path of said beam of infrared light, said element including said first filter and at least a second filter having a bandwidth equal to or less than 100 cm^{-1} centered about a second predetermined wavelength in the infrared range, said first and second filters being positioned to alternately be placed in the path of said beam of infrared light as said rotating element rotates.

5,534,067

SPRAYING SYSTEM FOR SPRAYING PRINTED CIRCUIT BOARDS

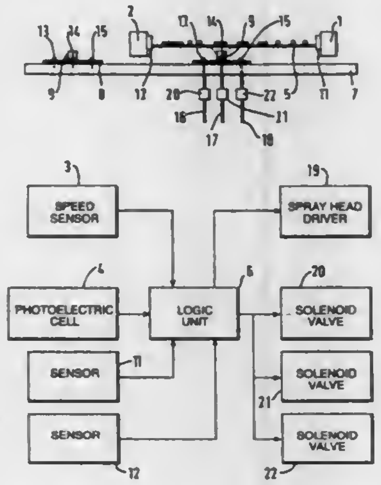
Philip H. Fulker, Aylesford, and Trevor A. Smith, Sheppey, both of, England, assignors to Electrovert USA Corp., Camdenton, Mo.

Filed Feb. 28, 1994, Ser. No. 202,550

Claims priority, application United Kingdom, Mar. 5, 1993, 9304491

Int. Cl.^{6} B05C *11/00*

U.S. Cl. 118—681 **9 Claims**



1. A spraying system comprising a spraying station;

a conveyor positioned and arranged for conveying a series of printed circuit boards through said spraying station, each board having a leading edge and a trailing edge;

a spray nozzle at the spraying station for spraying liquid flux onto a board located at the spraying station;

means for supplying liquid flux to said spray nozzle,

sensing means positioned and arranged to sense the speed of the conveyor and to emit a series of pulses proportional to the sensed speed of said conveyor,

sensing means for sensing the presence of a board on the conveyor;

a logic unit positioned and arranged to count the pulses from the said speed sensing means and being arranged to commence counting pulses when the leading edge of a board is sensed by said board sensing means and to stop the counting of pulses when the trailing edge of the board passes beyond said board sensing means;

said logic unit being further arranged to calculate the length of the board in pulses and the rate of movement and hence the position of the board on the conveyor from said speed sensing means thereby to determine when the leading edge of the board reaches the spraying station and the progress of said board along the conveyor;

means for activating the supply means when the leading edge of the board reaches the spraying station;

means for reciprocating said spray nozzle beneath the board while the board is located at the spraying station;

means for controlling said spray nozzle whereby liquid flux is sprayed from the spray nozzle during reciprocation of the nozzle only when said nozzle is located below the board;

and means for controlling reciprocating movement of said spray nozzle in such a manner that movement of the nozzle in one direction is stopped at one side of the conveyor and movement of the nozzle in the opposite direction is not commenced until said control means receives a signal from the logic unit indicating that the board has moved a predetermined distance on the conveyor with respect to the spraying station.

5,534,068

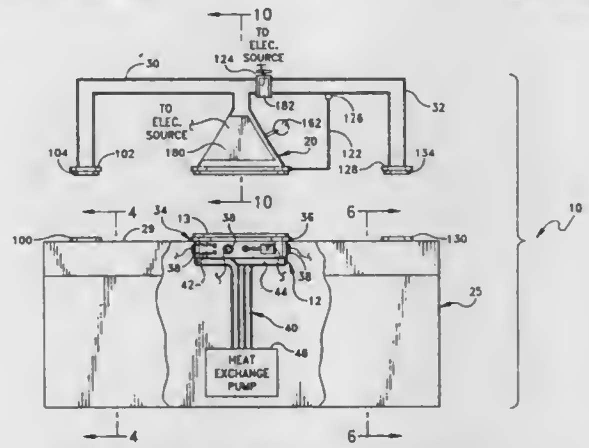
PARYLENE DEPOSITION APPARATUS INCLUDING A TAPERED DEPOSITION CHAMBER AND DUAL VACUUM OUTLET PUMPING ARRANGEMENT

William F. Beach, Bridgewater, N.J.; John Wary, Noblesville, Ind., and Roger A. Olson, Amery, Wis., assignors to Specialty Coating Systems, Inc., Indianapolis, Ind.

Filed Oct. 27, 1995, Ser. No. 549,169

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—719 **6 Claims**



1. A parylene deposition apparatus comprising:

a vacuum chamber system including a vaporization chamber, a pyrolysis chamber coupled to said vaporization chamber, and a deposition chamber having an inlet end and an inlet opening in said inlet end, said inlet opening being coupled to said pyrolysis chamber for receiving a gaseous parylene monomer from said pyrolysis chamber, said deposition chamber having a tapered configuration including a smaller dimension end which defines said inlet end of said deposition chamber, and a larger dimension end which defines an outlet end of said deposition chamber;

a support assembly arranged adjacent the outlet end of the deposition chamber for supporting an article to be coated; and

vacuum means connected to an outlet opening at said outlet end of said deposition chamber for creating sub-atmospheric pressure conditions within said deposition chamber, said pyrolysis chamber and said vaporization chamber, and for drawing vapor flow from said inlet opening through said deposition chamber to said outlet opening, said tapered configuration of said deposition chamber minimizing deposition chamber volume and maximizing flow of monomer vapor over a surface of an article supported on said support assembly.

5,534,069

METHOD OF TREATING ACTIVE MATERIAL

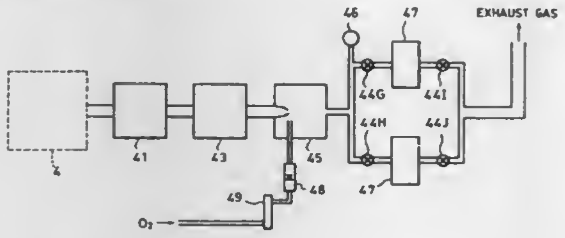
Hideshi Kuwahara, Atsugi; Yasushi Kawasumi, Fujisawa; Tetsuo Asaba, Odawara; Kenji Makino, Yokohama; Yuzo Kataoka, Atsugi; Yasuhiro Sekine, Yokohama, and Shigeru Nishimura, Hiratsuka, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1993, Ser. No. 92,782

Claims priority, application Japan, Jul. 23, 1992, 4-197047; Dec. 25, 1992, 4-346396

Int. Cl.^{6} C23C *16/18;16/46;16/48*

U.S. Cl. 118—719 **10 Claims**



1. An active substance treating device for a film forming apparatus which comprises:

an exhaust pump

a reaction chamber for forming said film, said reaction chamber having means for supplying organic metal material an exhaust path between said exhaust pump and said reaction chamber;

means for introducing an inactivating substance in vapor form to react with said organic metal material into said exhaust pump, wherein the reaction is carried out in said exhaust pump.

5,534,070

PLASMA CVD PROCESS USING A VERY-HIGH-FREQUENCY AND PLASMA CVD APPARATUS

Nobuyuki Okamura; Atsushi Yamagami, both of Kawasaki, and Satoshi Takaki, Komae, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP94/00537, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994

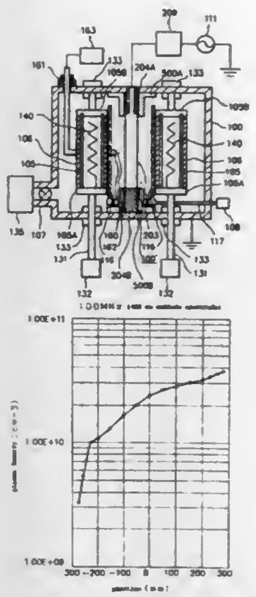
PCT Filed Mar. 31, 1994, Ser. No. 343,560

Claims priority, application Japan, Mar. 31, 1993, 5-074030

Int. Cl.^{6} C23C *16/00;* H05H *1/20*

U.S. Cl. 118—723 E **17 Claims**

12. A plasma CVD apparatus comprising a reaction chamber capable of being substantially vacuumed, a gas feed means for introducing a film-forming raw material gas into said reaction chamber, a plurality of rotatable substrate holders spacedly arranged on a concentric circle in said reaction chamber so as to form a discharge space at the central position of the inside of said reaction chamber, a cathode electrode disposed at the central position of said discharge space, and a high frequency power source, wherein a high frequency power from said high frequency power source is applied to said cathode electrode to produce plasma between a plurality of cylindrical substrates each being positioned on one of said plurality of substrate holders and said cathode electrode to thereby form a deposited film on the surface of each of said plurality of cylindrical substrates, characterized in that an earth shield comprising a non-magnetic material and a soft magnetic material or an insulating material being stacked is disposed at each of the opposite end portions of said cathode electrode, and said reaction chamber is designed to allow a very-high-frequency energy of a frequency range of 60 MHz or more from said high frequency power source to be applied to said cathode electrode.



5,534,071

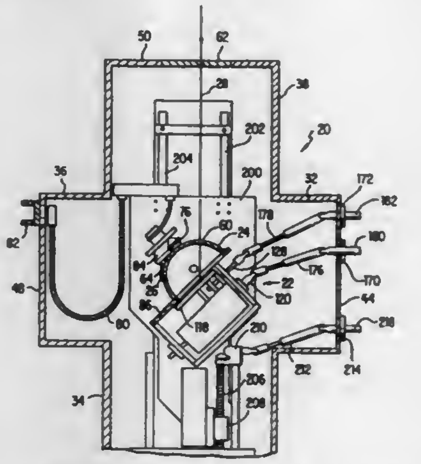
INTEGRATED LASER ABLATION DEPOSITION SYSTEM

Usha Varshney, Radford, and Lawrence H. Decker, Christiansburg, both of Va., assignors to American Research Corporation, Radford, Va.

Continuation-in-part of Ser. No. 852,078, Mar. 13, 1992. This application May 10, 1994, Ser. No. 240,458

Int. Cl.^{6} C23C *14/00*

U.S. Cl. 118—726 **22 Claims**



1. A laser ablation deposition system for depositing material onto a substrate, said system comprising:

a chamber;

a vacuum system connected to said chamber;

a first movable platform for supporting said material, said first movable platform being located within said chamber;

a substrate support structure for supporting said substrate, said substrate support structure being located within said chamber;

a laser for generating a laser beam for ablating said material, such that said material is deposited onto said substrate;

a chamber support structure, wherein said chamber is mounted on said chamber support structure;

a support frame, wherein said laser is supported on said support frame; and

a carriage for vertically moving said first movable platform and said substrate, said carriage being located within said chamber.

5,534,072
INTEGRATED MODULE MULTI-CHAMBER CVD PROCESSING SYSTEM AND ITS METHOD FOR PROCESSING SUBTRATES

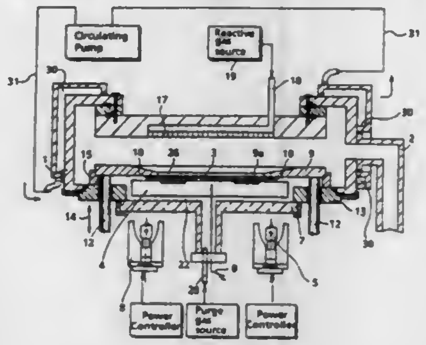
Shigeru Mizuno; Yoshihiro Katsumata, and Nobuyuki Takahashi, all of Fuchu, Japan, assignors to Anelva Corporation, Fuchu, Japan

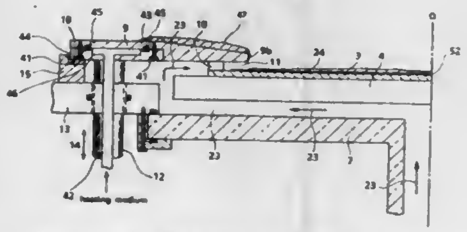
Filed Jun. 16, 1993, Ser. No. 77,687

Claims priority, application Japan, Jun. 24, 1992, 4-190040

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—728 **59 Claims**





1. A CVD processing apparatus comprising:

a reaction vessel having a window made of light-transmissive material;

a substrate holder for holding a substrate in a fixed position, said substrate holder having a backside and is arranged within the reaction vessel such that the backside faces the window;

a ring-shaped member to affix the substrate in the fixed position on the substrate holder;

reactive gas supply means for supplying reactive gas into the reaction vessel;

a plurality of heating means which are arranged at the backside of the substrate holder and outside the reaction vessel;

a purge gas supply means for supplying purge gas from the backside of the substrate holder;

an exhaust means for exhausting the reaction vessel;

a center of the fixed position is positioned at a central axis of the ring-shaped member;

an innermost diameter of the ring-shaped member is smaller than a diameter of the substrate;

the ring-shaped member has at least three contact members for contacting the substrate and a ring-shaped portion, said contact members and ring-shaped portion being arranged such that only the contact members, and not the ring-shaped portion contact the substrate;

a side of each of the contact members that is arranged facing the central axis of the ring-shaped member is located on a circumference of a concentric circle having a diameter larger than the innermost diameter of the ring-shaped member; and

within the reaction vessel, there are passages in which the purge gas flows between the window and the substrate holder, between the substrate holder and the ring-shaped member, and between the ring-shaped member and the substrate.

42. A CVD processing apparatus, comprising:

a reaction vessel having a window made of light-transmissive material

a substrate holder for holding a substrate in a fixed position, said substrate holder having a backside and is arranged within the reaction vessel such that the backside faces the window;

a ring-shaped member to affix the substrate in the fixed position on the substrate holder;

reactive gas supply means for supplying reactive gas into the reaction vessel;

a plurality of heating means which are arranged in a zone at the backside of the substrate holder and outside the reaction vessel for heating the substrate holder; and

a plurality of power controllers, wherein each of said heating means within said zone has a respective power controller for separately controlling electric power to the heating means.

51. A CVD processing apparatus, comprising:

a reaction vessel;

reactive gas supply means for supplying reactive gas into the reaction vessel;

a substrate holder for holding a substrate within the reaction vessel; and

a ring-shaped member for contacting a first surface of the substrate in order to hold a second surface of the substrate in a fixed position against a surface of the substrate holder, said ring shaped member comprises a canopy-like portion and a pedestal-like portion, wherein said canopy-like portion is replaceable separately from said pedestal-like portion.

5,534,073
SEMICONDUCTOR PRODUCING APPARATUS COMPRISING WAFER VACUUM CHUCKING DEVICE

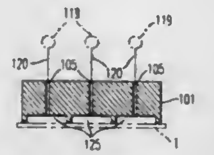
Yoshimi Kinoshita; Tomoyuki Kanda; Katsuhisa Kitano; Kazuo Yoshida; Hiroshi Ohnishi; Kenichiro Yamanishi, all of Amagasaki; Shigeo Sasaki; Hideki Komori, both of Tokyo; Taizo Eshima, Fukuoka; Kouichirou Tsutahara, Itami; Toshihiko Noguchi, Fukuoka; Toru Takahama; Yoshihiko Kusakabe, both of Amagasaki; Takeshi Iwamoto, and Nobuyuki Kosaka, both of Amagasaki, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

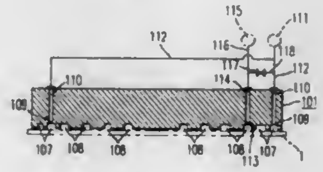
Filed Sep. 7, 1993, Ser. No. 116,968

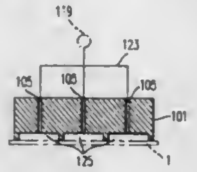
Claims priority, application Japan, Sep. 7, 1992, 4-238313; Dec. 25, 1992, 4-346456; Aug. 9, 1993, 5-197561

Int. Cl.^{6} C23C *16/00;* **B25B** *11/00;* **B23B** *5/22;31/30*

U.S. Cl. 118—728 **9 Claims**







1. A vacuum chucking device in a semiconductor producing apparatus, comprising:

a vacuum chuck main body having a major surface for supporting a semiconductor;

separated grooves formed in the major surface of said vacuum chuck main body;

vacuum evacuation holes spaced in an area of each of the separated grooves of the vacuum chuck main body and leading to the separate grooves;

a vacuum means connected to the vacuum evacuation holes for providing a vacuum to said each of the separated grooves when the semiconductor is to be supported by the vacuum chuck main body; and

wherein, said vacuum means provides said vacuum in said each of the separated grooves at all times when the semiconductor is to be supported and each of at least two of said separated grooves is independently exhausted by a respective separated pump.

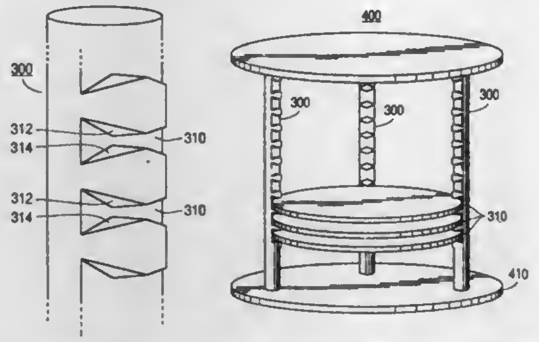
5,534,074
VERTICAL BOAT FOR HOLDING SEMICONDUCTOR WAFERS

John J. Koons, Georgetown, Tex., assignor to Heraeus Amersil, Inc., Duluth, Ga.

Filed May 17, 1995, Ser. No. 442,999

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—728 **13 Claims**



1. A vertical boat for holding semiconductor wafers, comprising:

a plurality of support members, each having at least one slot cut perpendicular to axis extending longitudinally through the support member, each slot having at least one peaked surface,

wherein the slots are aligned so that a wafer can be jointly received by a corresponding slot from each member, thereby allowing the boat to hold the wafers in a stack with both sides of the wafers exposed,

wherein each support member, respective slots, and respective peaked surfaces are monolithic, and wherein peaks of the peaked surfaces extend radially from the support members.

5,534,075
PROCESS FOR THE PRODUCTION OF GLUCOSE

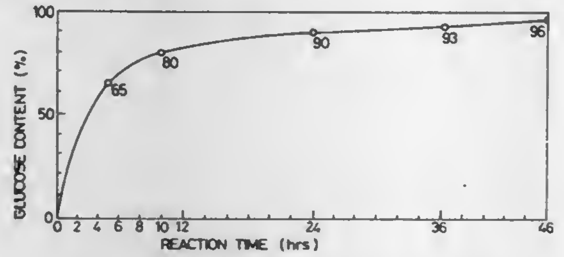
Isamu Miyawaki, and Kikuzo Kaneko, both of Tokyo, Japan, assignors to Organo Corporation, Japan

Continuation of Ser. No. 084,594, Jul. 1, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,206

Claims priority, application Japan, Jul. 7, 1992, 4-201881

Int. Cl.^{6} C13J *1/06;* **C02F** *1/00;1/28;* **B01D** *15/08*

U.S. Cl. 127—46.1 **6 Claims**



1. A process for producing glucose having a purity of 97% or more, comprising the steps of:

(a) subjecting liquified starch to a saccharification reaction with glucoamylase;

(b) discontinuing the saccharification reaction of the liquified starch at a point where the glucose content is in the range of 80 to 93% by weight on a solid basis;

(c) passing the resulting saccharified solution through a softening column in which calcium and magnesium ions present in said solution are replaced with sodium ions of a cation-exchange resin in the sodium form;

(d) passing the softened saccharified solution from step (c) through a chromatography column packed with beads of a cation-exchange resin in the sodium form and thereby eluting an ash-color fraction, an oligosaccharide fraction, and a glucose fraction in this order; and

(e) recovering the resulting glucose fraction as glucose having a purity of 97% or more, the oligosaccharide fraction as starch syrup or an oligosaccharide product and the ash-color fraction as an additive to livestock feed; and optionally

(f) recycling the oligosaccharide fraction eluted in step (d) to the saccharification reaction step (a).

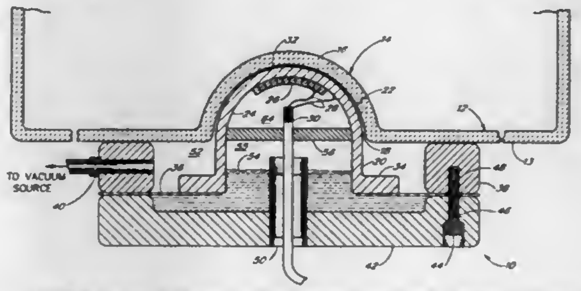
5,534,076
MEGASONIC CLEANING SYSTEM

Mario E. Bran, Garden Grove, Calif., assignor to Verteg, Inc., Santa Ana, Calif.

Filed Oct. 3, 1994, Ser. No. 316,940

Int. Cl.^{6} B08B *3/12*

U.S. Cl. 134—1 **49 Claims**



1. An apparatus for processing semiconductor wafers comprising:

a tank having a wall including a portion forming a transmitter of sonic energy;

a frame mounted to an exterior surface of said tank wall;

a flexible diaphragm extending across and supported by said frame;

a transducer carrier supported on the diaphragm with the carrier having a surface held by said diaphragm adjacent to the transmitter; and

a transducer mounted to an opposite surface of said carrier.

5,534,077
METHOD AND AN APPARATUS FOR THE DISPOSAL OF FOAM MATERIALS CONTAINING PROPELLANTS AND MORE PARTICULARLY OF FOAM MATERIALS SUCH AS POLYURETHANE EMPLOYED AS INSULATING MATERIAL FOR REFRIGERATION DEVICES

Josef Lichtblau, Lerchensir. 8,, D-83620 Feldkirchen-Westerham, and Heinrich Wallner, Laimgrubersir. 1., D-83339 Chieming, both of, Germany

Filed Aug. 11, 1993, Ser. No. 104,029

Claims priority, application Germany, Dec. 11, 1991, 41 40 848.9

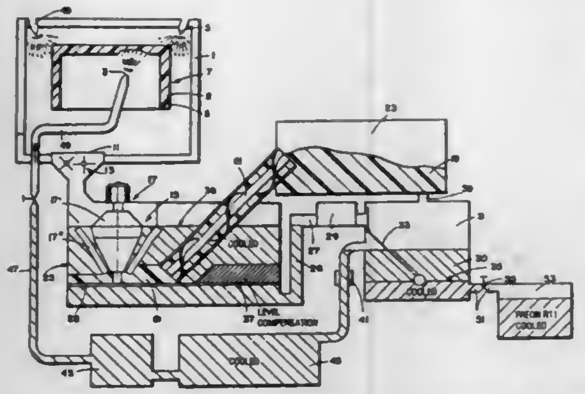
Int. Cl.^{6} A62D *3/00;* **B09B** *3/00;* **C07C** *17/38*

U.S. Cl. 134—7 **21 Claims**

1. A method of recovering polyurethane foam materials containing a blowing agent used as insulation materials from refrigeration appliances without mechanically shredding the appliances and recovering the halogenated hydrocarbon blowing agent therefrom, said method comprising the steps of:

(a) placing the appliance into a closed chamber;

(b) abrading the foam material with a cooled liquid abrading medium at a temperature below the boiling point of the blowing agent thereby detaching the polyurethane resin foam from the appliance, destroying the cell walls of the polyurethane foam, converting the polyurethane foam to flock or



powder and releasing the halogenated hydrocarbon blowing agent as a liquid directly from the foam into the cooled liquid abrading medium; and thereafter

(c) separating and recovering the polyurethane powder or flock and the halogenated hydrocarbon blowing agent from the fluid abrading medium.

5,534,078

METHOD FOR CLEANING ELECTRONIC ASSEMBLIES

Rex Breunsbach, 14732 S.E. 117th. Ave., Clackamas, Oreg. 97015

Filed Jan. 27, 1994, Ser. No. 189,508

Int. Cl.^{6} B08B *3/00*

U.S. Cl. 134—10 **23 Claims**

1. A method of cleaning electronic assemblies positioned within a wash chamber with a fluid having an aqueous component and an immiscible solvent component drawn from a supply tank, the method comprising the steps:

transferring a fluid having a high solvent concentration from the supply tank to the wash chamber;

contacting the assemblies in the wash chamber with the fluid while gradually decreasing the solvent concentration of the fluid by gradually adding additional aqueous component to the fluid.

5,534,079

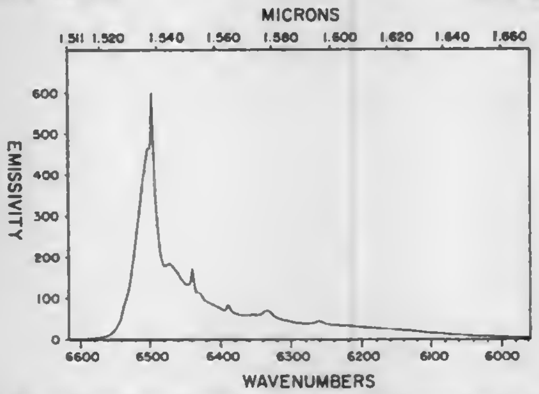
SUPERSATURATED RARE EARTH DOPED SEMICONDUCTOR LAYERS FORMED BY CHEMICAL VAPOR DEPOSITION

David B. Beach, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 940,416, Aug. 31, 1992, Pat. No. 5,322,813. This application Mar. 9, 1994, Ser. No. 207,942

Int. Cl.^{6} C09K *11/77*

U.S. Cl. 148—33 **25 Claims**



1. A rare earth-doped semiconductor layer comprising a semiconductor consisting of silicon, germanium, or silicon-germanium and a rare earth element in substantially a single phase at a concentration which is higher than the equilibrium concentration for a single phase of said rare earth in said semiconductor layer and wherein said layer is substantially free of rare earth silicide and rare earth germanide precipitates.

5,534,080

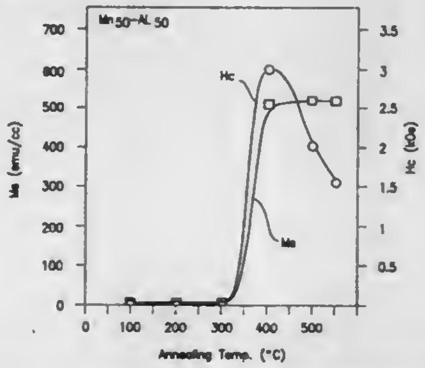
METHOD FOR PRODUCING MN-AL THIN FILMS

Po C. Kuo; Jin H. Huang, and Shang C. Chen, all of Taipei, Taiwan, assignors to National Science Council of Republic of China, Taipei, Taiwan

Filed Jun. 1, 1995, Ser. No. 456,794

Int. Cl.^{6} H01F *1/00*

U.S. Cl. 148—121 **14 Claims**



1. A method for producing a magnetic recording medium comprising the steps of: forming an ε-phase Mn-Al film by magnetron sputtering; and applying a heat treatment on the ε-phase Mn-Al film to transform the film to a τ-phase Mn-Al film having magnetic properties of Ms>300 emu/cc and Hc>600 Oe.

5,534,081

FUEL INJECTOR COMPONENT

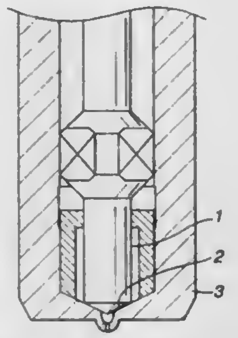
Yosiaki Takagi; Jun Takizawa, both of Saitama-ken, and Katsuaki Fukushima, Shimane-ken, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Hitachi Metals, Ltd., both of Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,433

Claims priority, application Japan, May 11, 1993, 5-132883; Jun. 8, 1993, 5-163980

Int. Cl.^{6} C22C *38/22*

U.S. Cl. 148—325 **14 Claims**



1. A fuel injector component made of a martensite stainless steel for use in a fuel injector for injecting fuel directly into a combustion chamber of a clean-burn gasoline engine, said component being of a composition consisting essentially of, by weight:

0.6 to 1.5% of C;
2.0% or less of Si;
1.0% or less of Mn;
10 to 18% of Cr;
1 to 6% of a member selected from a group consisting of Mo and Mo+(½)W;

a balance of Fe and inevitable impurities; and

wherein said fuel injection component is formed by the following process:

providing a fuel injector component with a desired shape;

hardening the fuel injection component by subjecting the fuel injector component to a temperature of from 1050° to 1100° C.;

cooling the fuel injector component; and

tempering the fuel injector component at a temperature in a range of 450° C. to 550° C. so as to achieve a Vickers hardness at 300° C. of at least Hv 580.

5,534,082

COMPOSITION AND PROCESS FOR TREATING METAL

David Y. Dollman, deceased, late of Bloomsburg, Pa.; Shawn E. Dolan, Sterling Heights, Mich., and Lester E. Steinbrecher, North Wales, Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation of Ser. No. 213,138, Mar. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 131,645, Oct. 5, 1993, Pat. No. 5,356,490, which is a continuation-in-part of Ser. No. 862,012, Apr. 1, 1992, Pat. No. 5,281,282. This application Apr. 21, 1995, Ser. No. 429,431

Int. Cl.^{6} C23C *22/48*

U.S. Cl. 148—247 **40 Claims**

21. A process for treating aluminum and alloys thereof comprising contacting said aluminum with an aqueous liquid composition comprising water and:

(A') from about 0.5 to about 50 g/l of a water soluble or dispersible polymer selected from the group consisting of polyvinyl alcohol, polyethylene glycol, modified starch, and mixtures thereof;

(B') from about 0.5 to about 50 g/l of polymers and copolymers of acrylic and methacrylic acid and their salts;

(C') a component selected from the group consisting of H_2TiF_6, H_2ZrF_6, H_2HfF_6, H_3AlF_6, H_2SiF_6, H_2GeF_6, H_2SnF_6, HBF_4, and mixtures thereof; and, optionally, one or more of the following components:

(D') a component selected from the group consisting of the water insoluble oxides, water insoluble hydroxides, water insoluble carbonates, and water insoluble elemental forms of all of titanium, zirconium, hafnium, boron, aluminum, silicon, germanium, and tin; and

(E') a component selected from the group consisting of water soluble oxides, water soluble carbonates, and water soluble hydroxides of all of Ti, Zr, Hf, B, Al, Si, Ge, and Sn.

5,534,083

METHOD FOR PRODUCING A REINFORCING STAINLESS STEEL WIRE - ALUMINUM ALLOY COMPOSITE STRUCTURE AND A PRODUCT THEREOF

Bum-Goo Chung, Kyungsangnam, and Myung-Ho Kim, Inchun, both of, Rep. of Korea, assignors to Hyundai Motor Co., Ltd., Seoul, Rep. of Korea

Filed May 4, 1995, Ser. No. 434,590

Claims priority, application Rep. of Korea, May 4, 1994, 94-9782

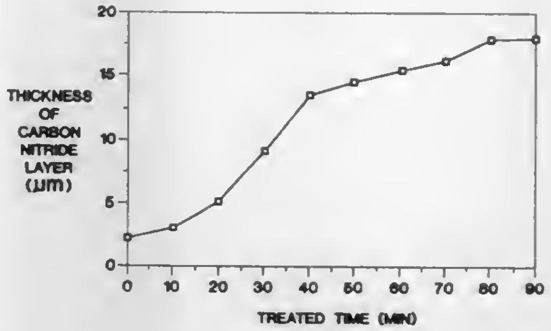
Int. Cl.^{6} C23C *2/12;8/32*

U.S. Cl. 148—218 **4 Claims**

1. A method for producing a reinforcing stainless steel wire—aluminum alloy composite structure, which comprises:

carbon nitriding the surface of a stainless steel wire at a temperature of about 550° C. to 650° C., and

coating the thus treated stainless steel wire with an aluminum alloy to form the stainless steel wire aluminum alloy composite structure.



5,534,084

CONTINUOUS-CAST SLAB AND STEEL PRODUCT HAVING DISPERSED FINE PARTICLES

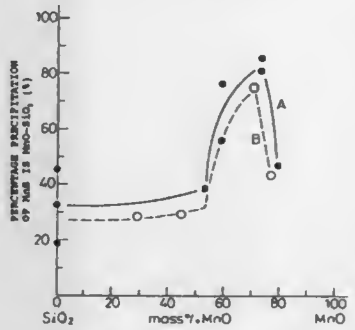
Masamitsu Wakoh; Takashi Sawai, and Shozo Mizoguchi, all of Futtsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 24, 1995, Ser. No. 424,269

Claims priority, application Japan, Feb. 26, 1992, 4-39796

Int. Cl.^{6} C22C *38/04;38/02*

U.S. Cl. 148—328 **5 Claims**



1. A continuous-cast slab having dispersed fine particles, characterized by comprising as main constituents Mn: 0.1 to 3.0% by weight, Si: 0.003 to 1.5% by weight, and S: 0.001 to 0.01% by weight, and including mnS and an oxide, both MnS and the oxide having a diameter of 0.1 to 10 μm, said oxide including Mn oxide and Si oxide with said Mn oxide occupying 50 to 80% of the sum of the Mn oxide and the Si oxide, said MnS and said oxide being dispersed in an amount of 30 to 2000 pieces per mm^2 of section of said cast slab.

5,534,085

LOW TEMPERATURE FORGING PROCESS FOR FE-NI-CO LOW EXPANSION ALLOYS AND PRODUCT THEREOF

Fred P. Cone, Jupiter; Stephen V. Prece, Palm Beach Gardens, both of Fla., and Donn A. Best, Alta Loma, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1994, Ser. No. 233,789

Int. Cl.^{6} C22C *38/52;30/00;* **C21D** *8/00*

U.S. Cl. 148—336 **23 Claims**

1. A method of making a low expansion Fe—Ni—Co superalloy having a substantially uniform microstructure, comprising the steps of:

a) warm forging a low expansion Fe—Ni—Co superalloy at a temperature below that needed to recrystallize said Fe—Ni—Co superalloy; said temperature being between about 1200° F. to about 1700° F.; and

b) recrystallizing said material at a temperature between about 1800° F. to about 1950° F.;

wherein said warm forging step introduces sufficient strain throughout said Fe—Ni—Co superalloy such that after said recrystallizing step said Fe—Ni—Co superalloy has a substantially uniform microstructure.

5,534,086
METHOD FOR MAKING A COBALT-BORIDE DISPERSION-STRENGTHENED COPPER

James S. Andrus, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 170,932, Dec. 21, 1993, Pat. No. 5,435,828. This application May 1, 1995, Ser. No. 432,061

Int. Cl.^{6} B22F ***3/02;9/08;*** **C22F** ***1/08***

U.S. Cl. 148—513 15 Claims

1. A method of making a strengthened copper alloy comprising the steps of:

a) forming a melt comprising copper and 0.01 to 2.0 weight % boron and 0.1 to 6.0 weight % cobalt; and
b) rapidly solidifying said melt at a rate of at least 10,000° F./second to obtain a copper powder having cobalt boride particulate dispersed therein;
c) compacting and warm working said powder to form a warm worked piece; and
d) repeatedly cold rolling and annealing said piece.

5,534,087
METHOD OF PRODUCING CU - AG ALLOY BASED CONDUCTIVE MATERIAL

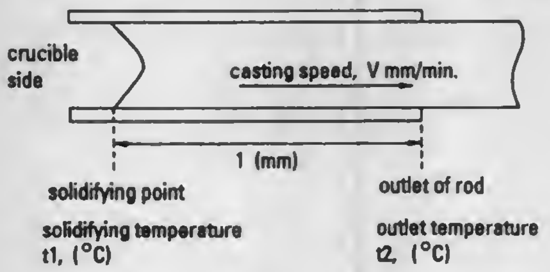
Tooru Hirota, Tokyo; Akira Imai, Kanagawa-ken; Tomoyuki Kumano, Kanagawa-ken; Masamitsu Ichihara, Kanagawa-ken; Yoshikazu Sakai, Ibaraki-ken; Kiyoshi Inoue, Ibaraki-ken, and Hiroshi Maeda, Ibaraki-ken, all of, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kanagawa-ken, and General Director of National Research Institute for Metals, Tokyo, both of, Japan

Filed Sep. 15, 1993, Ser. No. 121,379

Claims priority, application Japan, Sep. 16, 1992, 4-246888

Int. Cl.^{6} C22F ***1/08***

U.S. Cl. 148—554 20 Claims



I. A method of producing a copper-silver alloy based conductive material comprising about 10 at % to about 20 at % of Ag and substance consisting of copper and impurities, said method comprising the steps of:

continuously casting a copper based alloy comprising about 10 at % to about 20 at % of Ag into a cast rod and cooling the cast rod at an average cooling rate wherein substantially no precipitation occurs, wherein said continuous casting is performed in a mold having an outlet, and said average cooling rate is represented by the following equation:

$$R(^\circ\text{C./sec}) = \frac{t_1 - t_2}{\frac{l}{V} \cdot 60}$$

wherein t_1, is a solidifying temperature, t_2 is a temperature in the outlet of said mold, l is a length from a solidifying point to said outlet, and V is a casting speed;

cold working the cast rod to a reduction in area of greater than about 80% to produce a cold-worked rod;

heating the cold-worked rod at a temperature within the range of about 250° C. to about 350° C. for at least about 1 hour to produce a heat-treated rod; and

cold-workiing the heat-treated rod to a reduction in area of greater than about 90% based on the cast rod to form a cold-worked rod having a reduced area.

5,534,088
METHOD OF OPTIMIZING THE DISTRIBUTION OF INHERENT STRESS IN SPRINGS

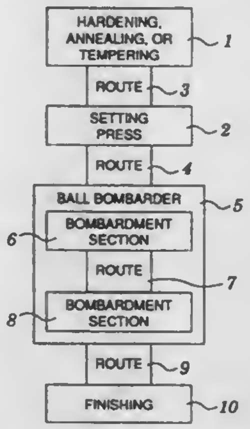
Hans Vondracek, Breckerfeld, Germany, assignor to Hoesch Federn GmbH, Hagen, Germany

Filed Sep. 9, 1994, Ser. No. 303,609

Claims priority, application Germany, Sep. 11, 1993, 43 30 832.5

Int. Cl.^{6} C21D ***7/06;9/02***

U.S. Cl. 148—580 8 Claims



1. A method for optimizing distribution of stress in rod cross-sections of high-strength helical compression springs in vehicle suspensions, comprising the steps of: supplying springs at a gradient of temperature and strength prescribed for a specific rod cross-section; setting the springs; bombarding the set springs; with balls to vary the cross-sectional stress distribution in helical springs by locally demarcated control of the flow threshold in the cross-section of the rod, so that asymmetry of the stress distribution derived from curvature of the springs can be varied; and tempering by sections generating definite temperature contours in the cross-section of the springs to control stress induced during said setting and bombarding steps.

5,534,089
METHOD OF MANUFACTURING SMALL PLANAR ANISOTROPIC HIGH-STRENGTH THIN CAN STEEL PLATE

Chikako Fujinaga; Akio Tosaka; Toshiyuki Kato, and Kaku Sato, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 20, 1994, Ser. No. 360,250

Claims priority, application Japan, Dec. 21, 1993, 5-322410

Int. Cl.^{6} C21D ***8/02***

U.S. Cl. 148—603 11 Claims

1. A method of manufacturing a high-strength can steel plate having small ageing and small planar anisotropic characteristics, comprising the steps of:

hot-rolling a steel slab to obtain a hot rolled steel strip at a hot rolled finished temperature of at least an Ar_3 transformation point said slab having a composition which is essentially comprised of and which satisfies the conditions of: $C \leqq 0.004\%$, $Si \leqq 0.02\%$, $Mn = 0.5\%–3\%$, $P \leqq 0.02\%$, $Al = 0.02\%–0.05\%$, $0.008\% \leqq N \leqq 0.024\%$, with the remainder being Fe and other unavoidable impurities, wherein said conditions have the relationship of: $Al\%/N\% > 2$;

cooling the resultant hot rolled steel strip at a cooling rate of at least 10° C./s so as to at least cool said strip to a temperature of 650° C.

coiling the resultant strip at a temperature in a temperature range from 550° C. to 400° C.;

cold-rolling the resultant strip at a reduction ratio of at least 82%, preceded by removing a scale to obtain cold rolled steel strip;

continuously annealing the resultant cold rolled steel strip at least at a recrystallization temperature and

temper-rolling the resultant cold rolled steel strip.

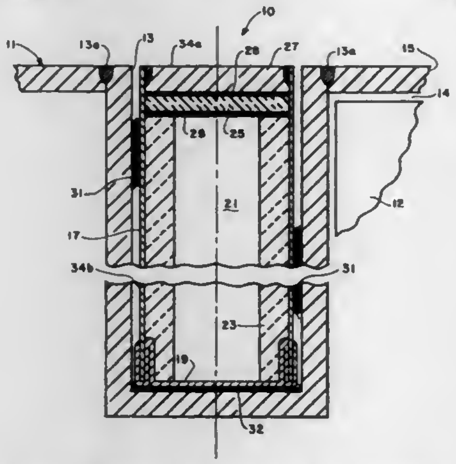
5,534,090
DOSIMETER CAPSULE INDICATING SERVICE LIFE OF A ROCKET MOTOR

Richard B. Leining, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,417

Int. Cl.^{6} G01N ***21/01***

U.S. Cl. 149—15 6 Claims



1. A dosimeter capsule for indicating the condition of solid propellant including a chemical stabilizer, such as contained within a rocket motor or the like, comprising:

a. a sealed expandable container; and
b. a portion of said solid propellant sealed within said expandable container, said portion containing a smaller concentration of chemical stabilizer than that which characterizes the said solid propellant contained within said rocket motor, said portion sized to substantially fill the available volume of said expandable container.

5,534,091
JOINING METHOD OF CERAMICS AND INSERTION MEMBER FOR HEATING AND JOINING FOR USE IN THE METHOD

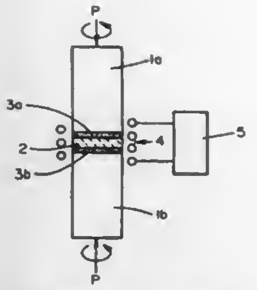
Kouji Okuda, Kobe; Tokumitsu Nishi, Osaka; Hiroshi Takai, Nishinomiya, and Hisakiyo Hoshino, Settsu, all of, Japan, assignors to Daihen Corporation, Osaka, Japan

Continuation of Ser. No. 940,901, Oct. 23, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 281,861

Claims priority, application Japan, Feb. 26, 1991, 3-56140

Int. Cl.^{6} B32B ***31/00***

U.S. Cl. 156—89 3 Claims



1. A method for joining ceramic members comprising the steps of

butting ceramic members to be joined against each other with a sintered heating ceramic member intervened therebetween, a part or the whole of said heating ceramic member having an electric conductivity larger than those of said ceramic members to be jointed, and, thereby constituting an assembled body,

supplying an electric current to an induction heating coil provided in the vicinity of the butting part while pressing said assembled body in the butting direction to heat said heating ceramic member mainly by the induction heating, and

heating said butting part up to a joining temperature needed for joining said ceramic members.

2. A method for joining ceramic members comprising the steps of

butting ceramic members to be joined against each other with a sintering heating ceramic member intervened therebetween via joining agents, a part or the whole of said heating ceramic member having an electrical conductivity larger than those of said ceramic members to be jointed, and, thereby constituting an assembled body,

supplying an electric current to an induction heating coil provided in the vicinity of the butting part while pressing said assembled body in the butting direction to heat said heating ceramic member or said heating ceramic member and said joining agents mainly by the induction heating, and

heating said butting part up to a joining temperature needed for joining said ceramic members.

5,534,092
METHOD OF MANUFACTURING MULTILAYER CERAMIC ELECTRONIC COMPONENT

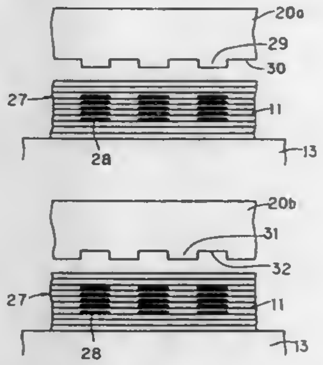
Mamoru Ogawa; Tatsuya Todo, and Miyuki Mizukami, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 1, 1994, Ser. No. 283,948

Claims priority, application Japan, Aug. 5, 1993, 5-194864

Int. Cl.^{6} B32B ***31/20;31/26***

U.S. Cl. 156—89 14 Claims



1. A method of manufacturing a multilayer ceramic electronic component, comprising the steps of:

stacking a plurality of ceramic green sheets being provided with conductor films with each other;

pressing a laminate as obtained along the direction of stacking; and

thereafter firing said laminate,

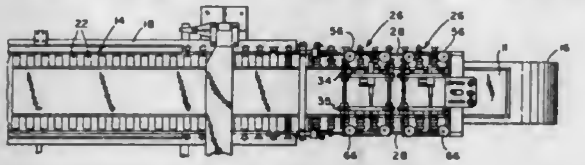
said pressing step including a preliminary pressing step and a main pressing step being carried out subsequently thereto,
said preliminary pressing step including a step of pressing a major surface of said laminate under conditions of a temperature of at least 40° C. and a pressure of not more than 50 kgf/cm^2;
wherein said preliminary pressing step includes a first preliminary pressing step and a second preliminary pressing step being carried out subsequently thereto,
regions of said laminate being provided with said conductor films being mainly pressed in said first preliminary pressing step so that voids are removed from said regions,
at least regions of said laminate being provided with no said conductor films being mainly pressed in said second preliminary pressing step.

5,534,093

METHOD FOR TIRE TREAD APPLICATION

Patrick D. Marks, Cuyahoga Falls, and Michael W. Smith, Mogadore, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 85,306, Jun. 30, 1993, Pat. No. 5,389,187. This application Nov. 14, 1994, Ser. No. 337,986
Int. Cl.^{6} B29D *30/30*
U.S. Cl. 156—128.6 **5 Claims**

1. A method of uniformly stretching a tread along its length, said method comprising the steps of:



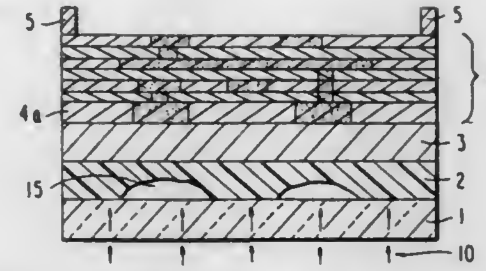
(a) loading said tread between pairs of opposed pressure means for applying force generally perpendicularly to edges of said tread;
(b) urging said pressure means against said edges of said tread;
(c) conveying said tread through said pressure means; and,
(d) controlling said force applied by said pressure means so that constant force is applied to said edges of said tread to uniformly resist movement of said tread through said pressure means wherein said controlling of said force includes urging said pressure means against said edges by a pneumatic piston cylinder, said pneumatic piston cylinder being controlled to deliver a constant force independent of the width of said tread.

5,534,094

METHOD FOR FABRICATING MULTI-LAYER THIN FILM STRUCTURE HAVING A SEPARATION LAYER

Gnanalingam Arjavalingam, Yorktown Heights; Alina Deutsch, Chappaqua; Fuad E. Doany, Katonah; Bruce K. Furman, Beacon; Donald J. Hunt, Pine Bush; Chandrasekhar Narayan, Hopewell Junction; Modest M. Oprysko, Mahopac; Sampath Purushothaman, Yorktown Heights; Vincent Ranieri, Tarrytown; Stephen Renick, Mahopac, all of N.Y.; Jane M. Shaw, Ridgefield, Conn.; Janusz S. Wilczynski, Ossining, and David F. Witman, Pleasantville, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Continuation of Ser. No. 80,085, Jun. 21, 1993, abandoned, which is a division of Ser. No. 695,368, May 3, 1991, Pat. No. 5,258,236. This application Sep. 29, 1994, Ser. No. 314,789
Int. Cl.^{6} B32B *31/28*
U.S. Cl. 156—155 **7 Claims**

1. A method for releasing a workpiece from a substrate comprising the steps of:
providing a substrate which is transparent to a predetermined wavelength of electromagnetic radiation;



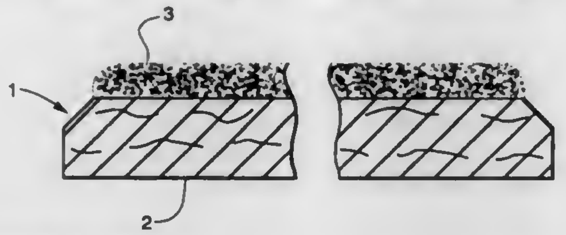
subsequently forming, on said substrate, a separation layer which ablates in response to said predetermined radiation;
providing a workpiece on said separation layer; and
directing said predetermined radiation at said separation layer through said transparent substrate so as to ablate said separation layer and to separate said workpiece from said substrate, without disintegrating said substrate or said workpiece.

5,534,095

TWO LAYERED COMPOSITE EMBOSSED BOARD

David S. Brown, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Division of Ser. No. 291,855, Aug. 17, 1994, Pat. No. 5,441,792. This application Mar. 23, 1995, Ser. No. 408,938
Int. Cl.^{6} B44C *1/24*
U.S. Cl. 156—209 **2 Claims**

2. The method of forming a composite two layer ceiling board comprising the steps of:



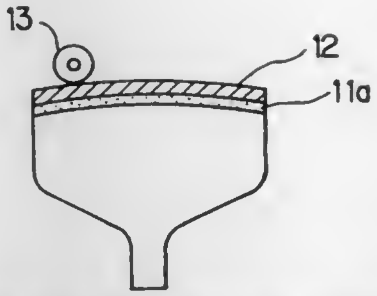
(a) providing a base board comprising a number of ceiling board material elements with an upper surface;
(b) placing a powder material of a formulation comprising at least one of the elements of the base board on the base board upper surface;
(c) after step (b) wetting the powder material with water; and
(d) forming a flat smooth surface in the powder material by using heat and pressure to compact the powder layer.

5,534,096

CATHODE-RAY TUBE APPARATUS AND METHOD OF PRODUCING THE SAME

Tsunenari Saito, Tokyo; Shiro Kenmotsu, and Takuji Inoue, both of Saitama, all of, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 15, 1994, Ser. No. 276,435
Claims priority, application Japan, Jul. 21, 1993, 5-201754
Int. Cl.^{6} B32B *17/06*
U.S. Cl. 156—212 **5 Claims**

1. A method of producing cathode-ray tube apparatus which includes a panel glass surface treating process, said panel glass surface treating process comprising the steps of:
coating a surface of a panel glass which has been subjected to no external polishing with an ultraviolet-curing resin composition which gives a cured material having a refractive index which differs from a refractive index of said panel glass by not more than 0.8%;
providing a light-transmitting film on said ultraviolet-curing resin composition;

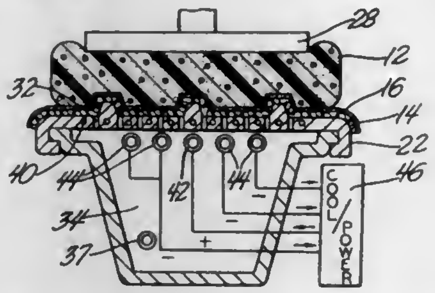


roll pressing the light-transmitting film so as to unify the thickness of the ultraviolet-curing resin composition between the panel glass and light-transmitting film; and
curing said ultraviolet-curing resin composition by irradiation with ultraviolet radiation, thereby integrating said panel glass, ultraviolet-curing resin composition and light-transmitting film into one unit.

5,534,097

METHOD OF BONDING A SEAT TRIM COVER TO A FOAM CUSHION UTILIZING MAGNETIC INDUCTION BONDING

Clarice Fasano, Bloomfield Hills, and Jeffrey J. Frelich, Redford, both of Mich., assignors to Lear Corporation, Meeting Place, Pa.
Filed Sep. 2, 1994, Ser. No. 300,737
Int. Cl.^{6} B32B *31/04;31/20;* **B29C** *65/14*
U.S. Cl. 156—214 **7 Claims**

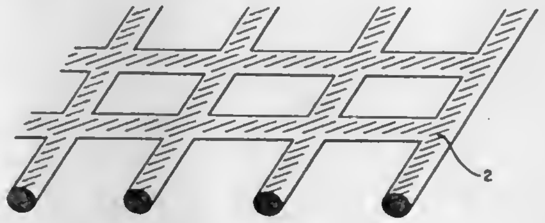


1. A method of bonding a trim layer (14) to a foam pad (12), the method including the steps of:
placing a fabric trim layer (14) over a mold surface of an insulated contoured mold (22);
positioning a removable and separate, adhesive film (16) comprising magnetic particles in an air impervious thermoplastic material between the trim layer (14) and a precontoured foam pad (12) in the mold (22);
applying a vacuum pressure over the mold surface to draw the trim layer (14) and adhesive film (16) against tho mold surface to shape the trim layer (14) and the film (16) to conform with the contour of the foam pad (12);
placing the foam pad (12)onto the shaped adhesive film (40);
producing an oscillating electromagnetic field by excitation of induction coils (40) in the mold (22) to develop a flux between the coils (40) and the magnetic particles in the adhesive film (16) to develop a magnetic flux between the coils (40) and the magnetic particles in the adhesive film to generate hysteresis heat to melt the thermoplastic material;
compressing together the trim layer (14) and adhesive film (16) mid foam pad (12) in the mold (22) to disperse the thermoplastic material and bond the foam pad (22) and trim layer (14);
drawing air through the mold (22) to cool the melted adhesive film (16) and cure the bond between the trim layer (14) and foam pad (12); and
providing an insulated mold (22) with the induction coils (40) embedded therein by non-magnetic material and passing cool liquid through the coils (40) to create energy loss due to eddy currents and hysteresis to heat the adhesive film (16).

5,534,098

PROCESS AND DEVICE FOR PRINTING ON TEXTILES

Thomas Kerle, Furth, Germany, assignor to Eidos Lizenzverwertungs GmbH, Kummersbruck, Germany
Filed Sep. 2, 1994, Ser. No. 300,481
Claims priority, application Germany, Sep. 3, 1993, 43 29 741.2
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—230 **7 Claims**

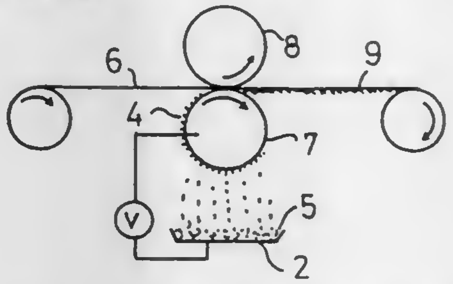


1. A process for printing for producing a transparent imprint on a transparent fabric, comprising the steps of:
(a) applying the ply of the fabric to be printed on onto a base provided with a heat-resistant anti-adhesive coating;
(b) feeding an offset-transfer onto the area of the fabric to be printed on;
(c) covering the areas of the fabric not to be printed on with a thermal insulation layer;
(d) applying pressure directed against the base at least on the offset-transfer at a temperature of more than 90° C. for a period of at least 5 seconds;
(e) relieving at least the printed area of the fabric; and
(f) removing the offset-transfer as well as the thermal insulation layer from the fabric and removing the fabric from the base.

5,534,099

PROCESS FOR PRODUCING HEAT-SENSITIVE STENCIL SHEET

Yasuo Yamamoto, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan
Filed Aug. 1, 1994, Ser. No. 283,600
Claims priority, application Japan, Aug. 2, 1993, 5-191348
Int. Cl.^{6} B41N *1/24;* **B05D** *1/16;1/04*
U.S. Cl. 156—230 **1 Claim**



1. A process for producing a heat-sensitive stencil sheet comprising the steps of:
flocking conjugate polyester binder fibers on the surface of a releasable member electrostatically;
superimposing a thermoplastic resin film on said fibers-flocked releasable member;
thermally compressing the superimposed film and fibers-flocked releasable member to obtain a heat-sensitive stencil sheet; and
removing said releasable member to obtain a heat-sensitive stencil sheet.

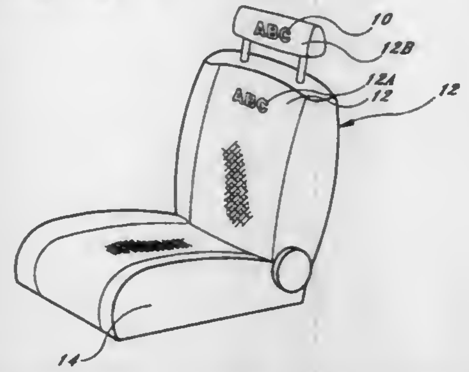
5,534,100
PORTABLE METHOD AND APPARATUS FOR THE APPLICATION OF A FLOCK MATERIAL GRAPHIC TO A FABRIC SURFACE

Larry Mitchell, 5720 McKinley Dr., Garden Valley, Calif. 95633

Filed Sep. 2, 1994, Ser. No. 300,321

Int. Cl.⁶ B44C *1/16*

U.S. Cl. 156—230 2 Claims



1. A method for applying a heat transfer flock material to a seat having a cloth surface thereon at any location on site, comprising the steps of:

(a) selecting a seat having a suitable upholstery cloth surface thereon for transferring a graphic flock material design to said cloth surface without removing the cloth surface from said seat;

(b) applying a solvent to clean the cloth surface in the area where the graphic is to be applied;

(c) selecting a suitable graphic heat transfer flock material of a suitable design to be applied to the cloth surface, said flock material comprising fibrous flock material having an adhesive layer backing, and fixing the flock material design in place on the seat surface with a plurality of straight pins;

(d) covering the graphic flock material design and seat with a heat shield barrier, comprising a teflon glass bead sheet;

(e) applying a heated tool to one area of the flock material graphic design through the heat barrier to apply a heated area of approximately 375° for at least 10 seconds, causing the adhesive on the heat flock material to melt and bond with the seat cloth material;

(f) repeating the heat transfer and application to the graphic design in other areas not previously treated, until the entire area of the graphic design has been heat treated to approximately 375° for at least 10 seconds or sufficient time for all of the adhesive to melt and bond to the cloth surface;

(g) whereby the flock material graphic design is permanently affixed to the cloth surface.

5,534,101
METHOD AND APPARATUS FOR MAKING OPTICAL COMPONENTS BY DIRECT DISPENSING OF CURABLE LIQUID

Barrie P. Keyworth, and James N. McMullin, both of Edmonton, Canada, assignors to Telecommunication Research Laboratories, Edmonton, Canada

Filed Mar. 2, 1994, Ser. No. 204,517

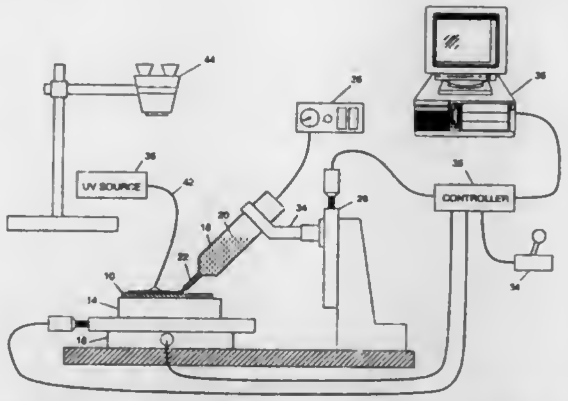
Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—244.12 29 Claims

1. A method of forming an optical element on a substrate used for making optoelectronic circuits, the substrate having a surface layer, comprising the steps of:

controllably ejecting a first curable light guide forming liquid from a nozzle onto the surface layer in a defined pattern; and

curing the first curable light guide forming liquid to form an optical element on the surface layer of the substrate, the optical element forming a light guide having the defined pattern for light passing through or along the substrate.



13. A method of forming an optical element on a substrate, the substrate having a surface layer with an index of refraction n_1, the method comprising the steps of:

controllably ejecting a first curable light guide forming liquid from a nozzle onto the surface layer;

moving the nozzle in a linear pattern over the surface layer of the substrate while ejecting the first curable light guide forming liquid from the nozzle; and

curing the first curable light guide forming liquid to form an optical waveguide on the surface layer of the substrate for guiding light along the linear pattern, the optical waveguide having an index of refraction n_2 greater than n_1.

29. A method of forming an optical element on a substrate used for making optoelectronic circuits, the substrate baving a surface layer, comprising the steps of:

controllably ejecting a first curable light guide forming liquid from a nozzle onto the surface layer; and

curing the first curable light guide forming liquid to form a microlens on the surface layer of the substrate, the optical element forming a light guide for light passing through the substrate.

5,534,102
COMPONENT SUPPLY METHOD

Nobuaki Kadono, and Kenichirou Kidou, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

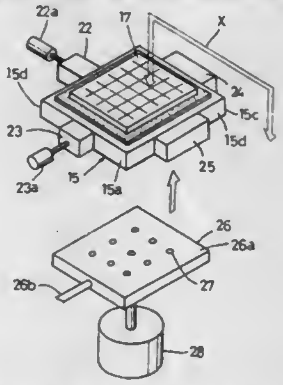
Continuation of Ser. No. 2,270, Jan. 8, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 290,343

Claims priority, application Japan, Jan. 8, 1992, 4-001472

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—250 16 Claims

1. A component supply method comprising the steps of:



providing a pallet having a reference portion comprising side surfaces of the pallet used for locating objects to be mounted on said pallet for processing;

providing an adhesive sheet formed by a base material having a first surface, a second surface, a first adhesive layer made of a foam releasable adhesive and located on said first surface, and a second adhesive layer located on said second surface, said first adhesive layer being capable of having its adhesion reduced by heating, said second adhesive layer not being capable of having its adhesion reduced by heating or only being capable of having its adhesion reduced by an amount less than said first adhesive layer by heating;

sticking said adhesive sheet onto a surface of said pallet while aligning said adhesive sheet to have a predetermined positional relation with respect to said reference portion of said pallet;

sticking a wafer onto said first adhesive layer of said adhesive sheet while aligning said wafer to have a predetermined positional relation with respect to said reference portion of said pallet;

cutting said wafer on the basis of said reference portion thereby obtaining individual components;

reducing adhesion of said first adhesive layer by heating;

positioning the individual components by moving a movable guide member into contact with the side surfaces of the pallet to move the side surfaces of the pallet into contact with a fixed guide member; and

removing said individual components from said first adhesive layer on the basis of said reference portion.

5,534,103
METHOD FOR BONDING OF A CERAMIC BODY AND A METALLIC BODY

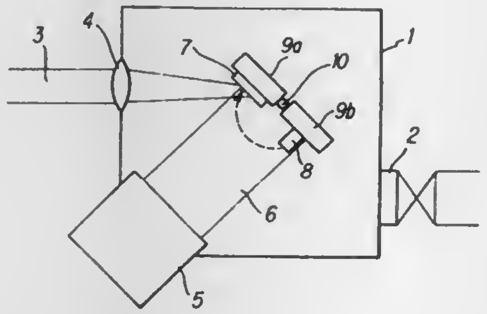
Tetsuo Yano, Takamatsu; Toshihiko Ooie, Kida-gun; Masafumi Yoneda, Takamatsu: Akihiro Utsumi, Ayauta-gun; Munehide Katsumura, and Jun Matsuda, both of Takamatsu, all of, Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,550

Claims priority, application Japan, Oct. 15, 1993, 5-281780

Int. Cl.⁶ B32B *31/28*

U.S. Cl. 156—272.8 2 Claims



1. A method for bonding of a ceramic body and a metallic body which consists essentially of the steps of:

(a) irradiating the surface of the ceramic body in vacuum with a laser beam so as to isolate an inorganic or metallic nonvolatile element which is a decomposition product of the ceramic material in the form of a layer on the surface of the ceramic body;

(b) subjecting the surface of the metallic body which is to be bonded to the surface of the ceramic body of step (a) to a cleaning or activating treatment in vacuum by the bombardment with ions of an inert gas or by irradiation with an excimer laser beam; and then

(c) pressing the surface of the metallic body of step (b) in vacuum at an elevated temperature against the surface of the ceramic body covered with the layer of the inorganic or metallic non-volatile element as the decomposition product of the ceramic material of step (a) to effect pressure welding.

5,534,104
METHOD AND APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS

Hans J. Langer, Gräfelfing, and Johannes Reichle, München, both of, Germany, assignors to EOS GmbH Electro Optical Systems, Planegg, Germany

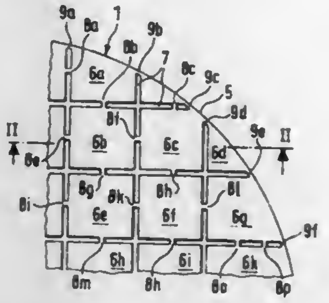
PCT No. PCT/EP93/02709, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO94/07681, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 4, 1993, Ser. No. 244,498

Claims priority, application Germany, Oct. 7, 1992, 42 33 812.3

Int. Cl.⁶ B29C *35/08;41/02*

U.S. Cl. 156—275.5 10 Claims



1. A method for producing a three-dimensional object by solidifying successive layers of said object within a bath of a liquid material by directing electromagnetic radiation onto said material, said method comprising

a) solidifying partial regions of said layer so as to leave narrow liquid intermediate regions between adjacent ones of said partial regions while at the same time connecting said partial regions to corresponding partial regions of a previously solidified layer so as to form multilayered cells,

b) interconnecting adjacent ones of said partial regions of said layer by solidifying narrow connecting regions bridging said intermediate regions in the form of connecting webs, and

c) thereafter solidifying said intermediate regions between said partial regions for completing the solidification of said object.

5,534,105
METHOD AND APPARATUS FOR SEALING APPLIED SCENT SLURRY DURING THE PRINTING PROCESS

Craig A. Boyd, 109-8, Bucks Hill Rd., Waterbury, Conn. 06704

Continuation-in-part of Ser. No. 45,111, Apr. 12, 1993, abandoned. This application Jun. 9, 1994, Ser. No. 257,298

Int. Cl.⁶ B32B *31/08;31/12;35/00*

U.S. Cl. 156—324 18 Claims

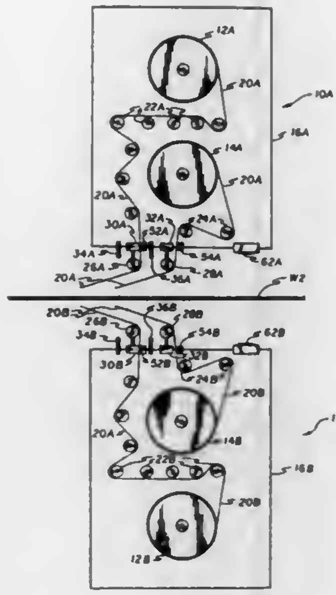
1. A method of imperviously sealing a scent slurry on a continuous web of material from two sheets of impervious material confined in a cabinet during a printing process comprising the following steps:

providing a continuous web of material having a first surface and an opposite second surface during a printing process;

applying a scent slurry to preselected areas on the first surface of the web of material;

providing a cabinet adjacent to said continuous web of material including a first and second spool means, respectively having a continuous first sheet and a second sheet of impervious material rolled thereon for the dispensing of the sheet of impervious material;

continually applying the first sheet of impervious material in an overlying manner to the first surface of the web of material; and adhesively sealing the periphery of the first sheet of impervious material to the first surface of the web of material so that the area of slurry on the first surface of the web of material is completely contained within the sealed periphery of the first sheet of impervious material, thereby imperviously sealing the slurry beneath the first sheet of impervious material; and



continually applying the second sheet of impervious material over the second surface of the web of material to imperviously seal the periphery of said second sheet and sandwich the scent slurry on the web of material between said first continuous sheet of material and said second continuous sheet of material.

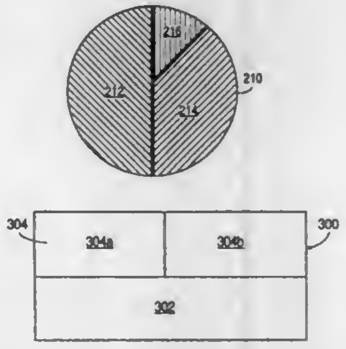
5,534,106
APPARATUS FOR PROCESSING SEMICONDUCTOR WAFERS

William J. Cote, Poughquag, N.Y.; James G. Ryan, Newtown, Conn.; Katsuya Okumura, Poughkeepsie, and Hiroyuki Yano, Wappingers Falls, both of N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1994, Ser. No. 280,818

Int. Cl.^{6} B24B *37/00;* H01L *21/00*

U.S. Cl. 156—636.1 **23 Claims**



1. A method for polishing a semi-conductor wafer having a surface, the method comprising:

disposing the wafer on a rotatable wafer carrier such that rotating motion is imparted to the wafer;

bringing the rotating wafer into contact with a rotating pad divided into a plurality of wedge-shaped sectors having surfaces, the plurality of sectors including an abrasion sector having a relatively rough surface texture and a polishing sector having a relatively fine surface texture; wherein,

the wafer is continuously in alternating contact with each of the sector surfaces during polishing.

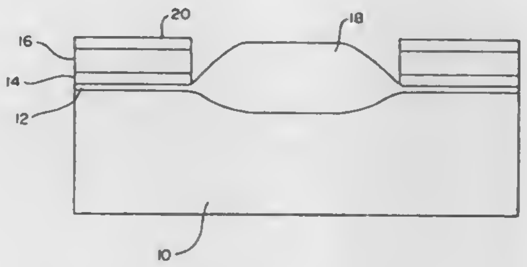
5,534,107
UV-ENHANCED DRY STRIPPING OF SILICON NITRIDE FILMS

David C. Gray, Sunnyvale, Calif., and Jeffery W. Butterbaugh, Chanhassen, Minn., assignors to FSI International, Chaska, Minn.

Continuation-in-part of Ser. No. 259,542, Jun. 14, 1994. This application Aug. 18, 1994, Ser. No. 292,359

Int. Cl.^{6} H01L *21/00;* C03C *15/00;* B44C *1/22*

U.S. Cl. 156—643.1 **35 Claims**



1. A method of removing silicon nitride from a substrate, the method comprising

placing the substrate in a gaseous environment comprising at least one first gas and at least one second gas, the first gas being a fluorine-containing gas which can be photodissociated by UV radiation to produce atomic fluorine and the second gas being a chlorine-containing or a bromine containing gas which can be photodissociated by UV radiation to produce atomic chlorine or bromine, and

exposing the substrate to UV irradiation in the presence of the gaseous environment.

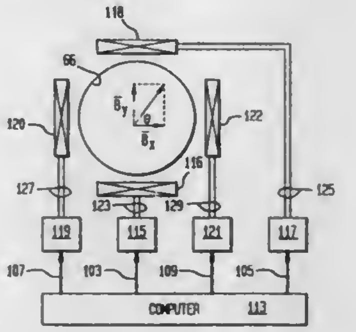
5,534,108
METHOD AND APPARATUS FOR ALTERING MAGNETIC COIL CURRENT TO PRODUCE ETCH UNIFORMITY IN A MAGNETIC FIELD-ENHANCED PLASMA REACTOR

Xue-Yu Qian, Milpitas; Gerald Yin, Cupertino; Graham W. Hills, Los Gatos, and Robert Steger, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 69,049, May 28, 1993, abandoned. This application Mar. 7, 1995, Ser. No. 400,468

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 156—643.1 **28 Claims**



1. A method of uniformly etching the surface of a substrate with a magnetic field enhanced plasma etcher, comprising:

generating a plasma within a chamber for etching a substrate contained within the chamber; and

generating a rotating magnetic field over the substrate variable in amplitude or velocity over selected regions of the substrate during each cycle of rotation of the magnetic field to improve uniformity of etch of the substrate in said regions.

5,534,109
METHOD FOR ETCHING HGCDTE SUBSTRATE

Koji Fujiwara; Gen Sudo, and Kenji Arinaga, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 11, 1994, Ser. No. 320,249

Claims priority, application Japan, Dec. 28, 1993, 5-336959

Int. Cl.^{6} H01L *21/306;* B44C *1/22*

U.S. Cl. 156—643.1 **6 Claims**

1. A method for etching a mercury cadmium tellurium substrate comprising the steps of:

a) forming a gas containing molecules having a bond of nitrogen and hydrogen into a plasma; and

b) etching the mercury cadmium tellurium substrate using the plasma as an etching gas.

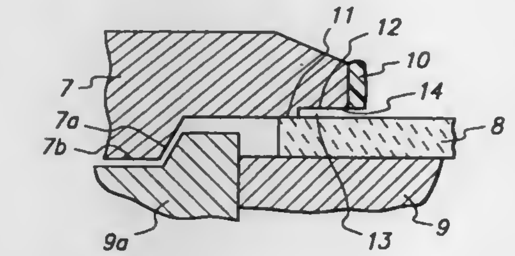
5,534,110
SHADOW CLAMP

Eric H. Lenz, Palo Alto, and Henry Brumbach, Fremont, both of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed Jul. 30, 1993, Ser. No. 99,314

Int. Cl.^{6} H05H *1/00;* B25B *5/00*

U.S. Cl. 156—643.1 **11 Claims**



1. A method of treating a wafer in a plasma reaction chamber, the plasma reaction chamber including at least one bas inlet means for introducing processing gas into the reaction chamber and plasma generating means for activating the processing gas to form a plasma in the reaction chamber, comprising steps of:

clamping a clamping member against an outer periphery of a wafer in the plasma reaction chamber, the clamping member including a clamping portion and a shadow portion, the clamping portion being clamped against the outer periphery of the wafer and the shadow portion extending over the wafer with a gap between the wafer and the shadow portion, the gap being in fluid communication with an interior of the plasma reaction chamber and the gap being dimensioned to prevent built-up deposits on an inner edge of the clamping member from contacting the wafer during the clamping step; and

treating the wafer by introducing a plasma processing gas into the plasma reaction chamber and activating the plasma generating means to form plasma.

5,534,111
THERMAL ISOLATION MICROSTRUCTURE

G. Benjamin Hocker; James O. Holmen, and Robert G. Johnson, all of Minnetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 29, 1988, Ser. No. 172,118

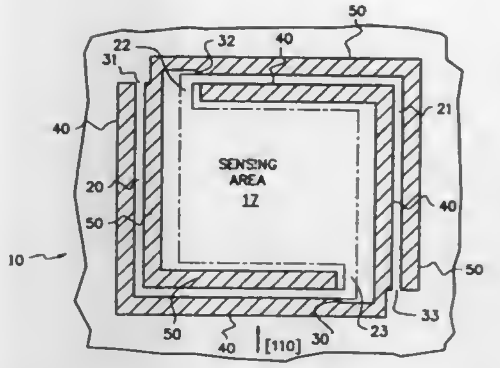
Int. Cl.^{6} B44C *1/22;* C23F *1/02*

U.S. Cl. 216—15 **6 Claims**

1. A process for fabricating a thermal isolation microbridge used as an infrared radiation detection element, the steps comprising:

providing a monocrystalline silicon substrate wafer having a planar surface;

depositing a thin film silicon nitride layer on said surface;



depositing and delineating a thin film layer of temperature-sensitive, electrically-resistive material for a sensor and electrode leadout on said silicon nitride layer;

depositing a further thin film silicon nitride layer over said material and said first silicon nitride layer;

depositing a thin absorber layer over the last deposited silicon nitride in the area of the sensor;

depositing and delineating a thin film photo-lithographic mask;

making a plurality of silicon nitride cuts outlining the elongated legs containing the electrode leadout and the support tabs for the microbridge;

dry etching the legs and the support tabs to remove about ½ the thickness of silicon nitride;

introducing anisotropic etchant through said cuts and anisotropically etching away silicon to form a pit beneath the microbridge sensor and legs;

removing the thin film photolithographic mask with a liquid etch;

etching with a plasma dry etch the exposed silicon nitride on said elongated legs to remove the Si_3N_4 down to the electrode leadouts, which act as an etch stop to the dry etch, the plasma dry etch also removing the Si_3N_4 of the leg extending laterally of the electrode.

5,534,112
METHOD FOR TESTING ELECTRICAL PROPERTIES OF SILICON SINGLE CRYSTAL

Izumi Fusegawa; Hirotoshi Yamagishi; Nobuyoshi Fujimaki, and Yukio Karasawa, all of Gunma-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 796,385, Nov. 22, 1991. This application May 5, 1994, Ser. No. 238,722

Claims priority, application Japan, Nov. 22, 1990, 2-320467

Int. Cl.^{6} H01L *21/306*

U.S. Cl. 156—662.1 **2 Claims**

1. A method for testing electrical properties of a silicon single crystal comprising:

(a) pulling up a silicon semiconductor single crystal by the Czochralski method or the floating zone pulling method,

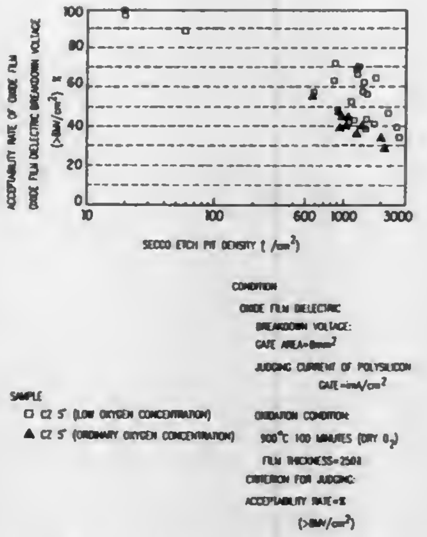
cutting a wafer from said single crystal,

etching the surface of the wafer with a mixed solution of hydrofluoric acid and nitric acid thereby relieving said wafer of strain,

selectively etching the surface of the wafer in a mixed solution of $K_2Cr_2O_7$, hydrofluoric acid, and water without agitation, and

counting the number of scale-like patterns consequently appearing on the surface of the wafer;

(b) obtaining a correlation of the number of scale-like patterns to the acceptability rate of oxide film dielectric breakdown voltage, wherein the number of scale-like patterns is obtained, independent of the step (a), by the same selective etching technique as recited in the step (a) with respect to a plurality of wafers; and



(c) evaluating the acceptability of oxide film dielectric breakdown voltage from the number of scale-like patterns counted in the step (a) on the basis of said correlation obtained in the step (b).

5,534,113

FORMING SOLUTIONS

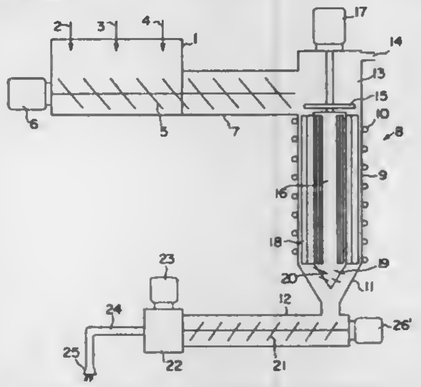
Michael C. Quigley, Coventry, United Kingdom, and Rainer F. Naef, Dietikon, Switzerland, assignors to Courtaulds Fibres (Holdings) Limited & Buss AG, London, United Kingdom

Continuation of Ser. No. 121,308, Sep. 14, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 410,035

Claims priority, application United Kingdom, Sep. 17, 1992, 9219693

Int. Cl.^{6} B01D *1/22*

U.S. Cl. 159—49 **9 Claims**



1. In a method of forming a solution of cellulose in a tertiary amine N-oxide which comprises the steps of:

(a) forming a premix of a tertiary amine N-oxide, water and cellulose,

(b) heating the premix under a pressure lower than atmospheric in a vertically mounted thin-film evaporator having a heated inner surface and a central shaft with paddle blades disposed along the shaft so that, on rotation of the shaft, material in the evaporator will be contacted by a plurality of blades annularly spaced around the shaft,

(c) evaporating the water from the premix to a level such that the cellulose forms a solution in the amine oxide and

(d) removing the solution form the thin-film evaporator,

wherein the improvement consists essentially of using a heated inner surface with an area in the range of 1 m^2 to 125 m^2, rotating a rotor such that the tips of the blades have a linear speed of 2.5 m/sec to 8 m/sec, ensuring a circumferential spacing between the tips of adjacent blades in the range of 65 mm to 175 mm, applying a vacuum in the range 25 millibars to 100 millibars and heating the heated inner surface to a temperature such that, under the conditions of applied vacuum, the solution is removed at a temperature in the range 90° to 135° C.

5,534,114

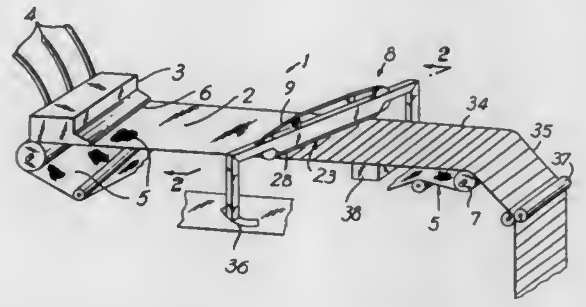
METHOD AND APPARATUS FOR APPLYING A MATERIAL TO A WEB

Edwin L. Cutright, Powhatan; G. Robert Scott, Midlothian, and Howard W. Vogt, Jr., Providence Forge, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 6, 1992, Ser. No. 847,375

Int. Cl.^{6} D21H *19/66;19/68*

U.S. Cl. 162—139 **45 Claims**



1. A method of applying a fluid material to a substrate, comprising the steps of:

(a) moving said substrate along a first path;

(b) moving at least one orifice along a second endless path, said second endless path including a second path portion which transversely crosses said first path;

(c) retaining a supply of fluid material under pressure, said retaining step including the step of disposing said supply of fluid material under pressure along said second path portion; and

(d) discharging said fluid material under pressure from said at least one orifice and onto said substrate by communicating said retained supply of fluid material under pressure with said at least one orifice while said at least one orifice moves along said second path portion so that said fluid material is applied continuously and transversely onto said substrate as said at least one orifice moves along said second path portion.

5,534,115

PROCESS FOR PRESERVING THE MECHANICAL STRENGTH PROPERTIES OF CHEMICAL PAPER PULPS

Marc Hoyo, Cuesmes; Marcel Robberechts, Beersel, and Paul Essemaeker, Brussels, all of, Belgium, assignors to Interox International (Société , Brussels, Belgium

PCT No. PCT/EP91/01906, § 371 Date Apr. 15, 1993, § 102(e) Date Apr. 15, 1993, PCT Pub. No. WO92/07139, PCT Pub. Date Apr. 30, 1992

PCT Filed Oct. 4, 1991, Ser. No. 39,146

Claims priority, application Belgium, Oct. 17, 1990, 09000985

Int. Cl.^{6} D21C *9/147;9/16*

U.S. Cl. 162—65 **10 Claims**

1. A process for preserving the mechanical strength properties of a chemical kraft paper pulp during a delignification and bleaching treatment by means of a peroxidic reagent, comprising:

a first stage for delignifying and bleaching said chemical kraft paper pulp with a peroxidic reagent in an acidic medium,

a second stage treating said delignified and bleached chemical kraft paper pulp with a reducing compound, and

a third stage for further delignifying and bleaching said chemical kraft paper pulp with a peroxidic reagent in an alkaline medium.

5,534,116

COMPACT PRESS SECTION WITH CLOSED DRAW OF THE WEB IN A PAPER MACHINE

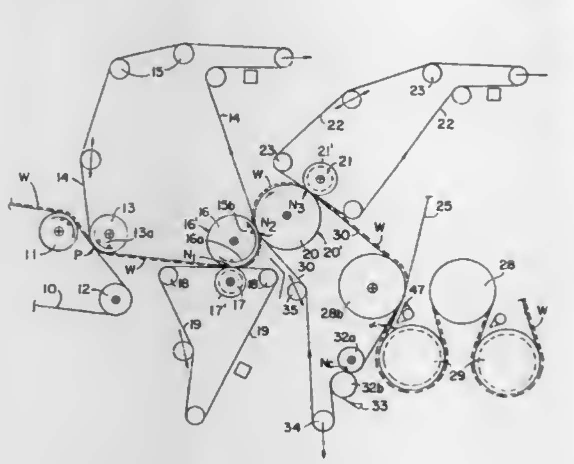
Mikko Karvinen, Vihtavuori; Reima Kerttula, Muurame; Jorma Laapotti, Palokka, and Juhani Pajula, Jyvaskyla, all of, Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Division of Ser. No. 25,190, Mar. 2, 1993, Pat. No. 5,393,383, which is a continuation-in-part of Ser. No. 829,989, Feb. 3, 1992, Pat. No. 5,240,563. This application Oct. 20, 1994, Ser. No. 326,581

Claims priority, application Finland, Dec. 19, 1991, 916026

Int. Cl.^{6} D21F *3/04*

U.S. Cl. 162—274 **17 Claims**



1. A closed press section in a paper machine, comprising

a compact combination of press rolls defining press nips with each other, one of said press rolls being a center roll,

a plurality of fabrics supporting a web, one of said fabrics comprising a transfer band defining a closed loop around said center roll, said transfer band having an outer face upon which the web is transferred,

at least a last one of said press nips being defined between said center roll and another one of said press rolls, a closed loop of said transfer band being passed around said center roll, said transfer band defining a closed draw located after said last press nip in said compact combination of rolls, the web being constantly supported in said closed draw,

said transfer band comprising a fabric which substantially does not receive water such that said transfer band does not rewet the web, said outer face of said transfer band fabric having web-adhesion properties such that, after said last nip, the web follows said transfer band fabric in a straight run,

a drying cylinder arranged inside said loop of said transfer band and after said straight run in the running direction of the web such that said transfer band carries the web over a sector of said drying cylinder, and

directing means for directing a drying wire over said sector of said drying cylinder into engagement with the web carried on said transfer band, a loop of said drying wire being devoid of any roll directly opposite said drying cylinder, said directing means and said drying cylinder being arranged relative to one another such that the web is detached from said transfer band fabric in said sector and directly transferred onto said drying wire that carries the web further into a drying section following said press section.

5,534,117

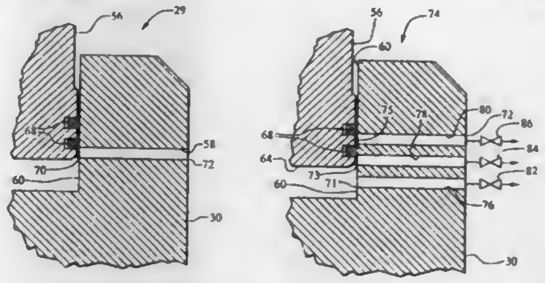
POSITION CONTROL FOR SELF-LOADING ROLL

Arnold J. Roerig, Gold Canyon, Ariz., assignor to Beloit Technologies, Inc., Wilmington, Del.

Continuation of Ser. No. 293,978, Aug. 22, 1994, Pat. No. 5,447,605. This application Jun. 8, 1995, Ser. No. 489,018

Int. Cl.^{6} D21F *3/08;3/00;* **B21B** *29/00*

U.S. Cl. 162—358.3 **8 Claims**



1. In a papermaking machine having a first cylindrical roll and a nip member supported on a stationary cross head, wherein the nip member engages a paper web between the first cylindrical roll and the nip member, defining a nip therebetween, and a piston mounted within a piston cavity formed in the cross head which is operable to move in a nipwad direction toward and away from the nip, the improvement comprising:

a first port extending from the piston cavity through the cross head;

a second port extending from the piston cavity through the cross head, wherein the second port is spaced form the first port away from the nip; and

a valve which is operable to selectively block the first port, wherein hydraulic fluid introduced into the piston cavity may escape from the piston cavity to a low pressure vent area through either the first or the second port depending on the state of the valve when the piston is positioned within the cavity so as to uncover said first or second port, such that the piston may be advanced nipward a limited amount in response to the introduction of hydraulic fluid into the piston cavity.

5,534,118

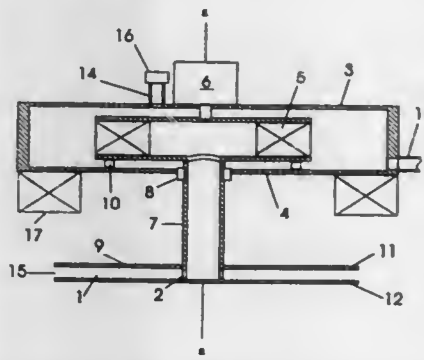
ROTARY VACUUM DISTILLATION AND DESALINATION APPARATUS

Wilmot H. McCutchen, P.O. Box 701129, Houston, Tex. 77270

Continuation of Ser. No. 929,286, Aug. 13, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 207,800

Int. Cl.^{6} B01D *3/10*

U.S. Cl. 202—205.000 **13 Claims**



1. An apparatus for vacuum distillation, comprising a combination of:

means for creating a vortex in a distilland about an axis of rotation;

means for defining an afferent mesial passage,

the afferent mesial passage having an inlet distal to said axis of rotation and an outlet proximal to said axis of rotation, the outlet communicating with an inlet of a pump, and the inlet communicating with the distilland,

said means for defining an afferent mesial passage being selected from the group consisting of
parallel disks,
conical elements,
tubes, and
a hollow disk, wherein the hollow disk being centered on the axis of rotation and having tubular passages through at least one of its surfaces, the inlet of said tubular passages being the inlet of the afferent mesial passage;

means for pumping vapor radially inward through the afferent mesial passage so as to remove vapor continuously from the surface of the distilland across the inlet of the afferent mesial passage, thereby allowing for continuous evaporation of the distilland at said surface; and

means for condensing vapor to produce a distillate;

wherein the vapor pressure of a distillate is created through opposed centrifugal and centripetal forces in the distilland, the centripetal force being due to said means for pumping vapor and the centrifugal force being due to said means for creating a vortex in the distilland, with said opposed forces being focussed through the afferent mesial passage.

10. Apparatus for desalination of salt water, comprising:

a rotatable distilland pump comprising at least two parallel disks defining between them an afferent mesial passage at least in part in a plane normal to the axis of rotation of the distilland pump,

a vapor pump having an inlet and an outlet,

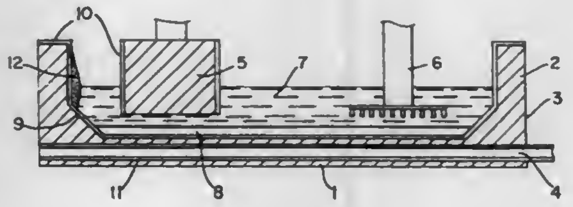
means for rotating the vapor pump and the distilland pump,

a hollow shaft connecting the vapor pump and the distilland pump, the shaft having a bore communicating with both the inlet of the vapor pump and the afferent mesial passage, such that a closed path exists through the afferent mesial passage and through the bore into the inlet of the vapor pump, and

means for condensing water vapor, said condensing means communicating with the outlet of the vapor pump.

5,534,119
METHOD OF REDUCING EROSION OF CARBON-CONTAINING COMPONENTS OF ALUMINUM PRODUCTION CELLS

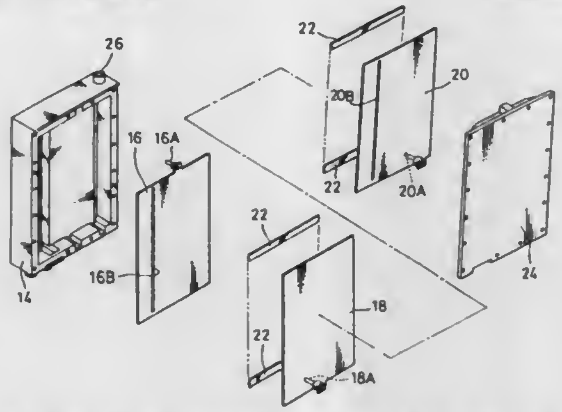
Jainagesh A. Sekhar, 2310 E. Hill Ave., Cincinnati, Ohio 45208
Continuation-in-part of Ser. No. 898,052, Aug. 12, 1992, Pat. No. 5,364,513. This application Jun. 6, 1994, Ser. No. 254,289
Claims priority, application WIPO, May 28, 1993, PCT/US93/05142
Int. Cl.^{6} C25C *3/06;3/08*
U.S. Cl. 205—372 **19 Claims**



1. A method of using for the prevention of erosion, a carbon-containing cell component of a cell for production of aluminum by electrolysis of alumina dissolved in a molten electrolyte, said component having a coating of particulate refractory hard metal boride in a colloid applied from a slurry of the particulate refractory hard metal boride in a liquid colloidal carrier, wherein said erosion is physical erosion due to movement of molten aluminum and molten electrolyte and does not include any chemical attack or reaction.

5,534,120
MEMBRANELESS WATER ELECTROLYZER

Shigeru Ando; Hisato Haraga; Hidetaka Miyahara; Junji Tanaka, and Hiroshi Takamatsu, all of Kita-kyushi, Japan, assignors to Toto Ltd., Fukuoka, Japan
Filed Jul. 3, 1995, Ser. No. 497,742
Int. Cl.^{6} C02F *1/46;* **C25B** *1/26;15/08*
U.S. Cl. 205—464 **19 Claims**



18. A process for producing chlorinated acidic water by the electrolysis of an aqueous solution of sodium chloride, said process comprising the steps of:

providing a flow path having a slit-shaped cross-section and having an upstream end and a downstream end, said flow path being defined by first and second opposite surfaces, said surfaces being spaced apart from one another at a distance small enough to establish a laminar flow when fluid is allowed to flow therethrough;

positioning planar cathodic and anodic electrodes with the working surfaces thereof in flusb with said first and second surfaces, respectively;

providing a slit-shaped recovery port opening onto the downstream region of said second surface and extending perpendicular to the direction of flow in said flow path, said recovery port being located upstream of said downstream end of said flow path at such a distance from said downstream end that laminar flow as established in said flow path is substantially sustained as fluid flowing in said flow path is advanced past said port in the direction of said flow path;

causing an aqueous solution of sodium chloride to flow throughout said flow path while allowing laminar flow to be established in said flow path;

applying an electric potential between said electrodes to electrolyze aqueous solution of sodium chloride thereby to produce a layer of chlorinated acidic water flowing along said second surface; and,

causing said layer of chlorinated acidic water to flow out of said port in a direction perpendicular to the direction of said laminar flow and perpendicular to said second surface while substantially maintaining said laminar flow in the region of said flow path downstream of said port whereby said layer of chlorinated acidic water is separated from the remainder of said laminar flow and is recovered from said port.

5,534,121
PREPARATIVE TWO DIMENSIONAL GEL ELECTROPHORESIS SYSTEM

B. Alex Merrick, Cary; Rachel M. Patterson, Chapel Hill; Robert G. Hall; Chaoying He, both of Durham, and James K. Selkirk, Chapel Hill, all of N.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed May 16, 1994, Ser. No. 243,643
Int. Cl.^{6} G01N *27/26;27/447*
U.S. Cl. 204—459 **10 Claims**

1. An integrated method for separating complex protein mixtures which comprises the steps of:

a) prefocusing an isoelectric focusing tube gel having a length of about 22 cm and an inside diameter of about 6 mm for a period of time sufficient to produce a linear pH gradient through said isoelectric focusing tube gel;

b) loading said prefocused isoelectric focusing tube gel with a sample mixture of proteins;

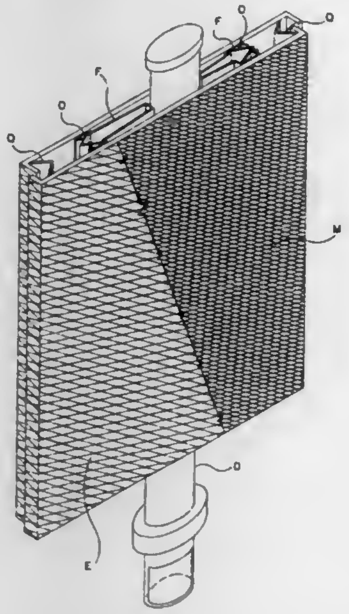
c) applying a voltage across said sample-loaded isoelectric tube to cause separation of said sample mixture along a first direction;

d) transferring said sample mixture from step c) to a slab gel having dimensions of 20×25 cm.; and

e) applying a voltage across said slab gel to cause separation of said sample mixture along a second direction.

5,534,122
CELL HAVING A POROUS DIAPHRAGM FOR CHLOR-ALKALI ELECTROLYSIS AND PRCESS USING THE SAME

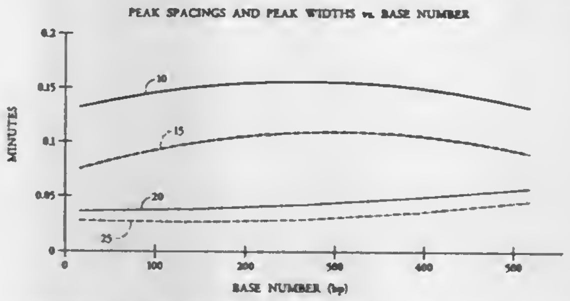
Carlo Traini, and Giovanni Meneghini, both of Milan, Italy, assignors to De Nora Permelec S.p.A., Milan, Italy
Continuation of Ser. No. 189,098, Jan. 31, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 412,754
Claims priority, application Italy, Feb. 12, 1993, MI93A0257
Int. Cl.^{6} C25B *9/00*
U.S. Cl. 204—266 **11 Claims**



1. A chlor-alkali diaphragm electrolysis cell comprising pairs of interleaved cathodes (C) and anodes (B), said cathodes having surfaces with openings and are provided with porous corrosion resistant diaphragms, said cell further comprising feed brine inlets and outlets (H, I, L) for the removal of produced chlorine, hydrogen and caustic, said anodes (B) are expanded by internal extenders (F) and have electrode surfaces with openings for releasing produced gaseous chlorine, characterized in that each of said expanded anodes (B) comprises in addition to the internal extenders a plurality of pressing means (O,Q) made of corrosion resistant material having elastic properties to maintain the electrode surfaces of the anodes to maintain constant and homogeneously distributed pressure of the anodes' surfaces against the diaphragm and said pressing means are longitudinally positioned inside the anodes.

5,534,123
DENATURING SEPARATION MATRIX HAVING HYDROXYETHYL CELLULOSE FOR NUCLEIC ACID ELECTROPHORESIS

John S. Bashkin, Mountain View; David L. Barker, Foster City, and Richard F. Johnston, Murphys, all of Calif., assignors to Molecular Dynamics, Sunnyvale, Calif.
Filed Jul. 10, 1995, Ser. No. 500,097
Int. Cl.^{6} G01N *27/26;* **B01D** *57/02*
U.S. Cl. 204—455 **20 Claims**

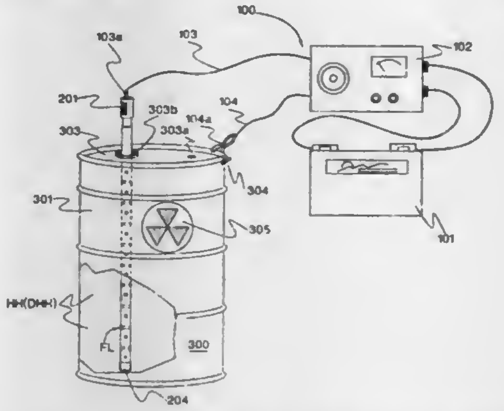


1. A denaturing separation matrix for capillary electrophoresis of nucleic acids, the matrix comprising:

an aqueous solution of hydroxyethyl cellulose in combination with urea, the urea being present at a concentration in the range of 5M to 7M wherein the hydroxyethyl cellulose comprises 1 to 3% w/v of the solution.

5,534,124
ON-SITE ELECTROCHEMICAL DEHALOGENATION PROCESS AND SYSTEM

Patrick A. Rundhaug, Tucson, Ariz., assignor to Chem-Pro, Tucson, Ariz.
Filed Sep. 19, 1995, Ser. No. 530,068
Int. Cl.^{6} C25F *5/00*
U.S. Cl. 588—204 **7 Claims**



1. An electrochemical process for dehalogenating halogenated hydrocarbon compounds, said process comprising:

(a) providing waste material contained in a container, said waste material comprising a halogenated hydrocarbon compound;

(b) providing a probe structure, said probe structure comprising a rigid, elongated, hollow, multi-piece tubular structure including an electrical insulating member, an electrode member and a hollow vessel portion;

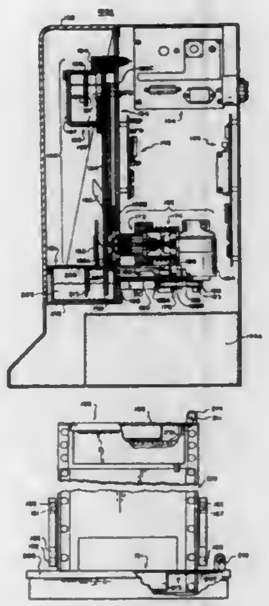
(c) providing an electrical energy source for energizing said electrode member;

(d) determining that said halogenated hydrocarbon compound exceeds a toxic level of concentration;

(e) admixing to said contained halogenated hydrocarbon compound a predetermined amount of at least one metal hydroxide selected from a metallic hydroxide group consisting of sodium hydroxide, calcium hydroxide, and potassium hydroxide;

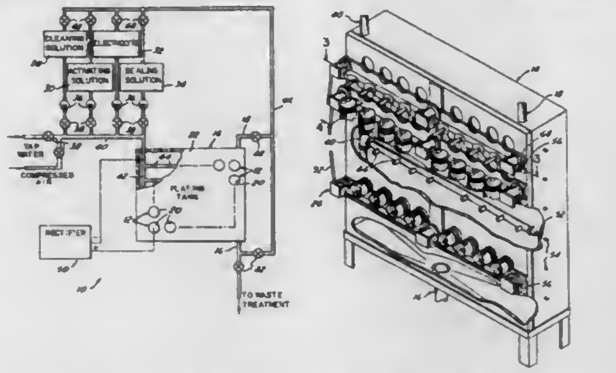
(f) further admixing an alcohol into the halogenated hydrocarbon compound/metal hydroxide mixture, said alcohol being selected from an alcohol group consisting of methanol, ethanol, or isopropanol;
(g) inserting said probe structure into said container;
(h) applying a voltage to said electrode member from said electrical energy source;
(i) producing an electrolyte salt solution containing metallic cations and halogen anions;
(j) migrating halogen anions towards said electrode member and into said hollow vessel portion of said probe structure;
(k) trapping said migrated halogen ions in said hollow vessel portion;
(l) stopping application of voltage and removing said probe structure containing trapped halogen from said container and disposing of said trapped halogen; and
(m) repeating steps (d) through (l) as required until the concentration levels of halogen in the halogenated hydrocarbon compound is at, or below, a acceptable concentrations level.

5,534,125
DNA SEQUENCING
Lyle R. Middendorf; Robert C. Bruce, both of Lincoln, and Robert D. Eckles, Malcolm, all of Nebr., assignors to Li-Cor, Inc., Lincoln, Nebr.
Division of Ser. No. 18,806, Feb. 17, 1993, Pat. No. 5,360,523, which is a continuation-in-part of Ser. No. 763,230, Sep. 20, 1991, Pat. No. 5,230,781, and Ser. No. 570,503, Aug. 21, 1990, Pat. No. 5,207,880, each which is a continuation-in-part of Ser. No. 78,279, Jul. 27, 1987, abandoned, which is a division of Ser. No. 594,676, Mar. 29, 1984, Pat. No. 4,729,947. This application Aug. 10, 1994, Ser. No. 288,461
Int. Cl.^{6} G01K *27/26;* **G01N** *27/447*
U.S. Cl. 204—618 **4 Claims**



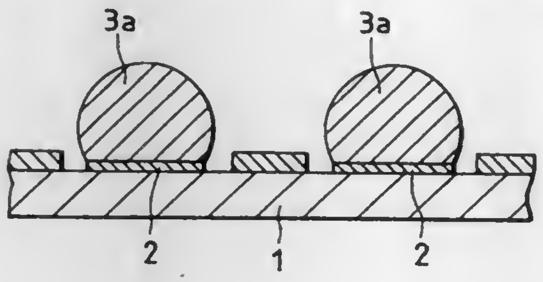
1. Apparatus for sequencing DNA comprising:
a gel electrophoresis slab having an upper portion and a lower portion;
means for applying fluorescently marked DNA samples at a plurality of locations for electrophoresing in a plurality of channels through the gel electrophoresis slab;
means for establishing electrical potential across said gel electrophoresis slab wherein DNA samples are resolved in accordance with the size of DNA fragments in said gel electrophoresis slab into fluorescently marked DNA bands;
means for scanning the separated fluorescently marked DNA bands photoelectrically with a laser and a sensor, wherein the laser scans with a scanning light at a scanning light frequency within an absorbent spectrum of said fluorescently marked DNA samples;
means for sensing light at an emission frequency of the marked DNA;
said means for scanning including means for focusing a microscope on the gel portion of the electrophoresis slab, wherein the bands are scanned while still in the gel but after being resolved;
the means for establishing an electrical potential across said gel electrophoresis slab including an upper buffer assembly connected to an upper end of the slab and a lower buffer assembly connected to a lower portion of the gel electrophoresis slab; and
means for positioning the gel electrophoresis slab at any one of a plurality of different elevations, wherein different lengths of gel electrophoresis slabs may be accommodated.

5,534,126
APPARATUS AND METHOD FOR SELECTIVE COATING OF METAL PARTS
David M. Stadler, Lathrup Village, and Jeffrey R. Pernick, Commerce, both of Mich., assignors to International Hardcoat, Inc., Detroit, Mich.
Filed Feb. 9, 1995, Ser. No. 386,012
Int. Cl.^{6} C25D *21/18:5/02;17/06;* **C25B** *9/00*
U.S. Cl. 205—101 **19 Claims**



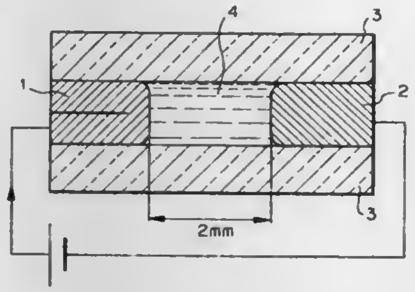
1. An apparatus for simultaneously generating an electrolytic coating on a first surface portion of each of at least two electrically-conductive workpieces, said apparatus comprising:
a plating tank having an interior and including a wall having at least two apertures formed therein adapted to receive said workpieces, one of said workpieces to one of said apertures, said tank further including at least one electrode extending into the plating tank, and a drain;
means for temporarily securing said workpieces in said apertures so as to place the first surface portions thereof in fluid communication with the interior of said tank;
a seal for sealing said apertures about said workpieces when said workpieces are secured therein such that only the first surface portion of said workpieces are placed in fluid communication with the interior of the plating tank;
means for directing an electrolyte into said tank such that said electrolyte bridges each of said workpieces and said at least one electrode; and
a power supply connected to said workpieces and said at least one electrode, respectively, for applying a current across said electrolyte in said tank when said electrolyte bridges said workpieces and said at least one electrode, whereby an electrolytic coating is generated on the first surface portion of each of said workpieces; and
means for directing a rinsing fluid into the tank to rinse the first surface portion of each of said workpieces.

5,534,127
METHOD OF FORMING SOLDER BUMPS ON ELECTRODES OF ELECTRONIC COMPONENT
Tadahiko Sakai, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 11, 1995, Ser. No. 371,433
Claims priority, application Japan, Jan. 11, 1994, 6-001145
Int. Cl.^{6} C25D *5/02*
U.S. Cl. 205—125 **10 Claims**



1. A method of forming a solder bump on an electrode provided on an electronic component, comprising steps of:
forming a first solder layer on the electrode of the electronic component;
melting said first solder layer by a thermal processing so as to form a molten solder in a spherical shape;
cooling down said spherical molten solder to form a hardened spherical core of bump;
forming a second solder layer on said spherical core so as to cover a surface of said spherical core, a height of said second solder layer being higher than that of said spherical core;
heating said second solder layer until said second solder layer fuses together with said core so as to form an integrated molten solder in a spherical shape; and
cooling down said integrated molten solder to form a hardened spherical bump on the electrode.

5,534,128
NON-CYANIDE COPPER-ZINC ELECTROPLATING BATH, METHOD OF SURFACE TREATMENT OF COPPER FOIL FOR PRINTED WIRING BOARD USING THE SAME AND COPPER FOIL FOR PRINTED WIRING BOARD
Kazuyoshi Aso; Masami Noguchi; Katsumi Kobayashi, and Takeshi Yamagishi, all of Shimodate, Japan, assignors to Nippon Denkai, Ltd., Tokyo, Japan
Filed Feb. 24, 1995, Ser. No. 393,496
Claims priority, application Japan, Feb. 24, 1994, 6-049972
Int. Cl.^{6} C25D *5/10;5/12;3/58;* **C23C** *28/00*
U.S. Cl. 205—176 **12 Claims**



1. A non-cyanide copper-zinc electroplating bath comprising an aqueous solution containing 5 to 60 g/l of a copper salt, 2 to 30 g/l of a zinc salt, 30 to 120 g/l of a hydroxycarboxylic acid or salt thereof, an aliphatic dicarboxylic acid or a sodium salt or a potassium salt thereof, and a thiocyanic acid or a salt thereof.

5,534,129
CYANIDIC-ALKALINE BATHS FOR THE GALVANIC DEPOSITION OF COPPER-TIN ALLOY COATINGS, USES THEREOF, AND METALLIC BASES COATED WITH SAID COPPER-TIN ALLOY COATING
Gerd Hoffacker, Alfdorf; Hasso Kaiser, Schwaebisch Gmuend; Klaus Reissmueller, Spraitbach, and Guenter Wirth, Heubach, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany
Filed Jul. 20, 1994, Ser. No. 277,631
Claims priority, application Germany, Jul. 26, 1993, 43 24 995.7
Int. Cl.^{6} C25D *3/58;3/60*
U.S. Cl. 205—241 **17 Claims**

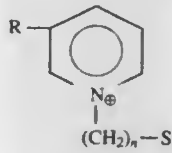
1. An alkaline-cyanidic bath for the electrolytic deposition of bright to brilliant, leveled copper-tin alloy coatings, said bath comprising 1 to 60 g/l copper in the form of copper(I) cyanide, 1 to 50 g/l tin in the form of alkali metal stannate, 0 to 10 g/l zinc in the form of zinc cyanide, 1 to 100 g/l free alkali metal cyanide, 1 to 50 g/l free alkali metal hydroxide, 0 to 50 g/l alkali metal carbonate, 0 to 100 mg/l lead as lead(II) acetate or lead(II) sulfonate, 1 to 200 g/l of at least one complex binder selected from the group consisting of oligosaccharides, polysaccharides and mixtures thereof, and 0.01 to 5 g/l of at least one brightener selected from the group consisting of:
(a) alkene sulfonates of the formula

$$R—CH{=}CH—(CH_2)_n—SO_3Na$$

and its derivatives, in which R=H, CH_3, C_2H_5, C_3H_7, C_2H_3 or C_6H_5 and n=0 to 5;
(b) alkyne sulfonates of the formula

$$R—(CH_2)_m—C{\equiv}C—(CH_2)_n—SO_3Na$$

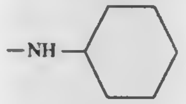
and its derivatives, in which R=H, CH_3, C_2H_5, C_3H_7 or C_6H_5, m=0 to 5 and n=0to 5;
(c) pyridinium compounds of the formula



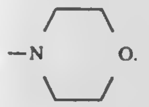
and its derivatives, in which R=H, CHO, CH_3, C_2H_3O, CH_3, $CONH_2$, C_2H_3 or $C_6H_5—CH_2$ and n=1 to 5, and R can occur in ortho, meta or para position; and
(d) sulfur-containing propane sulfonates of the formula

$$R—(CH_2)_3—SO_3^-$$

and its derivatives, in which R=—OH —NH—C—$(CH_2OH)_3$



OR



5,534,130
APPLICATION OF PHOSPHATES OF ALUMINUM TO CARBONACEOUS COMPONENTS OF ALUMINUM PRODUCTION CELLS

Jainagesh A. Sekhar, Cincinnati, Ohio, assignor to Moltech Invent S.A., Luxembourg

Filed Jun. 7, 1994, Ser. No. 255,224

Int. Cl.^{6} C25C *3/06*

U.S. Cl. 205—372 **20 Claims**

1. A method for treating a carbonaceous electrolytic cell component to prolong useful life of said component, consisting essentially of applying a treatment composition to said component, said treatment composition consisting essentially of a solution of one or more phosphates of aluminum and one or more colloidal carriers, wherein said method is carried out at temperatures up to 200° C.

5,534,131
PROCESS FOR HEAVY METALS ELECTROWINNING

Gianni Zoppi, Dino di Sonvico, Switzerland, assignor to Ecochem Aktiengesellschaft, Liechtenstein

Filed Sep. 6, 1995, Ser. No. 524,438

Claims priority, application Switzerland, Sep. 8, 1994, 02746/94

Int. Cl.^{6} C25D *1/16;1/08*

U.S. Cl. 205—560 **7 Claims**

1. Process for producing Me metals selected from copper, zinc, nickel, cadmium and cobalt, in which the corresponding water-soluble metal-ammino complex $Me(NH_3)_nCl_m$ is formed and said complex is submitted, in aqueous solution, to electrolysis inside a cell with no separation means between anode and cathode, characterized in that to said aqueous solution, bromide ion is added.

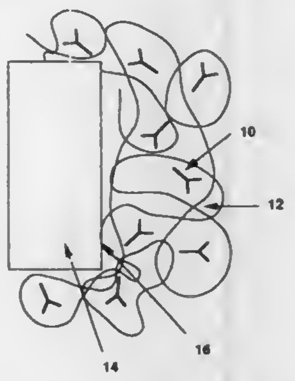
5,534,132
ELECTRODE AND METHOD FOR THE DETECTION OF AN AFFINITY REACTION

Mark Vreeke, 14603 Cedar Point, Houston, Tex. 77070, and Patrick Rocca, 91, Chemin de Cléres, 76130 Mont-Saint-Aignan, France

Filed May 4, 1995, Ser. No. 434,782

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 205—777.5 **15 Claims**



8. A method for sensing the occurrence of a binding reaction between a selective binding unit (SBU) and a conjugate to the SBU where changing of the incubation solution is not necessary to differentiate bound and unbound conjugate comprising the steps of coating a current collecting electrode with a hydrogel, the polymer network of which comprises SBUs and multiple reducible and oxidizable centers chemically bound to the network, immersing the hydrogel coated electrode in a solution containing the conjugate, to which an oxidoreductase is covalently bound, allowing the SBU to bind with its conjugate, and measuring the current frown the electrode when the electrolytic solution contains a substrate of the oxidoreductases.

5,534,133
CONTINUOUS METHOD FOR INCREASING THE Q. I. CONCENTRATION OF LIQUID TAR WHILE CONCURRENTLY PRODUCING A Q. I. FREE TAR

Irwin C. Lewis; Ching F. Chang, both of Strongsville, Ohio; George E. Keller, II, South Charleston; Gary L. Gilleskie, Dunbar, both of W. Va., and Richard L. Shao, North Royalton, Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.

Filed Nov. 17, 1994, Ser. No. 341,395

Int. Cl.^{6} C10C *1/00*

U.S. Cl. 208—39 **5 Claims**

1. Continuous method for increasing the concentration of infusible solids (Q.I.) in a Q.I. containing liquid tar to a desired level while simultaneously producing a Q.I. free permeate which comprises: continuously introducing Q.I. containing liquid tar feed having a known Q.I. concentration into a circulation loop which includes, in series, a cross-flow filtration membrane filter, a pump and a flow controller to continuously circulate said feed in said circulation loop to obtain (i) a Q.I. free permeate liquid tar product exiting the circulation loop via said cross-flow filter at a desired known permeate flow rate and (ii) a Q.I. containing liquid concentrate product of increased Q.I. concentration compared to the liquid tar feed which passes through said cross-flow filter and circulates in the circulation loop; thereafter continuously, and concurrently with the introduction of additional Q.I. containing liquid tar feed into the circulation loop, withdrawing a portion of said Q.I. containing liquid concentrate of increased Q.I. concentration from the circulation loop, the flow rate of the additional Q.I. containing liquid tar feed being the same as the flow rate of the Q.I. containing concentrate product withdrawn from the circulation loop and maintaining the relationship between Q.I. concentrations and flow rates as follows:

$$\begin{array}{c}\textit{Q.I.}\text{ Concentration}\\ \text{of Concentrate}\\ \text{Portion withdrawn}\\ \text{from Circulation}\\ \text{Loop}\end{array} = \begin{array}{c}\textit{Q.I.}\text{ Concentration}\\ \text{of Feed Introduced}\\ \text{into Circulation}\\ \text{Loop}\end{array} \times \frac{\text{Feed Flow Rate}}{\begin{array}{c}\text{Feed Flow Rate} -\\ \text{Permeate Flow Rate}\end{array}}$$

5,534,134
LOW PAH PITCH AND PROCESS FOR SAME

William Roder, Indianapolis, and Eric F. V. Scriven, Greenwood, both of Ind., assignors to Reilly Industries, Inc., Indianapolis, Ind.

Filed Nov. 23, 1993, Ser. No. 156,240

Int. Cl.^{6} C10C *3/00*

U.S. Cl. 208—42 **14 Claims**

1. A pitch product, comprising a pitch including a substantially homogeneous blend of coal tar pitch, gilsonite pitch and petroleum pitch, said pitch being substantially free from separated layers containing coal tar pitch, gilsonite pitch or petroleum pitch and having a Ring and Ball (ASTM D36) softening point of about 60° C. to about 150° C.

5,534,135
SYNTHESIS OF ZEOLITES

Pei-Shing E. Dai; David E. Sherwood, Jr., and Burton H. Bartley, all of Port Arthur, Tex., assignors to ABB Lummus Global Inc., Bloomfield, N.J.

Filed Mar. 7, 1994, Ser. No. 206,803

Int. Cl.^{6} C10G *11/05;45/00;* **B01J** *29/08*

U.S. Cl. 208—120 **15 Claims**

1. A method of treating a charge zeolite to produce a zeolite having an ultra low Unit Cell Size, wherein the charge zeolite is characterized by (i) a framework Silica to Alumina Ratio of about 5–10, (ii) a Lattice Constant of 24.45 Å–24.60 Å, (iii) a Secondary Pore Volume less than about 0.05 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 1–3, and (v) an Acid Site Density of about 5–32 cc NH_3/g which consists essentially of

contacting said charge zeolite with steam at about 1000° F.–1200° F.;

maintaining said charge zeolite in said contact with steam for about 0.5–8 hours during which time said charge zeolite is converted into a hydrothermally-treated zeolite characterized by (i) a framework Silica to Alumina Ratio of about 10–36, (ii) a decreased Lattice Constant of about 24.28 Å–24.47 Å, (iii) a Secondary Pore Volume of about 0.09–0.13 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 1–1.5:1, and (v) an Acid Site Density of about 5–16 cc NH_3/g;

contacting said hydrothermally-treated zeolite in acid medium of concentration greater than 0.2N at 140° F.–250° F. for 0.5–8 hours thereby converting said hydrothermally-treated zeolite into a hydrothermally-treated acidified zeolite characterized by (i) a framework Silica to Alumina Ratio of about 60–80, (ii) a decreased Lattice Constant of below about 24.19 Å, (iii) an increased Secondary Pore Volume of about 0.11–0.14 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 24–36, and (v) an Acid Site Density of about 1–6 cc NH_3/g and

recovering said hydrothermally-treated acidified zeolite characterized by (i) a framework Silica to Alumina Ratio of about 60–80, (ii) a decreased Lattice Constant of below about 24.19 Å, (iii) an increased Secondary Pore Volume about 0.11–0.14 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 24–36, and (v) an Acid Site Density of about 1–6 cc NH_3/g.

8. A novel dealuminated Y- Zeolite characterized by a Unit Cell Size less than about 24.19 Å which is the product of contacting a charge Y-zeolite characterized by (i) a framework Silica to Alumina Ratio of about 5–10, (ii) a Lattice Constant of 24.45 Å–24.60 Å, (iii) a Secondary Pore Volume less than about 0.05 cc/g (iv) a Surface Silicon to Aluminum Ratio of about 1–3, and (iv) an Acid Site Density of about 7–32 cc NH_3/g with steam at about 1000° F.–1200° F.;

maintaining said charge Y-zeolite in said contact with steam for about 0.5–8 hours during which time said charge Y-zeolite is converted into a hydrothermally-treated Y-zeolite characterized by (i) a framework Silica to Alumina Ratio of about 10–36, (ii) a decreased Lattice Constant of about 24.28 Å–24.47 Å, (iii) a Secondary Pore Volume of about 0.09–0.13 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 1–1.5:1, and (v) an Acid Site Density of about 5–16 cc NH_3/g;

contacting said hydrothermally-treated Y-zeolite in acid medium of concentration greater than 0.2N at 140° F.–250° F. for 0.5–8 hours thereby converting said bydrothermally-treated Y-zeolite into a hydrothermally-treated acidified zeolite characterized by (i) a framework Silica to Alumina Ratio of about 60–80, (ii) a decreased Lattice Constant of below about 24.19 Å, (iii) an increased Secondary Pore Volume of about 0.11–0.14 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 24–36, and (v) an Acid Site Density of about 1–6 cc NH_3/g.

recovering said hydrothermally-treated acidified zeolite characterized by (i) a framework Silica to Alumina Ratio of about 60–80, (ii) a decreased Lattice Constant of below about 24.19 Å, (iii) an increased Secondary Pore Volume of about 0.11–0.14 cc/g, (iv) a Surface Silicon to Aluminum Ratio of about 24–36, and (v) an Acid Site Density of about 1–6 cc NH_3/ g.

12. A method of cracking a hydrocarbon charge which comprises

contacting said hydrocarbon charge with, as all or portion of a catalyst, a zeolite having a Unit Cell Size of 24.02 Åto 24.14 Å, a framework silica to alumina ratio of about 60–80, a secondary pore volume of about 0.11–0.14 cc/g, a surface silicon to aluminum ratio of about 24–36, and an acid site density of about 1–6 NH_3/g;

maintaining said hydrocarbon charge in contact with said zeolite having a Unit Cell Size of 24.02 Åto 24.14 Å at cracking conditions including temperature of about 900° F.–1100° F. and pressure of about 0–20 psig.

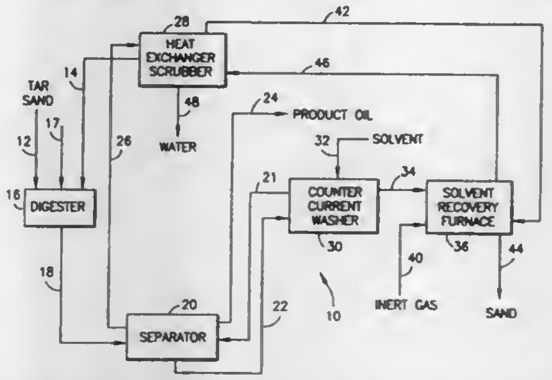
5,534,136
METHOD AND APPARATUS FOR THE SOLVENT EXTRACTION OF OIL FROM BITUMEN CONTAINING TAR SAND

William J. Rosenbloom, 8 Pioneer Rd., Westport, Conn. 06880

Filed Dec. 29, 1994, Ser. No. 366,261

Int. Cl.^{6} C10G *1/04*

U.S. Cl. 208—390 **8 Claims**



1. A process for recovering bitumen products from tar sand, the process comprising the step of:

(a) contacting a viscous tar sand feed comprising sand, oil, resins, asphaltenes, clay and water with heated thinning oil, the thinning oil comprising product oil diluted with solvent vapor, to dissolve at least a portion of the oil, resins and asphaltenes of the tar sand feed in solvent, said contacting step forming a feed slurry having a lower viscosity than the viscosity of the tar sand feed;

(b) mixing the feed slurry with light oil, the light oil comprising solvent and recovered occluded oil, and separating the mixture of feed slurry and light oil into product oil and oil sand, the oil sand comprising sand having occluded oil thereon;

(c) introducing a portion of the product oil to a heat exchanger/scrubber;

(d) washing the oil sand with solvent in a countercurrent fashion so as to recover occluded oil from the oil sand, wherein the washing step forms the light oil mixed with the feed slurry in step (b) and washed sand, the washed sand comprising sand wet with solvent and water having substantially no occluded oil;

(e) heating the washed sand to a temperature above the boiling point of the solvent so as to vaporize substantially all of the solvent from the sand;

(f) flowing inert gas through the heated washed sand to strip the solvent vapor formed in step (e) from the sand and to cool the sand by heat transfer to the inert gas;

(g) directing the inert gas and solvent vapor to the heat exchanger/scrubber wherein the solvent vapor is contacted with the product oil introduced to the heat exchanger/scrubber in step (c), wherein the solvent vapor is absorbed by the product oil to form the heated thinning oil mixed with the tar sand feed in step (a) and wherein the inert gas transfers heat to the thinning oil; and

(h) reusing the inert gas to strip the solvent vapor from the sand in step (f).

5,534,137
PROCESS FOR DE-ASHING COAL TAR

E. Sean Griggs, and William R. Roder, both of Indianapolis, Ind., assignors to Reilly Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 69,121, May 28, 1993, abandoned.

This application Mar. 21, 1994, Ser. No. 215,010

Int. Cl.^{6} C10G *1/00;* **C10C** *1/00;1/04*

U.S. Cl. 208—425 **17 Claims**

1. A process for treating an ash-containing coal tar in sequential Centrifugation steps to remove ash therefrom and produce a coal tar suitable to form a binder pitch, comprising the steps of:

subjecting an ash-containing coal tar starting material having an ash content of greater than about 0.6 weight percent to centrifugation at a centrifugal force of about 2000 to about 4000 G's, said centrifuging being effective to separate the coal tar starting material into a first fraction which is an intermediate goal tar having a reduce level of ash as compared to the starting material and a second fraction having an increased level of ash as compared to the starting material;

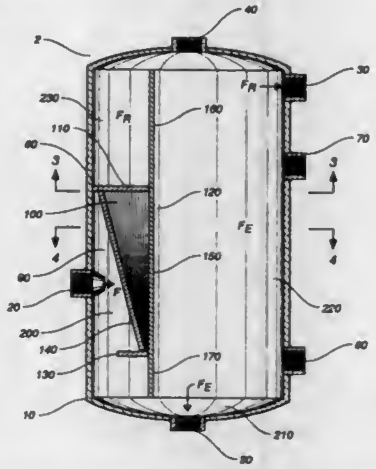
recovering said intermediate coal tar; and

subjecting said intermediate coal tar to one or more centrifugations, at least one of which is at a centrifugal force of about 5000 G's to about 10000 G's so as to separate the coal tar into a finished coal tar fraction having a reduced level of ash as compared to the intermediate coal tar and not greater than about 0.4 weight percent, said finished coal tar fraction having a QI component content of about 4 to about 12 weight percent and being effective upon distillation to form binder pitch, and a further fraction having an increased level of ash as compared to the intermediate coal tar; and

recovering said finished coal tar fraction.

5,534,138
FUEL SEPARATOR APPARATUS

Christopher F. Coale, 1501 S. Front, Angleton, Tex. 77515
Filed Apr. 26, 1995, Ser. No. 429,351
Int. Cl.^{6} B01D *17/038*
U.S. Cl. 210—86 **10 Claims**



8. In an engine having a fuel tank and a fuel filter, an apparatus for separating contaminated liquid fuel into a substantially uncontaminated homogeneous raffinate fuel portion and into a heterogeneous extract portion, with said raffinate fuel portion having a lower specific gravity than said extract portion, said apparatus comprising:

an elongated housing means placed between said fuel tank and said fuel filter, and having a top portion, a bottom portion disposed below said top portion, and first and second lateral wall portions disposed medially and perpendicularly of said top portion and said bottom portion;

an inlet means disposed upon said first lateral wall portion of said elongated housing means, for receiving said contaminated liquid fuel from said fuel tank into a separation region;

an outlet means disposed upon said second lateral wall portion of said elongated housing means, for delivering said raffinate portion to said fuel filter;

heating means disposed upon said second lateral wall portion of said elongated housing means, for heating said contaminated liquid fuel and said extract portion to promote flow and to prevent solidification thereof;

a separator chamber means contained within said elongated housing means and having a centrifugation means and said separation region therein;

said centrifugation means including longitudinal plate means having a partially frustoconically-shaped convex surface facing said first lateral wall portion and said separation region with a vertex end facing said bottom portion and an opposite base end facing said top portion, for causing circular turbulent flow of said contaminated liquid fuel thereabout;

said longitudinal plate means of said partially frustoconically-shaped surface of said centrifugation means disposed obliquely relative to said first lateral wall portion of said elongated housing means and having a longitudinal axis;

said centrifugation means further having an impact plate means disposed oppositely of said longitudinal plate means and facing an extract collection region, for interrupting said circular turbulent flow of said contaminated liquid fuel;

a first baffle plate means disposed perpendicularly to said longitudinal axis of said longitudinal plate means and abuttably of said vertex end of said partially frustoconically-shaped surface of said centrifugation means and projecting into said separation region, for controlling the gravitation rate of said extract portion from said contaminated liquid fuel as said extract portion gravitates from said separation region to an extract sump region disposed upon said bottom portion of said housing means;

a discharge means disposed upon said bottom portion of said elongated housing means, for draining said extract portion from said extract sump region;

an extract collection region bounded by said second lateral wall portion of said elongated housing means and said impact plate means, and disposed contiguously with said extract sump region, for accumulating said separated extract portion;

a raffinate collection region bounded by said top portion and said first and second lateral wall portions of said elongated housing means, for receiving said raffinate portion from said separation region and for delivering said raffinate portion to said outlet means;

a second baffle plate means disposed parallel to and along said longitudinal axis of said longitudinal plate means and disposed contiguously with said impact plate means and said top portion, for preventing admixing of said raffinate portion contained in said raffinate collection region with said extract portion contained in said extract collection region;

a third baffle plate means disposed parallel to and along said longitudinal axis of said longitudinal plate means and contiguously with said impact plate means and adjacent said bottom portion, for controlling the rate of flow of said extract portion from said extract sump region to said extract collection region;

sensor means disposed upon said second lateral wall portion disposed medially of said outlet means and said discharge means, for sensing the level of said extract portion accumulating in said extract collection region; and

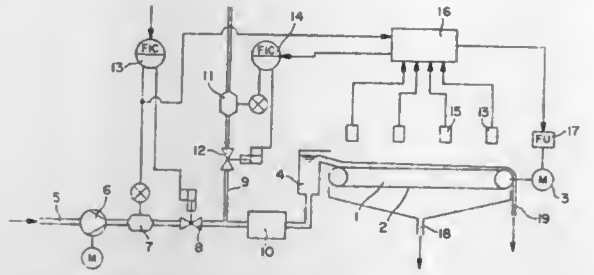
a fourth baffle plate means disposed perpendicularly to said longitudinal axis of said longitudinal plate means and abuttably of said base end of said partially frustoconically-shaped surface of said centrifugation means, for controlling the flow of said contaminated liquid fuel from said separation region to said raffinate collection region;

said fourth baffle plate means having a plurality of apertures therein for limiting entry to only said raffinate portion of said raffinate collection region from said separation region, as said contaminated fuel rises in said separation region.

5,534,139
APPARATUS FOR CONTROLLING SOLIDS-LIQUID SEPARATION

Walter Cadek; Johannes Kappel, both of Graz, and Rudolf Neuhold, Gratwein, all of, Austria, assignors to Andritz-Patentverwaltungs-Gesellschaft m.b.H., Graz, Austria
Filed Nov. 10, 1994, Ser. No. 338,756
Claims priority, application Austria, Nov. 12, 1993, 2298/93
Int. Cl.^{6} C02F *11/14*
U.S. Cl. 210—96.1 **16 Claims**

1. An apparatus for separating liquid from a solid-liquid mixture comprising:



a liquid separation device having a means for continuously moving a solid-liquid mixture through a liquid separating zone of said liquid separating device, said separation zone having an upstream end and a downstream end;

at least two photodetector assemblies positioned above said separating zone;

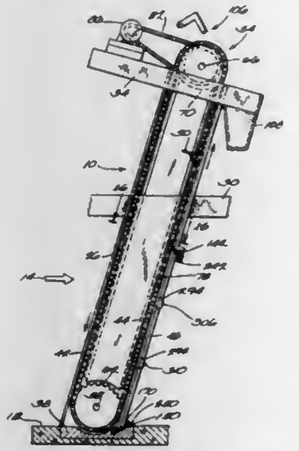
each of said photodetector assemblies having a light source for projecting light onto an illumination area of an upper surface of the solid-liquid mixture at a first angle with respect to said upper surface, and a first photodetector for detecting said light reflected from said illumination area on said upper surface at a second angle with respect to said upper surface, said first photodetector having means for producing a first output signal in response to detected reflected light;

at least one of said photodetector assemblies having a second photodetector for detecting light reflected from said illumination area on said upper surface at a third angle with respect to said upper surface, said second photodetector having means for producing a second output signal in response to detected reflected light;

control means connected to said photodetector assemblies for receiving said output signals and for controlling the liquid separation of said mixture.

5,534,140
BAR SCREEN HAVING COMPOUND FINE SCREEN BAR RACK

Robert A. Brummond; Roger Scheel, and James L. Heidner, all of Waukesha, Wis., assignors to Envirex, Inc., Waukesha, Wis.
Filed Mar. 17, 1994, Ser. No. 210,312
Int. Cl.^{6} B01D *39/10*
U.S. Cl. 210—106 **27 Claims**



1. A bar screen for screening a flow of wastewater, the bar screen comprising

a frame,

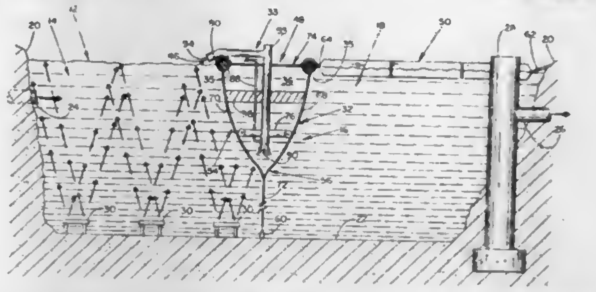
a first bar rack extending across the flow of wastewater, the first bar rack including a plurality of generally parallel, elongated first bars each having a top end and a bottom end, the plurality of first bars defining therebetween a plurality of upstream spaces,

a second bar rack extending across the flow of wastewater, the second bar rack including a plurality of generally parallel, elongated second bars each having a top end and a bottom end, and

mounting means for fixing the first bar rack to the frame and for releasably mounting the second bar rack on the frame, the mounting means including a laterally extending first plate fixed to the first bars, a laterally extending second plate fixed to the second bars and overlapping a portion of the first plate, and a fastener fixing the first plate to the frame, the first and second bar racks thereby defining a fine screen compound bar rack wherein the second bars have a portion aligning with a respective upstream space.

5,534,141
WASTEWATER TREATMENT SYSTEM WITH IN-POND CLARIFIER

David W. McAnaney, Eden Prairie, Minn., and John R. Dorner, Mequon, Wis., assignors to The Lemna Corporation, Mendota Heights, Minn.
Filed Dec. 9, 1994, Ser. No. 353,546
Int. Cl.^{6} B01D *21/02*
U.S. Cl. 210—110 **41 Claims**



1. A clarifier enclosure for deployment within a pond having a floor and a wastewater surface and for use with solid removal means which removes settled solids from the enclosure, the enclosure including means for inputting wastewater into the enclosure and means for removing wastewater from the enclosure, the enclosure comprising:

a plurality of walls joined to one another so as to define a clarifying chamber adjacent to the wastewater surface;

an isolation wall extending downward from the plurality of walls, the isolation wall having a height so as to extend to the pond floor for dividing the pond into distinct treatment zones on opposite sides of the clarifying chamber; and

a frame positioned within the clarifying chamber and engaging the plurality of walls, the frame including an upper brace, a lower brace and a vertical member connecting the upper brace and the lower brace.

5,534,142
FLOW-REVERSING SYSTEM FOR SERIES CONNECTED REACTION CHAMBERS

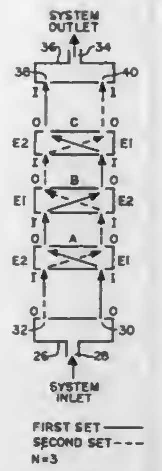
Frederick E. Bernardin, and Ronald L. Peterson, both of Tucson, Ariz., assignors to Vulcan Peroxidation Systems, Inc., Tucson, Ariz.
Filed Nov. 25, 1994, Ser. No. 344,992
Int. Cl.^{6} B01D *17/12;* **B01J** *4/00*
U.S. Cl. 210—141 **3 Claims**

1. Apparatus for reversing the direction of flow of a fluid within each of a number N of reaction chambers without altering the sequence of the reaction chambers through which the fluid flows, said apparatus comprising in combination:

an inlet manifold having a system inlet and two outlet ports;

an outlet manifold having a system outlet and two inlet ports;

a number N of reaction chambers, each having a first end and a second end, having an inlet port and an outlet port near the first end and having an inlet port and an outlet port near the



second end, whereby the total number of ports including those on said inlet manifold and on said outlet manifold is 4N+4;

a first set of N+1 valved interconnections connecting a first one of the outlet ports of said inlet manifold to the inlet port near the first end of a first one of said reaction chambers, connecting the outlet port near the second end of the first reaction chamber to the inlet port near the first end of a second one of said reaction chambers, and so on if N exceeds 2 until the remaining reaction chambers have been connected in series, and connecting the outlet port near the second end of the Nth one of said reaction chambers to a first one of the inlet ports of said outlet manifold;

a second set of N+1 valved interconnections connecting the second outlet port of said inlet manifold to the inlet port near the second end of the first one of said reaction chambers, connecting the outlet port near the first end of the first reaction chamber to the inlet port near the second end of the second one of said reaction chambers, and so on if N exceeds 2 until the remaining reaction chambers have been connected in series, and connecting the outlet port near the first end of the Nth one of said reaction chambers to the second one of the inlet ports of said outlet manifold; and,

actuator means operatively connected to said first set of N+1 valved interconnections and maintaining equal flow through each valved interconnection of said first set, and operatively connected to said second set of N+1 valved interconnections and maintaining equal flow through each valved interconnection of said second set, for selectively routing is also operable to apportion entire flow through said first set by interrupting flow through said second set or routing the entire flow through said second set by interrupting flow through said first set.

5,534,143

MICROBUBBLE GENERATOR FOR THE TRANSFER OF OXYGEN TO MICROBIAL INOCULA, AND MICROBUBBLE GENERATOR IMMOBILIZED CELL REACTOR

Ralph J. Portier, Baton Rouge, La., and Huazhong Mao, Edmonton, Canada, assignors to The Louisiana State University Board of Supervisors, a Governing body of Louisiana State University Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 109,623, Aug. 20, 1993, abandoned, which is a division of Ser. No. 584,075, Sep. 18, 1990, Pat. No. 5,240,598. This application Jan. 25, 1995, Ser. No. 378,072

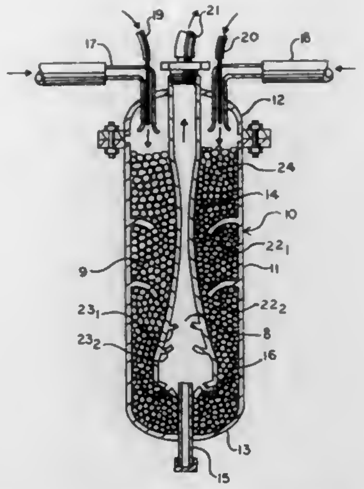
The portion of the term of this patent subsequent to Sep. 18, 2010, has been disclaimed.

Int. Cl.^{6} C02F *3/10*

U.S. Cl. 210—151 **9 Claims**

1. An apparatus for facilitating high oxygen levels in a liquid, comprising:

(a) a first chamber packed with inert solid particles of small diameter, said first chamber having at least one inlet through



which an oxygen-containing gas and a liquid can be admitted under pressure into said first chamber and contacted together to form mixed liquid-gas phases in which the gas is dispersed as bubbles, and an outlet through which the mixed liquid-gas phases can be removed from said first chamber; and

(b) a second chamber of venturi configuration, said second chamber having an inlet connected to the outlet of said first chamber through which the mixed liquid-gas phases from said first chamber can be admitted, and forced therethrough under pressure to further reduce the size of the bubbles of the mixed liquid-gas phases, and an outlet for the discharge of the mixed liquid-gas phases.

5,534,144

TUBULAR FILTER ARRANGEMENT WITH LIQUID DISTRIBUTING CASING

Bengt Hemström, Älvkarleby; Johan Persson, Gävle, and Rolf Karlsson, Älvkarleby, all of, Sweden, assignors to Vattenfall Utveckling AB, Alvkarleby, Sweden

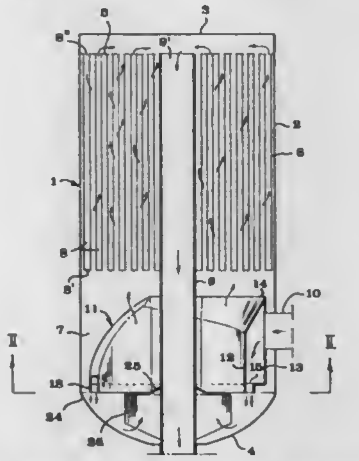
PCT No. PCT/SE93/00483, § 371 Date Dec. 1, 1994, § 102(e) Date Dec. 1, 1994, PCT Pub. No. WO93/24217, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 1, 1993, Ser. No. 347,355

Claims priority, application Sweden, Jun. 2, 1992, 9201705

Int. Cl.^{6} B01D *37/02;29/90*

U.S. Cl. 210—193 **17 Claims**



1. A unit operable for treating liquid, including a container having an inlet and an outlet and having an upper chamber with a plurality of tubes or ducts, having a liquid treatment medium associated therewith, through which liquid is forced to pass en route from said inlet of said container to said outlet, a lower chamber including a liquid-distributing annular casing, said casing having inner and outer side walls sealingly interconnected along an edge portion therein and interconnected by at least one transverse wall, said at least one transverse wall being opposite to said edge portion and including a plurality of apertures, operable for directing the liquid in the form of a large number of separate jets, a cross-sectional area of the liquid-distributing casing continuously decreasing from one end close to said inlet towards an opposite end of the casing; and means substantially centrally located in said lower chamber for deflecting and guiding liquid flowing inwardly from said liquid-distributing casing in a controlled and even flow directed towards said plurality of tubes or ducts for treating the liquid.

5,534,145

COMPACT WATER FILTRATION PUMP

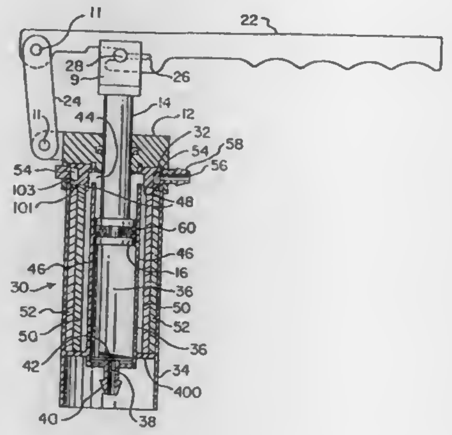
Sanford Platter; Jeffrey K. Aldred, and Richard J. Kraemer, all of Boulder, Colo., assignors to SweetWater, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 285,351, Aug. 3, 1994, Pat. No. 5,431,816, and a continuation-in-part of Ser. No. 990,526, Dec. 15, 1992, Pat. No. 5,366,642, and a continuation-in-part of Ser. No. 682,650, Apr. 9, 1991, Pat. No. 5,433,848. This application Aug. 15, 1994, Ser. No. 290,688

The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.

Int. Cl.^{6} B01D *35/26*

U.S. Cl. 210—90 **16 Claims**



1. A pump for fluid filtration, said pump comprising:

a housing;

a piston rod slidably mounted on said housing for movement along a first axis of said housing;

a piston affixed to a lower end of said piston rod;

elongated lever means having one end pivotably attached to an upper portion of said housing and attachable at an intermediate location of said lever means to a cross head on an upper end of said piston rod for slidably moving said piston along said first axis of said housing when said lever means is pivoted;

a pump cylinder having an upper end mounted to said housing for enabling said piston to slide within a circular inner bore of said cylinder;

a lower end of said cylinder having inlet means for enabling fluid to enter said inner bore of said cylinder when said piston moves away from said inlet means;

a replaceable filter cartridge;

connector means for removably engaging said replaceable filter cartridge with said housing, said replaceable filter cartridge including:

cylindrical filtering means concentric with and surrounding said pump cylinder;

an inner plenum formed between an upper end portion of said pump cylinder and said filtering means for enabling a substantially uniform, laminar flow of unfiltered fluid to be pumped from said inner bore and through said inner plenum and through said filtering means when said piston moves within said inner bore; and

baffle means abutting said cylindrical filtering means and adjacent said inner plenum at an upper end of said inner bore for directing said substantially uniform flow of fluid pumped from said inlet means and through said inner bore into said inner plenum and through said filtering means; and

outlet means disposed at an upper end of said cartridge for enabling said fluid to exit said filter cartridge after said fluid is pumped through said filtering means at said substantially uniform flow.

5,534,146

PROCESS FOR PRODUCING IN SITU POLYMERIZATION OF A REVERSE OSMOSIS MEMBRANE AND PRODUCT THEREFROM

Craig L. Netwig, 947 Intrepid Ct., Del Mar, Calif. 92014, and David L. Kronmiller, 1717 N. Elm St., Escondido, Calif. 92026

Filed Jun. 15, 1994, Ser. No. 259,876

Int. Cl.^{6} B01D *71/64*

U.S. Cl. 210—490 **9 Claims**

1. The process of producing a reverse osmosis membrane by the steps of:

a) preparing a liquid mixture of N-vinyl pyrrolidone, maleic anhydride and maleimide;

b) wetting a porous membrane with said mixture; and,

c) irradiating said wetted membrane with laser energy with energy sufficient to polymerize said mixture to form a terpolymer of N-vinyl pyrrolidone, maleic anhydride and maleimide on said membrane.

5,534,147

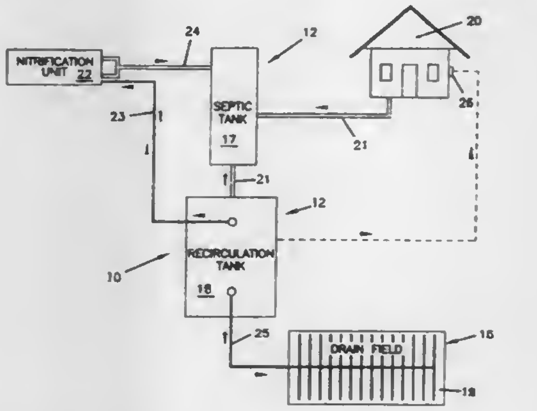
APPARATUS AND METHOD FOR MODIFYING WASTE WATER

Thomas J. Kallenbach; Justin M. Buchanan; Matthew H. Goodrich, all of Bozeman; Ronald V. Skinner, Ronan; Greg R. Poncelet, and Trina J. Kallenbach, both of Bozeman, all of Mont., assignors to Fluidyne, Incorporated, Bozeman, Mont.

Filed Feb. 1, 1995, Ser. No. 382,260

Int. Cl.^{6} C02F *3/30*

U.S. Cl. 210—605 **5 Claims**



1. A method for modifying waste water comprising:

feeding waste water containing organic nitrogenous compounds and carbonaceous compounds and feeding effluent containing nitrate compounds from a nitrification region to a gentle mixing tank to disperse carbon containing particles, wherein an anaerobic environment is provided to effect ammonification of organic nitrogenous compounds and denitrification of nitrate compounds;

feeding clarified effluent containing ammonium from the gentle mixing tank to a recirculation tank, wherein an anaerobic environment is provided to effect ammonification of organic nitrogenous compounds and denitrification of nitrate compounds;

feeding clarified effluent containing ammonium from the recirculation tank to the nitrification region, wherein an aerobic environment is provided to effect nitrification of ammonium to produce the effluent containing nitrate compounds; and

feeding clarified effluent from the recirculation tank to an effluent drainage region.

5,534,148

PROCESS FOR TREATING PHOTOGRAPHIC WASTE SOLUTION

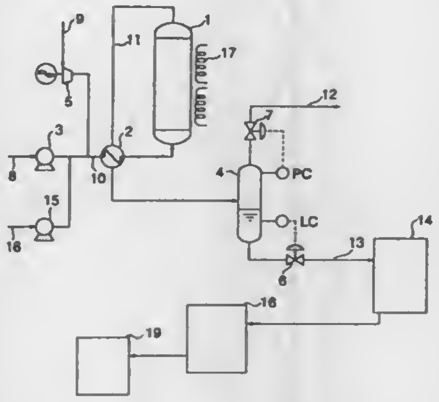
Seiji Suzuki; Kiyotaka Hori, both of Minami ashigara; Yusuke Shiota, Himeji, and Kiichiro Mitsui, Akashi, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, and Nippon Shokubai Co., Ltd., Osaka, both of, Japan

Filed Jun. 27, 1995, Ser. No. 495,001

Claims priority, application Japan, Jun. 27, 1994, 6-165773

Int. Cl.^{6} C02F ***3/30;11/08;1/72***

U.S. Cl. 210—605 **13 Claims**



1. A process for treating a photographic waste solution which comprises purifying thereof by successively performing the following steps;

(i) a first step for subjecting the photographic waste solution to noncatalytic wet oxidation at a temperature of from 140° C. up to 370° C. under a pressure as to hold said waste solution in a liquid phase while supplying an oxygen-containing gas thereto;

(ii) a second step for eliminating solid matters and/or suspended matters formed in the first step from the treated solution of the first step;

(iii) a third step for subjecting the treated solution of the second step to catalytic wet oxidation at a temperature of from 140° C. up to 370° C. under a pressure as to hold said waste solution in a liquid phase while supplying an oxygen-containing gas thereto; and

(iv) a fourth step for subjecting the treated solution of the third step to a biological treatment comprising a combination of an aerobic biological treatment with an anaerobic biological treatment.

5,534,149

METHOD OF SEPARATING CATALYST-FREE WORKING SOLUTION FROM THE HYDROGENATION CYCLE OF THE ANTHRAQUINONE METHOD FOR THE PRODUCTION OF HYDROGEN PEROXIDE

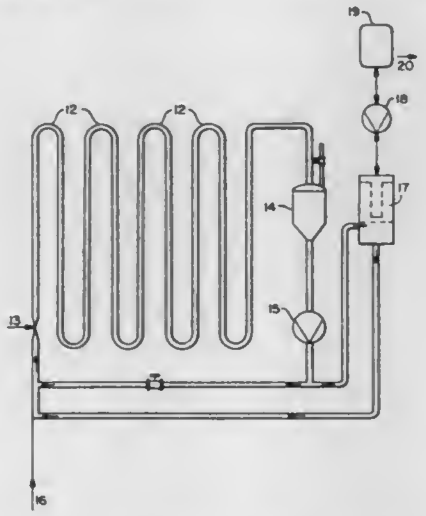
Hans Birkenbeil, Frankfurt; Ulrich Brand, Langenselbold; Gustaaf Goor, Hanau, and Wolfgang Kunkel, Frankfurt, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 20, 1995, Ser. No. 406,519

Claims priority, application Germany, May 31, 1994, 44 18 931.1

Int. Cl.^{6} B01D ***61/00;*** **C02F** ***1/44***

U.S. Cl. 210—636 **8 Claims**



1. A method for the separation of catalyst-free working solution from working solution containing noble-metal black as catalyst, obtained in the hydrogenation cycle of the anthraquinone method for the production of hydrogen peroxide comprising filtering the catalyst-containing working solution using filter candles formed of an open-pore inert support body with an average pore width in a range of 5 to 100 μm and of a single-layer or multilayer membrane of ceramic material with an average pore width in a range of at least about 1 up to 10 μm located on one side of and in contact with the support body wherein the catalyst-containing working solution passes through the membrane first.

5,534,150

SELECTIVELY-PERMEABLE MEMBRANE AND THE USE THEREOF

Catia Bastioli, Novara, and Vittorio Bellotti, Fontaneto D'Agogna, both of, Italy, assignors to Novamont S.P.A., Milan, Italy

Continuation of Ser. No. 875,453, Apr. 29, 1992, abandoned. This application May 17, 1994, Ser. No. 245,065

Claims priority, application Italy, May 3, 1991, TO91A0327

Int. Cl.^{6} B01D ***61/36***

U.S. Cl. 210—640 **25 Claims**

1. A method of separating liquid aqueous-organic mixtures by pervaporation with the use of a selectively-permeable membrane, wherein the membrane is constituted by a composition comprising non-ionic starch and at least one synthetic thermoplastic polymer, wherein the non-ionic starch and the synthetic polymer are at least partially interpenetrated to provide a substantially water-insoluble material.

5,534,151

PROCESS FOR SEPARATING AND RECOVERING HALOCARBONS FROM MIXTURES THEREOF

Kung H. Lee, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 215,455, Mar. 21, 1994, Pat. No. 5,456,841, which is a continuation-in-part of Ser. No. 96,570, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 923,671, Aug. 3, 1992, Pat. No. 5,282,968. This application Jun. 7, 1995, Ser. No. 477,744

Int. Cl.^{6} B01D ***15/00***

U.S. Cl. 210—640 **6 Claims**

1. A process for separating components of an azeotropic or azeotrop-like mixture comprising hexafluoropropylene and monochlorodifluoromethane in which said azeotropic or azeotrope-like mixture is contacted with a semipermeable membrane to form at least one exit stream having an increased concentration of hexafluoropropylene and at least one other exit stream having an increased concentration of monochlorodifluoromethane and, thereafter, recovering at least one exit stream.

5,534,152

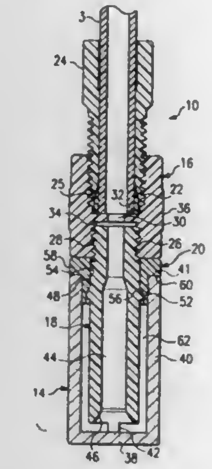
INLET FILTER AND METHOD OF USING SAME

Hans G. Schick, Anacortes, Wash., assignor to Upchurch Scientific, Inc., Oak Harbor, Wash.

Division of Ser. No. 41,481, Apr. 1, 1993, Pat. No. 5,366,620. This application Aug. 31, 1994, Ser. No. 298,757

Int. Cl.^{6} B01D ***15/08***

U.S. Cl. 210—656 **2 Claims**



1. A method of replacing a filtering element comprising the steps of:

loosening a coupling nut to which an expansion member which is removably attached to a filtering element has been removably attached;

removing the filtering element from a seal ring attached to the expansion member;

replacing the filtering element with a different filtering element; and

tightening the coupling nut to secure the coupling nut to the expansion member and secure the seal ring to the filtering element.

5,534,153

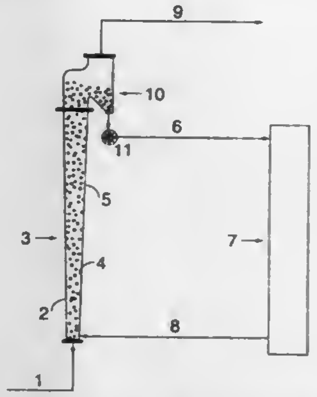
CONTINUOUS FLUIDIZED-BED CONTACTOR WITH RECYCLE OF SORBENT

Charles D. Scott, Oak Ridge, Tenn.; James N. Petersen, Moscow, Id., and Brian H. Davison, Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jul. 24, 1992, Ser. No. 919,819

Int. Cl.^{6} B01D ***15/02***

U.S. Cl. 210—661 **12 Claims**



1. A method of operating a fluidized-bed contactor system, comprising the steps of:

providing a contactor vessel having a fluid inlet and a fluid outlet;

introducing into said contactor vessel an upwardly flowing fluid solvent phase containing a sorbate;

introducing into said contactor vessel a particulate sorbent phase having a sedimentation velocity that allows said particulate sorbent phase to be suspended by said upwardly flowing fluid solvent phase, said particulate sorbent phase sorbing said sorbate resulting in a sorbate-loaded particulate sorbent phase having a decreased sedimentation velocity so that said sorbate-loaded particulate sorbent phase migrates upwardly, said particulate sorbent phase decreasing in diameter as said particulate sorbent phase sorbs said sorbate; and

recovering said sorbate-loaded particulate sorbent phase.

5,534,154

SYSTEM FOR CLEANING CONTAMINATED SOIL

Robert W. Gillham, Guelph, Canada, assignor to University of Waterloo, Waterloo, Canada

PCT No. PCT/GB92/00759, § 371 Date Oct. 22, 1993, § 102(e) Date Oct. 22, 1993, PCT Pub. No. WO90/19556, PCT Pub. Date Nov. 12, 1992

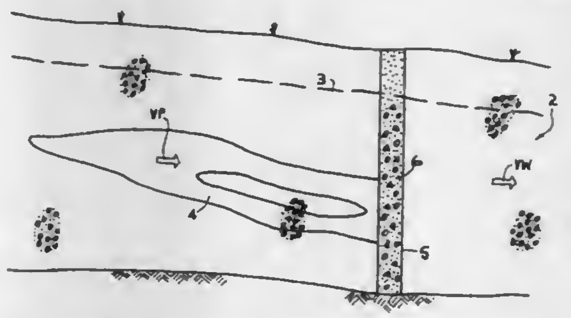
PCT Filed Apr. 24, 1992, Ser. No. 137,195

Claims priority, application United Kingdom, Apr. 25, 1991, 91/09071

The portion of the term of this patent subsequent to Oct. 22, 2013, has been disclaimed.

Int. Cl.^{6} C02F ***1/28***

U.S. Cl. 210—668 **17 Claims**



1. Procedure for treating contaminated water, by passing the water containing contaminant in solution through a permeable

body of treatment material comprising particles of an adsorptive material physically mixed with particles of a metal, wherein:

the nature of the contaminant and the nature of the metal are such that the contaminant breaks down by chemical reaction into chemically distinct and different substances when brought into, and during the course of, prolonged contact with the particles of metal;

the nature of the adsorptive material is such that the contaminant is adsorbed out of solution onto the particles of adsorptive material upon the contaminated water being passed over and through the permeable mixture;

the adsorptive capacity of the adsorptive material is such that the velocity of the contaminant passing through the permeable mixture is substantially more retarded than the velocity of the water passing through the permeable body;

whereby the contaminant, being retarded on and by the parities of adsorbent material, is held physically adjacent to the particles of metal for a substantially longer period of time than the passing water, and is so held long enough for chemical breakdown of the contaminant to take place;

and the procedure includes the step of so disposing and arranging the mixture that all oxidising agents and materials, including atmospheric oxygen, are excluded from contact with the mixture.

5,534,155

METHOD FOR PURIFICATION OF COOLING AGENTS AND/OR LUBRICANTS USED INROLLING MILLS

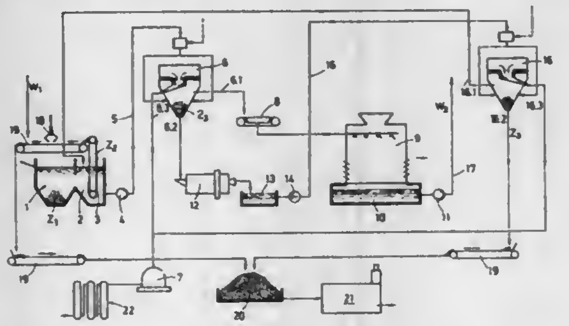
Werner Schimion, Hilchenbach, and Willi Leineweber, Krefeld, both of, Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed May 15, 1992, Ser. No. 883,827

Claims priority, application Germany, May 15, 1991, 41 15 819.9

Int. Cl.^{6} B03C *1/30;* C02F *1/48*

U.S. Cl. 210—695.000 **2 Claims**



1. A method of separating rolling scale and substances containing oil or grease from industrial water flowing in open circulation lines of rolling mills, said method comprising the steps of:

separating rolling scale particles having a diameter larger than 0.5 mm from industrial water by gravity sedimentation;

thereafter, separating rolling scale particles having a diameter less than 0.5 mm from the industrial water by magnetic separation;

thereafter, separating by flotation the industrial water into fractions containing oil concentrate, water and rolling scale particles remaining after magnetic separation;

grounding the separated by flotation rolling scale particles and suspending the grounded rolling scale particles in water to form a suspension;

separating by flotation the suspension into fractions containing oil concentrate, water and grounded rolling scale particles containing oil;

utilizing water as a cooling agent;

separating the oil concentrate into waste oil, water and rolling scale particles containing oil; and

smelting all of separated rolling scale particles for producing a metal.

5,534,156

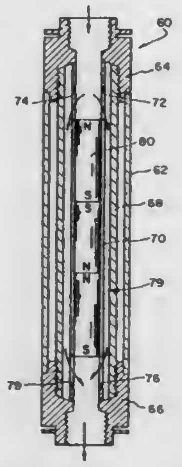
REGULATION OF *ESCHERICHIA COLI* AND OTHER MICROORGANISMS THROUGH MAGNETIC WATER TREATMENT

Charles H. Sanderson, Fort Wayne, Ind., assignor to Magnatech Corporation, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 197,928, Feb. 17, 1994, Pat. No. 5,368,748. This application Nov. 28, 1994, Ser. No. 345,137

Int. Cl.^{6} C02F *1/48*

U.S. Cl. 210—695 **7 Claims**



1. A method for treating water to kill microorganisms, said method comprising:

providing a first volume of water containing microorganisms;

treating at least a portion of said volume of water by passing said portion through a plurality of magnetic fields of alternating polarity formed by a magnet surrounded by a magnetic casing to maximize the magnetic field therein, said volume of water passing through said casing; and

mixing said treated portion back into said first volume thereby killing said microorganisms.

5,534,157

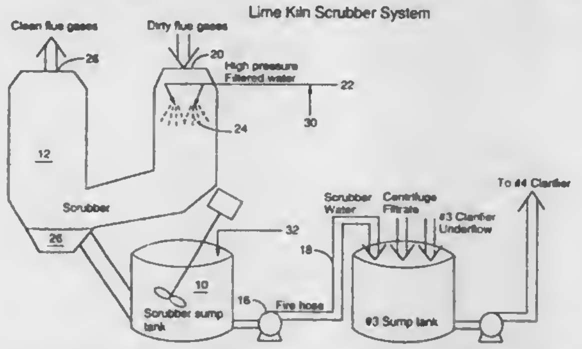
POLYETHER POLYAMINO METHYLENE PHOSPHONATES FOR HIGH PH SCALE CONTROL

Craig D. Iman, Cranberry Township, Pa., and Robert E. Tomilson, Portland, Me., assignors to Calgon Corporation, Pittsburgh, Pa.

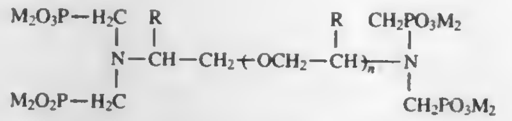
Filed Nov. 10, 1994, Ser. No. 338,016

Int. Cl.^{6} C02F *5/14*

U.S. Cl. 210—700 **20 Claims**



1. A method of inhibiting the formation, deposition and adherence of calcium sulfite in an aqueous system of a pulp and/or paper mill, wherein said aqueous system has a pH of at least 8.5 and a calcium sulfite saturation level of at least 150 times the solubility limit of calcium sulfite in said aqueous system, comprising the step of adding to said system an amount sufficient to establish a concentration, on an active basis, of from 5 to 30 ppm of a polyether polyamino methylene phosphonate of the formula:



$$\begin{array}{l} M_2O_3P-H_2C \quad R \qquad\qquad\qquad\quad R \quad CH_2PO_3M_2 \\ \qquad\qquad N-CH-CH_2\leftarrow OCH_2-CH\rightarrow_n N \\ M_2O_2P-H_2C \qquad\qquad\qquad\qquad\qquad CH_2PO_3M_2 \end{array}$$

where n is an integer or fractional integer which is, or on average is, from about 2 to about 12, inclusive; M is hydrogen or a suitable cation; and each R may be the same or different and is independently selected from hydrogen and methyl.

5,534,158

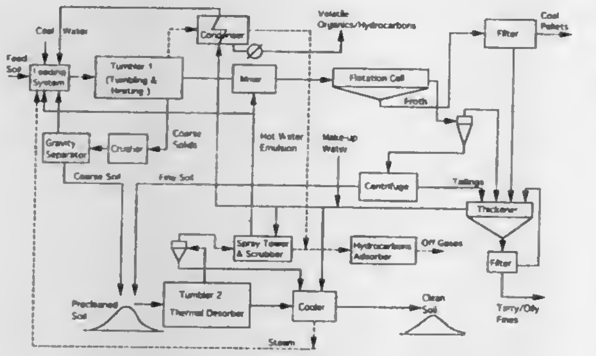
METHOD FOR CLEAN-UP OF SOILS OR REFUSE MATERIALS CONTAMINATED WITH HIGHLY VISCOUS COAL OR PETROLEUM DERIVED TARS/OILS

Teresa Ignasiak, Edmonton, Canada, assignor to Envirotech Consulting Inc., Edmonton, Canada

Continuation of Ser. No. 170,877, Dec. 21, 1993, abandoned. This application Mar. 31, 1995, Ser. No. 414,958

Int. Cl.^{6} B01D *17/035;11/02;* B09B *5/00*

U.S. Cl. 210—703 **1 Claim**



Flowsheet of the Integrated Process for Treating Tar/Oil Contaminated Soil According to the Present Invention.

1. A method for the clean-up of coal-tar and/or petroleum contaminated soils which is based on the integration of soil washing techniques with modified thermal desorption and comprises the steps of:

(a) precleaning the contaminated soil or refuse material by:
  slurrying in water the contaminated soil with pulverized contaminant adsorbent to form a first mixture of between 30% to 60% solids with a ratio of contaminant adsorbent to contaminant being from 10:100 to 87:13 and feeding said first mixture in a tumbling and heating step;
  agitating said first mixture at a temperature of between 80°–95° C. in said tumbling and heating step for a time of about 5–20 minutes then screening coarse fraction containing coarse soil and coarse organic solids at a size of 0.5–3.3 mm from said first mixture to yield a resultant mixture without said coarse fraction;
  adding to said resultant mixture a frother and diluting said resultant mixture to between 10–40% solids concentration thereby forming a second mixture;
  subjecting said second mixture to flotation in the presence of air which causes a floating froth to form, said froth composed of fines containing the contaminants and separating off the floating froth from the remaining slurry; the remaining slurry containing precleaned fine soil;
  separating the precleaned fine soil from the remaining slurry thereby resulting in a precleaned fine soil fraction;
  separating the coarse soil from the coarse organic solids thus resulting in a precleaned coarse soil fraction;

(b) either combining the precleaned fine soil fraction and the precleaned coarse soil fraction and feeding the combined fraction to a thermal desorber step, or feeding the precleaned fine soil fraction to a thermal desorber step or feeding the precleaned coarse soil fraction to a thermal desorber step;

(c) heating the precleaned soil fraction from step b) in said thermal desorber at a temperature range of 250°–480° C., residence time of up to 20 minutes while employing the heat of combustion gases for the heating; maintaining the partial pressure of steam in the combustion gases at a level of about 50% and forming therein a stream of hot gases with residual contaminants and clean very fine soil therein;

(d) discharging clean fine and/or clean coarse soil from the thermal desorber into a cooling vessel where steam is generated;

(e) separating clean very fine soil from hot gases exiting the thermal desorber by cycloning the hot gases stream exiting the thermal desorber; directing the separated clean very fine soil to cooling vessel;

(f) directing the hot gases still containing residual contaminants from the cyclone to a spray tower where the hot gases are cooled with recycle water and thus heating the recycle water to about 95° C. while including in said recycle water residual contaminants;

(g) directing the hot recycle water containing the residual contaminants to step (a) of the process where the contaminated soil is slurried.

5,534,159

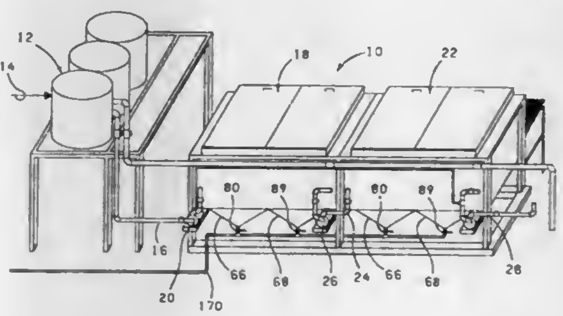
PORTABLE WASTEWATER TREATMENT METHOD

Joseph P. Krieger, Guthrie, Okla., assignor to JTJ Systems, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 100,876, Aug. 1, 1993, which is a continuation of Ser. No. 969,615, Oct. 30, 1992, Pat. No. 5,288,737, which is a continuation of Ser. No. 616,583, Nov. 21, 1990, Pat. No. 5,173,184. This application Sep. 2, 1994, Ser. No. 300,686

Int. Cl.^{6} C02F *1/24*

U.S. Cl. 210—704 **42 Claims**



1. A method for recycling a contaminated aqueous surfactant solution of a parts washer assembly, comprising the steps of:

(a) passing the aqueous surfactant solution from the parts washer assembly into a mixing zone in a housing;

(b) introducing air into the aqueous surfactant solution prior to the aqueous surfactant solution being introduced into the mixing zone in an amount sufficient so that large air bubbles are formed in the aqueous surfactant solution in the mixing zone;

(c) spraying water onto the aqueous surfactant solution in the mixing zone so that the sprayed water contacts the large air bubbles in the mixing zone and substantially reduces the size of the large air bubbles in the mixing zone;

(d) passing the aqueous surfactant solution from the mixing zone into a quiescent zone in the housing where the aqueous surfactant solution is separated into an upper layer containing light sludge, an intermediate layer constituting a treated aqueous solution and a lower layer containing a heavy sludge;

(e) passing the treated aqueous surfactant solution from the quiescent zone into a discharge zone in the housing; and

(f) passing the treated aqueous surfactant solution from the discharge zone to the parts washer assembly.

5,534,160

METHOD FOR THE RE-TREATMENT OF RESIDUE GENERATED FROM THE REMOVAL OF FLUORINE DISSOLVED IN WASTE WATER

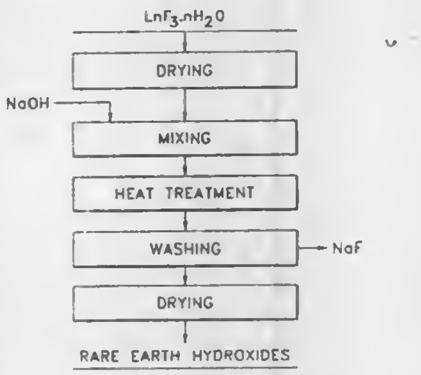
Young H. Hong; Jae H. Roh, and Sang M. Woo, all of Seoul, Rep. of Korea, assignors to Lucky Metals Corporation, Seoul, Rep. of Korea

Filed Apr. 19, 1994, Ser. No. 229,657

Claims priority, application Rep. of Korea, May 7, 1993, 7838/1993

Int. Cl.^{6} C02F *1/58*

U.S. Cl. 210—710 **1 Claim**



1. A method for treating waste water containing fluorine, comprising the steps of:
- adding rare earth compounds to said waste water to give rare earth fluorides;
- separating the rare earth fluorides from the waste water;
- drying the rare earth fluorides;
- mingling the dried rare earth fluorides with solid sodium hydroxide, the weight ratio of said dried rare earth fluorides to sodium hydroxide being from about 0.6 to about 1.0;
- heating the resultant admixture at a temperature in the range of about 320° C. to about 450° C. for about 0.5 to about 5 hours, thereby obtaining a solid lump consisting of rare earth hydroxides and alkaline fluoride salts; and
- subjecting said solid lump to a washing process with water and a solid-liquid separation process, so as to obtain rare earth hydroxides.

5,534,161

AUTOMATIC WATER DRAIN AND PRIMING PUMP FOR FUEL SYSTEMS

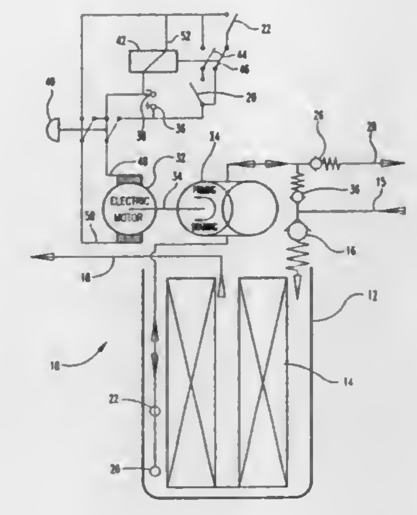
Yul J. Tarr; C. Edward Morris, and Glen T. Haegele, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 16, 1994, Ser. No. 358,026

Int. Cl.^{6} B01D *36/00*

U.S. Cl. 210—744 **16 Claims**

12. A method of draining water and priming fuel in a fuel system, comprising the steps of:
- (a) activating a pump coupled to a fuel/water separator in a first flow direction to drain water from the fuel/water separator; and
- (b) activating the pump in a second flow direction to prime the fuel/water separator with fuel.



5,534,162

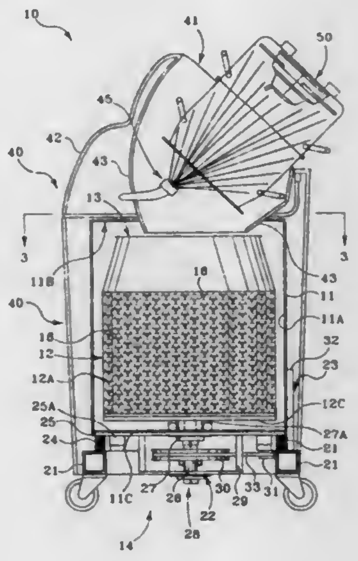
METHOD FOR DISPOSAL OF BIOLOGICAL WASTE

Mathew J. Adams; Kenneth R. Lamaster, both of Indianapolis; David B. Mennel; Jeffrey C. Rapp, both of Greenwood, all of Ind.; Lewis I. Schwartz, Bratenahl; Norman L. Siegel, Mentor, both of Ohio, and Joseph H. Wilson, Speedway, Ind., assignors to Ecomed, Inc./Steris Corp., Indianapolis, Ind.

Filed Mar. 11, 1994, Ser. No. 209,818

Int. Cl.^{6} B01D *33/06;* **A01N** *33/00*

U.S. Cl. 210—781 **16 Claims**



9. A method of disposal of biological waste, the method comprising:
- placing a mixture of liquid and disintegrated biological waste in a porous container,
- spinning the porous container and contained mixture of liquid and disintegrated biological waste and providing sufficient centrifugal force on the liquid and disintegrated biological waste to remove substantially unabsorbed liquid from the porous container and disintegrated biological waste to an outer liquid collection receiver, and
- disposing separately the porous container containing biological waste and the removed liquid.

5,534,163

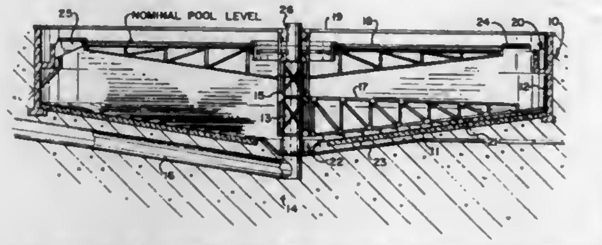
CENTER COLUMN EXTENSION FOR A CLARIFIER

John H. Michel, Baltimore, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 23, 1995, Ser. No. 493,942

Int. Cl.^{6} B01D *21/24*

U.S. Cl. 210—800 **8 Claims**



1. A method for preparing a clarifier tank for repairs or maintenance, said tank having underground inlet piping and a center column distributor with a discharge opening below the normal level of the liquid pool in the clarifier comprising:
- (a) temporarily interrupting the flow of effluent to be clarified to the clarifier tank;
- (b) pumping effluent from the clarifier tank to achieve a liquid level below the discharge opening of the center column distributor;
- (c) installing a center column extension at the top of the center column distributor; and,
- (d) restoring the flow of effluent to be clarified to the clarifier tank by pumping the effluent directly into the clarifier tank via an alternate route thereby bypassing the underground inlet piping and center column distributor.

5,534,164

NON-TOXIC, ENVIRONMENTALLY BENIGN FIRE EXTINGUISHANTS

Elio Guglielmi, 304 - 700 West Pender St., Vancouver, British Columbia, Canada

PCT No. PCT/CA92/00104, § 371 Date Nov. 18, 1994, § 102(e) Date Nov. 18, 1994, PCT Pub. No. WO93/17758, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 10, 1992, Ser. No. 302,709

Int. Cl.^{6} A62D *1/08*

U.S. Cl. 252—8 **5 Claims**

1. A fire extinguishing mixture comprising:
- (a) about 1% wt. of 2,2-dichloro-1,1,1-trifluoroethane or 1,2-dichloro-1,1,2-trifluoroethane;
- (b) about 9.5% wt. of 2-chloro-1,1,1,2-tetrafluoroethane or 1-chloro-1,1,2,2-tetrafluoroethane;
- (c) about 79.5 to 88.5% wt. of chlorodifluoromethane; and
- (d) about 1 to 10% wt. of isobutylene, said fire extinguishing mixture being non-toxic and environmentally benign in both natural form and degraded form on exposure to fire.

5,534,165

FABRIC TREATING COMPOSITION CONTAINING BETA -CYCLODEXTRIN AND ESSENTIALLY FREE OF PERFUME

David Pilosof; Jerome P. Cappel, both of Cincinnati; Philip A. Geis, West Chester; Mark Lee McCarty, Loveland; Toan Trinh, Maineville, and Susan S. Zwerdling, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1994, Ser. No. 289,969

Int. Cl.^{6} D06M *15/03;* **C08L** *5/16*

U.S. Cl. 252—8.91 **18 Claims**

1. A stable, aqueous odor absorbing fabric treating composition, comprising:
- A. from about 0.1% to about 1.85% of solubilized, uncomplexed beta-cyclodextrin;
- B. aqueous carrier;
- C. an effective amount for preserving said composition, of a water-soluble, antimicrobial preservative having a water-solubility of greater than about 0.3% at room temperature; and

wherein said composition is essentially free of any material that would soil or stain fabric; and wherein said composition is essentially free of perfume and has a pH of greater than about 3.

5,534,166

PREPARATION OF CONDENSATES OF ARENESULFONIC ACIDS AND FORMALDEHYDE AND USE THEREOF

Ralf Brueckmann, Goennheim; Johannes P. Dix, Neuhofen; Rolf Fikentscher; Manfred Herrmann, both of Ludwigshafen, and Norbert Zimmermann, Waldsee, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 900,742, Jun. 19, 1992, which is a continuation of Ser. No. 600,128, Oct. 22, 1990, abandoned, which is a continuation of Ser. No. 438,027, Nov. 20, 1989, abandoned. This application Mar. 26, 1993, Ser. No. 37,392

Claims priority, application Germany, Dec. 14, 1988, 38 41 987.4

Int. Cl.^{6} B01F *17/52;* **C09B** *67/42;* **C08G** *16/02*

U.S. Cl. 8—557 **15 Claims**

1. A dye formulation containing 100 parts by weight of a dye and from 8 to 500 parts by weight; of a dispersing agent, said dispersing agent prepared by a process consisting essentially of the steps of:
- (a) thermally cracking a naphthenic residue oil to obtain a cracked product and then fractional distilling said cracked product to obtain an arene compound composition distilling at 100°–120° C. and 1013 said composition comprising 30 to 55 wt. % naphthalene, at least about 9 wt. % methyl naphthalene and at least about 3 wt. % indene,
- (b) sulfonating said arene compound composition with oleum at from 120° to 160° C.,
- (c) using from 0.7–1.2 parts by weight of oleum having an SO_3 content of 24% by weight per part by weight of said arene compound composition, and
- (d) condensing the arene sulfonic acid thus obtained with formaldehyde in an aqueous medium.

5,534,167

CARPET CLEANING AND RESTORING COMPOSITION

Fred L. Billman, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 259,211, Jun. 13, 1994, abandoned. This application Feb. 17, 1995, Ser. No. 397,740

Int. Cl.^{6} C11D *3/24;1/14;3/20;3/39*

U.S. Cl. 510—280 **16 Claims**

1. A carpet cleaning and oil and water repellency restoring composition comprising:
- (a) from about 0.50% to about 6.0% by weight of ethylene glycol n-hexyl ether;
- (b) from about 0.05% to about 1.0% by weight of a water-soluble or water miscible fluorinated hydrocarbon which forms a water and oil repellent surface upon drying;
- (c) from about 0.25% to about 5.0% by weight of a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants and mixtures thereof;
- (d) from about 0.1% to about 7.0% by weight of a olefinic/acrylic polymer having an acid number of about 10 to about 450 and selected from the group consisting of
  - i. 60% styrene/alpha methyl styrene/acrylic resin, having a molecular weight 1,700, a glass transition temperature of 56°, and acid number of 238;
  - ii, 34% styrene/acrylic methyl styrene/acrylic resin, molecular weight 8,500, glass transition temperature of 85° C., acid number of 215;

- iii, 30.5% styrene/alpha methyl styrene/acrylic resin, molecular weight 12,500, glass transition temperature of 73° C., acid number of 213;
- iv. 45.5% styrene/alpha methyl styrene/2-ethyl hexylacrylate/acrylic acid, molecular weight >200,000, glass transition temperature of 7° C. acid number of 50;
- v. 45% styrene/alpha methyl styrene/acrylic acid/methyl methacrylate/butyl methacrylate/butyl acrylate, molecular weight >200,000, glass transition temperature of 64° C. acid number of 53;
- vi. about 98.% solid styrene/alpha methyl styrene/acrylic resin which is cut into solution with 28% ammonia to pH of 7.85, molecular weight 17,000, glass transition temperature of 85° C. and acid number of 175:
- vii. carboxylated water-soluble polymer having an acid number of 196;
- viii. carboxylated water-soluble polymer having an acid number of 512;
- ix. carboxylated water-soluble polymer having an acid number of 427: and
- x. mixtures thereof; and

(e) the balance water, wherein the composition forms a non-tacky residue upon drying.

5,534,168

PREPARATION OF OVERBASED MAGNESIUM SULPHONATES

John A. Cleverley, Didcot; Robert A. Wardle, Abingdon; Joseph M. Swietlik, Abingdon; John F. Marsh, Abingdon, and Jeremy R. Spencer, Oxford, all of, United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

PCT No. PCT/EP92/01113, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/20694, PCT Pub. Date Nov. 26, 1992

PCT Filed May 19, 1992, Ser. No. 142,370

Claims priority, application United Kingdom, May 24, 1991, 9111257

Int. Cl.^{6} C10M *125/00*

U.S. Cl. 508—396 **11 Claims**

1. A process for the production of an overbased magnesium sulphonate oil solution comprising: (a) preparing a mixture comprising:

- 1 an oil-soluble sulphonate or an oil-soluble sulphonic acid;
- 2 from 1 to 45 equivalents or magnesium oxide per equivalent of oil soluble sulphonate or sulfonic acid
- 3 a hydrocarbon solvent in which the sulphonate or sulphonic arid of 1 and the overbased magnesium sulfonate are at least partially soluble;
- 4 water;
- 5 water-soluble C_1–C_5 alcohol; and
- 6 promoter comprising at least one substance selected from amines, organic acids, ammonia, ammonium compounds, ketones, and anhydrides.

(b) carbonating the mixture wherein additional Water and optionally additional alcohol are introduced into the mixture during carbonation, and

(c) thereafter filtering the mixture at a rate of at least 150 kg/m^2/hr to remove any solids, wherein the magnesium oxide has a citric acid number of 200 seconds to 700 seconds, a surface area measured by the BET single point method of less than 12 m^2/g, and at least 92 volume % of its particles are greater than 2 μm, and wherein the magnesium oxide has a purity as measured by EDTA titration of at least 95%,

wherein the total amount of water introduced into the mixture, including say introduced before carbonation but excluding water generated by chemical reactions, is at lust 0.5 mole per mole of magnesium present in the amount of magnesium oxide large enough to produce sufficient colloidal magnesium derivatives to provide a high TBN

(d) stripping water, alcohol, and volatile solvents prior to or following step (c).

5,534,169

METHODS FOR REDUCING FRICTION BETWEEN RELATIVELY SLIDEABLE COMPONENTS USING METAL CARBOXYLATES

James N. Vinci, Mayfield Hts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 788,687, Nov. 6, 1991, abandoned, which is a continuation of Ser. No. 554,613, Jul. 18, 1990, abandoned, which is a continuation of Ser. No. 340,902, Apr. 20, 1989, abandoned. This application Oct. 21, 1994, Ser. No. 327,127

Int. Cl.^{6} C10M *129/26;135/00*

U.S. Cl. 508—460 **18 Claims**

1. A method for reducing friction between relatively slideable components comprising applying to a slideably engaging surface of a slideable component a lubricating amount of a lubricating composition comprising non-Newtonian colloidal disperse system comprising (1) solid metal-containing colloidal particles dispersed in (2) a disperse medium of at least one inert organic liquid and (3) as a third component at least one organic compound which is soluble in said disperse medium and contains a hydrophobic portion and at least one polar substituent.

5,534,170

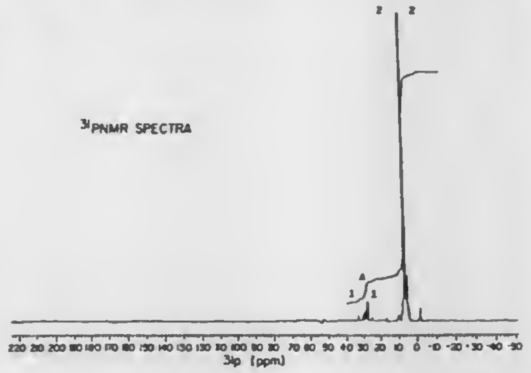
MIXED PHOSPHORUS- AND SULFUR-CONTAINING REACTION PRODUCTS USEFUL IN POWER TRANSMITTING COMPOSITIONS

Frederick W. Raymond, Long Valley, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 260,863, Jun. 16, 1994, abandoned, which is a continuation of Ser. No. 927,563, Aug. 10, 1992, Pat. No. 5,326,487, which is a division of Ser. No. 370,315, Jun. 22, 1989, Pat. No. 5,242,612, which is a continuation-in-part of Ser. No. 210,831, Jun. 24, 1988, abandoned. This application May 18, 1995, Ser. No. 444,169

Int. Cl.^{6} C10M *137/00;153/00*

U.S. Cl. 508—161 **12 Claims**



1. A composition comprising reaction product of a reaction mixture comprising:

(1) at least one beta-hydroxy thioether reactant represented by the formula:

$$R—(SCH_2CH_2OH)_x \qquad I$$

wherein R represents an unsubstituted or substituted hydrocarbyl group and wherein x is a number from 1 to about 3 and which identifies the number of $—SCH_2CH_2OH$ groups attached to R;

(2) an amount of phosphorous-containing reactant selected from the group consisting of dihydrocarbyl hydrogen phosphite, trihydrocarbyl phosphite, and mixtures thereof, sufficient to provide at least about ten mole percent of phosphorous containing reactant based on the total moles of reactants in said reaction mixture; and optionally

(3) nucleophilic reactant containing at least one reactive hydroxy group and being free from any reactive mercapto or $—SCH_2CH_2OH$ groups;

wherein said reaction mixture is admixed in a manner and under conditions sufficient to form a one or two phase mixture comprising:

(i) non-phosphorous containing compounds having within their structure at least one group represented by the formula:

$$—S—CH_2CH_2—Q— \qquad I''$$

wherein Q is independently selected from the group consisting of oxygen or sulfur, said Q constituting a portion of the residue derived from: (1) beta-hydroxy thioether reactant, (2) the hydrocarbyl portion of the organic phosphite reactant, (3) when present, the nucleophilic reactant, and (4) mixtures of (1) to (3); and wherein the remainder of Structure I", exclusive of Q, contains residue of beta-hydroxy thioether reactant; and

(ii) phosphorous containing compounds comprising phosphorous acid and organic phosphites having within their structure at least one group represented by the formula:

$$R—SCH_2CH_2O— \qquad I'$$

bonded directly to the phosphorous atom of the organic phosphite said $R—SCH_2CH_2O—$ group representing a residue of beta-hydroxy thioether; and

(iii) wherein (i) and (ii) are further supplemented with an inorganic phosphorous acid or anhydride.

5,534,171

PROCESS FOR MAKING A POLYMERIC LUBRICANT ADDITIVE DESIGNED TO ENHANCE ANTI-WEAR ANTI-OXIDANCY, AND DISPERSANCY THEREOF

Thomas F. Derosa, Passaic, N.J.; Nicholas Benfaremo, Wappingers Falls, N.Y.; Maria M. Kapuscinski, Carmel, N.Y.; Benjamin J. Kaufman, Hopewell Junction, N.Y., and Rosemary J. Jennejahn, Nelsonville, N.Y., assignors to DSM Copolymer Inc., Baton Rouge, La.

Continuation of Ser. No. 346,360, Nov. 29, 1994, Pat. No. 5,472,627. This application Jun. 6, 1995, Ser. No. 466,455

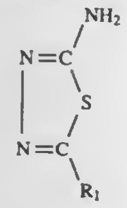
Int. Cl.^{6} C10M *151/02*

U.S. Cl. 508—231 **6 Claims**

1. A process for the manufacture of an anti-wear, anti-oxidancy dispersant polymeric lubricant additive composition comprising the steps of:

(a) reacting a polymer prepared from ethylene and at least one (C_2–C_{10}) alpha-monoolefin and, optionally, a polyene selected from non-conjugated dienes and trienes comprising from about 15 to 80 mole percent of said ethylene, from about 20 to 85 mole percent of said (C_3–C_{10}) alpha-monoolefin and from about 0 to 15 mole percent of said polyene, and having a number average molecular weight ranging from about 5,000 to 500,000, with at least one olefinic carboxylic acid or acid anhydride acylating agent to form one or more acylating reaction intermediates having a carboxylic acid or acid anhydride acylating function within their structure; and

(b) reacting said reaction intermediate with an amino-thiadiazole containing an amine represented by the formula:



wherein R_1 is H_2 or a (C_1–C_{10}) alkyl radical selected from the group consisting of alkyl, alkenyl, alkoxyl, aralkyl alkaryl, hydroxyalkyl and aminoalkyl, to produce said polymeric lubricant additive.

5,534,172

CUTTING FLUID

Phillip G. Perry, Webster; Gene W. O'Dell, Williamson, both of N.Y., and Ronny W. F. van Asten, Asten, Netherlands, assignors to Xerox Corporation, Stanford, Conn.

Continuation-in-part of Ser. No. 143,720, Nov. 1, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 404,382

Int. Cl.^{6} C10M *173/00*

U.S. Cl. 508—156 **22 Claims**

1. An aqueous-based cutting fluid comprising:

(A) about 0.01 to about 5 parts by weight of at least one antioxidant;

(B) about 0.1 to about 5 parts by weight of one or more surfactants, wherein at least one of the surfactants is a water-soluble polysiloxane surfactant in an amount of about 0.01 to about 3 parts by weight;

(C) about 1 to about 20 parts by weight of at least one lubricant; and

(D) about 70 to about 98.9 parts by weight deionized water,

wherein the pH of said cutting fluid is from about 7.0 to about 8.0.

5,534,173

LIGHT DUTY LUBRICANT COMPOSITION AND METHOD OF USE

Robert D. Faber, Grand Rapids, and Ronald C. Jackson, Wyoming, both of Mich., assignors to Amway Corporation, Ada, Mich.

Filed Aug. 30, 1994, Ser. No. 298,241

Int. Cl.^{6} C10M *105/76*

U.S. Cl. 508—203 **20 Claims**

1. A light duty lubricant composition with enhanced penetration and spreadability comprising:

from about 30% to about 97% by weight of a hydrocarbon solvent;

from about 1% to about 30% by weight of a volatile silicone, wherein the volatile silicone has a viscosity of less than about 10 cst. at 25° C.

5,534,174

GRAFT COPOLYMER COMPRISING A STAR-SHAPED POLYMER AND AN N-ALLYL AMIDE

Christian S. Harstick, St. Louis, and Kenneth O. Henderson, Florissant, both of Mo., assignors to Ethyl Petroleum Additives, Inc., Richmond, Va.

Filed Apr. 20, 1990, Ser. No. 511,663

Int. Cl.^{6} C10M *133/16;149/00*

U.S. Cl. 508—543 **22 Claims**

1. A graft copolymer having viscosity index improving properties and dispersant properties;

said copolymer comprising a star-shaped polymer to which is grafted a dispersing amount comprising from about 1 to about 50 weight percent, based on the weight of said star-shaped polymer, of an N-allyl amide, thereby forming a graft copolymer;

said star-shaped polymer being further characterized by having a poly(polyalkenyl coupling agent) nucleus and at least 4 polymeric arms linked to said nucleus, and by being adapted to have an N-allyl amide grafted thereto under free-radical conditions;

said graft copolymer being formed in and being in solution in a liquid poly(alpha-olefin) oligomer solvent.

12. A lubricating oil composition comprising a major proportion of an oil of lubricating viscosity and a minor proportion of a copolymer of claim 1.

5,534,175

COPOLYMERS OF UNSATURATED FATTY ESTERS, THEIR USE AS VISCOSITY IMPROVER AND LUBRICATING OIL CONTAINING SAID COPOLYMERS

Robert Cantiani, Puteaux, France, assignor to The Lubrizol Corporation, Wickliffe, Ohio

PCT No. PCT/US93/12528, § 371 Date Nov. 11, 1994, § 102(e) Date Nov. 11, 1994, PCT Pub. No. WO94/14860, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 22, 1993, Ser. No. 295,696

Claims priority, application France, Dec. 28, 1992, 92/15780

Int. Cl.^{6} C10M *145/14;* **C08F** *220/18*

U.S. Cl. 508—469 **23 Claims**

1. A copolymer comprising carboxylic acid ester comprising a percentage a by mass of an ester of a carboxylic acid A_1 containing from 3 to 5 carbon atoms and exhibiting an ethylenic unsaturation alpha to the carboxylic functional group, with an alcohol of formula R_1OH containing from 1 to 3 carbon atoms;

a percentage b by mass of an ester of a carboxylic acid A_2 containing from 3 to 5 carbon atoms and exhibiting an ethylenic unsaturation alpha to the carboxylic functional group, with an alcohol of formula R_2OH containing on average from 11 to 15 carbon atoms; and

a percentage c by mass of an ester of a carboxylic acid A_3 containing from 3 to 5 carbon atoms and exhibiting an ethylenic unsaturation alpha to the carboxylic functional group, with an alcohol of formula R_3OH containing on average from 16 to 25 carbon atoms in which a is between about 12 and about 20%, c is between about 14 and about 30% and b is between about 72 and about 45%, such that a +b+c=100%.

5,534,176

REFRIGERATION LUBRICANTS PREPARED BY POLYMERIZING ALKENE HAVING A PERFLUOROALKYL GROUP ON ONE END THEREOF

David Nalewajek, West Seneca; Richard E. Elbeck, Orchard Park, and Raymond H. P. Thomas, Amherst, all of N.Y., assignors to AlliedSignal Inc., Morris County, N.J.

Continuation of Ser. No. 982,269, Nov. 25, 1992, abandoned, which is a continuation of Ser. No. 738,077, Jul. 30, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,470

Int. Cl.^{6} C10M *107/38*

U.S. Cl. 252—68 **2 Claims**

1. A composition for use in compression refrigeration and air-conditioning comprising:

(a) at least one refrigerant selected from the group consisting of hydrofluorocarbon, hydrochlorofluorocarbon, fluorocarbon, and chlorofluorocarbon; and

(b) a sufficient amount to provide lubrication of at least one lubricant of the formula

$$—[(R_f)CHCH_2]_m—[(R)CHCH_2]_n—$$

where m is 4 to 40; n=m; R_f is perfluoroalkyl group having 1 to 8 carbon atoms; and R is alkyl of 1 carbon atom wherein said lubricant has a molecular weight between about 300 and about 3,000, has a viscosity of about 5 to about 150 centistokes at 37° C., is miscible in combination with said refrigerant in the range between about −40° C. and at least about +20° C., and the perfluoroalkyl and alkyl groups are pendant groups wherein of the total number of the pendant groups, at least 40% of the pendant groups are perfluoroalkyl groups.

5,534,177

COMPOSITIONS USEFUL FOR REMOVING PRODUCTS OF METAL CORROSION

Kenneth G. Mayhan, 57 Lehigh Aisle, Irvine, Calif. 92715

Filed Feb. 14, 1992, Ser. No. 835,665

Int. Cl.^{6} C02F *5/00*

U.S. Cl. 510—245 **5 Claims**

1. A composition useful for removing products of metal corrosion from corroded metals, said composition comprising:

an aqueous solution of a corrosion removal effective concentration of malonic acid and an organic solvent said organic solvent selected from the group consisting of formamide, dimethylformamide, and dimethylsulfoxide.

5,534,178

PERFORATED, STABLE, WATER SOLUBLE FILM CONTAINER FOR DETERSIVE COMPOSITIONS

Helen Bailly, Eagan; Arthur Luedtke, Woodbury; Paul Pankratz, Lakeville; Joy Allen, Jordan; Tina O. Outlaw, Inver Grove Heights; Lance K. Fisher, Excelsior, and Kelvin D. Sundeen, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Dec. 12, 1994, Ser. No. 354,379

Int. Cl.^{6} C11D *17/00*

U.S. Cl. 510—367 **20 Claims**

1. A sealed, water soluble, detersive package comprising:

(a) a mono-layer, water soluble film container having uniform microscopic perforations of a diameter size of about 0.0005 to 0.125 in., a distance between column of perforations of about 0.5 to 12.0 in., a distance between perforations within a column of about 0.05 to 1.0 in., and a film wall thickness of about 0.5 to 5.0 mil, and

(b) a use amount of cast solid, pelletized or particulate detersive composition contained within said container, wherein said composition is unable to pass through the perforations.

5,534,179

DETERGENT COMPOSITIONS COMPRISING MULTIPERACID-FORMING BLEACH ACTIVATORS

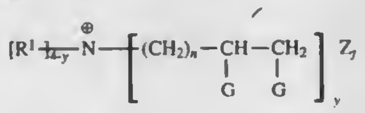
Gregory S. Miracle; Mark R. Sivik, and Patti J. Kellett, all of The Procter & Gamble Company, Miami Valley Laboratories, 11810 E. Miami River Rd., Ross, Ohio 45061

Filed Feb. 3, 1995, Ser. No. 383,397

Int. Cl.^{6} C11D *3/26;3/395;7/38*

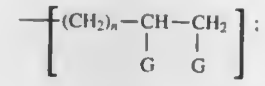
U.S. Cl. 510—305 **18 Claims**

1. A detergent composition comprising an effective amount of a bleach activator wherein said bleach activator undergoes perhydrolysis to form a multiperacid, said bleach activator having the formula:



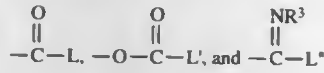
$$[R^1]_{4-y}\overset{\oplus}{N}—\left[(CH_2)_n—\underset{G}{\underset{|}{CH}}—\underset{G}{\underset{|}{CH_2}}\right]_y Z_j$$

wherein y is an integer from 1 to 4; n is an integer from 1 to 6, provided that any n may be independently selected for each



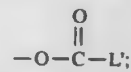
$$—\left[(CH_2)_n—\underset{G}{\underset{|}{CH}}—\underset{G}{\underset{|}{CH_2}}\right];$$

each G is independently selected from the group consisting of



$$—\overset{O}{\overset{\|}{C}}—L,\ —O—\overset{O}{\overset{\|}{C}}—L',\ \text{and}\ —\overset{NR^3}{\overset{\|}{C}}—L'',$$

provided that at least one G is



$$—O—\overset{O}{\overset{\|}{C}}—L';$$

and wherein R^3, when present, is selected from C_1-C_{12} alkyl and C_6-C_{12} aryl and wherein L, L' and L" are leaving groups: each R^1 is independently selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, and polyoxyalkylene; each R^2, when present, is independently selected from alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, alkoxyalkylene, polyalkoxy-alkylene, and hydroxyalkylene, any R^2 being substituted with a moiety selected from H, C_1-C_{20} alkyl, alkenyl, aryl, aralkyl, and alkaryl; Z is an oxidation compatible ion: and j is selected such that said bleach activator is electrically neutral; and

wherein said composition further comprises an effective amount of a source of hydrogen peroxide.

5,534,180

AUTOMATIC DISHWASHING COMPOSITIONS COMPRISING MULTIPERACID-FORMING BLEACH ACTIVATORS

Gregory S. Miracle, and Mark R. Sivik, both of 11810 East Miami River Rd., Ross, Ohio 45061

Filed Feb. 3, 1995, Ser. No. 383,398

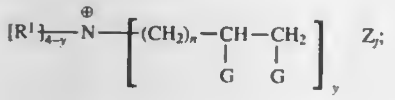
Int. Cl.^{6} C11D *3/26;3/395;7/38*

U.S. Cl. 510—220 **17 Claims**

1. An automatic dishwashing detergent composition comprising

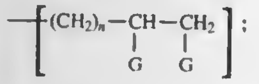
(a) an effective amount of a source of hydrogen peroxide and

(b) a stain-removal improving amount of a bleach activator having the formula:



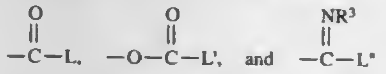
$$[R^1]_{4-y}\overset{\oplus}{N}—\left[(CH_2)_n—\underset{G}{\underset{|}{CH}}—\underset{G}{\underset{|}{CH_2}}\right]_y\quad Z_j;$$

wherein y is an integer from 1 to 4; n is an integer from 1 to 6, provided that any n may be independently selected for each



$$—\left[(CH_2)_n—\underset{G}{\underset{|}{CH}}—\underset{G}{\underset{|}{CH_2}}\right];$$

each G is independently selected from the group consisting of



$$—\overset{O}{\overset{\|}{C}}—L,\quad —O—\overset{O}{\overset{\|}{C}}—L',\quad \text{and}\quad —\overset{NR^3}{\overset{\|}{C}}—L''$$

wherein R^3, when present, is selected from C_1–C_{12} alkyl and C_6–C_{12} aryl and wherein L, L' and L" are leaving groups;

each R^1 is independently selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, and polyoxyalkylene; each R^2, when present, is independently selected from alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, alkoxyalkylene, polyalkoxy-alkylene, and hydroxyalkylene, any R^2 being substituted with a moiety selected from H, C_1–C_{20} alkyl, alkenyl, aryl, aralkyl, and alkaryl; Z is an oxidation compatible ion; and j is selected such that said bleach activator is electrically neutral.

5,534,181

AQUEOUS HARD SURFACE CLEANING COMPOSITIONS HAVING IMPROVED CLEANING PROPERTIES

Herbert W. Henkel, East Hanover; Elisabeth Kaplan, Oceanport, both of N.J., and Philip G. Hall, Oxford, United Kingdom, assignors to Castrol North America Automotive Inc., Wayne, N.J.

Filed Aug. 30, 1995, Ser. No. 521,520

Int. Cl.^{6} C11D *1/66;3/04;3/32;3/22*

U.S. Cl. 510—423 **27 Claims**

1. A cleaning composition comprising:

a. from about 0.4% to about 5% of an alkali metal gluconate;

b. from about 0.3% to about 4% of a nonionic fatty acid amide;

c. from about 0.3% to about 4% of an iso-fatty acid;

d. from about 2% to about 7% of a builder;

e. from about 1% to about 15% of a glycol ether;

f. from about 1% to about 15% of a nonionic surfactant which is different from said nonionic fatty acid amide; and

g. from about 50% to about 95% of water.

5,534,182

PROCESS AND LAUNDRY FORMULATIONS FOR PREVENTING THE TRANSFER OF DYE IN LAUNDRY PROCESSES

Thomas C. Kirk, Langhorne; Curtis Schwartz, Ambler, and Barry Weinstein, Dresher, all of Pa., assignors to Rohm and Haas Company, Phila., Pa.

Filed Jul. 12, 1993, Ser. No. 90,860

Int. Cl.^{6} C11D *3/37*

U.S. Cl. 8—137 **11 Claims**

1. A laundry detergent dye transfer inhibiting formulation comprising 1) from 0.1 to 20 weight percent of at least one dye transfer inhibiting agent selected from the group consisting of a polyethoxylated urethane, and an acrylamide containing polymer having a molecular weight from about 2,000 to about 500,000; and 2) from 99.9 to 80 weight percent of at least one additive selected from the group consisting of water, solvent, builder, surfactant, and fabric softening agent.

5,534,183

STABLE, AQUEOUS CONCENTRATED LIQUID DETERGENT COMPOSITIONS CONTAINING HYDROPHILIC COPOLYMERS

Sridhar Gopalkrishnan, Woodhaven; John V. Sherman, Allen Park; Kathleen M. Guiney, Wyandotte; David T. Durocher, Westland, and Michael C. Welch, Woodhaven, all of Mich., assignors to BASF Corporation, Mount Olive, N.J.

Filed Jul. 14, 1994, Ser. No. 274,938

Int. Cl.^{6} C11D *3/37*

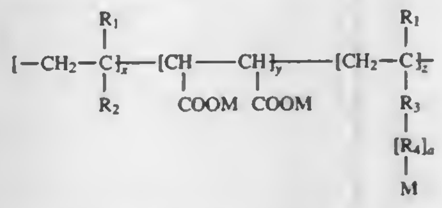
U.S. Cl. 510—434 **16 Claims**

1. A stable aqueous liquid detergent composition, comprising:

a) about 25–70% of detergent active matter selected from the group consisting of anionic, nonionic, cationic, amphoteric and zwitterionic surfactants;

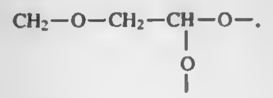
b) about 1–60% of one or more electrolytes;

c) about 0.01–4% of at least one hydrophilic copolymer, comprised of an unsaturated hydrophilic monomer copolymerized with a hydrophilic oxyethylated monomer, wherein said copolymer is selected from Formula I, Formula II, or both, wherein Formula I is:



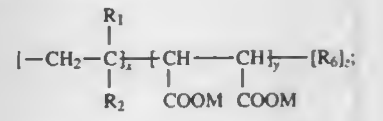
wherein x and y are integers representing the amounts of the said unsaturated hydrophilic monomer in Formula I; and wherein z is an integer representing the amount of the said hydrophilic oxyethylated monomer in Formula I; a is an integer from about 1–200, representing the amounts of R_4 in the said hydrophilic oxyethylated monomer; and M is an alkali metal or hydrogen, and said monomer units are in random order; (x+y): z is from about 5:1 to 1000:1, and y is zero up to the value of x; wherein further each

R_1=H or CH_3;
R_2=COOM, OCH_3, SO_3M, O—CO—CH_3, CO—NH_2;
R_3=CG_2—O—, CH_2—N—, COO—, —O—,

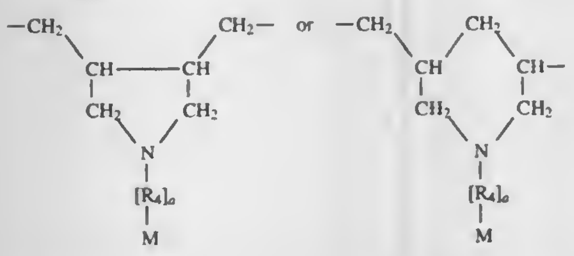


$CH_2-O-CH_2-\underset{\underset{|}{\overset{|}{O}}}{CH}-O-.$

CO—NH;—
R_4=—CH_2—CH_2—O;
and Formula II is:



where R_6 =



or mixtures of both, wherein in Formula II, wherein x and y are integers representing the amounts of the said unsaturated hydrophilic monomer in Formula II; and wherein z is an integer representing the amount of the said hydrophilic oxyethylated monomer in Formula II; a is an integer from 1–200 representing the amounts of R_4 in the said hydrophilic oxyethylated monomer; and M is an alkali metal or hydrogen, and said monomer units are in random order; (x+y):z is from about 5:1 to 1000:1, and y is zero up to the value of x; wherein further, each

R_1=H or CH_3;
R_2=COOM, OCH_3, SO_3M, O—CO—CH_3, CO—NH_2
R_4=CH_2—CH_2—O (oxyethylene);

d) water, wherein further said aqueous composition has a phase separation of less than about 2% over a one month period.

5,534,184

CONCENTRATED LIQUID HARD SURFACE DETERGENT COMPOSITIONS CONTAINING MALEIC ACID-OLEFIN COPOLYMERS

David C. Underwood, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

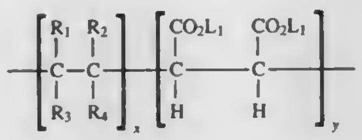
Continuation of Ser. No. 81,742, Jun. 23, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 326,156

Int. Cl.⁶ C11D *3/37;1/75;1/90;1/92*

U.S. Cl. 510—426 **13 Claims**

1. Concentrated liquid detergent composition suitable for dilution with hard or de-ionized water, comprising, based on the total weight of said composition:

(a) about 1% of a maleic acid-olefin copolymer having the formula:



$$-\left[\begin{matrix} R_1 & R_2 \\ | & | \\ C- & C \\ | & | \\ R_3 & R_4 \end{matrix}\right]_x \left[\begin{matrix} CO_2L_1 & CO_2L_1 \\ | & | \\ C- & C \\ | & | \\ H & H \end{matrix}\right]_y -$$

where L_1 is hydrogen, ammonium or an alkali metal; R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen and an alkyl group containing from 1 to about 8 carbon atoms; and the monomer ratio of x to y is from about 1:5 to about 5:1;

(b) from about 0.05 to about 10% detergent surfactant,

(c) from about 0.5% to about 10% beta-aminoalkanol containing from about 3 to about 6 carbon atoms and/or monethanolamine;

(d) a pH of from about 9 to about 13; and

(e) less than about 60% water.

5,534,185

PROCESS FOR THE PREPARATION OF FLUOROCHLOROHYDROCARBON-FREE LOW DENSITY POLYURETHANE SOFT FOAMS AND SOFT ELASTIC POLYURETHANE MOLDING FOAMS AND POLYISOCYANATE MIXTURES MODIFIED WITH URETHANE GROUPS AND DIPHENYLMETHANE-DIISOCYANATE BASE

Werner Hinz, Frankenthal; Ruth Zschlesche, Mannheim; Heinz-Dieter Lutter, Neckargemuend, and Bernd Bruchmann, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 24,589, Mar. 1, 1993, Pat. No. 5,374,667. This application Sep. 21, 1994, Ser. No. 310,591

Claims priority, application Germany, Feb. 27, 1992, 42 05 934.8

Int. Cl.⁶ C08G *18/70;18/00;* **C07C** *249/00*

U.S. Cl. 252—182.22 **5 Claims**

1. The method of producing mixtures of liquid polyisocyanate-containing-urethane groups in a bound form on a diphenylmethane-diisocyanate base, having an NCO group content of 22 to 30 weight percent, which comprises the steps of:

reacting

a mixture of diphenylmethane-diisocyanate and polyphenyl-polymethylene-polyisocyanates having a diphenylmethane-diisocyanate isomers content of 35 to 94 weight percent with respect to the total weight, and

at least one polyoxypropylene-polyoxyethylene-polyol having a functionality of 2.5 to 3.5, a hydroxyl number of 50 to 90 and a polymerized ethylene oxide groups content of more than 30 to less than 50 weight percent with respect to the weight of polymerized ethylene oxide and 1,2-propylene oxide groups, or

reacting

a 4,4'diphenylmethane diisocyanate or

a mixture of diphenylmethane diisocyanate isomers with the aforementioned polyoxypropylene-polyoxyethylene-polyol to yield a urethane-group containing quasi prepolymer having an NCO content ranging from 10 to 19 weight percent, and

diluting same with the aforesaid mixture consisting of diphenylmethane-diisocyanates and polyphenyl-polymethylene-polyisocyanates having a diphenylmethane-diisocyanate-isomers content of 35 to 94 weight percent, with respect to the total weight.

5,534,186

GEL-BASED VAPOR EXTRACTOR AND METHODS

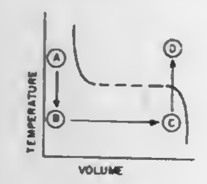
David H. Walker, Winchester; Harris Gold, Lexington; George W. McKinney, III, Chestnut Hill; John F. McCoy, III, North Chelmsford, and Xiaohong Yu, Boston, all of Mass., assignors to Gel Sciences, Inc., Bedford, Mass.

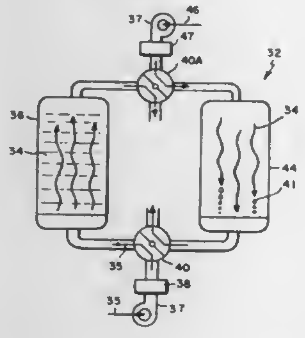
Filed Dec. 15, 1993, Ser. No. 168,723

Int. Cl.⁶ C02F *1/28*

U.S. Cl. 252—194 **33 Claims**

1. An apparatus for extracting vapor from a gas stream, comprising:





a gel sorbent capable of sorption of said vapor into liquid when exposed to a first environmental condition selected from the group consisting of temperature, pH, solvent concentration and ion concentration and wherein said gel sorbent is capable of disgorging said liquid as a liquid when exposed to a change in said environmental condition selected from a change in temperature, a change in pH, a change in solvent concentration and a change in ion concentration;

means for causing movement of said gel sorbent so that said gel sorbent is alternately exposed to said first environmental condition and then to said changed environmental condition.

5,534,187

LIQUID CRYSTALLINE COMPOUND AND LIQUID CRYSTAL COMPOSITION

Kazutoshi Miyazawa; Shuichi Matsui; Yasuyuki Goto; Etsuo Nakagawa, and Shinichi Sawada, all of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan

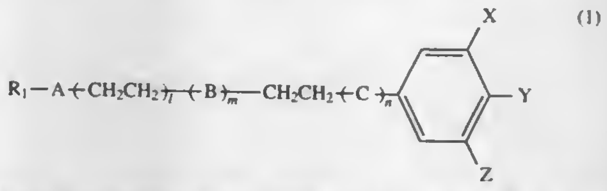
Filed Mar. 24, 1995, Ser. No. 410,297

Claims priority, application Japan, Mar. 29, 1994, 6-058705

Int. Cl.⁶ C09K *19/52;* **G02F** *1/13;* **C07C** *25/13*

U.S. Cl. 252—299.01 **10 Claims**

1. A liquid crystalline compound expressed by the formula (I)


(I)

wherein R_1 represents an alkyl group of 1 to 12 carbon atoms and one or two not adjacent CH_2 groups excluding the terminal in the alkyl group may be replaced by oxygen atom, —CO— group, —OCO— group, —COO— group or —CH═CH— group; X and Z each represent H, F or Cl atom; Y represents a trifluoromethyl or difluormethyloxy group; one of A, B and C represents cyclohexene ring and the others thereof can be chosen from among covalent bond or cyclohexane ring and benzene rings and these rings may be substituted by F atom or Cl atom; and l, m and n each are 0 or 1 independently of each other, but when m=0, l=0.

5,534,188

ACETYLENE DERIVATIVES, PROCESS FOR PRODUCING THE SAME, LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME AS AN ACTIVE INGREDIENT, AND LIQUID CRYSTAL ELEMENT USING SAID LIQUID CRYSTAL COMPOSITION

Masayoshi Minai, Moriyama; Takayuki Higashii, Takatsuki; Shoji Toda, Takatsuki; Naoyuki Takano, Takatsuki; Kayoko Ueda, and Koichi Fujisawa, both of Tsukuba, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP93/01544, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO94/10116, PCT Pub. Date May 11, 1994

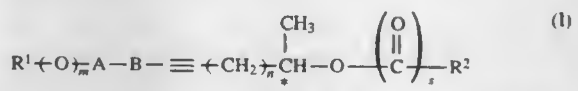
PCT Filed Oct. 26, 1993, Ser. No. 256,051

Claims priority, application Japan, Oct. 26, 1992, 4-287375; Dec. 3, 1992, 4-324477; Dec. 22, 1992, 4-342050

Int. Cl.⁶ C09K *19/12;19/30;* **C07D** *239/02;213/62*

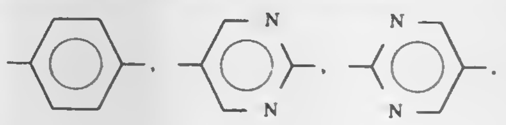
U.S. Cl. 252—299.61 **3 Claims**

1. An acetylene derivative represented by the formula (I):


(I)

$$R^1(O)_m A-B-\equiv(CH_2)_n\underset{*}{\overset{\overset{CH_3}{|}}{C}}H-O-\left(\overset{\overset{O}{\|}}{C}\right)_s R^2$$

wherein R^1 represents a C_3–C_{20} alkyl group, a C_3–C_{20} haloalkyl group, a C_3–C_{20} alkenyl group, a C_3–C_{20} alkynyl group of a C_3–C_{20} carbocyclic group, R_2 represents a C_1–C_{20} alkyl group, a C_1–C_{20} haloalkyl group, a carbocyclic group having carbon atoms up to 20, an alkoxyalkyl group having 2–20 atoms, an alkenyl group having carbon atoms up to 20, or an alkynyl group having carbon atoms up to 20, A and B each represents



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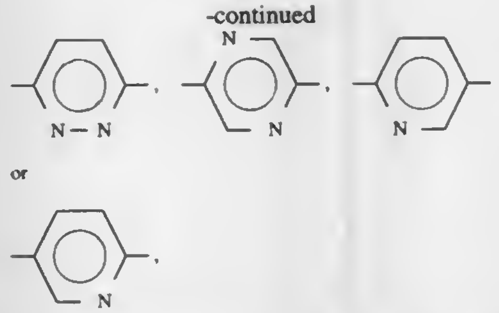


m and s each represents 0 or 1, n represents an integer of 0–6, and the mark * means asymmetric carbon atom.

5,534,189

LIQUID CRYSTAL COMPOSITION

Etsuo Nakagawa, and Shinichi Sawada, both of Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jun. 21, 1995, Ser. No. 493,156

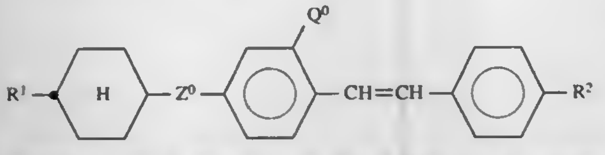
Int. Cl.^{6} C09K *19/30;19/52;* **G02F** *1/13*

U.S. Cl. 252—299.63 **17 Claims**

1. A liquid crystal composition comprising:

a first component consisting of at least one compound expressed by general formula (I):

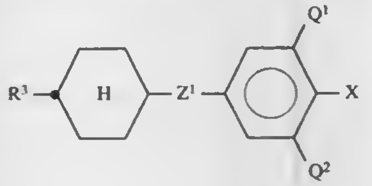
(I)



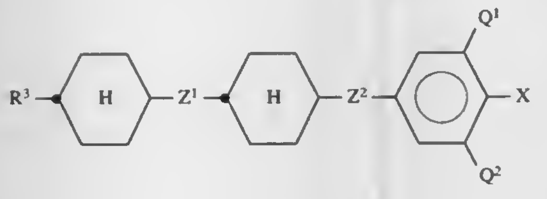
wherein R^1 and R^2 each represent independently an alkyl group of 1 to 10 carbon atoms in which one or two non-adjacent methylene group(s) may be substituted by an oxygen atom; Z^0 represents —CH_2CH_2— or a single bond; and Q^0 represents H or F, and

a second component consisting of at least one compound selected from the group consisting of compounds expressed by formula (II), (III) or (IV):

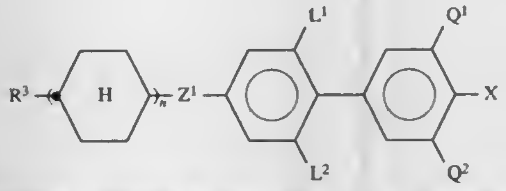
(II)



(III)



(IV)



wherein R^3 represents an alkyl group of 1 to 10 carbon atoms; X represents F, Cl, CF_3, OCF_3, CHF_2, $OCHF_2$, OCF_2Cl or OCF_2CHFCF_3; Q^1 and Q^2 each represent independently H, F or Cl; L^1 and L^2 each represent independently H or F; n represents an integer of 1 or 2; and Z^1 and Z^2 each represent independently —CH_2CH_2— or a single bond.

5,534,190

ANTI-FERROELECTRIC LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY

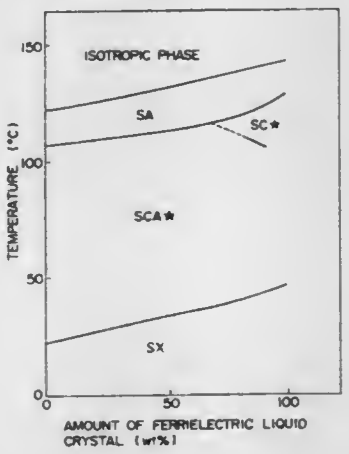
Masahiro Johno, Tsukuba; Tomoyuki Yui, Nagareyama; Takahiro Matsumoto, and Yoshihisa Arai, both of Tsukuba, all of, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 102,277, Aug. 5, 1993, abandoned. This application Oct. 26, 1994, Ser. No. 329,057

Claims priority, application Japan, Aug. 5, 1992, 4-209058

Int. Cl.^{6} C09K *19/12;19/52*

U.S. Cl. 252—299.65 **9 Claims**



1. An anti-ferroelectric liquid crystal composition consisting essentially of an eutectic mixture of at least one of an anti-ferroelectric liquid crystal (A) compound and at least one of a ferrielectric liquid crystal (B) compound,

wherein the anti-ferroelectric liquid crystal (A) has a smectic A phase and has a melting point equal to or lower than room temperature and a tilt angle of at least 25°, and has a phase sequence of isotropic phase—smectic A phase—anti-ferroelectric phase—crystal phase,

the anti-ferroelectric liquid crystal (A) is at least one compound selected from the group consisting of

C_8H_{17}—O—Ph—Ph—COO—Ph(3-F)—COO—$C^*H(CH_3)(CH_2)_5OC_2H_5$

C_8H_{17}—O—Ph—Ph—COO—Ph(3-F)—COO—$C^*H(CF_3)(CH_2)_5OC_2H_5$

C_8H_{17}—O—Ph—Ph—COO—Ph(3-F)—COO—$C^*H(CH_3)C_8H_{17}$

C_8H_{17}—O—Ph—Ph—COO—Ph—COO—$C^*H(CF_3)(CH_2)_5Oc_2H_5$

and

C_9H_{19}—O—Ph—Ph—COO—Ph—(3-F)—COO—$C^*H(CF_3)(CH_2)_5OC_2H_5$,

the ferroelectric liquid crystal (B) is at least one compound selected from the group consisting of

C_8H_{17}—O—Ph—COO—Ph—Ph—COO—$C^*H(CH_3)C_4H_9$

$C_{10}H_{21}$—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)C_5H_{11}$

$C_{12}H_{25}$—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)C_7H_{15}$

C_8H_{17}—O—Ph—CH_2O—Ph—Ph—COO—$C^*H(CF_3)(CH_2)_2OC_2H_5$

C_9C_{19}—O—Ph—CH_2O—Ph—Ph—COO—$C^*H(CF_3)(CH_2)_2OC_2H_5$

$C_{10}H_{21}$—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)C_6H_{13}$

C_9H_{19}—O—Ph—CH_2O—Ph—Ph—COO—$C^*H(CF_3)CH_2COOC_2H_5$

C_8H_{17}—O—Ph—Ph—COO—Ph—COO—$C^*H(CF_3)CH_2COOCH_3$

C_8H_{17}—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)CH_2OC_6H_{13}$

C_9H_{19}—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)CH_5H_{11}$

$C_{12}H_{25}$—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)C_5H_{11}$

$C_{11}H_{23}$—O—Ph—Ph—COO—Ph—COO—$C^*H(CH_3)C_7H_{15}$

$C_{10}H_{21}$—O—Ph—CH_2O—Ph—Ph—COO—$C^*H(CF_3)(CH_2)_2OC_2H_5$

and

C_8H_{17}—O—Ph—CH_2O—Ph—Ph—COO—$C^*H(CF_3)CH_2COOC_2H_5$

in which —Ph— represents a benzene ring bonding to a p-position and C* represents an optically active carbon atom, and the ferroelectric liquid crystal (B) is contained in an amount sufficient to decrease a voltage required for driving the anti-ferroelectric liquid crystal (A).

5,534,191

TETRADECAHEDRAL RARE EARTH ACTIVATED ALKALINE EARTH METAL FLUOROHALIDE PHOSPHOR AND RADIAITON IMAGE STORAGE PANEL

Kazubiro Hasegawa; Kenji Takahashi, and Yasushi Kojima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1994, Ser. No. 364,260

Claims priority, application Japan, Dec. 27, 1993, 5-348854; Oct. 20, 1994, 6-281268

Int. Cl.^{6} C09K *11/61*

U.S. Cl. 252—301.4 H **8 Claims**

1. A process of the preparation for a tetradecahedral rare earth activated alkaline earth metal fluorohalide phosphor represented by the formula (I):

$$Ba_{1-x}M''_xFX{:}yM',zLn \qquad (I)$$

wherein M'' is at least one alkaline earth metal selected from the group consisting of Sr and Ca; M' is at least one alkaline metal selected from the group consisting of Li, Na, K, Rb and Cs; X is at least one halogen selected from the group consisting of Cl, Br and I; Ln is at least one rare earth element selected from the group consisting of Ce, Pr, Sm, Eu, Gd, Tb, Tm and Yb; and x, y and z are numbers satisfying the conditions of $0 \leqq x \leqq 0.5$, $0 \leqq y \leqq 0.05$ and $0 < z \leqq 0.2$, respectively, which comprises the steps of:

preparing an aqueous solution which contains BaX_2, a halide of Ln, a halide of M'' if x in the formula (I) is not 0, and a halide of M' if y in the formula (I) is not 0 and in which the concentration of BaX_2 is not more than 1.4 mol./l;

adding an aqueous solution of an inorganic fluoride to the above-prepared solution under the condition that the temperature of the latter solution is kept at 20°–100° C. to precipitate precursor crystals of the tetradecahedral rare earth activated alkaline earth rectal fluorohalide phosphor;

separating the precursor crystals from the aqueous solution; and firing the precursor crystals under the condition that the fired crystals are not sintered.

5,534,192

COMPOSITION AND METHOD FOR TREATING SUBSTRATES TO REDUCE ELECTROSTATIC CHARGE AND RESULTANT ARTICLE

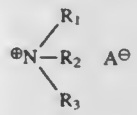
Michael J. Incorvia, Lansdale, and Stephen A. Fischer, Yardley, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 154,665, Nov. 18, 1993, Pat. No. 5,478,486. This application Feb. 22, 1995, Ser. No. 392,712

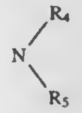
Int. Cl.^{6} H05F *1/00;1/02*

U.S. Cl. 252—500 **24 Claims**

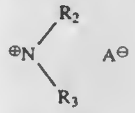
1. An antistatic agent of the formula $(Q—L—R)_d—X$, wherein Q represents a straight or branched, saturated or unsaturated perfluoroaliphatic radical, L represents a linkage selected from the group consisting of ester, ether, amide or alkylene amine linkages, R represents a straight or branched alkylene-oxyalkylene or a straight or branched alkylene-poly(oxyalkylene) group, and d is 1 or 2, and, when d is 1, X represents at least one quaternary ammonium group of the formula



and, optionally, a tertiary amine-forming group of the formula



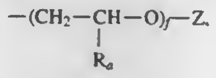
and, when d is 2, X represents a quaternary amine-forming group of the formula



and, optionally, a tertiary amine-forming group of the formula

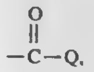
N—R_5

wherein R_1 and R_4 independently represent



$$-(CH_2-\underset{\displaystyle R_a}{\underset{|}{CH}}-O)_f-Z,$$

Z being H, Q or



$$-\overset{\displaystyle O}{\overset{\|}{C}}-Q,$$

wherein Q is as defined above, f being an integer from 1 to 50, R_2 represents a C_1–C_4 alkyl group, R_3 and R_5 independently represent a normal or branched, saturated or unsaturated C_6–C_{22} aliphatic group, R_a represents H or CH_3, and A represents an organic or inorganic anion.

5,534,193

WHITE ELECTROCONDUCTIVE POWDERS WITH ANTIMONY AND TIN OXIDES

Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 17,078, Feb. 12, 1993, Pat. No. 5,364,566. This application Jun. 21, 1994, Ser. No. 263,276

Int. Cl.^{6} H01B *1/08;1/20;* **C04B** *35/457;* **C01G** *30/02*

U.S. Cl. 252—518 **14 Claims**

1. A substantially white electroconductive powder composition consisting essentially of an amorphous silica shell or an amorphous silica coated particle in association with a surface coating comprising a conducting network of antimony-containing tin oxide crystallites having a size less than about 100 angstroms, made by a method comprising the steps of:

(a) providing an aqueous suspension comprising a particulate substrate;

(b) preparing separate aqueous solutions comprising hydrolyzable tetravalent tin and trivalent antimony salts, optionally adding at least one cation;

(c) combining the tin and antimony salt solutions, and adjusting the pH in the range of about −1.0 to about +3.0;

(d) applying a coating layer comprising hydrous oxides of antimony and tin onto the substrate surface of said particulate substrate by adding the combined salt solution to the suspension wherein said layer contains less than about 3 wt. % antimony based upon tin oxide.

5,534,194

THICK FILM RESISTOR COMPOSITION CONTAINING PYROCHLORE AND SILVER-CONTAINING BINDER

William Borland; Keiichiro Hayakawa, both of Kanagawa-Ken; Takeshi Sato, Tokyo-To, and Jerome Smith, Kanagawa-Ken, all of, Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 245,885, May 19, 1994, abandoned, which is a continuation of Ser. No. 52,426, Mar. 30, 1993, abandoned. This application Oct. 11, 1995, Ser. No. 540,807

Int. Cl.^{6} H01B *1/08*

U.S. Cl. 252—518 **4 Claims**

1. A thick film resistor composition comprising by weight, basis inorganic component

(a) 14–75% wt. conductive compounds being expressed by the following general formula:

$$(M_xBi_{2-x})(M'_yM''_{2-y})O_{7-z}$$

wherein

M is selected from the group consisting of yttrium, thallium, indium, cadmium, lead, copper, and rare earth metals,

M' is selected from the group consisting of platinum, titanium, chromium, rhodium, and antimony,

M" is ruthenium, iridium or a mixture thereof,

x denotes 0 to 2 with a proviso that $x \leqq 1$ for monovalent copper,

y denotes 0 to 0.5 with the proviso that when M' is rhodium or two or more of platinum, titanium, chromium, rhodium, and antimony, y stands for 0 to 1, and

z denotes 0 to 1 with a proviso that when M is divalent lead or cadmium, z is at least equal to about x/2; and

(b) 86–25% wt. inorganic binder comprising 40–80 wt. % PbO, 10–50 wt. % SiO_2 wherein the total amount of PbO and/or SiO_2 exceeds or is equal to 60 wt. % of binder weight and 0.1–10 wt. % Ag_2O or $AgNO_3$; and

all of (a) and (b) dispersed in an organic medium.

5,534,195

PROCESS FOR MAKING PARTICLES COMPRISING LACTAM BLEACH ACTIVATORS

Benjamin E. Chapman, and Michael T. Creedon, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 178,374, Dec. 23, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 350,087

Int. Cl.^{6} C11D *1/14;1/22;17/06;* **C11P** *3/28*

U.S. Cl. 510—444 **10 Claims**

1. An aqueous process for preparing a particulate bleach activator composition, comprising the steps of:

(I) intimately mixing from about 10% to about 70% by weight of a liquid lactam bleach activator selected from the group comprising hexanoyl caprolactam, hexanoyl valerolactam, octanoyl caprolactam, octanoyl valerolactam, nonanoyl caprolactam, nonanoyl valerolactam, isononanoyl caprolactam, isononanoyl valerolactam, decanoyl caprolactam, decanoyl valerolactam, undecanoyl caprolactam, undecanoyl valerolactam, 3,5,5-trimethylhexanoyl caprolactam, 3,5,5-trimethylhexanoyl valerolactam and mixtures thereof with from about 1% to about 60% by weight of a surfactant selected from the group consisting of non-amide surfactants, polyhydroxy fatty acid amide thickener surfactants, or mixtures thereof, and from about 5% to about 60% by weight of non-surfactant thickeners, to provide a thickened paste having a free moisture content less than 15%, by weight;

(II) homogenizing the paste of step I with from about 10% to about 85% by weight of a hydratable filler material to provide a semi-particulate mass or damp powder; and

(III) forming the product of step II into agglomerates having a free moisture content less than about 8%, by weight, of water.

5,534,196

PROCESS FOR MAKING LACTAM BLEACH ACTIVATOR CONTAINING PARTICLES

Benjamin E. Chapman, and Michael T. Creedon, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 173,308, Dec. 23, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 350,089

Int. Cl.^{6} C11D *1/14;1/22;3/28;17/06*

U.S. Cl. 252—186.27 **9 Claims**

1. A process for preparing particulate bodies containing one or more acyl lactam bleach activator compounds, comprising the steps of (A) intimately mixing solid acyl lactam bleach activator compounds selected from the group consisting of substituted benzoyl caprolactam, benzoyl caprolactam, substituted benzoyl valerolactam, benzoyl valerolactam, and mixtures thereof with one or more surfactants in liquid or deformable paste form at a temperature below the melting point of the bleach activator compounds, wherein the weight ratio of the bleach activator compounds to the surfactants is between about 50:1 to about 5:1; (B) mixing the product of step A with from about 10% to about 95 wt. % of a crystalline hydratable material at a temperature which is between 0° C. and the temperature of hydration of the crystalline material to provide a damp powder comprising less than about 15 wt. % of non-hydrated water; and (C) forming the damp powder into particles wherein said process does not include a drying step.

5,534,197

GEMINI POLYHYDROXY FATTY ACID AMIDES

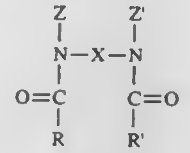
Jeffrey J. Scheibel; Daniel S. Connor, and Yi-Chang Fu, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 187,251, Jan. 25, 1994, abandoned. This application Nov. 21, 1994, Ser. No. 342,558

Int. Cl.^{6} C07C *233/18;233/36;* **C11D** *1/52*

U.S. Cl. 510—356 **9 Claims**

1. Novel gemini polyhydroxy fatty acid amide compounds having the formula:



$$\begin{array}{ccc} Z & & Z' \\ | & & | \\ N & -X- & N \\ | & & | \\ O{=}C & & C{=}O \\ | & & | \\ R & & R' \end{array}$$

wherein:

X is selected from the group consisting of unsubstituted, linear alkyl moieties having the formula —$(CH_2)_n$—, wherein n is an integer from 2 to about 15, and unsubstituted, branched alkyl moieties having from 2 to about 15 carbon atoms; Z and Z' are independently selected from the group consisting of —CH_2—$(CHOH)_p$—CH_2OH, —$CH(CH_2OH)$—$(CHOH)_{p-1}$—CH_2OH, —CH_2—$(CHOH)_2(CHOR^1)(CHOH)$—CH_2OH, where p is an integer from 1 to 5, inclusive, and R^1 is H or a cyclic mono- or polysaccharide, and alkoxylated derivatives thereof, or one of Z or Z' is hydrogen; and R and R' are the same or different hydrocarbyl moieties having from about 1 to about 21 carbon atoms and can be saturated, branched or unsaturated and mixtures thereof.

5,534,198

GLASS CLEANER COMPOSITIONS HAVING GOOD FILMING/STREAKING CHARACTERISTICS AND SUBSTANTIVE MODIFIER TO PROVIDE LONG LASTING HYDROPHILICITY

Ronald A. Masters, Loveland, and Michael S. Maile, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 284,778, Aug. 2, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 378,205

Int. Cl.^{6} C11D *1/12;1/88;3/43*

U.S. Cl. 510—182 **28 Claims**

1. An aqueous liquid hard surface detergent composition having improved cleaning and good filming/streaking characteristics after rewetting and comprising:

(A) from about 0.001% to about 2% by weight of detergent surfactant selected from the group consisting of:

(1) an amphocarboxylate detergent surfactant having the general formula:

$$RN(R^1)(CH_2)_nN(R^2)(CH_2)_pC(O)OM$$

wherein R is a C_{6-10} hydrophobic fatty acyl moiety which in combination with the nitrogen atom forms an amido group, R^1 is hydrogen or a C_{1-2} alkyl group, each R^2 is a C_{1-3} alkyl or substituted C_{1-3} alkyl, each n is an integer from 1 to 3, each p is an integer from 1 to 2, and M is a water-soluble cation selected from alkali metal, ammonium, alkanolammonium, and mixtures thereof;

(2) a zwitterionic detergent surfactant having the general formula:

$$R^3\text{—}[C(O)\text{—}N(R^4)\text{—}(CR^5_2)_{n1}\text{—}]_mN(R^6)_2^{(+)}\text{—}(CR^5_2)_{p1}\text{—}Y^{(-)}$$

each R^3 is an alkyl, or alkylene, group containing from about 10 to 18 carbon atoms, each (R^4) and (R^6) is selected from the group consisting of hydrogen, methyl, ethyl, propyl, hydroxy substituted ethyl or propyl and mixtures thereof, each (R^5) is selected from the group consisting of hydrogen and hydroxy groups, with no more than about one hydroxy group in any $(CR^5_2)_{p1}$ moiety; m is 0 or 1; each n1 and p1 is a number from 1 to about 4; and wherein Y is selected from the group consisting of a carboxylate or sulfonate group;

(3) an anionic detergent surfactant having the generic formula:

$$R^9\text{—}(R^{10})_{0-1}\text{—}SO_3^{(-)}M^{(+)}$$

wherein each R^9 is a C_6–C_{20} alkyl chain; R^{10} is a C_6—C_{20} alkylene chain, a C_6H_4 phenlyene group or O; and M is a water-soluble cation selected from alkali metal, ammonium, alkanolammonium, and mixtures thereof; and

(4) mixtures thereof;

(B) from about 0.5% to about 15% by weight of hydrophobic solvent having a hydrogen bonding parameter of from about 2 to about 7.7;

(C) alkaline material to provide a pH, measured on the product, of from about 9 to about 12;

(D) from about 0.01% to about 0.3% by weight of substantive polymer that makes glass more hydrophilic, in an effective amount to provide an improvement in spotting/filming after at least three rewettings of the glass, said polymer being selected from the group consisting of polycarboxylate polymers having a molecular weight of from about 10,000 to about 3,000,000, and sulfonated polystyrene polymers having a molecular weight of from about 10,000 to about 1,000,000; and

(E) the balance being an aqueous solvent system comprising water and optionally, non-aqueous polar solvent with only minimal cleaning action selected from the group consisting of methanol, ethanol, isopropanol, ethylene glycol, polypropylene glycol, glycol ethers having a hydrogen bonding parameter of greater than 7.7, and mixtures thereof.

5,534,199

VEHICLE WASH DETERGENT/FOAM AND METHOD

J. A. Winkler, III, 201 S. Locksley Dr., Lafayette, La. 70508

Filed Sep. 22, 1995, Ser. No. 532,094

Int. Cl.^{6} C11D *1/83;1/94*

U.S. Cl. 510—242 **11 Claims**

1. A vehicle wash detergent/foam concentrate solution for use in automated vehicle washing equipment comprising:

(a) 67.0–90.0% water as a diluting solvent;

(b) 9.0–14.0% dodecyl benzene sulfonic acid as a detergent and foam producing agent;

(c) a pH-modifying substance in an amount sufficient to establish the resulting solution on the base side of neutrality, specifically a pH greater than 7.0, selected from the group consisting of monoethanolamine, diethanolamine, and triethanolamine; wherein the pH-modifying substance is present in an amount of at least about 0.5%;

(d) 1.8–2.5% of a fatty acid amide selected from the group consisting of a 2:1 cocoamide DEA (82% in water), a 1:1 cocoamide DEA (82% in water), 2:1 cocoamide MEA (82% in water), and 1:1 cocoamide MEA (82% in water), as a detergent and foam producing agent;

(e) 0.9–1.4% coco-dimethylamidopropyl betaine as a foam producing agent;

(f) 0.9–1.4% sodium lauryl sulfate as a detergent and foam producing agent;

(g) 0.6–1.6% propylene glycol as a solvent;

(h) 0.1–0.3% of a surfactant selected from the group consisting of a poly-ethoxylated secondary alcohol, and a poly-ethoxylated nonyl phenol.

5,534,200
GELLED MICROEMULSION CLEANING COMPOSITION
Rita Erilli, Liege, and Maria Galvez, Grace Hollogne, both of, Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

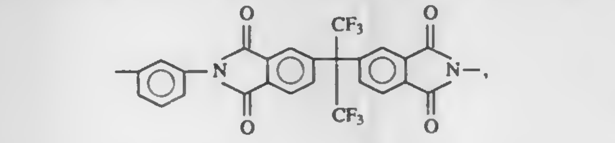
Continuation-in-part of Ser. No. 91,774, Jul. 14, 1993, abandoned. This application Jul. 1, 1994, Ser. No. 270,000
Int. Cl.^{6} C11D *1/065*
U.S. Cl. 510—396 **9 Claims**

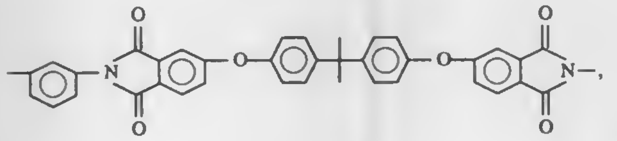
1. A gelled hard surface cleaner composition comprising approximately by weight:
- a) 13 to 50% of a mixture of a paraffin sulphonate and an alkyl ether sulphate and the ratio of the paraffin sulphonate to said alkyl ether sulphate is about 4:1 to 2:1;
- b) 1 to 20% of at least one of a water insoluble organic compound; selected from the group consisting of D-limonene and aliphatic and isoaliphatic hydrocarbons having about 8 to about 16 carbon atoms and mixtures thereof and has a δ_p of about 0 to about 2, a δ_H of about 0 to about 1 (MPa)$^{1/2}$, and a δ_d of about 14 to about 18 (MPa)$^{1/2}$;
- c) 5 to 20% of at least one water soluble hydroxy containing organic compound selected from the group consisting of diethylene glycol butyl ether, propylene glycol, ethanol, and isopropanol and mixtures thereof and
- d) the balance being water, wherein the composition has a pH of about 1 to about 11, a complex viscosity at 1 rad s^{-1} of about 1 to about 10^3 Pascal seconds and the interfacial tension between the lipophile droplets of said composition and the aqueous phase being less than about 10^{-2}mN/m.

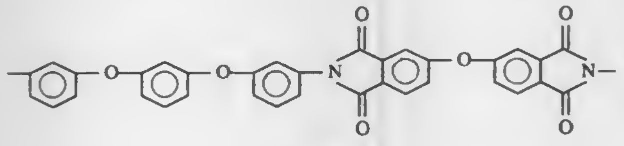
5,534,201
NLO DYE COMPOSITIONS AND USE THEREOF IN PRODUCING NLO ELEMENTS
John D. Summers, Newtown Square, and Wilson Tam, Boothwyn, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1992, Ser. No. 860,863
Int. Cl.^{6} F21V *9/00*
U.S. Cl. 252—582 **4 Claims**

1. A nonlinear optical element comprising: a blend of (i) a processible polyimide having a glass transition temperature Tg below its thermal decomposition point; and (ii) an NLO dye having a molecular hyperpolarizability of greater than about 10^{-30} electrostatic units: wherein the NLO dye is aligned in conformance with an externally applied electric field and wherein said processible polyimide has a repeat unit selected from the group consisting of







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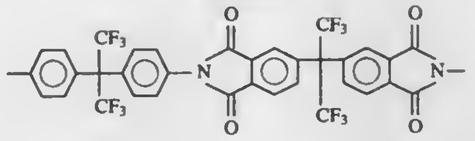
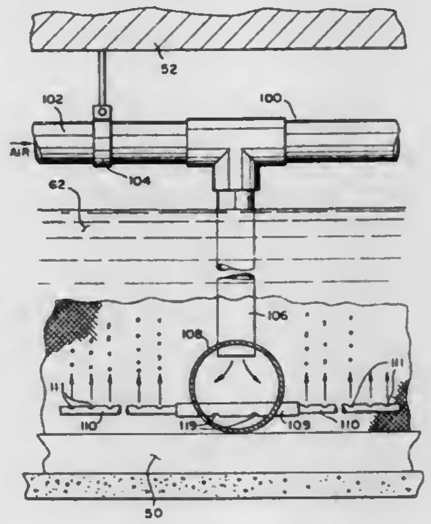


5,534,202
AIR GRID FOR UNDERDRAINS AND SIMILAR SYSTEMS
R. Lee Roberts, Boothwyn; Douglas H. Eden, Wallingford, both of Pa., and Andrew S. Taylor, Atlanta, Ga., assignors to Roberts Filter Manufacturing Company, Darby, Pa.

Filed Apr. 5, 1994, Ser. No. 223,236
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—122.1 **15 Claims**

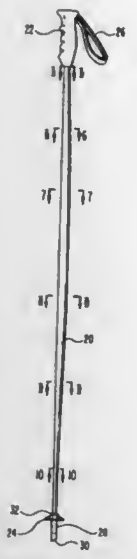


1. In a fluid flow apparatus having a section for containing a quantity of liquid and having a bottom structure, an air grid comprising:
- an air supply header disposed above the bottom structure;
- one or more connecting tubes extending downwardly from the air supply header;
- one or more header pipes connected to and supported only by at least one of the connecting tubes; and
- a plurality of air laterals connected to each of the header pipes, wherein each of the air laterals includes a plurality of orifices for distributing air, and wherein the air laterals are connected to the header pipes by a spreader conduit disposed within the header pipe at a location displaced from a central axis of the header pipe,
- whereby the header pipes and air laterals are disposed above the bottom structure without any supporting connection therebetween.

5,534,203
COMPOSITE POLE MANUFACTURING PROCESS FOR VARYING NON-CIRCULAR CROSS-SECTIONS AND CURVED CENTER LINES
Ronald H. Nelson, and Dimitrije Milovich, both of Salt Lake City, Utah, assignors to Radius Engineering, Inc., Salt Lake City, Utah

Filed Feb. 9, 1994, Ser. No. 195,461
Int. Cl.^{6} B27N *3/10*
U.S. Cl. 264—101 **12 Claims**

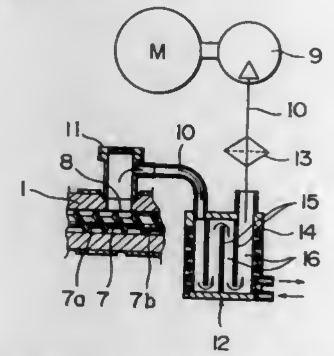
1. A method for making a composite pole comprising;



- (a) forming a skin of fiber material impregnated with heat curable resin around a flexible substrate comprising a pressurizable bladder;
- (b) positioning the skin and flexible bladder substrate in a female mold,
- (c) pressurizing the bladder to circumferentially expand the skin to internal walls of the female tooling and to apply pressure to an inside surface of the skin,
- (d) curing the resin of the skin to a substantially hard state while maintaining pressure in the bladder to form a pole with external dimensions determined by the internal walls of the female mold, and
- (e) removing the pole from the female mold.

5,534,204
METHOD OF INJECTION MOLDING POLYETHYLENE TEREPHTHALATE
Hidemi Aoki; Yasuhiko Takeuchi, and Kazuo Anzai, all of Nagano-ken, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-Ken, Japan

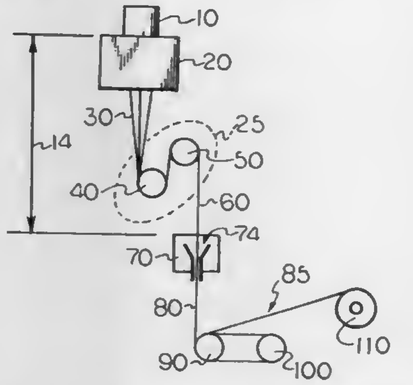
Filed Aug. 18, 1994, Ser. No. 292,510
Claims priority, application Japan, Aug. 24, 1993, 5-229664; Mar. 7, 1994, 6-059788
Int. Cl.^{6} B29C *45/63*
U.S. Cl. 264—102 **1 Claim**



1. A method of injection molding a polyethylene terephthalate using an injection cylinder having an injection screw disposed therein and having a vent on the injection cylinder, comprising:
- feeding a molding material of an undried polyethylene terephthalate from a material feeder on a rear portion of the injection cylinder to plasticate the polyethylene terephthalate for injection molding of the polyethylene terephthalate into a required molded article; and
- cooling and removing a vaporized content from the polyethylene terephthalate by drawing under vacuum between 50 and 150 torr the vaporized content into a recovery tank and a filter downstream of the recovery tank, the recovery tank and the filter disposed in a vacuum circuit in communication with the vent, said cooling step further including the step of flowing water through a jacket of said recovery tank in peripheral walls surrounding an enclosure compartmented alternately by portion walls to form a passageway for the vaporized content from the polyethylene terephthalate, wherein in the cooling step the vaporized content is drawn into the enclosure under vacuum through the vent of the injection cylinder and passes through the passageway and is cooled by the flow of cooling water flowing through the jacket, whereby the vaporized content is cooled for recovery.

5,534,205
METHOD FOR PREPARING POLYBENZOXAZOLE OR POLYBENZOTHIAZOLE FIBERS
Timothy L. Faley; Michael E. Mills, both of Midland, Mich.; Yoshihiko Teramoto, Ohtsu, Japan; Douglas E. Turek, Midland, Mich., and Kazuyuki Yabuki, Ohtsu, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1994, Ser. No. 286,297
Int. Cl.^{6} D01D *5/16;* **D01F** *6/74*
U.S. Cl. 264—103 **11 Claims**



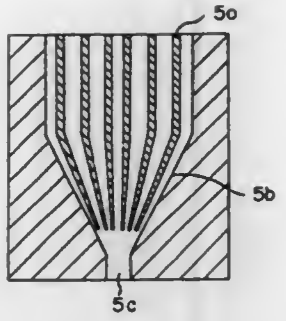
1. A process for preparing a polybenzoxazole or polybenzothiazole filament, said process comprising the sequential steps of:
- (a) extruding a polybenzoxazole or polybenzothiazole dope filament;
- (b) drawing the dope filament while in an air gap;
- (c) contacting the dope filament with a stress isolation device while the filament resides in the air gap; and
- (d) coagulating the dope filament.

5,534,206
METHOD FOR PREPARING BAKED PENCIL LEADS USING CONCENTRIC STRAIGHTENING PLATES
Hideo Odashima, Gunma, Japan, assignor to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 118,030, Sep. 8, 1993, Pat. No. 5,430,075. This application Feb. 9, 1995, Ser. No. 385,967
Claims priority, application Japan, Sep. 25, 1992, 4-256307; May 25, 1993, 5-122611
Int. Cl.^{6} B29C *47/70*
U.S. Cl. 264—108 **4 Claims**

1. A method for preparing baked pencil leads which comprises the steps of blending a filler and a binder as the main materials with pore generating materials, kneading them, extruding the kneaded material, and then subjecting the extruded articles to a heat treatment at a high temperature, wherein a plurality of concentric conical tubular straightening plates having the sectional area of a flow path continuously decreased toward a nozzle orifice are provided on the upstream side of an extrusion nozzle, and the extrusion is carried out through the straightening plates and the extrusion nozzle.

4



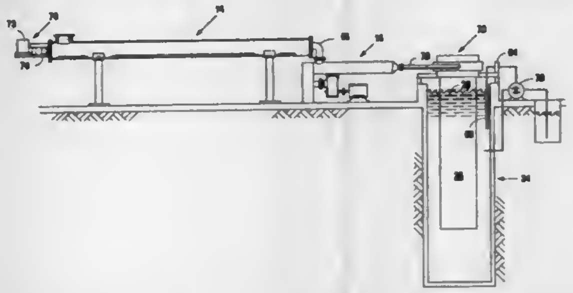
5,534,207
METHOD AND APPARATUS FOR FORMING AN ARTICLE FROM RECYCLABLE PLASTIC MATERIALS

Thomas N. Burrus, Brenham, Tex., assignor to Natural Resource Recovery, Inc., Brenham, Tex.

Filed Jul. 8, 1994, Ser. No. 271,954

Int. Cl.^{6} B29C *47/12;47/36*

U.S. Cl. 264—150.000 **23 Claims**



1. A method for forming an article from recyclable plastic material, comprising:
  dividing a recyclable thermoplastic material having a predetermined melting temperature into a plurality of separate solid particles;
  progressively heating said solid particles to about said predetermined melting temperature;
  mixing said particles concurrently with said progressive heating and forming a substantially homogeneous molten mixture of said thermoplastic material;
  continuously conveying said thermoplastic material during said progressive heating and said mixing from a first position at which said solid particles of the thermoplastic material are received in a substantially continuous flow, to a second position at which said material is discharged as a substantially continuous stream of said molten mixture;
  subsequently shaping said molten mixture;
  cooling said shape molten mixture; and,
  forming controllably a solidified article having a preselected shape.

14. An apparatus for simultaneously heating, mixing, melting and conveying recyclable thermoplastic materials, comprising:
  an elongated shell having a first end, a second end, and a cylindrical interior wall surface concentrically disposed about a longitudinal axis and extending between said first and second ends;
  a rotor rotatably mounted in said shell in coaxial alignment with said longitudinal axis and having a predefined length, an exterior cylindrical wall surface spaced radially inwardly from the interior wall surface of said shell and extending along said length and cooperating with said exterior wall surface to form an annular cavity therebetween, and a plurality of elongated members each extending radially outwardly from said exterior wall surface of said rotor to a position proximate the interior wall surface of said shell, said elongated members being arranged in radially and axially spaced relationship in a spiral pattern around and along said longitudinal axis;
  an inlet port forming an opening through said shell at a position adjacent the first end of said shell;
  a discharge port forming an opening proximate the second end of said shell;
  a means for heating the interior wall surface of said shell; and,
  a means for rotating said rotor.

20. A die for continuously forming an elongated member having a cross sectional structure consisting essentially of a plurality of internally disposed interconnected wall surfaces defining elongated cavities within said member, comprising:
  a top wall;
  a plurality of side walls cooperating with said top wall to define an open-ended cavity and having an opening through at least one of said side walls communicating with a pressurized source of fluid material; and,
  a plurality of internal surface forming members, said members being disposed within said open-ended cavity in spaced relationship with said side walls and with each other and having one end attached to said top wall of the die and at least one material shaping surface adjacent the open end of said cavity.

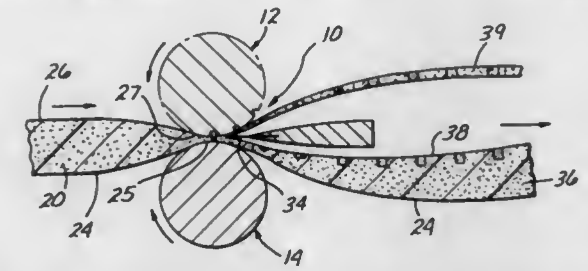
5,534,208
THREE DIMENSIONAL SURFACE SHAPING OF SYNTHETIC FOAM PADS BY CONTINUOUS ROTARY PROCESS

Arthur Barr, Riverside; Lewis Sturgill, Fontana, and Jose D. J. M. Contreras, Rancho Cucamonga, all of Calif., assignors to Foamex L.P., Linwood, Pa.

Continuation of Ser. No. 122,701, Sep. 15, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 477,282

Int. Cl.^{6} B26D *7/14*

U.S. Cl. 264—160 **21 Claims**



1. A method for shaping a resilient material to a desired three dimensional surface geometry including raised portions and depressions, comprising the steps of:
  providing a die with a die surface having raised die portions and die depressions corresponding in mirror image relationship to said raised portions and depressions of said desired three dimensional geometry;
  providing a slab of resilient material;
  pressing said slab against said die surface to compress some portions of said slab to a reduced thickness against said raised die portions and extrude other portions of said slab into said die depressions; and
  cutting away said other portions from said slab.

5,534,209
METHOD FOR MANUFACTURING A LIQUID CRYSTAL POLYMER FILM AND A LIQUID CRYSTAL POLYMER FILM MADE THEREBY

Akira Moriya, Okayama, Japan, assignor to Japan Gore-Tex, Inc., Japan

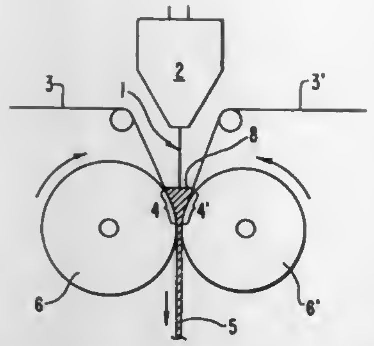
Filed Mar. 13, 1995, Ser. No. 403,516

Claims priority, application Japan, Mar. 15, 1994, 6-68922

Int. Cl.^{6} B29C *43/24*

U.S. Cl. 264—171.13 **12 Claims**

1. A method for manufacturing a liquid crystal polymer film comprising the steps of:



  (a) feeding a thermotropic liquid crystal polymer material into a melt region formed between opposed inward-facing surfaces of two support membranes,
  each support membrane, in the melt region, having an outward-facing surface in contact with the surface of a heated roll,
  said heated rolls spaced apart to form an opening between the rolls and a gap between said support membranes passing over said rolls;
  (b) heating and maintaining said liquid crystal polymer material at a temperature at or above its melt point and accumulating sufficient liquid crystal polymer material in the melt region above said gap to form a reservoir of melted liquid crystal polymer material wherein said liquid crystal polymer becomes randomly oriented;
  (c) passing said support membranes and liquid crystal polymer material through said opening between said rolls to form a sandwich structure comprising a liquid crystal polymer film between said support membranes,
  the width of said opening adjusted to preserve the random orientation of said liquid crystal polymer material forming said liquid crystal polymer film;
  (d) solidifying said liquid crystal polymer film.

5,534,210
METHOD OF TAKING OUT A FIBER BUNDLE AND METHOD OF MANUFACTURING A RESIN STRUCTURE REINFORCED WITH LONG FIBERS

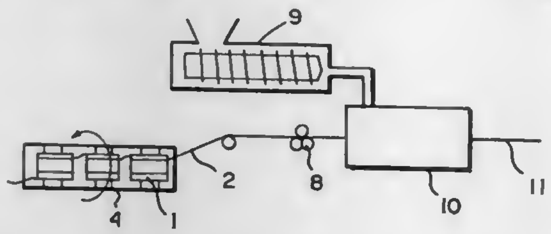
Yoshimitsu Shirai, Shizuoka; Haruji Murakami, and Takeshi Amaike, both of Fuji, all of, Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Jan. 23, 1995, Ser. No. 377,214

Claims priority, application Japan, Jan. 26, 1994, 6-023808

Int. Cl.^{6} B29C *47/02;70/20;70/28*

U.S. Cl. 264—171.130 **3 Claims**



1. A method of manufacturing a resin structure reinforced with long fibers comprising continuously taking out a twist-free fiber bundle from an inner side of a plurality of fiber bundle packages each having a hollow cylindrical shape, and impregnating the fiber bundle with a resin while the fiber bundle is drawn, wherein the trailing and of the fiber bundle package and the leading end of another fiber bundle package are spliced to each other in advance, and wherein the plurality of fiber bundle packages thus spliced are attached to a body of revolution, which is one of:
  (1) a cylindrical body having a radius larger than that of the fiber bundle packages so that longitudinal axes of said plurality of fiber bundle packages are aligned along a longitudinal axis of the cylindrical body of revolution in which the plurality of fiber bundle packages are secured in order of splicing, and the cylindrical body of revolution being rotated about its axis, and
  (2) a turntable on which said plurality of spliced fiber bundle packages are placed and the turntable being rotated for taking out the fiber bundle, and wherein
  the fiber bundle is taken out at a speed which is determined based on the taking-out speed of the fiber bundle and in a direction eliminating twist of the fiber bundle thus taken out while the body of revolution is rotated.

5,534,211
LAMINATING RESINS HAVING LOW ORGANIC EMISSIONS

Thomas W. Smeal, Murrysville Boro, and George L. Brownell, Mount Lebanon Township, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 75,432, Jun. 14, 1993, Pat. No. 5,393,830, which is a continuation-in-part of Ser. No. 24,022, Mar. 1, 1993, abandoned. This application May 6, 1994, Ser. No. 239,061

Int. Cl.^{6} B29C *41/02;41/08*

U.S. Cl. 264—308 **7 Claims**

1. Method of laminating a solid formed body without creating significant volatile emissions in the workplace comprising (a) providing a forming surface having a desired positive or negative shape, (b) providing a liquid mixture comprising (1) about two parts by weight unsaturated polyester resin, said polyester resin composed of glycols, unsaturated and saturated polycarboxylic acids and 1–60% by weight of dicyclopentadiene, (2) about one part to about four parts by weight alkoxylated bisphenol-A diacrylate or dimethacrylate, (3) about 20% to about 60%, based on the total weight of (1) and (2), of vinyl toluene, and (4) an effective amount of a polymerization catalyst, and wherein said liquid mixture emits no more than 20 grams per square meter as measured by Section 1162 of the Regulations of the South Coast (California) Air Quality District, (c) applying said mixture to said forming surface at ambient temperatures in layers while permitting said layers incrementally to polymerize, thereby building said shaped article, and (d) removing the finished solid formed body from said forming surface.

5,534,212
PROCESS FOR THE MANUFACTURE OF SOAP BARS AND APPARATUS FOR USE IN SAME PROCESS

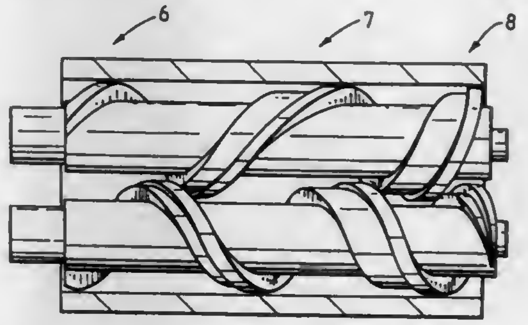
Kalyansundaram D. Chokappa, and Vijay M. Naik, both of Bombay, Ind., assignors to Lever Brothers Company, Division of Conopco,Inc., New York, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,798

Claims priority, application United Kingdom, Feb. 15, 1994, 9402837

Int. Cl.^{6} B29C *47/40*

U.S. Cl. 264—211.11 **8 Claims**



1. Apparatus for the manufacture of soap forms comprising a twin screw, intermeshing counter-rotating extruder, said screws being oppositely threaded, non-matching and such that the ratio of the length to diameter of each screw is independently greater than

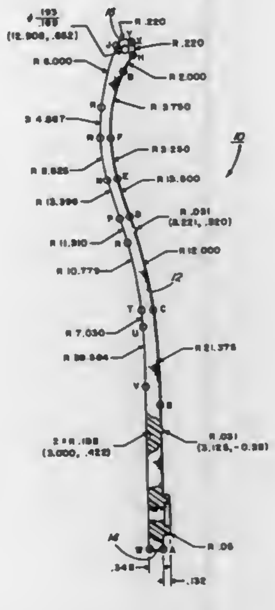
1:1; said screws further being mounted for rotation within a barrel, the barrel having a first feed end and a second discharge end, each screw independently having a cross-sectional profile which varies from feed end to discharge end of the barrel such that the flight width increases from discharge end to feed end by more than 50%, the rotational clearance between the screws adjacent the discharge end being at least 5°, and the screw-to-barrel clearance such that as the feedstock passes along at least a part of the barrel from said first end towards said second end, it is divided into a plurality of discrete, substantially C-shaped segments bounded by the screw and barrel surfaces and conveyed into a path whereby the bulk of the feedstock moves substantially parallel to the rotational axis of the screws.

2. A process for manufacture of soap forms which includes the step of treating a soap/detergent feedstock by passage through a twin screw, intermeshing counter-rotating extruder, said screws being oppositely threaded, non-matching and such that the ratio of the length to diameter of each screw is independently greater than 1:1; said screws further being mounted for rotation within a barrel, the barrel having a first feed end and a second discharge end, each screw independently having a cross-sectional profile which varies from feed end to discharge end of the barrel such that the flight width increases from discharge end to feed end by more than 50%, the rotational clearance between the screws adjacent the discharge end being at least 5°, and the screw-to-barrel clearance such that as the feedstock passes along at least a part of the barrel from said first end towards said second end, it is divided into a plurality of discrete, substantially C-shaped segments bounded by the screw and barrel surfaces and conveyed into a path whereby the bulk of the feedstock moves substantially parallel to the rotational axis of the screws.

5,534,213

INJECTION MOLDED LIMB FOR COMPOUND BOW

Marvin E. Epling, 1111 Corporate Dr., Farmington, N.Y. 14425
Continuation of Ser. No. 133,886, Oct. 12, 1993. This application Mar. 16, 1995, Ser. No. 405,915
Int. Cl.^{6} B29C *45/00;* **F41B** *5/00*
U.S. Cl. 264—328.1 **29 Claims**



1. A method of making a plastic limb for a compound archery bow comprising the step of injecting a thermoplastic material reinforced with a plurality of long staple fibers having a nominal fiber length of about three-eighths inch or more axially into a limb mold cavity.

5,534,214

PROCESS FOR COLORING CONCRETE

Nobuyuki Sakamoto, Kanagawa-ken; Takehiko Kobayashi, and Takashi Horiguchi, both of Tokyo, all of, Japan, assignors to Toyoko Giken Co., Ltd., and Nikko Chemical Institute Inc., both of Kanagawa, Japan
Division of Ser. No. 34,358, Mar. 19, 1993, Pat. No. 5,476,722. This application Dec. 7, 1994, Ser. No. 350,694
Claims priority, application Japan, Mar. 24, 1992, 4-97121; Mar. 1, 1993, 5-93517 C
Int. Cl.^{6} B28B *3/00*
U.S. Cl. 264—333 **4 Claims**

1. A process for coloring concrete comprising the steps of:

providing a pattern formwork for concrete having a textured concrete contact surface;

applying a concrete penetration layer of about 30 to about 200 μm in thickness to the concrete contact surface of the pattern formwork;

placing the pattern formwork in spaced relation to a panel;

placing concrete in the space between the pattern formwork and the panel;

curing the concrete; and

releasing the pattern formwork from the concrete,

wherein said concrete penetration layer comprises:

a) polyethylene oxide having a molecular weight of about 100,000 to about 5,000,000, said polyethylene oxide prepared by ring opening polymerization of ethylene oxide, and

b) a composition containing an additive selected from the group consisting of dyes, pigments and mixtures thereof.

5,534,215

PROCESS FOR THE PREPARATION OF BIAXIALLY ORIENTED POLYESTER FILM

Il-Cheon Song, Kunpo; Sang-Il Kim, Suwon, and Young-Jin Lee, Anyang, all of, Rep. of Korea, assignors to SKC Limited, Suwon, Rep. of Korea
Filed Oct. 4, 1995, Ser. No. 539,283
Claims priority, application Rep. of Korea, Oct. 6, 1994, 94-25497
Int. Cl.^{6} B29C *71/02*
U.S. Cl. 264—345 **1 Claim**

1. A process for preparing a biaxially oriented polyester film which comprises: (a) melt-extruding and extending biaxially a polyester resin to shape it into a film; (b) treating the film thermally under a condition that formulae (1), (2) and (3) are satisfied; and (c) relaxing the film at a temperature range of Tm-60° C. to Tm-140° C. during the step (b) :

$$Tm\text{-}60°\ C. < T1 < Tm\text{-}10°\ C. \qquad (1)$$

$$50 < T1 - T2 < 100 \qquad (2)$$

$$5 < (T1 < T2)/t < 25 \qquad (3)$$

wherein:

Tm represents the melting point of the film (°C.),

T1 represents the initial temperature for the thermal treatment of the film (°C.),

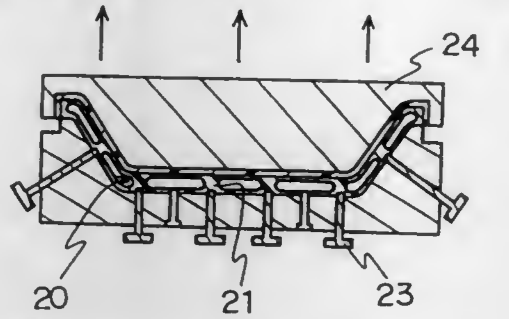
T2 represents the terminal temperature for the thermal treatment of the film (°C.), and

t represents time for the thermal treatment (sec.).

5,534,216

METHOD FOR MANUFACTURING SYNTHETIC RESIN CONTAINERS

Tadamasa Kamiyama, Takatsuki, Japan, assignor to RP Topla Limited, Ibaraki, Japan
Filed Apr. 28, 1994, Ser. No. 234,878
Claims priority, application Japan, May 11, 1993, 5-109552
Int. Cl.^{6} B29C *45/04;45/14*
U.S. Cl. 264—511 **1 Claim**



1. A method for manufacturing a bathtub, comprising the steps of:

(a) pre-forming an inner surface layer component comprising a polymethyl methacrylate resin sheet by thermoforming onto a mold using a vacuum forming method;

(b) fitting the inner surface layer component onto a male die;

(c) forming a reinforcing layer by inserting a molten synthetic thermoplastic resin into the inside of a female die wherein the female die further comprises at least one independently movable portion;

(d) fitting the male die onto the female die and bringing the male die and the female die close together to compress the reinforcing layer within a cavity defined between a back surface of the inner surface layer component fitted on the male die and the female die;

(e) injecting compressed air into the reinforcing layer through at least one air nozzle formed in the female die while enlarging the cavity between the male and female dies so as to correspond to a predetermined thickness of the synthetic resin container thereby forming hollow portions within the reinforcing layer and after a lapse of a predetermined time period, moving the independently movable portion in a direction so as to enlarge said cavity between the male and female dies to form a reinforcing rib within said hollow portions;

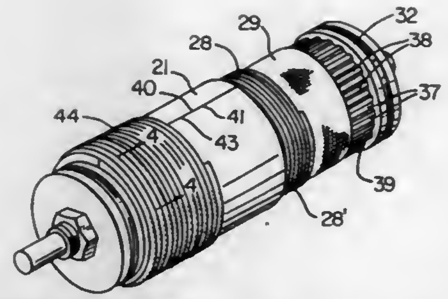
(f) causing the compressed air to press the reinforcing layer against the entire back surface of the inner surface layer component and the female die; and

(g) cooling the synthetic resin of the reinforcing layer to solidify the same and releasing the bathtub from the dies.

5,534,217

METHOD OF MAKING TOOTHED BELTS FORMED MAINLY OF THERMOPLASTIC MATERIAL

Danny L. Thomas, Forsyth, and Clinton L. Bishop, Springfield, both of Mo., assignors to Dayco Products, Inc., Dayton, Ohio
Division of Ser. No. 110,177, Aug. 20, 1993, Pat. No. 5,392,831, which is a continuation of Ser. No. 844,361, Mar. 2, 1992, abandoned. This application Jul. 18, 1994, Ser. No. 276,295
Int. Cl.^{6} F16G *1/00;1/28;5/20*
U.S. Cl. 264—516 **3 Claims**



1. A method of making toothed belts comprising the steps of:

(1) wrapping a fabric circumferentially around a building drum having a generally cylindrical configuration and a surface defining a series of parallel, tooth-shaped grooves;

(2) winding a cord of tensile material helically about said fabric, said tensile material being formed from a plastic having a high tensile strength and a high softening temperature;

(3) wrapping said cord of tensile material with a layer of thermoplastic material having a melting temperature substantially below said softening temperature of said tensile material and selected from the group consisting of polyether blocked amide having a softening temperature of about 165 deg. F. and a melting temperature of about 306 deg. F., segmented thermoplastic copolyester elastomer having a softening temperature of about 356 deg. F. and a melting temperature of about 412 deg. F. and a low density polyethylene having a softening temperature of about 200 deg. F. and a melting temperature of about 251 deg. F.;

(4) winding a cord of shrink material helically about said thermoplastic material, said shrink material being formed from a plastic having a higher softening temperature than said thermoplastic material;

(5) extruding said thermoplastic material through said tensile material to fill said grooves and stretch said fabric against said surface by applying pressurized steam to said shrink material at a temperature which is below the softening temperature thereof and between said softening temperature and said melting temperature of said thermoplastic material;

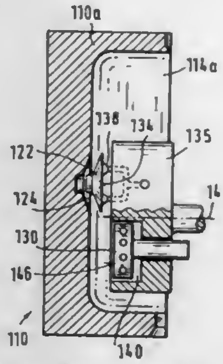
maintaining application of steam as aforesaid until said belts have been formed; and

separating said belts from each other and from said drum.

5,534,218

PROCESS FOR THE PRODUCTIN OF A HOLLOW BODY OF THERMOPLASTIC MATERIAL

Werner Daubenbüchel, Bergisch-Gladbach, and Alfred Jira, Königswinter, both of, Germany, assignors to Krupp Kautex Maschinenbau GmbH, Bonn, Germany
Filed Oct. 22, 1993, Ser. No. 141,916
Claims priority, application Germany, Oct. 28, 1992, 42 36 439.6
Int. Cl.^{6} B29C *49/20*
U.S. Cl. 264—516 **17 Claims**



1. In a process for the production of a hollow body of thermoplastic material, which includes at least one additional portion, comprising the steps of: introducing a preform into an open divided blow molding mold which is provided at its inside wall with a seat into which the additional portion is fitted and seated; closing the divided mold; expanding the preform in the closed mold to provide the hollow body; and pressing a region of the wall of the preform in the course of the expansion operation in a still hot-plastic state against the additional portion to form an adhering connection between the additional portion and the hollow body, the improvement comprising prior to completing the step of expanding the preform, the steps of heating at least a part of a surface of the

additional portion with a heating element while the additional portion is in the mold, said part of the surface to be connected to the hollow body produced by expansion of the preform, by the transmission of heat from the heating element to the part of the surface of the additional portion to raise the part of the surface to a temperature effective to form the adhering connection between the additional portion and the hollow body, while simultaneously effectively covering the part of the surface from exposure to the outside atmosphere in the open mold with the heating element.

5,534,219

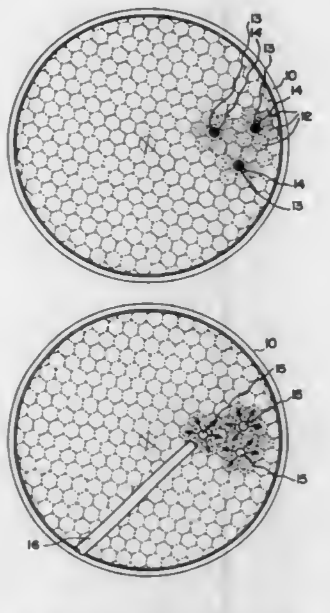
METHOD FOR PRODUCING MULTIFILAMENTARY NIOBIUM-TIN SUPERCONDUCTOR

William G. Marancik, Watchung; Seungok Hong, New Providence, both of N.J., and Rouyi Zhou, Los Alamos, N.M., assignors to Oxford Instruments Inc., Carteret, N.J.

Filed May 27, 1994, Ser. No. 249,945

Int. Cl.^{6} B22F *7/00*

U.S. Cl. 419—4 **13 Claims**



1. A method for producing a multifilamentary superconductor containing niobium-tin (Nb_3Sn), comprising the steps of:

forming a fully bonded niobium/copper composite billet having a plurality of longitudinally extending channels which are symmetrically distributed with reference to transverse cross-sections of the billet, each channel being filled with an inert filler material which is removable by application of a solvent in which the material is soluble;

said fully bonded billet being formed by forming an unbonded billet which includes a plurality of metallic tubes, the center channels of which are filled with said inert material, and subjecting the unbonded billet to bonding conditions adequate to form said fully bonded composite billet;

removing the inert filler material to open the longitudinally extending channels in said billet;

inserting tin, or a tin alloy, into said channels; and

cold drawing the niobium/copper composite billet, with the inserted tin or tin alloy, to the desired final dimensions; and heating the drawn composite to effect in situ formation of the niobium-tin.

5,534,220

METHOD OF SINTERING MACHINABLE FERROUS-BASED MATERIALS

Charles G. Purnell, West Midlands; Mohammad S. Mahmoud, London, and Helen A. Brownlie, Coventry, all of, United Kingdom, assignors to Brico Engineering Limited, Coventry, England

Filed Sep. 30, 1994, Ser. No. 313,052

Claims priority, application United Kingdom, Apr. 1, 1992, 9207139

Int. Cl.^{6} B22F *3/12*

U.S. Cl. 419—45 **21 Claims**

1. A method of enhancing the machinability of a sintered ferrous-based material, the method comprising the steps of (1) making a mixture of a ferrous-based powder, the mixture including (a) a chemical compound of at least one metal selected from the group consisting of manganese and the alkaline-earth series of metals and (b) at least one sulphur donating material; (2) pressing the powder mixture and (3) sintering the pressed mixture so as to cause the formation, by a chemical reaction between said chemical compound and said sulphur donating material during sintering of a sulphide of the at least one metal within the sintered material, whereby fine particles of said sulphide of said metal are formed, and uniformly distributed, in said sintered material.

5,534,221

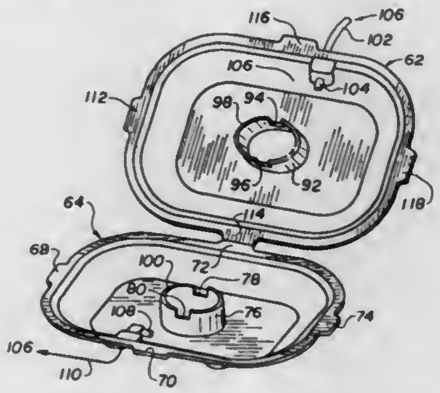
DEVICE AND SYSTEM FOR STERILIZING OBJECTS

H. William Hillebrenner, Apex; Vipul B. Sheth, Cary; Joseph M. Stack, Raleigh; Charles T. Curtis, Cary; Kevin H. Butler, Hillsborough; David E. Shoff, Raleigh; Robert S. Petko; William C. Little, both of Cary; Thaddeus Mielnik, Apex, and Peter Zell, Raleigh, all of N.C., assignors to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 851,096, Mar. 13, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 282,228

Int. Cl.^{6} A61L *2/20*

U.S. Cl. 422—33 **7 Claims**



4. A method for sterilizing and storing endoscopes comprising the steps of:

a) providing one or more endoscopes, each of said endoscopes including an outer surface and at least one lumen;

b) providing a sealable cassette comprising:

i) a first container section;

ii) a second container section engagable with said first container section;

iii) an input port; and

iv) an output port; and

c) providing a connector for connecting the one or more endoscopes to said output port;

d) connecting an end of each of the endoscope(s) to said connector;

e) connecting said connector to said output port;

f) engaging said first container section with said second container section to create a fluid-tight inner cavity therebetween, said one or more endoscopes being enclosed within said fluid-tight inner cavity;

g) introducing a gaseous sterilizing agent into said inner cavity through said input port to sterilize the outer surface of said one or more endoscopes;

h) applying a vacuum to said output port and expelling the gaseous sterilizing agent within said inner cavity by drawing the gaseous sterilizing agent through the endoscope(s) lumen(s) at subatmospheric pressure and through said connector and through said output port and out of said inner cavity.

5,534,222

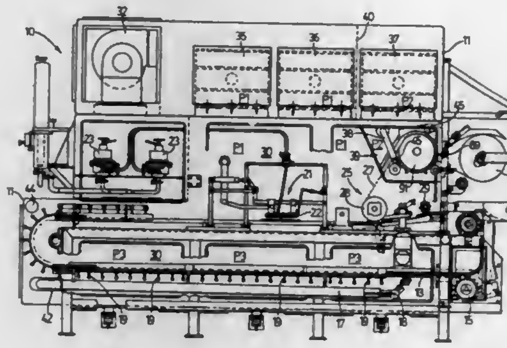
METHOD FOR STERILIZING INTERNAL SURFACES OF AN EDIBLE LIQUID PACKAGING MACHINE

William J. Kelbrick; Vincent J. Rouble, both of Peterborough; Ralph D. Larmer, Fraserville; Stuart L. Pepper, and Eric T. Warburton, both of Peterborough, all of, Canada, assignors to Purity Packaging A Division of Great Pacific Enterprises, Peterborough, Canada

Filed Jul. 11, 1995, Ser. No. 503,897

Int. Cl.^{6} A61L *2/20;2/04*

U.S. Cl. 422—33 **7 Claims**



1. A method for sterilizing internal surfaces of a cabinet enclosing an edible liquid packaging machine, comprising the steps of:

(1) providing a packaging machine enclosed within a cabinet, wherein the machine has a container sterilizing station, a product filling station, a container sealing station having a lidstock sterilizing zone with a lidstock sterilizing heater wheel, and an endless conveyor for receiving containers and transporting the containers to the container sterilizing station, product filling station, container sealing station, and then ejecting the filled and sealed containers from the machine, and wherein the machine is equipped with a positive pressure airflow through it, whereby the air is passed through an HEPA filter prior to its entry into the stations within the machine cabinet, and the machine having means for heating air prior to its entry into the machine cabinet;

(2) maintaining the cabinet at an air temperature of 28°–32° C., and injecting a fine spray of aqueous hydrogen peroxide into air flowing into the cabinet, whereby the inflowing air is heated to 40°–48 ° C., and directing the inflowing hydrogen peroxide laden air sequentially into the container sterilizing station, the container sealing station where a spray of aqueous hydrogen peroxide is also directed against the sterilizing heater wheel which is at 125°–150° C., and the container filling station, so that a fog of condensed aqueous hydrogen peroxide is provided in the stations for sufficient periods to effect complete contact of all exposed surfaces with a bactericidal concentration of hydrogen peroxide; and

(3) upon termination of the injection of the fine spray of aqueous hydrogen peroxide, completing sterilization by heating dry inflowing air so that the internal cabinet temperature is raised to 41°–47° C. and the temperature of the HEPA filters is raised to 36°–40° C., and maintaining the temperatures and air flows for a sufficient time to effect sterilization and drying of all exposed surfaces of the container sterilizing, filling and sealing stations, thereby providing an aseptic zone for the packaging of an edible liquid.

5,534,223

HYBRID PROTEINS BETWEEN AN EXTRACYTOPLASMIC ENZYME AND AT LEAST ANOTHER PROTEIN, METHOD FOR PREPARING THEM AND ALSO THEIR APPLICATIONS

Paul Boquet, Marly le Roi; Jean-Claude Boulain, Palaiseau; Frederic Ducancel; Daniel Gillet, both of Paris, and André Ménez, St Rémy les Cheurleuse, all of, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 876,910, Apr. 30, 1992, Pat. No. 5,362,644, which is a continuation of Ser. No. 542,772, Jun. 25, 1990, abandoned. This application Jun. 30, 1994, Ser. No. 269,072

Claims priority, application France, Jun. 26, 1989, 89 08444

Int. Cl.^{6} G01N *33/531*

U.S. Cl. 422—61 **4 Claims**

1. A kit for carrying out an immunoenzymological assay for protein, comprising a diagnostic reagent consisting of a hybrid protein comprising, in order, a polypeptide P1 which is an N-terminal portion of mature alkaline phosphatase comprising from 6 to 28 of the N-terminal amino acids of said mature alkaline, joined to a polypeptide P2 capable of interacting with an antibody or an antigen, joined to a polypeptide P3 which is selected from the group consisting of a) the C-terminal remaining amino acids of said mature alkaline phosphatase, b) the mature sequence of alkaline phosphatase and c) enzymatically active fragments of b).

5,534,224

CHEMICAL ANALYSIS FILM CARTRIDGE

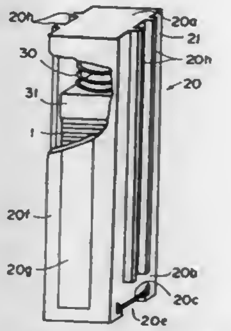
Yoshihiko Abe, Saitama-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 14, 1994, Ser. No. 273,131

Claims priority, application Japan, Jul. 16, 1993, 5-177055; Jul. 16, 1993, 5-177057

Int. Cl.^{6} G01N *35/00*

U.S. Cl. 422—63 **4 Claims**



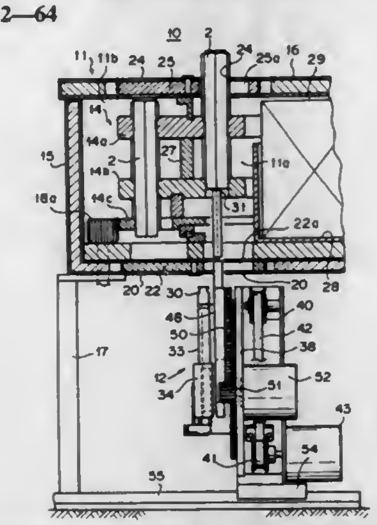
1. A chemical analysis film cartridge comprising:

a casing body having first and second end walls opposed to each other and in which a plurality of dry frameless chemical analysis film chips, each comprising a reagent containing layer formed on a support sheet, are stored in a stack extending between the end walls, a first opening being formed in a side wall of the casing body at a portion near the first end wall of the casing body so that only the chemical analysis film chip nearest the first end wall can be removed from the casing body through the first opening by moving the chemical analysis film chip in a direction substantially perpendicular to a direction in which the chips are stacked, and a second opening being formed in the first end wall of the casing body so that a film takeout means can hold the chemical analysis film chip nearest the first end wall through the second opening and deform the film chip into a predetermined warped shape to remove the film chip from the casing body through the first opening, the first opening having a shape and size that permit only the film chip having the predetermined warped shape to be removed through the first opening, wherein

the first opening and the second opening communicate with each other, and wherein a space (c) defined between an edge (**20***i*) of the second opening and an upper edge (**20***j*) of the first opening above the edge (**20**i) in the direction in which the chips are stacked is larger than the thickness of one chemical analysis film chip and smaller than double the thickness of one chemical analysis film chip.

5,534,225
CHEMICAL ANALYSIS ELEMENT SUPPLIER
Yoshihiro Seto, and Yoshiyuki Doi, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1995, Ser. No. 498,467
Claims priority, application Japan, Jul. 5, 1994, 6-153418
Int. Cl.^{6} G01N *37/00*
U.S. Cl. 422—64 **4 Claims**

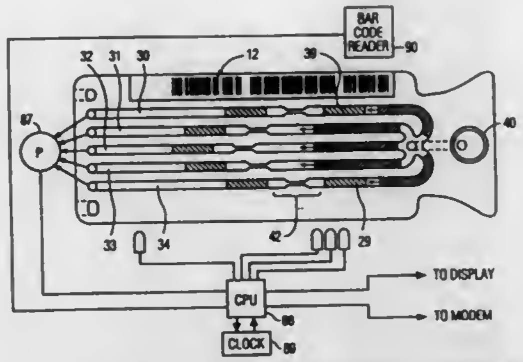


1. A chemical analysis element supplier comprising a cartridge container for storing a cartridge in which a plurality of chemical analysis elements are stored, the container having a top, a bottom, a cartridge insertion port, which is formed in the top of the container and through which the cartridge is inserted into the container, and an element take-out port which is formed in the bottom of the container to give access to the cartridge in the container; and an element take-out means which moves up and down and takes out a selected one of the chemical analysis elements in the cartridge through the element take-out port,

wherein said element take-out means is provided with a lifting member which is operative to move upward through the element take-out port to abut and lift the cartridge in the container so that at least a part of the cartridge projects upward through the cartridge insertion port so as to be exposed outside of the container, thereby to permit the cartridge to be removed and replaced with another cartridge.

5,534,226
PORTABLE TEST APPARATUS AND ASSOCIATED METHOD OF PERFORMING A BLOOD COAGULATION TEST
Michael Gavin, Warren; Catherine M. Cimini, Somerset; Ming Huang, Milltown; Anthony Kuklo, Jr., Bridgewater, all of N.J.; James A. Mawhirt, Brooklyn, N.Y., and Eduardo Marcelino, Edison, N.J., assignors to International Technidyne Corporation, Edison, N.J.

Division of Ser. No. 327,320, Oct. 21, 1994, Pat. No. 5,504,011.
This application Apr. 19, 1995, Ser. No. 424,063
Int. Cl.^{6} G01N *33/86*
U.S. Cl. 422—73 **17 Claims**



1. An apparatus for a blood sample that contains an anticoagulant, comprising:

a disposable cuvette comprising:

a) a plurality of conduits, that include at least one test conduit and at least one control conduit, disposed within said cuvette, each of said plurality of conduits extending from a distal end to a proximal end, wherein each of said plurality of conduits contains at least one restricted region in between said distal end and said proximal end;

b) means for introducing a predetermined volume of the blood into each of said plurality of conduits;

c) a normalizing agent disposed within said at least one control conduit, wherein said normalizing agent is capable of counteracting effects of the anticoagulant in the blood being tested thereby creating a normalized blood sample; and

a test device that includes:

a) a receptacle for receiving said disposable cuvette within said test device;

b) means for reciprocally moving said predetermined volume of the sample back and forth in each of said plurality of conduits through said restricted region between a plurality of zones;

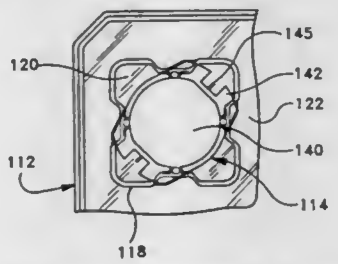
c) detecting means for detecting the presence of said predetermined volume of the blood within each of said plurality of conduits in each of said plurality of zones;

d) means, coupled to said detecting means, for determining an elapsed time to when a predetermined degree of coagulation has occurred in each of said plurality of conduits, thereby providing a test coagulation time for each said test conduit and providing a control coagulation time for each said control conduit, and

e) quantifying means for quantifying said test coagulation time with said control coagulation time to produce a quantified coagulation time result for the blood being tested.

5,534,227
THERMOFORM DISH INSERT
William Lahm, Sumter, S.C., and Timothy A. Stevens, Madison, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 5, 1995, Ser. No. 462,932
Int. Cl.^{6} B01L *3/00;* **C12M** *3/00*
U.S. Cl. 422—102 **15 Claims**



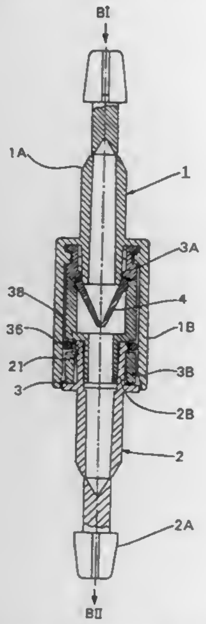
10. A base for receiving a plurality of cell culture inserts, comprising:

a plurality of wells, each well including a bottom wall and a pair of opposing side walls, each of said wells including a generally rectangular well opening;

each of said side walls of said respective wells including a step defined therein, each of said steps including a substantially horizontal surface and a substantially vertical surface, said vertical surface of each step including a portion extending obliquely with respect to one of said side walls, whereby a cell culture insert having a pair of diametrically opposing flanges can be positioned within said wells such that said flanges are supported by said horizontal surfaces and are positioned near diagonally opposing corner portions of said well opening.

5,534,228
CONNECTOR SYSTEM FOR CONNECTING LIQUID CONTAINERS
Matthias Wesseler, Melle, Germany, assignor to Fresenius AG, Bad Homburg von der Hohe, Germany

Filed Apr. 14, 1994, Ser. No. 228,802
Claims priority, application Germany, Apr. 26, 1993, 43 13 636.2
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 422—103 **13 Claims**



1. A connector system for connecting liquid containers together and to a receiver for liquid from said containers in a predetermined connection sequence comprising;

first and second connecting pieces, each of said connecting pieces having a first connector at one end, a second connector at the opposite end, and a longitudinal bore for enabling fluid flow through each said connecting piece, said first connector being configured for connection to at least one of said liquid containers,

an intermediate connecting piece having a first intermediate connector at one end, a second intermediate connector at the opposite end, and a longitudinal bore for enabling fluid flow through said intermediate connecting piece, and

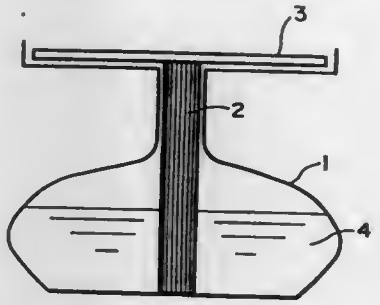
a connection fitting for a liquid receiver, said connection fitting comprising a longitudinal bore for enabling fluid flow therethrough and being configured for detachable connection to said first intermediate connector of said intermediate connecting piece,

wherein said first connector of each of said first and second connecting pieces is configured for connection to at least one of said liquid containers, said second connector of said first connecting piece is configured for detachable connection to said first intermediate connector of said intermediate connecting piece, said second connector of said second connecting piece is configured for non-detachable connection to said second intermediate connector of said intermediate connecting piece, and said second connector of each of said first and second connecting pieces is configured such that connection of said first and second connecting pieces is enabled exclusively by the intermediate connecting piece,

further wherein said intermediate connecting piece is disposed inside said first connecting piece by connection of said first intermediate connector to said second connector of said first connecting piece, such that removal of the intermediate connecting piece from said first connecting piece prior to attachement of said second connecting piece to said second intermediate connector of said intermediate connecting piece is precluded.

5,534,229
VOLATILIZATION SUPPRESSING AGENT
Ryuji Nomura, and Haruo Shibatani, both of Tokyo, Japan, assignors to Nomura & Shibatani, Tokyo, Japan

Continuation of Ser. No. 120,912, Sep. 15, 1993, abandoned.
This application Dec. 20, 1994, Ser. No. 360,131
Claims priority, application Japan, Sep. 16, 1992, 4-270767
Int. Cl.^{6} A61L *9/01;9/04;9/12*
U.S. Cl. 422—123 **12 Claims**



1. An air freshener system, comprising a container, said container containing a volatile liquid composition and a wick which penetrates said volatile composition, said volatile liquid composition comprising a volatile effective component, and an effective amount of a volatilization suppression agent, the effective amount being sufficient to decrease the rate of volatilization of said volatile liquid as the temperature increases, said volatile suppression agent comprising at least one thermosensitive polymer and the volatile liquid composition having a characteristic of thermoreversibly aggregating or gelling as its temperature increases.

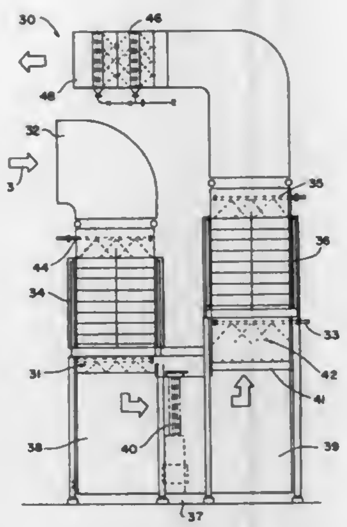
5,534,230
SEGMENTED HEAT EXCHANGER FLUE GAS TREATMENT
Dennis W. Johnson, Barberton, and Karl H. Schulze, North Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 5, 1994, Ser. No. 270,705
Int. Cl.^{6} F01N *3/10*
U.S. Cl. 422—173 **5 Claims**

1. A segmented heat exchanger system for treating a flue gas, the system comprising:

a housing having an inlet and an outlet, the flue gas entering the housing through the inlet and exiting the housing through the outlet;

first tubular heat exchanger means in the housing below the inlet for removing heat from the flue gas, the first tubular heat exchanger means having heat exchanger tubes with a corrosion resistant covering, and being constructed and arranged such that the flue gas downwardly in the housing through the first tubular heat exchanger means, the first tubular heat



exchanger means operating in a condensing mode for removing both sensible and latent heat from the flue gas;

liquid spray means located in an exit of the first tubular heat exchanger means for assisting in removal of particulate and pollutants from the flue gas passing therethrough, the liquid spray means saturating the flue gas with water;

first collection means in the housing below the first tubular heat exchanger means for collecting liquid and particulate from the flue gas;

first mist elimination means situated in the housing in an exit of the first collection means for removing mist from the flue gas;

reagent slurry spray means positioned in the housing prior to an inlet of a second tubular heat exchanger means for further washing and removing pollutants from the flue gas with an alkali slurry;

second tubular heat exchanger means positioned in the housing prior to the outlet of the housing for condensibly removing pollutants from and being constructed and arranged such that the flue gas, the flue gas passes upwardly in the housing through the second tubular heat exchanger means after passing through the first tubular heat exchanger means, the second tubular heat exchanger means having heat exchanger tubes with a corrosion resistant covering; and

second collection means in the housing below the second tubular heat exchanger means and adjacent the first mist elimination means for collecting liquid reacted slurry, alkali slurry and particulate.

5,534,231
LOW FREQUENCY INDUCTIVE RF PLASMA REACTOR
Stephen E. Savas, Newark, Calif., assignor to Mattson Technology, Inc., Fremont, Calif.

Continuation of Ser. No. 460,707, Jan. 4, 1990. This application Jan. 17, 1995, Ser. No. 374,404

Int. Cl.^{6} B01J *8/00*

U.S. Cl. 216—67 **114 Claims**

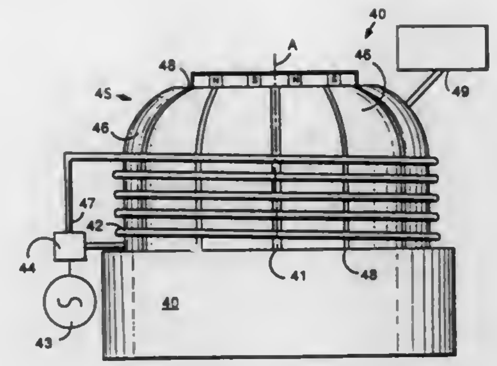
1. A plasma reactor for processing a semiconductor substrate comprising:

a reactor chamber within which a plasma is generated to produce at least one plasma product for processing the semiconductor substrate;

a gas source coupled to the reactor chamber to provide gas into the reactor chamber;

an exhaust system coupled to the reactor chamber to exhaust gas from the reactor chamber;

a first source of radio frequency power;



an induction coil adjacent to the reactor chamber and coupled to said first source of radio frequency power to inductively couple power into the plasma from said first source of radio frequency power;

a split Faraday shield between the induction coil and the plasma, the split Faraday shield forming at least one substantially nonconductive gap such that the induction coil inductively couples power from said first radio frequency power source through the split Faraday shield to sustain the plasma; and

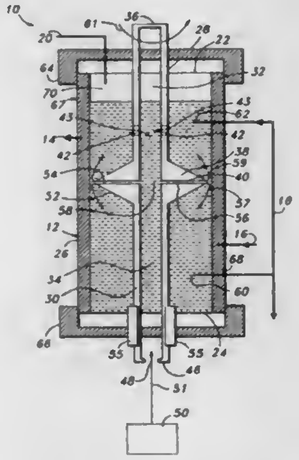
a support for the semiconductor substrate positioned such that the semiconductor substrate is exposed to said at least one plasma product during processing.

5,534,232
APPARATUS FOR REACTIONS IN DENSE-MEDIUM PLASMAS
Ferencz S. Denes, and Raymond A. Young, both of Madison, Wis., assignors to Wisconsin Alumini Research Foundation, Madison, Wis.

Filed Aug. 11, 1994, Ser. No. 289,621

Int. Cl.^{6} B01J *19/08*

U.S. Cl. 422—186.26 **22 Claims**



1. An apparatus for reacting dense-phase chemicals in an induced plasma state comprising:

(a) a reaction vessel having a first upper end, a second lower end, and side walls to define an enclosed area;

(b) a rotatable first electrode comprising a hollow shaft having first and second ends wherein said first electrode extends through the first end of said reaction vessel such that the second end of said first electrode is positioned near an interior center of the reaction vessel;

(c) a static second electrode comprising a hollow shaft having first and second ends wherein said second electrode extends through the second end of said reaction vessel such that the second end of said second electrode is positioned near an interior center of the reaction vessel;

(d) means for rotating said rotatable first electrode; and

(e) means for connecting space within said hollow shaft of said first electrode to said enclosed area of said reaction.

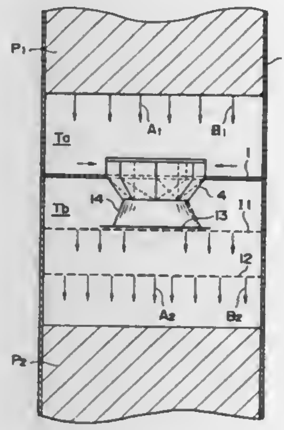
5,534,233
LIQUID FLOW CONTROL DEVICE, REACTOR USING SAME AND LIQUID FLOW CONTROL METHOD
Osamu Yamamoto, Kawasaki; Seiya Hirohama; Ryuichiro Kajiyama, both of Yokohama; Yoshikazu Shimoyama, Kawasaki, and Junichiro Tanaka, Yokohama, all of, Japan, assignors to Chiyoda Corporation, Yokohama, Japan

Filed Dec. 14, 1994, Ser. No. 355,485

Claims priority, application Japan, Dec. 15, 1993, 5-343118

Int. Cl.^{6} B01J *8/04*

U.S. Cl. 422—191 **11 Claims**



1. A device for controlling a liquid flow in a generally vertically extending pipe, comprising:

a plate member arranged in said pipe generally perpendicular to the axis thereof and having an opening therethrough disposed so that the liquid conducted by said pipe is permitted to pass said plate member only through said opening;

a tubular guide member formed in said plate member by a wall extending downwardly and inwardly from the periphery of said opening and terminating in an edge operative to form a liquid outlet having a flow area smaller than that of said opening;

a plurality of flow-directing partition members each having a lower end connected to said tubular guide member and an upper end projecting upwardly from the periphery of said opening, said lower end of each of said partition members extending obliquely downwardly from the periphery of said opening along the wall of said tubular guide member substantially to the outlet to define on said tubular guide member a plurality of flow-conducting passages corresponding in number to the number of said partition members and being in fluid communication with said liquid outlet; and

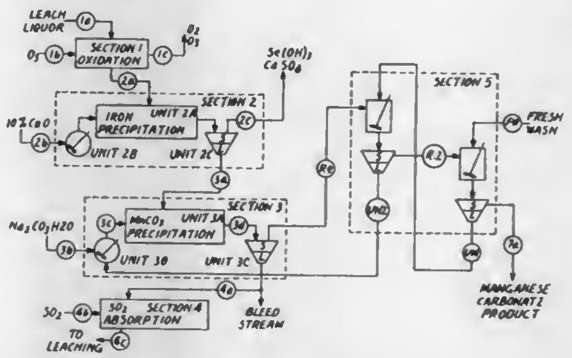
a fluid obstruction cover plate member covering said plurality of passages, and cooperating with said plate member so that the liquid flow through said pipe is directed through said passages and is discharged from said liquid outlet in the form of a vortex flow.

5,534,234
RECOVERY OF MANGANESE FROM LEACH SOLUTIONS
Lorin D. Reddin, 1437 E. 3115 South, Salt Lake City, Utah 84016; Malcolm T. Hepworth, 6908 Cornelia Dr., Edina, Minn. 55435; Rachid Ben-Slimane, 1016 17th St. SE., Minneapolis, Minn. 55414, and Glenn D. Welch, 6390 Golden Chain Rd., Murray, Utah 84107

Filed Nov. 14, 1994, Ser. No. 339,083

Int. Cl.^{6} C01G *45/00;* **C22B** *47/00*

U.S. Cl. 423—50 **15 Claims**



1. A method of producing manganese carbonate from a leach liquor, the method comprising the steps of:

a) providing a sulfurous acid leach solution comprising manganese and iron;

b) oxidizing the iron in the solution by combining an oxidizing agent with the solution while maintaining the oxidation potential of the solution between about 650 to about 800 mV measured with a platinum-silver/silver chloride electrode, wherein the oxidizing agent is selected from the group consisting of ozone and hydrogen peroxide;

c) selectively precipitating substantially all of the iron out of the solution as ferric hydroxide in a kinetic reaction lasting less than about two hours while maintaining substantially all of the manganese in solution, wherein the step of precipitating substantially all of the iron comprises adding milk of lime to the solution after the step of oxidizing, and further wherein gypsum co-precipitates with the ferric hydroxide;

d) filtering substantially all of the ferric hydroxide and gypsum out of the solution; and

e) selectively precipitating manganese out of the solution as manganese carbonate by adding sodium carbonate.

5,534,235
POLYMERS CONTAINING PHOSPHONIC ACID GROUPS FOR THE TREATMENT OF RED MUD IN THE BAYER PROCESS
Peter E. Reed, Plainfield, and Robert P. Mahoney, Warrenville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 5, 1995, Ser. No. 523,993

Int. Cl.^{6} C01F *7/00;* **B01D** *21/00*

U.S. Cl. 423—121 **18 Claims**

1. A process for treating Bayer process red mud-containing liquor consisting of adding to the liquor a phosphonic acid polymer to form a red mud phase and a clarified liquor phase, the polymer being added in an amount sufficient to form a red mud phase having a concentration of solids that is at least about 150% of the initial concentration of solids in the red mud-containing liquor.

5,534,236

REMOVING AMMONIA FROM AN AMMONIA-CONTAINING GAS MIXTURE

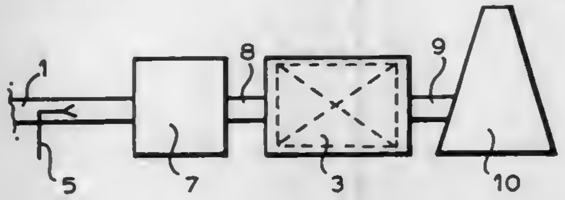
Alex F. Woldhuis, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1995, Ser. No. 495,746

Claims priority, application European Pat. Off., Apr. 18, 1994, 94201068

Int. Cl.^{6} C01C *3/00*

U.S. Cl. 423—237 **1 Claim**



1. In a process for removing ammonia from an ammonia-containing gas mixture containing molecular oxygen which comprises introducing a precursor of nitrogen oxides, selected from the group consisting of nitric acid, a nitrate, a nitrite and aqueous solutions of said nitric acid, nitrate or nitrite, into said gas mixture containing ammonia at a temperature above the decomposition temperature of said chosen precursor and subsequently contacting the mixture of gases in a reactor in the presence of a catalyst to obtain a gas mixture having a reduced ammonia content, the improvement which consists of interrupting the introduction of the precursor into said gas mixture for a period of time to allow said molecular oxygen to oxidize said ammonia in said reactor.

5,534,237

METHOD OF CLEANING AN EXHAUST GAS AND EXHAUST GAS CLEANER THEREFOR

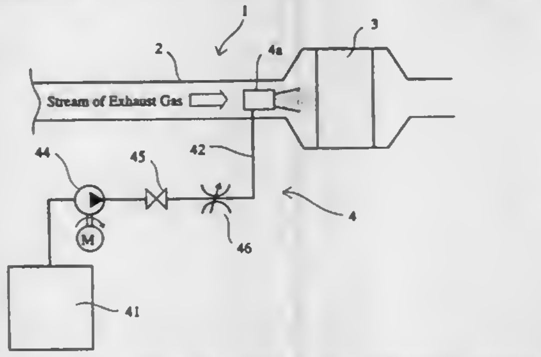
Kiyohide Yoshida; Gyo Muramatsu; Akira Abe, all of Kumagaya, and Tatsuo Miyadera, Tsukuba, all of, Japan, assignors to Kubushiki Kaisha Riken, Tokyo, and Shunso Ishishara, Director–General of Agency Of Industrial Science And Technology, Ibaraki-ken, both of, Japan

Continuation of Ser. No. 104,894, Aug. 12, 1993, which is a continuation-in-part of Ser. No. 916,409, Jul. 21, 1992, abandoned. This application Apr. 25, 1995, Ser. No. 428,635

Claims priority, application Japan, Jul. 23, 1991, 3-206529; Sep. 30, 1991, 3-280476; Sep. 30, 1991, 3-280479; Sep. 30, 1991, 3-280482; Sep. 30, 1991, 3-280825; Feb. 25, 1992, 4-73399; Apr. 30, 1992, 4-137959; Apr. 30, 1992, 4-138070; Jul. 8, 1992, 4-204539; Jan. 14, 1993, 5-21788; Jan. 14, 1993, 5-21789

Int. Cl.^{6} B01J *8/02*

U.S. Cl. 423—239.1 **5 Claims**



1. A method of cleaning an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which consists essentially of:

(a) disposing an exhaust gas cleaner in a flow path of said exhaust gas, said exhaust gas cleaner consisting essentially of a heat-resistant, porous inorganic oxide body made of alumina or a composite oxide thereof and impregnated with a catalytically active component consisting essentially of Ag or its oxide, said exhaust gas cleaner being subjected to a treatment with SO_2 prior to contact with said exhaust gas by contacting said exhaust gas cleaner with a gas containing SO_2 and an aliphatic oxygen-containing organic compound so that 0.02–1 mmol of SO_2 is brought into contact per 1 g of said exhaust gas cleaner;

(b) introducing a reducing agent selected from the group consisting of hydrocarbons having 2 or more carbon atoms and aliphatic oxygen-containing organic compounds into a stream of said exhaust gas on the upstream side of said exhaust gas cleaner; and

(c) bringing the exhaust gas containing said reducing agent into contact with said exhaust gas cleaner at a temperature of 200°–600° C., to cause a reaction between said nitrogen oxides and said reducing agent, thereby removing said nitrogen oxides.

5,534,238

METHOD FOR THE PREPARATION OF PURIFIED AQUEOUS HYDROGEN PEROXIDE SOLUTION

Shoichiro Kajiwara, and Hirokazu Serizawa, both of Ashigarakami-gun, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 23, 1995, Ser. No. 493,986

Claims priority, application Japan, Jun. 28, 1994, 6-146526; Jun. 28, 1994, 6-146527

Int. Cl.^{6} C01B *15/01*

U.S. Cl. 423—584 **6 Claims**

1. A method for the preparation of a highly purified aqueous hydrogen peroxide solution from a crude aqueous hydrogen peroxide solution containing metallic and inorganic impurities as the starting material which comprises the steps of:

(a) acidifying the crude aqueous hydrogen peroxide solution as the starting material by the addition of an acid having an acid dissociation index pKa in pure water not higher than 5 at 25° C. in an amount of 0.005 to 5 milliequivalents per liter of the solution; and

(b) bringing the crude aqueous hydrogen peroxide solution acidified in step (a) into contact with a strongly acidic cation-exchange resin in the hydrogen-form or a mixture of a strongly acidic cation-exchange resin in the hydrogen-form and a strongly basic anion-exchange resin in the hydroxy-form, carbonate-form or hydrogencarbonate-form, of which the volume fraction of the cation-exchange resin is at least 10% based on the total volume of the mixture.

5,534,239

PROCESS FOR THE SYNTHESIS OF A SILICA ENRICHED CRYSTALLINE ALUMINOSILICATE HAVING THE OFFRETITE STRUCTURE, THE ALUMINOSILICATE OBTAINED AND ITS USE AS A CATALYST FOR THE CONVERSION OF HYDROCARBONS

Fajula François, Theyran; Patarin Joel, Mulhouse; Des Courieres Thierry, and Fitoussi Fredj, both of Lyons, all of, France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Continuation of Ser. No. 163,590, Dec. 6, 1995, abandoned, which is a continuation of Ser. No. 893,592, Jun. 2, 1992, abandoned, which is a continuation of Ser. No. 670,975, Mar. 18, 1991, abandoned. This application Oct. 6, 1995, Ser. No. 539,507

Claims priority, application France, Mar. 23, 1990, 90 03704

Int. Cl.^{6} C01B *39/30*

U.S. Cl. 423—713 **22 Claims**

I. Process for the synthesis of dealuminated offretite, which comprises the following steps:

preparation of a nucleation gel A containing sources of silicon, aluminum, alkali metal ions (M), an organic structuring agent (Z) and water

aging this mixture

preparation of a growth gel B containing a source of silicon, aluminum, alkali metal ions and water

addition of at least 2% by weight of aged gel A to fresh gel B

heating the gel A-B with stirring to achieve its crystallization, followed by separation, washing and drying of the crystals

calcination at a temperature greater than about 500° C. to remove organic structuring agent

replacement of the alkali metal ions by protons

hydrothermal treatment with 100% steam at a temperature between about 500° to 800° C. for a period of less than 5 hours

treatment with a strong mineral acid in an aqueous medium, followed by separation, washing and conditioning of the crystals.

5,534,240

UNCHELATED MANGANESE COMPOSITION FOR MRI OF THE GASTROINTESTINAL TRACT

Hideo Hasegawa, Saitama; Kikuhei Tateno, Hyogo; Tamotsu Kuwata, Saitama; Yoshiro Yamamoto, Tokyo; Kumiko Hiraishi; Osamu Fujita, both of Osaka, and Isamu Narabayashi, Hyogo, all of, Japan, assignors to Meiji Milk Products Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 20,114, Feb. 19, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 400,017

Claims priority, application Japan, Feb. 20, 1992, 4-069370

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 424—9.36 **4 Claims**

3. A method for visualizing the gastrointestinal tract during magnetic resonance imaging comprising administering to a patient, in need of said imaging, an aqueous composition comprising:

(1) a manganese-containing drink or food, or a manganese-containing drink or food enriched with a manganese compound, wherein said manganese is uncomplexed or unchelated and is present in a concentration of from 0.80 to 50 μg/ml and wherein the dose is from 2 to 10 ml per kg body weight, and

(2) a carrier for MRI imaging

and then conducting magnetic resonance imaging.

5,534,241

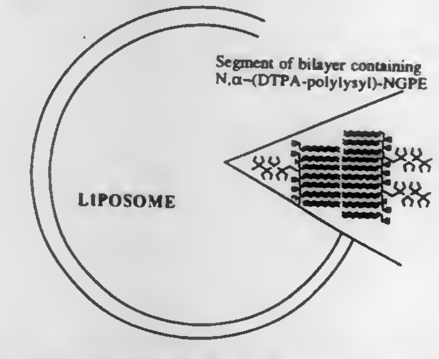
AMPHIPATHIC POLYCHELATING COMPOUNDS AND METHODS OF USE

Vladimir P. Torchilin, 41, 8th St., #3208, Charlestown, Mass. 02129; Vladimir S. Trubetskoy, 9 Morton Ter., Milton, Mass. 02186, and Gerald L. Wolf, 5 Hawthorn Rd., Winchester, Mass. 01890

Filed Jul. 23, 1993, Ser. No. 96,083

Int. Cl.^{6} A61B *5/055*

U.S. Cl. 424—9.321 **16 Claims**



1. A micelle comprising lipids and an amphipathic polychelating compound comprising a hydrophilic polymeric moiety having a backbone and a plurality of reactive side groups, a lipid-soluble anchor linked to the N terminal of said polymeric moiety, and a plurality of chelating agents linked to the side groups of said polymeric moiety, wherein said polychelating compound is linked to said lipids via said lipid-soluble anchor.

5,534,242

LIDOCAINE-VASOCONSTRICTOR AEROSOL PREPARATION

Richard A. Henry, 7 Toronto Street, Kingston, Ontario, Canada

Continuation-in-part of Ser. No. 236,408, May 2, 1994, Pat. No. 5,453,445. This application Mar. 24, 1995, Ser. No. 408,877

Int. Cl.^{6} A61L *9/04;* **A61K** *31/165;31/135*

U.S. Cl. 424—45 **11 Claims**

1. An aerosol-dispensable pharmaceutical composition, comprising:

lidocaine base present in an amount ranging between 1–30% by weight;

a vasoconstricting agent present in an amount ranging between 0.01–10% by weight;

a hydrofluorocarbon propellant present in an amount ranging between 45–99% by weight, said lidocaine base and said vasoconstricting agent being dissolved in said hydrofluorocarbon.

5,534,243

AQUEOUS ORAL COMPOSITIONS

Cloyd Dixon, Jr., Covington, Ky., and Stephen J. Hunter-Rinderle, Mason, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 26, 1994, Ser. No. 312,358

Int. Cl.^{6} A61K *7/16;31/30*

U.S. Cl. 424—49 **11 Claims**

1. An aqueous oral composition comprising:

a.) a safe and effective amount of copper bis-glycinate;

b.) a surfactant;

c.) a polyhydric alcohol selected from the group consisting of propylene glycol, the polyethylene glycols, butylene glycol, hexylene glycol and mixtures thereof; and

d.) a pharmaceutically acceptable carrier

wherein the composition contains less than 5% ethyl alcohol.

5,534,244

METHODS AND COMPOSITIONS FOR MINERALIZING AND/OR FLUORIDATING CALCIFIED TISSUES WITH AMORPHOUS STRONTIUM COMPOUNDS

Ming S. Tung, 15233 Falconbridge Ter., Gaithersburg, Md. 20878

Continuation-in-part of Ser. No. 104,350, Aug. 9, 1993, Pat. No. 5,437,857, which is a division of Ser. No. 723,839, Jul. 1, 1991, Pat. No. 5,268,167, which is a division of Ser. No. 356,201, May 24, 1989, Pat. No. 5,037,639. This application May 6, 1994, Ser. No. 239,244

Int. Cl.^{6} A61K *7/16;7/18;9/12*

U.S. Cl. 424—52 **27 Claims**

1. A method for treating and remineralizing teeth through the formation of mineral onto and into the dental tissue comprising contacting a dental restorative with the teeth, said dental restorative comprising in combination:

a carrier selected from the group of a gel, a polymer, a chewing gum, a powder, a mouth rinse, an aerosol, a carbonated solution, a candy, a confectionary or a toothpaste for suspension of amorphous strontium compounds; and

amorphous strontium compounds or solutions which will form amorphous strontium compounds suspended within said carrier, whereby when the combination is applied to the teeth, the amorphous strontium compounds will precipitate into and on the teeth and form strontium containing apatite.

5,534,245

ANTIPERSPIRANT DEODORANT COMPOSITIONS

Ramiro Galleguillos, Glendale Heights; Billie L. Radd, Naperville, and Anjana K. Jadav, Chicago, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 199,492, Feb. 22, 1994. This application Jan. 17, 1995, Ser. No. 373,111

Int. Cl.^{6} A61K *7/34;7/38*

U.S. Cl. 424—66 **27 Claims**

1. A roll-on or gel antiperspirant composition comprising:

(a) about 1% to about 40% by weight of an antiperspirant compound;

(b) about 0.005% to about 10% by weight of a hydrophilic polymer selected from the group consisting of a polyethylene glycol, having a weight average molecular weight of at least about 5,000; and

(c) a carrier comprising water, a water-soluble solvent and mixtures thereof;

wherein the antiperspirant composition has a pH of about 2 to about 6.

5,534,246

TOPICALLY-EFFECTIVE COMPOSITIONS

Craig A. Herb, Chicago; Wel-Mei Sun, Palatine; Priscilla M. Walling, Darien, and Susan A. Stiffe, Peoria, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Aug. 29, 1994, Ser. No. 297,659

Int. Cl.^{6} A61K *7/34;7/36;7/38*

U.S. Cl. 424—66 **43 Claims**

1. An emulsified, water-in-oil antiperspirant composition comprising:

(a) about 65% to about 99.5% by weight of the composition of an aqueous phase, said aqueous phase comprising
 (i) about 1% to about 40% by weight of the composition of an antiperspirant compound and
 (ii) water;

(b) about 0.5% to about 35% by weight of the composition of an organic phase comprising a volatile silicone compound, a volatile hydrocarbon compound, or a mixture thereof; and

(c) about 0.1% to about 15% by weight of the composition of a surfactant phase consisting essentially of a surfactant or a surfactant blend, wherein the surfactant or surfactant blend has an HLB value of about 10 or less and is free of silicon, and wherein the surfactant phase comprises a nonionic surfactant selected from the group consisting of a polyoxyethylene ether of a fatty (C_6–C_{22}) alcohol, an ethoxylated alkylphenol, a polyethylene glycol ether of methyl glucose, a polyethylene glycol ether of sorbitol, and mixtures thereof.

5,534,247

MASCARA COMPOSITION

David Franjac, Cordova, and John Caradonna, Germantown, both of Tenn., assignors to Maybelline Intermediate Co., Wilmington, Del.

Continuation of Ser. No. 36,889, Mar. 25, 1993, abandoned. This application Oct. 3, 1994, Ser. No. 316,461

Int. Cl.^{6} A61K *7/032*

U.S. Cl. 424—707 **3 Claims**

1. A mascara composition in the form of an oil-in-water emulsion comprising:

from about 10% to about 15% by weight of a hair fixative resin comprising a mixture of polyvinylpyrrolidone/vinyl acetate copolymer and diglycol/cyclohexanedimethanol/isophthalate/sulfoisophthalate copolymer;

from about 14% to about 20% by weight of lipid comprising at least one wax;

from about 1% to about 3% by weight of a humectant comprising propylene glycol;

from about 10% to about 15% by weight of pigment;

from about 2% to about 6% by weight of surface active agent emulsifier;

from about 0.5% to about 2% by weight of thickener comprising hydroxyethyl cellulose;

from about 0.05% to about 1.6% by weight of a curl retention additive comprising a mixture of Polyquaternium 29 and panthenyl hydroxypropyl steardimonium chloride;

from about 8% to about 10% by weight ethanol; and

from about 40% to about 50% by weight of water.

5,534,248

TOILETRY COMPOSITION FOR HAIR CARE

Takashi Matsuo, Chiba; Kumiko Adachi, and Kazuyuki Yahagi, both of Tokyo, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 27, 1993, Ser. No. 127,066

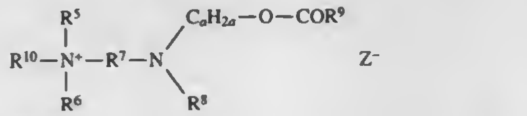
Claims priority, application Japan, Oct. 9, 1992, 4-271577; Oct. 21, 1992, 4-282901; Jun. 16, 1993, 5-144792; Jun. 16, 1993, 5-144793

Int. Cl.^{6} A61K *7/06;7/075*

U.S. Cl. 424—70.28 **7 Claims**

1. A toiletry composition for hair care comprising:

(a) a quaternary ammonium salt compound represented by the following general formula (4):



$$R^{10}-\overset{R^5}{\underset{R^6}{N^+}}-R^7-N\begin{matrix}C_aH_{2a}-O-COR^9\\ R^8\end{matrix}\quad Z^- \qquad (4)$$

wherein

R^5 and R^6 may be the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms;

R^7 represents an alkylene or alkenylene group having 2 to 6 carbon atoms;

R^8 represents a straight-chain or branched alkyl or alkenyl group having 4 to 36 carbon atoms;

R^9 represents a straight-chain or branched alkyl or alkenyl group having 7 to 35 carbon atoms;

R^{10} represents a hydrogen atom or an alkyl or hydroxyalkyl group having 1 to 4 carbon atoms;

Z^- represents a halogen ion, $\frac{1}{2}SO_4^{2-}$, HSO_4^-, $RCOO^-$ wherein R represents an alkyl or alkenyl group having 1 to 4 carbon atoms in which a hydroxyl group may substitute for a hydrogen atom or an $R'SO_4^-$ (wherein R' represents an alkyl group having 1 to 4 carbon atoms; and

a is an integer of 2 to 9;

(b) an anionic surfactant; and

(c) a water soluble polymer.

5,534,249

METHOD OF REDUCING MALODOR USING METAL COMPLEX

Gerald L. Maurer, Cincinnati, Ohio, assignor to National Research Labs, Cincinnati, Ohio

Filed May 15, 1995, Ser. No. 440,828

Int. Cl.^{6} A61L *9/01*

U.S. Cl. 424—76.3 **13 Claims**

1. A method of reducing malodor comprising the step of:

delivering at or near the source of said malodor an effective amount of a (1:1) metal complex comprising dialkali monometal polyfunctional organic ligand chelate, and a compatible admixture wherein said admixture is a buffer, said metal complex acting as an oxidation catalyst in the presence of oxygen to chemically neutralize the source of said malodor.

5,534,250

POLYMERS CONTAINING DIESTER UNITS

Jo Klaveness; Per Strande, both of Oslo, and Unni N. Wiggen, Rasta, all of, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

PCT No. PCT/EP91/01751, § 371 Date May 5, 1993, § 102(e) Date May 5, 1993, PCT Pub. No. WO92/04392, PCT Pub. Date Mar. 19, 1992

PCT Filed Sep. 7, 1991, Ser. No. 982,746

Claims priority, application United Kingdom, Sep. 7, 1990, 9019650; Jul. 8, 1991, 9114678

Int. Cl.^{6} A61K *31/765;* **C08G** *63/02;63/16;63/48*

U.S. Cl. 424—78.37 **13 Claims**

1. Biodegradable polymers comprising diester units of the formula (I)

$$\text{-}[CO-O-C(R^1R^2)-O-CO]\text{-} \qquad (I)$$

where R^1 and R^2 each represents a hydrogen atom or a carbon-attached monovalent organic group or R^1 and R^2 together form a carbon-attached divalent organic group.

5,534,251

STABILIZED IL-1α MEDICINAL COMPOSITION

Yuji Sugahara, and Yasuo Nakayama, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00983, § 371 Date Feb. 14, 1994, § 102(e) Date Feb. 14, 1994, PCT Pub. No. WO93/03747, PCT Pub. Date Mar. 4, 1993

PCT Filed Jul. 31, 1992, Ser. No. 193,182

Claims priority, application Japan, Aug. 12, 1991, 3-201702

Int. Cl.^{6} A61K *45/05*

U.S. Cl. 424—85.2 **6 Claims**

1. A stabilized IL-1α medicinal composition consisting essentially of the following ingredients (1)–(3), adjusted to a pH of 7 with a buffer solution:

(1) a pharmacologically effective amount of a human IL-1α derivative having an amino acid sequence designated by SEQ ID NO: 1 in which 36-Asn is replaced with Asp and 141-Cys is replaced with Ser,

(2) about 1–10 mg per milliliter of human serum albumin, and

(3) about 3–10 mg per milliliter of sucrose.

5,534,252

TWO STAGE METHOD FOR THE PROTECTION OF LUMBER AGAINST SAPSTAIN

Brenda J. McAfee, Wakefield, and Manon Gignac, Ottawa, both of, Canada, assignors to Forintek Canada Corporation, Vancouver, Canada

Filed Jul. 28, 1994, Ser. No. 281,776

Claims priority, application Canada, Jul. 28, 1993, 2101485

Int. Cl.^{6} A01N *63/00;63/04;65/00*

U.S. Cl. 424—93.5 **14 Claims**

1. A method for controlling sapstain in wood and wood products comprising:

a) steam pasteurizing the wood or wood product; and

b) subsequently treating the wood or wood product with a biological control agent comprising one or more fungi selected from the class Hyphomycetes, wherein the efficacy of b) in controlling sapstain is greater when used in conjunction with a), relative to the use of b) alone.

5,534,253

METHOD OF TREATING ENTEROPATHOGENIC BACTERIAL INFECTIONS IN POULTRY

Ivan A. Casas, Raleigh, N.C., and Bo Mollstam, Lerum, Sweden, assignors to Biogaia AB, Stockholm, Sweden

Filed Jun. 7, 1995, Ser. No. 474,101

Int. Cl.^{6} A01N *63/00*

U.S. Cl. 424—93.45 **6 Claims**

1. A method of treating enteropat/Logenic bacterial infections in poultry, comprising:

(a) selecting a strain of *Lactobacillus reuteri,* which is characterized as producing β-hydroxypropionaldehyde under anaerobic conditions in the presence of glycerol or glyceraldehyde;

(b) administering an effective amount of cells of said strain to said poultry; and

(c) treating said poultry with an effective amount of gentamycin.

5,534,254

BIOSYNTHETIC BINDING PROTEINS FOR IMMUNO-TARGETING

James S. Huston, Chestnut Hill, Mass.; L. L. Houston, Oakland; David B. Ring, Redwood City, both of Calif., and Hermann Oppermann, Medway, Mass., assignors to Chiron Corporation, Emeryville, Calif., and Creative BioMolecules, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 831,967, Feb. 6, 1992. This application Oct. 7, 1993, Ser. No. 133,804

Int. Cl.^{6} A61K *39/00;39/395*

U.S. Cl. 424—135.1 **30 Claims**

1. A composition for targeting an epitope on an antigen expressed in a mammal, wherein the composition comprises a pharmaceutically acceptable carrier in combination with,

a dimeric biosynthetic construct for binding at least one preselected antigen, wherein the construct comprises:

(a) two separate polypeptide chains, each of which have an amino acid sequence defining
 (1) an sFv comprising two polypeptide domains connected by a polypeptide linker spanning the distance between the C-terminus of one domain and the N-terminus of the other, the amino acid sequence of each said domain comprising complementarity determining regions (CDRs) interposed between framework regions (FRs), the CDRs and FRs of each said sFv together defining a binding site immunologically reactive with a said preselected antigen, and
 (2) a C-terminal tail essentially free of helical character under physiological conditions and comprising at least one amino acid having derivatizable amino acid side chain; and

(b) an sFv coupler linking together each said sFv through the derivatizable amino acid side chain disposed within the C-terminal tail of each sFv,

said dimeric construct having a conformation wherein the binding site of each said sFv binds a said preselected antigen when said dimeric construct is administered to said mammal.

5,534,255

MONOCLONAL ANTIBODY SPECIFIC TO HUMAN α_2-PLASMIN INHIBITOR

Yoshihiko Sumi; Yukiya Koike, both of Hino; Yataro Ichikawa, Tokorozawa; Nobuhiko Yoshida, Tochigi-ken, and Nobuo Aoki, Tokyo, all of, Japan, assignors to Teijin Limited, Tokyo, Japan

Continuation of Ser. No. 552,832, Jul. 16, 1990, abandoned, which is a continuation of Ser. No. 724,636, Apr. 16, 1985, abandoned. This application Jun. 17, 1991, Ser. No. 716,694

Claims priority, application Japan, Apr. 17, 1984, 59-75778; May 1, 1984, 59-86101; Oct. 12, 1984, 59-212587; Oct. 18, 1984, 59-217312

Int. Cl.^{6} A61K *39/00;* **C07K** *15/28*

U.S. Cl. 424—141.1 **6 Claims**

1. A monoclonal antibody specific to a human α_2-plasmin inhibitor, said antibody having the function of specifically blocking the reactive site of the human α_2-plasmin inhibitor, and thereby said antibody having the function of specifically blocking that site of the human α_2-plasmin inhibitor which inhibits the fibrinolytic activity of plasmin, and of suppressing said fibrinolytic activity inhibiting function of said α_2-plasmin inhibitor.

5,534,256

HAEMOPHILUS SOMNUS OUTER MEMBRANE PROTEIN EXTRACT ENRICHED WITH IRON-REGULATED PROTEINS

Andrew A. Potter, and Richard J. Harland, both of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Filed Jul. 2, 1992, Ser. No. 908,253

Int. Cl.^{6} A61K *39/102;39/116;39/02;45/00*

U.S. Cl. 424—184.1 **10 Claims**

1. A vaccine composition comprising a pharmaceutically acceptable vehicle, an outer membrane protein extract of *Haemophilus somnus* enriched with iron-regulated proteins, an immunogenic RTX leukotoxin protein and a *Pasteurella haemolytica* saline extract.

5,534,257

ANTIGEN-PRESENTING CAPSID WITH FUSION MS2-COAT PROTEIN

Robert A. Mastico, Braintree, Mass.; Peter G. Stockley, Ilkley, and Simon J. Talbot, Street, both of, England, assignors to British Technology Group Limited, England

PCT No. PCT/GB92/00124, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO92/13081, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 22, 1992, Ser. No. 90,148

Claims priority, application United Kingdom, Jan. 24, 1991, 9101550

Int. Cl.^{6} A61K *39/116;39/12;* **C07K** *14/195;* **C12N** *7/01*

U.S. Cl. 424—192.1 **4 Claims**

1. A chimeric protein selected from the group consisting of a coat protein of bacteriophages MS-2, R17, fr, GA, Qβ and SP modified by an insertion of a foreign peptide epitope between amino acids 14 and 15 of the bacteriophage MS-2 coat protein or corresponding amino acids of the coat protein from bacteriophages R17, fr, GA, QB and SP.

5,534,258

POLYPEPTIDES TO PREVENT ATHEROSCLEROTIC PLAQUE

Daniel B. Golubev, Jackson Heights, N.Y., and Alexander Chaihorsky, Garfield, N.J., assignors to Bio-Virus Research Incorporated, San Matteo, Calif.

Filed Jul. 27, 1994, Ser. No. 281,702

Int. Cl.^{6} A61K *39/245;38/00;39/25;39/295*

U.S. Cl. 424—231.1 **2 Claims**

1. A polypeptide selected from the group consisting of:

Ala Pro Leu Pro Ala Pro Ala Pro Pro Ser Thr Pro Pro Gly (Seq ID 2)
1 5 10

Pro Glu Pro Ala Pro Ala Gln Pro Ala Ala Pro Arg Ala Ala
15 20 25

wherein the polypeptide Seq ID 2 contains only these amino acids;

Ala Pro Pro Glu Ala Asp Ala Arg Thr Leu Arg Arg (Seq ID 4)
1 5 10

Pro Gly Pro Pro Leu Pro Leu Pro Pro Ser Leu Leu Pro
15 20 25

wherein the polypeptide Seq ID 4 contains only these amino acids;

Gly Thr Asp Gly Pro Ala Arg Gly Gly Gly Ser Gly (Seq ID 6)
1 5 10

Gly Gly Arg Gly Pro Gly Gly Gly Arg Gly Gly Pro Arg Gly
15 20 25

wherein the polypeptide Seq ID 6 contains only these amino acids; and

Gly Trp Ala Ala Arg Arg Gly Arg Arg Arg Gly Arg (Seq ID 8)
1 5 10

Arg Arg Gly Arg Arg Arg Arg Gln Arg Arg Ala Ala Arg Arg
15 20 25

Arg Arg

wherein the polypeptide Seg ID 8 contains only these amino acids.

5,534,259

POLYMER COMPOUND AND COATED PARTICLE COMPOSITION

Samuel Zalipsky, Fremont, and Francis J. Martin, San Francisco, both of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Filed Jul. 8, 1993, Ser. No. 89,086

Int. Cl.^{6} A61K *9/127;* **A01N** *25/26;25/28*

U.S. Cl. 424—450 **21 Claims**

1. A pharmaceutical composition for use in the parenteral delivery of a pharmaceutical compound, said composition comprising

particles having a selected uniform size in a size range between 0.03–1.0 microns,

each particle including (a) a single layer of linked polymer compounds composed of an outer hydrophilic polymer, an inner hydrophobic moiety, and a linking segment linking the polymer to the hydrophobic moiety and containing at least two chemical groups by which the compound can be crosslinked to at least two other compounds, (b) a crosslinked particle surface coated by said hydrophilic polymers, said crosslinked surface formed by a crosslinking structure created by crosslinks between said chemical groups, and (c) said pharmaceutical compound entrappod in said particle.

5,534,260

PERCUTANEOUS DRUG DELIVERY SYSTEM

Robert V. Petersen, Murray, Utah; Tsung-Min Hsu, Union City, Calif.; Han-Chen Lee, Salt Lake City, Utah, and Don Christy, Albany, N.Y., assignors to University of Utah, Salt Lake City, Utah

Division of Ser. No. 856,866, Mar. 24, 1992, Pat. No. 5,296,222, which is a continuation of Ser. No. 484,372, Feb. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 352,926, May 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 314,819, Feb. 23, 1989, abandoned. This application Mar. 21, 1994, Ser. No. 216,210

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—448 **32 Claims**

1. A method of delivering a drug through the skin of an animal comprising:

applying a percutaneous permeation enhancer to a localized area of the skin of an animal to enhance the permeability of said skin to a drug, said percutaneous permeation enhancer comprising a proteolytic enzymatic component and a non-enzymatic component;

occluding said localized area of skin with occlusion means;

removing said occlusion means; and

applying a percutaneously administrable drug to said localized area of skin to effect permeation of said drug through said skin.

5,534,261

RETINOID-BASED COMPOSITIONS AND METHOD FOR PREVENTING ADHESION FORMATION USING THE SAME

Kathleen E. Rodgers, Long Beach, and Gere S. Dizerega, Pasadena, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jan. 17, 1995, Ser. No. 373,399

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 **20 Claims**

1. A method for preventing post-surgical adhesion formation between organ surfaces, comprising administering an effective amount of at least one retinoid to a site of surgical activity on an organ surface for a period of time sufficient to permit tissue repair.

5,534,262

PHARMACEUTICAL GRANULATED COMPOSITION AND METHOD FOR PREPARING SAME

Anatoly E. Dobrotvorsky, ulitsa Nizhegorodskaya, 5, kv. 133; Yaroslav A. Rozputnyak, ulitsa akademika Yangelya, 8, kv. 102, both of Moscow; Galina N. Khuchua, p/o Mosrentgen, 2, kv. 34, Moskovskaya oblast, Vidnoe-4, and Irina A. Komissarova, ulitsa Medkov, 24, kv. 47, Moscow, all of, Russian Federation

PCT No. PCT/RU92/00004, § 371 Date Sep. 10, 1993, § 102(e) Date Sep. 10, 1993, PCT Pub. No. WO93/13756, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 10, 1992, Ser. No. 119,049

Int. Cl.^{6} A61K *9/16;9/20;31/195*

U.S. Cl. 424—464 **12 Claims**

1. A pharmaceutical granulated composition comprising a water soluble pharmaceutical substance selected from the group consisting of glycine, mannitol and histidine, a binder selected from the group consisting of cellulose esters, starch and polyvinylpyrrolidone, a lubricant and water, said pharmaceutical substance, binder, lubricant and water being present in the composition in the following ratio by weight %:

Pharmaceutical substance	96.0–98.0
Binder	0.5–2.0
Lubricant	0.5–1.0
Water	1.0–3.0

and composition having a plasticity sufficient to allow it to be formed into a tablet having a hardness of at least 13N at a tableting pressure of 98 MPa.

5,534,263

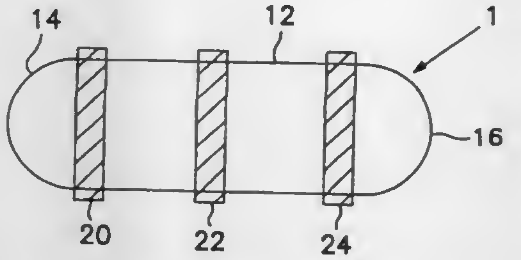
ACTIVE AGENT DOSAGE FORM COMPRISING A MATRIX AND AT LEAST TWO INSOLUBLE BANDS

Patrick S.-L. Wong, Palo Alto; David E. Edgren, El Granada; Liang C. Dong, Sunnyvale, and Vincent J. Ferrari, Foster City, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 24, 1995, Ser. No. 394,074

Int. Cl.^{6} A61K *9/24*

U.S. Cl. 424—473 **19 Claims**



1. An active agent dosage form for the prolonged delivery of an active agent formulation to a fluid environment of use, the dosage form comprising an active agent formulation matrix with at least two insoluble bands positioned in spaced relationship on the surface of the active agent formulation matrix with the surface of the matrix on both sides of each band exposed to the fluid environment of use.

5,534,264

Patent Not Issued For This Number

5,534,265

THICKENED NONABRASIVE PERSONAL CLEANSING COMPOSITIONS

Timothy J. Fowler, Cincinnati; Richard L. McManus, West Chester, and George E. Deckner, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1994, Ser. No. 296,566

Int. Cl.^{6} A61K *9/10;9/14*

U.S. Cl. 424—489 **6 Claims**

1. A nonabrasive personal cleansing aqueous gel composition comprising;

(a) from about 0.1% to about 20% of insoluble particles selected from the group consisting of polybutylene, polyethene, polyisobutylene, polymethylstyrene, polypropylene, polystyrene, polyurethane, nylon, teflon, and mixtures thereof having a mean particle size diameter from about 20 microns to about 50 microns, with greater than about 95% of said particles in said composition having a diameter less than about 75 microns,

(b) from about 0.25% to about 2.5% of a water soluble or dispersible gelling agent selected from the group consisting of carboxylic acid polymers, crosslinked polyacrylate polymers, polyacrylamide polymers, polysaccharides, gums, crosslinked vinyl ethylene/maleic anhydride copolymers, cellulosic thickeners, crosslinked poly(N-vinylpyrrolidones), and mixtures thereof,

(c) from about 20% to about 99.85% water,

(d) from about 0.05% to about 40% of a surfactant selected from the group consisting of sodium cetearyl sulfate, sodium lauryl sulfate, sodium lauryl sarcosinate, sodium cocoyl isethionate, coamidopropyl betaine, sodium laureth sulfate, cetyl dimethyl betaine, ammonium lauryl sulfate, sodium tallow soap, sodium coconut soap, ceteth-10, steareth-21, steareth-2, ceteth-2, glyceryl stearate, glucose amides, dilauryl dimethyl ammoniun chloride, distearyl dimethyl ammonium chloride, dimyristyl dimethyl ammonium chloride, dipalmityl dimethyl ammonium chloride, and mixtures thereof, and

(e) from about 0.1% to about 50% of an emollient selected from the group consisting of mineral oil, petrolatum, cholesterol, dimethicone, dimethiconol, diisopropyl adipate, isopropyl myristate, myristyl myristate, cetyl ricinoleate, sorbitan distearate, sorbitan dilaurate, sorbitan stearate, sorbitan laurate, sucrose laurate, sucrose dilaurate, sodium isostearyl lactylate, lauryl pidolate, sorbitan stearate, stearyl alcohol, cetyl alcohol, behenyl alcohol, PPG-14 butyl ether, PPG-15 stearyl ether, and mixtures thereof.

5,534,266
BOVINE TEAT DIP

David J. Ricketts, Irvine, Calif., assignor to Devtech Corporation, Irvine, Calif.

Filed Jun. 20, 1994, Ser. No. 262,774

Int. Cl.^{6} A61K *33/36;31/19;31/045*

U.S. Cl. 424—672 22 Claims

1. A teat dip solution consisting of:

a water soluble solution of a non-ionic, laureth (11–16) carboxylic acid having an HLB of about 10–16 about 7.5%–12.5%; an effective amount of an iodophor; glycerin: about 5%–12.5%; a buffer; an agent for adjusting the pH to about 4.0–5.5; and, water: balance all parts by weight; the solution having a phase stable shelf life of up to about two years at ambient temperatures.

5,534,267
COMPOSITION FOR THE OXIDATIVE DYEING OF HAIR CONTAINING 4,5-DIAMINOPYRAZOLE DERIVATIVES AS WELL AS NEW 4,5-DIAMINOPYRAZOLE DERIVATIVES AND PROCESS FOR THEIR SYNTHESIS

Hans Neunhoeffer, Mühltal; Stefan Gerstung, Reinheim; Thomas Clausen, and Wolfgang R. Balzer, both of Alsbach, all of, Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

PCT No. PCT/EP93/02641, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO/9408970, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 29, 1993, Ser. No. 244,729

Claims priority, application Germany, Oct. 16, 1992, 42 34 887.0

Int. Cl.^{6} A61K *7/13;* **C07D** *231/38*

U.S. Cl. 424—701 11 Claims

1. Composition for oxidative dyeing of hair based on a combination of developer substances and coupler substances, containing as a developer substance a 4,5-diaminopyrazole selected from the group consisting of 4,5-diamino-1-(4'-methoxybenzyl)pyrazole, 4,5-diamino-1-(4'-methylbenzyl)pyrazole. 4,5-diamino -1-(4'-chlorobenzyl)pyrazole, 4,5-diamino-1-(3'-methoxybenzyl)pyrazole, 4-amino-1-(4'-methoxybenzyl)-5-methylaminopyrazole and 4-amino-5-(2'-hydroxyethyl)amino-1-(4'-methoxybenzyl)pyrazole.

5,534,268
LIPOSOMES CONTAINING BIOAVAILABLE IRON (II) AND PROCESS FOR OBTAINING THEM

Tomás De Paoli, Ramos Mejía, and Alfredo A. Hager, Villa Adelina, both of, Argentina, assignors to Juan Carlos Ferroni, Lujan, and Lipotech S.A., Buenos Aires, both of, Argentina

Filed Jun. 24, 1994, Ser. No. 264,974

Claims priority, application Argentina, Nov. 9, 1993, 326.541

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 10 Claims

1. Liposomes useful as a source of bioavailable iron which comprises an iron (II) source selected from a group consisting of ferrous sulfate, ferrous lactate and ferrous citrate in an aqueous solution; said iron being microcapsulated and stabilized with ascorbic acid and soluble salts thereof as an inhibitor of iron (II); said liposomes being formed by lecithin phosphoglycerides.

5,534,269
METHOD OF PRODUCING SUSTAINED-RELEASE PREPARATION

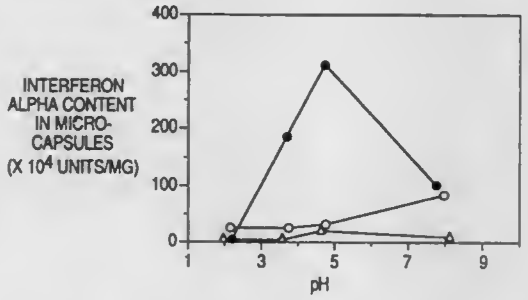
Yasutaka Igari, Kobe; Kazumichi Yamamoto, Nara; Kayoko Okamoto, Osaka, and Yutaka Yamagata, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 5, 1994, Ser. No. 270,838

Claims priority, application Japan, Jul. 5, 1993, 5-165793; Apr. 20, 1994, 6-081765

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—489 19 Claims



1. A method of producing a sustained-release preparation which comprises permitting a water-soluble polypeptide in an aqueous solution to permeate into a biodegradable matrix.

5,534,270
METHOD OF PREPARING STABLE DRUG NANOPARTICLES

Lan De Castro, West Chester, Pa., assignor to NanoSystems LLC, Collegeville, Pa.

Filed Feb. 9, 1995, Ser. No. 386,028

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—490 14 Claims

1. A method of preparing sterilized nanoparticulate crystalline drug particles comprising the steps of:

1) providing a drug substance having a solubility in water of less than 10 mg/ml

2) depyrogenating rigid grinding media having an average particle size less than 3 mm at from 200° C. to 300° C. for from 6 to 20 hours

3) mixing the drug substance and rigid grinding media and autoclaving it from 100° C. to 150° C. for 10 to 50 minutes and

4) adding a surface modifier to the autoclaved drug substance and rigid grinding media to a dispersion medium and wet grinding the drug substance sufficiently to maintain an effective average particle size of less than 400 nm.

5,534,271
PROCESS FOR IMPROVING THE UTILIZATION OF FEEDSTUFFS BY RUMINANTS

Douglas R. Ware, Bothell, Wash., and Bryan E. Garner, Amarillo, Tex., assignors to Nutrition Physiology, Amarillo, Tex.

Filed Nov. 16, 1994, Ser. No. 340,660

Int. Cl.^{6} A23K *1/18;* **A61K** *35/74*

U.S. Cl. 426—2 29 Claims

1. A process for improving the utilization of feedstuffs by ruminants through adjusting the microbial content of the rumen of the ruminants, the process comprising the steps of:

mixing a lactic acid producing bacteria culture and a lactate utilizing bacteria culture;

admixing said bacteria cultures with an animal feedlot diet selected from the group consisting of corn, dried grain, alfalfa, corn meal, said admixing forming a composition; and,

administering said composition orally to the ruminants, said lactic acid producing bacteria culture producing lactic acid in the rumen of the ruminant in order to promote the growth of said lactate utilizing bacteria culture in order to prepare the rumen for a feed diet which generates high levels of lactic acid in the rumen, said lactate utilizing bacteria culture consuming lactic acid produced in the rumen thereby decreasing levels of lactic acid in the rumen.

5,534,272
APPETITE SUPPRESSANT CHEWING GUM CONTAINING CHROMIC PICOLINATE

Richard Bernstein, Toluca, Calif., assignor to Bernstein Brothers Marketing Corp., Burbank, Calif.

Filed Jan. 3, 1995, Ser. No. 368,213

Int. Cl.^{6} A23G *3/30*

U.S. Cl. 426—3 3 Claims

1. An appetite suppressant, comprising: a chewing gum base; and an appetite suppressant quantity of chromic picolinate.

5,534,273
METHOD FOR MANUFACTURING PACKED WET-TYPE INSTANT NOODLES

Youichi Ito, Sapporo; Akihiro Hanaoka, Chiba, and Kenichi Tezuka, Sapporo, all of, Japan, assignors to Toyo Suisan Kaisha, Ltd., Tokyo, Japan

Filed May 31, 1995, Ser. No. 454,695

Claims priority, application Japan, Jul. 15, 1994, 6-163875

Int. Cl.^{6} A23L *1/16;1/162;* **A21D** *2/00*

U.S. Cl. 426—18 25 Claims

1. A method for manufacturing packed wet instant noodles, which comprises the steps of;

forming a first noodle strip from a dough obtained by kneading in a vacuum a first raw material containing an alkaline agent and raw powders consisting mainly of wheat flour and starch;

forming a second noodle strip from a dough obtained by kneading a second raw,material in a vacuum higher in degree than that employed in kneading said first raw material, said second raw material containing alginic acid or alginate, an alkaline agent and raw powders consisting mainly of wheat flour and 7.0% by weight or more of protein;

forming a two-ply noodle strip by superposing said first noodle strip upon said second noodle strip, and by rolling the superposed strips;

cutting said two-ply noodle strip into a plurality of noodles thereby obtaining two-ply raw noodles;

steaming the two-ply raw noodles;

drying the two-ply raw noodles with a hot air;

boiling and then cooling with water the dried two-ply raw noodles;

treating the cooled two-ply raw noodles with an acid solution;

packing the two-ply raw noodles in a bag; and

heat treating the packed two-ply raw noodles thereby thermally sterilizing the two-ply raw noodles.

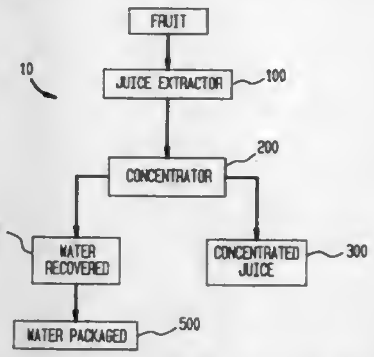
5,534,274
METHOD FOR RECOVERING WATER FROM FRUIT

Donald DeStefano, 100 Ballentine Rd., Andover, N.J. 07821

Continuation of Ser. No. 30,591, Mar. 11, 1993, abandoned. This application Jun. 1, 1994, Ser. No. 252,055

Int. Cl.^{6} A23L *2/08;* **C02F** *1/02*

U.S. Cl. 426—66 5 Claims



1. A method for recovering drinking water from fruit comprising the steps of:

extracting juice from fruit;

removing water from said extracted juice to form concentrated juice;

collecting said water removed from said extracted juice, said collected water having less than

0.05 ppm	Arsenic
1.0 ppm	Barium
0.01 ppm	Cadmium
250.0 ppm	Chloride
0.06 ppm	Chromium-6
1.0 ppm	Copper
0.2 ppm	Cyanide
0.3 ppm	Iron
0.05 ppm	Lead
0.05 ppm	Manganese
45.0 ppm	Nitrate
0.001 ppm	Phenols
0.01 ppm	Selenium
0.06 ppm	Silver
250.0 ppm	Sulfate
500.0 ppm	Solids
5.0 ppm	Zinc
1.4 ppm	Fluoride

a turbidity of less than 5.0 units, less than 15 units of color, and an odor which does not exceed odor No. 3A; and

bottling said collected water at a water packaging station for distribution to consumers,

wherein said bottled water is drinking water fit for human consumption.

5,534,275
FOODSTUFFS CONTAINING A CEREAL INGREDIENT AND FERRIC EDTA

Robert D. Humbert; Leila Saldanha, both of Battle Creek, and John Kepplinger, Portage, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Continuation of Ser. No. 203,143, Feb. 28, 1994, abandoned. This application Apr. 27, 1995, Ser. No. 430,110

Int. Cl.^{6} A23L *1/304*

U.S. Cl. 426—74 15 Claims

1. A cooked, cereal ingredient containing, storage stable, iron fortified product, comprising:

(i) at least one cereal ingredient,

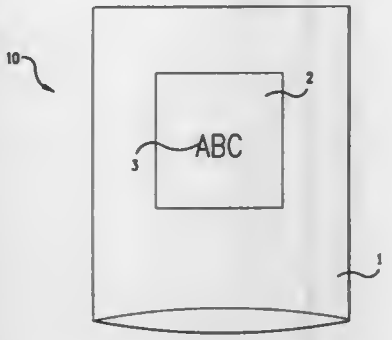
(ii) a ferric EDTA compound, and

(iii) no more than 12% moisture,

wherein said product has bright appearance, good bioavailability of iron and little metallic offtaste.

5,534,276
BONE-IN MEAT CONTAINERS

Gary D. Ennis, Wichita Falls, Tex., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Continuation of Ser. No. 102,171, Aug. 4, 1993, Pat. No. 5,447,591. This application Mar. 24, 1995, Ser. No. 410,619
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 426—127 **7 Claims**



1. A bone-in meat container comprising:
a) a bone-in fresh red meat;
b) an oriented, heat shrinkable, thermoplastic bag containing the bone-in fresh red meat, the bag having an outer surface and an inner surface;
c) an oriented, heat shrinkable sheet of bone guard patch film adhered to the outer surface of the oriented, heat shrinkable, thermoplastic bag, the bone guard patch film having an outer surface and an inner surface;
d) printing indicia disposed on the inner surface of the bone guard patch film in a reverse print format; and
e) an adhesive composition disposed between the inner surface of the bone guard patch film, and the outer surface of the oriented, heat shrinkable, thermoplastic bag, such that the reverse printing is disposed between the inner surface of the bone guard patch film and the adhesive composition.

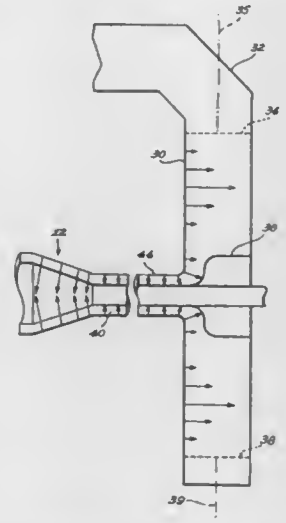
5,534,277
FILM FOR COOK-IN APPLICATIONS WITH PLURAL LAYERS OF NYLON BLENDS

Ram K. Ramesh, Greenville; Gerald B. Woods, Simpsonville, and Robert W. Campbell, Duncan, all of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Dec. 9, 1994, Ser. No. 352,466
Int. Cl.^{6} A22C *13/00*
U.S. Cl. 426—129 **25 Claims**

1. A multilayer film comprising:
a) a first layer consisting essentially of a blend of a first crystalline nylon and a material which disrupts the crystallinity of the crystalline nylon, said material selected from the group consisting of
  i) a second crystalline nylon different from the first crystalline nylon, and
  ii) olefinic material;
b) a second layer consisting essentially of a blend of a first crystalline nylon and a material which disrupts the crystallinity of the crystalline nylon, said material selected from the group consisting of
  i) a second crystalline nylon different from the first crystalline nylon, and
  ii) olefinic material; and
c) a third layer, between the first and second layers, comprising a material having a modulus lower than the modulus of the crystalline nylon, and having a crystallinity of less than 60%.

5,534,278
PROCESS AND APPARATUS FOR MAKING MEAT ANALOGS

Peter W. De Ruyter, 6865 Chemin Norwalk, Suite 806, Cote St. Luc, Quebec, Canada; Noel Almey, 1576 Avenue Ducharme, Montreal, Quebec, Canada; Josef Slanik, 40 Caribou Crescent, Kirkland, Quebec, Canada, and Wesley W. Teich, 111 Pettey La., Westport, Mass. 02790-1408
Filed Jan. 6, 1994, Ser. No. 178,203
Int. Cl.^{6} H05B *3/00;6/00;* **A23J** *3/00*
U.S. Cl. 426—237 **19 Claims**



1. A method of producing a food product having fibers formed therein, the method comprising the steps of
a) forming a doughmass,
b) passing said doughmass through a conduit having a decreasing cross-sectional area in the direction of doughmass flow,
c) subjecting said doughmass to a thermal treatment while in said conduit such that a greater heat intensity is applied to the interior portion of the doughmass compared to the doughmass adjacent the conduit walls,
d) thereafter passing said doughmass through an exit pipe having a substantially constant cross-sectional area.

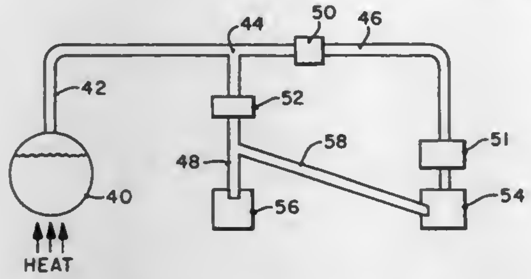
5,534,279
PROCESS FOR PRODUCING A LOW SODIUM MEAT PRODUCT

Josep Boatella I Riera; Magdalena Rafecas I Martinez; Rafael Codony I Salcedo, all of Barcelona; Genaro Minguell I Juncosa, and Josep Cases I Sellart, both of Bellpuig, all of, Spain, assignors to Geml Aliment, S.A., Bellpuig, Spain
Filed Feb. 2, 1994, Ser. No. 190,513
Claims priority, application Spain, Feb. 3, 1993, 93.00.194
Int. Cl.^{6} A23L *1/314;1/317*
U.S. Cl. 426—266 **10 Claims**

1. In a process for curing a meat product comprising
(a) removing bones, nerve and fat from a meat product;
(b) injecting a brine composition into said meat product;
(c) macerating said meat product for approximately 24 hours in a vacuum at a temperature of between 2°–5° C.;
(d) vacuum packaging said macerated meat product;
(e) heating the vacuum packaged meat product until an internal region of said meat product reaches a temperature of approximately 67° C.;
(f) unmoulding and re-packaging said meat product for sale; and
(g) cool-storing said meat product;
wherein the improvement comprises injecting, as the brine composition of step (b), a brine composition comprising calcium citrate, calcium lactate, potassium chloride, lactose, saccharose, potassium phosphate, ascorbic acid, and sodium nitrite into said meat product.

5,534,280
METHOD FOR DEHYDRATION OF SOLID FOODS

George Welch, P.O. Box 2539, Santa Clara, Calif. 95055
Continuation of Ser. No. 116,923, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 719,055, Jun. 21, 1991, abandoned, which is a continuation of Ser. No. 462,342, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 129,107, Dec. 4, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 487,924
Int. Cl.^{6} A23B *4/033;* **B01D** *5/00*
U.S. Cl. 426—321 **24 Claims**

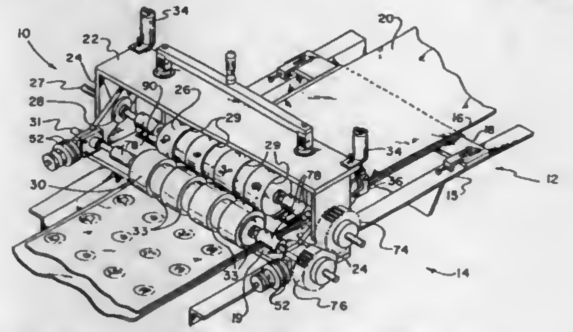


1. A process for treating a solid food product having water soluble and water insoluble volatiles with the water insoluble volatiles having volatiles soluble part in ethyl alcohol and part in ether, said process comprising:
cutting the product into pieces;
placing the product pieces in a volume of water containing an anti-oxidant;
drawing a vacuum on the product pieces in said volume of water to pull air out of the cells of the product pieces;
releasing the vacuum to cause water and said anti-oxidant to enter the cells of the product pieces;
heating the product pieces to dry the pieces and to generate steam and drive off the water soluble and water insoluble volatiles therefrom;
directing the steam and the volatiles through an adsorbent to remove the water soluble and water insoluble volatiles by adsorption;
passing steam through the adsorbent to remove the water soluble volatiles from the adsorbent and to produce water with water soluble volatiles mixed therewith when the steam is condensed;
passing ethyl alcohol through the adsorbent to remove the alcohol soluble, water insoluble volatiles from the adsorbent and to produce ethyl alcohol with ethyl alcohol soluble water insoluble volatiles mixed therein;
passing ether through the adsorbent to remove the ether soluble, water insoluble volatiles from the adsorbent and to produce ether with ether soluble water insoluble volatiles mixed therein;
distilling the ether from the ether and volatiles mixture to leave the volatiles;
condensing the steam and stripping said steam of its volatiles as natural adsorbent-filtered water;
treating the adsorbent-filtered water to generate hydrogen and oxygen gases by electrolysis; and
adding the water mixed with the water soluble volatiles to the dried product pieces to leave the product pieces with said volatiles returned to the product pieces.

12. A process for treating a solid food product having water soluble and water insoluble volatiles with the water insoluble volatiles having volatiles soluble part in ethyl alcohol and part in ether, said process comprising:
placing the product in a volume of water containing an anti-oxidant;
drawing a vacuum on the product in said volume of water to pull air out of the cells of the product;
releasing the vacuum to cause water and said anti-oxidant to enter the cells of the product;
heating the product to dry the product and to generate steam and drive off the water soluble and water insoluble volatiles therefrom;
directing the steam and the volatiles through an adsorbent to remove the water soluble and water insoluble volatiles by adsorption;
passing the steam through the adsorbent to remove the water soluble volatiles from the adsorbent and to produce distilled water with water soluble volatiles mixed therewith when the steam is condensed;
passing ethyl alcohol through the adsorbent to remove the alcohol soluble, water insoluble volatiles from the adsorbent to produce ethyl alcohol with ethyl alcohol water insoluble volatiles mixed-therein;
passing ether through the adsorbent to remove the ether soluble, water insoluble volatiles from the adsorbent to produce ether soluble water insoluble volatiles mixed therein;
distilling the ether from the ether and volatiles mixture to leave the volatiles; and
condensing the steam which is stripped of its volatiles as natural adsorbent-filtered distilled water.

5,534,281
METHOD OF MAKING PRINTED BAKED GOODS

Chris Pappas, Ridgewood; Daniel A. Koppa, Bloomfield; Roger E. Skeels, Essex Fells, and Agostino Aquino, Paterson, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.
Continuation of Ser. No. 972,505, Nov. 6, 1992, abandoned, which is a division of Ser. No. 682,834, Apr. 9, 1991, Pat. No. 5,162,119. This application Nov. 23, 1994, Ser. No. 347,168
Int. Cl.^{6} A21D *6/00*
U.S. Cl. 426—383 **20 Claims**



17. A method of making printed foods comprising:
forming individual dough pieces;
transferring the individual pieces on a conveyor in a predetermined arrangement comprising a plurality of aligned longitudinal rows and a plurality of aligned lateral rows to at least one rotary printer;
maintaining the individual pieces in the predetermined arrangement during transfer to said printer;
registering the longitudinal rows of individual pieces with said printer; and
printing on the individual pieces in the predetermined arrangement with said printer, said printing comprising transferring ink to an inking roller which is engraved with rows of indicia for holding ink within the grooves forming the indicia wherein the rows of engraved indicia are spaced from each other by a circumferential groove, removing excess ink from the surface of the inking roller to form printed indicia within said grooves, directing at least a portion of the excess ink into each circumferential groove of the inking roller so as to avoid contact of the excess ink with said dough pieces, the depth of each circumferential groove being sufficiently shallow such that said at least a portion of said excess ink remains in each circumferential groove due to the surface tension of the ink preventing ink from spinning off during rotation of the inking roller during printing, transferring laterally aligned rows of printed indicia from the inking roller to a continuously rotating printing roller having a resilient surface which conforms to said individual pieces, the rows of printed indicia on said printing roller being spaced from each other by a circumferential groove with each groove of the printing roller being

wider than each groove of the inking roller so that the edges of the printing roller defined by each circumferential groove do not contact the ink contained in each groove of the inking roller, and transferring the laterally aligned rows of printed indicia from the resilient surface to the predetermined arrangement of individual pieces by simultaneously contacting the individual pieces in each lateral row with the resilient surface of the continuously rotating printing roller without deforming the pieces.

5,534,282
PACKING PERISHABLE GOODS

Anthony J. M. Garwood, Hawthorn, Australia, assignor to Seawell North America Inc., Wilmington, Del.

Continuation of Ser. No. 137,261, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 835,976, Feb. 27, 1992, abandoned. This application Jun. 27, 1994, Ser. No. 265,932

Claims priority, application Australia, Aug. 30, 1989, PJ6039

Int. Cl.^{6} B65B *7/16;31/02*

U.S. Cl. 426—396.000 **23 Claims**

1. An improved method for packaging perishable goods comprising the following steps:

(a) providing a base with perishable goods over said base;
(b) aligning a flexible web of material over said base and said perishable goods;
(c) aligning a lid over said flexible web, and in alignment with said base and said perishable goods;
(d) applying a member to said flexible web to stretchingly deform said flexible web towards said perishable goods over said base;
(e) closing a gas flushing chamber means over said base and said lid;
(f) gas flushing said gas flushing chamber with a suitable gas for enhancing the keeping properties of the perishable goods;
(g) relatively moving said lid, the stretchingly deformed flexible web, and the base together within said gas flushing chamber;
(h) causing the stretchingly deformed flexible web to engage with said perishable goods and said base; and
(i) sealing said lid, said flexible web and said base together whereby said perishable goods will be held to said base and there will be said suitable gas within said packaging.

5,534,283
METHOD FOR POURING QUANTITIES OF CHOCOLATE INTO MOLDS

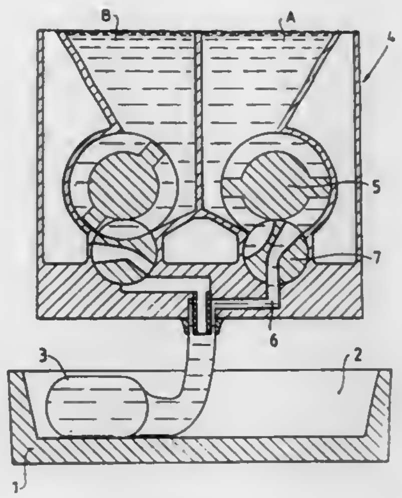
Renzo Cerboni, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed May 5, 1994, Ser. No. 238,688

Claims priority, application Italy, May 6, 1993, MI93A-0911

Int. Cl.^{6} A23G *1/00*

U.S. Cl. 426—515 **5 Claims**



1. A method of pouring a liquid mass of chocolate into a mold extending along a longitudinal axis, comprising the sequential steps of:

a) depositing a first quantity of the mass along a first, longitudinal distance at one end region of the mold;
b) depositing a second quantity of the mass along a second longitudinal distance at an intermediate region of the mold; and
c) depositing a third quantity of the mass along a third longitudinal distance at an opposite end region of the mold;
d) said steps a) and c) being performed by depositing said first and third quantities in individual amounts greater than said second quantity;
e) said step b) being performed by depositing said second quantity over said second distance which is longer than either one of said first and third distances.

5,534,284
NONDIGESTIBLE FAT COMPOSITIONS CONTAINING SOLID POLYOL POLYESTER POLYMER FOR PASSIVE OIL LOSS CONTROL

Patrick J. Corrigan, and John K. Howie, both of The Procter & Gamble Company, 6071 Center Hili Ave., Cincinnati, Ohio 45224-1703

Continuation-in-part of Ser. No. 968,791, Oct. 30, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 301,947

The portion of the term of this patent subsequent to Oct. 30, 2012, has been disclaimed.

Int. Cl.^{6} A23L *1/00*

U.S. Cl. 426—531 **17 Claims**

1. A nondigestible fat composition useful as a replacement for triglyceride fats or oils in foods, which composition has a Solid Fat Content profile slope between 70° F. and 98.6° F. of from 0 to about –0.75%solids/° F., and which composition comprises:

A. a liquid nondigestible oil having a complete melting point below about 37° C.; and
B. nondigestible solid particles of polyol polyester material dispersed in said oil in an amount sufficient to control passive oil loss upon ingestion of said composition, said nondigestible solid particles having a complete melting point above about 37° C., wherein said polyol polyester material comprises from about 10% to about 50% of a polyol polyester polymer component and from about 50% to about 90% of a polyol polyester monomer component, wherein at least 45% of the hydroxyl groups of the polyol polyester material are esterified with C_{20} and higher long chain saturated fatty acid radicals and wherein the polyol polyester polymer component has an Iodine Value of less than about 20; and wherein the liquid nondigestible oil and the nondigestible solid particles are cocrystallized in a manner such that the nondigestible solid forms dispersed platelet-like particles having a thickness of 1 micron or less in the liquid nondigestible oil.

5,534,285
LOW CALORIE CHEMICALLY LEAVENED CAKES AND SURFACTANT SYSTEMS THEREFOR

Carole S. Setser, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 821,319, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 534,966, Jun. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 370,918, Jun. 23, 1989, abandoned. This application Oct. 22, 1993, Ser. No. 141,419

Int. Cl.^{6} A21D *10/04*

U.S. Cl. 426—552 **16 Claims**

1. A reduced calorie, chemically leavened cake batter, consisting essentially of:

respective amounts of flour, egg and chemical leavening agent;

an amount, up to about 96% (flour weight basis) of bulking agent selected from the group consisting of sorbitol, lactitol, polydextrose, maltodextrose, maltitol, cellulosic or hemicellulosic agents, and mixtures thereof;

an amount, up to about 50% (flour weight basis) of a sweetening agent, including individual quantities of a first sweetening agent selected from the group consisting of sucrose and fructose, and a second sweetening agent selected from the group consisting of aspartame, acesulfame K, cyclamates, chlorinated sugars, L-sugars, dipeptides, thaumatin and mixtures thereof; and

a quantity of preformed expanded liquid or gel mesophase emulsifier product consisting essentially of water and sucrose ester emulsifier, said sucrose ester emulsifier containing a mixture of monoester and di-, tri- and polyesters with the amount of monoester being greater than the total amount of di-, tri- and polyesters therein, said emulsifier product being present in the batter at a level to give the batter an emulsifier content of from about 0.5 to 4% (flour weight basis), said batter, upon collection and baking thereof to form a cake product, giving a cake product having a caloric value of up to about 200 Calories per 100 g. of cake product,

said batter being aerated and having a water content of from about 100 to 200% (flour weight basis).

5,534,286
NO-FAT GELLAN GUM SPREAD

William F. Chalupa, Aurora, Ill., and George R. Sanderson, Carlsbad, Calif., assignors to Monsanto Company, St Louis, Mo.

Filed Jun. 1, 1994, Ser. No. 252,307

Int. Cl.^{6} A23L *1/0522*

U.S. Cl. 426—573 **9 Claims**

1. A spread composition comprising 81–95.9% water, 2–11% non-gelling starch, 1–3% gelling salt, 1–3% nonfat milk solids, and 0.1–1.0% gellan gum.

5,534,287
METHODS FOR APPLYING AN ELASTIC COATING LAYER ON STENTS

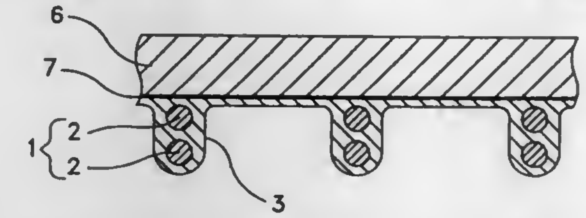
Goran Lukic, Bülach, Switzerland, assignor to Schneider (Europe) A.G., Bulach, Switzerland

Division of Ser. No. 173,542, Dec. 22, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 346,066

Claims priority, application European Pat. Off., Apr. 23, 1993, 93106646

Int. Cl.^{6} B05D *1/28;3/02;* **B29C** *65/00;* **B32B** *31/00*

U.S. Cl. 427—2.25 **5 Claims**



1. A method for applying a covering layer to a stent comprising:

(a) radially contracting the stent;
(b) coating the inner surface of a tube with a lifting medium;
(c) inserting at least a portion of the contracted stent into the tube;
(d) radially expanding at least the portion of the stent in the tube or allowing at least the portion of the stent to radially expand in the tube;
(e) preparing an elastomeric composition dissolved in a solvent;
(f) coating the tube and stent with the elastomeric polymerisable composition dissolved in the solvent;
(g) evaporating the solvent;
(h) polymerizing the elastomeric composition and forming at least a portion of a layer on the stent in the tube; and
(i) removing the stent from the tube.

5,534,288
INFECTION-RESISTANT SURGICAL DEVICES AND METHODS OF MAKING THEM

Elliott A. Gruskin, East Norwalk; Daniel R. Lee, Madison, and Lloyd S. Brown, Guilford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 134,146, Jul. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 36,076, Mar. 23, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 389,460

Int. Cl.^{6} B05D *1/36;7/24;* **A61J** *3/00*

U.S. Cl. 427—2.31 **10 Claims**

1. A method of preparing a black colored surgical device comprising:

(a) providing a substrate comprising one or more filaments;
(b) impregnating the substrate with a composition comprising glycerine and from about 0.001 to about 15 percent by weight of a silver salt; and
(c) imparting a black color to the device by contacting the impregnated substrate with ethylene oxide.

5,534,289
STRUCTURAL CRACK MONITORING TECHNIQUE

Wayne H. Bilder, Northampton; Richard D. Granata, Bethlehem, both of Pa., and Henry Leidheiser, Jr., Venice, Fla., assignors to Competitive Technologies Inc., Bethlehem, Pa.

Filed Jan. 3, 1995, Ser. No. 367,039

Int. Cl.^{6} B05D *3/00*

U.S. Cl. 427—8 **6 Claims**

1. A method for monitoring a structure for the formation of cracks and for providing protection of the structure from the environment, comprising the steps of:

(a) applying to the structure a first coating comprising microcapsules of a first color;
(b) applying over the first coating, a second coating having a second color; and
(c) identifying cracked portions which form in the structure by

observing changes in the color of the second coating resulting from eruption of microcapsules in the first coating.

5,534,290

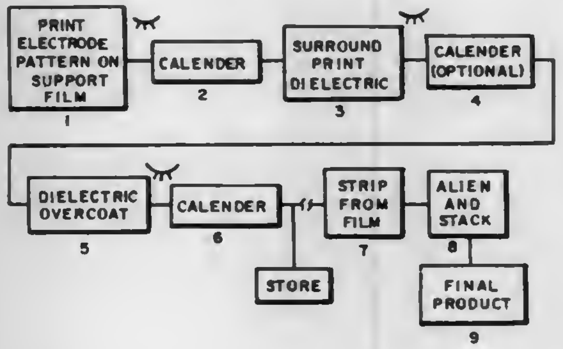
SURROUND PRINT PROCESS FOR THE MANUFACTURE OF ELECTRODE EMBEDDED DIELECTRIC GREEN SHEETS

Jewel G. Rainwater, North Richland; Paul Benson, Graham, both of Tex.; William R. Belko, Rancho La Costa, Calif.; Robert J. Deffeyes, Dayton, Ohio, and Arne B. Carlson, deceased, late of Graham, Tex., assignors to Visatech Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 860,063, Mar. 30, 1992, Pat. No. 5,292,548, which is a continuation-in-part of Ser. No. 504,330, Apr. 3, 1990, Pat. No. 5,101,319. This application Mar. 7, 1994, Ser. No. 206,756

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—97 **10 Claims**



1. A method of making an electrode embedded green sheet which comprises:

printing electrodes on a support sheet;

surrounding said electrodes with a first surround print dielectric layer without overcoating said electrodes to form surround printed electrodes;

drying the first surround print dielectric layer;

calendering said surround printed electrodes and said first surround print dielectric layer to densify the electrodes and the dielectric and to flatten the upper surfaces of said electrodes and said dielectric; and

coating a second dielectric layer over said surround printed electrodes to form an electrode embedded green sheet.

5,534,291

PROCESS FOR PRODUCING A MELAMINE-COATED AMMONIUM POLYPHOSPHATE

Chikashi Fukumura, Kitakyushushi; Masuo Iwata, Yokohamashi; Noriaki Narita, Yokohamashi; Kouji Inoue, Yokohamashi, and Ryoji Takahashi, Tokyoto, all of, Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 207,051, Mar. 8, 1994. This application Mar. 20, 1995, Ser. No. 406,596

Claims priority, application Japan, Mar. 9, 1993, 5-075256

Int. Cl.[6] B05D *7/00*

U.S. Cl. 427—221 **7 Claims**

1. A process for producing a powdery ammonium polyphosphate having a surface which is uniformly coated with melamine which comprises sublimating melamine and adding and/or adhering it onto the particle surface of a powdery ammonium polyphosphate.

5,534,292

METHOD FOR PRODUCING AND CURING HYDRAULIC MATERIAL

Koji Mitsuo, Miyazaka 1 Chome 28 Ban 7 Go Mezon Wada 402, Setagaya-Ku, Japan

Continuation-in-part of Ser. No. 761,746, Sep. 17, 1991, abandoned. This application Oct. 14, 1992, Ser. No. 960,648

Claims priority, application Japan, Oct. 15, 1991, 3-331089

Int. Cl.[6] B05D *3/14;* **C04B** *7/00*

U.S. Cl. 427—228 **6 Claims**

1. A method for surface moisture control curing of hydraulic material by performing the steps:

providing a form or mold for said hydraulic material;

placing said hydraulic material in said form or mold during initial stages of cure to set or fix a shape to said hydraulic material;

coating said hydraulic material with a fat or oily fluid impermeable material;

adhering said fat or oily fluid impermeable material to skid hydraulic material by heating said fat or oily fluid impermeable material to carbonize and harden said fat or oily fluid impermeable material onto said hydraulic material;

curing said hydraulic material with said carbonized and hardened fat or oily coating on said hydraulic material.

5,534,293

METHOD FOR PRODUCING HAFNIUM CARBIDE SURFACES ON CARBON BASED MATERIALS

Bradley D. Wisneskie, Irvine, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Continuation of Ser. No. 130,407, Oct. 1, 1993, abandoned, which is a continuation of Ser. No. 887,487, May 21, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,725

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—228 **35 Claims**

1. A method for treating the surface of a carbon based material, comprising the steps of:

coating the surface with a slurry comprising the element hafnium and a carrier fluid;

drying said coating;

heating said surface in either a vacuum or an inert atmosphere to a temperature above 2650 degrees Fahrenheit for a sufficient time period to cause formation of a layer containing only hafnium carbide substantially disposed within the surface of the carbon based material, and to remove substantially all other slurry materials from said surface; and

cooling said surface to room temperature.

5,534,294

PROCESS FOR PRODUCING SEMICONDUCTOR SILICON WAFER

Atsuko Kubota, Yokohama; Masakatu Kojima, Yokosuka; Norihiko Tsuchiya, Setagaya-Ku; Shuichi Samata, Yokohama; Masanori Numano, Yokohama, and Yoshihiro Ueno, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 22, 1994, Ser. No. 279,007

Claims priority, application Japan, Jul. 22, 1993, 5-181602; Jun. 10, 1994, 6-128959

Int. Cl.[6] C23C *16/24*

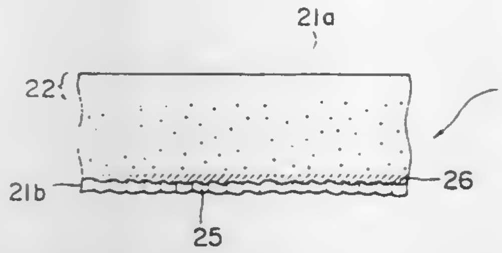
U.S. Cl. 427—255 **4 Claims**

1. A process for producing a semiconductor silicon wafer, comprising the steps of:

forming an oxide film with a thickness of 1 nm to 3 nm on one side of a silicon wafer;

depositing a polycrystal silicon on the oxide film thus formed; and

subjecting said silicon wafer to a heat treatment in an inert gas, a reducing gas or a mixture thereof in a manner where the other side of said silicon wafer is exposed to said gases, so that oxygen is discharged from the other side whereby a denuded zone is formed on the other side.



5,534,295

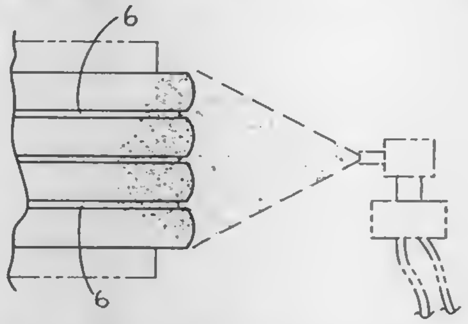
POLYUREA/POLYURETHANE EDGE COATING AND PROCESS FOR MAKING

Mark E. Schlichter, Chippewa Falls, and Mark S. Barton, Black River Falls, both of Wis., assignors to August Lotz Co., Inc., Boyd, Wis.

Filed Mar. 21, 1994, Ser. No. 210,999

Int. Cl.[6] B05D *1/02;3/10;7/08*

U.S. Cl. 427—284 **7 Claims**



1. A method for making edge protected articles by coating edges of wooden substrates, said method comprising the following steps:

a) smoothing the edges to be coated by sanding;

b) aligning the edges to be coated by stacking the wooden substrates with a spacer placed between each pair of adjacent substrates adjacent the edges to be coated;

c) spraying the edges with an elastomer to form a durable protective coating resistant to chipping and peeling, said elastomer selected from the group consisting of polyureas, polyurethanes, and mixtures thereof, said step of spraying utilizing a spray gun to form at a nozzle a solventless mixture comprising a first polyisocyanate component and a second component selected from the group consisting of an amine and a polyol;

d) trimming the coating to remove any excess coating or overspray.

5,534,296

PROCESS FOR THE PRE-TREATMENT OF LIGHT METALS AND ARTICLES PRODUCED

Franz Rieger, Riedstrasse 1, 7924 Steinheim am Albuch, Germany

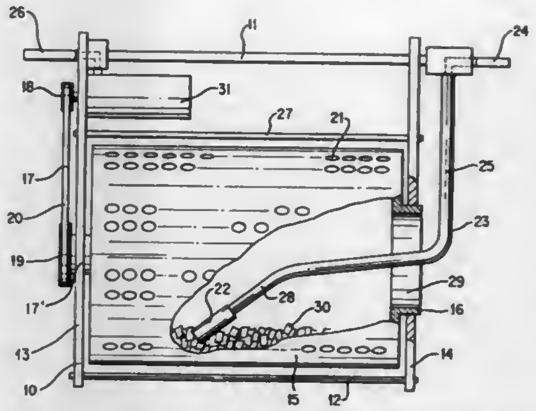
Division of Ser. No. 25,026, Mar. 2, 1993, Pat. No. 5,380,451. This application May 23, 1994, Ser. No. 247,917

Claims priority, application Germany, Sep. 17, 1992, 42 31 052.0; Nov. 12, 1992, 42 38 242.4

Int. Cl.[6] C23C *18/52*

U.S. Cl. 427—304 **54 Claims**

1. Process for pre-treatment of light metals that form oxide layers comprising treating articles of such light metal in an aqueous bath containing phosphoric acid, and subsequently electrolessly depositing metal on said light metal articles.



5,534,297

METHOD FOR SURFACE MODIFICATION OF POLYOLEFIN RESIN MOLDED ARTICLE AND METHOD FOR COATING THE SURFACE OF POLYOLEFIN RESIN MOLDED ARTICLE

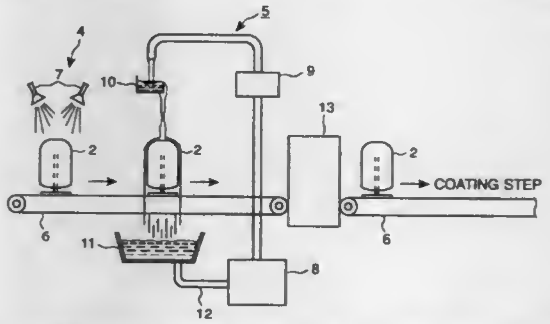
Yasuhiko Ogisu; Mamoru Kato, both of Nagoya, and Shigeyuki Takabashi, Kuwana, all of, Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Filed Feb. 15, 1995, Ser. No. 388,696

Claims priority, application Japan, Feb. 16, 1994, 6-019574; Jun. 27, 1994, 6-145058

Int. Cl.[6] B05D *3/00;3/12*

U.S. Cl. 427—322 **11 Claims**



1. A method for treating the surface of a polyolefin resin molded article which comprises applying a stream of running aqueous solution of ozone onto a polyolefin resin molded article to oxidize the surface of the polyolefin resin molded article for modifying the surface.

5,534,298

STIFF FABRIC AND METHOD OF FORMING THE STIFF FABRIC

David M. Cross, Westport, Conn.; Manfred H. K. Hueneke, Graham; Ronald A. Farris, Gibsonville; Bobby L. McConnell, Greensboro, and Robert M. Newman, Thomasville, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

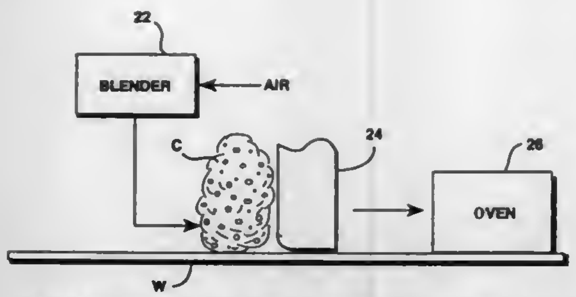
Division of Ser. No. 182,986, Jan. 19, 1994. This application Apr. 13, 1995, Ser. No. 421,313

Int. Cl.[6] B05D *3/12*

U.S. Cl. 427—358 **15 Claims**

1. A method of forming a stiff fabric comprising the steps of:

coating a woven fabric with a latex composition in an amount of about 34.1–61.5 gms./m^2 and curing the latex composition coated on the fabric in an oven at a temperature within a range of 121°–193° C. to produce a fabric having a stiffness such



that a flat piece of said fabric 8.89 cm. wide cantilevered in a horizontal direction 12.7 cm. from a support has a droop at its distal end within a range of 7.6–10.2 cm.

5,534,299

PROCESS FOR INSULATING PIPES

Norbert Eisen, Köln, and Lutz-Peter Godthardt, Leverkusen, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 30, 1995, Ser. No. 453,838

Claims priority, application Germany, Jun. 22, 1994, 44 21 817.6

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—373 **10 Claims**

1. A process for insulating pipes comprising applying at least one layer of a polyisocyanurate plastic to a steel pipe, applying at least one layer of rigid polyurethane foam to said polyisocyanurate layer and covering said foam with an outer layer.

5,534,300

TWO-LAYER HIGH TEMPERATURE COATING ON A CERAMIC SUBSTRATE, AND PROCESS FOR OBTAINING SAME

Stanislav S. Solntsev; Vladimir M. Tjurin; Natalia V. Izaeva; Alexei Y. Bersenev, and Galina A. Solovjeva, all of Moscow, U.S.S.R., assignors to Aerospatiale Societe Nationale Industrielle, Paris, France, and VIAM-All Russian Institut of Aviation Materials, Moscow, U.S.S.R.

Filed Mar. 16, 1995, Ser. No. 404,921

Claims priority, application France, Mar. 16, 1994, 94 03049

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—376.2 **9 Claims**

1. A process for providing a ceramic substrate with a coating which includes a barrier layer containing quartz glass and silicon tetraboride with over 96 weight percent SiB_4 and an emissivity glaze layer containing high silica glass and silicon tetraboride with over 96 weight percent SiB_4, wherein said barrier layer comprises about 0.1 to 10 weight percent of said silicon tetraboride and about 90 to 99.9 weight percent of said quartz glass, and said emissivity glaze layer comprises about 1.5 to 5.0 weight percent of said silicon tetraboride and about 95 to 98.5 weight percent high silica glass, said process comprising the steps of:

(i) preparing a first slurry of a powder comprising about 0.1 to 10 weight % of silicon tetraboride with over 96 weight % of SiB^4, and about 90 to 99.9 weight % of quartz glass, in a compatible dispersion medium, with a powder to liquid weight ratio of about 1:1 to 1:5;

(ii) applying the first slurry, by spraying under pressure, onto a ceramic substrate which has undergone a preparatory treatment;

(iii) drying the resulting layer and firing it at a temperature of between about 1100° and 1150° C. for about 10 to 20 minutes, to obtain a barrier layer;

(iv) preparing a second slurry of a powder comprising about 1.5 to 5.0 weight % of silicon tetraboride SiB_4 and from about 95 to 98.5 weight % of high silica glass in a compatible dispersion medium, with a powder to liquid weight ratio of about 1:1 to 1:5;

(v) applying the second slurry, by spraying under pressure, onto the barrier layer; and

(vi) drying the layer resulting from step (v) and firing it at a temperature of about 1250° to 1300° C. for about 10 to 20 minutes, to obtain an emissivity glaze layer.

5,534,301

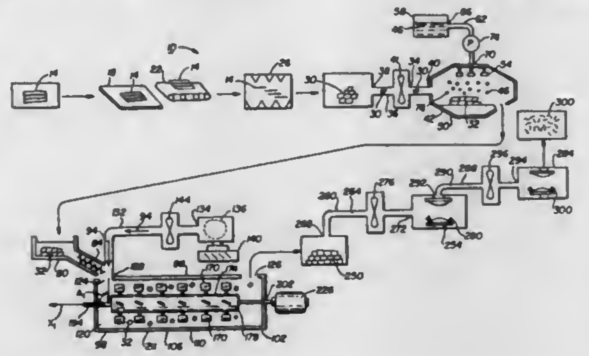
METHOD FOR PRODUCING CELLULOSE INSULATION MATERIALS USING LIQUID FIRE RETARDANT COMPOSITIONS

Thomas C. Shutt, Las Vegas, Nev., assignor to Echochem International, Inc., Wheat Ridge, Colo.

Filed May 10, 1995, Ser. No. 438,378

Int. Cl.^{6} B05D *3/02;3/04*

U.S. Cl. 427—377 **29 Claims**



1. A method for producing a fire-resistant cellulose insulation product comprising the steps of:

providing a supply of individual pieces of paper and a paper drying chamber;

applying at least one liquid fire retardant composition to said pieces of paper, said liquid fire retardant composition soaking into said pieces of paper to produce a fire retardant-soaked paper product;

passing a stream of heated air through said drying chamber;

passing said fire retardant-soaked paper product through said drying chamber in combination with said stream of heated air, said stream of heated air moving said paper product through said drying chamber;

interrupting said passing of said fire retardant-soaked paper product through said drying chamber at least once during movement of said paper product and said heated air through said drying chamber in order to cause a delay in said passing of said paper product through said chamber, said delay allowing said heated air to completely dry said paper product to produce a dried, fire-resistant cellulose insulation product within said drying chamber; and

collecting said fire-resistant cellulose insulation product from said drying chamber.

5,534,302

METHOD OF PREPARING A FIBER REINFORCED MODIFIED PHENOLIC RESIN COMPOSITE

Chen-Chi M. Ma; Hew-Der Wu, and Ming-Shiu Li, all of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Jan. 5, 1995, Ser. No. 368,886

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—379 **13 Claims**

1. A method of preparing a fiber reinforced modified phenolic resin composite, which comprises the following steps:

a) preparing a resole phenolic resin having 60–75 wt % solid content and 5–10 wt % free aldehyde;

b) preparing a blocked polyurethane resin having an average molecular weight of 2000–8000 and a viscosity of 500–1000 cps at 80° C.;

c) mixing the resole phenolic resin, the blocked polyurethane resin and an acid catalyst to form an impregnating resin, wherein the amount of the acid catalyst mixed is 2–10 wt %, based on the weight of the resole type phenolic resin, and the amount of the blocked polyurethane mixed is 5–20 wt %, based on the total weight of the mixed resins; and

d) impregnating a plurality of filaments with the impregnating resin, and curing the impregnated filaments with a heat treatment to form a fiber reinforced modified phenolic resin composite.

5,534,303

COATING SOLUTION FOR TREATING BASEMENT WALLS

Michael G. Roberts, Akron, Ohio, and Charles E. Bolen, 2346 Short Hills Dr., Akron, Ohio 44333, assignors to Ozko, Inc., and Charles E. Bolen, both of Akron, Ohio

Continuation of Ser. No. 221,039, Mar. 31, 1995, abandoned, which is a division of Ser. No. 632,130, Dec. 20, 1990, Pat. No. 5,362,531. This application May 26, 1995, Ser. No. 453,566

Int. Cl.^{6} B05D *1/02;5/10*

U.S. Cl. 427—385.5 **4 Claims**

1. A method of coating an exterior surface of a concrete foundation, comprising the steps of preparing a coating composition comprising a mixture of a hydrocarbon resin and a copolymer selected from the group consisting of a polystyrene-polyisoprene block copolymer, a polystyrene-polyisoprene-polystyrene block copolymer, a polystyrene-polybutadiene block copolymer, a polystyrene-polybutadiene-polystyrene block copolymer, and mixtures thereof, adding toluene and an aliphatic petroleum distillate as solvents to said mixture in an amount sufficient to provide a homogenous solution having a viscosity of about 3000 to 5000 cps at 70° F., spraying the solution on an exterior surface of a concrete foundation, and thereafter evaporating the solvents to provide a continuous impervious elastomeric coating on said surface.

5,534,304

PROCESS FOR TREATING A SUBSTRATE WITH A SUPERABSORBENT MATERIAL

Herman J. Geursen, Rozendaal, and Stephanus Willemsen, Rheden, both of, Netherlands, assignors to Akzo Nobel NV, Arnhem, Netherlands

PCT No. PCT/EP93/00600, § 371 Date Oct. 21, 1994, § 102(e) Date Oct. 21, 1994, PCT Pub. No. WO93/18223, PCT Pub. Date Sep. 16, 1993

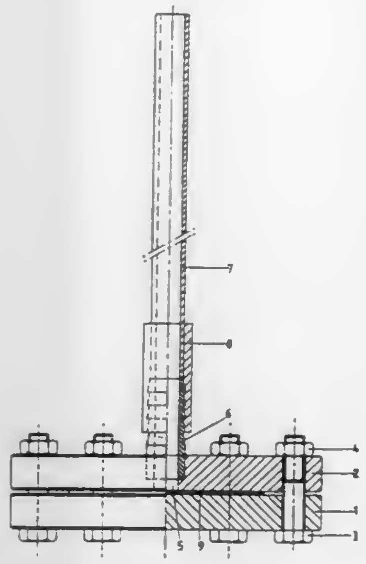
PCT Filed Mar. 12, 1993, Ser. No. 295,883

Claims priority, application Netherlands, Mar. 13, 1992, 9200472

Int. Cl.^{6} B05D *3/02;7/02*

U.S. Cl. 427—389.9 **14 Claims**

1. A process for providing a non-aramid yarn with water-



blocking properties comprising applying to the surface of the non-aramid yarn a layer of a water-in-oil emulsion which comprises a superabsorbent material in its aqueous phase, said superabsorbent material comprising 0.3 to 40 wt. % of said yarn based on the dry weight of said yarn, and subsequently wholly or partially removing the liquid constituents of the emulsion from the yarn.

5,534,305

WOOD PROCESSING COMPOSITION, PROCESSED WOOD AND A METHOD OF PROCESSING WOOD

Satoshi Fujiki, Fukuoka, and Hideo Kamata, Akita, both of, Japan, assignors to Az Company, Fukuoka, Japan

Continuation of Ser. No. 952,868, Nov. 17, 1992, abandoned. This application Aug. 31, 1994, Ser. No. 299,038

Claims priority, application Japan, Apr. 4, 1991, 3-071685; Sep. 20, 1991, 3-241969

Int. Cl.^{6} C08L *61/20;77/06*

U.S. Cl. 427—393 **1 Claim**

1. A wood processing composition consisting essentially of 1–50% by weight of an aqueous solution of 20% by weight of polyethylene glycol; 2–40% by weight of an alkyd resin; 5–40% by weight of urea and 5–80% by weight of an aqueous solution of 37% formalin.

5,534,306

PROCESS FOR THE PREPARATION OF A MULTICOAT FINISH, NON-AQUEOUS COATINGS AND AUTOCROSSLINKABLE POLYACRYLATE RESINS

Ulrike Röckrath, Marl; Peter Betz, Münster; Ulrich Poth, Münster, and Georg Wiger, Münster, all of, Germany, assignors to BASF Lacke+Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP93/00088, § 371 Date Jul. 15, 1994, § 102(e) Date Jul. 15, 1994, PCT Pub. No. WO93/14882, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 15, 1993, Ser. No. 256,553

Claims priority, application Germany, Jan. 23, 1992, 42 01 724.6

Int. Cl.^{6} B05D *1/36;7/00;* **C08F** *24/00;122/04*

U.S. Cl. 427—407.1 **9 Claims**

1. Autocrosslinkable polyacrylate resin prepared by free radical co-polymerization of a mixture of

(a) an ester selected from the group consisting of esters of acrylic acid, methacrylic acid and mixtures thereof,
(b) an epoxide selected from the group consisting of olefinically unsaturated epoxide compounds and mixtures thereof,
(c) an anhydride selected from the group consisting of olefinically unsaturated acid anhydrides and mixtures thereof,
(d) an unsaturated compound selected from the group consisting of olefinically unsaturated compounds containing at least one alkylsiloxane group per molecule, where said alkylsiloxane is selected from the group consisting of tri-, di- and monoalkoxysilanes, and
(e) a further olefinically unsaturated compound different from (a), (b), (c) and (d), or a mixture of such unsaturated compounds,

characterized in that the polyacrylate resin is prepared by free radical co-polymerization, at temperatures of between 60° C. and 160° C., of a mixture of

component (a) 0.5 to 65% by weight,
component (b) 14 to 70% by weight,
component (c) 10 to 50% by weight,
component (d) 10 to 50% by weight, and
component (e) 0 to 50% by weight,

the sum of the weight percentages for components (a) to (e) being 100% by weight, to give an autocrosslinkable polyacrylate resin which contains on statistical average at least one epoxide group per molecule, at least one acid anhydride group per molecule, and at least 0.2 tri-, di- or monoalkoxysilane groups per molecule, and has a number average molecular weight of between 1000 and 50,000.

5,534,307

RESIN IMPREGNATING METHOD FOR FIBROUS SUBSTRATE

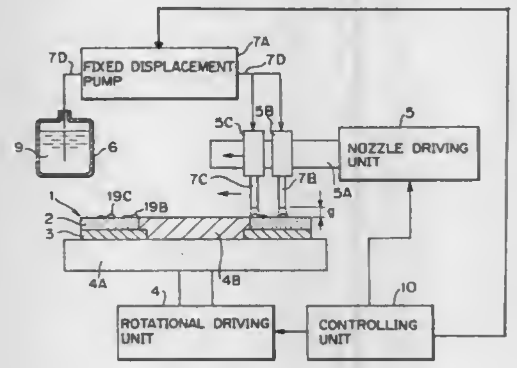
Hiroshi Hikita; Tetsuo Kohriyama; Yutaka Nozawa, and Yoshito Sugino, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1994, Ser. No. 321,891

Claims priority, application Japan, Oct. 15, 1993, 5-257363

Int. Cl.^{6} B05D *7/00*

U.S. Cl. 427—421 **7 Claims**



1. A resin impregnating method comprising the steps of:

moving a work in a predetermined direction, said work including a metallic base plate and a fiber based substrate joined to said metallic base plate, said fiber based substrate including friction increasing material therein;

moving at least one nozzle in a direction transverse to the direction of movement of said work, said nozzle being spaced from said work with a predetermined gap and serving to eject resin therefrom so as to allow said fiber based substrate to be impregnated with the ejected resin; and

drying said resin impregnated in said fiber based substrate by utilizing the air flow generated as said work is moved.

5,534,308

CERAMIC, HEAT INSULATION LAYER ON METAL STRUCTURAL PART AND PROCESS FOR ITS MANUFACTURE

Joachim Bamberg, Dachau; Ludwig Steinhauser, Maisach; Erwin Bayer, and Peter Adam, both of Dachau, all of, Germany, assignors to MTU Motoren-Und Turbinen-Union München GmbH, München, Germany

Division of Ser. No. 191,273, Feb. 3, 1994. This application May 11, 1995, Ser. No. 439,277

Claims priority, application Germany, Feb. 4, 1993, 43 03 135.8

Int. Cl.^{6} B05D *1/08;3/02*

U.S. Cl. 427—454 **10 Claims**

1. A process for producing a heat insulation, ceramic layer on a metal structural part, comprising:

depositing a material containing zirconium oxide onto a metal structural part to form a heat insulation layer on said metal part, said heat insulation layer having an open, inner structure, and

impregnating said heat insulation layer with a liquid containing a passivating agent of ceramic nanocrystalline particles to form a passivating coating of said ceramic particle on surfaces of said open, inner structure of said heat insulation layer, and

wherein said ceramic particles of said passivating coating infiltrate and are confined in said inner structure of said heat insulation layer.

5,534,309

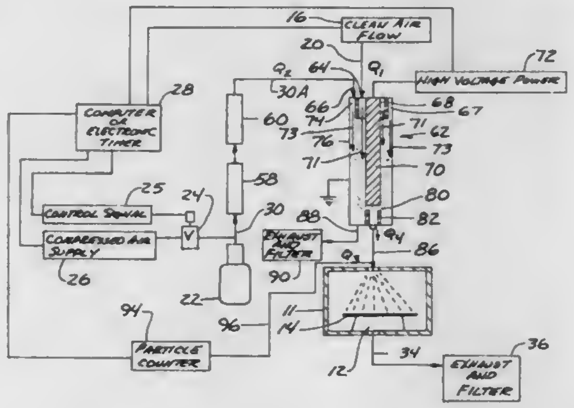
METHOD AND APPARATUS FOR DEPOSITING PARTICLES ON SURFACES

Benjamin Y. H. Liu, North Oaks, Minn., assignor to MSP Corporation, Minneapolis, Minn.

Filed Jun. 21, 1994, Ser. No. 263,128

Int. Cl.^{6} B05D *1/12*

U.S. Cl. 427—458 **10 Claims**



1. A method of depositing particles from a source onto a wafer supported in place at a known location in a deposition chamber comprising the steps of:

providing and maintaining a clean gas flow into the deposition chamber directed onto the wafer supported in place at the known location to purge unwanted particles from the deposition chamber;

providing a gas flow containing particles from the source into the deposition chamber onto the wafer supported in place at the known location for a time to deposit a desired number of particles from the source onto the wafer and then discontinuing the gas flow containing particles from the source; and

maintaining the wafer at the known location and providing for a selected time a clean gas flow into the chamber after discontinuing gas flow containing particles from the source prior to moving the wafer from the known location in the deposition chamber.

5,534,310

METHOD OF IMPROVING ADHESIVE OF DURABLE COATINGS ON WEATHERED SUBSTRATES

Joseph M. Rokowski, Riegelsville, and William C. Finch, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 292,130, Aug. 17, 1994. This application Jun. 6, 1995, Ser. No. 471,945

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—494 **8 Claims**

1. A method for improving adhesion and gloss of a coating on a weathered substrate, wherein the improvement comprises:

applying on said substrate a film of a latex binder comprising an aqueous evaporable carrier maintained at a pH of 8.5 to 9.5 and having dispersed therein a latex polymer bearing an acid functional pendant moiety and enamine functional pendant moiety wherein said enamine functional pendant moiety results from the reaction of an acetoacetyl functional pendant moiety on said latex polymer with ammonia or amine, said polymer having a peak molecular weight in the range of 10,000 to 200,000, and an acid number in the range of 1 to 70;

evaporating said aqueous evaporable carrier from said film; and

exposing said film to actinic light and air to cure said film into said coating on said weathered substrate having improved adhesion.

5,534,311

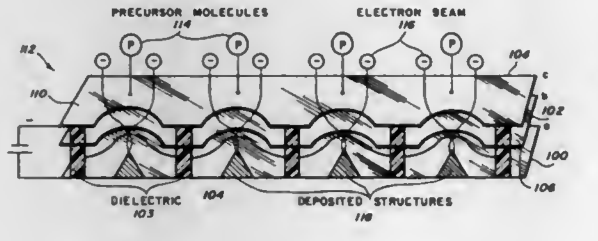
PRODUCTION OF STRUCTURES BY ELECTROSTATICALLY-FOCUSED DEPOSITION

Jonathan L. Shaw, Springfield, and Henry F. Gray, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1995, Ser. No. 454,982

Int. Cl.^{6} B05D *3/06*

U.S. Cl. 427—526 **25 Claims**



1. A method of depositing a material upon a substrate so as to form a deposit having a controlled three-dimensional geometry, comprising the steps of:

providing a conductive substrate having a surface upon which said material is to be deposited;

positioning a first conductive member, having a first aperture therein, opposite, spaced apart from, electrically isolated from, and essentially parallel to said substrate surface;

electrically biasing at least a portion of said first conductive member with respect to said substrate surface by applying a voltage therebetween, so as to form a first electrostatic focusing field in the vicinity of said first aperture and said substrate surface;

exposing said substrate surface to a flux of a gaseous precursor, whereupon said precursor attaches to said substrate surface;

directing a charged particle beam, comprising charged particles, through said first aperture and onto said substrate surface, whereupon said attached precursor is transformed into a deposit of said material upon said substrate surface;

focusing said charged particle beam passing through said first aperture, so that said charged particles intersect at a focal point, by regulating said voltage between said portion of said first conductive member and said substrate surface, thus regulating said first electrostatic focusing field in the vicinity of said first aperture and said substrate, so as to control the geometry of said deposit of said material upon said substrate surface.

5,534,312

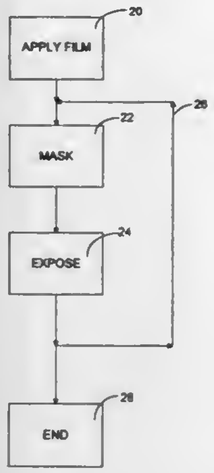
METHOD FOR DIRECTLY DEPOSITING METAL CONTAINING PATTERNED FILMS

Ross H. Hill, Coquitlam, Canada; Bentley J. Palmer, Athens, Ga.; Alfred A. Avey, Jr., Burnaby, Canada; Sharon L. Blair, Vancouver, Canada; Chu-Hui W. Chu, Burnaby, Canada; Meihua Gao, Burnaby, Canada, and Wai L. Law, Port Moody, Canada, assignors to Simon Fraser University, Burnaby, Canada

Filed Nov. 14, 1994, Ser. No. 339,127

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 427—533 **32 Claims**



1. A method for making a pattern of a metal containing material on a substrate, said method comprising the steps of:

(a) depositing an amorphous film of a metal complex on a surface of a substrate;
(b) placing said film in a first atmosphere; and
(c) exposing a first area of said film to electromagnetic radiation to cause said metal complex in said first area to undergo a photo-chemical reaction, said reaction transforming said metal complex in said first area into a first metal containing material adherent to said substrate.

5,534,313

INDUCTION HEATING OF DIFFUSION COATINGS

Steven C. Kung, and Richard A. Gleixner, both of North Canton, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 1, 1995, Ser. No. 406,346

Int. Cl.^{6} B05D *5/06*

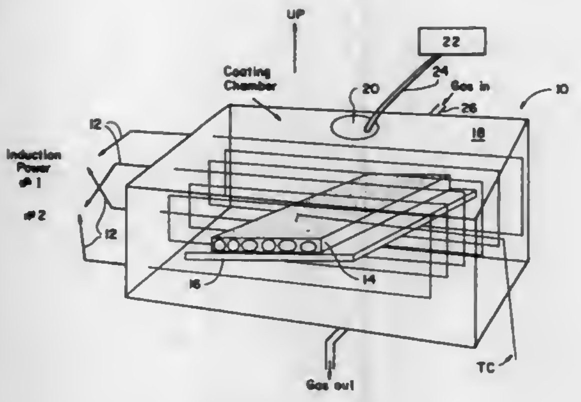
U.S. Cl. 427—543 **13 Claims**

1. A method of applying a diffusion coating of a member selected from the group consisting of chromium, silicon, and aluminum to a substrate comprising the steps of:

preparing a coating on a substrate;

placing the coated substrate within a heating chamber having induction coils therein to have the coated substrate surrounded by the induction coils; and

induction heating the coated substrate to provide a diffusion coating of a member selected from the group consisting of chromium, silicon, and aluminum on the substrate.



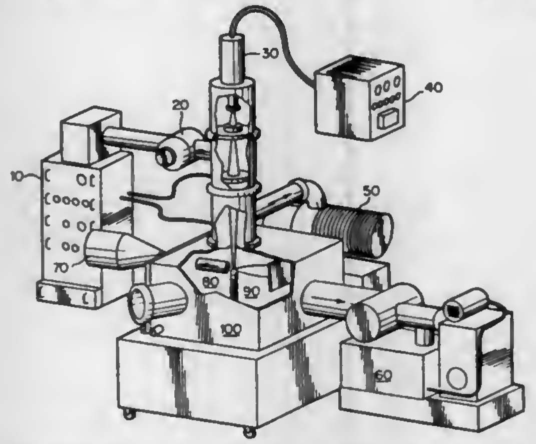
5,534,314
DIRECTED VAPOR DEPOSITION OF ELECTRON BEAM EVAPORANT

Haydn N. G. Wadley, Keswick, and James F. Groves, Charlottesville, both of Va., assignors to University of Virginia Patent Foundation, Charlottesville, Va.

Filed Aug. 31, 1994, Ser. No. 298,614

Int. Cl.^{6} C23C *8/00*

U.S. Cl. 427—585 **45 Claims**



1. A process for vapor depositing an evaporant onto a substrate comprising:
- presenting the substrate to a deposition chamber, wherein said deposition chamber has an operating pressure of from 0.001 Torr to atmospheric pressure and has coupled thereto a means for providing a carrier gas stream and a means for providing an electron beam at said operating pressure and further contains an evaporant source;
- impinging said evaporant source with said electron beam to generate said evaporant;
- entraining said evaporant in said carrier gas stream; and
- coating said substrate with said carrier gas stream which contains said entrained evaporant.

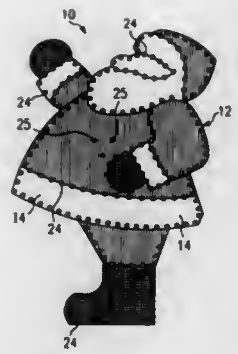
5,534,315
DECORATIVE ART FORM

Donald H. Witte, 500 Lakeside Dr., Altus, Okla. 73521

Filed Mar. 17, 1995, Ser. No. 405,734

Int. Cl.^{6} B44F *3/00*

U.S. Cl. 428—7 **26 Claims**



1. A decorative art form structured to be a substantially rigid and free-standing display, said decorative art form comprising:
- a first sheet of material lying generally in a first plane and having a first side and a second side, said first sheet having a predetermined plurality of first apertures formed therethrough in a predetermined pattern to outline the profile of the decorative art form;
- a second sheet of material lying generally in a second plane and having a first side and a second side, said second plane generally parallel to said first plane, said second sheet positioned with said first side of said second sheet facing said second side of said first sheet, said second sheet having a predetermined plurality of second apertures formed therethrough in a predetermined pattern, said predetermined pattern of second apertures outline the same profile as that outlined by said predetermined pattern of first apertures formed through said first sheet; and
- a predetermined plurality of retainers having a first end and a second end with each predetermined one of said predetermined plurality of retainers having a first end inserted into a predetermined one of said predetermined plurality of first apertures and a second end inserted into a corresponding aperture of said predetermined plurality of second apertures to maintain said first and said second sheet in a rigid and parallel relationship to form a free-standing decorative art form.

5,534,316
MOLDING AND METHOD OF PRODUCING THE SAME

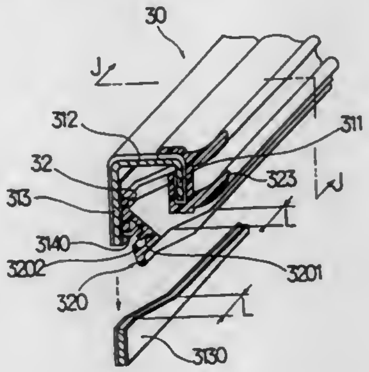
Yukihiko Yada, and Kazuyoshi Higuchi, both of Oobu, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan

Division of Ser. No. 781,374, Oct. 23, 1991, Pat. No. 5,281,291. This application Oct. 1, 1993, Ser. No. 130,392

Claims priority, application Japan, Oct. 24, 1990, 2-286708; Nov. 8, 1990, 2-304884

Int. Cl.^{6} B60R *13/00*

U.S. Cl. 428—31 **39 Claims**



1. A molding with the cross-section thereof varying in the longitudinal direction, said molding comprising:
- a support strip; and
- a protector provided along the length of said support strip;
- said support strip including a mounting portion, an outer piece with the height thereof varying along the length of said support strip, and a top portion for connecting said mounting portion and said outer piece at a top of said outer piece; and
- said protector being integrally provided with said outer piece of said support strip at a lower portion of the outer piece by extrusion molding.

5,534,317
PLASTIC CONTAINER MADE FROM A FUSION BLEND OF POST CONSUMER PLASTIC AND ETHYLENE POLYMERS

James N. Herman, and James E. Hiltner, both of Sylvania, Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 842,838, Feb. 27, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 369,990

Int. Cl.^{6} C08L *23/06*

U.S. Cl. 428—35.7 **3 Claims**

1. A plastic container made from a fusion blend of a post consumer resin and ethylene polymers consisting essentially of a fusion blend of
- post consumer plastic resin of homopolymer high density polyethylene plastic, a small amount of linear low density polyethylene resin,
- virgin high density polyethylene copolymer resin in said fusion blend,
- said virgin high density polyethylene copolymer resin having a density of at least about 0.94 gm/ml, a melt index of less than about 0.5 gm/10 min. and will have polymerized therein at least about 98 mole % ethylene with any comonomer polymerized therein being an alpha-monoolefin containing about 3–12 carbon atoms,
- said post consumer resin having a density of about 0.961 and a melt index of about 0.75,
- said linear low density polyethylene having a density in the range of about 0.91 to about 0.93 gm/ml, and a melt index of less than about 2.0 and having polymerized about 2–6 mole % of an alpha-monoolefin containing 3–12 carbon atoms with the balance of the monoolefin polymerized therein being ethylene,
- said post consumer resin ranging between about 25–95% by weight, said linear low density polyethylene resin ranging between about 2.5 to 25% by weight,
- said virgin high density polyethylene copolymer resin ranges between about 2.5–72.5% by weight,
- said container having environmental stress crack resistance which is maintained as contrasted to the loss of such environmental stress resistance that has heretofore resulted from the use of post consumer resins.

5,534,318
HOLLOW FIBER-REINFORCED PLASTIC BODY

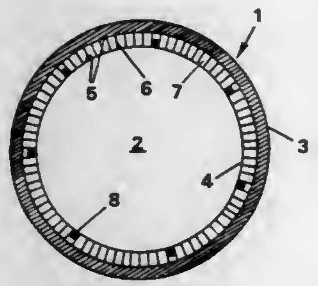
Gilles Andre De La Porte, Rozendaal, and Cornelis T. J. M. Swinkels, Helmond, both of, Netherlands, assignors to Parabeam Industrie-en Handelsonderneming B.V., Netherlands

Continuation of Ser. No. 853,180, Mar. 17, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,598

Claims priority, application Germany, Mar. 18, 1991, 9103282 U; Jun. 13, 1991, 9107320 U; Dec. 14, 1991, 9115518 U

Int. Cl.^{6} B29D *24/00*

U.S. Cl. 428—36.9 **17 Claims**



1. A hollow fiber-reinforced body tank consisting of:
- a double-walled structure consisting of a layer of a double-ply cloth tape having spaced apart top and bottom plies, defining a continuous cavity, together with binding pile threads extending therebetween in a hollow space;
- said tape forming said body as a winding having side edges in an edge-to-edge manner with laterally open adjacent edges;
- said tape being impregnated with a curable resin without filling said cavity; and
- an inner and outer finishing layer overlaying and adhered to inner and outer surfaces, respectively, of said double-walled structure that surrounds and seals the hollowing interior thereof.

5,534,319
PROTECTIVE SHELL FOR INSULATING PIPES AND FITTINGS

Joseph B. Tice, Avon; Antonio A. Diaz, Newington, and Dennis P. Manning, Kensington, all of Conn., assignors to Bayer Corporation, Pittsburgh, Pa.

Division of Ser. No. 194,556, Feb. 10, 1994, abandoned. This application May 19, 1995, Ser. No. 445,394

Int. Cl.^{6} F16L *57/00*

U.S. Cl. 428—36.91 **3 Claims**

1. A shell for protectively enveloping insulation of pipes and their fittings comprising a thermoformed laminate of
- (a) a layer having a thickness of about 0.0015 to 0.004 inch consisting essentially of polyvinyl fluoride,
- (b) a polycarbonate layer having a thickness of about 0.005 to 0.060 inch and
- (c) a heat activated, stretchable adhesive layer having a thickness of about 0.0002 to 0.0004 inch interposed between said (a) and said (b).

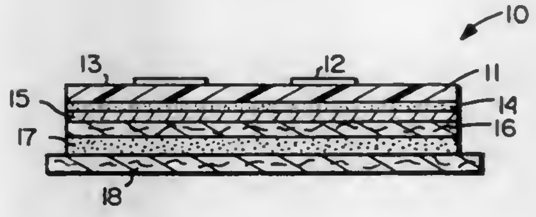
5,534,320
ID CARDS FOR IMPACT AND NON-IMPACT PRINTERS

James M. Raby, Niagara, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Division of Ser. No. 38,632, Mar. 29, 1993, Pat. No. 5,413,532. This application Jun. 16, 1994, Ser. No. 260,788

Int. Cl.^{6} B41L *1/20*

U.S. Cl. 428—42.1 **17 Claims**



1. An ID card assembly, comprising:
- a carrier sheet having first length and width dimensions and a top face;
- permanent adhesive disposed on said carrier sheet top face;
- stock having top and bottom faces, said stock bottom face connected to said permanent adhesive;
- repositional adhesive operatively connected to said stock top face:
- an ID card having top and bottom faces;
- indicia provided on said ID card top face, and said ID card bottom face engaging said repositional adhesive; and
- said permanent adhesive, stock, repositional adhesive, and ID card having second length and width dimensions, both significantly less than said first dimensions, and said repositional adhesive having greater affinity for said stock, and said permanent adhesive having greater affinity for said carrier sheet, than said repositional adhesive has for said card bottom face.

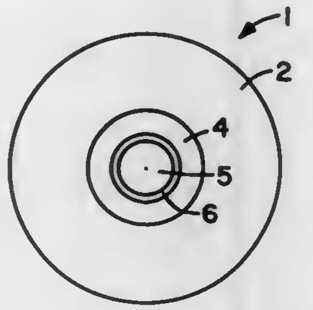
5,534,321
DISK SUBSTRATE FOR MAGNETIC MEMORY DEVICES

James W. Alpha, Corning, and Nicholas F. Borrelli, Elmira, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 63,768, May 20, 1993, abandoned. This application Jan. 3, 1994, Ser. No. 176,432

Int. Cl.^{6} G11B *5/66;* **B32B** *3/02;3/10*

U.S. Cl. 428—64.2 **9 Claims**



1. A glass substrate for a rigid information disk in a magnetic storage device, said substrate having a circular orifice in the center thereof, having a first circular region surrounding said orifice and a second circular region surrounding said first circular region, each region having an upper surface, said first circular region having crystals dispersed in a glassy matrix and having a selectively etched, upper surface that exhibits a R_{PV} value greater than 10 nm, said second circular region being essentially crystal-free and having an upper surface that exhibits a R_{PV} value less than 10 nm, whereby, when said substrate is used in a magnetic storage device comprising a head pad and a rigid information disk, the first circular region is the landing zone for the head pad and the second circular region comprises the: data containing region.

5,534,322
RECORDING MEDIUM

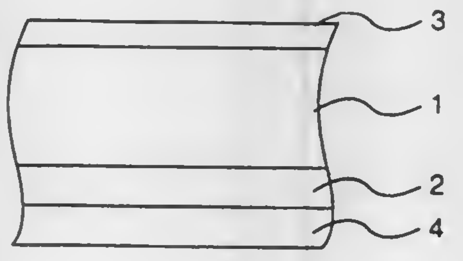
Kenichi Ueyama, and Hiroshi Kawamukai, both of Tochigi-ken, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 25, 1994, Ser. No. 231,749

Claims priority, application Japan, Jun. 29, 1993, 5-158388; Mar. 25, 1994, 6-055725

Int. Cl.^{6} B32B *3/02;9/04;27/30;* **G11B** *5/66*

U.S. Cl. 428—64.2 **19 Claims**



1. A recording medium comprising a film provided on a surface of said recording medium, wherein said film comprises a copolymer formed by polymerizing a composition which comprises:

(a) a compound A having at least one (meth)acryloyl group; and

(b) a reactive antistatic agent B in the form of a quaternary ammonium salt having attached to the nitrogen thereof one or two alkylene glycol chains, two or one hydrocarbon groups each containing four or more carbons, and a copolymerizable double-bond-containing group.

5,534,323
BIAXIALLY ORIENTED FILM OF POLYETHYLENE-2,6-NAPHTALENEDICARBOXYLATE FOR MAGNETIC RECORDING FLOPPY DISKS

Takao Chunjou; Ieyasu Kobayashi; Hisashi Hamano, all of Sagamihara, and Masami Etchu, Yokohama, all of, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP93/00422, § 371 Date Dec. 2, 1993, § 102(e) Date Dec. 2, 1993, PCT Pub. No. WO93/20553, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 2, 1993, Ser. No. 157,055

Claims priority, application Japan, Apr. 2, 1992, 4-080856

Int. Cl.^{6} B32B *27/06;27/36;* **G11B** *5/66;5/70*

U.S. Cl. 428—65.3 **20 Claims**

1. A biaxially oriented base film for a high-density magnetic recording floppy disk,

(a) the biaxially oriented base film consisting essentially of polyethylene-2,6-naphthalenedicarboxylate,

(b) the biaxially oriented base film having surface protrusions formed by inert particles dispersed in the film whose height, (h) in nanometers and number of surface protrusions satisfy the following expressions (1), (2) and (3),

$$1 \leqq h < 50 \text{ and } 2{,}000\text{–}20{,}000 \text{ protrusions/mm}^2 \tag{1}$$

$$50 \leqq h < 100 \text{ and } 0\text{–}2{,}000 \text{ protrusions/mm}^2 \tag{2}$$

$$100 \leqq h \text{ and } 0\text{–}300 \text{ protrusions/mm}^2 \tag{3}$$

(c) the biaxially oriented base film having a plane orientation coefficient (NS) and an average refractive index ($\bar{n}$) which satisfy the following expressions (4) and (5),

$$NS \leqq 1.607\bar{n} - 2.434 \tag{4}$$

$$1.665 \leqq \bar{n} 1.675 \tag{5}$$

(d) the biaxially oriented base film having a viscoelastic coefficient (tan δ), measured in one in-plane direction at a frequency of 110 Hz at a temperature of 60° C., of 0.08 or less,

(e) the biaxially oriented base film having a heat shrinkage, measured in one in-plane direction after heat treatment under no load in an atmosphere at 60° C. at 80% RH for 72 hours, of 0.05% or less and a heat shrinkage, measured after heat treatment under no load at 105° C. for 0.5 hour, of 0.3% or less.

5,534,324
MAGNETIC RECORDING MEDIUM AND METHOD FOR PRODUCING THE SAME

Ryuji Sugita; Kiyokazu Tohma, both of Hirakata; Tatsuaki Ishida, Sakai, and Yasuaki Ban, Neyagawa, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

Filed Nov. 10, 1993, Ser. No. 151,704

Claims priority, application Japan, Nov. 12, 1992, 4-302026

Int. Cl.^{6} H01F *1/00;* **G11B** *5/66;5/70*

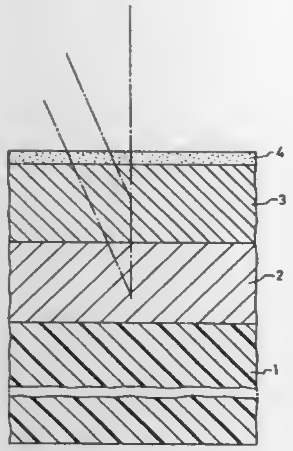
U.S. Cl. 428—694 T **8 Claims**

1. A magnetic recording medium comprising:

a substrate;

a cobalt and oxygen containing first magnetic layer formed on said substrate, said first magnetic layer having a surface remote from said substrate, wherein the axis of easy magnetization slants from a normal line of the plane of said substrate and wherein the oxygen concentration within said first magnetic layer is at a maximum proximate the surface of said first magnetic layer remote from said substrate; and

a cobalt and oxygen containing second magnetic layer formed on said first magnetic layer, wherein the axis of easy magnetization slants from a normal line of the plane of said substrate and wherein the oxygen concentration within said second magnetic layer is at a maximum proximate said first magnetic layer.



5,534,325
FLAME BARRIER COMPRISING A NONWOVEN FABRIC LAYER CONTAINING PHENOLIC, PARA-ARAMID OR MELAMINE STAPLE FIBERS IN COMBINATION WITH VERMICULITE

Kurt Jörder, Weinheim-Heiligkreuz; Werner Schäfer, Birkenau, and Hans Hettenbach, Ladenburg, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Mar. 30, 1995, Ser. No. 413,737

Int. Cl.^{6} B32B *3/06;5/16;5/02;5/06*

U.S. Cl. 428—102 **6 Claims**

1. A nonwoven fabric flame barrier for use as a component of a planar multilayer structure, especially a vehicle or aircraft passenger seat, containing flameproof fibers, the barrier comprising:

a) "phenolic,para-aramid or melamine" staple fibers and

b) 15 to 30 wt % vermiculite, distributed through the entire volume of the nonwoven fabric in such a way that when the nonwoven fabric is viewed from above in its cross-sectional direction, complete surface coverage with the vermiculite particles is exhibited in all cross-sectional planes of the nonwoven fabric, wherein the nonwoven fabric flame barrier has a mass per unit area of 100 g/m^2 to 210 g/m^2.

5,534,326
CELLULOSIC FIBROUS STRUCTURES HAVING DISCRETE REGIONS WITH RADIALLY ORIENTED FIBERS THEREIN, APPARATUS THEREFOR AND PROCESS OF MAKING

Paul D. Trokhan, Hamilton; Dean Van Phan, and Larry L. Huston, both of West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 922,436, Jul. 29, 1992, abandoned. This application Dec. 6, 1993, Ser. No. 163,498

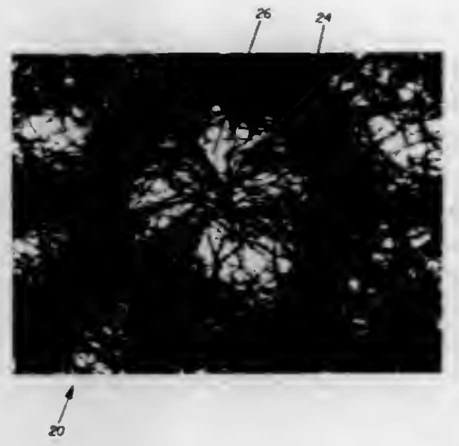
Int. Cl.^{6} B32B *3/10;7/02;5/16;* **D04H** *1/58*

U.S. Cl. 428—131 **7 Claims**

1. A single lamina cellulosic fibrous structure having a machine direction and a cross machine direction orthogonal thereto, and consisting essentially of two regions disposed in a nonrandom, repeating pattern, said cellulosic fibrous structure consisting essentially of

a first region, of a relatively high basis weight and comprising an essentially continuous network; and

a plurality of mutually discrete second regions comprising a relatively low basis weight and being circumscribed by said first region, said second regions being comprised of a plurality of substantially radially oriented fibers, said radially oriented fibers being disposed in said machine direction, in said cross machine direction, and in spaced angular relationship therebetween.



5,534,327
POWDERED LEATHER AND METHOD OF PRODUCING THE SAME

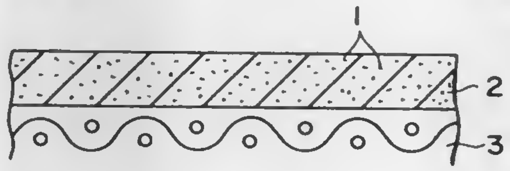
Tohru Nishi; Yasuji Kawamura, both of Ichihara; Kazuo Minato; Nobuo Kusamoto, both of Tokyo; Haruki Kai; Kazuhisa Kaneda, both of Ichihara, and Takao Inokuchi, Tokyo, all of, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 697,763, May 9, 1991, abandoned. This application Dec. 17, 1993, Ser. No. 169,747

Claims priority, application Japan, May 11, 1990, 2-122001; May 11, 1990, 2-122002

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—151 **4 Claims**



2. A finished product comprising:

(a) from 90 to 1% by weight of a powdered leather which is composed of at least 85% by weight of cortex, at most 2% by weight of oil and fat, and at most 0.5% by weight of sum of free ions Na^+ and Ca^{2+} capable of being eluted in water and which has an average particle size of at most 7 μm, a standard deviation of said average particle size being at most 3 μm; and

(b) 10 to 99% by weight of synthetic resin.

5,534,328
INTEGRATED CHEMICAL PROCESSING APPARATUS AND PROCESSES FOR THE PREPARATION THEREOF

James W. Ashmead; Charles T. Blaisdell, both of Middletown, Del.; Melvin H. Johnson; Jack K. Nyquist, both of Chadds Ford, Pa.; Joseph A. Perrotto, Landenberg, Pa., and James F. Ryley, Jr., Drexel Hill, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

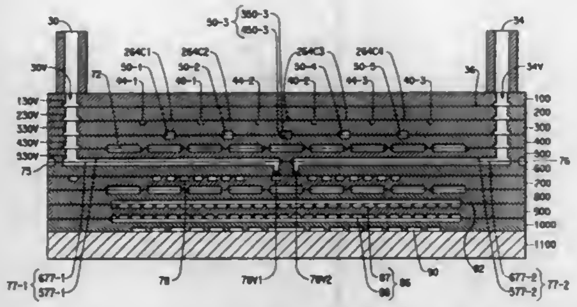
Filed Dec. 2, 1993, Ser. No. 161,379

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—166 **27 Claims**

1. An integral structure for chemical processing and manufacture comprising a plurality of laminae joined together with at least one inlet port and at least one outlet port formed therein for the receipt and discharge of chemicals, and at least one three-dimensionally tortuous channel formed therethrough for accommodating chemicals to be processed, wherein

said channel is connected to said inlet and outlet ports, said laminae further comprising a material selected for compatibility with the chemical process, and further wherein



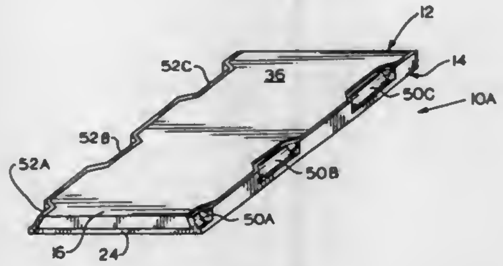
said channel is precisely oriented between adjacent laminae and said channel is continuous along one or more laminae and discontinuous along one or more other laminae thereof, and further wherein

said discontinuous channel is continuously aligned between adjacent laminae to form a continuous pathway therethrough and configured to cooperate with means to perform at least one unit operation positioned to effect a desired control so that the chemicals are processed.

5,534,329
COMPOSITE STRUCTURE

Haim Bunimovich, Vered St. 12, Kirvat Motzkin, 26394, Israel, and Tatyana Loersky, 6542 Lakeridge Rd., Los Angeles, Calif. 90068

Filed Jul. 14, 1994, Ser. No. 275,621
Int. Cl.^{6} B32B *23/02*
U.S. Cl. 428—192 3 Claims



1. A composite structure comprising:

a first member that has an outer face, an edge, and an inner face and that has a plurality of spaced recesses in its edge, with each recess being wider at said outer face than at said inner face;

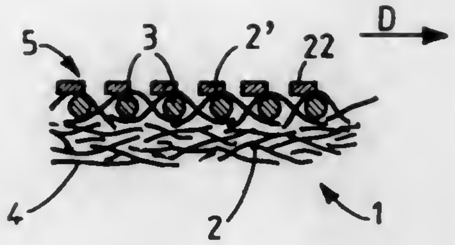
a second member that has a portion lying against a location of said first member that is opposite said outer face, said second member also having a flange lying adjacent to said edge and deformed at each of said spaced recesses into said recesses.

5,534,330
THERMOBONDING INTERLINING COMPRISING A LAYER OF FIBERS INTERMINGLED WITH TEXTURED WEFT YARNS AND ITS PRODUCTION METHOD

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie S.A., France

Filed Oct. 4, 1994, Ser. No. 317,577
Claims priority, application France, Oct. 11, 1993, 93 12384
Int. Cl.^{6} B32B *27/14*
U.S. Cl. 428—198 5 Claims

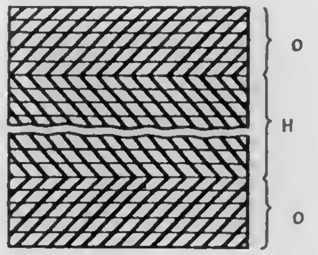
1. A thermobonding interlining comprising at least one non-woven layer of intermingled fibers or filaments presented generally in a longitudinal direction, weft yarns of textured continuous filaments disposed crosswise to said longitudinal direction and bonded to said non-woven layer as a result of the intermingling of the fibers or filaments of said non-woven layer, and dots of thermofusible polymer coated on one face of said non-woven layer.



5,534,331
METHOD OF MANUFACTURING A MULTI-LAYERED CERAMIC CIRCUIT BOARD CONTAINING LAYERS OF REDUCED DIELECTRIC CONSTANT

Shigenori Aoki; Hiroshi Kamezaki; Masaharu Hida, and Kishio Yokouchi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 21,575, Feb. 24, 1993, Pat. No. 5,324,370.
This application Mar. 24, 1994, Ser. No. 216,978
Claims priority, application Japan, Feb. 27, 1992, 4-041098
Int. Cl.^{6} B32B *9/00*
U.S. Cl. 428—209 6 Claims



1. A multi-layered ceramic circuit board comprising hybrid-laminated ceramic layers of a first ceramic powder material containing hollow silica and of a second ceramic powder material containing no hollow silica, the ceramic layers having resulted from firing the hybrid-laminated layers of green sheets of the first ceramic powder material containing hollow silica interposed between overlaying and underlying layers of green sheets of the second ceramic powder material containing no hollow silica, and electrically conductive layers being disposed in contact with at least the ceramic layers resulting from firing the green sheets of the first ceramic powder material containing the hollow silica, wherein the compositions of the first and second ceramic powder materials are controlled, so that the difference between the percentage of shrinkage of both green sheets during the firing thereof is within 1%; wherein the first ceramic powder material contains, as inorganic ingredients, 10 to 50% by volume of hollow silica, 20 to 50% by volume of borosilicate glass, more than 0% and not greater than 55% by volume of quartz glass, and 10 to 30% by volume of alumina; and the second ceramic powder material contains, as inorganic ingredients, 20 to 60% by volume of borosilicate glass, more than 0% and not greater than 65% by volume of quartz glass, and 10 to 50% by volume of alumina.

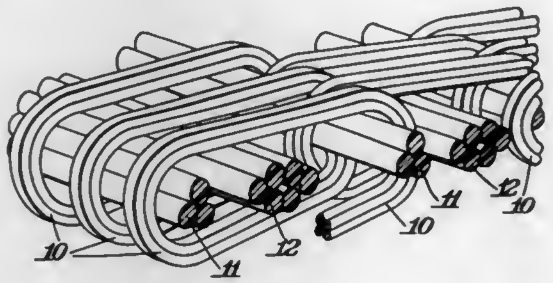
5,534,332

Patent Not Issued For This Number

5,534,333
SPIRAL FABRIC

Robert A. Keller, and William L. Price, III, both of Columbia, S.C., assignors to Shakespeare, Columbia, S.C.

Filed Apr. 7, 1995, Ser. No. 418,694
Int. Cl.^{6} D21F *7/08*
U.S. Cl. 428—222 14 Claims



1. In a spiral fabric comprising a plurality of coils extending in a common direction, the coils having loops meshed together to form channels at points of contact between adjacent loops, and locking pins positioned in the channels joining adjacent coils successively together forming a fabric mesh, the improvement wherein at least one of the coils and the locking pins comprises a cable structure of at least two thermoplastic filaments, each filament having a cross-sectional shape that is bilaterally symmetrical and fused to at least one adjacent filament along about from 1 to 100% of its perimeter.

5,534,334
BASE FABRIC FOR INK RIBBONS

Kenji Hama; Nobutake Hiroe, and Junko Kuroda, all of Shiga-ken, Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP93/01251, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO94/05504, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 3, 1993, Ser. No. 232,184
Claims priority, application Japan, Sep. 10, 1992, 4-241746
Int. Cl.^{6} D03D *3/00*
U.S. Cl. 428—224 4 Claims

1. A woven fabric for ink ribbons, composed of synthetic multi-filament yarns, comprising the warp used to form the woven fabrics, being 30 to 50 D in yarn thickness and 330 to 600 T/M in the number of twist.

5,534,335
NONWOVEN FABRIC FORMED FROM ALLOY FIBERS

Dennis S. Everhart, Alpharetta; Mary L. Delucia, Roswell; Terry K. Timmons, Marietta, and Robert D. Wright, Peachtree City, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

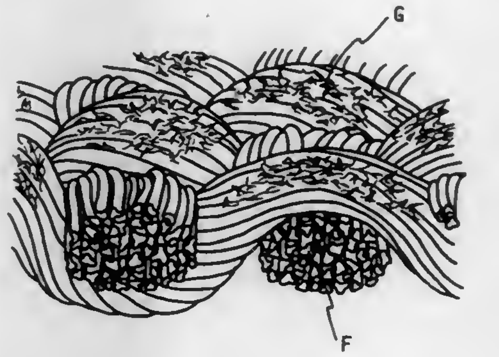
Continuation of Ser. No. 125,632, Sep. 23, 1993, abandoned.
This application Oct. 7, 1994, Ser. No. 320,098
Int. Cl.^{6} D03D *3/00*
U.S. Cl. 428—224 16 Claims

1. A nonwoven fabric comprising multiconstituent alloy fibers composed of at least two thermoplastic polymers and a compatibilizer, wherein one of said thermoplastic polymers has a polymer melt temperature and forms a dominant continuous phase, and the other one or more polymers form a non-continuous phase or phases wherein the polymer of said non-continuous phase or phases has a polymer melt temperature less than 30° C. below the polymer melt temperature of said continuous phase.

5,534,336
FABRIC SUPERIOR IN ANTI-DRAPE STIFFNESS, STIFFNESS AND SOFT HANDLE, AND MANUFACTURING THEREOF

Yasuhiko Nomura, Iwakuni; Ikuharu Nishida, Osaka, and Tadaaki Kashima, Ise, all of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 17, 1995, Ser. No. 516,482
Claims priority, application Japan, Aug. 22, 1994, 6-196820; Aug. 25, 1994, 6-200798
Int. Cl.^{6} D03D *3/00*
U.S. Cl. 428—229 3 Claims



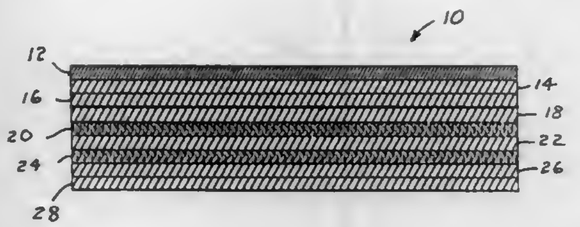
1. A fabric superior in anti-drape stiffness, stiffness and soft handle, which is formed using a spun yarn comprising regenerated fibers having an average polymerization degree of not less than 400 and a modified cross-section, in a proportion of at least 20% by weight of the yarn, wherein at least one regenerated fiber from among the regenerated fibers of said fabric, is split or fibrilar, or split and fibrilar.

5,534,337
THERMOSET REINFORCED CORROSION RESISTANT LAMINATES

Edward D. Bailey, Jr., Baton Rouge, La., assignor to Cobale Company, L.L.C., Baton Rouge, La.

Filed Apr. 5, 1993, Ser. No. 43,200
Int. Cl.^{6} B32B *5/02;27/00;5/06*
U.S. Cl. 428—236 20 Claims

1. In a reinforced corrosion resistant laminate, the improvement comprising incorporating therein a surfacing veil of a thermoplastic fluoropolymer.



5,534,338

HEAT RESISTANT CLOTH FOR FIRE FIGHTING COMPRISING IN ORDER: A FABRIC SUBSTRATE, A RUBBER LAYER, A METAL COATED POLYESTER FILM LAYER AND A TETRAFLUOROETHYLENE COPOLYMER FILM LAYER

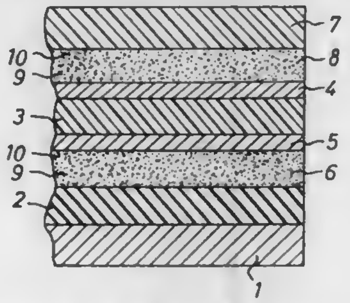
Masami Saito; Akio Mogami; Yoshihisa Kanasasi, all of Mishima, and Torataro Kobayashi, Tokyo, all of, Japan, assignors to Toyo Metallizing Kabushiki Kaisha, and Kobayashi Bokafuku Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 359,022

Claims priority, application Japan, Dec. 22, 1993, 5-68545 U

Int. Cl.^{6} B32B *5/16;7/00;15/00;* **B27N** *9/00*

U.S. Cl. 428—242 5 Claims



1. A heat resistant cloth for firefighting comprising in the following order: a fabric substrate, a first bonding layer containing a flame retardant, a polyester film layer having metal deposited on opposite sides thereof, a second bonding layer containing a flame retardant, and a tetrafluoroethylene copolymer film layer, said layers bonded together on an outer surface of the substrate fabric.

5,534,339

POLYOLEFIN-POLYAMID CONJUGATE FIBER WEB

Ty J. Stokes, Suwanee, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 201,582, Feb. 25, 1994, Pat. No. 5,424,115. This application Jan. 27, 1995, Ser. No. 379,373

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—284 22 Claims

1. A conjugate fiber comprising a polyolefin and a polyamide selected from polycaprolactam, copolymers of caprolactam and hexamethylene adipamide, hydrophilic copolymers of caprolactam and ethylene oxide diamine, and blends thereof, wherein said polyamide has a number average molecular weight up to about 16,500.

5,534,340

NONWOVEN MATERIALS COMPRISING 0.5 TO 1.2 DECITEX CARDABLE POLYOLEFIN FIBERS AND HAVING LIQUID STRIKE THROUGH RESISTANCE AS WELL AS AIR PERMEABILITY

Rakesh K. Gupta, and Richard J. Legare, both of Conyers, Ga., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 29, 1993, Ser. No. 145,360

Claims priority, application United Kingdom, Apr. 6, 1993, 9307117

Int. Cl.^{6} B32B *27/00;5/06;* **D02G** *3/00*

U.S. Cl. 428—286 90 Claims

1. A liquid barrier fabric comprising at least one carded and thermally consolidated nonwoven web comprising at least 10% by weight, based on the total weight of cardable fibers, of cardable polyolefin staple fibers having a fiber fineness of about 0.5 to about 1.2 decitex, wherein the liquid strike-through resistance (mm of H_2O) of the fabric is at least about 150 millimeters and the air permeability is at least about 80 cubic feet per minute.

5,534,341

EMULSION BINDERS

Stephen J. Baines, Horsham, and Barry Hayward, Wallington, both of, United Kingdom, assignors to Unilever Patent Holdings BV, Rotterdam, Netherlands

Continuation of Ser. No. 831,097, Feb. 10, 1992, abandoned, which is a continuation of Ser. No. 406,328, Sep. 12, 1989, abandoned. This application May 8, 1995, Ser. No. 436,821

Claims priority, application England, Sep. 12, 1988, 8821350

Int. Cl.^{6} D04H *1/58;* **B32B** *27/00*

U.S. Cl. 428—288 7 Claims

1. An ignition resistant lofted non-woven wadding material comprising a web of lofted nonwoven fibers bonded by a polymer emulsion having:

- i) a Tg from about 20° C. to about 60° C.,
- ii) a weight average molecular weight less than about 3×10^6 for homopolymers and a weight average molecular weight less than about 5×10^5 for copolymers, and being substantially free of crosslinking or being substantially non-crosslinkable on drying,
- iii) a ratio of Mw/Mn below about 5 and a solution viscosity below about 0.15 poise in tetrahydrofuran at 10% solid material, and
- iv) the polymer of the polymer emulsion consisting essentially of a compound selected from the group consisting of copolymers of a vinyl C_1–C_3 alkanoate with vinyl chloride, ethylenic hydrocarbons, or alkyl maleates; copolymers of styrene and an acrylate; copolymers of methacrylates and acrylates, homopolymers of vinyl C_1–C_3 alkanoates; and homopolymers of dimethyl-maleate,

wherein the emulsion polymer has low inherent flammability and forms a melt on application of a flame which shrinks back from the flame without forming a gel which holds the fibers in place.

5,534,342

Patent Not Issued For This Number

5,534,343

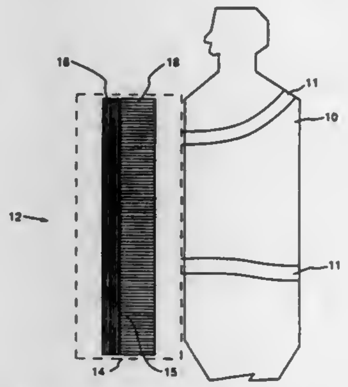
FLEXIBLE BALLISTIC RESISTANT ARTICLE HAVING A THERMOPLASTIC ELASTOMERIC HONEYCOMB PANEL

Curtis L. Landi; Susan L. Wilson, both of Sunnyvale, and Michael S. Huber, Campbell, all of Calif., assignors to Supracor Systems, Inc., Sunnyvale, Calif.

Filed Jul. 15, 1994, Ser. No. 275,771

Int. Cl.^{6} F41H *5/02;* **B32B** *3/04;3/21*

U.S. Cl. 428—313.5 12 Claims



1. A flexible ballistic resistant article to protect a user from a high speed projectile, comprising:

- a) an outer layer for stopping the forward motion of said projectile and including at least one ply having a plurality of fibers;
- b) an inner layer for controlling force transmission to said user, said inner layer being disposed between and adjacent to each of said user and said outer layer, and including
  - (i) a honeycomb core formed of undulated strips of resilient thermoplastic material, thermal compression bonded together to form cell walls defining a plurality of contiguous regularly shaped cells, said core having a first face formed by a first extremity of said cell walls and a second face formed by a second extremity of said cell walls;
  - (ii) at least one facing sheet of resilient thermoplastic material being fixably engaged to at least one of said first or second faces to maintain said core in an expanded configuration so that it can anisotropically flex to stabilize and spread the load when said article is impacted by the projectile;
- c) a cover for encasing each of said inner and said outer layers; and
- d) a user attachment means for being engaged to said cover for removably attaching said cover to said user.

5,534,344

CHARGING MEMBER HAVING A LOOSELY SUPPORTED CHARGER PORTION

Hiroki Kisu, Fujisawa; Masaharu Ohkubo, Yokohama; Kazushige Sakurai; Michihito Yamazaki, both of Tokyo; Erika Asano, Kawasaki; Yasushi Shimizu, Tokyo, and Hiroaki Ogata, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,870

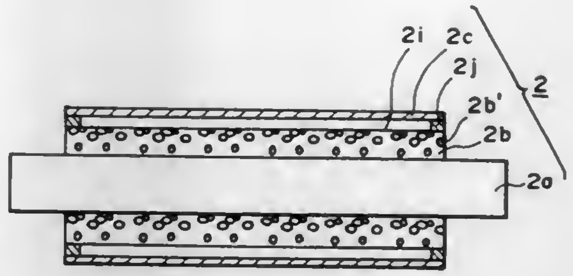
Claims priority, application Japan, Jan. 30, 1992, 4-040141

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—323 32 Claims

1. A charging member contactable to a member to be electrically charged, said charging member comprising:

- a charging portion contactable to the member to be electrically charged; and
- a supporting portion for supporting said charging portion, wherein said supporting portion and said charging portion are substantially independently movable, said supporting portion comprising an elastic layer and a core for supporting said elastic layer, said supporting portion urging said charging portion to the member to be electrically charged.



5,534,345

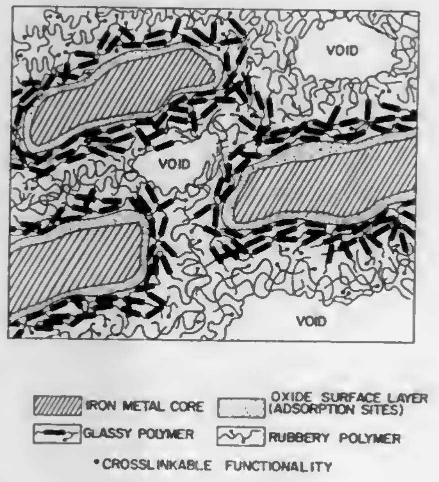
MAGNETIC RECORDING MEDIUM HAVING AN INORGANIC FILLER ON WHICH A GLASSY POLYMER HAS BEEN ADSORBED

Richard L. Bradshaw, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 76,896, Jun. 15, 1993, Pat. No. 5,446,085. This application Apr. 17, 1995, Ser. No. 422,949

Int. Cl.^{6} G11B *5/702*

U.S. Cl. 428—323 17 Claims


VOID
VOID
VOID
IRON METAL CORE
OXIDE SURFACE LAYER (ADSORPTION SITES)
GLASSY POLYMER
RUBBERY POLYMER
*CROSSLINKABLE FUNCTIONALITY

1. A flexible magnetic recording media which comprises a flexible substrate coated with a composition comprising:

- A) an inorganic filler having adsorption sites selected from the group consisting of unhydrated oxide sites, hydrated oxide sites and mixtures thereof; and
- B) a binder component wherein said binder component comprises
  - 1) a glassy polymer having a glass transition temperature of at least about 60° C., and having polar groups that interact with said adsorption sites on the surface of said filler to thereby remain in contact with and to encapsulate said filler; and
  - 2) a rubbery polymer having polar groups and being compatible with said glassy polymer wherein the relative amounts of B)1) and B)2) are about 50% to about 80% by weight of B) 1) and correspondingly about 20% to about 50% by weight of B) 2) based upon the total of B) 1 and B) 2) in the composition; and wherein said glassy polymer and said rubbery polymer are chlorine free;

  and wherein the relative amounts of A) and B) are about 35% to about 60% of A) and correspondingly 65% to about 40% by volume of B) based upon the total of A) and B) in the composition;

  and wherein the inorganic filler includes ferromagnetic pigment;

  and being obtained by forming a premix of said inorganic filler, said glassy polymer and an organic diluent, which contains a volatile polar organic solvent wherein said premix contains about 2 to about 20% by weight of said glassy polymer, and about 20 to about 50% by weight of said filler; and admixing said premix and said rubbery polymer; and providing in the composition a high boiling secondary diluent in an amount to provide a blend of diluent of about 70 to about 90% by weight of said volatile polar organic solvent and correspondingly about 10 to about 30% by weight of said secondary diluent; and wherein said high boiling diluent is a non solvent for said glassy polymer; and thereby causing said glassy polymer to adsorb onto said inorganic filler and interact with adsorption sites on said filler to thereby encapsulate said filler, and to intertwine said rubbery polymer within the matrix of said glassy polymer.

5,534,346

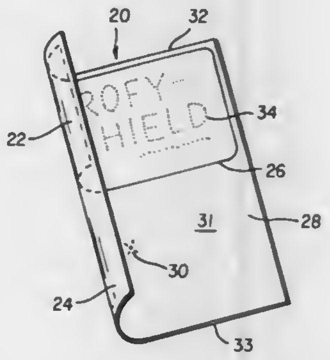
ATTACHABLE THIN FILM PROPHYLACTIC BARRIER

Wilbur D. Robinson, 4571 W. Lake Rd., Canandaigua, N.Y. 14424

Continuation of Ser. No. 17,846, Feb. 16, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,449

Int. Cl.^{6} C09J *7/02*

U.S. Cl. 428—343 **22 Claims**



1. Apparatus for protecting an object prophylactically which comprises a sheet of thin pliable plastic material, sufficiently thin to deform when manually pinched between thumb and forefinger of one hand, and being of the order of from 0.0003 cm. (0.0001 in.) to 0.051 cm. (0.020 in.) thick, and of sufficient area to shield said object of protection when said Sheet is placed upon said object, said area of said sheet further defined as being essentially of uninterrupted rectangular form, said sheet having opposite side edges and first and second opposite end edges, said sheet also having top and bottom opposite. surfaces, with said bottom opposite surface alone. having thereon an adhesive material for adhering said sheet to said object, said adhesive material being a releasable material for releasing said sheet when it is pulled away from said object, said adhesive material covering a first area on said bottom surface of said sheet equal in area to about one-half of said area of said sheet, said first area on said bottom surface of said sheet being essentially an adhesive area, said adhesive area extending from adjacent to said first of said opposite end edges toward said second of said opposite end edges and along said opposite side edges of said sheet, a second area between said adhesive area and the extreme outside limit of said second of said opposite end edges defining a nontacky skirt, said nontacky skirt being free of any said adhesive whatsoever, said skirt depending from said adhesive area and defining an area whereupon said top opposite surface of said sheet can be pinched, and grasped with but said one hand, said one hand needing therefore to contact said top surface alone, in order to gain control over said sheet.

5,534,347

FUSING ROLL HAVING A FLUOROCARBON-SILICONE BARRIER LAYER

Tsang J. Chen, Rochester; Jiann-Hsing Chen, Fairport; Ming-Shih Lian, Pittsford; Lawrence P. DeMejo, Rochester, and Gary F. Roberts, Macedon, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 940,929, Sep. 4, 1992, abandoned. This application May 27, 1994, Ser. No. 250,325

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—375 **20 Claims**

1. A coated roll comprising:

a substrate, and coated thereon an underlying layer of a silicone elastomer, and coated on said silicone elastomer a barrier layer formed by curing a polymeric composition comprising:

a fluorocarbon polymer;

a fluorocarbon-curing agent; and

a curable polyfunctional poly(C_{1-6} alkyl)phenylsiloxane polymer, and creating an interpenetrating network consisting essentially of separately crosslinked polymers, said fluorocarbon polymer, and said fluorocarbon-curing agent form one said crosslinked polymer and said curable polyfunctional poly(C_{1-6} alkyl)phenylsiloxane polymer forms a second said crosslinked polymer.

5,534,348

HOLLOW BOROSILICATE MICROSPHERES AND METHOD OF MAKING

J. Stanley Miller, Collegeville, and Reginald Thompson, Chester, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation of Ser. No. 118,421, Sep. 8, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,394

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—402 **8 Claims**

1. Hollow borosilicate microspheres having a mean diameter below 25 microns and a true density below 0.25 g/cc.

5,534,349

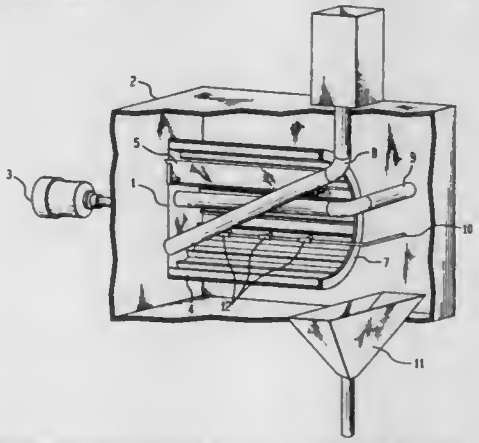
GRANULATION OF PHOSPHORUS PENTASULFIDE WITH A PREDETERMINED REACTIVITY

Jean M. Bacardi, 205 Augusta National Ct., Franklin, Tenn. 37074; Robert L. Camerer, 444 Pine St., Eldred, Ill. 62027; Andrew M. Huey, Rt. 11, Box 66-S, and Arthur R. Shirley, Jr., Rte. 7, Box 182, both of Florence, Ala. 35630

Continuation of Ser. No. 84,373, Jun. 29, 1993. This application May 24, 1995, Ser. No. 449,195

Int. Cl.^{6} B01J *2/12*

U.S. Cl. 428—403 **9 Claims**



1. A product prepared by a process comprising spraying molten P_2S_5 in the presence of an inert gas onto an active mass of particles which is solid P_2S_5 or a combination of solid P_2S_5 and an inert material.

5,534,350

POWERFREE GLOVE AND ITS MAKING METHOD

Derlin Liou, 4 Fl., No. 293, Sung-Chiang Rd., Taipei, Taiwan

Filed Dec. 28, 1994, Ser. No. 365,136

Int. Cl.^{6} B32B *27/00*

U.S. Cl. 428—423.1 **10 Claims**

1. A glove making method for making gloves which are powder-free consisting essentially of the steps of:

i: dipping a ceramic former into a powder free coagulant dispersion, which contains a polyurethane polymer, then removing said ceramic former from said coagulant dispersion and drying it to form a first lubricating layer on said ceramic former;

ii: dipping said first lubricating layer into a latex emulsion and then drying it so as to form an intermediate layer of elastomer on said ceramic former over said first lubricating layer;

iii: dipping said layer of elastomer into a polyurethane solution containing a silicone emulsion and then drying it so as to form a second lubricating layer on said intermediate layer of elastomer;

iv: putting said ceramic former with said first and second lubricating layers and said intermediate layer of elastomer into an approximately 110° C. vulcanizing oven, permitting said intermediate layer of elastomer to be vulcanized and said first and second lubricating layers to be cured; and

v: cooling the cured first and second lubricating layers and vulcanized intermediate layer of elastomer, and then removing the powder-free glove from said ceramic former.

5,534,351

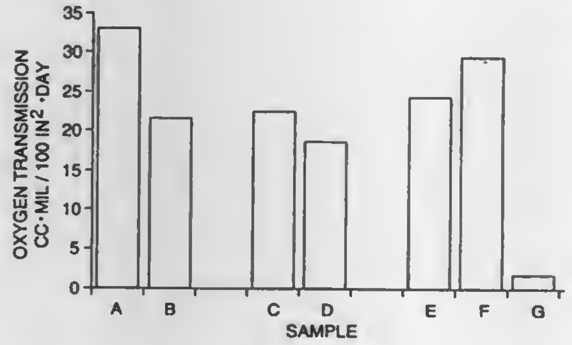
LAMINAR ARTICLES MADE FROM BLENDS OF ETHYLENE-VINYL ALCOHOL COPOLYMERS AND OLEFIN POLYMERS

Scott D. Pearson, Woodbury, and Diane North, Inver Grove Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 27, 1994, Ser. No. 313,429

Int. Cl.^{6} B32B *27/08*

U.S. Cl. 428—516 **15 Claims**



1. A laminar article comprising a

(a) at least one olefin polymer;

(b) at least one ethylene-vinyl alcohol copolymer, said at least one ethylene-vinyl alcohol copolymer having a melting point at least about 5° C. lower than that of said at least one olefin polymer, wherein the ethylene vinyl alcohol copolymer is present within the olefin polymer as multiple, thin, substantially parallel, overlapping layers.

5,534,352

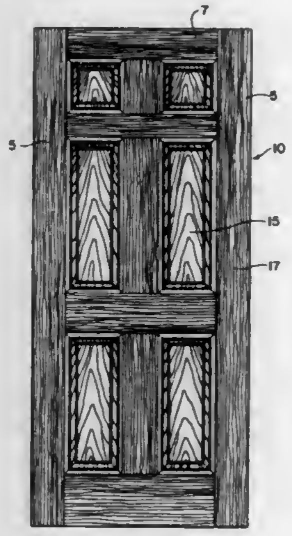
FINISHING PROCESS FOR TEXTURED PANELS, AND STRUCTURES MADE THEREBY

Raymond H. Pittman, Batavia; Mark A. Ruggie, Lombard, and Karine A. Luetgert, Geneva, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Aug. 16, 1994, Ser. No. 291,417

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—535 **53 Claims**



1. A process of pre-finishing a wood composite structure comprising the consecutive steps of:

(a) providing a textured substrate with pitted and smooth surface portions and further having flat and contoured surface portions;

(b) applying a ground coat having smooth, opaque pigments to the substrate to substantially uniformly coat both the pitted and smooth surface portions;

(c) applying a buffing glaze to the substrate;

(d) buffing the substrate using a brush to selectively remove the buffing glaze from portions of the substrate; and

(e) applying a sealer to the buffed surface to protect the remaining buffing glaze from being removed in subsequent operations.

5,534,353

COMPOSITE SINTERED MATERIAL HAVING FINE PARTICLES OF HARD COMPOUND DISPERSED IN GRAINS OF TITANIUM OR TITANIUM ALLOY MATRIX

Takahiro Kaba, Kobe; Takashi Nishi, and Tsuyoshi Mitsubashi, both of Amagasaki, all of, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Feb. 1, 1994, Ser. No. 189,845

Claims priority, application Japan, Feb. 2, 1993, 5-039469

Int. Cl.^{6} B22F *7/00*

U.S. Cl. 428—552 **6 Claims**

1. A composite sintered material comprising discrete fine particles of TiC and/or ZrC up to about 10 micrometers in particle size and generally uniformly dispersed in a volume ratio of about 5% to about 60% in grains of matrix of an alloy, the alloy consisting essentially of 5 to 40 wt. % of Mo and the balance substantially Ti.

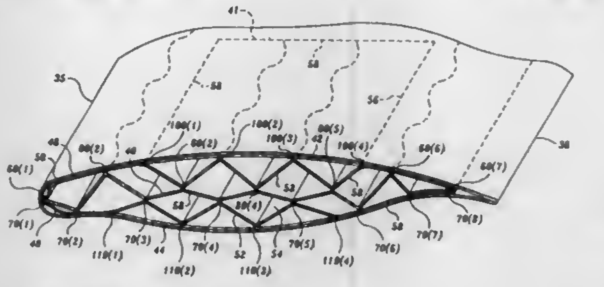
5,534,354
MULTIPLE DENSITY SANDWICH STRUCTURES

Paul S. Gregg, Seattle; Matthew G. Kistner, Enumclaw, and Jeff D. Will, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 195,998, Feb. 14, 1994, Pat. No. 5,451,472, which is a division of Ser. No. 809,304, Dec. 19, 1991, Pat. No. 5,330,092. This application Jun. 7, 1995, Ser. No. 474,336

Int. Cl.^{6} B32B *3/28;15/00;* **B64C** *3/20*

U.S. Cl. 428—593 **14 Claims**



12. An airfoil, comprising:

(a) a double thickness upper skin having an aerodynamically smooth outer surface, the upper skin formed of two or more sheets joined by diffusion bonding;

(b) a double thickness lower skin having an aerodynamically smooth outer surface, the lower skin being formed of two or more sheets of superplastically formable material joined by diffusion bonding; wherein the upper and lower skins are joined together to define the outer contour of the airfoil; and

(c) an internal webbed reinforcement of superplastically formable material attached to and extending between the interior surfaces of the upper and lower skins, the internal reinforcement including a plurality of interconnected webs that extend diagonally between the upper and lower skins, the internal reinforcement having a different number of webs through the thickness of the internal reinforcement at at least two different locations along the span of the airfoil, and a different number of webs through the thickness of the internal reinforcement at at least two different locations along the cord of the wing so that the airfoil can withstand different loadings at different locations because of the differing density of the webs.

5,534,355
ARTIFICIAL MULTILAYER AND METHOD OF MANUFACTURING THE SAME

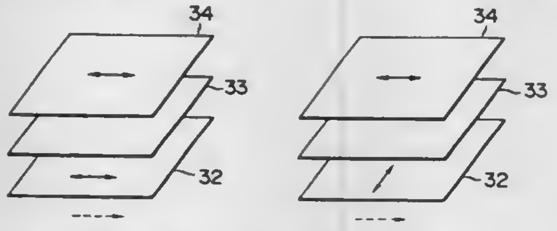
Shiho Okuno, Kawasaki; Susumu Hashimoto, Ebina; Keiichiro Yusu, Kawasaki, and Koichiro Inomata, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 120,236, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 786,727, Nov. 1, 1991, abandoned. This application Apr. 19, 1995, Ser. No. 424,082

Claims priority, application Japan, Nov. 1, 1990, 2-293566; Mar. 27, 1991, 3-063527

Int. Cl.^{6} G11B *5/66;* **B32B** *15/01*

U.S. Cl. 428—611 **52 Claims**



1. A magnetoresistance device comprising:

ferromagnetic and non-magnetic layers which are laminated to form a multilayer structure, wherein said ferromagnetic layers have a uniaxial magnetic anisotropy along the surface of the said multilayer structure which is introduced by a magnetic field, each of said ferromagnetic layers having a thickness between 0.5 and 20 nm;

a substrate having a non-singlecrystalline surface, wherein said ferromagnetic and non-magnetic layers are laminated upon said substrate; and

means, coupled to said multilayer structure, for measuring resistivity of the multilayer structure along a direction that is parallel to the layers of the multilayer structure.

5,534,356
ANODIZED ALUMINUM SUBSTRATE HAVING INCREASED BREAKDOWN VOLTAGE

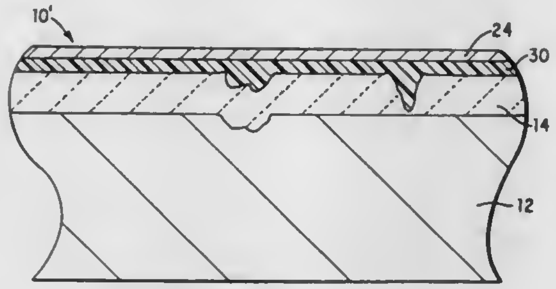
Deepak Mahulikar, Madison; Efraim Sagiv, Meriden; Arvind Parthasarathi, North Branford; Satish Jalota, Wallingford; Andrew J. Brock, Cheshire, all of Conn.; Michael A. Holmes, Ripon, Calif.; Jeffrey M. Schlater, Oakdale, Calif.; German J. Ramirez, Antioch, Calif., and Dexin Liang, Fremont, Calif., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 26, 1995, Ser. No. 427,921

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—615 **5 Claims**

1. A component for electronic applications comprising:



an anodizable metal core having a yield strength in excess of 30 ksi; and

an anodic film coating at least a portion of said core wherein the alloy constituents within said anodizable metal core are substantially soluble in an anodization electrolyte thereby increasing the breakdown voltage.

5,534,357
BRAZING SHEET FOR VACUUM BRAZING

Tatsuhiko Nonoyama, Chiryu; Shoei Teshima, Kariya; Haruhiko Otsuka, Okazaki; Yasuyuki Tanaka, Gamagori, and Kouji Hiragami, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

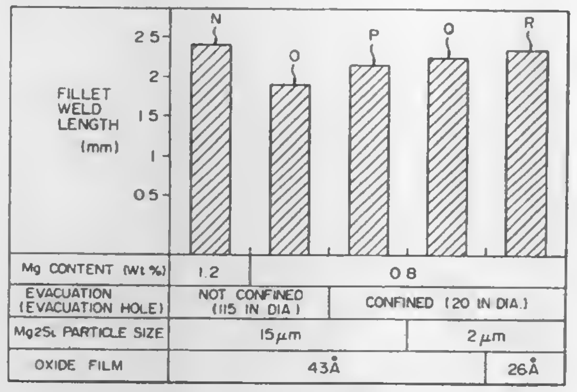
Division of Ser. No. 76,186, Jun. 14, 1993, abandoned, which is a division of Ser. No. 860,759, Mar. 31, 1992, Pat. No. 5,257,731. This application Mar. 6, 1995, Ser. No. 399,145

Claims priority, application Japan, Apr. 4, 1991, 3-071851

Int. Cl.^{6} B32B *15/20*

U.S. Cl. 428—629 **2 Claims**

2. A brazing sheet for vacuum brazing, wherein said sheet is clad with an aluminum alloy brazing filler metal having a content of Mg sufficient for vacuum brazing but less than 1.2 wt. % and the Mg_2Si particle size among Mg contained in said metal is not more than 5 μm as a typical value and an oxide film thickness on a surface of said metal is less than 100 angstroms.



5,534,358
IRON-PLATED ALUMINUM ALLOY PARTS

Sue Troup-Packman, Calabasas, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 959,881, Oct. 13, 1992, abandoned. This application Feb. 2, 1994, Ser. No. 190,816

Int. Cl.^{6} B32B *15/20*

U.S. Cl. 428—648 **8 Claims**

5. Iron-plated 390 aluminum alloy pistons, wherein said aluminum alloy pistons have a first layer of nickel ranging from about 0.000002 to 0.0015 inch in thickness on a surface of said piston, a second layer of iron ranging from about 0.00002 to 0.0015 inch in thickness on said layer of nickel, and a third layer of tin ranging from about 0.000005 to 0.001 inch in thickness on said layer of iron.

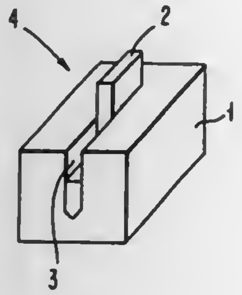
5,534,359
CALIBRATION STANDARD FOR 2-D AND 3-D PROFILOMETRY IN THE SUB-NANOMETER RANGE AND METHOD OF PRODUCING IT

Johann W. Bartha, Aidlingen; Thomas Bayer, Sindelfingen; Johann Greschner, Pliezhausen; Martin Nonnenmacher, deceased, late of Schoenaich, and Helga Weiss, Boeblingen, all of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1994, Ser. No. 255,209

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—688 **8 Claims**



1. A calibration standard comprising:

a supporting structure (1) of single crystal material with at least one pair (4) of different kinds of structures (2,3) wherein said at least one pair has one of said different kinds of structures extending above a major surface of said supporting structure, the structures (2,3) of each of said pair (4) of different kinds of structures having substantially the same width and sidewall surfaces exposed for profilometry.

5,534,360
AMORPHOUS URANIUM ALLOY AND USE THEREOF

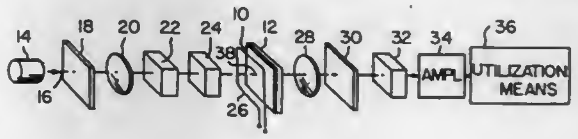
Richard J. Gambino, Yorktown Heights, N.Y.; Michael W. McElfresh, West Lafayette, Ind.; Thomas R. McGuire, Yorktown Heights, and Thomas S. Plaskett, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 781,196, Dec. 13, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 264,238

Claims priority, application WIPO, Apr. 13, 1990, PCT/US90/02009

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—694 ML **24 Claims**



1. A magnetic system comprising:

a magnetic medium comprising an amorphous alloy exhibiting magneto-optical rotation and containing uranium and a member selected from the group consisting of N, P, As, Sb, Bi, S, Se, Te, Po and mixtures thereof wherein the atomic ratio of the uranium to said member is from about 60:40 to about 20:80, and wherein said alloy further includes about 5 to 40 atomic % of Mn, Co or both;

and wherein said magnetic medium exhibits a square loop hysteresis curve, a Tc of at least about 70° K, and is responsive to light in the visible wavelengths; and has a Faraday rotation of at least about 0.9×10^6 deg/cm or a magneto-optic Kerr rotation of at least 1 degree; magnetization of at least about 100 emu/cm^3; Hc of at least about 5 kOe; Hall angle of at least about 4 degrees; and resistivity value of at least about 200 micro ohm-cm;

writing means for changing the magnetic state of said magnetic medium;

said writing means being comprised of beam generating means for directing electromagnetic energy at said magnetic medium and magnetic field producing means for providing a magnetic field in said magnetic medium; and

reading means for detecting the magnetic state of said magnetic mediums.

5,534,361
FERROMAGNETIC METAL POWDER

Seiichi Hisano; Kazuhisa Saito; Satoshi Aizawa; Kazushi Sano; Kazuyuki Matsumoto, and Kenji Murata, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,227

Claims priority, application Japan, Jul. 1, 1993, 5-186578

Int. Cl.^{6} G11B *5/66*

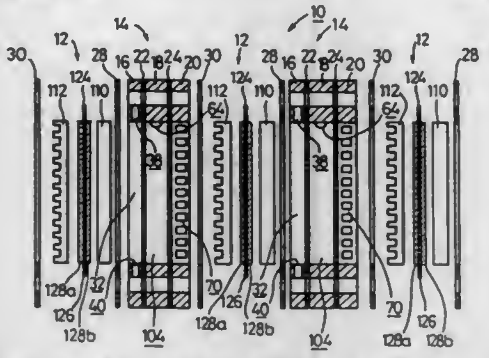
U.S. Cl. 428—694 RE **18 Claims**

1. Acicular ferromagnetic metal particles consisting essentially of iron, 0.1–10 atm % based on the total quantity of the metal

elements present of yttrium or any other rare earth element, and 0.05 wt % or less of an element of Group Ia of the periodic table contained as an incidental component, said element of Group Ia being selected from the group consisting of lithium, sodium and potassium.

5,534,362
FUEL CELL STACK AND METHOD OF PRESSING TOGETHER THE SAME

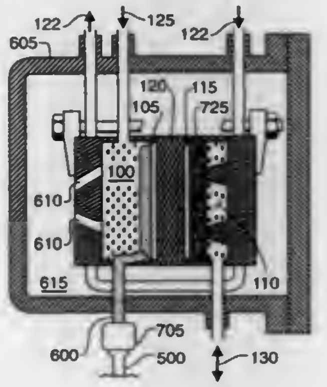
Takafumi Okamoto; Manabu Tanaka; Ichiro Baba; Hideo Kato, and Norimasa Kawagoe, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 78,788, Jun. 17, 1993, Pat. No. 5,419,980. This application Apr. 10, 1995, Ser. No. 419,417
Claims priority, application Japan, Jun. 18, 1992, 4-182860; Jul. 13, 1992, 4-206977
Int. Cl.^{6} H01M *8/04*
U.S. Cl. 429—32 **28 Claims**



1. A fuel cell stack comprising a plurality of unit cells for taking out electrical energy from a reaction gas and a plurality of separators interposed between said unit cells, wherein
- each of said unit cells comprises a solid polymer electrolyte membrane having a pair of electrode catalysts attached on both surfaces thereof, and means of a rigid porous material provided in each said separator, respectively, for applying pressure to each of said electrode catalysts, and
- each of said separators includes plates defining a chamber therein into which a fluid is introduced, said rigid porous material means is displaceable by said chamber toward one of said electrode catalysts.

5,534,363
HOLLOW ARTERY ANODE WICK FOR PASSIVE VARIABLE PRESSURE REGENERATIVE FUEL CELLS

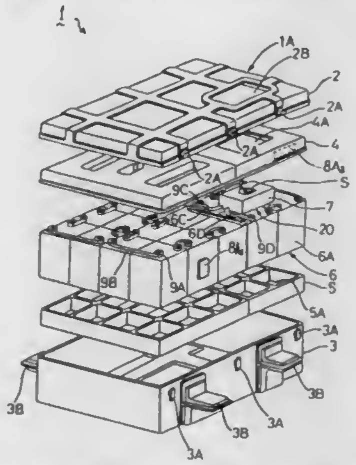
Kenneth M. Sprouse, Northridge, Calif., and James D. Navratil, Nederland, Colo., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Mar. 22, 1994, Ser. No. 215,547
Int. Cl.^{6} H01M *8/04*
U.S. Cl. 429—34 **13 Claims**



1. A fuel cell anode wick comprising:
(a) a network of perforated arterial tubing that is:
  (1) formed in (A) a spoke-and-wheel configuration or (B) a trunk-and-branch configuration, and
  (2) wrapped in a hydrophilic porous covering;
(b) a knitted or a felted fabric that includes:
  (1) a plurality of regions of hydrophobic fibers comprising polytetrafluroethylene, at least some of said regions being rectangular, and
  (2) a plurality of hydrophilic fibers communicating with said hydrophilic porous covering that transverse said fabric and that defines said plurality of regions of hydrophobic fibers, at least some of said hydrophilic fibers comprising (A) proton exchange membrane fibers or (B) rice hulls.

5,534,364
BATTERY BOX DEVICE FOR ELECTRIC VEHICLE

Satoshi Watanabe, Utsunomiya, and Hitoshi Nakayama, Kawaguchi, both of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 29, 1994, Ser. No. 235,063
Claims priority, application Japan, Apr. 30, 1993, 5-104035; Dec. 20, 1993, 5-319837
Int. Cl.^{6} H01M *2/10;* B60K *1/00*
U.S. Cl. 429—61 **37 Claims**

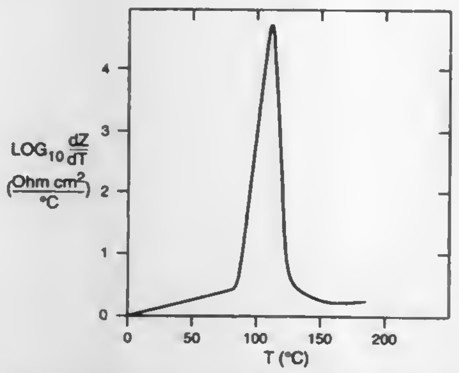


1. A battery box device for use on an electric vehicle, comprising:
- a drive power supply having a plurality of storage batteries for supplying an electric energy for at least one external load outside said battery box device to drive the electric vehicle;
- a circuit breaker device having control means for producing a power supply control signal based on a condition of the electric vehicle and having a circuit breaker for turning off said drive power supply for said at least one external load in response to the control signal from said control means; and
- a battery box housing at least said storage batteries and being mounted on the electric vehicle, said circuit breaker device being directly mounted on said battery box and operable from outside of said battery box for independently turning off said drive power supply.

5,534,365
BATTERY WITH FUSIBLE SOLID ELECTROLYTE

Michael A. Gee, 5525 Blossom Gardens Cir., San Jose, Calif. 95123, and Ib I. Olsen, 730 S. Saratoga Ave., #W301, San Jose, Calif. 95129
Filed Jun. 7, 1994, Ser. No. 255,018
Int. Cl.^{6} H01M *10/40*
U.S. Cl. 429—62 **24 Claims**

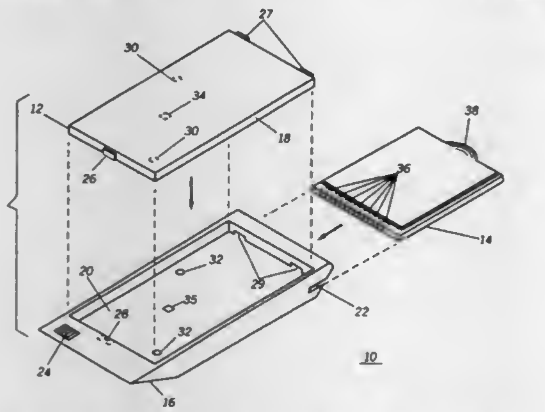
14. A secondary electrochemical cell comprising:
an anode composed of a compatible anodic material;



a cathode composed of a compatible cathodic material; and interposed therebetween a fusible solid polymeric electrolyte comprising dispersed particles of an inert fusible material.

5,534,366
MODULAR BATTERY PACK

B. Chester Hwang, Alpharetta; Jose M. Fernandez, Lawrenceville; Vernon Meadows, Lilburn; Simon Thomas, Lawrenceville, and Willard F. Amero, Jr., Flowery Branch, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 22, 1995, Ser. No. 561,736
Int. Cl.^{6} H01M *2/10*
U.S. Cl. 429—91 **9 Claims**

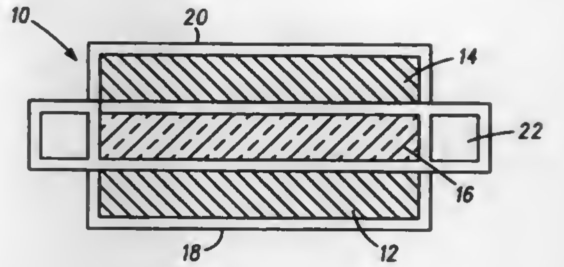


1. A modular battery pack for powering an electrical device, comprising:
- a battery cell cartridge having at least one battery cell disposed therein;
- a circuit cartridge; and
- a housing having a first pocket for receiving said battery cell cartridge and a second pocket for receiving said circuit cartridge, and a housing circuit for interfacing said modular battery pack with said electrical device.

5,534,367
MOLTEN SALT ELECTROLYTE SEPARATOR

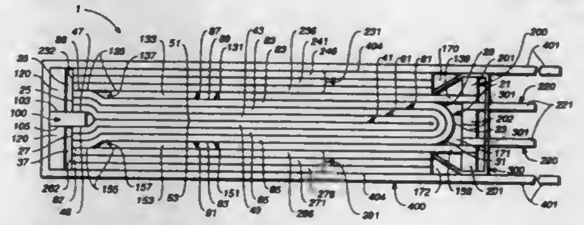
Thomas D. Kaun, New Lenox, Ill., assignor to University of Chicago, Chicago, Ill.
Filed Dec. 28, 1993, Ser. No. 173,990
Int. Cl.^{6} H01M *4/36;4/48*
U.S. Cl. 429—103 **15 Claims**

1. An apparatus for electrically insulating electrochemical cell electrodes with a quaternary system of binary salts, comprising:
- a molten ternary mixture of binary salts, said mixture forming an electrolyte composition; and
- a fourth binary salt dispersed in said composition, said fourth salt a solid within said composition such that a two-phase system is maintained during cell operation.



5,534,368
BATTERY MODULE

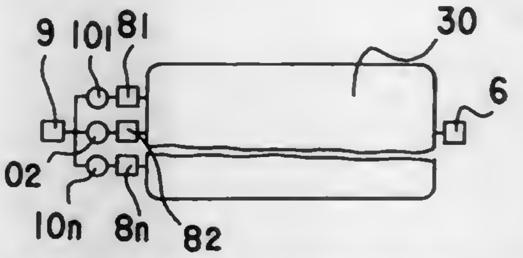
Jerry L. Morris, 207 Vineyard Dr., San Jose, Calif. 95119; Michael E. McAleavey, 559 Gettysburg Dr., San Jose, Calif. 95123, and S. Scot Cheu, 3858 Heppner La., San Jose, Calif. 95136
Filed May 12, 1994, Ser. No. 241,879
Int. Cl.^{6} H01M *6/46*
U.S. Cl. 429—152 **17 Claims**



1. A battery module, comprising:
current collector spacer means;
- a first laminate having a first electrode side having a first polarity and a polymer electrolyte side, the first laminate being compressed around the spacer means such the first electrode side contacts the spacer means and a raised area and a recessed area are formed on the polymer electrolyte side; and
- a second electrode, the second electrode having a second polarity, the second electrode having first and second sides, the second electrode being received in the recessed area such that the first side of the second electrode contacts the polymer electrolyte side.

5,534,369
BATTERY HAVING DIVIDED ELECTRODE PORTIONS

Toru Nagaura, Fukuoka, Japan, assignor to Hival Ltd., Fukuoka, Japan
Filed Mar. 10, 1995, Ser. No. 402,040
Claims priority, application Japan, Mar. 10, 1994, 6-079149
Int. Cl.^{6} H01M *2/26;2/20*
U.S. Cl. 429—161 **1 Claim**



1. A battery wherein an electrode assembly comprising a positive electrode, a negative electrode and a separator sandwiched therebetween is impregnated with an electrolyte and encased in a closed container, wherein at least one of the positive electrode and the negative electrode comprising at least two divided electrode portions which contain no electrically connecting member therebetween within the closed container, each of the divided electrode

portions having an electrode lead extending outward from the closed container, the closed container having externally thereof at least two external terminals of the same polarity each provided by the electrode lead, and

wherein said at least two external terminals of the same polarity are electrically connected outside of the closed container to each other via a resistor having a Positive Temperature Coefficient (PTC) effect.

5,534,370

ORGANIC ELECTROLYTIC SOLUTION CELL

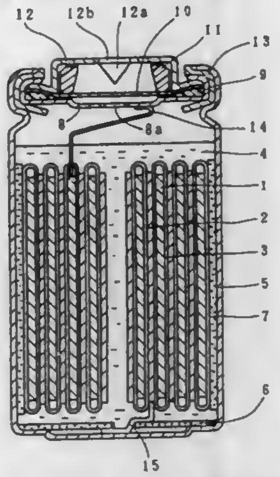
Fusaji Kita; Kouji Murakami; Masaharu Higashiguchi; Akira Kawakami, and Ginnosuke Tanaka, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka-fu, Japan

Filed Jun. 17, 1994, Ser. No. 262,317

Claims priority, application Japan, Jun. 18, 1993, 5-172333

Int. Cl.^{6} H01M *10/40*

U.S. Cl. 429—198 **17 Claims**



1. An organic electrolytic solution cell comprising a positive electrode, a negative electrode which is made of an alkali metal or a compound comprising an alkali metal and an organic electrolytic solution which contains, as an electrolyte, an organic metal salt comprising an atom selected from the group consisting of the elements of groups IIIA to VA of the Periodic Table which forms an anion center and an electron attractive organic group bonded to said atom through an oxygen atom.

5,534,371

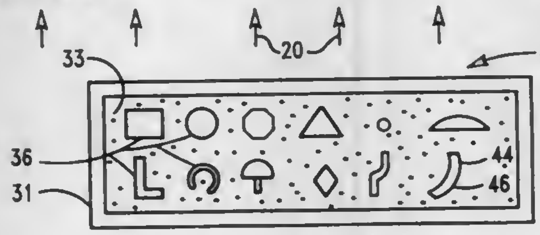
REPAIRED APERTURED LASER METAL MASK

Rajesh S. Patel, and Laertis Economikos, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1995, Ser. No. 446,355

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **22 Claims**



1. A repaired laser metal mask for use intermediate a U.V. light source, said mask comprising:

a substrate of quartz, and

at least one layer of apertured metal having a lower surface and an upper surface, wherein said lower surface is in direct contact with said substrate, said layer of apertured metal having at least one defect, wherein at least one layer of metal strip is secured over said at least one defect to at least a portion of said upper surface, such that said at least one layer of metal strip completely covers said at least one defect and prevents the penetration of said U.V. light source through said at least one defect.

5,534,372

IC CARD HAVING IMAGE INFORMATION

Kunihiro Koshizuka; Shigehiro Kitamura; Masataka Takimoto, and Tomonori Kawamura, all of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed Jul. 25, 1994, Ser. No. 279,997

Claims priority, application Japan, Jul. 28, 1993, 5-186253

Int. Cl.^{6} G03F *7/11*

U.S. Cl. 430—10 **14 Claims**

14. A card in which an IC (integrated circuit) chip is incorporated, said card comprising:

a first base board and a second base board constructed to form said card, said first base board and said second base board having a tensile elastic modulus (ASTM D790) of 210 kgf mm^{-2} to 1020 kgm mm^{-2};

an IC chip incorporated between said first base board and said second base board;

an image receiving layer onto which an ink image is transferred from an ink supply sheet by a thermal transfer method, said image receiving layer being disposed on an outside of said first base board; and

a cushion layer provided between said IC chip and said image receiving layer, said cushion layer having a tensile elastic modulus of 20 kgf mm^{-2} to 200 kgf mm^{-2}, whereby said cushion layer is softer than said first base board, thereby smoothing irregularities caused by said IC chip and improving a flatness of said image receiving layer.

5,534,373

PEEL-APART PROCESS FOR THE PRODUCTION OF A COLORED IMAGE AND IMAGED PRODUCT PRODUCED THROUGH THE PROCESS

Stephan J. W. Platzer, Califon, N.J.; Andrea Buchmann, Wiesbaden, and Gerhard Buhr, Königstein, both of, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Division of Ser. No. 288,323, Aug. 10, 1994. This application Apr. 19, 1995, Ser. No. 424,800

Claims priority, application Germany, Aug. 26, 1993, 43 28 676.3

Int. Cl.^{6} G03F *7/34*

U.S. Cl. 430—15 **20 Claims**

1. A process for the production of a colored image, comprising laminating the adhesion-promoting layer of a photosensitive material comprising

(A) a flexible transparent film support;

(B) a colored photosensitive layer on the support which contains an organic binder (B1) and a dye or a colored pigment (B2), a compound (B3), which forms a strong acid on exposure to radiation, and a compound (B4) which has at least one group cleavable by the strong acid; and

(C) an adhesion-promoting layer on the photosensitive layer which contains a thermoplastic polymer which has a softening temperature in the range from 40° to 200° C.,

under pressure and at a temperature above room temperature, with an image-receiving sheet (D),

exposing the obtained laminate imagewise through the film support (A), whereby, compound (B3) forms a strong acid and compound (B4) is cleaved by the strong acid,

developing the image by peeling off the film support together with the unexposed parts of the photosensitive layer (B) from the image-receiving sheet (D), such that the exposed parts of the photosensitive layer (B) remain O he adhesion promoting layer,

wherein the adhesion (a_1) of the unexposed photosensitive layer (B) to the adhesion-promoting layer (C) is less than the adhesion (a_2) of the adhesion-promoting layer (C) to the image-receiving sheet (D) and less than the adhesion (a_3) of the unexposed photosensitive layer (B) to the film support (A) and less than each of the cohesions of the layers (B) and (C), and

the adhesion (a_3') of the exposed photosensitive layer (B) to the film support (A) is less than the adhesion (a2) of the adhesion-promoting layer (C) to the image-receiving sheet (D) and the adhesion (a_1') of the exposed photosensitive layer (B) to the adhesion-promoting layer (C) and less than each of the cohesions of the adhesion-promoting layer (C) and of the exposed photosensitive layer (B).

5,534,374

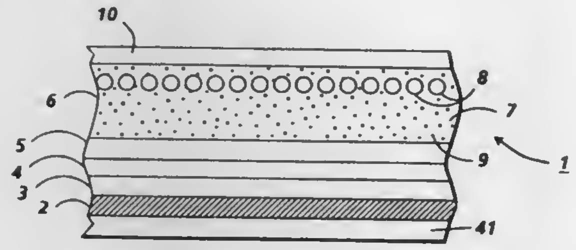
MIGRATION IMAGING MEMBERS

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1995, Ser. No. 432,380

Int. Cl.^{6} G03G *5/02*

U.S. Cl. 430—41 **39 Claims**



1. A migration imaging member comprising (a) a substrate, (b) a softenable layer situated on one surface of the substrate, said softenable layer comprising a softenable material and a photosensitive migration marking material, and (c) an antistatic layer situated on the surface of the substrate opposite to the surface in contact with the softenable layer, said antistatic layer containing an antistatic agent selected from the group consisting of amine acid salt compounds, pyrrole acid salt compounds, pyrrolidine acid salt compounds, pyridine acid salt compounds, piperidine acid salt compounds, homopiperidine acid salt compounds, quinoline acid salt compounds, isoquinoline acid salt compounds, quinuclidine acid salt compounds, indole acid salt compounds, indazole acid salt compounds, pyrimidine acid salt compounds, pyrazole acid salt compounds, oxazole acid salt compounds, isoxazole acid salt compounds, morpholine acid salt compounds, thiazole acid salt compounds, thiazolidine acid salt compounds, thiadiazole acid salt compounds, phenothiazine acid salt compounds, and mixtures thereof.

5,534,375

COMPOSITION FOR FORMING CHARGE TRANSPORT LAYER AND ELECTROPHOTOGRAPHIC MEMBER CONTAINING ALKOXYBENZENE

Susumu Kaneko; Kouji Ohkoshi; Keiichi Endo; Seiji Miyaoka; Megumi Matsui; Shigeru Hayashida; Takayuki Akimoto, and Mikio Itagaki, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,670

Claims priority, application Japan, Dec. 27, 1993, 5-329438; Dec. 27, 1993, 5-331072; Feb. 7, 1994, 6-013444

Int. Cl.^{6} G03G *5/047*

U.S. Cl. 430—58 **8 Claims**

1. An electrophotograhic member comprising an electroconductive substrate, formed thereon a charge generation layer, and formed thereon a charge transport layer, said charge transport layer containing alkoxybenzene in an amount of 0.05 to 10% by weight based on the weight of the charge transport layer.

5,534,376

TETRAFLUORO HYDROXYGALLIUM PHTHALOCYANINES AND PHOTOCONDUCTIVE IMAGING MEMBERS

James D. Mayo; James M. Duff; Gordon K. Hamer, all of Mississauga, and Sandra J. Gardner, Willowdale, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.

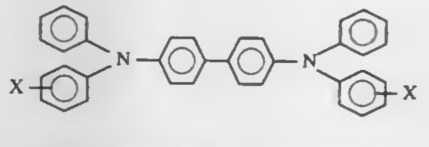
Filed Aug. 3, 1995, Ser. No. 510,726

Int. Cl.^{6} G03G *5/06;5/047*

U.S. Cl. 430—59 **20 Claims**

1. A photoconductive imaging member comprised of a supporting substrate, a photogenerating layer, and a charge transport layer, and wherein said photogenerating layer is comprised of a tetrafluoro hydroxygallium phthalocyanine.

9. A member in accordance with claim 1 wherein the charge transport layer is comprised of hole transport molecules of the formula



dispersed in a highly insulating and transparent polymer binder, wherein X is an alkyl group or a halogen.

5,534,377

NONMAGNETIC ONE-COMPONENT DEVELOPING METHOD

Masao Takano, Wheeling; Ryozo Okuno, Buffalo Grove, and Kimihiko Nakamura, Wheeling, all of Ill., assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 996,405, Dec. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 661,621, Feb. 28, 1991, abandoned. This application Nov. 28, 1994, Ser. No. 351,053

Int. Cl.^{6} G03G *13/08*

U.S. Cl. 430—102 **11 Claims**

1. A contact-type nonmagnetic one-component developing method using a developing apparatus having at least a developer carrying member and a developer layer thickness control member provided so as to be adjacent to, or to be in contact under pressure with, said developer carrying member, which comprises feeding a developer to said developer carrying member, forming a thin layer of the developer on a surface of the developer carrying member with the developer layer thickness control member with negatively charging the developer under friction, bringing the thin layer of the developer into contact with a photoconductive material holding an electrostatic latent image to develop the electrostatic latent image, and transferring the resultant developed image to an image receptor, said developer being a nonmagnetic one-component developer prepared by attaching fine particles of an additive to be positively charged to particles of a toner which is comprised mainly of a binder resin and a colorant and is to be negatively charged, said which developer being designed to be negatively charged under the friction with a hopper, the amount of fine particles of the additive being 0.05 to 3 parts by weight per 100 parts by weight of the toner.

5,534,378
CARRIERS DOUBLY COATED WITH METAL OXIDE AND INTENDED FOR ELECTRO-PHOTOGRAPHY

Jörg Adel, Ludwigshafen, and Rainer Dyllick-Brenzinger, Weinheim, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 23, 1995, Ser. No. 408,987

Claims priority, application Germany, Mar. 23, 1994, 44 09 966.5

Int. Cl.^{6} G03G *9/107;9/113*

U.S. Cl. 430—106.6 **5 Claims**

1. A carrier for electrophotography, based on magnetic cores coated with different metal oxides, which has
   A) a first layer which consists essentially of electrically insulating metal oxide and
   B) a second layer which consists essentially of a different metal oxide controlling the electrostatic charging of the toner and which does not substantially decrease the electroresistance of the carrier, which resistance is provided by the layer (A).

5,534,379
ENVIRONMENTALLY FRIENDLY TONER COMPOSITION

Edul N. Dalal, Webster; Sue E. Blaszak, Penfield; Robert L. Gruber, Pittsford; Jacques C. Bertrand, Ontario, and Roger N. Ciccarelli, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 262,170, Jun. 20, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,376

Int. Cl.^{6} G03G *9/09*

U.S. Cl. 430—106 **19 Claims**

1. A method of forming a toner composition containing a predetermined metal content, comprising:
   (a) determining a first target percentage of at least one pigment or dye containing metal in a toner composition according to a prescribed level of metal content in said toner;
   (b) determining a second target percentage of at least one metal-free pigment or dye in said toner required to provide sufficient coloration without allowing a percentage of said at least one pigment or dye containing metal to exceed said first target percentage; and
   (c) dispersing said at least one pigment or dye containing metal and said at least one metal-free pigment or dye together in a toner composition.

5,534,380
PROCESS OF FORMING A COLORED IMAGE UTILIZING AQUEOUS-PROCESSABLE IMAGING ELEMENT TONABLE AT ROOM TEMPERATURE BEFORE AND AFTER EXPOSURE TO ACTINIC RADIATION

Gregory A. Bodager, Monroeton, Pa., and Bruce M. Monroe, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 196,881, Feb. 15, 1994, Pat. No. 5,401,603, which is a continuation of Ser. No. 805,669, Dec. 12, 1991, abandoned. This application Nov. 28, 1994, Ser. No. 345,175

Int. Cl.^{6} G03F *7/11*

U.S. Cl. 430—143 **14 Claims**

1. A process for forming a colored image comprising the steps of:
   (A) imagewise exposing a tonable photosensitive element comprising:
      (1) a support, and
      (2) a tonable, aqueous-processable photosensitive layer consisting essentially of:
         (a) an aqueous-processable, photoinsolubilizable, photosensitive composition comprising a photosensitive material and
         (b) a water-soluble plasticizer, wherein said photosensitive material is present in sufficient amount to insolubilize said photosensitive layer on exposure to actinic radiation, said photosensitive composition is present in sufficient amount for form a solid layer when said photosensitive layer is coated, and said plasticizer is present in sufficient amount to make said photosensitive layer tonable at room temperature before and after exposure to actinic radiation; said photosensitive material and plasticizer being present in admixture in said photosensitive layer;
   (B) washing out the unexposed regions of the photosensitive layer with an aqueous solvent; and
   (C) applying a colorant to the photosensitive layer; wherein step (A) is carried out before step (B).

5,534,381
ACETAL POLYMERS USEFUL IN PHOTOSENSITIVE COMPOSITIONS

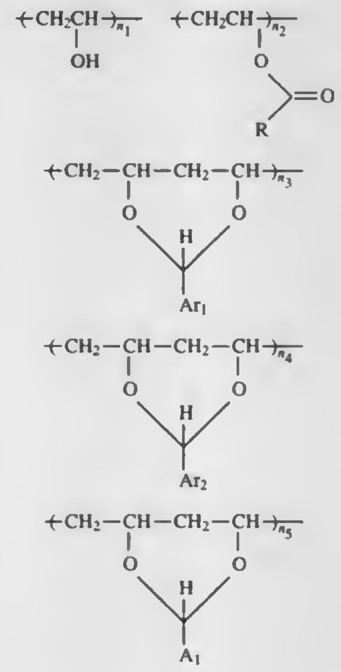
M. Zaki Ali, and Mahfuza B. Ali, both of Mendota Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 6, 1995, Ser. No. 498,881

Int. Cl.^{6} G03F *7/021;* **G03C** *1/54;1/77*

U.S. Cl. 430—156 **11 Claims**

1. A polymer having the formula:



$-(CH_2CH)_{n_1}-$
OH
$-(CH_2CH)_{n_2}-$
O
=O
R
$-(CH_2-CH-CH_2-CH)_{n_3}-$
O
H
Ar₁
$-(CH_2-CH-CH_2-CH)_{n_4}-$
Ar₂
$-(CH_2-CH-CH_2-CH)_{n_5}-$
A₁

where
- R is an alkyl group of 1 to 10 carbon atoms;
- Ar_1 is an aromatic group substituted with an aliphatic group containing 3 to 20 carbon atoms or an alkoxy group having 3 to 20 carbon atoms;
- Ar_2 is a non-substituted aromatic group;
- A_1 is an acid group;
- n_1, n_2, n_3, n_4, n_5 represent the molar percents of the respective repeating units, and
- n_1=0–20 mole %,
- n_2=2–20 mole %,
- n_3=15–85 mole %,
- n_4=0 to 40 mole %, and
- n_5=5–40 mole %.

5,534,382
POSITIVE PHOTORESIST COMPOSITION

Yasumasa Kawabe, and Kenichiro Sato, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

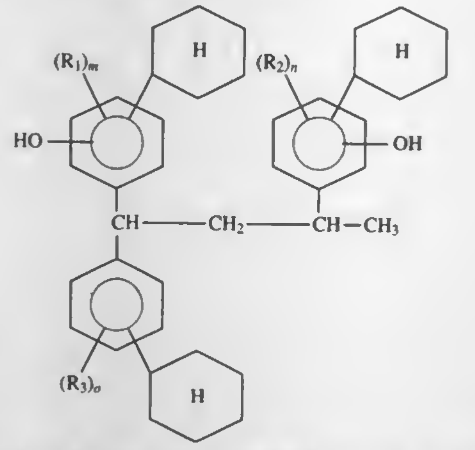
Filed Mar. 27, 1995, Ser. No. 411,209

Claims priority, application Japan, Apr. 7, 1994, 6-069710

Int. Cl.^{6} G03F *7/021;7/30*

U.S. Cl. 430—192 **6 Claims**

1. A positive photoresist composition comprising an alkali-soluble resin and a photosensitive compound in admixture, wherein the photosensitive composition is a 1,2-naphthoquinonediazido-5-(and/or -4-)sulfonic acid ester of a polyhydroxy compound, and wherein the polyhydroxy compound is represented by the following formula (I):



(I)

wherein R_1 to R_3 may be the same or different and each represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group, or an alkoxy group; and m, n and o each represent an integer of from 1 to 3.

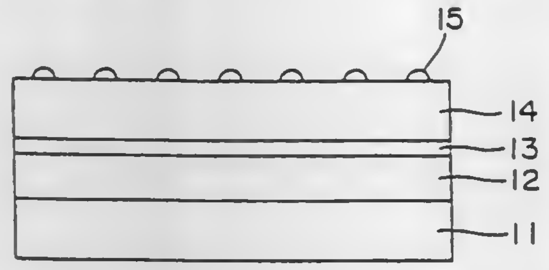
5,534,383
IMAGE TRANSFER SHEET, ITS LAMINATE AND IMAGE FORMING METHOD

Yonosuke Takahashi; Naoya Imamura; Hideyuki Nakamura, and Kouya Kawabata, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 9, 1995, Ser. No. 512,762

Int. Cl.^{6} G03C *8/42;1/76;* **G03F** *7/039*

U.S. Cl. 430—201 **10 Claims**



4. A laminate for image formation which comprises, an image transfer sheet comprising, in order, a support sheet, a light-heat conversion layer containing a light-heat conversion material which absorbs a laser light and instantly produces a heat, a heat sensitive releasing layer containing a material which produces a gas upon receiving the heat produced in the light-heat conversion layer, and an image formation layer which comprises a thermoplastic resin and a pigment, and an image receiving sheet via a thermally fusible material in the form of a large number of dots or in the form of lines to divide an interface between the image formation layer and the image receiving sheet into different areas.

5,534,384
PHOTOSENSITIVE MATERIAL FOR THE PRODUCTION OF A MULTICOLORED IMAGE

Stephan J. W. Platzer, Eltville/Erbach; Siegfried Nuernberger, Eltville/Martinsthal, and Karin Maerz, Mainz, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 19, 1993, Ser. No. 27,540

Claims priority, application Germany, Feb. 19, 1992, 42 04 950.4

Int. Cl.^{6} G03C *1/795;7/027;* **G03F** *7/34*

U.S. Cl. 430—260 **20 Claims**

1. A photosensitive material for the production of color proofing films for multicolor printing suitable for developing by a peel-apart development process, comprising:
   (A) a transparent, flexible plastic support film,
   (B) a photopolymerizable layer which comprises:
      (B1) a polymeric binder,
      (B2) a free-radically polymerizable compound,
      (B3) a compound which is capable of initiating the polymerization of (B2) on exposure to actinic light, and
      (B4) a dye or a colored pigment in a primary color of multicolor printing, and
   (C) a thermoplastic heat-activatable adhesive layer having a layer weight of from about 2 to about 30 g/m^2 on the photopolymerizable layer, which thermoplastic layer comprises from about 0.01 to about 0.5% by weight of a transparent, colorless pigment having a mean particle size of from about 1 to less than 100% of the adhesive layer thickness,

   wherein said photopolymerizable layer exhibits an adhesion change upon development, such that in exposed areas said photopolymerizable layer adheres more strongly to said support film, and in unexposed areas said photopolymerizable layer adheres more strongly to said adhesive layer.

5,534,385
OVERCOAT FOR OPTICAL TAPE HAVING SBINSN RECORDING LAYER

Robert G. Spahn, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1995, Ser. No. 416,105

Int. Cl.^{6} G11B *7/24;7/26*

U.S. Cl. 430—270.13 **4 Claims**

1. A flexible optical recording element comprising a flexible support having thereon, in order, an SbInSn phase-change alloy optical recording layer and an overcoat layer, the overcoat layer being a silicon oxide layer having an index of refraction greater than about 1.8 at about 800 nm wavelength and a thickness of about $\lambda/4$, where λ is the wavelength at which the element is read.

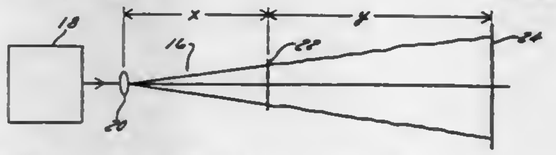
5,534,386
HOMOGENIZER FORMED USING COHERENT LIGHT AND A HOLOGRAPHIC DIFFUSER

Joel Petersen, Valley Village, and Jeremy Lerner, Culver City, both of Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Continuation of Ser. No. 97,953, Jul. 27, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,050

Int. Cl.^{6} G03H *1/32;* **G02D** *51/32*

U.S. Cl. 430—320 **23 Claims**



18. A process for making a homogenizer comprising:
   A. generating random disordered non-planar speckle in a photosensitive medium having a refractive index by exposing said

photosensitive medium with coherent light, said coherent light having been diffused through a master holographic diffuser, so as to define non-discontinuous and smoothly varying changes in said refractive index of said photosensitive medium, said non-discontinuous and smoothly varying changes scattering collimated light into a controlled pattern with smooth brightness variation;

B. developing said photosensitive medium to form a micro-sculpted surface structure that (i) controls the direction in which light propagates and (ii) homogenizes light with directionality;

C. placing a release agent on said micro-sculpted surface structure so as to form a release coating; and

D. making a replica of said micro-sculpted surface structure formed in said photosensitive medium by coating a substrate with an epoxy, placing said epoxy against said release coating, curing said epoxy, and separating said epoxy from said release coating,

wherein light scattered from said replica of said micro-sculpted surface structure is characterized by said random, disordered and non-planar speckle.

5,534,387

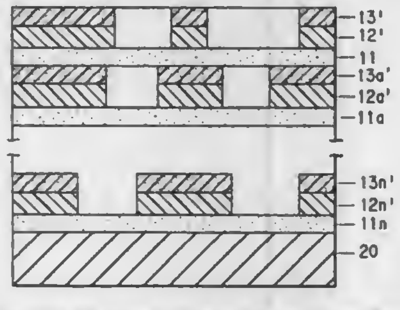
TRANSFER PROCESS FOR FORMING A COLORED IMAGE UTILIZING A NON-PHOTOSENSITIVE/ PHOTOSENSITIVE COMBINATION

Gregory A. Bodager, Monroeton, Pa., and Phillip L. Beighle, Colts Neck, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1994, Ser. No. 315,739

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—325 **26 Claims**



1. A process for forming a colored image comprising, in order:

(A) applying at least one aqueous-permeable, colorant-containing composition to a photosensitive element comprising, in order,

(1) a carrier element having a release surface, said carrier element being resistant to aqueous liquid development,

(2) a first adhesive layer,

(3) an unpigmented, first photosensitive layer consisting essentially of a photosensitive composition which is developable by aqueous liquid which is selected from water or an aqueous solution that consists essentially of water, wherein the aqueous-permeable, colorant-containing composition is applied to said first photosensitive layer;

(B) imagewise exposing to actinic radiation the photosensitive element from step (A) having applied thereon the permeable, colorant-containing composition to form imagewise exposed and unexposed regions in the unpigmented, first photosensitive layer and the overlying permeable, colorant-containing composition;

(C) developing the exposed element from step (B) by washing with an aqueous liquid, thereby removing either the imagewise exposed or imagewise unexposed regions of the unpigmented first photosensitive layer and its overlying aqueous-permeable, colorant-containing layer, to produce a first colored pattern;

(D) laminating to the element from step (C) a transfer element having a release surface, wherein the release surface is adjacent to the first colored pattern in the element from step (C);

(E) removing said carrier element having a release surface, revealing the adhesive layer;

(F) laminating the element from step (E) to a permanent support, wherein the adhesive layer is adjacent to the permanent support; and

(G) removing said transfer support having a release surface; wherein the adhesion force between the release surface of said carrier element and said adhesive layer has a value of F1; the adhesion force between said adhesive layer and said first colored pattern has a value of F2; the adhesion force between said first colored pattern and said release surface of said transfer support has a value of F3; and the adhesion force between said adhesive layer and said permanent support has a value of F4; and wherein

each of F2 and F3 is greater than F1, and

each of F2 and F4 is greater than F3.

5,534,388

PROCESS FOR GENERATION OF ACID AND FOR IMAGING, AND IMAGING MEDIUM FOR USE THEREIN

Jurgen M. Grasshoff, Hudson; John L. Marshall, Somerville; Richard A. Minns, Arlington; Mark R. Mischke, Arlington; Anthony J. Puttick, Arlington; Lloyd D. Taylor, Lexington, and Stephen J. Telfer, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 319,925, Oct. 7, 1994, Pat. No. 5,445,917, which is a division of Ser. No. 141,860, Oct. 22, 1993, Pat. No. 5,395,736, which is a continuation-in-part of Ser. No. 965,162, Oct. 23, 1992, Pat. No. 5,334,489. This application Mar. 20, 1995, Ser. No. 407,576

Int. Cl.^{6} G03C *1/725;1/73;1/735;5/00*

U.S. Cl. 430—338 **8 Claims**

1. An imaging medium comprising:

a superacid precursor capable of generating a superacid upon exposure to actinic radiation;

a secondary acid generator capable of undergoing thermal decomposition to produce a secondary acid, the thermal decomposition of the secondary acid generator being catalyzed by the superacid; and

an acid-sensitive material which changes color in the presence of the secondary acid liberated when the secondary acid generator is decomposed.

5,534,389

PROCESSING METHOD OF BLACK-AND-WHITE LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PROCESSING AGENT FOR THE SAME

Takeo Arai; Tadashi Sekiguchi; Takeshi Habu; Shiyouji Nishio; Hiroyuki Usiroyama; Kenichi Tanaka, and Akira Kobayashi, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 888,876, May 26, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,270

Claims priority, application Japan, May 31, 1991, 3-129389; Jul. 18, 1991, 3-178438

Int. Cl.^{6} G03C *3/00;5/18;5/26;5/38*

U.S. Cl. 430—401 **12 Claims**

1. A method for processing an exposed black-and-white light-sensitive silver halide photographic material containing a tetrazolium compound or a hydrazine compound, which method comprises:

developing said photographic material with a developing solution,

wherein said developing solution is prepared from a processing agent which is in granule or tablet form,

said processing agent comprising a mixture of a polyhydroxybenzene and at least one compound selected from the group consisting of 1-phenyl-3-pyrazolidone, 1-phenyl-4,4-dimethyl- 3-pyrazolidone, 1-phenyl-4-methyl-4-

hydroxymethyl-3-pyrazolidone, 1-phenyl-4,4-dihydroxymethyl-3-pyrazolidone and N-methyl-p-aminophenol sulfate, and containing water in an amount of 2000% by weight or less based on an amount of said polyhydroxybenzene.

5,534,390

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Nobuo Seto; Yasuhiro Yoshioka, and Masakazu Morigaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

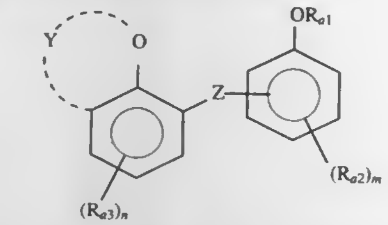
Continuation-in-part of Ser. No. 337,472, Nov. 8, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 478,770

Claims priority, application Japan, Nov. 12, 1993, 5-305999

Int. Cl.^{6} G03C *7/392*

U.S. Cl. 430—551 **18 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one layer containing at least one compound represented by formula (A)



(A)

wherein R_{a1} represents a hydrogen atom, an aliphatic group, an aliphatic acyl group, an arylacyl group, or an aliphatic sulfonyl group, or an arylsulfonyl group; R_{a2} represents a substituent; R_{a3} represents an aliphatic group, an aryl group, a carbamoyl group, a sulfamoyl group, an aliphatic oxycarbonyl group, an aryloxycarbonyl group, an aliphatic oxy group, an aryloxy group, an aliphatic thio group, an arylthio group, an aliphatic sulfonyl group, an arylsulfonyl group, an aliphatic amino group, an arylamino group, an aliphatic acylamino group, an arylacylamino group, an aliphatic oxycarbonylamino group, an aryloxycarbonylamino group, or a halogen atom; Y represents a non-metallic atomic group necessary for forming a coumaran ring or a chroman ring together with the oxygen atom; Z represents a single bond, an oxygen atom, a sulfur atom, or —C(R_{a4})(R_{a5})—, wherein R_{a4} and R_{a5}, which may be the same or different, each represents a hydrogen atom, an aliphatic group, or an aryl group; m represents an integer of from 0 to 4; n represents an integer of from 0 to 3; when m is 2 or more, plural R_{a2}''s may be the same or different; when n is 2 or more, plural R_{a3}'s may be the same or different; and when n is 2 or more, plural R_{a3}'s in the ortho-position may combine with each other, with the proviso that R_{a1} and R_{a2} do not combine with each other and when m is 2 or more, plural R_{a2}'s do not combine with each other.

5,534,391

AZIRIDINE PRIMER FOR FLEXOGRAPHIC PRINTING PLATES

Paul J. Wang, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 28, 1994, Ser. No. 189,075

Int. Cl.^{6} G03C *1/73*

U.S. Cl. 430—271.1 **4 Claims**

1. A flexible plate comprising

a flexible substrate primed with an aziridine functional material, and contacting the primed substrate,

a first photosensitive layer which comprises a substantially polar acrylate compound, an elastomeric block copolymer, and a photoinitiator, and

a second photosensitive layer over the first photosensitive layer, the second photosensitive layer being applied to the first photosensitive layer after the first photosensitive layer is cured by exposure to radiation wherein the second photosensitive layer comprises an acrylate compound, an elastomeric block copolymer, and a photoinitiator and the acrylate compound of the second photosensitive layer is polybutadiene diacrylate.

5,534,392

PROCESS FOR ELECTROPHOTOGRAPHIC IMAGING WITH LAYERED LIGHT RECEIVING MEMBER CONTAINING A-SI AND GE

Shigeru Shirai, Nagahama, and Shigeru Ohno, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 942,820, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 754,250, Aug. 26, 1991, abandoned, which is a continuation of Ser. No. 580,327, Sep. 10, 1990, abandoned, which is a division of Ser. No. 459,288, Dec. 29, 1989, abandoned, which is a division of Ser. No. 210,223, Jun. 23, 1988, Pat. No. 4,911,998, which is a division of Ser. No. 11,505, Feb. 5, 1987, Pat. No. 4,818,651. This application Jun. 21, 1994, Ser. No. 263,407

Claims priority, application Japan, Feb. 7, 1986, 61-23691; Feb. 13, 1986, 61-27900; Feb. 13, 1986, 61-27901; Feb. 13, 1986, 61-27902; Feb. 20, 1986, 61-33923; Feb. 20, 1986, 61-33924; Feb. 24, 1986, 61-37357

Int. Cl.^{6} G13G *13/04*

U.S. Cl. 430—31 **3 Claims**

1. An electrophotographic process comprising the steps of:

(a) charging a light receiving member comprising a substrate and a light receiving layer disposed on said substrate; said light receiving layer comprising:

(a) a 1 to 100 μm thick first layer having photoconductivity formed directly on said substrate; and

(b) a 0.003 to 30 μm thick second layer having an insulating property in sequence from the side of the substrate, said second layer having a free surface;

said first layer (i) consisting essentially of (i-1) an amorphous material containing silicon atoms, (i-2) 1 to 6×10^5 atomic ppm of germanium atoms, (i-3) at least one kind of atom selected from the group consisting of hydrogen atoms and halogen atoms in a total amount of 0.01 to 40 atomic %, and (i-4) a conductivity controlling element selected from the group consisting of B, Al, Ga, In and Tl of Group III or a conductivity controlling element selected from the group consisting of P, As, Sb and Bi of Group V of the Periodic Table, wherein said germanium atoms being so distributed in the thickness direction that the concentration thereof is enhanced at the position adjacent to the substrate and the concentration thereof is reduced or made substantially zero at the position adjacent to the interface with said second layer (ii); wherein said second layer (ii) comprises a second amorphous material containing (ii-1) silicon atoms, (ii-2) 0.001 to 90 atomic % of carbon atoms, (ii-3) at least one kind of atom selected from the group consisting of oxygen atoms and nitrogen atoms, said at least one kind of atom being uniformly distributed in the direction of thickness of said second layer and (ii-4) 1.0 to 1×10^4 atomic ppm of an atom selected from the group consisting of B, Al, Ga, In and Tl belonging to Group III or an atom selected from the group consisting of P, As, Sb and Bi belonging to Group V of the Periodic Table; and

(b) irradiating said light receiving member with an electromagnetic wave carrying information thereby forming an electrostatic image.

5,534,393

PROCESS FOR THERMOCHEMICAL GENERATION OF ACID AND FOR THERMAL IMAGING

Roger A. Boggs, Wayland; Jurgen M. Grasshoff, Hudson; Mark R. Mischke, Arlington; Anthony J. Puttick, Arlington; Stephen J. Telfer, Arlington; David P. Waller, Lexington, and Kenneth C. Waterman, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 106,353, Aug. 13, 1993, Pat. No. 5,401,619, which is a division of Ser. No. 965,172, Oct. 23, 1992, Pat. No. 5,278,031. This application Nov. 28, 1994, Ser. No. 345,073

Int. Cl.^{6} G03C *5/16*

U.S. Cl. 430—348 **13 Claims**

1. A process for imaging, which process comprises heating an acid generator for a temperature and time sufficient to produce an acid from the acid generator, the heating being effected in the presence of an acid-sensitive material which changes color in the presence of the acid produced from the acid generator, the acid generator and acid-sensitive material, prior to the heating, being in admixture with an amount of a basic material insufficient to neutralize all the acid liberated by the acid generator during the heating, so that the acid liberated by the acid generator during the heating neutralizes all of the basic material and leaves excess acid sufficient to effect the color change of the acid-sensitive material.

2. A process for imaging, which process comprises heating an acid generator for a temperature and time sufficient to produce an acid from the acid generator, the heating being effected in the presence of an acid-sensitive material which undergoes an irreversible color change in the presence of the acid produced during the heating, such that neutralization of the acid after the heating will not reverse the color change.

5,534,394

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takatoshi Ishikawa; Shinji Ueda; Hirotomo Sasaki, and Tetsuro Kojima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 41,897, Apr. 2, 1993, abandoned, which is a continuation of Ser. No. 630,616, Dec. 20, 1990, abandoned. This application Nov. 1, 1994, Ser. No. 331,876

Claims priority, application Japan, Dec. 21, 1989, 1-332148

Int. Cl.^{6} G03C *7/42*

U.S. Cl. 430—393 **12 Claims**

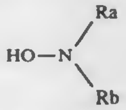
1. A method for processing a silver halide color photographic material comprising color developing and bleach-fixing said photographic material, wherein said bleach-fixing step is performed with a bleach-fixer comprising:

(1) thiosulfate,

(2) at least one compound represented by formula (I) indicated below,

(3) an adduct of bisulfite with at least one type of compound selected from the group consisting of compounds represented by formulae (A), (B), (C) and (D) indicated below, and

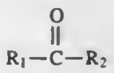
(4) a bleaching agent; wherein compounds of formula (I) are represented by the following:



$$\mathrm{HO{-}N}\!<^{Ra}_{Rb} \qquad (I)$$

wherein Ra and Rb each independently represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or a heterocyclic group, provided that Ra and Rb are not both at the same time hydrogen atoms;

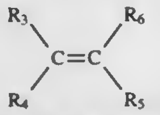
compounds of formula (A) are represented by the following:



$$R_1-\overset{\overset{\displaystyle O}{\|}}{C}-R_2 \qquad (A)$$

wherein R_1 represents a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group, and R_2 represents an alkyl group, an aryl group or a heterocyclic group, provided that R_1 and R_2 do not combine to form a ring;

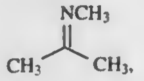
compounds of formula (B) are represented by the following:



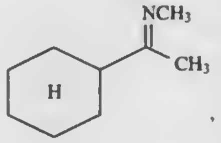
(B)

wherein R_3, R_4 and R_5 each independently represents a hydrogen atom, an alkyl group, an alkenyl group, an aralkyl group, a cycloalkyl group, an aryl group, a heterocyclic group, a carboxylic acid group, an ester group, an acyl group, a halogen atom, an ether group, sulfo groups or salts thereof, a sulfinyl group, a sulfonyl group, a cyano group, a nitro group, a carbamoyl group or a sulfamoyl group, and R_6 represents an electron attractive group selected from the group consisting of a nitro group, a cyano group, a sulfonyl group and an acyl group;

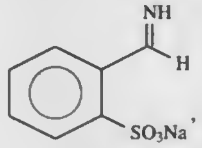
compounds of formula (C) are selected from the group consisting of:



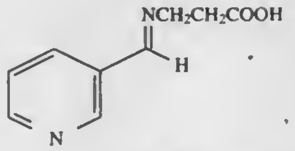
C-1



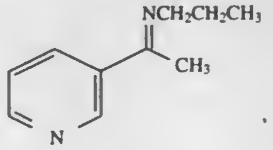
C-2



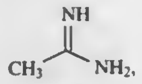
C-3



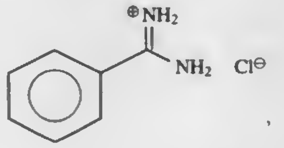
C-4



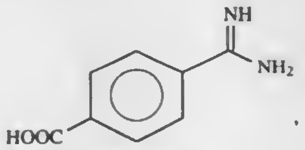
C-5



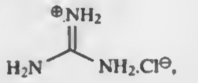
C-6



C-7



C-8



C-9

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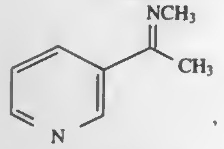
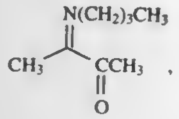
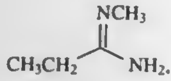


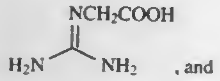
C-10



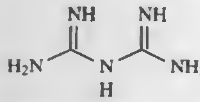
C-11



C-14

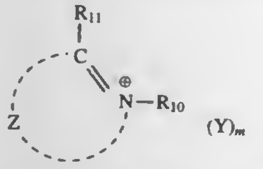


C-15



C-16

compounds of formula (D) are represented by the following:



(D)

wherein R_{10} represents an alkyl group, an alkenyl group, an aralkyl group, a cycloalkyl group, an aryl group, a heterocyclic group or a hydrogen atom, R_{11} represents an alkyl group, an alkenyl group, an aralkyl group, a cycloalkyl group, an aryl group, a heterocyclic group, a hydrogen atom, a halogen group, an ether group, a carboxyl group, an acyl group, a cyano group, a sulfo group, a carbamoyl group, a nitro group, a dialkylamino group or an ester group, Z is selected from the group consisting of an imidazolium ring, a benzimidazolium ring, and a quinolinium ring, Y represents an anion, m represents 0 or 1, and R_{10} can be bonded to an atom in Z to form a ring; and

wherein the thiosulfate is added to the bleach-fixer in an amount of from 0.1 to 2 mol/l, the at least one compound represented by formula (I) is added to the bleach-fixer in an amount of from 0.1 to 20 g/l, the at least one type of compound selected from among the group of compounds represented by formulae (A), (B), (C) or (D) is added to the bleach-fixer in an amount of from 0.01 to 1.0 mol/l and the amount of the bleaching agent added to the bleach-fixer is 0.05 to 1.0 mol/l.

5,534,395

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Katsushige Kamada, and Kazuaki Yoshida, both of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

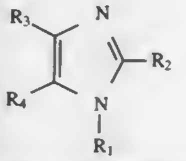
Filed Jun. 6, 1995, Ser. No. 472,047

Claims priority, application Japan, Jun. 9, 1994, 6-150647; Aug. 11, 1994, 6-298002

Int. Cl.^{6} G03C *7/00;5/38;11/00;5/18*

U.S. Cl. 430—400 **17 Claims**

1. A method of processing a silver halide color photographic material by processing with a color developing solution an imagewise exposed silver halide color photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer containing silver halide and a color dye forming coupler, and immediately thereafter processing said photographic material with a bleach-fixing solution, wherein said bleach-fixing solution contains an imidazole compound represented by the following formula (α) and the replenishment rate of said bleach-fixing solution is 200 ml or less per m^2 of the photographic material:



(α)

wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a hydroxyalkyl group having from 1 to 5 carbon atoms, or an alkenyl group.

5,534,396

RINSE COMPOSITION FOR PHOTOGRAPHIC PAPER CONTAINING ALKYL ETHER SULFATE AND BIOCIDE, AND METHOD OF USE

Hugh G. McGuckin, Rochester; Jerel R. Carli, Penfield; John S. Badger, Webster, and Stephen J. Waffle, Ontario, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 9, 1994, Ser. No. 336,431

Int. Cl.^{6} G03C *5/39*

U.S. Cl. 430—463 **17 Claims**

1. A photographic paper rinse composition having a pH of from about 4 to about 9 and comprising:

a vinyl pyrrolidone polymer,

at least about 0.02 g/l of a biocide mixture comprising 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazoline-3-one,

a source of at least about 0.3 ppm cupric ion, and

at least about 0.02 g/l of an alkyl ether sulfate surfactant having the structure (I);

$$R—O—(—R'—O—)_n—O_3M$$

wherein R is a branched or linear alkyl group of 6 to 14 carbon atoms, R' is wthylene, M is hydrogen, an alkali metal or ammonium ion, and n is 2 to 20.

5,534,397

ELECTRON BEAM RECORDING FILM WITH LOW VISUAL AND ULTRAVIOLET DENSITY

Charles C. Anderson, Penfield; David A. Niemeyer, Rochester, and David F. Jennings, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 241,823, May 12, 1994, abandoned. This application May 18, 1995, Ser. No. 443,638

Int. Cl.^{6} G03C *1/85;1/76*

U.S. Cl. 430—530 **18 Claims**

1. An imaging element for use in an electron-beam-recording process in which said element is introduced into a vacuum chamber, imagewise exposed within said vacuum chamber to an electron beam, and then processed to form a visible image; said element comprising a polyester film support having, in order, on one side thereof a conductive layer having electrical conductivity sufficient to serve as a ground plane in said electron-beam-recording process, a barrier layer, an adhesion-promoting hydrophilic colloid layer, and an imaging layer; said conductive layer comprising vanadium pentoxide, said barrier layer serving to prevent dissolution of said vanadium pentoxide during processing of said element, and said imaging layer comprising an electron-beam-sensitive silver halide emulsion, said vanadium pentoxide being present in said conductive layer in an amount sufficient to impart thereto a resistivity of less than 5×10^8 ohms/square, and said imaging element having a visible D_{min} of no greater than 0.07 density units and an ultraviolet D_{min} of no greater than 0.12 density units.

5,534,398

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING EMULSION LAYER CONTAINING COLOR COUPLER

Tomokazu Yasuda; Yukio Karino; Seiya Sakurai, and Masataka Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

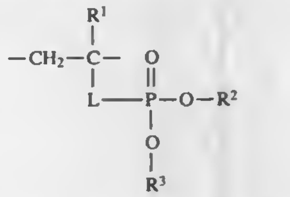
Filed Jul. 12, 1995, Ser. No. 501,496

Claims priority, application Japan, Jul. 12, 1994, 6-160144

Int. Cl.^{6} G03C *7/388;7/396*

U.S. Cl. 430—545 **10 Claims**

1. A silver halide photographic material comprising at least one silver halide emulsion layer containing a color coupler provided on a support, wherein the color coupler is present in particles of a polymer dispersed in the silver halide emulsion layer, said polymer comprising repeating units represented by the formula (I):



(I)

in which R^1 is a hydrogen atom, a halogen atom or an alkyl group having 1 to 4 carbon atoms, each of R^2 and R^3 independently is an aliphatic group or an aromatic group, or R^2 and R^3 are combined with the oxygen atoms and the phosphorus atom to form a heterocyclic ring; and L is a divalent linking group selected from the group consisting of —CO—, —O—, —S—, —NR^4—, —SO_2—, a divalent aliphatic group, a divalent aromatic group and a combination thereof, and R_4 is a hydrogen atom or an aliphatic group.

5,534,399

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Keiji Mihayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 204,889, Mar. 2, 1994, abandoned, which is a continuation of Ser. No. 683,152, Apr. 10, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 329,135

Claims priority, application Japan, Apr. 12, 1990, 2-96757

Int. Cl.^{6} G03C *1/035;7/333*

U.S. Cl. 430—553 **15 Claims**

1. A silver halide color photographic photosensitive material comprising a support having thereon at least one hydrophilic colloid layer, at least one layer of which is a photosensitive silver halide emulsion layer, wherein at least 50% of the total projected area of the silver halide grains constituting the at least one silver halide emulsion layer is accounted for by silver iodobromide tabular hexagonal grains having two parallel planes as outer surfaces, and the ratio of the length of the side having the shortest length to the length of the side having the longest length is not more than 2 and having an average aspect ratio of at least 2:1 and a silver iodide content of 4 to 12 mol %, and the relative standard deviation of the silver iodide content between the tabular silver iodobromide grains is not more than 20%, and a yellow colored cyan coupler is contained in at least one hydrophilic colloid layer, wherein the yellow colored cyan coupler is a cyan coupler which upon coupling with the oxidized form of a primary aromatic amine developing agent releases a residual compound containing a water-soluble 6-hydroxy-2-pyridon-5-ylazo group, a water-soluble 2-acylaminophenylazo group, or a water-soluble 2-sulfonamidophenylazo group.

5,534,400

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeto Hirabayashi, and Shuichi Sugita, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

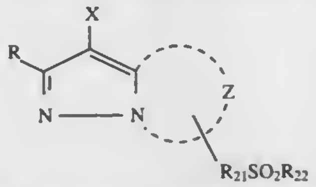
Continuation-in-part of Ser. No. 109,533, Aug. 20, 1993, abandoned. This application Jan. 5, 1995, Ser. No. 368,880

Claims priority, application Japan, Aug. 24, 1992, 4-245936; Aug. 24, 1992, 4-245937

Int. Cl.^{6} G03C *1/08;7/26;7/32*

U.S. Cl. 430—558 **5 Claims**

1. A silver halide color photographic light-sensitive material comprising a support and a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein the green-sensitive silver halide emulsion layer contains a coupler of formula M-XI:



M-XI

wherein R represents a primary alkyl group having 5 or more carbon atoms; X represents a hydrogen atom or a substituent which splits off upon reaction with the oxidation product of a color developing agent; Z represents a group of non-metal atoms necessary to form a nitrogen-containing heterocyclic ring; R21 represents an alkylene or alkenylene group having a primary carbon bound directly to Z; R22 represents an alkyl group, an alkenyl group, a cycloalkyl group or an aryl group.

5,534,401

RETOUCHABLE REVERSAL SILVER HALIDE PHOTOGRAPHIC ELEMENT WITH A PYRAZOLOAZOLE MAGENTA DYE-FORMING COUPLER

J. R. Vargas, Webster; John W. Harder, Rochester; Phillip D. Knight, Fairport; Paul A. Burns, and Lynda D. Weber, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 154,839, Nov. 19, 1993, abandoned, which is a division of Ser. No. 872,473, Apr. 23, 1992, Pat. No. 5,296,337. This application Mar. 1, 1995, Ser. No. 396,836

Int. Cl.^{6} G03C *1/08;7/26;7/32*

U.S. Cl. 430—558 **7 Claims**

1. A light sensitive reversal photographic element comprising a support bearing a silver halide emulsion associated with a pyrazoloazole magenta dye-forming coupler having the structure:

$$\text{Bal-P}_1 \qquad \text{I.}$$

where:

P_1 is a pyrazoloazole dye forming coupler moiety, and

Bal is an organic ballast group

a) which is attached to the coupler at a position other than the coupling position,

b) which immobilizes the coupler and the dye formed from the coupler on color development,

c) which is not cleavable from the coupler by reversal color photographic processing, but

d) which is cleavable from the dye by reaction with a dinucleophile to thereby render the dye mobile.

5,534,402

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Koichi Kuno, and Jiroyuki Mifune, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1994, Ser. No. 355,024

Claims priority, application Japan, Dec. 13, 1993, 5-311955

Int. Cl.^{6} G03C *1/485*

U.S. Cl. 430—596 **8 Claims**

1. A direct-positive silver halide photographic material comprising a support having thereon at least one prefogged light-sensitive silver halide emulsion layer, wherein said silver halide emulsion layer contains a silver halide emulsion which has been previously fogged with a gold compound and a tellurium compound.

5,534,403

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Junji Nishigaki, and Takashi Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

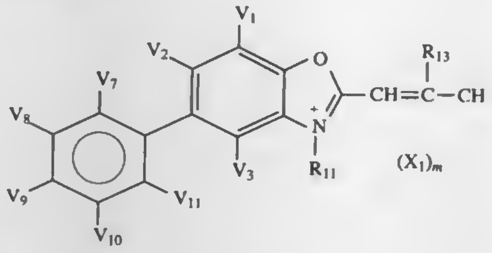
Filed Apr. 15, 1994, Ser. No. 228,200

Claims priority, application Japan, Apr. 16, 1993, 5-112504

Int. Cl.^{6} G03C *1/18*

U.S. Cl. 430—585 **18 Claims**

1. A silver halide photographic material comprising a support and having thereon at least one silver halide photographic emulsion layer and containing at least one compound represented by the following formula (I):



wherein

R_{11} and R_{12} are the same or different and each represents an alkyl group;

R_{13} represents a hydrogen atom, an alkyl group or an aryl group;

V_1, V_2, V_3, V_4, V_5, V_6, V_8, V_9, V_{10}, V_{11} and W_{01} are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 5 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms, an aryloxy group having from 6 to 10 carbon atoms, a halogen atom or a trifluoromethyl group;

V_7 represents an alkyl group having from 1 to 5 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms, an aryloxy group having from 6 to 10 carbon atoms, a halogen atom or a trifluoromethyl group;

X_1 represents a charge-neutralizing counter ion; and

m represents a number of 0 or more necessary for neutralizing the molecular charge.

5,534,404

GLUCOSE RESPONSIVE INSULIN SECRETING β-CELL LINES AND METHOD FOR PRODUCING SAME

Megan E. Laurance, Portland, Oreg.; David Knaack, Chepachet, R.I.; Deborah M. Flore, Swansea, Mass., and Orion D. Hegre, Chepuchet, R.I., assignors to CytoTherapeutics, Inc., Providence, R.I.

Continuation of Ser. No. 165,088, Dec. 10, 1993. This application Mar. 10, 1994, Ser. No. 208,873

Int. Cl.^{6} C12N *5/06;5/08;* **C12Q** *1/54;* **C12P** *21/00*

U.S. Cl. 435—3 **11 Claims**

1. A method of selecting correctly regulated β-cells comprising the following steps:

(a) providing a population of cells from a β-cell line that includes cells in which increased intracellular concentrations of calcium ions is correlated with the extracellular presence of glucose;

(b) exposing the population to a first concentration of glucose between about 3 mM to 10 mM, said first concentration being sufficient to result in secretion of insulin;

(c) exposing the population to a second concentration of glucose that is higher than said first concentration; and

(d) selecting from the population, cells which exhibit a higher level of intracellular free calcium or insulin secretion when exposed to said second concentration compared to said first concentration to obtain correctly regulated β-cells.

5,534,405

ANTIBODIES, DIAGNOSTIC SYSTEMS AND METHODS FOR ASSAYING HBXAG

Ann M. Moriarty, Poway, Calif.; Hannah Alexander, Columbia, Mo., and Richard A. Lerner, La Jolla, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 976,529, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 553,982, Jul. 17, 1990, Pat. No. 5,183,734, which is a division of Ser. No. 54,424, May 26, 1987, Pat. No. 4,942,125, which is a continuation-in-part of Ser. No. 648,142, Sep. 7, 1984, Pat. No. 4,777,240, which is a continuation-in-part of Ser. No. 587,570, Mar. 8, 1984, abandoned. This application Nov. 18, 1994, Ser. No. 342,374

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **16 Claims**

1. A receptor molecule that includes an antibody combining site that specifically binds both with HBxAg and with an antigenic synthetic polypeptide selected from the group consisting of polypeptides represented by the formulae:

(a) Leu-Ser-Ala-Met-Ser-Thr-Thr-Asp-Leu-Glu-Ala-Tyr-Phe-Lys-Asp-Cys;

(b) Cys-Leu-Phe-Lys-Asp-Trp-Glu-Glu-Leu-Gly-Glu-Glu-Ile-Arg-Leu-Lys-Val; and

(c) Ala-Pro-Ala-Pro-Cys-Asn-Phe-Phe-Thr-Ser-Ala,

wherein said receptor molecule is an antibody, a substantially whole antibody, a Fab fragment, or a $(Fab')_2$ fragment.

5,534,406

METHOD OF DETECTING ANTIGENIC NUCLEIC ACID-CONTAINING MACROMOLECULAR ENTITIES

Tsanyang Liang, Brookline, and Jack R. Wands, Waban, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 701,148, May 17, 1991, which is a division of Ser. No. 262,347, Oct. 25, 1988, Pat. No. 5,077,192. This application Mar. 2, 1994, Ser. No. 204,885

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **3 Claims**

1. A method for the detection or identification of an antigenic, nucleic acid-containing virus present at dilute level in a biological sample, wherein said virus is selected from the group consisting of hepatitis virus, picornavirus, retrovirus, reovirus, togavirus, orthomyxovirus, paramyxovirus, rhabdovirus, arenavirus, coronavirus, bunyavirus, papovirus, parvovirus, adenovirus, herpetovirus, and poxvirus, which comprises the steps of:

a. affinity capturing whole virus from said biological sample being tested, thereby concentrating said whole virus;

b. denaturing said whole virus to yield a mixture of antigen and nucleic acid; and

c. directly amplifying denatured nucleic acid sequences specific to said virus present in said mixture, thereby detecting or identifying said virus.

5,534,407

METHOD FOR NUCLEIC ACID HYBRIDIZATION USING SINGLE-STRANDED DNA BINDING PROTEIN

Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnnt Hill, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 826,955, Jan. 28, 1992, abandoned. This application Apr. 18, 1994, Ser. No. 229,396

Int. Cl.^{6} C12Q *1/70;1/68*

U.S. Cl. 435—5 **6 Claims**

1. A method for hybridization of nucleic acids to detect the presence of a nucleic acid sequence in a sample comprising a population of different nucleic acid sequences using a nucleic acid probe, wherein said nucleic acid probe hybridizes under hybridizing conditions with said nucleic acid sequence but does not hybridize to said different nucleic acid sequences in said population under said conditions, comprising the steps of:

contacting a sample comprising the population of different nucleic acid sequences, and potentially comprising the presence of said nucleic acid sequence, with said nucleic acid probe under hybridizing conditions in the presence of a T-7 type single stranded DNA binding protein which in the absence of nucleoside triphosphates stimulates greater than 500 fold the renaturation of an M13mGP1-2 single stranded DNA molecule with 1.0 fmole of a 167mer fragment generated from the primer, SEQ ID NO:1, and an M13mGP1-2 template, and

detecting hybridization of said probe with said nucleic acid sequence whereby the presence of said nucleic acid sequence in said sample.

5,534,408

2-DEOXYSTREPTAMINE AMINOGLYCOSIDE INHIBITION OF HIV RRE/REV BINDING

Michael R. Green; Maria L. Zapp, both of Boylston, and Seth Stern, Sterling, all of Mass., assignors to University Of Massachusetts Medical Center, Worcester, Mass.

Continuation-in-part of Ser. No. 965,341, Oct. 23, 1993, abandoned. This application Sep. 24, 1993, Ser. No. 126,236

Int. Cl.^{6} C12Q *1/70;1/68*

U.S. Cl. 435—5 **54 Claims**

1. A method for inhibiting HIV Rev protein binding to RNA containing a Rev-responsive element in vitro, comprising contacting the RNA with a 2-deoxystreptamine aminoglycoside that binds directly to the RNA, thereby inhibiting HIV Rev protein binding to the Rev-responsive element, wherein one or more amino groups of the 2-deoxystreptamine aminoglycoside are functionalized with modifying groups whose combined molecular weight is less than 500 daltons.

5,534,409

CYTOKINE REGULATED TRANSCRIPTION FACTOR

Bernd Groner, Basel, Switzerland; Fabrice Gouilleux, Mulhouse, France, and Hiroshi Wakao, Palo Alto, Calif., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Dec. 29, 1994, Ser. No. 366,276

Claims priority, application England, May 11, 1994, 9409396

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **5 Claims**

1. An isolated DNA encoding mammary gland growth factor (MGF) consisting of the amino acid sequence set forth in SEQ ID NO: 2.

5,534,410

TATA-BINDING PROTEIN ASSOCIATED FACTORS DRUG SCREENS

Robert Tjian, Berkeley; Lucio Comai, El Corrito, both of Calif.; Brian D. Dynlacht, Charlestown, Mass.; Timothy Hoey, San Francisco; Siegfried Ruppert, Berkeley; Naoko Tanese, Berkeley; Edith Wang, San Francisco, and Robert O. J. Weinzierl, Berkely, all of, assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 87,119, Jun. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 13,412, Jan. 28, 1993, abandoned. This application Jan. 28, 1994, Ser. No. 188,582

Int. Cl.^{6} C12Q *1/68;* **G01N** *33/53*

U.S. Cl. 435—6 **20 Claims**

11. A method of screening for a compound which modulates the formation of a transcription complex comprising a human TATA-Binding Protein Associated Factor (TAF), said method comprising the steps of:

adding an agent to a mixture comprising transcription complex components including a substantially pure, biologically active polypeptide consisting of a sequence of six or more consecutive amino acids of a human TAF protein or peptide selected from the group consisting of hTAFII30α peptide 1 (SEQ ID NO:28), hTAFII30α peptide 2 (SEQ ID NO:33), hTAFII30α peptide 3 (SEQ ID NO:34), hTAFII30β peptide 1 (SEQ ID NO:27), hTAFII30β peptide 2 (SEQ ID NO:35), hTAFII30β peptide 3 (SEQ ID NO:36), hTAFII40 (SEQ ID NO:26), hTAFII70 (SEQ ID NO:13), hTAFII100 (SEQ ID NO:18), hTAFII130 (SEQ ID NO:16), hTAFII250 (SEQ ID NO:11), hTAFI48 (SEQ ID NO:30), and hTAFI110 (SEQ ID NO:32); and,

comparing the in vitro association of said components before and after said adding step;

wherein a difference between said in vitro association before and after said adding step identifies said agent as a lead pharmaceutical compound which modulates the formation of a transcription complex comprising a human TAF.

5,534,411

MONOCLONAL IGA ANTIBODY SPECIFIC FOR RESPIRATORY SYNCYTIAL VIRUS, A HYBRIDOMA CELL LINE THAT PRODUCES THIS ANTIBODY AMD METHODS OF USING THE ANTIBODY TO DIAGNOSE RSV INFECTION

Richard A. Weltzin, Lunenburg, Mass., assignor to OraVax, Inc., Cambridge, Mass.

Continuation of Ser. No. 99,477, Jul. 30, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,858

Int. Cl.^{6} G01N *33/53;* **C07K** *16/08;* **C12N** *5/20*

U.S. Cl. 435—7.2 **9 Claims**

1. A monoclonal IgA antibody to Respiratory Syncytial Virus which is produced by hybridoma cell line HNK20 (ATCC accession number HB 11394).

5,534,412

ALLOANTIGEN ENHANCEMENT ASSAY

Philippe Pouletty, Atherton, and Chin-Hai Chang, Los Altos, both of Calif., assignors to SangStat Medical Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 961,579, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 745,163, Aug. 15, 1991, abandoned, which is a continuation of Ser. No. 698,319, May 10, 1991, Pat. No. 5,256,543. This application Sep. 29, 1994, Ser. No. 315,203

Int. Cl.^{6} G01N *33/536;33/543*

U.S. Cl. 435—7.24 **9 Claims**

1. A method for determining the presence of a soluble first HLA antigen in a sample with antibody which cross- reacts with said first and a second HLA antigen, said method comprising:

combining aliquots of said sample with said cross-reacting antibody in first and second containers in the absence and presence of anti-second HLA antigen, respectively; and

combining a separate negative control lacking said first and second HLA antigens with said cross-reacting antibody and a separate positive control comprising said second HLA antigen with said cross-reacting antibody wherein separate portions of each control are combined in the absence and presence of anti-second HLA antigen, respectively, wherein the presence of anti-second HLA antigen acts to enhance a signal;

adding a conjugate of antibody and a spectrophotometrically detectable label which antibody of said conjugate binds to a common epitope of said first and second HLA antigens at other than the binding site of said cross-reacting antibody; and

determining a signal from said detectable label in said first and second containers and said negative and positive controls;

wherein a signal value is positive for the presence of said first HLA antigen which has both the OD of the sample in the absence of the anti-second HLA antigen≧DV1 and the percent enhancement as a result of the presence of anti-second HLA antigen in the sample≦DV2, wherein DV1 is defined as equal to the OD of the negative control in the absence of anti-second HLA antigen plus a percentage of the OD of the positive control in the absence of anti-second HLA antigen; DV2 is defined as a percentage of the percent enhancement as a result of the presence of anti-second HLA antigen in the positive control, wherein the percentages are selected to avoid false results.

5,534,413

ADHERENT AND INVASIVE MYCOPLASMA

Shyh-Ching Lo, Potomac; Richard Y. Wang, Bethesda, both of Md., and Michael M. Hayes, Alexandria, Va., assignors to American Registry of Pathology, Washington, D.C.

Division of Ser. No. 800,370, Dec. 2, 1991, Pat. No. 5,215,914, and a continuation-in-part of Ser. No. 710,361, Jun. 6, 1991, Pat. No. 5,242,820, which is a continuation-in-part of Ser. No. 265,920, Nov. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 875,535, Jun. 18, 1986, abandoned. This application May 4, 1993, Ser. No. 57,168

Int. Cl.^{6} C12Q *1/04;* **C07K** *16/12;* **G01N** *33/569*

U.S. Cl. 435—7.32 **5 Claims**

2. A method for the detection of antibodies which specifically bind to an antigenic site of a mycoplasma designated ATCC 55252 in samples of body tissues, cells and fluids comprising the steps of:

(a) contacting an antigen with said sample; and

(b) measuring the formation of antigen-antibody complex; said antigen selected from the group consisting of antigens isolated from a mycoplasma designated ATCC 55252 by sonication and detergent extraction.

5,534,414

PROCESS FOR PREPARING CONJUGATES CONSISTING OF A SPECIFIC BINDING PARTNER AND A CARBOHYDRATE-CONTAINING PROTEIN

Reinhold Pollner; Michael Noah, and Günther Nau, all of Marburg, Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 145,502, Nov. 4, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,058

Claims priority, application Germany, Nov. 6, 1992, 42 37 479.0

Int. Cl.^{6} G01N *33/576;* **C12N** *9/96*

U.S. Cl. 435—794 **17 Claims**

1. A process for preparing a conjugate consisting of a specific binding partner and a carbohydrate-containing protein, comprising the steps of:

(a) oxidizing the carbohydrate-containing protein with periodic acid or with a corresponding alkali metal salt in a buffered solution,

(b) introducing additional amino groups into the oxidized protein by reaction with a diamine and reductive stabilization,

(c) reacting the amino groups introduced in step (b) with iminothiolane which results in the formation of sulfhydryl groups, and subsequently

(d) coupling the specific binding partner and the protein activated in steps (a)–(c) via a heterobifunctional reagent.

5,534,415

SELECTIVE AND DIFFERENTIAL MEDIUM FOR THE GROWTH AND DETECTION OF CANDIDA ALBICANS

Sylvain Orenga, Lyon, France, assignor to Bio Merieux, Marcy L'Etoile, France

Continuation-In-part of Ser. No. 980,727, Nov. 24, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,107

Claims priority, application France, Nov. 25, 1991, 91 14972

Int. Cl.^{6} C12Q *1/04;1/02;1/34;1/24*

U.S. Cl. 435—34 **49 Claims**

1. A method for the rapid and selective detection of yeasts of the species *Candida albicans* comprising:

a) providing a detection medium comprising a nutrient base metabolized by said yeasts, a fluorigenic or chromogenic substrate capable of being hydrolyzed by a hexosaminidase enzyme characteristic of said yeasts, to release a marker and a hexosamine portion, and an activator selected from the group consisting of hexosamine-containing compounds which are different from said substrate, and which do not inhibit the hydrolysis of said substrate by said enzyme,

b) providing a sample assumed to contain said yeasts,

c) contacting said sample with said detection medium,

d) incubating said sample contacted with said detection medium in step c), whereby in case of the presence of said yeasts, the fluorigenic or chromogenic substrate is split into said marker and said hexosamine portion, in addition to said activator,

e) visually observing the absence or the presence of said marker in the mixture of step d).

5,534,416

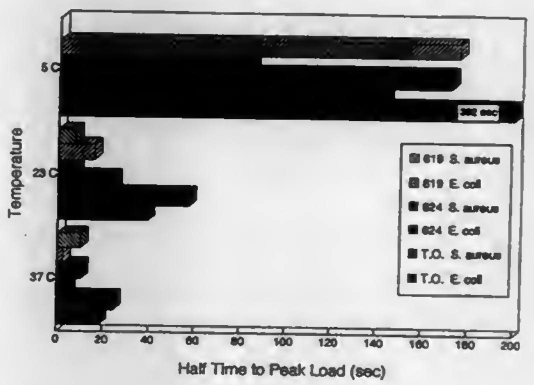
FLUORESCENT VIABILITY ASSAY USING CYCLIC-SUBSTITUTED UNSYMMETRICAL CYANINE DYES

Paul J. Millard, Eugene; Bruce L. Roth, Corvallis; Stephen T. Yue, and Richard P. Haugland, both of Eugene, all of Oreg., assignors to Molecular Probes, Inc., Eugene, Oreg.

Continuation of Ser. No. 90,890, Jul. 12, 1993, Pat. No. 5,436,134, and Ser. No. 146,328, Nov. 1, 1993, each which is a continuation-in-part of Ser. No. 47,683, Apr. 13, 1993, abandoned. This application Nov. 8, 1993, Ser. No. 148,847

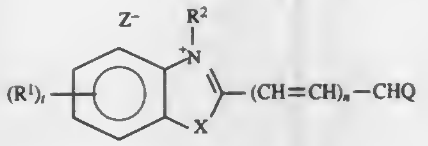
Int. Cl.^{6} G01N *33/00;* **C12Q** *1/04;1/68;* **C07H** *1/00*

U.S. Cl. 436—34 **20 Claims**



1. A method of analyzing cell viability, comprising:

a) combining a sample of cells with an aqueous dye solution comprising a fluorescent Dye I of the formula:



where t=1–4 and each R^1, which may be the same or different, is H, C_{1-6} alkyl; trifluoromethyl; halogen; or —OR^8, —SR^8 or —(NR^8R^9) where R^8 and R^9, which can be the same or different, are independently H; C_{1-6} alkyl; or 1–2 alicyclic, heteroalicyclic, aromatic, or heteroaromatic rings having a total of 3–16 ring atoms wherein the heteroatoms are O, N or S; or R^8 and R^9 taken in combination are —$(CH_2)_2$—L—$(CH_2)_2$— where L=a single bond or —CH_2—, —O—, or —NR^{10}, where R^{10} is H or C_{1-6} alkyl;

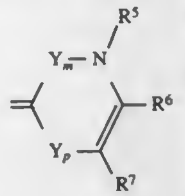
R^2 is C_{1-6} alkyl;

Z^- is a biologically compatible counterion;

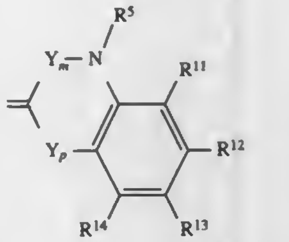
X is O; S; Se; or NR^{15}, where R^{15} is H or C_{1-6} alkyl; or $CR^{16}R^{17}$, where R^{16} and R^{17}, which may be the same or different, are independently H or C_{1-6} alkyl, or the carbons of R^{16} and R^{17} taken in combination complete a five or six membered saturated ring;

n=0, 1, or 2;

Q has the formula Q1 or Q2



(Q1)



(Q2)

wherein

Y is —CR^3═CR^4—; p and m=0 or 1, such that p+m=1;

R^5 is a C_{1-6} alkyl, C_{1-6} alkenyl, C_{1-6} polyalkenyl, C_{1-6} alkynyl or C_{1-6} polyalkynyl group; or R^5 is an OMEGA;

R^3, R^4, R^6 and R^7, which may be the same or different, are independently H; or a C_{1-6} alkyl, C_{1-6} alkenyl, C_{1-6} polyalkenyl, C_{1-6} alkynyl or C_{1-6} polyalkynyl group; or halogen; or —OR^8, —SR^8, —(NR^8R^9), as defined previously; or —OSO_2R^{19} where R^{19} is C_{1-6} alkyl, or C_{1-6} perfluoroalkyl, or aryl; or an OMEGA; or R^6 and R^7, taken in combination are —$(CH_2)_v$— where v=3 or 4, or R^6 and R^7 form a fused aromatic ring according to formula Q2;

R^{11}, R^{12}, R^{13}, and R^{14}, which may be the same or different, are independently H; or a C_{1-6} alkyl, C_{1-6} alkenyl, C_{1-6} polyalkenyl, C_{1-6} alkynyl or C_{1-6} polyalkynyl group; or a halogen; or an OMEGA; or —OH, —OR^8, —SR^8, or —(NR^8R^9);

OMEGA is a saturated or unsaturated, substituted or unsubstituted, cyclic substituent that has a total of 2–16 ring carbon atoms in 1–2 alicyclic, heteroalicyclic, aromatic, or heteroaromatic rings, containing 1–4 heteroatoms wherein the heteroatoms are O, N or S, that is unsubstituted or optionally substituted one or more times, independently, by halogen, alkyl, perfluoroalkyl, amino, alkylamino, dialkylamino, alkoxy or carboxyalkyl, having 1–6 carbons, and that is attached as R^3, R^4, R^5, R^6, R^7, R^{11}, R^{12}, R^{13}, or R^{14} by a single bond;

such that at least one of R^3, R^4, R^5, R^6, R^7, R^{11}, R^{12}, R^{13}, and R^{14} is an OMEGA, and, where more than one of R^3, R^4, R^5, R^6, R^7, R^{11}, R^{12}, R^{13}, and R^{14} is an OMEGA, each OMEGA is optionally the same or different;

and a fluorescent Dye II that selectively stains either viable or non-viable cells, where Dye II and Dye I together intracellularly have a detectable fluorescent response in combination with cells in the sample that is different from a fluorescent response of Dye I alone, and where Dye I and Dye II are each present in an amount sufficient to give a detectable fluorescent response, resulting in a sample of stained cells;

b) illuminating the sample of stained cells at a suitable absorption wavelength that results in one or more illuminated cells; and

c) observing the illuminated cells with means for detecting a fluorescent response resulting from illumination.

5,534,417
MICROORGANISM GROWTH APPARATUS

Shoshana (Malis) Arad, Omer, and Ephraim Cohen, Lehavim, both of, Israel, assignors to Ben-Gurion University of the Negev, Beer-Sheva, Israel

Division of Ser. No. 332,437, Oct. 31, 1994, which is a continuation of Ser. No. 69,347, May 28, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 337,737

Claims priority, application Israel, Jun. 12, 1992, 102189

Int. Cl.^{6} C12P *23/00;* C12N *1/12;* C12M *1/04*

U.S. Cl. 435—67 **22 Claims**

1. A method of growing microalgae outdoors, comprising the steps of:

A) providing a growth apparatus located outdoors, comprising in combination:
  a) a plurality of vertical elongated transparent flexible cells, capable of containing a biomass, the plurality of cells being exposed to daylight;
  b) vertical support means to support the plurality of cells in close juxtaposition to one another, and in vertical position;
  c) at least one gas inlet and one gas outlet, to permit the bubbling of gas through the biomass in each cell and the ventilation of each cell;
  d) at least one fluid inlet and/or fluid outlet to permit feeding of nutrient solution to the biomass and harvesting of the biomass from each cell; and
  e) common conveying means connected to each said at least one fluid inlet and/or fluid outlet for harvesting the biomass, to receive and convey biomass harvested from the plurality of cells, all or part of them, away from the growth apparatus;

B) filling the cells of the provided growth apparatus through said at least one fluid inlet and/or fluid outlet with a nutrient solution containing microalgae to be grown;

C) bubbling through said at least one gas inlet and the growth apparatus cells filled with nutrient solution, air in an amount sufficient to obtain efficient mixing of the biomass and removal of oxygen therefrom through said at least one gas outlet;

D) providing to the growth apparatus cell contained biomass, CO_2 in an amount sufficient to promote biomass growth;

E) periodically harvesting from the cells of the growth apparatus the biomass grown by removing a fraction of the volume contained in each cell through said common conveying means, causing solids contained therein to precipitate and recycling the solution from which the solids have precipitated to the cells through said at least one fluid inlet and/or fluid outlet; and

F) making-up the fraction removed from the growth apparatus cells with nutrient solution and/or materials as required.

5,534,418
CONTROLLED EXPRESSION OF RECOMBINANT PROTEINS

Roland M. Evans, La Jolla, Calif.; Cary A. Weinberger, Silver Springs, Md.; Stanley M. Hollenberg, Seattle, Wash.; Vincent Giguere, Etobicoke, Canada; Jeffrey Arriza, Carlsbad, Calif.; Catherine C. Thompson, La Jolla, Calif., and Estelita S. Ong, San Diego, Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Division of Ser. No. 667,602, Mar. 7, 1991, Pat. No. 5,312,732, which is a division of Ser. No. 108,471, Oct. 20, 1987, Pat. No. 5,071,773, which is a continuation-in-part of Ser. No. 922,585, Oct. 24, 1986, abandoned. This application Dec. 10, 1993, Ser. No. 166,177

Int. Cl.^{6} C12N *15/67*

U.S. Cl. 435—69.1 **13 Claims**

1. A process for the controlled production of a recombinant protein in a eukaryotic cell, wherein said cell contains a gene encoding said recombinant protein, wherein transcription of said gene is activated by a ligand when said ligand is complexed with a receptor which is a hormone receptor selected from a glucocorticoid receptor, a mineralocorticoid receptor, a thyroid hormone receptor, or an estrogen-related receptor, ERR1 or ERR2, and wherein said cell expresses non-endogenous DNA encoding said receptor, said process comprising

contacting said cell with a concentration of said ligand sufficient to induce expression of said gene, thereby producing said protein.

5,534,419
METHOD OF PRODUCING FOREIGN GENE PRODUCTS

Toshiya Takano, Saitama, and Minoru S. H. Ko, Chiba, both of, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 139,877, Oct. 22, 1993, abandoned, which is a continuation of Ser. No. 841,269, Feb. 26, 1992, abandoned, which is a continuation of Ser. No. 269,044, Nov. 9, 1988, abandoned. This application Aug. 28, 1995, Ser. No. 519,760

Claims priority, application Japan, Nov. 9, 1987, 62-282893

Int. Cl.^{6} C12N *15/00;* C12P *21/06;* C07H *21/04*

U.S. Cl. 435—691 **9 Claims**

1. A method of producing mammalian cells capable of producing a physiologically active substance comprising:

(1) transfecting mammalian cells with both:
  (a) a first expression plasmid, comprising a mouse mammary tumor virus (MMTV) long terminal repeat (LTR) operably linked to a glucocorticoid receptor protein gene (GRP), wherein on transfection said cell produces glucocorticoid receptor protein as a result of expression of said first expression plasmid; and
  (b) a second expression plasmid, comprising an MMTV LTR operably linked to a gene encoding said physiologically active substance, wherein on transfection said cell produces said physiologically active substance as a result of expression of said second expression plasmid;

(2) exposing the resulting transfected cells to said glucocorticoid, wherein said GRP, which is produced as a result of expression of said first expression plasmid binds a glucocorticoid to form a GRP-glucocorticoid complex; wherein said GRP-glucocorticoid complex binds to said MMTV LTR of said first expression plasmid thereby enhancing production of said GRP, and said GRP-glucocorticoid complex binds to said MMTV LTR of said second expression plasmid thereby enhancing production of said physiologically active substance; and

(3) selecting for transfected mammalian cells that exhibit greater expression of said physiologically active substance in the presence of said glucocorticoid than in the absence thereof.

5,534,420
BIOTRANSFORMATION OF GLYCOPEPTIDE ANTIBIOTICS

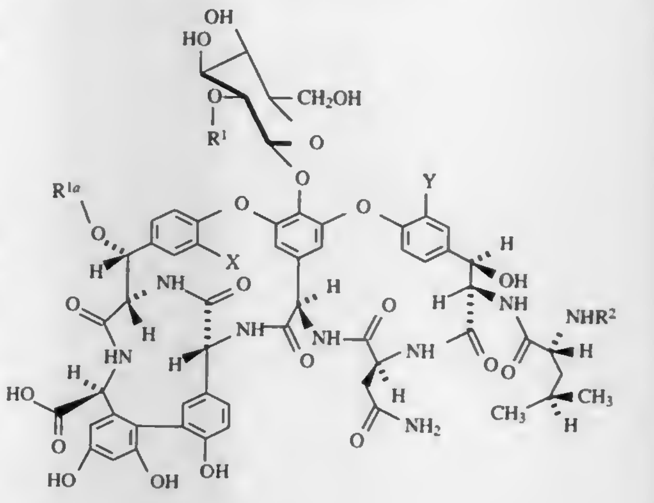
Manuel Debono, Indianapolis; Robert M. Logan, Greenwood; Gary G. Marconi, Indianapolis; R. Michael Molloy, Danville, and Milton J. Zmijewski, Jr., Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 117,376, Sep. 3, 1993, abandoned, which is a continuation of Ser. No. 627,628, Dec. 13, 1990, abandoned, which is a continuation of Ser. No. 225,690, Jul. 28, 1988, abandoned. This application May 18, 1995, Ser. No. 444,119

Int. Cl.^{6} C12N *1/20;* C12P *21/00*

U.S. Cl. 435—71.3 **5 Claims**

1. A process for bioconverting a vancomycin-type glycopeptide compound of the formula



wherein

X and Y independently are H or Cl;

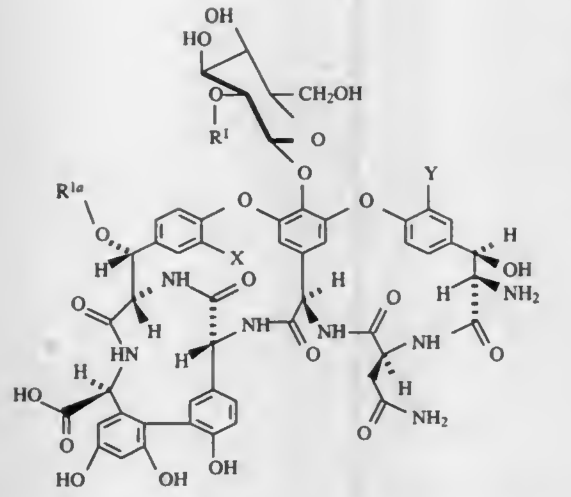
R^2 is H or methyl;

R^1 is selected from H, vancosaminyl and 4-epi-vancosaminyl;

R^{1a} is selected from H and 4-epi-vancosaminyl;

provided that 1) when R^{1a}=H, R^1 must be vancosaminyl or H and both X and Y must be Cl; and 2) when X=H, R^1 must be 4-epi-vancosaminyl;

which comprises 1) cultivating *Actinomadura citrea* NRRL 18382, or a mutant thereof capable of removing D-amino acids from the vancomycin-type glycopeptide compound, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions 2) adding the vancomycin-type glycopeptide compound to the growing culture and 3) continuing the fermentation until a recoverable amount of a bioconverted compound of the formula



wherein X, Y, R^1, and R^{1a} are as hereinabove defined, is produced.

5,534,421

PRODUCTION OF ISOLEUCINE BY *ESCHERICHIA COLI* HAVING ISOLEUCINE AUXOTROPHY AND NO NEGATIVE FEEDBACK INHIBITION OF ISOLEUCINE PRODUCTION

Vitaly A. Livshits; Vladimir G. Debabov; Aaveilova O. Fedorovva; Zakataeva N. Pavlovva; Rustem S. Shakulov; Tatyana A. Bachina, and Evgeny M. Khurges, all of Moscow, Russian Federation, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Division of Ser. No. 707,616, May 30, 1991. This application Sep. 7, 1993, Ser. No. 116,601
Int. Cl.^{6} C12P *13/06;13/08*
U.S. Cl. 435—116 **9 Claims**

1. A method of producing L-isoleucine comprising:
(i) culturing a revertant *Escherichia coli* strain in a nutrient medium, (ii) accumulating L-isoleucine in the medium, and (iii) collecting L-isoleucine from the medium, wherein said revertant *Escherichia coli* strain is prepared by (a) contacting a strain of *Escherichia coli* selected from the group consisting of IleS2, IleS17, and IleS32 with a mutating agent to obtain mutants, (b) screening said mutants for the ability to excrete isoleucine and (c) selecting a mutant which excretes isoleucine, to obtain said revertant *Escherichia coli* strain.

5,534,422

BIOCONVERSION OF BETA KETO-ESTER TO (R) HYDROXYESTER

Michel Chartrain, and Joseph D. Armstrong, III, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed May 19, 1995, Ser. No. 447,163
Int. Cl.^{6} C12P *17/10*
U.S. Cl. 435—118 **1 Claim**

1. A method of converting β-ketoester {[2S-[2α,4β]],-1-[(1,1-dimethylethoxy) carbonyl]-4-hydroxy-β-oxo-2-pyrrolidinepropanoic acid 1,1-dimethylethyl ester} to (R)-β-hydroxyester {[2S-[2α(S*),4β]]-β, 4-dihydroxy-1-[(1,1-dimethylethoxy)carbonyl]-2-pyrrolidinepropanoic acid 1,1-dimethylethyl ester} comprising:
(a) cultivating *Mortierella alpina* MF5534 (ATCC 74350)in a medium containing {[2S-[2α,4β]]-1-[(1,1-dimethylethoxy)carbonyl]-4-hydroxy-β-oxo-2-pyrrolidinepropanoic acid 1,1-dimethylethyl ester}; and
(b) recovering the (R)-β-hydroxyester {[2S-[2α(S*), 4β]]-β,4-dihydroxy-1-[(1,1-dimethylethoxy)-carbonyl]-2-pyrrolidinepropanoic acid 1,1-dimethylethyl ester.

5,534,423

METHODS OF INCREASING RATES OF INFECTION BY DIRECTING MOTION OF VECTORS

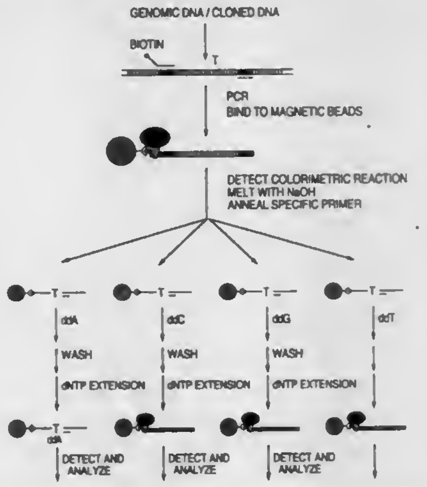
Bernhard Ø. Palsson; Michael F. Clarke, and Alice S. Y. Chuck, all of Ann Arbor, Mich., assignors to Regents of the University of Michigan, Ann Arbor, Mich.
Filed Oct. 8, 1993, Ser. No. 134,105
Int. Cl.^{6} C12N *15/64*
U.S. Cl. 435—172.1 **16 Claims**

1. A method of infecting or transfecting target cells with vectors comprising the steps of:
a) putting the target cells on a porous membrane that supports the target cells, wherein the target cells are substantially stationary with respect to the porous membrane that supports them; and
b) directing the vectors to contact the target cells by moving a liquid containing the vectors through the porous membrane at a flow rate from about 0.01 cm per hour to that rate which significantly decreases the viability of the target cells.

5,534,424

CHEMICAL METHOD FOR THE ANALYSIS OF DNA SEQUENCES

Mathias Uhlen, Upsala, and Joakim Lundeberg, Stockholm, both of, Sweden, assignors to Cemu Bioteknik AB, Upsala, Sweden
PCT No. PCT/EP93/01203, § 371 Date Apr. 18, 1995, § 102(e) Date Apr. 18, 1995, PCT Pub. No. WO93/23562, PCT Pub. Date Nov. 25, 1993
PCT Filed May 12, 1993, Ser. No. 331,552
Claims priority, application United Kingdom, May 12, 1992, 9210176
Int. Cl.^{6} C12P *19/34;* **C12Q** *1/70;1/68;* **C07H** *21/04*
U.S. Cl. 435—91.2 **7 Claims**



1. A method of identifying the base in a target position in a DNA sequence of sample DNA, wherein:
(A) said sample DNA is subjected to amplification, thereby forming amplified, double-stranded DNA;
(B) said amplified, double-stranded DNA is immobilised on a solid support at one end of one strand of said double-stranded DNA, thereby forming an immobilised strand and a non-immobilised strand, and then subjected to strand separation, whereby said non-immobilised strand is removed and immobilised single-stranded DNA remains;
(C) an extension primer is provided, which hybridises to said immobilised single-stranded DNA at a position immediately adjacent to said target position;
(D) each of four aliquots of said immobilised single-stranded DNA is subjected to a polymerase reaction in the presence of a dideoxynucleotide, each aliquot using a different dideoxynucleotide, whereby only in the aliguot using the dideoxynucleotide complementary to the base at said target position will said dideoxynucleotide become incorporated into said immobilised single-stranded DNA to form dideoxy-blocked DNA;
(E) each of said four aliquots are subjected to extension in the presence of all four deoxynucleotides, whereby the DNA which did not form dideoxy-blocked DNA is extended to form double-stranded DNA, while the dideoxy-blocked DNA remains as non-extended DNA; and
(F) the formation of double-stranded DNA and/or non-extended DNA is identified to indicate which dideoxynucleotide was incorporated into said immobilised single-stranded DNA, and hence which base was present at said target position.

5,534,425

SOYBEANS HAVING LOW LINOLENIC ACID CONTENT AND METHOD OF PRODUCTION

Walter R. Fehr, and Earl G. Hammond, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Continuation of Ser. No. 180,115, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 839,242, Feb. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 654,244, Jan. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 445,393, Dec. 5, 1989, abandoned, which is a continuation of Ser. No. 151,705, Feb. 3, 1988, abandoned. This application Jan. 20, 1995, Ser. No. 376,535
Int. Cl.^{6} A01H *5/00;1/04;1/06;* **C12N** *15/01*
U.S. Cl. 435—172.1 **15 Claims**

2. A method for producing soybean plants that yield mature seed having a reduced endogenous linolenic acid content comprising:
(a) crossing a first soybean parent plant selected from the group consisting of A5 having ATCC Accession No. 97371, C1640 having ATCC Accession No. 97368 and A1937EMS-65 having. ATCC Accession No. 97370. with a second soybean parent plant selected from the group consisting of FA47437EMS having ATCC Accession No. 40537, FA47451EMS having ATCC Accession No. 97372, FA26315EMS having ATCC Accession No. 97367 and FA26591EMS having ATCC Accession No. 97369;
(b) obtaining the hybrid soybean seeds from the cross and germinating said seeds to produce segregating populations of soybean plants that are allowed to self-pollinate; and
(c) selecting plants of step (b) that yield mature seed following self pollination having an endogenous linolenic acid content in an amount lower than the linolenic acid of the parent plant of step (a) having the lower endogenous linolenic acid content when the parent plants and the offspring of the cross are grown under the same conditions.

5,534,426

ONCOPROTEIN PROTEIN KINASE

Michael Karin; Masahiko Hibi, both of San Diego, and Anning Linn, La Jolla, all of Calif., assignors to The Regents of The University of California, Oakland, Calif.
Filed Jul. 19, 1993, Ser. No. 94,533
Int. Cl.^{6} C12N *9/12;* **C07K** *14/47*
U.S. Cl. 435—194 **4 Claims**

1. An isolated polypeptide characterized by:
(a) having a molecular weight of 46 kD as determined by reducing SDS-PAGE;
(b) having serine and threonine kinase activity; and
(c) phosphorylating the c-Jun N-terminal activation domain.

5,534,427

PSEUDOMONAS FLUORESCENS LIPASE

Robert M. Johnston, Whitehouse Station; Steven L. Goldberg, Gillette, and Paul M. Cino, Bound Brook, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Jul. 31, 1992, Ser. No. 923,120
Int. Cl.^{6} C12N *9/20;15/55;15/70*
U.S. Cl. 435—198 **6 Claims**

1. An isolated nucleic acid molecule comprising a sequence encoding a lipase, wherein the lipase has the amino acid sequence of SEQ. ID. NO.: 2.

5,534,428

CLONED SSTI/SACI RESTRICTION-MODIFICATION SYSTEM

Mary C. Longo, Germantown; Michael D. Smith, Rockville, both of Md., and Raymond D. Harris, Falkirk, Scotland, assignors to Life Technologies, Inc., Gaithersburg, Md.
Filed Sep. 6, 1994, Ser. No. 300,226
Int. Cl.^{6} C12N *9/22;15/55;15/70*
U.S. Cl. 435—199 **20 Claims**

1. A recombinant DNA molecule comprising:
(a) a vector, and
(b) a structural gene encoding SstI or SacI restriction endonuclease
wherein the structural gene is linked to the vector,
whereby the structural gene may be maintained in a cell by the vector.

5,534,429

STRAIN OF CEPHALOSPORIUM HAVING ATCC ACCESSION NO. 74297, A PROCESS OF ISOLATING SAID STRAIN OF CEPHALOSPORIUM AND A PROCESS FOR PREPARING EXTRACELLULAR ENDOXYLANASE

Meenakshi V. Rele; Snehal M. Bansod, and Mandayam C. Srinivasan, all of Pune, Ind., assignors to Council Of Scientific & Industrial Research, New Delhi, Ind.
Filed Aug. 22, 1994, Ser. No. 294,068
Int. Cl.^{6} C12N *9/24;9/26*
U.S. Cl. 435—200 **15 Claims**

1. A process for preparing extracellular endoxylanase that is stable and active at high alkaline pH comprising growing Cephalosporium strain deposited at American Type Culture Collection bearing accession number 74297 on xylan rich natural media supplemented with nitrogen-rich nutrients at high alkaline pH either by submerged or semisolid fermentation, said Cephalosporium strain having been isolated from humus rich soil collected from Ganeshkind, Pune, India and growing at high alkaline pH in a range of from 5 to 10 and said strain producing an extracellular-cellulase-free xylanase stable and active at high alkaline pH ranging from 5 to 10.

5,534,430

CELL STRAIN CAPABLE OF MULTIPLYING AN EPSTEIN-BARR VIRUS

Kenzo Takada, Ube; Akiko Tochikura, Nagaokakyo, and Mitsuo Yamaki, Mito, all of, Japan, assignors to Hitachi Chemical Company Limited, Tokyo, Japan
Filed Aug. 24, 1994, Ser. No. 294,996
Claims priority, application Japan, Aug. 31, 1993, 5-214641
Int. Cl.^{6} C12N *5/00;7/01;7/02*
U.S. Cl. 435—240.2 **2 Claims**

1. A cell line which is deposited under the accession number FERM BP-4742.

5,534,431

HYBRIDOMAS AND MONOCLONAL ANTIBODIES SPECIFIC FOR UNIQUE DETERMINANTS OF NEPHROPATHY-RELATED IMMUNOGLOBULIN G AND COMPLEXES THEREOF

Thomas L. McDonald, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Feb. 28, 1994, Ser. No. 202,904

Int. Cl.^{6} C12N *5/20;* **C07K** *16/42;* **G01N** *33/53*

U.S. Cl. 435—240.27 **6 Claims**

1. A monoclonal antibody, or antigen-binding fragment thereof, which specifically binds to native or purified human nephropathy related immunoglobulin glycoprotein and which binds specifically to an antigenic determinant on neuropathy related immunoglobulin glycoprotein, said antigenic determinant being defined by reactivity with a monoclonal antibody selected from the group consisting of the monoclonal antibody produced by American Type Culture Collection (ATCC) hybridoma cell line deposit No. HB-10490 and the monoclonal antibody produced by ATCC hybridoma cell line deposit No. HB-10491.

5,534,432

POLYHYDROXYBUTYRATE POLYMERASE

Oliver P. Peoples, Arlington, and Anthony J. Sinskey, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 234,721, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 73,603, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 944,881, Sep. 14, 1992, abandoned, which is a division of Ser. No. 700,169, May 8, 1991, Pat. No. 5,245,023, which is a continuation of Ser. No. 378,155, Jul. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 67,695, Jun. 29, 1987, abandoned. This application Apr. 7, 1995, Ser. No. 418,868

Int. Cl.^{6} C12N *1/21;5/04*

U.S. Cl. 435—240.4 **10 Claims**

1. An organism not naturally containing a gene encoding polyhydroxybutyrate polymerase which has been genetically engineered to express polyhydroxybutyrate polymerase from an isolated heterologous structural gene, wherein the polymerase in the genetically engineered organism is capable of reacting with an appropriate substrate to produce polyhydroxybutyrate.

5,534,433

BASAL NUTRIENT MEDIUM FOR IN VITRO CULTURES OF LOBLOLLY PINES

Jay E. Coke, Summerville, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 2, 1995, Ser. No. 457,876

Int. Cl.^{6} C12N *5/02*

U.S. Cl. 435—240.54 **20 Claims**

1. An aqueous basal nutrient medium for loblolly pine tissue cultures which comprises: 15–30 mM of NO_3, 6–15 mM of NH_4, 10–25 mM of K, 1–2.3 mM of H_2PO_4, 2–7 mM of Ca, 1–9 mM of Mg, 1–10 mM of SO_4, 0.0001–25 mM of Cl, 0.1–0.3 mM of Na, 0.05–0.6 mM of H_2BO_4, 0.45–0.124 mM of Mn, 0.05–0.2 mM of Fe, 0.015–0.2 mM of Zn, 0.0005–0.003 mM of Cu, 0.0001–0.001 mM of I, 0.00005–0.006 mM of MoO_4, 0.00005–0.006 mM of Co, 0.0002–0.002 mM of Thiamine, and 0.05–0.2 mM of ethylenediaminetetraacetic acid.

5,534,434

BASAL NUTRIENT MEDIUM FOR IN VITRO CULTURES OF LOBLOLLY PINES

Jay E. Coke, Summerville, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 2, 1995, Ser. No. 457,026

Int. Cl.^{6} L12N *5/02*

U.S. Cl. 435—240.54 **20 Claims**

1. An aqueous basal nutrient medium for loblolly pine tissue cultures which comprises: 8–30 mM of NO_3, 6–18 mM of L-glutamine, 10–25 mM of K, 1–2.3 mM of H_2PO_4, 2–7 mM of Ca, 1–9 mM of Mg, 1–10 mM of SO_4, 0.0001–25 mM of Cl, 0.1–0.3 mM of Na, 0.05–0.6 mM of H_2BO_4, 0.124–0.45 mM of Mn, 0.05–0.2 mM of Fe, 0.015–0.2 mM of Zn, 0.0005–0.003 mM of Cu, 0.0001–0.001 mM of I, 0.00005–0.006 mM of MoO_4, 0.00005–0.006 mM of Co, 0.0002–0.002 mM of thiamine, and 0.05–0.2 mM of ethylenediaminetetraacetic acid.

5,534,435

PROCESS FOR DECOMPOSING PEROXYCARBOXYLIC ACIDS

Sven E. Godtfredsen, Værløse; Ole Kirk, and Ture Dambus, both of Copenhagen, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 946,998, Sep. 17, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 390,351

Claims priority, application Denmark, Mar. 20, 1990, 0714/90

Int. Cl.^{6} C12P *7/40*

U.S. Cl. 435—262.5 **7 Claims**

1. A process for converting a peroxycarboxylic acid to the corresponding carboxylic acid, wherein the peroxycarboxylic acid is of formula I:

$$R—CO—OOH \qquad (I)$$

wherein

R is a linear or branched alkyl group, an aryl group or an aryl-alkyl group, each of which may optionally be substituted with one or more hydroxy, halogen, alkoxy, amino, alkylamino, sulfo, sulfoxy, sulfono, amido, carboxy, percarboxy or nitro groups; comprising treating the peroxycarboxylic acid with an enzyme selected from the group consisting of esterase and lipase in an aqueous medium at suitable conditions.

5,534,436

ENZYMATIC RESOLUTION OF ASYMMETRIC ALCOHOLS BY MEANS OF VINYL ESTERS OF POLYBASIC CARBOXYLIC ACIDS

Peter Seufer-Wasserthal, Schwanenstadt; Herbert Mayrhofer, Engerwitzdorf; Irma Wirth, Enss, and Peter Pöchlauer, Linz, all of, Austria, assignors to Chemie Linz GmbH, Linz, Austria

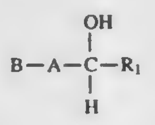
Filed Mar. 30, 1995, Ser. No. 413,439

Claims priority, application Austria, Mar. 30, 1994, A672/94

Int. Cl.^{6} C12P *41/00*

U.S. Cl. 435—280 **5 Claims**

1. A process for the resolution of asymmetric alcohols of the formula



$$B—A—\underset{\displaystyle H}{\overset{\displaystyle OH}{C}}—R_1 \qquad 1$$

wherein

R_1 is COOH, $COOC_1–C_4$-alkyl, CN, $C_1–C_4$-alkyl which can be straight-chain or branched, saturated or unsaturated and optionally mono- or polysubstituted by halogen, $C_1–C_4$-alkoxy, methylenedioxy, ethylenedioxy, NH_2, $C_1–C_4$-alkylamino, $NH\text{-}SO_2CH_3$, $COCH_3$, COOH, $COOC_1–C_4$-alkyl, NO_2, CN or N_3,

A is either a single bond, $C_1–C_4$-alkylene or $C_2–C_6$-alkenylene, and

B is phenyl, naphthyl, pyridyl, pyrimidyl, furyl, thienyl, imidazolyl,

$C_1–C_{20}$-alkyl which can be straight-chain or branched, and saturated or unsaturated by one or more double or triple bonds, where one or more methylene groups can be replaced by a keto group, by O, by NH or by N-alkyl($C_1–C_4$),

$C_3–C_7$-cycloalkyl which can be saturated or unsaturated, where a methylene group can optionally be replaced by a keto group and one or two methylene groups can optionally be replaced by O or NH, where the radical B can be mono- or polysubstituted by halogen,

$C_1–C_4$-alkoxy, methylenedioxy, ethylenedioxy, $NH_2C_1–C_4$-alkylamino, $NO—SO_2CH_3$, $CO—CH_3$, COOH, $COOC_1–C_4$-alkyl, NO_2,CN or N_3, or

A is a single bond and R_1 and B together are a $C_3–C_8$-alkylene or -alkenylene group, in which 2 methylene groups can additionally be bridged by means of a further $C_1–C_4$-alkylene chain, where one or more methylene groups can be replaced by a keto group, or by O, NH or N-alkyl($C_1–C_4$) and where the ring formed from R_1 and B can optionally be mono- or polysubstituted by halogen, $C_1–C_4$-alkyl which can be straight-chain or branched, by $C_1–C_4$-alkoxy, methylenedioxy, ethylenedioxy, NH_2, $C_1–C_4$-alkylamino, $NH\text{-}SO_2CH_3$, $CO—CH_3$, COOH, $COOC_1–C_4$-alkyl, NO_2, CN or N_3,

which comprises reacting an asymmetric alcohol of the formula I with a vinyl or isopropenyl diester of a $C_2–C_{10}$ alkane or a $C_2–C_{10}$ alkene dicarboxylic acid in the presence of a lipase as catalyst, and isolating the unreacted, enantiomerically-enriched alcohol of the formula I, and, optionally, isolating and hydrolyzing the ester formed by the process.

5,534,437

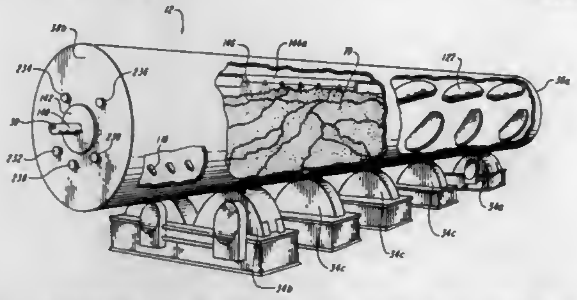
CO-COMPOSTING PROCESS AND APPARATUS FOR TREATING SOLID WASTE AND SEWAGE SLUDGE

Agustin H. Arrau, Mill Neck, N.Y., assignor to Bio-Waste Technologies, International, Ltd., Kingston, Br. Indian Ocean Ter.

Continuation of Ser. No. 251,515, Jun. 6, 1994, abandoned, which is a continuation of Ser. No. 77,238, Jun. 14, 1993, abandoned. This application Mar. 24, 1995, Ser. No. 409,542

Int. Cl.^{6} C12M *1/10;* **B01J** *8/08*

U.S. Cl. 435—290.3 **7 Claims**



1. An apparatus for processing solid organic waste material and sludge comprising:

a. a vessel having a cylindrical wall having an axis and two opposing end walls, which cylindrical wall and end walls define a chamber, said vessel having opening means, mixing means, gas input means, water input means, temperature control means, and gas output means, said opening means for receiving solid organ waste material and sludge, and discharging one or more biodegradation products; said mixing means for forming an admixture of solid organic waste material and sludge, for forming admixture of one biodegradation products and microorganisms, for bringing said admixture in contact with gases and water and to provide temperature uniformity throughout said vessel, said mixing means cooperating with the rotation of said vessel to distribute solids throughout said vessel upon receiving solids within said chamber from opening means and to propel said solids to said opening means to discharge said solids from said vessel; said gas input means, water input means, and temperature control means for imposing one or more growth conditions within said vessels, said gas output means for discharging gases from said vessel;

vessel rotating means for rotating said vessel about said axis in cooperation with said mixing means to direct movement of said solids within said vessel;

said vessel for receiving solid organic waste material and sludge within said chamber, said mixing means forming a first of said solid organic waste material and sludge, admixture and said vessel imposing first growth conditions, said first growth conditions comprising a temperature of 160° to 185° F., gaseous water in a concentration of 25 to 40%, and sufficient oxygen to promote growth of thermophilic microorganisms, said thermophilic microorganism biodegrading said admixture to form a thermophilic biodegradation product, and said vessel for receiving a mesophilic microorganism through said opening means, said mixing means forming a second admixture comprising said thermophilic biodegradation product and said mesophilic microorganism, said vessel for imposing second growth conditions on said second admixture to promote growth of said mesophilic microorganisms, said second growth conditions comprising a temperature of 145° to 162° F., gaseous water of 25 to 45%, and sufficient oxygen to support growth of mesophilic microorganisms to form a mesophilic biodegradation product comprising an organic material which is from said chamber.

5,534,438

PROCESS FOR ISOLATING GENES AND THE GENE CAUSATIVE OF HUNTINGTON'S DISEASE AND DIFFERENTIAL 3' POLYADENYLATION IN THE GENE

Michael Hayden; Paul Goldberg; Susan Andrew, all of Vancouver, and Johanna M. Rommens, Willowdale, all of, Canada, assignors to University of British Columbia, Vancouver, and HSC Research & Development Ltd., Ontario, both of, Canada

Filed Sep. 24, 1993, Ser. No. 126,587

Claims priority, application Canada, Mar. 25, 1993, 2092455

Int. Cl.^{6} C12N *15/12;15/63*

U.S. Cl. 435—320.1 **13 Claims**

1. A purified DNA molecule having the following sequence designated GT70:

AAAGGAAATT AAAAAGAATG GTGCCCCTCG

GAGTTTGCGA GCTGCCCTGT GGAGGTCTGC

TGAGCTGGCT CACCTGGTTC GGCCTCAGAA

ATGCAGGCCT TACCTGGTGA ACCTTCTGCC

GTGCCTGACT CGAACAAGCA AGAGACCCGA

AGAATCAGTC CAGGAGACCT TGGCTGCAGC

TGTTCCCAAA ATTATGGCTT CTTTTGGCAT

TTGCAAATGA CAATGAAAGG TTGTTAAAGG

CCTTCATAGC GAACTGAAGT CAAGCGGCCC

-continued

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          CCACCATTCG GCGGACAGCG GCTGGATCAG
CAGTGAGCAT CTGCCAGCAC TCAAGAAGGA
          CACAATATTT CTATAGTTGG CTACTAAATG
TGCTCTTAGG CTTCGCGTTC CTGTCGAGGA
          TGAACACTCC ACGTGCTGAT TCTTGGCGTG
CTGCTCACCT TGAGGTATTT GGTGCCCTTG
          CTGCAGCAGC AGGTCAAGGA CACAAGCCTG
AAAGGAAGTCT TCGGAGTGAC AAGGAAAGAA
          AGGAAGTCTC TCCTTCTGCA GAGCACTTGA
TCCAGGTTTA TGAACTGACG TTACATGATA
          CACAGCACCA AGACCACAAT GTTGTGACCG
GAGCCCTGGA GCTGTTGCAG CAGCTCTTCA
          GAACGCCTCC ACCCGAGCTT CTGCAAACCC
TGACCGCAGT CGGGGGCATT GGCAGGCTCA
          CCGCTGCTAA GGAGGAGTCT GGTGGCCGAA
GCCGTAGTGG GAGTATTGTG GAACTTATAG
                              CTGGAGG.
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5,534,439

ISOLATED DNA OF HUMAN PAPILLOMAVIRUS TYPE 55 (HPV55)

Gerard Orth, Sceaux; Michel Favre; Dina Kremsdorf, both of Paris, and Gérard Pehau-Arnaudet, Montreuil, all of, France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 951,118, Sep. 25, 1992, Pat. No. 5,342,930. This application May 10, 1994, Ser. No. 240,497

Claims priority, application France, May 13, 1988, 88 06486; Jun. 21, 1988, 88 08324

Int. Cl.^{6} C12N *15/37;7/01*

U.S. Cl. 435—320.1 **3 Claims**

1. Isolated and essentially pure DNA having the nucleotide residue sequence of HPV 55 having Accession Numbers C.N.C.M. I-757 and I-758.

5,534,440

COMPOUNDS AND METHODS FOR SEQUENCING AMINO ACIDS

Rudolf H. Aebersold, and Edward J. Bures, both of Vancouver, Canada, assignors to Biomedical Research Centre Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 698,403, Feb. 22, 1991, Pat. No. 5,240,859. This application Aug. 30, 1993, Ser. No. 115,481

Int. Cl.^{6} C07C *331/16;331/28;* **G01N** *33/68*

U.S. Cl. 436—89 **9 Claims**

1. A compound comprising:

(a) an isothiocyanate group;

(b) an ionizable group capable of detection by mass spectrometry; and

(c) a linker connecting said isothiocyanate group with said ionizable group.

5,534,441

OPTICALLY MEASURING AN IMMUNOLOGICALLY ACTIVE MATERIAL BY DEGREE OF AGGLUTINATION OF AN ANTIGEN-ANTIBODY REACTION PRODUCT

Takeshi Miyazaki, Ebina; Kazumi Tanaka, Yokohama; Masanori Sakuranaga, Atsugi, and Tadashi Okamoto, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 173,481, Dec. 27, 1993, abandoned, which is a continuation of Ser. No. 24,860, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 570,604, Aug. 21, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,870

Claims priority, application Japan, Aug. 23, 1989, 1-214888; Jul. 12, 1990, 2-186796; Jul. 13, 1990, 2-185675

Int. Cl.^{6} G01N *33/557*

U.S. Cl. 436—517 **9 Claims**

1. A method for measuring an immunologically active material by physically or chemically immobilizing a material which is selectively immunologically active to a material in a specimen which is to be quantitated on dehydrated solid fine particles, reacting said immobilized selectively immunologically active material immobilized on said solid fine particles with said specimen in a liquid medium, thereby causing an agglutination and optically measuring said agglutination, said method comprising the steps of:

(i) providing dry reagent fine particles comprising dehydrated solid fine particles ranging in size from 0.05 μm to 5 μm, the surfaces of said fine particles comprising a material which is selectively immunologically active to a material to be quantitated contained in a specimen, said material on said surfaces of said particles being physically or chemically immobilized on the surfaces of said fine particles,

(ii) placing said dry reagent fine particles in a measuring cell and introducing a dispersing medium into said measuring cell,

(iii) stirring said dispersing medium and said dry reagent fine particles to produce a mixture in a dispersed state in said measuring cell while optically measuring a degree of dispersion of said mixture comprising said dispersing medium and said dry reagent fine particles in said measuring cell and while confirming if the ratio of an index A obtained by the equation (1): $A=\log Io/I$ versus an index Ao obtained by the equation (2): $Ao=\log I'o/I'$ satisfies the equation: $A/Ao \leqq 1.1$, wherein the equation (1) is of a dispersed body comprising said dry reagent fine particles dispersed in said dispersing medium, Io is an intensity of incident monochromatic light upon passing through said measuring cell containing said dispersed body, and I is an intensity of light transmitted or scattered when said monochromatic light is passed through said measuring cell, and wherein the equation (2) is of a reference standard dry reagent particles dispersed body, I'o is an intensity of incident monochromatic light upon passing through a measuring cell containing said reference standard dry reagent particles dispersed body, and I' is an intensity of light transmitted or scattered when said monochromatic light is passed through said measuring cell; and terminating the stirring when the equation: $A/Ao \leqq 1.1$ is satisfied to obtain a desired dispersion in said measuring cell,

(iv) adding said specimen to the dispersion, mixing and reacting the mixture, thereby causing an agglutination, and

(v) optically measuring the agglutination of the reaction mixture.

5,534,442

PROCESS OF PROVIDING UNIFORM PHOTORESIST THICKNESS ON AN OPTO-ELECTRONIC DEVICE

James W. Parker, Stortford; Paul M. Harrison, Springfield, and Robert G. Peall, Harlow, all of, United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

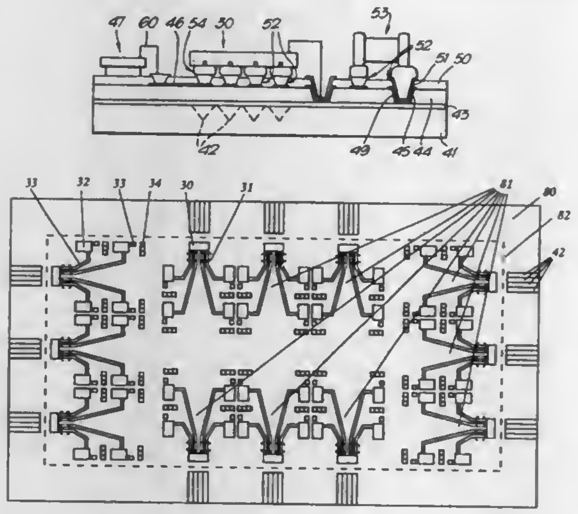
Continuation-in-part of Ser. No. 160,064, Nov. 30, 1993, abandoned, which is a division of Ser. No. 878,757, May 5, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 319,435

Claims priority, application United Kingdom, May 10, 1991, 9110155

Int. Cl.^{6} H01L *21/283;21/312;21/56;21/70*

U.S. Cl. 437—2 **7 Claims**

1. A process for manufacturing opto-electronic hybrid modules and comprising the steps of forming V-grooves in one surface portion of a silicon substrate for reception of optical fibres or for other features, depositing an electrically conducting ground plane over the substrate including the grooves, depositing a first dielectric layer on the ground plane, forming vias in the first dielectric layer, defining an electrical interconnect pattern on the first dielectric layer which electrical interconnect pattern is in contact with the ground plane via the vias, depositing a second dielectric layer on the first dielectric layer and electrical interconnect pattern, forming vias in the second dielectric layer depositing solder-wettable material in the vias in the second dielectric layer whereby at least to provide solder-wettable pads at positions where solder bumps for use in flip-chip bonding of opto-electronic components are to be formed, defining solder elements on said pads, reflowing the solder elements to form solder bumps thereat, disposing said opto-electronic components having corresponding solder-wettable pads on said solder bumps, heating the arrangement to melt the solder, surface tension forces causing alignment of the opto-electronic components and the processed substrate which processing steps include the application of photoresist to the substrate in a region from which it is centrifugally spread over the surface of the substrate by the spinning of the substrate, wherein the layout of the modules is such that profiles, including said grooves, that disrupt the smooth flow of said centrifugal spreading of the photoresist are excluded from an area of the substrate that circumscribes said vias in the first dielectric layer, said electrical interconnect pattern, said vias in the second dielectric layer, and said solder wettable pads whereby, within said area substantial uniformity of thickness of the centrifugally spread photoresist is ensured.



5,534,443

METHOD OF MANUFACTURING A SOLID STATE IMAGING DEVICE

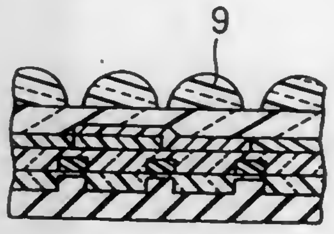
Tomoko Ohtagaki, Kyoto, and Yoshikazu Sano, Osaka, both of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 23, 1995, Ser. No. 408,974

Claims priority, application Japan, Mar. 25, 1994, 6-055551

Int. Cl.^{6} H01L *31/18*

U.S. Cl. 437—2 **14 Claims**



1. A method of manufacturing a solid state imaging device comprising forming dyeing layers of acrylic-based resin on a semiconductor substrate on which a solid state imaging element is formed and adding carboxylate and a urea compound as dyeing assistant auxiliaries in an aqueous dyestuff solution in the step of forming the dyeing layers of acrylic-based resin on the semiconductor substrate, wherein the urea is added to the aqueous dyestuff solution in an amount of from 0.1 to 10 weight percent based on the amount of the aqueous dyestuff solution.

5,534,444

PROCESS FOR PRODUCING AN ELECTRICALLY CONTROLLABLE MATRIX OF VERTICALLY STRUCTURED QUANTUM WELL COMPONENTS

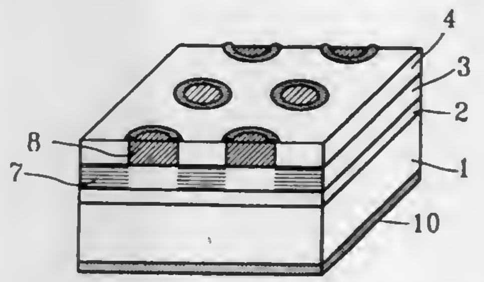
Yves Nissim, Paris, and Marcel Bensoussan, Boulogne, both of, France, assignors to France Telecom, Paris, France

Filed Jun. 22, 1995, Ser. No. 493,786

Claims priority, application France, Jun. 22, 1994, 94 07640

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 437—5 **8 Claims**



1. A process for producing an electrically controllable matrix of vertically-structured quantum well components from a doped n (or p) substrate (1) on which has been deposited, by epitaxy, a doped n (or p) lower mirror (2) composed of one or several alternations of semiconductor thin layers surmounted by an active "epitaxiated" layer (3) made up of quantum well heterostructures, characterized in that:

a) the active quantum well layer is encapsulated with a dielectric layer (4) capable of inducing an alloy interdiffusion in the said quantum well layer,
b) the said dielectric layer (4) is etched in such a way as to create a self-alignment mask (5) demarcating recesses (6) with respect to the non-covered regions (which are left intact) of the active layer,
c) the substrate covered by the self-alignment mask is treated thermally so as to create in the active layer, by alloy interdiffusion, vertically-divided regions (7) whose composition is modified in relation to the original state (interpixel regions), and also to create non-modified regions (pixels) in matrix form,
d) an upper mirror (8) in doped p (or n) semiconductor material inversely to the lower mirror, is deposited by "epitaxiated" growth in the recesses of the mask,
e) the edges of the upper mirrors in contact with the dielectric layer are metallized so as to leave an opening at the center of the mirror of each pixel for the optical inputs and outputs of the pixel.

5,534,445

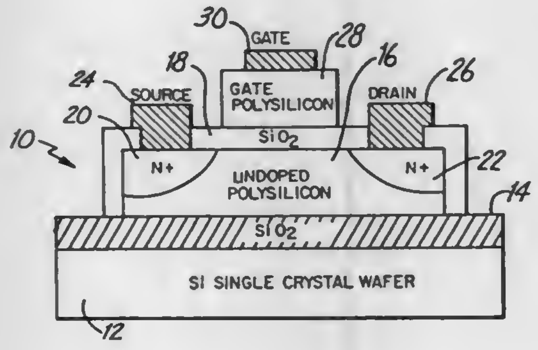
METHOD OF FABRICATING A POLYSILICON THIN FILM TRANSISTOR

Nang T. Tran, and Michael P. Keyes, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 978,184, Nov. 17, 1992, abandoned, which is a continuation of Ser. No. 648,529, Jan. 30, 1991, abandoned. This application May 23, 1995, Ser. No. 447,926

Int. Cl.^{6} H01L *21/336*

U.S. Cl. 437—21 **5 Claims**



1. A process for making a hydrogenated polysilicon thin film transistor comprising the steps of:
providing a substrate;
depositing a layer of amorphous silicon on the substrate;
annealing said layer of amorphous silicon to form a first polysilicon layer;
patterning the first polysilicon layer to form islands;
growing a layer of silicon dioxide on the islands to form a gate dielectric layer;
depositing and patterning a second layer of polysilicon;
doping the first and second polysilicon layers to form a source, a drain, and a gate;
depositing and patterning a metal layer to provide a source contact, a drain contact, and a gate contact for the respective source, drain, and gate and thereby forming a polysilicon thin film transistor;
annealing said polysilicon thin film transistor;
hydrogenating the polysilicon thin film transistor; and
depositing an atomic hydrogen-containing layer on the polysilicon thin film transistor.

5,534,446

PROCESS FOR PRODUCING BURIED INSULTOR LAYER IN SEMICONDUCTOR SUBSTRATE

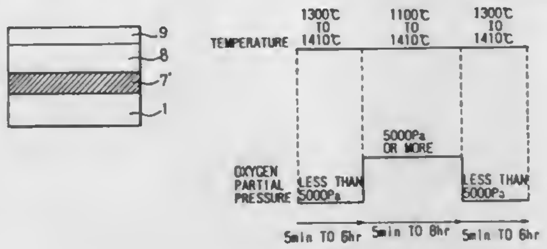
Masaharu Tachimori; Takayuki Yano; Yasuo Tsumori; Tatsuo Nakajima, and Isao Hamaguchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Japan

Filed Sep. 26, 1995, Ser. No. 534,169

Claims priority, application Japan, Sep. 30, 1994, 6-237896

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—26 **20 Claims**



1. A process for producing a semiconductor substrate, including the phases of implanting oxygen ions into a semiconductor silicon substrate through one surface thereof to form an oxygen concentration layer in the semiconductor silicon substrate, and then heat-treating the semiconductor substrate to cause a chemical reaction to occur between the implanted oxygen ions and the silicon, thereby forming a buried insulating silicon oxide film in the semiconductor silicon substrate, wherein:
the heat treating phase for forming the buried insulating silicon oxide film includes at least a beat treatment step using an atmosphere having an oxygen partial pressure of 5×10^3 Pa or more.

5,534,447

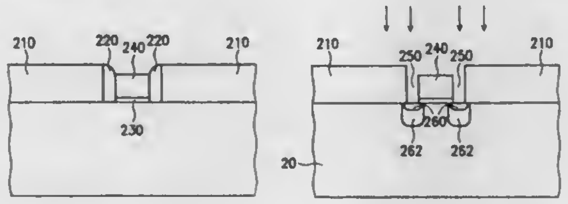
PROCESS FOR FABRICATING MOS LDD TRANSISTOR WITH POCKET IMPLANT

Gary Hong, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Nov. 13, 1995, Ser. No. 558,115

Int. Cl.^{6} H01L *21/8234*

U.S. Cl. 437—27 **7 Claims**



1. A process for fabricating a MOS transistor device on a semiconducting substrate of a first conductivity type, comprising:
forming over said substrate a shielding layer having an opening with sidewalls defining a channel region;
forming first sidewall spacers on said sidewalls;
forming a gate insulating layer over said channel region;
forming a gate electrode over said gate insulating layer;
removing said first sidewall spacers to form trenches between said gate electrode and said shielding layer;
forming lightly doped regions of a second conductivity type in said substrate beneath said trenches, and forming doped regions of the first conductivity type that surround said lightly doped regions;
removing said shielding layer;
forming second sidewall spacers overlying said lightly doped regions; and
forming heavily doped regions of the second conductivity type in said substrate adjacent to both said lightly doped region and said doped region of the first conductivity type.

5,534,448

PROCESS FOR REALIZING P-CHANNEL MOS TRANSISTORS HAVING A LOW THRESHOLD VOLTAGE IN SEMICONDUCTOR INTEGRATED CIRCUITS FOR ANALOG APPLICATIONS

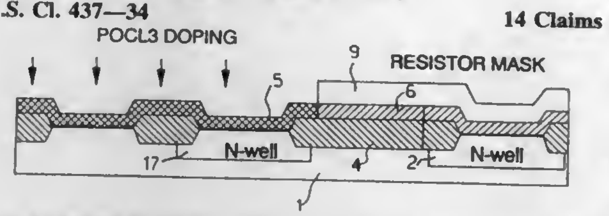
Livio Baldi, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Milan, Italy

Filed Jul. 28, 1994, Ser. No. 282,408

Claims priority, application European Pat. Off., Jul. 29, 1993, 93830336

Int. Cl.^{6} H01L *21/8238*

U.S. Cl. 437—34 **14 Claims**



1. A process for forming P-channel MOS transistors having a first threshold voltage in semiconductor integrated circuits for analog applications using CMOS processes, said circuits including resistors formed in a layer of polycrystalline silicon and N-channel MOS transistors having active areas which have been obtained by implantation, comprising the steps of:
providing a first mask over both said resistors and the semiconductor regions where the P-channel transistors are to be formed;
doping the polycrystalline layer left exposed by said first mask;
providing a second mask for protecting the resistors and the semiconductor regions where said P-channel transistors are to be formed; and
N+ implanting the active areas of the N-channel transistors.

5,534,449

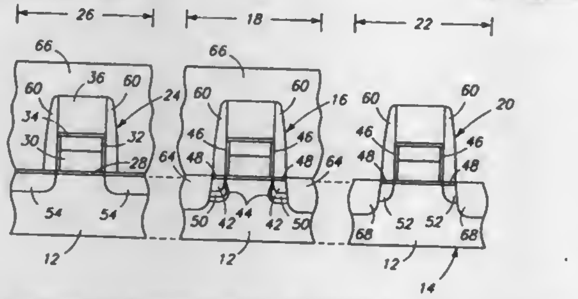
METHODS OF FORMING COMPLEMENTARY METAL OXIDE SEMICONDUCTOR (CMOS) INTEGRATED CIRCUITRY

Charles H. Dennison, Meridian, and Mark Helm, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 17, 1995, Ser. No. 503,419

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—34 **30 Claims**



1. A method of forming CMOS integrated circuitry comprising the following steps:
providing a series of gate lines over a semiconductor substrate, a first gate line being positioned relative to an area of the substrate for formation of an NMOS transistor, a second gate line being positioned relative to an area of the substrate for formation of a PMOS transistor;
masking the second gate line and the PMOS substrate area while conducting a p-type halo ion implant into the NMOS substrate area adjacent the first gate line, the p-type halo ion implant being conducted at a first energy level to provide a p-type first impurity concentration at a first depth within the NMOS substrate area; and
in a common step, blanket ion implanting phosphorus into both the NMOS substrate area and the PMOS substrate area adjacent the first and the second gate lines to form both NMOS LDD regions and PMOS n-type halo regions, respectively, the phosphorus implant being conducted at a second energy level to provide an n-type second impurity concentration at a second depth within both the PMOS substrate area and the NMOS substrate area, the first energy level and the first depth being greater than the second energy level and the second depth, respectively.

5,534,450

METHOD FOR FABRICATAION A SEMICCNDUCTOR DEVICE

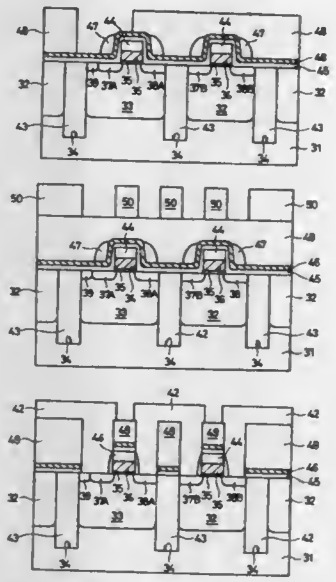
Jae K. Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed May 3, 1995, Ser. No. 434,280

Claims priority, application Rep. of Korea, May 4, 1994, 94-9838

Int. Cl.^{6} H01L *21/8238*

U.S. Cl. 437—34 **5 Claims**



1. A method for fabricating a semiconductor device, comprising the steps of:
forming an N well and a P well at predetermined portions in a P type semiconductor substrate;
forming a trench filled with an insulating material at the boundary between the N well and the P well, said trench serving as an element isolator for said wells;
establishing a gate structure over each N well and P well, said gate structure comprising a stack of a gate oxide film, a gate electrode and a first insulating film pattern;
implanting impurities into the N well and the P well to form their respective source electrodes and drain electrodes, said impurities having a type opposite to the well to be implanted;
depositing a second insulating film and an etch stopper over the resulting structure, in sequence;
forming an insulating spacer at a side wall of said etch stopper, said side wall being attributed to said stack;
implanting N type impurities into a part of the source electrode of a P-MOSFET in the presence of a photosensitive film pattern to form an N type substrate electrode, said photosensitive film pattern covering all structure but said source electrode which has partly been uncovered by said insulating spacer;
removing said photosensitive film pattern and coating a blanket third insulating film upon the resulting structure;
selectively etching the third insulating film by use of contact masks to form contact holes through which said source electrodes, said drain electrodes and said substrate electrodes of the P well are exposed; and
forming a wiring pattern in which the source electrode and said substrate electrode of the P well are connected with a V_{DD}, the drain electrode of the P well is connected with the drain

electrode of the N well and the source electrode of the N well is connected with a V_{SS}.

5,534,451

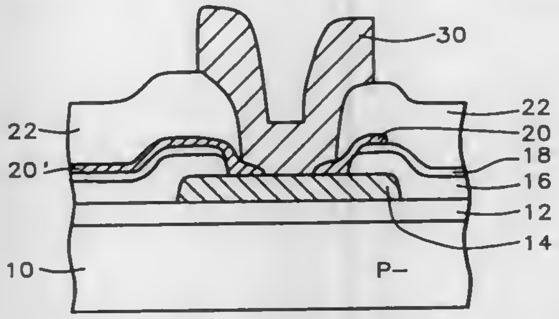
METHOD FOR FABRICATING A REDUCED AREA METAL CONTACT TO A THIN POLYSILICON LAYER CONTACT STRUCTURE HAVING LOW OHMIC RESISTANCE

Shou-Gwo Wuu; Mong-Song Liang; Chung-Hui Su, and Chen-Jong Wang, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Apr. 27, 1995, Ser. No. 429,728

Int. Cl.⁶ H01L *21/283;21/335*

U.S. Cl. 437—40 **19 Claims**



1. A method for fabricating reduced area metal contacts to a thin polysilicon layer that forms portions of thin film transistors on a semiconductor substrate, comprising the steps of:

providing said semiconductor substrate having semi-conductor devices formed from a patterned first and second polysilicon layer and having a first insulating layer there between, and portions of said second polysilicon layer forming also patterned buffer layers for making metal contacts thereon;

depositing a second insulating layer on said patterned second polysilicon layer;

depositing and patterning by masking and plasma etching a third polysilicon layer, and thereby forming gate electrodes for said thin film transistors;

depositing a third insulating layer on said patterned third polysilicon layer and thereby forming a gate oxide on said gate electrodes and said gate oxide extending over said patterned buffer layer areas;

forming first contact openings by masking and anisotropic plasma etching in said third and second insulating layer to the surface of said buffer layer formed from said patterned second polysilicon layer;

depositing a thin fourth polysilicon layer over said third insulating layer and over and in said first contact openings, and thereby contacting said patterned buffer layer;

doping selectively said thin fourth polysilicon layer by masking and ion implantation, and thereby forming source/ drain areas for said thin film transistors and by the same said ion implantation, doping said thin fourth polysilicon layer over said first contact openings and contiguous with said source/drain doping;

patterning said thin fourth polysilicon layer by masking and plasma etching, and thereby forming electrically conducting stripes contiguous with said source / drain areas and extending over said first contact openings; depositing a fourth insulating layer over said patterned thin fourth polysilicon layer;

forming second contact openings by masking and anisotropically etching, said second contact openings aligned over and smaller in width than said first contact openings and extending down to said thin fourth polysilicon layer;

depositing a first metal layer over said third insulating layer and in said second contact opening, and making electrical contact to said thin fourth polysilicon layer;

patterning said first metal layer, and thereby completing said reduced area metal contacts to said thin fourth polysilicon layer contiguous with said source / drain areas of said thin film transistors.

5,534,452

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE

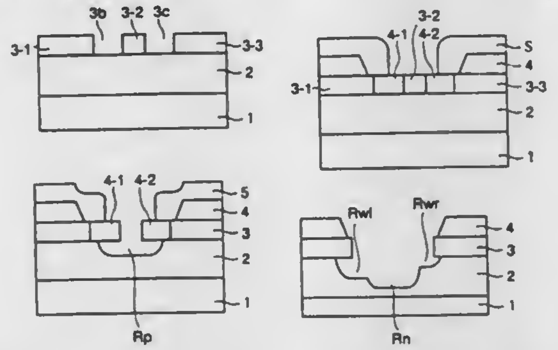
Mamiko Nakanishi, Itami, and Yasutaka Kohno, deceased, late of Saijyo, both of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1995, Ser. No. 534,212

Claims priority, application Japan, Oct. 11, 1994, 6-245443

Int. Cl.⁶ H01L *21/8232*

U.S. Cl. 437—40 R **7 Claims**



1. A method for producing a semiconductor device comprising:

preparing a semi-insulating substrate having an active layer;

depositing a first insulating film on the active layer and forming two first openings in the first insulating film;

depositing a second insulating film on the first insulating film to fill the first opening and make a flat surface with the first insulating film;

removing a portion of the first insulating film between the first openings to form a second opening;

etching the active layer to a depth through the second opening;

removing portions of the second insulating film from the active layer adjacent the second opening to form a third opening; and

etching the active layer through the third opening to form a double-stage recess in the active layer.

5,534,453

METHOD OF MANUFACTURING TITANIUM SILICIDE CONTAINING SEMICONDUCTORS

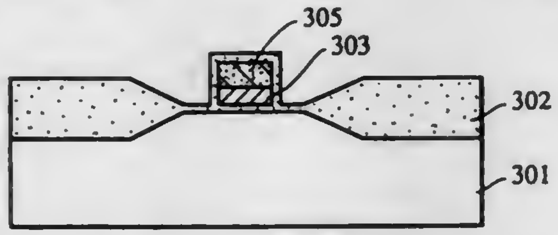
Tetsuo Asaba, Odawara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1993, Ser. No. 160,141

Claims priority, application Japan, Dec. 4, 1992, 4-350207

Int. Cl.⁶ H01L *21/44;21/28*

U.S. Cl. 437—41 **5 Claims**



1. A method of manufacturing a field effect transistor having a titanium silicide layer, said method comprising the steps of:

a) forming a polysilicon layer on an insulating layer;

b) forming a titanium layer on the polysilicon layer;

c) forming a silicon layer on the titanium layer to cover the whole titanium layer;

d) washing a surface of said silicon layer;

e) heat treating said titanium layer which is not exposed after said step of washing to make said titanium layer a titanium silicide layer,, wherein said titanium silicide layer is laminated to said polysilicon layer;

f) etching the silicon layer, titanium silicide layer and polysilicon layer to form a gate electrode; and

g) covering the surface of the gate electrode with a heat oxide film.

5,534,454

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE HAVING ACCURATE CURRENT DETECTION

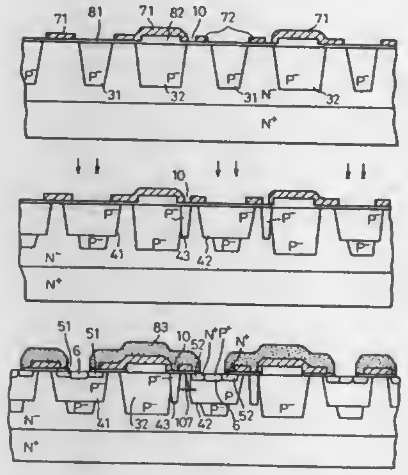
Yasuaki Tsuzuki, Anjo; Akira Kuroyanagi, Okazaki, and Toshiaki Nishizawa, Obu, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 38,951, Mar. 29, 1993, Pat. No. 5,410,171. This application Feb. 8, 1995, Ser. No. 385,553

Claims priority, application Japan, Mar. 30, 1992, 4-74534

Int. Cl.⁶ H01L *21/265;21/70;27/00*

U.S. Cl. 437—41 **2 Claims**



1. A method for producing a semiconductor device, comprising the steps of:

forming an epitaxial layer on a semiconductor substrate of a first conduction type,

forming a gate insulation film over the semiconductor substrate, forming a main gate electrode and a subgate electrode on the gate insulation film, and forming a line opening between the main gate electrode and the subgate electrode;

doping the surface of the epitaxial layer with impurities with at least the main gate electrode and the subgate electrode serving as masks, to form main wells reaching under the main gate electrode, subwells reaching under the subgate electrode, and a line well, which is independent of the main wells and surrounds the subwells with a distance away from the subwells; and

doping the surfaces of the main wells and the subwells with impurities with at least the main gate electrode and the subgate electrode serving as masks, to form sources of the first conduction type for a main current section and a detective section, the sources being shallower and narrower than the main wells and the subwells and reaching under the main gate electrode and the subgate electrode.

5,534,455

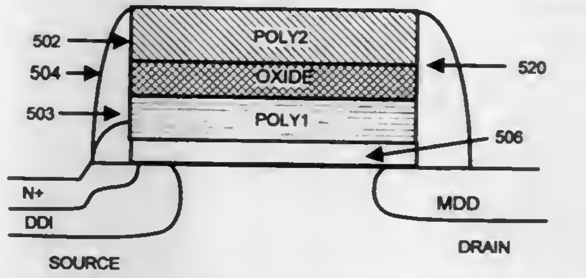
METHOD FOR PROTECTING A STACKED GATE EDGE IN A SEMICONDUCTOR DEVICE FROM SELF ALIGNED SOURCE (SAS) ETCH

David K. Y. Liu, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 233,174, Apr. 25, 1994, Pat. No. 5,470,773. This application May 2, 1995, Ser. No. 433,267

Int. Cl.⁶ H01L *21/8247*

U.S. Cl. 437—43 **7 Claims**



1. A method for protecting a stacked gate edge to minimize damage to a tunnel oxide and to maintain source junction uniformity of a semiconductor device comprising the sequential steps of:

(a) providing the stacked gate edge on the semiconductor device;

(b) performing a source implant on the semiconductor device;

(c) providing a spacer on the stacked gate edge;

(d) providing a self aligned source (SAS) etch on the semiconductor device; and

(e) providing a source connection implant.

5,534,456

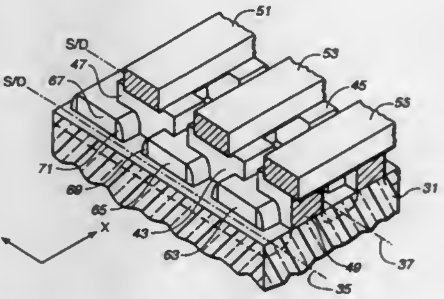
METHOD OF MAKING DENSE FLASH EEPROM CELL ARRAY AND PERIPHERAL SUPPORTING CIRCUITS FORMED IN DEPOSITED FIELD OXIDE WITH SIDEWALL SPACERS

Jack H. Yuan, Cupertino; Eliyahou Harari, Los Gatos; Henry Chien, and Gheorghe Samachisa, both of San Jose, all of Calif., assignors to SanDisk Corporation, Santa Clara, Calif.

Division of Ser. No. 248,735, May 25, 1994. This application Mar. 30, 1995, Ser. No. 414,333

Int. Cl.⁶ H01L *21/8247*

U.S. Cl. 437—43 **9 Claims**



1. A method of constructing a plurality of memory cells across a surface of a semiconductor substrate, comprising the steps of:

forming a plurality of parallel elongated strips of field oxide with walls substantially perpendicular to said substrate surface, said field oxide strips being elongated in a first direction along said substrate surface and spaced apart in a second direction to form openings therebetween, said first and second directions being substantially orthogonal with each other,

forming a first plurality of parallel elongated strips of polysilicon over said field oxide strips and extending into said openings, said first plurality of polysilicon strips being elongated in said second direction and spaced apart in said first direction, thereby exposing portions of the field oxide strips and openings which lie between the polysilicon strips, removing by a dry etch process at least a portion of the field oxide strips that are exposed between the first polysilicon strips, and

implanting ions into the surface of the substrate in regions positioned between the first polysilicon strips including locations where the field oxide strips extending therebetween have been removed, said implanted regions being elongated in the second direction.

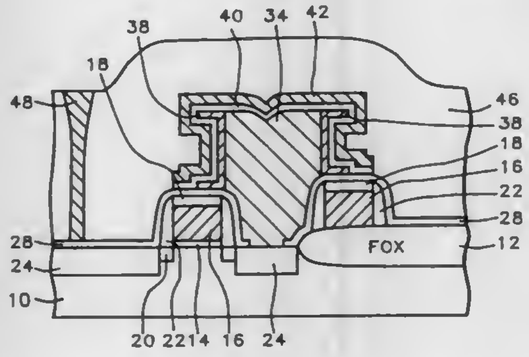
5,534,457
METHOD OF FORMING A STACKED CAPACITOR WITH AN "T" SHAPED STORAGE NODE

Horng-Huei Tseng, and Chih-Yuan Lu, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jan. 20, 1995, Ser. No. 375,783

Int. Cl.^{6} H01L *21/70;27/00*

U.S. Cl. 437—52 **19 Claims**



10. A method of fabricating a dynamic random access memory device including a stacked capacitor on a semiconductor substrate having a field oxide region, a device region, a gate structure formed in the device region, an interconnection line formed over said field oxide region, and source/drain regions associated with the gate structure, a first insulating layer over portions of the device and field oxide regions, an opening in the first insulating layer exposing source/drain regions where electrical contact is formed to the stacked capacitor, the method comprising:

forming a pattern of a second polysilicon layer and a second insulating layer over the opening in the first insulating layer, over portions of the device region, and over parts of said gate structure and said interconnection line, said second polysilicon layer contacting said source/drain regions;

laterally etching the second polysilicon layer so that portions of the second polysilicon layer are etched out beneath the second insulating layer, the second insulating layer having top and bottom sides, and the second polysilicon layer having vertical sidewalls;

forming a third polysilicon layer on said bottom side of said second insulating layer, and on said vertical sidewalls of the second polysilicon layer and on portions of said first insulating layer;

removing the second insulating layer after forming said third polysilicon layer;

forming a capacitor dielectric layer covering at least the second and third polysilicon layers;

forming a top electrode over the capacitor dielectric layer; and

forming metal lines, passivation layers, and contacts, to complete the dynamic random access memory device.

5,534,458
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH HIGH DIELECTRIC CAPACITOR HAVING SIDEWALL SPACERS

Tomonori Okudaira; Takeharu Kuroiwa; Nobuo Fujiwara, and Keiichiro Kashihara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

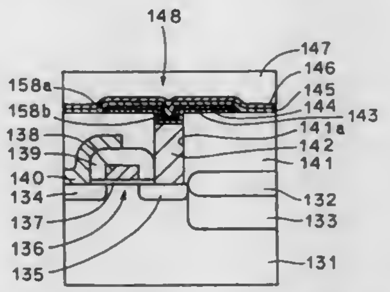
Division of Ser. No. 255,854, Jun. 7, 1994, Pat. No. 5,442,213.

This application May 17, 1995, Ser. No. 442,925

Claims priority, application Japan, Jun. 23, 1993, 5-152364

Int. Cl.^{6} H01L *21/70;27/00*

U.S. Cl. 437—52 **2 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming an impurity region on a main surface of a semiconductor substrate,

forming an interlayer insulation film on the main surface of the semiconductor substrate to cover said impurity region,

forming a contact hole in said interlayer insulation film reaching said impurity region,

forming a buried conductive layer, filling said contact hole, in contact with said impurity region, and having a top face lower in level than a top face of said interlayer insulation film,

forming a lower electrode layer on said interlayer insulation film to come into contact with said buried conductive layer,

forming a first sidewall spacer at an edge face portion of said lower electrode layer, from a top face corner of said lower electrode layer to the top face of said interlayer insulation film,

forming a second sidewall spacer on said lower electrode layer in a recess portion defined by a sidewall of said contact hole and said buried conductive layer, from a top face corner of said lower electrode layer formed on said interlayer insulation film to said lower electrode layer formed on said buried conductive layer,

forming a high dielectric film of a high dielectric constant material to cover said lower electrode layer, and said first and second sidewall spacers, and

forming an upper electrode layer to cover said high dielectric film.

5,534,459
METHOD FOR FORMING SILICON ON INSULATOR STRUCTURED

Sung S. Kim, Daeku-si, Rep. of Korea, assignor to LG Semicon Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 7, 1995, Ser. No. 482,002

Claims priority, application Rep. of Korea, Jun. 17, 1994, 13740/1994

Int. Cl.^{6} H01L *21/20*

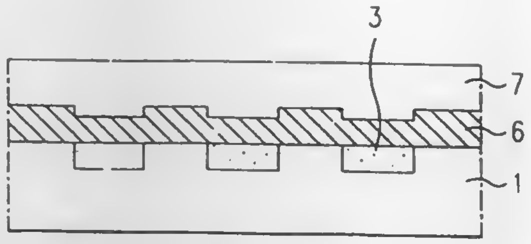
U.S. Cl. 437—89 **5 Claims**

1. A method for forming an SOI (Silicon On Insulator) structured substrate comprising the steps of:

forming a first insulation film on a silicon substrate;

selectively exposing the substrate by selectively removing the first insulation film;

forming first high density impurity regions in the substrate by injecting high density impurity ions into the exposed substrate wherefrom the first insulation film has been removed;



forming a first epitaxial layer on the surface of the first insulation film and the first high density impurity regions;

removing a portion of the first epitaxial layer on each of the first high density impurity regions;

forming a second insulation film on the first epitaxial layer;

forming an insulation layer including the first insulation film and the second insulation film on the substrate by etching the second insulation film to expose the first epitaxial layer; and,

growing a second epitaxial layer on the surface of the insulation layer.

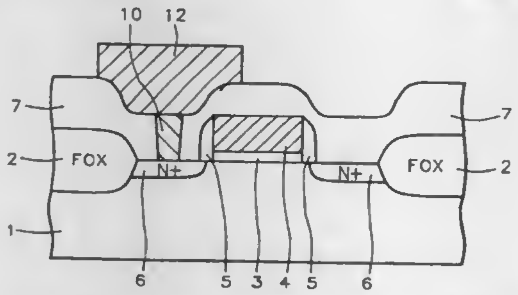
5,534,460
OPTIMIZED CONTACT PLUG PROCESS

Horng-Huei Tseng, and Chih-Yuan Lu, both of Hsin Chu, Taiwan, assignors to Vanguard International Semiconductor Corp., Hsinchu, Taiwan

Filed Apr. 27, 1995, Ser. No. 430,191

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—187 **20 Claims**



1. A method for fabricating a MOSFET device on a semiconductor substrate, using a conductive plug to provide electrical contact between an active device region in the substrate, and the interconnect metallization, comprising the steps of:

providing said active device element in said semiconductor substrate;

depositing a first dielectric layer on said semiconductor substrate, that includes said active device element;

depositing a second dielectric layer on said first dielectric layer, to form composite dielectric layer;

photolithographic processing to open a region in photoresist, exposing said composite dielectric layer, directly overlying said active device element;

anisotropic removal of said composite dielectric layer, in said exposed region in photoresist, to create a contact hole to said active device region;

cleaning surface of said active device region, in said contact hole opening;

depositing an insitu doped layer of polysilicon on said active device region, in said contact hole, and on said second dielectric layer;

oxidation of said insitu doped polysilicon layer to completely convert said insitu doped polysilicon, on said second dielectric layer, to silicon oxide, while converting only top portion of said insitu doped polysilicon, in said contact hole, to silicon oxide;

removal of said silicon oxide from surface of said second dielectric layer, and from surface of said insitu doped polysilicon, in said contact hole; and

removal of said second dielectric layer from surface of said first dielectric layer.

5,534,461
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING PLANARIZED WIRING

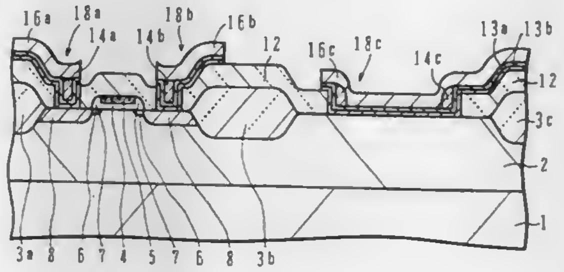
Tetsuya Kuwajima, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Mar. 2, 1995, Ser. No. 397,616

Claims priority, application Japan, Mar. 4, 1994, 6-060221

Int. Cl.^{6} H01L *21/283*

U.S. Cl. 437—189 **25 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

(a) providing a semiconductor substrate having a primary surface of a first level and a projection of a second level;

(b) forming an insulating layer over the semiconductor substrate, the insulating layer having a topography including flat portions and a slope portion connecting adjacent flat portions, the topography transferring features of the primary surface and the projection;

(c) forming a first contact hole and a second contact hole through the insulating layer, the contact hole having a side wall;

(d) forming a first metal layer over the insulating layer;

(e) forming a second metal layer over the first metal layer, the second metal layer being conformal to a surface of the first metal layer, wherein the second metal layer having a thickness of R on the flat portion and a thickness of Rs on the side wall; a thickness of the insulating layer being defined as d, a coverage ratio of the side wall being defined as $C=Rs/R$; a preselected aspect ratio of a contact hole being defined as k_o, an aperture size r of the first and second contact holes being selected in a range of $r \leqq 2CR$ and $r \geqq 2CR+d/k_o$, respectively; and

(f) selectively removing the second metal layer so as to bury the first contact hole and to leave a second metal film on the side wall of the second contact hole and to completely remove a second metal film on the flat and slope portions.

5,534,462
METHOD FOR FORMING A PLUG AND SEMICONDUCTOR DEVICE HAVING THE SAME

Robert W. Fiordalice; Papu D. Maniar; Jeffrey L. Klein, and Bernard J. Roman, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

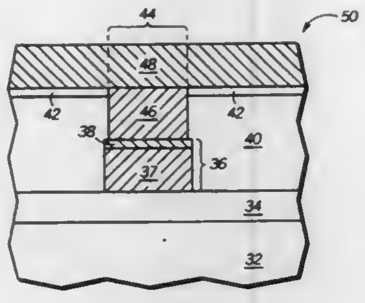
Filed Feb. 24, 1995, Ser. No. 393,782

Int. Cl.^{6} H01L *21/44*

U.S. Cl. 437—190 **25 Claims**

1. A method for making a semiconductor device, comprising the steps of:

providing a semiconductor substrate having a metal interconnect;



depositing an interlayer dielectric over the metal interconnect;
depositing a glue layer comprised of aluminum nitride on the interlayer dielectric;
etching an opening through both the interlayer dielectric and the glue layer, wherein the opening overlies the metal interconnect and exposes a portion thereof;
depositing a conductive plug material on the glue layer and into the opening sufficiently to fill the opening; and
polishing back the conductive plug material to form a conductive plug in the opening and electrically connected to the metal interconnect.

5,534,463
METHOD FOR FORMING A WIRING LAYER

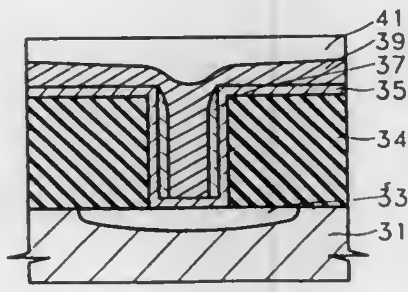
Sang-in Lee, and Chang-soo Park, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jan. 25, 1993, Ser. No. 8,775

Claims priority, application Rep. of Korea, Jan. 23, 1992, 92-904

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 437—195 **27 Claims**



27. A method for manufacturing a semiconductor device including a wiring layer comprising the steps of:
forming an insulating layer on a semiconductor substrate;
providing said insulating layer with an opening exposing a portion of a surface of an underlying layer beneath said insulating layer;
forming a reactive spacer on a sidewall of said opening;
forming a first conductive layer on said insulating layer, on said reactive spacer, and on said exposed surface portion of said underlying layer by subsequently depositing a first metal having a Si component to form a first metal layer and a second metal having no Si component to form a second metal layer; and
heat-treating said first conductive layer for an appropriate time to fill up said opening with the material of said first conductive layer, without breaking vacuum, after forming said first conductive layer.

5,534,464
SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR CHIP MOUNTED ON AN INSULATING BODY

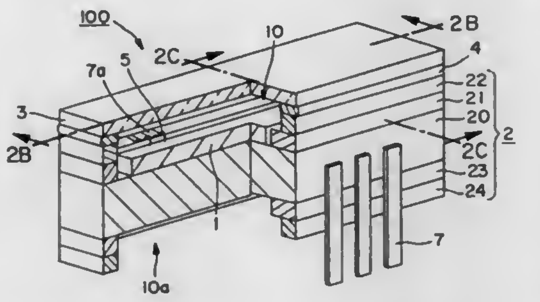
Masato Ujiie, Tokyo, Japan, assignor to NEC Corporation, Japan

Division of Ser. No. 88,264, Jul. 7, 1993, Pat. No. 5,450,287. This application Jun. 7, 1995, Ser. No. 478,280

Claims priority, application Japan, Jul. 10, 1992, 4-182751

Int. Cl.⁶ H01L *21/60*

U.S. Cl. 437—209 **12 Claims**



1. A method of fabricating a semiconductor device, said method comprising the steps of:
(a) preparing an insulating package body with a mounting face for receiving a semiconductor chip, said package body having a side wall that surrounds said mounting face to produce a concavity on and adjacent to said mounting face, said side wall having windows formed at respective positions opposite each other, and bottoms of said windows being at a level which is no higher than a level of said mounting face;
(b) fixing insulating side plates to said respective windows;
(c) mounting said semiconductor chip on said mounting face, said chip being housed within said concavity; and
(d) fixing a sealing member to an opening end of said package body.

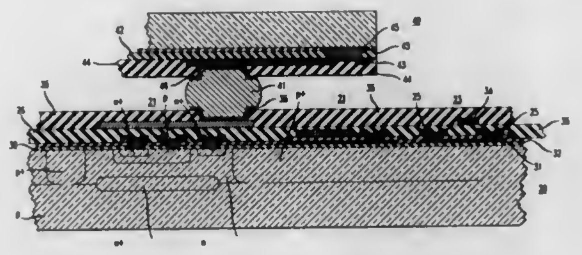
5,534,465
METHOD FOR MAKING MULTICHIP CIRCUITS USING ACTIVE SEMICONDUCTOR SUBSTRATES

Robert C. Frye, Piscataway, and King L. Tai, Berkeley Heights, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jan. 10, 1995, Ser. No. 370,902

Int. Cl.⁶ H01L *21/60*

U.S. Cl. 437—209 **5 Claims**



1. A method for making a circuit comprising a plurality of integrated circuit chips comprising the steps of:
providing a semiconductor substrate having formed therein a set of isolated and unconnected electrical components for interconnecting said circuit chips, said components including at least one bipolar transistor;
forming a plurality of electrical paths for interconnecting said circuit chips, said electrical paths including electrical components in said semiconductor substrate; and
mounting said chips on said substrate in electrical contact with said electrical paths to form a circuit comprising said interconnected plurality of chips.

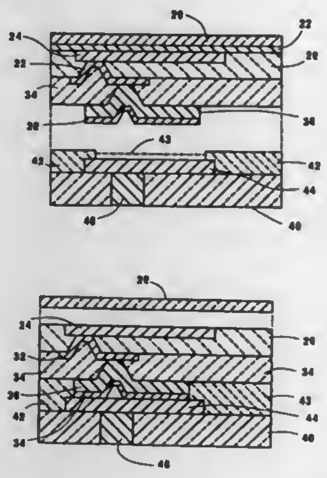
5,534,466
METHOD OF MAKING AREA DIRECT TRANSFER MULTILAYER THIN FILM STRUCTURE

Eric D. Perfecto, Poughkeepsie; Chandrika Prasad, Wappingers Falls, both of N.Y.; George E. White, Hoffman Estates, Ill., and Kwong H. Wong, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1995, Ser. No. 457,191

Int. Cl.⁶ H01L *21/18*

U.S. Cl. 437—208 **19 Claims**



1. A process for transferring a film wiring layer to a substrate in the construction of single or multilayer chip modules comprising the steps of:
a) providing a carrier for constructing a multilevel film structure;
b) depositing at least one sacrificial release layer on a surface of the carrier;
c) forming on the release layer a multilevel film structure comprising at least one dielectric material and at least one wiring path of metallic material, at least a portion of the metallic material being exposed on a surface of the multilevel film structure opposite the carrier;
d) providing a substrate;
e) applying solder to one or both of the exposed metallic surface of the multilevel film structure and the substrate;
f) applying the multilevel film structure to the substrate so that the attached carrier is remote from the substrate;
g) heating the solder to join the multilevel film structure and attached carrier to the substrate; and
h) contacting the release layer with an etchant for the release layer, said etchant being substantially inert to the dielectric layer and the metallic layer of the multilevel film structure, so as to remove the carrier from the multilevel film structure to produce a multilayer chip module.

5,534,467
SEMICONDUCTOR PACKAGES FOR HIGH I/O SEMICONDUCTOR DIES

Michael D. Rostoker, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

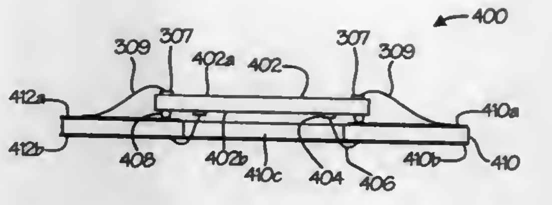
Continuation of Ser. No. 33,718, Mar. 18, 1993, Pat. No. 5,340,771. This application Aug. 22, 1994, Ser. No. 293,667

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.⁶ H01L *21/60*

U.S. Cl. 437—209 **17 Claims**

1. A method of packaging a semiconductor die requiring a high number of connections, comprising the steps of:
providing a substrate having two opposite surfaces, one of which is a first surface, another of which is a second surface, a die-receiving area defined on the first surface of the substrate;
providing a first plurality of conductive lines on the first surface of the substrate;



providing a second plurality of conductive lines on the substrate;
providing a semiconductor die having:
a first plurality of bond sites around a periphery of a one surface of the semiconductor die;
a second plurality of bond sites around a periphery of an other surface of the semiconductor die, the other surface of the die being opposite the one surface of the die; and
providing the first plurality of conductive lines within the die-receiving area where the die is mounted on the first surface of the substrate, connecting the first plurality of bond sites of the die to the first plurality of conductive lines with first connections, and connecting the second plurality of bond sites to the second plurality of conductive lines with second connections.

5,534,468
CERAMIC OXIDE COMPOUNDS

Ronald R. Stephenson, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 566,557, Aug. 13, 1990, Pat. No. 5,407,618. This application Sep. 30, 1994, Ser. No. 315,376

Int. Cl.⁶ C04B *35/50;35/624*

U.S. Cl. 501—12 **12 Claims**

1. A $La_{1-x}Sr_xCr_{1-y}Mn_yO_3$ ceramic oxide gel obtainable by the process comprising the steps of:
(a) providing a colloidal solution of polyhydroxyorganic chelating agents selected from the group consisting of ethylene glycol and citric acid, and metal salts selected from the group consisting of lanthanum, strontium, chromium, and manganese, each salt being present in an amount necessary to provide the stoichiometric amount of metal ions required in the ceramic oxide gel;
(b) heating the colloidal solution to hydrolyze and polymerize the metal ions in the solution to a mixed metal oxide precursor of the ceramic oxide gel; and
(c) adding organic acid, water or both to the precursor of the ceramic oxide gel to peptize the metal ions; and
(d) heating the peptized precursor to evaporate solvent to form a thick, viscous, flexible, ductile, handleable gel that can be cast, extruded, or drawn; wherein x and y are independently 0 or 1.

5,534,469
LOW TEMPERATURE NON-CRYSTALLIZING SEALING GLASS

Masaaki Hayashi, Shiga-ken, Japan, assignor to Nippon Electric Glass Co., Ltd., Otsu, Japan

Filed Sep. 12, 1995, Ser. No. 526,910

Int. Cl.⁶ C03C *8/10;8/24*

U.S. Cl. 501—15 **4 Claims**

2. A sealing composition comprising, by volume, 60–95% of non-crystallizing sealing glass powder and 40–5% of refractory filler powder, said sealing glass essentially consisting, by weight, of 65–80% of PbO, 5.5–8% of $B_2 O_3$, 3–9% of ZnO, 7–22% of Bi_2O_3, 16% or more of $ZnO+Bi_2O_3$, 0.2–1% of SiO_2, 0.3–2% of Fe_2O_3, and 1.5–4.5% of Cs_2O.

5,534,470
LITHIUM ALUMINOBORATE GLASS-CERAMICS

Ronald l. Andrus, Corning, and John F. MacDowell, Penn Yan, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 27, 1994, Ser. No. 329,403
Int. Cl.^{6} C03C *14/00*

U.S. Cl. 501—32 **4 Claims**

1. A sintered glass-ceramic-bonded ceramic composite body comprising about 70–90% by weight of alumina particulates and about 10–30% by weight of glass-ceramic comprising lithium aluminoborate crystals, said glass-ceramic being crystallized in situ from a thermally crystallizable glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

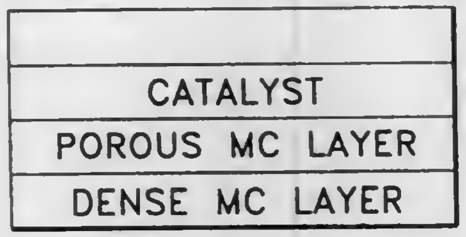
SiO_2	25–55	MgO	0–12
B_2O_3	35–65	Li_2O + MgO	4–16.
Li_2O	2–15		

5,534,471
ION TRANSPORT MEMBRANES WITH CATALYZED MIXED CONDUCTING POROUS LAYER

Michael F. Carolan, and Paul N. Dyer, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 12, 1994, Ser. No. 180,938
Int. Cl.^{6} B01J *20/28;35/00*

U.S. Cl. 502—4 **40 Claims**



1. An ion transport membrane comprising a porous mixed conducting multicomponent metallic oxide layer having a first surface which is coated with a catalyst and a second surface which is contiguous with a dense mixed conducting multicomponent metallic oxide layer.

5,534,472
VANADIUM-CONTAINING CATALYST SYSTEM

Linda N. Winslow, Cincinnati; Douglas D. Klendworth, West Chester; Raghu Menon, West Chester; Michael W. Lynch, West Chester, all of Ohio; Garry L. Fields, Seneca, and Kenneth W. Johnson, Naperville, both of Ill., assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Mar. 29, 1995, Ser. No. 412,633
Int. Cl.^{6} B01J *31/14*

U.S. Cl. 502—116 **47 Claims**

1. A vanadium-containing catalyst system comprising:
(A) a supported catalyst component prepared by the steps of
  (a) preheating silica at a temperature in the range of between about 150° C. and about 800° C.;
  (b) contacting said preheated silica with a contacting agent selected from the group consisting of (1) a compound or complex which includes at least one carbon to magnesium covalent bond, (2) a compound which includes at least one carbon to a metal of Group III of the Periodic Table of the Elements covalent bond and (3) both a compound or complex which includes at least one carbon to magnesium covalent bond and a compound which includes at least one carbon to Group III metal covalent bond;
  (c) contacting said product of step (b) with whichever of contacting agent (1) and (2) that does not contact said preheated silica in step (b), with the proviso that this step is omitted if said contacting agent (3) is employed in step (b);
  (d) contacting said product of step (b) or (c) with a vanadium compound which includes at least one halogen atom; and
  (e) contacting said product of step (d) with an alcohol;
(B) an organoaluminum compound cocatalyst; and
(C) a halogen-containing promoter compound having the structural formula $C_tH_sX^2_{2t+2-s}$ where X^2 is the same or different and is fluorine, chlorine or bromine; t is an integer of 1 to 3 and s is 0 or an integer of 1 to 7.

5,534,473
CATALYST SYSTEMS FOR PRODUCING BROAD MOLECULAR WEIGHT POLYOLEFIN

M. Bruce Welch; Rolf L. Geerts; Syriac J. Palackal, all of Bartlesville, Okla., and Ted M. Pettijohn, Marshall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 305,243, Sep. 13, 1994, which is a continuation-in-part of Ser. No. 226,600, Apr. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 192,223, Feb. 3, 1994, which is a continuation-in-part of Ser. No. 734,853, Jul. 23, 1991, Pat. No. 5,436,305. This application Jun. 5, 1995, Ser. No. 463,839
Int. Cl.^{6} C08F *4/643*

U.S. Cl. 502—117 **8 Claims**

1. A catalyst system suitable for preparing a polyolefin having a molecular weight distribution, M_w/M_n, greater than 3 from an olefin or or mixture of olefins comprising
(1) at least first and second different metallocenes characterized by the fact that said first metallocene is a bridged metallocene which contains a fluorenyl group and said second metallocene is an unbridged metallocene and by the fact that said first metallocene if used as the sole metallocene to prepare polyolefin, would produce a higher molecular weight than said second metallocene would produce if used as the sole metallocene under the same polymerization conditions, and
(2) a suitable cocatalyst for the metallocenes.

5,534,474
PROCESS FOR PREPARING ALUMINOXANE ON INERT SUPPORT MATERIAL

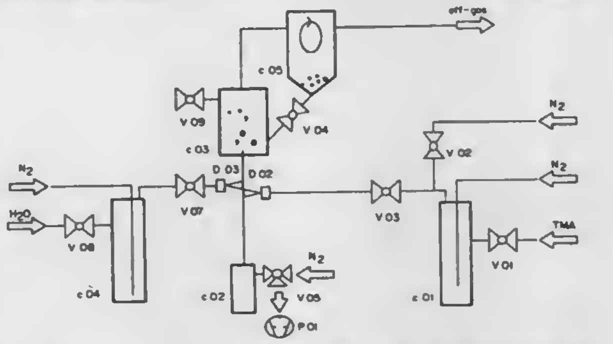
Ralf-Jürgen Becker, Hamm; Stefan Gürtzgen, Wuppertal, and Dirk Kutschera, Dortmund, all of, Germany, assignors to Witco GmbH, Bergkamen, Germany

Filed Mar. 13, 1995, Ser. No. 402,899

Claims priority, application Germany, Mar. 18, 1994, 44 09 249.0

Int. Cl.^{6} B01J *37/02;* **C07F** *5/06*

U.S. Cl. 502—152 **11 Claims**



1. A process for preparing one or more alkylaluminoxanes immobilized on solid, particulate inert support material from one or more alkylaluminum compounds and water, comprising metering said one or more alkylaluminum compounds in one or more atomized or gaseous feed streams into a fluidized bed reactor containing therewithin said solid, particulate inert support material while maintaining said support material under fluidizing conditions with an inert gas stream, and providing water in said reactor, whereby said one or more alkylaluminum compounds and water react and form said one or more alkylaluminoxanes on said support material directly in said inert gas stream.

5,534,475
CATALYTICALLY ACTIVE CERAMIC MONOLITHS FOR THE REDUCTION OF LEADED GASOLINE FUELED ENGINE POLLUTANTS AND THE PRODUCTION THEREOF

Luis E. M. Cardenas; Salavador C. Cervantes, and Florencia M. M. Pineda, all of Mexico City, Mexico, assignors to Instituto Mexicano Del Petroleo, Mexico

Filed Mar. 2, 1994, Ser. No. 204,567
Int. Cl.^{6} B01J *21/04;23/10;23/26;23/72*

U.S. Cl. 502—304 **17 Claims**

1. A process for the preparation of catalytically active ceramic monoliths for the reduction of pollutants derived from leaded gasoline fueled engines comprising the steps of impregnating a gamma alumina-cerium oxide base-coated honeycomb ceramic monolith with an aqueous solution comprising chromium, copper and nickel and subsequently heating the impregnated monolith.

7. A catalyst for conversion of exhaust gas pollutants comprising a gamma alumina-cerium oxide base-coated honeycomb ceramic monolithic substrate in which said gamma alumina is impregnated with chromium, copper and nickel.

5,534,476
USE OF A SUPER ALLOY AS A SUBSTRATE FOR CATALYSTS

Marjo Luoma; Keijo Torkkell, both of Oulu; Reijo Lylykangas, and Pirkko Virta, both of Vihtavuori, all of, Finland, assignors to Kemira Oy, Espoo, Finland

Continuation of Ser. No. 923,931, Oct. 26, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,587

Claims priority, application Finland, Jan. 3, 1991, 910029
Int. Cl.^{6} B01J *21/02;23/74*

U.S. Cl. 502—335 **6 Claims**

1. A catalytic alloy substrate for purifying exhaust gases, consisting essentially of a roll-formed, thin, nickel-based metal foil having at least 4% by weight aluminum, wherein the highest individual metal concentration in the metal alloy is nickel, its concentration being higher than 40% by weight, and the thickness of the foil is about 0.03–0.1 mm, wherein said substrate has a catalyst support layer in integral contact with said substrate.

5,534,477
IMAGE RECEIVING SHEET FOR THERMAL TRANSFER PRINTING

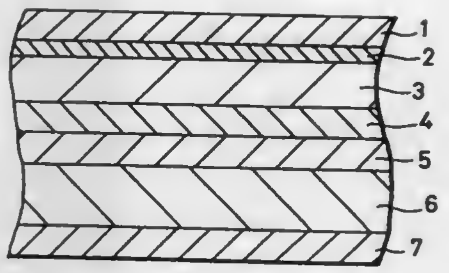
Yoshinori Nakamura; Huy Sam, both of Miyagi; Yukio Kusaka, Tochigi; Shigeo Hayasi, and Toshikazu Nagura, both of Kanagawa, all of, Japan, assignors to Sony Corporation, and New Oji Paper Co., Ltd., both of Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 345,713

Claims priority, application Japan, Nov. 24, 1993, 5-319044
Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **5 Claims**

1. An image receiving sheet for thermal transfer printing, comprising:
a dye receiving layer;
a foam film;
an adhesive layer;
a release layer;
a support layer; and
a lubricant layer, which are successively laminated, said dye receiving layer, said foam film and said adhesion layer composing a seal portion, said release layer, said support layer and said lubricant layer composing a support portion, wherein smoothness of said dye receiving layer is equal to or larger than 2000 seconds, wherein said foam film contains a white inorganic pigment of 5 to 30 weight % and has a microvoid formed by mixing resins that are not compatible with each other, having a cushion ratio of 5 to 30% and a density of 0.7 to 1.1 g/cm^3 measured in accordance with a measuring method of JIS L1015, wherein each of said seal portion and said support portion has more than one antistatic layer; and wherein stiffness of the whole image receiving sheet for the thermal transfer printing ranges from 400 to 1000 standard Gurley unit when it is measured in accordance with a measuring method of TAPPI T 543pm84.



5,534,478
THERMAL DYE TRANSFER SYSTEM WITH POLYESTER IONOMER RECEIVER

Wayne A. Bowman, Walworth; Leslie Shuttleworth, and Helmut Weber, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1995, Ser. No. 469,132
Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **20 Claims**

11. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder, said dye being a cationic dye or a deprotonated cationic dye which is capable of being reprotonated to a cationic dye having a N—H group which is part of a conjugated system, and imagewise transferring said dye to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a polymeric dye image-receiving layer comprising a polyester ionomer comprising a polyester backbone containing units of a sulfonic acid or a sulfonimide or their salts, with the proviso that when said dye is a deprotonated cationic dye which is capable of being reprotonated to a cationic dye having a N—H group which is part of a conjugated system, said dye image-receiving layer comprises a polyester ionomer comprising a polyester backbone containing units of a sulfonic acid or a sulfonimide.

5,534,479
THERMAL DYE TRANSFER SYSTEM WITH RECEIVER CONTAINING AN ACID MOIETY

Leslie Shuttleworth, Webster; Wayne A. Bowman, Walworth, and Helmut Weber, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1995, Ser. No. 469,248
Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **6 Claims**

4. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric

binder, said dye being a deprotonated cationic dye which is capable of being reprotonated to a cationic dye having a N-H group which is part of a conjugated system, and imagewise transferring said dye to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a polymeric dye image-receiving layer, said polymeric dye image-receiving layer containing an organic acid moiety as part of the polymer chain which is capable of reprotonating said deprotonated cationic dye, said polymeric dye image-receiving layer comprising a polyester, an acrylic polymer or a styrene polymer.

5,534,480

PESTICIDE STICKER-EXTENDER COMPRISING MALEIC ANHYDRIDE, SULFURIC ACID, TURPENTINE, BUTANOL, AND ALKANOLAMINES

Joseph T. Brennan, Blytheville, Ark., assignor to Terra International, Inc., Sioux City, Iowa

Filed Apr. 28, 1994, Ser. No. 234,418

Int. Cl.^{6} A01N *25/24*

U.S. Cl. 504—116 **1 Claim**

1. A sticker-extender for pesticides comprising a first mixture mixed with a second mixture, said first mixture comprising more than 50% of the total mixture, said first mixture comprising maleic anhydride, an acid and turpentine, said second mixture comprising butanol, monoethanolamine, diethanolamine, triethanolamine and mono isopropyl amine, said first mixture comprises about 34.92% maleic anhydride about 0.37% sulfuric acid, and about 64.7% acintene P-AC turpentine, and wherein said second mixture comprises about 22.40% butanol, about 6.80% monoethanolamine, about 2.00% diethanolamine, about 5.90% triethanolamine and about 2.50% mono isopropyl amine and said first mixture being about 60.40% of the total mixture.

5,534,481

INDAZOLESULFONYLUREA DERIVATIVE, ITS USE AND INTERMEDIATE FOR ITS PRODUCTION

Chiharu Suzuki; Katsumi Masuda; Masatoshi Tamaru; Masahito Inamori; Nobuo Takefuji, all of Iwata-gun; Katsutada Yanagisawa, Ogasa-gun, and Yasunori Ogawa, Kakegawa, all of, Japan, assignors to Kumiai Chemical Industry Co., Ltd., and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP94/01016, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO95/00509, PCT Pub. Date Jan. 5, 1995

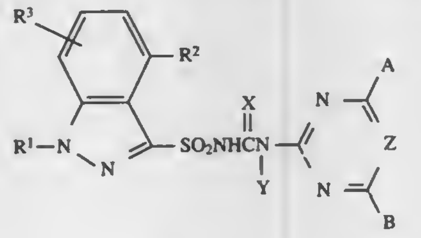
PCT Filed Jun. 24, 1994, Ser. No. 373,273

Claims priority, application Japan, Jun. 25, 1993, 5-180809; Jun. 25, 1993, 5-180810; Dec. 10, 1993, 5-341772

Int. Cl.^{6} C07D *403/12;* A01N *43/54*

U.S. Cl. 504—215 **4 Claims**

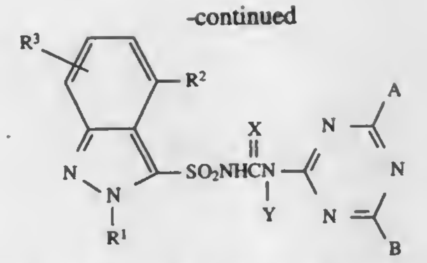
1. An indazolesulfonylurea derivative of the formula:



[I]

or

-continued



[II]

wherein R^1 is a hydrogen atom, a straight or branched chain C_{1-30} alkyl group, a C_3 cycloalkyl group, a C_{1-30} haloalkyl group, a C_{1-30} haloalkyl group, a C_{1-30} alkoxyalkyl group, a C_{1-30} benzyloxyalkyl group, a benzyl group, a phenyl group, a pyridyl group, a C_{1-30} dialkylaminocarbonyl group, a C_{1-30} alkoxycarbonyl group, a C_{1-30} alkylsulfonyl group, a phenylsulfonyl group, a C_{1-30} dialkylaminosulfonyl group, a C_{1-30} haloalkylcarbonyl group, a C_{1-30} alkylcarbonyl group, a benzoyl group or a C_{2-20} alkenyl group;

R^2 and R^3 are, independently, a hydrogen atom, a halogen atom, a straight or branched chain C_{1-30} alkyl group, a C_3 cycloalkyl group, a C_{2-20} alkenyl group, a C_{1-30} alkoxycarbonylalkenyl group, a C_{2-20} alkynyl group, a C_{1-30} haloalkyl group, an C_{1-30} alkoxyalkyl group, a C_{1-30} alkoxycarbonylalkyl group, a C_{1-30} alkylcarbonylalkyl group, a C_{1-30}cycloalkylcarbonylalkyl group, a C_{1-30} cyanoalkyl group, a C_{1-30} dialkylaminocarbonylalkyl group, a C_{1-30} dialkylaminoalkyl group, a C_{1-30} dialkylaminosulfonylalkyl group, a C_{1-30} azidoalkyl group, a benzyl group, a phenyl group, a nitro group, a cyano group, an azide group, an amino group, a C_{1-30} monoalkylamino group, a C_{1-30} dialkylamino group, a benzylamino group, an C_{1-30} alkylcarbonylamino group which may be substituted by a halogen atom, a benzoylamino group, a C_{1-30} alkoxycarbonylamino group, a phenoxycarbonylamino group, a C_{1-30} alkylsulfonylamino group wherein the amino group may be substituted by a C_{1-30} alkyl group, a phenylsulfonylamino group wherein the amino group may be substituted by an C_{1-30} alkyl group, a C_{1-30} alkylideneamino group, a benzylideneamino group, a tetrazolyl group which may be substituted with methyl, a group of the formula —COR^4,

wherein R^4 is a hydrogen atom, a hydroxyl group, a C_{1-30} alkyl group, a C_{1-30} cycloalkyl group, a C_{1-30} haloalkyl group, a C_{2-20} alkenyl group, a C_{2-20} alkynyl group, a benzyl group, a phenyl group, a C_{1-30} alkoxy group, a C_{1-30} haloalkoxy group, an C_{1-30} alkoxyalkoxy group, a C_{2-20} alkenyloxy group, a C_{1-30} haloalkenyloxy group, a C_{2-20} alkynyloxy group, a benzyloxy group or a phenoxy group,

a group of the formula —$C(O)NR^5R^6$,

wherein R^5 and R^6 are, independently, a hydrogen atom, an C_{1-30} alkyl group, a C_{2-20} alkenyl group, a C_{2-20} alkynyl group, a benzyl group, a phenyl group or a C_{1-30} alkoxy group, and

a group of the formula —SR^7,

wherein R^7 is a hydrogen atom, a C_{1-30} alkyl group or a halo(C_{1-30})alkyl group,

a group of the formula —$SO_2NR^5R^6$,

wherein R^5 and R^6 have the same meanings as defined above,

a group of the formula —$S(O)^nR^8$,

wherein n represents an integer of 1 or 2, and R^8 represents a C_{1-30} alkyl group, a C_{2-20} alkenyl group or a halo(C_{1-30})alkyl group,

a group of the formula —OR^9,

wherein R^9 is a hydrogen atom, a C_{1-30} alkyl group, a C_3 cycloalkyl(C_{1-30})alkyl group, a C_{1-30} alkenyl group, a C_{1-30} alkynyl group, a benzyl group,

wherein said benzyl group may be substituted by a halogen atom, a C_{1-30} alkyl group or a C_{1-30} alkoxy group and,

a halo(C_{1-30})alkyl group, a halo(C_{1-30}) alkenyl group, a phenyl group

said phenyl group may be substituted by a halogen atom, a C_{1-30} alkyl group or a C_{1-30} alkoxy group,

a C_{1-30} alkoxyalkyl group, a C_{1-30} alkoxyalkoxyalkyl group, a C_{1-30} haloalkoxyalkyl group, a C_{1-30} benzyloxyalkyl group, a C_{1-30} phenoxyalkyl group, a C_{1-30} alkylthioalkyl group, a C_{1-30} dialkylaminoalkyl group, an C_{1-30} azidoalkyl group, a C_{1-30} alkylcarbonyl group, a C_{1-30} haloalkylcarbonyl group, a benzoyl group, a C_{1-30} dialkylaminocarbonyl group, a cyanoalkyl group, a C_{1-30} alkylideneamino group, a C_{1-30} dialkylideneamino group, a benzylideneamino group or a C_{1-30} alkoxycarbonylalkyl group,

or the formula —$C(=NOR^{10})R^{11}$,

wherein R^{10} represents a hydrogen atom, a C_{1-30} alkyl group, a C_{2-20} alkenyl group, a C_{2-20} alkynyl group, a benzyl group, a C_{1-30} haloalkyl group or a phenyl C_{1-30} group, and R^{11} represents a hydrogen atom, a alkyl group, a benzyl group, a C_{1-30} haloalkyl group or a phenyl group,

R^2 and R^3 may together be —O—C_2H_4—O—, —S—C_2H_4—S— or —O—CH_2—O—;

A and B are, independently, C_{1-30} alkyl group, a C_{1-30} haloalkyl group, a C_{1-30} alkoxy group, a C_{1-30} monoalkylamino group, a C_{1-30} dialkylamino group, a halogen atom or a C_{1-30} haloalkoxy group,

Z is a methine group;

X is an oxygen atom or a sulfur atom; and

Y is a hydrogen atom, a C_{1-30} alkyl group or a C_{1-30} alkoxyalkyl group.

5,534,482

HERBICIDAL IMIDAZO[1,2-A]PYRIDIN-3-YLSULFONYLUREA

Yasuo Ishida, Osaka; Kazunari Ohta, Ibaraki, and Harutoshi Yoshikawa, Kyoto, all of, Japan, assignors to Takeda Chemical Industries, Ltd.

Continuation of Ser. No. 75,017, Jun. 11, 1993, which is a continuation of Ser. No. 760,392, Sep. 16, 1991, abandoned.

This application Jun. 7, 1995, Ser. No. 476,680

Claims priority, application Japan, Sep. 26, 1990, 258142

Int. Cl.^{6} A01N *43/54*

U.S. Cl. 504—215 **2 Claims**

1. A method for controlling an undesired weed selected from the group consisting of at least one of black grass and downy brome in an upland-field of wheat comprising

(i) mixing a herbicidal composition into the field or soil of the field prior to sowing,
(ii) treating the field or soil of the field with a herbicidal composition prior to sprouting of the wheat, and/or
(iii) sprinkling a herbicidal composition over stems and leaves of wheat in the field;

wherein the herbicidal composition comprises

(a) a herbicidally effective amount of N-(2-ethylsulfonylimidazo[1,2-a]pyridin-3-ylsulfonyl)-N'-(4,6-dimethoxy- 2-pyrimidinyl)urea; or an agriculturally acceptable salt thereof,
(b) a surfactant in an amount of from 1 to 25% by weight of the composition, and
(c) an agriculturally acceptable vehicle.

5,534,483

(2-IMIDAZOLIN-2-YL) FUSED HETEROPYRIDINE COMPOUNDS INTERMEDIATES FOR THE PREPARATION OF AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

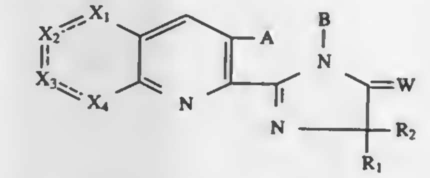
Barrington Cross, Rocky Hill; Marinus Los, Pennington; Robert F. Doehner, Jr., East Windsor; David W. Ladner, Hamilton Square, and Jerry L. Johnson, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 123,827, Sep. 20, 1993, which is a division of Ser. No. 465,569, Jan. 16, 1990, Pat. No. 5,252,538, which is a continuation of Ser. No. 178,408, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 876,599, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,578, Dec. 13, 1985, abandoned, and a continuation-in-part of Ser. No. 612,531, May 21, 1984, Pat. No. 5,129,454. This application Jun. 2, 1995, Ser. No. 460,707

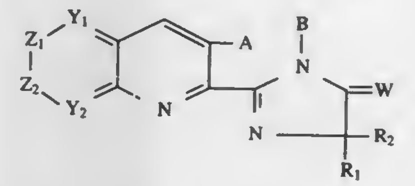
Int. Cl.^{6} A01N *43/90;* C07D *513/06;498/06*

U.S. Cl. 504—221 **10 Claims**

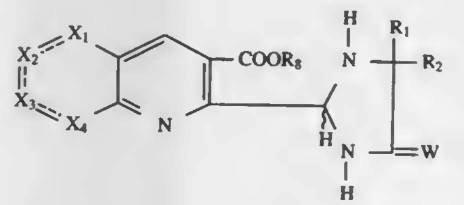
1. (2-Imidazolin-2-yl) fused heteropyridine compounds having the structure



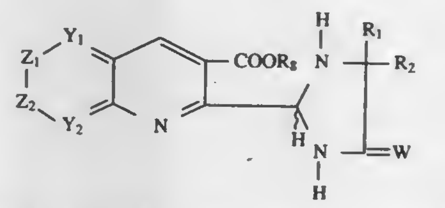
(I)



(III)

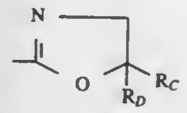


(XVII)



(XIX)

wherein A is $COOR_8$, CHO, CH_2OH, $COCH_2OH$, $CONH_2$, CH_2CH_2OH, CONHOH or



R_C and R_D are each hydrogen or C_1–C_4 alkyl;

R_B is hydrogen, C_1–C_4 alkyl which may be interrupted by O or S, or is optionally substituted with C_1–C_4 alkoxy, halogen, hydroxy, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, furfuryl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, nitrophenyl, carboxyl, C_1–C_4 alkoxy carbonyl, cyano or C_1–C_4 trialkylammonium; C_3–C_6 alkenyl, optionally substituted with one or two C_1–C_3 alkoxy, phenyl or halogen groups; C_3–C_6 cycloalkyl, optionally substituted with one or two C_1–C_3 alkyl groups; C_3–C_{10} alkynyl, optionally substituted with phenyl, halogen, C_1–C_4 alkoxy; or a cation selected from the group consisting of alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and organic ammonium;

B is H, COR_9 or SO_2R_{10}. R_9 is C_1–C_{11} alkyl, chloromethyl, C_1–C_4 alkoxyl or phenyl optionally substituted with one chloro, one nitro, one methyl, or one methoxy group; R_{10} is C_1–C_5 alkyl, phenyl, or phenyl substituted

with one methyl, halogen, nitro or C_1–C_4 alkoxy;

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl;

and when taken together with the carbon to which they are attached, R_1 and R_2 may represent C_1–C_6 cycloalkyl, optionally substituted with methyl;

- - - represents a single or double bond;

W is O or S;

X_1, X_2, X_3 and X_4 are any combination of CR_4, CR_5R_6, N or NR_3 and are the same or different, with the proviso that one of X_1, X_2, X_3 and X_4 must be N or NR_3, one of X_1, X_2, X_3 and X_4 must be O or S and two of X_1, X_2, X_3 and X_4 must be the same or different CR_4 or CR_5R_6 groups;

Y_1 and Y_2 are N or CR_4;

Z_1 and Z_2 are O, S, NR_3 or CR_5R_6 with the proviso that one of Y_1, Y_2, Z_1 and Z_2 must be N or NR_3, one of Z_1 or Z_2 must be O or S, and two of Y_1, Y_2, Z_1 and Z_2 must be the same or different CR_4 or CR_5R_6 groups;

R_3 is C_1–C_4 alkyl, which may be optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyl, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyl, optionally substituted with phenyl or halogen; C_1–C_4 alkoxy, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyloxy optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyloxy optionally substituted with halogen or phenyl; or C_2–C_6 alkanoyloxy, optionally substituted with halogen or phenyl;

R_4 is hydrogen, halogen, C_1–C_6 alkyl; C_1–C_4 alkoxy; C_2–C_6 alkanoyloxy; C_1–C_4 alkylthio; phenoxy; C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkoxycarbonyl; C_1–C_4 dialkylamino; C_1–C_4 alkylsulfonyl or phenyl, optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl;

R_5 and R_6 are each hydrogen, C_1–C_4 alkyl; C_1–C_4 alkoxy, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkylsulfonyl or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl; or any combination of these groups except when R_5 and R_6 are the same group, they are either both hydrogen or both C_1–C_4 alkyl; and when taken together, R_5 and R_6 may form a ring in which R_5R_6 are represented by the structure $—(CH_2)_n—$ where n is an integer of 4 or 5, or when taken together, R_5 and R_6 may form a group $=O$ or $=NR_7$ wherein R_7 is phenyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylamino;

R_3, R_4, R_5 and R_6, when present on adjacent positions may, along with the atoms to which they are attached, form a ring and such R_3–R_6 pairs can be represented by the structure $—(CH_2)_m—$ or $—(CH)_m—$ where m is an integer of 3 or 4;

with the provisos that

- - - represents a single bond between;

X_1 and X_2 when either X_1 or X_2 is O, S, NR_3 or CR_5R_6;

X_2 and X_3 when either X_2 or X_3 is O, S, NR_3 or CR_5R_6;

X_3 and X_4 when either X_3 or X_4 is O, S, NR_3 or CR_5R_6;

when one of X_{1-4} is oxygen, the X_{1-4} to which it is attached is N, NR_3, CR_4 or CR_5R_6; and

when B is COR_9 or SO_2R_{10} and R_8 is hydrogen, then - - - represents an aromatic bond, R_3 is C_1–C_4 alkyl, and R_4 may not be halogen.

5,534,484

NOVEL (2-IMIDAZOLIN-2YL)FUSED HETEROPYRIDINE COMPOUNDS INTERMEDIATES FOR THE PREPARATION OF AND USE OF SAID COMPOUNDS AND HERBICIDAL AGENTS

Barrington Cross, Rocky Hill; Marinus Los, Pennington; Robert F. Doehner, Jr., East Windsor; David W. Ladner, Hamilton Square, and Jerry L. Johnson, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Madison, N.J.

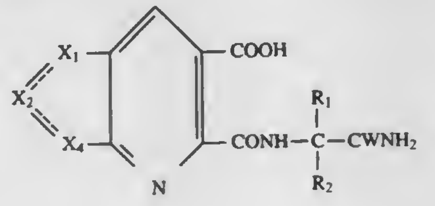
Division of Ser. No. 123,827, Sep. 20, 1993, which is a division of Ser. No. 465,569, Jan. 16, 1990, Pat. No. 5,252,538, which is a continuation of Ser. No. 178,408, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 876,599, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,578, Dec. 13, 1986, abandoned, and Ser. No. 612,531, May 21, 1984. This application Jun. 2, 1995, Ser. No. 460,317

Int. Cl.⁶ A01N *43/90;* **C07D** *487/22*

U.S. Cl. 504—235 **10 Claims**

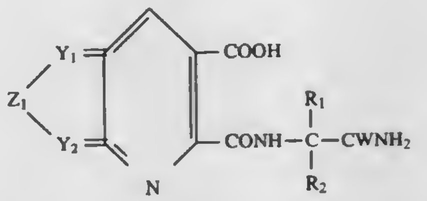
1. (2-Imidazolin-2-yl) fused heteropyridine compounds having the structure

(XXII)



or

(XXIV)



wherein

R_8 is hydrogen, C_1–C_4 alkyl which may be interrupted by O or S, or is optionally substituted with C_1–C_4 alkoxy, halogen, hydroxy, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, furfuryl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, nitrophenyl, carboxyl, C_1–C_4 alkoxy carbonyl, cyano or C_1–C_4 trialkylammonium; C_3–C_6 alkenyl, optionally substituted with one or two C_1–C_3 alkoxy, phenyl or halogen groups; C_3–C_6 cycloalkyl, optionally substituted with one or two C_1–C_3 alkyl groups; C_3–C_{10} alkynyl, optionally substituted with phenyl, halogen, C_1–C_4 alkoxy; or a cation selected from the group consisting of alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and organic ammonium;

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl;

and when taken together with the carbon to which they are attached, R_1 and R_2 may represent C_1–C_6 cycloalkyl, optionally substituted with methyl;

- - - represents a single or double bond;

W is O or S;

X_1, X_2, X_3 and X_4 are any combination of CR_4, CR_5R_6, N or NR_3 and are the same or different, with the proviso that one of X_1, X_2, X_3 and X_4 must be N or NR_3 and two of X_1, X_2, X_3 and X_4 must be CR_4 or CR_5R_6;

Y_1 and Y_2 are N or CR_4;

Z_1 and Z_2 are NR_3 or CR_5R_6 with the proviso that one of Y_1, Y_2, Z_1, and Z_2 must be N or NR_3 and two must be CR_4 or CR_5R_6 groups;

R_3 is C_1–C_4 alkyl, which may be optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyl, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyl, optionally substituted with phenyl or halogen; C_1–C_4 alkoxy, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyloxy optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyloxy optionally substituted with halogen or phenyl; or C_2–C_6 alkanoyloxy, optionally substituted with halogen or phenyl;

R_4 is hydrogen, halogen, C_1–C_6 alkyl; C_1–C_4 alkoxy; C_2–C_6 alkanoyloxy; C_1–C_4 alkylthio; phenoxy; C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkoxycarbonyl; C_1–C_4 dialkylamino; C_1–C_4 alkyl-sulfonyl or phenyl, optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl;

R_5 and R_6 are each hydrogen, C_1–C_4 alkyl; C_1–C_4 alkoxy, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkylsulfonyl or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl; or any combination of these groups except when R_5 and R_6 are the same group, they are either both hydrogen or both C_1–C_4 alkyl; and when taken together, R_5 and R_6 may form a ring in which R_5R_6 are represented by the structure $—(CH_2)_n—$ where n is an integer of 4 or 5, or when taken together, R_5 and R_6 may form a group $=O$ or $=NR_7$ wherein R_7 is phenyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylamino;

R_3, R_4, R_5 and R_6, when present on adjacent positions may, along with the atoms to which they are attached, form a ring and such R_3–R_6 pairs can be represented by the structure $—(CH_2)_m—$ or $—(CH)_m—$ where m is an integer of 3 or 4;

with the provisos that

- - - represents a single bond between;

X_1 and X_2 when either X_1 or X_2 is NR_3 or CR_5R_6; and

X_2 and X_3 in structures V, IX, and XIII, when either X_2 or X_3 is NR_3 or CR_5R_6;

X_3 and X_4 in structures V, IX and XIII, when either X_3 or X_4 is O, S, NR_3 or CR_5R_6;

when B is COR_9 or SO_2R_{10} and R_8 is hydrogen, then - - - represents an aromatic bond, R_3 is C_1–C_4 alkyl, and R_4 may not be halogen.

5,534,485

(2-IMIDAZOLIN-2-YL) FUSED HETEROPYRIDINE COMPOUNDS, INTERMEDIATES FOR THE PREPARATION OF AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

Barrington Cross, Rocky Hill; Marinus Los, Pennington; Robert F. Doehner, Jr., East Windsor; David W. Ladner, Hamilton Square, and Jerry L. Johnson, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Madison, N.J.

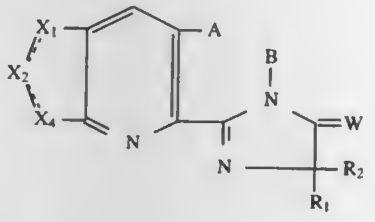
Division of Ser. No. 123,827, Sep. 20, 1993, which is a division of Ser. No. 465,569, Jan. 16, 1990, Pat. No. 5,252,538, which is a continuation of Ser. No. 178,408, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 876,599, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,578, Dec. 13, 1985, abandoned, and Ser. No. 612,531, May 21, 1984, Pat. No. 5,129,454. This application Jun. 2, 1995, Ser. No. 458,939

Int. Cl.⁶ A01N *43/90;* **C07D** *498/06;513/06*

U.S. Cl. 504—246 **10 Claims**

1. (2-Imidazolin-2-yl) fused heteropyridine compounds having the structure

(II)



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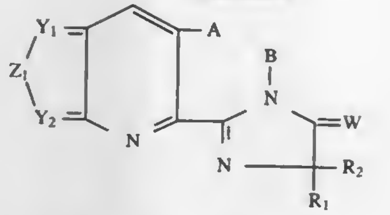
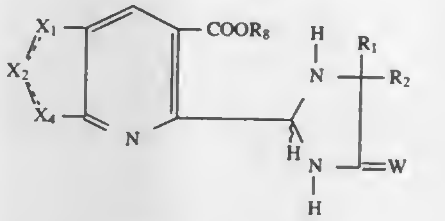
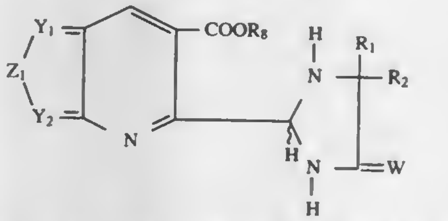
(IV)



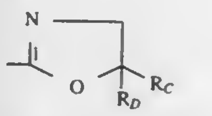
(XVIII)



(XX)



wherein A is $COOR_8$, CHO, CH_2OH, $COCH_2OH$, $CONH_2$, CH_2CH_2OH, CONHOH or



R_C and R_D are each hydrogen or C_1–C_4 alkyl;

R_B is hydrogen, C_1–C_4 alkyl which may be interrupted by O or S, or is optionally substituted with C_1–C_4 alkoxy, halogen, hydroxy, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, furfuryl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, nitrophenyl, carboxyl, C_1–C_4 alkoxy carbonyl, cyano or C_1–C_4 trialkylammonium; C_3–C_6 alkenyl, optionally substituted with one or two C_1–C_3 alkoxy, phenyl or halogen groups; C_3–C_6 cycloalkyl, optionally substituted with one or two C_1–C_3 alkyl groups; C_3–C_{10} alkynyl, optionally substituted with phenyl, halogen, C_1–C_4 alkoxy; or a cation selected from the group consisting of alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and organic ammonium;

B is H, COR_9 or SO_2R_{10}. R_9 is C_1–C_{11} alkyl, chloromethyl, C_1–C_4 alkoxyl or phenyl optionally substituted with one chloro, one nitro, one methyl, or one methoxy group;

R_{10} is C_1–C_5 alkyl, phenyl, or phenyl substituted with one methyl, halogen, nitro or C_1–C_4 alkoxy;

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl;

and when taken together with the carbon to which they are attached, R_1 and R_2 may represent C_3–C_6 cycloalkyl, optionally substituted with methyl;

- - - represents a single or double bond;

W is O or S;

$_1$, X_2, X_3 and X_4 are any combination of CR_4, CR_5R_6, N or NR_3 and are the same or different, with the proviso that at least two of X_1, X_2, and X_4 must be N or NR_3, one of X_1, X_2, and X_4 must be CR_4 or CR_5R_6, and one of X_1, X_2 and X_4 must be O or S;

Y_1 and Y_2 are N or CR_4 with the proviso that one of Y_1 and Y_2 must be N and the other must be CR_4;

Z_1 is O or S;

R_3 is C_1–C_4 alkyl, which may be optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyl, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyl, optionally substituted with phenyl or halogen; C_1–C_4 alkoxy, optionally substituted with phenyl or one or more halogens; C_3–C_6 alkenyloxy optionally substituted with phenyl or one or more halogens; C_3–C_6 alkynyloxy optionally substituted with halogen or phenyl; or C_2–C_6 alkanoyloxy, optionally substituted with halogen or phenyl;

R_4 is hydrogen, halogen, C_1–C_6 alkyl; C_1–C_4 alkoxy; C_2–C_6 alkanoyloxy; C_1–C_4 alkylthio; phenoxy; C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkoxycarbonyl; C_1–C_4 dialkylamino; C_1–C_4 alkylsulfonyl or phenyl, optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl;

R_5 and R_6 are each hydrogen, C_1–C_4 alkyl; C_1–C_4 alkoxy, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkylsulfonyl or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl; or any combination of these groups except when R_5 and R_6 are the same group, they are either both hydrogen or both C_1–C_4 alkyl; and when taken together, R_5 and R_6 may form a ring in which R_5R_6 are represented by the structure —$(CH_2)_n$— where n is an integer of 4 or 5, or when taken together, R_5 and R_6 may form a group =O or =NR_7 wherein R_7 is phenyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylamino;

R_3, R_4, R_5 and R_6, when present on adjacent positions may, along with the atoms to which they are attached, form a ring and such R_3–R_6 pairs can be represented by the structure —$(CH_2)_m$— or —$(CH)_m$— where m is an integer of 3 or 4;

with the provisos that

- - - represents a single bond between:

X_1 and X_2 when either X_1 or X_2 is S, O, NR_3 or CR_5R_6;

X_2 and X_4 when either X_2 or X_4 is O, S, NR_3 or CR_5R_6; and

when B is COR_9 or SO_2R_{10} and R_8 is hydrogen, then - - - represents an aromatic bond, R_3 is C_1–C_4 alkyl, and R_4, may not be halogen.

5,534,486

HERBICIDAL SULPHONYLAMINOCARBONYL TRIAZOLINONES HAVING SUBSTITUENTS BONDED VIA OXYGEN

Klaus-Helmut Müller, Duesseldorf; Klaus König, Odenthal; Joachim Kluth, Langenfeld; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Gergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

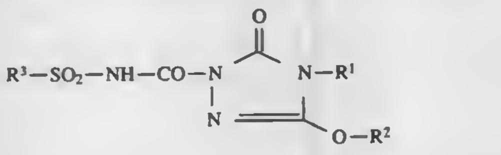
Continuation of Ser. No. 48,026, Apr. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 857,025, Mar. 24, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,196

Claims priority, application Germany, Apr. 4, 1991, 41 10 795.0

Int. Cl.^{6} A01N *43/653;* **C07D** *249/12;* **C07F** *7/10*

U.S. Cl. 504—273 **20 Claims**

1. A sulphonylaminocarbonyltriazolinone of the formula



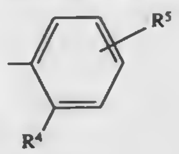
(I)

in which

R^1 represents hydrogen; methyl optionally substituted by fluorine, chlorine, cyano or C_1–C_4 -alkoxy; or cyclopropyl;

R^2 represents C_1–C_6-alkyl optionally substituted by fluorine, chlorine, C_3–C_6-cycloalkyl or C_1–C_4-alkoxy; C_3 -C_6-alkenyl optionally substituted by at least one of fluorine, chlorine and bromine; C_3–C_6-alkinyl; C_3–C_6 -cycloalkyl; phenyl; or fluorophenyl,

R^3 represents the group



in which

R^4 and R^5 are identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, nitro, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylaminocarbonyl, di-(C_1–C_4-alkyl) amino-carbonyl, hydroxyl, C_1–C_4-alkoxy, formyloxy, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkoxy-carbonyloxy, C_1–C_4 -alkylamino-carbonyloxy, C_1–C_4-alkylthio, C_1–C_4 -alkylsulphinyl, C_1–C_4-alkylsulphonyl, di-(C_1–C_4-alkyl)-aminosulphonyl, C_3–C_6-cycloalkyl or phenyl), or represent C_2–C_6-alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_2–C_6-alkinyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_1–C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_3–C_6-alkenyloxy (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), or represent C_2–C_6-alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkylthio or C_1–C_4-alkoxycarbonyl), C_3–C_6-alkinyloxy, C_3–C_6-alkinylthlo or the radical —$S(O)_p$—R^6 where

P represents the numbers 1 or 2 and

R^6 represents C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkenyl, C_3–C_6-alkinyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C $_1$–C_4-alkylamino, C_1–C_4-alkylamino, di-(C_1–C_4 -alkyl)-amine, phenyl or the radical —$NHOR^7$ where

R^7 represents $C_{11\ -C12}$-alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1–C_4 -alkoxy, C_1–C_4-alkylthio. C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylcarbonyl, C_1–C_4 -alkoxy-carbonyl, C_1–C_4-alkylaminocarbonyl or di-(C_1–C_4-alkyl)-amino-carbonyl), or represents C_3–C_6-alkenyl (which is optionally substituted by fluorine, chlorine or bromine), C_3–C_6 -alkinyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C $_1$–C_2-alkyl, phenyl-C_1–C_2-alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano. C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4 -alkoxy-carbonyl), or represents benzhydryl, or represents phenyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, c_1–c_4-alkyl, trifluoromethyl, C_1–C_4 -alkoxy, C_1–C_4-fluoroalkoxy, C_1–C_4-alkylthio, trifluoromethylthio or C_1–c_4-alkoxy-carbonyl),

R^4 and/or R^5 furthermore represent phenyl or phenoxy, or represent C_1–C_4-alkylcarbonylamino, C_1–C_4 -alkoxycarbonylamino, C_1–C_4-alkylamino-carbonyl-amino, di-(C_1–C_4-alkyl)-amino-carbonylamino, or the radical —CO—R^8 where

R^8 represents C_1–C_6-alkyl, C_1–C_6-alkoxy, C_3–C_6 -cycloalkoxy, C_3–C_6-alkenyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1 –C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine and/or chlorine),

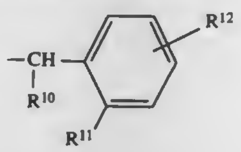
R^4 and/or R^5 furthermore represent trimethylsilyl, C_1–C_4-alkylsulphonyl, di-(C_1–C_4-alkyl)-aminosulphonylamino or the radical —CH=N—R^9 where

R^9 represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, or

represents benzyl which is optionally substituted by fluorine or chlorine, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, each of which is optionally substituted by fluorine or chlorine, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or represents optionally fluorine- and/or chlorine-substituted C_1–c_6 -alkoxy, C_3–C_6-alkenoxy, C_3–C_6-alkinoxy or benzyloxy, or represents amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)-amino, phenylamino. C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxycarbonylamino or C_1–C_4-alkyl-sulphonylamino, or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl,

furthermore

R^3 represents the radical



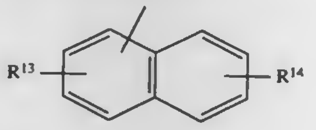
where

R^{10} represents hydrogen or C_1–C_4-alkyl,

R^{11} and R^{12} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4 -alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1–C_4 -alkoxy-carbonyl, dimethylaminocarbonyl, C_1–C_4 -alkylsulphonyl or di-(C_1–c_4-alkyl)aminosulphonyl;

furthermore

R^3 represents the radical



where

R^{13} and R^{14} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine)

or a salt thereof,

with the exception of the compounds:

2-(2-methoxycarbonyl-phenylsulphonylaminocarbonyl)-4-methyl-5 -methoxy-2,4-dihydro-3H-1,2,4-triazol-3-one, and

2-(2-trifluoromethoxy-phenylsulphonylaminocarbonyl)-4 -cyclopropyl-5-methoxy-2,4-dihydro-3H-1,2,4-triazol-3-one.

5,534,487

STABILIZATION OF 3-ISOTHIAZOLONE SOLUTIONS

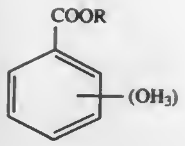
Kevin F. Gironda, Alpha, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 16, 1995, Ser. No. 441,913

Int. Cl.^{6} A01N *43/80;* **C07D** *275/03*

U.S. Cl. 504—290 **10 Claims**

1. A composition useful as a biocide comprising 0.5 to 5% 3-isothiazolone compound(s) selected from the group consisting of 5-chloro-2-methyl-3-isothiazolone, 2-methyl-3-isothiazolone, and 2-n-octyl-3-isothiazolone, solvent comprising water, a nucleophile, and a sufficient amount of a stabilizing compound of the formula:



to stabilize said 3-isothiazolone against said nucleophile, said sufficient amount being 0.1 to 5parts of said stabilizing compound per 0.5 to 5 parts of said 3-isothiazolone compound(s).

5,534,488

INSULIN FORMULATION

James A. Hoffmann, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 13, 1993, Ser. No. 106,106

Int. Cl.^{6} A61K *38/28*

U.S. Cl. 514—3 **19 Claims**

1. A formulation of human insulin comprising a suspension of human Ultralente insulin crystals in a total formulation zinc concentration of between about 0.5 milligrams to about 20 milligrams per 100 units of insulin wherein the formulation does not contain proteins other than insulin.

5,534,489

METHOD OF FABRICATING OXIDE SUPERCONDUCTING FILMS BY LASER DEPOSITION

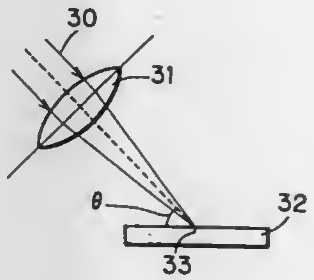
Noriki Hayashi, and Noriyuki Yoshida, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 523,615, May 15, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 739,783

Claims priority, application Japan, May 26, 1989, 1-132970; May 19, 1989, 1-126849

Int. Cl.^{6} B05D *3/06;5/12*

U.S. Cl. 505—474 **2 Claims**



1. A method of fabricating an oxide superconducting film using laser deposition by applying a laser beam onto a target of an oxide superconductive material through a converging lens and depositing atoms scattered from said target onto a base material, comprising the steps of:

irradiating a pattern of atoms on said target,

reciprocating said pattern on said target by reciprocating said converging lens, and

depositing said atoms on said base material to form said oxide superconducting film.

5,534,490

(HG,CU) $BA_2CA_2CU_3O_Y$ OXIDE SUPERCONDUCTOR AND METHOD OF PREPARING THE SAME

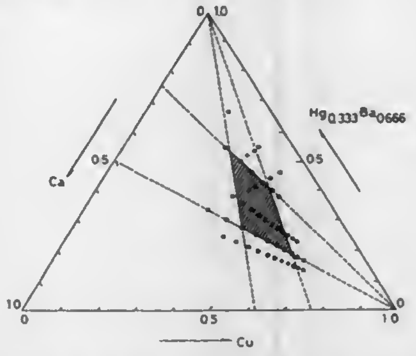
Makoto Itoh; Ayako Yamamoto; Kazuyuki Isawa; Seiji Adachi; Hisao Yamauchi, and Shoji Tanaka, all of Tokyo, Japan, assignors to Sumitomo Electric Industries, Ltd.; Tohoku Electric Power Co., Inc.; Matsushita Electric Industrial Co., Ltd., and International Superconductivity Technology Center, all of, Japan

Filed Jun. 23, 1994, Ser. No. 264,660

Claims priority, application Japan, Jun. 25, 1993, 5-155444

Int. Cl.^{6} C04B *35/45;35/50;* **H01B** *12/00*

U.S. Cl. 505—490 **7 Claims**



1. A method of preparing an oxide superconductor consisting essentially of Hg, Ba, Ca, Cu and O and being expressed in a chemical formula $(Hg_{1-X}Cu_X)\ Ba_2Ca_2Cu_3O_Y$, wherein X=0.05 to 0.7 and Y=8 to 8.75, said method comprising the steps of:

mixing raw materials of Hg, Ba, Ca and Cu with each other so that mole ratios of Hg, Ba, Ca and Cu are (Hg+Ba):Ca:Cu=b:1:c and Hg:Ba=(1−a):a, wherein $0.625 \leqq a \leqq 0.714$, $1 \leqq b \leqq 3$ and $1.667 \leqq c \leqq 3.444$, compression-molding the mixture; and

heat treating a compact obtained by said compression molding.

5,534,491

PROCESS FOR PREPARING A LAYERED STRUCTURE CONTAINING AT LEAST ONE THIN FILM OF OXIDE SUPERCONDUCTOR

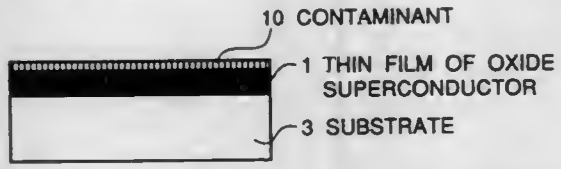
Takao Nakamura, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 183,265, Jan. 19, 1994, abandoned, which is a continuation of Ser. No. 858,706, Mar. 27, 1992, abandoned. This application Jan. 31, 1995, Ser. No. 381,278

Claims priority, application Japan, Mar. 28, 1991, 3-089616; Mar. 28, 1991, 3-089617

Int. Cl.^{6} H01L *39/24*

U.S. Cl. 505—500 **14 Claims**



1. A process for producing a layered structure on a film of a YBa_2Cu_3 oxide superconductor having a contaminated surface, said oxide superconductor film being deposited on a substrate, characterized in that said film of oxide superconductor is heat-treated in an atmosphere containing oxygen having a purity higher than 5 N (99.999%) under a background ultra-high vacuum pressure of lower than 1×10^{-9} Torr, wherein a partial pressure of oxygen is between 20 mTorr and 25 Torr, said heat treatment being conducted at a temperature between 350° C. and 700° C. for a time duration of from several minutes to ten minutes before another film is deposited on said film of oxide superconductor.

5,534,492

MURAMYL PEPTIDE FOR THE TREATMENT OF TOXICITY

Roger Aston, Wiltshire, United Kingdom, and Igor E. Kovalev, Moscow, U.S.S.R., assignors to Peptech (UK) Limited, London, United Kingdom

PCT No. PCT/GB93/00408, § 371 Date Jan. 3, 1995, § 102(e) Date Jan. 3, 1995, PCT Pub. No. WO93/16713, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 26, 1993, Ser. No. 302,692

Claims priority, application United Kingdom, Feb. 28, 1992, 9204354

Int. Cl.^{6} A61K *37/02*

U.S. Cl. 514—8 **23 Claims**

1. A method for detoxifying a human body containing toxins resulting from the presence of a compound taken from the group consisting of ethanol, hypnotics, anesthetics, opioids, and in vivo hepatic metabolites thereof, which comprises stimulating the activity of the cytochrome P_{450} system by administering an effective amount of a muramyl peptide compound.

5,534,493

USE OF GROWTH FACTOR IGF-I OR IGF-II

Peter D. Gluckman, Auckland, and David J. Mellor, Palmerston North, both of, New Zealand, assignors to Pharmacia AB, Sweden

PCT No. PCT/SE93/00502, § 371 Date Feb. 17, 1994, § 102(e) Date Feb. 17, 1994, PCT Pub. No. WO93/25226, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 7, 1993, Ser. No. 193,017

Claims priority, application New Zealand, Jun. 8, 1992, 243070

Int. Cl.^{6} C07K *14/00;13/00;* **A61K** *38/27;38/00*

U.S. Cl. 514—12 **7 Claims**

1. Method for the treatment of pancreatic disorders and insufficiency in a patient in need thereof by administering to said patient a medicament adopted for oral or any gastrointestinal route comprising IGF-1 or IGF-II wherein said treatment is selected from the group consisting of promoting pancreatic growth in a patient, treating exocrine pancreatic deficiency and promoting development in a growth retarded new-born patient.

5,534,494

POLYPEPTIDE COMPOUNDS HAVING GROWTH HORMONE RELEASING ACTIVITY

Cyril Y. Bowers, New Orleans, La.; Frank A. Momany, Concord, Mass.; Ching H. Chang; Wayne L. Cody, both of Kingsport, Tenn.; John C. Hubbs, Gray, and Charles H. Foster, Kingsport, both of Tenn., assignors to Polygen Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 880,284, May 4, 1992, abandoned, which is a continuation of Ser. No. 770,710, Oct. 3, 1991, abandoned, which is a continuation of Ser. No. 149,267, Jan. 28, 1988, abandoned. This application Apr. 21, 1994, Ser. No. 231,986

Int. Cl.^{6} A61K *38/00;38/02;* **C07K** *5/00;7/00*

U.S. Cl. 514—16 **9 Claims**

1. A polypeptide which promotes the release and elevation of growth hormone levels in the blood of a recipient animal, wherein said polypeptide is selected from the group consisting of polypeptides having the generic structure:

X'—AA2—AA3—Trp—AA5—Y—Z,

wherein X' is selected from the group consisting of His—AA1'—, 3(NMe)His—AA1'—, AA0—His—AA1', and AA0—3(NMe)His—AA1'; wherein AA0 is selected from the group consisting of all naturally occurring L-amino acids, Met(O), DOPA and Abu; and AA1' is selected from the group consisting of Ala, Ser, Gln, Leu, Pro, and DAla,

AA2 is selected from the group consisting of DPhe, DTrp, 5-fluoro-DTrp, 5-fluoro-Trp, 6-fluoro-DTrp, 6-fluoro-Trp, (formyl)DTrp, and ,XTrp, wherein ,XTrp is selected from the group consisting of $(N^{\alpha}Me)$DTrp, (indole NMe)DTrp, D^{α}Nal and D^{β}Nal;

AA3 is selected from the group consisting of Ala, Gly and Ser;

AA5 is selected from the group consisting of DPhe and (NMe)DPhe;

Y is AA7, wherein AA7 is selected from the group consisting of Arg, iLys, Lys and Orn; and

Z represents the C terminal end group of said polypeptide, the C terminal amino acid plus end group, or the C terminal amino acids plus end group wherein Z is selected from the group consisting of $—CONH_2$, —COOH, —COOR, —CONHR, $—CONR_2$, $—CH_2OH$, $—CH_2OR$, —Gly—Z', —Met—Z', —Lys—Z', —Cys—Z', —Gly—Tyr—Z', and —Ala—Tyr—Z', wherein Z' is selected from the group consisting of $—CONH_2$, —COOH, —CONHR, —COOR, $—CONR_2$, $—CH_2OH$, and $—CH_2OR$, wherein R is an alkyl group having 1–6 carbon atoms or an aromatic ring having up to 12 carbon atoms;

or organic or inorganic addition salts of any of said polypeptides;

wherein all three letter amino acid abbreviations preceded by a "D" indicate the D-configuration of the amino acid residue; and glycine is included in the scope of the term "naturally occurring L-amino acids".

7. A method of promoting the release and elevation of blood growth hormone levels in a mammal, which comprises administering to the mammal in need of the treatment an effective amount of the polypeptide of claim 1.

5,534,495

TREATMENT OF NON-HIV NEUROPATHIC PAIN SYNDROMES

Candace B. Pert, and Michael R. Ruff, both of Potomac, Md., assignors to Advanced Peptides and Biotechnology Sciences, Sewickley, Pa.

Continuation of Ser. No. 67,523, May 25, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,443

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—16 **18 Claims**

1. A method for treating non-HIV related neuropathic pain syndrome in mammals which comprises administering an effective amount of a peptide of the formula (I):

$$R^a\text{-Ser-Thr-Thr-Thr-Asn-Tyr-}R^b \qquad (I)$$

wherein

R^a represents an amino terminal residue which is Ala-, D-Ala, or Cys-Ala; and

R^b represents a carboxy terminal Thr- or Thr-amide an ester or amide derivative thereof,

or a linear peptide of the formula (II):

$$R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5 \qquad (II)$$

wherein

R^1 is an amino terminal residue which is X-R' or R' wherein R' is Thr-, Ser-, Asn-, Leu-, Ile-, Arg- or Glu- and X is Cys;

R^2 is Thr, Ser, or Asp;

R^3 is Thr, Ser, Asn, Arg, Gln, Lys or Trp;

R^4 is Tyr; and

R^5 is a carboxy terminal residue which is R"X or R' wherein R" may be any amino acid or an ester or amide derivative thereof;

or a linear peptide of the formula (III):

$$R^{1'}\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^{5'} \qquad (III)$$

wherein

$R^{1'}$ is an amino terminal residue Ala-R^1d-Ala-R' or X-Ala-R'; and

$R^{5'}$ is a carboxy terminal residue or an amide or ester derivative thereof;

or the physiologically acceptable salts of a peptide of formulas (I), (II) or (II).

5,534,496

METHODS AND COMPOSITIONS TO ENHANCE EPITHELIAL DRUG TRANSPORT

Vincent H. Lee, Monterey Park, Calif., and Wan-Ching Yen, Columbus, Ohio, assignors to University of Southern California, University Park, Los Angeles, Calif.

Continuation-in-part of Ser. No. 909,908, Jul. 7, 1992, abandoned. This application Mar. 29, 1994, Ser. No. 219,156

Int. Cl.^{6} A61K *38/08*

U.S. Cl. 514—17 **8 Claims**

1. A method for enhancing the delivery of a drug across epithelial cells at a mucosal site comprising:

(a) introducing a peptide to said mucosal site either concomitant with or prior to administration of said drug or

(b) introducing to said mucosal site a peptide which is covalently bonded to said drug;

wherein said peptide is selected from the group consisting of Pro-Leu-Gly-Pro-Arg [SEQ ID NO: 4], Pro-Leu-Gly-Pro-Lys [SEQ ID NO: 6], Pro-Leu-Gly-Pro-Glu [SEQ ID NO: 7], Pro-Leu-Gly-Pro-Asp [SEQ ID NO: 8], Pro-Leu-Gly-Pro [SEQ ID NO: 5], Pro-Leu-Gly and Pro-Leu, and having a protective group selected from the group consisting of Pz-, N-methyl, t-Boc, FMOC and CBZ at the N-terminus of said peptide to the mucosal site by an oral, nasal, pulmonary, buccal, rectal, transdermal, vaginal or ocular route in an amount sufficient to enhance the transport of said drug across epithelial cells at the mucosal site.

5,534,497

TECHNETIUM CHELATES TO BE USED FOR DETERMINING THE RENAL FUNCTION

Alfons M. Verbruggen, Leuven, Belgium, assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

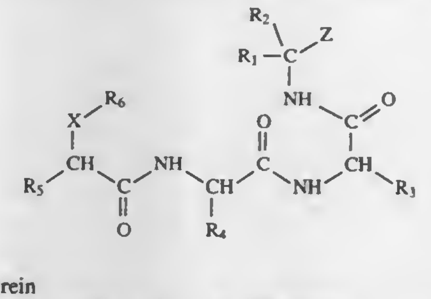
Continuation of Ser. No. 688,733, Apr. 19, 1991, abandoned, which is a division of Ser. No. 335,606, Apr. 10, 1989, Pat. No. 5,187,264, which is a division of Ser. No. 54,649, May 26, 1987, Pat. No. 4,849,511. This application Jun. 4, 1993, Ser. No. 70,926

Claims priority, application Netherlands, May 28, 1986, 8601369

Int. Cl.^{6} A61K *51/08;* **C07F** *13/00;* **C07K** *5/083;5/103*

U.S. Cl. 514—18 **10 Claims**

1. A tripeptide compound, of the general formula



wherein

X is a sulphur atom or an imino group,

Z is a hydrogen group, a carboxy group, an alkoxycarbonyl group having 1–4 carbon atoms, an aminocarbonyl group, a sulpho group, an aminosulphonyl group or a carboxymethylaminocarbonyl group,

R_1 is a hydrogen atom or an alkyl group having 1 or 2 carbon atoms,

R_2, R_3, R_4, and R_5 are equal or different and represent hydrogen atoms or branched or non-branched alkyl groups having 1–4

carbon atoms, which alkyl groups are optionally substituted with a hydroxy group, a halogen atom, a carboxy group or an aminocarbonyl group.
with the proviso that R_3, R_4 and R_5 are not all hydrogen atoms, and
R_6 is a hydrogen or a suitable protective group;
as well as water-soluble salts of these compounds.

5,534,498

TRYPSIN INHIBITORS

Terence K. Brunck; Michael G. Pepe, both of San Diego; Daniel A. Pearson, Solana Beach, and Thomas R. Webb, Encinitas, all of Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 828,388, Jan. 30, 1992, abandoned. This application Jan. 29, 1993, Ser. No. 11,666

Int. Cl.^{6} A61K *37/02;* **C07K** *5/08;5/06*

U.S. Cl. 514—19 **41 Claims**

1. A compound of the formula:

$$Pr\text{-}A_1\text{-}A_2\text{-}A_3$$

wherein Pr is a hydrophobic group;
A_1 is selected from the group consisting of Glu, Asp, and an equivalent of Glu and Asp,
A_2 is Pro or an equivalent of Pro,
A_3 is Arg aldehyde and an equivalent of said Arg aldehyde, and
said compound is active to inhibit trypsin activity with an IC_{50} for trypsin at least 50 fold lower than the IC_{50} for kallikrein, protein C, plasmin, factors Xa, XIa, and VIIa, thrombin, tPA, and urokinase.

5,534,499

LIPOPHILIC DRUG DERIVATIVES FOR USE IN LIPOSOMES

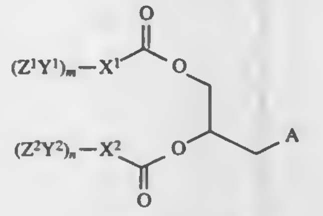
Steve Ansell, Vancouver, Canada, assignor to The University of British Columbia, Vancouver, Canada

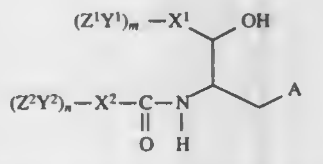
Filed May 19, 1994, Ser. No. 246,010

Int. Cl.^{6} A61K *31/70;31/715;9/127*

U.S. Cl. 514—25 **19 Claims**

1. A pharmaceutical compound for use in liposome and micellar formulations, said compound being a member selected from the group consisting of compounds of formula I and compounds of formula II:


I


II

wherein,
A is a member selected from the group consisting of a serine radical, an ethanolamine radical, a choline radical, a phosphocholine radical, a phosphoserine radical, a phosphoethanolamine radical, a glycerol radical, a phosphoglycerol radical, an inositol radical, a phosphoinositol radical, —NR^1R^2, —$OCOR^3$, —OH, —O—glucose, —O—galactose and —O—oligosaccharide;
wherein,
R^1 and R^2 are each members independently selected from the group consisting of H and lower alkyl; and
R^3 is a member selected from the group consisting of alkyl radicals and unsaturated alkyl radicals;
X^1 and X^2 are each members independently selected from the group consisting of alkyl, unsaturated alkyl, alkyl linking group, and unsaturated alkyl linking group;
Y^1 and Y^2 are each members independently selected from the group consisting of —S—, —NH—, —NHCO—, —$CO(CH_2)_pCO_2$—, —O—, =NNHCO—, —CO— and —$CO(CH_2)_pCONH$—, wherein p is an integer of from 0 to 8;
Z^1 and Z^2 are each independently a therapeutic agent; and
m and n are each independently an integer of from 0 to 1, with the proviso that n+m is at least 1; and with the further provisos that when m is 0, X^1 is not a linking group, and when n is 0 that X^2 is not a linking group.

5,534,500

PROCESS FOR PREPARING SURFACTANT MIXTURES HAVING HIGH SOLIDS CONTENT

Thomas Casamassina, Totowa; Florencio Morales, Jr., Jersey City; Barry A. Salka, Fair Lawn, all of N.J.; John Fallon, Point Pleasant, Pa.; Sureshchandra G. Desai, Wayne, N.J., and Patrick M. McCurry, Jr., Lansdale, Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 120,624, Sep. 13, 1993. This application Aug. 22, 1994, Ser. No. 293,861

Int. Cl.^{6} A61K *31/70;* **C07G** *3/00;* **C07H** *1/00;* **C11D** *9/00*

U.S. Cl. 252—353 **27 Claims**

1. A process for making a concentrated surfactant solution which comprises adding the acid form of a neutralizable surfactant to an aqueous composition comprised of a base and a compound of the formula I

$$R_1O(Z)_a \qquad \text{I}$$

wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is saccharide residue having 5 or 6 carbon atoms; a is a number having a value from 1 to about 6; wherein the concentration of said base in said aqueous solution is such that the pH of the final surfactant solution has a value of from about 6 to about 8 and wherein the neutralizable surfactant is added in amount such that from about 25% to about 40% by weight of the neutralized surfactant is present in the concentrated surfactant solution and the compound of formula I is present in said aqueous composition in amount such that from about 25% to about 50% by weight thereof is present in the concentrated surfactant solution.

5,534,501

PARTICLE FOR USE AS A MILK FAT GLOBULE SUBSTITUTE, COMPOSITION CONTAINING SAME AND PROCESS FOR THE PREPARATION OF SIAD PARTICLE

Daniel Samain, and Joëlle Gibilaro, both of Toulouse, France, assignors to A Et S Biovecteurs, Ramonville-Saint-Agne, France

Continuation of Ser. No. 978,685, Apr. 2, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 479,539

Claims priority, application France, Jun. 4, 1991, 91 06744

Int. Cl.^{6} A01N *43/04;25/34;* **A61K** *9/127;* **B01J** *13/02*

U.S. Cl. 514—60 **31 Claims**

1. In a fat-substitute composition useful for human consumption, the improvement wherein the composition includes particles, each particle comprising (a) an insoluble hydrophilic matrix surrounded by (b) a first hydrophobic layer of fatty acids linked to the matrix via covalent bonds and (c) a second layer which is lipid and/or amphiphilic.

5,534,502

PROCESS FOR PRODUCING FAT EMULSION

Junzo Seki, Hyogo; Hirofumi Yamamoto, Kyoto; Shuji Yamane, Kyoto; Yutaka Takahashi, Kyoto, and Kouichi Ushimaru, Kyoto, all of, Japan, assignors to Nippon shinyaku Co. Ltd., Japan

Continuation of Ser. No. 50,215, Jun. 21, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,861

Claims priority, application Japan, Nov. 6, 1990, 2-301639; Nov. 6, 1990, 2-301640

Int. Cl.^{6} A61K *31/20;31/44;47/30;47/44*

U.S. Cl. 514—31 **8 Claims**

1. A process for preparing a fatty emulsion containing Amphotericin B in a fatty emulsion particle that is comprised of a phospholipid and a simple lipid, which process comprises the steps of:
a. dissolving Amphotericin B and a member of the group consisting of the phospholipid and the mixture of the phospholipid and the simple lipid, wherein the amount of said member of the group being dissolved is part of or entirely a predetermined amount; in ethanol, acidified with an acid compatible with the ethanol and Amphotericin B;
b. neutralizing the acid with an alkali, compatible with the ethanol and Amphotericin B;
c. removing the ethanol, to leave a product containing Amphotericin B and phospholipid or the mixture of phospholipid and simple lipid; and
d. adding sufficient additional phospholipid or simple lipid or both phospholipid and simple lipid, if needed, to reach said predetermined amount; and water thereto; and
e. emulsifying the combination.

5,534,503

2'-O, N^6-DISUBSTITUTED AND 2'-O, N^6, 2-TRISUBSTITUTED ADENOSINES AND THEIR MEDICINAL USES

Fulvio Gadient, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

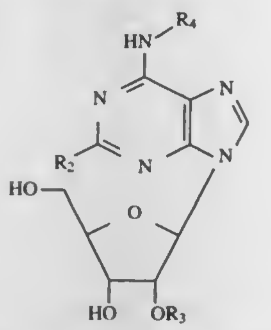
Continuation of Ser. No. 106,004, Aug. 13, 1993, abandoned, which is a continuation of Ser. No. 449,020, Dec. 11, 1989, abandoned. This application Oct. 27, 1994, Ser. No. 330,043

Claims priority, application Germany, Dec. 13, 1988, 38 41 881.9

Int. Cl.^{6} A61K *31/70;* **C07H** *19/167*

U.S. Cl. 514.00—46.00 **16 Claims**

1. A compound of formula


I

wherein
R_1 signifies allyl, methallyl, a straight-chain or branched (C_{3-7})alkynyl, (C_{3-8})cycloalkyl, or phenyl being independently of one another mono- or disubstituted by halogen with an atomic number of 9 to 35, (C_{1-4})alkyl, (C_{1-4})alkoxy or CF_3,
R_2 is hydrogen, (C_{1-4})alkyl, (C_{3-5})cycloalkyl or halogen with an atomic number of 9 to 35 and
R_3 is (C_{1-4})alkyl.

16. A method of lowering blood lipid level and treating raised blood pressure in a subject in need of said treatment, which comprises administering to the subject a therapeutically effective amount of a compound according to claim 1.

5,534,504

TREATING MYOCARDIAL INFARCTION BY ADMINISTRATION OF A THROMBOLYTIC AGENT TOGETHER WITH ADENOSINE

Alf Sollevi, Bromma, Sweden, assignor to Item Development, Stocksund, Sweden

Division of Ser. No. 167,745, Dec. 15, 1993, Pat. No. 5,449,665, which is a division of Ser. No. 31,666, Mar. 15, 1993, abandoned, which is a division of Ser. No. 821,395, Jan. 14, 1992, Pat. No. 5,231,086, which is a continuation of Ser. No. 630,413, Dec. 19, 1990, Pat. No. 5,104,859, which is a continuation of Ser. No. 138,306, Dec. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 30,245, Mar. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 779,516, Sep. 24, 1985, abandoned. This application Dec. 21, 1994, Ser. No. 361,995

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—46 **5 Claims**

1. In a method for coronary thrombolysis (CTL), treatment of acute myocardial infarction in a human patient by administration of thrombolytic substance having an ability to dissolve a blood clot in the coronary circulation, the improvement of simultaneously administering adenosine by continuous infusion into the blood stream of said patient to lessen negative effects of said CTL.

5. A solution for intravascular administration in treatment of acute myocardial infarction in a human patient, said solution comprising an effective amount of a thrombolytic substance having an ability to dissolve a blood clot in the coronary circulation and adenosine in an amount effective to prevent re-occlusion of initially occluded vessels.

5,534,505

URSODEOXYCHOLIC ACID-CONTAINING MEDICAMENT IN A LIQUID ADMINSTRATION FORM

Josef O. Widauer, Allschwil, Switzerland, assignor to Medichemie AG, Bruhistrasse, Switzerland

Filed Aug. 25, 1994, Ser. No. 296,355

Claims priority, application Switzerland, Aug. 30, 1993, 2567/93

Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—169 **10 Claims**

1. Medicament in a liquid administration form containing ursodeoxycholic acid as the active agent, particularly for the treatment of cholestatic hepatic diseases in infants, characterized in that the liquid to be taken is a suspension prepared by the addition of a swelling or thickening agent which said suspension contains the active agent mainly in a finely crystalline form in the disperse phase and only in a much smaller proportion dissolved in the aqueous dispersant.

5,534,506

USE OF PURPURINS, CHLORINS AND PURPURIN- AND CHLORIN-CONTAINING COMPOSITIONS

Alan R. Morgan, Swanton; Steven H. Selman, and Martha Kreimer-Birnbaum, both of Toledo, all of Ohio, assignors to University of Toledo; Medical College of Ohio, and St. Vincent Medical Center, all of Toledo, Ohio

Continuation of Ser. No. 70,105, May 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 763,916, Sep. 23, 1991, Pat. No. 5,216,012, which is a continuation-in-part of Ser. No. 388,643, Aug. 2, 1989, Pat. No. 5,051,415, which is a continuation-in-part of Ser. No. 874,097, Jun. 13, 1986, abandoned, and a continuation-in-part of Ser. No. 842,125, Mar. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 815,714, Jan. 2, 1986, abandoned. This application Jun. 20, 1994, Ser. No. 263,508

Int. Cl.^{6} A61K *31/40*

U.S. Cl. 514—185 **23 Claims**

1. A method for detecting diseased tissue which comprises administering intravenously, intramuscularly, subcutaneously

or topically to a human or animal patient an effective amount of a purpurin or a purpurin metal complex, or a chlorin or a chlorin metal complex, and, after sufficient time for healthy tissue to reject the purpurin or the like, examining the patient under illumination which causes residual purpurin or the like to fluoresce, wherein the purpurin has the structure of one of FIGS. **7**, **14–18** and **29–38**, below:

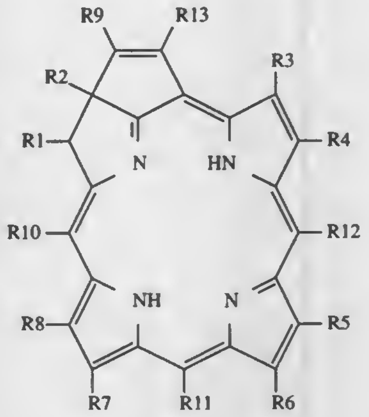


Fig. 7

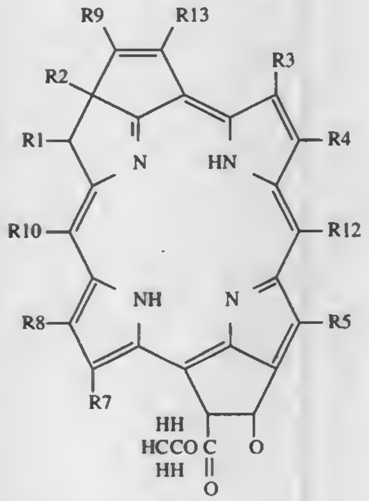


Fig. 14

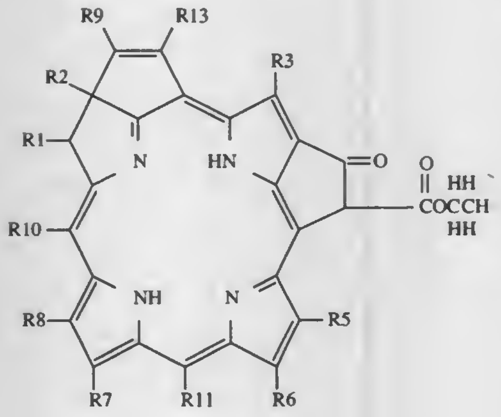


Fig. 15

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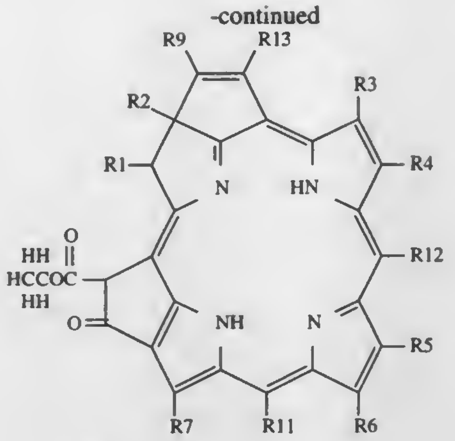

Fig. 16

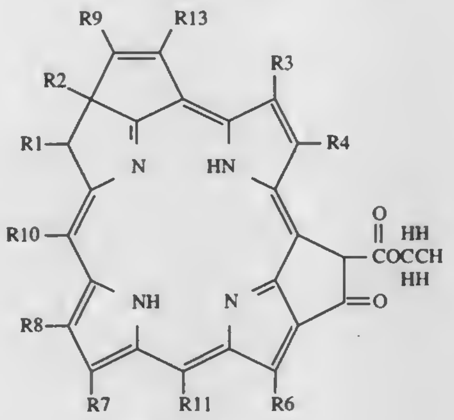

Fig. 17

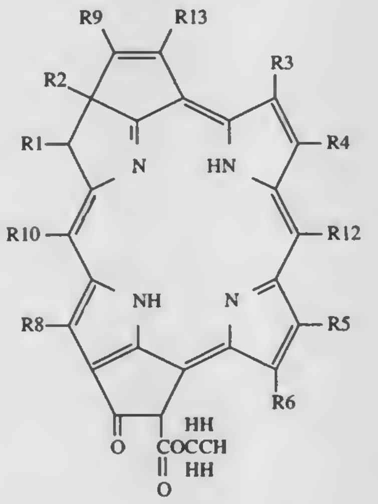

Fig. 18

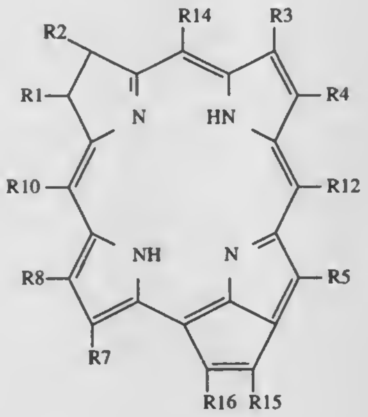

Fig. 29

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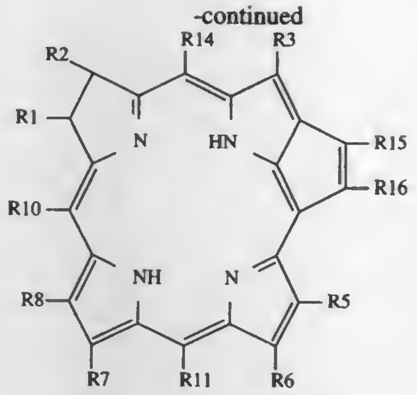

Fig. 30

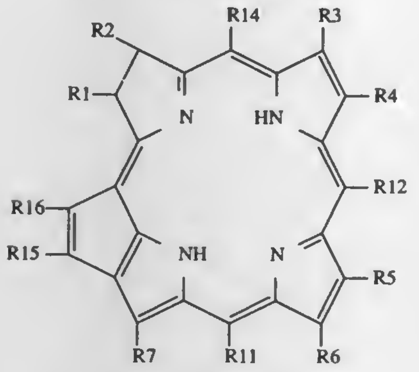

Fig. 31

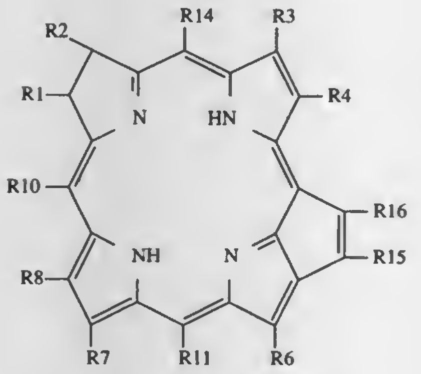

Fig. 32

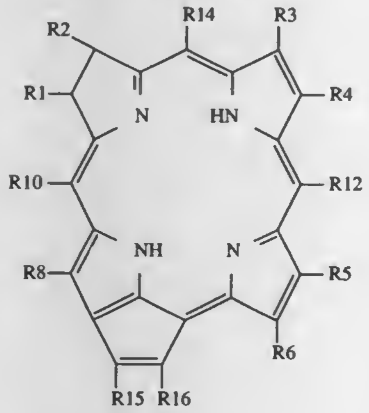

Fig. 33

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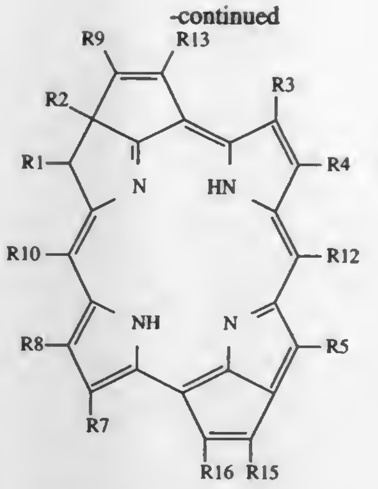

Fig. 34

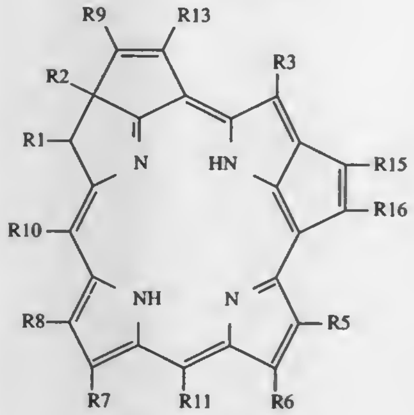

Fig. 35

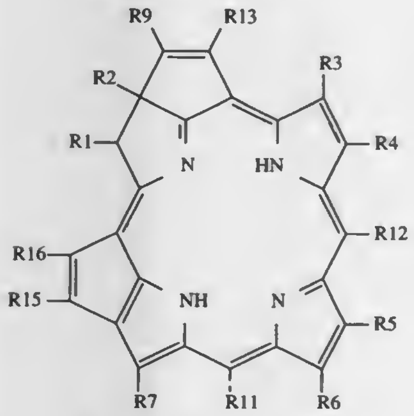

Fig. 36

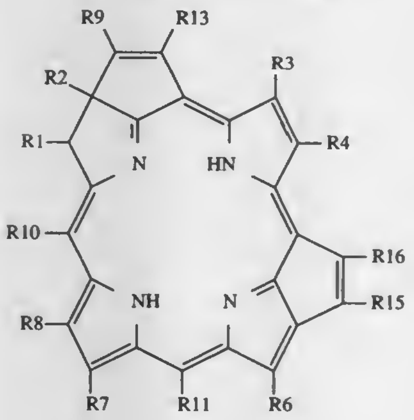

Fig. 37

-continued

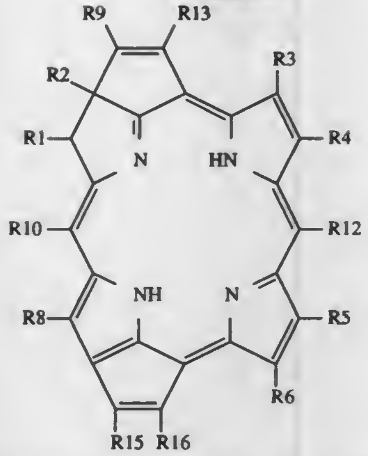

Fig. 38

the purpurin metal complex has the structure of one of FIGS. **1**, **44**–**48** and **54**–**58**, below:

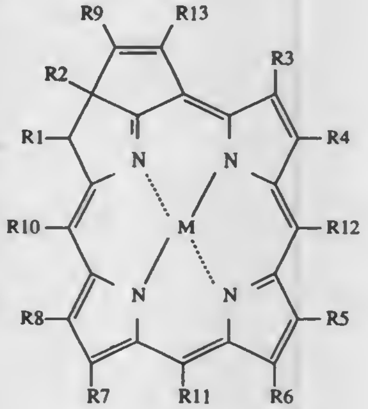

FIG. 1

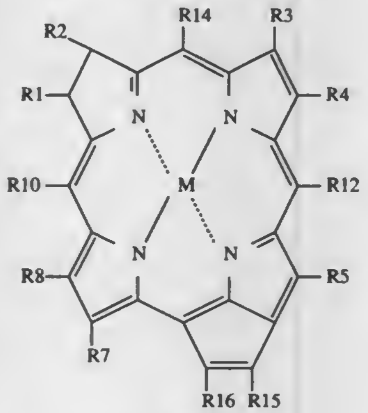

Fig. 44

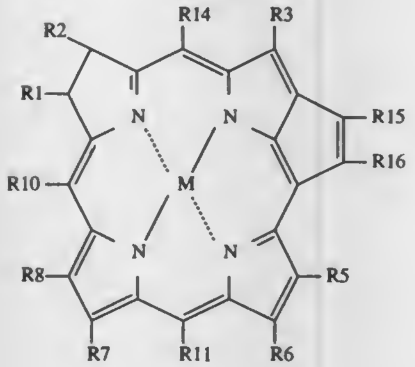

Fig. 45

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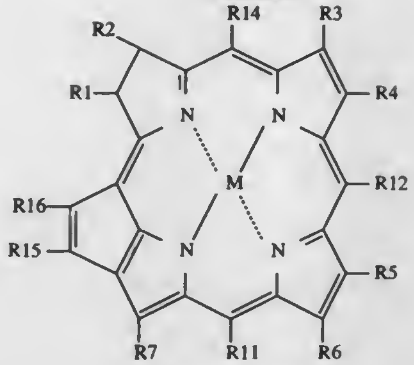

Fig. 46

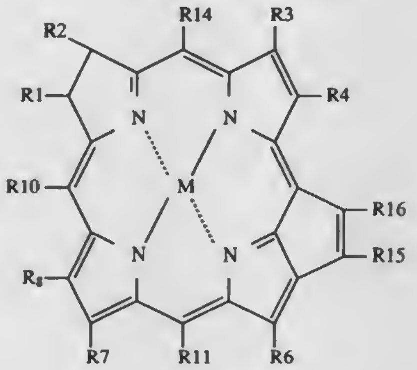

Fig. 47

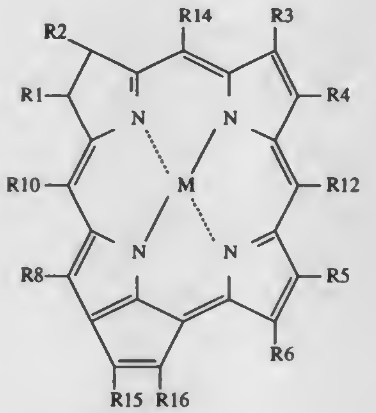

Fig. 48

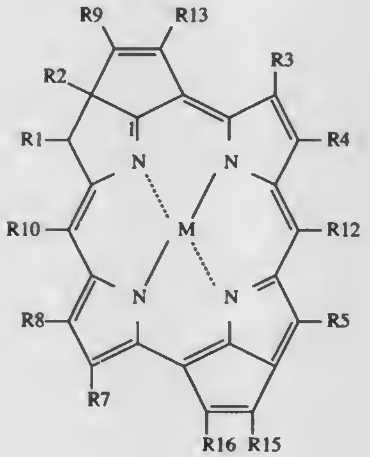

Fig. 54

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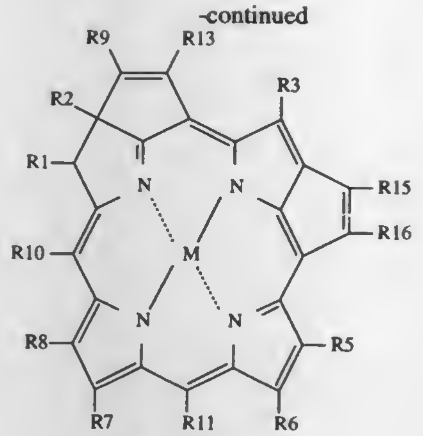

Fig. 55

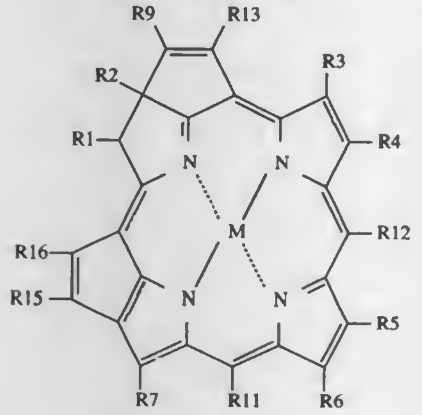

Fig. 56

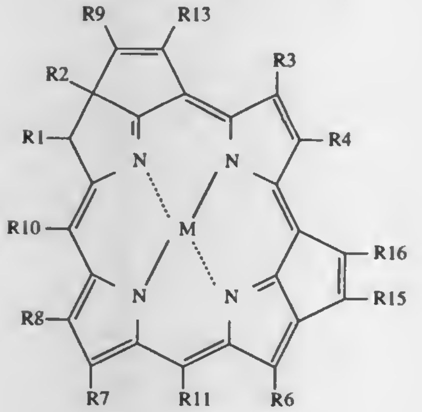

Fig. 57

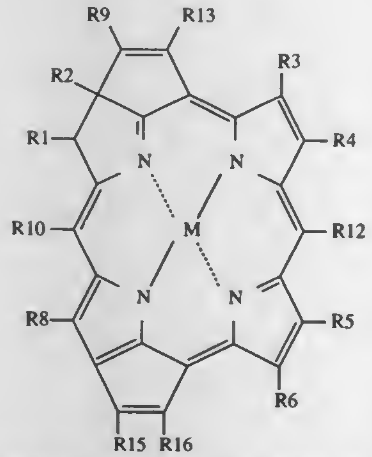

Fig. 58

the chlorin has the structure of one of FIGS. **8**, **24**–**28**, and **39**–**43**, below:

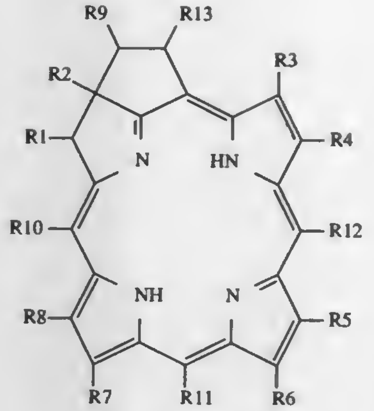

Fig. 8

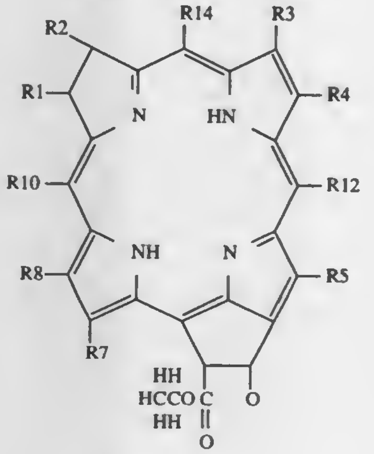

Fig. 24

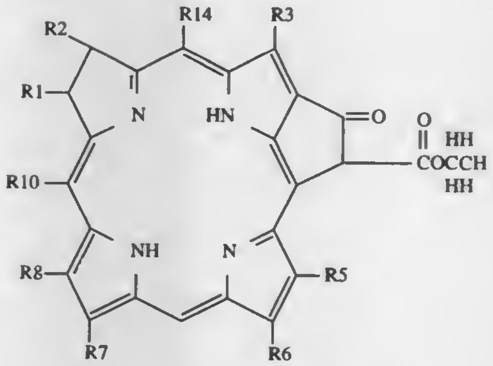

Fig. 25

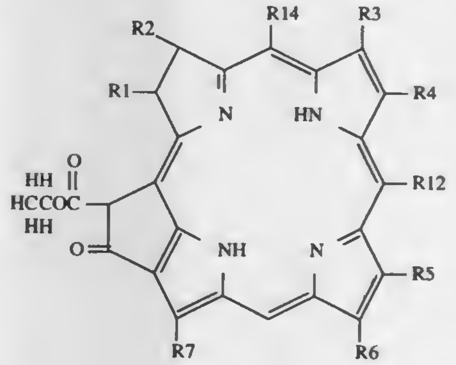

Fig. 26

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Fig. 27

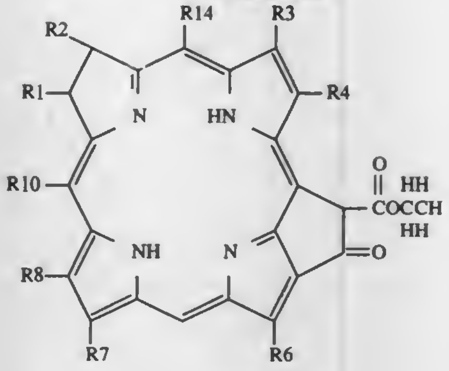

Fig. 28

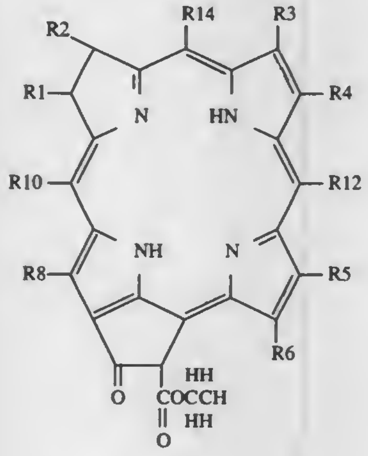

Fig. 39

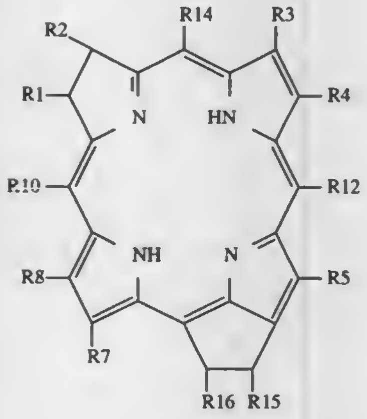

Fig. 40

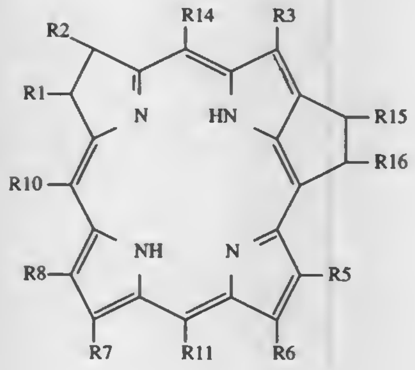

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Fig. 41

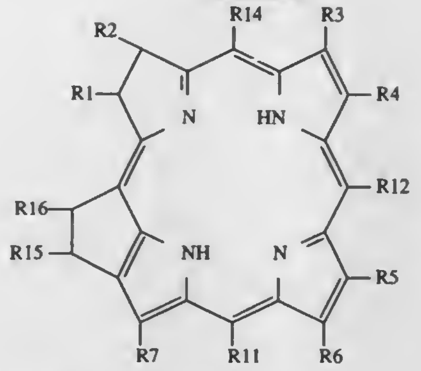


Fig. 42

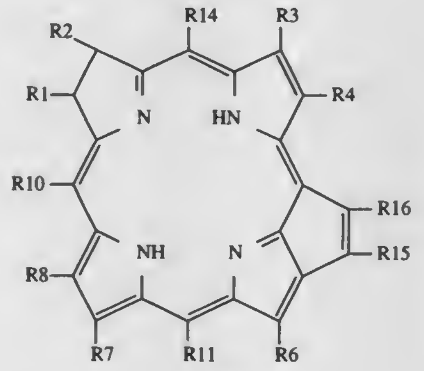
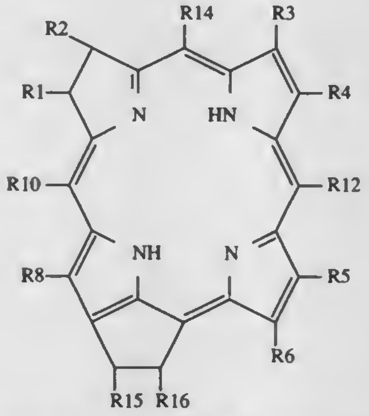


Fig. 43



and the chlorin metal complex has the structure of one of FIGS. **2** and **49** through **53**, below:

Fig. 2

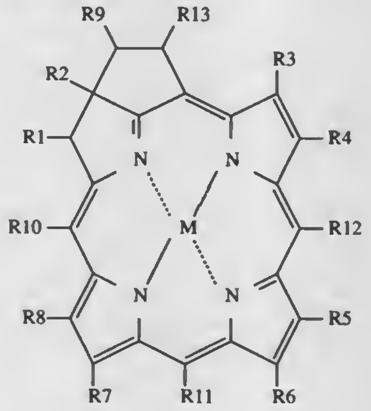


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Fig. 49

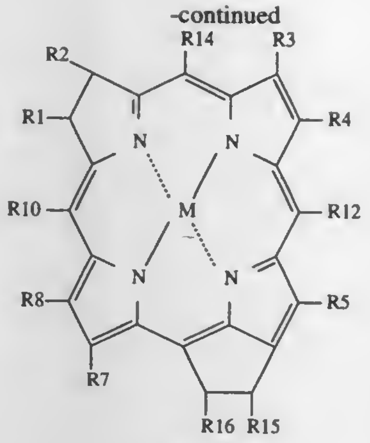

Fig. 50

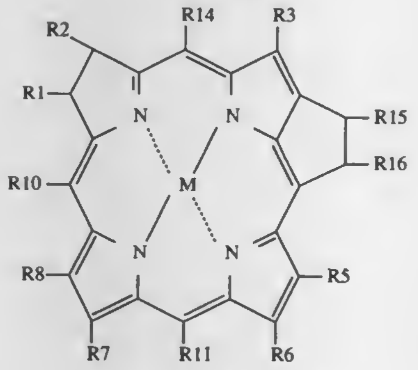

Fig. 51

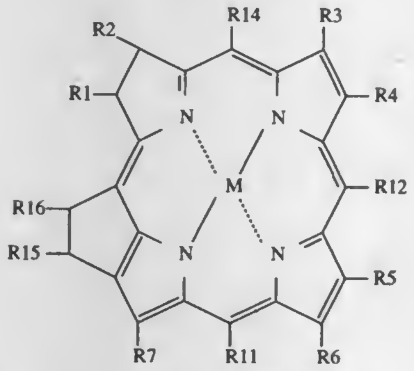

Fig. 52

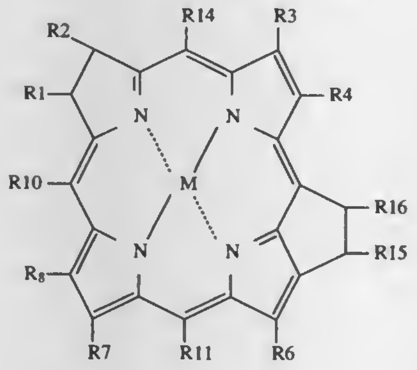

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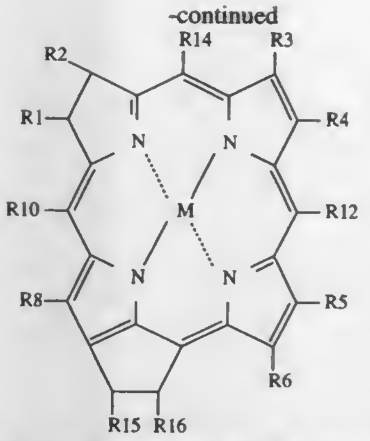
Fig. 53



and wherein each of R10 through R13 and R16 is hydrogen, and each of R1 through R9, R14 and R15 is:

H or CHO,

an alkyl group having from 1 to 4 carbon atoms, excluding tertiary butyl,

an alkylene group having from 2 to 4 carbon atoms,

a group having the formula $R_2N(R_3)_2$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; R_3 is hydrogen or an alkyl group having from 1 to 2 carbon atoms and the two R_3 groups can be the same or different,

a group having the formula $R_2N(R_4)_3A$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; A is a physiologically acceptable anion; and R_4 is an alkyl group having from 1 to 2 carbon atoms and the three R_4 groups can be the same or different,

a group having the formula R_2OH were R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond,

CO_2R', CH_2CO_2R' or $CH_2CH_2CO_2R'$, where R' is hydrogen or an alkyl group having from 1 to 4 carbon atoms, excluding tertiary butyl,

an amino acid moiety which is attached to the purpurin or chlorin moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of lysine, glutamic acid, histidine, cystine, arginine or aspartic acid and a CO_2R', CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the purpurin or chlorin, or

in the purpurins and purpurin metal complexes of FIGS. **1**, **7**, **14–18**, **34–38** and **54–58** and in the chlorins and chlorin metal complexes of FIGS. **2** and **8** R1 can be a bivalent aliphatic hydrocarbon radical having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin, chlorin, or metal complex, and in the purpurins and purpurin metal complexes of FIGS. **29–33** and of FIGS. **44–48** and in the chlorins and chlorin metal complexes of FIGS. **24–28**, **39–43** and **49–53**, both R1 and R2 can be bivalent aliphatic hydrocarbon radicals having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin or metal complex, and

M comprises a metal cation that is complexed with two of the nitrogens of the purpurin or chlorin and is Ag, Al, Ce, Co, Cr, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu, Mn, Mo, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sin, Sn, Tb, ^{99m}Tc, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr, with the proviso that not more than one of R1 through R9, R14 and R15 is CHO, a group having the formula $R_2N(R_3)_2$, a group having the formula $R_2N(R_4)_3A$, or an amino acid moiety.

5,534,507
3-ARYL OR HETEROARYL-7-HETEROARALKYLAMIDO CEPHALOSPORIN COMPOUNDS, COMPOSITIONS AND METHODS OF USE

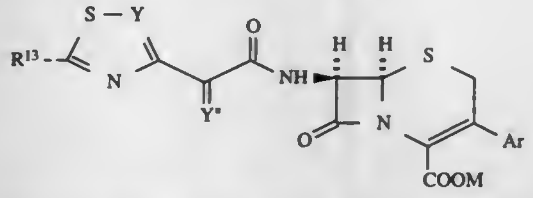
Lovji D. Cama, Tenafly, and James V. Heck, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 102,439, Aug. 5, 1993, Pat. No. 5,455,239. This application Jun. 6, 1995, Ser. No. 470,694

Int. Cl.⁶ C07D *501/22;* **A61K** *31/545*

U.S. Cl. 514—206 **19 Claims**

1. A compound of the Formula I:



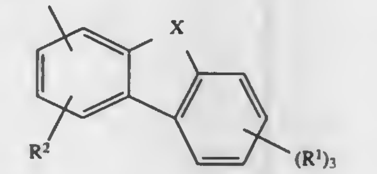
or a pharmaceutically acceptable salt or solvate thereof, wherein:

R^{13} represents hydrogen, NH_2, C_{1-4} alkyl, C_{1-4} alkylamino or di(C_{1-4})alkylamino-;

Y represents CH or N;

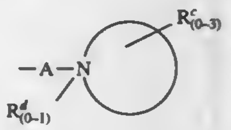
Y" represents (a) $CR^{y'}R^{z'}$, with R_y' and $R^{z'}$ independently representing H, C_{1-6} alkyl, C_{3-8} cycloalkyl or C_{1-6} alkyl substituted with C_{3-8} cycloalkyl, or (b) N substituted with —OR^{14} with R^{14} representing H, C_{1-4} alkyl, C_{3-6} cycloalkyl or C_{1-4} alkyl substituted with COOH;

Ar represents

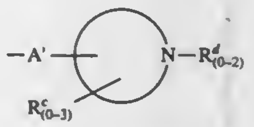


wherein X represents —O— or —$S(O)_x$— wherein x is equal to 0, 1 or 2;

one of R^1 and R^2 represents hydrogen, W as defined below or one of the groups (a) through (d) below, and the other represents H or W with the proviso that each R^1 group is considered independently;

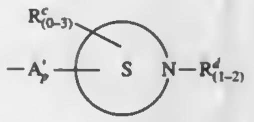


(a)



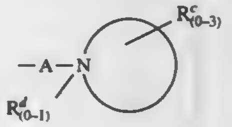
(b)

$$—Ap—NR^{10}R^{11}R^{12}_{(0-1)}; \text{ and} \qquad (c)$$



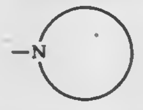
(d)

when one of R^1 and R^2 represents (a)



A represents —$(CR^{3'}R^{4'})_r$—Q— $(CR^{3'}R^{4'})_s$— wherein r represents an integer of from 0–6, s represents an integer of from 1–6 and Q represents: a covalent bond, —O—, —$S(O)_x$— with x equal to 0, 1 or 2, —$NR^{3'}$—, —$SO_2NR^{3'}$—, —$NR^{3'}SO_2$—, —$C(O)NR^{3'}$—, —$NR^{3'}C(O)$—, —$CR^{3'}$=$CR^{4'}$—, —C(O)— or —OC(O)—;

with $R^{3'}$ and $R^{4'}$ independently representing H or C_{1-4} lower alkyl, and $(CR^{3'}R^{4'})_s$— being attached to the ring nitrogen;



represents a 5 or 6 membered mono-cyclic heterocycle or an 8–10 membered bicyclic heterocycle, bonded to A through the ring nitrogen and having a substituent group R^d optionally attached to the ring nitrogen, and having 0–3 R^c groups attached to other atoms of the heterocyclic group, said ring nitrogen being tertiary or quaternary by virtue of the ring bonds and R^d which may be optionally attached, said heterocyclic group being saturated or unsaturated, aromatic, partially aromatic or non-aromatic,

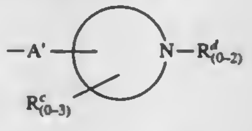
said heterocycle also containing 0–3 additional nitrogen atoms and 0–1 oxygen or sulfur atom;

each R^c independently represents W as defined below or NR^yR^z, wherein R^y and R^z independently represent H, C1 to C4 alkyl, C1 to C4 alkyl substituted with R^q or R^y and R^z are taken together to represent either a 3- to 5-membered alkylidene radical to form a ring, optionally substituted with R^q, or a 2- to 4-membered alkylidene radical interrupted by O or $S(O)_x$ with x equal to 0, 1 or 2, to form a ring, said alkylidene being optionally substituted with R^q as defined below;

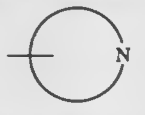
each R^d independently represents hydrogen, NH_2, O— or C1 to C4 alkyl, optionally mono-substituted with R^q as defined below;

R^q is selected from hydroxy, methoxy, cyano, —$C(O)NH_2$, —$OC(O)NH_2$, —CHO, —$OC(O)N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$S(O)CH_3$, —SO_2CH_3, —F, —CF_3, —SO_3M^b with M^b representing H or alkali metal, or —CO_2M^a, where M^a is H, alkali metal, methyl or phenyl; tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is optionally mono-substituted by another R^q group as defined above);

when one R^1 and R^2 represents (b)



A' represents —$(CR^{3'}R^{4'})_{m}'$—Q— $(CR^{3'}R^{4'})_m'$— with each m' independently equal to 0–6, and Q, $R^{3'}$ and $R^{4'}$ are as defined above, except that when each m' is 0, Q is not a covalent bond, and —$(CR^{3'}R^{4'})_m'$ is attached to the phenyl ring;



represents a 5 or 6 membered mono-cyclic heterocycle or an 8–10 membered bicyclic heterocycle, said heterocycle being unsaturated and aromatic, partially aromatic or non-aromatic, bonded to A' through an atom other than the ring nitrogen, and optionally having 0–2 R^d substituent groups attached to the ring nitrogen, said nitrogen in the heterocycle being tertiary or quaternary by virtue of the ring bonds and the optional R^d groups which may be attached;

said heterocycle may further contain 0–1 oxygen or sulfur atom and 0–2 additional nitrogen atoms therein:

R^c and R^d are as defined above;

when one of R^1 and R^2 represents (c) —A_p—$NR^{10}R^{11}R^{12}_{(0-1)}$;

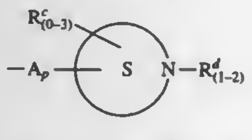
A is as defined above and p is an integer 0 or 1;

R^{10}, R^{11} and where present, R^{12}, are independently H, C_{1-4} alkyl or C_{1-4} alkyl optionally mono-substituted with R^q;

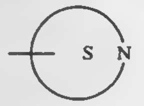
or R^{10}, R^{11} and R^{12} may be taken in combination to represent a C4 to C10 alkanetriyl group, optionally substituted with tip to three W groups, with W as defined below;

such that the nitrogen atom to which said R^{10}, R^{11} and R^{12} groups are attached is tertiary or quaternary;

when one of R^1 and R^2 represents (d)



A, p, R^c and R^d are as previously defined, and



represents a saturated 5 or 6 membered mono-cyclic heterocycle or an 8–10 membered bicyclic heterocycle, bonded to A' through an atom other than the ring nitrogen, and having one or two R^d substituent groups attached to the ring nitrogen, said nitrogen in the heterocycle being tertiary or quaternary by virtue of the ring bonds and the R^d groups which may be attached;

W represents a member selected from the group consisting of:

a) trifluoromethyl group: —CF3;

b) a halogen atom: —Br, —Cl, —F, or —I;

c) C_1–C_4 alkoxy radical: —OC_{1-4} alkyl, wherein the alkyl is optionally mono-substituted by R^q, where R^q is as defined above;

d) a hydroxy group: —OH;

e) a carbonyloxy radical: —$OC(O)R^s$, where R^s is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

f) a carbamoyloxy radical; —$OC(O)N(R^y)R^z$, where R^y and R^z are independently H, C_{1-4} alkyl, (optionally mono-substituted by R^q as defined above), or are taken together to represent a 3- to 5-membered alkylidene radical which forms a ring (optionally substituted with R^q as defined above), or a 2- to 4-membered alkylidene radical interrupted by —O—, —S—, —S(O)— or —$S(O)_2$— which forms a ring, said ring being optionally mono-substituted with R^q as defined above;

g) a sulfur radical: —$S(O)_n$—R^s, where n=O—2, and R^s is defined above;

h) a sulfamoyl group: —$SO_2N(R^y)R^z$, where R^y and R^z are as defined above;

i) azido: N_3;

j) a formamido group: —$N(R^t)C(O)H$, where R^t is H or C_{1-4} alkyl, said alkyl group being optionally mono-substituted with R^q as defined above;

k) an alkylcarbonylamino radical: —$N(R^t)C(O)C1$–4 alkyl, wherein R^t is as defined above;

l) an alkoxycarbonylamino radical: —$N(R^t)C(O)OC_{1-4}$ alkyl, where R^t is as defined above;

m) a ureido group: —$N(R^t)C(O)N(R^y)R^z$ where R^t, R^y and R^z are defined above;

n) a sulfonamido group: —$N(R^t)SO_2R^s$, where R^s and R^t are as defined above;

o) a cyano group: —CN;

p) a formyl or acetalized formyl radical: —C(O)H or —$CH(OCH_3)_2$;

q) an alkylcarbonyl radical wherein the carbonyl is acetalized: —$C(OCH_3)_2$ C1–C4 alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

r) a carbonyl radical: —$C(O)R^s$, where R^s is as defined above;

s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: —$(C{=}NOR^z)R^y$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

t) an alkoxycarbonyl radical: —$C(O)OC_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

u) a carbamoyl radical: —$C(O)N(R^y)R^z$, where R^y and R^z are as defined above;

v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: —$C(O)N(OR^y)R^z$, where R^y and R^z are as defined above, except they may not be joined together to form a ring;

w) a thiocarbamoyl group: —$C(S)N(R^y)R^z$ where R^y and R^z are as defined above;

x) carboxyl: —$COOM^a$ where Ma is as defined above;

y) thiocyanate: —SCN;

z) trifluoromethylthio: —SCF_3;

aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

ab) an anionic function selected from the group consisting of: phosphono [$P{=}O(OM^a)_2$]; alkylphosphono {$P{=}O(OM^a)$-[O(C1–C4 alkyl)]}; alkylphosphinyl [$P{=}O(OM^a)$—(C_1–C_4 alkyl)]; phosphoramido [$P{=}O(OM^a)N(R^y)R^z$ and $P{=}O(OM^a)NHR^x$]; sulfino (SO_2M^a); sulfo (SO_3M^a); acylsulfonamides selected from the structures $SO_2NM^aCON(R^y)R^z$; and SO_2NM^aCN, where R^x is phenyl or heteroaryl, where heteroaryl is a mono-cyclic, aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, one of the carbon atoms has been replaced by a nitrogen atom, one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and from 1 to 2 additional carbon atoms are optionally replaced by nitrogen heteroatoms, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, said R^q, M^a, R^y and R^z being as defined above;

ac) a C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N(C_1–C_4 alkyl) and in which one additional carbon may be replaced by the NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

ad) a C_2–C_4 alkenyl radical, optionally mono-substituted by one of the substituents a) to ac) above and phenyl which is optionally substituted by R^q as defined above;

ae) a C_2–C_4 alkynyl radical, optionally mono-substituted by one of the substituents a) to ac) above;

af) a C_1–C_4 alkyl radical;

ag) a C_1–C_4 alkyl group mono-substituted by one of the substituents a)–ac) above;

ah) a C_1–C_6 alkyl group substituted with up to 3 groups selected from oxime (=N—OR^{14}), cycloalkyl, aryl, heterocycloalkyl, heteroaryl and C_{1-3} alkoxy groups;

ai) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from S and NR' (where R' is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents a) to ag) above, and

M represents hydrogen, a negative charge, a biolabile ester forming group, a carboxyl protecting group or a pharmaceutically acceptable cation.

5,534,508

CEPHEM COMPOUNDS AND ANTIMICROBIAL AGENTS

Sadao Hayashi, Hirakata; Eiji Nakanishi, Kawasaki; Yasuyuki Kurita, Hirakata, and Masahiko Okunishi, Kawasaki, all of, Japan, assignors to Katayama Seiyakusyo Co., Ltd., Osaka, and Ajinomoto Co., Inc., Tokyo, both of, Japan

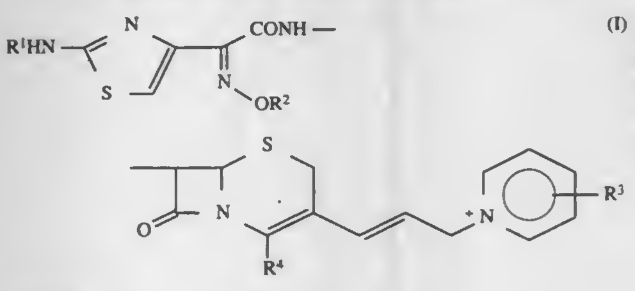
Filed Jul. 28, 1994, Ser. No. 281,513

Claims priority, application Japan, Jul. 29, 1993, 5-188443

Int. Cl.^{6} C07D *501/46;* A61K *31/545*

U.S. Cl. 514—206 **8 Claims**

1. A cephem compound having the formula (I):



(I)

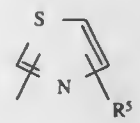
wherein

R^1 is hydrogen;

R^2 is hydrogen;

R^4 is a carboxyl or carboxylate group which may be protected;

R^3 is selected from the group consisting of ureido and a group having the formula (1),



(1)

wherein

R^5 is amino; and physiologically acceptable salts thereof.

5,534,509

PHARMACEUTICAL COMPOSITION REGULATING FUNCTION OF A LIVING BODY

Jin-emon Konishi, Musashino, and Giichi Hamada, Nishinomiya, both of, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 15, 1994, Ser. No. 213,065

Claims priority, application Japan, Mar. 19, 1993, 5-085322

Int. Cl.^{6} A61K *33/00*

U.S. Cl. 514—210 **12 Claims**

1. A pharmaceutical composition for use in treating diseases accompanied by or associated with allergy, inflammation or pain or for use in improving peripheral blood circulation or paresthesia comprising a pharmaceutically effective amount of a water-soluble silicate polymer as an active ingredient, and an inert carrier or diluent comprising at least one member selected from the group consisting of saccharides and sugar alcohols, said silicate polymer having a molecular weight in the range of 4,800 to 2,000,000 as determined by gel-filtration and a degree of polymerization in the range of 75 to 33,000 wherein the monomer unit is $-(SiO_2)-$.

5,534,510

2-[1-(1,3-THIAZOLIN-2-YL)AZETIDIN-3-YL]THIO-CARBAPENEM DERIVATIVES

Takao Abe, Sakado; Takeshi Isoda, Sayama; Chisato Sato, Kamifukuoka; Ado Mihira, Asaka; Satoshi Tamai, Kawasaki, and Toshio Kumagai, Kawagoe, all of, Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

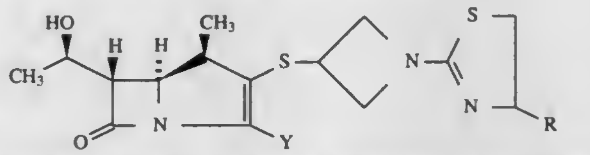
Filed Jun. 29, 1994, Ser. No. 267,397

Claims priority, application Japan, Jul. 1, 1993, 5-213306; Mar. 28, 1994, 6-079320; May 12, 1994, 6-122046

Int. Cl.^{6} C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 **9 Claims**

1. A (1R,5S,6S)-2-[1-(1,3-thiazolin-2-yl)azetidin-3-yl]thio-6-[(R)-1 -hydroxyethyl]-1-methyl-carbapen-2-em-3-carboxylic acid derivative represented by the following formula:



(I)

wherein R is hydrogen; lower alkyl group which is unsubstituted or substituted by hydroxy or lower alkoxy which is unsubstituted or substituted by lower alkoxy; —COOR^1 wherein R^1 is hydrogen or lower alkyl; or —CONR^{2}R^3 wherein R^2 and R^3 are, independently of each other, hydrogen or lower alkyl,

Y is carboxy or protected carboxy, or a pharmaceutically acceptable salt thereof.

5,534,511

AMINOALKYL BENZOXAZOLINONES AND BENZOTHIAZOLINONES

Ange Mouithys-Mickalad, Loos; Patrick Depreux, Armentieres; Daniel Lesieur, Gondecourt; Gérard Adam, Le Mesnil Le Roi; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Marie-Claire Rettori, Courbevole, all of, France, assignors to Adir Et Compagnie, Courbevole, France

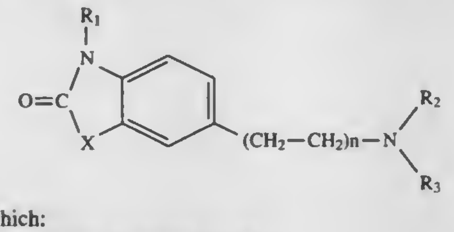
Filed Mar. 21, 1995, Ser. No. 407,238

Claims priority, application France, Mar. 22, 1994, 94 03298

Int. Cl.^{6} A61K *31/55;* C07D *403/00*

U.S. Cl. 514—212 **5 Claims**

1. A compound which is selected from those of formula (I):



(I)

in which:

R$_1$ represents hydrogen or alkyl,

n represents 1 or 2,

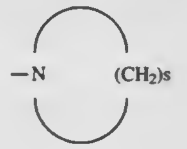
X represents oxygen or sulfur,

R$_2$ represents hydrogen or alkyl,

and R$_3$ represents the group $-(CH_2)_m-R_4$ in which:

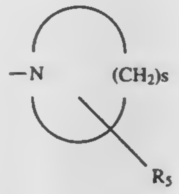
m represents 1,2, 3 or 4,

and R$_4$ represents a group selected from cycloalkylamino, dicycloalkylamino, N-cycloalkyl-N-alkylamino and a heterocyclic radical of formula:



wherein s is six (6), which is unsubstituted or substituted with a radical selected from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

or alternatively R$_2$ forms, with R$_3$ and the nitrogen atom which bears them, a group:



wherein is six (6), wherein the substituent R$_5$ is chosen from aryl, arylalkyl, substituted aryl, and substituted arylalkyl,

term "substituted", used reference to the "aryl" and "arylalkyl" radicals, meaning that these groups are substituted with one or more groups chosen from halogen, alkyl, hydroxyl, alkoxy, and trifluoromethyl,

the terms "alkyl" and "alkoxy" denote linear or branched groups containing 1 to 6 carbon atoms, inclusive

the term "aryl" represents a phenyl or naphthyl group,

the term "cycloalkyl" denotes a group of 3 to 9 carbon atoms, inclusive

the optical isomers thereof and the addition salts thereof with a pharmaceutically-acceptable acid and, when R$_1$ represents a hydrogen atom, with a pharmaceutically-acceptable base.

5,534,512

Patent Not Issued For This Number

5,534,513

ANTITUMOR POTENTIATOR AND ANTITUMOR COMPOSITION

Uchida Junji; Okabe Hiroyuki; Takechi Teiji; Takeda Setsuo, all of Tokushima, and Yamada Yuji, Tokorozawa, Japan, assignors to Taiho Pharmaceutical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 849,413, Apr. 29, 1992, abandoned.

This application Nov. 29, 1993, Ser. No. 158,476

Claims priority, application Japan, Sep. 5, 1991, 2-238719

Int. Cl.^{6} A61K *31/495;31/50;31/505*

U.S. Cl. 514—249 **9 Claims**

1. A method for further potentiating the antitumor effect resulting from administration of an antitumor composition to a patient with a cancer wherein the cancer is sensitive to treatment with the combinations shown below, wherein the antitumor composition contains tegafur and uracil in a molar ratio of 1:4, said method comprising administering folinic acid or a pharmaceutically acceptable salt thereof in an amount effective for potentiation of antitumor effect to said patient.

5,534,514

ANTI-NEOPLASTIC COMPOSITIONS AND METHODS FOR APPLICATION THEREOF

Phillip B. B. Moheno, La Jolla, Calif., assignor to San Diego State University, San Diego, Calif.

Continuation of Ser. No. 967,283, Oct. 27, 1992, abandoned.

This application May 22, 1995, Ser. No. 445,794

Int. Cl.^{6} A61K *31/495;31/50*

U.S. Cl. 514—249 **4 Claims**

1. A method for treating mammary neoplasm or lymphocytic leukemia in a mammalian creature comprising administering to the creature a composition comprising a mixture of substantially about 32 micrograms per milliliter xanthopterin and substantially about 16 micrograms per milliliter isoxanthopterin suspension diluted in an inert carrier, applied in an amount of frequency sufficient to inhibit the growth of the neoplasm.

5,534,515

PYRROLOPYRIDAZINES HAVING GASTROINTESTINAL PROTECTIVE EFFECTS

Gerhard Grundler, Constance, Germany, assignor to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

PCT No. PCT/EP92/02418, § 371 Date Apr. 25, 1994, § 102(e) Date Apr. 25, 1994, PCT Pub. No. WO93/08190, PCT Pub. Date Apr. 29, 1993

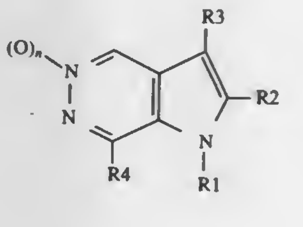
PCT Filed Oct. 21, 1992, Ser. No. 211,990

Claims priority, application Switzerland, Oct. 25, 1991, 03119/91; Oct. 25, 1991, 03120/91; Oct. 25, 1991, 03123/91

Int. Cl.^{6} A61K *31/50;* C07D *487/04*

U.S. Cl. 514—248 **13 Claims**

1. A compound of the formula 1



(I)

in which

R1 is 1–4C-alkyl or R5-substituted 1–3C-alkylene,

R2 is 1–4C-alkyl,

R3 is hydrogen, halogen, CHO (formyl), hydroxy-methyl, nitro, amino or the substituent —CH_2O—COR7,

R4 is halogen or the substituent —A—B—R6,

R5 is furyl, thienyl, tetrahydrofuryl, phenyl or phenyl substituted by one or two identical or different substituents from the group consisting of halogen, 1–4C-alkyl and 1–4C-alkoxy,

R6 is hydrogen, thienyl, furyl, phenyl or phenyl substituted by one or two identical or different substituents from the group consisting of halogen, 1–4C-alkyl, 1–4C-alkoxy, nitro, —NH—CO—NH_2 (ureido), amino, 1-4-C-alkylcarbonylamino and 1–4C-alkoxycarbonylamino,

R7 is 1–4C-alkyl, 1–4C-alkoxy-1–4C-alkyl, 1–4C-alkoxycarbonyl-1–4-C-alkyl or carboxy-1–4C-alkyl,

A is O (oxygen) or NH,

B is a valence bond, —CH_2— (methylene) or —CH_2CH_2— (1,2-ethylene) and

n is the number 0 or 1, or a salt thereof.

5. 1-Benzyl-7-(4-fluorobenzyloxy)-3-hydroxymethyl-2-methylpyrrolo [2,3-d]pyridazine, or a salt thereof.

5,534,516

ACETYLENES DISUBSTITUTED WITH A HETEROAROMATIC GROUP AND A 2-SUBSTITUTED CHROMANYL, THIOCHROMANYL OR 1, 2, 3, 4-TETRAHYDROQUINOLINYL GROUP HAVING RETINOID-LIKE ACTIVITY

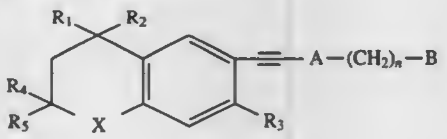
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan

Division of Ser. No. 144,178, Oct. 27, 1993, Pat. No. 5,407,937, which is a division of Ser. No. 967,630, Oct. 28, 1992, Pat. No. 5,272,156, which is a division of Ser. No. 732,270, Jul. 18, 1991, Pat. No. 5,183,827, which is a division of Ser. No. 409,476, Sep. 19, 1989, Pat. No. 5,045,551. This application Feb. 7, 1995, Ser. No. 385,000

Int. Cl.^{6} A61K *31/50*

U.S. Cl. 514—253 **17 Claims**

1. Compounds of the formula



where X is S, O, or NR', where R' is hydrogen or lower alkyl;

R_1, R_2 and R_3 are hydrogen or lower alkyl;

R_4 and R_5 are hydrogen or lower alkyl with the proviso that R_4 and R_5 both are not hydrogen;

n is an integer from 0 to 5;

A is pyrazinyl, and

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $COONR_9R_{10}$, —CH_2OH, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_2)_2$, $CHOR_{13}O$, —COR", CR"$(OR_{12})_2$, or CR"$OR_{13}O$, where R" is an alkyl, having 1 to 5 carbons, alkenyl group of 2 to 5 carbons or cycloalkyl group of 3 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, R_{13} is divalent alkyl radical of 2–5 carbons.

5,534,517

(ARYL(ALKYL)CARBONYL)-HETEROCYCLIC COMPOUNDS AND THEIR USE IN THE TREATMENT OF ANXIETY AND DEPRESSION

Ousmane Diouf, Villeneuve D'Ascq; Daniel Lesieur, Gondecourt; Patrick Depreux, Armentieres; Beatrice Guardiola-Lemaitre, Saint-Cloud; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Gérard Adam, Le Mesnil Le Roi, all of, France, assignors to Adir Et Compagnie, Courbevoie, France

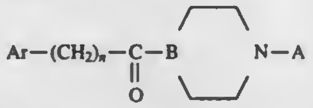
Division of Ser. No. 206,451, Mar. 4, 1994, Pat. No. 5,387,586. This application Aug. 26, 1994, Ser. No. 296,665

Claims priority, application France, Mar. 5, 1993, 93 02528

Int. Cl.^{6} A61K *31/495;31/535;31/445*

U.S. Cl. 514—253 **9 Claims**

1. A method of treating or preventing anxiety or depression in a mammal subject thereto, and depressive syndromes, psychotic conditions, and Parkinson's comprising the step of administering to said mammal an amount of a compound which is selected from those of formula (I):

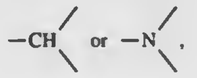


(I)

wherein:

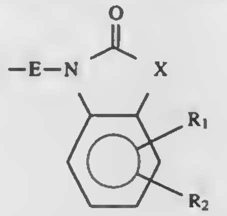
Ar represents phenyl or naphthyl, Ar being unsubstituted or substituted by one or more radicals selected from halogen, lower alkyl, lower alkoxy, and trifluoromethyl, n represents 0 or 1 to 4, inclusive

B represents

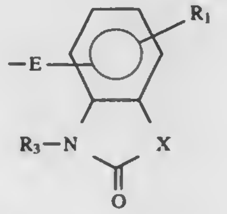


and

A represents a group of formula (A1) or (A2):



(A1)



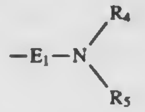
(A2)

wherein:

E represents a linear or branched alkylene chain having 1 to 6 carbon atoms, inclusive,

R_1 represents a radical selected from hydrogen, hydroxyl, lower alkyl, and lower alkoxy,

R_2 represents



where E_1 has the same definition as E as described above and where R_4 and R_5 are selected, independently from one another, from hydrogen and lower alkyl, or form, together with the nitrogen to which attached, a heterocycle selected from pyrrolidine, piperidine, substituted piperidine, morpholine, piperazine, and substituted piperazine,

R_3 represents a radical selected from hydrogen and lower alkyl, and

X represents sulfur or oxygen, its optical isomers, in pure form or in the form of a mixture, and addition salts thereof with a pharmaceutically-acceptable base or acid,

it being understood that, except when otherwise specified, the terms "lower alkyl" and "lower alkoxy" denote linear or branched groups having 1 to 6 carbon atoms, inclusive, and the term "substituted" assumed by the "piperidine" and "piperazine" heterocycles means that these heterocycles can be substituted in the 4-position by a radical selected from lower alkyl, aryl, and lower arylalkyl, the term "aryl" denoting phenyl, naphthyl, or pyridyl, which aryl can itself be unsubstituted or substituted by one or more radicals selected from halogen, lower alkyl, hydroxyl, lower alkoxy, and trifluoromethyl, which is effective for said purpose.

5,534,518

INSECTICIDAL SUBSTITUTED-2,4-DIAMINOQUINAZOLINES

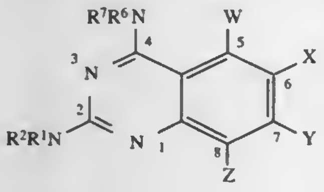
Robert N. Henrie, II, East Windsor; Clinton J. Peake, Trenton; Thomas G. Cullen, Milltown; Albert C. Lew, Princeton Junction; Munirathnam K. Chaguturu, Lawrenceville, all of N.J.; Partha S. Ray, Memphis, Tenn.; Walter H. Yeager, Yardley, Pa.; Ian R. Silverman, Maple Shade, N.J.; John W. Buser, North Brunswick, N.J.; James J. Fiordeliso, Somerset, N.J., and John A. Dixson, Newtown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 149,491, Nov. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 19,389, Feb. 18, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 267,340

Int. Cl.^{6} C07D *239/95;* **A61K** *31/505*

U.S. Cl. 514—260 **33 Claims**

1. An insecticidal composition comprising, in admixture with an agriculturally acceptable carrier, and a surface active agent, an insecticidally effective amount of a 2,4-diaminoquinazoline compound of the formula:



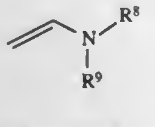
wherein

R^1 and R^6 are independently hydrogen or lower alkyl;

R^2 and R^7 are hydrogen, lower alkyl, alkylcarbonyl, lower alkoxycarbonyl, lower haloalkylcarbonyl, alkoxyalkylcarbonyl, alkoxyalkoxyalkylcarbonyl, alkoxyalkoxyalkoxyalkylcarbonyl, arylcarbonyl, substituted arylcarbonyl, or alkynylcarbonyl;

or R^1 and R^2, taken together, form the group —R^5—O—R^5, wherein R^5 is lower alkylene;

or R^1 and R^2, taken together, and R^6 and R^7 taken together each form the group



wherein R^8 and R^9 are independently straight or branched chain lower alkyl; or

R^8 and R^9 taken together with two to five methylene groups form an alkylene ring;

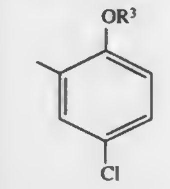
W, Y, and Z are independently hydrogen, halogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, thienyl or substituted thienyl, aroyl or substituted aroyl, cyano, nitro, amino, lower dialkylamino, aryl or substituted aryl, arylalkyl, arylalkenyl, arylalkynyl, arylthio, arylsulfinyl, arylsulfonyl, arylaminoalkyl, arylalkylamino, arylalkylimino, (aryl)(halo)alkenyl, substituted (aryl)(halo)alkenyl, (aryl)(alkyl)aminoalkyl, arylalkycarbonylamino, arylalkylthio, or arylthioalkyl; and

X is

(a) hydrogen, halogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, thienyl or substituted thienyl, aroyl or substituted aroyl, cyano, nitro, amino, lower dialkylamino, aryl, arylalkyl, arylalkenyl, arylalkynyl, aryloxy, arylthio, arylsulfinyl, arylsulfonyl, arylaminoalkyl, arylalkylamino, arylalkylimino, (aryl)(halo)alkenyl, or substituted (aryl)(halo)alkenyl, (aryl)(alkyl)aminoalkyl, or arylalkycarbonylamino; or

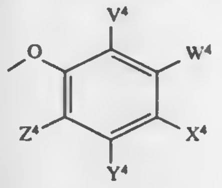
(b) substituted aryl, wherein the substituents are selected from one or more of halogens, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, formyl, lower alkoxycarbonyl, phenyl or phenyl substituted with one or more halogens or lower haloalkyl, phenoxy, or phenoxy substituted with one or more halogens, lower haloalkoxy, lower alkoxyalkyl, carboxy, cyano, nitro, aminocarbonyl, lower alkylcarbonylamino, lower alkylsulfonylamino;

or substituted phenyl of the formula



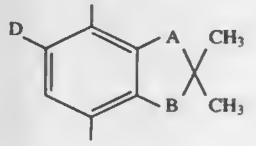
wherein R^3 is hydrogen; alkyl, tri(lower alkyl)silylalkyl; (4-halophenyl)lower alkyl; pentahalophenylalkyl; pyridin-2-ylalkyl; or 2-(4-alkylsulfonylphenoxy)alkyl; or

(c) substituted aryloxy, of the formula:



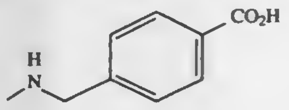
wherein V^4, W^4, X^4, Y^4, and Z^4 are selected from hydrogen, halogen, or haloalkyl; or

(d) a benzo-fused oxygen-containing heterocycle of the formula:



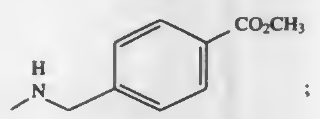
wherein A and B are independently selected from oxygen, methylene, and carbonyl, with the proviso that at least one of A or B is oxygen; D is hydrogen, halogen, lower alkyl, or lower haloalkyl; and E is hydrogen, hydroxy, or lower alkoxy; to form the corresponding heterocycle 2,3-dihydro-2,2-dimethylbenzofuran-4-yl, 2,3-dihydro-2,2-dimethylbenzofuran-7-yl, 6-halo-2,3-dihydro-2,2-dimethylbenzofuran-4-yl, 5-halo-2,3-dihydro-2,2-dimethylbenzofuran-7-yl, or 2,3-dihydro- 2,2-dimethyl-3-benzofuranon-4-yl; or

(e) an arylalkylamino of the formula:



-continued

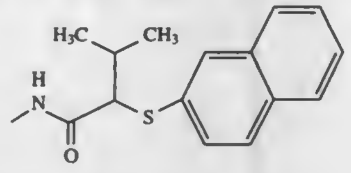
or



;

or

(f) an arylthioalkylcarbonylamino of the formula:



,

and agriculturally acceptable salts thereof.

5,534,519

5,10,-METHYLENE-TETRAHYDROFOLATE AS A MODULATOR OF A CHEMOTHERAPEUTIC AGENT

Colin P. Spears, Glendale, Calif., and Bengt G. Gustavsson, Göteborg, Sweden, assignors to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 174,571, Dec. 23, 1993, Pat. No. 5,376,658, which is a continuation of Ser. No. 789,729, Nov. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 521,712, May 11, 1990, abandoned. This application Oct. 20, 1994, Ser. No. 326,414

Int. Cl.^{6} A61K *31/505*

U.S. Cl. 814—274 **12 Claims**

1. A composition for inhibiting TS activity in mammalian cells comprising an amount of unnatural diastereomer (6S)-CH_2FH_4 or unnatural diastereomer (6R)-FH_4 sufficient to effect said activity inhibition, together with a pharmaceutically acceptable carrier.

5,534,520

SPIRO COMPOUNDS CONTAINING FIVE-MEMBERED RINGS

Abraham Fisher, 4717 David Elazar Street, Holon; Yishai Karton, 8 Ben-Gurion Street, Ness-Ziona; Daniele Marciano, 22 Usichkin Street, Ramat-Hasharon; Dov Barak, 20 Usichkin Street, Removot, and Haim Meshulam, 13 Harishohim Street, Bat-Yam, all of, Israel

Continuation-in-part of Ser. No. 685,397, Apr. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 507,708, Apr. 10, 1990, abandoned. This application Jul. 20, 1993, Ser. No. 94,855

Int. Cl.^{6} A61K *31/445;* **C07D** *221/20;491/10;491/20*

U.S. Cl. 514—278 **32 Claims**

1. A compound having muscarinic activity and which is selected from the group consisting of: 1-methylpiperidine-4-spiro-5'-(3'-ethylhydantoin), 1-methylpiperidine-4-spiro-5'-(1'-acetylhydantoin), piperidine-4-spiro-5'-(3'-ethythydantoin), 1-methylpiperidine-4-spiro-5'-(3'-methylhydantoin), piperidine-4-spiro-5'-(3'-methylhydantoin), 1-methylpiperidine-4-spiro-5'-(3'-propargylhydantoin), 1-methylpiperidine-4-spiro-5'-(3'-ethyl-4'-thiohydantoin), 1-methylpiperidine-4-spiro-5'-(4'-methylthio-3'-imidazoline2'-thione), 1-methylpiperidine-4-spiro-5'-(2',4'-dithiohydantoin), 1-methylpiperidine-4-spiro-5'-(3'-ethyl-2',4'-dithiohydantoin), 1-methylpiperidine-4-spiro-5'-(4'-ethylthio-3'-imidazoline-2'-thione), 1-methylpiperidine-4-spiro-4'-(1'-ethyl-2'-ethylthio-2'-imidazoline-5'-thione), 1-methylpiperidine-4-spiro-5'-(2'-thiohydantoin), 1-methylpiperidine-4-spiro-5'-(2'-thio-4'-β-hydroxyethyliminohydantoin), 1-methylpiperidine-4-spiro-5'-(oxazolidine-2'-thione), 1-methylpiperidine-4-spiro-5'-(3'-ethyloxazolidine-2'-one), 1-methylpiperidine-4-spiro-4'-(3'-ethyloxazolidine-2'-one), 1-methylpiperidine-4-spiro-4'-(2'-methyl-2'-thiazoline), 1-methylpiperidine-4-spiro-4'(5')-(2'-mehyl-2'-imidazoline), 1-methylpiperidine-4-spiro-5'-(2'-methyl-2'-oxazoline-4'-one), and their pharmaceutically acceptable salts, quaternary compounds, enantiomers and racemates.

5,534,521

BENZIMIDAZOLE COMPOUNDS

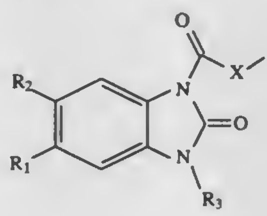
Daniel L. Flynn, Mundelein; Alan E. Moormann, Skokie; Daniel P. Becker, Glenview, all of Ill.; Michael S. Dappen, San Bruno, Calif.; Roger Nosal, Buffalo Grove, Ill.; Robert L. Shone, Palatine, Ill., and Clara I. Villamil, Glenview, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 8, 1994, Ser. No. 325,303

Int. Cl.^{6} A61K *31/395;* **C07D** *471/12*

U.S. Cl. 514—290 **17 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof

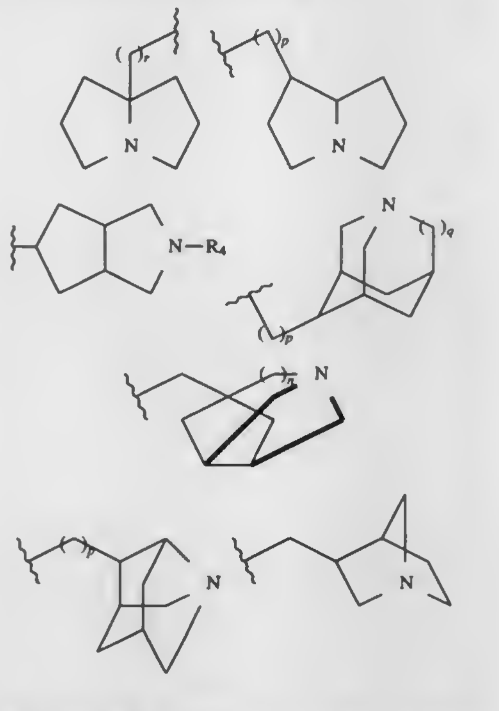
wherein

R_1 and R_2 are independently selected from the group consisting of hydrogen, alkoxy, halogen, amino, monoalkylamino, dialkylamino, acylamino and alkylsulfonylamino;

R_3 is selected from the group consisting of H, alkyl and cycloalkyl;

X is NH or O;

Z is selected from the group consisting of



R_4 is alkyl optionally substituted by cycloalkyl or phenyl;

n and r are independently 1 or 2;

p is 0 or 1; and

q is 0or 1.

5,534,522

(R)-(Z)-1-AZABICYCLO [2.2.1] HEPTAN-3-ONE,0-[3-(3-METHOXYPHENYL)-2-PROPYNYL] OXIME MALEATE AS A PHARMACEUTICAL AGENT

Howard Y. Ando, Ypsilanti; Stephen D. Barrett, Livonia; Juan C. Jaen, Plymouth; Steven E. Rose, and Haile Tecle, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 7, 1995, Ser. No. 474,622

Int. Cl.^{6} A61K *31/445*

U.S. Cl. 514—299 **6 Claims**

1. (R)-(Z)-1-Azabicyclo[2.2.1]heptan-3-one,O-[3-(3-methoxyphenyl)-2-propynyl]oxime maleate as a pharmaceutical agent.

5,534,523

ANTI-AIDS VIRUS COMPOSITION

Minoru Ono, Tokyo, Japan; Yuka Tamura, St. Petersburg, Fla., and Michinori Akasu, Tokyo, Japan, assignors to Kaken Shoyaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 38,060, Mar. 29, 1993, abandoned, which is a continuation of Ser. No. 751,844, Aug. 29, 1991, abandoned. This application Dec. 2, 1994, Ser. No. 353,376

Claims priority, application Japan, Aug. 29, 1990, 2-225253

Int. Cl.^{6} A61K *31/435*

U.S. Cl. 514—308 **4 Claims**

1. A method of treating AIDS which comprises administering cepharanthine or a pharmaceutically acceptable salt thereof to a patient infected with AIDS Virus in a therapeutically effective amount for treating AIDS.

5,534,524

SUPPRESSION OF BONE RESORPTION BY QUINOLINES

Lynda Bonewald; G. R. Mundy, and Wolf E. Gallwitz, all of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 9, 1994, Ser. No. 240,027

Int. Cl.^{6} A61K *31/47;31/505;31/44;31/35*

U.S. Cl. 514—314 **11 Claims**

1. A method for inhibiting bone resorption comprising administering 1-ethyl-6-[fluoro-5-(4-methoxy-3,4,5,6-tetrahydro-2H-pyran-4-yl)phenoxy]methyl-quinol- 2-one to a subject in an amount suppressing production of an osteoclast-stimulating factor.

5,534,525

LACTAM DERIVATIVES

Scott C. Miller, Newark, Del., assignor to Zeneca Limited, London, United Kingdom

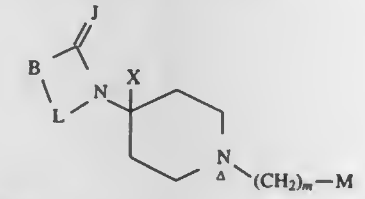
Filed Oct. 31, 1994, Ser. No. 332,290

Claims priority, application United Kingdom, Nov. 3, 1993, 9322643

Int. Cl.^{6} A61K *31/445;* **C07D** *413/12*

U.S. Cl. 514—316 **11 Claims**

1. A compound of formula I:



(t)

wherein:

X is (1–6C)alkyl, —CH_2OR^2, —CH_2SR^a, —$CH_2S(=O)R^g$, —$CH_2S(=O)_2R^g$, —$C(=O)R^a$, —$C(=O)OR^a$, —$C(=J^a)NR^bR^c$, —C (R^a(OR^d((OR^e), —$CH_2N(R^a)C(=J^a)R^f$, —$CH_2N(R^a)C(=O)OR^f$ or —$CH_2N(R^a)C(=J^a)$ NR^bR^c;

B is a direct bond and L is a hydrocarbon chain in which the 1-position is bound to B and L is selected from tetramethylene, cis-1-butenylene and cis,cis-butadienylene;

J and J^a are independently oxygen or sulfur;

R^a, R^f and R^h are independently hydrogen or (1–6C)alkyl;

R^b and R^c are independehtly hydrogen or (1–6C)alkyl in which said (1–6C)alkyl may be substituted by a group selected from hydroxy and (1–3C)alkoxy, or said (1–6C)alkyl may be terminally substituted by a group selected from hydroxy, (1–3C)alkoxy, phenyl, —$C(=O)OR^i$ and —$C(=O)NR^jR^k$; or

R^b and R^c together with the nitrogen to which they are attached form a piperidino group;

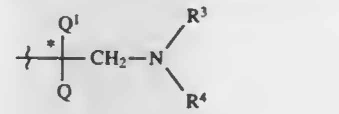
R^d and R^e are independently (1–3C)alkyl or together form a divalent hydrocarbon chain selected from ethylene and trimethylene;

R^g is (1–6C)alkyl;

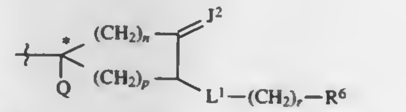
R^i R^j and R^k are independently hydrogen or (1–3C)alkyl;

m is 2 or 3;

M is a residue of formula Ia or formula Ib:



(Ia)



(Ib)

wherein

Q is phenyl which may bear one or two substituents independently selected from halo, trifluoromethyl, hydroxy, (1–3C)alkoxy, (1–3C)alkyl and methylenedioxy; or Q is naphthyl which may bear a halo substituent; or Q is biphenylyl;

Q^a is hydrogen, (1–4C)alkyl, or a radical of formula —$(CH_2)_q$—NR^7R^8 in which q is 2 or 3 and R^7 and R^8 are independently (1–4C)alkyl or NR^7R^8 is piperidino;

R^3 is hydrogen, methyl or (2–6C)n-alkyl which may bear a terminal amino radical;

R^4 is —$C(=O)R^5$, —$C(=O)OR^5$ or —$C(=J^1)NHR^5$ in which J^1 is oxygen or sulfur and R^5 is hydrogen, (1–6C)alkyl, phenyl(1–3C)alkyl (in which the phenyl may bear one or more halo, hydroxy, (1–4C)alkoxy or (1–4C)alkyl substituents), naphthyl(1–3C)alkyl, styryl, aryl (which may bear one or more halo, hydroxy, (1–4C)alkoxy or (1–4C)alkyl substituents), or (when R^4 is —COR^5) α-hydroxybenzyl;

n is 0, 1, 2 or 3;

p is 1 or 2, and when p is 2, n is 1 and J^2 is two hydrogens; J^2 is oxygen or two hydrogens;

L^1 is carbonyl or methylene;

r is 0, 1, 2, or 3; and

R^6 is phenyl which may bear one or more halo, trifluoromethyl, (1–4C)alkyl, hydroxy or (1–4C)alkoxy substituents (and particularly one or more chloro or fluoro substituents); or naphthyl which may bear one or more halo, trifluoromethyl, (1–4C)alkyl or hydroxy substituents; or when L^1 is carbonyl, the group —$(CH_2)_r$—R^6 may represent an aryl, or a benzyl group bearing an α-substituent selected from hydroxy, (1–4C)alkoxy and (1–4)alkyl, and further wherein the aryl, or phenyl portion of the benzyl group may bear one or more substituents selected independently from halo, trifluoromethyl, (1–4C)alkyl, hydroxy and (1–4C)alkoxy;

or the N-oxide of the piperidino nitrogen indicated by Δ;

or a pharmaceutically acceptable salt thereof;

or a quaternary ammonium salt thereof in which the piperidino nitrogen indicated by A is a quadricovalent ammonium nitrogen wherein the fourth radical on the nitrogen R^9 is (1–4C)alkyl or benzyl and the associated counterion A is a pharmaceutically acceptable anion.

5,534,526

METHODS FOR INHIBITING VASOMOTOR SYMPTOMS AND ATTENDING PSYCHOLOGICAL DISTURBANCES SURROUNDING POST-MENOPAUSAL SYNDROME

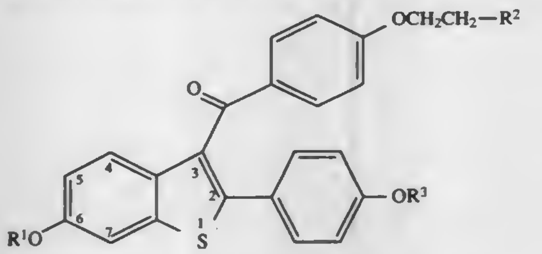
George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 173,502

Int. Cl.^{6} A61K *31/445;31/40;31/38*

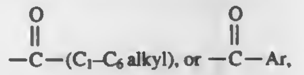
U.S. Cl. 514—324 **4 Claims**

1. A method of inhibiting vasomotor symptoms and attending psychological disturbances surrounding post-menopausal syndrome comprising administering to a female human in need thereof an effective amount of a compound having the formula



(I)

wherein R^1 and R^3 are independently hydrogen, —CH$_3$,



$-\overset{\overset{\displaystyle O}{\|}}{C}-(C_1\text{–}C_6\,\text{alkyl})$, or $-\overset{\overset{\displaystyle O}{\|}}{C}-Ar$,

wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,534,527

METHODS FOR INHIBITING BONE LOSS BY TREATING WITH AROYLBENZOTHIOPHENES AND ESTROGEN

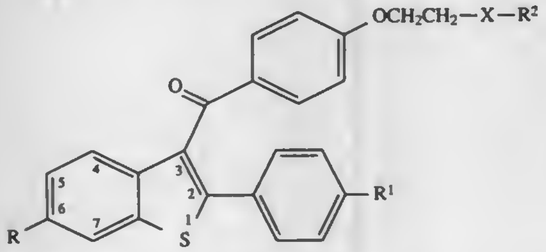
Larry J. Black, Indianapolis, and George J. Cullinan, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 329,396, Oct. 26, 1994, Pat. No. 5,457,117, which is a division of Ser. No. 180,522, Jan. 12, 1994, Pat. No. 5,393,763, which is a continuation of Ser. No. 920,933, Jul. 28, 1992, abandoned. This application Apr. 14, 1995, Ser. No. 422,096

Int. Cl.^{6} A61K *31/44;31/40*

U.S. Cl. 514—333 **1 Claim**

1. A pharmaceutical formulation comprising an effective amount of a compound of formula l



(I)

wherein

X is a bond, CH$_2$, or CH$_2$CH$_2$;

R and R^1, independently, are hydrogen, hydroxyl, C$_1$–C$_6$-alkoxy, C$_1$–C$_6$-acyloxy, C$_1$–C$_6$-alkoxy-C$_2$–C$_6$-acyloxy, R^3-substituted aryloxy, R^3-substituted aroyloxy, R^4-substituted carbonyloxy, chloro, or bromo;

R^2 is a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, or hexamethyleneimino;

R^3 is C$_1$–C$_3$-alkyl, C$_{1–C3}$-alkoxy, hydrogen, or halo; and

R^4 is C$_1$–C$_6$-alkoxy or aryloxy; or

a pharmaceutically acceptable salt thereof; estrogen and a pharmaceutically acceptable carrier.

5,534,528

THIADIAZOLYL TETRHYDRPYRIDINES FOR TREATING GLAUCOMA

Per Sauerberg, Valby, and Preben H. Olesen, Copenhagen, both of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

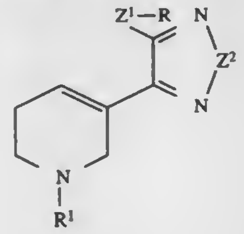
Continuation of Ser. No. 145,420, Oct. 29, 1993, abandoned, which is a division of Ser. No. 745,033, Aug. 14, 1991, Pat. No. 5,328,924. This application Jun. 7, 1995, Ser. No. 472,351

Claims priority, application Denmark, Aug. 21, 1990, 1983/90

Int. Cl.^{6} A61K *31/44;* **C07D** *417/04*

U.S. Cl. 514—342 **7 Claims**

1. A method for treating glaucoma in a subject in need thereof, comprising administering topically to said subject an effective amount of a compound of formula I



(I)

wherein

Z^1 is oxygen or sulphur;

Z^2 is sulphur;

R is R^2, —R^2—Z^3—R^3, —R^2—CO—R^3, —R^2—CO$_2$—R^3, —R^2—O$_2$C—R^3, —R^2—CONH—R^3 or —R^2—NHCO—R^3, wherein Z^3 is oxygen or sulphur and R^2 and R^3 independently are straight or branched C$_{1-15}$-alkyl substituted with halogen, OH, CN or one or two phenyl, phenoxy, benzoyl or benzyloxycarbonyl groups wherein each aromatic group is optionally substituted with halogen, CN or C$_{1-4}$-alkyl; and

R^1 is H, straight or branched C$_{1-5}$-alkyl, straight or branched C$_{2-5}$-alkenyl or straight or branched C$_{2-5}$-alkynyl; or a pharmaceutically-acceptable salt thereof.

5,534,529

SUBSTITUTED AROMATIC AMIDES AND UREAS DERIVATIVES HAVING ANTI-HYPERCHOLESTEREMIC ACTIVITY, THEIR PREPARATION AND THEIR THERAPEUTIC USES

Akira Yoshida; Koza Oda; Sadao Ishihara; Takashi Kasai; Fujio Saito; Hiroyuki Koike; Teiichiro Koga; Eiichi Kitazawa; Hiroshi Kogen, and Ichiro Hayakawa, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

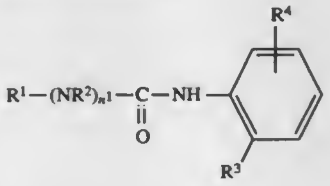
Filed Jun. 28, 1994, Ser. No. 267,124

Claims priority, application Japan, Jun. 30, 1993, 5-162572

Int. Cl.^{6} C07C *275/28;275/30;* **A61K** *31/17;31/24;* **C07D** *311/82;513/04*

U.S. Cl. 514—357 **66 Claims**

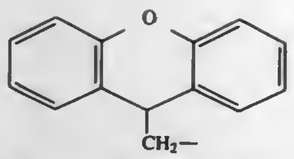
1. A compound of formula (I):



(I)

wherein:

R^1 represents an alkyl group having from 1 to 20 carbon atoms, or a group of formula (II):



(II)

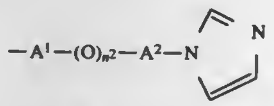
wherein any aromatic ring in said group represented by R^1 is unsubstituted or is substituted by one or more substituents selected from the group consisting of substituents α, defined below;

R^2 represents a hydrogen atom or an alkyl group having from 1 to 10 carbon atoms;

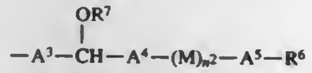
R^3 represents

an alkyl group having from 1 to 10 carbon atoms,
an alkoxy group having from 1 to 10 carbon atoms,
an alkylthio group having from 1 to 10 carbon atoms,
an alkylsulfinyl group having from 1 to 10 carbon atoms,
an alkylsulfonyl group having from 1 to 10 carbon atoms,
a phenylthio group in which the phenyl part is unsubstituted or is substituted by one or more substituents selected from the group consisting of substituents α, defined below;
a phenylsulfinyl group in which the phenyl part is unsubstituted or is substituted by one or more substituents selected from the group consisting of substituents α, defined below;
a phenylsulfonyl group in which the phenyl part is unsubstituted or is substituted by one or more substituents selected from the group substituents α, defined below, or
an alkoxyalkyl group in which the alkoxy part has from 1 to 6 carbon atoms and the alkyl part has from 1 to 4carbon atoms;

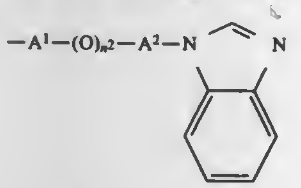
R^4 represents a group of formula (VI), (VII), (VIII), (IX), (X) or (XI):



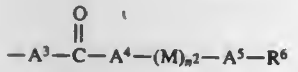
(VI)



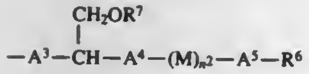
$-A^3-\overset{\overset{\displaystyle OR^7}{|}}{CH}-A^4-(M)_{n2}-A^5-R^6$ (VII)



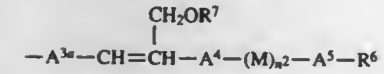
(VIII)



$-A^3-\overset{\overset{\displaystyle O}{\|}}{C}-A^4-(M)_{n2}-A^5-R^6$ (IX)



$-A^3-\overset{\overset{\displaystyle CH_2OR^7}{|}}{CH}-A^4-(M)_{n2}-A^5-R^6$ (X)



$-A^{3a}-CH=\overset{\overset{\displaystyle CH_2OR^7}{|}}{C}H-A^4-(M)_{n2}-A^5-R^6$ (XI)

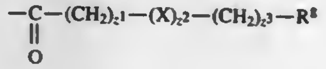
where

A^1 represents a single bond or an alkylene group having from 1 to 4 carbon atoms, A^2 represents a single bond or an alkylene group having from 1 to 6 carbon atoms, A^3, A^{3a}, A^4 and A^5 are independently selected from the group consisting of single bonds and alkylene groups having from 1 to 10 carbon atoms which is saturated or includes a carbon—carbon double bond, provided that the total number of carbon atoms in A^3, A^4 and A^5 and that in A^{3a}, A^4 and A^5 does not exceed 10;

R^6 represents an alkyl group having from 1 to 6 carbon atoms, a cycloalkyl group having from 3 to 9 carbon atoms in one or more aliphatic carbocyclic rings, said rings being unsubstituted or being substituted by one or more substituents selected from the group consisting of substituents α, defined below, or an aryl group, as defined below; and

in the groups of formulae (VI) and (VIII), the imidazolyl and benzimidazolyl groups are unsubstituted or are substituted by one or more substituents selected from the group consisting of substituents β, defined below;

R^7 represents a hydrogen atom, a benzyl group, a phosphono group or a group of formula (XII):



$-\underset{\underset{\displaystyle O}{\|}}{C}-(CH_2)_{z1}-(X)_{z2}-(CH_2)_{z3}-R^8$ (XII)

where:

z^1 is 0 or 1;

z^2 is 0, 1 or 2;

X is an oxygen or sulfur atom or a sulfinyl, sulfonyl or phenylene group, provided that, when z^2 is 2, at least one X is a phenylene group;

z^3 is 0 or an integer from 1 to 4; and

R^8 is a carboxy group, a phenyl group, a group of formula —NR^{9}R^{10},

where R^9 and R^{10} are independently selected from the group consisting of hydrogen atoms and alkyl groups having from 1 to 4 carbon atoms,

or a heterocyclic group having 5 or 6 ring atoms of which 1 or 2 are hetero-atoms selected from the group consisting of oxygen and nitrogen atoms, said heterocyclic group being unsubstituted or being substituted on a carbon atom by an oxygen atom or by an alkyl group having from 1 to 4 carbon atoms; and

said groups of formula (CH$_2$)$_z$1 and (CH$_2$)$_z$3 being unsubstituted or being substituted on a carbon atom by an alkyl group having from 1 to 4 carbon atoms or by a group of formula —NR^{9}R^{10}, where R^9 and R^{10} are as defined above;

n^1 is 0,

n^2 is 0 or 1;

M represents an oxygen atom, a sulfur atom, a sulfinyl group or a sulfonyl group;

said substituents α are selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, alkoxy groups having from 1 to 4 carbon atoms and halogen atoms; and

said substituents β are selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms and phenyl groups which are unsubstituted or are substituted by one or more substituents selected from the group consisting of said substituents α;

said aryl groups are aromatic carbocyclic groups having from 6 to 10 ring carbon atoms and are unsubstituted or are substituted by one or more substituents selected from the group consisting of said substituents α; defined above;

PROVIDED THAT, where R^4 represents said group of formula (VII), (IX), (X) or (XI), R^1 does not represent said alkyl group and that, where n^2 is 1, A^4 does not represent a single bond, and that, where n^1 is 0, R^3 is ethyl and R^4 is 2-acetyl, R^1 does not represent a methyl group;

or a pharmaceutically acceptable salt thereof.

51. A method for the treatment and prophylaxis of hypercholesteremia or arteriosclerosis in a mammal, which may be human, which comprises administering to said mammal an effective amount of a compound of formula (I), as defined in claim 1, or a pharmaceutically acceptable salt thereof.

5,534,530

5-ACYLAMINO-1,2,4-THIADIAZOLES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Daniel Frebel, Toulouse; Danielle Gully, Saubens; Robert Bolgegrain, Assas; Alain Badorc, Roquettes; Jean-Pierre Bras, Toulouse, and Pierre Despeyroux, Labarthe s/Leze, all of, France, assignors to Elf Sanofi, Paris, France

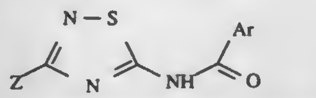
Filed Apr. 13, 1994, Ser. No. 226,862

Claims priority, application France, Apr. 16, 1993, 93 04535

Int. Cl.^{6} C07D *285/12;* **A61K** *31/41*

U.S. Cl. 514—361 **11 Claims**

1. A compound of formula I



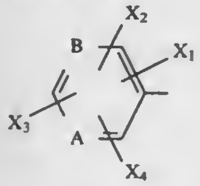
I

in which Ar represents a nitrogen-containing aromatic heterocycle selected from quinolyl, isoquinolyl, benzimidazolyl, indolyl, indolyl substituted on the nitrogen with a group W where W is selected from

(i) —CO—(C_1–C_4)alkyl;
(ii) —$(CH_2)_n$COR, where n represents 1 or 2 and R is selected from OR_1 and NR_1R_2, R_1 and R_2 which may be identical or different, being selected from H and (C_1–C_4) alkyl;
(iii) hydroxy(C_1–C_4)alkyl;
(iv) (C_2–C_6)alkoxyalkyl;
(v) tetrahydropyranyl;
(vi) a —$(CH_2)_3$-chain

in which the last carbon is attached to the phenyl ring of the indole to form a 6-membered heterocycle; Z is selected from (a) and (b), where

(a) is the group



where A and B are independently selected from C, CH and N; and X_1, X_2, X_3 and X_4, which may be identical or different, are independently selected from hydrogen, chlorine, bromine, (C_1–C_3)alkyl, (C_1–C_3)alkoxy and trifluoromethyl; and

(b) is selected from naphtyl and naphtyl substituted with a group selected from (C_1–C_3)alkyl, (C_1–C_3)alkoxy and halogen as well as its pharmaceutically acceptable salts.

5,534,531

COMPOUNDS

Erik O. Pettersen, Oslo; Rold O. Larsen, Langesund; John M. Dornish, Bekkestua; Bernt Bøorretzen, Heistad; Reidar Oftebro, Hvalstad, and Thomas Ramdahl, Eiksmarka, all of, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

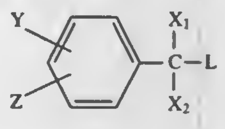
Filed Jan. 19, 1993, Ser. No. 5,979

Claims priority, application United Kingdom, Jan. 21, 1992, 9201274

Int. Cl.^{6} A61K *31/425;31/335*

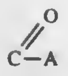
U.S. Cl. 514—365 **4 Claims**

1. A compound of the formula I



wherein L may be H or D;

Y may be CN or



wherein A may be H, D, alkyl with 1–4 carbon atoms, OR wherein R is H or alkyl with 1–4 carbon atoms, or $CR_1R_2R_3$ wherein R_1, R_2 and R_3 are the same or different and are H or alkyl with 1–4 carbon atoms;

Z is H, D, Y or alkyl with 1–4 C-atoms, halogen, nitro, amino, monoalkyl amino or dialkyl amino wherein the alkyl groups have 1–4 C atoms, or OR wherein R may be H or alkyl with 1–4 C-atoms, or $CR_4R_5R_6$ wherein R_4, R_5 and R_6 may be the same or different and may be H or F;

X_1 and X_2 may be the same or different and may be OR, NR_1R_2 or SR, wherein R, R_1 and R_2 may be the same or different and may be alkyl having 1–22 carbon atoms which may be branched or straight chained and/or may be further substituted; or

X_1 and X_2 may together with the carbon atom to which they are bound form a cyclic acetal, thioacetal, dithiane, aminal, oxazolidine or thiazolidine;

or a pharmaceutically acceptable salt thereof.

5,534,532

ALIPHATIC AMINO BIS-ARYL SQUALENE SYNTHASE INHIBITORS

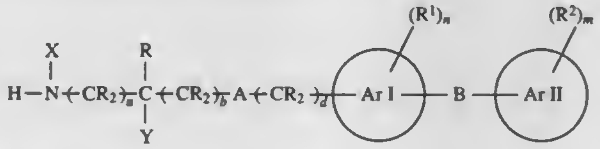
Robert A. Groneberg, Oaks; John R. Regan, Collegeville; Kent W. Neuenschwander, Schwenksville, and Anthony C. Scotese, King of Prussia, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Division of Ser. No. 65,966, May 21, 1993, Pat. No. 5,455,260. This application Jan. 25, 1995, Ser. No. 378,146

Int. Cl.^{6} A61K *31/425;* **C07D** *277/64;277/66*

U.S. Cl. 514—367 **16 Claims**

1. A compound of the formula:



where:

X is hydrogen or —$(CH_2)_2(CR_2)_f$—D—E and

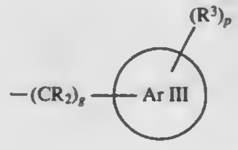
Y is hydrogen or —$(CR_2)_h$—D—G provided one of X or Y is hydrogen;

A is O, S, NR, SO, SO_2, O═C, NR—C═O, O═C—NR, RC═CR, C≡C or a bond;

B is a bond;

D is O, S, NR, SO, SO_2, O═C, CH_2, RC═CR or a bond;

E is



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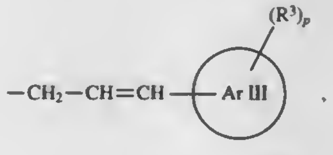

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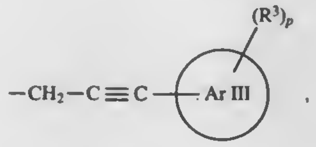

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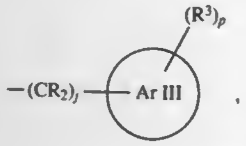
$CH_2-CH=CR-CH_2-CH_2-CH=CR-CH_3$ or

$CH_2-CR=CH-CH_2-CH_2-CR=CH-CH_3$;

G is



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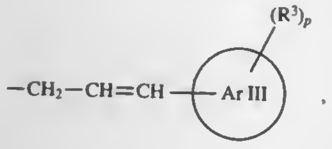

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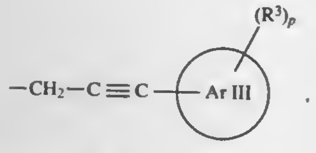


,

$CH_2-CH=CR-CH_2-CH_2-CH=CR-CH_3$ or

$CH_2-CR=CH-CH_2-CH_2-CR=CH-CH_3$

R is hydrogen or alkyl;

R^1, R^2 and R^3 are independently hydrogen, alkyl, alkoxy, hydroxy, halo, haloalkyl, nitro, amino, mono- or di-alkylamino or phenyl;

Ar I is phenylene;

Ar II is benzthiazolyl;

Ar III is aryl;

a, b and d are independently 0–3;

a+b+d is 1–3;

f and g are independently 0–4;

f+g is 3 or 4 when f and g are both present;

h and j are 0–6;

h+j is 6 or 7 when h and j are both present; and

m, n and p are 0–2; and

its stereoisomers, enantiomers, diastereoisomers and racemic mixtures; or pharmaceutically acceptable salt thereof.

5,534,533

CARBOXYLATE DERIVATIVES EXHIBITING PHOSPHOLIPASE A2 INHIBITORY ACTIVITY

Mitsuaki Ohtani, Nara; Toshiyuki Kato, Suita, and Yozo Hori, Hirakata, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

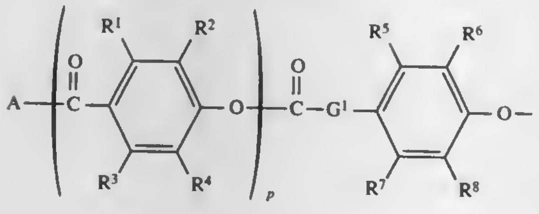
Filed Sep. 28, 1994, Ser. No. 313,890

Claims priority, application Japan, Oct. 1, 1993, 5-246732; Jul. 6, 1994, 6-154937

Int. Cl.^{6} A61K *31/40;* **C07D** *209/48*

U.S. Cl. 514—372 **8 Claims**

1. A compound of the formula:



(I)

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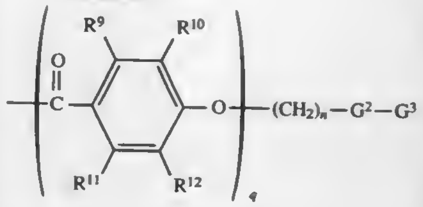


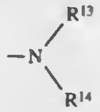
wherein A is hydroxy, amino, or lower alkylamino;

R^1 to R^{12} are independently hydrogen, methyl, methoxy, or hydroxy, provided that only one of R^1 to R^4 may be hydrogen, only one of R^5 to R^8 may be hydrogen, and only one of R^9 to R^{12} may be hydrogen;

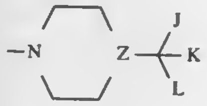
G^1 is a single bond, or a group —$(CH_2)_xO(CH_2)_y$— wherein x and y are independently an integer of from 0 to 5;

G^2 is a single bond, oxygen, sulfur, carbonyl, sulfinyl, or sulfonyl;

G^3 is alkyl, alkenyl, aryl, arylalkyl, arylalkenyl, bicyclo[3.1.1]heptenyl. bicyclo[2,2,1]heptyl, bornyl, chromanyl, or a group of the formula:



wherein R^{13} and R^{14} are independently hydrogen, alkyl, aryl, —SO_2—B in which B is aryl or alkyl, —CO—D in which D is aryl or alkoxy, or —CH_2—E in which E is aryl or a heterocyclic group; or R^{13} and R^{14} may be taken together with the adjacent nitrogen atom to form a heterocyclic group or a group of the formula:



wherein Z is a carbon atom or a nitrogen atom,

J, K, and L are independently hydrogen or aryl, provided that when Z is a carbon atom, one of J, K, or L may be combined with Z to form a double bond;

p and q are independently 0, 1, or 2, provided that p and q are not simultaneously 0; and

n is an integer of 1 to 8; or a pharmaceutically acceptable salt thereof.

5,534,534

PHARMACEUTICAL COMPOSITIONS FOR ORAL USE AND METHOD OF PREPARING THEM

Tadashi Makino; Yashio Mizukami, and Jun-ichi Kikuta, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

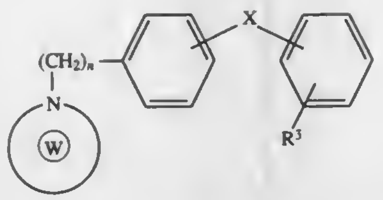
Filed Nov. 18, 1992, Ser. No. 978,290

Claims priority, application Japan, Nov. 20, 1991, 3-304924

Int. Cl.^{6} A61K *31/415*

U.S. Cl. 514—388 **27 Claims**

1. A solid pharmaceutical composition for oral use, which comprises an effective amount of a compound of the formula (I), in a crystalline form, having antagonistic action to angiotensin II



wherein the ring W is an optionally substituted N-containing heterocyclic residue; R^3 is a group capable of forming an anion or a group convertible thereinto; X is a direct bond or a spacer having an atomic length of two or less between the phenylene group and the phenyl group; and n is an integer of 1 or 2', and a polymer of alkylene oxide dispersed throughout the composition and is present in an amount from 0.005 to 0.15 weight per 1 weight of the composition.

5,534,535
THERAPEUTIC NUCLEOSIDES

Leroy B. Townsend; John C. Drach, both of Ann Arbor, Mich.; Steven S. Good, Durham, N.C.; Susan M. Daluge, Chapel Hill, N.C., and Michael T. Martin, Durham, N.C., assignors to Burroughs Wellcome Co., Triangle Park, N.C., and The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Sep. 9, 1994, Ser. No. 304,006

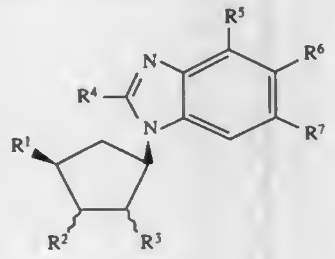
Claims priority, application United Kingdom, Mar. 9, 1992, 9205071

Int. Cl.^{6} C07D *235/04;* **A61K** *31/415*

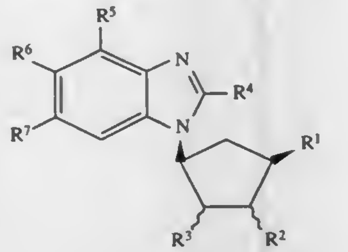
U.S. Cl. 514—394 **9 Claims**

1. Compounds of formulae (I) and (I-1)

(I)



(I-1)



wherein

R^1 is H, CH_3 or CH_2OH; R^2 is H or OH; R^3 is H or OH; or R^2 and R^3 together form a bond:

R^4 is H, Cl, Br, I, C_{1-4} alkyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl, C_{1-4} perfluoroalkyl, NH_2, C_{1-4} alkylamino, C_{1-4} dialkylamino, C_{3-7}cycloalkylamino, diC_{3-7}cycloalkylamino, N-C_{1-4}alkyl-N-C $_{3-7}$cycloalkylamino, N-C_{1-4}alkyl-N-C_{3-7}cycloalkylC_{1-4}alkylamino, diC_{3-7}cycloalkylC_{1-4}alkylamino, C_{3-7}cycloalkylC_{1-4}alkylamino, N-C $_{3-7}$cycloalkyl-N-C_{3-7}cycloalkylC_{1-4}alkylamino, SH, C_{1-4} alkylthio, C_{6-10}arylC_{1-4}alkylthio, OH, C_{1-4} alkoxy, C_{6-10}arylC_{1-4}alkoxy or C_{6-10}arylC_{1-4}alkyl; and R^5, R^6 and R^7 are independently selected from H, F, Cl, Br, I, CF_3 and CH_3, provided that at least one of R^1, R^2 and R^3 is or contains OH; and pharmaceutically acceptable salts thereof.

5,534,536
FUSED PHENOL DERIVATIVES

Shuichi Ohuchida; Fumio Nambu, and Masaaki Toda, all of Osaka, Japan, assignors to Ono Pharmaceuticals Co. Ltd., Osaka, Japan

Filed Aug. 23, 1994, Ser. No. 294,015

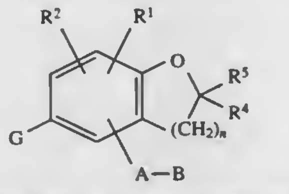
Claims priority, application Japan, Aug. 24, 1993, 5-231004

Int. Cl.^{6} A61K *31/415;* **C07D** *405/06*

U.S. Cl. 514—397 **15 Claims**

1. A fused phenol compound of the formula (I):

(I)

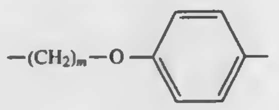


wherein R^1 and R^2 each, independently, is

1) hydrogen atom,
2) halogen atom,
3) trifluoromethyl,
4) cyano,
5) C1–10 alkyl,
6) C1–4 alkoxy,
7) C3–7 cycloalkyl,
8) C7–10 phenylalkyl,
9) C1–10 alkyl substituted by C1–4 alkoxy,
10) C1–4 alkyl substituted by C3–7 cycloalkyl,
11) C1–6 alkyl substituted by phenylthio,
12) C1–6 alkyl substituted by phenoxy,
13) —COOH,
14) —$COOR^6$ (in which R^6 is C1–6 alkyl),
15) C2–10 alkenyl or
16) R^1 and R^2 taken together, represent —CH═CH—CH═CH—, when R^1 and R^2 are attached ortho to each other;

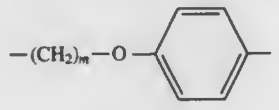
A is

1) C1–8 alkylene,
2) C2–8 alkenylene,
3) C1–6 oxyalkylene or



in which m is 1–6,

B is 1-imidazolyl with the proviso that B can be bonded to an oxygen in the C1–6 oxyalkylene and to phenylene in the



G is —OR^{3A} or —$NR^{3B}R^{3C}$ in which R^{3A}, R^{3B} and R^{3C} each, independently, is hydrogen atom, C1–4 alkyl, C7–10 phenylalkyl, C2–5 acyl, phenylcarbonyl, C7–C10 phenylalkyl carbonyl or C2–4 alkoxyalkyl;

R^4 and R^5 each, independently, is a hydrogen atom, C1–8 alkyl, C7–10 phenylalkyl or R^4 and R^5 together with the carbon atom to which they are attached represent C4–7 cycloalkyl; and n is 1–3 with the proviso that when R^4 is a hydrogen atom, R^5 is a group other than a hydrogen atom;

a non-toxic salt thereof or non-toxic acid addition salt thereof or hydrate thereof.

5,534,537
PRODRUGS OF INHIBITORS OF FARNESYL-PROTEIN TRANSFERASE

Terrence M. Ciccarone, Telford; Suzanne C. MacTough, Chalfont, and Theresa M. Williams, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

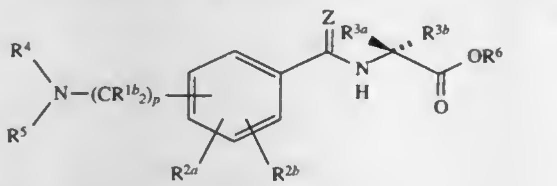
Filed Mar. 29, 1995, Ser. No. 412,830

Int. Cl.^{6} A61K *31/41;* **C07D** *403/12;233/56*

U.S. Cl. 514—397 **17 Claims**

1. A compound having the Formula II:

II



wherein:

R^{1a} and R^{1b} are independently selected from:

a) hydrogen,
b) aryl, heterocycle, cycloalkyl, alkenyl, alkynyl, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, NO_2, $(R^{10})_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}C(O)NR^{10}$—,
c) C_1–C_6 alkyl unsubstituted or substituted by aryl, heterocyclic, cycloalkyl, alkenyl, alkynyl, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, $(R^{10})2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, $N(R^{10})_2$, or $R^{11}OC(O)$— NR^{10}—;

R^{2a} and R^{2b} are independently selected from:

a) hydrogen,
b) C_1–C_6 alkyl unsubstituted or substituted by alkenyl, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, N_3, $(R^{10})_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—,
c) aryl, heterocycle, cycloalkyl, alkenyl, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, NO_2, $(R^{10})_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—, and
d) C_1–C_6 alkyl substituted with an unsubstituted or substituted group selected from aryl, heterocyclic and C_3–C_{10} cycloalkyl;

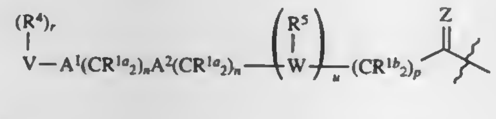
R^{3a} and R^{3b} are independently selected from:

a) a side chain of a naturally occurring amino acid,
b) an oxidized form of a side chain of a naturally occurring amino acid which is:
  i) methionine sulfoxide, or
  ii) methionine sulfone, and
c) substituted or unsubstituted C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_3–C_{10} cycloalkyl, aryl or heterocyclic group, wherein the substituent is selected from F, Cl, Br, $N(R^{10})_2$, NO_2, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, $(R^{10})_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, $R^{11}OC(O)NR^{10}$— and C_1–C_{20} alkyl, and
d) C_1–C_6 alkyl substituted with an unsubstituted or substituted group selected from aryl, heterocycle and C_3–C_{10} cycloalkyl; or

R^{3a} and R^{3b} are combined to form —$(CH_2)_s$— wherein one of the carbon atoms is optionally replaced by a moiety selected from: O, $S(O)_m$, —NC(O)—, and —$N(COR^{10})$—;

R^4 and R^5 are independently selected from:

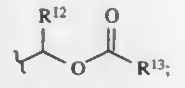
a) hydrogen, and
b)



$$\underset{V—A^1(CR^{1a}_2)_nA^2(CR^{1a}_2)_n}{\overset{(R^4)_r}{|}} —\left(\overset{R^5}{\underset{W}{|}}\right)_u—(CR^{1b}_2)_p—\overset{Z}{\overset{\|}{C}}—\ ;$$

R^6 is

a) substituted or unsubstituted C_1–C_8 alkyl or substituted or unsubstituted C_5–C_8 cycloalkyl, wherein the substituent on the alkyl is selected from:
  1) aryl,
  2) heterocycle,
  3) —$N(R^{11})_2$,
  4) —OR^{10}, or
b)



R^7 is independently selected from:

a) hydrogen,
b) aryl, heterocycle, cycloalkyl, alkenyl, alkynyl, perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, NO_2, $R^{10}{}_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—, and
c) C_1–C_6 alkyl unsubstituted or substituted by aryl, heterocycle, cycloalkyl, alkenyl, alkynyl, perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NH$—, CN, H_2N—C(NH)—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{10}OC(O)NH$—;

R^8 is selected from:

a) hydrogen,
b) alkenyl, alkynyl, perfluoroalkyl, F, Cl, Br, $R^{10}O$—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, NO_2, $(R^{10})_2N$—C—(NR^{10})—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—, and
c) C_1–C_6 alkyl unsubstituted or substituted by perfluoroalkyl, F, Cl, Br, R^{10}—, $R^{11}S(O)_m$—, $R^{10}C(O)NR^{10}$—, CN, $(R^{10})_2N$—$C(NR^{10})$—, $R^{10}C(O)$—, $R^{10}OC(O)$—, N_3, —$N(R^{10})_2$, or $R^{11}OC(O)NR^{10}$—;

R^{10} is independently selected from hydrogen, C_1–C_6 alkyl, benzyl and aryl;

R^{11} is independently selected from C_1–C_6 alkyl and aryl;

R^{12} is independently selected from hydrogen and C_1–C_6 alkyl;

R^{13} is independently selected from C_1–C_6 alkyl;

A^1 and A^2 are independently selected from: a bond, —CH═CH—, —C≡C—, —C(O)—, —$C(O)NR^{10}$—, —$NR^{10}C(O)$—, O, —$N(R^{10})$—, —$S(O)_2N(R^{10})$—, —$N(R^{10})S(O)_2$—, or $S(O)_m$;

V is selected from:

a) hydrogen,
b) heterocycle,
c) aryl,
d) C_1–C_{20} alkyl wherein from 0 to 4 carbon atoms are replaced with a a heteroatom selected from O, S, and N, and
e) C_2–C_{20} alkenyl,

provided that V is not hydrogen if A^1 is $S(O)_m$ and V is not hydrogen if A^1 is a bond, n is 0 and A^2 is $S(O)_m$;

W is a heterocycle;

Z is independently H_2 or O;

m is 0, 1 or 2;

n is 0, 1, 2, 3 or 4;

p is 0, 1, 2, 3 or 4;

r is 0 to 5, provided that r is 0 when V is hydrogen;

s is 4 or 5; and

u is 0 or 1;

or a pharmaceutically acceptable salt thereof.

5,534,538
N-ACYL DIPEPTIDES AND THEIR COMPOSITIONS

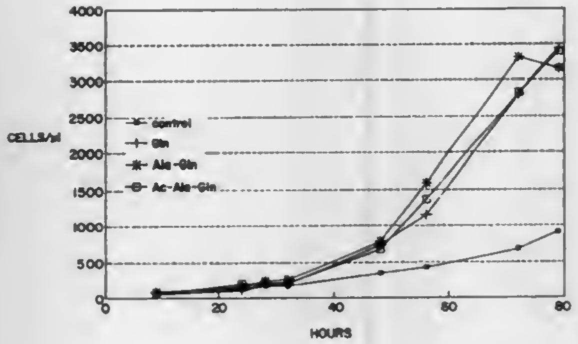
Karlheinz Drauz, Freigericht; Günter Knaup, Bruchköbel, and Ulrich Groeger, Aschaffenburg, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany Division of Ser. No. 727,903, Jul. 10, 1991, abandoned. This application Feb. 10, 1994, Ser. No. 194,568

Claims priority, application Germany, Jul. 12, 1990, 40 22 267.5

Int. Cl.^{6} C07C *233/00;233/24;233/34;* **A61K** *31/415;31/405;31/16*

U.S. Cl. 514—19 **2 Claims**

1. A composition for enteral or parenteral nutrition comprising an N-acyl dipeptide of the formula:



$$R^2—NH—CHR^1—CO—AS \qquad (I')$$

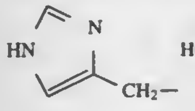
in which AS stands for the residue obtained by removing a hydrogen from the nitrogen atom of an amino acid selected from the group consisting of valine, leucine, isoleucine, tyrosine, tryptophane, glutamine and cysteine, R^1 signifies a member of the group consisting of

$H-$ CH_3- $(CH_3)_2CH-$ $(CH_3)_2CHCH_2-$

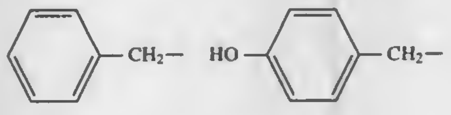
$CH_3CH_2(CH_3)CH-$ $HOOC-CH_2-$ $H_2NCO-CH_2-$

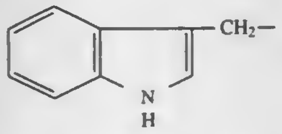
$HOOC-CH_2CH_2-$ $H_2NCO-CH_2CH_2-$

$H_2NCH_2CH_2CH_2CH_2-$ $H_2NC(NH)NH-CH_2CH_2CH_2-$



$HO-CH_2-$ $CH_3CH(OH)-$





$HS-CH_2-$

$CH_3-S-CH_2CH_2-$ $H_2N-CH_2-CH_2CH_2-$

and R^2 signifies a formyl- or acetyl group or an acyl group of an aliphatic mono-or dicarboxylic acid containing 3 to 6 carbon atoms, and/or a physiologically compatible carboxylic-acid salt of the N-acyl dipeptide as a source for said amino acid, and/or mixtures thereof and/or in the presence of inert carriers.

5,534,539
BIOLOGICALLY ACTIVE UREIDO DERIVATIVES USEFUL AS ANIT-METASTIC AGENST

Nicola Mongelli, Milan; Giovanni Biasoli, Gavirate; Mariangela Mariani, Desio, and Francesco Sola, Serengo, all of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

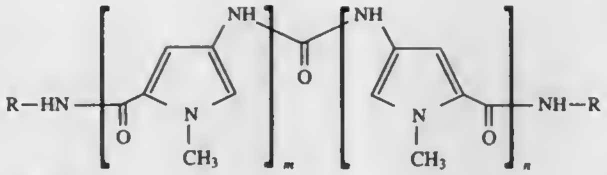
Continuation of Ser. No. 200,381, Feb. 23, 1994, abandoned.
This application Jun. 12, 1995, Ser. No. 489,621

Claims priority, application United Kingdom, Mar. 5, 1993, 9304589

Int. Cl.^{6} A61K *31/395*

U.S. Cl. 514—422 **7 Claims**

1. A method of inhibiting tumoral cell adhesion to lung, liver, or bone in mammals comprising administering to a mammal in need thereof a therapeutically effective amount of a compound of formula (I)



(I)

wherein

each of m and n, being the same, is an integer of 1 to 3; and each of the R groups, which are the same, is a naphthyl group substituted by 1 to 3 sulfonic groups, or a pharmaceutically acceptable salt thereof.

5,534,540
METHODS OF INHIBITING THE ADVANCED GLYCOSYLATION OF PROTEINS USING TETRAMIC AND TETRONIC ACIDS AND COMPOSITIONS THEREFOR

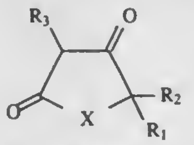
Peter C. Ulrich, Old Tappan, N.J., and Dilip R. Wagle, Valley Cottage, N.Y., assignors to Alteon Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 27,086, Mar. 5, 1993, abandoned, which is a division of Ser. No. 672,946, Mar. 25, 1991, Pat. No. 5,218,001, which is a continuation-in-part of Ser. No. 503,804, Apr. 3, 1990, Pat. No. 5,175,192, which is a continuation-in-part of Ser. No. 481,869, Feb. 20, 1990, Pat. No. 5,128,360, which is a continuation-in-part of Ser. No. 220,504, Jul. 18, 1989, abandoned, which is a division of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Jul. 20, 1993, Ser. No. 95,095

Int. Cl.^{6} A61K *31/40;31/34*

U.S. Cl. 514—425 **15 Claims**

1. A method for inhibiting the advanced glycosylation of a target protein comprising contacting the target protein with an effective amount of composition comprising a compound selected from the group consisting of compounds of the formula



(I)

wherein X is oxygen or nitrogen;

R_1 is hydrogen, lower alkyl or aryl;

R_2 is hydrogen, lower alkyl, lower alkenyl, aryl, or hydroxy lower alkyl;

R_3 is hydrogen, hydroxy, lower alkyl, aryl, halo, lower alkanoyl, or aryl lower alkyl; and their biologically or pharmaceutically acceptable salts with organic or inorganic bases; and mixtures thereof, and a carrier therefor.

5,534,541
COMPOUNDS FOR COMBATING PLANT DISEASE

Karlheinz Drauz, Freigericht, and Jürgen Martens, Oldenburg, both of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 120,321, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 953,292, Sep. 30, 1992, abandoned, which is a continuation of Ser. No. 677,350, Mar. 29, 1991, abandoned. This application Jan. 23, 1995, Ser. No. 376,666

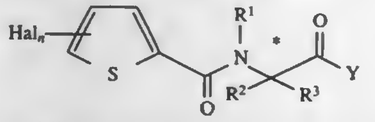
Claims priority, application Germany, Apr. 6, 1990, 40 11 172.5

Int. Cl.^{6} A01N *43/10;43/40*

U.S. Cl. 514—448 **5 Claims**

1. A method of treating plants to provide protection against phytopathogenic microorganisms which comprises applying to the plants, their plant parts or the site of their growth an effective

amount of a compound of the general formula I:



I

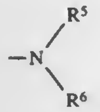
wherein Hal is chlorine or bromine, n is the number 2 or 3, and R^2 and R^3 can be the same or different, and includes all possible isomers at *,

R^1 is (1) hydrogen, (2) a straight-chain alkyl group having 1–4 carbon atoms or (3) a branched-chain alkyl group having 3–4 carbon atoms,

R^2 is (1) hydrogen, (2) a straight-chain alkyl group having 1–16 carbon atoms or (3) a branched-chain alkyl group having 3–16 carbon atoms, wherein (2) and/or (3) can be substituted by hydroxy-, carboxy-, C_1–C_6 alkoxy-or C_1–C_6 alkoxycarbonyl, mercapto- or C_1–C_6 alkylmercapto- orbenzylmercapto, (4) an aryl group having 6–10 carbon atoms or (5) an aralkyl group with 7–16 carbon atoms, wherein (4) and/or (5) can be substituted with 1–3 fluorine, chlorine or bromine atoms, and (6) a cycloalkyl-methyl group with a total of 4–9 carbon atoms,

R^3 is (1) hydrogen, (2) an alkyl group having 1–4 carbon atoms, (3) an alkenyl having 2–4 carbon atoms or (4) an alkynyl group having 2–4 carbon atoms, and further wherein R^1 and R^3 or R^2 and R^3 can form an alkylene bridge having 2–8 carbon atoms in which one CH_2 unit can be substituted by NR^1, an oxygen atom or a sulfur atom,

Y is OH, OR^4 or



$$-N\begin{matrix}R^5\\R^6\end{matrix}$$

wherein,

R^4 is an alkyl group having 1–4 carbon atoms, whose hydrogen atoms can be replaced entirely or partially by halogen atoms,

R^5 is (1) hydrogen, (2) an alkyl group having 1–6 carbon atoms, (3) hydroxy- or (4) an alkoxy group having 1–6 carbon atoms,

R^6 is (1) hydrogen, (2) an alkyl group having 1–6 carbon atoms, (3) a phenyl group or (4) a cycloalkyl group having 3–8 carbon atoms, and further wherein R^5 and R^6 can form a 5–6 membered ring with inclusion of the nitrogen atom, wherein said ring can contain an additional heteroatom.

5,534,542
METHODS AND MATERIALS RELATING TO A BI-METALLIC CROSS-LINKING SPECIES

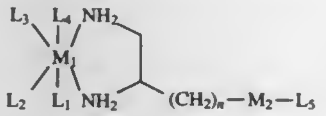
Thomas V. O'Halloran, Kenilworth, Ill., and Stephen P. Watton, Waltham, Mass., assignors to Northwestern University, Evanston, Ill.

Filed Jan. 24, 1994, Ser. No. 187,389

Int. Cl.^{6} A61K *31/28;* **C07F** *19/00;15/00;3/10*

U.S. Cl. 514—492 **32 Claims**

1. A bi-metallic cross-linking reagent according to the following formula:



wherein M_1 is a metal ion species capable of forming a complex of coordination number four or coordination number six;

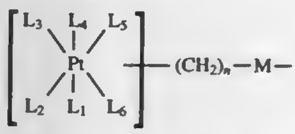
wherein L_1, L_2, L_3, and L_4 are each independently a halide, ammonia, dimethyl sulfoxide, carboxylate, thiolate, imidazole, a nucleobase, or an empty coordination site, provided that no more than two of L_1, L_2, L_3, and L_4, are empty coordination sites;

wherein M_2 is a metal ion species capable of forming a complex of coordination number two with a first ligand that is a hydrocarbon moiety and a second ligand that is kinetically labile;

wherein L_5 is a ligand that forms a kinetically labile coordination bond with M_2; and

wherein n is an integer from two to nine.

11. A bi-metallic nucleotide/peptide cross-linking reagent according to the following formula:



wherein L_1 to L_6 are each independently amine, a halide, cyclohexylamine, carboxylato, or empty coordination sites, provided that no more than two of L_1–L_4 are empty coordination sites;

wherein any two of L_1 to L_6 are together cyclobutane-1,1-dicarboxylato-O,O', tetrahydro-4H-pyran-4,4-dimethanamine-N,N', 1,2-diaminecyclohexane-N,N', or 2,2-bis(aminomethyl)-1,3-propanediol;

wherein M is a metal ion species capable of forming a complex of coordination number two with a first ligand that is a hydrocarbon moiety and a second ligand that is kinetically labile;

wherein L_7 is a ligand that forms a kinetically labile coordination bond with M; and

wherein n is an integer from 2 to 9.

5,534,543
SYNERGISTIC INSECTICIDAL COMPOSITIONS

Masaaki Kataoka, Yaizu; Akira Wakai, Hadano, and Takehiko Nakamura, Shizuoka, all of, Japan, assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 199,233, Feb. 22, 1994, Pat. No. 5,491,168. This application Jun. 2, 1995, Ser. No. 459,196

Claims priority, application Japan, Aug. 27, 1991, 3-238923; Oct. 8, 1991, 3-289157

Int. Cl.^{6} A01N *37/34;41/02*

U.S. Cl. 514—517 **10 Claims**

1. A composition useful for controlling *Thrips palmi* comprising synergistic insecticidally effective amounts of:

(A) 2-(4-tert-butylphenoxy) cyclohexyl prop-2-ynyl sulfite; and

(B) a synthetic pyrethroid selected from the group consisting of cyfluthrin, cyhalothrin, and tralomethrin.

5,534,544
SURFACTANTS AND EMULSIFYING AGENTS TO INHIBIT HELICOBACTER

Andrew G. Plaut, Lexington, and Anne V. Kane, Newtown, both of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Filed Aug. 19, 1994, Ser. No. 293,690

Int. Cl.^{6} A61K *31/23*

U.S. Cl. 514—552 **8 Claims**

1. A method for inhibiting the growth of *Helicobacter pylori* in a mammal, said method comprising orally administering to said

mammal a composition comprising polyethylene glycol stearate, said composition being substantially free of calcium, magnesium, aluminum, and silicon ions.

5,534,545
PARENTERAL AMINO ACID FORMULATIONS FOR THE INHIBITION OF SYSTEMIC HYPOTENSION ASSOCIATED WITH NITRIC OXIDE PRODUCTION

Robert G. Kilbourn, Houston, Tex.; Owen W. Griffith, and Steven S. Gross, both of New York, N.Y., assignors to Board of Regents, The University of Texas System, Austin, Tex., and Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 767,265, Sep. 27, 1991, Pat. No. 5,286,739. This application Nov. 12, 1993, Ser. No. 152,050

Int. Cl.^{6} A61K *31/195;31/385;31/40*

U.S. Cl. 514—565 **6 Claims**

1. An anti-hypotensive parenteral feeding formulation for the treatment of hypotension in an animal consisting essentially of:
   about 0.001–1 g/l arginine;
   about 3–4 g/l isoleucine;
   about 4–6 g/l leucine;
   about 3–4 g/l lysine;
   about 1–2 g/l methionine;
   about 1–2 g/l phenylalanine;
   about 2–3 g/l threonine;
   about 0.5–1.5 g/l tryptophan;
   about 3–4 g/l valine;
   about 4–5 g/l alanine;
   about 1–2 g/l histidine;
   about 3–4 g/l proline;
   about 1–2 g/l serine;
   about 0.25–0.75 g/l tyrosine;
   about 4–5 g/l glycine; and
   about 2–3 g/l aspartic acid.

5,534,546
INDENE DERIVATIVES AND ANTIMICROBIAL AGENTS CONTAINING SAME

Yukio Ishiguro, Tochigi; Youji Sonoda, 3490-90 Nagara, Gifu-shi gifu; Kenji Okamoto, Tochigi; Takamitsu Okamoto, Tochigi, and Hideki Sakamoto, Tochigi, all of, Japan, assignors to Kagome Kabushiki Kaisha, and Youji Sonoda, Japan

Continuation of Ser. No. 218,537, Mar. 28, 1994, abandoned. This application Jan. 17, 1995, Ser. No. 372,729

Claims priority, application Japan, Mar. 31, 1993, 5-098669; Apr. 12, 1993, 5-109984

Int. Cl.^{6} A61K *31/12*

U.S. Cl. 514—681 **4 Claims**

1. An indene derivative shown by Formula (1) given below:

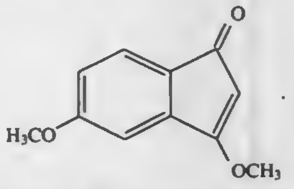


FIG. (1)

3. An antimicrobial agent having the indene derivative of claim 1 as effective component.

5,534,547
PROSTAGLANDINS OF THE D SERIES, AND TRANQUILIZERS AND SOPORIFICS CONTAINING THE SAME

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya; Ichie Kato, Kawanishi, and Tomio Oda, Sanda, all of, Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

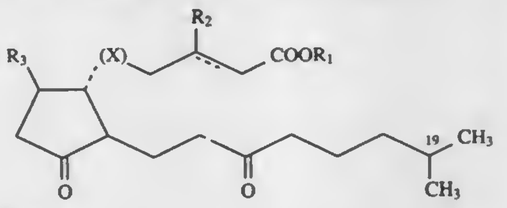
Continuation of Ser. No. 43,991, Apr. 7, 1993, abandoned, which is a continuation of Ser. No. 715,156, Jun. 13, 1991, abandoned, which is a continuation of Ser. No. 403,774, Sep. 6, 1989, Pat. No. 5,073,569, which is a continuation-in-part of Ser. No. 149,272, Jan. 28, 1988, abandoned. This application Sep. 23, 1994, Ser. No. 310,109

Claims priority, application Japan, Jan. 28, 1987, 62-18821

Int. Cl.^{6} C07C *177/00;405/00;* **A61K** *31/557*

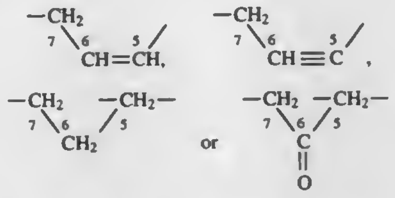
U.S. Cl. 514—530 **25 Claims**

1. A prostaglandin D represented by formula (I):



(I)

where (X) is



R_1 is a physiologically acceptable alkyl ester residue;
R_2 is hydrogen or methyl;
R_3 is hydroxyl, methyl or hydroxymethyl;
and wherein carbons at the 2–3 positions may have a double bond.

5,534,548
METHOD OF TREATING PREECLAMPSIA

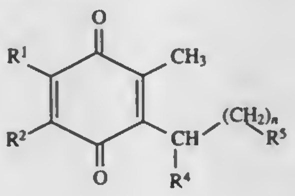
Anthony Killian, Libertyville, Ill., assignor to TAP Pharmaceuticals, Inc., Deerfield, Ill.

Filed May 3, 1994, Ser. No. 237,075

Int. Cl.^{6} C07C *50/02;* **A61K** *31/235*

U.S. Cl. 514—545 **4 Claims**

1. A method for the therapy or prophylaxis of preeclampsia and eclampsia in pregnant females comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound selected from the group consisting of compounds having the structural formula



wherein
  n is an integer of from 2 to 10, inclusive;
  R^1 and R^2 are methyl; and
  R^4 is selected from the group consisting of
    unsubstituted phenyl, and
    phenyl substituted with one or more substituents selected from the group consisting of
      alkyl of one to three carbon atoms,

      alkoxy of one to three carbon atoms, and
      halogen;
  R^5 is selected from the group consisting of
    carboxyl
    alkoxycarbonyl of two to five carbon atoms, and
    phenoxycarbonyl;
or a pharmaceutically acceptable salt thereof.

5,534,549
EASTERS OF ACYL L-CARNITINES WITH GAMMA-HYDROXYBUTYRIC ACID AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM FOR INHIBITING NEURONAL DEGENERATION AND FOR THE TREATMENT OF COMA

Maria O. Tinti; Domenico Misiti; Claudio Cavazza, all Rome, and Nazareno Scafetta, Pavona, all of, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Continuation of Ser. No. 317,750, Oct. 4, 1994, abandoned, which is a continuation of Ser. No. 984,736, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 649,046, Feb. 1, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 395,914

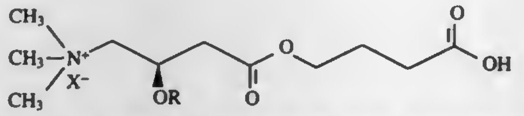
Claims priority, application Italy, Feb. 12, 1990, 47618/90

The portion of the term of this patent subsequent to Oct. 4, 2014, has been disclaimed.

Int. Cl.^{6} A16K *31/22*

U.S. Cl. 514—551 **32 Claims**

1. A compound of formula (I):



(I)

wherein X^- is an anion of a pharmacologically acceptable acid and R is a straight or branched alkanoyl group having from 2 to 5 carbon atoms.

5,534,550
2-OXIMINO-2PHENYL-ACETAMIDES

Peter Gerdes, Aachen; Herbert Gayer, Monheim; Stefan Dutzmann, Hilden, and Heinz-Wilhelm Dehne, Monheim, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

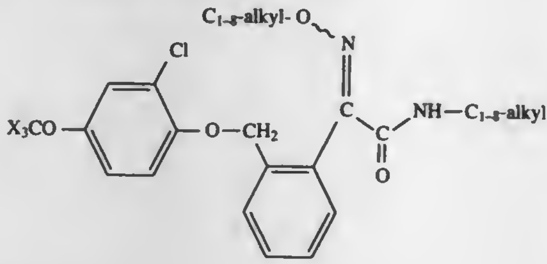
Filed May 31, 1994, Ser. No. 251,807

Claims priority, application Germany, Jun. 7, 1993, 43 18 917.2

Int. Cl.^{6} A61K *31/165;* **C07C** *233/05*

U.S. Cl. 514—620 **6 Claims**

1. A 2-oximinoacetamide of the formula



in which
  X is halogen.

5. A method of combatting fungi which comprises applying to such fungi or to a fungicidal habitat a fungicidally effective amount of a 2-oximino-2-phenyl-acetamide according to claim 1.

5,534,551
AMINOGUANIDINE SPRAY DRYING PROCESS

Phillip E. Page, Lee's Summit, Mo.; Jonathan Berman, Lenexa, Kans.; Janet M. Pence, Raymore, and Sharon K. Minish, Independence, both of Mo., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 869,558, Apr. 15, 1992, abandoned. This application Dec. 22, 1994, Ser. No. 318,754

Int. Cl.^{6} A61K *31/155*

U.S. Cl. 514—634 **21 Claims**

1. A method of making a direct compression tablet suitable for commercial pharmaceutical use comprising between about 50% to about 99% aminoguanidine or pharmaceutically acceptable salt thereof by weight of the tablet comprising:
  combining a sufficient amount of aminoguanidine or a pharmaceutically acceptable salt thereof, a sufficient amount of a solvent capable of substantially dissolving the aminoguanidine or pharmaceutically acceptable salt thereof, and a sufficient amount of a suitably compatible binder to produce an aminoguanidine solution;
  spray-drying the aminoguanidine solution into a drying chamber under conditions sufficient to obtain a spray-dried powder suitable for direct compression into tablets; and
  sufficiently compressing the spray-dried powder into a compressed tablet for administration to a patient.

5,534,552
CLEAR NON-ALCOHOLIC SINUS AND ALLERGY MEDICATION

Swati Bapat, Willowdale, Canada, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 2, 1994, Ser. No. 205,055

Int. Cl.^{6} A61K *9/08;31/13;47/00;47/10*

U.S. Cl. 514—667 **17 Claims**

1. A clear aqueous non-alcoholic sinus and allergy medication free of dyes comprising diphenhydramine hydrochloride in an amount from about 0.05% w/v to about 0.20% w/v of the total composition, the humectants glycerin and sorbitol, the glycerin being in the amount from about 10.0% w/v to about 15% w/v of the total composition, carboxymethylcellulose in an amount from about 0.1% w/v to about 0.3% w/v of the total composition, an effective amount of citric acid and sodium citrate, and flavor agents.

5,534,553
DRUG CONTAINING FATTY AMINO ALCOHOLS OR DERIVATIVES THEREOF

Wilhelm Hoerrmann, Staltacherstr. 34, D. 82393 Iffeldorf, Germany

Continuation-in-part of Ser. No. 7,271, Jan. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 725,638, Jul. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 480,311, Feb. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 309,136, Feb. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 62,683, Jun. 16, 1987, abandoned. This application Mar. 7, 1994, Ser. No. 206,336

Claims priority, application Germany, Jun. 12, 1987, 37 1 9720.7

Int. Cl.^{6} A61K *31/13*

U.S. Cl. 514—669 **1 Claim**

1. A method for alleviating the structural and functional disturbances of endogenous glycosphingolipids and sphingomyelines in a patient suffering from a drug dependency which comprises administering to said patient one or more fatty-amino-alcohols or physiologically acceptable, functionally equivalent derivatives thereof in an amount of approximately 100–400 mg/kg bodyweight daily.

5,534,554

SUCROSE ESTER-C20 TO C28 ALCOHOL FORMULATIONS

David H. Katz, La Jolla; Mohammed H. Khalil; John F. Marcelletti, both of San Diego; Laura E. Pope, Carlsbad, and Lee R. Katz, La Jolla, all of Calif., assignors to Lidak Pharmaceuticals, La Jolla, Calif.

Continuation-in-part of Ser. No. 166,523, Dec. 13, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 299,944

Int. Cl.^{6} A61K *31/045;9/107;9/06;7/48*

U.S. Cl. 514—724 **22 Claims**

1. A therapeutic cream for application to skin and membranes consisting essentially of a sugar-based ester surfactant, greater than about 5% by weight n-docosanol, mineral oil, an emollient co-solvent, and water, for the treatment of viral and inflammatory diseases, wherein said cream is stable at temperatures of at least 40° C. for a period of at least three months and after repeated freeze-thaw cycles.

5,534,555

TABLETING EXCIPIENT

Michael M. Meggelaars, Odiliapeel; Henricus A. van den Biggelaar, and Klaas D. Kussendrager, both of Veghel, all of, Netherlands, assignors to Campina Melkunie B.V., 's-Hertogenbosch, Netherlands

Continuation of Ser. No. 868,712, Apr. 14, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,344

Claims priority, application Netherlands, Apr. 19, 1991, 9100691

Int. Cl.^{6} A61K *47/00*

U.S. Cl. 514—777 **9 Claims**

1. An excipient for making tablets by direct tableting wherein said excipient is a homogeneous powdered solid composition comprising lactose which is predominantly β-lactose and 1–15 wt % of a sugar alcohol based on the amount of solids to be dried, said excipient obtained by drying a solution of lactose and sugar alcohol at a temperature sufficient to result in the lactose being predominantly in the β-lactose form.

5,534,556

PROCESS FOR THE SEPARATION AND REUTILIZATION OF FABRIC MATERIALS FROM POLYURETHANE ADHESIVE BONDED COMPOSITE LAMINATES

Gunther Bauer, Krähenfeldstr. 18, 73434 Dewangen, Germany

Filed Jul. 14, 1994, Ser. No. 275,208

Claims priority, application Germany, Jul. 14, 1993, 43 23 558.1

Int. Cl.^{6} C08J *11/04;11/24*

U.S. Cl. 521—49 **12 Claims**

1. A process for separating the fabric components of a fabric laminate in which the fabric components have been laminated together by a polyurethane adhesive, consisting of the steps of:

(a) treating the laminate with a monofunctional aliphatic alcohol containing from between 3 to 12 carbon atoms or mixtures thereof at temperatures of 160° C. to 200° C., whereby the alcohol reacts with the polyurethane to form an alcoholisate;

(b) separating the alcoholisate from fabric components that do not form alcoholisates under the conditions of step (a); and

(c) separating the fabric components from one another.

5,534,557

ONIUM SALT, PHOTOPOLYMERIZATION INITIATOR, ENERGY RAY-CURING COMPOSITION CONTAINING THE INITIATOR, AND CURED PRODUCT

Tetsuya Abe; Kazuhiko Ishii, both of Yono, and Minoru Yokoshima, Toride, all of, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

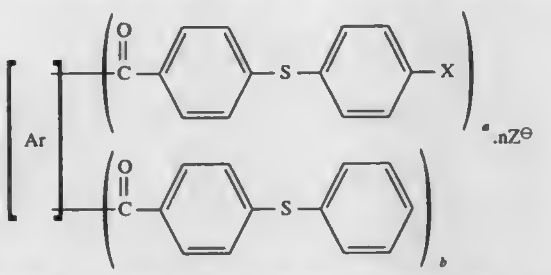
Division of Ser. No. 255,469, Jun. 8, 1994, Pat. No. 5,502,083. This application Jun. 2, 1995, Ser. No. 459,027

Claims priority, application Japan, Jun. 18, 1993, 5-170853

Int. Cl.^{6} C07C *148/00;149/46;319/00;* **C08F** *2/50*

U.S. Cl. 522—15 **15 Claims**

1. An onium salt represented by the following formula (1):



(1)

wherein Ar is a mono- to tetra-valent aromatic group, X is a bisphenylsulfonio group which may have a substituent, a is 1–4, b is 0 or 1–3, a+b is 1–4, n is 1–4, and Z is a halide represented by the following formula (3):

$$MQ_m(-OH)_l \qquad (3)$$

where M is a boron atom, a phosphorus atom, an arsenic atom or an antimony atom, Q is a halogen atom, m is 3–6, l is 0 or 1, and m+l is 4–6.

5,534,558

PROCESS AND COMPOSITION FOR CLADDING OPTICAL FIBERS

Richard A. Minns, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 720,233, Jun. 24, 1991, Pat. No. 5,484,822. This application Jun. 2, 1995, Ser. No. 460,228

Int. Cl.^{6} C08F *2/46*

U.S. Cl. 522—35 **11 Claims**

1. A process for cladding an optical fiber, which process comprises:

providing a photopolymerizable composition comprising a copolymer having pendant photoinitiating groups, this copolymer having repeating units from a photoinitiator monomer having both a photoinitiating group and an ethylenically unsaturated group, and repeating units from a fluorosubstituted monomer having an ethylenically unsaturated group; and a fluorosubstituted diacrylate;

coating the optical fiber with a layer of the photopolymerizable composition; and

exposing the coated optical fiber to ultraviolet light, thereby curing the photopolymerizable composition to produce a cladding on the optical fiber.

5,534,559

DAYLIGHT CURING COMPOSITIONS CONTAINING BISACYLPHOSPHINE OXIDE PHOTOINITIATORS

David G. Leppard, Marly, Switzerland; Manfred Köhler, Freiburg, Germany, and Ljubomir Misev, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

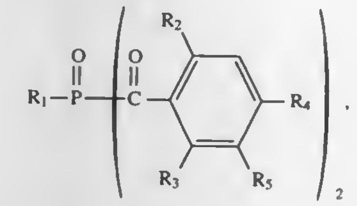
Continuation of Ser. No. 212,524, Mar. 11, 1994, abandoned. This application May 25, 1995, Ser. No. 451,115

Claims priority, application Switzerland, Mar. 18, 1993, 816/93

Int. Cl.^{6} C08F *2/50;4/00;* **C08L** *67/06;* **C08K** *3/22*

U.S. Cl. 522—64 **19 Claims**

1. A process for curing ethylenically unsaturated polymerisable compounds, which comprises adding to said compounds at least one photoinitiator of formula I



(I)

wherein

R_1 is C_1–C_{12}alkyl, cyclopentyl, cyclohexyl, unsubstituted phenyl, naphthyl or biphenyl,

R_2 and R_3 are each independently of the other C_1–C_{12}alkyl,

R_4 is hydrogen or C_1–C_{12}alkyl, and

R_5 is hydrogen or methyl,

and irradiating the mixture so obtained with daylight or with light sources equivalent to daylight.

5,534,560

COMPOUND FOR THE CORRECT TAKING OF DENTAL IMPRESSIONS

Tiziano Busin, and Enrico Faccio, both of Badia Polesine, Italy, assignors to Zhermack S.p.A., Badia Polesine, Italy

Filed Mar. 12, 1993, Ser. No. 30,976

Claims priority, application Italy, Mar. 18, 1992, PD92A0043

Int. Cl.^{6} A61K *6/10;* **A61C** *9/00;* **C08K** *5/24;5/05*

U.S. Cl. 523—109 **6 Claims**

1. Nebulizable liquid composition for application on surfaces to be affected by dental impression taking before applying thereon dental impression silicone materials, wherein the liquid composition comprises a surface-active substance, a solvent for said surface-active substance, a coloring agent and a flavoring agent, and wherein the surface-active substance is a silicone-glycol copolymer compatible with silicone materials.

5,534,561

ADHESIVES COMPOSITION FOR A WOUND DRESSING

Robert W. Volke, 11765 Parkman Rd., Garrettsville, Ohio 44231

Division of Ser. No. 69,784, Jun. 1, 1993, abandoned. This application Jul. 18, 1994, Ser. No. 276,443

Int. Cl.^{6} C08L *1/26;3/02;3/04;* **A61F** *13/02*

U.S. Cl. 523—111 **9 Claims**

1. A wound dressing comprising:

a plastic film layer; and

an adhesive bonded to one side thereof, said adhesive comprising a mixture of polyisobutylene and a rubber polymer selected from the group consisting of random copolymers of styrene and butadiene and halobutyl rubber, said adhesive having at least one hydrocolloid dispersed therein.

5,534,562

COMPOSITIONS AND METHODS FOR PRIMING AND SEALING DENTAL AND BIOLOGICAL SUBSTRATES

Steven D. Jensen, Sandy, and Dan E. Fischer, Midvale, both of Utah, assignors to Ultradent Products, Inc., South Jordan, Utah

Filed Apr. 7, 1995, Ser. No. 418,764

Int. Cl.^{6} C08K *5/10;* **A61K** *6/08;* **A61C** *5/00;5/04*

U.S. Cl. 523—118 **108 Claims**

1. A stable premixed primer for sealing or priming for bonding a dental substrate or a biological substrate, the stable premixed primer comprising:

a polymerization initiator; and

a polymerizable promoter characterized as being capable of being polymerized in situ by initiation of the polymerization initiator after the primer is placed in contact with the substrate, wherein the polymerizable promoter is selected from the group consisting of methacrylic acid, 4-pentenoic acid, 6-heptenoic acid and 2,2-dimethyl-4-pentenoic acid, and wherein the polymerizable initiator and the polymerizable promoter once mixed thereafter form a stable premixed primer ready for storage and subsequent application directly to the substrate without additional mixing.

5,534,563

SILICONE SEALANTS

Chiu-Sing Lin, Schenectady, and John J. Dziark, Ballston Spa, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jan. 31, 1994, Ser. No. 189,537

Int. Cl.^{6} C08K *5/41*

U.S. Cl. 523—122 **11 Claims**

1. A mildew resistant silicone composition comprising a sealant selected from the group consisting of acetoxy, ketoximo, and alkoxy sealants and di-iodomethyl-para-tolylsulfone in an amount ranging from about 0.01% by weight up to about 2.00% by weight whereby tensile strength and percent elongation are improved.

5,534,564

PROCESS FOR THE COLOR STABILIZATION OF AN AQUEOUS N-VINYL HETEROCYCLIC COPOLYMER SOLUTION

Yuanzhen Zhong, Wayne, and Philip F. Wolf, Bridgewater, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Dec. 13, 1994, Ser. No. 355,137

Int. Cl.^{6} C08K *5/3415*

U.S. Cl. 523—340 **12 Claims**

1. In a process for the preparation of an aqueous color stabilized 10–80% solids solution derived from the polymerization of from about 40 to about 80 wt. % of a N-vinyl heterocyclic monomer having from 3 to 6 ring carbon atoms and from about 60 to about 20 wt. % of a copolymerizable vinyl comonomer which comprises copolymerizing said monomer and comonomer in an alcohol solvent media in the presence of a free radical initiator to form a corresponding copolymer having a K value of from about 10 to about 100 in alcohol and subjecting the resulting alcohol copolymer mixture to solvent exchange with deionized water the improvement which comprises:

(a) contacting said alcohol copolymer mixture with (1) from about 50 to about 150 volume % deionized water per volume of alcohol and (2) between about 0.02 and about 5 wt. %, of a stabilizing agent selected from the group consisting of sulfurous acid, an alkali metal monosulfite or bisulfite, a nitrogen containing borane complex compound and mixtures thereof,

(b) subjecting the resulting alcohol/copolymer/deionized water and stabilizer to stripping under a vacuum of from about 10 to about 740 mm Hg at a temperature below 90° C. to selectively remove said alcohol in exchange with deionized water and

(c) recovering a 10 to 80% solids, aqueous solution of said copolymer which solution is stable and resistant to yellowing or darkening for a period of at least one year.

5,534,565
SOLVENT FREE EPOXY RESIN COMPOSITIONS CONTAINING SUBSTITUTED CYANOGUANIDINES

Joseph J. Zupancic, Bensenville; Jeffrey P. Conrad, Chicago, both of Ill.; Jiri D. Konicek, Onalaska, Wis., and Aroon V. Tungare, Arlington Heights, Ill., assignors to AlliedSignal Inc., Morris County, N.J.

Continuation of Ser. No. 994,004, Dec. 21, 1992, abandoned. This application Apr. 15, 1994, Ser. No. 227,915

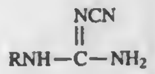
Int. Cl.^{6} C08L *63/02*

U.S. Cl. 523—454 **13 Claims**

1. A solvent-free, homogeneous and liquid curable composition for preparation of epoxy resin laminates consisting essentially of

(a) a liquid epoxy resin;

(b) as a curing agent a substituted dicyandiamide dissolved in said liquid epoxy of (a) having the formula



$$\mathrm{RNH{-}\overset{\overset{\displaystyle NCN}{\|}}{C}{-}NH_2}$$

where

R is $CH_2C_6H_4X$, or $—CH_2CH_2C_6H_4X$

and

X is —H, $—CH_3$, or OCH_3

(c) a chain extender selected from the group consisting of biphenols, bisphenols, trisphenols, tetraphenols, multifunctional phenols, dicarboxylic acids, tricarboxylic acids, tetracarboxylic acids, phenol carboxylic acids and mixtures thereof;

(d) optionally, a stabilizer comprising organic or inorganic acids; and

(e) a catalyst selected from the group consisting of nitrogen containing and phosphorous containing catalysts and mixtures thereof.

5,534,566
STABILIZED HALOGEN-CONTAINING POLYMERS

Wolfgang Wehner, Ober-Ramstadt; Rolf Drewes, Lindenfels; Karl J. Kuhn, Lautertal; Hans-Jürgen Sander, Lorsch, and Markus Kolb, Plankstadt, all of, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,311

Claims priority, application Switzerland, Apr. 15, 1994, 1143/94

Int. Cl.^{6} C08K *5/053*

U.S. Cl. 524—27 **15 Claims**

1. A stabilized halogen-containing polymer comprising

(a) a halogen-containing polymer or a recyclate thereof,

(b) a di- or polysaccharide alcohol of the formula $C_6H_{11}O_6(C_6H_{10}O_5)_nC_6\,H_{13}O_5$, in which n is a number from 0 to 5; and (c) an inorganic or organic zinc, aluminium or rare-earth compound, where, if component (b) is maltitol, the composition does not comprise a combination of a calcium and zinc soap.

5,534,567

Patent Not Issued For This Number

5,534,568
ASPHALT CEMENT MODIFICATION

Gerald O. Schulz, Stow, and Daniel F. Klemmensen, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 10, 1995, Ser. No. 386,779

Int. Cl.^{6} C08L *95/00*

U.S. Cl. 524—69 **20 Claims**

1. An asphalt concrete which is comprised of (A) from about 90 weight percent to about 99 weight percent of an aggregate, and (B) from about 1 weight percent to about 10 weight percent of a modified asphalt cement which is comprised of (1) from about 90 weight percent to about 99 weight percent of asphalt; and (2) from about 1 weight percent to about 10 weight percent of a rubbery polymer which is comprised of repeat units which are derived from (a) about 64 weight percent to about 84.9 weight percent of a conjugated diolefin monomer, (b) about 15 weight percent to about 33 weight percent of a vinyl aromatic monomer, and (c) about 0.1 weight percent to about 3 weight percent of isobutoxymethyl acrylamide.

5,534,569
RUBBER COMPOSITION

Akiko Etoh, Saitama-ken, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 120,451, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 763,832, Sep. 23, 1991, abandoned. This application Mar. 8, 1995, Ser. No. 400,479

Claims priority, application Japan, Sep. 27, 1990, 2-255309

Int. Cl.^{6} C08K *5/16;5/24*

U.S. Cl. 524—99 **8 Claims**

1. A method of manufacturing a rubber composition having improved low heat generation properties consisting essentially of the step of kneading with a mixer,

100 parts by weight of at least one rubber selected from the group consisting of natural rubber, synthetic polyisoprene rubber, styrene-butadiene rubber and polybutadiene rubber,

20 to 150 parts by weight carbon black, and

0.05 to 20 parts by weight of a compound selected from the group consisting of isonicotinic hydrazide, 1,3-bis(hydrazinocarboethyl)-5-isopropylhydantoin, anthraniloylhydrazine, salicylic hydrazide, 4-hydroxybenzoic hydrazide and 2-hydroxy-3-naphthalic hydrazide.

5,534,570
PLASTICIZED POLYESTERS FOR SHRINK FILM APPLICATIONS

Wayne K. Shih, and Ronald R. Light, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 157,546, Nov. 26, 1993, abandoned. This application Mar. 24, 1995, Ser. No. 410,594

Int. Cl.^{6} C08J *5/18;* **C08K** *5/15*

U.S. Cl. 524—114 **9 Claims**

1. A heat-shrinkable film comprising a blend of:

(A) 90 to 99 weight percent of an amorphous polyester having a glass transition temperature of 40° C. to 100° C. and an inherent viscosity of 0.5 to 1.2 dL/g, comprising

(1) a dicarboxylic acid component comprising repeat units from at least 80 mole percent of terephthalic acid, based on 100 mole percent dicarboxylic acid, and

(2) a diol component comprising repeat units from 65 to 90 mole percent ethylene glycol and 35 to 10 mole percent 1,4-cyclohexanedimethanol, based on 100 mole percent diol; and

(B) 1 to 10 weight percent of a plasticizer selected from the group consisting of octyl epoxy soyate, epoxy tallates, epoxidized soybean oil, epoxidized linseed oil, triphenyl phosphate, neopentyl glycol dibenzoate, glycerine, vegetable oil, and mineral oil, provided the plasticizer decreases the Tg of the

polyester by at least about 10° C., wherein the combined weights of (A) and (B) total 100 percent.

5,534,571
PREPARATION OF SOLVENT-FREE AQUEOUS POLYMER AND TACKIFIER DISPERSIONS

Oral Aydin, Mannheim; Hubertus Kröner, Ludwigshafen; Eckehardt Wistuba, Bad Duerkheim, and Peter Fickeisen, Dirmstein, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 216,304, Mar. 23, 1994, abandoned. This application May 30, 1995, Ser. No. 453,377

Claims priority, application Germany, Apr. 15, 1993, 43 12 303.1

Int. Cl.^{6} C08L *93/04*

U.S. Cl. 524—272 **11 Claims**

1. A process for preparing an aqueous dispersion, said dispersion comprising a synthetic polymer obtained by free radical polymerization and a rosin, said process comprising:

(i) mixing an aqueous dispersion of said synthetic polymer with an aqueous suspension of said rosin, wherein said rosin contains 0.1 to 0.5 mole of carboxyl groups per 100 g of rosin, and wherein said aqueous rosin suspension is free of organic solvents and plasticizers, and free of emulsifiers, dispersants, protective colloids, and other assistants capable of dispersing or emulsifying said rosin.

5,534,572
POLYETHYLENE WITH REDUCED MELT FRACTURE

Joseph W. Taylor, Halton Hills; Shivendra K. Goyal, Calgary; Norman D. J. Aubee, Okotoks, and Nick K. K. Bohnet, Calgary, all of, Canada, assignors to Novacor Chemicals Ltd., Calgary, Canada

Division of Ser. No. 387,270, Feb. 13, 1995, Pat. No. 5,459,187. This application Jul. 6, 1995, Ser. No. 498,970

Int. Cl.^{6} C08L *91/06;* **C08K** *5/06*

U.S. Cl. 524—275 **11 Claims**

1. An extrudable composition comprising:

i) a predominant amount of an olefin polymer;

ii) from 0.01 to 1 weight % of a chemical selected from the group consisting of C_{1-4} alkyl ethers of poly C_{2-6} ethylenically unsaturated glycols and mixtures thereof, said ethers having a weight average molecular weight less than 20,000;

iii) from 0.01 to 1 weight % of fluoropolymer having an atomic ratio of fluorine to carbon of at least 1:2; and

iv) from 50 to 500 ppm of a metal oxide, or hydrotalcite ($Mg_6Al_2(OH)_{16}CO_3.4H_2O$), the weight ratio of component ii) to component iii) being from 0.60:1 to 0.90:1, further characterized in that said extrudable composition is in the form of an extruded coating on a wire or optical cable.

5,534,573
AMINOTRIAZINE PHOSPHONATES IN PLASTICS

Jonathan S. Leake, Coventry, United Kingdom, assignor to Courtaulds PLC, London, United Kingdom

PCT No. PCT/GB92/02349, § 371 Date Jun. 8, 1994, § 102(e) Date Jun. 8, 1994, PCT Pub. No. WO93/12173, PCT Pub. Date Jun. 24, 1993

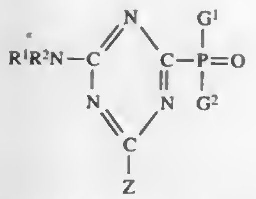
PCT Filed Dec. 17, 1992, Ser. No. 244,728

Claims priority, application United Kingdom, Dec. 18, 1991, 9126841

Int. Cl.^{6} C08K *5/04*

U.S. Cl. 524—100 **11 Claims**

1. (Twice amended) A plastics material containing a phosphorus-containing heterocyclic flame retardant, wherein the flame retardant is a sym-triazine compound of the formula:

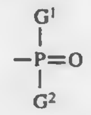


(I)

where R^1 represents an alkyl group having 1 to 12 carbon atoms, and R^2 represents an alkyl group having 1 to 12 carbon atoms;

G^1 and G^2 are each independently selected from an $-OR^3$ group, an amine group of the formula $-NR^4R^5$, an -OH group or an anionic group -0^- in the form of a metal salt or an amine or ammonium salt, where R^3 represents an alkyl or cycloalkyl group having 1 to 12 carbon atoms, and R^4 and R^5 each independently represent hydrogen or an alkyl or cycloalkyl group having 1 to 12 carbon atoms;

Z represents an amine group of the formula $-NR^6R^7$ or a phosphonic group of the formula:



$$-\overset{\overset{\displaystyle G^1}{|}}{\underset{\underset{\displaystyle G^2}{|}}{P}}=O$$

where G^1 and G^2 are defined as above;

R^6 represents an alkyl group having 1 to 12 carbon atoms, and

R^7 represents an alkyl group having 1 to 12 carbon atoms.

5,534,574
SILICA REINFORCED RUBBER PREPARATION AND TIRE WITH TREAD THEREOF

Paul H. Sandstrom, Tallmadge; David J. Zanzig, Uniontown, and Mark S. Sinsky, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 10, 1995, Ser. No. 401,844

Int. Cl.^{6} C08K *5/54;3/36*

U.S. Cl. 524—262 **11 Claims**

1. A method of preparing a rubber composition by a process consisting of at least two sequential mixing steps which comprises the sequential steps of:

(A) thermomechanically mixing in at least one individual preparatory mixing step, in the absence of sulfur and sulfur vulcanization accelerators except as hereinafter provided, at a temperature in a range of about 140° C. to about 190° C. for a total mixing time of about 4 to about 20 minutes

(i) 100 parts by weight of at least one sulfur vulcanizable elastomer selected from conjugated diene homopolymers and copolymers and from copolymers of at least one conjugated diene and aromatic vinyl compound,

about 15 to about 100 phr of particulate precipitated silica,

(ii) about 0.01 to about 0.2 parts by weight per part by weight of said silica of a bis-(3-trialkoxysilylalkyl)polysulfide where the sulfide bridge portion contains 2 to 8 connecting sulfur atoms in which the average polysulfide bridge contains about 4.5 to about 5.5 sulfur atoms and in which at least 75 percent of the polysulfide bridge portion contains at least 3 sulfur atoms, and

(iv) about 0.01 to about one part by weight of at least one of 2-mercaptobenzothiazole, benzothiazyl disulfide and N,N'-di, or N-mono, substituted 2-benzothiazole sulfenamides wherein the substituents are selected from cyclohexyl, tertiary butyl, and isopropyl groups per part of said bis-(3-trialkoxysilylalkyl)polysulfide;

(B) subsequently blending therewith in a final, individual thermomechanical mixing step at a temperature in a range of about 100° C. to about 130° C. for a time of about 1 to about 3 minutes, about 0.5 to about 8 phr elemental sulfur and at least one sulfur vulcanization accelerator, provided, however, that the total of sulfur vulcanization accelerator added to the rubber mixture, including the aforesaid 2-mercaptobenzothiazole added in a preparatory mixing stage(s) is in a range of about 0.5 to about 5 phr.

5,534,575
HOT MELT ADHESIVE COMPOSITION

Mary E. Foster, Vadnais Heights; Eugene R. Simmons, Maplewood; Lowell G. Lindquist, St. Paul, and William L. Bunnelle, Hugo, all of Minn., assignors to H.B. Fuller Licensing & Financing, Inc., Wilmington, Del.

Continuation of Ser. No. 907,678, Jul. 2, 1992, abandoned. This application Jan. 30, 1995, Ser. No. 380,215

Int. Cl.⁶ C08K *5/10;5/09;* **B23B** *7/12;15/04*

U.S. Cl. 524—270 **26 Claims**

1. A hot melt adhesive comprising at least 5% of a thermoplastic elastomer block copolymer selected from the group consisting of polyester-polyether, polyamide-polyester, polyamide-polyether and polyurethane block copolymer elastomers, the copolymer having a Vicat softening temperature of at least 60° C. and a melting point of at least 100° C., said hot melt adhesive being characterized by an open time after melt application to a first substrate, after which the adhesive bond rapidly strengthens so that a second substrate, joined to said first substrate during said open time, may no longer be repositioned, said open time lasting for a period of between 1 minute and 2 hours.

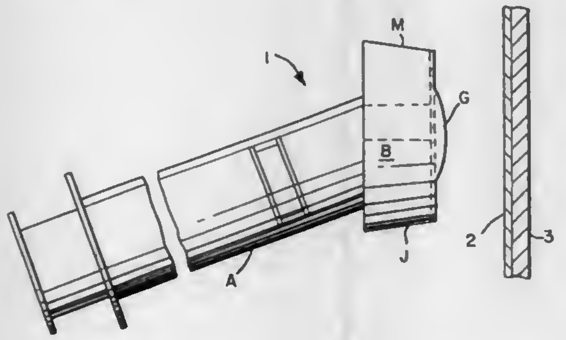
5,534,576
SEALANT FOR ELECTROCHEMICAL CELLS

Walther G. Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 17, 1990, Ser. No. 511,180

Int. Cl.⁶ C08J *3/20;* **C08K** *5/06;* **C08L** *27/18*

U.S. Cl. 524—377 **13 Claims**



1. A sealant composition comprising (a) 20–50 weight % fluoropolymer on a dry basis, (b) the fluoropolymer having particles with a diameter no greater than 25 micrometers, and (c) 0–5 weight % thickener dispersed in an amount of a single phase liquid medium chosen to add to 100 weight %, (d) the liquid medium comprising 50–100 weight % of a low-volatility liquid wherein the low-volatility liquid has a boiling point at 5 mm Hg of at least 50° C. and 0–50% of a more volatile liquid, and (e) wherein said composition has a viscosity of about 10–5000 poises.

5,534,577
AQUEOUS POLYOLEFIN RESIN COMPOSITION

Hiroaki Namba, and Ken-ichi Fujino, both of Iwakuni, Japan, assignors to Nippon Paper Industries Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 145,090, Nov. 3, 1993, abandoned. This application Dec. 15, 1993, Ser. No. 166,903

Claims priority, application Japan, Nov. 11, 1992, 4-326118; Mar. 2, 1993, 5-64874; Oct. 13, 1993, 5-280127

Int. Cl.⁶ C08K *5/04*

U.S. Cl. 524—377 **15 Claims**

1. An aqueous polyolefin resin composition comprising: (a) a polyolefin or a modified polyolefin selected from the group consisting of polyolefins which have been modified by graft copolymerization with an unsaturated carboxylic acid, unsaturated carboxylic acid anhydride or mixture thereof, polyolefins which have been modified by graft copolymerization with a reactive monomer having radical polymerizability and mixtures thereof and (b) a of poly(alkylene oxide) compound having a solubility parameter (SP value) of not lower than 7 $cal^{1/2} \cdot cm^{-3/2}$ to not higher than 12 $cal^{1/2} \cdot cm^{-3/2}$ at a proportion of not less than 0.001 wt. % to not more than 50 wt. % upon aqueous conversion of the polyolefin or modified polyolefin.

5,534,578
SILICA REINFORCED RUBBER COMPOSITION CONTAINING SALTS OF SALICYLIC ACID

Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 6, 1994, Ser. No. 300,767

Int. Cl.⁶ C08K *5/04*

U.S. Cl. 524—396 **17 Claims**

1. A rubber composition comprised of (A) 100 parts by weight of at least one diene-based elastomer, (B) about 10 to about 250 phr particulate silica and (C) about 0.5 to 50 phr of a silica coupler selected from the zinc salt of salicylic acid, the ammonium salt of salicylic acid, the sodium salt of salicylic acid and mixtures thereof.

5,534,579
HIGHLY WEATHER-RESISTANT, SINGLE PACKAGE, CROSSLINKABLE EMULSION

Toshiki Nikaya; Yoshifumi Fukushima, both of Suita, and Teruo Kikuta, Nagaokakyo, all of, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Nov. 18, 1992, Ser. No. 978,506

Claims priority, application Japan, Nov. 18, 1991, 3-329929

Int. Cl.⁶ C08F *2/16*

U.S. Cl. 524—460 **8 Claims**

1. A highly weather-resistant, single package, emulsion comprising

an emulsion polymer synthesized by polymerizing, in an aqueous medium, an emulsion comprising polymerizable monomer ingredients:

(a) 0.3% to 10% by weight, of a polymerizable UV-ray stable monomer,

(b) 5% to 99.4% by weight, of a cycloalkyl group-containing polymerizable monomer,

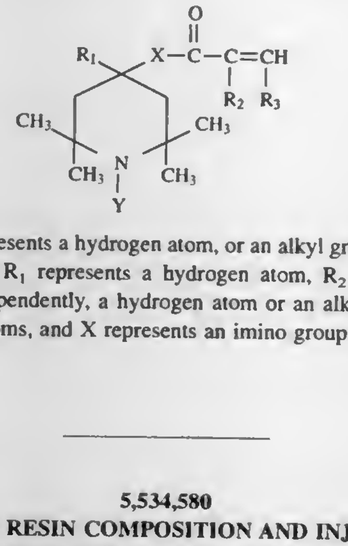
(c) 0.5% to 40% by weight, of a polymerizable monomer which contains groups having reactivity with carboxyl groups, and

(d) 0% to 94.4% by weight, of other polymerizable monomers,

wherein the sum of the weight % of said polymerizable monomers (a), (b), (c) and (d) is 100%,

wherein said polymerization takes place in the presence of a water soluble or water dispersible polymer, having a terminal alkyl group, and an acid value of 200 or greater, wherein said water soluble or water dispersible polymer is obtained by polymerizing a monomer mixture comprising an unsaturated carboxylic acid, or a salt thereof, in the presence of a C_{6-18} alkyl mercaptan,

wherein said polymerizable UV-ray stable monomer is a monomer of the formula (1):



(1)

wherein Y represents a hydrogen atom, or an alkyl group of 1 to 18 carbon atoms, R_1 represents a hydrogen atom, R_2 and R_3 each represent, independently, a hydrogen atom or an alkyl group of 1 or 2 carbon atoms, and X represents an imino group or an oxygen atom.

5,534,580
STYRENIC RESIN COMPOSITION AND INJECTION- AND EXTRUSION-MOLDED ARTICLES

Shinichi Mitsui; Hayato Kihara, and Shuji Yoshimi, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 4, 1994, Ser. No. 334,330

Claims priority, application Japan, Nov. 5, 1993, 5-276995; Dec. 22, 1993, 5-324537; Apr. 5, 1994, 6-067110

Int. Cl.⁶ C08K *3/32*

U.S. Cl. 524—417 **23 Claims**

1. A resin composition, comprising:

(a) a polymer or copolymer of styrene or a styrene-containing compound, said polymer or copolymer having a weight average molecular weight of 100,000 to 2,000,000 and being produced by a thermal polymerization method or a polymerization method using a radical initiator; and

(b) a finely divided particulate inorganic substance or a finely divided particulate organic substance, the inorganic substance having a refractive index of 1.5–2.0 and an average particle diameter of 0.1–20 μm, and the organic substance having a refractive index of 1.5–2.0, an average particle diameter of 0.1–20 μm and not having a glass transition temperature in a temperature range of 90° C. or below,

said particulate inorganic or organic substance accounting for 0.002 to 1 weight % based on the resin composition.

5,534,581
TRANSFER MATERIAL CARRYING MEMBER AND IMAGE FORMING APPARATUS MAKING USE OF THE SAME

Noriko Ohtani; Naoto Fujimura, both of Yokohama; Kiyoshi Sakai, Hachioji; Teigo Sakakibara, Yokohama; Masahiro Inoue, Yokohama; Nobuhiko Takekoshi, Yokohama; Shinya Mayama, Yamato; Hideo Ohtaki, Toyonaka; Tadami Kinugawa, Toyonaka; Toshiaki Takada, Toyonaka, and Yuichi Hashimoto, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 227,985, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 858,408, Mar. 27, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,185

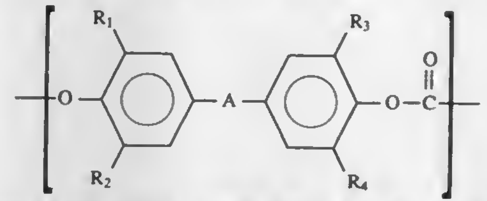
Claims priority, application Japan, Mar. 28, 1991, 3-064795; Jan. 30, 1992, 4-038457

Int. Cl.⁶ C08K *3/04;3/22;* **H01B** *1/24;1/20*

U.S. Cl. 524—430 **27 Claims**

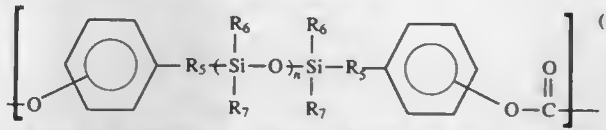
1. A transfer material carrying member comprising a sheet formed from a copolymer and conductive particles;

said copolymer being a copolymer having a component unit represented by the following Formula (I) :



(I)

wherein A represents a straight-chain, branched or cyclic alkylidene group having 1 to 10 carbon atoms, an aryl-substituted alkylidene group, an arylenedialkylidene group, —O—, —S—, —CO—, —SO— or —SO_2—; and R_1, R_2, R_3 and R_4 each represent a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkenyl group, and a component unit represented by the following Formula (II):



(II)

wherein R_3 represents an alkylene group having 2 to 6 carbon atoms, or an alkylidene group; R_6 and R_7 each represent an alkyl group having 1 to 3 carbon atoms, a phenyl group or a substituted phenyl group; and n represents an integer of 1 to 200; and said component unit represented by Formula (II) being in an amount of from 0.1% by weight to 50% by weight based on the total weight of said copolymer.

5,534,582
METAL/PLASTICS COMPOSITE CONTAINING INORGANIC FILLERS AND PROCESSES FOR THE PRODUCTION THEREOF

Siegfried Krause, and Leonidas Kiriazis, both of Münster, Germany, assignors to BASF Lacke+ Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP92/02546, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO93/10174, PCT Pub. Date May 27, 1993

PCT Filed Nov. 6, 1992, Ser. No. 232,183

Claims priority, application Germany, Nov. 12, 1991, 41 37 139.9

Int. Cl.⁶ C08J *5/10;* **C08K** *3/08;* **C08L** *23/10*

U.S. Cl. 524—441 **6 Claims**

1. Metal/plastics composite containing inorganic fillers, characterized in that a thermoplastics film selected from the group consisting of polyolefins, polyamides, polyesters, polyvinyl chloride, polyvinylidene chloride, polyurethanes and polycarbonates and bonded to a metal sheet of a thickness from 0.04 to 1 mm contains between 0.1% to 6% by weight, based on the total weight of the

mixture of thermoplastics and filler, of at least one metal powder, selected from the group consisting of aluminum powder, magnesium powder, zinc powder, manganese powder and mixtures thereof, where the average particle size of the metal powder is in the range of 5 to 20 μm.

5,534,583

COATING SOLUTION FOR TREATING BASEMENT WALLS

Michael G. Roberts, and Charles E. Bolen, both of Akron, Ohio, assignors to Ozko, Inc. & Charles E. Bolen, Akron, Ohio

Division of Ser. No. 453,566, May 26, 1995, which is a continuation of Ser. No. 221,039, Mar. 31, 1994, abandoned, which is a division of Ser. No. 632,130, Dec. 20, 1990, Pat. No. 5,352,531. This application Oct. 10, 1995, Ser. No. 541,805

Int. Cl.^{6} C08K *5/01;* **C08L** *57/02;53/02*

U.S. Cl. 524—476 **11 Claims**

1. An asphalt free organic solvent solution comprising:

(i) a hydrocarbon resin,

(ii) a polystyrene-polyisoprene block copolymer or a polystyrene-polyisoprene-polystyrene block copolymer or a polystyrene-polybutadiene block copolymer or a polystyrene-polybutadiene-polystyrene block copolymer or mixtures thereof, and

(iii) a solvent mixture of toluene and an aliphatic petroleum distillate which is a mixture of paraffinic and cycloparaffinic hydrocarbons, said distillate having a boiling range of about 190° F.– 230° F., a flash point of about 18° F. a specific gravity of between about 0.709 to about 0.732 and an evaporation rate of about 2.2–2.6, said solvent being between about 80% to about 95% (weight) of said distillate and about 20% to about 5% of toluene.

5,534,584

GLASS-REINFORCED THERMOPLASTIC RESIN COMPOSITIONS CONTAINING THE ANATASE FORM OF TITANIUM DIOXIDE AS A WHITE PIGMENTING AGENT

Hiroshi Kitamura, and Masamichi Mitsuuchi, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Japan

Continuation of Ser. No. 126,737, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 845,077, Mar. 3, 1992, abandoned. This application Apr. 13, 1995, Ser. No. 421,458

Claims priority, application Japan, Mar. 4, 1991, 3-037355

Int. Cl.^{6} C08K *3/22*

U.S. Cl. 524—497 **7 Claims**

1. A glass-reinforced thermoplastic resin composition consisting essentially of, based on 100 parts by weight of the composition:

(A) between 35 to 95 parts by weight of a thermoplastic base resin which is selected from the group consisting of polybutylene terephthalate, polyacetal and polycarbonate,

(B) between 5 to 65 parts by weight of a particulate glass filler material, and

(C) a white-pigmenting effective amount between about 0.1 to 2 parts by weight of a white pigment which is the anatase form of titanium dioxide having a grain size of less than 0.1 to 0.5 μm.

5,534,585

POLYMER-MODIFIED PARTICULATE TITANIUM DIOXIDE

Brian J. Roulstone, Burnham, and Julian A. Waters, Goring-on-Thames, both of, England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of Ser. No. 189,279, Jan. 31, 1994, Pat. No. 5,412,019, which is a continuation of Ser. No. 995,010, Dec. 22, 1992, abandoned. This application Aug. 24, 1994, Ser. No. 295,103

Claims priority, application United Kingdom, Dec. 23, 1991, 9127293

Int. Cl.^{6} C08K *3/22;3/10;3/00;9/02*

U.S. Cl. 524—497 **20 Claims**

1. A polymer-modified (including copolymer-modified) particulate titanium dioxide comprising particles of organic polymer attached to particles of titanium dioxide, the particles of titanium dioxide having a number average particle size (Dt) of from 100 to 400 nm, and the polymer particles having a particle size which allows them to be accommodated around the titanium dioxide particles, wherein

a) the polymer particles are pre-formed prior to their attachment to the titanium dioxide particles,

b) the polymer particles are pre-formed either by,

i) a free radical initiated aqueous emulsion or dispersion polymerization performed in the presence of a water-soluble compound which bonds chemically to the polymer as it is being formed, or

ii) a polymerization which is followed by the chemical bonding of the water-soluble compound to the polymer, and

c) the water-soluble compound is a polymeric material which

i) has a weight average molecular weight of at least 1500 prior to bonding to the polymer,

ii) is chemically bondable to the polymer and which contains at least one moiety adsorbable onto the titanium dioxide particles, and

iii) is chosen from the group consisting of celluloses, cellulose ethers, polymers and copolymers of acrylamide, vinyl alcohol, vinyl pyrrolidone and acrylic acid, and polymers containing poly(ethoxylate) chains.

5,534,586

GRINDING AND/OR DISPERSING AGENT CONTAINING POLYMERS AND/OR COPOLYMERS PARTIALLY NEUTRALIZED BY MAGNESIUM FOR AQUEOUS SUSPENSIONS OF MINERAL SUBSTANCES, TO BE USED IN PIGMENTARY APPLICATIONS

Jean-Bernard Egraz, Ecully; Jacques Mongoin, Champagne-Au-Mont-d'or, and Georges Ravet, Saint-Genis-les-Ollieres, all of, France, assignors to Coatex S.A., Genay, France

Continuation of Ser. No. 974,282, Nov. 10, 1992, Pat. No. 5,432,239. This application Feb. 6, 1995, Ser. No. 384,004

Claims priority, application France, Nov. 12, 1991, 91 14138; Nov. 12, 1991, 91 14139

Int. Cl.^{6} C08K *3/00*

U.S. Cl. 524—547 **3 Claims**

1. An aqueous suspension of fine mineral substances refined using a grinding process comprising:

(i) preparing an aqueous suspension of a coarse mineral substance and a grinding agent comprising a polymer selected from the group consisting of acrylic polymers, vinyl polymers, acrylic and vinyl copolymers, and a mixture thereof, wherein said polymer contains acid groups which are partially or completely neutralized, wherein the active acid sites of said polymer are completely or partially neutralized, such that the percentage of said active acid sites neutralized by magnesium ions ranges between 45 and 55%, including terminals, and such that up to 55% of said active acid sites of said agent are neutralized by sodium ions;

ii adding a grinding substance to said aqueous suspension; and

ii grinding said mixture thus constituted, wherein the size of at least 65% of the particles in the ground substance is less than one micron.

5,534,587

COLOR-CHANGEABLE MARKING COMPOSITION

Mark T. Smith, Waltham, Mass., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 194,466, Feb. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 97,461, Jul. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 139,560, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 965,803, Oct. 23, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,565

Int. Cl.^{6} C08L *9/08;33/08;* **C09D** *11/18*

U.S. Cl. 524—575 **6 Claims**

1. A color-changeable marking composition comprising:

(a) an emulsion, said emulsion comprising a discontinuous polymeric, film-forming phase and a continuous phase, said emulsion being characterized by its ability to be transformed, upon being contacted with the surface of a conventional porous marking substrate, from a first state in which the emulsion is stable to a second state in which the emulsion is unstable and the discontinuous polymeric, film-forming phase rapidly agglomerates to form a film deposited on the surface of the conventional porous marking substrate with low adhesion thereto, said emulsion being an aqueous emulsion of non-carboxylated styrene-butadiene rubber latex characterized by a basic pH;

(b) a first colorant present in said emulsion, said first colorant being characterized by its association with said film when said emulsion is transformed into said second state, said first colorant being a water-insoluble pigment; and

(c) a second colorant present in said emulsion and different in color from said first colorant, said second colorant being characterized both by its solubility in said continuous phase and by its lack of association with said film when said emulsion is transformed into said second state whereby, upon contact of said emulsion with the surface of the conventional porous marking substrate, said second colorant becomes absorbed by the conventional porous marking substrate, said second colorant being a water-soluble acid dye.

5,534,588

ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITIONS EMPLOYING PHENYL SUBSTITUTED TRIS-FUNCTIONAL KETOXIME SILANES

Jeffrey A. Knepper, Branchburg; Dale R. Flackett, Somerset, and Edward T. Asirvatham, Chatham, all of N.J., assignors to AlliedSignal Inc., Morris County, N.J.

Continuation of Ser. No. 248,615, May 24, 1994, abandoned. This application May 18, 1995, Ser. No. 443,286

Int. Cl.^{6} C08K *5/54*

U.S. Cl. 524—730 **25 Claims**

1. A room temperature vulcanizable composition which is storable and stable in one package when protected from moisture and cures upon exposure to moisture comprising:

(A) at least one polydiorganosiloxane having terminal hydroxyl groups in an amount sufficient to form a silicone composition which is curable to an elastomer upon crosslinking;

(B) at least one phenyl substituted tris-functional ketoximino silane crosslinking agent of the formula: $\mathrm{R{-}Si(OR')_p(ON{=}CR''R''')_{3-p}}$ where R is phenyl, R', R", and R'" are, independently of each other, a saturated straight chain or branched alkyl radical of 1 to 8 carbon atoms and p=0, 1 or 2, said crosslinking agent present in an amount sufficient to crosslink the diorganosiloxane polymer in the presence of moisture;

(C) from about 0 to about 60 weight percent of at least one filler;

(D) from 0 to about 2.5 weight percent of at least one adhesion promoter; and

(E) from 0 to 80 parts by weight of one or more plasticizer per 100 parts by weight of the polydiorganosiloxane which composition, upon curing, has an elongation of from about 700 percent to about 1,800 percent, a modulus value of about 0.4 Mpa or less, a skin over time of about 60 minutes or less, a tack free time of about 120 minutes or less, and a scratch time of about 180 minutes or less.

5,534,589

REPULPABLE PLASTIC FILMS

Patrick J. Hager, and Richard J. Goetz, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 4, 1994, Ser. No. 238,226

Int. Cl.^{6} C08G *63/48;63/91;* **C08L** *29/04*

U.S. Cl. 525—57 **22 Claims**

1. A water dispersible fiber or film for use as an envelope window insert, tape backing said film or fiber comprising:

(a) 0 to 95 parts of a water soluble film forming polymer, and

(b) 5 to 100 parts of a non-tacky, water and solvent insoluble or infusible, film-forming, plastic, and polymeric microsphere having a diameter of at least 1 micron formed from free radically polymerizable monomers where components a) and b) are blended and formed into a water dispersible fiber or film having a tensile strength of at least 1.6 Mpa and said film being usable as an envelope window insert, tape backing.

5,534,590

POLYMER COMPOSITE, ITS MOLDED ARTICLE AND LAMINATE

Takafumi Horile, Kyoto, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan

PCT No. PCT/JP93/00441, § 371 Date Oct. 5, 1993, § 102(e) Date Oct. 5, 1993, PCT Pub. No. WO93/21246, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 5, 1993, Ser. No. 122,571

Claims priority, application Japan, Apr. 9, 1992, 4-117939; Jul. 8, 1992, 4-206004; Oct. 21, 1992, 4-308261

Int. Cl.^{6} C08L *51/04;55/00*

U.S. Cl. 525—71 **18 Claims**

1. A polymer composite comprising a matrix phase and a dispersed phase dispersed in said matrix phase, produced by a process which comprises polymerizing, without employing a substantial amount of a solvent, (1) a styrenic monomer component, in the presence of (2) a rubbery copolymer, and (3) a polyolefin, wherein the component (2) comprises from 50 to 300 parts by weight and the component (3) comprises from 50 to 300 parts by weight, relative to 100 parts by weight of said styrenic monomer component, wherein said matrix phase comprises (i) said polyolefin and (ii) a graft copolymer formed by graft polymerizing said styrenic monomer component onto said polyolefin; wherein said dispersed phase comprises (iii) a polymer of said styrenic monomer component, and (iv) a graft copolymer formed by graft polymerizing said styrenic monomer component onto said rubbery copolymer.

5,534,591
OVERCOAT AND ADHESIVE COMPOSITIONS BASED ON CHLORINATED POLYOLEFINS HAVING HIGH CHLORINE CONTENTS

Hiroyoshi Ozawa, Tokyo; Noboru Kamiya, Saitama-ken, and Ryuji Futaya, Yamanashi-ken, all of, Japan, assignors to Lord Corporation, Cary, N.C.

Division of Ser. No. 180,139, Jan. 11, 1994, Pat. No. 5,492,963. This application Nov. 22, 1995, Ser. No. 561,710
Int. Cl.^{6} C08F *8/32*

U.S. Cl. 525—194 **3 Claims**

1. An adhesive composition comprising a first chlorinated polyolefin, a crosslinking agent for said chlorinated polyolefin, and a second halogenated polymeric material, wherein the chlorinated polyolefin has a chlorine content greater than about 60 percent and a molecular weight greater than about 500.

5,534,592
HIGH PERFORMANCE BLEND FOR TIRE TREADS

Adel F. Halasa, Bath; Wen-Liang Hsu, Akron; David J. Zanzig, Uniontown; Paul H. Sandstrom, Tallmadge; Steven K. Henning, Cuyahaga Falls, all of Ohio, and Danielle Lucas, Weisdorf, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 22, 1995, Ser. No. 531,841
Int. Cl.^{6} C08L *9/00;* **C08K** *5/54*

U.S. Cl. 525—236 **15 Claims**

1. A high performance polybutadiene rubber blend for utilization in manufacturing tire tread compounds which is comprised of (a) a first polybutadiene rubber, (b) a second polybutadiene rubber, and (c) a third polybutadiene rubber; wherein the first polybutadiene rubber, the second polybutadiene rubber, and the third polybutadiene rubber are selected from the group of consisting of super-high vinyl polybutadiene rubbers having a vinyl content which is within the range of 80 percent to 100 percent, high vinyl polybutadiene rubbers having a vinyl content which is within the range of 60 percent to 79 percent, medium vinyl polybutadiene rubbers having a vinyl content which is within the range of 35 percent to 59 percent, and low vinyl polybutadiene rubbers having a vinyl content which is within the range of 8 percent to 34 percent; wherein at least three members selected from the group consisting of super-high vinyl polybutadiene rubbers, high vinyl polybutadiene rubbers, medium vinyl polybutadiene rubbers, and low vinyl polybutadiene rubbers are included in the blend, wherein at least one of the polybutadiene rubbers in the blend has a vinyl content which is within 35 percentage points of the vinyl content of at least one other polybutadiene rubber in the blend, wherein the vinyl content of the first polybutadiene rubber differs from the vinyl content of the second polybutadiene rubber and the third polybutadiene rubber by at least 5 percentage points, wherein the vinyl content of the second polybutadiene rubber differs from the vinyl content of the third polybutadiene rubber by at least 5 percentage points, wherein the blend as a whole has a total vinyl content of at least 40 percent, and wherein the blend contains at least 10 parts of the first polybutadiene rubber, at least 10 parts of the second polybutadiene rubber and at least 10 parts of the third polybutadiene rubber, based upon a total of 100 parts of rubber in the blend.

5,534,593
POLYMETHYLPENTENE/POLYPROPYLENE BLEND AND FILM

Michael Friedman, Wayne, N.J., assignor to Norton Performance Plastics Corporation, Worcester, Mass.

Continuation of Ser. No. 275,927, Jul. 15, 1994, abandoned, which is a continuation of Ser. No. 55,238, Apr. 27, 1993, abandoned. This application May 23, 1995, Ser. No. 447,850
Int. Cl.^{6} C08L *23/12*

U.S. Cl. 525—240 **16 Claims**

1. A release film comprising a blend of:

(A) from about 90% to about 10% by weight of polymethylpentene, wherein the polymethylpentene has a molecular weight from about 200,000 to about 700,000, and a melt flow rate between from about 30 grams/10 minutes to about 200 grams/10 minutes; and

(B) from about 10% to about 90% by weight of polypropylene, wherein the polypropylene has a weight average molecular weight from about 150,000 to about 350,000, and a melt flow rate between from about 1 gram/10 minutes to about 10 grams/10 minutes;

whereby the blend of (A) and (B) has an elongation greater than about 250% and a release load less than about 0.60 lb/in.

5,534,594
PREPARATION OF BUTADIENE-BASED IMPACT MODIFIERS

Edward J. Troy, and Anibal Rosado, both of Bristol, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 5, 1994, Ser. No. 349,645
Int. Cl.^{6} C08F *265/06*

U.S. Cl. 525—310 **11 Claims**

3. A process for preparing a core/shell impact modifier which comprises:

a. polymerizing in emulsion, in a pressure vessel, a first mixture of monomers, comprising at least 40% butadiene, and further comprising at least one polyunsaturated monomer for controlling the crosslinking of the polybutadiene, in the presence of an emulsifier and a free-radical initiator, until 60%–90% conversion of the monomers to polymer and a particle size of 120–240 nm. have been achieved;

b. continuing the polymerization of the first mixture of monomers while adding a second mixture of monomers which mixture comprises at least one of a C_1–C_4 alkyl methacrylate or a vinyl aromatic monomer;

c. continuing the polymerization of the second mixture of monomers to at least 80% conversion to polymer;

d. beginning addition of a third mixture of monomers, which mixture comprises at least one of a C_1–C_4 alkyl methacrylate or a vinyl aromatic monomer; and

e. continuing the polymerization to 60–100% conversion of all monomers present from the second and third monomer mixtures to polymer.

5,534,595
SYNDIOTACTIC PROPYLENE COPOLYMER, PREPARATION OF THE SAME, AND RESIN COMPOSITION CONTAINING THE SAME

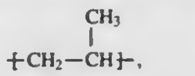
Tadashi Asanuma, Takaishi; Hiroshi Matsuzawa, Atsugi; Tateyo Sasaki, and Kaoru Kawanishi, both of Takaishi, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 270,226, Jul. 1, 1994, abandoned, which is a continuation of Ser. No. 63,057, May 19, 1993, abandoned, which is a continuation of Ser. No. 683,771, Apr. 11, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,316

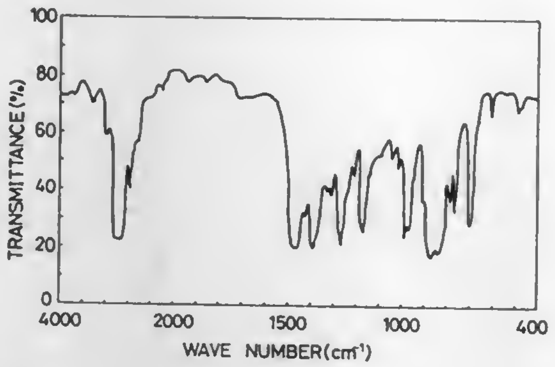
Claims priority, application Japan, Apr. 18, 1990, 2-100386; Jul. 19, 1990, 2-189378; Nov. 28, 1990, 2-323140
Int. Cl.^{6} C08F *4/642;210/06*

U.S. Cl. 525—326.5 **15 Claims**

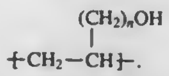
1. A resin composition comprising a polyolefin and a propylene copolymer substantially having a syndiotactic structure which comprises repeating units of the formula (I):



$$-\!\!\left(CH_2-\overset{\overset{\displaystyle CH_3}{|}}{CH}\right)\!\!-,\qquad (I)$$



from 0.01 to 40 mol % of repeating units of the formula (II):



$$-\!\!\left(CH_2-\overset{\overset{\displaystyle (CH_2)_nOH}{|}}{CH}\right)\!\!-.\qquad (II)$$

where n represents 0 or an integer of 1 or more, wherein, of absorption peaks attributed to the methyl groups of the propylene units on an absorption spectrum by ^{13}C-NMR, the intensity of an absorption peak observed at about 20.2 ppm is 0.3 or more of the intensity of absorption peaks of all the methyl groups attributed to the propylene units; the content of the propylene copolymer being from 0.1 to 100% by weight.

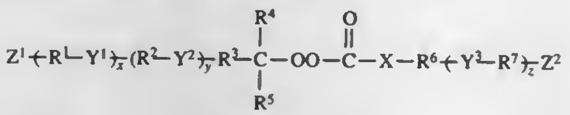
5,534,596
PROCESS FOR POLYMERIZATION REACTIONS WITH FUNCTIONALIZED PEROXIDES

Daryl L. Stein, Bolingbrook, Ill., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 214,938, Mar. 17, 1994, Pat. No. 5,466,855, which is a division of Ser. No. 908,576, Jun. 25, 1992, Pat. No. 5,319,130, which is a continuation of Ser. No. 577,977, Sep. 5, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 467,331
Int. Cl.^{6} C07C *69/96;* **C08L** *33/04*

U.S. Cl. 525—330.3 **12 Claims**

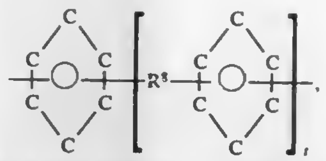
1. A process for polymerizing an unsaturated monomer or unsaturated polymer comprising reacting an unsaturated monomer or unsaturated polymer and about 0.001% by weight to about 50% by weight of a peroxide compound under conditions effective to polymerize the unsaturated monomer or polymer, the unsaturated monomer or unsaturated polymer being selected from the group consisting of ethylenically unsaturated monomers, unsaturated polyester resins, unsaturated elastomer resins, polymers susceptible to graft polymerization and acrylic monomers, and the peroxide compound having the following Formula I:



$$Z^1\!-\!\!\left(R^1\!-\!Y^1\right)_{\!x}\!\left(R^2\!-\!Y^2\right)_{\!y}\!R^3\!-\!\underset{\underset{\displaystyle R^5}{|}}{\overset{\overset{\displaystyle R^4}{|}}{C}}\!-\!OO\!-\!\overset{\overset{\displaystyle O}{\|}}{C}\!-\!X\!-\!R^6\!\left(Y^3\!-\!R^7\right)_{\!z}\!Z^2\qquad I$$

wherein

R^1, R^2, R^6 and R^7 are independently a substituted or unsubstituted alkyl diradical of 1 to 18 carbons, a substituted or unsubstituted cycloalkyl diradical of 5 to 18 carbons, a substituted or unsubstituted bicycloalkyl diradical of 7 to 12 carbons, a substituted or unsubstituted bicycloalkenyl diradical of 7 to 12 carbons, a substituted or unsubstituted alkenyl diradical of 2 to 18 carbons, a substituted or unsubstituted alkynyl diradical of 2 to 18 carbons, a substituted or unsubstituted aralkyl diradical of 7 to 18 carbons, a substituted or unsubstituted naphthyl diradical or a substituted or unsubstituted diradical having the following Formula II:



II

R^3 is a substituted or unsubstituted alkyl diradical of 1 to 18 carbons, a substituted or unsubstituted aralkyl diradical of 7 to 18 carbons, a substituted or unsubstituted naphthyl diradical or the substituted or unsubstituted diradical having the Formula II;

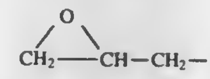
R^4 and R^5 are independently a substituted or unsubstituted alkyl radical of 1 to 10 carbons;

R^8 is a direct bond, —O—, —S—, —S(=O)$_2$—, —C(=O)—, —C(=O)—O—, —O—C(=O)—, —O—C(=O)—O—, —NH—C(=O)—, —C(=O)—NH—, —NH—C(=O)—NH— or a substituted or unsubstituted alkyl diradical of 1 to 6 carbons;

X is —O—;

Y^1, Y^2, and Y^3 are independently —O—, —S—, —S(=O)$_2$—, —C(=O)—, —C(=O)—O—, —O—C(=O)—, —O—C(=O)—O—, —NH—C(=O)—, —C(=O)—NH—, —NH—C(=O)—O—, —O—C(=O)—NH—, —NH—C(=O)—NH—, —C(=O)—C(=O)—, —O—C(=O)—C(=O)—O—, —NH—C(=O)—C(=O)—NH—, —NH—C(=O)—C(=O)—O— or —O—C(=O)—C(=O)—NH—;

Z^1 and Z^2 are independently H$_2$N—, O=C=N—, Cl—C(=O)—, Br—C(=O)—, HO—C(=O)—,



H$_2$N—C(R^9) (R^{10})—(CH$_2$)$_w$—Y^1— or R^{11}—O—C(=O)—;

R^9 and R^{10} are independently hydrogen or a substituted or unsubstituted alkyl radical of 1 to 4 carbons;

R^{11} is an alkyl radical of 1–4 carbons, benzyl or phenyl;

t, x, y and z are independently 0 or 1;

w is an integer from 1 to 12; and

substituents for any of R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9 or R^{10} are independently one or more of chloro, bromo, fluoro, cyano, amino, sulfo, carboxy, nitro, alkoxy of 1 to 12 carbons, alkylamino of 1 to 12 carbons, acyloxy of 1 to 12 carbons, alkenoyloxy of 3 to 12 carbons, alkenoylamino of 3 to 12 carbons, aroyloxy of 7 to 15 carbons, aroylamino of 7 to 15 carbons, phthalimido, alkoxycarbonyloxy of 2 to 13 carbons, alkoxycarbonylamino of 2 to 13 carbons, alkenyloxycarbonyloxy of 3 to 12 carbons, alkenyloxycarbonylamino of 3 to 12 carbons, aryloxycarbonyloxy of 7 to 15 carbons, alkylaminocarbonyloxy of 2 to 13 carbons, arylaminocarbonyloxy of 7 to 15 carbons, aralkylaminocarbonyloxy of 7 to 16 carbons, alkylsulfonyloxy of 1 to 8 carbons, alkylsulfonylamino of 1 to 8 carbons, arylsulfonylamino of 6 to 11 carbons or epoxyalkoxycarbonyl of 2 to 13 carbons.

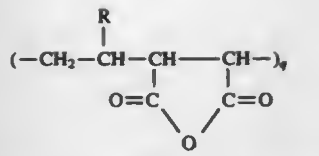
5,534,597
WATER INSOLUBLE CROSS-LINKED ACID COMPOSITIONS

John Krupey, Glen Rock, N.J., assignor to Affinity Technology, Inc., New Brunswick, N.J.

Division of Ser. No. 207,274, Mar. 7, 1994, Pat. No. 5,453,493, which is a continuation-in-part of Ser. No. 854,302, Apr. 30, 1992, Pat. No. 5,294,681. This application Jun. 2, 1995, Ser. No. 459,252
Int. Cl.^{6} C08F *8/30;8/12*

U.S. Cl. 525—327.6 **5 Claims**

1. A water insoluble cross-linked polyhydroxy polycarboxylic acid obtained by cross-linking a polymer of the formula:

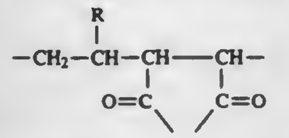


wherein R is hydrogen or lower alkylene or lower alkoxy of 1–4 carbon atoms, or phenyl,and q is an integer of 7 to 10,000, with an alpha, omega diaminohydroxy alkane of the formula:

$H_2N.[(H)_p(CH)_z\text{-}(OH)_m].NH_2$

wherein z is an integer of 1–4, p is 0 or an integer up to z–1, m is 1 or an integer up to z, and hydrolyzing the unreacted anhydride groups, wherein the ratio of the initially charged diaminohydroxyalkane to the initially charged poly (alkylene maleic anhydride) is between about 1 and about 200 to 1 mol/mol, said water insoluble cross-linked polyhydroxy polycarboylic acid being selected from the group consisting of such acids having at least two strands each having a strand skeleton of formula III:

III

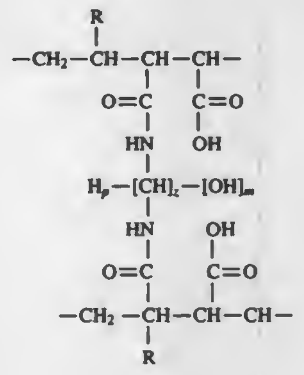


wherein one carbonyl group of at least one maleoyl moiety thereof in each strand is covalently linked to a

$—HN.[(H)_p(CH)_z\text{-}(OH)_m].NH—$

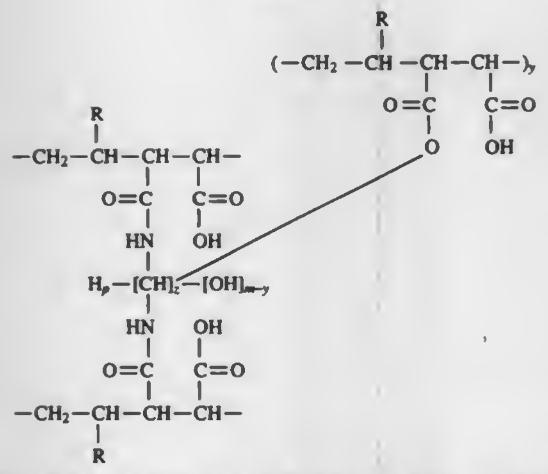
moiety to provide the presence therein of cross linking moieties of the formula:

V



and

VI



wherein R, z, p and m are as defined above, and y is an integer up to m, and the esters thereof with the anhydride corresponding to the skeleton of formula III, wherein the ratio of cross-links to poly (alkylene carbonic acid) strands is between about 1 and about 200 to 2.

5,534,598

HYDROXY-FUNCTIONAL ACRYLATE RESINS

Shao-Hua Guo, West Goshen, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 341,823, Nov. 18, 1994, Pat. No. 5,475,073. This application Jun. 6, 1995, Ser. No. 467,342

Int. Cl.^{6} C08F *16/04;* **C08L** *29/08;29/06;63/00*

U.S. Cl. 525—329.2 **6 Claims**

1. A thermoset polymer which comprises the reaction product of:

(a) a low-molecular-weight, hydroxy-functional acrylate resin which comprises

recurring units of:

(1) an allylic alcohol;

(2) a C_1–C_{20} alkyl or aryl acrylate or methacrylate monomer; and

(3) optionally, one or more ethylenic monomers selected from the group consisting of vinyl aromatic monomers, unsaturated nitriles, vinyl esters, vinyl ethers, vinyl halides, vinylidene halides, unsaturated anhydrides, unsaturated dicarboxylic acids, acrylic and methacrylic acids, acrylamide and methacrylamide, and conjugated dienes;

wherein the acrylate resin has a hydroxyl number within the range of about 20 to about 500 mg KOH/g, and a number average molecular weight within the range of about 500 to about 10,000; and

(b) a member selected from the group consisting of:

(1) a melamine resin, to produce a melamine thermoset;

(2) a di- or polyisocyanate or an isocyanate-terminated prepolymer, to produce a polyurethane;

(3) an epoxy resin, to produce an epoxy thermoset;

(4) an anhydride, to produce a thermoset polyester;

(5) a styrene-maleic anhydride copolymer, to produce a crosslinked polymeric resin;

(6) a fatty acid and a low-molecular-weight polyol, to produce an alkyd; and

(7) a fatty acid, a low-molecular-weight polyol, and a di- or polyisocyanate, to produce a polyurethane-modified alkyd.

5,534,599

TIRE WITH SILICA REINFORCED RUBBER TREAD

Paul H. Sandstrom, Tallmadge; David J. Zanzig, Uniontown, and Mark S. Sinsky, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 10, 1995, Ser. No. 402,427

Int. Cl.^{6} C08C *19/25;* **B60C** *5/00*

U.S. Cl. 525—342 **1 Claim**

1. A vulcanized tire prepared by preparing an assembly of a tire of sulfur vulcanizable rubber with a tread of rubber composition and vulcanizing the assembly at a temperature in a range of about 135° C. to about 180° C.; wherein said rubber composition for said tread is prepared in at least two sequential mixing steps which comprise:

(A) thermomechanically mixing in at least one individual preparatory mixing step at a temperature in a range of about 140° C. to about 190° C. for a total mixing time of about 4 to about 12 minutes;

(i) 100 parts by weight of at least one sulfur vulcanizable elastomer selected from conjugated diene homopolymers and copolymers and from copolymers of at least one conjugated diene and aromatic vinyl compound,

(ii) about 30 to about 100 phr of particulate precipitated silica,

(iii) about 0.01 to about 0.2 parts by weight per part by weight of said silica of bis-(3-triethoxysilylpropyl)polysulfide where the sulfide bridge portion contains 2 to 8 connecting sulfur atoms in which the average polysulfide bridge contains about 4.5 to about 5.5 sulfur atoms and in which at least 75 percent of the polysulfide bridge portion contains at least 3 sulfur atoms, and

(iv) about 0.01 to about one part of at least one of elemental sulfur and polymeric sulfur by weight per part of silane coupling agent;

(B) subsequently blending therewith in a final, individual thermomechanical mixing step at a temperature in a range of about 100° C. to about 130° C. for a time of about 1 to about 3 minutes, about 0.5 to about 5 phr elemental and/or polymeric sulfur and at least one sulfur vulcanization accelerator, provided, however, that the total of sulfur added to the rubber mixture, including the aforesaid sulfur added in a preparatory mixing stage(s) is in a range of about 1.0 to about 8 phr.

5,534,600

EXTRUDABLE THERMOPLASTIC COMPOSITION COMPRISING A COMPATIBILIZED POLYPHENYLENE ETHER POLYAMIDE RESIN BLEND

Christiaan M. E. Bailly, Kalmthout, Belgium, and Christiaan H. J. Koevoets, DJ Roosendaal, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 23, 1994, Ser. No. 294,705

Claims priority, application European Pat. Off., Mar. 25, 1994, 94104746.6

Int. Cl.^{6} C08L *77/00;71/00*

U.S. Cl. 525—397 **12 Claims**

1. An extrudable thermoplastic composition comprising a compatibilized polyphenylene ether-polyamide resin blend, wherein the polyphenylene ether has an intrinsic viscosity of more than 45 ml/g as measurred in toluene at 25 degrees C. and a concentration of 0.6 gram per 100 ml and wherein the polyamide has a reduced viscosity of more than 175 ml/g as measured in sulphuric acid in accordance with ISO 307 wherein said polyamide is a polyamide 6,6.

5,534,601

POLYISOCYANATE-MODIFIED DICARBOXYLIC (POLY) ANHYDRIDES

Knud Reuter, Krefeld; Walter Schäfer, Leichlingen; Hanns P. Müller, Odenthal; Hans-Ulrich Meier-Westhues, Leverkusen; Lothar Kahl, Bergisch Gladbach, and Manfred Bock, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 19, 1995, Ser. No. 504,159

Claims priority, application Germany, Aug. 1, 1994, 44 27 225.1

Int. Cl.^{6} C08G *18/34*

U.S. Cl. 525—424 **4 Claims**

1. A polyisocyanate-modified dicarboxylic (poly)anhydride which is solid below 40° C., liquid above 120° C. and based on the reaction product of an organic polyisocyanate with more than equivalent quantities, based on the NCO/COOH reaction, of a dicarboxylic (poly)anhydride containing free carboxyl groups and optional subsequent modification of the reaction product with less than equivalent quantities, based on the anhydride groups, of anhydride-reactive amino and/or hydroxyl groups.

5,534,602

HIGH TEMPERATURE POLYETHER IMIDE COMPOSITIONS AND METHOD FOR MAKING

John H. Lupinski, and Herbert S. Cole, Jr., both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 546,964, Jul. 2, 1990, abandoned. This application Apr. 19, 1993, Ser. No. 47,531

The portion of the term of this patent subsequent to Dec. 2, 2013, has been disclaimed.

Int. Cl.^{6} C08L *77/00*

U.S. Cl. 525—432 **1 Claim**

1. A blend of 2,2-bis[4-(3,4-dicarboxyphenoxy)phenyl] propane/bis(4-aminophenyl) sulfone polyetherimide and 3,3', 4,4'-tetracarboxybipbenyl/bis(4-aminophenyl) sulfone polyimide.

5,534,603

Patent Not Issued For This Number

5,534,604

COPOLYMERS BASED ON ETHYLENICALLY UNSATURATED DICARBOXYLIC ANHYDRIDES, LONG-CHAIN OLEFINS AND FLUOROOLEFINS

Michael Bildhauer, Neu-Isenburg; Rainer Kupfer, Hattersheim; Günther Siebott, Frankfurt am Main; Bernhard Mees, Eppstein, and Herbert Friedrich, Heusenstamm, all of, Germany, assignors to Hoechst, Frankfurt am Main, Germany

Filed May 5, 1995, Ser. No. 436,156

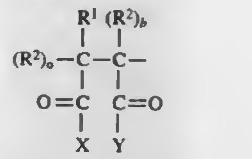
Claims priority, application Germany, May 10, 1994, 44 16 415.7

Int. Cl.^{6} C08F *14/18*

U.S. Cl. 526—253 **4 Claims**

1. A copolymer comprising:

a) 10 to 60% by weight of bivalent structural units of the formula A



(A)

wherein

R^1 and R^2, independently of one another, are hydrogen or C_1–C_6-alkyl,

a and b are zero or one and a+ b is one,

X and Y are identical or different and are

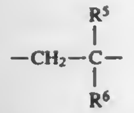
i) the group —NR—HR^3, where R^3 is C_1–C_{40}-alkyl, C_3–C_{40}-alkenyl, C_5–C_{20}-cycloalkyl or C_6–C_{18}-aryl,

ii) the group —N—R^3)$_2$; where R^3 are identical or different and have the abovementioned meaning,

iii) the group —O—R^4, where R^4 is hydrogen, an alkali metal cation, one equivalent of an alkaline earth metal ion, a cation of the formula $H_2N^{\oplus}(R^3)_2$ or $H_3N^{\oplus}R^3$, C_1–C_{40}-alkyl, C_5–C_{20}-cycloalkyl or C_6–C_{18}-aryl, or

iv) mixtures of i), ii) or iii),

b) 30 to 89% by weight of bivalent structural units of the formula B



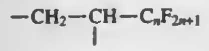
$$-CH_2-\overset{R^5}{\underset{R^6}{C}}-\qquad (B)$$

wherein

R^5 is hydrogen or C_1–C_4-alkyl and

R_6 is C_6–C_{40}-alkyl or C_6–C_{18}-aryl, and

c) 1 to 20% by weight of bivalent structural units of the formula C



$$-CH_2-\underset{|}{CH}-C_nF_{2n+1}\qquad (C)$$

wherein

n is a number from 6 to 24.

5,534,605

HYDROPHILIC OXYGEN PERMEABLE POLYMERS

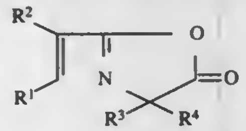
Ronald E. Bambury, Fairport, N.Y., and Dong J. Choo, Seoul, Rep. of Korea, assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 947,080, Sep. 17, 1992, Pat. No. 5,357,013, which is a continuation of Ser. No. 479,316, Feb. 13, 1990, which is a division of Ser. No. 153,901, Feb. 9, 1988, Pat. No. 4,910,277. This application Jul. 20, 1994, Ser. No. 277,464

Int. Cl.^{6} C08F *226/06;* **G02C** *7/04*

U.S. Cl. 526—260 **3 Claims**

1. An article of manufacture that is shaped as a contact lens and made of a polymeric material formed by polymerizing a mixture comprising a compound represented by the general formula



where R^1 and R^2 independently denote a hydrogen atom or a lower alkyl radical with one to six carbon atoms, and R^3 and R^4 independently denote alkyl radicals with one to six carbon atoms or a cycloalkyl radical with five or six carbon atoms.

5,534,606

RIGID CYCLOOLEFIN COPOLYMER FILM

Cynthia Bennett, Alzey; Michael-Joachim Brekner, Frankfurt am Main; Otto Herrmann-Schoenherr, Bensheim, and Frank Osan, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 14, 1994, Ser. No. 195,084

Claims priority, application Germany, Feb. 12, 1993, 43 04 308.9

Int. Cl.^{6} C08F *32/08*

U.S. Cl. 526—281 **17 Claims**

1. A film having at least one layer in which at least one of said layers comprises a non-ring opening cycloolefin copolymer, wherein the cycloolefin copolymer has an intrinsic E modulus (E_i) satisfying the following relation:

$$E_i=(0.0025[GPa/^{\circ}C.]\times T_g[^{\circ}C.])+B[GPa]$$

where B=2.93–3.19 and T_g is the glass transition temperature of the cycloolefin copolymer.

5,534,607

GAS PHASE POLYMERISATION PROCESS

Andre Martens, Martigues; Frederic R. M. M. Morterol, Sausset-Les-Pins, and Charles Raufast, Martigues, all of, France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 320,838, Oct. 7, 1994, abandoned, which is a continuation of Ser. No. 95,360, Jul. 21, 1993, abandoned, which is a continuation of Ser. No. 746,474, Aug. 16, 1991, abandoned. This application May 31, 1995, Ser. No. 454,616

Claims priority, application France, Aug. 31, 1990, 90 11058

Int. Cl.^{6} C08F *2/34*

U.S. Cl. 526—88 **13 Claims**

1. A continuous process for the polymerization of an alpha-olefin having from 2 to 12 carbon atoms, which is carried out in the absence of a retarder in a gas phase polymerization reactor by bringing a gaseous reaction mixture, comprising the alpha-olefin to be polymerized, into contact with a catalyst system of the Ziegler-Natta type consisting of a solid catalyst comprising at least one compound of a transition metal belonging to groups IV, V, or VI of the Periodic Table of the elements, and of a cocatalyst comprising at least one organometallic compound of a metal belonging to groups II or III of the Periodic Table, said process being characterized in that the polymerization reactor is continuously fed with alpha-olefin at a constant rate, and in that the total pressure of the gaseous reaction mixture is from 0.5 to 5 MPa and can vary between a predetermined maximum pressure and a predetermined minimum pressure and the polymerization rate is regulated by variations in the partial pressure of the alpha-olefin in the polymerization reactor.

5,534,608

SYNTHESIS OF LOW SILANOL CONTENT, TRIORGANO-STOPPED SILICONE FLUIDS

Dennis P. Thompson, Clifton Park, N.Y.; Patricia P. Anderson, Williamstown, Mass., and Donald Slick, Clifton Park, N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 91,898, Jul. 15, 1993, Pat. No. 5,408,025. This application Jan. 30, 1995, Ser. No. 380,267

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 528—12 **5 Claims**

1. A process for preparing linear triorganosiloxy-terminated organopolysiloxane fluids consisting essentially of

(1) feeding a mixture of linear polydiorganosiloxanediols and cyclic polyorganosiloxanes said mixture comprising a diorganodichlorosilane hydrolyzate wherein said mixture has a content of cyclic polyorganosiloxanes greater than about 14 weight percent and a silanol content greater than about 1000 ppm by weight to a reaction zone comprising:
  (a) a fixed bed of equilibration, catalyst;
  (a') a fixed bed of equilibration catalyst in the presence of a hexaorganodisiloxane chain stopper; or
  (a") a condensation/disproportionation catalyst in the presence of a hexaorganodisiloxane chain stopper; until a first stage product is obtained and
(2) thereafter
  (b) feeding the first stage product of step (a) to a reaction zone comprising a condensation/disproportionation catalyst and hexaorganodisiloxane chain stopper;
  (b') feeding the first stage product of step (a') to a reaction zone comprising a condensation/disproportionation catalyst; or
  (b") feeding the first stage product of step (a") to a reaction zone comprising a fixed bed of equilibration catalyst; wherein said condensation/disproportionation catalyst is selected from the group consisting of:
  (i) phosphonitrilic halides;
  (ii) linear oligomeric phosphonitrilic halides;
  (iii) a reaction product between the group consisting of phosphonitrilic halides and linear oligomeric phosphonitrilic halides and the group consisting of water, alcohols, carboxylic acids, an organopolysiloxane that will react with said phosphonitrilic halide and an organosilane that will react with said phosphonitrilic halide; and
  (iv) mixtures thereof; whereby a low molecular weight triorganosiloxy terminated oil mixture having no more than about 14–16% by weight cyclic polyorganosiloxane and a silanol content below about 200 ppm by weight is produced.

5,534,609

POLYSILOXANE COMPOSITIONS

Kenrick M. Lewis, Rego Park, and Eugene C. Ward, Lake Carmel, both of N.Y., assignors to OSi Specialties, Inc., Tarrytown, N.Y.

Filed Feb. 3, 1995, Ser. No. 383,092

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 528—15 **48 Claims**

1. A composition that comprises:

(A) a polydiorganosiloxane that contains at least two unsaturated hydrocarbon groups per molecule,

(B) a polyorganohydrosiloxane that has at least three Si—H bonds per molecule,

(C) a compound that has at least one $—SiH_3$ group,

wherein the amount of (A) is between about 10 wt. % and 95 wt. %, the amount of (B) is between about 0.1 wt. % and about 50 wt. %, the amount of (C) is between about 0.01 wt. % and about 5.0 wt. %, the amounts of (A)–(C) being relative to each other; and

(D) an effective amount of hydrosilation catalyst.

5,534,610

SOLVENTLESS TWO COMPONENT PRIMER COMPOSITION FOR IMPROVED ADHESION OF RTV SILICONE ELASTOMERS TO SUBSTRATES

Brian P. Bayly, Middle Grove; Gary M. Lucas, Scotia, and Van W. Stuart, Clifton Park, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 400,938, Mar. 8, 1995. This application Jun. 30, 1995, Ser. No. 497,131

Int. Cl.^{6} C08G *77/26*

U.S. Cl. 528—38 **4 Claims**

1. A primer composition for room temperature vulcanizable silicone elastomers consisting essentially of a low viscosity dimethylsiloxane oligomer end capped with amino-ethyl-amino-propyl-dimethoxysiloxyl having the formula:

$$(NH_2(CH_2)_2NH(CH_2)_3)Si(OCH_3)_2O—)_2—(Si(CH_3)_2O—)_x$$

where x varies from about 6 to about 12 whereby cured room temperature vulcanizable silicone elastomers may be painted after said primer has been applied to said cured silicone elastomer.

5,534,611

SULFONATED AND CARBOXYLATED AMINOETHYLENEPHOSPHONIC ACID AND AMINOBIS (METHYLENE) PHOSPHINIC ACID

David A. Huddleston, Sugar Land, and Robert K. Gabel, Houston, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

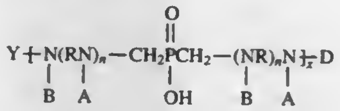
Continuation-in-part of Ser. No. 143,017, Oct. 29, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,142

Int. Cl.^{6} C08G *8/04;14/02;8/28*

U.S. Cl. 528—129 **19 Claims**

1. A composition prepared by:

1. reacting a polyethylene polyamine with a compound selected from the group consisting of sulfoalkylation agents and carboxymethylation agents to form a sulfoalkylated or carboxylated polyamine;
2. reacting said sulfoalkylated or carboxyalkylated polyamine with formaldehyde and a hypophosphorous acid selected from the group consisting of hypophosphorous acid or its water soluble salts to form linked sulfoalkylated or carboxyalkylated polyamines; and then,
3. phosphonomethylating the linked sulfoalkylated and or carboxyalkylated polyamines, said composition having the following formula:



$$Y\left[\underset{B}{N}(R\underset{A}{N})_n-CH_2\underset{OH}{\overset{\overset{O}{\|}}{P}}CH_2-(\underset{B}{N}R)_n\underset{A}{N}\right]_x D$$

wherein the group $N(RN)_n$ is a polyamine in which R is alkyl containing 2 to 6 carbon atoms or, taken with N is a piperazinyl radical, with n being a whole number of from 1–15; A, B, D and Y are the same or different and are independently selected from the group consisting of:

a. hydrogen;
b. carboxylic acid containing groups selected from the groups consisting of: alkyl substituted alkylene carboxylic acids containing 1 to 6 carbon atoms or salts thereof;
c. sulfonic acid containing groups selected from the group consisting of: methylene, ethylene and propylenesulfonic acid or salts thereof; 2-hydroxypropylsulfonic acid and salts thereof; 2-acrylamido-2-methyl propanesulfonic acid and salts thereof;
d. methylenephonsphinic acid and salts thereof; and
e methylenephosphonic acid or its salts thereof;

wherein x is a whole number of from 1 to 20, and A,B,D, and Y taken together include per each mole of said polyamine, at least 0.5 mole of methylene phosphonic acid or salts thereof and at least 0.5 mole of a compound selected from the group consisting of said sulfonic acid containing groups or said carboxylic acid containing groups.

5,534,612

GLASS FIBER BINDING COMPOSITIONS, PROCESS OF MAKING GLASS FIBER BINDING COMPOSITIONS, PROCESS OF BINDING GLASS FIBERS, AND GLASS FIBER COMPOSITIONS

Thomas J. Taylor, and William H. Kielmeyer, both of Englewood, Colo., assignors to Schuller International, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 886,668, May 19, 1992. This application May 19, 1993, Ser. No. 64,759

Int. Cl.^{6} C08G *8/04*

U.S. Cl. 528—129 **14 Claims**

1. A method of making a glass fiber binding composition, comprising the steps of:

providing an effective binding amount of an acidic furan resin;

providing a source of reactable formaldehyde;

mixing a formaldehyde scavenger with the furan resin in the presence of the source of reactable formaldehyde to form a first mixture;

heating the first mixture to a temperature of less than 100 degrees C. for period of from 1 to 10 hours;

adding a source of ammonia to the first mixture to form a second mixture;

heating the second mixture to a temperature of less than 100 degree C. for a period of from 1 to 10 hours; and

adding sufficient water to form a binding composition having from 0.5 to 80% nonvolatile.

5,534,613
BENZOBISAZOLE POLYMERS CONTAINING TRIARYLAMINO MOIETIES

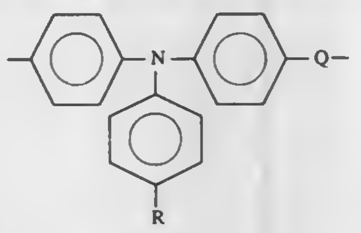
Loon-Seng Tan, Centerville, and Kasturi R. Srinivasan, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 26, 1995, Ser. No. 380,177

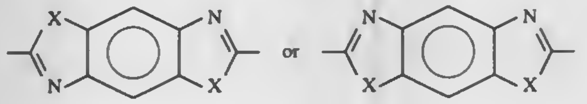
Int. Cl.^{6} C08G *63/00*

U.S. Cl. 528—176 **11 Claims**

1. A polymer having repeating units of the formula:



wherein R is selected from the group consisting of —H, —CH_3, —$N(CH_3)_2$ and —OH, and Q is



wherein X is —S— or —O—.

5,534,614
METHOD FOR THE PREPARATION OF AMIDE OLIGOMERS AND POLYBENZAZOLE POLYMERS THEREFROM

James J. O'Briem, and Edmund P. Woo, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 33,680, Mar. 16, 1993, Pat. No. 5,322,916. This application Mar. 28, 1994, Ser. No. 218,475

Int. Cl.^{6} C08G *69/00;69/44*

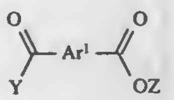
U.S. Cl. 528—183 **9 Claims**

1. A method for preparing a polyamide precursor of a polybenzazole polymer, which method comprises reacting together:

(a) an aromatic bis(alkenyl)ester;

(b) an aromatic diamine having ring closing functional groups MR" ortho to each amine group, wherein MR" is halogen, or M is oxygen, sulfur NH, or NR", and R" is hydrogen, alkyl or inertly substituted alkyl, aryl or inertly substituted aryl, acyl, or aroyl, alkoxycarbonyl, aryloxycarbonyl, or trialkylsilyl; and

(c) a derivative of an aromatic dicarboxylic acid represented by the formula:



wherein Z is hydrogen or alkenyl and Y is either chloride or imidazolide and Ar^1 is aromatic or inertly or essentially inertly substituted aromatic.

5,534,615
CARDIAC HYPERTROPHY FACTOR AND USES THEREFOR

Joffre Baker, El Granada; Kenneth Chien, La Jolla; Kathleen King, Pacifica; Diane Pennice, Burlingame, and William Wood, San Mateo, all of Calif., assignors to Genentech, Inc., South San Francisco, and The Regents of the University of California, Oakland, both of Calif.

Filed Apr. 25, 1994, Ser. No. 233,609

Int. Cl.^{6} C07K *1/00;* **A61K** *35/14;35/30*

U.S. Cl. 530—350 **1 Claim**

1. Isolated CHF having the translated CHF amino acid sequence (SEQ ID NO: 3) shown in FIG. 1.

5,534,616
POLYHYDROXYALKANOATES AND FILM FORMATION THEREFROM

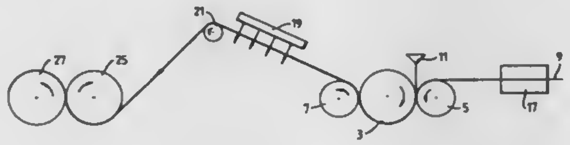
Simon D. Waddington, Cambridge, Mass., assignor to Zeneca Limited, London, England

Filed Jul. 13, 1995, Ser. No. 491,929

Claims priority, application United Kingdom, Jan. 13, 1993, 9300554

Int. Cl.^{6} C08J *5/18;* **B29D** *7/00;* **C08L** *67/00*

U.S. Cl. 558—503 **11 Claims**



1. A process for preparing a film of a polyhydroxyalkanoate polymer, the process comprising applying a layer of molten polyhydroxyalkanoate to a surface not substantially above the glass transition temperature of the polymer so as to form a film and subsequently raising the temperature of the film so formed towards the optimum temperature for growth of the polymer's crystallites.

5,534,617
HUMAN GROWTH HORMONE VARIANTS HAVING GREATER AFFINITY FOR HUMAN GROWTH HORMONE RECEPTOR AT SITE 1

Brian C. Cunningham, Piedmont; Henry Lowman, Hercules, and James A. Wells, Burlingame, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 960,227, Oct. 13, 1992, abandoned, and Ser. No. 50,058, Apr. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 743,614, Aug. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 715,300, Jun. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 683,400, Apr. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 621,667, Dec. 3, 1990, abandoned, said Ser. No. 960,227is a continuation of Ser. No. 875,204, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 428,066, Oct. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 264,611, Oct. 28, 1988, abandoned. This application May 25, 1993, Ser. No. 67,160

Int. Cl.^{6} C07K *14/61;* **A61K** *38/25;* **C12P** *21/06*

U.S. Cl. 530—399 **4 Claims**

1. A human growth hormone variant having at least one amino acid substitution selected from the group consisting of the lysine at position 41 and the leucine at position 45 of native human growth hormone, numbered from the mature N-terminus of native human growth hormone.

5,534,618
POLYETHERS CONTAINING HINDERED AMINES WHICH CAN BE CLEAVED OFF AS STABILIZERS

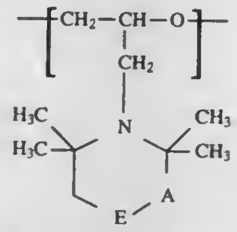
Alfred Steinmann, Praroman, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jul. 7, 1994, Ser. No. 271,703

Int. Cl.^{6} C08G *65/04*

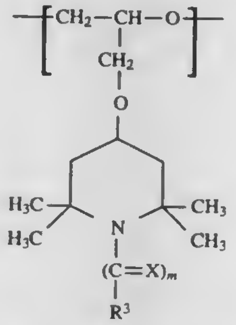
U.S. Cl. 528—419 **6 Claims**

1. A polyether comprising 1–100 mol % of recurring units of the formula I



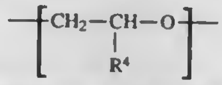
(I)

and 0–99 mol % of structural units selected from the group consisting of units of the formula II



(II)

and units of of the formula III



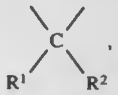
$$-\!\!\left[CH_2-\underset{\displaystyle R^4}{\underset{|}{CH}}-O\right]\!\!-,\qquad \text{(III)}$$

where the molecular weight M_n of the homopolymer or copolymer, measured by gel permeation chromatography, is from 600 to 600,000 g/mol, and in which

m is 0 or 1;

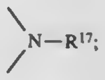
A is —CH_2— or —CO—;

when A is methylene, E is



and

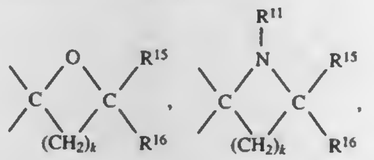
when A is carbonyl, E is



R^1 is hydrogen;

R^2 is hydrogen; —O—R^5; —S—R^5; or —N(R^{13})R^{14}; or

R^1 and R^2 together are a =O substituent or together with the carbon atom to which they are bonded are a five- or six-membered ring of the formulae



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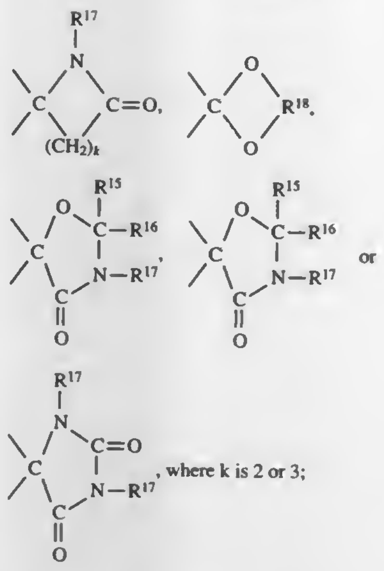


R^3, in the case where m is 0 or 1, is C_1–C_{36}alkyl or C_7–C_{36}aralkyl, each of which is unsubstituted or substituted by C_5–C_8cycloalkyl and/or is interrupted in the aliphatic part by C_5–C_8cycloalkylene and/or in the aliphatic part by oxygen or sulfur or —NR^{11}— and/or is substituted in the aromatic part by 1 to 3 C_1–C_4alkyl or C_1–C_4alkoxy radicals;

C_5–C_{12}cycloalkyl which is unsubstituted or substituted by 1 to 4 C_1–C_4alkyl and/or C_1–C_4alkoxy radicals; C_6–C_{10}aryl which is unsubstituted or substituted by 1 to 4 C_1–C_4alkyl and/or C_1–C_4alkoxy radicals; and

R^3, in the case where m is 0, can alternatively be hydrogen; C_1–C_{36}alkoxy or C_7–C_{36}aralkoxy, each of which is unsubstituted or substituted by C_5–C_8cycloalkyl and/or is interrupted in the aliphatic part by C_5–C_8cycloalkylene and/or in the aliphatic part by oxygen or sulfur or —NR^{11}— and/or is substituted in the aromatic part by 1 to 3 C_1–C_4alkyl or C_1–C_4alkoxy radicals; C_5–C_{12}cycloalkoxy which is unsubsdtuted or substituted by 1 to 4 C_1–C_4alkyl and/or C_1–C_4alkoxy radicals; or C_6–C_{10}aryloxy which is unsubstituted or substituted by 1 to 4 C_1–C_4alkyl and/or C_1–C_4alkoxy radicals;

R^4 is as defined below for R^5 or is —O—R^5, —CH_2—O—R^5 or hydrogen;

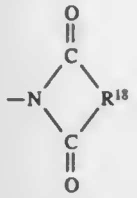
R^5 is C_1–C_{50}alkyl; or C_2–C_{50}alkyl which is interrupted by —O—, —S— and/or C_5–C_8cycloalkylene; or R^5 is C_5–C_{12}cycloalkyl which is unsubstituted or substituted by 1 to 4 —R^{12}; C_6–C_{10}aryl which is unsubstituted or substituted by 1 to 4 —R^{12} or —OR ^{12}; or C_7–C_{50}aralkyl which is unsubstituted or substituted by C_5–C_8cycloalkyl and/or is interrupted in the aliphatic part by C_5–C_8cycloalkylene and/or is interrupted in the aliphatic part by oxygen or sulfur and/or is substituted in the aromatic part by 1 to 4 —R^{12} or —OR^{12};

R^{11} is C_1–C_{18}alkyl; C_5–C_8cycloalkyl; phenyl; naphthyl; C_7–C_9phenylalkyl; or C_{11}–C_{14}naphthylalkyl;

R^{12} is C_1–C_{18}alkyl; C_5–C_7cycloalkyl; phenyl or benzyl;

R^{13} and R^{14}, independently of one another, each have one of the meanings given for R^5; or

R^{13} and R^{14}, together with the nitrogen atom to which they are bonded, are cyclic imide of the formula



whose ring structure contains 4 to 6 carbon atoms;

R^{15} and R^{16}, independently of one another, are H; or C_1–C_{12}alkyl; or together are straight-chain, α,ω-linked C_4–C_{13}alkylene;

R^{17} has one of the meanings for R^{11};

R^{18} is C_2–C_{18}alkylene; and

X is an oxygen or sulfur atom.

5,534,619

PEPTIDES FOR HEPARIN AND LOW MOLECULAR WEIGHT HEPARIN ANTICOAGULATION REVERSAL

Thomas W. Wakefield; James C. Stanley, and Philip C. Andrews, all of Ann Arbor, Mich., assignors to The Board of Regents acting on behalf of University of Michigan, Ann Arbor, Mich.

Filed Nov. 12, 1993, Ser. No. 152,488

Int. Cl.^{6} A61K *38/00;* **C07K** *14/00*

U.S. Cl. 530—324 **28 Claims**

1. A synthetic peptide having a sequence of 20–40 uncharged and charged amino acids having a total cationic charge of less than [+21], but not lower than [+14], as determined by the number of positively charged amino acids in the sequence, the uncharged amino acids being selected from the group consisting of glycine, glutamine, serine, threonine, asparagine, proline, valine, and isoleucine, and the ability to at least partially reverse the effects of heparin anticoagulation.

5,534,620

METHOD OF HETEROGENOUS PURIFICATION USING A BIDENTATE CONJUGATE

Chan S. Oh, Diamond Bar, and Elizabeth K. Kearns, Chino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 984,171, Nov. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 536,058, Jun. 8, 1990, Pat. No. 5,196,351, which is a continuation of Ser. No. 103,237, Sep. 30, 1987, abandoned. This application May 25, 1995, Ser. No. 450,652

Int. Cl.^{6} C07K *1/22;* **C12N** *11/00;11/06;* **G01N** *33/547*

U.S. Cl. 530—413 **17 Claims**

1. A heterogenous purification method with a solid phase and a liquid phase, the method comprising the sequential steps of:

(a) providing a bidentate conjugate comprising a first bidentate member attached to a second bidentate member through a spacer moiety wherein the spacer moiety comprises between about 16 atoms and about 22 atoms and the spacer moiety has a length between about 21 Å and about 29 Å, said first and second bidentate members being different small molecule ligands, each of the ligands being capable of specifically binding to their respective and different first and second macromolecular specific binding partners;

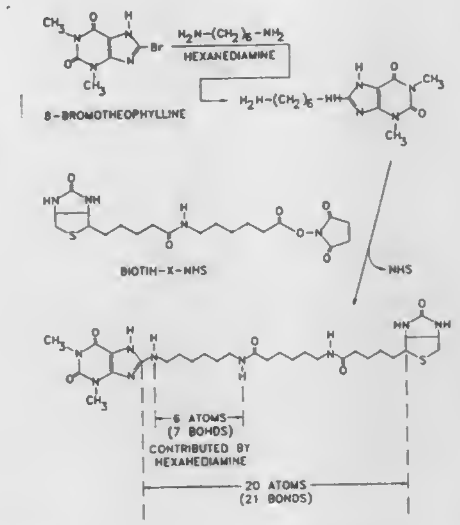
(b) immobilizing said bidentate conjugate on a solid phase;

(c) contacting the immobilized bidentate conjugate with a liquid phase comprising a first macromolecular specific binding partner capable of adhering in a specific binding affinity reaction to the bidentate conjugate;

(d) separating the immobilized bidentate conjugate with the adhered first macromolecular specific binding partner from contact with the liquid phase;

(e) eluting from said bidentate conjugate a first macromolecular specific binding partner with a substantially undiminished biological activity as compared to the biological activity of the first macromolecular specific binding partner prior to adherence to the bidentate conjugate, thereby obtaining a purified first macromolecular binding partner; and

(f) regenerating the solid phase to thereby render it reusable for the purification of additional first macromolecular binding partner.



5,534,621

IMMUNOAFFINITY PURIFICATION METHODS USING SINGLE POLYPEPTIDE CHAIN BINDING MOLECULES

Robert C. Ladner, Ijansville; Robert E. Bird, Rockville, and Karl Hardman, Chevy Chase, all of Md., assignors to Enzon Labs, Inc., Piscataway, N.J.

Division of Ser. No. 40,440, Apr. 1, 1993, Pat. No. 5,455,030, which is a division of Ser. No. 512,910, Apr. 25, 1990, Pat. No. 5,260,203, which is a division of Ser. No. 299,617, Jan. 19, 1989, Pat. No. 4,946,778, which is a continuation-in-part of Ser. No. 92,110, Sep. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 902,971, Sep. 2, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 468,992

Int. Cl.^{6} C07K *1/22;16/00*

U.S. Cl. 530—413 **15 Claims**

1. In a method of immunoaffinity purification which utilizes an antibody therefor, the improvement which comprises using in place of said antibody a single polypeptide chain binding molecule which comprises:

(a) a first polypeptide comprising the antigen binding portion of the light chain variable region of an antibody;

(b) a second polypeotide comprising the antigen binding portion of the heavy chain variable region of an antibody; and

(c) at least one peptide linker linking said first and second polypeptides (a) and (b) into a single chain polypeptide having binding affinity for said antigen.

5,534,622

RARE EARTH CRYPTATES, PROCESSES FOR THEIR PREPARATION, SYNTHESIS INTERMEDIATES AND APPLICATION AS FLUORESCENT TRACERS

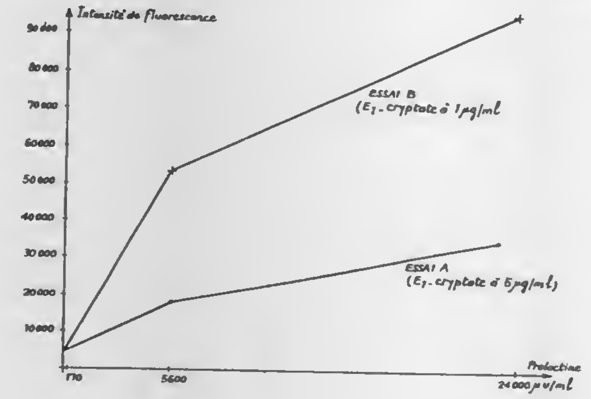
Jean-Marie Lehn, Strasbourg; Gerard Mathis, Bagnols-Sur-Ceze; Béatrice Alpha; Robert Deschenaux, both of Strasbourg, and Etienne Jolu, Bagnols-Sur-Ceze, all of, France, assignors to Compagnie Oris Industrie, SA, Paris, France

Division of Ser. No. 275,072, Jun. 9, 1994, Pat. No. 5,457,185, which is a division of Ser. No. 927,063, Sep. 14, 1992, Pat. No. 5,346,996, which is a division of Ser. No. 737,556, Jul. 26, 1991, Pat. No. 5,162,508, which is a continuation of Ser. No. 547,316, Jul. 2, 1990, abandoned, which is a continuation of Ser. No. 147,693, Jan. 25, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,861

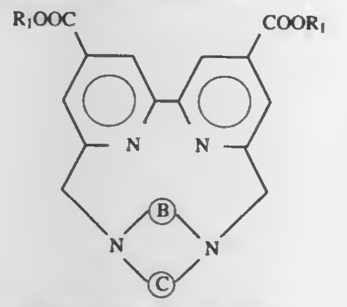
Claims priority, application France, Dec. 18, 1987, 87 17765

Int. Cl.^{6} C07D *267/22;* **C07F** *5/00*

U.S. Cl. 534—15 **11 Claims**

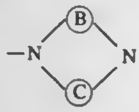


1. A process for the preparation of cryptates consisting essentially of subjecting a compound of the formula:

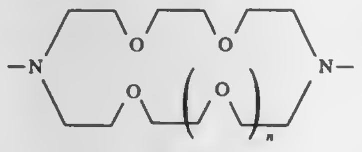


3

in which R_1 is a C_1-C_{10} alkylene group, the ring of the formula

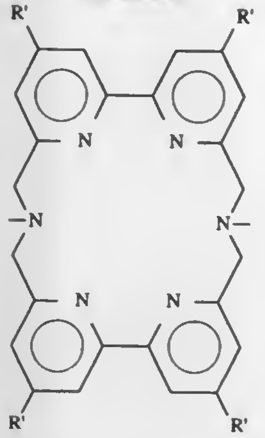


is a macrocycle of the formula:



or

-continued



where n=0 or 1,

R' is selected from the group consisting of hydrogen, —CO—NH—Y—Z, or —COOR" in which R" is C_1-C_{10} alkyl;

to aminolysis by reaction with an amine of the formula NH_2—Y—Z,

wherein Y is a divalent organic radical selected from the group consisting of (1) linear or branched C_1-C_{20} alkylene groups optionally containing at least one double bond and optionally being interrupted by one or more heteroatoms selected from the group consisting of O, N, S and P, (2) C_5-C_8 cycloalkylene groups optionally substituted by an alkyl, aryl or sulfonate group; and (3) C_6-C_{14} arylene groups optionally substituted by an alkyl, aryl or sulfonate group; and

Z is a functional group capable of bonding covalently with a biological substance.

5,534,623

PROCESS FOR PREPARING A POLYUNSATURATED DIAZONIUM COMPOUNDS

John R. Wade, Leeds; Michael J. Pratt, Ilkley, and Jianrong Ren, Leeds, all of, United Kingdom, assignors to Du Pont (UK) Limited, United Kingdom

Division of Ser. No. 6,862, Jan. 21, 1993, Pat. No. 5,466,789. This application May 30, 1995, Ser. No. 454,486

Int. Cl.^{6} C07C *245/20*

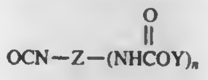
U.S. Cl. 534—560 **5 Claims**

1. A process for producing a polyunsaturated diazonium compound comprising the steps of:

(a) reacting a polyisocyanate of the formula:

$$OCN—Z—(NCO)_n$$

wherein Z is selected from the group consisting of an aromatic, an alicyclic, or heterocyclic ring or an alkylene group, and n is 1 or 2, and an ethylenically unsaturated monohydroxy compound YOH wherein Y contains at least two ethylenically unsaturated double bonds to form a polyethylenically unsaturated mono-isocyanate compound of the formula:



$$OCN—Z—(NH\overset{\overset{\displaystyle O}{\|}}{C}OY)_n$$

wherein Z, Y, and n have the aforesaid meanings, said reaction being conducted in a medium wherein said polyisocyanate and said ethylenically unsaturated monohydroxy compound are miscible but the resulting polyethylenically unsaturated mono-isocyanate compound is immiscible; and

(b) reacting said polyethylenically unsaturated mono-isocyanate compound of step (a) with an aromatic diazonium compound of the formula:

$(A^-N_2^+)_p$—Ar—$(R)_q$—$(XH)_r$

to produce the polyunsaturated diazonium compound; wherein p and q are integers ranging from 1 to 5; r is an integer ranging from 1 to 10; Ar is a substituted or unsubstituted divalent or polyvalent radical derived from an aromatic or heteroaromatic compound; X is oxygen, sulfur, or a secondary or tertiary amino group; R represents a single bond or a substituted or unsubstituted divalent or other polyvalent radical and may be the same or different when q is greater than 1; and A^- is an anion.

5,534,624
1,3,5-TRIAZINE-2,4,6-TRIS-ALKYLAMINOCARBOXYLIC ACID AMINO ESTERS, BIOCIDAL AGENTS CONTAINING SUCH ESTERS, AND METHODS OF PREPARING THEM

Jörg Lesmann, and Hermann G. Schäfer, both of Hamburg, Germany, assignors to CG-Chemie GmbH, Hamburg, Germany

PCT No. PCT/EP92/02249, § 371 Date May 19, 1994, § 102(e) Date May 19, 1994, PCT Pub. No. WO93/10105, PCT Pub. Date May 27, 1993

PCT Filed Sep. 29, 1992, Ser. No. 244,114

Claims priority, application Germany, Nov. 19, 1991, 41 38 089.4

Int. Cl.^{6} C07D *251/54*

U.S. Cl. 544—196 **3 Claims**

1. 1,3,5-Triazine-2,4,6-tris-alkyleminocarboxylic acid amino esters and amides of the general formula

1,3,5-triazine-2,4.6-tris[NH—$(CH_2)_n$—CO—O—R^1] (I)

or

1,3,5,-triazine-2,4,6-tris[NH—$(CH_2)_n$—CO—$R^{1'}$] (I')

in which

n denotes a number in the range from 4 to 11 and

R^1 denotes a C-linked radical of an alkanolamine of the general formula

$(R^2)_3N$ (II)

and

$R^{1'}$ denotes a N-linked radical of an alkanolamine of the general formula

$(R^2)_2N[H]$ (II')

in which at least one of the groups R^2 is

a) a hydroxyalkyl group having 2 to 4 carbon atoms,

b) a hydroxyalkyl-oxyalkylene group having 4 to 6 carbon atoms or

c) a dihydroxyalkyl group having 3 to 6 carbon atoms and, in the case of the general formula II, if less than three of the groups R^2 have the above meaning, the other groups R^2 are hydrogen, or one of the groups R^2 has the abovementioned meanings and the second is an alkyl group having 1 to 6 carbon atoms and the third is hydrogen and, in the case of general formula II', if only one of the groups R^2 have the above meaning, the other group R^2 is hydrogen, wherein the radical of formula (II) is attached via the carbon atom of the alkyl chain of the alkanolamine group.

5,534,625
MELAMINE DERIVATIVES FOR USE IN THE TREATMENT OF CANCER

Michael Jarman, and Helen M. Coley, both of The Institute of Cancer Research, Royal Cancer Hospital 15 Cotswold Road, Belmont, Sutton Surrey SM2 5NG, Great Britain

PCT No. PCT/GB93/00625, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO93/20056, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 26, 1993, Ser. No. 313,071

Claims priority, application United Kingdom, Mar. 27, 1992, 9206768

Int. Cl.^{6} C07D *251/70*

U.S. Cl. 544—196 **9 Claims**

1. 2,4-Bis[(hydroxymethyl)(methyl)amino]-6]methylamino-1,3,5-triazine.

5,534,626
1-ARYLETHYL-3-SUBSTITUTED PIPERIDINES

David Alker, Birchington; Peter E. Cross, Canterbury, and Robert M. Wallis, Ramsgate, all of, England, assignors to Pfizer Inc., New York, N.Y.

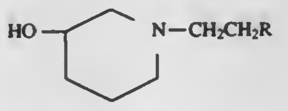
Division of Ser. No. 60,190, May 11, 1993, Pat. No. 5,410,046, which is a division of Ser. No. 832,173, Feb. 5, 1992, Pat. No. 5,231,104, which is a division of Ser. No. 376,263, Jul. 6, 1989, Pat. No. 5,089,505. This application Jan. 4, 1995, Ser. No. 368,573

Claims priority, application United Kingdom, Jul. 8, 1988, 8816365

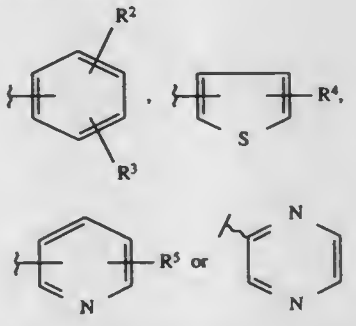
Int. Cl.^{6} C07D *211/46;211/54;405/06;405/14;401/06*

U.S. Cl. 544—360 **8 Claims**

1. A compound having the (3R,S)- or (3R)-configuration of the formula:



where R is a group of the formula:



where R^2 and R^3 are each independently hydrogen, C_1–C_4 alkyl, hydroxy-(C_1–C_4 alkyl), hydroxy, C_1–C_4 alkoxy, halogen, trifluoromethyl, nitro, cyano, sulphamoyl, —CO(C_1–C_4 alkyl), —OCO(C_1–C_4 alkyl), —CO_2(C_1–C_4 alkyl), —$(CH_2)_nCONR^6R^7$, —$(CH_2)_nOCONR^6R^7$, —$(CH_2)_nNR^8R^9$ or —$NHSO_2NH_2$, in which R^6 and R^7 are each independently hydrogen or C_1–C_4 alkyl, n is 0, 1 or 2, and R^8 and R^9 are each independently hydrogen or C_1–C_4 alkyl, or R^8 is hydrogen and R^9 is —SO_2(C_1–C_4 alkyl), —CO(C_1–C_4 alkyl) or —CONH(C_1–C_4 alkyl), with the proviso that at least one of said R^2 and R^3 is always other than hydrogen or C_1–C_4 alkyl; or R^2 and R^3, when attached to adjacent carbon atoms, represent, together with the carbon atoms to which they are attached, a group of the formula —$O(CH_2)_mO$— where m is 1, 2 or 3, —$O(CH_2)_2$ or —$(CH_2)_3$—; R^4 is hydrogen, C_1–C_4 alkyl, or —$CONH_2$; and R^5 is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy.

5,534,627
POLYCYCLIC VAT DYES

Udo Bergmann, Bensheim; Harald Schlueter, Weisenheim, and Michael Schmitt, Worms, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

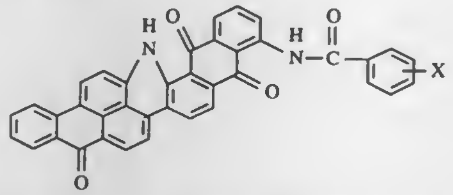
Filed Aug. 10, 1994, Ser. No. 288,310

Claims priority, application Germany, Aug. 10, 1993, 43 26 773.4

Int. Cl.^{6} C09B *5/40*

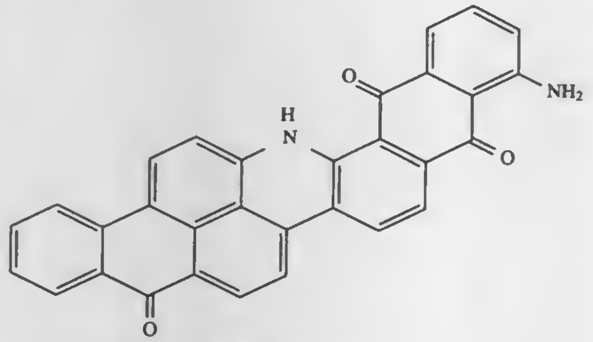
U.S. Cl. 546—30 **7 Claims**

1. Polycyclic vat dyes of the formula



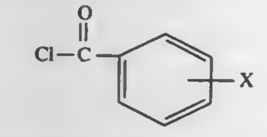
I

where X is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or nitro, obtained by reacting (9)-benzo-5-aminoanthraquinonyl(2,1-h)-8-azapyrenone-3(II)



II

a benzoyl chloride of the formula III



III

a dipolar aprotic solvent selected from the group consisting of aliphatic carboxamides, six-membered lactams, five or six-membered cyclic ureas, aliphatic sulfoxides and sulfones.

5,534,628

Patent Not Issued For This Number

5,534,629
α-AMINOACETOPHENONES AS PHOTOINITIATORS

Vincent Desobry, Marly; Kurt Dietliker, Fribourg; Rinaldo Hüsler, Marly; Werner Rutsch, Fribourg; Manfred Rembold, Aesch, and Franciszek Sitek, Therwil, all of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

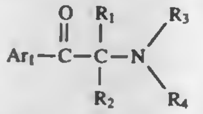
Continuation of Ser. No. 222,764, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 14,055, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 758,928, Sep. 11, 1991, abandoned, which is a division of Ser. No. 501,409, Mar. 28, 1990, Pat. No. 5,077,402, which is a continuation of Ser. No. 403,004, Sep. 5, 1989, abandoned, which is a continnation of Ser. No. 172,618, Mar. 24, 1988, abandoned. This application May 1, 1995, Ser. No. 432,035

Claims priority, application Switzerland, Mar. 26, 1987, 1152/87

Int. Cl.^{6} C07D *265/30;* **C08F** *2/46*

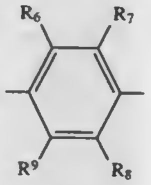
U.S. Cl. 544—78 **5 Claims**

1. A compound of the formula I



$$Ar_1-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle R_2}{|}}{\overset{\overset{\displaystyle R_1}{|}}{C}}-N\begin{matrix}R_3\\R_4\end{matrix} \quad (I)$$

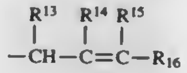
in which Ar_1 is an aromatic radical of the formula IV



(IV)

and

R_1 is either (a) a radical of the formula:



$$-\underset{}{\overset{\overset{\displaystyle R^{13}}{|}}{CH}}-\overset{\overset{\displaystyle R^{14}}{|}}{C}=\overset{\overset{\displaystyle R^{15}}{|}}{C}-R_{16}$$

or (b) a radical of the formula —$CH(R_{13})$—Ar_2, in which $Ar_2$is a phenyl radical which is unsubstituted or substituted by halogen, C_1–C_{12}alkyl, C_1–C_4alkoxy, C_1–C_8alkylthio or —$(OCH_2CH_2)_nOCH_3$, or benzoyl, n being 1–10,

R_2' is C_1–C_8alkyl or phenyl

R_3 and R_4 independently of one another are C_1–C_{12}alkyl, C_2–C_4alkyl which is substituted by C_1–C_4alkoxy, —CN or —COO(C_1–C_4alkyl), or are allyl, cyclohexyl or benzyl, or R_3 and R_4 together are C_4–C_6alkylene, which can be interrupted by —O— or —$N(R_{17})$—,

R_5 is a group —OR_{18},

R_6 is hydrogen, halogen, C_1–C_4alkyl or one of the meanings of R_5,

R_7 and R_8 are hydrogen,

R_9 is hydrogen or C_1–C_4alkyl,

R_{13}, R_{14}, R_{15} and R_{16} independently of one another are hydrogen or methyl,

R_{17} is hydrogen C_1–C_4alkyl, benzyl, 2-hydroxyethyl or acetyl,

R_{18} is hydrogen C_1–C_4alkyl, benzyl, 2-hydroxyethyl, 2-methoxyethyl, 2-allyloxyethyl, allyl, cyclohexyl, phenyl, benzyl, $Si(CH_3)_3$ or C_1–C_6alkyl, which is substituted by —COO(C_1–C_4alkyl), and in the case where R_1 is alkyl and R_2 is methyl, R_5 is not —OCH_3, and in the case where R_1 is benzyl and R_2 is methyl or benzyl, R_5 is not —OCH_3.

5,534,630

BIOLOGICALLY ACTIVE INITIATORS FOR RADICAL POLYMERIZATION

Ludger Heiliger, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 130,880, Oct. 4, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,597

Claims priority, application Germany, Oct. 9, 1992, 42 34 074.8; Jul. 9, 1993, 43 22 885.2

Int. Cl.^{6} C08F ***4/00;* C07D** ***445/04***

U.S. Cl. 534—752 **4 Claims**

1. Biologically active initiators of the formula (I)

$$A—L—B—[—L—A]_y \qquad (I)$$

wherein

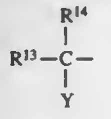
A represents a biotin moiety;

B represents a radical forming moiety derived from covalent attachment to the biotin moiety of an azo structure of the general formula (V):

$$R^{11}—N{=}N—R^{12} \qquad (V),$$

wherein

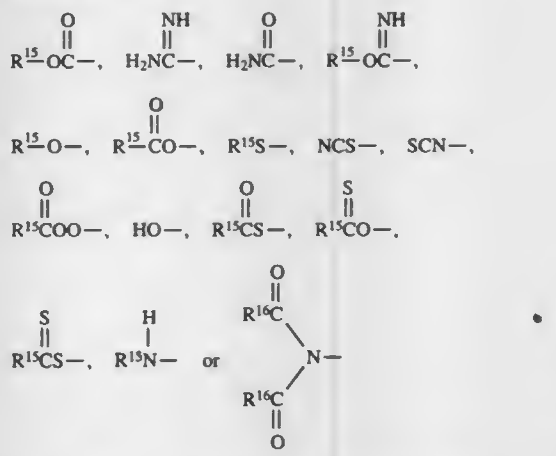
R^{11} and R^{12} signify C_1–C_{20} alkyl, C_3–C_{10} cycloalkyl, C_7–C_{20} aralkyl or the group



$$R^{13}—\underset{Y}{\overset{R^{14}}{C}}—$$

and

Y signifies CN, N_3 or



$$R^{15}O\overset{O}{\overset{\|}{C}}—,\ H_2N\overset{NH}{\overset{\|}{C}}—,\ H_2N\overset{O}{\overset{\|}{C}}—,\ R^{15}O\overset{NH}{\overset{\|}{C}}—,$$

$$R^{15}O—,\ R^{15}\overset{O}{\overset{\|}{C}}O—,\ R^{15}S—,\ NCS—,\ SCN—,$$

$$R^{15}\overset{O}{\overset{\|}{C}}OO—,\ HO—,\ R^{15}\overset{O}{\overset{\|}{C}}S—,\ R^{15}\overset{S}{\overset{\|}{C}}O—,$$

$$R^{15}\overset{S}{\overset{\|}{C}}S—,\ R^{15}\overset{H}{\overset{|}{N}}—\ \text{or}\ (R^{16}C(=O))_2N—$$

R^{13}, R^{14} and R^{15} independently of each other signify C_1–C_{20} alkyl or C_3–C_6 cycloalkyl or, if R^{13} and R^{14} are linked, C_2–C_{30} alkylene or additionally one of the groups R^{13} or R^{14}, but not both simultaneously, signifies phenyl, tolyl, xylyl, benzyl or phenethyl,

R^{16} independently signifies C_1–C_6 alkyl, C_3–C_6 cycloalkyl or C_6–C_{12} aryl;

and L represents a linker group which links the biotin moiety to R^{11} and R^{12} on the radical forming moiety, said linker being a covalent bond or selected from the group consisting of:

—SO_2—, —COO—, —SO_2NH—, —CO—NH—, —NH—CO—O—, —NH—CS—O—, —NH—CO—NH—, —NH—CS—NH—, —O—, —NH—, —S— and

Y represents the number 0 or 1.

5,534,631

CELLULAR FACTOR ILF

Ching Li, Hamden, Conn.; Richard B. Gaynor, and Ajay Nirula, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 30, 1992, Ser. No. 906,930

Int. Cl.^{6} C12N ***15/09;* C07H** ***21/00***

U.S. Cl. 536—23.1 **11 Claims**

1. A DNA molecule encoding a nucleic acid binding factor protein characterized by the following properties:

binding with a NFAT-like DNA motif altering HIV gene expression; and containing a fork head DNA binding domain, said nucleic acid binding factor protein having a molecular weight of about 60kDa as determined by sucrose gradient.

5,534,632

MACROCYCLIC CARBAMATE IMMUNOMODULATORS

Yat S. Or, and Jay R. Luly, both of Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

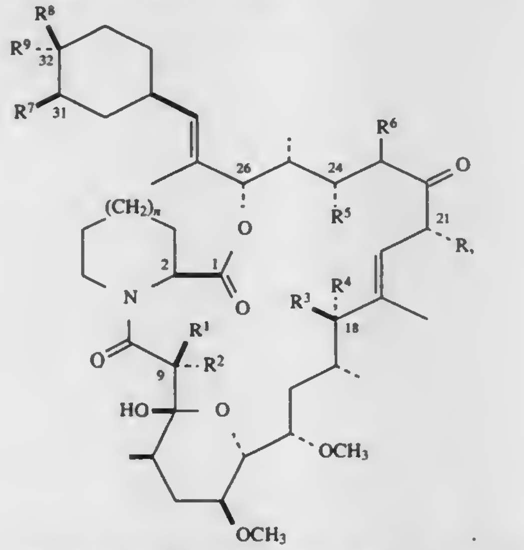
Continuation-in-part of Ser. No. 32,958, Mar. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 755,208, Sep. 5, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 212,474

Int. Cl.^{6} C07D ***491/16;* A61K** ***31/435***

U.S. Cl. 540—456 **13 Claims**

1. A compound having the formula:

(I)



or a pharmaceutically acceptable salt, ester or amide thereof wherein the ester is selected from C1-to-C6 -alkyl esters, C5-to-C7 cycloalkyl esters, arylalkyl esters and esters resulting from reaction of an alcohol moiety in the compound of formula I with a C1-to-C6-alkyl carboxylic acid, a C1-to-C6-alkyl dicarboxylic acid or an arylcarboxylic acid and wherein the amide results from reaction of a carboxylic acid moiety in the compound of formula I with NH_3, NH_2(C1-to-C3-alkyl), NH(C1-to-C2 alkyl)$_2$ or a 5 - or 6- membered ring heterocycle containing one nitrogen atom, wherein:

n is selected from the group consisting of zero and one;

R is selected from the group consisting of hydrogen, methyl, ethyl, allyl, propyl, 2-hydroxyethyl, cyclopropylmethyl, 2-oxopropyl and 2-ethanal;

R^1 and R^2 are independently selected from the group consisting of hydrogen and hydroxy, with the proviso that when one of R^1 or R^2 is hydroxy, the other of R^1 and R^2 is hydrogen; or, taken together, R^1 and R^2 are oxo;

R^3 and R^4 are independently selected from the group consisting of hydrogen, halogen and hydroxy, with the proviso that when one of R^3 or R^4 is halogen or hydroxy, the other of R^3 and R^4 is hydrogen; or, taken together, R^3 and R^4 are oxo;

R^5 is selected from the group consisting of (a) hydrogen, (b) hydroxy and (c) hydroxy protected by a hydroxy-protecting group selected from methylthiomethyl, dimethylthexylsilyl, tris(C1–C10-alkyl)silyl, C1–C10-alkyldiarylsilyl, triarylsilyl, tri(aryl-C1–C10-alkyl)silyl, C1–C10-alkyl-C(O)—, aryl-C(O)-, C1–C10-alkoxycarbonyl, —S(O)$_2$- (C1–C10-alkyl), and —S(O)2-(aryl);

R^6 is hydrogen; or, taken together, R^5 and R^6 form a C-23C-24 bond;

R^7 is selected from the group consisting of (a) hydroxy and (b) hydroxy protected by a hydroxy protecting group independently as defined above; and

R^8 and R^9 are selected such that one of R^8 and R^9 is hydrogen, and the other is selected from the group consisting of:

(1) —OC(=N $R^{10)\text{-}NHR10}$, where R^{10} is selected from the group consisting of (C1–C6-alkyl) and cyclo(C3–C10-alkyl);

(2) OC(=O)-R^{11}, where R^{11} is selected from the group consisting of -O-aryl, imidazolyl, N-methylimidazolyl, —O-(N-succinamidyl), —O-benzotriazolyl, —O-2-pyridyl, triazolyl and tetrazolyl;

(3) —OC(=O)-$NR^{12}R^{13}$, where R^{12} and R^{13} are independently selected from the group consisting of:
  - (a) —CH_2-aryl;
  - (b) —CH_2-Het;
  - (c) (C2–C10-alkyl) optionally substituted with R^{21} and R^{22} where R^{21} and R^{22} are independently selected from the group consisting of:
    - (i) hydroxy,
    - (ii) —COOH,
    - (iii) —Q-(C1–C6-alkyl) where Q is a divalent radical selected from the group consisting of —O—,—S—, —C(O)—, —O—C(O)—,—C(O)—O—, —C(O)-NH—, NHC(O)—,—OC(O)-NH— and —NHC(O)—O—,
    - (vi) aryl,
    - (v) Het,
    - (vi) —$NR^{23}R^{24}$ where R^{23} and R^{24} are independently selected from the group consisting of hydrogen, C1–C6-alkyl,-aryl and -Het,
    - (vii) guanidino, and
    - (viii) —S(O)$_2$NH$_2$;
  - (d) cyclo(C3–C10-alkyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above; and
  - (e) —(C2–C10-alkenyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above;

or, alternatively, R^{12} and R^{13}, taken together with the nitrogen atom to which they are attached, form a 5- to 7-membered heterocyclic ring,

the heterocyclic ring being optionally substituted by a radical selected from the group consisting of:
  - (a) -aryl,
  - (b) -Het,
  - (c) —(C1–C10-alkyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above;
  - (d) -cyclo(C3–C10-alkyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above; and
  - (e) —(C2–C10-alkenyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above;

(4) —OC(=O)-N(OR^{14})R^{12}, where R^{12} is defined as above and R^{14} is selected from the group consisting of:
  - (a) -aryl,
  - (b) -Het,
  - (c) —CH_2-aryl;
  - (d) —CH_2-Het;
  - (e) —(C2–C10-alkyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above;
  - (f) -cyclo(C3–C10-alkyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above;
  - (g) —(C2–C10-alkenyl) optionally substituted with R^{21} and R^{22} wherein R^{21} and R^{22} are defined as above; and
  - (h) hydrogen;

(5) —OC(=O)-$NHNR^{12}R^{13}$ wherein R^{12} and R^{13} are defined as above;

(6) —OC(=O)-NH-NHC(=O)-$NR^{12}R^{13}$ wherein R^{12} and R^{13} are defined as above;

(7) —OC(=O)-NH-NHS(O)$_2$-$NR^{12}R^{13}$ wherein R^{12} and R^{13} are defined as above; and

(8) —OC(=O)-NH-NHC(=NR^{21})-$NR^{12}R^{13}$ wherein R^{12} and R^{13} and R^{21} are defined as above;

and wherein at each occurrence the aryl group is independently selected from the group consisting of phenyl, 1-naphthyl, 2-naphthyl, fluorenyl, (1,2)-dihydronaphthyl, (1,2,3,4,)-tetrahydronaphthyl and indenyl and wherein each aryl group is unsubstituted or substituted with one, two or three substituents independently selected from halogen, hydroxy, —CN, —CHO, —COOH, —NO_2, —N_3, —(C1–C7-alkyl), —(C_2–C6-alkenyl), —(C2–C6-alkynyl), mono-, di-, tri- or perhalogenated —(C1–C6-alkyl), —$(CH_2)_m$N(C1–C6-alkyl)$_2$ wherein m is zero to six, —S(O)$_s$(C1–C6-alkyl) wherein s is zero to two, —C(O)NH(C1–C6-alkyl), C1–C6-alkoxy, —$(CH_2)_m$O(C1–C6-alkyl) wherein m is zero to six, —$(CH_2)_m$OC(O)(C1–C6-alkyl) wherein m is zero to six, —$(CH_2)_m$C(O)O(C1–C 6-alkyl) wherein m is zero to six, —S(O)$_2$N(C1–C6-alkyl)$_2$, —C≡C-Si(CH$_3$)$_3$, —OC(O)(C1–C6-alkyl), guanidino, unsubstituted aryl and unsubstituted Het and

at each occurrence the Het group or heterocyclic group is independently selected from the group consisting of pyrrolyl, pyrazolyl, piperidinyl, piperazinyl, morpholinyl, cytosinyl, thiocytosinyl, imidazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, xanthenyl, xanthonyl, xanthopterinyl, oxazoyl, thiouracilyl, isoxazolyl, indolyl, quinolinyl, uracilyl, urazolyl, uricyl, thiazolyl, isothiazolyl, isoquinolinyl, thyminyl, benzimidazolyl, benzothiazolyl, benzoxazolyl, furyl, thienyl and benzothienyl wherein any carbon or heteroatom with suitable valence may bear a substituent independently selected at each occurrence from the group consisting of halogen, hydroxy, —COOH, —CN, —CHO, —NO_2, —N_3, —(C1–C6-alkyl), —(C2–C6-alkenyl), —(C2–C6-alkynyl), mono-, di- tri-, or perhalogenated —C1–C6-alkyl, —$(CH_2)_m$N(C1–C6-alkyl)$_2$ where m is zero to six, —S(O)$_s$(C1–C6-alkyl) where s is zero to two, —C(O)NH(C1–C6-alkyl), —$(CH_2)_m$O(C1–C6-alkyl) wherein m is zero to six, —$(CH_2)_m$OC(O)(C1–C6-alkyl) wherein m is zero to six, —$(CH_2)_m$C(O)O(C1–C6-alkyl) wherein m is zero to six, —S(O)$_2$N(C1–C6-alkyl)$_2$, —C—C-Si(CH$_3$)$_3$, —C1–C6-alkoxy, —OC(O)(C1–C6-alkyl), guanidino, unsubstituted aryl, and unsubstituted Het.

5,534,633

AMINOKETONE SENSITIZERS FOR PHOTOPOLYMER COMPOSITIONS

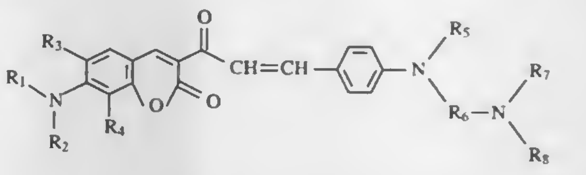
M. Zaki Ali, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 234,760, Apr. 28, 1994, Pat. No. 5,415,976, which is a continuation-in-part of Ser. No. 199,542, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 784,468, Oct. 25, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 383,363

Int. Cl.^{6} C07D ***311/16;405/10***

U.S. Cl. 546—196 **11 Claims**

1. An aminoketone-substituted coumarin sensitizer having the formula:



wherein

R_1 and R_2 each represent an alkyl group having 1 to 6 carbon atoms, and R_3 and R_4 each represent hydrogen, or at least one of R_1 and R_3 or R_2 and R_4 together represent an alkylene group having 2 to 4 carbon atoms;

R_5 represents an alkyl group having 1 to 6 carbons or H,

R_6 represents an alkylene group having 1 to 6 carbon atoms, and

R_7 and R_8 each independently represent an alkyl group having 1 to 6 carbon atoms, both R_7 and R_8 taken together represent an alkylene group having 4 to 6 carbon atoms, or R_5 or R_6 may be taken with R_7 or R_8 to represent a five, six, or seven membered heterocyclic ring group.

5,534,634
PROCESS FOR PREPARING TRIFLUOROETHYL SULFUR COMPOUNDS FROM THIOLATES AND 1-CHLORO-2,2,2-TRIFLUOROETHANE

Wolfgang Appel, Kelkheim; Frank Ebmeyer, Hattersheim; Tobias Metzenthin, Frankfurt, and Günter Siegemund, Hofheim, all of, Germany, assignors to Hoechst AG, Germany

Filed Sep. 29, 1994, Ser. No. 314,943

Claims priority, application Germany, Sep. 29, 1993, 43 33 058.4

Int. Cl.^{6} C07D *213/70;277/72;235/28;* **C07C** *321/14*

U.S. Cl. 546—303 **16 Claims**

1. A process for preparing trifluoroethyl sulfur compounds from thiolates and 1-chloro- 2,2,2-trifluoroethane, which consists essentially of allowing 1-chloro-2,2,2-trifluoroethane to act in a polar aprotic solvent upon salts of thiols of the formula RSH, at a low pressure of up to 5 bar, where R is an unsubstituted or substituted radical as defined below:

C_1–C_{20}-alkyl

or C_3—C_{12}-cycloalkyl

or a monocyclic, condensed dicyclic or condensed tricyclic aryl radical,

or a saturated or unsaturated monocyclic or dicyclic heterocyclic radical, which contains a total of one or two heteroatoms, which can, independently of one another, be N, S or O.

5,534,635
PROCESS FOR PREPARING PYRIDINE-2-CARBOXAMIDES

Michelangelo Scalone, and Peter Vogt, both of Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

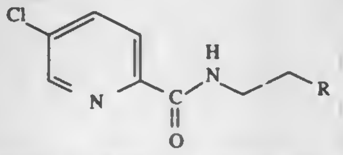
Division of Ser. No. 67,329, May 25, 1993, Pat. No. 5,380,861, which is a continuation of Ser. No. 740,692, Aug. 6, 1991, abandoned, which is a continuation of Ser. No. 484,292, Feb. 26, 1990, abandoned. This application Sep. 12, 1994, Ser. No. 304,460

Claims priority, application Switzerland, Feb. 28, 1989, 736/89; Dec. 4, 1989, 4323/89

Int. Cl.^{6} C07D *213/81;213/56*

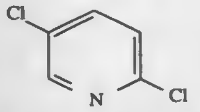
U.S. Cl. 546—323 **20 Claims**

1. A process for the preparation of pyridine-2-carboxamides of the formula



I

wherein R is amino or a residue convertible into amino, which comprises reacting 2,5-dichloropyridine of the formula

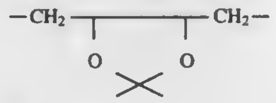


II

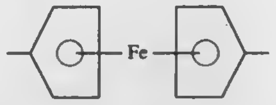
in the presence of a palladium-phosphine catalyst wherein the palladium-phosphine catalyst is prepared in situ from 0.0001–0.05 mol % of metallic palladium or a complex or salt of 0-, 2- or 4-valent palladium and 0.01–100 mol per mol of palladium of a phosphorus compound of the formula

$P(R^4)(R^5)(R^6)$ and $(R^4)(R^5)P—(X)—P(R^4)(R^5)$

wherein R^4, R^5 and R^6 each independently are C_{1-8}-alkyl, cyclohexyl, benzyl, phenyl or phenyl which is substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, trifluoromethyl or phenyl and X is binaphthyl or one of the groups $—(CH_2)_n—$, $CH_2CH_2—P(C_6H_5)—CH_2—CH_2—$,

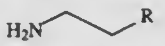


or



and n is 1–8

with carbon monoxide and an amino compound of the formula



VI

wherein R is as described above.

5,534,636
1-ALKYL-,1-ALKENYL-,AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Hamer, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, abandoned, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,200, Mar. 13, 1990, abandoned. This application Apr. 21, 1995, Ser. No. 426,452

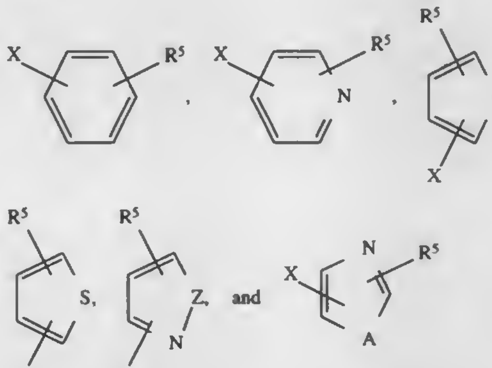
Int. Cl.^{6} C07D *263/06;333/06;413/06*

U.S. Cl. 548—228 **7 Claims**

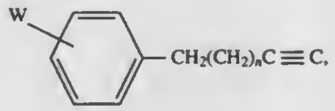
1. A compound of the formula

$RCH(OR^1)CHR^{18}R^{19}$

wherein R is



wherein R^5 is $CH_3(CH_2)_mC{\equiv}C$, $CH_3(CH_2)_mCH{=}CH$, $CH_3(CH_2)_mCH_2CH_2$,



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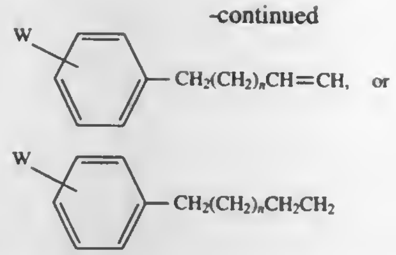
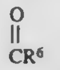
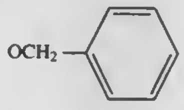


wherein m is 3 to 15, n is 0 to 12, and W and X are independently hydrogen, alkyl, alkoxy, halogen, or trifluoromethyl, Z is S, O, or C=O; and A is S or O; R^1 is hydrogen or

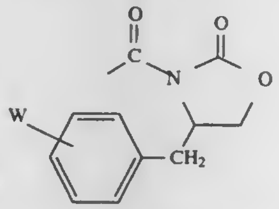


$$\overset{\displaystyle O}{\overset{\|}{C}}R^6$$

wherein R^6 is hydrogen, alkyl, alkoxy, or



R^{18} is halogen or N_3; and R^{19} is a group of the formula



wherein W is hydrogen, loweralkyl, loweralkoxy, halogen, or trifluoromethyl.

5,534,637
STARTING MATERIALS FOR PREPARTION OF SULFONYLUREA DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Jong K. Choi; In B. Chung; Jae C. Lee; Byoung W. Suh; Jong S. Sa, and Tae H. Heo, all of Daejeon, Rep. of Korea, assignors to Lucky Ltd., Seoul, Rep. of Korea

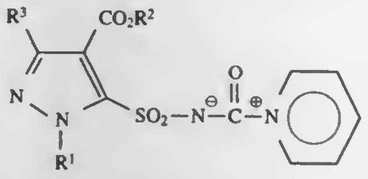
Division of Ser. No. 205,400, Mar. 3, 1994, Pat. No. 5,480,993. This application Nov. 29, 1994, Ser. No. 350,979

Claims priority, application Rep. of Korea, Mar. 5, 1993, 93-3308; Apr. 16, 1993, 93-6409; Oct. 7, 1993, 93-20759

Int. Cl.^{6} C07D *231/14;231/16;231/28;231/30;231/54*

U.S. Cl. 548—374.1 **6 Claims**

1. A compound 1-[[(pyrazolesulfonyl)amino]carbonyl]pyridinium hydroxide having the following formula (VIII),



(VIII)

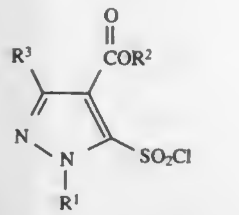
wherein

R^1 represents hydrogen, C_1–C_4 alkyl or phenyl,

R^2 represents hydrogen, C_1–C_4 alkyl, allyl or propargyl, and

R^3 represents hydrogen, methyl, ethyl or phenyl.

3. A process for preparing sulfonylchloride derivatives having the following formula (V),



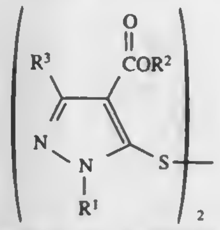
(V)

wherein

R^1 represents hydrogen, C_1–C_4 alkyl or phenyl;

R^2 represents hydrogen, C_1–C_4 alkyl, allyl or propargyl; and

R^3 represents hydrogen, methyl, ethyl or phenyl, comprising reacting a pyrazole disulfide derivative of formula (XI),



(XI)

wherein R^1, R^2 and R^3 are as defined above, with an aqueous hydrochloric acid solution and hydrogen peroxide solution in the presence of an organic solvent.

5,534,638
BIS(ETHYLENEDITHIO) TETRATHIAFULVALENE.CYANOMETALATE COMPLEX

Hatsumi Mori, Aichi; Izumi Hirabayashi, Aichi; Shoji Tanaka, Tokyo; Takehiko Mori, Tokyo; Yusei Maruyama, Aichi, and Hiroo Inokuchi, Aichi, all of, Japan, assignors to International Superconductivity Technology Center, Tokyo, Japan

Continuation of Ser. No. 50,187, May 4, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 429,009

Claims priority, application Japan, Sep. 19, 1991, 3-268268; Jun. 19, 1992, 4-186133

Int. Cl.^{6} C07D *409/04*

U.S. Cl. 549—3 **2 Claims**

1. Superconductive tetracyano platinum acid bis(ethylenedithio)tetrathiafulvalene salt.hydrate which is represented by $(BEDT\text{-}TTF)_4[Pt(CN)_4].H_2O$.

5,534,639
HYDROQUINONE DERIVATIVES AND INTERMEDIATES FOR PRODUCTION THEREOF

Hirotomo Masuya, Inagawa-cho, and Masayoshi Yamaoka, Toyonaka, both of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

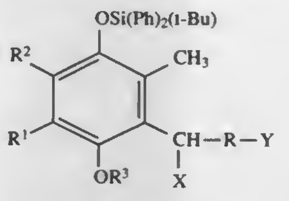
Division of Ser. No. 30,880, Mar. 12, 1993, Pat. No. 5,436,359. This application Apr. 24, 1995, Ser. No. 427,585

Claims priority, application Japan, Mar. 13, 1992, 4-055007

Int. Cl.^{6} C07D *333/06;333/12*

U.S. Cl. 549—62 **4 Claims**

1. A compound of the formula



wherein R^1 and R^2 are the same or different and are methyl or methoxy, or R^1 and R^2 are joined together to form the group of the formula: $—CH{=}CH—CH{=}CH—$;

R^3 is hydrogen or a protecting group selected from the group consisting of acetyl, propionyl, butyryl, benzoyl, nicotinoyl, tetrahydropyranyl, methoxymethyl, ethoxyethyl, methoxyethoxymethyl, methylthiomethyl and trityl;

X is thienyl unsubstituted or substituted by at least one substituent selected from the group consisting of alkyl of 1–3 carbon atoms, alkoxy of 1–3 carbon atoms and halogen;

R is a saturated or unsaturated bivalent straight-chain hydrocarbon group having up to 20 carbon atoms or a chemical bond;

Y is a member selected from the group consisting of
- (1) hydrogen,
- (2) hydroxymethyl,
- (3) methoxymethyloxymethyl,
- (4) acetoxymethyl,
- (5) nitroxymethyl,
- (6) aminocarbonyloxymethyl,
- (7) methylaminocarbonyloxymethyl,
- (8) ethylaminocarbonyloxymethyl,
- (9) dimethylaminocarbonyloxymethyl,
- (10) phenylaminocarbonyloxymethyl,
- (11) morpholinocarbonyloxymethyl
- (12) piperidinocarbonyloxymethyl,
- (13) carboxyl,
- (14) alkoxycarbonyl having 2 to 5 carbon atoms,
- (15) aryloxycarbonyl having 7 to 8 carbon atoms, and
- (16) aminocarbonyl which is unsubstituted or is substituted by
  - (a) hydroxyl,
  - (b) alkyl of 1 to 4 carbon atoms,
  - (c) phenyl or naphthyl each of which is unsubstituted or is substituted by hydroxyl, amino, nitro, halogen, methyl or methoxy,
  - (d) morpholinocarbonyl,
  - (e) thiomorpholinocarbonyl, or
  - (f) piperidinocarbonyl;

Ph is phenyl; and
t-Bu is tert-butyl.

5,534,640

1-ALKYL-, 1-ALKENYL-, AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

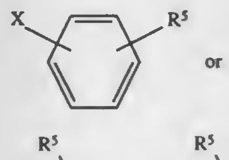
John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Harmer, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, abandoned, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,200, Mar. 13, 1990, abandoned. This application Apr. 21, 1995, Ser. No. 426,755

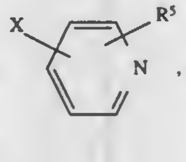
Int. Cl.^{6} C07D *333/08;* C07C *25/13;25/24*

U.S. Cl. 549—80 4 Claims

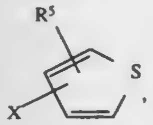
1. A compound of the formula



or



, or



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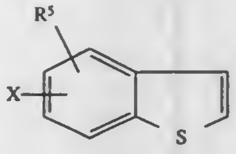

or

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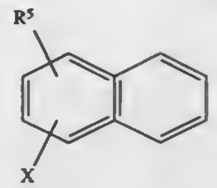
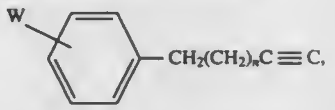
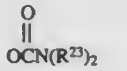


wherein R^5 is $CH_3(CH_2)_mC \equiv C$, or

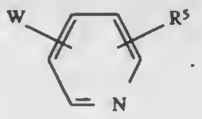


wherein m is 3 to 15, n is 0 to 12, and W and X are independently hydrogen, hydroxy, loweralkyl, loweralkoxy, halogen, trifluoromethyl or



$$\overset{O}{\overset{\|}{O C}}N(R^{23})_2$$

wherein R^{23} is loweralkyl, with proviso that X is not hydrogen or lower alkyl when the compounds are



5,534,641

ACETYLENES DISUBSTITUTED WITH 2-TETRAHYDROPYRANOXYARYL AND ARYL OR HETEROARYL GROUPS HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY

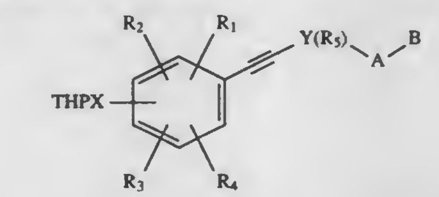
Tae K. Song, Long Beach, and Roshantha A. Chandraratna, Missio Viejo, both of Calif., assignors to Allergan

Filed Dec. 29, 1994, Ser. No. 366,173

Int. Cl.^{6} C07D *309/12*

U.S. Cl. 549—416 21 Claims

1. A compound of the formula



wherein R_1–R_3 and R_5 independently are hydrogen, lower alkyl of 1 to 6 carbons, branched chain alkyl or cycloalkyl of 3 to 15 carbons, lower alkyl substituted cycloalkyl of 3 to 15 carbons;

R_4 is branched chain alkyl or cycloalkyl of 3 to 15 carbons, lower alkyl substituted cycloalkyl of 3 to 15 carbons or 2-(1-adamantyl);

THP is a 2-tetrahydropyranyl group;

X is S or O;

Y is a phenyl group substituted with the R_5 group defined above;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, $—CH_2OH$, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, $—COR_7$, $CR_7(OR_{12})_2$, or $CR_7OR_{13}O$, where R_7 is an alkyl group of 1 to 5 carbons, cycloalkyl group of 3 to 5 carbons or alkenyl group of 2 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons.

5,534,642

SYNTHESIS OF AMIDO ACIDS FROM CARBOXYLIC ACIDS AND LACTAMS

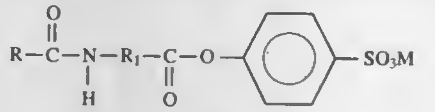
Stephen W. Heinzman, Wyoming; Jeffrey S. Dupont, Fairfield, and William C. Tettenhorst, Okeana, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 121,013, Sep. 14, 1993, Pat. No. 5,414,099. This application Feb. 23, 1995, Ser. No. 392,599

Int. Cl.^{6} C11D *1/28*

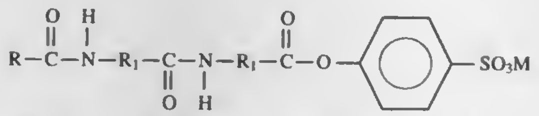
U.S. Cl. 554—98 17 Claims

1. A method for preparing bleach activators which are amido acid phenyl ester sulfonates, or mixtures thereof, of the formulas:



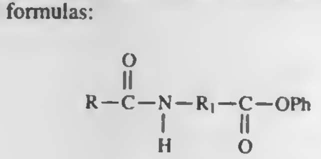
(V)

and



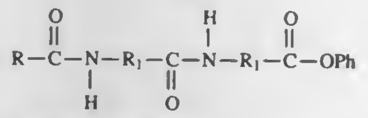
(VI)

wherein R is a C_1–C_{21} hydrocarbyl substituent and R^1 is a C_2–C_{10} hydrocarbylene substituent, the sulfonate group is ortho or para substituted, and M is a cation moiety, said method comprising sulfonating and neutralizing an amido acid phenyl ester selected from the formulas:



$$R-\overset{O}{\overset{\|}{C}}-\underset{H}{\underset{|}{N}}-R_1-\underset{O}{\underset{\|}{C}}-OPh \qquad (III)$$

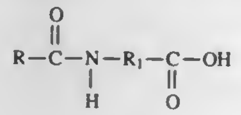
and



$$R-\overset{O}{\overset{\|}{C}}-\underset{H}{\underset{|}{N}}-R_1-\underset{O}{\underset{\|}{C}}-\overset{H}{\overset{|}{N}}-R_1-\overset{O}{\overset{\|}{C}}-OPh \qquad (IV)$$

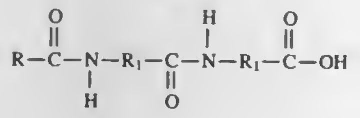
prepared by a method comprising:

(a) preparing an amido acid, or mixture thereof, of the formulas



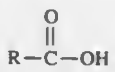
$$R-\overset{O}{\overset{\|}{C}}-\underset{H}{\underset{|}{N}}-R_1-\underset{O}{\underset{\|}{C}}-OH \qquad (I)$$

and



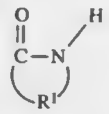
$$R-\overset{O}{\overset{\|}{C}}-\underset{H}{\underset{|}{N}}-R_1-\underset{O}{\underset{\|}{C}}-\overset{H}{\overset{|}{N}}-R_1-\overset{O}{\overset{\|}{C}}-OH \qquad (II)$$

by reacting in the presence of an acid catalyst a carboxylic acid of the formula



$$R-\overset{O}{\overset{\|}{C}}-OH$$

with a lactam of the structure



wherein R and R^1 are as described before; and

(b) reacting the amido acid, or mixture thereof, of step (a) with phenol in the presence of a strong acid catalyst and boric acid.

5,534,643

SURFACE-TREATING AGENT FOR METAL CAN AND METHOD FOR TREATING METAL CANSURFACE

Syunichi Endou; Satoshi Miyamoto, both of Osaka; Kaoru Komiya, and Naomi Koishikawa, both of Tokyo, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, and Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 186,516

Claims priority, application Japan, Jan. 29, 1993, 5-013182

Int. Cl.^{6} C07C *57/00*

U.S. Cl. 554—227 4 Claims

1. A surface-treating agent for a metal can, comprising polyglyceride esters of fatty acids, said polyglyceride esters having a polymerization degree of 6 to 20 and an esterified ratio of 5 to 20%.

5,534,644

PROCESS FOR THE PREPARATION OF 4-METHYL-5-(2-CHLOROETHYL)-THIAZOLE AND ANALOGUES THEREOF

Endre Pálosi; Dezso Korbonits, both of Budapest; Erzsébet Molnár née Bakó, Szödliget; Ida Szvoboda née Kanzel, Dunakeszi; Gergely Héja, Budapest; Pál Kiss, Budapest; Csaba Gönczi, Budapest; Ferenc Sperber, Budapest; Csaba Huszár, Budapest; György Mihalovics, Budapest; Attila Németh, Göd; Mihály Sütö, Budapest; Károl Gyüre, Fenyveslitke; István Bóné, Budapest; Ferenc Mórász, Budapest; László Ledniczky, Budapest; Erzsébet Szabó née Kardos, Budapest; Péter Györi, Budapest; Erzsébet Szalay, Budapest; Károly Bán, Budapest; Ildikó Buttkai, Budapest; Arpád Kövári, Göd, and Sándor Garaczy, Budapest, all of, Hungary, assignors to Aktiebolaget Astra, Sodertalje, Sweden

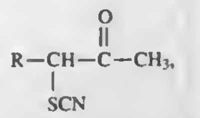
Division of Ser. No. 232,207, Jun. 27, 1994. This application Jun. 5, 1995, Ser. No. 464,308

Claims priority, application Hungary, Oct. 30, 1991, 34 02/91; Oct. 30, 1991, 34 03/91; Oct. 30, 1991, 34 04/91; Apr. 3, 1992, 11 24/92; Apr. 3, 1992, 11 25/92

Int. Cl.^{6} C07C *331/02*

U.S. Cl. 558—14 2 Claims

1. A compound of the general formula


$$R-\underset{\displaystyle SCN}{\underset{|}{CH}}-\overset{\displaystyle O}{\overset{\|}{C}}-CH_3,$$
(IV)

(a 3-thiocyanato-5-chloro-2-alkanone) wherein R is defined as a straight chain C1–C5 alkyl group substituted by a chlorine in the 2-position.

5,534,645

TRIVALENT PHOSPHOROUS COMPOUNDS STABILIZED WITH AMINES

Udo Quotschalla, Heppenheim, Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

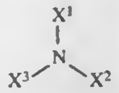
Division of Ser. No. 129,705, Sep. 30, 1993, Pat. No. 5,371,263. This application Aug. 31, 1994, Ser. No. 298,894

Claims priority, application Switzerland, Oct. 5, 1992, 3104/92; Nov. 27, 1992, 3647/92

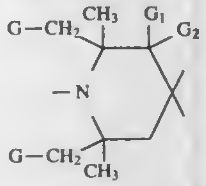
Int. Cl.^{6} C09K *15/32*

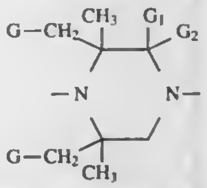
U.S. Cl. 558—71 11 Claims

1. A crystalline organic phosphite or phosphonite, stabilized against hydrolysis, prepared by introducing a mixture, comprising a phosphite or phosphonite, a solvent or a solvent mixture, and 0.1 to 100% by weight (relative to phosphite or phosphonite) of an amine and having a temperature of 50°–100° C., as a homogeneous melt into a liquid crystallization medium whose temperature during the addition is maintained 10°–70° C. below the temperature of the melh wherein the phosphite is of the formula $P(OR^1)_3$ wherein each radical R^1 is independently of the other hydrogen or a hydrocarbon radical which optionally contains a hetero atom selected from the group consisting of N, O, F, Si, P, S, Cl, Br, Sn or I with the proviso that a maximum of two of the three radicals R^1 are hydrogen and wherein the phosphonite is of the formula $P(OR^2)_2R^3$ wherein each radical R^2 and R^3 is each independently of the other as defined for R^1 or halogen and wherein the amine is of the formula I


(I)

in which X^1 and X^2, independently of one another, are H, C_1–C_{20}alkyl, C_4–C_{20}alkyl which is interrupted by one or more —O— and unsubstituted or substituted by one or more hydroxyl groups, or is C_2–C_{20}hydroxyalkyl, and X^3 is C_2–C_{20}alkyl, C_4–C_{20}alkyl which is interrupted by one or more —O— and unsubstituted or substituted by one or more hydroxyl groups, or is $—(CH_2)_m—NX^1X^2$, or C_2–C_{20}hydroxyalkyl, in which X^2 and X^3 together are $—(CH_2)_m—$, $—C_2H_4—O—C_2H_4—$ or $—C_2H_4—NX^1—C_2H_4—$, m being an integer from the range 4 to 6 and X^1 and X^2 being as defined above; or a cyclic sterically hindered amine containing at least one group of the formulae II or III


(II)


(III)

in which G is hydrogen or methyl, and G_1 and G_2 are hydrogen, methyl or together are =O.

5,534,646

SUBSTITUTED 1,3,2,4-DIAZADIPHOSPHETIDINES AND COMPOSITIONS STABILIZED THEREWITH

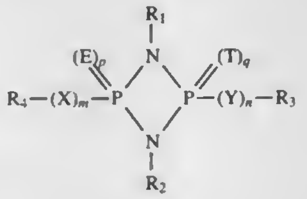
Sai P. Shum, Hightstown, N.J., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Aug. 31, 1994, Ser. No. 298,897

Int. Cl.^{6} C07C *229/00;261/00;* **C07F** *9/22;9/36*

U.S. Cl. 558—80 4 Claims

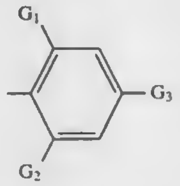
1. A substituted 1,3,2.4-diazadiphosphetidine of formula I


(I)

wherein

R_1 and R_2 are independently straight or branched chain alkyl of 1 to 20 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one to three alkyl of 1 to 8 carbon atoms;

R_3 and R_4 are independently an aryl group of formula II


(II)

wherein

G_1 and G_2 are independently hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms or phenylalkyl of 7 to 9 carbon atoms,

G_3 is hydrogen, alkyl of 1 to 18 carbon atoms, $—CH_2CH_2COOL$ where L is hydrogen or alkyl of 1 to 18 carbon atoms; or G_3 is $—NL_1L_2$ where L_1 and L_2 are independently hydrogen, alkyl of 1 to 18 carbon atoms or alkenyl of 3 to 6 carbon atoms, or

when X is $—NR_{,4}$ and Y is $—NR_{15}$, R_3 and R_4 are also independently straight or branched chain alkyl of 5 to 20 carbon atoms,

X is —O—or $—NR_{14}—$,

Y is —O—or $—NR_{15}—$.

R_{14} and R_{15} are alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkenyl of 3 to 6 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by 1 to 3 alkyl of 1 to 8 carbon atoms,

m and n are 1, and

p and q are 0.

5,534,647

VINYL MONOMER HAVING LINEAR CARBONATE AND HYDROXYL GROUPS

Takao Morimoto, Suita, and Shinji Nakano, Takatsuki, both of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

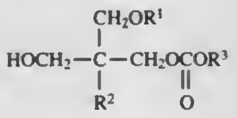
Filed Jun. 6, 1995, Ser. No. 466,684

Claims priority, application Japan, Jun. 16, 1994, 6-159438

Int. Cl.^{6} C07C *69/96*

U.S. Cl. 558—275 4 Claims

1. A compound of the formula:


$$HOCH_2-\overset{\displaystyle CH_2OR^1}{\underset{\displaystyle R^2}{C}}-CH_2O\underset{\displaystyle O}{\underset{\|}{C}}OR^3$$

wherein R^1 is acryloyl, methacryloyl or 4-vinylbenzyl; R^2 is C_{1-4}-alkyl; and R^3 is alkyl, alkoxyalkyl, alkenyl, alkynyl, aralkyl or aryl, all being of up to 18 carbon atoms.

5,534,648

PROCESS FOR CONTINUOUSLY PRODUCING DIMETHYL CARBONATE

Keigo Nishihira; Shinichi Yoshida, and Shuji Tanaka, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 28, 1994, Ser. No. 345,568

Claims priority, application Japan, Nov. 30, 1993, 5-299337; Dec. 3, 1993, 5-303916

Int. Cl.^{6} C07C *69/96*

U.S. Cl. 558—277 20 Claims

1. A process for continuously producing dimethyl carbonate comprising:

a first step of preparing dimethyl carbonate by a catalytic reaction of carbon monoxide with methyl nitrite in a gas phase in the presence of a solid catalyst in a reactor;

a second step of absorbing the dimethyl carbonate by an absorption medium comprising dimethyl oxalate in a dimethyl carbonate-absorbing column, to provide a liquid fraction containing dimethyl carbonate absorbed by the absorbing medium and a non-condensed gas fraction containing nitrogen monoxide;

a third step of regenerating methyl nitrite by bringing at least a major portion of the non-condensed gas fraction containing nitrogen monoxide into contact with molecular oxygen and methyl alcohol in a methyl nitrite-regenerating column, to provide a liquid fraction containing water dissolved in methyl alcohol and a regenerated gas fraction containing the regenerated methyl nitrite and nitrogen oxides, at least a major portion of the regenerated gas fraction being recycled to the reactor of the first step;

a fourth step of collecting dimethyl carbonate by distilling the absorbing medium liquid fraction produced in the second step, in a distilling column; and

a fifth step of producing and recovering methyl nitrite by bringing a purge gas consisting of a minor portion of the gas fraction withdrawn from one of the second step and the third step and a gas comprising an oxidation product of ammonia with a molecular oxygen-containing gas into contact with methyl alcohol in a molar amount of 5 to 200 times the total molar amount of nitrogen monoxide and methyl nitrite contained in the purge gas and NOx contained in the ammonia-oxidation product gas, and having a temperature of 20° C. or less, in a methyl nitrite-recovering column, so as to convert nitrogen oxides contained in the purge gas and the ammonia-oxidation product gas to methyl nitrite and to absorb methyl nitrite contained in the purge gas and regenerated by the above-mentioned conversion, by methyl alcohol.

5,534,649

PROCESS FOR PREPARING DIALKYL CARBONATES

Tsurahide Cho, Tokyo; Takaaki Tamura, Kawasaki; Toshitsura Cho, Tokyo, and Kazumi Suzuki, Kawasaki, all of, Japan, assignors to Tama Chemicals Co., Ltd., Tokyo, Japan, and Moses Lake Industries, Inc., Moses Lake, Wash.

Filed Dec. 29, 1994, Ser. No. 365,846

Claims priority, application Japan, Oct. 21, 1994, 6-257175

Int. Cl.^{6} C07C *68/00*

U.S. Cl. 558—277 4 Claims

1. A process for preparing dialkyl carbonates comprising the step of reacting one or a mixture of two or more compounds selected from the group consisting of urea, methyl carbamate and ethyl carbamate, with methanol and/or ethanol in the presence of a quaternary ammonium compound catalyst under pressure at a temperature of 100° to 250° C.

5,534,650

METHOD FOR PRODUCING A NITRILE

Takashi Ushikubo; Kazunori Oshima, both of Yokohama; Tatsuya Ihara, and Hiroyuki Amatsu, both of Kurashiki, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jan. 12, 1995, Ser. No. 372,022

Claims priority, application Japan, Jan. 12, 1994, 6-001665

Int. Cl.^{6} C07C *253/00*

U.S. Cl. 558—319 9 Claims

1. A method for producing an α, β-ethylenically unsaturated nitrile by a gas phase catalytic oxidation reaction of an alkane with ammonia in the presence of an ammoxidation catalyst, which comprises:

supplying an alkane of at least three carbon atoms, in the presence of elemental oxygen and ammonia to a reactor having an alkane, oxygen, ammonia mixed gas inlet and an ammonia inlet, each inlet being upstream of the ammoxidation catalyst bed in the reactor with the ammonia inlet positioned between the mixed gas inlet and the position of the catalyst layer, said ammonia, which is supplied to the reactor through the ammonia inlet, ranging in an amount of 5 to 10 mol % of the total amount of ammonia supplied to the reactor.

5,534,651

PROCESS FOR PREPARING γ-MERCAPTOCARBOXYLIC ACID DERIVATIVES

Wilhelm Quittmann, and John McGarrity, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

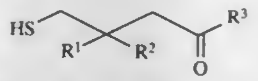
Filed Aug. 30, 1994, Ser. No. 297,756

Claims priority, application Switzerland, Sep. 3, 1993, 2626/93

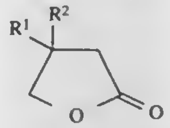
Int. Cl.^{6} C07C *321/00*

U.S. Cl. 560—15 24 Claims

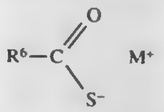
1. A process for preparing a γ-mercaptocarboxylic acid derivative of the formula:


I

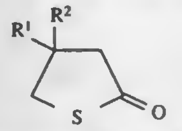
wherein R^1 and R^2 are either, independently of one another, hydrogen, C_1–C_6-alkyl or aralkyl or together are a $—(CH_2)_n$-group having n being an integer of 2 to 5. R^3 is hydroxy, C_1–C_6-alkoxy, cycloalkyloxy, aryloxy or aralkyloxy, or a salt thereof, comprising: reacting a γ-lactone of the formula:


II

wherein R^1 and R^2 are as defined above, with a thiocarboxylate of the formula:


III

wherein R^6 is a C_1–C_6-alkyl group or a phenyl group and M is an alkali metal, in a polar solvent to give the corresponding thiolactone of the formula:


IV

wherein R^1 and R^2 are as defined above, and subsequently reacting the thiolactone with a nucleophile of the formula:

R^3H V

wherein R^1 and R^2 are as defined above, or the corresponding anion:

$(R^3)^-$ V'

to give the γ-mercaptocarboxylic acid derivative of formula I or a corresponding salt thereof.

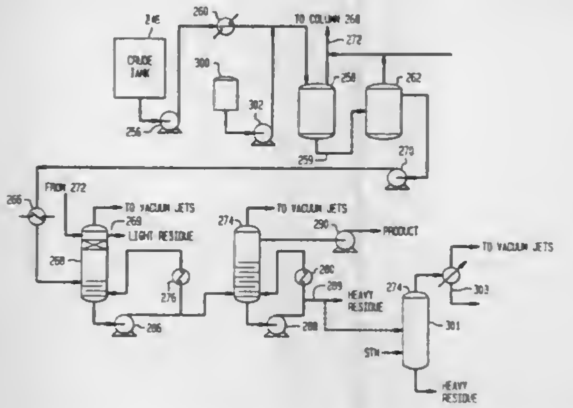
5,534,652
PREPARATION OF PLASTICIZER ESTERS FROM PHTHALIC ANHYDRIDE RESIDUE

Larry O. Jones, Baton Rouge, La.; Paul H. Daniels, League City, Tex.; Leonard G. Krauskopf; Konstantinos R. Rigopoulos, both of Baton Rouge, La., and Richard H. Schlosberg, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc. (ECPI), Linden, N.J.

Filed Oct. 18, 1994, Ser. No. 324,544

Int. Cl.⁶ C07C *67/08*

U.S. Cl. 560—98 **16 Claims**



1. A process for the formation of mixed esters from at least one light phthalic anhydride residue stream produced from the vapor phase oxidation of o-xylene and/or naphthalene having an oxidation section and finishing section, wherein said light phthalic anhydride residue stream comprises at least two compounds selected from the group consisting of: phthalic anhydride, maleic anhydride, benzoic acid and citraconic acid, said process comprising:

a. adding said light phthalic anhydride residue taken from the overhead from a first fractionation column of said finishing section of said vapor phase oxidation of o-xylene, and/or naphthalene, and a mono-alcohol to a reaction vessel to form a reaction mixture; and

b. heating said reaction mixture and maintaining a pressure sufficient to obtain boiling of said reaction mixture thereby converting any acid and/or anhydride components of said light phthalic anhydride residue stream to mixed esters.

5,534,653
P-HYDROXYANILINE DERIVATIVES, THEIR PREPARATION AND THEIR USE

Oliver Wagner, Bexbach; Karl Eicken, Wachenheim; Norbert Götz, Worms; Harald Rang, Altrip; Eberhard Ammermann, Heppenheim, and Gisela Lorenz, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

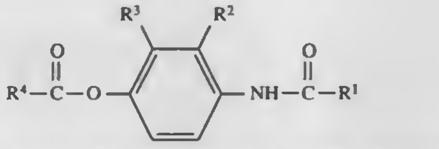
Filed Nov. 10, 1994, Ser. No. 339,230

Claims priority, application Germany, Nov. 11, 1993, 43 38 512.5; May 26, 1994, 44 18 380.1

Int. Cl.⁶ C07C *211/00;* **A01N** *25/00*

U.S. Cl. 564—32 **9 Claims**

1. A p-hydroxyaniline compound of the formula I


I

wherein the substituents have the following meanings:

R^1 is C_6–C_{15}-bicycloalkyl or C_7–C_{15}-bicycloalkenyl, optionally these groups partly or completely halogenated optionally substituted by one to five of the following radicals:

C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and aryl, said radicals optionally partly or completely halogenated optionally substituted by one ro three of the following radicals: nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio;

R^2 and R^3 independently of one another are halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy;

R^4 is C_1–C_6-alkyl, C_2–C_6-alkenyl. optionally partly or completely halogenated, optionally substituted by one of the following radicals: C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_3–C_7-cycloalkyl, C_5C_7-cycloalkenyl or aryl, the aromatic radicals in turn optionally substituted by one to three of the following groups:

nitro, cyano, halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio; C_3–C_7-cycloalkyl, C_5–C_7-cycloalkenyl, optionally substituted by one to three of the following radicals:

halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy;

R^5 is C_1–C_6-alkyl or C_2–C_6-alkenyl, optionally partly or completely halogenated, optionally substituted by one of the following radicals: C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_3–C_7-cycloalkyl, C_5–C_7-cycloalkenyl or aryl, optionally the aromatic radicals in turn being substituted by one to three of the following groups:

nitro, cyano, halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio; C_3–C_7-cycloalkyl, C_5–C_7-cycloalkenyl, optionally substituted by one to three of the following radicals:

halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy; or is aryl, optionally partly or completely halogenated, optionally substituted by one to three of the following radicals: nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio; and

R^6 is hydrogen or C_1–C_6-alkyl, or its salts.

5,534,654
AROMATIC-SULFONAMIDE-TYPE HYDROXAMIC ACID DERIVATIVE

Mitsuaki Ohtani, Nara; Hitoshi Arita, Kawanishi; Kenji Sugita, Kobe; Takaharu Matsuura, Kyoto, and Kazuhiro Shirahase, Neyagawa, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

PCT No. PCT/JP92/01593, § 371 Date Aug. 3, 1993, § 102(e) Date Aug. 3, 1993, PCT Pub. No. WO91/12075, PCT Pub. Date Jun. 24, 1993

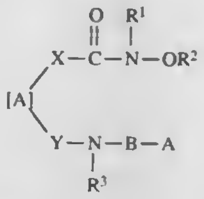
PCT Filed Dec. 7, 1992, Ser. No. 98,272

Claims priority, application Japan, Dec. 10, 1991, 3-350793

Int. Cl.⁶ A61K *31/18;* **C07C** *259/04;311/30*

U.S. Cl. 564—90 **3 Claims**

1. A compound of the formula (Ia)


(Ia)

wherein

[A] represents a benzene ring, which is unsubstituted or substituted by one or more substituents selected from the group consisting of alkyl, hydroxy, alkoxy, aryloxy, carboxy, hydroxyamino, alkoxyamino, halogen, nitro, formyl, alkanoyl, aroyl, sulfonamide, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, nitroalkyl and carboxyalkyl;

A represents phenyl, naphthyl, anthryl or phenanthryl, each of which is unsubstituted or substituted by one or more substituents selected from the group consisting of alkyl, hydroxy, alkoxy, aryloxy, carboxy, hydroxyamino, alkoxyamino, halogen, nitro, formyl, alkanoyl, aroyl, sulfonamide, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, nitroalkyl and carboxyalkyl;

B represents a single bond or a bivalent group of the formula —B_1—B_2—, wherein B_1 represents —SO_2— and B_2 represents C_1–C_8 alkylene, C_2–C_8 alkenylene, C_1–C_8 alkyleneoxy or C_2–C_8 alkenyleneoxy; or

—B—A represents (1) —SO_2— optionally substituted phenyl wherein the optional substituent is nitro, methyl, bromo, methoxy or fluoro, (2) —SO_2— naphthyl or (3) —CO-phenyl;

X represents C_2–C_{10} alkylene which optionally contains an unsaturated bond(s);

Y represents a single bond;

R^1, R^2 and R^3 each independently represents (1) hydrogen, (2) C_1–C_8 alkyl which is unsubstituted or substituted by one or more substituents selected from the group consisting of alkyl, hydroxy, alkoxy, carboxy, hydroxyamino, alkoxyamino, halogen, nitro, formyl, alkanoyl, aroyl, sulfonamide, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, nitroalkyl and carboxyalkyl, or (3) phenyl, naphthyl, anthryl or phenanthryl which is unsubstituted or substituted by one or more substituents selected from the group consisting of alkyl, hydroxy, alkoxy, aryloxy, carboxy, hydroxyamino, alkoxyamino, halogen, nitro, formyl, alkanoyl, aroyl, sulfonamide, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, nitroalkyl and carboxyalkyl; or

a pharmaceutically acceptable salt thereof.

5,534,655
PROCESS FOR PREPARING ACRYLAMIDE

Yoshihiko Kambara; Yoshikazu Uehara; Takeya Abe, and Koichi Asao, all of Osaka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Feb. 23, 1995, Ser. No. 392,508

Claims priority, application Japan, Feb. 3, 1994, 6-032094

Int. Cl.⁶ C07C *231/06*

U.S. Cl. 564—127 **13 Claims**

1. A process for preparing acrylamide by subjecting acrylonitrile to a hydration reaction in a reaction system including the presence of copper based catalyst wherein the improvement comprises allowing a compound having an active methylene group and an acidic group in one molecule or a salt of the compound to be present in the reaction system wherein the active methylene group is defined by the formula X-CH_2-Y wherein each of X and Y is selected from the group consisting of NO_2, CN, COR, COAr, CONHR, CONHAr, CO_2R, CO_2H, SO_2, S, Ar and quaternary pyridinium wherein R is an alkyl group and Ar is an aryl group.

5,534,656
ORGANIC COMPOUND CONVERSION WITH MCM-58

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 205,437, Mar. 3, 1994, Pat. No. 5,437,855, which is a continuation-in-part of Ser. No. 137,705, Oct. 18, 1993. This application Apr. 28, 1995, Ser. No. 431,159

Int. Cl.⁶ C07C *2/56;5/22;4/24*

U.S. Cl. 585—709 **16 Claims**

1. A process for converting a feedstock comprising organic compounds to conversion product which comprises contacting said feedstock at organic compound conversion conditions with a catalyst composition comprising an active form of synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table I of the specification and having a composition comprising the molar relationship

X_2O_3:(n)YO_2,

wherein n is from greater than about 10 to about 1000, X is a trivalent element, and Y is a tetravalent element.

5,534,657
ISOPARAFFIN-OLEFIN ALKYLATION

Bruce B. Randolph, Bartlesville, Okla.; Ronald G. Abbott, Kingwood, Tex.; Jonathan E. Child, Sewell, and Kenneth J. Del Rossi, Woodbury, both of N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 877,336, May 1, 1992, and a continuation-in-part of Ser. No. 856,270, Mar. 23, 1992, which is a continuation-in-part of Ser. No. 719,879, Jun. 21, 1991, abandoned. This application Jan. 20, 1995, Ser. No. 376,176

Int. Cl.⁶ C07C *2/62*

U.S. Cl. 585—723 **19 Claims**

1. A method of inhibiting corrosion in an alkylation process which utilizes a catalyst system containing a hydrogen halide and a sulfone compound, comprising the step of:

incorporating into said catalyst system water in an amount sufficient to inhibit corrosion.

5,534,658
PROCESS FOR REDUCING THE BENZENE CONTENT OF PETROLS

Christine Travers, Rueil Malmaison; Philippe Courty, Houilles, and Patrick Sarrazin, Rueil Malmaison, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Division of Ser. No. 365,930, Dec. 29, 1994. This application Jun. 7, 1995, Ser. No. 477,588

Claims priority, application France, Dec. 29, 1993, 93 15953

Int. Cl.

Int. Cl.^{6} C07C *5/13;5/22;* **C10G** *35/06*

U.S. Cl. 585—738 **19 Claims**

1. A process for reducing the benzene content of petrol fractions and isomerising paraffins, comprising conducting isomerisation on a mixture of a) a feed defined by the following composition by weight: 40% to 80% of paraffins, 0.5% to 7% of cyclic hydrocarbons and 6% to 45% of aromatics, and by a maximum distillation temperature of 70° C. to 90° C., b) a C_5–C_6 cut defined by a paraffin content of more than 90% by weight, a cyclic hydrocarbon content of less than 10% by weight and a benzene content of less than 1.5% by weight, and c) a chlorine-containing compound, in contact with a catalyst comprising 4% to 15% of at least one halogen and at least one group VIII metal on a support which consists essentially of eta alumina and gamma alumina, the eta alumina content being between 85% and 95% by weight with respect to the support, the complement to 100% of the support being gamma alumina.

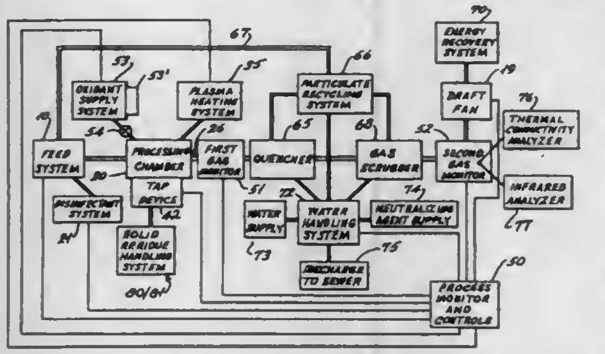
5,534,659
APPARATUS AND METHOD FOR TREATING HAZARDOUS WASTE

Marlin D. Springer, Huntsville; William C. Burns, Harvest, and Thomas Barkley, Ardmore, all of Ala., assignors to Plasma Energy Applied Technology Incorporated, Huntsville, Ala.

Filed Apr. 18, 1994, Ser. No. 229,016

Int. Cl.^{6} A62D *3/00*

U.S. Cl. 588—227 **39 Claims**



1. An apparatus for treating waste consisting of inorganic and organic components, comprising:

a waste processing chamber;

means for continually feeding waste into said processing chamber at a controlled feed rate;

a plasma arc torch for heating said processing chamber to a sufficient temperature to convert organic components of the waste to a gas comprising hydrogen, carbon monoxide and carbon dioxide, and to particulate including carbon particulate, and to convert inorganic components of the waste substantially to molten material;

means for withdrawing gas from said processing chamber as an off-gas;

thermally insulated conduit means for maintaining the off-gas at an effective temperature to substantially prevent the formation of complex organic compounds;

means for removing said molten material from said processing chamber;

first monitoring means for monitoring the amount of carbon particulate entrained in the off-gas;

means for injecting an oxidant into said processing chamber in an amount effective to convert a majority of said carbon particulate to carbon monoxide;

means responsive to said first monitoring means for controlling the amount of oxidant injected into said processing chamber so as to minimize the formation of carbon particulate; and

means for rapidly cooling the off-gas from said effective temperature to a temperature of less than about 150° C. and for separating the particulate from the cooled off-gas to form a product gas.

5,534,660
PH GENES AND THEIR USES

George S. Chuck, Berkeley; Hugo K. Dooner, Walnut Creek; Neal Courtney-Gutterson, Oakland; Janis Keller, Castro Valley; Charanjit S. Nijjar, Richmond, and Edward J. Ralston, Pleasant Hill, all of Calif., assignors to DNA Plant Technology Corporation, Oakland, Calif.

Filed Apr. 16, 1993, Ser. No. 49,282

Int. Cl.^{6} A01H *1/04;5/02;* **C12N** *15/10;15/63;* **C07H** *19/00*

U.S. Cl. 800—205 **27 Claims**

1. An isolated DNA construct comprising a polynucleotide sequence of at least about 30 nucleotides from a Ph6 gene.

13. A transgenic plant comprising a recombinant expression cassette comprising a plant promoter operably linked to a polynucleotide sequence of at least about 30 nucleotides from a Ph6 gene.

5,534,661
INBRED MAIZE LINE PHKW3

Kory W. Maughan, North Platte, Nebr., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 31, 1995, Ser. No. 381,172

Int. Cl.^{6} A01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **13 Claims**

1. Seed of maize inbred line designated PHKW3 and having ATCC Accession No. 97435.

ELECTRICAL

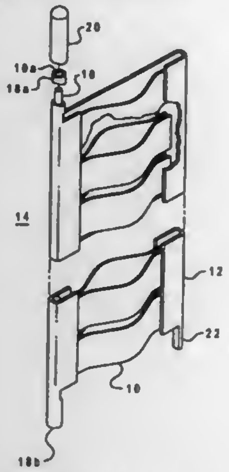
5,534,662
CHASSIS MOUNTED ELECTROMAGNETIC INTERFERENCE GROUNDING ASSEMBLY FOR ELECTRONIC MODULES

James L. Peacock, and Bruce P. Otis, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1994, Ser. No. 298,625

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 174—35 GC **8 Claims**



1. A spring carrier assembly for use in a chassis housing electronic components that radiate electromagnetic interference emissions during operation comprising:

an elongated multileaf conductive spring having a free edge and curvededge; and

an elongated carrier having a first edge encompassing the curved edge and a second edge encompassing the free edge, wherein portions of the conductive spring are exposed and the elongated carrier has a first pivot member formed at a first end and second pivot member formed at a second end of the first edge.

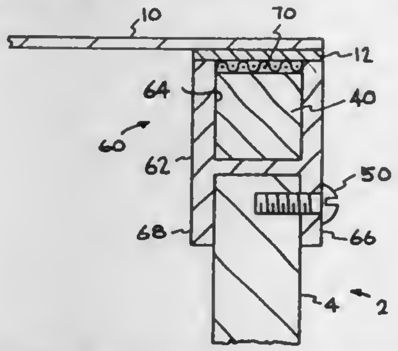
5,534,663
ELECTRICALLY SHIELDED ENCLOSURE WITH MAGNETICALLY RETAINED REMOVABLE COVER

Craig J. Rivers, Livermore; Roanne A. Lee, San Francisco, and Glenn E. Jones, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 14, 1994, Ser. No. 340,303

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 174—35 GC **4 Claims**



1. An electrically shielded enclosure with magnetically retained removable cover comprising:

a) an enclosure of electrically conductive material having a bottom and an enclosing side wall forming an opening;

b) a magnetic securement means including

a body of electrically conductive material, said body having legs for mechanically and electrically attaching said securement means to said side wall, said body having a flexible top portion between said legs, and

a magnet disposed between the top of said side wall and said flexible top portion; and

c) a cover of electrically conductive material for covering the opening; said cover having ferromagnetic means which is disposed over said flexible top portion of said magnetic securement means when said cover is mounted on said enclosure, the magnetic attraction between said magnet and said ferromagnetic means securing said ferromagnetic means against said flexible top portion to provide an electrical connection and an electromagnetic radiation seal between said cover and said enclosure.

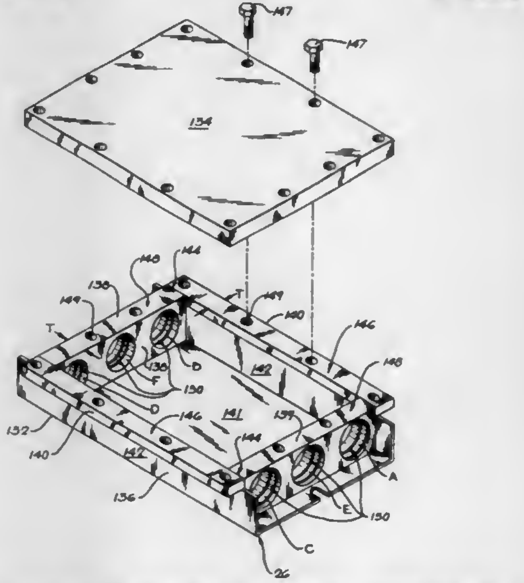
5,534,664
EXPLOSION PROOF POWER SUPPLY ENCLOSURE FOR HAZARDOUS ATMOSPHERE LIGHTING SYSTEMS

Oliver H. Fearing, Jr., Huntington; Peter J. Green, Barboursville, and Richard E. Kirby, Ona, all of W. Va., assignors to Service Machine Co., Barboursville, W. Va.

Division of Ser. No. 892,558, Jun. 2, 1992, Pat. No. 5,381,321. This application Jul. 25, 1994, Ser. No. 279,945

Int. Cl.^{6} H02G *3/08*

U.S. Cl. 174—50 **8 Claims**



1. An explosion proof enclosure for electrical components used in hazardous atmospheres comprising:

a U-shaped metal plate having a horizontal section comprising the bottom wall of the enclosure, and two horizontally spaced vertical sections comprising opposed side walls of the enclosure;

two thick rectangular metal plates welded inside the ends of the U-shaped plate, comprising opposite vertical end walls of the enclosure, the height of the end walls exceeding that of the side walls;

a pair of rectangular bars welded to the tops of the side walls and to corresponding ends of the end walls, the top surfaces of said bars and end walls being horizontally coplanar having substantially the same horizontal thickness and comprising a rectangular rim for said enclosure;

a rectangular cover plate and means for fastening said plate to the rim; and

a plurality of identical circular openings extending through said vertical end walls, each opening comprising a bore and a counterbore with a shoulder therebetween defining one side of a flame-quenching path, the total length of which is a minimum ¾" measured axially along the bore and counterbore and radially along the shoulder.

5,534,665

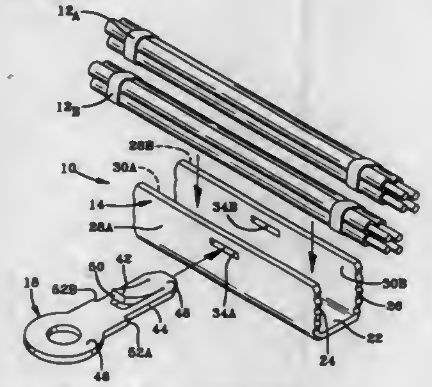
WIRING HARNESS SHROUD

Charles F. Long, Pittsboro, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1994, Ser. No. 235,583

Int. Cl.⁶ H01B *17/00;* **F16L** *3/00*

U.S. Cl. 174—72 A **5 Claims**



1. A wiring harness shroud comprising:

a U-channel having an elongate base with substantially parallel side walls extending substantially perpendicularly from said base;

each said side wall having one or more receiving slots;

said receiving slots in said opposed side walls being registered;

said U-channel having a minimum of two end openings;

a mounting member having a tang portion and a head portion;

a resilient, spring lock presented from said tang portion;

said spring lock having a blocking surface facing said head portion;

said tang portion being demountably received within said receiving slots until said blocking surface abuts one said side wall, with the tang portion extending into the registered slot in the other side wall;

said head portion has a bore therethrough so that a fastening means may be received within said bore to secure said mounting member in a desired location.

5,534,666

MULTI-LAYER WIRING BOARD HAVING A BASE BLOCK AND A STACKING BLOCK CONNECTED BY AN ADHESIVE LAYER

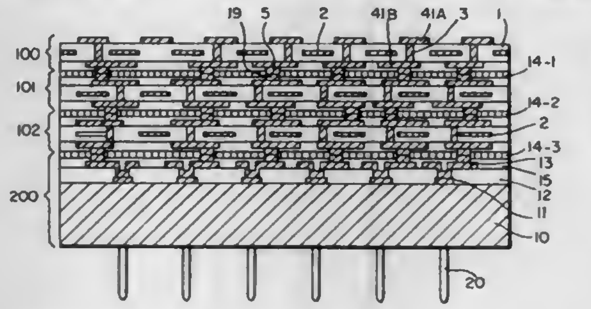
Hisashi Ishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 230,699

Claims priority, application Japan, Apr. 21, 1993, 5-117954

Int. Cl.⁶ H05K *1/14*

U.S. Cl. 174—260 **8 Claims**



1. A multi-layer wiring board, comprising:

a base block having an insulating base substrate, and at least one wiring layer formed over one major surface of said insulating base substrate;

at least one stacking block, being stacked over said base block, having an insulating hard substrate, a grounding layer formed in said insulating hard substrate, wiring layers formed over at least one major surface of said insulating hard substrate, and throughholes formed in said insulating hard substrate for electrical connection between said wiring layers formed over at least one major surface of said insulating hard substrate; and

connecting means, insulated with an adhesive layer, for connecting between each adhesive pair of layer among wiring layer of said base block and outside layers of said wiring layers of said at least one stacking block.

5,534,667

PRINTED CIRCUIT BOARD HAVING ZIG-ZAG CONTACT ARRANGEMENT

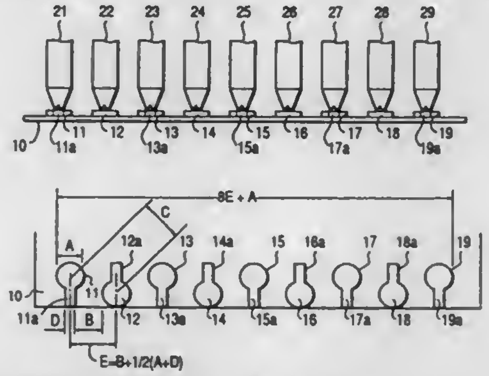
Hidenori Miyamoto, Urayasu, and Isao Soshi, Tokyo, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 187,164, Jan. 27, 1994, abandoned. This application Jan. 13, 1995, Ser. No. 372,840

Claims priority, application Japan, Jan. 27, 1993, 5-031282

Int. Cl.⁶ H05K *1/18*

U.S. Cl. 174—261 **3 Claims**



1. A printed circuit board comprising:

a circuit pattern portion, said circuit pattern portion allowing transmission of electrical signals; and

a plurality of land pattern portions, said plurality of land pattern portions allowing said circuit pattern portion to be electrically coupled to circuitry operatively coupled to said printed circuit board, and said plurality of land pattern portions being arranged in zig-zag fashion to form a plurality of rows disposed on said printed circuit board.

5,534,668

DEADWEIGHT DROPPING TYPE WAVE SOURCE

Kimio Ogura, Saitama, Japan, assignor to Oyo Corporation, Tokyo, Japan

Continuation of Ser. No. 84,263, Jul. 8, 1993, Pat. No. 5,416,281. This application Jan. 27, 1995, Ser. No. 379,207

Claims priority, application Japan, Nov. 8, 1991, 3-320951; Sep. 16, 1992, 4-272278; Sep. 17, 1992, 4-273676; Sep. 29, 1992, 4-283956

The portion of the term of this patent subsequent to Jul. 8, 2013, has been disclaimed.

Int. Cl.⁶ G01V *1/02;1/147;1/40*

U.S. Cl. 181—106 **16 Claims**

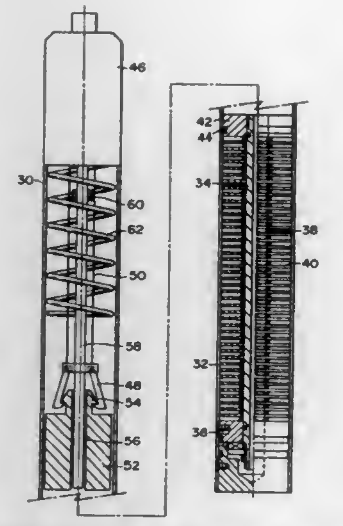
9. A deadweight dropping-type wave source for use in non-water-holding bore holes, comprising:

a laminate comprising a plurality of resilient members and a plurality of plate members piled up in an alternating manner;

a deadweight positioned above said laminate and adapted to be dropped onto said laminate;

a water-tight expansible cover surrounding said laminate;

means for supplying liquid to an interior of said expansible cover;



wherein said plurality of resilient members and said plurality of plate members are piled up in said alternating manner in a vertical direction; and

wherein said plate members are all vertically movable relative to one another.

5,534,669

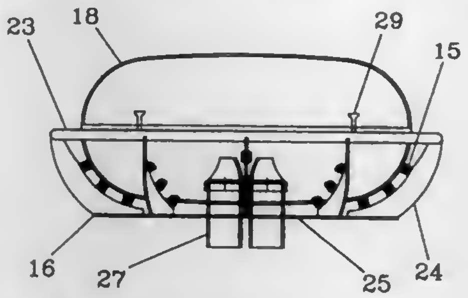
TRANSPORTABLE INCUBATOR CHAMBER FOR HUMAN AND ZOOLOGICAL APPLICATIONS

Jeff Schroeder, 428 Schroeder Ave., Delevan, Wis. 53115, and Gary Taylor, N3395 Beach Rd., Lake Geneva, Wis. 53147

Filed Nov. 14, 1994, Ser. No. 337,761

Int. Cl.⁶ A47B *81/06;* **A61G** *11/00*

U.S. Cl. 181—198 **1 Claim**



1. An acoustically advanced incubator housing system for a transport incubator, said housing system comprising: a housing formed of transparent material and having an oval shape, said housing comprising double walled upper and lower halves, a tongue and groove system for mating said housing halves, means for hinging and latching for opening and closing of said housing halves, a cradle system for supporting said housing, said cradle system comprising a top rail, a bottom mounting plate, and a plurality of supports connecting the top rail to the bottom mounting plate, a plurality of suspension means provided between said housing and said cradle system for isolating vibration and noise pressure levels from the interior of said housing, and means for providing air flow to said housing for establishing normal incubator conditions.

5,534,670

MUFFLER FOR BOOSTER

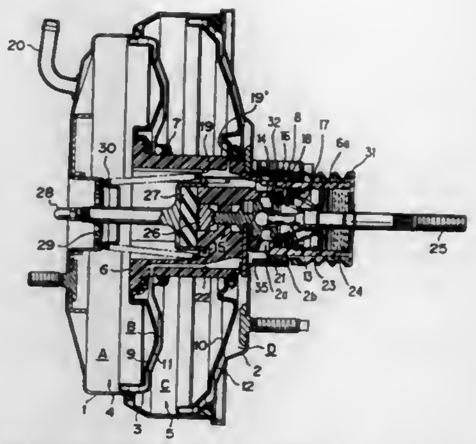
Masahiro Ikeda, Saitama-ken, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,577

Claims priority, application Japan, Mar. 31, 1994, 6-085789

Int. Cl.⁶ F01N *3/02*

U.S. Cl. 181—230 **8 Claims**



1. A booster including a shell which defines a constant pressure chamber and a variable pressure chamber and includes a tubular portion having an internal surface, a tubular valve body slidably disposed within the shell and having a terminal portion which projects externally through the tubular portion of the shell, a valve mechanism disposed within the valve body, a constant pressure passage for providing a communication between the valve mechanism and the constant pressure chamber formed in the shell, a variable pressure passage for providing a communication between the valve mechanism and the variable pressure chamber formed in the shell, and a pressure passage for providing a communication between the valve mechanism and a source of pressure fluid located externally of the shell, and in which the variable pressure passage has an opening to permit entry of the pressure fluid into the variable pressure chamber, the opening being disposed opposite to the internal surface of the tubular portion of the shell when the booster is inoperative, the internal surface of the tubular portion of the shell including means defining an uneven surface disposed in an opposing relation with the opening for reducing generation of sounds made by pressure fluid from the variable pressure opening impinging on the internal surface.

5,534,671

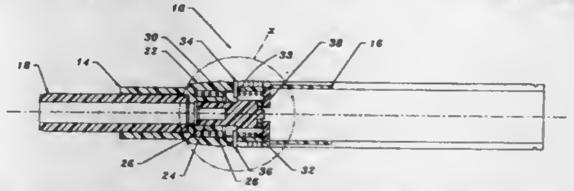
SWITCH FOR COMPUTER PEN

Joseph J. Gierut, Glenview; Julie Suvada Rutkowski, Chicago, and Robert Dam, Buffalo Grove, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 21, 1994, Ser. No. 210,935

Int. Cl.⁶ H01H *35/00;* **G06F** *3/00;* **G06K** *11/18*

U.S. Cl. 200—52 R **20 Claims**



1. A switch structure for use in a computer pen comprising:

a cylindrically-shaped housing having an inner wall surface and a hollow sleeve disposed coaxially within said inner wall surface in a spaced apart relationship to define first and second annular cavities therebetween, said housing having a first end disposed adjacent to an annular flange and a second end;

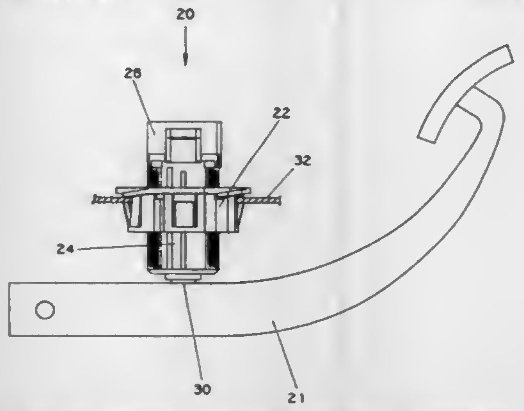
a top compression spring disposed circumferentially on the outer surface of said hollow sleeve so as to lie in said first annular cavity;

an actuator being formed of a tubular member and disposed in a cylindrically-shaped recess of said sleeve, said actuator including a pair of opposed arcuate-shaped arms which are spaced radially from the outer surface of said tubular member, said arms surrounding the outer circumferential surface of said hollow sleeve;

a bottom compression spring being disposed circumferentially on the outer surface of said hollow sleeve so as to lie in said second annular cavity;

a cover plate for closing the second end of said housing;
a pair of terminals disposed in the opposite sides of said housing in the area substantially intermediate to said annular flange and said cover plate;
a first end of said top spring being supported in said annular flange and a second end thereof being supported by the arms of said actuator so that the second end thereof is disengaged from said pair of terminals when said actuator is in its fully extended position; and
a first end of said bottom spring being supported by said cover plate and a second end thereof being supported by the arms of said actuator so that the second end thereof contactly engages said pair of terminals to produce an electrical connection therebetween when said actuator is in its fully extended position.

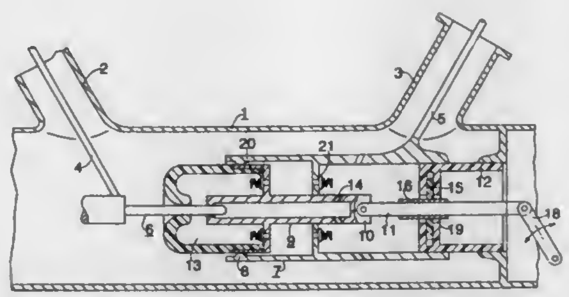
5,534,672
MULTIPLE PLUNGER PEDAL SWITCH ASSEMBLY
James P. Meagher, Indianapolis, Ind., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Feb. 6, 1995, Ser. No. 385,001
Int. Cl.^{6} H01H ***3/14***
U.S. Cl. 200—61.89 **23 Claims**



1. A multiple plunger pedal switch assembly, comprising:
(a) a housing;
(b) a switch carrier engaging the housing to mount the multiple plunger pedal switch assembly to a stationary surface;
(c) at least two switches enclosed in the housing to operate an electrical device; and
(d) at least two concentric plungers that are separate and operate independently from each other, spring biased, and slideably carried in the housing, each plunger having at least one cam and a shaft such that each cam selectively engages a switch for switch operation when the plunger causes the shaft to move within the housing.

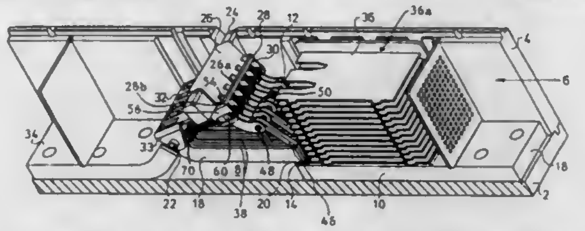
5,534,673
ELECTRIC HIGH-VOLTAGE CIRCUIT BREAKER
Volker Lehmann, and Heiner Marin, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Jun. 3, 1994, Ser. No. 253,636
Claims priority, application Germany, Jun. 4, 1993, 9308586 U
Int. Cl.^{6} H01H ***33/70;33/04***
U.S. Cl. 218—68 **2 Claims**

1. An electric high-voltage circuit breaker, comprising:
a housing;
an insulating support connected to said housing, said insulating support having an opening therethrough;
a drive rod passing through the opening in said insulating support;
a movable contact connected to one side of said drive rod;
an operating lever connected to a side of said drive rod opposite to that of said movable contact;



a stationary contact which is conductively connected to said movable contact when said movable contact physically engages said stationary contact;
an insulating disk in said insulating support, said insulating disk sealingly surrounding said drive rod and sealing the opening in said insulating support; and
a bushing secured to said drive rod and extending through the opening in said insulated disk such that said insulating disk glides on said bushing.

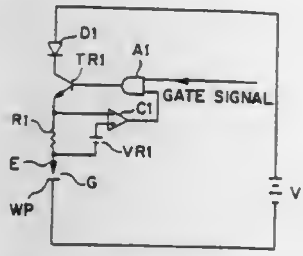
5,534,674
CURRENT LIMITING CONTACT SYSTEM FOR CIRCUIT BREAKERS
Wilhelm Steffens, Sankt Augustin, Germany, assignor to Klöckner-Moeller GmbH, Bonn, Germany
Filed Nov. 2, 1994, Ser. No. 333,548
Claims priority, application Germany, Nov. 2, 1993, 43 37 344.5
Int. Cl.^{6} H01H ***3/46;77/10***
U.S. Cl. 218—154 **20 Claims**



1. A current limiting unit for a circuit breaker, said unit comprising:
housing means;
at least one contact system disposed at least partly within said housing means;
said contact system for being operatively associated with a circuit breaker;
said contact system comprising:
first means for conveying electrical current;
second means for conveying electrical current;
means for providing electrical communication between said first means for conveying current and said second means for conveying current;
said means for providing electrical communication comprising:
toggle means, said toggle means having means for conveying electrical current;
first connecting means for electrically connecting said toggle means with said first means for conveying current;
second connecting means for electrically connecting said toggle means with said second means for conveying current;
said first connecting means comprising:
a first contact portion operatively connected to said toggle means;
a second contact portion disposed on said first means for conveying current;
said first contact portion and said second contact portion being disposed to be engageable with one another to electrically connect said toggle means with said first means for conveying current;

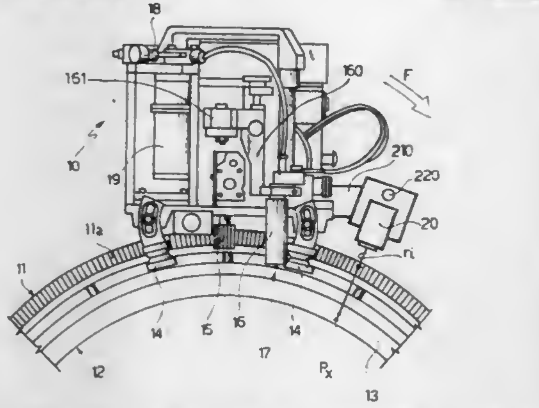
means for displaceably mounting said toggle means to permit displacement of said toggle means into at least a first position, wherein said first contact portion and said second contact portion are engaged with one another, and a second position, wherein said first contact portion and said second contact portion are disengaged from one another to disrupt the electrical connection between said toggle means and said first means for conveying current;
means for biasing said toggle means such that said toggle means will remain in said second position upon disruption of the electrical connection between said toggle means and said first means for conveying current;
said toggle means comprising:
contact arm means, said first contact portion being disposed on said contact arm means;
toggle arm means having a first end portion and a second end portion and an axis defined between said first end portion and said second end portion;
said first end portion of said toggle arm means being operatively connected to said contact arm means;
said second end portion of said toggle arm means being disposed adjacent said biasing means;
said biasing means having a longitudinal axis and being disposed to provide a biasing force along the longitudinal axis of said biasing means, the biasing force acting on said second end portion of said toggle arm means, said toggle arm means for transferring the biasing force of said biasing means so as to bias said contact arm means such that said toggle means will remain in said second position; and
said axis of said toggle arm means forming an angle of greater than about 90° with respect to the longitudinal axis of said biasing means, with said toggle means being in said second position and with the electrical connection between said toggle means and said first means for conveying current having been disrupted, said toggle arm means assuming a rest position with said toggle means being in said second position.

5,534,675
POWER SUPPLY SYSTEM FOR ELECTRIC DISCHARGE MACHINES
Yuji Kaneko, and Shinji Ito, both of Kanagawa, Japan, assignors to Sodick Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 156,067, Nov. 23, 1993, Pat. No. 5,386,095, which is a division of Ser. No. 818,536, Jan. 9, 1992, Pat. No. 5,298,709, which is a division of Ser. No. 429,794, Oct. 31, 1989, Pat. No. 5,126,525. This application Dec. 2, 1994, Ser. No. 341,228
Claims priority, application Japan, Nov. 1, 1988, 63-276957; Nov. 1, 1988, 63-276958; Nov. 16, 1988, 63-289837
Int. Cl.^{6} B23H ***1/02***
U.S. Cl. 219—69.13 **17 Claims**



1. A machining gap circuit for an electroerosion machine having a machining gap (G, **50**, **140**) formed by a tool electrode (E) and a workpiece electrode (WP), a power source (V1, **60**, **150**) for supplying machining energy to said machining gap and a means for inputting a gate signal (Gate **0**) for controlling application of said power source to said gap, said gate signal comprising pulses indicative of machining pulse ON time and machining pulse OFF time, said machining gap circuit further comprising:
a switch (TR1, **140**, **141**) connected in series with said machining gap for controlling the flow of current through said gap;
a machining current detector (R1, **41**, R11) for detecting the magnitude of said gap current:
a comparator (C1, **31**, **111**) for comparing the magnitude of said detected current with a reference value (VR1, D/A out, VR); and
a gate means (A1, **32**, **113**) responsive to said comparator means and to said gate signal for operating said switch, whereby said switch is closed when said machining current is below said reference value and said gate signal is at a value indicative of a machining pulse ON time.

5,534,676
SYSTEM FOR AUTOMATICALLY CONTROLLING WELD MATERIAL BEADING IN ORBITAL WELDING PROCESSES FOR MEDIUM- AND LARGE-SIZE PIPES
Fernando Rinaldi, Guardamiglio; Guglielmo Crivellaro, Paullo, and Rinaldo Denaro, Pantigliate, all of, Italy, assignors to P.W.T. S.p.A., Milan, and S & H S.n.c. di Guglielmo Crivellaro & C., Peschiera Borromeo, both of, Italy
Filed May 22, 1995, Ser. No. 446,971
Claims priority, application Italy, May 26, 1994, TO94A0433
Int. Cl.^{6} B23K ***9/095***
U.S. Cl. 219—124.34 **18 Claims**



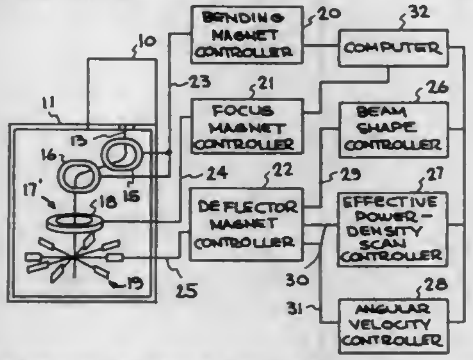
1. A control system for automatically controlling a series of orbital welding bead depositions in a welding gap disposed between a pair of juxtaposed pipe segments, comprising:
a welding carriage;
a guide arrangeable about the juxtaposed pipe segments for guidably supporting said welding carriage;
a drive mechanism for orbitally moving said welding carriage on said guide;
a welding torch movably mounted on said welding carriage including a welding current generator;
a drive mechanism for moving said welding torch into selected positions with respect to the welding gap;
a metal wire feed device mounted on said welding carriage for feeding metal wire to said welding torch;
a welding gap profile measurement device for determining a plurality of measured welding gap profiles of the welding gap as the welding carriage travels on said guide, said welding gap profile measurement device producing electrical signals corresponding to said plurality of measured welding gap profiles;
an electronic memory device storing a plurality of nominal welding gap profiles, said electronic memory device being adapted for sending electrical signals corresponding to said plurality of nominal welding gap profiles;
comparison and processing electrical circuitry electrically connected to said welding gap profile measurement device and said electronic memory device for receiving and comparing said electrical signals corresponding to said plurality of measured welding gap profiles and plurality of nominal welding gap profiles, and said comparison and processing electrical circuitry being operative to process said signals for producing

welding control electrical signals, said comparison and processing electrical circuitry being electrically connected to at least one of: said drive mechanism for moving said welding torch; said welding current generator of said welding torch; said metal wire feed device; and said drive mechanism for orbitally moving said welding carriage on said guide, such that said welding control electrical signals control at least one of: the movement of said welding torch with respect to the welding gap; the welding current generated by said welding current generator; the wire feed rate of said metal wire feed device; and the movement of said welding carriage on said guide.

5,534,677
ELECTRON BEAM MACHINING USING ROTATING AND SHAPED BEAM POWER DISTRIBUTION

John W. Elmer, Pleasanton, and Dennis W. O'Brien, Livermore, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Mar. 18, 1993, Ser. No. 33,607
Int. Cl.⁶ B23K *15/00*
U.S. Cl. 219—121.35 **22 Claims**

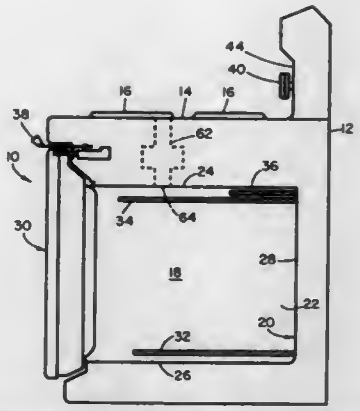

BENDING MAGNET CONTROLLER
20
32
COMPUTER
10
23
21
FOCUS MAGNET CONTROLLER
26
BEAM SHAPE CONTROLLER
11
13
16
15
17'
18
24
22
29
27
DEFLECTOR MAGNET CONTROLLER
EFFECTIVE POWER-DENSITY SCAN CONTROLLER
19
25
30
31
28
ANGULAR VELOCITY CONTROLLER

1. An apparatus for electron beam machining, comprising:
means for producing an electron beam along a first axis;
means for bending said beam along a second axis substantially parallel to said first axis and for directing the beam onto an associated workpiece;
means for focusing the beam;
means for shaping, scanning, and rotating the beam; and
means for controlling said means for bending the beam, said means for focusing the beam, and said means for shaping, scanning, and rotating the beam.

5,534,678
OVEN WITH IMPROVED SELF-CLEANING CYCLE

Patrick J. Bowles; Stephen M. Bakanowski; Michael T. Beverle; Robert V. Chou; John C. Reiche, all of Louisville, Ky., and Nayson N. Khoshnood, Chattanooga, Tenn., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 12, 1993, Ser. No. 151,539
Int. Cl.⁶ A21B *1/02*
U.S. Cl. 219—396 **30 Claims**

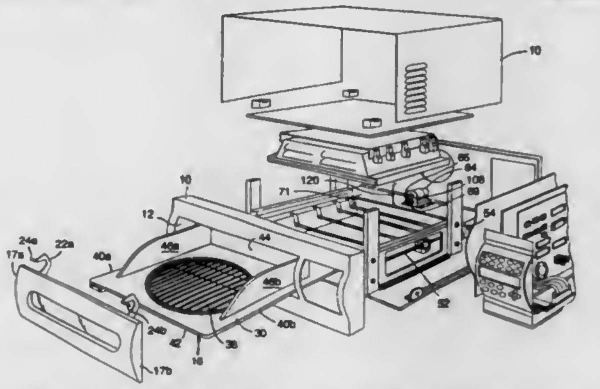


1. A pyrolytically cleaned cooking oven having:
a liner forming a cooking chamber; a smoke eliminator having an entrance communicating with said chamber through said liner;
first heating means positioned in the portion of said chamber adjacent said smoke eliminator entrance and second heating means positioned in a portion of said chamber remote from said smoke eliminator entrance;
temperature sensing means for sensing the temperature in said chamber; and
control means for providing a pyrolytic cleaning operation of said oven, said control means being connected to said first and second heating means and to said sensing means and constructed and arranged selectively to continuously energize said heating means and to energize said heating means in a cyclical mode of operation with predetermined duty cycles in which the time of energization of each heating means during each duty cycle is substantially shorter than the overall period of that cyclical mode of operation so that the heat output of the cyclically operated heating means is less than it would be with a continuous operation mode for a corresponding period of time; said control means being effective to continuously energize said first heating means until said sensing means senses a predetermined trigger temperature; to thereafter cyclically energize at least a selected one of said heating means with a predetermined duty cycle until said sensing means senses a predetermined off temperature, higher than the trigger temperature; and to thereafter deenergize both of said heating means from each time said sensing means senses the off temperature until said sensing means subsequently senses a predetermined on temperature, lower than the off temperature, and to cyclically energize at least a selected one of said heating means from each time said sensing means senses the on temperature until said sensing means subsequently senses the off temperature.

5,534,679
APPARATUS FOR AUTOMATED FOOD HANDLING

Robert I. Beaver, II, Atherton, and William H. Sehestedt, Santa Clara, both of Calif., assignors to Quadlux, Inc., Fremont, Calif.

Filed May 20, 1994, Ser. No. 247,029
Int. Cl.⁶ F27D *11/00*
U.S. Cl. 219—413 **12 Claims**

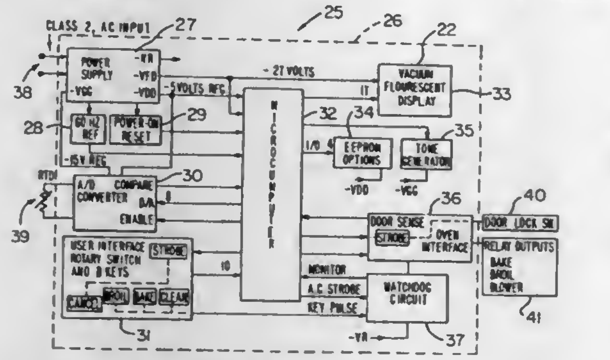


1. An apparatus for automatically removing a food item from a cooking chamber at the end of a cooking period, comprising:
an oven having an opening;
a door mean moveable between a closed position, wherein the opening is covered by the door means, and an open position wherein the opening is exposed;
a food support drive assembly mounted within the oven;
a food support engaged with the food support drive assembly, the food support automatically moveable by the food support drive assembly through the opening between a first position within the oven and a second position at least partially outside the oven, the food support having a camming surface and positioned for abutment with the door during movement of the food support from the first to the second position to thereby automatically move the door from the closed position to the open position.

5,534,680
CONTROL UNIT AND METHOD OF MAKING THE SAME

Brian J. Kadwell, Holland; Daniel L. Fowler, Kentwood, and Gregory F. Gawron, Holland, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 262,952, Jun. 21, 1994, Pat. No. 5,451,796, which is a division of Ser. No. 877,314, May 1, 1992, Pat. No. 5,324,918, which is a division of Ser. No. 621,998, Dec. 4, 1990, Pat. No. 5,126,537, which is a division of Ser. No. 444,444, Nov. 30, 1989, Pat. No. 4,994,653, which is a division of Ser. No. 259,189, Oct. 18, 1988, Pat. No. 4,899,034, which is a division of Ser. No. 939,872, Dec. 10, 1986, Pat. No. 4,782,215. This application Jun. 7, 1995, Ser. No. 487,206
Int. Cl.⁶ H05B *1/02*
U.S. Cl. 219—505 **8 Claims**

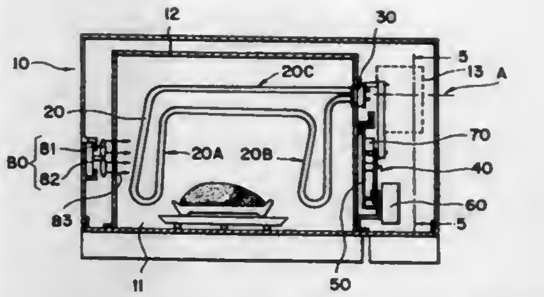


1. A method of calibrating a temperature regulating control unit having a RTD temperature sensor, means for applying electrical signals to said sensor, and a microcomputer for receiving digital signals from said sensor in relation to the temperature being sensed by said sensor, comprising the steps of:
accessing a test mode contained in the microcomputer;
replacing the RTD temperature sensor with a precision resistor;
calculating a desired current level using said microcomputer;
applying a varying voltage electrical signal to said precision resistor;
measuring a current through said precision resistor; and
recording a value of said varying voltage when said current matches said desired current level.

5,534,681
MICROWAVE OVEN WITH ELECTRIC HEATER ADJUSTABLE TO DIFFERENT POSITIONS

Yun-Ic Hwang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 12, 1995, Ser. No. 440,349
Claims priority, application Rep. of Korea, May 12, 1994, 94-10500 U; Feb. 17, 1995, 95-2594 U
Int. Cl.⁶ H05B *6/80*
U.S. Cl. 219—685 **12 Claims**

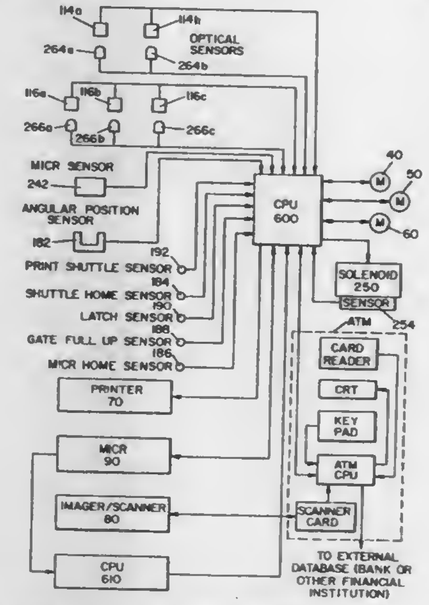


1. A microwave oven having a body constituting an enclosure and a cooking chamber formed by a cavity within the body, the apparatus comprising:
a heater assembly including a support mounted in the body for rotation relative thereto and a heating element fixed to the support and situated in the cooking chamber for movement between different positions therein in response to rotation of the support;
power generating means fixed to the body adjacent one side of the cavity to generate an operating power for rotation of the heater; and
power transmission means for transferring the power generated by the power generating means to the heating element, the power transmission means comprising a gear rotated by the power generating means, and a transmission member having a first end rotatably mounted to the gear by a projection extending between the first end and the gear, the transmission member including a second end pivotally connected to the support.

5,534,682
ARTICLE DEPOSITING APPARATUS

Harry T. Graef, Bolivar, and Michael J. Harty, North Canton, both of Ohio, assignors to InterBold, N. Canton, Ohio

Division of Ser. No. 4,829, Jan. 15, 1993, Pat. No. 5,422,467. This application Mar. 21, 1995, Ser. No. 407,750
Int. Cl.⁶ G06F *17/60*
U.S. Cl. 235—379 **17 Claims**



1. A document processing system comprising:
sensor means for sensing the position, thickness, width and opacity of a document;
magnetic scanning means for scanning said document for coded information thereon;
imaging means for obtaining digitized image data of said document;
memory means for storing said digitized image data obtained by said imaging means;
printing means for printing information on said document;
transport means for conveying a document past said sensor means, said magnetic scanning means, said imaging means, and said printing means;

a processing means for controlling said document processing system, said processing means being connected to said sensor means, said magnetic scanning means, said imaging means, said memory means, said printing means and said transport means; and

an ATM, connected to said processing means, including input means for inputting a user identification code and an input value, a display means, and a cash dispensing means.

5,534,683

SYSTEM FOR CONDUCTING TRANSACTIONS WITH A MULTIFUNCTIONAL CARD HAVING AN ELECTRONIC PURSE

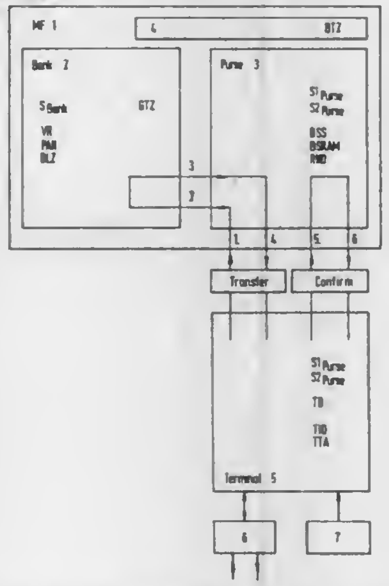
Wolfgang Rankl, München, and Dieter Weiss, Hergatz, both of, Germany, assignors to Giesecke & Devrient GmbH, Munich, Germany

Filed Sep. 30, 1994, Ser. No. 315,509

Claims priority, application Germany, Sep. 30, 1993, 43 33 388.5

Int. Cl.⁶ G06K *5/00*

U.S. Cl. 235—380 **7 Claims**



1. A system for conducting transactions, said system comprising:

(a) a multi-functional card having an integrated circuit which contains a bank application associated with a bank and at least one purse application associated with a services supplier or dealer; and

(b) an apparatus comprising means for loading transaction data representing at least a selectable sum of money into the purse application by transmitting the transaction data from the apparatus to the card and transferring the sum from the bank application to the purse application within the integrated circuit of the card;

said multifunctional card further comprising:

means for preparing a transaction certificate from the transaction data within the bank application using secret data known only to the bank or stored in the bank application and for transmitting the transaction certificate to the purse application;

means for authenticating the transaction certificate within the purse application to produce an authenticated transaction certificate, transmitting the authenticated transaction certificate from the purse application to the apparatus, and receiving from the apparatus a confirmation signal confirming that the apparatus has received the authenticated transaction certificate; and

means for loading the sum of money into the purse application only when the apparatus confirms that the apparatus has received the authenticated transaction certificate.

5,534,684

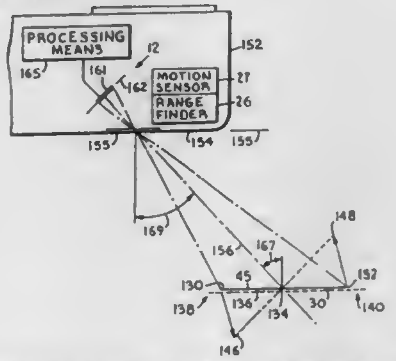
PORTABLE OPTICAL READER WITH MOTION SENSING SYSTEM AND METHOD

Arvin D. Danielson, Solon, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 303,333, Sep. 9, 1994, which is a continuation-in-part of Ser. No. 298,257, Mar. 31, 1994, abandoned, and a continuation-in-part of Ser. No. 300,178, Sep. 2, 1994, abandoned. This application Sep. 23, 1994, Ser. No. 311,483

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—472 **2 Claims**



1. An apparatus for reading optical indicia on a target surface, comprising:

a) a portable terminal unit of tablet configuration having an optical window near an underside thereof;

b) an optical reader contained within said terminal unit, said optical reader having a given depth of field and field of view at a given range from said window and an optical axis directed through said window such that at least a portion of the target is operably encompassed within said field of view;

c) ranging means for operably determining the range of the target area from said terminal unit;

d) motion sensing means for sensing motion of said terminal unit; and

e) control means for operably controlling, in conjunction with said ranging means, activation of said reader by a user, wherein said control means operably permits activation of said reader as the target area is spaced within said depth of field and motion of said terminal unit relative to the target area is halted.

5,534,685

REPEATEDLY USABLE RECORDING MEDIUM CARD AND RECORDING MEDIUM CARD PROCESSOR

Takatoshi Takemoto; Kazunari Kawashima, and Nobuyuki Muto, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

PCT No. PCT/JP93/00741, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO93/24901, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 2, 1993, Ser. No. 347,456

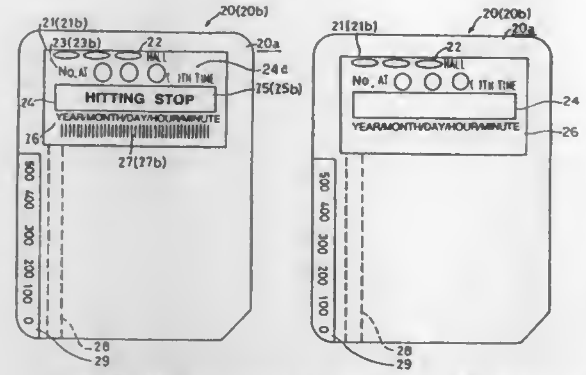
Claims priority, application Japan, Jun. 3, 1992, 4-142984; Oct. 28, 1992, 4-290550

Int. Cl.⁶ G06K *19/00*

U.S. Cl. 235—487 **10 Claims**

1. A gaming house system comprising a plurality of gaming machines, a computer for managing the gaming machines, a plurality of recording medium cards for recording output information from the gaming machines, and a recording medium card processor being connected to the computer for managing the recording medium cards for repetitive use of the cards, characterized in that each of said recording medium cards has:

a card substrate made of a flexible material, a data recording portion for visually recording necessary items on a part of the card substrate, and a number-of-use-times recording portion for recording information indicating the number of card use times, equivalent to the number of times data has been recorded and erased in the data recording portion, on another part of the card substrate, and in that



said recording medium card processor comprises:

means for taking in the recording medium card from outside;

means for erasing contents recorded in the data recording portion of the taken-in recording medium card;

a stacker mechanism for taking in the recording medium card from said erasing means and temporarily storing the card;

means for visually recording new data sent from said computer in the data recording portion of the card taken out from said stacker mechanism;

means for reading the number of card use times from the number-of-use-times recording portion and recording a new number of card use times in the number-of-use-times recording portion; and

means for discharging the card, onto which the new data is written, to the outside.

5,534,686

TWIN-CONTACT CHIP CARD AND METHOD OF COMMUNICATION WITH A CARD READER

Jacek Kowalski, Trets, and Jean Sureaud, Le Beausset, both of, France, assignors to Gemplus Card International, Gemenos, France

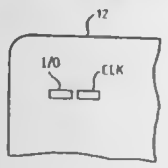
PCT No. PCT/FR93/00074, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/15477, PCT Pub. Date Aug. 5, 1993

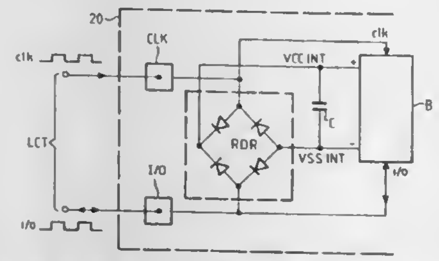
PCT Filed Jan. 26, 1993, Ser. No. 256,821

Claims priority, application France, Jan. 30, 1992, 92 01038

Int. Cl.⁶ G06K *19/067*

U.S. Cl. 235—492 **20 Claims**





1. Chip carrier of the type enabling a reciprocal exchange of information elements between the chip carrier and a reader into which the chip carrier is inserted, wherein:

the chip carrier comprises only two contacts, flush with the surface, through which there pass electrical signals representing the information elements of the reciprocal exchange, one of the contacts being a clock contact and the other contact being a data input/output contact, and wherein

the chip carrier further comprises a rectifier circuit having inputs connected to the two contacts and outputs providing the rest of the chip carrier with a rectified voltage necessary for supplying the chip carrier with power.

5,534,687

FOCUS DETECTING OPTICAL SYSTEM WITH AN OFF-AXIS LIGHT SOURCE AND LIGHT PROJECTING LENS

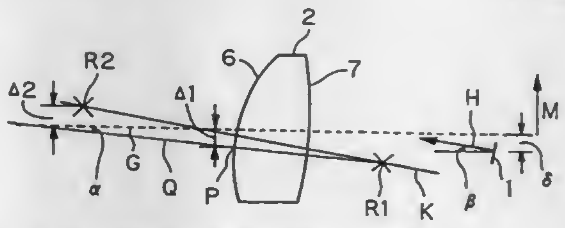
Motoyuki Ohtake, Ohmiya, Japan, assignor to Nikon Corporation, Japan

Filed Nov. 2, 1994, Ser. No. 334,324

Claims priority, application Japan, Nov. 4, 1993, 5-299020

Int. Cl.⁶ G02B *7/04*

U.S. Cl. 250—201.4 **8 Claims**



1. A focus detecting optical system comprising:

a light source;

a light projecting system having a light projecting lens through which a beam of light emitted from said light source is applied to an object; and

a light receiving system for receiving a reflected beam of light from the object;

said light source and an optical center of at least one lens surface of the light projecting lens of said light projecting system are positioned apart from each other and off-axis from a structural center axis of the light projecting lens of said light projecting system.

5,534,688

FOCUS DETECTING DEVICE HAVING LIGHT DISTRIBUTION DETECTION

Yosuke Kusaka, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 311,896, Sep. 26, 1994, which is a continuation of Ser. No. 225,913, Apr. 11, 1994, abandoned, which is a continuation of Ser. No. 129,576, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 32,176, Mar. 15, 1993, abandoned, which is a continuation of Ser. No. 951,317, Sep. 25, 1992, abandoned, which is a continuation of Ser. No. 837,106, Feb. 18, 1992, abandoned, which is a continuation of Ser. No. 641,431, Jan. 15, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 482,500

Claims priority, application Japan, Jan. 18, 1990, 2-11066

Int. Cl.⁶ G01J *1/20*

U.S. Cl. 250—201.8 **12 Claims**

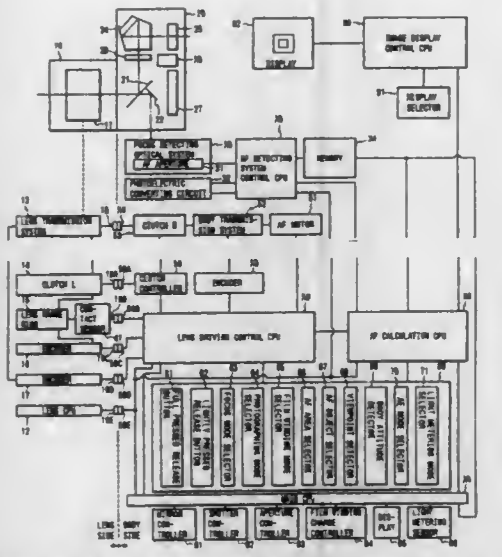
1. A focus detecting device comprising:

a phototaking optical system for forming an image of an object on a reference plane;

a focus detecting optical system for separating, from a light beam passing through said phototaking optical system, at least a pair of light beams passing through spatially different area on a first predetermined plane axially spaced by a first distance from said reference plane, thereby forming image of the object;

photoelectric conversion means composed of plural photosensor elements and adapted to generate object image signals corresponding to the intensity distribution of said object images formed by said focus detecting optical system;

phototaking optical system information means for generating information on the shape of exit pupil at the fully-open



diaphragm of said phototaking optical system and on a second distance from said reference plane to said exit pupil;

focus detecting optical system information means for generating information on the shape of said areas on said first predetermined plane and on said first distance;

light amount distribution detection means for determining the decrease in light amount on the plane of photosensor elements of said photoelectric conversion means as light amount information relating to the position on the plane of photosensor elements, encountered when said phototaking optical system and said focus detecting optical system are combined, based on the information from said phototaking optical system information means and from said focus detecting optical system information means; and

focus detection calculation means for effecting a process on said object image signals according to said light amount distribution information, thereby detecting the defocus amount of the current object image plane relative to said reference plane.

5,534,689

DEVICE TO CHECK THE SETTING OF THE POSITION AND ORIENTATION OF A HELMET WITH RESPECT TO THE HELMET WEARER'S HEAD

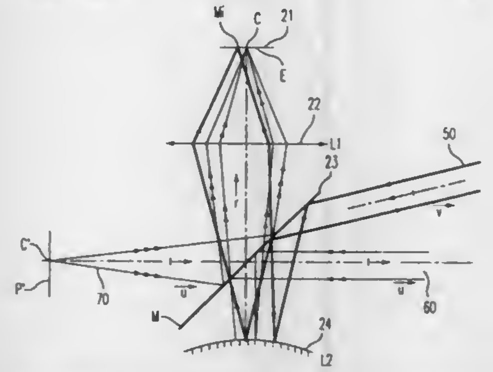
Bruno Barbier; Patrick Lach, both of Bordeaux, and Alain Leger, Courbevoie, all of, France, assignors to Sextant Avionique, Meudon La Foret, France

Filed Jan. 25, 1995, Ser. No. 377,828

Claims priority, application France, Jan. 25, 1994, 94 00768

Int. Cl.^{6} G01C *21/02*

U.S. Cl. 250—206.2 **6 Claims**



1. An instrument system for setting and verifying a position of a helmet with respect to a position of a helmet wearer having, in a position of rest, a viewing direction defined by an axial direction $\vec{u}$, said helmet being designed to received optronic instruments at a location physically represented by reference points on said helmet, said optronic instruments themselves having an optical pupil whose position with respect to the reference points is known, these optronic means also having an optical axis $\vec{v}$ whose direction with respect to said reference points is known, wherein the operations of setting and verification performed by said instrument system are aimed at verifying that the position of the wearer's pupil coincides with the position of the pupil of said optronic means and that the axial direction $\vec{u}$ of the wearer's line of view forms a predetermined angle with the optical axis $\vec{v}$ of said optronic means, said instrument system comprising:

first optical means designed to form an image of the pupil of the eye on a screen on which there is made a first test pattern, a mechanical assembly formed by said first optical means and said screen occupying a known fixed position with respect to said helmet, this position being such that sharp image of the pupil of the wearer's eye centered on said first test pattern can be obtained only if the position of the pupil of the eye coincides with the position of the pupil of the optronic means to be mounted on the helmet,

second optical means designed to provide points on said screen which each correspond to each of said axial direction and said optical axis wherein said screen further contains a second test pattern representing a figure, with said second optical means occupying a known fixed position with respect to the helmet, this position being such that a collimated figure located with respect to the wearer of the helmet in the direction $\vec{u}$ cannot have an image superimposed on said second test pattern unless said second optical means are oriented in a direction in which the axial direction $\vec{u}$ of the wearer's line of view and the axial direction $\vec{v}$ of the optical axis of said optronic means are oriented with respect to each other in said predetermined direction.

5,534,690

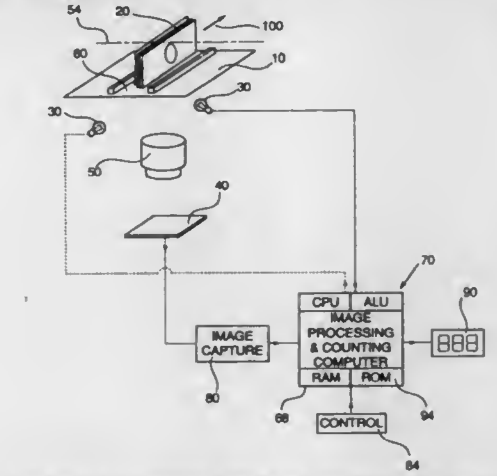
METHODS AND APPARATUS FOR COUNTING THIN STACKED OBJECTS

Llor Goldenberg, 4 Helez Street, Holon 58421, Israel; Charlie S. Antebi, 17 Harel Street, Holon 58231, Israel, and Oded R. Hecht, 55 Reading Street, Tel Aviv 69460, Israel

Filed Jan. 19, 1995, Ser. No. 374,806

Int. Cl.^{6} G01V *9/04*

U.S. Cl. 250—222.1 **17 Claims**



1. A method for counting banknotes employing an optical sensor comprising:

providing a stack of banknotes; and counting the number of banknotes in the stack characterized in that the mutual orientation of the banknotes relative to said optical sensor is substantially maintained, the counting step including:

employing at least one optical sensor for generally simultaneously viewing at least two separate columns along a surface defined by edges of the banknotes in the stack; and

receiving an output from said optical sensor and providing an output indication of a number of banknotes in the stack.

5,534,691

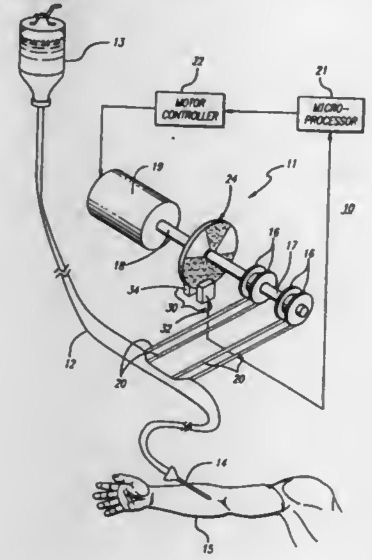
SYSTEM FOR DETERMINING PUMPING MECHANISM POSITION WHILE LIMITING VOLUME OF FLUID PUMPED

Charles R. Holdaway, San Diego, and Eric A. Warner, Vista, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Sep. 12, 1994, Ser. No. 304,582

Int. Cl.^{6} G01D *5/34*

U.S. Cl. 250—231.14 **14 Claims**



1. A system for determining the position of a drive member, the drive member moving in a plurality of movement increments over a complete rotation, the drive member connected to a pumping mechanism such that as the drive member turns through the plurality of movement increments over the complete rotation, the pumping mechanism correspondingly pumps volume increments of fluid, at least some of the volume increments varying in quantity from other volume increments, the system comprising:

a disk coupled to the drive member for rotation therewith, the disk having a plurality of spaced-apart markers, the number of markers being less than the plurality of movement increments of the drive member, the positions of the markers on the disk selected such that the markers are located on the disk in known positions that correspond to particular volume increments pumped by the pumping mechanism and the spacing between the markers selected so that known volume totals are pumped by the pumping mechanism between said markers with the markers being located closer together to correspond to higher pumped volume increments and the markers being located farther apart to correspond to lower pumped volume increments;

a sensor located to sense the markers of the disk as the drive member rotates and to produce marker signals upon sensing the markers; and

a processor that provides control signals to cause the drive member to turn sequentially through the plurality of movement increments, the processor receiving the marker signals from the sensor and counting the movement increments of the drive member between receipt of marker signals to calculate the position of the drive member based on the receipt of marker signals and the number of movement increments counted.

5,534,692

METHOD FOR DETECTING ORIGIN POINT OF POSITION SENSOR

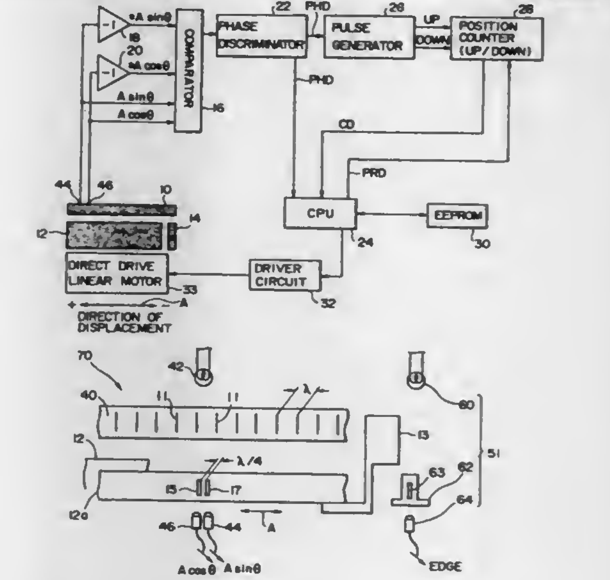
Akihito Nakayama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 117,713

Claims priority, application Japan, Sep. 14, 1992, 4-270880; Sep. 18, 1992, 4-275239

Int. Cl.^{6} G01D *5/34;* H01J *1/56;* G01B *11/14*

U.S. Cl. 250—231.16 **12 Claims**



1. A method for detecting a point of origin of a position sensor in a system for determining a position of an object member which is displaceable within a displacement range, said system including a stop means in proximity to an end of said displacement range, said position sensor being operable to generate an output indicative of the position of said object member, said method comprising the steps of:

displacing said object member into an abutting relationship with said stop means;

detecting a point of origin of said position sensor based on the position of said object member when abutting said stop means; and

setting the point of origin of said position sensor detected by the detecting step;

wherein said displacing step includes a step of keeping said object member pressed by a constant force against said stop means;

wherein the step of detecting includes the steps of:

obtaining a deviation of a detected point of origin from a previously detected point of origin; and

determining the detected point of origin when said deviation becomes zero; and

wherein said step of setting includes resetting the detected point of origin of said position sensor.

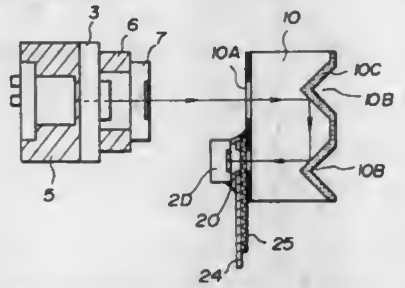
5,534,693

OPTICAL DISPLACEMENT DETECTION APPARATUS EMPLOYING DIFFRACTION GRATINGS AND A REFERENCE POSITION SENSOR LOCATED ON THE SCALE

Hiroshi Kondo, Yokohama; Kou Ishizuka, Ohmiya; Satoshi Ishii, and Yasushi Kaneda, both of Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 271,797, Jul. 7, 1994, abandoned.
This application Sep. 26, 1995, Ser. No. 534,058
Claims priority, application Japan, Jul. 12, 1993, 5-195130
Int. Cl.^{6} H01J *3/14*

U.S. Cl. 252—237 G **26 Claims**



21. An optical displacement measuring apparatus for measuring relative displacement between two objects, said apparatus comprising:

a scale provided on one of the two objects, for which relative displacement is to be measured;

a displacement detecting system, provided on the other one of the two objects for (i) projecting a light beam onto said scale, (ii) detecting light beams for measurement from said scale and (iii) measuring information relating to the relative displacement between the two objects by the detection of the light beams; and

a reference-position detection system comprising an optical system provided on said scale for guiding a light beam, other than the light beams for measurement, to a photosensor formed on one of said scale and said displacement detecting system, said reference-position detecting system detecting a reference position on said scale on the basis of detection of the light beam by said photosensor.

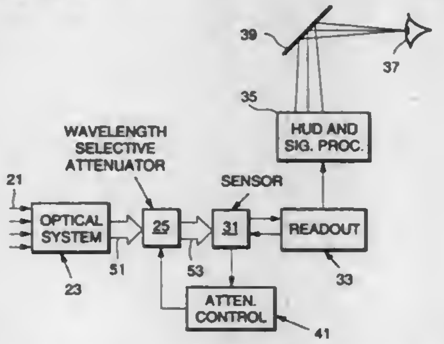
5,534,694

INFRARED IMAGING SYSTEM FOR ENHANCING THE PERCEPTION OF A SCENE BY A VEHICLE OPERATOR

Gary E. Ball, Palos Verdes Estates, and Edward D. Eby, Torrance, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Continuation of Ser. No. 894,143, Jun. 4, 1992, abandoned.
This application Sep. 6, 1994, Ser. No. 300,895
Int. Cl.^{6} G01J *5/00*

U.S. Cl. 250—330 **17 Claims**



1. An aircraft infrared imaging landing aid system for enhancing the perception of a scene by an operator comprising:

an infrared imaging sensor;

an optical system for receiving infrared radiation from a scene and forming an infrared image of the scene on said sensor;

a readout coupled to said sensor for outputting electrical signals representative of the infrared image of the scene on said sensor;

a display for receiving the electrical signals from said readout and producing a visible image viewable by said operator, said visible image being representative of the infrared image of the scene on said sensor; and

a wavelength-selective attenuator between the scene and said sensor for controllably attenuating a selected wavelength range of the infrared radiation received from the scene.

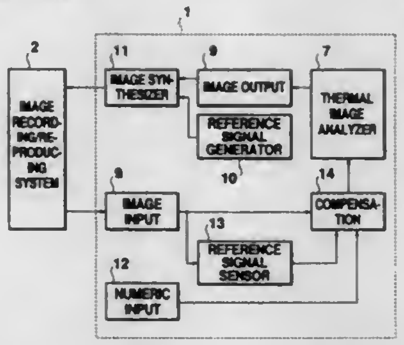
5,534,695

THERMAL IMAGE ANALYSIS SYSTEM

Tetsuo Miyoshi; Yuuji Hozumi; Akira Yamagishi, and Kaoru Koizumi, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1994, Ser. No. 327,973
Claims priority, application Japan, Oct. 29, 1993, 5-272085
Int. Cl.^{6} G01J *5/48*

U.S. Cl. 250—330 **26 Claims**



1. A thermal image analysis system having an optical system for imaging an infrared image radiated from a surface of a subject, an image sensor for taking the infrared image imaged by said optical system, a thermal image analyzing unit for processing the infrared image taken by said image sensor to analyze temperature on the surface of the subject, an image output circuit for outputting a thermal image signal and an image input circuit for receiving a recorded and reproduced thermal image signal from an external image recording/reproducing system, said thermal image analysis system further comprising:

a reference signal generating circuit for generating a first set of two or more reference signals;

an image synthesizing circuit for combining the thermal image signal from said image output circuit with said first set of reference signals and outputting a synthesized waveform signal;

a reference signal sensing circuit for sensing a second set of two or more reference signals within the recorded and reproduced image signal inputted into said image input circuit;

a numerical input circuit for receiving temperature information corresponding to said second set of two or more reference signals; and

a compensation circuit for compensating said recorded and reproduced image signal based on the temperature information inputted to said numerical input circuit and the second set of reference signals sensed from within the recorded and reproduced image signal by said reference signal sensing circuit.

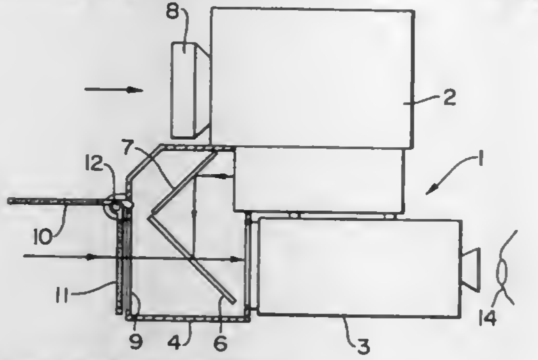
5,534,696

SIGHT

Stefan Johansson, Lidingö , and Unto Sandström, Johanneshov, both of, Sweden, assignors to CelsiusTech Electronics AB, Jarfalla, Sweden

Filed Dec. 5, 1994, Ser. No. 353,275
Claims priority, application Sweden, Dec. 16, 1993, 9304178
Int. Cl.^{6} G01J *5/00*

U.S. Cl. 250—330 **9 Claims**



1. A sight apparatus comprising:

an IR camera which converts thermal radiation coming in towards the opening of the IR camera into a visible image;

a sight part for incoming visible light;

means for guiding the image generated by the IR camera into the beam path for the incoming visible light; and

at least one filter with a filter characteristic which quenches visible light having wavelengths outside the wavelengths of blue light, said filter being arranged to be introduced into the beam path for the incoming visible light whereby said blue light is transmitted along with said image generated by said IR camera towards said sight part.

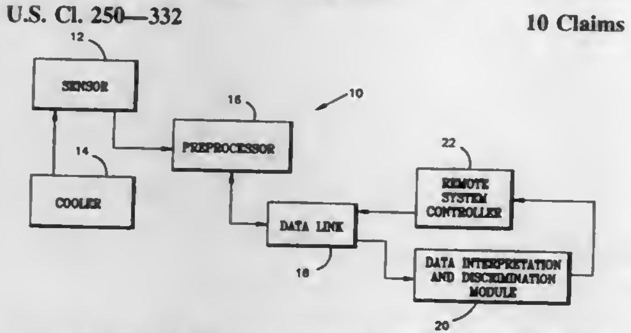
5,534,697

ELECTRO-OPTICAL SENSOR SYSTEM FOR USE IN OBSERVING OBJECTS

Veron R. Creekmore, Chino Hills, and John E. Davis, Claremont, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 2, 1994, Ser. No. 300,246
Int. Cl.^{6} G01J *5/10*

U.S. Cl. 250—332 **10 Claims**



1. An electro-optical sensor system for use in observing objects, comprising:

a) a staring sensor comprising a staring array of photon detectors for providing real-time observations of objects, said staring sensor for viewing a total azimuth perspective with a relatively narrow elevation perspective;

b) a preprocessor system connected to said staring sensor for providing temporal filtration of said real-time observations; and,

c) a remote control for controlling said temporal filtration.

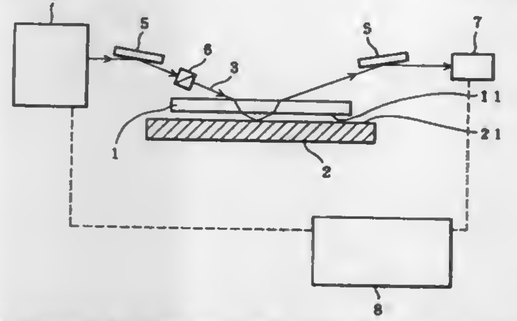
5,534,698

SOLID STATE SURFACE EVALUATION METHODS AND DEVICES

Hisayoshi Ohshima, and Yoshiyasu Yamada, both of Kariya, Japan, assignors to Research Development Corporation, Saitama, and Nippon Denso Co., Ltd., Aichi, both of, Japan

Filed Jul. 7, 1994, Ser. No. 271,741
Claims priority, application Japan, Jul. 7, 1993, 5-168217; Dec. 27, 1993, 5-329388
Int. Cl.^{6} G01J *3/42*

U.S. Cl. 250—339.11 **31 Claims**



1. A method of evaluating solid state surface properties by infrared absorption of lattice vibration, the method comprising the steps of:

placing a light transmissible solid state sample having a sample surface and a reverse surface next to a plane reflex mirror such that the sample surface faces the plane reflex mirror;

projecting infrared rays at the reverse surface of the solid state sample such that an interaction region is formed by reflected infrared rays reflecting from the plane reflex mirror, the solid state sample being located in the interaction region; and

evaluating the properties of the sample surface of the solid state sample by infrared reflection spectrometry of the reflected infrared rays.

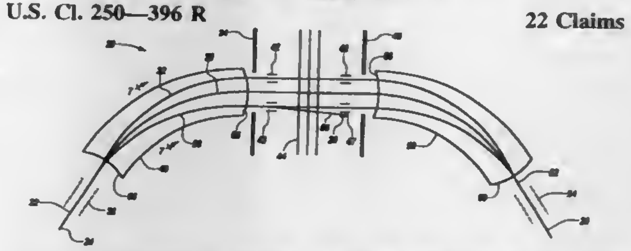
5,534,699

DEVICE FOR SEPARATING AND RECOMBINING CHARGED PARTICLE BEAMS

James A. Ferry, Middleton, Wis., assignor to National Electrostatics Corp., Middleton, Wis.

Filed Jul. 26, 1995, Ser. No. 506,778
Int. Cl.^{6} H01J *3/22*

U.S. Cl. 250—396 R **22 Claims**



1. A static-magnetic transport system for use with an ion beam composed of at least ions of two different momentums which are injected into a tandem accelerator, comprising:

a) a first electrostatic focusing lens having an ion beam inlet and an ion beam outlet;

b) a first dipole bending magnet having an input end relative to the beam outlet of the first electrostatic focusing lens and a output end, wherein the ion beam enters the input end and leaves the first magnet at the output end, the first magnet bending the ion beam about an angle sufficient to separate the ions of differing momentum, and to create at least a first ion beam and a second ion beam of differing momentums;

c) a first deflection means spaced from the output end of the first dipole bending magnet, the deflection means for deflecting the first ion beam a first amount, so as to be substantially parallel to the second ion beam;

- d) a second electrostatic focusing lens spaced from the first deflection means;
- e) a second deflection means spaced from the second electrostatic lens, the second deflection means for deflecting the first ion beam a second amount so that the first ion beam and the second ion beam converge;
- f) a second dipole bending magnet being spaced from the first magnet, the first and second deflection means being between the first and second bending magnets, the second electrostatic lens being spaced between the first and second deflection means, the second magnet having an input end and an output end, wherein the first and the second ion beams enter the input end and said first and second ion beams leave the second magnet at the output end substantially at the same point in space, the second magnet bending the first and second ion beams about an angle sufficient to recombine the first and second ion beams to form an injection ion beam for injection into the tandem accelerator;
- g) a means spaced between the first and second bending magnets for causing at least a selected one of said first and second ion beams not to enter the second bending magnet, so that ions of said selected ion beam a selectively removed from the injection ion beam; and
- h) a third electrostatic focusing lens having an ion beam inlet and an ion beam outlet being spaced from the second dipole bending magnet to focus the injection ion beam into the tandem accelerator.

5,534,700

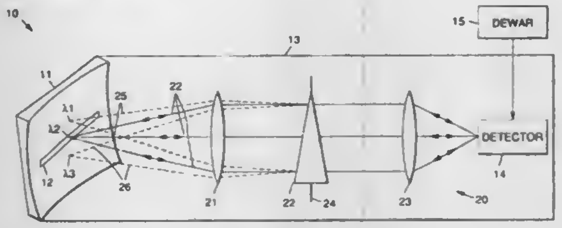
OPTICAL SPECTROMETER SYSTEM HAVING A CURVED REFLECTIVE IMAGING SLIT BODY

Charles L. McGlynn, Brookfield, and Ker L. Shu, New Milford, both of Conn., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1994, Ser. No. 279,725

Int. Cl.^{6} G01J *5/06*

U.S. Cl. 250—353 **14 Claims**



1. Optical apparatus comprising:

an optical cavity;

an optical spectrometer system disposed within the cavity;

a detector disposed at a first end of the cavity and located at a focal plane of the optical spectrometer system;

cooling means coupled to the detector for cooling it to a predetermined low temperature;

an entrance pupil disposed within the cavity; and

a two-dimensional, curved, reflective, low emissivity slit body comprising an spectrometer slit disposed at a second end of the cavity whose curved shape images radiation emitted by the detector back upon itself, and wherein the curved slit body substantially eliminates out-of-field radiation from impinging upon the detector and greatly reduces self-emission from the slit body.

5,534,701

TOMOGRAPHIC ACQUISITION METHOD HAVING TWO DETECTORS WITH SIGHTING CENTER DISTINCT FROM THE CENTER OF ROTATION

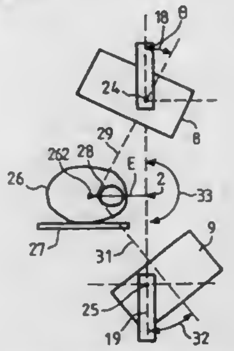
Michel Pierfitte, Villepreux, and Pierre DeLorme, Voisins les Brettoneux, both of, France, assignors to Sopha Medical, Paris, France

Continuation of Ser. No. 894,359, Jun. 4, 1992. This application Nov. 12, 1993, Ser. No. 152,286

Claims priority, application France, Jun. 7, 1991, 91 06962

Int. Cl.^{6} G01T *1/166*

U.S. Cl. 250—363.04 **18 Claims**



1. A method for the acquisition of tomographic images, in the course of an examination in nuclear medicine, carried out with a gamma camera with two detector heads, these two heads being held in a position facing each other by a stand rotating about a rotation axis, wherein:

at least one of the two heads is provided with an axis of angulation of its sighting direction, this angulation axis being parallel to the axis of rotation of the stand;

the sighting directions of the heads defining a sighting center having an offset with respect to this axis of rotation.

5,534,702

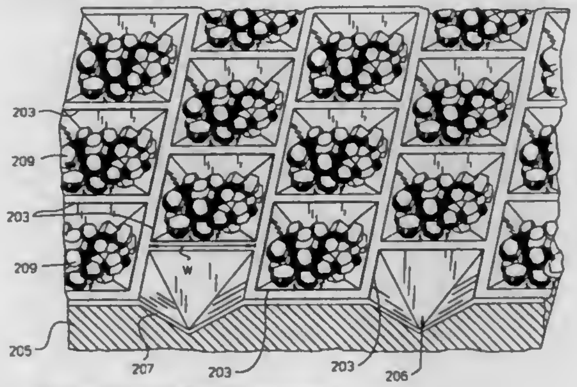
RESOLUTION IMPROVEMENT OF IMAGES RECORDED USING STORAGE PHOSPHORS

William R. Trutna, Jr., Atherton, and James B. Williamson, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 8, 1994, Ser. No. 287,433

Int. Cl.^{6} G03C *1/00*

U.S. Cl. 250—484.4 **19 Claims**



1. An optical apparatus comprising:

an array of optical apertures;

a plurality of portions of a phosphorescent material that stores a record of exposure to visible light, each portion being optically coupled to a respective one of the apertures; and

means for exposing the apertures to an optical image of visible light, so as to record the image in the plurality of portions of the phosphorescent material.

5,534,703

ELECTROPHORESIS ANALYZER WITH WAVELENGTH SELECTIVE DETECTION

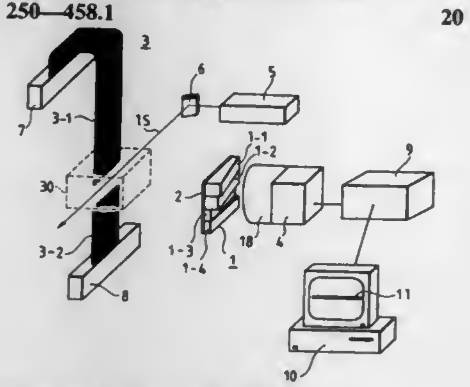
Hideki Kambara, Hachiouji; Takashi Anazawa, Kokubunji; Satoshi Takahashi, Kunitachi, and Katsuhiko Murakami, Koganei, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 220,261

Claims priority, application Japan, Apr. 7, 1993, 5-080927

Int. Cl.^{6} G01N *27/26;21/64*

U.S. Cl. 250—458.1 **20 Claims**



1. An electrophoresis analyzer comprising:

a light detector for detecting images of a linear fluorescence emitting region, the linear fluorescence emitting region including a plurality of fluorescence emitting points disposed along a straight line, each of the fluorescence emitting points being a point at which samples emit light including a plurality of wavelengths, the light detector including a line sensor, the line sensor including a plurality of photopixels disposed along a straight line, the photopixels constituting a detection surface of the line sensor;

image forming means for receiving the light emitted by the samples at the fluorescence emitting points and forming a plurality of images of each of the fluorescence emitting points on the detection surface of the line sensor at mutually different positions disposed at a predetermined interval along the straight line along which the photopixels are disposed; and

filter means disposed between the linear fluorescence emitting region and the light detector for selectively filtering the light emitted by the samples at the fluorescence emitting points such that the images of each of the fluorescence emitting points are formed by light including mutually different ones of the wavelengths.

5,534,704

OPTICAL IMAGE CORRELATOR AND SYSTEM FOR PERFORMING PARALLEL CORRELATION

Michael G. Robinson, Oxfordshire, and Peter C. H. Poon, London, both of, United Kingdom, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1994, Ser. No. 229,621

Claims priority, application United Kingdom, Apr. 21, 1993, 9308279

Int. Cl.^{6} G02B *27/42*

U.S. Cl. 250—550 **18 Claims**

1. An optical image correlator comprising:

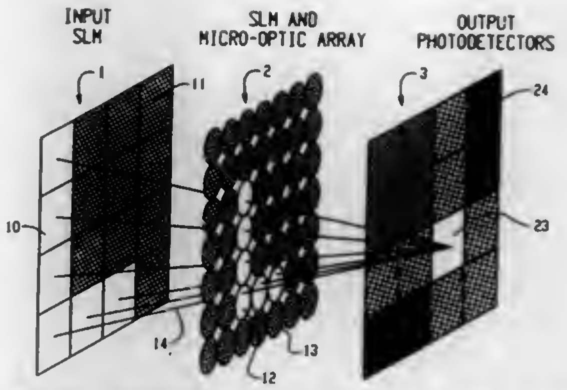
an array of optical detectors;

first image forming means for forming a first array of X first image picture elements, where X is an integer greater than one;

a set of optical path defining means; and

second image forming means for forming a second array of second picture elements, at least one of the first and second image forming means comprising a spatial light modulator each of whose picture elements has an optical transmissivity which is independently controllable,

wherein the set of optical path defining means comprises Y optical path defining means, where Y is an integer greater than one, the second array comprises Y second image picture elements, each of which is arranged to modulate the optical path defined by a respective one of the optical path defining means, and each of the optical detectors cooperates with a corresponding subset of the Y optical path defining means to define Zi optical paths between the optical detector and Zi of the first image picture elements, respectively, where Zi is an integer greater than one and less than or equal to X and each subset of the optical path defining means is different from all of the other subsets thereof.



5,534,705

METHOD FOR CONTROLLING ROBOT ATTITUDE BASED ON TOOL WORKPIECE ANGLE

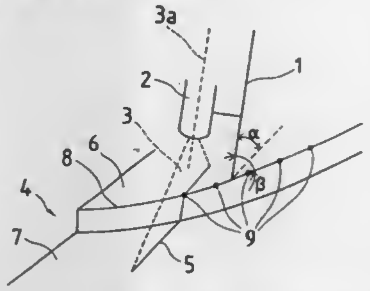
Fumikazu Terawaki; Yoshitaka Ikeda, and Yuuki Makihata, all of Yamanashi, Japan, assignors to Fanuc Ltd., Japan

Filed Oct. 27, 1995, Ser. No. 330,025

Claims priority, application Japan, Oct. 29, 1993, 5-293936

Int. Cl.^{6} G01N *21/86*

U.S. Cl. 250—559.29 **7 Claims**



1. A method of controlling a robot attached to a tool, comprising the steps of:

emitting a laser light;

periodically scanning a surface of a workpiece with said laser light toward a direction across an operating line of said workpiece;

forming a locus of laser irradiations points on a surface of said workpiece based on said scanning;

periodically calculating a work angle between an axis of said tool and said locus of laser irradiations points;

determining a target robot attitude based on said work angle equaling a predetermined angle value; and

controlling a movement of said robot along said operating line of said workpiece at said target robot attitude.

5,534,706

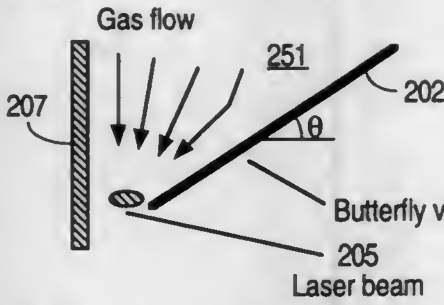
PARTICLE MONITOR FOR THROTTLED PUMPING SYSTEMS

Peter G. Borden, San Mateo; Derek G. Aqui, San Jose, both of Calif., and Matt A. Evanko, Placitas, N.M., assignors to High Yield Technology, Inc., Sunnyvale, Calif.

Filed Mar. 7, 1994, Ser. No. 207,329

Int. Cl.^{6} G01N *15/06;21/00*

U.S. Cl. 250—574 **12 Claims**



1. A method for monitoring particles in an exhaust line of a process chamber, said exhaust line being equipped with a throttle valve for restricting an opening of said exhaust line, said method comprising the steps of:

positioning a laser beam such that said laser beam crosses an opening created by said throttle valve being partially open said laser beam being positioned offset from a principal axis of said exhaust line; and

positioning a detector for detecting particles impinged by said laser beam.

5,534,707

APPARATUS AND METHOD FOR ALIGNING CAPILLARY COLUMN AND DETECTION OPTICS

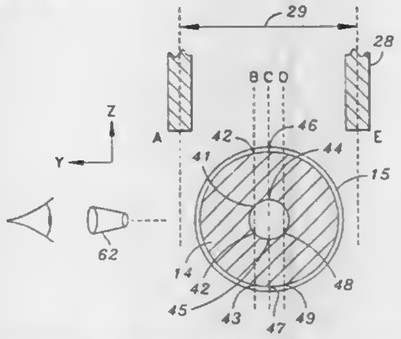
Stephen L. Pentoney, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

PCT No. PCT/US92/08589, § 371 Date Mar. 29, 1994, § 102(e) Date Mar. 29, 1994

Continuation-in-part of Ser. No. 772,997, Oct. 8, 1991, Pat. No. 5,208,466. This PCT application Oct. 8, 1992, Ser. No. 211,343

Int. Cl.^{6} G01N *27/00*

U.S. Cl. 204—452 **26 Claims**



1. An apparatus for aligning a capillary with respect to a radiation source comprising:

a capillary tube defining a capillary channel;

radiation means for illuminating a defined section of the capillary channel, the illumination from the radiation means coupled into the capillary tube via a lens moveable by an actuator and the illumination from the radiation means interacting with the capillary tube to produce a distinct light pattern at an image plane outside the capillary tube; and

alignment means comprising the actuator for aligning the capillary channel with respect to the radiation means based on the distinct light pattern.

5,534,708

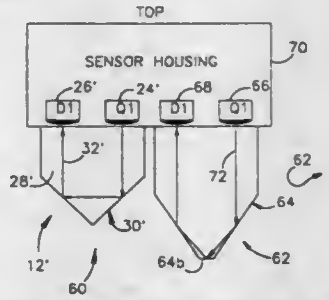
OPTICAL FUEL/AIR/WATER SENSOR AND DETECTOR CIRCUIT

Sylvester M. Ellinger, Charlotte, and Bruce R. Kline, Starksboro, both of Vt., assignors to Simmonds Precision Products Inc., Akron, Ohio

Filed Dec. 15, 1993, Ser. No. 167,742

Int. Cl.^{6} G01N *15/06*

U.S. Cl. 250—577 **26 Claims**



1. A liquid sensing apparatus for a fuel tank comprising: a first optical means for producing an output having a first state that corresponds to the first optical means being exposed to air and a second state that corresponds to the first optical means being exposed to fuel; second optical means for producing an output having a first state that corresponds to the second optical means being exposed to water, and a second state that corresponds to the second optical means being exposed to fuel; and circuit means for determining said first and second optical means output states.

5,534,709

RADIATION IMAGE READING APPARATUS

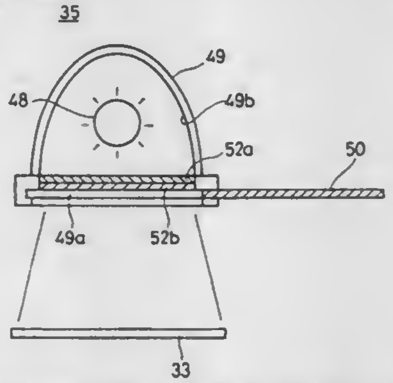
Shinichi Yoshimoto, and Fumihiro Namiki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 2, 1994, Ser. No. 299,109

Claims priority, application Japan, Oct. 7, 1993, 5-251345

Int. Cl.^{6} G01N *23/04*

U.S. Cl. 250—588 **22 Claims**



1. A radiation image reading apparatus operable in an alternating sequence of image reading and erasing, comprising:

a photostimulated phosphor member which absorbs a portion of radiation energy, transmitted through an object and incident thereon, and stores the absorbed radiation energy in a form of a latent image;

an excitation light source irradiating an excitation light onto said photostimulated phosphor member in a main scan direction so as to generate the emission of photostimulated luminescence light corresponding to the latent image from said photostimulated phosphor member;

an image reading unit for receiving and converging the photostimulated luminescence light emission from said photostimulated phosphor member and thereby reading image information of the latent image, which is dependent on light intensity of the corresponding photostimulated luminescence light, and outputting a corresponding electrical signal;

an erasing light source producing an irradiating erasing light for erasing residual, stored radiation energy of the latent image remaining in said photostimulated phosphor member at an erasure time, after obtaining the image information of the latent image by said image reading unit, said irradiating erasing light of said erasing light source having a major part of a spectral distribution thereof within a band substantially of a visible light region and said erasing light source further comprising a lamp, a controller and a shutter, the controller maintaining the lamp in an ON condition during the alternating sequence of image reading and erasing but switching the lamp to a reduced power level at times other than when erasing residual radiation energy and controlling the shutter to be closed to prevent irradiating, and to be opened to permit irradiating, the erasing light onto the photostimulated phosphor member for erasing same; and

a moving unit which moves said excitation light source and said image reading unit with respect to said photostimulated phosphor member in a moving direction which is perpendicular to the main scan direction.

5,534,710

RADIATION IMAGE STORAGE PANEL AND RADIATION IMAGE READING METHOD

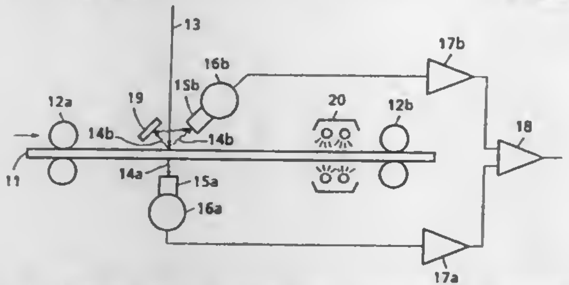
Hideki Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1995, Ser. No. 413,904

Claims priority, application Japan, Apr. 15, 1994, 6-101998

Int. Cl.^{6} G21K *4/00;* **G03B** *42/02*

U.S. Cl. 250—588 **8 Claims**



1. A radiation image storage panel comprising a stimulable phosphor layer and an erasing light-diffusion preventive layer capable of allowing transmission of stimulated emission while preventing an erasing light impinged thereupon from diffusing within the preventive layer along the plane thereof.

5,534,711

ELECTRICALLY ERASABLE, DIRECTLY OVERWRITABLE, MULTIBIT SINGLE CELL MEMORY ELEMENTS AND ARRAYS FABRICATED THEREFROM

Stanford R. Ovshinsky, Bloomfield Hills; David A. Strand, Bloomfield Township; Wolodymyr Czubatyj, Warren, and Patrick Klersy, Madison Heights, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

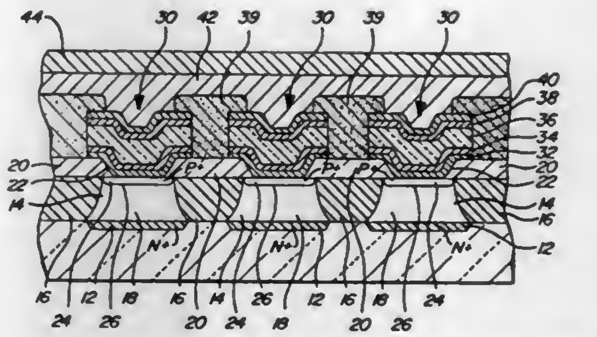
Continuation-in-part of Ser. No. 789,234, Nov. 7, 1991, Pat. No. 5,414,271, which is a continuation-in-part of Ser. No. 768,139, Sep. 30, 1991, Pat. No. 5,335,219, and a continuation-in-part of Ser. No. 747,053, Aug. 19, 1991, Pat. No. 5,296,716, which is a continuation-in-part of Ser. No. 642,984, Jan. 18, 1991, Pat. No. 5,166,758. This application Apr. 19, 1995, Ser. No. 423,484

Int. Cl.^{6} H01L *45/00*

U.S. Cl. 257—3 **21 Claims**

1. An electrically operated, directly overwritable, multibit, single-cell memory element comprising:

a volume of memory material defining a single cell memory element, said memory material characterized by (1) a large dynamic range of electrical resistance values, and (2) the ability to be set at one of a plurality of resistance values



within said dynamic range in response to selected electrical input signals so as to provide said single cell with multibit storage capabilities;

a pair of spacedly disposed contacts for supplying said electrical input signal to set said memory material to a selected resistance value within said dynamic range;

at least a filamentary portion of said single cell memory element being setable, by said selected electrical signal to any resistance value in said dynamic range, regardless of the previous resistance value of said material; and

a filamentary portion controlling means disposed between said volume of memory material and at least one of said spacedly disposed contacts, said means defining the size and position of said filamentary portion during electrical formation of the memory element and limiting the size and confining the location of said filamentary portion during use of the memory element, thereby providing for a high current density within said filamentary portion of said single cell memory element upon input of a very low total current electrical signal to said spacedly disposed contacts, wherein said filamentary portion controlling means comprises a layer of silicon nitride.

5,534,712

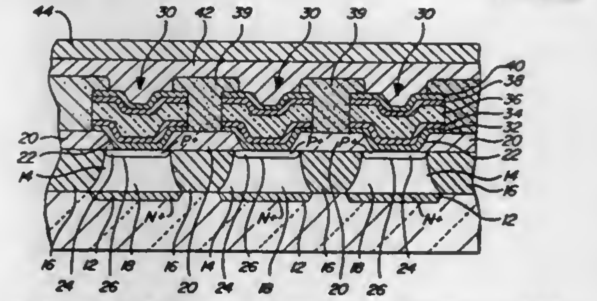
ELECTRICALLY ERASABLE MEMORY ELEMENTS CHARACTERIZED BY REDUCED CURRENT AND IMPROVED THERMAL STABILITY

Stanford R. Ovshinsky, Bloomfield Hills; David A. Strand, Bloomfield Township, and Patrick Klersy, Lake Orion, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 423,484, Mar. 19, 1995, which is a continuation-in-part of Ser. No. 789,234, Nov. 7, 1991, Pat. No. 5,414,271, which is a continuation-in-part of Ser. No. 768,139, Sep. 30, 1991, Pat. No. 5,296,716, and Ser. No. 747,053, Aug. 19, 1991, Pat. No. 5,296,716, each which is a continuation-in-part of Ser. No. 642,984, Jan. 18, 1991, Pat. No. 5,166,758. This application Aug. 21, 1995, Ser. No. 517,313

Int. Cl.^{6} H01L *45/00*

U.S. Cl. 217—3 **20 Claims**



1. In an electrically operated, directly overwritable, multibit, single-cell memory element, including a volume of memory material defining a single cell memory element, said memory material including at least one chalcogen element and at least one transition metal element,

the improvement comprising:

said at least one transition metal selected from the group consisting of Nb, Pd, Pt and mixtures or alloys thereof.

5,534,713

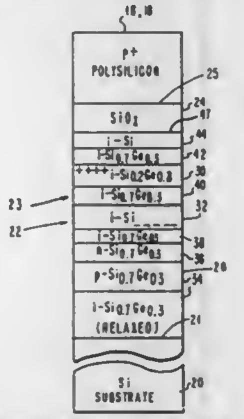
COMPLEMENTARY METAL-OXIDE SEMICONDUCTOR TRANSISTOR LOGIC USING STRAINED SI/SIGE HETEROSTRUCTURE LAYERS

Khaled E. Ismail, Cairo, Egypt, and Frank Stern, Pleasantville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1994, Ser. No. 246,549

Int. Cl.^{6} H01L *29/06*

U.S. Cl. 257—24 **11 Claims**



1. A layered structure for forming both n and p channel field effect transistors therein comprising:
- a single crystalline substrate,
- a first layer of relaxed $Si_{1-x}Ge_x$ formed epitaxially on said substrate where the Ge fraction x is in the range from 0.20 to 0.5,
- a second layer of n doped $Si_{1-x}Ge_x$ formed epitaxially on said first layer,
- a third layer of undoped $Si_{1-x}Ge_x$ formed epitaxially on said second layer,
- a fourth layer selected from the group consisting of silicon and silicon-germanium formed epitaxially on said third layer whereby said fourth layer is under tensile strain,
- a fifth layer of relaxed $Si_{1-x}Ge_x$ formed epitaxially on said fourth layer,
- a sixth layer of $Si_{1-y}Ge_y$ formed epitaxially on said fifth layer where the Ge fraction y is in the range from 0.5 to 1.0 and where $y-x>0.2$ whereby said sixth layer is under compressive strain,
- a seventh layer of relaxed $Si_{1-x}Ge_x$ formed epitaxially on said sixth layer,
- an eighth layer of silicon formed epitaxially on said seventh layer, and
- a ninth layer of dielectric material formed over said eighth layer.

5,534,714

INTEGRATED FIELD EFFECT TRANSISTOR AND RESONANT TUNNELING DIODE

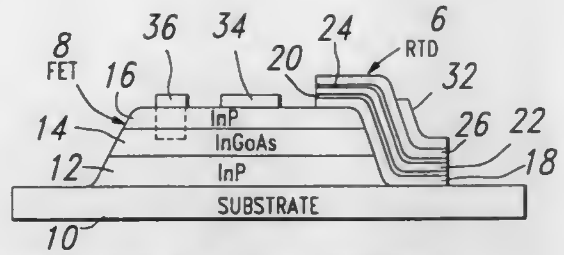
Edward A. Beam, III, Dallas, and Alan C. Seabaugh, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 153,116, Nov. 15, 1993, Pat. No. 5,416,040. This application Nov. 23, 1994, Ser. No. 344,039

Int. Cl.^{6} H01L *29/06;31/0328;31/0336*

U.S. Cl. 257—25 **8 Claims**

1. An integrated device comprising:
- a transistor comprising:
  - a substrate;
  - a buffer layer over said substrate; and
  - a channel layer over said buffer layer;



- a resonant tunneling diode (RTD) comprising:
  - a first contact layer abutting a sidewall of said transistor;
  - a first tunnel barrier layer over said first contact layer;
  - a quantum well layer over said first tunnel barrier layer;
  - a second tunnel barrier layer over said quantum well layer; and
  - a second contact layer over said second tunnel barrier layer;
- wherein said transistor and said RTD are integrated.

5,534,715

JOSEPHSON JUNCTION IN A WIRING PATTERN OF A SUPERCONDUCTOR OXIDE

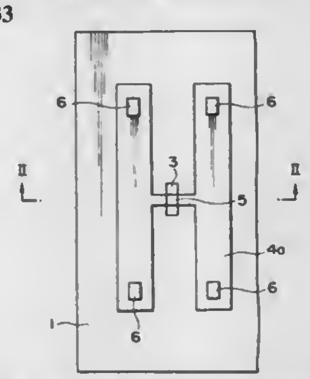
Christian Neumann, Karlsruhe, Germany; Katsumi Suzuki, Kodaira, Japan; Youichi Enomoto, and Shoji Tanaka, both of Tokyo, Japan, assignors to International Superconductivity Technology Center, and NEC Corporation, both of, Japan

Filed Nov. 8, 1993, Ser. No. 148,277

Claims priority, application Japan, Nov. 10, 1992, 4-299450

Int. Cl.^{6} H01L *39/22*

U.S. Cl. 257—33 **4 Claims**



1. A Josephson junction comprising a substrate of a single crystal having a substantially flat surface with an area portion implanted with Ga^+ ions, a wiring pattern of an oxide superconductor formed on said flat surface of said substrate, and an altered region formed in said wiring pattern directly above said area portion, said altered region having a width of 300 nm or less and intersecting said wiring pattern, said wiring pattern having a crystal orientation which is the same on both sides of said altered region and said altered region having an average crystal orientation which is equal to the crystal orientation of said Wiring pattern on both sides of said altered region.

5,534,716

SEMICONDUCTOR DEVICE HAVING TRANSISTORS WITH DIFFERENT ORIENTATIONS OF CRYSTAL CHANNEL GROWTH WITH RESPECT TO CURRENT CARRIER DIRECTION

Yasuhiko Takemura, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

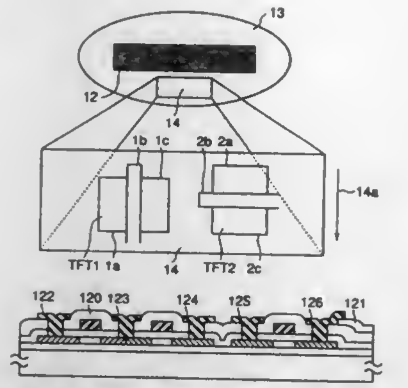
Filed Aug. 23, 1994, Ser. No. 294,740

Claims priority, application Japan, Aug. 27, 1993, 5-235461

Int. Cl.^{6} H01L *29/04;31/036*

U.S. Cl. 257—72 **16 Claims**

1. A semiconductor device comprising:
- a substrate; and



- a plurality of thin film transistors formed on the substrate, wherein the thin film transistors each have a crystalline silicon region crystal-grown in a crystal growth direction parallel to the substrate and a silicon oxide layer covering the crystalline silicon region,
- wherein at least one of the thin film transistors has a first angle formed between a carrier moving direction and the crystal growth direction and at least another one of the thin film transistors has a second angle which is different from the first angle and formed between the carrier moving direction and the crystal growth direction.

5,534,717

EPITAXIAL WAFER FOR LIGHT-EMITTING DIODE

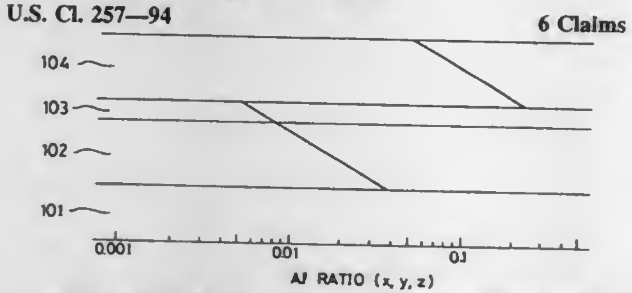
Shigetaka Murasato, and Koichi Hasegawa, both of Chichibu, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Apr. 27, 1995, Ser. No. 429,771

Claims priority, application Japan, Sep. 12, 1994, 6-217651; Dec. 13, 1994, 6-309084

Int. Cl.^{6} H01L *33/00*

U.S. Cl. 257—94 **6 Claims**



1. An epitaxial wafer for a light-emitting diode, comprised by an n-GaAs single crystal substrate on which are sequentially formed an $n\text{-}Ga_{1-x}Al_xAs$ epitaxial layer doped with Si, a $p\text{-}Ga_{1-y}Al_yAs$ active layer doped with Si, and a $p\text{-}Ga_{1-z}Al_zAs$ window layer having a Si concentration of below 1×10^{17} cm^{-3} and doped with Zn as p-type dopant so as to have a carrier concentration in the range of from 1×10^{17} to 1×10^{19} cm^{-3}, wherein Al mixing ratio x at an interface region between the epitaxial layer and the GaAs substrate is $0\leqq x\leqq 0.1$. Al mixing ratio y in the active layer is $0\leqq y\leqq 0.02$, and Al mixing ratio z is greater than y at an interface with the active layer and at a window layer surface is $y<z<(y+0.1)$.

5,534,718

LED PACKAGE STRUCTURE OF LED DISPLAY

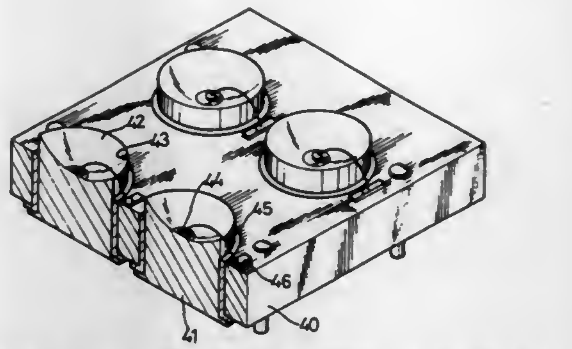
Fa-Sheng Chang, Taipei Hsien, Taiwan, assignor to Hsi-Huang LIN, Taipei, Taiwan

Continuation of Ser. No. 46,096, Apr. 12, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,171

Int. Cl.^{6} H01L *33/00;23/48*

U.S. Cl. 257—98 **6 Claims**

1. A light emitting diode display, comprising:



- a printed circuit board having a plurality of through-holes formed therein, said through-holes having electrically conductive materials placed on an inner surface of said through-holes;
- a plurality of electrically conductive members, each of said electrically conductive members being fixed in and electrically connected with a corresponding one of said plurality of through-holes of said printed circuit board and providing electrical connection for both sides of said printed circuit board;
- an end of each of said electrically conductive members having a bowl-shaped recess formed thereon defining a bowl-shaped reflecting surface;
- said bowl-shaped reflecting surface having a bottom center and a focus point along an optical axis of said bowl-shaped reflecting surface;
- a light emitting diode die being mounted on the bottom center of said bowl-shaped reflecting surface; and
- a conductive lead being electrically connected between the light emitting diode die and an electrically opposite polarity zone of the printed circuit board.

5,534,719

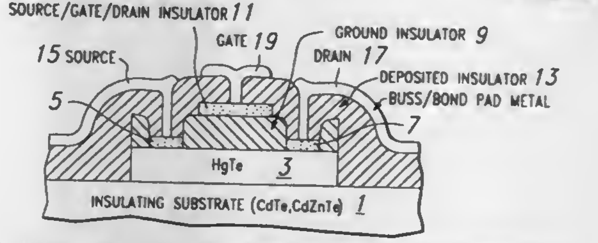
HGCDTE THIN FILM TRANSISTOR

Richard A. Schiebel; Michael A. Kinch, and Roland J. Koestner, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 151,722, Nov. 15, 1993, Pat. No. 5,403,760, which is a division of Ser. No. 598,282, Oct. 16, 1990, abandoned. This application Jan. 27, 1995, Ser. No. 379,065

Int. Cl.^{6} H01L *31/0328*

U.S. Cl. 257—188 **19 Claims**



1. A group II–VI thin film semiconductor device comprising:
- (a) a group II–VI insulating substrate;
- (b) a doped layer of a group II–VI semiconductor material disposed over said substrate, wherein the thickness of said doped layer is less than about 0.5 microns;
- (c) an insulating gate region disposed over said doped layer;
- (d) a pair of spaced contacts on said doped layer providing source and drain contacts;
- (e) a gate contact disposed over said insulating gate region between and not contacting said spaced contacts;
- (f) an insulating layer disposed over exposed regions of said substrate, said doped layer, said insulating gate region and said contacts; and
- (g) metallization disposed on said insulating layer and extending through said insulating layer to said contacts.

5,534,720

SOLID STATE IMAGE SENSING ELEMENT

Kwang B. Song; Sung K. Kim, both of Seoul, and Jin S. Shim, Kyungki-do, all of, Rep. of Korea, assignors to LG Semicon Co., Ltd., Seoul, Rep. of Korea

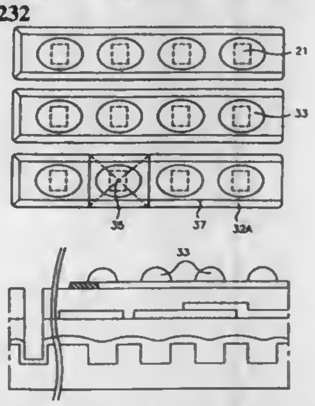
Continuation of Ser. No. 210,225, Mar. 17, 1994, abandoned. This application Sep. 7, 1995, Ser. No. 525,951

Claims priority, application Rep. of Korea, Feb. 23, 1994, 3197/1994

Int. Cl.

Int. Cl.^{6} H01L *27/148;29/768*

U.S. Cl. 257—232 **8 Claims**



2. A solid state image sensing element, comprising:
a support member;
a stripe microlens having a flat upper surface and an arc-shaped side surface, formed on said support member;
a plurality of mosaic microlenses formed on said flat upper surface;
wherein when viewed in cross-section in a row direction of said sensing element, both outer edges of said stripe microlens are spaced a distance inwardly from outer top edges of said support member.

5,534,721

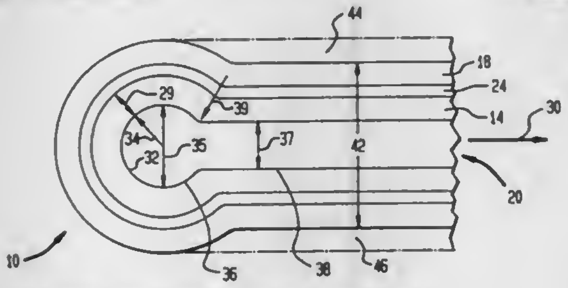
AREA-EFFICIENT LAYOUT FOR HIGH VOLTAGE LATERAL DEVICES

Muhammed A. Shibib, Wyomissing Hills, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Nov. 30, 1994, Ser. No. 346,706

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—339 **19 Claims**



1. A lateral semiconductor device comprising:
a semiconductor body of a first conductivity type;
a drift region of a second conductivity type opposite to that of the first conductivity type and formed on a surface of the semiconductor body;
a drain region formed in the drift region and having a surface area including at least two end portions, each having a predetermined surface radius of curvature selected such that the drain region will sustain a predetermined breakdown voltage of the device and a first surface width, a transitional portion which tapers from the first surface width to a second surface width smaller than the first surface width, and a medial portion having the second surface width; and
a source region formed in the drift region and spaced from the drain region.

5,534,722

INSULATOR SUBSTRATE FOR A LIGHT VALVE DEVICE HAVING AN ELECTROSTATIC PROTECTION REGION

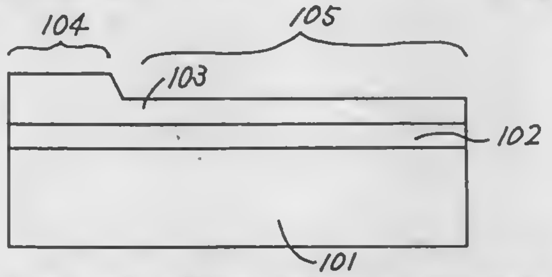
Hiroaki Takasu; Kunihiro Takahashi, and Tsuneo Yamazaki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Mar. 7, 1994, Ser. No. 206,768

Claims priority, application Japan, Mar. 8, 1993, 5-047021; Mar. 9, 1993, 5-048402; Mar. 9, 1993, 5-048403; Feb. 18, 1994, 6-021205

Int. Cl.^{6} H01L *27/01;27/12;23/62*

U.S. Cl. 257—347 **13 Claims**



1. A semiconductor substrate having a silicon single crystal thin film on an underlying insulation layer, the semiconductor substrate comprising: an input/output protection circuit region and a silicon single crystal device region which are formed on the silicon single crystal thin film; wherein the thickness of the silicon single crystal thin film in the input/output protection circuit region is greater than the thickness of the silicon single crystal thin film in the device region to protect the silicon single crystal device region from an electro-static damage.

5,534,723

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING OUTPUT AND INTERNAL CIRCUIT MISFETS

Hidetoshi Iwai, Ohme; Kazumichi Mitsusada, Kodaira; Masamichi Ishihara, Hinode-machi; Tetsuro Matsumoto, Higashiyamato; Kazuyuki Miyazawa, Iruma; Hisao Katto, Hinode-machi, and Kousuke Okuyama, Kawagoe, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

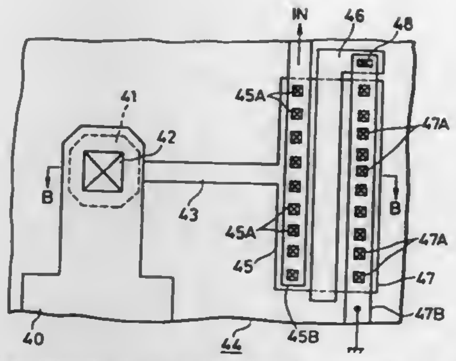
Division of Ser. No. 142,965, Oct. 29, 1993, Pat. No. 5,436,483, which is a continuation of Ser. No. 815,863, Jan. 2, 1992, Pat. No. 5,276,346, which is a continuation of Ser. No. 404,618, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 106,341, Oct. 9, 1987, abandoned, and Ser. No. 390,424, Aug. 4, 1989, abandoned, which is a continuation of Ser. No. 198,597, May 23, 1988, abandoned, which is a continuation of Ser. No. 937,452, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 686,598, Dec. 26, 1984, abandoned, said Ser. No. 106,341is a division of Ser. No. 825,587, Feb. 3, 1986, Pat. No. 4,717,684. This application Apr. 27, 1995, Ser. No. 431,568

Claims priority, application Japan, Dec. 26, 1983, 58-243801; Feb. 1, 1985, 60-16508

Int. Cl.^{6} H01L *29/06;29/78*

U.S. Cl. 257—360 **13 Claims**

1. A semiconductor integrated circuit device, comprising:
an output pad formed on a semiconductor substrate;
a first output MISFET having a first gate insulating film on said semiconductor substrate and a first gate electrode, with opposed edges, on said first gate insulating film, and further having source and drain regions and a first channel forming region in said semiconductor substrate; and
a first MISFET having a second gate insulating film on said semiconductor substrate and a second gate electrode, with opposed edges, on said second gate insulating film, and further having source and drain regions and a second channel forming region in said semiconductor substrate,



said drain region of said first MISFET including a first doped subregion of relatively high impurity concentration and a second doped subregion of relatively low impurity concentration,
said second doped subregion being formed between said first doped subregion and said second channel forming region,
said source and drain regions of said first MISFET being of a same conductivity type as said source and drain regions of said first output MISFET,
said first MISFET being included in an internal circuit of the semiconductor integrated circuit device,
said source region of said first output MISFET being electrically connected to a ground potential, and
said drain region of said first output MISFET being electrically connected to said output pad,
wherein a backward breakdown voltage at a pn-junction between said semiconductor substrate and said drain region of said first output MISFET at a drain edge thereof is lower than a backward breakdown voltage at a pn-junction between said semiconductor substrate and said drain region of said first MISFET at a drain edge thereof.

5,534,724

SEMICONDUCTOR MEMORY DEVICE

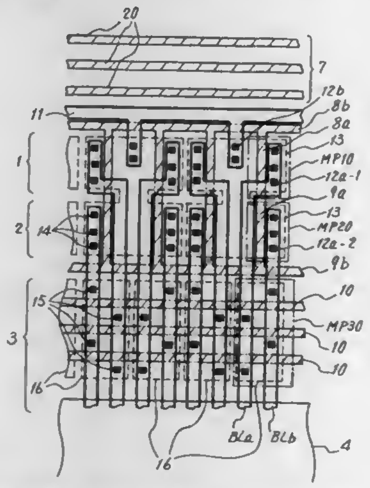
Hisayuki Nagamine, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 743,635, Aug. 12, 1991, abandoned. This application Jun. 9, 1994, Ser. No. 257,583

Claims priority, application Japan, Aug. 13, 1990, 2-213919

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—390 **7 Claims**



1. A semiconductor memory device comprising:
a memory cell array including a plurality of word lines arranged in rows, a plurality of pairs of bit lines arranged in columns and a plurality of memory cells each disposed at a different one of intersections of said word lines and said pairs of bit lines,
a plurality of pairs of wiring lines arranged in columns, each of said pairs of wiring lines extending continuously from an associated one of said pairs of bit lines to an external device,
a bit line balancing circuit including a plurality of first transistors each having source-drain paths directly connected to an associated one of said pairs of wiring lines, respectively, said first transistors having respective gates connected in common to a first conductive line, said first conductive line being elongated along said memory cell array in parallel to said word line,
a dummy conductive line formed along said first conductive line in parallel to said first conductive line, and
a bit line potential supply circuit disposed between said first conductive line and said dummy conductive line and including a potential supply line and a plurality of pairs of second transistors, said potential supply line receiving a power voltage, each of said pairs of second transistors being connected between said potential supply line and an associated one of said pairs of said wiring lines and, when rendered conductive, supplying said power voltage to an associated one of said pairs of bit lines via said pairs of wiring lines, respectively.

5,534,725

RESIN MOLDED CHARGE COUPLED DEVICE PACKAGE AND METHOD FOR PREPARATION THEREOF

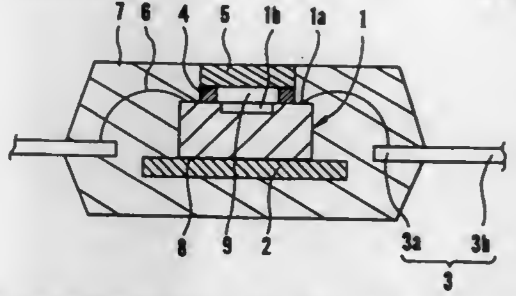
Ki R. Hur, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Continuation-in-part of Ser. No. 53,534, Apr. 29, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 337,016

Claims priority, application Rep. of Korea, Jun. 16, 1992, 10430/1992

Int. Cl.^{6} H01L *31/203;23/495*

U.S. Cl. 257—434 **4 Claims**

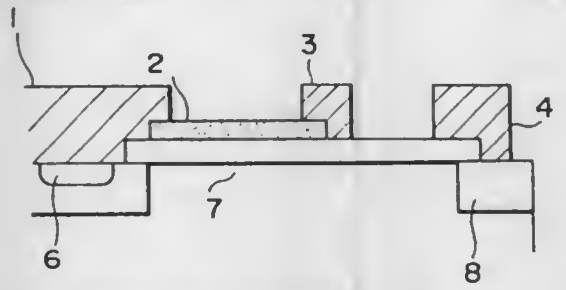


1. A resin molded charge coupled device package comprising:
a charge coupled device, said charge coupled device having a plurality of bond pads and a light reception region thereon;
a lead frame being integrally provided with a paddle and a plurality of leads, said paddle being adapted for mounting said charge coupled device thereon and said leads each comprising an inner lead and an outer lead;
a film wall having a polyimide layer and upper and lower adhesive layers formed on upper and lower surfaces of said polyimide layer, respectively, said lower adhesive layer being attached to an upper surface of said charge coupled device for providing a bonding force between said polyimide layer and said charge coupled device, said film wall being attached between said bond pads and said light reception region of said charge coupled device such that it surrounds the light reception region of said charge coupled device, said film wall having a predetermined height;
a glass lid for sealing said light reception region and transmitting an outside light to said light reception region, said glass lid being attached to said upper adhesive layer of said film wall;
a plurality of metal wires for electrically connecting said bond pads of the charge coupled device to individual inner leads of said lead frame; and

a mold resin package body for hermetically sealing said charge coupled device and said inner leads being wire-bonded to said charge coupled device up to a side surface of the glass lid.

5,534,726
SEMICONDUCTOR DEVICE PROVIDED WITH STATUS DETECTING FUNCTION

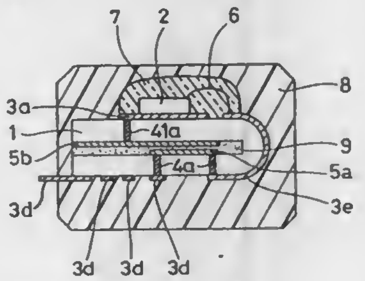
Tsukasa Ohoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 68,383, May 28, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,088
Claims priority, application Japan, Jun. 2, 1992, 4-141280
Int. Cl.^{6} H01L *23/58*
U.S. Cl. 257—489 **5 Claims**



1. A semiconductor device comprising:
a substrate; a semiconductor element formed in said substrate; an output electrode formed on said semiconductor element; a detector electrode; an aluminum electrode formed on said substrate and being spaced from and surrounding said detector electrode; an oxide film formed on said semiconductor substrate between said output electrode and said aluminum electrode; said detector electrode being formed on said oxide film such that said detector electrode is separated from and surrounds said output electrode; and a resistor connected only between said detector electrode and said output electrode.

5,534,727
SEMICONDUCTOR DEVICE

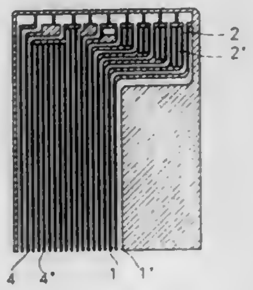
Akira Inoue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 32,653, Mar. 17, 1993, Pat. No. 5,382,829. This application Sep. 23, 1994, Ser. No. 312,275
Claims priority, application Japan, Jul. 21, 1992, 4-217254
Int. Cl.^{6} H01L *49/00;23/48*
U.S. Cl. 257—659 **3 Claims**



1. A semiconductor device comprising:
a first insulating film substrate having a front surface and a rear surface;
a high frequency semiconductor chip and circuit elements connected to said semiconductor chip and disposed on one of said front and rear surfaces of said first insulating film substrate;
a second insulating film substrate having a front surface and a rear surface;
a circuit element on said rear surface of said second insulating film substrate wherein said first film substrate and said second film substrate are laminated, connected to each other, and encapsulated in a resin; and
an electromagnetic shielding layer disposed on said second film substrate for electromagnetically separating said second film substrate from said first film substrate wherein said rear surface of said first film substrate is opposite one of said front and rear surfaces of said second film substrate and said high frequency semiconductor chip and circuit elements on said first and second film substrates are electrically connected to each other via through holes.

5,534,728
SEMICONDUCTOR DEVICE HAVING A CORROSION-RESISTANT METAL WIRING LAYER

Tae-ryong Kim, Kyungki-do; Hee-su Park, and Dal-sick Moon, both of Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Sep. 21, 1992, Ser. No. 947,640
Claims priority, application Rep. of Korea, Sep. 19, 1991, 91-16426
Int. Cl.^{6} H01L *27/02*
U.S. Cl. 257—692 **10 Claims**

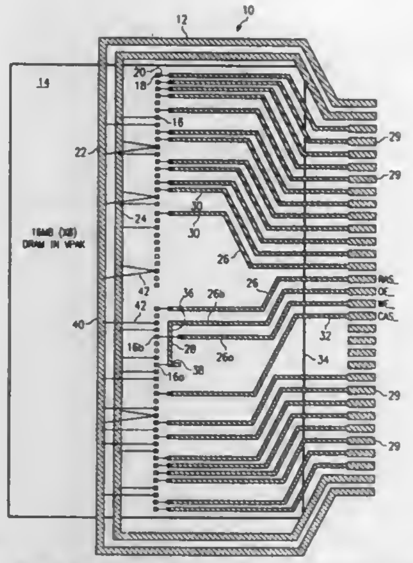


1. A semiconductor device including:
a metal wiring layer having a plurality of parallel, actual metal lines, with an endmost one of said actual metal lines being disposed adjacent to a first wiring-free region;
an active circuit portion, said actual metal lines being electrically connected to said active circuit portion; and,
at least one dummy metal line interposed between said endmost one of said actual metal lines and said wiring-free region, said at least one dummy metal line being electrically disconnected from said active circuit portion.

5,534,729
INTEGRATED CIRCUIT LEAD FRAME FOR COUPLING TO NON-NEIGHBORING BOND PADS

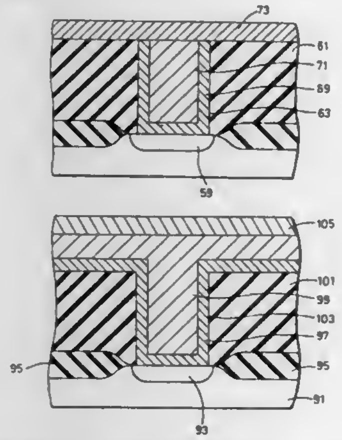
Ernest J. Russell, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 85,691, Jun. 29, 1993, Pat. No. 5,396,701. This application Feb. 17, 1995, Ser. No. 390,197
Int. Cl.^{6} H01L *23/04*
U.S. Cl. 257—692 **17 Claims**

1. A lead frame for placement adjacent an integrated circuit having a plurality of bonding pads forming a bonding pad row, said lead frame comprising:
a plurality of leads having first and second portions, said first portions positioned to be coupled to an external system, and said second portions disposed adjacent a first side of said bonding row, said second portions positioned to be coupled to an associated sequence of bonding pads; and
at least one lead finger coupled to a selected second portion of one of said leads, said at least one lead finger extending between said first side of said bonding pad row and at least one neighboring second portion to a position proximate a selected bond pad, said at least one lead finger positioned to permit said selected second portion to be coupled to said selected bond pad.



5,534,730
CONDUCTIVE LAYER CONNECTION STRUCTURE OF A SEMICONDUCTOR DEVICE AND A METHOD OF MANUFACTURING THEREOF

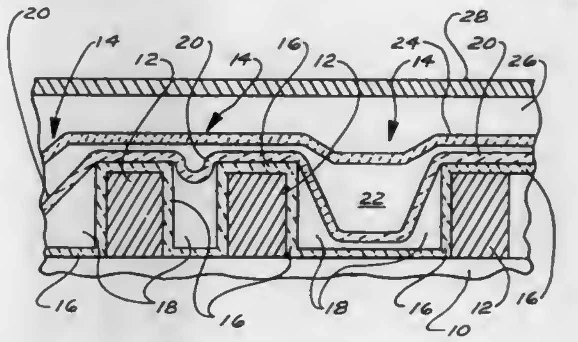
Kenichi Mori, and Katsuhiro Tsukamoto, both of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 180,823, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 970,703, Nov. 3, 1992, abandoned. This application Apr. 19, 1995, Ser. No. 423,476
Claims priority, application Japan, Nov. 11, 1991, 3-323923; Mar. 9, 1992, 4-050839
Int. Cl.^{6} H01L *21/285;29/41;29/43*
U.S. Cl. 257—757 **16 Claims**



11. A semiconductor device comprising:
a semiconductor substrate of silicon of a first conductivity type, having a main surface,
a lower conductive layer of an impurity diffusion region of a second conductivity type, formed on the main surface of said semiconductor substrate,
an insulation layer formed on the main surface of said semiconductor substrate, having a through-hole with sidewalls formed therein exposing a surface of said lower conductive layer,
a titanium silicide layer formed on the exposing surface of said lower conductive layer in the through-hole of said insulation layer, and on the side face of said through-hole of said insulation layer,
a connection conductive layer fully filling said through-hole of said insulation layer and electrically connecting to said lower conductive layer through said titanium silicide, said connection conductive layer being titanium nitride,
an upper conductive layer formed on the surface of said insulation layer opposite the main surface of said semiconductor substrate, and electrically connected to said lower conductive layer via said connection conductive layer, wherein substantially the entire sidewalls of said through-hole has said titanium silicide layer formed thereon.

5,534,731
LAYERED LOW DIELECTRIC CONSTANT TECHNOLOGY

Robin W. Cheung, Cupertino, Calif., assignor to Advanced Micro Devices, Incorporated, Sunnyvale, Calif.
Filed Oct. 28, 1994, Ser. No. 330,871
Int. Cl.^{6} H01L *23/48;29/06;23/52;29/40*
U.S. Cl. 257—759 **17 Claims**

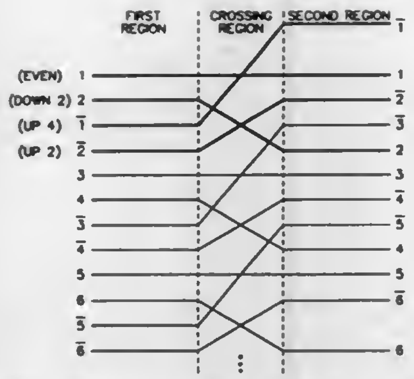


1. A layered dielectric structure separating a first layer of metal interconnects from each other in semiconductor devices and for separating said first layer of metal interconnects from a second, overlying layer of metal interconnects for making electrical contact to said first layer of metal interconnects, said layered dielectric structure comprising:
(a) a layer of an organic spin-on-glass material filling gaps between metal interconnects in said first layer of metal interconnects;
(b) a layer of an inorganic spin-on-glass material to provide planarization to support said second layer of metal interconnects; and
(c) a layer of a chemically vapor deposited oxide comprising silicon-rich silicon dioxide and separating said organic spin-on-glass layer and said inorganic spin-on-glass layer.

5,534,732
SINGLE TWIST LAYOUT AND METHOD FOR PAIRED LINE CONDUCTORS OF INTEGRATED CIRCUITS

John K. DeBrosse, Burlington; Jenifer E. Lary, Hinesburg, and Edmund J. Sprogis, Underhill, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 290,408, Aug. 15, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 567,437
Int. Cl.^{6} H01L *27/10*
U.S. Cl. 257—776 **15 Claims**

1. An interconnection array comprising:
a plurality of paired line conductors, each pair comprising a true line conductor and an associated complement line conductor;
said plurality of paired line conductors being substantially parallel within a first region and within a second region;
said plurality of paired line conductors crossing in a crossing region disposed between said first region and said second region;
said plurality of paired line conductors being located in said first region and said second region and being crossed in said crossing region such that no true line conductor is immediately adjacent to its associated complement line conductor in said first region and said second region; and,

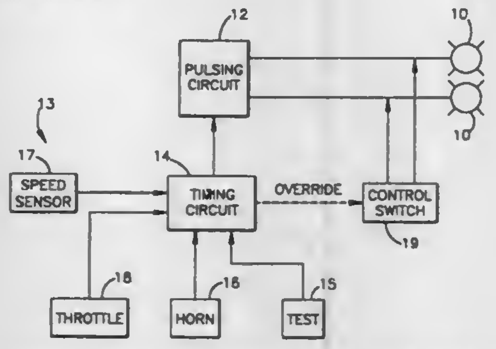


said plurality of paired line conductors further being located in said first region and said second region and being crossed in said crossing region such that for any given line conductor of said plurality of line conductors, capacitive coupling occurring in said first region and said second region between said given line conductor and immediately adjacent true line conductors of said plurality of line conductors is balanced by capacitive coupling occurring in said first region and said second region between said given line conductor and immediately adjacent complement line conductors associated with said immediately adjacent true line conductors.

5,534,733
DIGITAL DIMMING AND FLASHING CIRCUIT FOR LOCOMOTIVE DITCH LIGHTS

Donald C. Wetzel, Berea, and Robert A. Livsey, Richmond Heights, both of Ohio, assignors to Meg Trans Corp., Berea, Ohio

Filed Jun. 25, 1993, Ser. No. 82,617
Int. Cl.⁶ B60Q *1/26;1/54*
U.S. Cl. 307—9.100 **20 Claims**



1. A control circuit for an element connectable across a voltage, comprising:

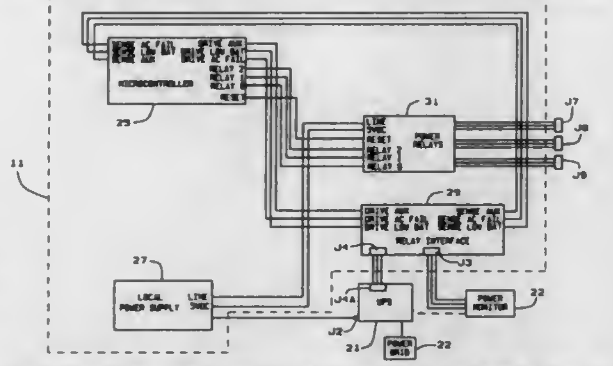
a switching circuit connected to control the voltage across the element; and

a dimming and flashing circuit connected to control the switching circuit for fully energizing the element to place the element continuously in a fully energized state, for energizing the element with a series of voltage pulses at a specific duty cycle to place the element in a dimmed state, and for alternately rapidly changing the states of the element between the fully energized state and the dimmed state to place the element in a flashing state, the dimming and flashing circuit including a control switch connected to operate the dimming and flashing circuit to continuously place the element in the fully energized state.

5,534,734
POWER SHEDDING DEVICE

William C. Pugh, Manchester, and John M. McNally, University City, both of Mo., assignors to Compusci, Inc., Fenton, Mich.

Filed Dec. 9, 1993, Ser. No. 164,160
Int. Cl.⁶ H02J *3/14*
U.S. Cl. 307—38 **20 Claims**



1. A power shedding device for controlling the application of power from an uninterruptible power supply, comprising:

means for detecting an alarm signal indicative of a condition requiring the rationing of power from the uninterruptible power supply;

a plurality of power outputs adapted for connection to a plurality of loads;

means for controlling the application of power to each power output such that the application of power to a first power output is independent of the application of power to a second power output;

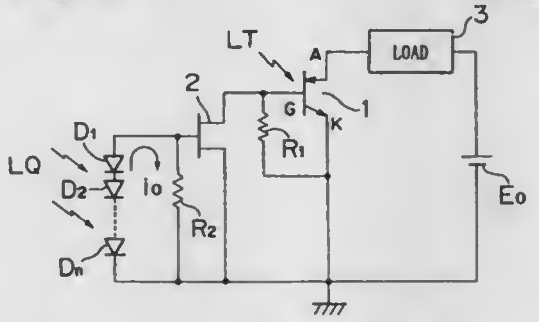
manually operable means for presetting shedding profiles for the power outputs;

said controlling means being responsive to receipt of the alarm signal to shed each power output in accordance with its corresponding manually preset shedding profile.

5,534,735
PHOTO SI THYRISTOR DRIVING CIRCUIT AND ITS PROTECTION CIRCUIT

Akira Baba; Kazuo Sugimura; Satoshi Miwa; Keizo Yamamoto, and Masayuki Saito, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 272,530
Claims priority, application Japan, Jul. 12, 1993, 5-171318; Jun. 13, 1994, 6-130256
Int. Cl.⁶ H01H *47/24*
U.S. Cl. 307—117 **11 Claims**



1. A photo SI thyristor driving circuit comprising:

a single photo SI thyristor;

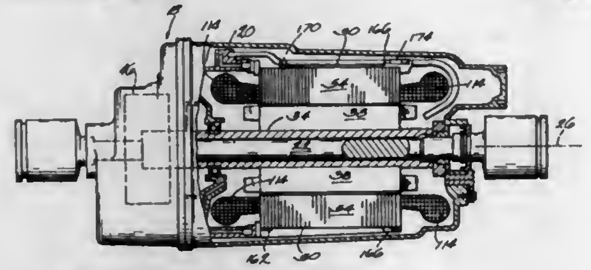
transistor means provided in a gate circuit of said photo SI thyristor for drawing charges accumulated at the gate of said photo SI thyristor when said photo SI thyristor is turned off; and

photo electromotive force means provided in a gate circuit of said transistor means for generating a photo current for applying a gate voltage to the gate of said transistor means.

5,534,736
STATOR FOR AN ELECTRIC VEHICLE AND METHOD FOR PRODUCING THE STATOR

J. Herbert Johnson, Tipp City, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Division of Ser. No. 101,875, Aug. 4, 1993, Pat. No. 5,398,397. This application Nov. 8, 1994, Ser. No. 335,929
Int. Cl.⁶ H02K *5/00*
U.S. Cl. 310—91 **5 Claims**



1. An electric vehicle comprising:

a body;

an axle rotatably supported by said body;

a rotor supported by said body for rotation about a longitudinal axis;

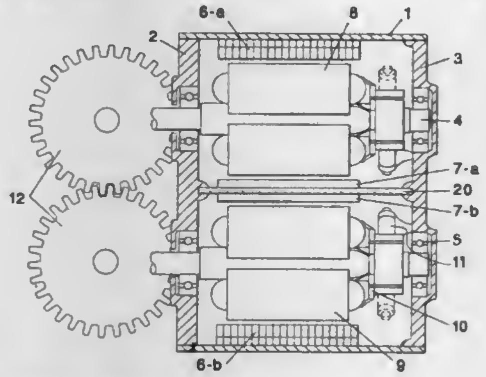
a gearing assembly for selectively drivingly connecting said rotor to said axle; and

a stator supported by said body, said stator including a stator core which has a longitudinal opening housing said rotor and which has an outer surface, said outer surface including upper and lower longitudinally extending recesses oppositely disposed relative to said axis, and said stator also including upper and lower cleats respectively mounted in said upper and lower longitudinally extending recesses, said cleats and said longitudinal axis defining a common vertical plane.

5,534,737
COMPOSITE MOTOR

Masayuki Nishimura, 33 Nishimachi 2-Chome, Ayabe-shi, Kyoto 623, Japan

Filed Dec. 21, 1994, Ser. No. 361,200
Int. Cl.⁶ H02K *16/00*
U.S. Cl. 310—112 **4 Claims**



1. A composite motor, comprising:

a housing including a front bracket, a back bracket and a yoke, said yoke having an inner wall surface and surrounding said front and back brackets;

a first armature and a second armature, each of said armatures defining an outer periphery and having a rotary shaft and coils rotatably supported in parallel within said housing by said front and back brackets, each of said rotary shafts being provided with gears, said gears meshing with each other, wherein adjacent rotary shafts are interlockingly rotatable in opposite directions;

a partitioning wall disposed between each armature at a position between where the outer peripheries of adjacent armatures are nearest to each other and the inner wall surface of the yoke on a second-half armature rotation side of the armatures in a rotation direction, said partitioning wall providing a magnetic block between adjacent armatures;

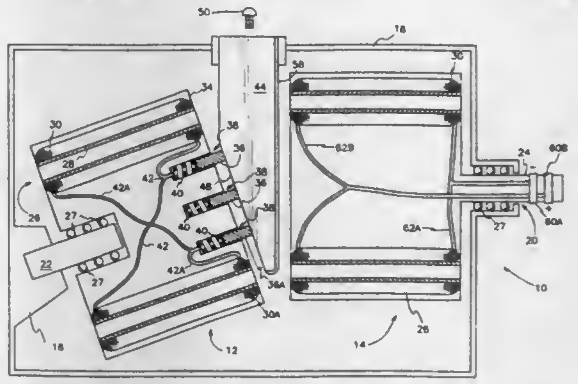
an opening disposed between each armature at a position between where the outer peripheries of adjacent armatures are nearest to each other and the inner wall surface of the yoke on a first-half armature rotation side of the armatures in a rotation direction, said opening permitting magnetic communication between adjacent armatures; and

stationary field members disposed adjacent the outer peripheries of said armatures at first and second positions with respect to each armature, said first position being located between where said armatures are closest to said partitioning wall and the inner wall surface of the yoke on a second-half armature rotation side of said armatures in a rotation direction, said second position being diametrically opposite said first position, said armatures being driven to rotate in opposite directions by interaction between an electric current flowing in the coils of said armatures and magnetic fluxes supplied by said stationary field members, and by forces of magnetic attraction acting between the coils of said armatures opposing each other at said opening disposed therebetween.

5,534,738
MOTOR HAVING NON-COAXIAL, SYNCHRONIZED ROTORS

George Miller, 2976 Shaffer Rd., Atwater, Ohio 44201

Filed Jun. 9, 1995, Ser. No. 488,845
Int. Cl.⁶ H02K *23/60*
U.S. Cl. 310—115 **17 Claims**



1. An electric motor comprising:

a first rotatable member having at least one first magnet mounted thereto, a first rotational axis, and a first end face, one pole of said first magnet oriented to project a flux field from said first end face away from said first rotatable member; and

a second rotatable member having at least one second magnet mounted thereto, a second rotational axis, and a second end face, one pole of said second magnet oriented to project a flux field from said second end face away from said second rotatable member;

said first rotational axis angulated with respect to and intersecting said second rotational axis with said angulated axes being sufficiently angled to generate synchronous rotation, said first end face facing said second end face, whereby the respective flux fields of said first magnet and said second magnet interact with one another to effect opposing magnetic fields located at variable proximity to one another, thereby inducing rotation of said first and second rotatable members responsive to electrical power imposed upon said first and second magnets.

5,534,739
ELECTRIC MACHINE

Götz Heidelberg, Starnberg-Percha; Andreas Gründl, and Peter Ehrhart, both of Munich, all of, Germany, assignors to Magnet-Motor Gesellschaft für magnetmotorische Technik mbH, Starnberg, Germany

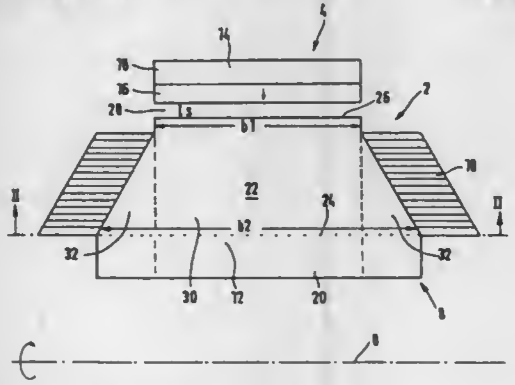
PCT No. PCT/EP91/01729, § 371 Date Jul. 14, 1992, § 102(e) Date Jul. 14, 1992, PCT Pub. No. WO92/05618, PCT Pub. Date Apr. 2, 1992

PCT Filed Sep. 11, 1991, Ser. No. 852,204

Claims priority, application Germany, Sep. 14, 1990, 40 29 271.1

Int. Cl.^{6} H02K *1/00*

U.S. Cl. 310—179 **14 Claims**



1. An electric machine comprising

an exciter part;

an induction part disposed adjacent the exciter part, the exciter part and the induction part defining an air gap therebetween and being moveable relative to one another thereby defining a direction of movement, the induction part further including:

teeth disposed adjacent one another and projecting in a direction toward the air gap, the teeth defining grooves therebetween, each of the teeth having a tooth base, and a tooth tip adjacent the air gap, each of a plurality of the teeth including:

a middle portion having two ends and a constant width defined in a direction along the air gap and perpendicular to the direction of movement; and

a pair of tooth widening portions, each of the tooth widening portions having a free end and a transition end and being located adjacent one of the two ends of the middle portion at the transition end thereof for forming said each of the plurality of the teeth with the middle portion, each of the tooth widening portions further having a dimension defined in the direction of movement which decreases from a corresponding end of the middle portion toward the free end, and a width defined in the direction along the air gap and perpendicular to the direction of movement which decreases from a corresponding tooth base toward a corresponding tooth tip; and

conductor coils disposed within the grooves.

5,534,740
ELECTROSTATIC ACTUATOR AND METHOD OF CONTROLLING THE SAME

Toshiro Higuchi, 14-1, Chigasakiminami 4-chome, Kouhoku-ku, Yokohama-shi, Kanagawa, 223, Yokohama, Japan; Saku Egawa; Toshiki Niino, both of Tokyo; Katsuhide Natori, and Fumio Tabata, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kawasaki, and Toshiro Higuchi, Yokohama, both of, Japan

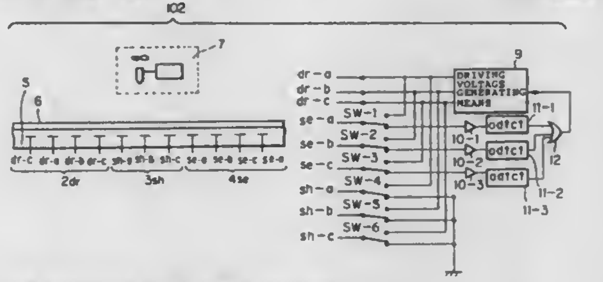
PCT No. PCT/JP92/00683, § 371 Date Jan. 27, 1993, § 102(e) Date Jan. 27, 1993, PCT Pub. No. WO92/22125, PCT Pub. Date Dec. 10, 1992

PCT Filed May 27, 1992, Ser. No. 966,157

Claims priority, application Japan, May 27, 1991, 3-121371

Int. Cl.^{6} H02N *1/00*

U.S. Cl. 310—309 **17 Claims**



1. An electrostatic actuator comprising:

a first member having a first surface;

a plurality of driving electrodes insulated from each other and disposed on the first surface of the first member, each driving electrode having a strip shape and the plurality of driving electrodes being disposed at positions spaced at predetermined intervals along a predetermined direction, on the first surface;

a second member placed on, and in contact with, the first surface of the first member, the first and second members being relatively moveable to successive, different relative positions therebetween;

control means for applying a first pattern of voltages of plural, different voltage levels to respective, different driving electrodes of the plurality of driving electrodes and thereby inducing a first pattern of plural, different charges in portions of the second member corresponding to the positions of the plurality of driving electrodes on the first member at a first relative position of the first and second members, the first pattern of charges producing first electric fields relative to the strip shape electrodes of the first member and corresponding attractive forces which attract the second member to the first member and produce a frictional force therebetween, the control means applying, alternatively in the first relative position of the first and second members, a second and different pattern of voltages of plural, different voltage levels to respective, different driving electrodes of the plurality of driving electrodes thereby temporarily producing second electric fields and corresponding repulsive and transverse forces which temporarily reduce the frictional force between the first and second members and move the first member relatively to the second member to a second, and different, successive relative position therebetween, the second pattern of plural different voltage levels establishing a corresponding second pattern of plural, different charges in the corresponding portions of the second member;

at least one detecting electrode disposed at a specified phase-related position with respect to the predetermined intervals of the plurality of driving electrodes on the first surface of the first member, the patterns of charges induced on the second member producing a corresponding electrical signal in each detecting electrode, in accordance with the specified phase-related position thereof; and

detecting means for detecting the position of the second member relative to the first member through the detection of the electric signals produced in each detecting electrode, the control means responding to the different electric signals for changing the pattern of voltages applied thereby to the driving electrodes in phased relationship to the relative movement of the first and second members to each next successive relative position.

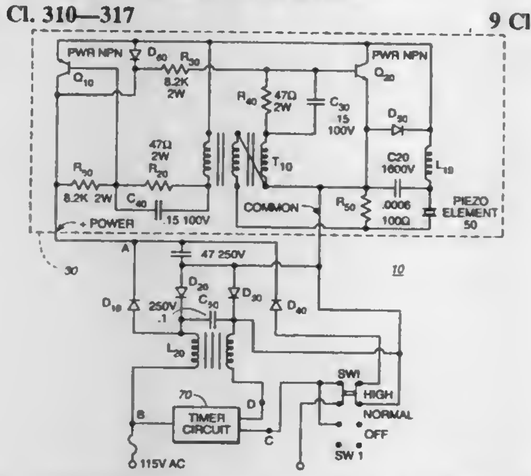
5,534,741
ULTRASONIC PULSE CLEANER

Blaine M. Smith, Lincoln City, Oreg., assignor to Sharper Image Corporation, San Francisco, Calif.

Filed Sep. 26, 1994, Ser. No. 311,874

Int. Cl.^{6} H01L *41/08*

U.S. Cl. 310—317 **9 Claims**



1. An ultrasonic pulse cleaner powered by an alternating source of electric current, comprising:

an ultrasonic energy generating element;

driving means, receiving said current, for driving said ultrasonic energy generating element, wherein said ultrasonic energy generating element generates ultrasonic energy at a self-oscillating frequency when driven by said driving means; and

a timer, connected to said driving means, controlling said driving means to permit operation in a first mode in which said ultrasonic energy generating element generates ultrasonic energy at a substantially continuous non-zero rate, and in a second mode in which said ultrasonic energy generating element generates ultrasonic energy as a plurality of discrete pulses;

wherein said ultrasonic energy generating element generates ultrasonic energy at all times when said ultrasonic pulse cleaner is powered by said source of electric current.

5,534,742
LAMP/REFLECTOR UNIT

Hans-Dieter Krapp, Nideggen-Schmidt; Martin Hanek, Baesweiler, and Hubert Frings, Alsdorf, all of, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1994, Ser. No. 270,951

Claims priority, application European Pat. Off., Jul. 5, 1993, 93201951

Int. Cl.^{6} H01K *1/46*

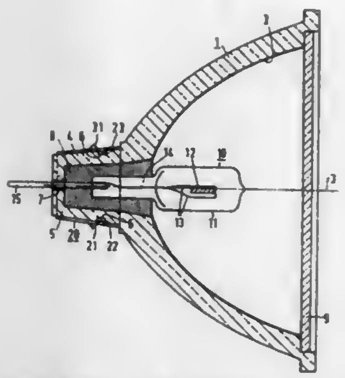
U.S. Cl. 313—113 **17 Claims**

1. A reflector lamp unit, comprising:

a glass reflector body including a concave reflecting surface having an optical axis, and around the optical axis a neck with a free-end portion;

an electric lamp with a lamp vessel having a seal sealing said lamp vessel in a gastight manner, an electric element arranged in the lamp vessel, and current conductors connected to said electric element and issuing to the exterior of said lamp vessel from said seal;

a metal sleeve fastened around the neck of the reflector body, which sleeve has projections which face away from one another and extend transversely to the optical axis,



the electric lamp being secured in the neck, and the current conductors each projecting from the neck and the sleeve to the exterior with a respective free end so as to form contact pins, characterized in that the neck has grooves, the metal sleeve has projections which face one another and which enter the grooves in the neck of the reflector body, and in that the neck projects with its free-end portion to outside the sleeve.

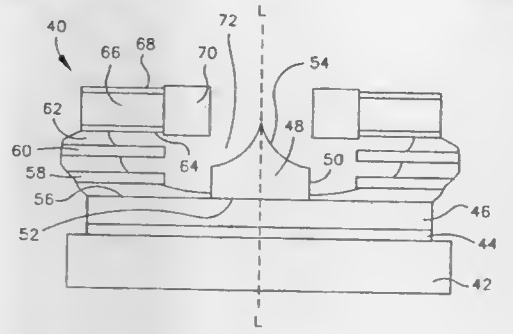
5,534,743
FIELD EMISSION DISPLAY DEVICES, AND FIELD EMISSION ELECTRON BEAM SOURCE AND ISOLATION STRUCTURE COMPONENTS THEREFOR

Gary W. Jones, Poughkeepsie, and Steven M. Zimmerman, Pleasant Valley, both of N.Y., assignors to FED Corporation, Hopewell Junction, N.Y.

Continuation-in-part of Ser. No. 290,238, Aug. 15, 1994, which is a continuation-in-part of Ser. No. 29,880, Mar. 11, 1993. This application Sep. 7, 1994, Ser. No. 301,473

Int. Cl.^{6} H01J *1/02*

U.S. Cl. 313—309 **10 Claims**



1. A field emitter structure, comprising:

a base substrate;

a field emitter element on the base substrate;

a multilayer differentially etched dielectric stack circumscribingly surrounding the field emitter element on the base of the substrate, said dielectric stack including at least three layers of dielectric material wherein adjacent layers have different etch rates associated therewith and are thereby etchably formed such that alternating layers are recessed farther from the field emitter element than those layers disposed therebetween thereby creating a long surface path length to inhibit undesirable charge flow; and

a gate electrode overlying the multilayer differentially etched dielectric stack, and in circumscribing spaced relationship to the field emitter element.

5,534,744

MICROPOINT EMISSIVE CATHODE ELECTRON SOURCE AND FIELD EMISSION-EXCITED CATHODOLUMINESCENCE DISPLAY MEANS USING SAID SOURCE

Thierry Leroux, IFS, and Robert Meyer, St. Ismier, both of, France, assignors to Commissariat a l'Energie Atomique, Paris, France

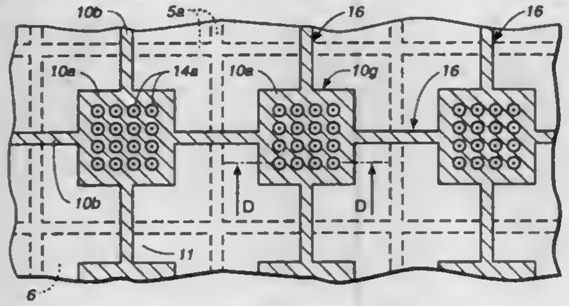
Continuation of Ser. No. 22,935, Feb. 26, 1993, abandoned.

This application Nov. 8, 1994, Ser. No. 337,528

Claims priority, application France, Feb. 26, 1992, 92 02220

Int. Cl.^{6} G09G *3/10*

U.S. Cl. 313—309 **7 Claims**



1. An apparatus comprising:
an electrically insulating support;
a resistive layer formed on the electrically insulating support;
a plurality of microtips made from an electron emitting material and formed in contact with the resistive layer;
a first series Of electrodes formed in contact with the resistive layer and serving as cathode conductors; and
a second series of electrodes serving as grids, the second series of electrodes being electrically insulated from the first series of electrodes; wherein:
the first series of electrodes is formed by a first plurality of parallel conductors and a second plurality of parallel conductors intersecting the first plurality of parallel conductors;
the second series of electrodes is formed by a third plurality of conductors each extending in one direction and periodically having narrow portions and wide portions, and a fourth plurality of conductors intersecting the third plurality of conductors and each extending in another direction and periodically having narrow portions and wide portions, the wide portions of the third conductors and the wide portions of the fourth conductors being merged;
the second series of electrodes is positioned with the narrow portions of the third and fourth plurality of conductors overlapping the first and second plurality of conductors of the first series of electrodes.

5,534,745

Patent Not Issued For This Number

5,534,746

COLOR PICTURE TUBE HAVING SHADOW MASK WITH IMPROVED APERTURE SPACING

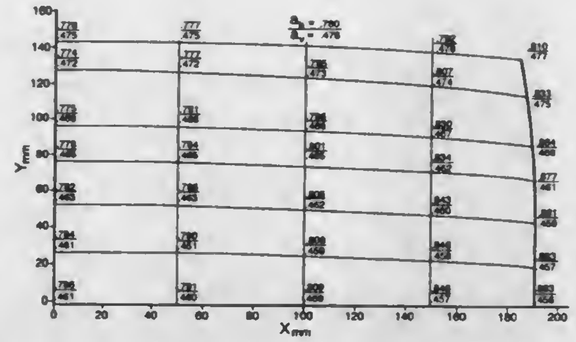
Bruce G. Marks, and Theodore F. Simpson, both of Lancaster, Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Jun. 6, 1995, Ser. No. 467,119

Int. Cl.^{6} H01J *29/07*

U.S. Cl. 313—408 **3 Claims**

1. In a color picture tube having a shadow mask and a dot screen, said mask being rectangular and having two horizontal long sides and two vertical short sides, said long sides paralleling a central major axis of said mask and said short sides paralleling a central minor axis of said mask, said mask including an array of apertures arranged in vertical columns and horizontal rows, apertures in one row being in different columns than are the apertures in adjacent rows, the vertical spacing between adjacent apertures within a column being the vertical pitch of the apertures and the horizontal spacing between adjacent apertures within a row being the horizontal pitch of the apertures; the improvement comprising
said horizontal pitch increasing from said minor axis to the short sides of said mask and decreasing from said major axis to the long sides of said mask, and
said vertical pitch decreasing from the center of said mask to the short sides of said mask, along said major axis, and increasing from said minor axis to the corners of said mask, adjacent the long sides of said mask.



5,534,747

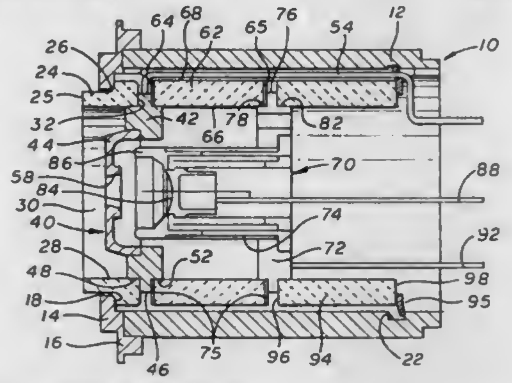
VARIABLE FOCUS ELECTRON GUN ASSEMBLY WITH CERAMIC SPACERS

Malcolm J. Carruthers, San Jose, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed May 13, 1994, Ser. No. 242,265

Int. Cl.^{6} H01J *29/46*

U.S. Cl. 313—456 **16 Claims**



1. An electron gun, comprising:
a shell comprising an inwardly protruding shoulder portion disposed at a first end thereof;
a cathode concentrically disposed within said shell and means for electrically connecting said cathode to an external negative voltage source;
a first electrically insulative spacing ring disposed within said shell in abutting engagement with said shoulder and said cathode, said cathode being electrically insulated from said shell by said first spacing ring;
an anode concentrically disposed within said shell in abutting engagement with said first spacing ring;
a second spacing ring disposed within said shell in abutting engagement with said anode, said cathode being in abutting engagement with said second spacing ring; and
means for holding said cathode, said anode, said first spacing ring, and said second spacing ring rigidly together within said shell;
wherein said holding means is capable of detachment from said electron gun for removal of said cathode, said first spacing ring, and said second spacing ring from said shell.

5,534,748

DISPLAY DEVICE COMPRISING A DISPLAY SCREEN PROVIDED WITH A LIGHT ABSORBING COATING

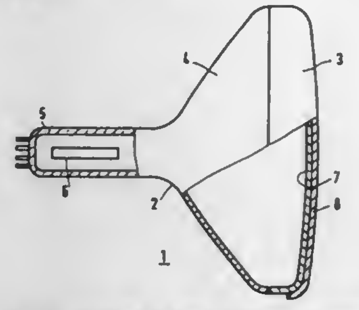
Emmanuel W. J. L. Oomen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1995, Ser. No. 395,949

Claims priority, application European Pat. Off., Mar. 3, 1994, 94200541

Int. Cl.^{6} H01J *29/89*

U.S. Cl. 313—479 **13 Claims**



1. A display device having a glass envelope comprising a cone, a neck, and a display screen, an electron gun inside the neck and a phosphor layer on the inside of the screen, the display screen also provided with a light-absorbing coating of an inorganic network comprising at least silicon oxide and a dyestuff, characterized in that a metal oxide of at least one metal selected from the group formed by Al, Ti, Zr and Ge is incorporated into the network, and in that the coating also comprises a carbon-containing polymer which is chemically bonded to the inorganic network via Si—C bonds.

5,534,749

FIELD-EMISSION DISPLAY WITH BLACK INSULATING LAYER BETWEEN TRANSPARENT ELECTRODE AND CONDUCTIVE LAYER

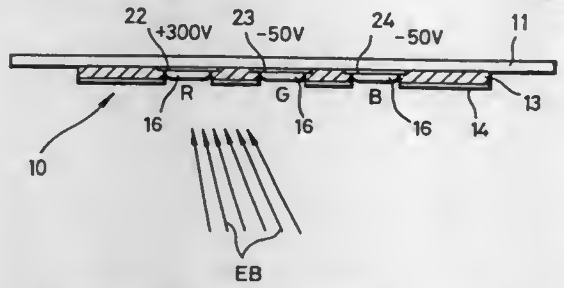
Toshio Ohoshi, Tokyo; Tadashi Kiyomiya, Saitama, and Masami Okita, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1994, Ser. No. 277,576

Claims priority, application Japan, Jul. 21, 1993, 5-180332

Int. Cl.^{6} H01J *1/62*

U.S. Cl. 313—497 **3 Claims**



1. A field-emission display, comprising:
a plurality of field-emission cathodes for emitting electron beams;
a phosphor panel assembly comprising a front panel, first, second and third different color phosphor layers coated on respective first, second, and third electrically independent transparent electrodes lying on an inner surface of said front panel, said phosphor layers emitting different color lights in response to bombardment of the electron beams emitted from the field-emission cathodes, a black insulating layer respectively disposed between the phosphor layers at the inside surface of the front panel, a conductive layer on the insulating layer between and adjacent each of the phosphor layers but not overlying the phosphor layers, and said black insulating layer insulating said conductive layer from said phosphor layers and said respective transparent electrodes;
a voltage V_f applied to said conductive layer; and
a voltage V_{P1} applied to said first transparent electrode, a voltage V_{P2} applied to said second transparent electrode, and a voltage V_{P3} applied to said third transparent electrode, and when said first phosphor layer emits light with the second and third phosphor layers not emitting light, said voltage V_{P1} is greater than V_{P2} and V_{P3} and said voltage V_f is lower than V_{P1}.

5,534,750

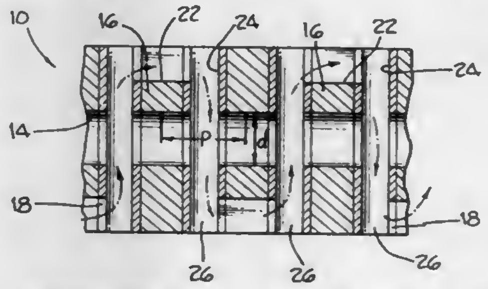
INTEGRAL POLEPIECE MAGNETIC FOCUSING SYSTEM HAVING ENHANCED GAIN AND TRANSMISSION

Alan J. Theiss, Redwood City, and Douglas B. Lyon, San Carlos, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 882,298, May 13, 1992, Pat. No. 5,332,947. This application Jun. 22, 1994, Ser. No. 263,762

Int. Cl.^{6} H01J *23/087*

U.S. Cl. 315—5.35 **12 Claims**



7. A focusing system for an electron beam within an RF amplification tube, comprising:
a plurality of magnetic polepieces each having a centrally disposed aperture;
a plurality of electrically conductive non-magnetic plates alternatingly and integrally provided with said polepieces, said non-magnetic plates each having a centrally disposed aperture, said apertures of said polepieces being aligned with said apertures of said non-magnetic plates to provide a beam tunnel;
at least one permanent magnet coupled to said polepieces, said magnet having magnetic flux which flows through said magnetic polepieces to provide an axial magnetic field within said beam tunnel;
wherein, a slow-wave circuit is provided within said polepieces and said non-magnetic plates that extends beyond a diameter of said beam tunnel, said diameter being greater than a separation distance between adjacent ones of said polepieces.

5,534,751

PLASMA ETCHING APPARATUS UTILIZING PLASMA CONFINEMENT

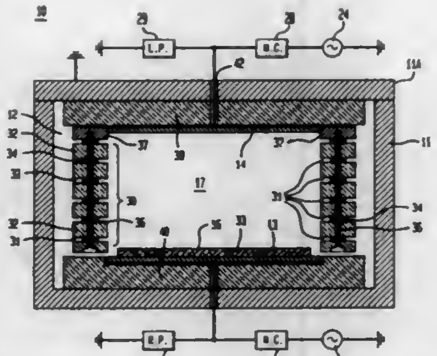
Eric H. Lenz, San Jose, and Robert D. Dible, Fremont, both of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Jul. 10, 1995, Ser. No. 500,196

Int. Cl.^{6} H01J *7/24*

U.S. Cl. 315—111.71 **30 Claims**

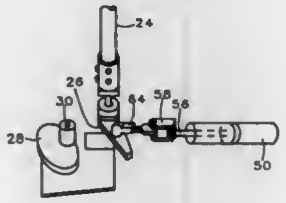
1. Plasma processing apparatus comprising:
means for a housing for containing a gaseous medium useful for processing a workpiece;
a parallel pair of electrodes defining therebetween an interaction space where a plasma capable of processing a workpiece supported on one of the electrodes is generated when radio-frequency energy is provided for establishing a discharge between the electrodes and ionizing the gaseous medium; and
a confinement assembly defining a plurality of separate parallel passages that allow gas flow through the confinement assembly from an inner surface to an outer surface, said parallel

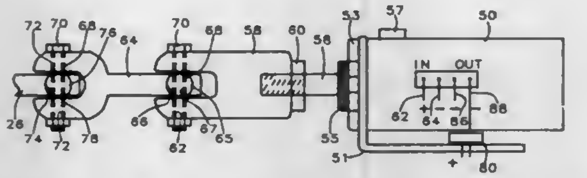


passages being spaced apart in a direction normal to that of the flow of gases through said passages, said confinement assembly being disposed between the electrodes, and said passages being proportioned for essentially confining the discharge within the interaction space by neutralizing charged particles created in the plasma when the charged particles pass through the passages.

5,534,752
SHUTTER LINKAGE FOR AN ION IMPLANTATION APPARATUS

Chung Hua-Chu, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan
Filed Jul. 26, 1995, Ser. No. 507,534
Int. Cl.⁶ H01J *37/08*
U.S. Cl. 315—111.81 **10 Claims**



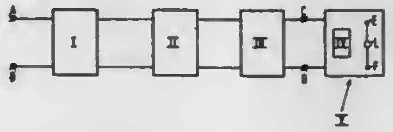


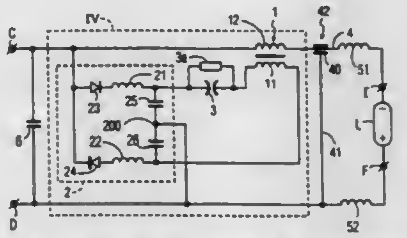
1. In an ion implantation apparatus for implanting ions into a masked semiconductor wafer, which apparatus has an ion source, an ion accelerator, an ion beam shaping means, an ion beam shutter, and a chamber enclosing the aforementioned elements, the improvement comprising an improved mechanism for activating said ion beam shutter having:

a rotatable shaft fixed to said ion beam shutter,
a cross bar fixed to said rotatable shaft,
an abutment means for limiting rotational movement of said cross bar,
a driving solenoid provided with a push rod,
a bifurcated element having first spaced prongs an end fixed to the end of said push rod,
aligned transverse apertures in said first spaced prongs,
a link joining said bifurcated element and said cross bar, said link having:
  a first truncated sphere shaped seating opening in a first end,
  a first spherical bearing element having a diametral aperture seated in said first truncated sphere shaped seating opening,
  a first pin joining the first spaced prongs of said bifurcated element to said first end of said link,
  said first pin passing through the aligned apertures of said first spaced prongs of said bifurcated element and said diametral aperture in said first spherical bearing element on said link, second spaced prongs with aligned transverse apertures on the opposite second end of said link,
  a second truncated sphere shaped seating opening in said cross bar,
  a second spherical bearing element having a diametral aperture seated in said second sphere shaped seating opening in said cross bar, and
  a second pin joining said cross bar to said second end of said link by passing through said aligned transverse apertures of said second spaced prongs and through said diametral aperture in said second spherical bearing element on said cross bar,
whereby said first and second spherical bearing elements cause uniform distribution of forces on said first and second pins during opening and closing of said ion beam shutter.

5,534,753
HIGH-PRESSURE DISCHARGE LAMP IGNITING CIRCUIT IN WHICH THE VOLTAGE-RAISING NETWORK INCLUDES INDUCTORS

Anton C. Blom, and Frans Slegers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 29, 1995, Ser. No. 413,060
Claims priority, application European Pat. Off., Apr. 6, 1994, 94200929
Int. Cl.⁶ H05B *37/00*
U.S. Cl. 315—244 **7 Claims**





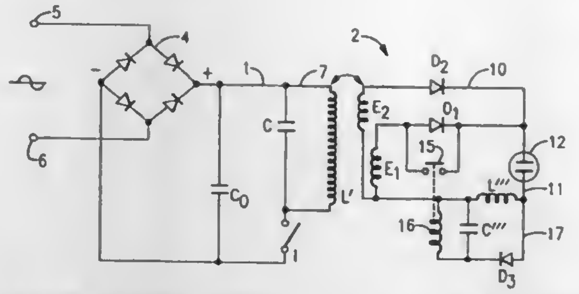
1. A circuit arrangement for igniting a high-pressure discharge lamp, provided with

input terminals for connection to a commutating supply source with a square-wave supply voltage;
a pulse-generating circuit provided with a voltage-dependent breakdown element and with a voltage-raising network formed by rectifying and capacitive means;
a pulse transformer having a primary winding connected between the voltage-dependent breakdown element and the voltage-raising network; and
an electrical connection between a secondary winding of the pulse transformer and lamp connection terminals, characterized in that the voltage-raising network itself also comprises inductive means in addition to the pulse transformer connected to the voltage-raising network.

5,534,754
APPARATUS FOR SUPPLYING ELECTRICAL POWER TO AN ARC LAMP INCLUDING RESONANT CIRCUIT

Michel Poumey, Ecully, France, assignor to Cableco, Poumey, Gaz de Bordeaux and General Export Industries - Sogexi, France
Filed Jun. 29, 1994, Ser. No. 268,258
Claims priority, application France, Jul. 6, 1993, 93 08534
Int. Cl.⁶ H05B *37/02*
U.S. Cl. 315—278 **12 Claims**

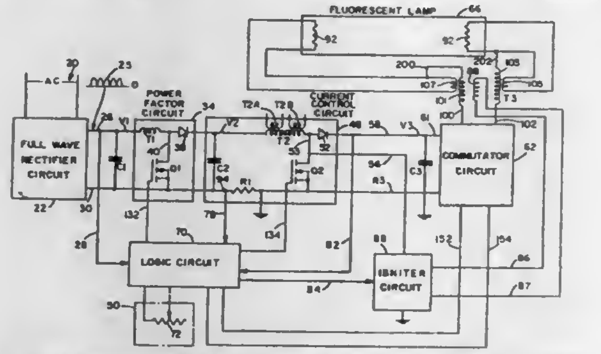
1. An apparatus for supplying electrical power to an arc lamp from an electrical power source comprising:



a primary winding and first and second secondary windings magnetically coupled to said primary winding, the first of said secondary windings being connected to continuously apply a relatively high voltage to said arc lamp to strike an arc therein, and the second of said secondary windings being connected to supply a relatively low voltage to said arc lamp to operate said arc lamp after said arc has been struck;
a capacitor connected to form a high frequency resonant circuit including said primary winding;
switching means for controllably connecting said resonant circuit to said power source;
first unidirectional conducting means for connecting said first secondary winding across said arc lamp to conduct current therethrough in a first direction; and
second unidirectional conducting means for connecting said second secondary winding across said arc lamp to conduct current therethrough in said first direction;
said first and second unidirectional conducting means serving to prevent the first and second secondary windings from short-circuiting together at the moment of striking the arc.

5,534,755
SYSTEM FOR PROVIDING A CONSTANT CURRENT TO A FLUORESCENT TUBE

Joe E. Deavenport, San Diego, Calif., and Joel A. Naive, Bigfork, Mont., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 569,941, Aug. 17, 1990, abandoned. This application May 11, 1994, Ser. No. 241,932
Int. Cl.⁶ H05B *41/392*
U.S. Cl. 315—307. **5 Claims**

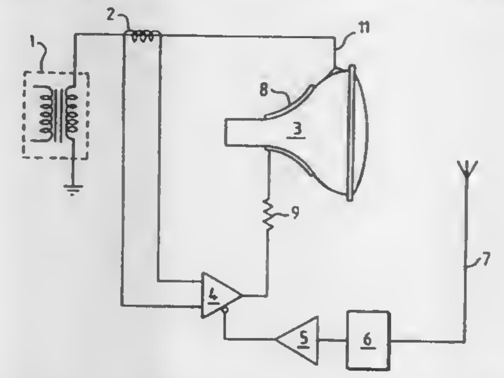


1. In a combination for exciting a fluorescent lamp to obtain luminescence from the lamp;

a current source for providing a direct current and voltage;
a commutator that impresses said direct current across the fluorescent lamp;
a current control circuit for maintaining said direct current to the lamp at a constant set level of magnitude that is independent of voltage changes across the lamp,
said commutator circuit including a switching circuit for switching the polarity of said constant direct current at a high speed having sharp rise and fall times, maintaining the switched direct current at a non-pulsing, constant level of magnitude across the fluorescent tube,
said current control circuit having means for setting said direct current at a magnitude that is held constant, irrespective of changes in voltage across the fluorescent lamp,
said current means including means responsive to a normal 60 Hz AC voltage source for providing output current;
current storage means for supplying current to said control circuit and maintaining a stored current at a magnitude sufficient to provide said direct current at a constant level of magnitude, during the low voltage cycle of said AC voltage source,
said switching means having means responsive to the AC line voltage for switching said constant direct current at the same periodic rate of the AC line voltage,
a power factor control circuit for processing said direct current provided by said direct current means to a set power factor,
said current storage means having means for storing the output direct current from said current control circuit causing a voltage increase or decrease,
a sensing circuit having a standard voltage for sensing the magnitude of the constant magnitude current supplied to said fluorescent lamp, comparing said current with said standard, and providing an output control signal,
means in said current control circuit for changing the magnitude of said current in response to said control signal,
means for changing the set magnitude of said current,
and pulse width modulator means responsive to said sensor control signal for providing pulses of current to said current control circuit for controlling the constant magnitude of said current to the set constant level.

5,534,756
ELECTRIC FIELD EMISSION REDUCTION SYSTEM

John Beeteson, Skelmorlie, and Andrew Knox, Kilbirnie, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 22, 1995, Ser. No. 408,511
Claims priority, application United Kingdom, Sep. 15, 1994, 9418570
Int. Cl.⁶ H01J *29/56*
U.S. Cl. 315—370 **10 Claims**



1. An electric field cancellation system comprising a sensor (**30**) for generating an input signal (I) indicative of an unwanted electric field (E) radiating from a source (**3**), a variable gain amplifier (**5**) for amplifying the input signal (I) to produce an output signal (O), a radiator (**20**) for generating a cancellation electric field (C) in antiphase to the unwanted field in response to the output signal to at least partially cancel the unwanted field, feedback means (**10**) for generating an error signal (F) indicative of the difference between the cancellation field and the unwanted field, and control means (**40**) for varying the gain of the amplifier to vary the output signal in response to the error signal.

5,534,757
AMPLIFYING CIRCUIT FOR DYNAMIC FOCUS

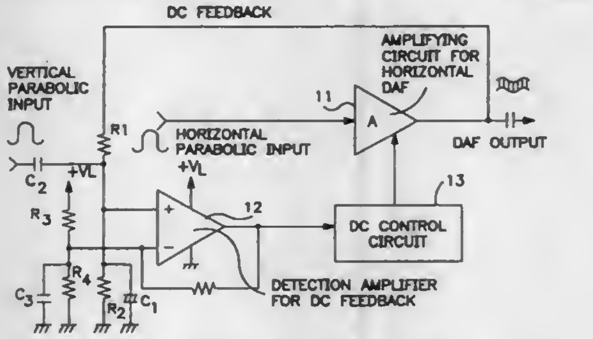
Masahiro Takatori, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1994, Ser. No. 329,279

Claims priority, application Japan, Oct. 28, 1993, 5-270614

Int. Cl.⁶ G09G *1/04*

U.S. Cl. 315—382 **6 Claims**


DC FEEDBACK
AMPLIFYING CIRCUIT FOR HORIZONTAL DAF
VERTICAL PARABOLIC INPUT
11
R1
A
HORIZONTAL PARABOLIC INPUT
DAF OUTPUT
C2
+VL
+VL
13
R3
12
DC CONTROL CIRCUIT
R4
C3
R2
C1
DETECTION AMPLIFIER FOR DC FEEDBACK

1. A dynamic focus correction circuit comprising:

an amplifying circuit for receiving and amplifying a parabolic waveform signal for horizontal dynamic focus, and delivering the amplified parabolic waveform signal to a grid for dynamic focus of a cathode-ray tube,

a detection amplifier for DC feedback for dividing the output of the amplifying circuit at a dividing point by using resistors, filtering a horizontal parabolic waveform signal component through a first capacitor connected between the dividing point and a ground, and amplifying a differential voltage between (i) the voltage at the dividing point added to a parabolic waveform signal for vertical dynamic focus coupled to the dividing point through a second capacitor, and (ii) a specific voltage, and

a DC control circuit for controlling a DC action point of the amplifying circuit by receiving the output voltage of the detection amplifier for DC feedback.

5,534,758
OPTICAL DISK DRIVE CIRCUIT AND OPTICAL DISK DRIVE DEVICE USING THE SAME

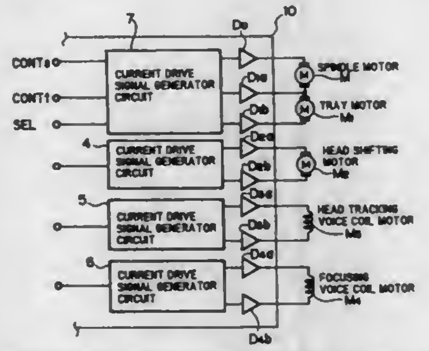
Seiichi Yamamoto, and Shinichi Hashimoto, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 20, 1994, Ser. No. 277,759

Claims priority, application Japan, Jul. 29, 1993, 5-207129

Int. Cl.⁶ H02P *1/58*

U.S. Cl. 318—112 **3 Claims**


7
Da
10
CONT0
CONT1
SEL
CURRENT DRIVE SIGNAL GENERATOR CIRCUIT
SPINDLE MOTOR
TRAY MOTOR
4
CURRENT DRIVE SIGNAL GENERATOR CIRCUIT
HEAD SHIFTING MOTOR
5
CURRENT DRIVE SIGNAL GENERATOR CIRCUIT
HEAD TRACKING VOICE COIL MOTOR
6
CURRENT DRIVE SIGNAL GENERATOR CIRCUIT
FOCUSING VOICE COIL MOTOR
Dab

1. An optical disk driver circuit comprising first, second and third drivers, wherein a motor for driving a tray which receives an optical disk to and fro by operating said first and second drivers in opposite phase to each other while an operation of said third driver is stopped and other motors housed in a device than the above mentioned motor is driven by operating said second and third drivers in opposite phase to each other while an operation of said first driver is stopped;

wherein, when said first driver is operated in response to an externally supplied selection signal, the operation of said third driver is stopped and said first and second drivers perform a BTL operation in response to a first input current signal and, when third driver is operated in response to said externally supplied selection signal, the operation of said first driver is stopped and said second and third drivers perform a BTL (balanced transformer-less) operation in response to a second input current signal;

a current drive circuit for generating said first input current signal in response to a first input voltage signal and said second input current signal in response to a second input voltage signal;

wherein said current drive circuit includes first and second voltage/current conversion circuits, said second voltage/current conversion circuit performing an inverting operation with respect to said first voltage/current conversion circuit and wherein one of said first and second voltage/current conversion circuits responds to said first input voltage signal to supply said first input current signal to said second driver and the other of said first and second voltage/current conversion circuits responds to said first input voltage signal to supply said first input current signal to said first and third drivers and one of said first and second voltage/current conversion circuits responds to said second input voltage signal to supply said second input current signal to said second driver and the other of said first and second voltage/current conversion circuits responds to said second input voltage signal to supply said second input current signal to said first and third drivers.

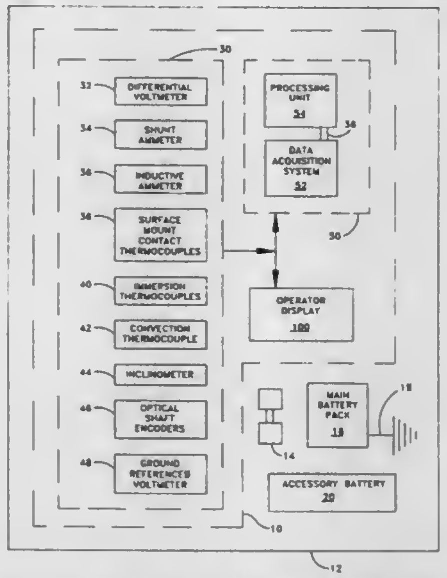
5,534,759
ELECTRIC VEHICLE MONITORING SYSTEM

Le Andra E. Evans, Groton; Robert J. White, Waterford; Russell L. Brown, Niantic; Kenneth R. Galliher, Mystic, and Mark E. Carlson, Gales Ferry, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1995, Ser. No. 445,152

Int. Cl.⁶ H02P *1/00*

U.S. Cl. 318—139 **13 Claims**



1. In an electric powered vehicle having a main electric power source transmitting power to an electric motor and having an accessory electric power source, a system for monitoring performance of said electric powered vehicle comprising:

sensor means for measuring performance characteristics of said electric powered vehicle and producing data signals corresponding to said measured performance characteristics, said sensor means comprising a first voltmeter for measuring a main voltage across said main electrical power source, a second voltmeter for measuring an accessory voltage across said accessory electric power source, a first ammeter for measuring an operating current draw of said main electrical power source when said electric powered vehicle is in an operating mode, a second ammeter for measuring a second current draw of said main electric power source when said electric powered vehicle is in an operating mode and when said electric powered vehicle is in a charging mode, a plurality of thermocouples for measuring a plurality of temperatures interior and exterior to said electric powered vehicle, a plurality of optical shaft encoders for measuring a plurality of shaft rotation rates within said electric powered vehicle and an inclinometer for measuring an angle of an incline on which said vehicle is travelling;

a data acquisition means electrically connected to said sensor means for collecting said data signals from said sensor means and converting said data signals from said sensor means into digital input signals;

a processing unit electrically connected to said data acquisition means for receiving said digital input signals from said data acquisition means, said processing unit storing and interpreting said digital input signals, said processing unit further generating reports of said performance characteristics; and

an operator display electrically connected to said sensor means for displaying operating characteristics of said electric powered vehicle, said operating characteristics corresponding to at least one of said performance characteristics, said operator display located within said electric powered vehicle to be in view of an operator of said vehicle when said operator is driving said vehicle.

5,534,760
COMPRESSOR CONTROL CIRCUIT

Yeong C. Jung, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

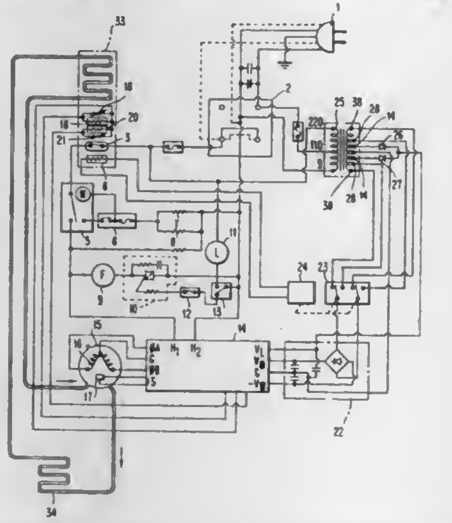
PCT No. PCT/KR93/00034, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO93/22716, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 29, 1993, Ser. No. 325,363

Claims priority, application Rep. of Korea, Apr. 30, 1992, 1992-7359

Int. Cl.⁶ H02P *7/01;6/00;* **G05D** *23/24*

U.S. Cl. 318—442 **10 Claims**



9. A compressor control circuit for a refrigerator comprising:

a DC motor for driving the refrigerator;

a first temperature sensor for sensing a temperature in a freezing chamber of the refrigerator;

means for converting an inlet AC power source into at least two DC power sources having different voltages to drive the DC motor;

a voltage switching circuit for selecting one of the at least two DC power sources responsive to the first temperature sensor; and

a motor control circuit for controlling a rotation speed of the DC motor depending on the DC power source selected by the voltage switching circuit, wherein the motor control circuit comprises a two phase control circuit which includes a second temperature sensor and at least one variable resistor for controlling the rotation speed of the DC motor.

5,534,761
MECHANISM FOR MOVEMENTS OF PREFIXED PATH, REFERABLE AS OF ELLIPTICAL SHAPE

Ugo Crippa, Via Brioschi 16, Sirtori, Italy

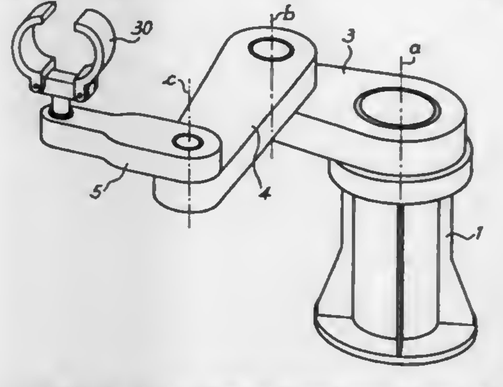
PCT No. PCT/IT91/00111, § 371 Date Oct. 28, 1993, § 102(e) Date Oct. 28, 1993, PCT Pub. No. WO92/20495, PCT Pub. Date Nov. 26, 1992

PCT Filed Dec. 17, 1991, Ser. No. 140,071

Claims priority, application Italy, May 21, 1992, MI91A1392

Int. Cl.⁶ B25J *18/00*

U.S. Cl. 318—568.1 **9 Claims**



1. A mechanism for providing a predetermined elliptical movement comprising:

a support base (1);

three arms including a first arm (3), a second arm (4) and a third arm (5) attached to the support base, each of the arms having an inner end and an outer end, the inner end of the first arm (3) being rotatably coupled to the support base, defining a first rotation axis (a), the inner end of the second arm (4) being rotatably coupled to the outer end of the first arm (3) to define a second rotation axis (b) and the inner end of the third arm (5) being rotatably coupled to the outer end of the second arm (4), to define a third rotation axis (c);

motor means (2) for rotating the first arm (3) about the first axis (a) with respect to the support base;

support means (30), for supporting an object, attached to the outer end of the third arm (5);

transmission means mounted inside said arms and comprising a first transmission means (13) in said first arm (3), linked between said support base (1) and the second arm (4) to control the rotation of the second arm; a second transmission means (16) in said second arm (4), linked between the outer end of the first arm (3) and the third arm (5) to control the rotation of the third arm, a third transmission means (19) linked between the outer end of the second arm (4) and the support means (30) to control at least one of translational and rotational movements of the support means with respect to the support base (1); and driving means (10, 11) for providing a power transfer coupling between said motor means (2) and said first arm (3) to control the rotation of the first, second and third arms, so that the first, second and third transmission means are driven by the motor means;

a first toothed wheel (12) integrally mounted to said support base (1) co-axially with the first rotation axis (a) of said first arm (3), and a second toothed wheel (14) located in the first arm (3), co-axial with the second rotation axis (b) of said second arm (4) and integral therewith, the first transmission

means (**13**) comprising a non-slip drive linkage connected between the first and second toothed wheels (**12, 14**);
a third toothed wheel (**15**) integrally mounted to the outer end of said first arm (**3**) co-axial with said second axis (b) and a fourth toothed wheel (**17**) located at the outer end of the second arm (**4**), co-axial with said third rotation axis (c) of the third arm (**5**) and integral therewith, the second transmission means comprising a second non-slip drive linkage connected between the third and fourth toothed wheels (**15, 17**);
a fifth toothed wheel (**18**) located at the inner end of said third arm (**5**), co-axial with said third axis (c) and integral with the outer end of the second arm (**4**); and a sixth toothed wheel (**20**) located at the outer end of the third arm (**5**), coaxial with an axis defined by said support means (**30**), the third transmission means comprising a third non-slip linkage connected between the fifth and sixth toothed wheels, the respective transmission ratios of said first, second and third transmission means (**13, 16, 19**) being respectively τ1, τ2 and τ3, where τ1, τ2 and τ3 are defined as the ratio between the toothed wheels connected by the respective first, second and third transmission means.

5,534,762

SELF-PROPELLED CLEANING ROBOT OPERABLE IN A CORDLESS MODE AND A CORD MODE

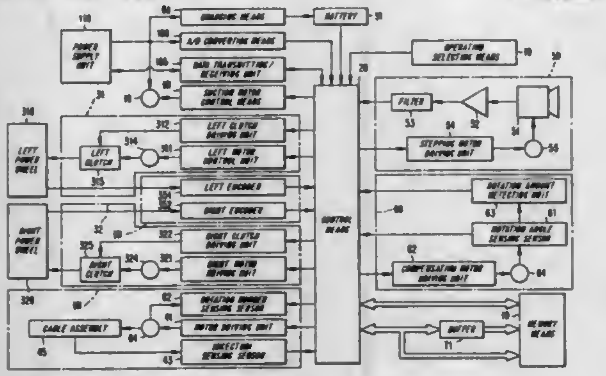
Ji-Hyun Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 27, 1994, Ser. No. 313,567

Claims priority, application Rep. of Korea, Sep. 27, 1993, 93-19893

Int. Cl.^{6} B25J *5/00*

U.S. Cl. 318—568.12 **9 Claims**



1. A cleaning robot, comprising:
a control mechanism;
a power supply cord adapted for supplying electrical power to the control mechanism from an external power supply disposed in a region to be cleaned, the power supply cord being stored on the robot and adapted to be payed-out and drawn in during movement of the robot;
a battery connected to the control mechanism for supplying electrical power thereto independently of the external power supply;
a cleaning device connected to the control mechanism to be powered by the external power supply during a cleaning operation;
a motor-driven propulsion mechanism connected to the control mechanism for being powered solely by the external power supply during the cleaning operation, and powered solely by the battery during travel of the robot to the next region to be cleaned, the propulsion mechanism including a steerable ground support structure for being steered in response to signals received from the control mechanism, to establish a direction of travel of the robot;
a battery charging mechanism powered by the external power supply for recharging the battery during a cleaning operation;
a travel distance detecting mechanism for detecting a distance traveled by the robot;
a travel direction detecting mechanism for detecting changes in a travel direction of the robot;
an obstacle sensing mechanism for sensing a presence of an obstacle and a distance from the robot to the obstacle;
the travel distance detecting mechanism, the travel direction detecting mechanism, and the obstacle sensing mechanism being connected to the control mechanism to supply respective signals thereto for steering the steerable ground support structure and thereby establish a direction of travel of the robot;
the motor-driven propulsion mechanism, the travel distance detecting mechanism, the travel direction detecting mechanism, and the obstacle sensing mechanism all being operable by power supplied from an external power supply and by power supplied from the battery.

5,534,763

METHODS OF AND/OR APPARATUS FOR ELECTRONICALLY COMMUTATED MOTOR CONTROL

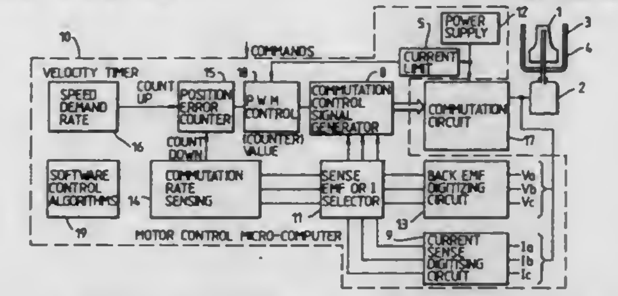
John J. Williams, and Christian J. W. Gianni, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Dec. 19, 1991, Ser. No. 810,382

Claims priority, application New Zealand, Dec. 19, 1990, 236542

Int. Cl.^{6} H02P *5/06*

U.S. Cl. 318—799 **20 Claims**



1. A method of controlling the commutation of power to an electronically commutated motor having a rotor and a stator with energizable windings and switching devices for connecting each winding to a power supply, which uses a controller to set the state of the switching devices to determine commutation sequences of application of voltage to said stator windings to cause torque producing current flow in said stator windings to thereby rotate said rotor, said method comprising the steps of:
(1) applying voltage to said windings so as to cause said current to flow therein,
(2) monitoring the torque-producing current waveform in at least one of said windings to detect occurrences of a predetermined waveform characteristic, said occurrences being cyclical and indicative of rotor position,
(3) passing the detected rotor position information to said controller,
(4) the controller after each detected occurrence using said information to determine the state said switching devices must attain at the end of a predetermined delay after each detected occurrence to ensure powered rotation of said rotor, and
(5) after said predetermined delay causing the controller to place the switching devices in the so determined state.

5,534,764

VEHICLE DRIVING CONTROL SYSTEM HAVING FUNCTION FOR SUPPRESSING VIBRATION

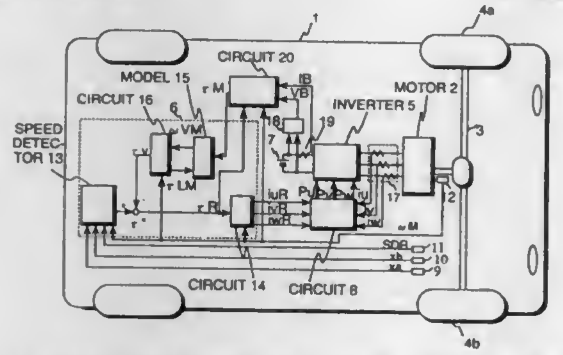
Ryoso Masaki, Hitachi; Nobuyoshi Mutoh, Hitachinaka, and Sanshiro Obara, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1994, Ser. No. 350,606

Claims priority, application Japan, Dec. 9, 1993, 5-308876

Int. Cl.^{6} H02P *05/34*

U.S. Cl. 318—802 **10 Claims**



1. A vehicle control system for a vehicle, comprising driving force generating means for driving the vehicle, accumulating means for accumulating driving energy for the vehicle, supply means for supplying the energy of said accumulating means to said driving force generating means, and control means for controlling said supply means based on a torque command of said driving force generating means, wherein:
said control means comprises a vehicle model for simulating the speed of the vehicle based on the torque command, and a torque command compensating means for compensating the torque command based on the simulated speed and the rotating speed of said driving force generating means.

5,534,765

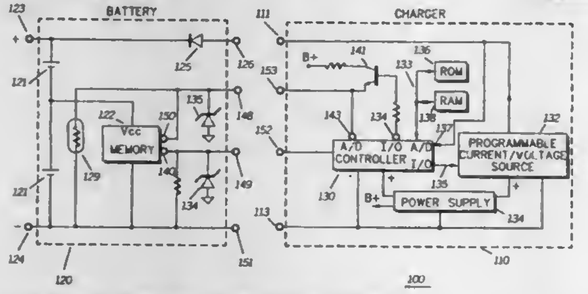
BATTERY WITH MEMORY FOR STORING CHARGE PROCEDURE

Robert D. Kreisinger; Arthur G. Burns, and Jose M. Fernandez, all of Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 26,657, Mar. 5, 1993, abandoned. This application Jun. 28, 1995, Ser. No. 495,370

Int. Cl.^{6} H01M *10/48*

U.S. Cl. 320—30 **2 Claims**



1. A battery charging system, comprising:
a battery charger for charging a rechargeable battery package, the rechargeable battery package having a memory with charging instructions stored therein, the charging instructions including high level software commands that provide the battery charger with a particular charging procedure that must be used in charging the rechargeable battery package; the battery charger including:
means for retrieving the charging procedure from said battery memory;
a current supply for providing charge current to the rechargeable battery package; and
a controller responsive to the means for retrieving to direct the current supply to supply charge current to the rechargeable battery package in accordance with the charging procedure retrieved therefrom.

5,534,766

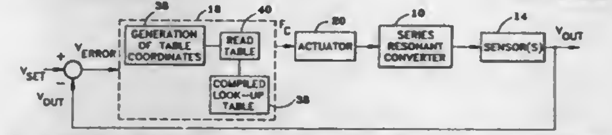
FUZZY LOGIC POWER SUPPLY CONTROLLER

Piero P. Bonissone; Michael J. Schutten, and Kenneth H.-C. Chiang, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1994, Ser. No. 221,608

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 323—235 **22 Claims**



1. A fuzzy logic power supply controller for controlling a power supply in which a sensor means senses at least one state variable defined for the power supply and an actuator means provides a control action to the power supply, the controller comprising:
means for generating a fuzzy logic knowledge base having a plurality of fuzzy rules defined for the at least one sensed state variable;
a compiled look-up table of control action response values derived from executing the fuzzy rules in the fuzzy logic knowledge base for the at least one sensed state variable, wherein the compiled look-up table of control action response values obviates a need for subsequent execution of the fuzzy rules;
means for producing addresses in the compiled look-up table for the at least one sensed state variable, wherein the addresses point to locations in the compiled look-up table where the control action response values are stored; and
means for reading the compiled look-up table corresponding to the generated addresses and outputting the control action response values to the actuator.

5,534,767

Patent Not Issued For This Number

5,534,768

REGULATED POWER SUPPLY HAVING WIDE INPUT AC/DC VOLTAGE RANGE

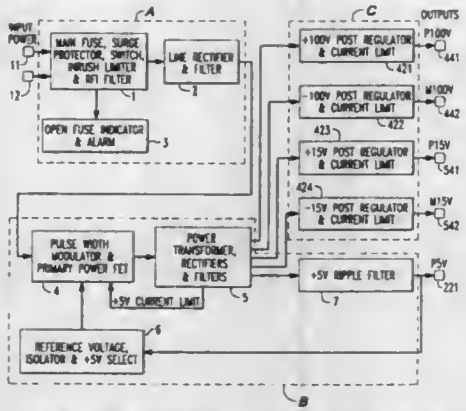
Theodore E. Chavannes, Thousand Oaks, and Richard L. Walsworth, Westlake Village, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 9, 1994, Ser. No. 193,816

Int. Cl.^{6} G05F *1/577*

U.S. Cl. 323—267 **6 Claims**

1. A regulated power supply circuit comprising:
a source voltage conditioning circuit having input terminals to which either a DC power source or an AC power source are directly connectable without preference to polarity of the power source terminals, and operating from a range of input voltage sources, said source voltage conditioning circuit being operative to output a rectified and filtered intermediate voltage at an output thereof, said source voltage conditioning circuit including a severable fuse device coupled in a circuit path between said input terminals and said output terminal, to which a pulse width modulator-driven DC-DC converter is coupled, and further including an open fuse detector coupled to said circuit path and being operative by either said DC power source or said AC power source without preference to polarity of said power source terminals to provide an open


INPUT POWER
11
12
MAIN FUSE, SURGE PROTECTOR, SWITCH, INRUSH LIMITER & RFI FILTER
1
LINE RECTIFIER & FILTER
2
OPEN FUSE INDICATOR & ALARM
3
A
C
OUTPUTS
+100V POST REGULATOR & CURRENT LIMIT
421
P100V
441
-100V POST REGULATOR & CURRENT LIMIT
422
M100V
442
423
+15V POST REGULATOR & CURRENT LIMIT
P15V
541
424
-15V POST REGULATOR & CURRENT LIMIT
M15V
542
PULSE WIDTH MODULATOR & PRIMARY POWER FET
4
POWER TRANSFORMER, RECTIFIERS & FILTERS
5
+5V CURRENT LIMIT
+5V RIPPLE FILTER
7
P5V
221
REFERENCE VOLTAGE, ISOLATOR & +5V SELECT
6
B

fuse indication in response to the occurrence of an open fuse condition of said severable fuse device;

a pulse width modulator-driven DC-DC converter having a power transformer, which includes a primary winding and a plurality of secondary windings, and a drive circuit therefor, said drive circuit being operative to controllably drive said primary winding with said rectified and filtered intermediate voltage in accordance with a pulse width modulated signal provided by said pulse width modulator;

respective secondary rectification and filtering circuits coupled to respective ones of said plurality of secondary windings and being operative to provide a plurality of different amplitude unregulated DC voltages; and

voltage regulator circuits coupled to respective ones of said respective secondary rectification and filtering circuits and being operative to provide a plurality of different amplitude regulated and current-limited DC voltages, and wherein

said drive circuit for said drive pulse width modulator-driven DC-DC converter comprises a plurality of power switch MOSFETs, having their source-drain paths coupled in circuit with said primary winding and said rectified and filtered intermediate voltage, and being operative to controllably drive said primary winding with said rectified and filtered intermediate voltage in accordance with a pulse width modulated signal provided by said pulse width modulator,

said power switch MOSFETs have their source terminals coupled through a primary current sense filter and attenuator circuit to a current sense input port of said pulse width modulator, said filter and attenuator circuit providing a current limit level signal for controlling the pulse width of the pulse width modulated signal provided by said pulse width modulator,

said pulse width modulator includes a voltage feedback port to which an error feedback signal from a selected secondary winding of said power transformer is coupled for controlling the pulse width of the pulse width modulated signal provided by said pulse width modulator,

said DC-DC converter further includes an error amplifier coupled in a feedback path from said selected secondary winding of said power transformer for providing said error feedback signal for controlling the pulse width of the pulse width modulated signal provided by said pulse width modulator,

said DC-DC converter further includes an opto-isolator coupled in circuit with said error amplifier for providing said error feedback signal for controlling the pulse width of the pulse width modulated signal provided by said pulse width modulator, and

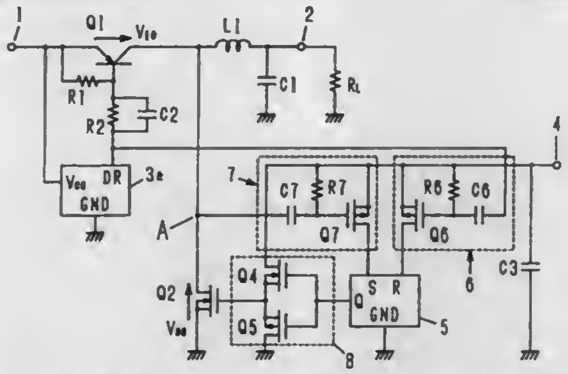
said opto-isolator has a first input coupled to said selected secondary winding of said power transformer, a second input coupled to an output of said error amplifier, and further including a feedback voltage reference circuit which provides a prescribed reference voltage derived from said selected winding of said power transformer to a first input of said error amplifier, and further including a trimmable resistor network which is operative to couple a feedback voltage derived from said selected secondary winding to a second input of said error amplifier.

5,534,769
SYNCHRONOUS RECTIFYING CIRCUIT

Masanori Ishii, Tsurugashima, Japan, assignor to Toko, Inc., Japan

Filed May 18, 1994, Ser. No. 245,594
Claims priority, application Japan, May 21, 1993, 5-031957
Int. Cl.^{6} H02M *3/157*

U.S. Cl. 323—283 **5 Claims**



4. A synchronous rectifying circuit for use with a switching power supply using a transistor as rectifying element, the rectifying transistor being arranged to be driven in synchronism with switching operation of switching element, said synchronous rectifying circuit comprising:

a first limiter circuit comprising a differentiating circuit connected at input side to pulse output terminal of a control circuit for driving said switching element, and a transistor switch adapted to be operated in accordance with signal derived from said differentiating circuit;

a second limiter circuit comprising a differentiating circuit connected at input side to current output terminal of said switching element, and a transistor switch adapted to be operated in accordance with signal derived from said differentiating circuit;

a flip-flop circuit having a reset terminal connected to the current output terminal of the transistor switch of said first limiter circuit, and a set terminal connected to the current output terminal of the transistor switch of said second limiter circuit; and

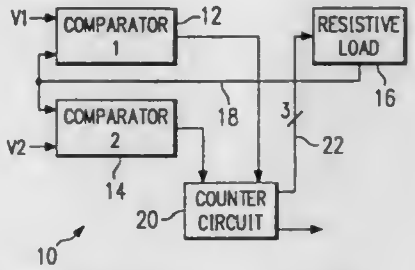
said rectifying transistor comprising an N channel type MOS FET and adapted to be operated in accordance with signal derived from said flip-flop circuit.

5,534,770
METHOD AND DEVICE FOR RESISTIVE LOAD COMPENSATION

Daniel A. Yaklin, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 991,726, Dec. 17, 1992, abandoned. This application Jan. 12, 1994, Ser. No. 180,943
Int. Cl.^{6} G05F *1/565*

U.S. Cl. 323—284 **15 Claims**



1. A device for compensating a load, comprising:

circuitry for comparing a load signal to a first reference voltage and to a second reference voltage;

circuitry for incrementing a count sequence in response to said load signal being greater than said first reference signal and for decrementing said count sequence in response to said load signal being less than said second reference voltage;

circuitry for stopping said count sequence when said count sequence reaches a minimum or maximum value; and

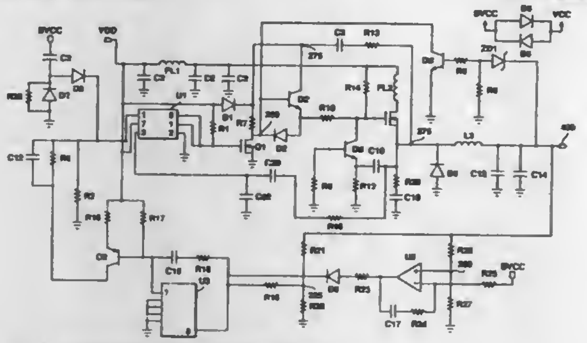
circuitry for controlling a load in response to said count sequence.

5,534,771
HIGH PRECISION DC-DC CONVERTER

Harold L. Massie, Linn, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 21, 1994, Ser. No. 184,387
Int. Cl.^{6} G05F *1/44*

U.S. Cl. 323—285 **35 Claims**



13. A computer system comprising:

a power supply for outputting a nominal direct current (DC) voltage VDD at a first accuracy level;

a plurality of components coupled to the power supply, each of the components using a system operating voltage SVCC as its operating voltage;

a processor coupled to at least one of the plurality of components, the processor requiring a DC voltage of VCC at a second accuracy level as its operating voltage; and

a high precision DC—DC converter circuit coupled to the power supply and the processor, the DC—DC converter circuit for converting the DC voltage VDD to the DC voltage VCC at the second accuracy level, the DC—DC converter circuit further including:

a switching transistor coupled to VDD, the switching transistor including an input and a first output;

a switching regulator circuit coupled to the input of the switching transistor for driving the switching transistor on and off according to a sensed voltage level such that VDD is coupled to the first output when the switching transistor is on, wherein the switching regulator circuit compares the sensed voltage level to a first setpoint reference voltage level having a second accuracy level to determine a duty cycle for driving the switching transistor, the switching regulator circuit further including:

a switching regulator coupled to the sensed voltage level and including a third output, the switching regulator for generating a plurality of having a second voltage level on the third output; and

a bootstrap circuit coupled to the third output and to the input, the bootstrap circuit for pulling up the second voltage level such that the switching transistor operates in a saturation range when switched on;

an output circuit coupled to the first output, the output circuit including a second output, the output circuit for generating a first voltage level at the second output in response to VDD being coupled and uncoupled from the first output, the output circuit further including

a transformer having a primary winding and a secondary winding, the primary and secondary windings being coupled to the first output, the secondary winding being coupled to the bootstrap circuit; and

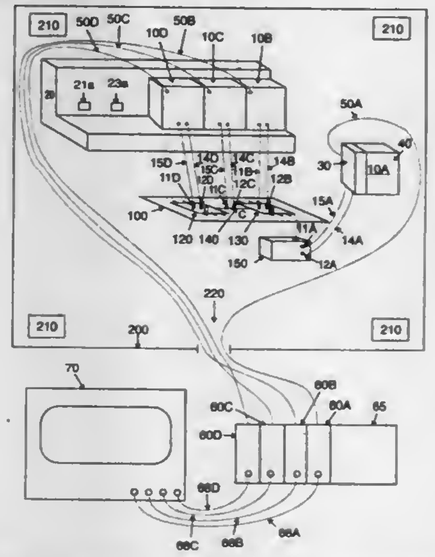
an output voltage regulator circuit coupled to the second output and the switching regulator circuit, the output voltage regulator circuit fox causing the switching regulator circuit to vary the duty cycle by controlling the sensed voltage such that the first voltage level is equal to VCC at the first accuracy level, the output voltage regulator for generating the sensed voltage level in response to comparing the first voltage level to a second internal setpoint reference voltage level having a third accuracy level that is more precise than the first and second accuracy levels.

5,534,772
APPARATUS AND METHOD FOR MONITORING RADIATION EFFECTS AT DIFFERENT INTENSITIES

Wesley A. Rogers, Grosse Pointe Park, Mich., assignor to Electronic Development Inc., Grosse Pointe Park, Mich.

Division of Ser. No. 169,703, Dec. 17, 1993, Pat. No. 5,440,227, which is a division of Ser. No. 862,621, Apr. 2, 1992, Pat. No. 5,311,116. This application May 15, 1995, Ser. No. 440,912
Int. Cl.^{6} G01R *19/28*

U.S. Cl. 324—72.5 **7 Claims**



1. A method of monitoring the possible effect of a radiation field on a device under test comprising:

(a) monitoring simultaneously voltage signals at a plurality of test points in the device;

(b) subjecting the device to a radiation field having at least a first and a second intensity levels;

(c) comparing the monitored voltage signals at the first intensity level and the monitored voltage signals at the second intensity level, the first intensity level corresponding to the level at which the monitored voltage signals are not being affected by the radiation field, the second intensity level being greater than the first intensity level; and

(d) determining from the comparing step whether or not the device is affected by the radiation field in response to any of the monitored voltage signals being affected by the radiation field at the second intensity level.

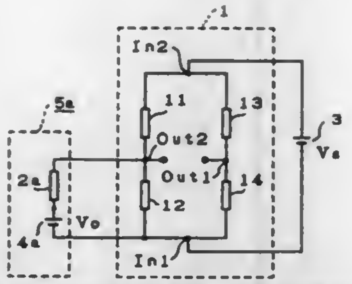
5,534,773
METHOD FOR COMPENSATING AN OFFSET VOLTAGE TEMPERATURE DRIFT IN A SEMICONDUCTOR STRAIN GAGE SENSOR

Masahiro Tsugai; Mikio Bessho, and Takashi Sesekura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,316
Int. Cl.^{6} G01R *1/44;* **G05F** *1/567*

U.S. Cl. 324—105 **7 Claims**

1. A method for compensatiog an offset voltage temperature drift in a semiconductor strain gage sensor including a bridge circuit



formed by a strain resistor gage with a compensating value derived from an output voltage of a temperature-sensitive power source connected to a compensating resistor in series between an output terminal of said bridge circuit and the ground, comprising the steps of:

modeling said temperature-sensitive power source as a power source for providing an output voltage expressed as=$KV_S(1+\alpha T)$, where K is a parameter which is not equal to ½, V_S is a voltage of an input power source for said bridge circuit, and α is a coefficient representing a temperature dependency of said temperature-sensitive power source;

deriving, from said output voltage, said compensating value as a function of the resistance of said compensating resistor, said parameter K, and said coefficient α; and

determining said parameter K, said coefficient α representing the temperature dependency of the temperature dependency of said temperature-sensitive power source, and the resistance of said compensating resistor on the basis of the temperature drift characteristic of the offset voltage to be compensated and the temperature characteristic of said strain resistor gage.

5,534,774

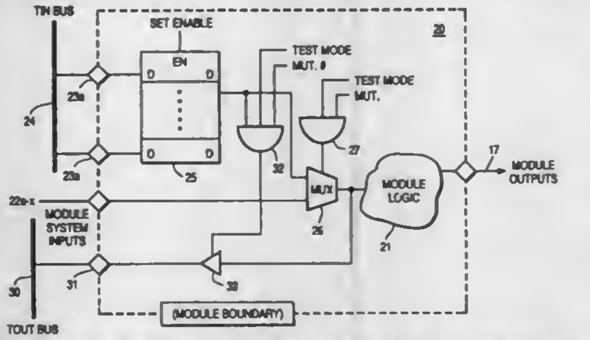
APPARATUS FOR A TEST ACCESS ARCHITECTURE FOR TESTING OF MODULES WITHIN INTEGRATED CIRCUITS

Alan Moore, Phoenix, and Patrick A. Themins, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 23, 1992, Ser. No. 873,365

Int. Cl.⁶ G01R *31/28*

U.S. Cl. 324—158.1 **6 Claims**



1. In an integrated circuit implemented on a chip and having a plurality of chip inputs for routing signals onto said chip, a plurality of chip outputs for routing signals out of said chip and first and second circuit modules, a method of testing said first circuit module and an interconnect on said chip coupling said first circuit module to said second circuit module, the method comprising the steps of:

providing a test signal and an expected result signal;

propagating said test signal over a test input bus on said chip that is coupled to a subset of said chip inputs to said first circuit module incorporated on said chip;

selecting said test signal as the input signal to the first circuit module;

propagating a test result signal from said first circuit module over said interconnect to said second circuit module incorporated on said chip;

routing said test result signal from said second circuit module onto a test output bus incorporated on said chip, said test output bus being coupled to a subset of said chip outputs; and

comparing said test result signal with said expected result signal to determine the integrity of said first circuit module and said interconnect.

5,534,775

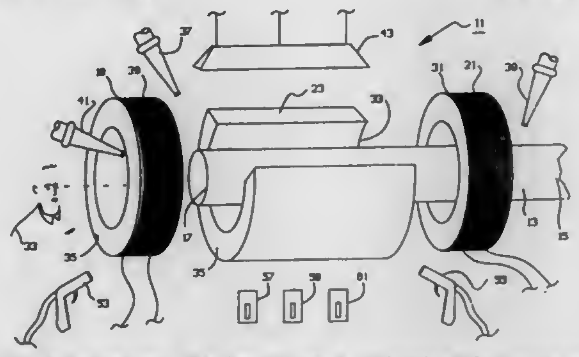
METHOD AND APPARATUS FOR NONCONTACT MAGNETIC PARTICLE STRAY MAGNETIC FLUX TESTING OF CYLINDRICAL MEMBERS

Clive C. Lam, Tomball; William W. Curtis, Jr., and Roy C. Grubbs, both of Houston, all of Tex., assignors to ICO, Inc., Houston, Tex.

Filed Mar. 16, 1993, Ser. No. 33,091

Int. Cl.⁶ G01N *27/84;27/72;* G01R *33/12*

U.S. Cl. 324—216 **16 Claims**



13. An apparatus for inspecting a cylindrical ferromagnetic member for defects, comprising:

a plurality of magnetic field members, each selectively generating a time-varying magnetic field, for combination into a time-varying composite longitudinal magnetic field with magnetic flux lines which are substantially aligned with a central longitudinal axis of said cylindrical ferromagnetic member;

wherein said plurality of magnetic field member comprise a plurality of current-carrying windings (a) each concentric to said central longitudinal axis of said cylindrical ferromagnetic member and (b) spaced apart along said central longitudinal axis; and

wherein time-varying current is passed through said plurality of current-carrying windings, in directions which ensure cancellation of magnetic field components adjacent said cylindrical ferromagnetic member which do not contribute to said time-varying composite longitudinal magnetic field;

a traverse magnetic field member which selectively generates a time-varying traverse magnetic field with magnetic flux lines which are substantially traverse to said central longitudinal axis of said cylindrical ferromagnetic member;

means for placing magnetic particles on selected portions of said cylindrical ferromagnetic member, including:

(a) said outer peripheral portion of said cylindrical ferromagnetic member; and

(b) said inner peripheral portion of any central bore extending through said cylindrical ferromagnetic member;

means for selectively applying (a) said time-varying composite longitudinal magnetic field and (b) said time-varying traverse magnetic field to said cylindrical ferromagnetic member;

means for rotating said cylindrical ferromagnetic member;

a viewing region for allowing unobstructed operator detection of defects in said cylindrical ferromagnetic member from accumulations of said magnetic particles at leakage fields corresponding to magnetic discontinuities of defects in said cylindrical ferromagnetic member wherein said viewing region allows unobstructed operator inspection of:

(a) an outer peripheral portion of said cylindrical ferromagnetic member; and

(b) an inner peripheral portion of any central bore extending through said cylindrical ferromagnetic member.

5,534,776

COUPLED RADIO FREQUENCY FIELD AND LIGHT POLARIZATION MAGNETOMETER

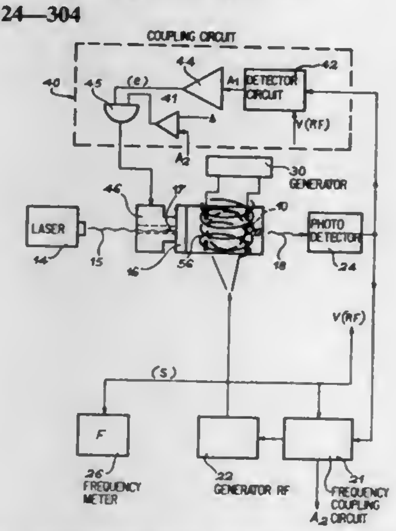
Jean-Michel Leger, Neylan, and Christophe Guttin, Virien, both of, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Nov. 23, 1994, Ser. No. 347,244

Claims priority, application France, Dec. 1, 1993, 93 14378

Int. Cl.⁶ G01V *3/00*

U.S. Cl. 324—304 **5 Claims**



1. Optical pumping, resonance magnetometer comprising:

a cell filled with a gas, whereof the atoms have a gyromagnetic ratio γ, said cell being placed in an ambient magnetic field $(\vec{B}_o)$, to be measured, a light source emitting a light beam, a linear polarizer through which said beam passes and giving said beam a linear polarization in a first direction, the linearly polarized beam then passing through the cell, a photodetector receiving the light beam which has passed through the cell, said photodetector supplying an electric signal, means for applying a radio frequency field $(\vec{B}_1)$ to the cell, said certain field having a second direction and a certain frequency, means for coupling said frequency to the Larmor frequency $F=\gamma Bo$, a means for measuring said frequency, the amplitude of the ambient magnetic field $(\vec{B}_o)$ being derived from the frequency F by the relation $Bo=F/\gamma$, said magnetometer further comprising means for mechanically joining to the polarizer the means for applying the radio frequency field $(\vec{B}_1)$ to the cell and coupling means acting on the mechanical joining means, said coupling means having a synchronous detection circuit receiving the electric signal supplied by the photodetector and a reference voltage (V_{RF}) at the frequency F of the radio frequency signal, said circuit detecting the amplitude (A_{1q}) of the component at frequency F, in phase quadrature with the reference signal (V_{RF}), said amplitude being used for controlling means for rotating the mechanical joining means of the polarizer with means for applying the radio frequency field to the cell.

5,534,777

METHOD AND APPARATUS FOR MAGNETIC RESONANCE IMAGING BY RADIALLY SCANNING THROUGH FREQUENCY SPACE AND EMPLOYING A CORRECTION IMAGE DERIVED FROM AN EDGE IMAGE

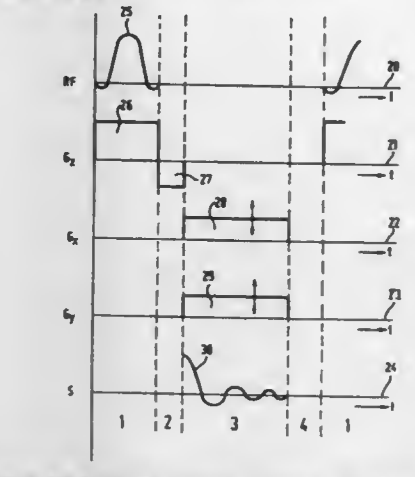
Miha Fuderer, Eindhoven, and Dirk Van Ormondt, Delft, both of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1994, Ser. No. 243,512

Claims priority, application European Pat. Off., May 18, 1993, 93201419

Int. Cl.⁶ G01R *33/48*

U.S. Cl. 324—309 **16 Claims**



1. Method for deriving a magnetic resonance image of an object when placed in a stationary and substantially homogeneous magnetic main field, comprising repeatedly exciting said object to emit magnetic resonance signals and sampling the emitted magnetic resonance signals in the presence of a read gradient superimposed on said main field, which read gradient is rotated to radially scan through frequency space, determining a first frequency image of said object on radius and angle coordinates, and performing the steps of:

a) determining an edge image in image-space,

b) deriving from said edge image a correction image in image-space with pixel values derived from pixel values of said edge image and a predetermined probability function of edge image values,

c) determining a corrected frequency image in frequency-space,

d) Fourier transforming said corrected frequency image to image-space.

5,534,778

MAGNETIC RESONANCE APPARATUS

Albertus L. J. G. M. Loos, and Otto R. A. M. Selder, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

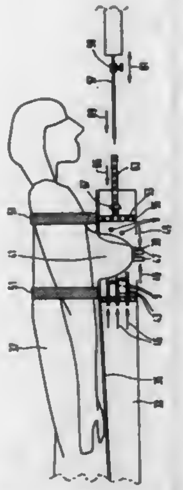
Filed Aug. 23, 1994, Ser. No. 294,286

Claims priority, application Belgium, Aug. 24, 1993, 09300866

Int. Cl.⁶ G01V *3/00*

U.S. Cl. 324—318 **13 Claims**

1. A magnetic resonance apparatus, comprising a magnet system for generating a steady magnetic field in a measurement space, a coil system for generating gradient fields in the measurement space, and at least one RF coil which is accommodated in a housing which can be arranged in the measurement space and which is also suitable to accommodate an object to be examined, the apparatus also comprising a jig for positioning an instrument to be introduced into the object to be examined, which jig comprises a first stop for defining the position of a free end of the instrument



in a first coordinate direction of a three-dimensional system of coordinates, a perforated plate mounted in the housing and provided with holes which are arranged in a matrix extending according to second and third coordinate directions of the system of coordinates in order to position the instrument in the second and third coordinate directions, the location of a coordinate axis extending parallel to the second or the third coordinate direction being defined by a first phantom which is rigidly arranged within the housing, the perforated plate being mounted in the housing in such a manner that it can be continuously displaced relative to the housing, parallel to the second and third coordinate directions, over distances which are at least equal to the center-to-center distances of the holes in these directions.

5,534,779
MAGNET SYSTEMS

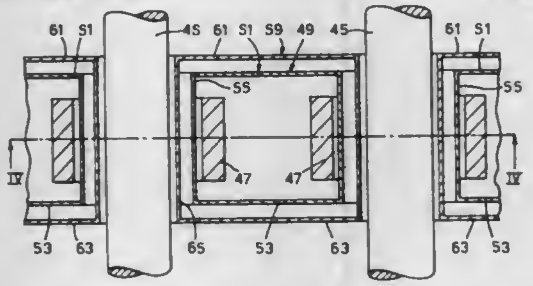
Ian R. Young, Marlborough, and John F. Eastham, Avon, both of, England, assignors to Picker International, Inc., Cleveland, Ohio

Filed Feb. 17, 1995, Ser. No. 390,024

Claims priority, application United Kingdom, Feb. 22, 1994, 9403321

Int. Cl.^{6} G01V *3/00*

U.S. Cl. 324—319 **9 Claims**



1. A magnet system, suitable for use in a magnetic resonance apparatus, comprising: a pair of pole pieces which define a gap; a yoke of magnetic material which extends between the pole pieces; an electric drive coil arrangement which is carried on the yoke and produces a magnetic field in the yoke and hence across the gap, a section of the length the yoke being divided into a plurality of discrete portions; and a superconducting magnetic field stabilising arrangement comprising a plurality of superconducting non-magnetic material rings each of which surrounds a respective said portion of the yoke.

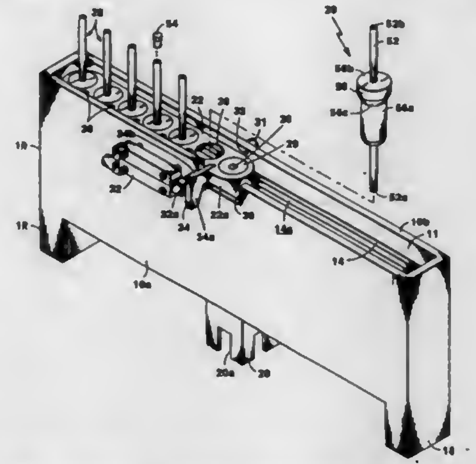
5,534,780
SAMPLE CHANGER FOR NMR SPECTROMETERS

Kevin Lilly, Derry, N.H., assignor to Bruker Instruments, Inc., Billerica, Mass.

Filed Apr. 7, 1994, Ser. No. 224,269

Int. Cl.^{6} G01R *33/20*

U.S. Cl. 324—321 **14 Claims**



1. A sample changer for sample analyzing apparatus of the type having

- a generally vertical sample loading air shaft in which an upflowing air stream is present, said changer comprising:
- support means for positioning at the apparatus;
- a carriage movably supported by the support means, said carriage having an array of generally vertical passages extending entirely through the carriage, said passages being adapted to contain sample holders;
- an air sensor for detecting a change in a flow of air from the air shaft which change occurs when a sample holder has been raised in the air shaft above a predetermined height by the upflowing air stream, the air sensor outputting a detection signal when said change in air flow is detected;
- an advancing mechanism for moving the carriage relative to the support means in response to the detection signal to sequentially position each passage over the air shaft so that said each passage becomes an extension of the air shaft whereby the sample holder in said air shaft may be buoyed up and supported in its passage by the air stream from said air shaft; and
- means for preventing the sample holders from dropping out of said air passages except when a passage is directly over the air shaft.

5,534,781
COMBUSTION DETECTION VIA IONIZATION CURRENT SENSING FOR A "COIL-ON-PLUG" IGNITION SYSTEM

Anson Lee, St. Clair, and Jan S. Pyko, Bloomfield Twp., both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

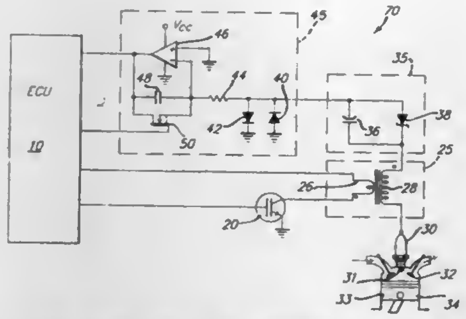
Filed Aug. 15, 1994, Ser. No. 291,644

Int. Cl.^{6} F02P *17/00;* G01M *15/00*

U.S. Cl. 324—380 **17 Claims**

1. An ionization current sensing system for a vehicle, the vehicle having a plurality of spark plugs with electrodes, each spark plug disposed within a combustion chamber in a cylinder and producing an ionization current upon combustion in the chamber, each spark plug in electrically operable relation with an ignition coil having a primary and a secondary winding, the ionization current sensing system comprising:

- a transistor connected to the primary winding of the ignition coil for supplying a charging current to the primary winding of the ignition coil, the charging current inducing a voltage potential in the secondary winding;



- sense voltage means directly in communication with the secondary winding of the ignition coil for sensing a spark plug ionization current and producing an output signal for integration; and
- integrator means, having an input and output, the input directly connected to the sense voltage means output for integrating the output signal produced by the sense voltage means and creating a voltage output in proportion to the integral of the ionization current emitted by the spark plug, the integrator means comprising an integrator reset switch connected between the input and output of the integrator means, the reset switch for changing the output signal of the integrator means to a different voltage state when a voltage is applied to the reset switch.

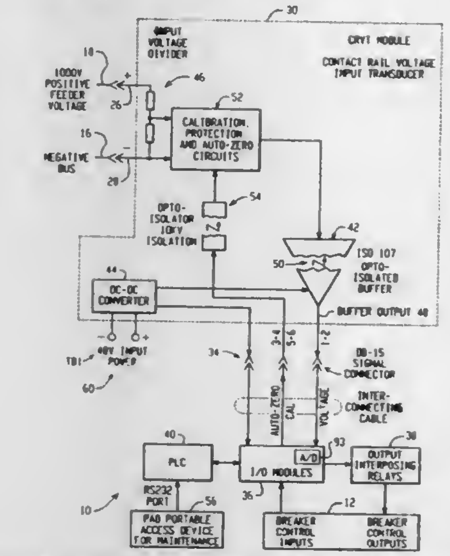
5,534,782
AUTOMATIC RECLOSING CIRCUIT BREAKER USING CONTROLLABLE FEEDER TRANSDUCER

George R. Nourse, Bolivar, Ohio, assignor to Controlled Power Limited Partnership, Canton, Ohio

Filed Nov. 17, 1993, Ser. No. 153,622

Int. Cl.^{6} G01R *31/00;* H02H *11/00*

U.S. Cl. 324—500 **32 Claims**



1. Automatic reclosing apparatus for a DC feeder circuit breaker connectable between a main power bus and a feeder line, comprising: transducer means connectable to the feeder line and a return bus for producing an output signal that corresponds to voltage on the feeder line; and programmable control means connectable to the breaker for reclosing the breaker when a fault condition is absent and for preventing breaker closure when a fault condition is present; said control means coupled to said transducer means for controlled calibration of said transducer means output signal by providing input control signals to said transducer means and detecting said transducer output signal.

5,534,783
METHOD FOR DETERMINING ANOMALIES IN A LINE WHICH IS TO BE INVESTIGATED

Stephan Meyer, Berlin, Germany, assignor to Siemens Aktiengesellschaft, München, Germany

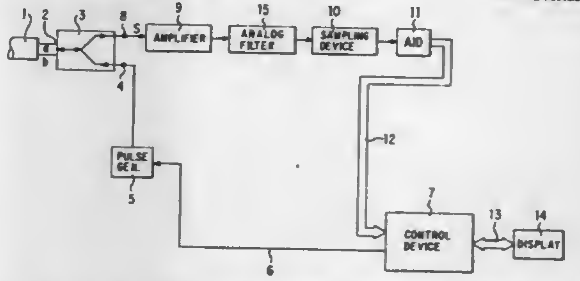
PCT No. PCT/DE93/00444, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO94/00772, PCT Pub. Date Jan. 6, 1994

PCT Filed May 17, 1993, Ser. No. 356,205

Claims priority, application Germany, Jun. 19, 1992, 42 20 409.7

Int. Cl.^{6} G01R *31/11*

U.S. Cl. 324—533 **21 Claims**



21. A method for obtaining a signal reproducing anomalies in a first line which is to be investigated, comprising the steps of:

- a) applying a signal in the form of a pulse to a first end of a second line, wherein said second line is of the same type as said first line, and wherein said second line has anomalies located at points different from said first line when acted in the form of a pulse;
- b) detecting at said first end of said second line a first reflected signal;
- c) forming a weighting function based on detected signal in step b) having a time profile which is characteristic of the reflective behavior of said first line, said second line, and any line of a same type;
- d) applying a single pulse to a first end of said first line;
- e) detecting at said first end of said first line a second reflected signal from applied signal in step d); and
- f) convolving said second reflected signal in step e) with said weighting function formed in step c) to produce a signal reproducing anomalies in said first line.

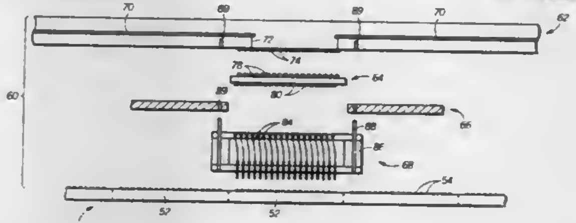
5,534,784
METHOD FOR PROBING A SEMICONDUCTOR WAFER

Thomas F. Lum, and James F. Wenzel, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1994, Ser. No. 236,847

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—757 **18 Claims**



1. A method for probing wafers comprising the steps of:

- providing a semiconductor wafer having a plurality of semiconductor die formed thereon, each die having a plurality of conductive bumps arranged in a first array;
- providing a probe card having a plurality of conductive pads arranged in a second array different from the first array;
- providing a first production package substrate having a first side which has a plurality of conductive pads arranged in the first array and an opposing second side which has a plurality of conductive pads arranged in the second array, wherein the plurality of conductive pads of the second side of the substrate

are electrically connected to the plurality of conductive pads on the probe card; and

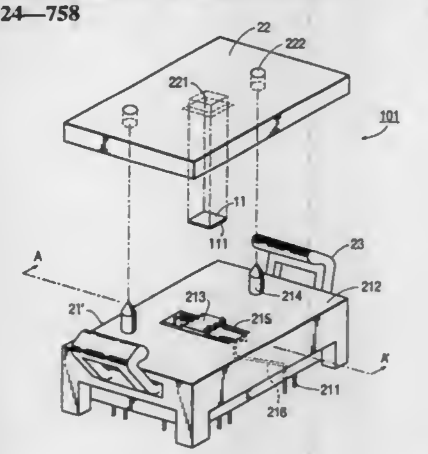
probing a first die of the plurality of semiconductor die by electrically connecting the plurality of conductive pads on the first side of the first production package substrate with the plurality of conductive bumps on the first die and performing electrical tests on the first die.

5,534,785
INTEGRATED CIRCUIT BARE CHIP CARRIER

Tsutomu Yoshizaki; Shigeyuki Maruyama, and Tsuyoshi Ohno, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 138,071, Oct. 20, 1993, abandoned.
This application Jun. 27, 1995, Ser. No. 495,149
Claims priority, application Japan, Oct. 20, 1992, 4-281378
Int. Cl.^{6} G01R *1/073;31/02*

U.S. Cl. 324—758 **6 Claims**



1. An integrated circuit bare chip carrier for carrying an integrated bare chip installation therein, said integrated bare chip carrier comprising:

means for installing the integrated bare chip, said installing means comprising a depressed surface for installing the integrated bare chip;

interconnecting means combinable with said installing means, for electrically interconnecting chip electrodes on the integrated bare chip with exterior of said integrated bare chip carrier when said installing means installs the integrated bare chip and said installing means and said interconnecting means are combined to one another, said interconnecting means including resilient electrodes for contacting the chip electrodes respectively by using resilient action when said installing means and said interconnecting means are combined to one another and output electrodes for electrically connecting the chip electrodes with the exterior of said integrated circuit bare chip carrier when said installing means and said interconnecting means are combined to one another;

clamping means for clamping, and thereby combining, said installing means and said interconnecting means when said installing means and said interconnecting means are aligned adjacent to one another; and

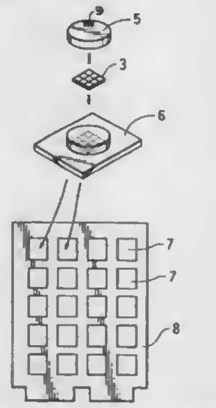
sealing means for producing a sealed space for the integrated bare chip and said resilient electrodes contacting with the electrodes of a chip respectively and for sealing the integrated bare chip and said resilient electrodes from outside of said integrated circuit bare chip carrier when said installing means and said interconnecting means are combined to one another and clamped by said clamping means.

5,534,786
BURN-IN AND TEST METHOD OF SEMICONDUCTOR WAFERS AND BURN-IN BOARDS FOR USE IN SEMICONDUCTOR WAFER BURN-IN TESTS

Kazuo Kaneko, Kawasaki; Masayasu Katayama, Yokohama, and Kiyoshi Kochi, Sagamihara, all of, Japan, assignors to Co-Operative Facility For Aging Tester Development, Kawasaki, Japan

Filed Feb. 22, 1995, Ser. No. 392,428
Claims priority, application Japan, Oct. 14, 1994, 6-249048
Int. Cl.^{6} G01R *31/28*

U.S. Cl. 324—760 **2 Claims**



1. A burn-in test method of a semiconductor wafer having a plurality of integrated circuits formed therein to be divided as respective bare dies, comprising the steps of:

dividing said semiconductor wafer into a plurality of blocks to be tested, each block including at least two bare dies;

assigning to each block positional information to indicate in which part of the semiconductor wafer the bare dies of each block are placed and recording the positional information;

preparing a burn-in board having a plurality of sockets to detachably hold a carrier and loading each carrier with one of said blocks to be tested;

fitting each carrier in a selected socket in the burn-in board and carrying out the burn-in test on the blocks in said burn-in board; and

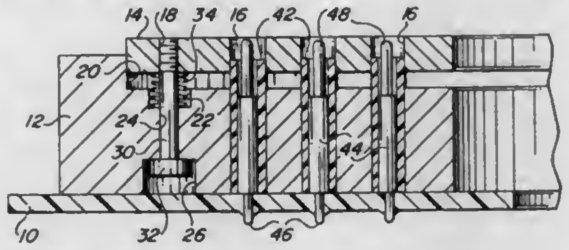
determining the defective part of the semiconductor wafer which includes at least one defective bare die based on the positional information assigned to the block as a result of said burn-in test.

5,534,787
HIGH-FREQUENCY COAXIAL INTERFACE TEST FIXTURE

Paul S. Levy, Chandler, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 9, 1994, Ser. No. 353,463
Int. Cl.^{6} G01R *31/02*

U.S. Cl. 324—761 **25 Claims**



1. A test fixture for use in the testing of integrated circuit devices, including in combination:

an electrically conductive base plate of a first predetermined thickness having an upper surface and a lower surface in spaced parallel planes;

a plurality of holes through said base plate extending therethrough between said upper surface and said lower surface;

an electrically conductive floating plate having a second predetermined thickness and having an upper surface and a lower surface in spaced parallel planes, said floating plate being resiliently mounted on said base plate and normally biased to a position spaced a predetermined distance above the upper surface of said base plate, said floating plate having a plurality of holes therethrough in alignment with corresponding holes in said base plate;

an insulating sleeve in each hole in said base plate, said sleeve having a length equal to the sum of said first and second predetermined thicknesses;

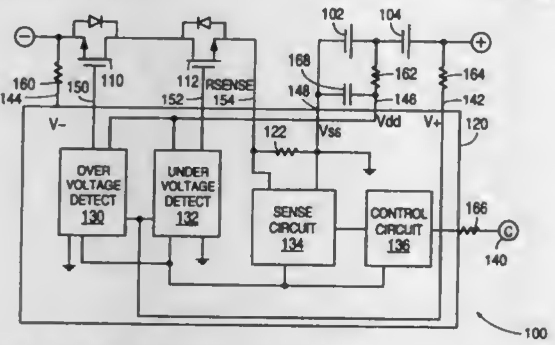
spring pin connectors mounted in each of said sleeves and having an extended length greater than the sum of said first and second predetermined thicknesses, but less than the sum of said first and second predetermined thicknesses and said predetermined distance, such that when said floating plate is depressed to engage the upper surface of said base plate, said spring pin connectors extend above the plane of the upper surface of said floating plate.

5,534,788
INTEGRATED RESISTOR FOR SENSING ELECTRICAL PARAMETERS

Gregory J. Smith, and David J. Kunst, both of Tucson, Ariz., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 9, 1994, Ser. No. 352,481
Int. Cl.^{6} G01R *31/36*

U.S. Cl. 324—771 **31 Claims**



1. An apparatus for sensing electrical parameters in an integrated circuit package comprising:

a leadframe;

an interconnect pattern integral with the leadframe including a plurality of patterned conductive pads connected to a plurality of leads for coupling to an integrated circuit;

a resistor coupling with selected conductive pads forming a resistive coupling between two of the leads;

a measurement circuit coupled to the interconnect pattern leads to measure electrical parameters across the resistor: and

a temperature compensation circuit to compensate for variations in the sensed electrical parameters measured across the resistor resulting from temperature variations.

5,534,789
MIXED MODE OUTPUT BUFFER CIRCUIT FOR CMOSIC

Tah-Kang J. Ting, Hsinchu, Taiwan, assignor to Etron Technology, Inc., Hsinchu, Taiwan

Filed Aug. 7, 1995, Ser. No. 512,237
Int. Cl.^{6} H03K *17/16*

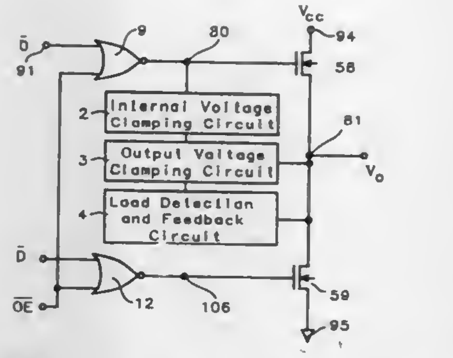
U.S. Cl. 326—21 **10 Claims**

1. An output voltage buffer circuit, comprising:

an internal voltage node;

an output voltage node;

a V_{cc} voltage supply node;


V_{cc}
94
58
D̄
91
9
80
2
Internal Voltage Clamping Circuit
81
3
Output Voltage Clamping Circuit
V_o
4
Load Detection and Feedback Circuit
D̄
$\overline{OE}$
12
106
59
95

a ground node;

a modified OR-INVERT gate having inputs and an output wherein said output of said modified OR-INVERT gate is connected to said internal voltage node;

a second OR-INVERT gate having inputs and an output;

an internal voltage clamping circuit connected to said internal voltage node;

an output voltage clamping circuit connected to said internal voltage node and said output voltage node;

a load detection and feedback circuit connected to said output voltage clamping circuit and said output voltage node;

a first output metal oxide semiconductor field effect transistor having a gate, a source, and a drain wherein said gate of said first output metal oxide field effect transistor is connected to said internal voltage node, said source of said first output metal oxide field effect transistor is connected to said output voltage node, and said drain of said first output metal oxide semiconductor field effect transistor is connected to said V_{cc} voltage supply node; and

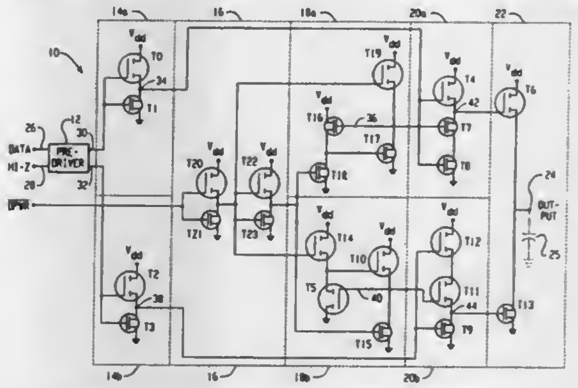
a second output metal oxide semiconductor field effect transistor having a gate, a source, and a drain wherein said drain of said second output metal oxide field effect transistor is connected to said output voltage node, said gate of said metal oxide field effect transistor is connected to said output of said second OR-INVERT gate, and said source of said second output metal oxide semiconductor field effect transistor is connected to said ground node.

5,534,790
CURRENT TRANSITION RATE CONTROL CIRCUIT

Bachvan Huynh, Fishkill, N.Y., and Charles J. Masenas, Jr., Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1994, Ser. No. 227,162
Int. Cl.^{6} H03K *17/16*

U.S. Cl. 326—27 **11 Claims**



1. A current transition rate control circuit, comprising:

first and second data inputs;

a first charge/discharge circuit for receiving said first data input, said first charge/discharge circuit comprising a switching pair of transistors and an NFET control transistor coupled in series with said switching pair of transistors, said first charge/discharge circuit further having a first output line;

a second charge/discharge circuit for receiving said second data input, said second charge/discharge circuit comprising a switching pair of transistors and a PFET control transistor coupled in series with said switching pair of transistors, said second charge/discharge circuit further having a second output line;

a first reference voltage circuit for sending a first control signal and a second reference voltage circuit for sending a second control signal to, respectively, said control transistors in said first and second charge/discharge circuits;

a first output PFET transistor coupled to said first output line of said first charge/discharge circuit, said gate of said first output transistor being directly coupled to said draio of said control transistor for said first charge/discharge circuit;

a second output NFET transistor coupled to said second output line of said second charge/discharge circuit, said gate of said second output transistor being directly coupled to the source of said control transistor for said second charge/discharge circuit; and

a test circuit for shutting off current flow in said first and second reference voltage circuits so that leakage current in said circuit may be measured.

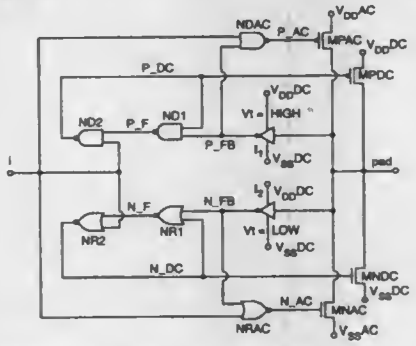
5,534,791
NOISE ISOLATED I/O BUFFER

Derwin W. Mattos, Sunnyvale; James D. Shiffer, II, and Jeffrey F. Wong, both of Fremont, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 52,442, Apr. 23, 1993, Pat. No. 5,426,376. This application Jan. 20, 1995, Ser. No. 375,741

Int. Cl.^{6} H03K *19/0948*

U.S. Cl. 326—27 **8 Claims**



1. A noise-isolated I/O buffer, comprising:

an output terminal;

feedback means, including a first logic gate and connected to a logic input signal and to said output terminal, for producing a first pair of output signals and a second pair of output signals;

transient switching circuit means connected to first power and ground voltage sources and responsive to said first pair of output signals for causing a logic level of said output terminal to be switched responsive to a change in said input signal, and for turning off in the absence of a change in said input signal; and

logic holding circuit means connected to second power and ground voltage sources separate from said first power and ground voltage sources and responsive to said second pair of output signals for causing the logic level of the output terminal to be maintained in the absence of a change in said input signal and for turning off responsive to a change in the input signal;

wherein said first logic gate is referenced to both one of said first power and ground voltage sources and to one of said second power and ground voltage sources.

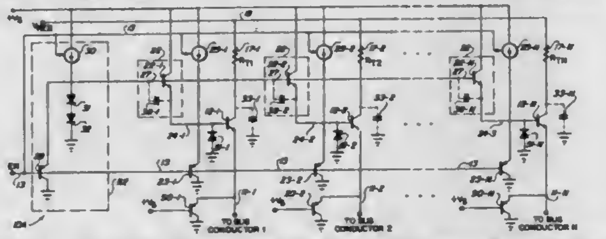
5,534,792
LOW CAPACITANCE ELECTRONICALLY CONTROLLED ACTIVE BUS TERMINATOR CIRCUIT AND METHOD

William J. Lillis, and Justin A. McEldowney, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 15, 1995, Ser. No. 388,719

Int. Cl.^{6} H03K *17/16;19/003*

U.S. Cl. 326—30 **13 Claims**



1. An electronically controlled active bus termination circuit including a voltage regulator, a plurality of termination resistors each having a first terminal and a second terminal, a plurality of corresponding transistor switches each having a control terminal and first and second current-carrying terminals, control circuitry having an input adapted to receive a control signal and outputs connected to control the control terminals of the transistor switches to turn on the transistor switches in response to a first level of the control signal and to turn off the transistor switches in response to a second level of the control signal, the improvement comprising in combination:

(a) a conductor connecting an output terminal of the voltage regulator to the first terminals of the termination resistors;

(b) a plurality of conductors connecting the first current-carrying terminal of each of the transistor switches to the second terminal of each of the termination resistors, respectively, each transistor switch having no current-carrying terminals other than the first and second current-carrying terminals; and

(c) a plurality of conductors connecting the second current-carrying terminal of each of the transistor switches to a plurality of output terminals, respectively, of the electronically controlled active bus termination circuit, the output terminals being adapted for connection to a plurality of corresponding bus conductors, respectively, of a computer bus,

wherein no electronic elements of the electronically controlled active bus termination circuit other than the transitor switches and electrostatic discharge protection devices are connected to the various output terminals of the electronically controlled active bus termination circuit.

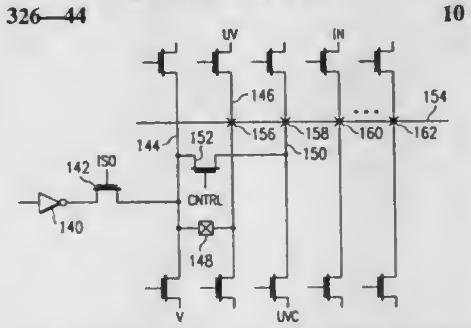
5,534,793
PARALLEL ANTIFUSE ROUTING SCHEME (PARS) CIRCUIT AND METHOD FOR FIELD PROGRAMMABLE GATE ARRAYS

Mitra Nasserbakht, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 24, 1995, Ser. No. 378,036

Int. Cl.^{6} H03K *19/173*

U.S. Cl. 326—44 **10 Claims**



1. A field programmable gate array architecture having a logic module with an output coupled to an output track coupled via a cross antifuse to an connecting track, said connecting track being coupled via at least one cross antifuse to at least one input track coupled to an input of at least one logic module, comprising:

a compensation track running generally parallel with said output track;

a parallel antifuse programmably coupling said compensation track and said connecting track; and

a controllable switch coupled between said output track and said compensation track, wherein said controllable switch is an n-channel transistor.

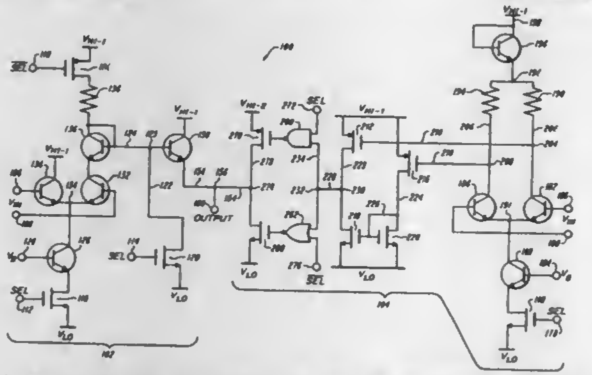
5,534,794
SELECTABLE LOGIC OUTPUT STAGE

Carl W. Moreland, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Dec. 1, 1994, Ser. No. 347,710

Int. Cl.^{6} H03K *19/0175*

U.S. Cl. 326—63 **16 Claims**



1. A circuit that is capable of use as an output stage for generating digital signals that may have one of a plurality of digital electronic formats, comprising:

a first section that may be used to generate output digital signals having at least a first digital electronic format, the first section further including,

a first input structure for receiving digital signals to be processed to have at least a first digital electronic format,

first switch means for enabling and disabling the first section,

first input receiving means for receiving digital signals output from the first input structure,

first voltage setting means connected to the first input receiving means for setting a voltage of digital signals output from the first input receiving means,

digital electronic format applying means connected to an output of the first input receiving means for applying a first desired digital electronic format to the digital signals output by the voltage setting means, and

output means connected to the digital electronic format applying means for outputting the digital signals with at least the first desired digital electronic format output tom the circuit; and

a second section that may be used to generate output digital signals having at least a second digital electronic format, the second section further including,

a second input structure for receiving digital signals to be processed to have at least a second digital electronic format,

second switch means for enabling and disabling the second section,

second input receiving means for receiving digital signals output from the second input structure,

second voltage setting means connected to the second input receiving means for setting a voltage of digital signals output from the second input receiving means,

processing means connected to the second input receiving means for ensuring that the digital signals output therefrom are single-ended digital signals,

logic means connected to the processing means for applying at least a second desired digital electronic format to the digital signals output from the processing means, and

the output means connected to the logic means for outputting the digital signals with at least the second desired digital electronic format from the circuit.

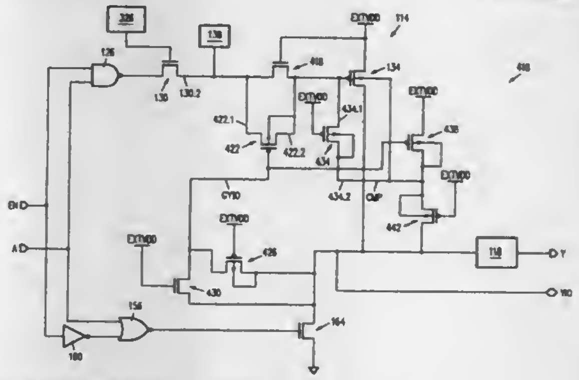
5,534,795
VOLTAGE TRANSLATION AND OVERVOLTAGE PROTECTION

Joseph D. Wert, Arlington, and Richard L. Duncan, Bedford, both of Tex., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 72,896, Jun. 7, 1993, Pat. No. 5,406,140. This application Dec. 9, 1994, Ser. No. 352,482

Int. Cl.^{6} H03K *19/0185;19/0948*

U.S. Cl. 326—81 **12 Claims**



1. An output driver comprising:

a power terminal for receiving a voltage V2;

an output terminal T1;

a transistor TR3 connecting said power terminal to said output terminal;

a circuit C1 for driving a gate of said transistor TR3 with a signal depending on an input signal of said output driver;

a comparator circuit comprising an output terminal T2 and further comprising:

a transistor CMPTR1 for connecting said output terminal T2 to said voltage V2;

a transistor CMPTR2 connecting said output terminal T2 to said output terminal T1;

a transistor CMPTR3 connecting said output terminal T 1 to a gate of said transistor CMPTR1; and

a transistor CMPTR4 having a transistor type that is complementary to a transistor type of said transistor CMPTR3 connecting said output terminal T 1 to the gate of said transistor CMPTR1; and

means for connecting said terminal T2 to the gate and the backgate of said transistor TR3.

5,534,796
SELF-CLOCKING PIPELINE REGISTER

Stephen W. Edwards, Madison, Ala., assignor to Intergraph Corporation, Huntsville, Ala.

Filed Apr. 21, 1995, Ser. No. 427,076

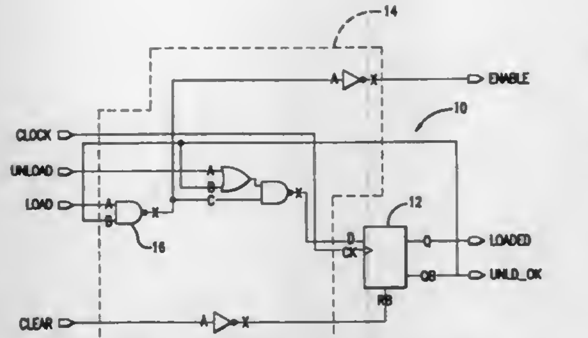
Int. Cl.^{6} H03K *19/096*

U.S. Cl. 326—93 **22 Claims**

1. A module for controlling a pipeline register comprising:

a flip-flop for indicating whether the pipeline register is occupied or vacant;

load means for receiving a load signal when data is available for loading into the pipeline register; and



state machine logic responsive to said flip-flop and said load means so as to generate an enable output to the pipeline register when said flip-flop indicates vacant and said load means has received a load signal.

5,534,797

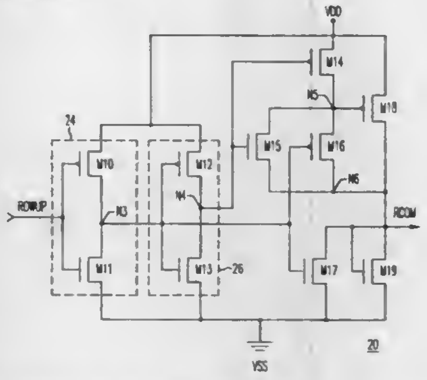
COMPACT AND FAST ROW DRIVER/DECODER FOR SEMICONDUCTOR MEMORY

Richard J. McPartland, Nazareth, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 23, 1994, Ser. No. 363,046

Int. Cl.⁶ H03K *19/017*

U.S. Cl. 326—105 **4 Claims**



1. An integrated circuit, comprising:

a plurality of row decoder-driver circuits each for raising the voltage of a respective row line, each of the plurality of row decoder-driver circuits having an address decoder capable of receiving a plurality of address bits, the plurality address bits when decoded by the address decoder identify one of the plurality of row decoder-drivers to provide an output, each of the plurality of row decoder-drivers having an input transistor having a gate, the input transistor having a conduction path coupled between a power supply node and the address decoder; and

a signal generating circuit, the signal generating circuit for receiving a signal to raise the voltage of a respective row line associated with the identified row decoder-driver circuit, the signal generating circuit providing an output that is coupled to the gate of the input transistor of each of the plurality of row decoder-driver circuits, the output maintains the gate of each input transistor near the edge of conduction of said input transistor.

5,534,798

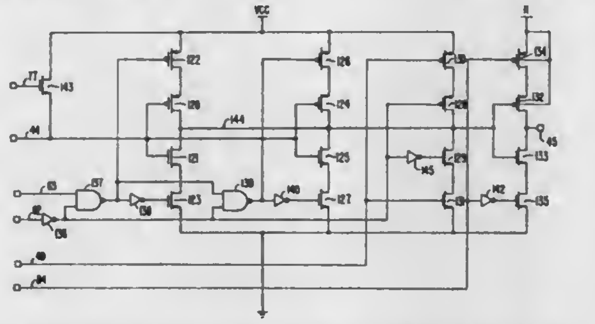
MULTIPLEXER WITH LEVEL SHIFT CAPABILITIES

Christopher E. Phillips, San Jose; Michael G. Ahrens, Sunnyvale; Joseph G. Nolan, III, and Laurence H. Cooke, both of San Jose, all of Calif., assignors to Crosspoint Solutions, Inc., Milpitas, Calif.

Division of Ser. No. 78,692, Jun. 17, 1993, which is a division of Ser. No. 718,677, Jun. 21, 1991, Pat. No. 5,221,865. This application Jun. 6, 1995, Ser. No. 467,340

Int. Cl.⁶ H03K *19/084;19/094*

U.S. Cl. 326—108 **10 Claims**



1. A multiplexer circuit for selecting signals from a plurality of input terminals to an output terminal responsive to signals on at least one control terminal, said circuit comprising

a plurality of inverters, each inverter having an input node, an output node and means for enabling said inverter, each input node connected to input terminal, said inverters including first and second inverters switching at different voltage levels on an input node;

logic means connected to said at least one control terminal and to said enabling means of each inverter for selecting one of said inverters responsive to signals on said at least one control terminal;

an output inverter having an input node connected to said inverter output nodes;

whereby said multiplexer selects signals operating at different logic levels from said input terminals to said output terminal.

5,534,799

COMPACT FLAG CONTROL CIRCUIT CAPABLE OF PRODUCING A ZERO FLAG IN A SHORT TIME

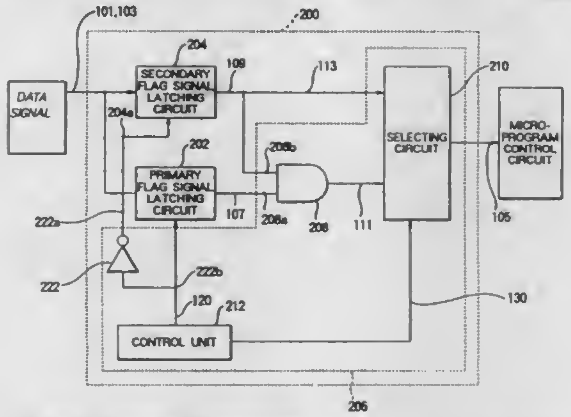
Shin-Ichiro Akiyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 30, 1993, Ser. No. 113,799

Claims priority, application Japan, Aug. 31, 1992, 4-230818

Int. Cl.⁶ H03K *19/08;* G06F *9/46*

U.S. Cl. 327—20 **9 Claims**



1. A microcomputer comprising:

an arithmetic and logic unit (ALU) for carrying out an arithmetic and logic operation in connection with a data signal, said data signal having a bit length greater than a bit length capacity of said ALU, said ALU processing the data signal by dividing the data signal into a lower digit portion having a bit length equal to said bit length capacity of said ALU to produce a first flag signal at a first predetermined logic level and a higher digit portion having a bit length equal to a number of bits exceeding said bit length capacity of said ALU to produce a second flag signal at a second predetermined logic level;

a flag control circuit successively supplied with said first and second flag signals from said ALU, said first and second flag signals corresponding to first and second results of calculations in said ALU, said flag control circuit producing an output flag signal in response to said first and said second flag signals, said first and said second results respectively corresponding to the lower digit portion and the higher digit portion obtained by the calculations of said ALU; and

a microprogram control circuit responsive to said output flag signal to control a branch point in a microprogram of said microcomputer:

said flag control circuit comprising:

a primary flag signal latching circuit for latching said first flag signal to produce a first latched flag signal;

a secondary flag signal latching circuit for latching said second flag signal to produce a second latched flag signal; and

a logic circuit for logically processing both said first latched flag signal and said second latched flag signal to produce said output flag signal.

5,534,800

SENSE AMPLIFIER, SRAM, AND MICROPROCESSOR

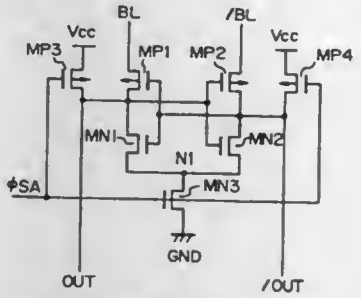
Mitsuru Hiraki, Hachioji; Yasuhiko Sasaki, Kokubunji; Koichi Seki, Hino, and Tatsuji Matsuura, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1993, Ser. No. 133,218

Claims priority, application Japan, Oct. 7, 1992, 4-268263

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 327—57 **15 Claims**



1. A sense amplifier for an SRAM comprising:

a first p-channel MOSFET having a source terminal connected to a first input signal line;

a second p-channel MOSFET having a source terminal connected to a second input signal line;

a first n-channel MOSFET having a drain terminal connected to a drain terminal of said first p-channel MOSFET and a gate terminal connected to a drain terminal of said second p-channel MOSFET and to a gate terminal of said first p-channel MOSFET;

a second n-channel MOSFET having a drain terminal connected to said drain terminal of said second p-channel MOSFET, a gate terminal connected to said drain terminal of said first p-channel MOSFET and to a gate terminal of said second p-channel MOSFET, and a source terminal connected to a source terminal of said first n-channel MOSFET;

a first switching circuit for controlling the connection/disconnection between a first power source and said source terminal of said first n-channel MOSFET;

a second switching circuit for controlling the connection/disconnection between a second power source and said drain terminal of said first p-channel MOSFET; and

a third switching circuit for controlling the connection/disconnection between said second power source and said drain terminal of said second p-channel MOSFET.

5,534,801

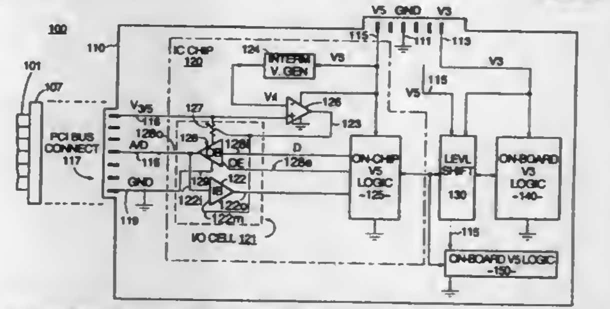
APPARATUS AND METHOD FOR AUTOMATIC SENSE AND ESTABLISHMENT OF 5V AND 3.3V OPERATION

Chih-Siung Wu, Saratoga, and Po-Shen Lai, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 24, 1994, Ser. No. 185,137

Int. Cl.⁶ H03K *5/153*

U.S. Cl. 327—72 **7 Claims**



1. An auto-sensing circuit for determining whether a signal bus is operating in a first signaling mode wherein discrete logic levels are represented by a first set of voltage levels or in a second signaling mode wherein discrete logic levels are represented by a different second set of voltage levels, the signal bus having a bus power line and a bus ground line across which there is established a bus voltage having either a first voltage V1 having a range of V1 (min) to V1 (max) for generating said first set of voltage levels or a second voltage V2 having a range of V2 (min) to V2 (max) for generating said second set of voltage levels in accordance with the signaling mode of the signal bus and where V1 (min) is greater than V2 (max), said auto-sensing circuit comprising:

intermediate level generating means for receiving the first voltage (V1) and for generating an intermediate test voltage V4 as a function of the instantaneous value of the first voltage (V1) where the intermediate test voltage (V4) has a value which is greater than V2 (max) and less than V1 (min); and

comparing means, having inputs operatively coupled to the bus power line and to the intermediate level generating means, for comparing the bus voltage with the intermediate test voltage V4 to determine whether the signal bus is operating in the first or second signaling mode.

5,534,802

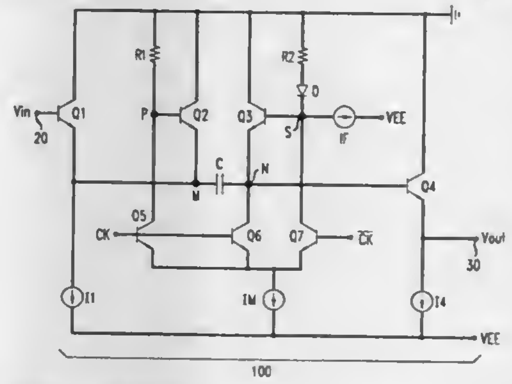
SAMPLE AND HOLD CIRCUITRY IN BIPOLAR TRANSISTOR TECHNOLOGY USING A BOOTSTRAPPING TECHNIQUE

Behzad Razavi, Aberdeen, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 1, 1994, Ser. No. 299,724

Int. Cl.⁶ G11C *27/02*

U.S. Cl. 327—94 **19 Claims**



1. Circuitry comprising:

(a) first and second clock-controlled bipolar transistors;

(b) a first resistor connected to a reference supply voltage and in series with the first clock-controlled transistor, whereby a first node is formed between them and a first branch is formed by them;

(c) a third bipolar transistor having a base terminal connected to the first node and having a high-current-carrying terminal connected to connected between said reference supply voltage and a second node;

(d) a fourth bipolar transistor connected to said reference supply voltage and in series with the second clocked-controlled transistor, whereby a third node is formed between them and a second branch is formed by them;

(e) a complementary-clocked voltage-dropping device, connected in parallel with the first and second branches, having a fourth node connected to a low-current-carrying terminal of the fourth transistor;

(f) a capacitor having a first terminal connected to the second node and a second terminal connected to the third node whereby the capacitor supplies bootstrapping; and

(g) an input device connected to the second node.

5,534,803

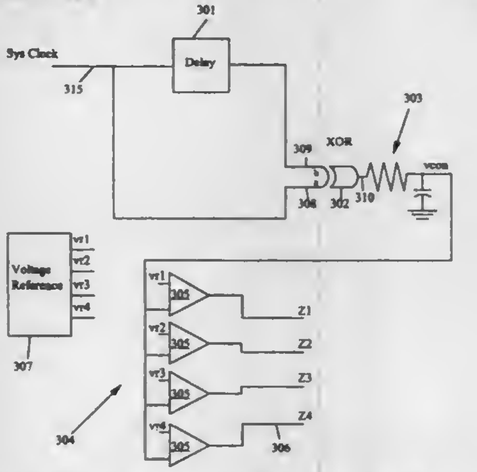
PROCESS INSENSITIVE OFF-CHIP DRIVER

Anthony Correale, Jr., Raleigh, and Gary T. Hendrickson, Chapel Hill, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1995, Ser. No. 420,947

Int. Cl.^{6} H03B *1/00*

U.S. Cl. 327—108 **12 Claims**



1. A control circuit for a compensated driver circuit, the control circuit comprising:

a clock terminal;

one or more control terminals for connection to one or more respective control inputs of said compensated driver circuit;

an exclusive OR gate having first and second inputs and an output, the first input of the exclusive OR gate connected to the clock terminal;

a delay circuit disposed between the clock terminal and the second input of the exclusive OR gate, the delay circuit being formed only by a single chain of delay elements connected in series so that the delay is influenced only by the number of delay elements and process and environmental variables;

an RC filter connected to the output of the exclusive OR gate; and

one or more comparators disposed one each between one of the one or more control terminals and the RC filter, each comparator being connected to a reference voltage so that the output of a given comparator is high or low depending on whether the voltage at the RC filter is greater than or less than the reference voltage connected to the given comparator.

5,534,804

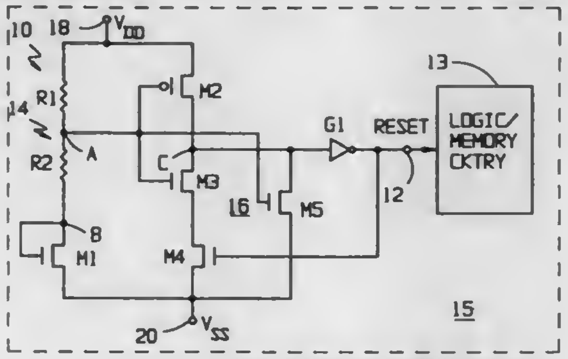
CMOS POWER-ON RESET CIRCUIT USING HYSTERESIS

Ann K. Woo, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 13, 1995, Ser. No. 387,688

Int. Cl.^{6} H03K *19/0948*

U.S. Cl. 327—143 **10 Claims**



CMOS POWER-ON-RESET CIRCUIT

1. A CMOS power-on reset circuit for generating a reset signal in response to the activation of a power supply voltage, said reset circuit comprising:

a power supply terminal (**18**) for receiving a power supply voltage (VDD);

voltage clamping means (**14**) responsive to said power supply voltage (VDD) for generating a first control voltage;

said voltage clamping means including an N-channel transistor (M1), a first resistor (R1), and a second resistor (R2);

said first resistor having its one end connected to the power supply terminal and its other end connected to one end of said second resistor at a first internal node (A) to provide the first control voltage, said N-channel transistor (M1) having its drain and gate electrodes connected together and to the other end of said second resistor, said N-channel transistor (M1) having its source electrode connected to a ground potential (VSS); and

hysteresis switching means responsive to said power supply voltage (VDD) and said first control voltage for generating a second control voltage which is used to turn off a reset signal at an output node when a first predetermined trip level has been exceeded and for turning on said reset signal when a second predetermined trip level has been reached which is lower than said first predetermined trip level.

5,534,805

SYNCHRONIZED CLOCK GENERATING APPARATUS

Yukio Miyazaki; Takenori Okitaka; Makoto Hatakenaka, and Junji Mano, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 289,837, Aug. 12, 1994, Pat. No. 5,369,318, which is a continuation of Ser. No. 809,007, Dec. 17, 1991, abandoned. This application May 24, 1995, Ser. No. 449,496

Claims priority, application Japan, Dec. 26, 1990, 2-406357; Aug. 1, 1991, 3-193033; Nov. 11, 1991, 3-293988

Int. Cl.^{6} H03L *7/00*

U.S. Cl. 327—144 **14 Claims**

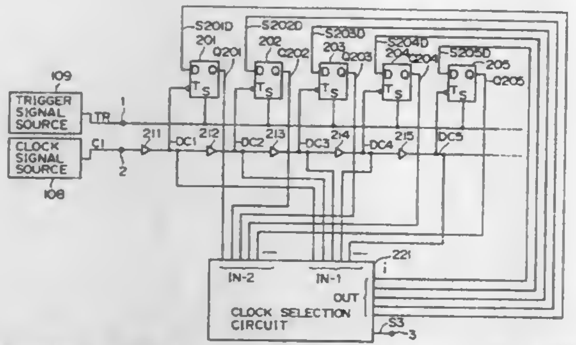
1. A synchronized clock generating apparatus comprising:

a delayed clock generating circuit;

said delayed clock generating circuit including a clock input having a basic clock signal applied thereto;

said delayed clock generating circuit including further a plurality of delaying elements connected in series;

said plurality of delaying elements being effective for producing a plurality of delayed clock signals each successively delayed relative to said basic clock signal;



a plurality of flip-flops, each having a respective one of said plurality of delayed clock signals applied to a first input thereof;

said plurality of flip-flops each having a second input with a trigger signal, asynchronous with said basic clock signal, applied thereto;

each of said plurality of flip-flops having a third input and a flip-flop output;

said plurality of flip-flops receiving said trigger signal and said delayed clock signals such that each flip-flop, of said plurality of flip-flops, switches a flip-flop output signal at said flip-flop output thereof to a reset state from a set state in response to receiving said respective one of said delayed clock signals after a transition of said trigger signal;

a clock selection circuit having a first plurality of inputs receiving said delayed clock signals, each of a second plurality of inputs receiving a respective one of said flip-flop output signals, a plurality of feedback outputs, and a selected clock output;

said clock selection circuit applying a selected one of said delayed clock signals to said selected clock output and a feedback signal to a selected feedback output of said feedback outputs in response to a first one of said flip-flop output signals switching to said reset state; and

feedback means for connecting said feedback outputs to said third input of respective ones of said plurality of flip flops.

5,534,806

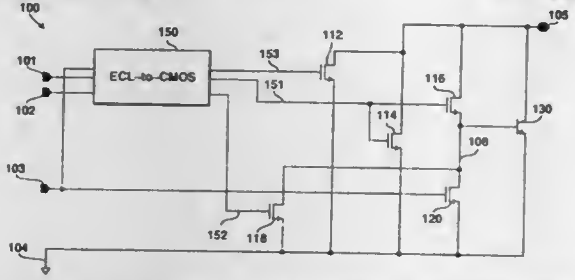
PULL-DOWN ACCESS FOR AN OUTPUT BUFFER

Shiva P. Gowni, New Delhi, Ind., and Allen R. White, Starkville, Miss., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Filed Oct. 5, 1994, Ser. No. 318,137

Int. Cl.^{6} H03K *5/12;17/04*

U.S. Cl. 327—170 **12 Claims**



1. A method for controlling a discharge of an output signal, comprising the steps of:

(a) receiving an input signal;

(b) generating a first control signal in response to the input signal;

(c) generating a second control signal in response to the first control signal;

(d) initially discharging the output signal in response to the second control signal; and

(e) controlling the second control signal in response to the first control signal such that the discharge of the output signal is controlled;

wherein the step of generating the second control signal includes the steps of:

(i) generating a third control signal in response to the first control signal, including the steps of

(1) inputting the first control signal and a fourth control signal into a logic gate, and

(2) outputting the third control signal from the logic gate; and

(ii) coupling a first voltage terminal to a second control signal node in response to the third control signal to generate the second control signal.

5,534,807

SAMPLING CIRCUIT, PHASE REFERENCE DETECTING CIRCUIT AND SAMPLING CLOCK SHIFTING CIRCUIT

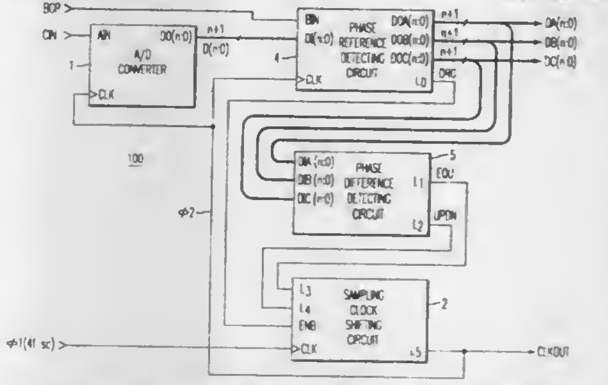
Yoshihiro Inada; Shinji Yamashita, and Miki Nishimoto, all of Itami, Japan, assignors to Mitsubishi Electric Semiconductor Software Corporation, Itami, Japan, and Mitsubishi Denki Kaisba Kaisha, Tokyo, Japan

Filed Mar. 21, 1995, Ser. No. 407,652

Claims priority, application Japan, Jun. 30, 1994, 6-149747

Int. Cl.^{6} H03H *11/16*

U.S. Cl. 327—234 **16 Claims**



1. A sampling circuit for sampling an analog signal-to-be-sampled using a sampling clock, said signal-to-be-sampled including a primary signal which is obtained by demodulating a carrier signal, and a fore signal which has a same frequency as said carrier signal and which is precedent to said primary signal, said sampling clock having a frequency which is m times as high as the frequency of said carrier signal (m is an integer), said sampling circuit comprising:

(a) an A/D converter for sampling said signal-to-be-sampled in accordance with said sampling clock and generating a digital basic signal;

(b) a phase reference detecting circuit for receiving the digital basic signal from the A/D converter and for generating at least three delayed basic signals having different phases from each other and being obtained by delaying said basic signal in synchronism with said sampling clock, and a phase reference signal which indicates a reference of a phase of said sampling clock;

(c) a phase difference detecting circuit for receiving the delayed signals from the phase reference detecting circuit and for generating a phase difference signal from said delayed basic signals, said phase difference signal indicating a phase difference between said fore signal and said basic signal when said phase reference signal is active; and

(d) a sampling clock shifting circuit for receiving the phase difference signal from the phase difference detecting circuit and the phase reference signal from the phase reference detecting circuit and for shifting the phase of said sampling clock in accordance with said phase difference signal only when said phase reference signal is active, to thereby supply said sampling clock to said converter and said phase reference detecting circuit.

5,534,808
SIGNAL DELAY METHOD, SIGNAL DELAY DEVICE AND CIRCUIT FOR USE IN THE APPARATUS

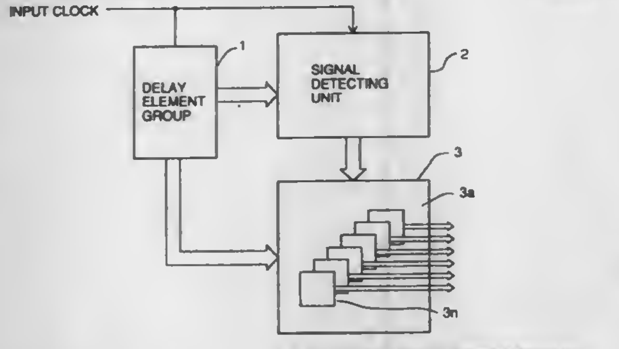
Koulchi Takaki, Hachiojl; Mitsuo Azumai, Hino, and Hiroshi Ishii, Kiyose, all of, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 25, 1993, Ser. No. 8,715

Claims priority, application Japan, Jan. 31, 1992, 4-016552

Int. Cl.^{6} H03K *5/13*

U.S. Cl. 327—261 **3 Claims**



3a-3n : OUTPUT SIGNAL DETERMINING UNIT

1. A device for providing a desired delayed signal, comprising:
(a) means for delaying an input signal to produce a plurality of delayed signals, each delayed signal having a different delay time with respect to said input signal;
(b) a plurality of phase detecting means for detecting a plurality of specific delayed signals having specific relations with said input signal from said plurality of delayed signals;
(c) masking means for making only one of said plurality of phase detecting means operative; and
(d) means for determining a desired delayed signal from said plurality of delayed signals according to the detected result by said plurality of detecting means to output said desired delayed signal.

5,534,809
PULSE PHASE DIFFERENCE ENCODING CIRCUIT

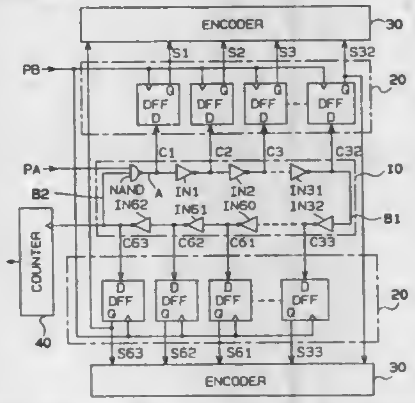
Takamoto Watanabe, Nagoya, and Seiki Aoyama, Toyohashi, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 14, 1994, Ser. No. 212,117

Claims priority, application Japan, Mar. 26, 1993, 5-68019

Int. Cl.^{6} H03B *27/00*

U.S. Cl. 327—269 **26 Claims**



1. A pulse phase difference encoding circuit comprising:
a ring delay pulse generating circuit, including a plurality of delay means connected in series to form a ring circuit, for receiving a first pulse signal and for passing said first pulse signal through said plurality of delay means;
a plurality of signal lines respectively connecting each of said plurality of delay means to an adjacent one of said plurality of delay means, a width and a length of each of said plurality of signal lines being such that load capacitances of each of said plurality of signal lines are substantially equal to each other; and
encoding means, connected to said ring delay pulse generating circuit, for receiving a second pulse signal delayed by a delay time from said first pulse signal received by said ring delay pulse generating circuit, for specifying respective positions of said plurality of delay means through which said first pulse signal passes at receipt of said second pulse signal, and for encoding said pulse phase difference based on a number of said plurality of delay means through which said first pulse signal has passed.

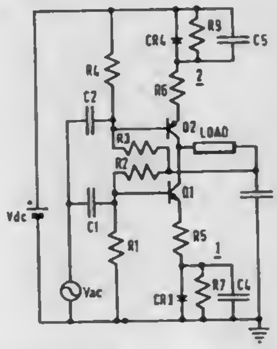
5,534,810
POWER STAGE BIAS CIRCUIT WITH IMPROVED EFFICIENCY AND STABILITY

Charles M. White, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 28, 1994, Ser. No. 366,295

Int. Cl.^{6} H03K *19/084;19/094*

U.S. Cl. 327—308 **19 Claims**



1. A beam scan velocity modulation driver circuit, comprising:
first and second transistors coupled in a push-pull configuration, having respective signal input electrodes coupled for receiving a beam scan velocity modulating signal having a video bandwidth, having respective and corresponding electrodes coupled to one another and to a beam scan velocity modulating coil and having respective main conductive paths; and,
respective bias circuits coupled to said main conductive paths of said transistors, including nonlinear devices having conductive states and substantially non conductive states depending upon a threshold voltage, said bias circuits establishing respective bias thresholds nearly equal to said threshold voltage when said first and second transistors are in quiescent states.

5,534,811
INTEGRATED I/O BUS CIRCUIT PROTECTION FOR MULTIPLE-DRIVEN SYSTEM BUS SIGNALS

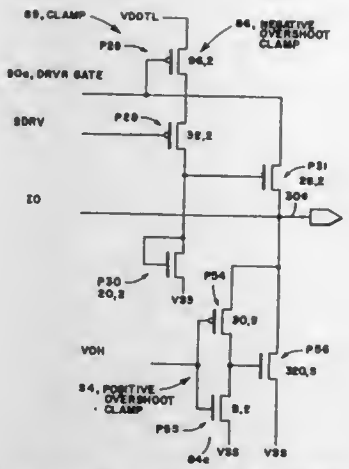
William B. Gist, Chelmsford, and Joseph P. Coyle, Leominister, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 18, 1993, Ser. No. 80,467

Int. Cl.^{6} H03K *19/092;5/00*

U.S. Cl. 327—309 **13 Claims**

1. A voltage clamping circuit, comprising:
a first transistor having a first input gate electrode fed by a control signal on a control line;
a second transistor having a second input gate electrode switchably coupled to said first transistor, an output drain electrode coupled to said control signal, and a reference source electrode fed by an output voltage, with said output voltage being controlled by said control signal.



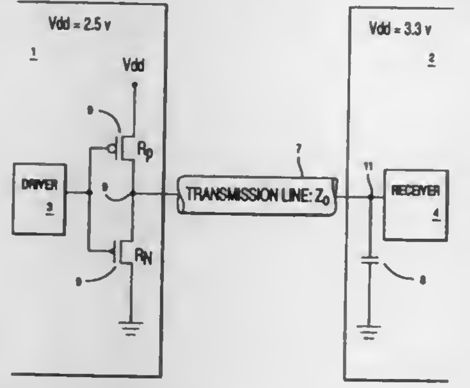
5,534,812
COMMUNICATION BETWEEN CHIPS HAVING DIFFERENT VOLTAGE LEVELS

Tai A. Cao; Satyajit Dutta; Thai Q. Nguyen; Thanh D. Trinh, and Lloyd A. Walls, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1995, Ser. No. 426,753

Int. Cl.^{6} H03L *5/00*

U.S. Cl. 327—333 **13 Claims**



1. A system, comprising:
a first circuit operating at a first voltage for transmitting control signals at said first voltage;
a second circuit operating at a second voltage different from said first voltage for receiving control signals at said second voltage;
a single transmission line, with a characteristic impedance different from an impedance of said second circuit, connecting said first and second circuits; and
means, within said first circuit, for varying an output impedance of said first circuit, by turning on a transistor having a predetermined resistance, to transform the control signals output by said first circuit from said first voltage to said second voltage.

5,534,813
ANTI-LOGARITHMIC CONVERTER WITH TEMPERATURE COMPENSATION

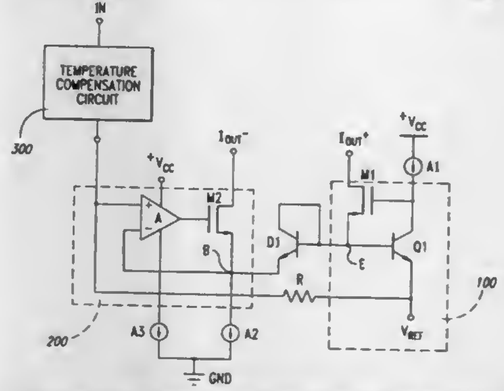
Marco DeMicheli, Como, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Milan, Italy

Filed Feb. 24, 1994, Ser. No. 201,208

Claims priority, application European Pat. Off., Feb. 26, 1993, 93830079

Int. Cl.^{6} G06F *7/556;* **G06G** *7/20*

U.S. Cl. 327—346 **16 Claims**



1. A converter of the anti-logarithmic type, characterized in that it comprises a unity gain non-inverting interface circuit having at least one input terminal, coupled to an input terminal of the converter, a first output terminal, forming a first output terminal of the converter, and a second output terminal, connected to a first terminal of a bipolar junction circuit element which has a second terminal connected to a reference voltage circuit means.

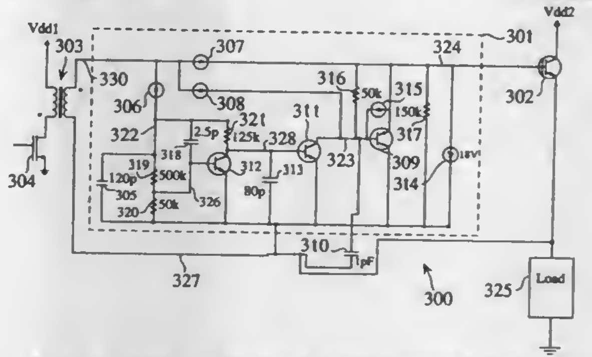
5,534,814
HIGH INPUT IMPEDANCE GATE DRIVER CIRCUIT WITH MILLER PROTECTION AND DELAYED TURNOFF

Stephen T. Archer, Sunnyvale, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1994, Ser. No. 359,807

Int. Cl.^{6} H03K *17/687;17/72;* **H03B** *1/00*

U.S. Cl. 327—427 **17 Claims**



1. A driver circuit for driving a control terminal of an output transistor, said output transistor being in a conducting state when said control terminal is at a first voltage level and in a nonconducting state when said control terminal is at a second voltage level, said driver circuit receiving a control signal having an active phase and an inactive phase, said driver circuit comprising:
a charging circuit receiving said control signal for driving said control terminal to said first voltage level during said active phase of said control signal;
a surge-protection circuit, coupled to said charging circuit and said control terminal, for preventing a surge in voltage in said control terminal that occurs at other than the active phase, said surge protection circuit being disabled during said active phase of said control signal to allow normal operation; and
a discharging circuit, receiving said control signal and coupled to said control terminal, for driving said control terminal to

said second voltage level following a predetermined delay, during said inactive phase of said control signal.

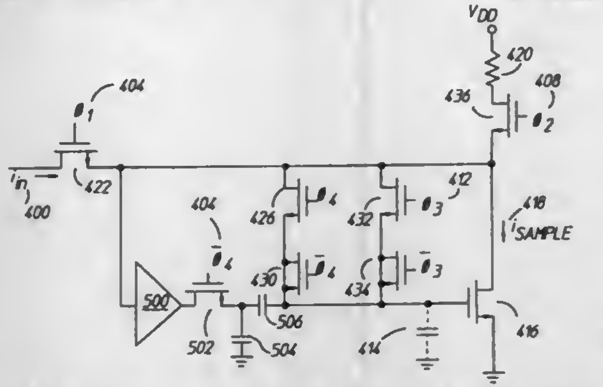
5,534,815
SWITCHING CIRCUIT FOR SIGNAL SAMPLING WITH REDUCED RESIDUAL CHARGE EFFECTS

Rajeev Badval, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 29, 1994, Ser. No. 282,941

Int. Cl.^{6} H03K *17/687*

U.S. Cl. 327—437 **6 Claims**



3. An electronic circuit for copying a current signal to a current sink, the current sink having a control terminal such that a voltage at the control terminal determines the magnitude of current through the current sink, the electronic circuit comprising:
- a first switch having a first switch input and a first switch output, the first switch input connected to the current signal, the first switch output connected to the current sink;
- a power supply current source;
- a second switch connected between the power supply current source and the current sink;
- a third switch connected between the first switch output and the control node of the current sink, the third switch having a third switch residual charge after opening;
- a fourth switch, smaller than the third switch, connected between the first switch output and the control node of the current sink, the fourth switch having a fourth switch residual charge after opening; and
- the third switch turning off before the fourth switch, thereby eliminating the effect of the third switch residual charge on the control node of the current sink and leaving only the effect of the fourth switch residual charge on the control node of the current sink.

5,534,816
PROGRAMMABLE TRANSDUCER AMPLIFIER CIRCUIT

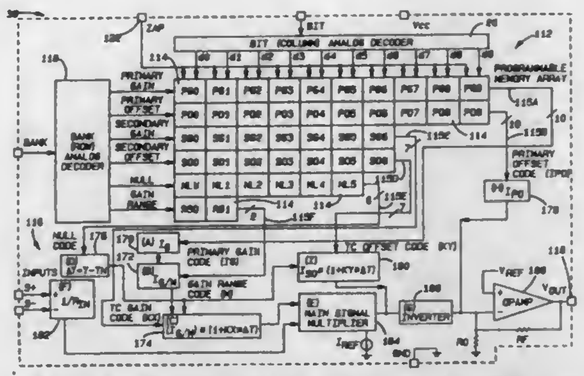
Dennis M. Koglin, Carmel, and Mark B. Kearney, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 14, 1995, Ser. No. 421,956

Int. Cl.^{6} H01L *35/00;* **H03K** *3/42*

U.S. Cl. 327—513 **23 Claims**

1. A programmable integrated amplifier circuit, said programmable integrated amplifier circuit being independently programmable at a first operating temperature and at a second operating temperature for adjusting operating characteristics of said amplifier circuit, said circuit comprising:
- binary adjustable circuit means for adjusting the operating characteristics of said amplifier circuit in a temperature independent and dependent manner; and
- a plurality of binary coded signals received by said binary adjustable circuit means for programming said binary adjustable circuit means at said first operating temperature in a temperature independent manner and at said second operating temperature in a temperature dependent manner in order to adjust the operating characteristics of said amplifier circuit, whereby adjusting the operating characteristics of said amplifier at said first operating temperature is independent of the adjusting of the operating characteristics of said amplifier circuit at said second temperature.



5,534,817
VOLTAGE GENERATING CIRCUIT

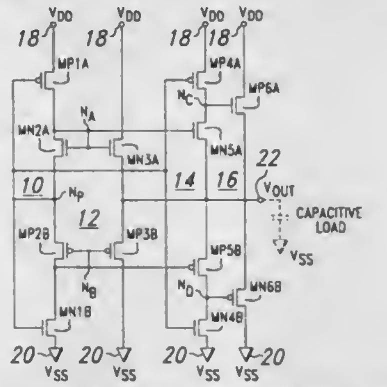
Tomohiro Suzuki, Tsukuba, Japan, and Toshiyuki Sakuta, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi Ltd., Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,538

Claims priority, application Japan, Aug. 18, 1993, 5-225094

Int. Cl.^{6} G05F *3/02*

U.S. Cl. 327—545 **1 Claim**



1. A voltage supply circuit for a capacitive load, comprising the following coupled in parallel between a supply voltage and a ground:
- a reference circuit for generating a first reference voltage half of the supply voltage, a second reference voltage equal to the first reference voltage plus a predetermined analog threshold voltage, and a third reference voltage equal to the first reference voltage minus the analog threshold voltage;
- an analog push-pull amplifier circuit having first and second reference inputs respectively coupled to the reference circuit to receive the second and third reference voltages, and a push-pull output terminal for coupling to the capacitive load;
- a digital detecting circuit having first and second detecting inputs respectively coupled to the reference circuit to receive the second and third reference voltages and a third detecting input coupled to the push-pull output terminal, a normally OFF first control output which generates a first ON control signal when the second reference voltage minus the push-pull output voltage exceeds a predetermined switching threshold voltage larger than the analog threshold voltage, and a normally OFF second control output which generates a second ON control signal when the push-pull output voltage minus the third reference voltage exceeds the predetermined switching threshold voltage; and
- a digital switch having first and second digital inputs respectively coupled and responsive to the digital detecting circuit to receive the first and second ON control signals, for coupling the push-pull output terminal and its capacitive load (i) to the supply voltage when the first ON control signal is present and (ii) to the ground when the second ON control signal is present.

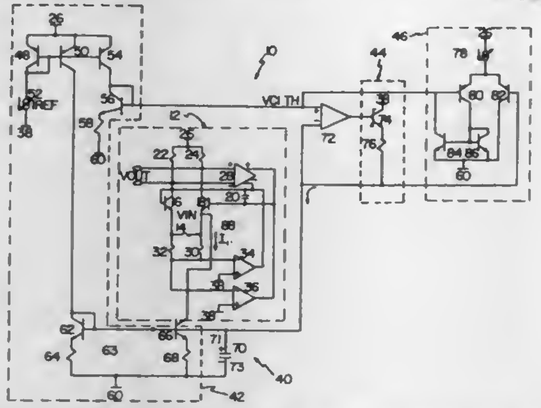
5,534,818
PREAMPLIFIER NOISE FILTERING CIRCUIT

Douglas R. Peterson, Minnetonka, Minn., assignor to VTC Inc., Bloomington, Minn.

Continuation of Ser. No. 175,735, Dec. 30, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 417,436

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 327—545 **8 Claims**



1. A circuit for rapidly charging a capacitor means, the circuit comprising:
- signal generating means for generating a first and a second signal, the second signal having a predetermined relationship to the first signal, the signal generating means electrically connected to the capacitor means to provide the second signal to the capacitor means;
- comparator means having a first and a second input and an output for comparing signals, the first input electrically connected to the signal generating means for receiving the first signal of the signal generating means and the second input electrically connected to the capacitor means; and
- controlled current charging means electrically connected to the output of the comparator means for controlling the current provided by the charging means, the controlled current charging means having an output electrically connected to the capacitor means; and
- modifying means electrically connected to the capacitor means and the first input of the comparator means for modifying a voltage at the first input of the comparator means when a voltage across the capacitor means exceeds the voltage at the first input of the comparator means to insure that the comparator means does not accidentally change output polarities.

5,534,819
CIRCUIT AND METHOD FOR REDUCING VOLTAGE ERROR WHEN CHARGING AND DISCHARGING A VARIABLE CAPACITOR THROUGH A SWITCH

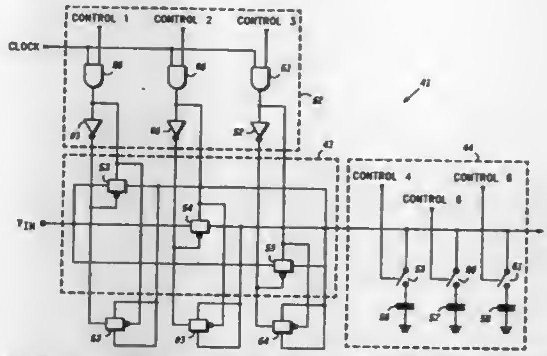
Brad D. Gunter, Phoenix; David Anderson, Scottsdale; Danny A. Bersch, Gilbert; Howard C. Anderson, Tempe, and Doug Garrity, Gilbert, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1995, Ser. No. 421,721

Int. Cl.^{6} H03B *1/00;* **H03K** *17/16*

U.S. Cl. 327—553 **8 Claims**

1. A circuit for reducing voltage error when charging and discharging a variable capacitor, the circuit comprising:
- a plurality of transmission gates coupled in parallel forming a switch, said switch is coupled to the variable capacitor for coupling a voltage thereto; and
- a control circuit for providing a control signal to each transmission gate of said plurality of transmission gates, said control circuit enables and disables transmission gates of said switch for changing a resistance of said switch to maintain a predetermined RC time constant as a capacitance of the variable capacitor is changed.



5,534,820
COMPENSATING FOR NON-LINEAR EFFECTS IN SIGNAL PROCESSING WITH ACTIVE DEVICES

George I. F. Tupper, High Wycombe; Anthony C. Allegranza, and Phillip J. Doherty, both of London, all of, United Kingdom, assignors to British Broadcasting Corporation, London, United Kingdom

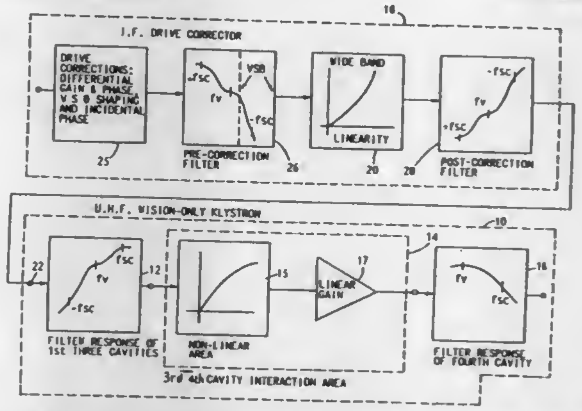
PCT No. PCT/GB93/01106, § 371 Date Dec. 16, 1994, § 102(e) Date Dec. 16, 1994, PCT Pub. No. WO93/26086, PCT Pub. Date Dec. 23, 1993

PCT Filed May 27, 1993, Ser. No. 338,557

Claims priority, application United Kingdom, Jun. 9, 1992, 9212151

Int. Cl.^{6} H03F *1/32*

U.S. Cl. 330—149 **15 Claims**


18
I.F. DRIVE CORRECTOR
DRIVE CORRECTIONS: DIFFERENTIAL GAIN & PHASE V S B SHAPING AND INCIDENTAL PHASE
-fsc
fv
VSB
-fsc
WIDE BAND
LINEARITY
-fsc
fv
+fsc
25
PRE-CORRECTION FILTER
26
20
28
POST-CORRECTION FILTER
U.H.F. VISION-ONLY KLYSTRON
10
14
22
12
15
17
LINEAR GAIN
fv
-fsc
fsc
16
FILTER RESPONSE OF 1st THREE CAVITIES
NON-LINEAR AREA
3rd 4th CAVITY INTERACTION AREA
FILTER RESPONSE OF FOURTH CAVITY

1. A method of compensating for non-linear characteristics of an active device (**10**), the active device having a transfer characteristic corresponding to the accumulated characteristics of a first filter stage (**12**) and a first non-linear device (**14**) in series connection, the method comprising modifying a signal prior to supply to the active device by the steps of:
- a) filtering the signal by a first pre-correction filter (**26**) having a frequency response characteristic determined by that of the said first filter stage (**12**);
- b) amplifying the pre-correction filtered signal using a first non-linear amplifier (**20**) having an input/output transfer characteristic complementary to that of the said first non-linear device (**14**); and
- c) filtering the amplified signal by a first post-correction filter (**28**) having a frequency response characteristic complementary to that applied at step a).

5,534,821
CHARGE PUMP CIRCUITS FOR PLL FREQUENCY SYNTHESIZER

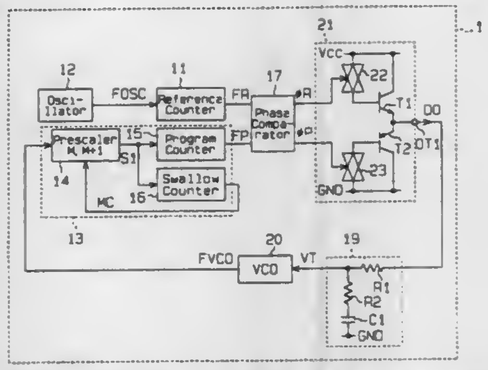
Takehiro Akiyama; Katsuya Shimomura; Kouzi Takekawa, and Takehito Doi, all of Kasugai, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 11, 1994, Ser. No. 288,924

Claims priority, application Japan, Sep. 20, 1993, 5-233559; Jan. 14, 1994, 6-002856

Int. Cl.^{6} H03L *7/093*

U.S. Cl. 331—8 **6 Claims**



4. A charge-pump circuit for use in a PLL frequency synthesizer circuit, the charge-pump circuit being operated based on first and second phase difference signals to be fed thereto, comprising:

an output terminal for outputting a voltage signal;

a first bipolar transistor, connected between a high-potential power supply and said output terminal, to be controlled based on the first phase difference signal;

a second bipolar transistor, connected between a low-potential power supply and said output terminal, to be controlled based on the second phase difference signal; and

both of said first and second bipolar transistors being emitter-follower types;

wherein said first bipolar transistor is an NPN transistor having a collector connected to said high-potential power supply and an emitter connected to said output terminal; and

wherein said second bipolar transistor is a PNP transistor having a collector connected to said low-potential power supply and an emitter connected to said output terminal.

5,534,822
PARALLEL PHASE-LOCKED LOOP OSCILLATOR CIRCUITS WITH AVERAGE FREQUENCY CALCULATION OF INPUT STAGE LOOP

Atsuki Taniguchi, and Chiyoko Yamamoto, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 31, 1994, Ser. No. 189,462

Claims priority, application Japan, Sep. 20, 1993, 5-233101

Int. Cl.^{6} H03L *7/087*

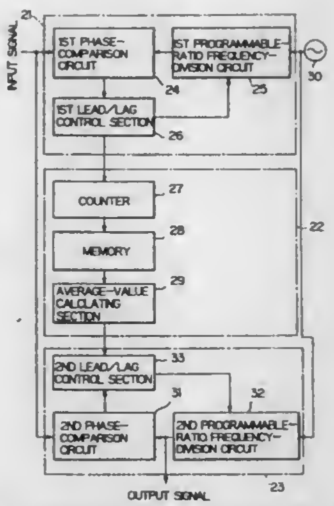
U.S. Cl. 331—2 **9 Claims**

1. A phase-locked oscillator circuit comprising:

an input-stage phase-locking circuit (2) which compares a phase of a 1st frequency-converted output signal derived by frequency division with a phase of an input signal by means of a 1st phase-comparison circuit (1), and which has a feedback loop which controls the phase of said 1st frequency-converted output signal;

a processing section (3) including an average-frequency calculation circuit which determines an average frequency of said input signal, based on a phase-comparison output signal of said 1st phase comparison circuit (1) of said input-stage phase-locking circuit (2); and

an output-stage phase-locking circuit (5) which compares a phase of a 2nd frequency-converted output signal derived by frequency division with the phase of said input signal by means of a 2nd phase-comparison circuit (4), and which has a feedback loop which controls the phase of said 2nd frequency-converted output signal based on a phase-comparison output of said 2nd phase-comparison circuit (4) and a processed output signal from said processing section (3).


21
INPUT SIGNAL
1ST PHASE-COMPARISON CIRCUIT
1ST PROGRAMMABLE-RATIO FREQUENCY-DIVISION CIRCUIT
30
24
25
1ST LEAD/LAG CONTROL SECTION
26
COUNTER
27
MEMORY
28
22
AVERAGE-VALUE CALCULATING SECTION
29
2ND LEAD/LAG CONTROL SECTION
33
31
32
2ND PHASE-COMPARISON CIRCUIT
2ND PROGRAMMABLE-RATIO FREQUENCY-DIVISION CIRCUIT
OUTPUT SIGNAL
23

5,534,823
PHASE LOCKED LOOP (PLL) CIRCUIT HAVING VARIABLE LOOP FILTER FOR SHORTENED LOCKING TIME

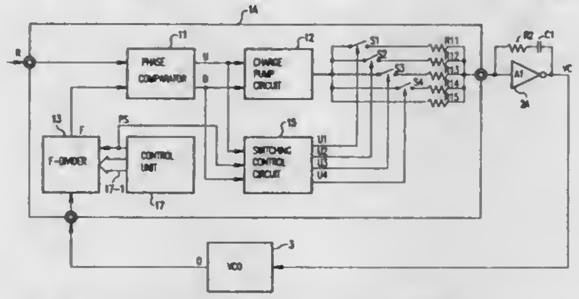
Toyoo Kondou, Yamagata, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,635

Claims priority, application Japan, Feb. 28, 1994, 6-030679

Int. Cl.^{6} H03L *7/093;7/107;7/18*

U.S. Cl. 331—16 **11 Claims**



1. A phase-locked-loop (PLL) circuit comprising:

a phase comparator for producing a difference signal indicative of a difference in phase between a first signal and a second signal;

an oscillation circuit for producing an oscillation signal from an output of said PLL circuit:

a frequency-division circuit for dividing said oscillation signal by frequency-division ratio data set therein and for producing said second signal; and

a switching circuit for causing a damping factor to have a first value in response to a first change of said difference signal caused by changing the frequency-division ratio data of said frequency-division circuit,

said switching circuit further for changing said damping factor from said first value to a second value that is smaller than said first value in response to a second change of said output signal of said phase comparator.

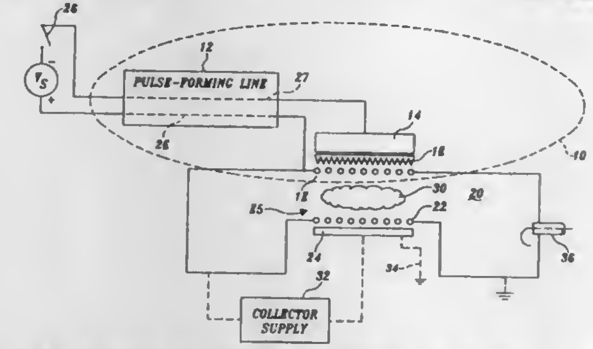
5,534,824
PULSED-CURRENT ELECTRON BEAM METHOD AND APPARATUS FOR USE IN GENERATING AND AMPLIFYING ELECTROMAGNETIC ENERGY

Ervin J. Nalos, Bellevue, and James C. Axtell, Des Moines, both of Wash., assignors to The Boeing Company

Continuation-in-part of Ser. No. 37,348, Mar. 26, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 326,113

Int. Cl.^{6} H01J *25/04;* **H03B** *9/02*

U.S. Cl. 331—81 **18 Claims**



1. An apparatus for generating a plurality of electrons in the form of an electron current pulse, comprising:

(a) an anode grid;

(b) a cold emission cathode, positioned in close proximity to the anode grid, the cathode including means for emitting electrons in response to a voltage difference between the cathode and the anode grid;

(c) first and second conductors, across which a voltage difference may be established, the first conductor being coupled to the anode grid;

(d) a switch, coupled between the cathode and the second conductor, for selectively connecting the second conductor to the cathode and allowing a voltage difference to be applied between the cathode and anode grid such that electrons are emitted from the cathode as an electron current pulse; and

(e) a closure grid, positioned opposite the anode grid, and an interaction region, defined between the anode grid and the closure grid.

5,534,825
VOLAGE-CONTROLLED OSCILLATION CIRCUIT WITH AN IMPEDANCE ELEMENT FOR CARRIER-TO-NOISE COMPENSATION

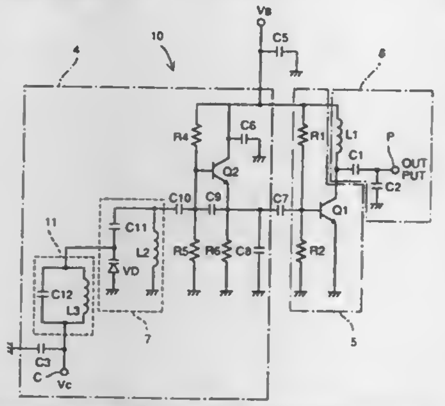
Shinji Goma, and Tatsuo Bizen, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 172,551, Dec. 23, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 431,409

Claims priority, application Japan, Dec. 25, 1992, 4-346496

Int. Cl.^{6} H03B *5/12*

U.S. Cl. 331—117 R **2 Claims**



1. A voltage-controlled oscillation circuit comprising:

an oscillation transistor;

a resonance circuit connected to said oscillation transistor for controlling an oscillation frequency thereof, said resonance circuit having a resonance frequency;

a control terminal for receiving a control voltage for controlling said resonance frequency of said resonance circuit;

said resonance circuit consisting of a variable-capacitance diode having a cathode which is connected to said impedance circuit so as to receive said control voltage from said control terminal via said impedance circuit for controlling said resonance frequency of said resonance circuit, and a grounded anode;

an inductor having a first end which delivers an output of said resonance circuit to said oscillation transistor, and a second end which is grounded; and

a capacitor connected between said cathode of said variable-capacitance diode and said first end of said inductor; and

a parallel impedance circuit interconnecting the control terminal and the resonance circuit, said parallel impedance circuit consisting of a single fixed capacitor in parallel with a single stripline inductor;

said resonance frequency of said resonance circuit being substantially equal to a resonance frequency of said parallel impedance circuit and said parallel impedance circuit having a substantially flat resonance characteristic.

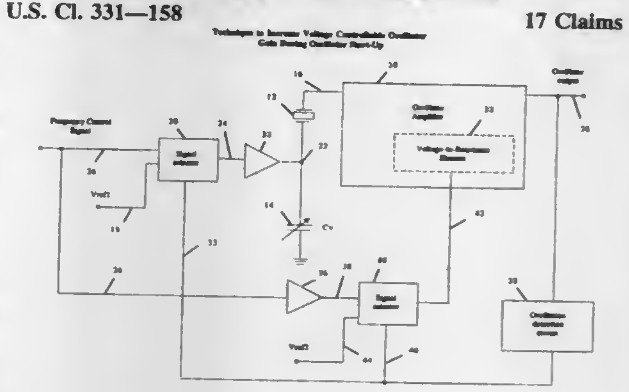
5,534,826
OSCILLATOR WITH INCREASED RELIABILITY START UP

Shawn M. Logan, Andover, Mass., assignor to AT&T Corp., Murray Hill, N.J.

Filed Oct. 24, 1994, Ser. No. 327,778

Int. Cl.^{6} H03B *5/06;5/36;* **H03K** *3/014*

U.S. Cl. 331—158 **17 Claims**



1. An oscillator, comprising;

at least one controllable element which sets the operating frequency of the oscillator in response to a control signal;

a means for detecting onset of oscillation of the oscillator;

a means responsive to the detecting means for setting a value of the control signal which insures that the oscillator will oscillate when it is turned on.

5,534,827
MODULATOR

Takafumi Yamaji, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 19, 1993, Ser. No. 33,750

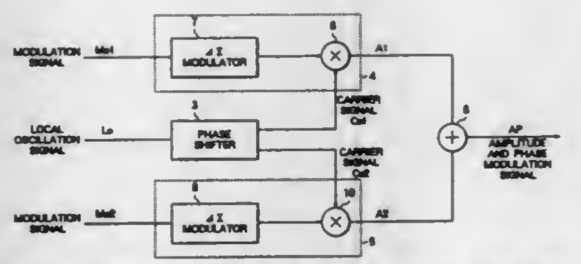
Claims priority, application Japan, Mar. 30, 1992, 4-074471; Feb. 8, 1993, 5-020072

Int. Cl.^{6} H03C *1/00;3/00*

U.S. Cl. 332—103 **9 Claims**

1. A modulator, comprising:

a delta sigma modulator for converting a modulation signal into a ternary signal, and



multiplication means for multiplying said ternary signal and a carrier signal and for outputting the product of said carrier signal and said ternary signal.

6. A modulator, comprising:

a delta sigma modulator for converting a modulation signal into a binary signal, and

multiplication means for multiplying said binary signal and a carrier signal and for outputting the product of said carrier signal and said binary signal, wherein values of the binary signal are 1 and −1.

5,534,828
DIGITIZED QUADRATURE MODULATOR

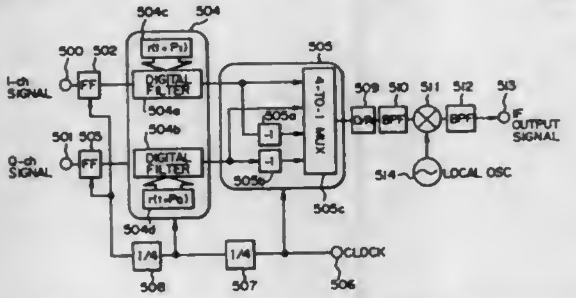
Takashi Okada, Kanagawa, and Tadashi Shirato, Tokyo, both of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 18, 1995, Ser. No. 503,478

Claims priority, application Japan, Jul. 20, 1994, 6-168280; Aug. 5, 1994, 6-203032; Aug. 5, 1994, 6-203033; Aug. 8, 1994, 6-204179

Int. Cl.^{6} H03C *1/00;3/00;* **H04L** *27/20*

U.S. Cl. 332—103 **13 Claims**



1. A digitized quadrature modulator for receiving n-sequence(s) (n is an integer equal to or greater than one) of I-channel input digital signal and n-sequence(s) of Q-channel input digital signal, and for quadrature modulating the I-channel and Q-channel input digital signals by a digital signal processing, comprising:

a digital filter for shaping a spectrum of the I-channel and Q-channel input digital signals to provide I-channel and Q-channel output signals, said output signals having a predetermined phase shift between the I-channel and the Q-channel so as to compensate a phase difference based upon the quadrature modulation by the digital signal processing;

complementary circuits for taking complement of the I-channel and Q-channel output signals to provide I-channel and Q-channel complement signals; and

a multiplexer circuit for multiplexing the I-channel and Q-channel output signals from the digital filter and the I-channel and Q-channel complement signals from the complementary circuits to provide a quadrature modulated output signal.

5,534,829
ANTENNA DUPLEXER

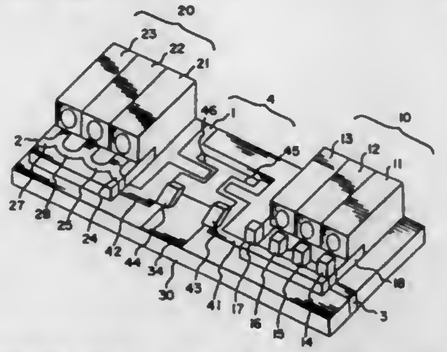
Yasumi Kobayashi; Kousuke Takeuchi; Yasuhiro Hirao, and Kenichi Shibata, all of Osaka-fu, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 25, 1994, Ser. No. 249,012

Claims priority, application Japan, May 31, 1993, 5-154132

Int. Cl.^{6} H01P *1/213*

U.S. Cl. 333—126 **12 Claims**



1. An antenna duplexer having a filter for wave receiving and a filter for wave transmission, respective one ends of both the filters being connected to an antenna shared terminal through a matching circuit which includes transmission lines, wherein

a characteristic impedance of at least one of the transmission line connecting said antenna shared terminal and said filter for wave receiving to each other and the transmission line connecting said antenna shared terminal and said filter for wave transmission to each other is a value other than a standard characteristic impedance of a receiver circuit and a transmitter circuit connected to said antenna duplexer, and a total impedance of said filters for wave transmission and wave receiving and the respective transmission lines is said standard characteristic impedance.

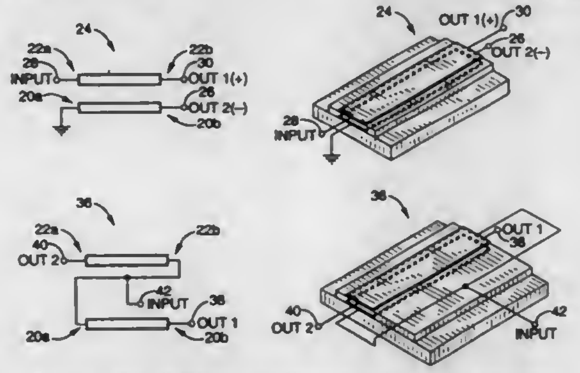
5,534,830
THICK FILM BALANCED LINE STRUCTURE, AND MICROWAVE BALUNS, RESONATORS, MIXERS, SPLITTERS, AND FILTERS CONSTRUCTED THEREFROM

Loren E. Ralph, Citrus Heights, Calif., assignor to R F Prime Corporation, Sacramento, Calif.

Filed Jan. 3, 1995, Ser. No. 368,551

Int. Cl.^{6} H01P *5/10;5/12;* **H01F** *5/00;* **H01G** *4/06*

U.S. Cl. 333—128 **11 Claims**



1. A thick film balanced transmission line cell, comprising:

(a) a dielectric substrate base;

(b) a first continuous metal trace, said first metal trace print and fire deposited on said substrate base, said first metal trace having a width W and a length L, said first metal trace having first and second ends;

(c) a dielectric layer, said dielectric layer print and fire deposited over and around said first metal trace, said dielectric layer having a thickness ranging from approximately 0.0026 inches to approximately 0.0038 inches, said dielectric layer having a dielectric constant ranging from approximately 6 to approximately 10; and

(d) a second continuous and exposed metal trace, said second metal trace print and fire deposited on said dielectric layer, said second metal trace having said width and said length L, said second metal trace having first and second ends, said second metal trace aligned with and generally parallel to said first metal trace over said width W and said length L, said first end of said second metal trace aligned with said first end of said first metal trace, said second end of said second metal trace aligned with said second end of said first metal trace;

(e) wherein said first and second metal traces form a balanced transmission line having a line impedance and operational frequency, said line impedance determined by said width W, said operational frequency determined by said length L.

5,534,831
PLANE TYPE STRIP-LINE FILTER IN WHICH STRIP LINE IS SHORTENED AND DUAL MODE RESONATOR IN WHICH TWO TYPES MICROWAVES ARE INDEPENDENTLY RESONATED

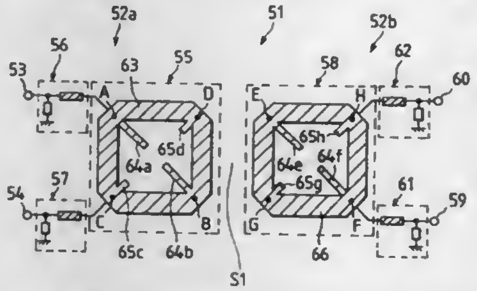
Hiroyuki Yabuki; Michiaki Matsuo, both of Kawasaki; Morikazu Sagawa, Tokyo, and Mitsuo Makimoto, Yokohama, all of, Japan, assignors to Matsushita Industrial Electric Co., Ltd., Osaka, Japan

Filed Oct. 4, 1994, Ser. No. 317,505

Claims priority, application Japan, Oct. 4, 1993, 5-247845; Dec. 22, 1993, 5-325070; Aug. 11, 1994, 6-189496

Int. Cl.^{6} H01P *1/203;7/08*

U.S. Cl. 333—204 **14 Claims**



1. A strip-line filter in which two microwaves are resonated and filtered, comprising:

a first one-wavelength loop-shaped strip line resonator having a uniform line impedance for selectively resonating a first microwave according to a first resonance mode and selectively resonating a second microwave according to a second resonance mode orthogonal to the first resonance mode, the first one-wavelength loop-shaped strip line resonator having a first parallel coupling line, and a first coupling point A, a second coupling point B spaced 180 degrees in electric length apart from the first coupling point A, a third coupling point C spaced 90 degrees in electric length apart from the first coupling point A and a fourth coupling point D spaced 180 degrees in electric length apart from the third coupling point C being placed in the first one-wavelength loop-shaped strip line resonator;

a first microwave inputting element for inputting the first microwave to the first one-wavelength loop-shaped strip line resonator to maximize a first electric voltage induced in the first one-wavelength loop-shaped strip line resonator by the first microwave at the coupling points A and B;

a second microwave inputting element for inputting the second microwave to the first one-wavelength loop-shaped strip line resonator to maximize a second electric voltage induced in the first one-wavelength loop-shaped strip line resonator by the second microwave at the coupling points C and D;

a pair of first open-end transmission lines connected to the coupling points A and B of the first one-wavelength loop-shaped strip line resonator for electromagnetically influencing the first microwave resonated in the first one-wavelength loop-shaped strip line resonator, the first open-end transmission lines having the same electromagnetic characteristics, and a first wavelength of the first microwave being determined by the line impedance of the first one-wavelength loop-shaped strip line resonator and the electromagnetic characteristics of the first open-end transmission lines;

a second one-wavelength loop-shaped strip line resonator having the same uniform line impedance as that of the first one-wavelength loop-shaped strip line resonator for selectively resonating the first microwave resonated in the first one-wavelength loop-shaped strip line resonator according to the first resonance mode and selectively resonating the second microwave resonated in the first one-wavelength loop-shaped strip line resonator according to the second resonance mode, the second one-wavelength loop-shaped strip line resonator having a second parallel coupling line which faces the first parallel coupling line of the first one-wavelength loop-shaped strip line resonator in parallel through a parallel coupling space to couple the second one-wavelength loop-shaped strip line resonator to the first one-wavelength loop-shaped strip line resonator, and a fifth coupling point E, a sixth coupling point F spaced 180 degrees in electric length apart from the fifth coupling point E, a seventh coupling point G spaced 90 degrees in electric length apart from the fifth coupling point E and an eighth coupling point H spaced 180 degrees in electric length apart from the seventh coupling point G being placed in the second one-wavelength loop-shaped strip line resonator;

a pair of second open-end transmission lines connected to two coupling points selected from among the coupling points E,F,G,H of the second one-wavelength loop-shaped strip line resonator for electromagnetically influencing the first microwave resonated in the second one-wavelength loop-shaped strip line resonator, the second open-end transmission lines respectively having the same electromagnetic characteristics as those of the first open-end transmission lines;

a first microwave outputting element for outputting the first microwave resonated in the second one-wavelength loop-shaped strip line resonator from a coupling point at which one of the second open-end transmission lines is connected; and

a second microwave outputting element for outputting the second microwave resonated in the second one-wavelength loop-shaped strip line resonator from another coupling point at which any second open-end transmission line is not connected.

5,534,832
SWITCH

Pierre Duchemin, Fouqueux; Gilles Baurand, Montesson la Borde, and Dominique Leglaye, Rueil Malmaison, all of, France, assignors to Telemecanique, Rueil Malmaison, France

Continuation of Ser. No. 217,868, Mar. 25, 1994, abandoned.

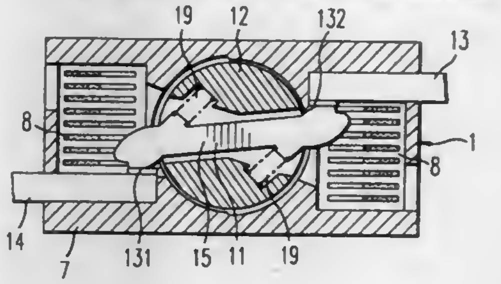
This application Nov. 13, 1995, Ser. No. 558,934

Claims priority, application France, Mar. 25, 1993, 93 03562; Sep. 24, 1993, 93 11481

Int. Cl.^{6} H01H *75/00*

U.S. Cl. 335—16 **21 Claims**

1. A switch having at least one power switching pole



comprising:
- a contact holder bearing a contact bridge;
- said contact bridge cooperating with fixed contacts and being fastened to a drive crank;
- wherein springs are mounted between said contact bridge and said contact holder to provide the contact pressure for the closing position of contacts and to induce no return force for the opening position of contacts;
- and wherein a transmission mechanism driven from an electromagnet or a tripping mechanism and adapted to operate on said drive crank for causing said contact bridge to move.

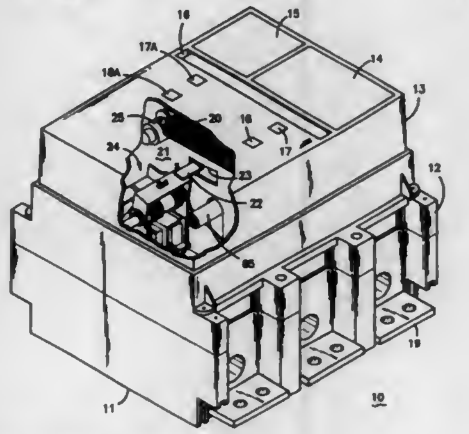
5,534,833
CIRCUIT BREAKER REMOTE CLOSING OPERATOR

Roger N. Castonguay, Terryville; James J. Smith, Avon, and Thomas A. Murphy, Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 11, 1994, Ser. No. 323,305

Int. Cl.⁶ H01H ***3/00***

U.S. Cl. 335—68 **14 Claims**



1. A circuit breaker comprising:
- a molded plastic base and cover;
- a circuit breaker closing spring within said cover and arranged for moving circuit breaker contacts to a closed position;
- an actuator lever within said cover arranged for releasing said closing spring;
- a remote closing assembly within said cover interacting with said actuator lever upon receipt of a remote signal for releasing said closing springs, said closing assembly including a closing lever interacting with said actuator lever and with a closing solenoid for moving said actuator lever to a releasing position; and
- a switch actuator lever interacting with said closing lever and a holding solenoid to electrically disconnect said closing solenoid when said closing springs are released.

5,534,834
ARMATURE MOUNT FOR AN ELECTROMAGNETIC RELAY

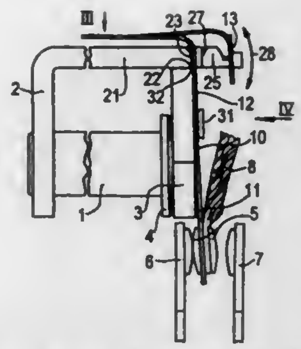
Horst Hendel, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 10, 1995, Ser. No. 513,616

Claims priority, application Germany, Aug. 19, 1994, 44 29 552.9

Int. Cl.⁶ H01H ***51/22***

U.S. Cl. 335—78 **20 Claims**



1. An armature mount for an electromagnetic relay, the armature mount comprising:
- a generally plate-like armature having an armature end face;
- a flat yoke leg arranged generally parallel to a coil core, the flat yoke leg having:
  - a broad side facing the armature and the coil core;
  - a yoke end face, at least one bearing edge being formed by the yoke end face and an adjacent portion of said broad side, the armature end face being seated against the broad side; and
  - at least one retainer peg projecting beyond the end face, whereby the armature is arranged at approximately a right angle relative to the yoke leg and forms a working air gap together with the coil core; and
- an armature spring having:
  - a bearing section secured flatly to a side of the armature facing away from the coil core, the bearing section lying on the yoke end face; and
  - a pre-stress section holding the spring at the retainer peg and being seated at the retainer peg at an engagement point with a pre-stress force such that the inside bearing edge formed between the bearing section of the spring and the armature end face is urged in contact against each bearing edge of the yoke leg.

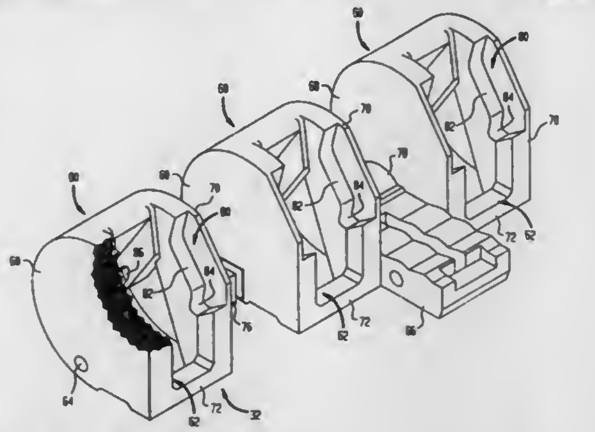
5,534,835
CIRCUIT BREAKER WITH MOLDED CAM SURFACES

Rex J. McColloch, Snellville; Stephen D. Cella, Stone Mountain, and Bernard DiMarco, Lilburn, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 30, 1995, Ser. No. 413,757

Int. Cl.⁶ H01H ***9/00***

U.S. Cl. 335—172 **25 Claims**



1. A circuit breaker comprising:
- a base;
- a contact arm pivotally attached to the base to pivot about a first axis between open and closed positions;
- a single piece crossbar formed from plastic, and pivotally attached to the base to pivot about a second axis parallel to the first axis between open and closed positions; and
- a clutch including a cam surface molded integrally with the crossbar, the clutch coupling the contact arm to the crossbar to move the contact arm from its closed position to its open position when the crossbar is moved from its closed position to its open position, and to permit the contact arm to move from its closed position to its open position while the crossbar is in its closed position.

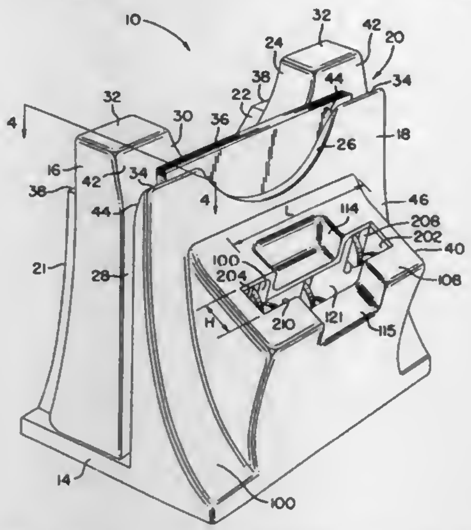
5,534,836
DEACTIVATOR FOR THEFT-DETERRENT MARKERS

Howard M. Schenkel, Boca Raton; Jon Buzzard, Margate, and Jeffrey J. Ronan, Deerfield Beach, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Nov. 28, 1994, Ser. No. 345,479

Int. Cl.⁶ H01F ***13/00***

U.S. Cl. 335—284 **47 Claims**



1. A device for activating a theft deterrent marker on an object, the device comprising:
- a receptacle for receiving the object, the receptacle comprising a first wall and a second wall defining a space therebetween, the first and second walls being spaced apart such that the object can be placed in the space between the first and second walls and the first wall being movable relative to the second wall such that the size of the space between the walls varies according to the size of the object;
- a deactivator for deactivating the marker, the deactivator being positioned in the receptacle such that the marker is deactivated when the object is placed between the first and second walls; and
- means for biasing the first wall towards the second wall such that when the object is placed in the space between the first and second walls, the object is held between the first and second walls by the means for biasing.

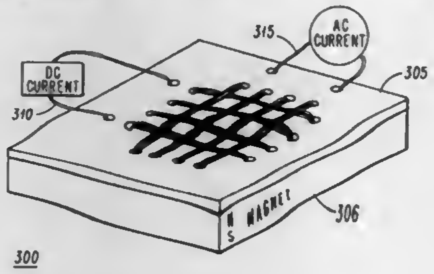
5,534,837
ORTHOGONAL-FIELD ELECTRICALLY VARIABLE MAGNETIC DEVICE

Randy L. Brandt, Orange, Calif., assignor to Rockwell International, Seal Beach, Calif.

Filed Jul. 28, 1994, Ser. No. 281,949

Int. Cl.⁶ H01F ***21/08***

U.S. Cl. 336—155 **16 Claims**



1. An electro-magnetic device comprising:
- a low-profile magnetically permeable substrate;
- a first set of windings, magnetically coupled to the substrate having a first resultant force with respect to an alternating current input signal; and,
- a second set of windings, magnetically coupled to the substrate, having a second resultant force with respect to a direct current input signal that is orthogonal in direction to the first resultant force;
- wherein the orthogonal resultant forces alters the permeability of the device, extending its operating range prior to saturation.

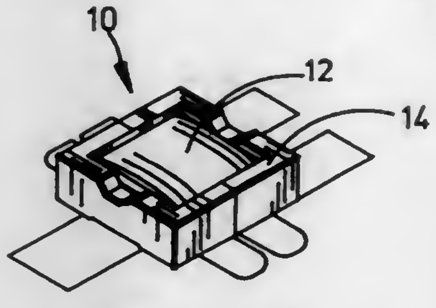
5,534,838
LOW PROFILE HIGH POWER SURFACE MOUNT TRANSFORMER

Paul M. Lindberg, San Diego, Calif., assignor to Pulse Engineering, Inc., San Diego, Calif.

Filed Aug. 5, 1993, Ser. No. 102,577

Int. Cl.⁶ H01F ***15/10;27/30***

U.S. Cl. 336—183 **20 Claims**



1. A low profile transformer, comprising:
- a support member for supporting a coil winding;
- a first elongated conductive tape section having at least one conductor having co-planar lead terminal formed integral therewith formed into a first coil of at least one turn on said support member;
- a second elongated conductive tape section having at least one conductor having co-planar lead terminals formed integral therewith wound into a second coil of at least one turn directly on said first coil;
- a third elongated conductive tape section having at least one conductor having a co-planar lead terminal formed integral therewith and said third tape section formed as a co-planar continuation of said first tape section with a laterally extending interconnection providing co-planar exit and co-planar entrance between coils of said first tape section and said third tape section, said third tape section wound directly on said second coil so that said second elongated conductive tape is interleaved between said first and third sections, said conductor of said first tape section, said conductor of said third tape section and said laterally extending interconnection consisting of a single continuous conductor, said terminal leads of each of said conductive tape sections extending from and disposed in a common plane at a base of said support member for engagement and surface bonding to a PC board.

5,534,839
MINIATURE TRANSFORMER

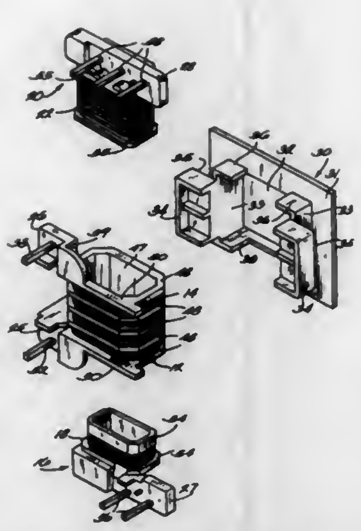
Sean M. Mackin, Wauwatosa, and Jeffrey D. Brown, Port Washington, both of Wis., assignors to Cramer Coil & Transformer Co., Inc., Saukville, Wis.

Filed Apr. 5, 1995, Ser. No. 417,002

Int. Cl.⁶ H01F ***15/10;27/30***

U.S. Cl. 336—192 **12 Claims**

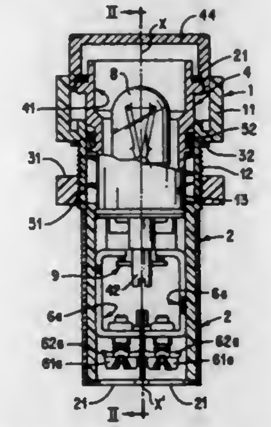
1. A miniature transformer for use with printed circuit boards includes a winding assembly comprising a first tubular bobbin having at least one end opening, a first winding disposed on the first bobbin, a second tubular bobbin, a second winding disposed on the second bobbin, said second tubular bobbin being telescopically received within the end opening of the first tubular bobbin,



and shroud means receivable over said first bobbin and including a locking portion for retaining said second bobbin within the end opening of said first bobbin, a first core receiving portion formed on said winding assembly and a second core receiving portion is formed on said shroud means, said first and second core receiving portions being disposed in a spaced apart relation, and a core receivable between said first and second core receiving portions and defining a magnetic circuit with respect to said first and second windings, said first and second core receiving portions including flange means for separating said core from said first and second windings.

5,534,840
CONTROL AND/OR INDICATOR UNIT

Patrick Cuingnet, Soyaux, France, assignor to Schneider Electric SA, Boulogne Billancourt, France
Filed Jul. 5, 1994, Ser. No. 270,666
Claims priority, application France, Jul. 2, 1993, 93 08234
Int. Cl.⁶ H01H *37/00;9/00*
U.S. Cl. 337—1 **12 Claims**



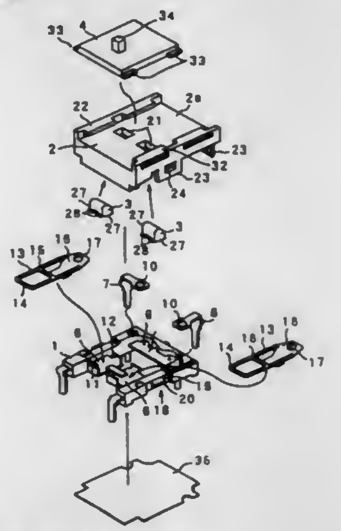
1. A switch unit which provides at least one of a control signal and an indicator signal comprising:
- (a) a body having:
  - (i) first and second ends;
  - (ii) a flange adjacent to said first end; and
  - (iii) a body opening at said second end;
- (b) a cap having:
  - (i) first and second ends;
  - (ii) a body receiving opening at said first end through which said second end of said body extends such that said cap at least partially closes said body opening;
  - (iii) a cap wall;
  - (iv) at least one wire access opening disposed in said cap wall; and
  - (v) at least one screw access opening at said second end of said cap;
- (c) at least one screw disposed inside of said cap, said at least one screw having a head inside of said cap, said head exposed to an exterior of said cap by way of said at least one screw access opening of said cap;
- (d) at least one bent conductive member disposed inside of said cap, said at least one bent conductive member including a connecting portion which receives said at least one screw, and wherein said connecting portion is exposed to the exterior of said cap by way of said at least one wire access opening of said cap.

5,534,841

Patent Not Issued For This Number

5,534,842
CIRCUIT BREAKING SWITCH WITH FUSIBLE ELEMENT THAT RESPONDS TO CURRENT OVERLOADS

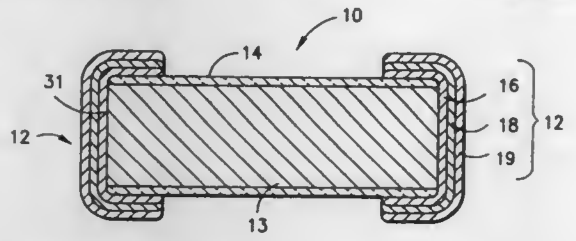
Keiichi Nagayama, Nagoya, Japan; Masami Noguchi, Aichi-gun, and Takahiro Sakakino, Nagoya, all of, Japan, assignors to Omron Corporation, Kyoto, Japan
Filed Aug. 26, 1994, Ser. No. 296,800
Claims priority, application Japan, Aug. 26, 1993, 5-234161
Int. Cl.⁶ H01H *37/76;85/00*
U.S. Cl. 337—402 **10 Claims**



1. An electrical switch comprising:
- a movable piece biased to render the switch open;
- a meltable actuator for holding the movable piece in a position that renders the switch closed, the actuator being made of a material that melts from an overcurrent therethrough, wherein melting of the actuator by such an overcurrent releases the movable piece to return to its switch open position and open the switch; and
- a mechanical assembly to allow the actuator to move away from the movable piece to place the switch in an OFF state when the actuator is not melted.

5,534,843
THERMISTOR

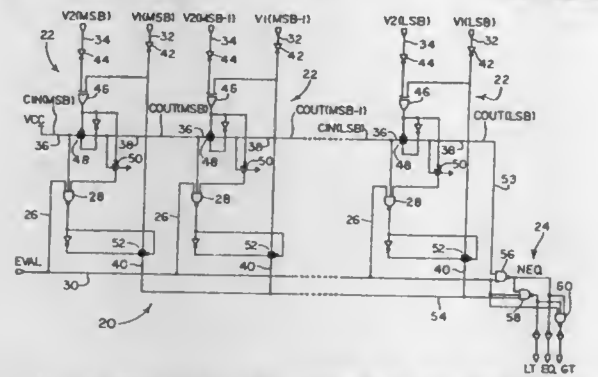
Masakiyo Tsunoda; Hiroaki Nakajima, and Masami Koshimura, all of Saitama-Ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Jan. 28, 1994, Ser. No. 189,163
Claims priority, application Japan, Jan. 28, 1993, 5-032755
Int. Cl.⁶ H01C *7/10*
U.S. Cl. 338—22 R **20 Claims**



1. A thermistor, comprising:
- a thermistor element having first and second opposed end surfaces, and first, second third and fourth peripheral sides;
- an insulating glass layer on said first, second third and fourth peripheral sides;
- said first and second opposed end surfaces being substantially free of said insulating glass layer;
- said insulating glass layer being at least partially crystallized glass;
- a terminal electrode on each of said first and second opposed end surfaces; and
- said terminal electrode having a baked-on electrode layer in contact with its respective end surface, and at least one plated layer on said baked-on electrode layer.

5,534,844
COMPARATOR CIRCUIT

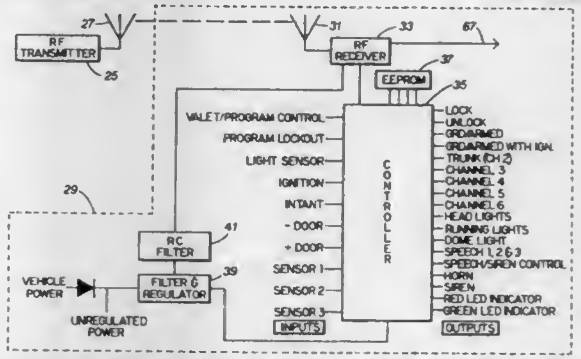
David Norris, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Division of Ser. No. 333,410, Nov. 2, 1994, Ser. No. 333,451, Nov. 2, 1994, Ser. No. 333,537, Nov. 2, 1994, Ser. No. 333,387, Nov. 2, 1994, Ser. No. 334,462, Nov. 2, 1994, Ser. No. 333,564, Nov. 2, 1994, Ser. No. 333,389, Nov. 2, 1994, Ser. No. 333,398, Nov. 2, 1994, Ser. No. 333,536, Nov. 2, 1994, Ser. No. 333,562, Nov. 2, 1994, Ser. No. 334,461, Nov. 2, 1994, Ser. No. 334,463, Nov. 2, 1994, Ser. No. 333,403, Nov. 2, 1994, Ser. No. 333,399, Nov. 2, 1994, Ser. No. 333,535, Nov. 2, 1994, Ser. No. 333,467, Nov. 2, 1994, Ser. No. 333,386, Nov. 2, 1994, Ser. No. 333,460, Nov. 2, 1994, and Ser. No. 399,951, Mar. 6, 1995. This application Apr. 3, 1995, Ser. No. 415,266
Int. Cl.⁶ G06F *7/02*
U.S. Cl. 340—146.2 **14 Claims**



1. A comparator circuit for comparing a first binary number having x bit positions with a second binary number having x bit positions, comprising:
- (a) a carry chain circuit of x comparison cells, each of said comparison cells having a first cell input for inputting a first voltage signal representing a binary value of a different bit position of said first number, a second cell input for inputting a second voltage signal representing a binary value of a bit position of said second number, said bit position of said second number corresponding to said bit position of said first number, and a first cell output;
- (b) a first carry chain input for inputting a third voltage to said carry chain circuit;
- (c) a first carry chain output for outputting said third voltage from said carry chain circuit; and
- (d) a second carry chain output connected to each of said first cell outputs;
  - wherein when said first binary number is equal to said second binary number, said comparator will output said third voltage signal through said first carry chain output, when said first binary number is greater than said second binary number, said comparator will output a fourth voltage signal through said second carry chain output, and when said first binary number is less than second binary number, said comparator will output a fifth voltage signal through said second carry chain output.

5,534,845
ADVANCED AUTOMOTIVE AUTOMATION AND SECURITY SYSTEM

Darrell E. Issa, 1598 Parkview Dr.; Jerry W. Birchfield, 743 Imperial Dr.; Glenn R. Busse, 2130 Redwood Crest; Sidney B. Perdue, 820 Sycamore Ave., #200, all of Vista, Calif. 92083, and Kenneth A. Ward, 3622 Mary La., Escondido, Calif. 92025
Filed Sep. 16, 1992, Ser. No. 945,667
Int. Cl.⁶ B60Q *1/00*
U.S. Cl. 340—425.5 **32 Claims**



1. An electrically powered security system for monitoring and controlling access to a protected area and having multiple levels of alert signal commensurate with the level of security threat to the area, comprising:
- a) a plurality of sensor input devices located about the protected area, for providing input corresponding to the level of security threat to the area;
- b) means for communicating multiple levels of alert signals, both visual and audible, commensurate with the level of threat received to the area, including:
  - (i) a low level alert consisting of a voice warnaway, series of audible chirps or blinking lights;
  - (ii) a medium level alert consisting of a combination of said voice warnaway, series of said audible chirps and said blinking lights; and,
  - (iii) a high level alert consisting of an immediate full siren alert and said blinking lights, wherein said audible siren alert is generated by a voltage at a siren;
- c) means for permanently storing system operational parameters within an electrically programmable and erasable read-only memory; and,
- d) a controller for using said operational parameters for controlling the operation of said security system so that said system operates in an armed mode wherein said controller monitors said input devices and causes said means for communicating to issue said multiple levels of alert signals of a level com-

mensurate with and in response to said sensor activated signal, or in a disarmed mode wherein said system is disabled from communicating said alert signals, said controller comprising:

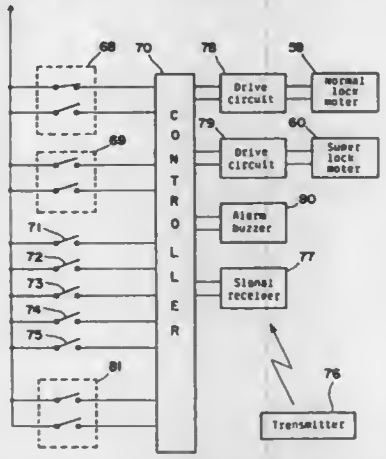
(i) means for detecting a sensor input signal corresponding to each said level of threat to the secured area;
(ii) means for generating an output signal to said means for communicating said level of alert corresponding to said sensor input signal; and,
(iii) means for generating an additional output signal to said means for communicating said level of alert upon receipt of additional input signals from said sensors either at the same or higher threat level or within a set period of time following receipt of first said sensor input signal.

5,534,846

VEHICLE DOOR LOCK DEVICE WITH SUPER LOCK MECHANISM

Katsuya Kuorda, Yamanashi-ken, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 91,288, Jul. 15, 1993, abandoned.
This application Jan. 30, 1995, Ser. No. 380,326
Claims priority, application Japan, Jul. 17, 1992, 4-213440; Sep. 21, 1992, 4-276651; Sep. 29, 1992, 4-283878
Int. Cl.^{6} B60R *25/10*
U.S. Cl. 340—426 **12 Claims**



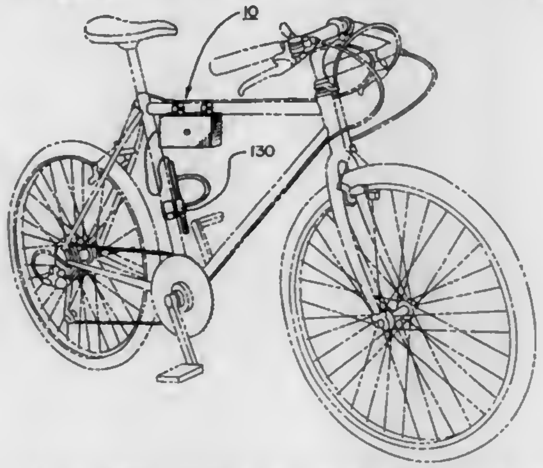
1. A door lock device for a car with a super lock mechanism comprising a lock lever moveable between a locked position and an unlocked position, a super lock member displaceable to a super locked position preventing the lock lever from moving between said locked position and said unlocked position and a released position enabling movement between said locked position and said unlocked position, super-lock-motor means for displacement of said super lock member between said super locked position and said released position, wherein rotation of a door key cylinder by a key in a locking direction actuates said super-lock-motor means to move the super lock member to said super lock position, wherein, rotation of the door key cylinder by the key in the unlocking direction actuates the super-lock-motor means to move the super lock member to the released position, and when said super-lock-motor means is inoperative further rotation of the door key cylinder by the key in the unlocking direction mechanically moves the lock lever into engagement with the super lock member and moves the super lock member to the released position,a first switch of a plurality of switches turned on when a key is inserted into an ignition key cylinder by the seat of a .driver of the car, a second switch of said plurality of switches turned on when a person is recognized within the car, a third switch of said plurality of switches turned on when a door of the car is open, a fourth switch of said plurality of switches turned on when the trunk is open, and the fifth switch of said plurality of switches turned on when a window of the car is open, and an alarm buzzer, said plurality of switches and the alarm buzzer connected to a control circuit of the door lock device, the alarm buzzer being actuated, when any one of said plurality of switches is turned on and the door key cylinder is rotated in a locking direction by the key.

5,534,847

BICYCLE ALARM SYSTEM

Gerald C. McGregor, 6096 SW. 29th Pl., Ft. Lauderdale, Fla. 33314

Filed Nov. 23, 1994, Ser. No. 344,215
Int. Cl.^{6} B62J *3/00*
U.S. Cl. 340—432 **1 Claim**



1. A bicycle alarm system for preventing unauthorized access of a user's bicycle comprising, in combination:

- a bicycle component further comprising:
  - a box-shaped rigid housing having a rectangular hack wall, a periphery formed of a top wall, bottom wall, and opposed side walls extended outwards from the back wall to define a hollow interior and a front opening, and a lid pivotally coupled to the bottom wall and positionable over the front opening and with one of the side walls further having a plurality of perforations disposed therethrough;
  - clamp means coupled to the top wall of the housing and securable to a frame of said bicycle for holding the housing in a rigid stationary position;
  - a key-lockable clamp adapted for securing said bicycle having a rigid tubular locking segment with two open ends and two spaced slots formed thereon between the ends, a rigid U-shaped electrically-conductive locking bracket having two free ends positionable within the slots of the locking segment, key-actuatable locking means disposed within one end of the locking segment and having a locked position for securing the locking bracket to the locking segment and an unlocked position for allowing the locking bracket to be removed from the locking segment, and an electrically-conductive alarm cable having a first terminal pair and a second terminal pair with the first terminal pair coupled to the ends of the locking bracket when placed in the locked position for defining an electrically conductive locking circuit;
  - a key-lockable cable mechanism adapted for securing said bicycle having a rigid locking base integral with the locking segment of the key-lockable clamp and extended outwardly therefrom in a direction opposite the locking bracket, a flexible sheathed locking cable having a fixed end secured to the locking base and a free end removably securable to the locking base, and a key-actuatable locking means extended from the locking base and having a locked position for securing the free end of the locking cable to the locking base and an unlocked position for allowing the free end of the locking cable to be removed from the locking base;
  - a motion detector extended from the housing and having an input terminal and an output terminal with the output terminal transmitting a motion detection signal when electrically energized through the input terminal and when

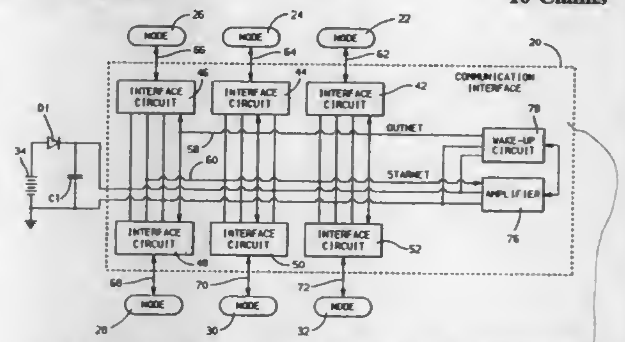
    actuated by intrusive motion of the housing with respect to the frame of the bicycle and with the output terminal transmitting no motion detection signal otherwise;
  - controller circuitry disposed within the housing and having a first input terminal coupled to a second terminal of the alarm cable, a second input terminal coupled to the output terminal of the motion detector, and an output terminal having one mode for transmitting an alarm activation signal upon receipt of said motion detection signal and another mode for transmitting an alarm activation signal when the locking circuit is intrusively broken;
  - a speaker coupled to the output terminal of the controller circuitry and positioned adjacent to the perforated side wall of the housing for transmitting an audible high frequency alarm signal upon receipt of the alarm activation signal;
  - a transmitter coupled to the output terminal of the controller circuitry for transmitting an alarm signal to a remote location through space upon receipt of the alarm activation signal;
  - an internal power source disposed within the housing for supplying electrical energy formed of a main battery and a back-up battery;
  - a power cable having an interior terminal end and an exterior terminal end with the exterior terminal end coupleable to an external power source for receiving electrical energy therefrom;
  - a power switch disposed within the housing and coupled between the internal power source and interior terminal of the power cable with the power switch having a first orientation for allowing electrical energy to be supplied from the main battery of the power source, a second orientation for allowing electrical energy to be supplied from the back-up battery of the power source, and a third orientation for allowing electrical energy to be supplied through the power cable;
  - a key-actuatable lockable activation switch coupled between the power switch, the motion detector, a second terminal end of the alarm cable, and the controller circuitry and further extended through the lid of the housing, the activation switch having a locked orientation for securing the lid to the housing while simultaneously allowing delivery of electrical energy to the motion detector, the alarm cable, and the controller circuitry, the activation switch further having an unlocked orientation for allowing the lid to be opened while simultaneously preventing the delivery of electrical energy;
  - a rigid holding clamp coupleable to the bicycle for holding the key-lockable clamp therein when not in use; and
  - a key for locking the key-lockable clamp and for actuating and locking the activation switch; and
- a user component further comprising:
  - a flexible strap having securement means on one end and securable means on the other end with the securable means coupleable with the securement means in a closed loop configuration about a wrist of a user;
  - a rigid box-shaped container having a bottom wall coupled to the strap between the ends thereof, a top wall, and a periphery of four side walls interconnecting the top wall with the bottom wall to define a hollow interior;
  - a receiver disposed within the container for transmitting an alarm activation signal upon receipt of the alarm signal from the transmitter of the bicycle component;
  - a speaker disposed within the container, coupled to the receiver, and extended through the top wall of the container for transmitting an audible high-frequency alarm upon receipt of the alarm activation signal;
  - a battery disposed within the container for supplying electrical energy; and
  - a power switch coupled between the battery and receiver and extended through the top wall of the container and with the power switch having one orientation for allowing electrical energy to be delivered to the receiver and another orientation for preventing such delivery.

5,534,848

AUTOMOTIVE FAULT TOLERANT SERIAL COMMUNICATION

Robert E. Steele, Cortland; Mark E. Burns, Burton, and David M. Felden, Boardman, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1994, Ser. No. 246,036
Int. Cl.^{6} G08B *23/00*
U.S. Cl. 340—517 **10 Claims**



1. A fault tolerant automotive on-board serial communication network having a plurality of nodes and a central communication interface, each of the plurality of nodes having at least one automotive electronic device associated therewith, wherein the automotive electronic device of any of the plurality of nodes may communicate bi-directionally with the electronic devices of the other of the plurality of nodes across the communication interface, the communication interface further comprising:

- an input serial communication link;
- an output serial communication link;
- a signal amplifier for receiving serial communication information from the input serial communication link and for outputting amplified serial communication information on the output serial communication link; and
- an interface circuit for communicating input serial communication information from at least one automotive electronic device to the input serial communication link and for communicating the amplified serial communication information from the output serial communication link to the at least one automotive electronic device, the interface circuit including fault tolerance circuitry for detecting the presence of any of a predetermined set of fault conditions indicated by the input serial communication information and for electronically isolating the communications network from the at least one automotive electronic device upon detecting the presence of any of the predetermined set.

5,534,849

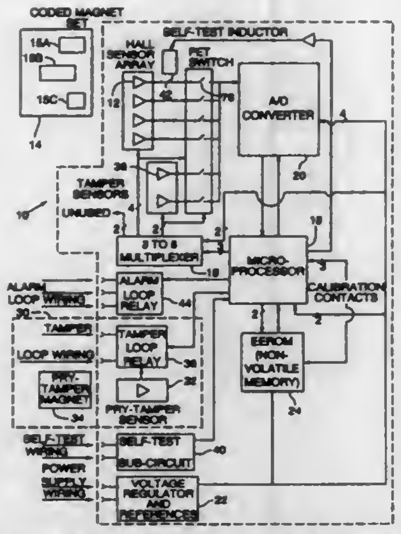
TIME MULTIPLEXED, FALSE ALARM RESISTANT MAGNETICALLY ACTUATED SECURITY SYSTEM

Kevin B. McDonald, Portland; Stephen W. Pierce, Tigard; Michael Benowitz, Lake Oswego, and David S. Terrett, Beaverton, all of Oreg., assignors to Sentrol, Inc., Tualatin, Oreg.

Continuation of Ser. No. 105,588, Aug. 11, 1993, abandoned.
This application Dec. 6, 1994, Ser. No. 351,566
Int. Cl.^{6} G08B *13/08*
U.S. Cl. 340—517 **16 Claims**

1. A system for detecting a relative placement of moveable and fixed members of a barrier outside of a spatial window defined by minimum and maximum allowable distances between the moveable and fixed members, comprising:

- a magnetic field source to provide a multi-directional proximal magnetic field;
- multiple determinably selectable magnetic field sensors producing output signals responsive to the proximal magnetic field; and



- a sensor output signal responsive electrical circuit capable of selecting fewer than all of the determinably selectable sensors at a time and adaptable to selectively establish first and second retainable sensor output signal levels corresponding to the respective minimum and maximum allowable distances between the moveable and fixed members that define the spatial window outside of which relative placement of the moveable and fixed barrier members enables the sensor output signal responsive electrical circuit to notify a monitoring system.

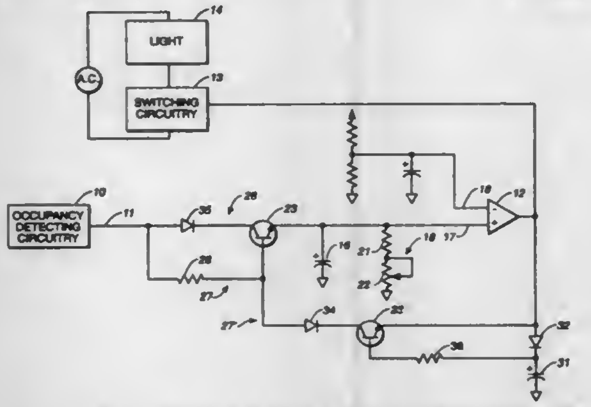
5,534,850
TRANSIENT CONTROL CIRCUIT FOR OCCUPANCY DETECTOR

Wade Lee, Lafayette, Calif., assignor to Larry C. Y. Lee, Hayward, Calif.

Filed Jul. 7, 1994, Ser. No. 271,886

Int. Cl.^{6} G08B *13/00*

U.S. Cl. 340—565 6 Claims



1. A circuit arrangement for use in an occupancy detector for protection against false triggering, the occupancy detector providing an intermediate signal indicating detection of a target object and including an output stage receiving said intermediate signal and providing a trigger signal in response thereto for energizing a load in response to the detection of said target object, said circuit arrangement comprising:

- a first RC network having a first characteristic charge decay time, said first RC network being coupled to said output stage such that said first characteristic charge decay time governs the duration for which said output stage asserts said trigger signal and thereby governs the duration for which said load is energized;
- a second RC network having a second characteristic charge decay time, said second RC network being coupled to said output stage to charge when said output stage asserts said trigger signal and to discharge when said output stage deasserts said trigger signal;
- a first transistor switch for applying said intermediate signal to said output stage, said first transistor switch being operative upon assertion of said intermediate signal to charge said first RC network;
- circuit means defining a bypass path for said intermediate signal bypassing said output stage; and
- a second transistor switch, operative upon deassertion of said trigger signal for a duration governed by said second characteristic charge decay time, for deactivating said first transistor switch and for diverting said intermediate signal to said bypass path;
- whereby any false intermediate signals generated upon deassertion of said trigger signal when said second transistor switch is operative will be diverted to said bypass path.

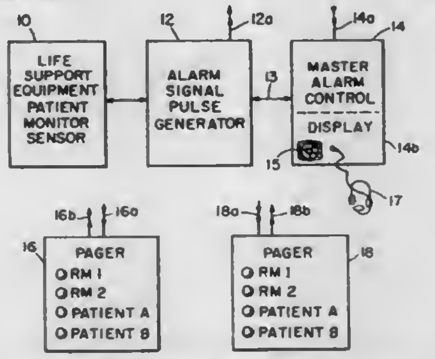
5,534,851
ALARM FOR PATIENT MONITOR AND LIFE SUPPORT EQUIPMENT

Linda G. Russek, 1200 N. Federal Hwy. Suite 209, Boca Raton, Fla. 33432

Continuation of Ser. No. 727,308, Jul. 10, 1991, Pat. No. 5,319,355, which is a continuation-in-part of Ser. No. 666,266, Mar. 6, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,393

Int. Cl.^{6} G08B *23/00*

U.S. Cl. 340—573 19 Claims



1. A communications system for medical use comprising:

- alarm signal generator means in communication with medical equipment associated with each of one or more patients for generating an alarm signal, said alarm signal identifying readings from said medical equipment;
- means for transmitting one or more paging messages to at least one paging means in response to said alarm signal, said one or more paging messages providing each of said at least one paging means with medical equipment status output information based upon said alarm signal, each of said at least one paging means having means for receiving said one or more paging messages and providing a visual display thereof;
- key input means for providing up-to-date staffing information to a memory means, said up-to-date staffing information being relevant to said one or more patients; and
- processing means for processing said up-to-date staffing information and said medical equipment status output information in order to prioritize said one or more paging messages, and automatically route said one or more paging messages to appropriate and available personnel based upon the up-to-date staffing information.

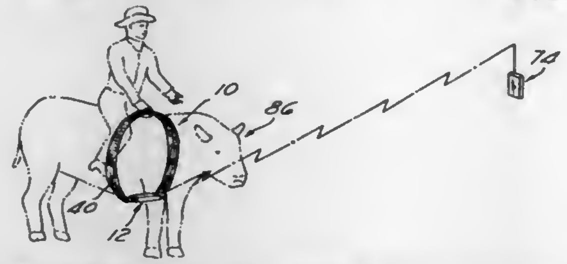
5,534,852
REMOTE SAFETY RELEASE MECHANISM

Craig L. Schuett, and Patrick Showalter, both of 1300 Matterhorn Dr., Riverside, Calif. 92506

Filed Mar. 29, 1995, Ser. No. 412,973

Int. Cl.^{6} G08B *23/00*

U.S. Cl. 340—573 4 Claims



1. A remote controlled safety release mechanism comprising:

- an elongate strap having opposed first and second ends;
- a housing, the first end of the strap being attached to the housing;
- a latch member pivotally connected to and protruding from the housing, the second end of the strap being releasably attached to the latch member; and
- an actuation assembly disposed within the housing and mechanically coupled to said latch member, said actuation assembly being operable to selectively move the latch member between a locked position wherein the second end of the strap is maintained in attachment thereto and an unlocked position wherein the second end of the strap is released therefrom, said actuation assembly comprising:
  - a cylinder having a piston rod extending therefrom which is pivotally connected to said latch member;
  - a solenoid valve fluidly connected to said cylinder;
  - a pressurized fluid source fluidly connected to said solenoid valve;
  - a power supply;
- a signal receiving module electrically connected to said power supply for receiving the control signal transmitted to the actuation assembly; and
- a switching module electrically connected to said power supply, said signal receiving module and said solenoid valve for channeling power from the power supply to the solenoid valve upon the transmission of the control signal to the signal receiving module;
- said actuation assembly being adapted to receive a control signal, with the movement of the latch member between the locked and unlocked positions being facilitated by the selective transmission of the control signal to the actuation assembly.

5,534,853
ELECTRONIC APPARATUS FOR MEASURING THE PARAMETERS OF AN OIL TRANSFORMER

Olivier Pioch, Nice, France, assignor to Pioch S.A., Carros Cedex, France

PCT No. PCT/FR92/01067, § 371 Date Jul. 21, 1993, § 102(e) Date Jul. 21, 1993, PCT Pub. No. WO93/10587, PCT Pub. Date May 27, 1993

PCT Filed Nov. 16, 1992, Ser. No. 90,081

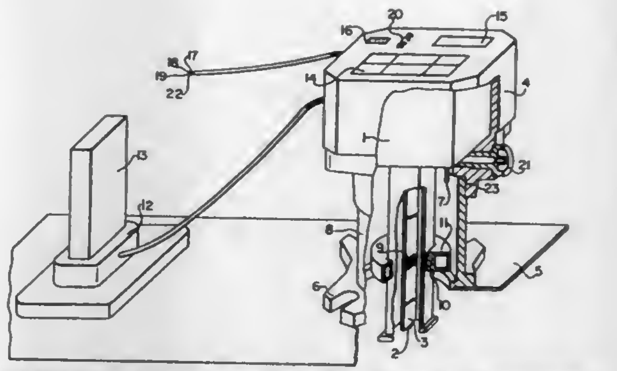
Claims priority, application France, Nov. 22, 1991, 91 14600

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—646 10 Claims

1. A protective device for an oil transformer, including electronic apparatus for measuring parameters of the oil transformer, the oil transformer having an interior and a dielectric fluid in the interior, said protective device comprising:

- a lower part fixed on the transformer, said lower part including a lower end penetrating into the interior of the transformer, said lower part being in communication with the interior of the transformer;



- parameter measuring means in said lower part for continuously measuring a set of operating parameters of the transformer;
- an upper part attached to and selectively separable from said lower part;
- memory means in said upper part for storing the parameters measured by said measuring means; and
- monitoring means for monitoring the operation of the parameters;
- said upper part and said lower part being made of a thermally and electrically insulating molded plastic and defining a separable, two-part casing.

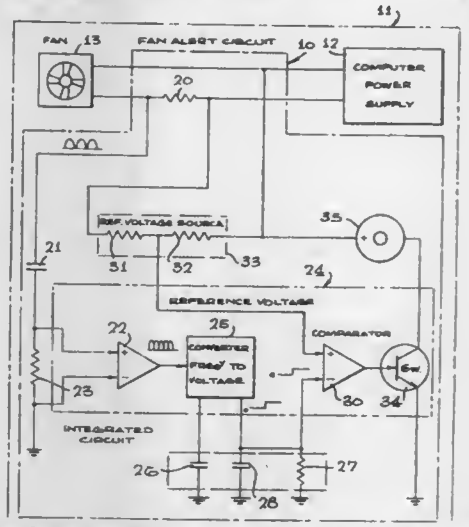
5,534,854
FAN FAILURE ALERT FOR ELECTRONIC EQUIPMENT

Rod J. Bradbury, 40323 Heathrow Dr., Palmdale, Calif. 93551; Willard C. Barnard, 13800 Oro Grande St., Sylmar, Calif. 91342, and Joel F. Wysong, Apt. C-56, 38419 5th St. West, Palmdale, Calif. 93551

Filed Jul. 10, 1995, Ser. No. 500,457

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—648 7 Claims



1. A fan failure alert for electronic equipment comprising:

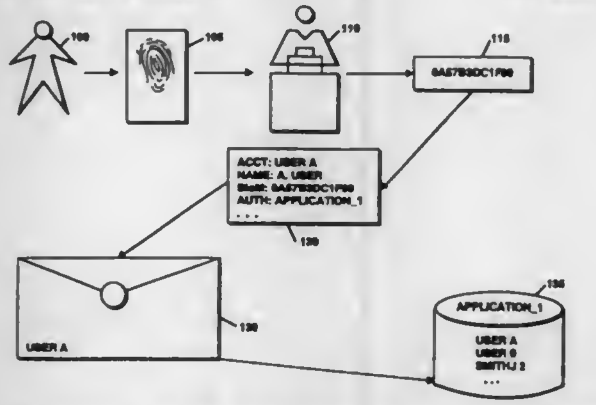
- a fan alert circuit coupled between a fan and its power source, said alert circuit comprising:
- a resistance sensing and pulse producing means for generating pulses having a frequency proportional to the fan's operating speed;
- an amplifier for receiving said pulses from said resistance sensing and pulse producing means;
- a frequency-to-voltage converter circuit coupled to said amplifier for producing an output voltage level in response to said amplified pulses;
- a reference voltage source connected to said resistance sensing and pulse producing means in parallel with said amplifier and said converter for setting a reference voltage level;
- a voltage comparator circuit receiving said reference voltage level and said output voltage level for comparison and for

generating a signal responsive to a difference between said reference voltage level and said output reference level; and

a switch connected to said comparator circuit operable in response to said signal for actuating an alert means.

5,534,855
METHOD AND SYSTEM FOR CERTIFICATE BASED ALIAS DETECTION

William R. Shockley, Salinas, Calif., and George E. Gajnak, Harvard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 916,818, Jul. 20, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 358,040
Int. Cl.^{6} H04Q *1/00*
U.S. Cl. 340—825.300 **27 Claims**



1. A method of operating a distributed computer system having alias detection, comprising the steps of:

A) storing, in a user account store of said computer system, identification information associated with each of a plurality of user accounts, said identification information for each said user account uniquely characterizing a computer user associated with said account;

B) storing a list of selected ones of said user accounts in an authorization store;

C) after steps (A) and (B), initiating execution of a computer system resources access program in response to a request on behalf of a first of said user accounts; and

D) after step (C), processing said request from said first user account for authorizing access to a computer system resource by performing the steps of

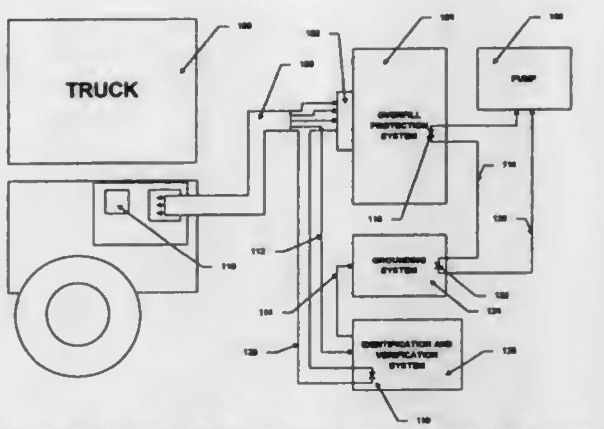
  i) comparing said identification information stored in said user account store in association with said first user account and identification information associated with each of said user accounts of said list of selected user accounts, and

  ii) executing said computer system access program if said compared identification information do not match, thereby indicating that said first user account is not an alias of any of said selected user accounts.

5,534,856
VEHICLE IDENTIFICATION AND VERIFICATION SYSTEM

Gary R. Cadman, Norwell, Mass., assignor to Scully Signal Company, Wilmington, Mass.
Filed Nov. 18, 1993, Ser. No. 154,346
Int. Cl.^{6} G08B *21/00;* **G06F** *7/04*
U.S. Cl. 340—825.340 **31 Claims**

1. A vehicle identification system including a vehicle apparatus and a monitoring terminal apparatus and being for use with a monitoring system having a wire for electrically connecting the vehicle to a monitoring terminal, the monitoring system, when said monitoring terminal apparatus is not present, generating monitoring signals on the wire, the identification system comprising:


TRUCK
OVERFILL PROTECTION SYSTEM
PUMP
GROUNDING SYSTEM
IDENTIFICATION AND VERIFICATION SYSTEM

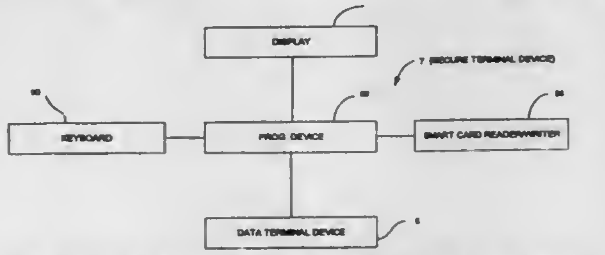
a memory mounted on the vehicle containing unique identifying information;

identification apparatus comprised by the monitoring terminal apparatus and connected between the monitoring terminal and the wire for generating identification signals and outputting them on the wire; and

interface apparatus connected between the wire and the memory, the interface apparatus, when the monitoring terminal apparatus is not present, being responsive to the monitoring signals for isolating the memory from the monitoring signals, and the interface apparatus, when the monitoring terminal apparatus is present, being responsive to the identification signals for allowing the memory to receive the identification signals.

5,534,857
METHOD AND SYSTEM FOR SECURE, DECENTRALIZED PERSONALIZATION OF SMART CARDS

Simon G. Laing, and Matthew P. Bowcock, both of Sydney, Australia, assignors to Security Domain Pty. Ltd., Australia
PCT No. PCT/AU92/00608, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/10509, PCT Pub. Date May 27, 1993
PCT Filed Nov. 10, 1992, Ser. No. 232,088
Claims priority, application Australia, Nov. 12, 1991. PK9443
Int. Cl.^{6} G07F *7/08;* **H04L** *9/32*
U.S. Cl. 340—825.34 **10 Claims**



1. A method for securely writing confidential data from issuer's secure computer to a customer smart card presented to a secure terminal device with smart card reader/writer connected to a retailer's data terminal device at a remote location, including the steps of:

(a) establishing a communications link between the data terminal device and the secure computer;

(b) authenticating the retailer to the issuer by:

  (i) presenting a retailer smart card to the secure terminal device reader/writer and establishing access to information stored in the smart card by entering a retailer secret code into the secure terminal device to unlock the retailer smart card

  (ii) reading data from the unlocked retailer smart card and sending only information pertaining to the identity of the retailer smart card to the secure computer;

  (iii) generating and sending from the secure computer a first random number to the secure terminal device;

  (iv) enciphering the first random number at the secure terminal device using a cipher key read from the unlocked retailer smart card, the cipher key having a value unrelated to the retailer secret code, and sending the enciphered first random number back to the secure computer;

  (v) comparing the retailer smart card identification data with data stored in the secure computer to identify the retailer smart card, then retrieving a cipher key stored in the secure computer associated with the identification data and enciphering the first random number with the cipher key; and

  (vi) comparing the enciphered first random number received from the secure terminal device with the enciphered first random number generated in the secure computer to authenticate the retailer when the values of the enciphered first random numbers are identical;

(c) establishing a mutual session key for enciphering data transfer between the secure terminal and the secure computer after authentication of the retailer to the issuer has been effected, the mutual session key being generated by using a common key stored in the secure computer and the retailer smart card;

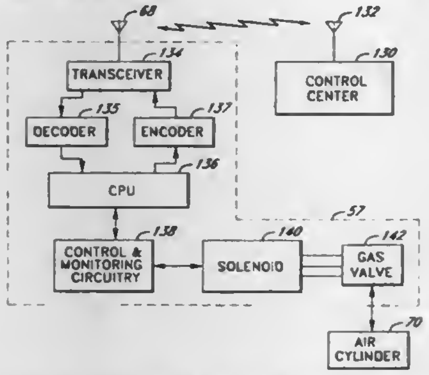
(d) retrieving the retailer smart card and subsequently presenting the customer smart card to the secure terminal device;

(e) enciphering at the secure computer, the confidential data to be written to the customer smart card using the mutual session key and sending the enciphered confidential data to the secure terminal device; and

(f) deciphering at the secure terminal device, the enciphered confidential data using the mutual session key and writing the confidential data on to the customer smart card.

5,534,858
POLETOP SWITCH AUTOMATION SYSTEM

Ronald B. Tinkham, Solana Beach, Calif., assignor to System Analysis & Integration, Inc., Orange, Calif.
Filed Jan. 14, 1994, Ser. No. 182,276
Int. Cl.^{6} G08C *19/22*
U.S. Cl. 340—870.07 **28 Claims**



1. A device for operating a high-voltage switch wherein the switch is mounted to the top of a utility pole and wherein said switch is connected to mechanical linkage extending along the pole and is activated through manipulation of said linkage, said device comprising:

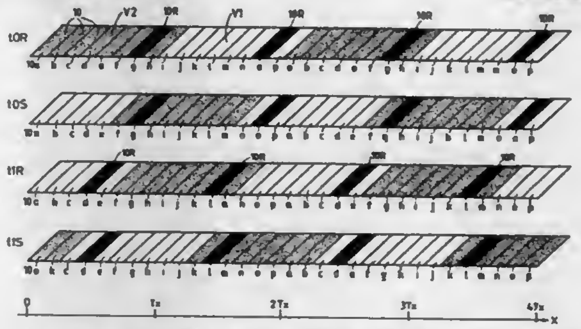
a manually-operable lever having a first end and a second end wherein said first end is rotatably connected to said pole at a pivot point;

a reciprocating assembly having first and second ends, said first end connected to said linkage and said second end connected to said lever at a point spaced from said pivot point such that a force applied in a first direction at said second end of said lever imparts movement of said assembly in said first direction, said assembly having a cylinder and having a reciprocating piston disposed therein for movement of said assembly while said lever is stationary, said movement of said assembly occurring between a first position wherein said reciprocating assembly is a first length and said switch is open, and a second position wherein said reciprocating assembly is a second different length and said switch is closed; and

a control unit in operative association with said reciprocating assembly permitting said position of said reciprocating assembly to be monitored and varied by said control unit.

5,534,859
INSTRUMENT FOR MEASURING LENGTHS OR ANGLES

Hans U. Meyer, Rue de Lausanne 42, 1110 Morges, Switzerland
Filed Sep. 23, 1994, Ser. No. 309,493
Claims priority, application Switzerland, Oct. 19, 1993, 3150/93
Int. Cl.^{6} G08C *19/10*
U.S. Cl. 340—870.37 **16 Claims**



1. A linear or angular measuring instrument comprising a capacitance sensor having a linear or curvilinear array of sensor electrodes, a scale facing said sensor and having an array of scale features, switching means for a) connecting first selected ones of the sensor electrodes to first means providing them with electrical signals so that they become part of a first spatially periodic pattern of momentarily transmitting electrodes and b) connecting second selected ones of the sensor electrodes to second means so that they become part of a second spatially periodic pattern of momentarily receiving electrodes, said second means determining a relative position of the sensor along the scale, wherein attribution of a sensor electrode to one of said first or second spatially periodic patterns is controlled by control means adapted to shift said first and said second spatially periodic patterns alternately by increments along said array of sensor electrodes so that the shifts of one spatially periodic pattern take place during the intervals between the shifts of the other spatially periodic pattern, the shifts of the first spatially periodic pattern being thus picked up by said second spatially periodic pattern of momentarily receiving electrodes, such that an electrode can be caused to become both transmitting and receiving during the course of a measurement said first and said second spatially periodic patterns being interleaved along said linear or curvilinear array of juxtaposed momentarily transmitting and receiving electrodes.

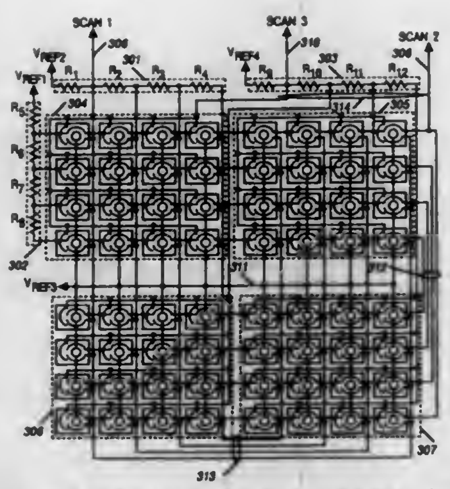
5,534,860
MULTIPLE KEY ARRAY

Joseph E. Phillips, 11709A Davey Dr., Huntley, Ill. 60142; John J. Oskorep, 9132 Stratford La., Palos Hills, Ill. 60465, and Steven S. Lee, 4214 Devonshire Ct., Northbrook, Ill. 60062
Filed May 2, 1994, Ser. No. 236,797
Int. Cl.^{6} H03M *11/20*
U.S. Cl. 341—22 **20 Claims**

1. An apparatus comprising:

a plurality of keys organized into K rows and J columns, where K and J are integer numbers greater than one;

a first resistor ladder comprised of K resistors connected in



series with a row node between each resistor, yielding K-1 row nodes, and a first voltage reference connected to a first end of the first resistor ladder and a Kth row node at a second end of the first resistor ladder;

K row conductors, wherein each of the K row nodes is coupled to one of the K row conductors;

a second resistor ladder comprised of J resistors connected in series with a column node between each resistor, yielding J-1 column nodes, and a

second voltage reference connected to a first end of the second resistor ladder and a Jth column node at a second end of the second resistor ladder;

J column conductors, wherein each of the J column nodes is coupled to one of the J column conductors;

a reference voltage conductor coupled to a third reference voltage;

a contact for each of the plurality of keys, such that when a key is depressed, electrical continuity is provided between the reference voltage conductor, one of the K row conductors, and one of the J column conductors.

5,534,861

METHOD AND SYSTEM FOR ADAPTIVELY BUILDING A STATIC ZIV-LEMPEL DICTIONARY FOR DATABASE COMPRESSION

Chung-Chia Chang, San Jose; Gregory L. Davoll, Los Gatos; Mohamed H. El-Ruby, San Jose; Craig A. Friske, San Jose; Balakrishna R. Iyer, San Jose; John P. Lazarus, San Jose; David Wilhite, Los Angeles, all of Calif., and Kenneth E. Plambeck, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

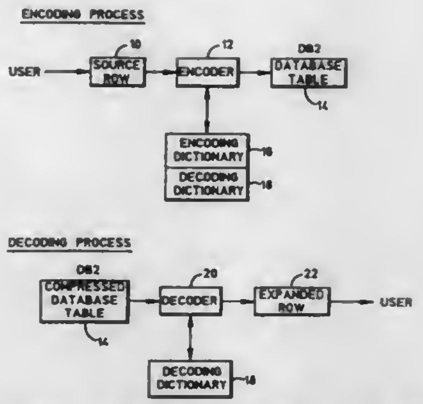
Continuation of Ser. No. 288,675, Aug. 10, 1994, Pat. No. 5,412,384, which is a continuation of Ser. No. 48,820, Apr. 16, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,683

Int. Cl.^{6} H03M *7/38*

U.S. Cl. 341—79 **9 Claims**

6. A computer program product for use with a computer-implemented system for compressing input data arranged in a data stream of one or more records consisting of sequences of source symbols selected from a source alphabet to form output data consisting of sequences of code symbols selected from a code alphabet according to a static dictionary stored in a memory, said dictionary representing a static parse-tree having nodes representing said code symbols, said nodes being linked into paths representing said source symbol sequences, said computer program product comprising:

means, recorded on said recording medium, for directing said computer-implemented system to initialize a parse-tree with a plurality of said paths representing a set of said source symbol strings, each said path having at least one node with a unity use count value;



means, recorded on said recording medium, for directing said computer-implemented system to set a current input pointer at the beginning of said data stream;

means, recorded on said recording medium, for directing said computer-implemented system to, until said data stream is exhausted, repeatedly perform the steps of

determining the longest said source symbol sequence S, represented by a path P in said parse-tree, that matches a current said source symbol sequence in said data stream beginning at said current input pointer,

incrementing said use count value for all nodes in said path P,

if said sequence S is not the final sequence in a record, adding a new node N having a unity use count value to said path P to form a new path P' representing a new source symbol sequence S' consisting of said sequence S extended by at least one immediately subsequent said source symbol in said data stream,

linking said new node N to the end of a LRU chain,

advancing said current input pointer to the end of said sequence S' in said data stream, and

initializing a use count value threshold to a fourth predetermined value and discarding from said LRU chain one said node whose use count value does not exceed said use count value threshold;

means, recorded on said recording medium, for directing said computer-implemented system to assemble said nodes with the associated said paths to form said static dictionary; and

means, recorded on said recording medium, for directing said computer-implemented system to store said static dictionary in said memory.

5,534,862

RESISTOR STRING WITH EQUAL RESISTANCE RESISTORS

George F. Gross, Jr., Reading; Richard J. McPartland, Nazareth, and Thayamkulangara R. Viswanathan, Albany Township, Berks County, all of Pa., assignors to AT&T Corp., Murray Hill, N.J.

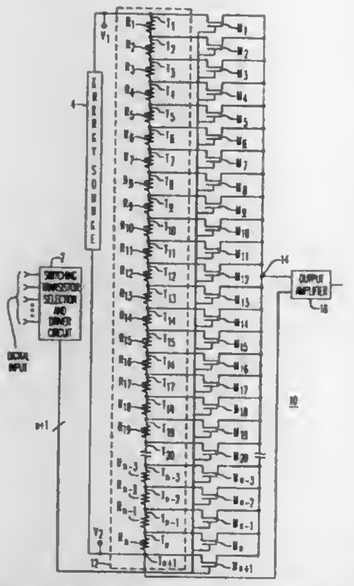
Continuation of Ser. No. 327,173, Oct. 21, 1994. This application Apr. 28, 1995, Ser. No. 431,694

Int. Cl.^{6} H03M *1/78*

U.S. Cl. 341—144 **28 Claims**

1. An integrated circuit including a resistive material runner resistor string having at least one runner direction reversal, comprising:

a plurality of serially coupled resistors providing a current path, each of said resistors having a first element and a second element, the first and second elements being contiguous and forming at the juncture thereof a runner direction change feature, the resistor string having taps at substantially equal resistance intervals, whereby each resistor in the resistor



string includes a runner direction change feature with the runner direction change feature in at least one resistor facilitating the direction reversal.

5,534,863

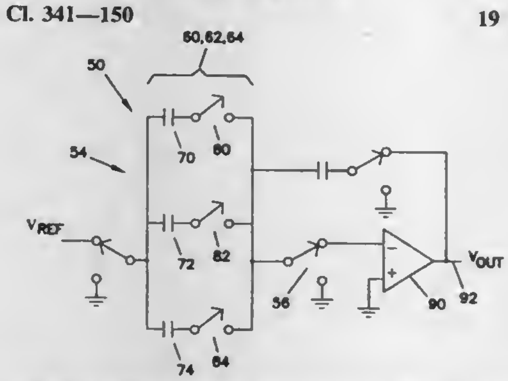
LOW RESOLUTION, HIGH LINEARITY DIGITAL-TO-ANALOG CONVERTER WITHOUT TRIM

James W. Everitt, Grass Valley, and Hiroshi Takatori, Sacramento, both of Calif., assignors to Level One Communications, Inc., Sacramento, Calif.

Filed Jan. 6, 1994, Ser. No. 177,925

Int. Cl.^{6} H03M *1/66*

U.S. Cl. 341—150 **19 Claims**



1. A digital-to-analog converter for converting an N state digital input word to an analog equivalent, N being a positive integer, comprising:

(a) an amplifier having an input and an output, the amplifier having a feedback path connecting the output to the input;

(b) an array of injectors connected to the input of the amplifier for generating weighted-signals, the weighted-signals being injected into the input of the amplifier when the injectors are triggered; and

(c) means for selectively providing a trigger to each injector and for determining a conversion period for converting the digital word to an analog voltage, the conversion period being divided into a plurality of subperiods and each injector capable of being triggered only once during each subperiod such that the amount of the signal injected during a single conversion period is constant, each injector in the array being triggered an equal number of times during a conversion period.

5,534,864

PIPELINED ANALOG-TO-DIGITAL CONVERTER

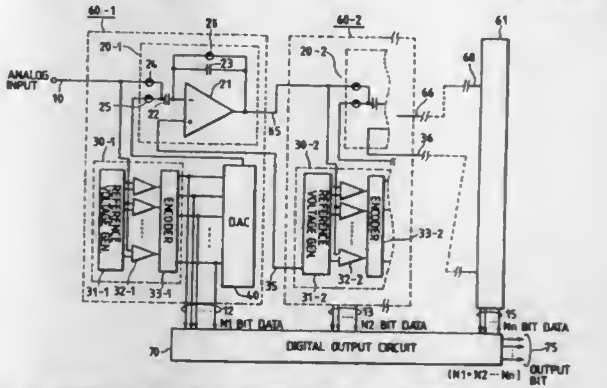
Koichi Ono, Kokubunji; Yoshito Nejime, Hachioji, and Etsuji Yamamoto, Fussa, all of, Japan, assignors to Hitachi, Ltd., and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Feb. 3, 1993, Ser. No. 12,759

Claims priority, application Japan, Feb. 3, 1992, 4-017453

Int. Cl.^{6} H03M *1/14*

U.S. Cl. 341—156 **9 Claims**



1. A pipelined analog-to-digital converter comprising:

a plurality of converting stages connected in a cascade form;

wherein each of said converting stages includes an analog-to-digital converter (ADC) unit for converting an analog conversion input into a digital output, said digital outputs from said converting stages forming a conversion output;

wherein each preceding converting stage except a last converting stage further includes amplifier means for deriving and amplifying a conversion residue representing a quantization error resulting from the conversion performed by said preceding converting stage based on said digital output outputted by said ADC unit of said preceding converting stage and said conversion input inputted to said preceding converting stage, said amplified conversion residue from said preceding converting stage being supplied as a input to a succeeding converting stage; and

connection means for connecting said amplifier means of said preceding converting stage to a node in said ADC unit of said succeeding converting stage, said node provides a base voltage which is used in said succeeding converting stage;

wherein said ADC unit of said succeeding converting stage includes a chopper amplifier which receives said conversion residue of said preceding converting stage, and a plurality of sampling capacitors which sample the output of said chopper amplifier at the same time, wherein said chopper amplifier includes a phase compensation circuit for changing a compensation factor when said output of said chopper amplifier is sampled.

5,534,865

ERGONOMIC WIRELESS REMOTE CONTROL TRANSMITTER FOR USE WITH CONSUMER ENTERTAINMENT ELECTRONICS APPLIANCE

Irving M. Kriegsman, 250 Baldwin Ave., Framingham, Mass. 01701; Edward M. Kriegsman, 215 Baldwin Ave., Framingham, Mass. 01701, and Daniel S. Kriegsman, 250 Baldwin Ave., Framingham, Mass. 01701

Filed Nov. 20, 1992, Ser. No. 984,184

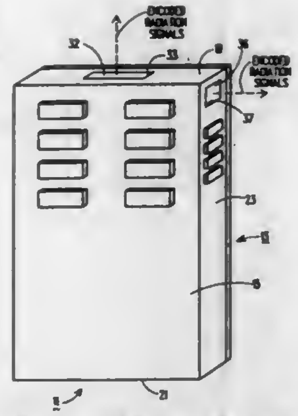
Int. Cl.^{6} H04B *10/00*

U.S. Cl. 341—176 **13 Claims**

1. A wireless remote control transmitter for remotely controlling the operation of a consumer entertainment electronics appliance, said wireless remote control transmitter comprising:

a) a housing, said housing including a front, a first side, a back and a second side, said front being wider than said first side;

b) an actuable electromagnetic radiation emitter disposed within said housing for emitting a control signal recognizable by the consumer entertainment electronics appliance;



- c) a first keyboard, said first keyboard having a plurality of manually depressible function keys located along said first side of said housing; and
- d) a first printed circuit board positioned inside said housing, said first printed circuit board being responsive to contact with at least one of said manually depressible function keys for appropriately actuating said actuable electromagnetic radiation emitter.

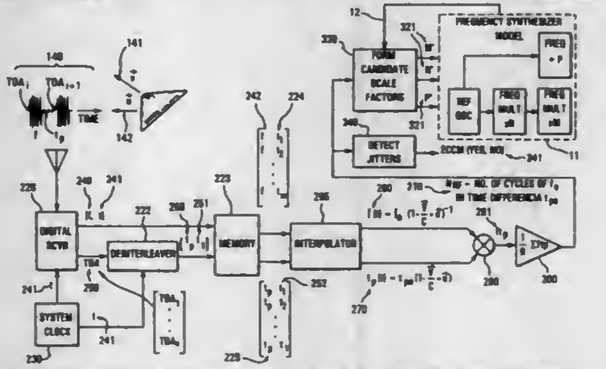
5,534,866

EMITTER FREQUENCY-TIME MEASUREMENT BY A MOVING OBSERVER USING NO NAVIGATION INPUT

Conrad M. Rose, Dahlgren, Va., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 10, 1995, Ser. No. 499,825
Int. Cl.^{6} G01S *7/40;7/285*

U.S. Cl. 342—13 **4 Claims**



1. A method for extracting a radar classification parameter requiring no navigational or orientation information concerning the observer, comprising the steps of:

measuring, at the observer, Doppler-shifted emitter RF frequency (f) and pulse times-of-arrival (TOA),

determining the times of individual frequency measurements of f relative to the received signal,

storing the results of said measuring determining steps,

extracting from the stored TOA information a periodic event representing an invariant time interval at the emitter, this event defining an interpulse repetition of patterns in the emitter signal (referred to as t_{po} at the emitter, and t_p at the observer),

recording the times, respectively, of the individual periodic event difference measurements t_p relative to the received emitter signal,

interpolating the simultaneous values of f and t_p relative to the receiving emitter signal, and forming the product of those values,

forming a product signal representing the number of cycles in the RF carrier rest frequency that would be measured at the emitter in the time interval t_{po}, said product being the multiplied simultaneous value of f and t_p, thereby forming said classification parameter.

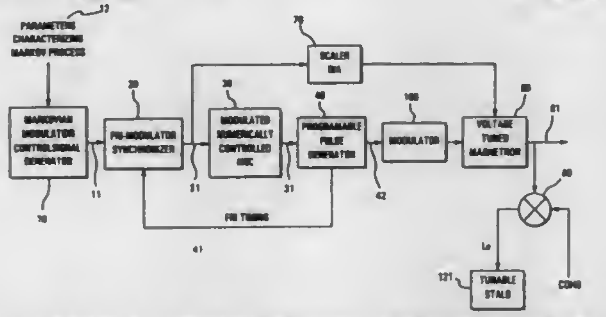
5,534,867

OPEN LOOP COUNTERMEASURE TO PASSIVE DIRECTION FINDING AND LOCATION OF RADAR TRANSMITTERS USING DOPPLER TECHNIQUES

Conrad M. Rose, Dahlgren, Va., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jun. 16, 1995, Ser. No. 491,597
Int. Cl.^{6} G01S *7/36*

U.S. Cl. 342—17 **6 Claims**


PARAMETERS CHARACTERIZING MARKOV PROCESS
MARKOVIAN MODULATOR CONTROL SIGNAL GENERATOR
PRI MODULATOR SYNCHRONIZER
MODULATED NUMERICALLY CONTROLLED OSC
PROGRAMMABLE PULSE GENERATOR
MODULATOR
VOLTAGE TUNED MAGNETRON
SCALER
PRI TIMING
TUNABLE STALO
COHO
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121

1. Apparatus for generating an emitter radar signal having characteristics for preventing the location of the emitter in range or bearing using Doppler techniques, comprising:

a first source of random control signals for setting the statistical characteristics of the emitter radar signal to simulate multipath pulse-on-pulse signal collisions, low signal to noise ratio or other signal degrading effects in the radar signal as received,

a variable second frequency source for producing the emitter's pulse repetition frequency (PRF) responsive to said control signals,

a third source of pulses with fixed integer spacings including means responsive to the PRF output of said second source for determining the interpulse time differences of the third source,

a fourth voltage-control source of RF carrier signal for the emitter, the frequency of which is responsive to the output of said first source,

means for scaling and converting the output of said first source to a voltage compatible with a control input of said fourth source according to the magnitudes determined by Equation 3 hereinabove to thereby produce the desired disruptive effect.

5,534,868

METHOD AND SYSTEM FOR THE DETECTION AND MEASUREMENT OF AIR PHENOMENA AND TRANSMITTER AND RECEIVER FOR USE IN THE SYSTEM

Dag K. Gjessing, Skedsmokorset, and Jens F. Hjelmstad, Lillestrøm, both of, Norway, assignors to Susar A/S, Oslo, Norway

PCT No. PCT/NO93/00042, § 371 Date Sep. 23, 1994, § 102(e) Date Sep. 23, 1994, PCT Pub. No. WO93/19383, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 15, 1993, Ser. No. 307,688
Claims priority, application Norway, Mar. 26, 1992, 921193
Int. Cl.^{6} G01S *13/95*

U.S. Cl. 342—26 **15 Claims**

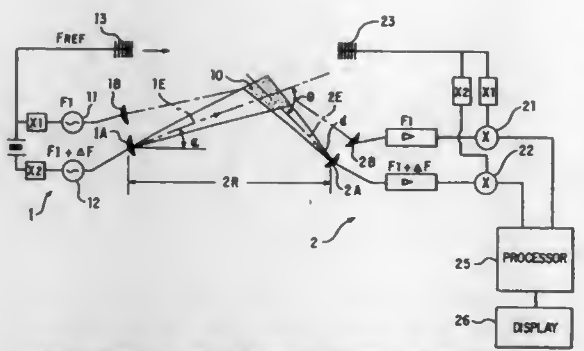
1. A system for detecting and measuring atmospheric air movement conditions such as wind velocity vectors, clear air turbulence and aircraft-induced vortices and turbulence, comprising:

a transmitter for irradiating a selected volume of air with a coherent electromagnetic energy beam in the microwave frequency range;

at least one receiver, positioned at a location separated from said transmitter by a preselected distance, for receiving and coherently demodulating a scattered electromagnetic energy beam resulting from scattering of said coherent electromagnetic energy beam in said selected volume of air to develop a demodulated signal, wherein said transmitter and at least one receiver each comprise a local oscillator locked to a common reference which is independent of said irradiated electromagnetic energy beam; and

processor means for processing said demodulated signal from said at least one receiver and deriving quantitative information on said atmospheric air movement conditions therefrom;

wherein antennas of said transmitter and said at least one receiver are directed such that a scattering angle θ of said scattered electromagnetic energy beam is small enough for said scattered electromagnetic energy beam to have a higher power than noise sources in the system.



5,534,869

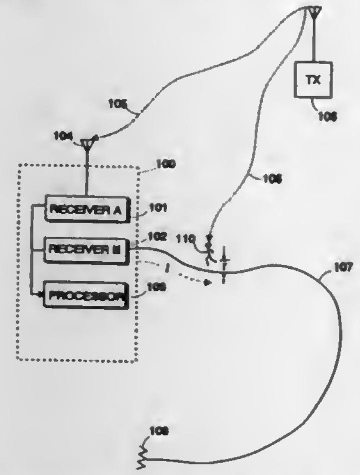
OPEN TRANSMISSION LINE LOCATING SYSTEM

Robert K. Harman, Kanata, Canada, assignor to Auratek Security Inc., Hull, Canada

PCT No. PCT/CA91/00050, § 371 Date Aug. 19, 1992, § 102(e) Date Aug. 19, 1992, PCT Pub. No. WO91/13415, PCT Pub. Date Sep. 5, 1991

PCT Filed Feb. 20, 1991, Ser. No. 920,563
Claims priority, application Canada, Feb. 20, 1990, 2010390
Int. Cl.^{6} G01S *13/00*

U.S. Cl. 342—27 **64 Claims**



1. An open transmission line system for detecting an entity moving within a defined pathway, the system utilizing transmissions from a remote, independent radio or television station transmitting at a known frequency, said system comprising an open transmission line extending along said pathway; receiver means connected to said transmission line, for receiving a first signal directly from said remote station and a second signal coupled into and transmitted along said transmission line from said remote station; and signal processing means coupled to said receiver means for processing said first and second signals to detect the movement of said entity relative to said open transmission line.

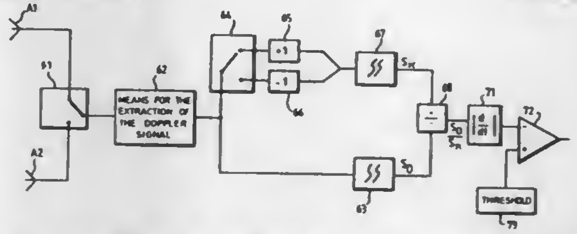
5,534,870

ANTICOLLISION DEVICE, NOTABLY FOR MOTOR VEHICLES

Bruno Avignon, Palaiseau; Charles Barre, Epinay-sur-Orge, and Yves Canal, Antony, all of, France, assignors to Thomson - CSF, Paris, France

Filed Dec. 14, 1994, Ser. No. 355,550
Claims priority, application France, Dec. 14, 1993, 93 14991
Int. Cl.^{6} G08G *1/16*

U.S. Cl. 342—70 **7 Claims**



1. A device to prevent a collision between a moving object and an obstacle, the moving object heading in a given direction along a movement vector and having a relative speed vector directed towards the obstacle, comprising:

first and second antennas fixedly joined to the moving object for transmitting, sequentially and in alternation, plural microwave signals liable to be received by the obstacle, and comprising means for preserving an instantaneous phase of plural echoes received during the plural antenna transmissions so as to obtain a Doppler signal constituted by said plural echoes, the Doppler signal indicating an angle, θ, between the movement vector and the relative speed vector;

reception means for receiving from said first and second antennas plural echo signals indicative of said plural echoes received from the obstacle;

means for analyzing said plural echo signals, comprising determining means for determining a variation with respect to time of the angle, θ, a substantially zero variation of the angle θ indicating a risk of collision;

first switching means having first and second switching inputs for receiving said plural signals connected to corresponding first and second antennas and having a first switching output for switching said plural signals;

means for obtaining the Doppler signal, connected to the output of said first switching means .and having a Doppler output;

a first lowpass filter having a first lowpass output, So, and having a first lowpass input connected to the Doppler output;

a second lowpass filter having a second lowpass output, Sπ, and having a second lowpass input;

a second switching means having a third switching input connected to the Doppler output and synchronous with said first switching means for switching the Doppler signal to an inverter channel or to a non-inverter channel, the non-inverter channel being switched over when said first antenna is switched over and the inverter channel being switched over when said second antenna is switched over, said inverter and non-inverter channels being connected to said second lowpass input; and

means for dividing having first and second inputs connected to said first and second lowpass outputs and having a ratio output, (So/Sπ), of said first and second lowpass outputs indicating the angle, θ.

5,534,871

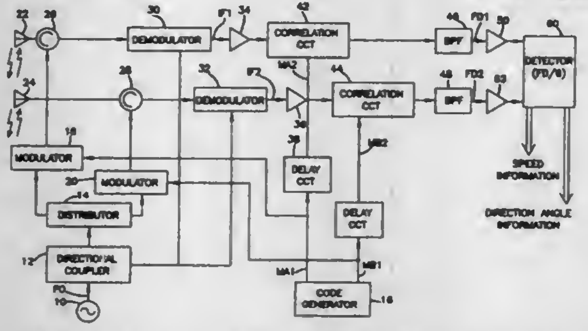
APPARATUS FOR MEASURING PHYSICAL QUANTITY RELATED TO RELATIVE MOVEMENT BETWEEN TWO OBJECTS

Keiki Hidaka, and Yoichiro Suzuki, both of Kamakura, Japan, assignors to Mitsubishi Precision Co., Ltd., Japan

Filed Apr. 25, 1994, Ser. No. 232,529

Int. Cl.^{6} G01S *13/60*

U.S. Cl. 342—113 **10 Claims**



1. An apparatus for measuring physical quantities related to a relative movement between two objects, the apparatus being provided in one of the two objects and comprising:

an oscillator for generating a carrier signal for transmission;

a code generator for generating first and second coded two-phase random signals for modulation, each of said first and second kinds of coded two-phase random signals having different phases;

a modulation circuit for effecting a direct spread modulation with respect to the transmission carrier signal using the generated coded two-phase random signal;

antenna means comprising first and second antennas having antenna patterns with different beam angles for transmitting the modulated transmission carrier signal as a radio wave toward the other of the two objects and for receiving a reflection wave from the other of the two objects, each of said first and second antennas transmitting and receiving a signal modulated by a corresponding one of the first and second kinds of coded two-phase random signals;

a demodulation circuit for demodulating a signal corresponding to the received reflection wave using the transmission carrier signal, to thereby generate an intermediate freguency signal;

a correlation circuit for making correlation between the intermediate frequency signal generated by the demodulation circuit and a signal having the same code as that of the coded two-phase random signal for modulation and having a phase delayed by a predetermined time compared with the coded two-phase random signal for modulation;

filtering means for extracting from an output signal of the correlation circuit a Doppler frequency component contained in a signal which has been propagated through a propagation path existing in a specified distance range; and

a detection circuit for properly processing a signal of the extracted Doppler frequency component, said detection circuit extracting only a Doppler frequency component contained in the reflection wave from an overlapped area of each antenna pattern of the first and second antennas and, based on the extracted Doppler frequency component, detecting physical quantities related to the relative movement between the two objects.

5,534,872

PORTABLE RADIO SIGNAL DETECTING SYSTEM

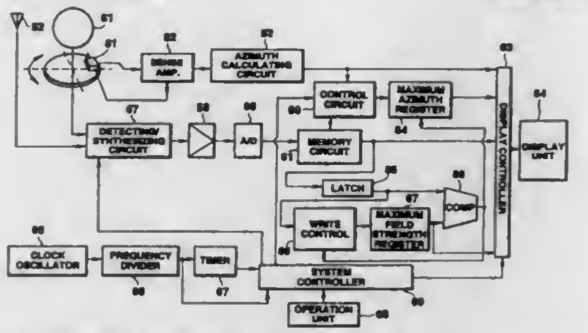
Kazunori Kita, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 263,474

Claims priority, application Japan, Jun. 30, 1993, 5-187557; Jun. 30, 1993, 5-187559

Int. Cl.^{6} G01S *13/42*

U.S. Cl. 342—146 **18 Claims**



1. A radio signal detecting system comprising:

a rotatable antenna mounted on a device body and which is rotatable relative to the device body;

rotation signal generating means for outputting a rotation signal every time when said rotatable antenna is rotated by a preselected rotation angle;

distance measuring means for transmitting a radio signal every time the antenna is rotated by the preselected rotation angle, and for receiving the radio signal reflected from a target to obtain distance data representing a distance between the target and said radio signal detecting system;

a memory having a plurality of memory areas for storing distance data obtained by the distance measuring means in correspondence with a corresponding rotation signal output by said rotation signal generating means; and

distance display means for displaying the distance data stored in the memory.

5,534,873

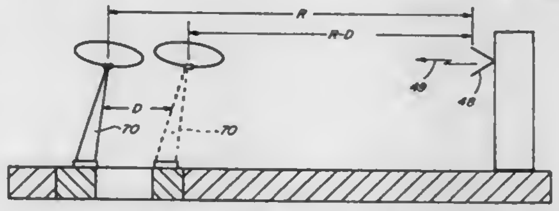
NEAR FIELD RCS TEST FACILITY AND TESTING METHOD

Alan R. Weichman, Chesterfield, Mo.; Barton G. Ferrell, Troy, Ill.; William G. Butters, Florissant, Mo.; Gregory Murden, Ballwin, Mo.; Phillip D. Alldredge, St. Charles, Mo.; L. Adam Latham; Mike J. Courtney, both of Florissant, Mo., and Paul J. Degroot, St. Louis, Mo., assignors to McDonnell Douglas Corp., St. Louis, Mo.

Filed Feb. 7, 1995, Ser. No. 358,057

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 342—165 **19 Claims**



1. A method of determining the far field RCS with near field spherical radar return data of an object with a stationary background thereabout including:

(a) illuminating the object and stationary background with radar energy at a first wavelength, thereby causing stationary spherical radar energy to be reflected by the stationary background;

(b) translating the object along a radial line-of-sight of the radar energy a distance of at least one half the first wavelength, thereby causing moving spherical radar energy to be reflected by the object;

(c) detecting the moving spherical radar energy and the stationary spherical radar energy; and

(d) separating the detected moving spherical radar energy from the detected stationary spherical radar energy.

5,534,874

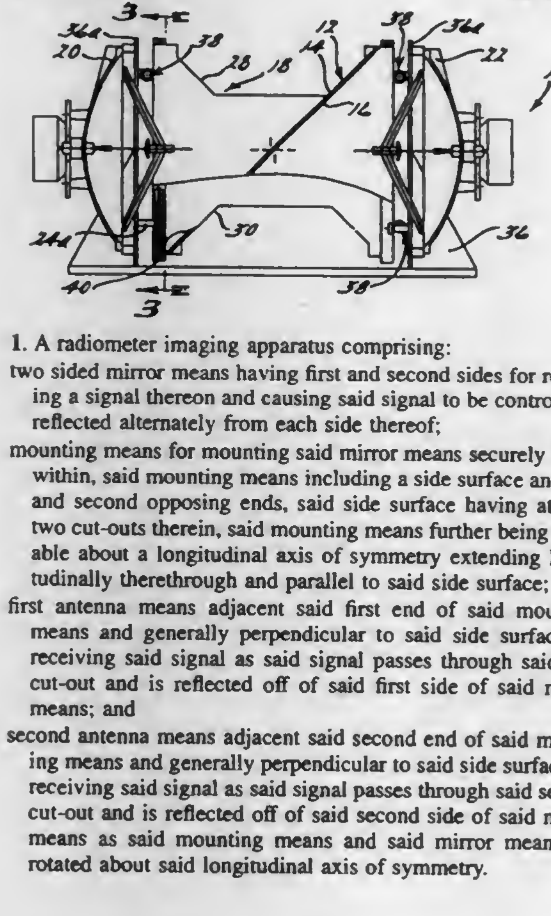
ROTATING MIRROR DRUM RADIOMETER IMAGING SYSTEM

Larry Yujiri, Torrance; Michael S. Mussetto, Glendale, and Gerald P. Uyeno, San Pedro, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 7, 1992, Ser. No. 160,981

Int. Cl.^{6} G01S *3/02*

U.S. Cl. 342—351 **16 Claims**



1. A radiometer imaging apparatus comprising:

two sided mirror means having first and second sides for receiving a signal thereon and causing said signal to be controllably reflected alternately from each side thereof;

mounting means for mounting said mirror means securely therewithin, said mounting means including a side surface and first and second opposing ends, said side surface having at least two cut-outs therein, said mounting means further being rotatable about a longitudinal axis of symmetry extending longitudinally therethrough and parallel to said side surface;

first antenna means adjacent said first end of said mounting means and generally perpendicular to said side surface for receiving said signal as said signal passes through said first cut-out and is reflected off of said first side of said mirror means; and

second antenna means adjacent said second end of said mounting means and generally perpendicular to said side surface for receiving said signal as said signal passes through said second cut-out and is reflected off of said second side of said mirror means as said mounting means and said mirror means are rotated about said longitudinal axis of symmetry.

5,534,875

ATTITUDE DETERMINING SYSTEM FOR USE WITH GLOBAL POSITIONING SYSTEM

Debra L. Diefes, Alexandria, Va.; Leopold C. Fan, Potomac, and Charles E. Rodgers, St. Leonard, both of Md., assignors to Adroit Systems, Inc., Alexandria, Va.

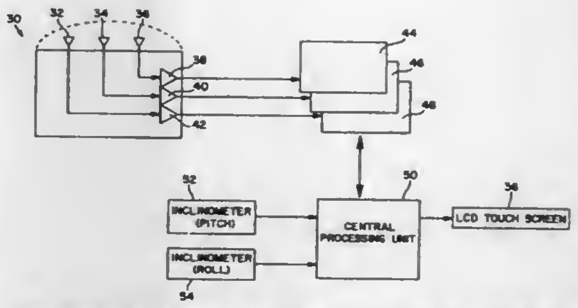
Filed Jun. 18, 1993, Ser. No. 77,734

Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **24 Claims**

1. A system employing telemetry and other electronic signals provided by a series of orbiting satellites to provide a real-time solution of direction of travel; and attitude, which is comprised of heading, pitch, and roll, of a platform on which said system is located, said system comprising:

antenna array means comprising at least two discrete antennae, each antenna forming at least one baseline with another of said antenna, said antenna array adapted to collect said telemetry and electronic signals transmitted by the series of orbiting satellites, wherein said discrete antennae are spaced such that the length of at least one of said baselines is less than the carrier wavelength being received from said orbiting satellites;



receiver means electrically communicating with each said discrete antenna, and adapted to interpret telemetry and electronic signals collected by said antenna array means;

mathematical algorithmic comparing means adapted to comparing information received from each said receiver means, to calculate heading, pitch, and roll and to reduce errors inherent in said received telemetry and electronic signals, wherein said algorithmic comparing means further includes a coarse attitude determining means for determining a first, general attitude, with accuracy between about +/–30°, and a fine attitude determining means for improving the accuracy of said first determination to within about +/– 0.5°, which occurs within the same solution time-frame, said algorithmic comparing means further including a satellite selecting regime for selecting one or more preferred satellites from among said series of orbiting satellites, and wherein said attitude is determined by carrier phase interferometry; and

microprocessor means for processing said information with said algorithm to accurately determine the attitude, heading, pitch, and roll of the platform.

5,534,876

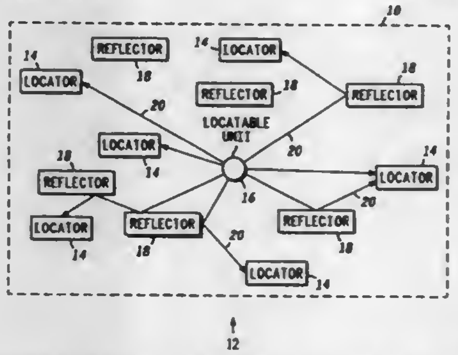
MULTIPATH TOLERANT LOCATION SYSTEM AND METHOD THEREFOR

Bart J. Erickson, Scottsdale, and Neal R. Anderson, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1994, Ser. No. 209,171

Int. Cl.^{6} G01S *1/24*

U.S. Cl. 342—387 **23 Claims**



1. A multipath tolerant method for determining a location of a locatable unit comprising steps of:

a) determining a maximum propagation duration, said maximum propagation duration being determined in response to a distance between first and second known-position locators;

b) determining a time difference, said time difference being approximately equal to a difference between a propagation duration for at least one location signal traveling between said locatable unit and said first known-position locator and a propagation duration for said at least one location signal traveling between said locatable unit and said second known-position locator:

c) verifying that said time difference is less than or equal to said maximum propagation duration: and

d) calculating a current location for said locatable unit in response to said step c), wherein said step d) is responsive to said at least one location signal when said time difference is less than or equal to said maximum propagation duration; and said step d) is substantially unresponsive to said at least one location signal when said time difference is greater than said maximum propagation duration.

5,534,877

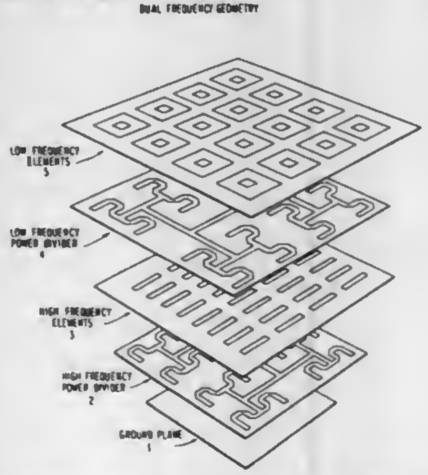
ORTHOGONALLY POLARIZED DUAL-BAND PRINTED CIRCUIT ANTENNA EMPLOYING RADIATING ELEMENTS CAPACITIVELY COUPLED TO FEEDLINES

Robert M. Sorbello, Potomac, and Amir I. Zaghloul, Bethesda, both of Md., assignors to Comsat, Bethesda, Md.

Continuation of Ser. No. 855,494, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 450,770, Dec. 14, 1989, abandoned. This application Sep. 24, 1993, Ser. No. 126,438

Int. Cl.^{6} H01Q *1/38*

U.S. Cl. 343—700 MS **4 Claims**


DUAL FREQUENCY GEOMETRY
LOW FREQUENCY ELEMENTS 5
LOW FREQUENCY POWER DIVIDER 4
HIGH FREQUENCY ELEMENTS 3
HIGH FREQUENCY POWER DIVIDER 2
GROUND PLANE 1

1. In a dual polarized printed antenna comprising a ground plane, a first power divider array disposed over said ground plane, a first array of radiating elements disposed over said first power divider array, a second power divider array disposed over said first array of radiating elements, and a second array of radiating elements disposed over said second power divider array,

the improvement wherein said first array of radiating elements comprises an array of radiating elements having a first size and being so configured as to operate within a first frequency band, and said second array of radiating elements comprises an array of radiating elements having a second size that is larger than said first size and being so configured as to operate within a second frequency band that is at least 1 GHz lower than said first frequency band, and wherein said second array of radiating elements have a gain that is at least 4.0 dB less than a gain of said first array of radiating elements throughout said first frequency band, and said first array of radiating elements have a gain that is at least 4.0 dB less than a gain of said second array of radiating elements throughout said second frequency band.

5,534,878

RADIO WITH RETRACTABLE ANTENNA

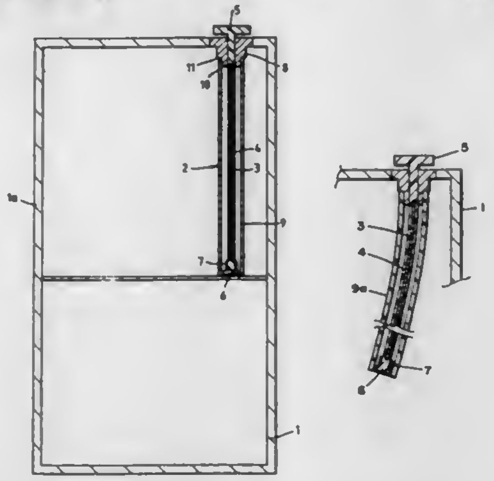
Terence Johnson, Fleet, England, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Mar. 25, 1993, Ser. No. 36,939

Claims priority, application United Kingdom, Apr. 8, 1992, 9207639

Int. Cl.^{6} H01Q *1/24*

U.S. Cl. 343—702 **9 Claims**



1. A radio comprising:

a housing for the radio,

an antenna carried by the housing, the antenna being retractable between an extended position and a retracted position, and

a flexible insulating sleeve provided inside the housing, wherein a portion of the antenna slides relative to and within the sleeve when the antenna is moved between the extended and retracted positions, the antenna being contactable with the flexible insulating sleeve along substantially the entire length of the sleeve.

5,534,879

ELECTRICAL CONNECTOR FOR VEHICLE WINDOW

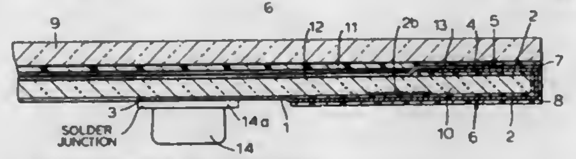
Jörg Braun, Reken, and Peter Paulus, Munster, both of, Germany, assignors to Flachglas Aktiengesellschaft, Furth, Germany

Filed Jan. 25, 1994, Ser. No. 187,300

Claims priority, application Germany, Jan. 27, 1993, 43 02 139.5

Int. Cl.^{6} H01Q *1/32*

U.S. Cl. 343—713 **19 Claims**



1. A vehicle window, comprising:

an outer glass pane;

an inner glass pane;

a laminating element securing said panes together; means for forming at least one electrical circuit element between said panes; and

a connector for said electrical circuit element and including at least one metal foil strip, said metal foil strip comprising:

an elongated inner section extending between said panes from an edge portion of the window and secured to said electrical circuit element,

an elongated outer section forming a single piece with said inner section and bonded to an outer surface of said inner pane and having at least an area of greater thickness than a lesser thickness of said inner section, and

at least one fold location folded about an edge of said inner pane at said edge portion and unitarily connected to said inner and said outer sections, said fold location being a linear junction between said greater thickness and said lesser thickness and disposed at said edge of said inner pane.

5,534,880

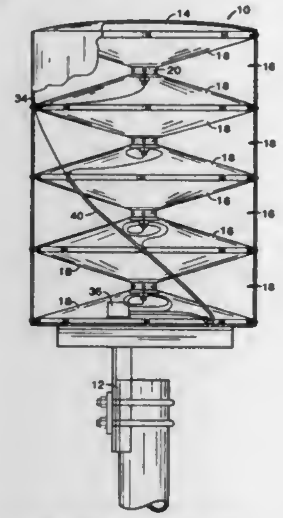
STACKED BICONICAL OMNIDIRECTIONAL ANTENNA

Donald D. Button, Standish; William D. Wyatt, Westbrook, and James F. McGrath, Cape Elizabeth, all of Me., assignors to Gabriel Electronics Incorporated, Scarborough, Me.

Continuation of Ser. No. 33,044, Mar. 18, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,870

Int. Cl.^{6} H01Q *13/04*

U.S. Cl. 343—774 **16 Claims**



1. An omnidirectional antenna comprising:

a plurality of axially aligned electromagnetic energy radiating elements;

a plurality of truncated flared apart reflecting surface pairs connected in an aligned stack, each pair including an upper surface disposed above and a lower surface disposed below one of said radiating elements, adjacent pairs in the stack being attached to one another about their outer circumferences;

the upper and lower surfaces of each of said pairs of reflecting surfaces being separated a fixed distance apart along the axis thereof by only nonconductive means therebetween, said nonconductive means including a plurality of nonconductive spacing collars, each positioned between the upper and lower surfaces of one of said pairs of reflecting surfaces along the axis thereof and around the respective radiating element disposed between said one of said pairs of reflecting surfaces;

a radome forming a cylinder about the outer circumference of the reflecting surfaces of said plurality of truncated flared apart reflecting surface pairs wherein said plurality of truncated flared apart reflecting surface pairs are not surrounded by a polarizing enclosure;

a power divider supported beneath a lowermost reflecting surface of said plurality of truncated flared apart reflecting surface pairs;

a plurality of transmission lines electrically connected to said power divider, a first of said transmission lines extending beneath said lowermost reflecting surface into connection with the radiating element disposed above said lowermost reflecting surface, the remaining transmission lines being helically directed along the cylinder formed by said radome, each of said remaining transmission lines extending from adjacent the cylinder formed by said radome into connection with one of said radiating elements and being fed between an upper surface of one of said reflecting surface pairs and a lower surface of a second one of said reflecting surface pairs, the second one of said reflecting surface pairs being located immediately above said one of said reflecting surface pairs.

5,534,881

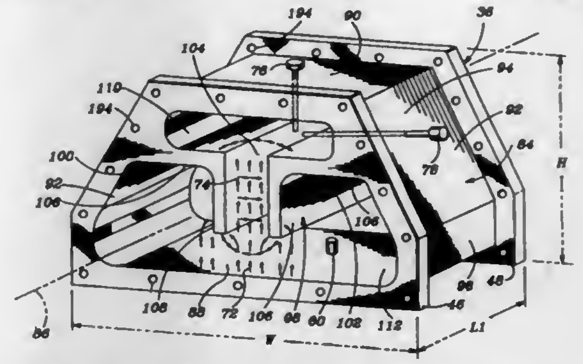
MICROWAVE FILTER ASSEMBLY HAVING A NONSYMMETRICAL WAVEGUIDE AND AN ANTENNA

Frederick A. Young, Huntington Beach; Louis W. Hendrick, Hermosa Beach, and Keith N. Loi, Rosemead, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 31, 1994, Ser. No. 298,630

Int. Cl.^{6} H01Q *3/30;* **H01P** *1/207;1/213*

U.S. Cl. 343—776 **11 Claims**



11. A feed for a phased array antenna comprising:

an array of radiating elements, an array of diplexers coupled to respective ones of the radiating elements, and a housing supporting the diplexers behind the radiating elements;

wherein each of said diplexers comprises two microwave filter assemblies, each of the filter assemblies having at least one cavity, said at least one cavity comprising:

a first end wall and a second end wall, and a section of waveguide disposed between and connecting with said first and said second end walls, said waveguide section extending along a longitudinal axis of said one cavity from said first end wall to said second end wall, said waveguide section having an outer wall encircling said axis;

a ridge extending from one of said walls inwardly toward a central region of said waveguide section; and

means in at least one of said walls for coupling electromagnetic energy into said one cavity; and

wherein in each cavity of each of said diplexers, the cavity has an approximate right semicircular cylindrical shape including a substantially planar wall surface;

in each of said diplexers, said at least one cavity in one of said filter assemblies is mounted back to back with a corresponding cavity in the second of said filter assemblies to provide a substantially right circular cylindrical shapes to the diplexer, the ridge in each of said cavities reducing the frequency of a resonant frequency of the cavity resulting in a diameter of diplexer which is less than a diameter of the corresponding radiating element.

5,534,882

GPS ANTENNA SYSTEMS

Alfred R. Lopez, Commack, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

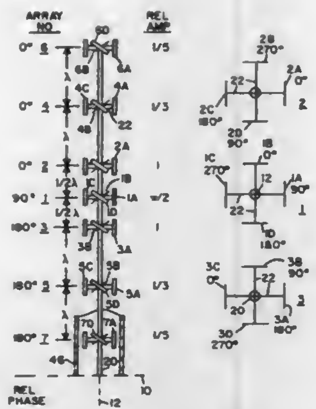
Filed Feb. 3, 1994, Ser. No. 191,562

Int. Cl.^{6} H01Q *1/12*

U.S. Cl. 343—891 **25 Claims**

1. An antenna system, having a first circular polarization characteristic horizontally and upward from a plane, comprising:

a plurality of element arrays spaced along an axis normal to said plane and configured to operate with circular polarization, each said element array including a plurality of radiating elements positioned around said axis, with said radiating



elements of each array in vertical alignment with corresponding radiating elements in other arrays;

distribution means, coupled to said element arrays, including:

transmission line means for distributing signals;

first coupling means, coupled to said transmission line means, for coupling to the respective radiating elements of a first element array of said plurality of element arrays, first signals of relative phase effective to produce a first radiation pattern having a 360 degree progressive phase characteristic around said axis, said first signals having a first average amplitude;

a plurality of additional coupling means, coupled to said transmission line means, for coupling to the respective radiating elements of the remaining element arrays of said plurality of element arrays additional signals of relative phase effective to produce respective additional radiation patterns each having a 360 degree progressive phase characteristic around said axis with at least one of said additional radiation patterns rotated in azimuth phase by a predetermined angle relative to said first radiation pattern, said additional signals coupled to at least one of said remaining element arrays having an average amplitude differing from said first average amplitude; and

means for supporting said antenna system above said plane.

5,534,883
VIDEO SIGNAL INTERFACE

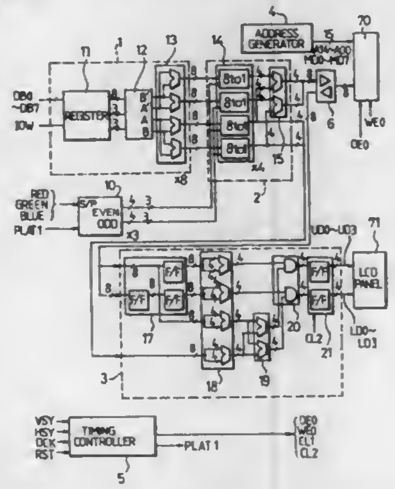
Yoshihiro Koh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 16, 1993, Ser. No. 47,207

Claims priority, application Japan, Apr. 24, 1992, 4-105119

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—3 **13 Claims**



1. In a video signal interface that converts display data in serial format for a first display device to display data appropriate to a second display device, said second display device having pixels capable of binary display and carrying out gray-scale display as a pseudo operation by switching with every frame between the binary displays to be carried out at every pixel,

a video signal interface comprising:

S/P converter means for converting said serially formatted display data to parallel data;

pattern generating means for holding gray-scale pattern data according to the number of gradations that can be displayed by said second display device and outputting with every frame unit of said second display device data corresponding to the type of binary display in accordance with said gray-scale pattern data;

memory means, having a number of bits equal to half the number of pixels of said second display means, for storing said display data appropriate to said second display means;

data generating means for generating display data of parallel format for use in said second display device based on both the output of said pattern generating means and the gradations of said converted display data;

memory control means for writing data generated by said data generating means to said memory means and for reading the data from said memory means;

address generating means for generating addresses corresponding to said memory means; and

output means for outputting data read from said memory means at timing matched with the operation of said second display device;

wherein the correlation between the memory addresses and the pixels of the second display is fixed;

wherein said pattern generating means has both a register and a gray-scale pattern generating circuit, said register being accessible to outside of said video signal interface and holding gray-scale pattern data, and said gray-scale pattern generating circuit outputting data corresponding to one of either binary display based on said gray-scale pattern data and in accordance with a clock signal to said LCD device.

5,534,884
ELECTRO-OPTICAL DEVICE SYSTEM AND METHOD OF DRIVING AN ELECTRO-OPTICAL DEVICE

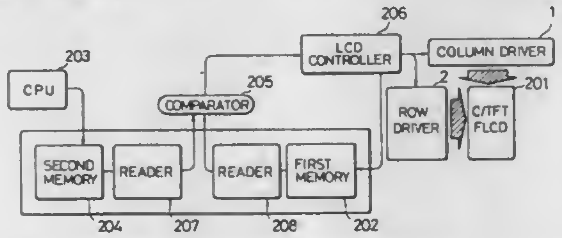
Akira Mase, Aichi, and Shunpei Yamazaki, Tokyo, both of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 813,757, Dec. 27, 1991, abandoned. This application Mar. 11, 1994, Ser. No. 208,802

Claims priority, application Japan, Dec. 27, 1990, 2-418868; Dec. 27, 1990, 2-418869

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—87 **37 Claims**



1. An electro-optical device system comprising:

a liquid crystal panel comprising a pair of substrates at least one of which is transparent, a liquid crystal layer disposed between said substrates, a plurality of electrodes formed on an inside of one of said substrates in order to define pixels arranged in a matrix, a plurality of pairs of complementary transistors provided for said pixels and connected with said electrodes respectively and a plurality of control lines formed on said inside of one of said substrates and connected with said complementary transistors in order to supply signals to said transistors;

a first memory having storage elements related to said pixels respectively in a one-to-one correspondence for storing a frame of the same information as said panel is displaying;

a second memory for sequentially receiving information desired to be displayed in said panel, said second memory having storage elements for storing a frame related to said pixels respectively in a one-to-one correspondence;

computer means for providing to said second memory said information desired to be displayed in said panel;

a comparator for comparing the contents of said first memory and said second memory; and

a controller operatively connected with said first and second memories and said liquid crystal panel for driving the said storage elements of said first memory and the said pixels of said liquid crystal panel which are dissimilar to the corresponding storage elements of said second memory in order to display said information desired to be displayed in said panel and to make information stored in said first memory equal to information being displayed in said panel.

5,534,885
CIRCUIT FOR DRIVING LIQUID CRYSTAL DEVICE

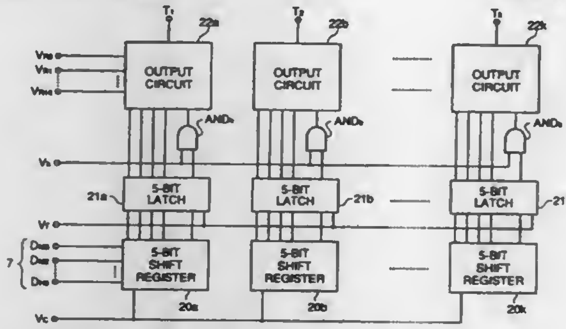
Sei Saitoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 2, 1993, Ser. No. 162,734

Claims priority, application Japan, Dec. 2, 1992, 4-349887

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—100 **23 Claims**



1. A liquid crystal display driving circuit comprising:

a plurality of switching means each having a first end connected in common to a source line of a liquid crystal display panel and a second end connected to a plurality of driving voltages, respectively, for supplying a different voltage to said source line, and

control means receiving an image input data for selectively turning on said switching means, for realizing a multiple gray scale display,

the control means including means, based on said image input data, for turning on only one switching means selected from said plurality of switching means during a first partial period of one horizontal display period, and for simultaneously turning on at least two switching means selected from said plurality of switching means during a second partial period of said one horizontal display period, said at least two switching means including said one switching means turned on during the first partial period,

said second partial period being different from said first partial period and following said first partial period.

5,534,886
DISPLAY-INTEGRATED TYPE TABLET DEVICE

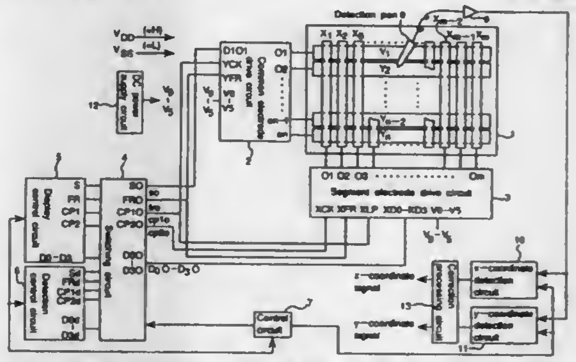
Toshio Nomura, Tenri; Takao Tagawa, Kashihara, and Noritoshi Kako, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 65,882, May 19, 1993, Pat. No. 5,442,373. This application May 22, 1995, Ser. No. 446,341

Claims priority, application Japan, May 22, 1992, 4-130695

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—104 **5 Claims**



1. A display-integrated type tablet device including a display panel driven by first electrodes and second electrodes crossing each other, a detection pen having at a tip of the detection pen an electrode which can be electrostatically coupled with the first electrodes and the second electrodes of the display panel, a first electrode drive circuit for driving the first electrodes, a second electrode drive circuit for driving the second electrodes, a display control circuit for displaying an image on the display panel by controlling the first electrode drive circuit and the second electrode drive circuit in an image display period, a detection control circuit for sequentially scanning at least one of the first and second electrodes of the display panel by controlling at least one of the first and second drive circuits in a coordinate detection period, and a coordinate detection circuit for detecting at least one of a detection x-coordinate value and a detection y-coordinate value on the display panel designated by the tip of the detection pen based on a time of generating an output signal from the detection pen and a time of scanning at least one of the first and second electrodes,

the display-integrated type tablet device comprising a correction processing circuit which has a periodical density fluctuation correction module for correcting periodical fluctuations of the detection x-coordinate value and the detection y-coordinate value caused by variations in distribution density of the first electrodes and the second electrodes in the periphery of an image display area.

5,534,887
LOCATOR ICON MECHANISM

Cary L. Bates, Rochester; Jeffrey M. Ryan, and Byron T. Watts, both of Byron, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1994, Ser. No. 198,748

Int. Cl.⁶ G09G *5/14*

U.S. Cl. 345—120 **23 Claims**

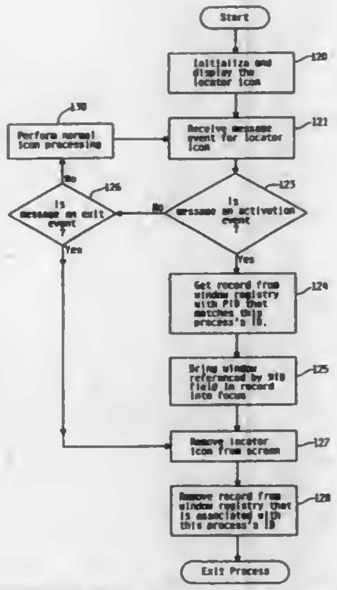
1. A display apparatus for locating a window on a screen that requires a user's attention, comprising:

first displaying means for displaying a first window on the screen such that contents of the first window that require the user's attention are not visible;

second displaying means for displaying a second window on the screen;

means for notifying the user that the first window requires the user's attention by displaying a first locator icon that identifies the first window; and

focusing means for bringing the first window into focus so that the first window contents are visible and the first window is


Start
Initialize and display the locator icon
120
Receive message event for locator icon
121
Perform normal icon processing
130
Is message an exit event ?
126
No
Yes
Is message an activation event ?
123
No
Yes
Get record from window registry with PID that matches this process's ID.
124
Bring window referenced by PID field in record into focus
125
Remove locator icon from screen
127
Remove record from window registry that is associated with this process's ID
128
Exit Process

active and ready to accept input from the user, in response to the user selecting the first locator icon with a pointing device.

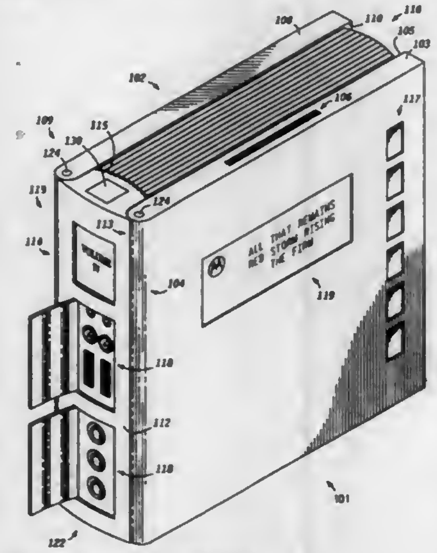
5,534,888
ELECTRONIC BOOK

Michael S. Lebby, Apache Junction, Ariz.; Thomas H. Blair, Schaumburg, Ill., and Gary F. Witting, Scottsdale, Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Feb. 3, 1994, Ser. No. 190,976

Int. Cl.⁶ G09G *1/00;* **G06F** *15/02*

U.S. Cl. 345—121 **23 Claims**



1. An electronic book comprising:

a multiple piece body including a first hollow body having a surface and an edge surface, a second hollow body having a first edge surface and a second edge surface, and a third hollow body having a surface and an edge surface, the edge surface of the first hollow body being hingeably attached to the first edge surface of the second hollow body and the edge surface of the third hollow body being hingeably attached to the second edge surface of the second hollow body;

a computer located in the multiple piece body including a processor for manipulating data, memory for data storage, an input for entering data, and an output for removing data;

a plurality of page displays operably coupled to the output of the computer for displaying data from the computer and attached to the multiple piece body such that closing the surface of the first hollow body onto the surface of the third hollow body protects the plurality of page displays; and

a switch mounted to the second hollow body between the first edge surface and the second edge surface, as well as coupled to at least one of the plurality of page displays and to the computer so that turning the at least one of the plurality of page displays advances the data through the plurality of page displays.

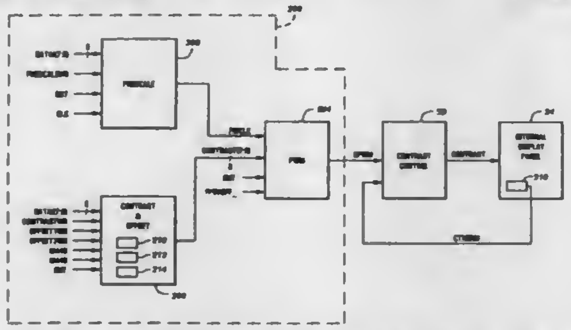
5,534,889
CIRCUIT FOR CONTROLLING BIAS VOLTAGE USED TO REGULATE CONTRAST IN A DISPLAY PANEL

Daniel B. Reents, Spring; Patrick R. Cooper, Houston; James H. Garrett, Spring, and Philip J. McKenzie, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 10, 1993, Ser. No. 119,422

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—132 **24 Claims**



1. A circuit for controlling a bias voltage used to regulate contrast in a video display system capable of operating in a plurality of modes, the circuit comprising:

means for detecting a video mode of the video display system;

means for generating a pulse width modulated signal having a duty cycle, wherein said duty cycle is varied based on said detected video mode, including:

a register for storing a base contrast value;

a register for storing a first offset contrast value;

means responsive to said detected video mode for selectively combining said base and first offset contrast values to produce a final contrast value, wherein said base and first offset contrast values are combined for a first video mode and said base contrast value is used alone for a second video mode; and

means responsive to said final contrast value for producing said pulse width modulated signal, wherein said duty cycle of said pulse width modulated signal is proportional to said final contrast value; and

means for converting said pulse width modulated signal to the bias voltage, wherein the bias voltage is proportional to the duty cycle of said pulse width modulated signal.

5,534,890
THERMAL PRINTER FOR PRINTING LABELS

Heldrun Krug, Wiesenbach; Jürgen Kunert, Rothenberg; Jürgen Schoon, Eberbach, and Horst Walter, Neckarsteinach, all of, Germany, assignors to Esselte Meto International Produktions GmbH, Hirschhorn/Neckar, Germany

Filed Jun. 17, 1993, Ser. No. 79,121

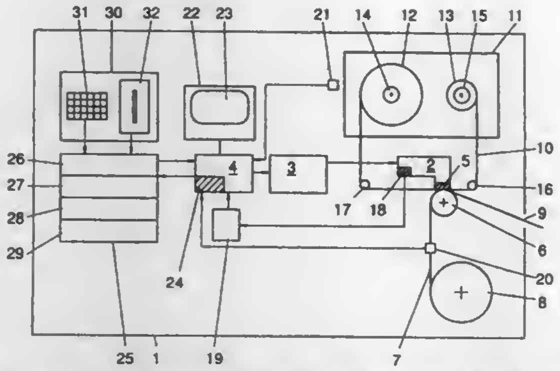
Claims priority, application Germany, Jun. 19, 1992, 42 20 003.2

Int. Cl.⁶ B41J *2/36;2/365*

U.S. Cl. 346—100 **20 Claims**

1. A thermal printer for printing on a printing stock, said thermal printer comprising:

thermal print head means for receiving energy and for printing on the printing stock in response thereto;



temperature sensor means disposed adjacent said thermal print head means for measuring and transmitting a signal representative of the temperature in the vicinity of said thermal print head means; and

a control circuit for controlling the energy received by said thermal printing head means, said control circuit comprising:

means for receiving a signal representative of a specific printing stock to be printed on selected from a plurality of printing stocks;

means for receiving a signal representative of a specific printing speed selected from a plurality of printing speeds, said plurality of printing speeds being associated with said selected printing stock;

means for receiving said temperature representative signal from said temperature sensor means;

means for generating, from said received selected printing stock signal, said received selected printing speed signal, and said temperature representative signal received from said temperature sensor means, a reference energy value; and

means for controlling the energy received by said thermal printing head means according to said reference energy value generated from said received selected printing stock signal, said received selected printing speed signal, and said temperature representative signal received from said temperature sensor means.

5,534,891
ELECTRONIC EQUIPMENT HAVING DISPLAY UNIT AND OPERATION INPUT UNIT

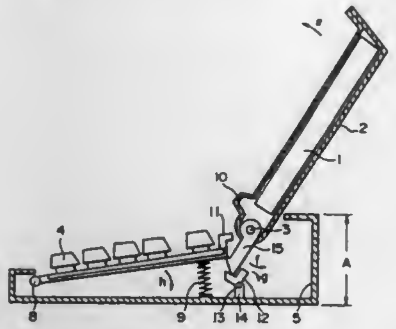
Hirokuni Takano, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 888,476, May 22, 1992, abandoned, which is a continuation of Ser. No. 533,431, Jun. 5, 1990, abandoned. This application Oct. 20, 1993, Ser. No. 138,381

Claims priority, application Japan, Jun. 8, 1989, 1-144213

Int. Cl.⁶ G09G *5/00;* **H05K** *5/00*

U.S. Cl. 345—169 **18 Claims**



1. Electronic equipment comprising:

key input means for inputting information, said key input means being pivotally supported about an axis and rotated within a very small angle to an inclined position during use;

display means for displaying the information input by an operation of said key input means;

support means for pivotally supporting said display means;

biasing means for biasing said key input means in a first direction toward the inclined position when said display means covers said key input means; and

pressing means for, when said display means is at a predetermined position, pressing said key input means toward the inclined position, thereby holding said key input means in the inclined position as said biasing means biases said key input means in a second direction substantially opposite to the first direction.

5,534,892
DISPLAY-INTEGRATED TYPE TABLET DEVICE HAVING AND IDLE TIME IN ONE DISPLAY IMAGE FRAME TO DETECT COORDINATES AND HAVING DIFFERENT ELECTRODE DENSITIES

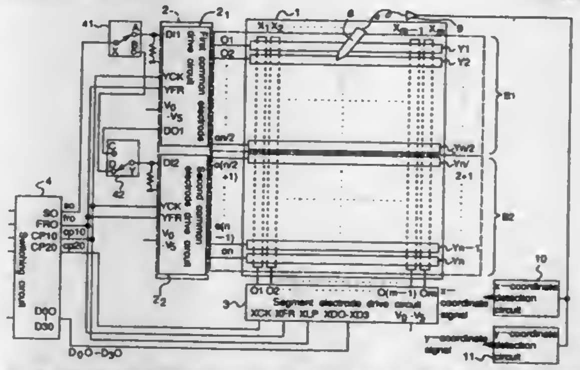
Takao Tagawa, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1994, Ser. No. 203,006

Claims priority, application Japan, May 20, 1992, 4-127255; Mar. 11, 1993, 5-050539

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—173 **5 Claims**


First common electrode drive circuit
Second common electrode drive circuit
Switching circuit
Segment electrode drive circuit
x-coordinate detection circuit
y-coordinate detection circuit
x-coordinate signal
y-coordinate signal
B1
B2
10
11

1. A display-integrated type tablet device including a matrix-shaped display panel having first electrodes and second electrodes which are intersecting each other at right angles and a display material, a detection pen having at a tip end of the detection pen an electrode to be electrostatically coupled with the first electrodes and second electrodes of the display panel, a first drive circuit for driving the first electrodes, a second drive circuit for driving the second electrodes, a display control circuit for displaying an image on the display panel by controlling the first drive circuit and the second drive circuit, a detection control circuit for sequentially scanning the first electrodes of the display panel by controlling the first drive circuit and sequentially scanning the second electrodes of the display panel by controlling the second drive circuit, an x-coordinate detection circuit for detecting an x-coordinate at a position pointed by the tip end of the detection pen on the display panel according to a timing of generating an output signal from the detection pen and a timing of scanning the first electrodes, a y-coordinate detection circuit for detecting a y-coordinate at a position pointed by the tip end of the detection pen on the display panel according to a timing of generating an output signal from the detection pen and a timing of scanning the second electrodes, the display-integrated type tablet device comprising:

a clock generating section which generates a second clock signal having a frequency higher than a frequency of a first clock signal output from the display control circuit;

a display data storage section into which display data of one display image frame is written in synchronization with an input sync signal and from which the written display data of one display image frame is read in synchronization with an input sync signal; and

a line switching section which switches a line of a sync signal input to the display data storage section in synchronization with a display image frame set up by the display control circuit to input the first clock signal as the sync signal to the display data storage section in writing the display data into the display data storage section and input the second clock signal as the sync signal to the display data storage section in reading the display data from the display data storage section, wherein

a time required for reading the display data of one display image frame from the display data storage section is made shorter than a time required for writing the display data of one display image frame into the display data storage section to provide a display data reading time and an idle time in one display image frame to thereby operate the detection control circuit in the idle time.

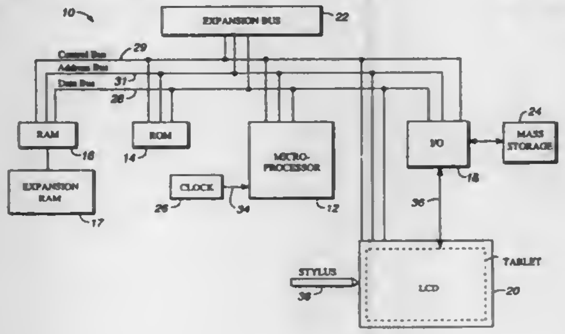
5,534,893
METHOD AND APPARATUS FOR USING STYLUS-TABLET INPUT IN A COMPUTER SYSTEM

Daniel J. Hansen, Jr., Cupertino; Michael L. Gough, Ben Lomond, and J. Rhoads Hollowell, Sunnyvale, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 15, 1993, Ser. No. 167,709

Int. Cl.⁶ G09G *3/02*

U.S. Cl. 345—179 30 Claims



1. A method of processing outputs from an input tablet, the method comprising the steps of:

forming a plurality of data structures from outputs of an input tablet;

storing said data structures in an ink pool memory of a computer system, the ink pool memory being independent of at least one application program running in the computer system;

creating multiple stroke objects from the data structures in the ink pool memory;

determining whether said at least one application program is stylus-aware; and

issuing one or more stroke commands to the multiple stroke objects within the ink pool if the application is stylus-aware, wherein one or more of the stroke commands include a step of producing an image of a stroke object on a computer display.

5,534,894
INK JET RECORDING MEDIUM DISCHARGING MECHANISM INCLUDING RESILENTLY BIASED FOLLOWER ROLLER

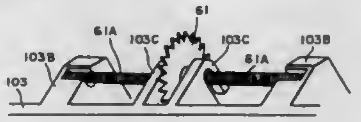
Hirofumi Hirano, Yokohama; Toshihiko Bekki, Kawasaki; Makoto Kashimura, Tokyo; Takehiko Kiyohara, Zama; Tetsuhiro Nitta, Yokohama, and Tetsuo Kimura, Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

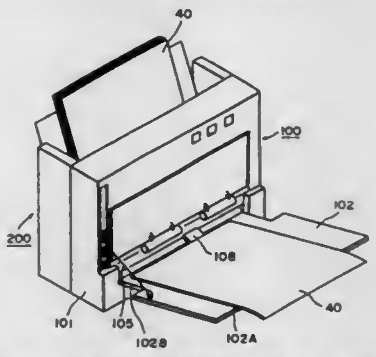
Division of Ser. No. 987,057, Dec. 7, 1992, Pat. No. 5,384,586, which is a continuation of Ser. No. 583,305, Sep. 17, 1990, abandoned. This application Jan. 23, 1995, Ser. No. 377,275

Claims priority, application Japan, Sep. 18, 1989, 1-241071; Sep. 18, 1989, 1-241072; Sep. 18, 1989, 1-241073; Sep. 18, 1989, 1-241074; Sep. 18, 1989, 1-241075

Int. Cl.⁶ G01D *15/24;* **B41J** *2/01;11/58;* **H04N** *1/00*

U.S. Cl. 346—134 15 Claims





1. An ink jet recording apparatus having a mechanism for discharging a recording material, disposed downstream of a recording region where ink jet recording is effected on the recording material in a recording operation using an ink jet recording head, said apparatus comprising:

an apparatus frame;

a discharging roller for discharging the recording material during the recording operation;

an auxiliary rotatable member for urging the recording medium to said discharging roller to apply conveying force to the recording material;

a supporting member for rotatably supporting said auxiliary rotatable member, said supporting member being movable relative to said apparatus frame;

a positioning member disposed at a position having a fixed positional relation with an axis of said discharging roller and contactable with a part of said supporting member; and

urging means for urging said supporting member to said positioning member.

5,534,895
ELECTRONIC AUTO-CORRECTION OF MISALIGNED SEGMENTED PRINTBARS

William M. Lindenfelser, Rochester, and Frederick A. Donahue, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

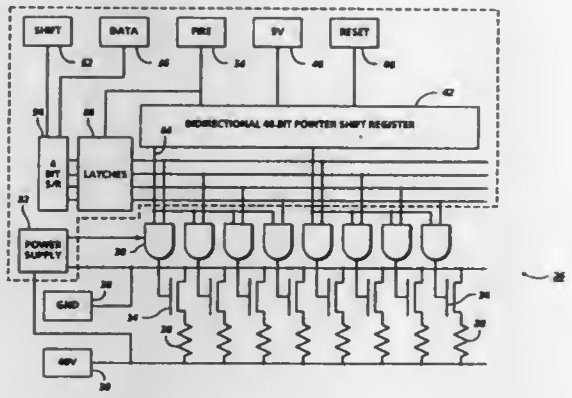
Filed Jun. 30, 1994, Ser. No. 269,319

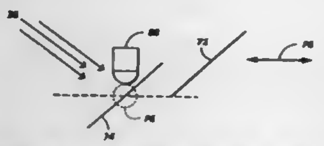
Int. Cl.⁶ B41J *29/393*

U.S. Cl. 347—19 27 Claims

1. A method for adjusting printing alignment of a printer having a scanning printbar, scanning in a scanning direction, printing upon a recording medium advanced substantially perpendicularly to the scanning direction in which the printbar includes banks of nozzles sequentially printing line segments, comprising the steps of:

printing a pattern having an alignment feature indicative of the printing alignment on the recording medium;





moving a sensing device in the scanning direction across the pattern to generate an output indicative of the alignment feature of the pattern;

determining a value based on the generated output; and

adjusting a time delay period between printing of sequentially printed line segments based on the value determined in said determining step.

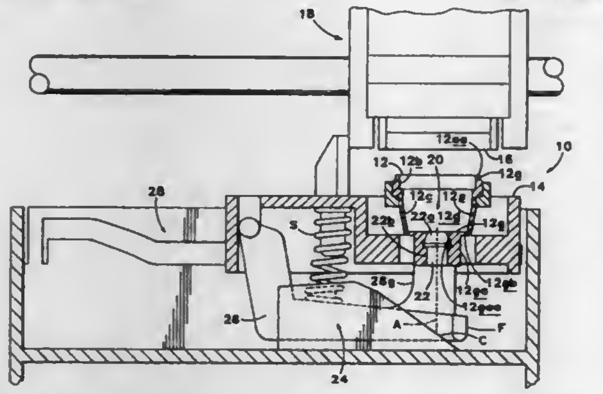
5,534,896
TUBELESS INK-JET PRINTER PRIMING CAP SYSTEM AND METHOD

William S. Osborne, Vancouver, Wash., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1993, Ser. No. 94,634

Int. Cl.⁶ B41J *2/165*

U.S. Cl. 347—29 14 Claims



11. A tubeless ink-jet carriage-mounted printhead priming system comprising:

a piston member having a distal end;

a first drive mechanism for reciprocating said distal end of said piston member generally along a predefined axis;

a generally vertically reciprocable cap, said cap having an upper peripheral lip located along said axis for sealingly engaging a printhead in a first predefined position of said cap relative to a horizontally reciprocable carriage that mounts the printhead, said lip having formed therein an aperture through which ink can be drawn, said cap including a receptacle for receiving ink droplets introduced thereunto from the printhead, said receptacle having a rolling diaphragm located along said axis and defining a lower region of said receptacle, when upper peripheral lip is sealing engaged with printhead, said receptacle having nominal volume into which ink can be drawn, said diaphragm having on a lower surface thereof structure operatively engaging said distal end of said piston member and said diaphragm being integrally molded from a flexible polymeric material and being flexed by generally vertical reciprocation of said distal end of said piston member in predefined synchronization with horizontal reciprocation of the printhead on the carriage with said cap in sealing engagement with the printhead, so that the printhead is primed by flexing said diaphragm to increase the volume of the receptacle to a volume greater than the nominal volume, thereby drawing droplets thereunto from the printhead while the printhead is sealingly engaged by said lip; and

a second drive mechanism for lowering said cap to a second predefined position below said first predefined position in predefined synchronization with reciprocation of said piston member such that said cap sealingly engages the printhead only during a downstroke of said piston member.

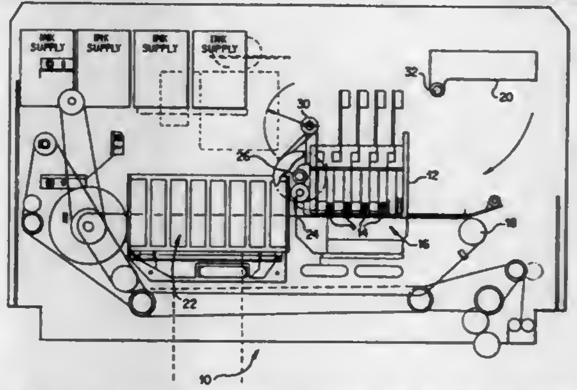
5,534,897
INK JET MAINTENANCE SUBSYSTEM

David G. Anderson, Ontario, and Alfred J. Claflin, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1993, Ser. No. 84,095

Int. Cl.⁶ B41J *2/165*

U.S. Cl. 347—32 17 Claims



1. A printing and maintenance system for an ink jet printer, comprising:

a printbar including a planar front nozzle face of a predetermined length defining a longitudinal axis of the printbar, the printbar being pivotally mounted for movement about an axis of rotation between a print position and a maintenance position, the maintenance position being angularly displaced from the print position; and

a maintenance station translatable along an axis parallel to said longitudinal axis from an inactive position axially offset from said front nozzle face to an active position immediately in front of said planar front nozzle face when the print bar is in the maintenance position, said maintenance station comprising at least one maintenance device.

5,534,898
INK JET HEAD, INK JET APPARATUS AND WIPING METHOD THEREFOR

Toshio Kashino, Chigasaki; Tsuguhiro Fukuda, Yokohama; Noribumi Koitabashi, Yokohama; Hiroshi Tajika, Yokohama; Atsushi Arai, Kasukabe, and Hiromitsu Hirabayashi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

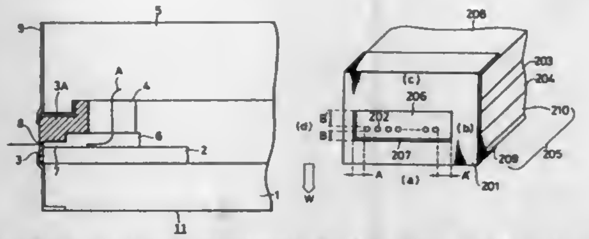
Continuation of Ser. No. 464,437, Jan. 12, 1990, abandoned. This application Sep. 24, 1991, Ser. No. 764,060

Claims priority, application Japan, Jan. 13, 1989, 1-7472; Jan. 18, 1989, 1-9548

Int. Cl.⁶ B41J *2/165*

U.S. Cl. 347—33 35 Claims

1. An ink jet apparatus using a head, said head having an ink chamber provided with a discharge energy generating element for



generating energy for discharging ink, an opening surface having an opening communicating with said ink chamber, a discharge port forming member joined to said opening surface and having a discharge port provided corresponding to said opening, and a press member for covering a section of a surface of said discharge port forming member, excluding a portion of the surface on which at least said discharge port is provided, to maintain a connection of said discharge port forming member to said opening surface, wherein said portion is segmented by said discharge port into a narrow side and a wide side, said apparatus comprising a wiping member for wiping the surface of said discharge port forming member by relative movement with said head, wherein said wiping member wipes the surface of said discharge port forming member in a direction from said narrow side to said wide side.

5,534,899
REPLACEABLE INK TANK

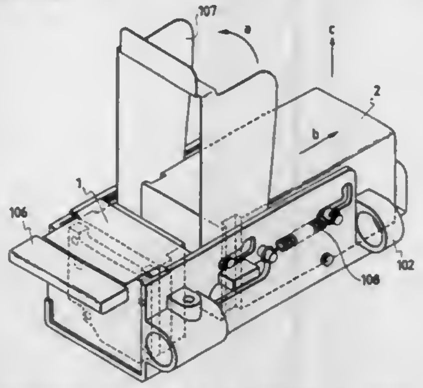
Yoshio Uchikata, Yokohama; Yoshifumi Hattori, Yamato; Yoji Ara, Yokohama; Masashi Kitani, Yokohama; Etsurou Suzuki, Yokohama; Toshihide Wada, Yokohama; Hiromitsu Hirabayashi, Yokohama; Hideo Saikawa, Kawasaki; Masami Kojima, Tokyo; Tadashi Hanabusa, Yokohama; Kenji Kawano, Tokyo; Koichi Tanno, Kawasaki; Tetsuyo Ohashi, Yokohama; Toshihiko Bekki; Kenji Aono, both of Kawasaki, and Masaharu Ikado, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 478,827, Jun. 7, 1995, Pat. No. 5,512,926, which is a continuation of Ser. No. 988,442, Dec. 9, 1992, abandoned. This application Oct. 18, 1995, Ser. No. 544,852

Claims priority, application Japan, Dec. 11, 1991, 3-327558; Dec. 11, 1991, 3-327709; Dec. 11, 1991, 3-327710; Dec. 11, 1991, 3-327711; Dec. 11, 1991, 3-327714; Dec. 11, 1991, 3-327715; Dec. 11, 1991, 3-327717; Dec. 11, 1991, 3-327719; Dec. 11, 1991, 3-336790; Dec. 11, 1991, 3-350807; Dec. 11, 1991, 3-351047

Int. Cl.^{6} B41J *2/175*

U.S. Cl. 347—49 **7 Claims**



1. A replaceable ink tank for a bubble jet printer having a carriage adapted to scan a recording sheet, an ink jet print head having at least one coupling member and an ink supply inlet for supplying liquid ink to the ink jet print head, which is mountable to the carriage for ejecting liquid ink by the action of thermal energy while the carriage scans the recording sheet, and an ink tank receiving portion on the carriage for receiving said replaceable ink tank and supporting same for connection to the ink jet print head using a movable mounting lever mechanism on the carriage, said ink tank comprising:

a container providing a reservoir for liquid ink to be supplied to the ink jet print head, said container being configured for reception in the ink tank receiving portion on the carriage;

an ink supply outlet in said container for supplying liquid ink in said reservoir to the ink supply inlet of the ink jet print head;

at least one engaging member on said container positioned relative to said ink supply outlet for cooperating with the coupling member on the ink jet print head for connecting said replaceable ink tank to the ink jet print head with said ink supply outlet connected to the ink supply inlet upon movement of the mounting lever mechanism to a secured position; and

an engaging portion on an outer surface of said container, said engaging portion being positioned for engagement with the mounting lever mechanism upon movement thereof to a replacement position for disconnecting said engaging member from the coupling member and separating said replaceable ink tank and the ink jet print head for permitting removal of said replaceable ink tank from the carriage.

5,534,900
INK-JET RECORDING APPARATUS

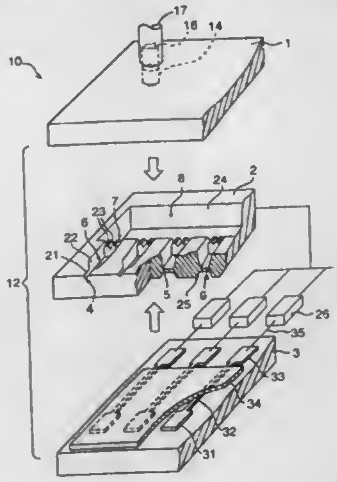
Yoshihiro Ohno; Mitsuro Atobe, both of Nagano-ken, and Hitoshi Tanbo, Hyogo-ken, all of, Japan, assignors to Seiko Epson Corporation, Japan

Filed Sep. 11, 1991, Ser. No. 757,691

Claims priority, application Japan, Sep. 21, 1990, 2-252252; Nov. 14, 1990, 2-307855; Nov. 15, 1990, 2-309335; Jun. 12, 1991, 3-140009

Int. Cl.^{6} B41J *2/045*

U.S. Cl. 347—54 **43 Claims**



1. An ink-jet apparatus comprising:

an ink-jet head comprising a substrate, the substrate including a plurality of nozzle openings, a plurality of independent ejection chambers each having side walls and respectively correspondingly communicated with said nozzle openings, diaphragms respectively correspondingly formed in said ejection chambers partly on at least one of said walls of each of said ejection chambers, said diaphragms being rectangular in shape having width a and length b, a plurality of driving means for respectively driving said diaphragms, and a common ink cavity for supplying ink to said plurality of ejection chambers so that, upon application of electric pulses to said plurality of driving means, said driving means respectively distort said diaphragms from a normal position by electrostatic force via said applied pulses to a distorted position and then respectively release said diaphragms upon either withdraw of said applied pulses or after reverse of polarity of said applied pulses permitting said diaphragms to distort in a direction inwardly of said chambers thereby increasing respective pressures in said ejection chambers to eject ink drops from said nozzle openings onto a recording medium,

wherein said respective driving means comprising electrodes disposed respectively adjacent to said diaphragms for respectively correspondingly distorting said diaphragms by the electrostatic force, and

wherein the driving voltage, V, for said applied pulses for acquiring the quantity of ejection of ink is expressed as:

$$V=t\cdot(3Eh^3\Delta w/\epsilon b)^{1/2}\cdot(1/a^5)^{1/2}$$

wherein t is the distance between a respective diaphragm and a respective electrode, E is Young's modulus for the substrate, h is the thickness of a diaphragm, w is the quantity of displacement of the diaphragm, ϵ is the dielectric constant of the diaphragm.

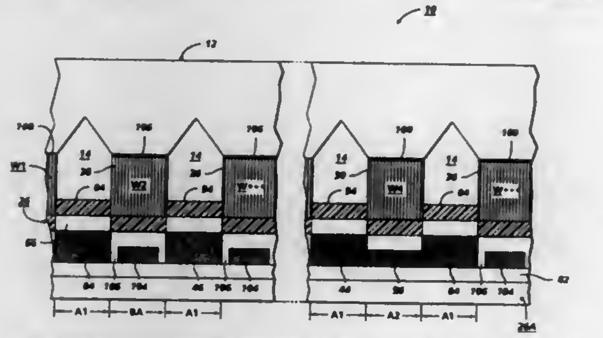
5,534,901
INK JET PRINTHEAD HAVING A FLAT SURFACE HEATER PLATE

Donald J. Drake, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1994, Ser. No. 254,793

Int. Cl.^{6} B41J *2/335*

U.S. Cl. 347—63 **17 Claims**



1. An improved heater plate for an ink jet printhead, the heater plate comprising:

(a) a silicon wafer base having a substantially flat first surface;

(b) a first insulating layer formed on said first surface of said wafer base;

(c) a second insulating layer spaced from said first insulating layer, said second insulating layer having a top surface for bonding the heater plate to a channel plate to form a printhead;

(d) a component sublayer formed between said second and said first insulating layers, said component sublayer including circuit and non-circuit areas, and having active patterns formed within said circuit areas defining said non-circuit areas; and

(e) non-active relief-compensating patterns formed within said non-circuit areas of said component sublayer for making flat said top surface of said second insulating layer of the heater plate by preventing said second insulating layer from sagging in areas thereof located above said non-circuit areas of said component sublayer.

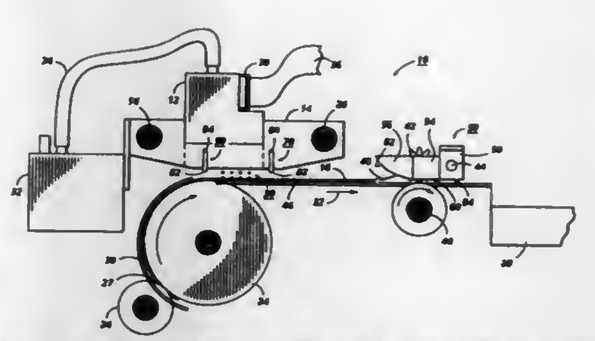
5,534,902
HOLDDOWN STRUCTURES FOR RECORDING MEDIUM HAVING CURL

David D. Hoesly, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1994, Ser. No. 221,675

Int. Cl.^{6} B41J *2/01;13/10*

U.S. Cl. 347—104 **27 Claims**



1. An ink jet printer of the type in which liquid ink is deposited on a recording medium having side edges, the recording medium traversing along a recording medium path on a platen including a post-printing area having a first side edge zone and a second side-edge zone and a middle zone located therebetween, the first and second side-edge zones corresponding to anticipated locations of the side edges of the recording medium traversing through the post-printing area, comprising:

a liquid ink printhead, located in the recording medium path before the post-printing area, depositing liquid ink on the recording medium; and

a first holddown member disposed in the post-printing area and in one of the first or second side-edge zones, said first holddown member including a first edge portion spaced a distance from the platen defining a first space therebetween and a second edge portion extending from said first edge portion in a transverse direction therewith and toward the middle zone, said second edge portion of said first holddown member disposed between said liquid ink printhead and said first edge portion of said first holddown member.

5,534,903
INK JET HEAD

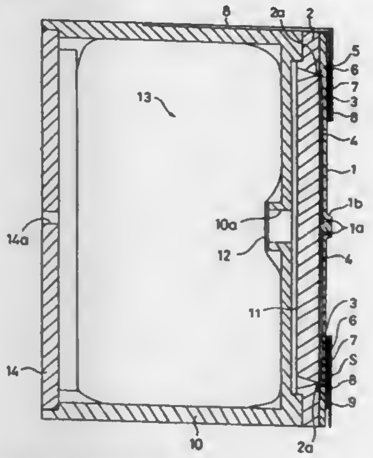
Tsuyoshi Hayakawa; Hajime Oda; Takashi Kogo; Yukiharu Shimizu; Shoichi Sato; Toshiya Tamura, and Hiroyuki Kojima, all of Chiba-ken, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1993, Ser. No. 93,281

Claims priority, application Japan, Jul. 20, 1992, 4-192290

Int. Cl.^{6} B41T *2/045*

U.S. Cl. 347—71 **2 Claims**



1. An ink jet head comprising:

(a) a nozzle plate provided with nozzles,

(b) a base plate provided with ink supplying holes and having one surface laminated with a surface and said nozzle plate,

(c) pressure chambers provided on at least one of said nozzle plate and said base plate,

(d) pressure means provided on one of said nozzle plate and said base plate correspondingly to each of said pressure chambers for effective ejection of ink,

(e) inner connecting channels provided between said nozzle plate and said base plate so as to connect each of said pressure chambers to each of said nozzles,

(f) outer connecting channels provided between said nozzle plate and said base plate so as to connect each of said pressure chambers to each of said ink supplying holes, and

(g) a common ink chamber connecting to said ink supplying holes so as to supply ink;

said head being characterized in that

(i) said nozzles are bored in a thickness direction of said nozzle plate,

(ii) said ink supplying holes are bored in a thickness direction of said base plate,

(iii) said pressure chambers and said inner and outer connecting channels are recessed on a surface of at least one of said nozzle plate and said base plate and substantially perpendicular to said nozzles and said ink supplying holes,

(iv) the diameter of said nozzles is smaller than a width of said inner connecting channels,

(v) the diameter of said ink supply holes is smaller than a width of said outer connecting channels,

(vi) said nozzle plate and said base plate are laminated to each other by adhesive applied outside of said pressure chambers and said inner and outer connecting channels,

(vii) said common ink chamber is provided on a surface of said base plate which is opposite to the surface laminated to said base plate, and

(viii) a direction of inkflow through said nozzles coincides with a direction of inkflow through said ink supplying holes.

5,534,904

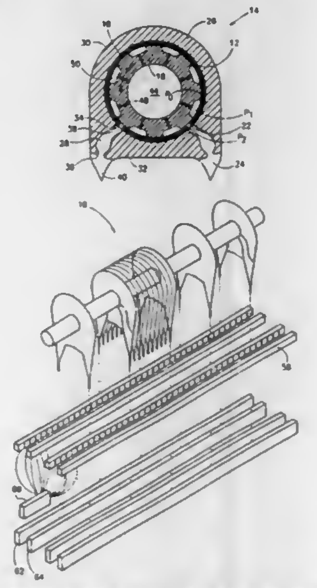
MULTI-JET GENERATOR DEVICE FOR USE IN PRINTING

Yhoshua Sheinman, Tel Aviv, Israel, assignor to Meir Weksler, Mazkeret Batya, Israel

Filed Nov. 7, 1994, Ser. No. 336,749

Int. Cl.^{6} B41J *2/02*

U.S. Cl. 347—75 30 Claims



1. A multi-jet generator device for use in a process for placing selected droplets of printing fluid onto a printing medium, the device comprising:

(a) a substantially horizontally printing fluid distribution member for providing a supply of printing fluid;

(b) an array of jet generators deployed along said printing fluid distribution member, each of said jet generators having at least one channel with an inlet in flow communication with said printing fluid distribution member and an outlet deployed over the printing medium, each of said at least one channel providing a jet of printing fluid; and

(c) a drop generator rotatably deployed within said printing fluid distribution member for regulating the flow of the printing fluid from said printing fluid distribution member to said array of jet generators so as to control the breakage of each said jet into droplets.

5,534,905

THERMAL-TRANSFER RECORDING PROCESS

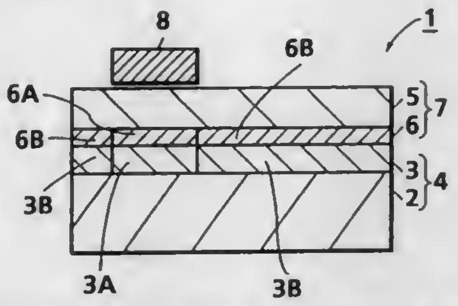
Yonosuke Takahashi, and Fumiaki Shinozaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1993, Ser. No. 134,882

Claims priority, application Japan, Oct. 13, 1992, 4-301807; Nov. 17, 1992, 4-330927

Int. Cl.^{6} B41M *5/26;* **B41J** *2/325*

U.S. Cl. 347—171 10 Claims



1. A thermal-transfer recording process comprising the steps of:

(1) placing a transfer material comprising a support film and an image forming layer provided thereon which contains a coloring material and an organic polymer on an image-receiving sheet comprising a substrate and a photopolymerizable thermal-adhesive layer in such a manner that the image forming layer and the photopolymerizable thermal-adhesive layer come into contact with each other, to form a composite;

(2) imagewise heating the support film using a thermal head to generate a first heated area in the image forming layer and a second heated area in the photopolymerizable thermal-adhesive layer, thereby increasing a bonding strength between said first heated area and said second heated area;

(3) separating the transfer material from the image-receiving sheet, thereby leaving said first heated area of the image forming layer on the photopolymerizable thermal-adhesive layer to form a colored replica image on the image-receiving sheet; and

(4) exposing the whole photopolymerizable thermal-adhesive layer to radiation to cure the photopolymerizable thermal-adhesive layer on the image receiving sheet.

5,534,906

ELECTRIC FIELD ASSISTED THERMAL RECORDING APPARATUS

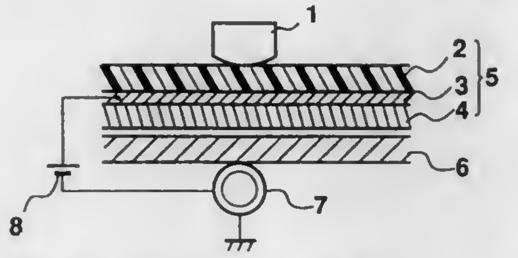
Keiki Yamada; Masaru Ohnishi; Yoshiaki Odai, and Ryoji Arima, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1992, Ser. No. 929,301

Claims priority, application Japan, Aug. 21, 1991, 3-209280; Feb. 13, 1992, 4-026974

Int. Cl.^{6} B41J *2/325*

U.S. Cl. 347—171 29 Claims



1. A thermal recording apparatus, comprising:

an ink sheet having layers including a conductive layer and one of a conductive ink layer and a chargeable ink layer, the one of a conductive ink layer and a chargeable ink layer having ink particles, wherein said conductive layer has an area larger than remaining layers of said ink sheet, the area being defined as a coupling area;

a thermal head for heating said ink sheet; and

means for generating an electric field between said ink sheet and a recording medium to cause at least some of the ink particles to fly from the ink sheet to the recording medium, the means for generating applying an electric potential to the coupling area to generate the electric field.

5,534,907

REVERSIBLE THERMOSENSITIVE COLORING RECORDING METHOD, RECORDING MEDIUM AND RECORDING APPARATUS FOR THE RECORDING METHOD

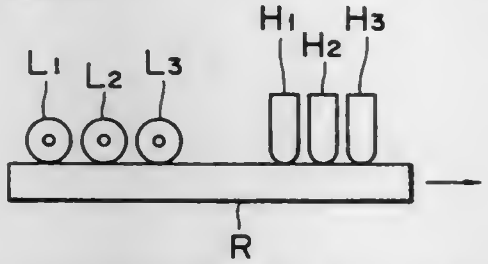
Kyoji Tsutsui, and Takehito Yamaguchi, both of Shizuoka-ken, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 28,229, Mar. 9, 1993. This application May 25, 1995, Ser. No. 451,071

Claims priority, application Japan, Mar. 9, 1992, 4-085902; Jun. 25, 1992, 4-191644

Int. Cl.^{6} B41J *2/325;* **B41M** *5/34;5/30;5/28*

U.S. Cl. 347—175 1 Claim



1. A recording apparatus for producing multi-color images by use of, or initializing, a reversible thermosensitive coloring recording medium which comprises a support and a reversible thermosensitive coloring recording layer formed thereon, said reversible thermosensitive coloring recording layer comprising a plurality of reversible thermosensitive coloring compositions, each of said reversible thermosensitive coloring compositions being independently present separated from and successively overlaid the other reversible thermosensitive coloring compositions, and capable of reversibly forming a color development state with a different color in a predetermined color development temperature range, and a decolorization state in a predetermined decolorization temperature range by the application of heat thereto and maintaining said color development state and said decolorization state at room temperature, said decolorization temperature range being located lower in terms of temperature than said color development temperature range therefor, comprising:

first heat generating means for applying heat imagewise to said reversible thermosensitive coloring recording medium to the color development temperature range of any of said reversible thermosensitive coloring compositions,

second heat generating means for applying heat imagewise to said reversible thermosensitive coloring recording medium to the decolorization temperature range of any of said reversible thermosensitive coloring compositions, and

third heat generating means for applying heat to the entire surface of said reversible thermosensitive coloring recording medium to the decolorization temperature range of each of said reversible thermosensitive coloring compositions.

5,534,908

THERMAL TRANSFER RECORDER WITH INK SHEET AND RECORDING MEDIUM CONVEYED ACCORDING TO RECORDING MODE

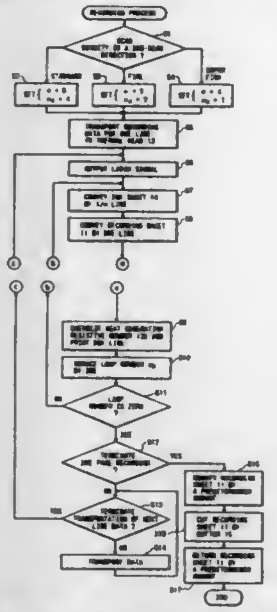
Tomoyuki Takeda, Yokohama; Takehiro Yoshida, Tokyo; Takeshi Ono, Yokohama; Satoshi Wada, Kawasaki; Masaya Kondo, Tokyo; Makoto Kobayashi, Tama; Takahiro Kato, Yokohama; Minoru Yokoyama, Yokohama; Akihiro Tomoda, Yokohama; Yasushi Ishida, Tokyo; Takashi Awai, and Masakatsu Yamada, both of Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 182,388, Jan. 18, 1994, abandoned, which is a continuation of Ser. No. 648,054, Jan. 30, 1991, abandoned. This application Sep. 15, 1995, Ser. No. 528,608

Claims priority, application Japan, Feb. 1, 1990, 2-20403; Feb. 1, 1990, 2-20404; Feb. 1, 1990, 2-20406

Int. Cl.^{6} B41J *11/42*

U.S. Cl. 347—215 12 Claims



1. A thermal transfer recording apparatus for transferring an ink of an ink sheet onto a recording medium to record an image on said recording medium, said apparatus comprising:

a recording medium mounting section for mounting said recording medium;

an ink sheet mounting section for mounting said ink sheet, said ink sheet mounting section accepting a multi-print ink sheet containing said ink in an amount sufficient to record plural times;

recording medium conveying means for conveying said recording medium in a sub-scan direction;

ink sheet conveying means for conveying said ink sheet;

a thermal head for selectively transferring said ink from said ink sheet to said recording medium so as to record a line of an image according to recording information across said recording medium perpendicular to said sub-scan direction;

discriminating means for discriminating a recording mode of the image to be recorded;

first control means for controlling a ratio of a conveyance amount of said ink sheet to a conveyance amount of said recording medium in accordance with the recording mode discriminated by said discriminating means so as to maintain constant a recording density of the recorded line of the image; and

second control means for controlling said thermal head to perform repeatedly a recording based on a same recording information a number of times which varies in accordance with the recording mode discriminated by said discriminating means,

wherein said number of times is a first number of times in a predetermined recording mode and a second number of times, different from said first number of times, in another recording mode different from said predetermined recording mode, and where in each said recording mode said thermal head performs repeatedly said recording on an area of said recording medium having a different length in said sub-scan direction, so that a total number of recordings performed in a given length in said sub-scan direction is constant for each said recording mode.

5,534,909

RECORDING APPARATUS REGULATING THERMAL HEAD POWER AND INK SHEET PEELING ANGLE

Tadashi Hanabusa, Zushi, and Nobuyuki Kuwabara, Tokyo, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

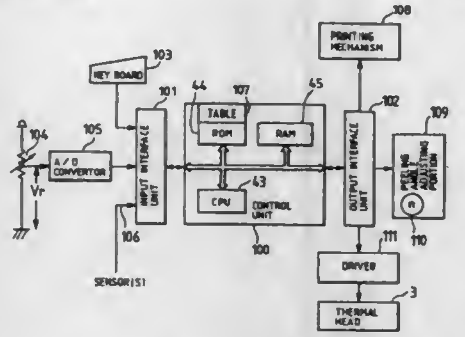
Continuation of Ser. No. 313,516, Feb. 22, 1989, abandoned.

This application Feb. 20, 1992, Ser. No. 837,597

Claims priority, application Japan, Feb. 25, 1988, 63-40677

Int. Cl.^{6} B41J *35/20*

U.S. Cl. 347—216 **18 Claims**



1. An image recording apparatus for recording an image by transferring an ink from a heat-sensitive transfer material onto a recording medium according to image information, comprising:

regulating means for regulating an electric energy to be supplied to a recording head, said recording head having a downstream side relative to a conveyance direction of said ink sheet and a downstream edge disposed on said downstream side;

peeling angle regulator means for regulating a peeling angle at which said heat-sensitive transfer material is peeled off from said recording medium near said downstream edge, said peeling angle regulator means comprising a peeling angle setting arm rotatable about a shaft fixed on a carriage;

peeling angle designating means for designating an angle value of said peeling angle;

designating means for designating a density value of the image to be recorded on said recording medium;

memory means for storing a plurality of sets of angle values designated by said peeling angle designating means and density values designated by said designating means in a mutually related manner;

control means for reading one of said sets of the angle values and the density values from said memory means and controlling and thereby maintaining a predetermined relationship between said peeling angle regulator means and said regulating means according to the angle values and the density values of said one of said sets; and

means for renewing a designated set of the angle values and the density values stored in said memory means, based on the angle designated by said peeling angle designating means and the density value designated by said designating means.

5,534,910

RECORDING APPARATUS WITH INK SHEET CONVEYANCE ADJUSTED ACCORDING TO A DETECTED INK SHEET CONVEYING STATE

Keizo Sasai; Masakatsu Iwata, both of Yokohama; Hirohisa Sawada, and Fumihiko Nakamura, both of Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

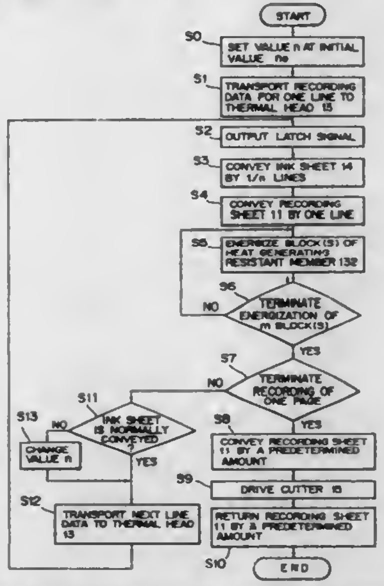
Continuation of Ser. No. 836,514, Feb. 18, 1992, abandoned.

This application Aug. 2, 1994, Ser. No. 284,288

Claims priority, application Japan, Feb. 18, 1991, 3-023058; Feb. 19, 1991, 3-024330; Feb. 21, 1991, 3-027166

Int. Cl.^{6} B41J *17/10*

U.S. Cl. 347—217 **17 Claims**



START
S0
SET VALUE n AT INITIAL VALUE n0
S1
TRANSPORT RECORDING DATA FOR ONE LINE TO THERMAL HEAD 13
S2
OUTPUT LATCH SIGNAL
S3
CONVEY INK SHEET 14 BY 1/n LINES
S4
CONVEY RECORDING SHEET 11 BY ONE LINE
S5
ENERGIZE BLOCK(S) OF HEAT GENERATING RESISTANT MEMBER 132
S6
NO
TERMINATE ENERGIZATION OF m BLOCK(S)
YES
S7
NO
TERMINATE RECORDING OF ONE PAGE
YES
S11
S13
NO
INK SHEET IS NORMALLY CONVEYED
YES
CHANGE VALUE n
S8
CONVEY RECORDING SHEET 11 BY A PREDETERMINED AMOUNT
S9
DRIVE CUTTER 15
S12
TRANSPORT NEXT LINE DATA TO THERMAL HEAD 13
RETURN RECORDING SHEET 11 BY A PREDETERMINED AMOUNT
S10
END

1. A thermal transfer recording apparatus for transferring ink of an ink sheet to a recording medium to record on the recording medium, said apparatus comprising:

ink sheet conveying means for conveying the ink sheet;

recording medium conveying means for conveying the recording medium;

a thermal head for thermally transferring ink of the ink sheet to the recording medium;

detecting means for detecting a conveyance condition of the ink sheet; and

changing means for changing a conveyance amount of the ink sheet in accordance with a detection by said detecting means that a conveyance amount of the ink sheet during a previous recording is not a predetermined amount.

5,534,911

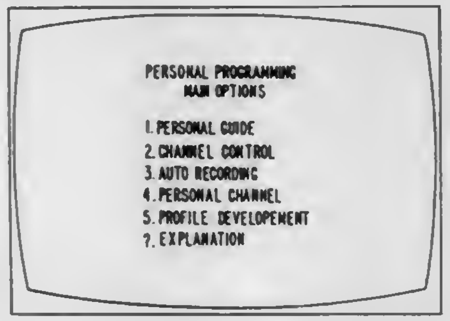
VIRTUAL PERSONAL CHANNEL IN A TELEVISION SYSTEM

Gutman Levitan, 101 Grove St., Stamford, Conn. 06901

Filed Nov. 2, 1994, Ser. No. 333,376

Int. Cl.^{6} H04N *7/03*

U.S. Cl. 348—1 **2 Claims**



1. An apparatus for providing a customer of a television system, in addition to regular television channels, with virtual personal channel which being selected for a customer television receiver delivers a television program of the most personal interest automatically chosen among programs concurrently transmitted on all available physical channels of the system, said apparatus comprising:

communication means at a television system headend for broadcasting descriptive and time/channel data of scheduled television programs prior to transmission of the programs, said descriptive and time/channel data formatted for computer analysis;

means at customer end for receiving said descriptive and time/channel data formatted for computer analysis;

means at customer end for storing customer profile data representing customer interests and preferences;

program evaluation means at customer end coupled to said receiving means and to said storing means for processing said formatted descriptive data of scheduled television programs and providing evaluations of the television programs in respect to said customer profile data; and

real-time control means at customer end coupled to said program evaluation means and to said customer television receiver for determining in correspondence with said television program evaluations and said television program time/channel data which of the programs currently scheduled for transmission has the best evaluation and, only when personal channel is selected by the customer, switching the customer television receiver to the channel of the television system on which the program having the best evaluation is scheduled for transmission.

5,534,912

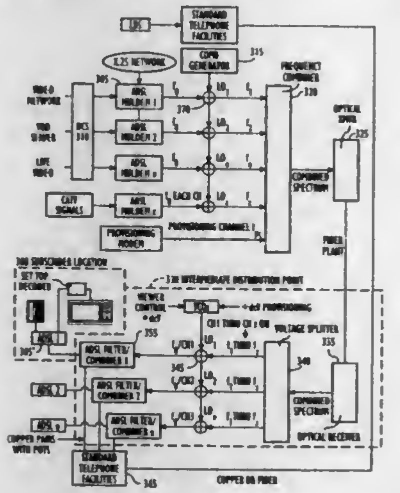
EXTENDED RANGE VIDEO ON DEMAND DISTRIBUTION SYSTEM

Bruce W. Kostreski, Wheaton, Md., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Apr. 26, 1994, Ser. No. 233,579

Int. Cl.^{6} H04N *7/16*

U.S. Cl. 348—6 **40 Claims**



1. In a video distribution system in which video signals are distributed to end users over a telephone wiring plant of a central office using respective pairs of asymmetrical digital subscriber line (ADSL) interface units, a source side interface unit of each pair being located relatively closer to a source of video information than a subscriber side interface unit and the subscriber side interface unit of each pair being located at an end user's location, a method of improving operating characteristics of said distribution system comprising the steps of:

(a) locating the ADSL source side interface unit at a site remote from said central office, and

(b) connecting the source of video information to the ADSL source side interface unit using a broadband communication link.

5,534,913

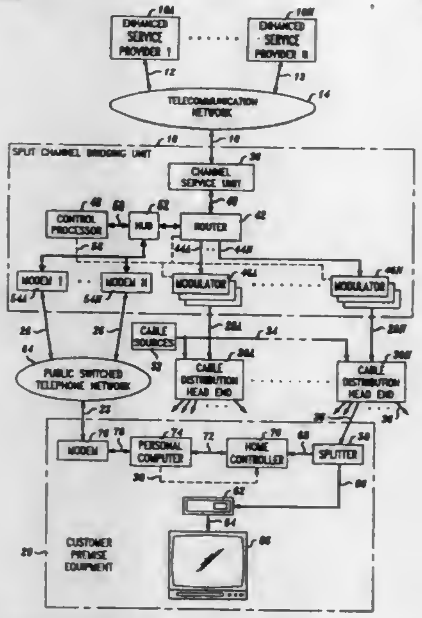
APPARATUS AND METHOD FOR INTEGRATING DOWNSTREAM DATA TRANSFER OVER A CABLE TELEVISION CHANNEL WITH UPSTREAM DATA CARRIER BY OTHER MEDIA

Venkata C. Majeti; Mowaffak T. Midani, both of Naperville, Ill.; Richard J. Watson, Catawissa, Mo., and Kenneth A. Zabriskie, Indianapolis, Ind., assignors to AT&T Corp., Murray Hill, N.J.

Filed Mar. 31, 1994, Ser. No. 221,348

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 348—7 **16 Claims**



ENHANCED SERVICE PROVIDER 1
ENHANCED SERVICE PROVIDER N
12
13
TELECOMMUNICATION NETWORK
14
SPLIT CHANNEL BRIDGING UNIT
CHANNEL SERVICE UNIT
CONTROL PROCESSOR
HUB
ROUTER
MODEM 1
MODEM N
MODULATOR
MODULATOR
CABLE SOURCES
PUBLIC SWITCHED TELEPHONE NETWORK
CABLE DISTRIBUTION HEAD END
CABLE DISTRIBUTION HEAD END
MODEM
PERSONAL COMPUTER
HOME CONTROLLER
SPLITTER
CUSTOMER PREMISE EQUIPMENT

1. In a telecommunication network that supports communications between users and information service providers by using high-speed cable transmission channels to transport information to the users' customer premise equipment and lower speed transmission channels that carry users' requests from the users' customer premises equipment, the lower speed transmission channels transported by a transmission medium physically separate from the transmission medium that transports the high speed cable transmission channels, a split channel bridging apparatus comprising:

means for receiving user generated requests carried on said lower speed transmission channels, each of said user generated requests having a destination of one of said service providers;

means coupled to said receiving means for transmitting each of said requests through a separate communication network to one of the destination service providers located remote from said transmitting means;

means for concurrently supporting the receipt of at least one high speed data channel from each of said service providers, said at least one of said high speed data channel carrying packets of data wherein each packet of data has a destination address associated with one user's customer premise equipment;

routing means coupled to said supporting means for segregating said received packets based on which users are served by each of the high speed cable transmission channels; and

modulating means coupled to said routing means for encoding said segregated packets onto respective high speed cable transmission channels for delivery to the associated users.

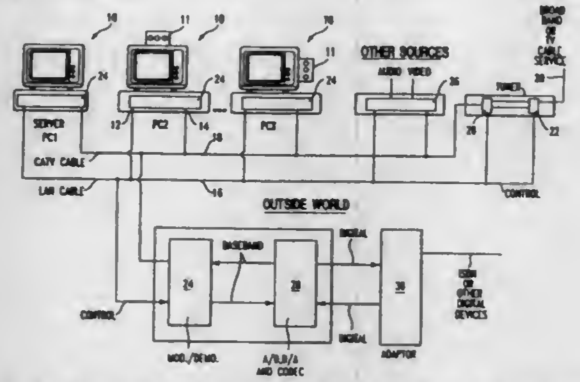
5,534,914
VIDEOCONFERENCING SYSTEM

Daniel P. Flohr, Wilmington, N.C., and Stuart Ross, Danbury, Conn., assignors to Target Technologies, Inc., Wilmington, N.C.

Division of Ser. No. 199,377, Feb. 18, 1994, Pat. No. 5,374,952, which is a continuation-in-part of Ser. No. 72,201, Jun. 3, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,732

Int. Cl.^{6} H04N *7/14;* **H04M** *11/00*

U.S. Cl. 348—15 **9 Claims**



1. A videoconferencing network for a plurality of digital computer stations, wherein each station includes:

(1) an image display;

(2) a digital computer for processing data in accordance with a software program, said computer being connected to supply image and control signals to said display for displaying data thereon;

(3) a video camera for producing video signals representing an image;

(4) a microphone for converting sound into an audio signal;

(5) a modulator having an output port, connected to said digital computer, said video camera and said microphone, for converting video signals received from said camera and associated audio signals received from said microphone into television signals at a selected frequency channel and supplying said television signals at said output port;

(6) a demodulator having an input port, connected to said digital computer, for converting television signals at a selected frequency channel received at said input port into video signals and associated audio signals;

(7) a display controller connected to said demodulator for converting video signals received from said demodulator into image and control signals supplied to said display for displaying a video image on said display; and

(8) a sound transducer connected to said demodulator for converting audio signals received from said demodulator into sound;

said network comprising in combination, a broadband local area network (B-LAN) directly connected to said input and output ports of said plurality of stations, for transmitting and receiving television signals between selected ones of said stations, each television signal being transmitted at a selected frequency channel;

said B-LAN comprising a two-way transmission line having a plurality of connection points, each directly coupled to one of said input and output ports, and extending from a first station to a remote, second connection point coupled to the input and output port of a second station, said transmission line being capable of two-way transmission between any two connection points, including said first and second connection point, via a first frequency channel for transmission in one direction and a second frequency channel for transmission in the opposite direction.

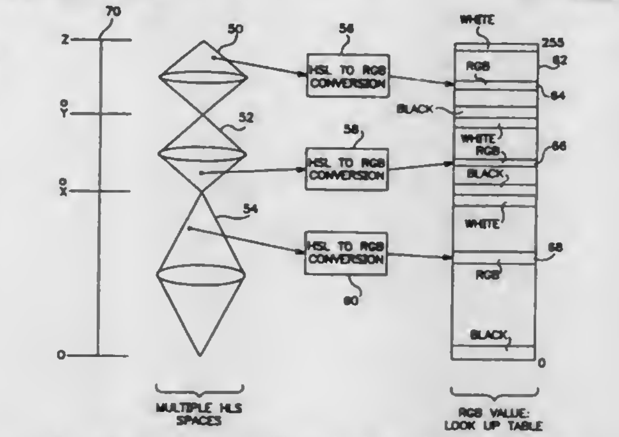
5,534,915
METHOD OF COLOR ENHANCING A MONOCHROME IMAGE USING MULTIPLE BASE COLORS FOR SELECTED REGIONS OF THE MONOCHROME IMAGE

Barry B. Sandrew, Encinitas, Calif., assignor to American Film Technologies, Inc., San Diego, Calif.

Filed Sep. 30, 1992, Ser. No. 954,009

Int. Cl.^{6} H04N *9/43*

U.S. Cl. 348—29 **13 Claims**



1. A method of color enhancing an image comprised of a plurality of pixels representing gray-scale value comprising the steps of:

a) selecting a region of pixels of said image;

b) selecting a first base color for applying to said pixels of said region of said image;

c) displaying a representation of said first base color at a first index value on a display graph having an axis defined by a plurality of base color index values corresponding to an allowable number of base colors;

d) selecting at least one additional base color

e) displaying a representation of said at least one additional base color on said display graph at a second index value in association with said first base color;

f) designating which of said pixel gray-scale values correspond to said first base color;

g) designating which of said pixels correspond to said at least one additional base color; and

h) applying said first base color and said at least one additional base color to corresponding pixels of said selected region, using a color transfer function comprising a look-up table.

5,534,916
DIGITAL ELECTRONIC STILL CAMERA OPERABLE IN A TEXT MODE FOR PHOTOGRAPHING A BILEVEL IMAGE

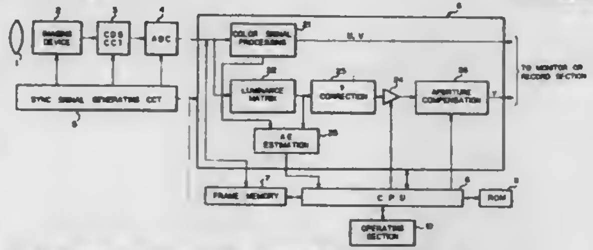
Norihiro Sakaguchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,208

Claims priority, application Japan, Apr. 5, 1994, 6-067214

Int. Cl.^{6} H04N *5/228*

U.S. Cl. 348—222 **4 Claims**



1. A digital electronic still camera comprising:

a lens for focusing a reflection from an object and incident thereto;

imaging means for transforming an image of the object focused by said lens to an analog image signal;

analog-to-digital converting means for converting the analog image signal to a digital image signal;

gain control means for executing gain control with a luminance signal produced from the digital image signal;

control means for setting a gain for the luminance signal in said gain control means;

storing means for storing shading data matching an optical characteristic of said lens beforehand; and

setting means for setting a text mode in said control means;

wherein when said text mode is set, said control means sets the gain in said gain control means in accordance with said shading data stored in said storing means.

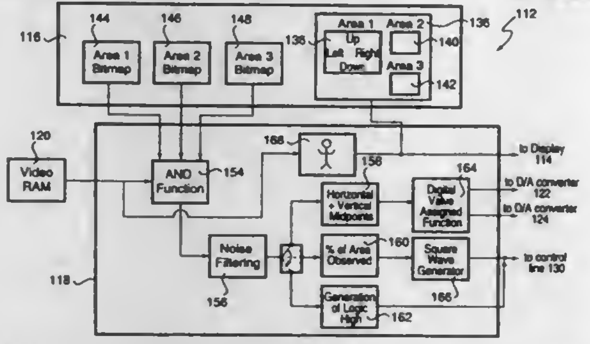
5,534,917
VIDEO IMAGE BASED CONTROL SYSTEM

Francis MacDougall, North York, Canada, assignor to Very Vivid, Inc., Toronto, Canada

Filed May 9, 1991, Ser. No. 697,584

Int. Cl.^{6} H04N *5/262;5/272*

U.S. Cl. 348—169 **42 Claims**



1. An interactive video image based control system comprising:

video imaging means for scanning a field of view occupied by a participant and taking successive images of said field of view;

first processing means in communication with said video imaging means and converting the images taken by said video imaging means into digital video information;

memory means storing digital area of interest information concerning at least one predetermined area of interest within said field of view;

second processing means examining said digital area of interest information in said memory means and said digital video information to determine whether at least a portion of any part of said participant is in said at least one area of interest and the proportion of said at least one area of interest occupied by said participant, said processing means generating output signals having magnitudes dependent on the proportion of said at least one area of interest occupied by said participant; and

display means to display a superimposed image of said at least one area of interest and a representation of said participant within said field of view, said display means: (i) providing visual feedback to said participant of the location of said participant relative to said at least one area of interest, and (ii) allowing said participant to interact with said one area of interest to modify said output signals.

5,534,918
IMAGE PROCESSING APPARATUS FOR DISPLAYING IMAGES ON LEFT AND RIGHT DISPLAY SCREENS

Tetsuo Torii, and Kiyokazu Mizoguchi, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

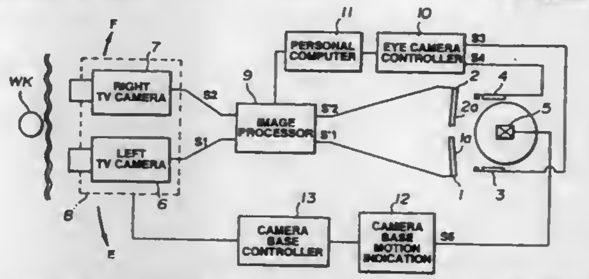
PCT No. PCT/JP93/00480, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO93/21737, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 15, 1993, Ser. No. 318,736

Claims priority, application Japan, Apr. 15, 1992, 4-095486

Int. Cl.^{6} H04N *13/00*

U.S. Cl. 348—53 **6 Claims**



1. An image processing apparatus in which images of an object picked up by left and right image-pick-up devices are displayed on respective screens of left and right display units for visual examination of said object displayed on the left and right screens by an operator's left and right eyes, said apparatus comprising:

visual examination position detection means for detecting respective visual examination positions on said left and right screens; and

image processing means for specifying the object visually examined on the right and left screens based on the visual examination positions detected by the visual examination position detection means, fixing a position of the specified object on one screen of the left and right screens, and shifting an entire image including the specified object on the other screen of the left and right screens so that the specified object on said other screen is located at a position corresponding to the position fixed on said one screen.

5,534,919
IMAGE PICKUP APPARATUS FOR ESTIMATING A COMPLEMENTARY COLOR VALUE OF A TARGET PIXEL

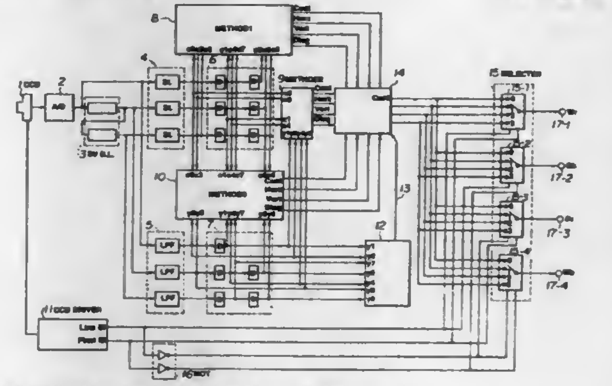
Kousuke Nobuoka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1994, Ser. No. 225,780

Claims priority, application Japan, Apr. 15, 1993, 5-088663

Int. Cl.^{6} H04N *9/64*

U.S. Cl. 348—246 **10 Claims**



6. An image pickup apparatus, comprising:

a plurality of color filters intermittently disposed at a predetermined pitch;

detection means for detecting light via said color filters and outputting an image signal having a luminance signal and a color signal;

luminance-signal formation means for forming luminance signals from the image signal output from said detection means; and

interpolation means for interpolating a signal present at a predetermined position in the output of said detection means with a signal of a first color present at an adjacent position, in accordance with the levels of the luminance signals,

wherein said interpolation means changes the interpolation calculating method in accordance with the levels of the luminance signals.

7. An image pickup apparatus, comprising: a plurality of color filters intermittently disposed at a predetermined pitch;

detection means for detecting light via said color filters and outputting an image signal having a luminance signal and a color signal;

luminance-signal formation means for forming luminance signals form the image signal output from said detection means; and

interpolation means for interpolating a signal present at a predetermined position in the output of said detection means with a signal of a first color present at an adjacent position, in accordance with the levels of the luminance signals,

wherein said interpolation means changes the interpolation calculating method in accordance with the luminance level of the signal present at the predetermined position.

5,534,920

VIEWFINDER BRIGHTNESS CONTROL CIRCUIT FOR A CAMCORDER EMPLOYING IRIS OUTPUT VOLTAGE AND METHOD THEREFOR

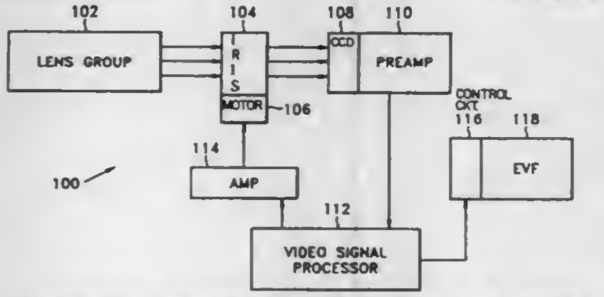
No-jin Kim, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 14, 1994, Ser. No. 273,126

Claims priority, application Rep. of Korea, Jul. 14, 1993, 93-13194

Int. Cl.^{6} H04N *5/222*

U.S. Cl. 348—333 5 Claims



1. A camcorder viewfinder brightness control circuit, comprising:

a first amplifier for amplifying a video signal representing an object to a predetermined level to thereby generate an amplified video signal;

a second amplifier for detecting a change in an iris output voltage, which voltage varies in response to a respective change in ambient brightness, and amplifying said change in iris output voltage by a predetermined ratio to thereby produce an amplified differential voltage; and

a light controller adding said amplified differential voltage generated by said second amplifier to said amplified video signal output from said first amplifier so as to permit automatic control of brightness of an object image provided by viewfinder in response to said change in said ambient brightness.

5,534,921

CCD DIGITAL CAMERA SYSTEM WITH SELECTABLE MEMORIES

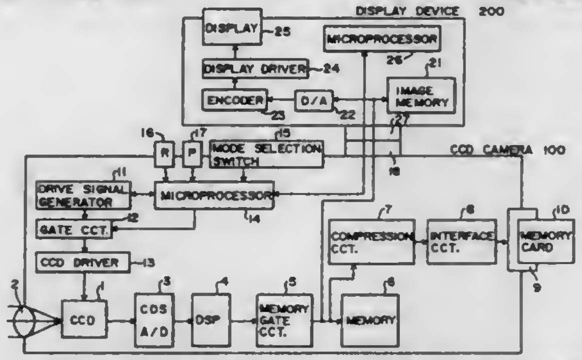
Keiji Sawanobori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1994, Ser. No. 311,357

Claims priority, application Japan, Sep. 24, 1993, 5-258971

Int. Cl.^{6} H04N *5/222;5/225*

U.S. Cl. 348—333 16 Claims



1. A CCD digital camera system including a digital camera and a detachable display device, said digital camera comprising:

an imaging device for receiving an image of an object to be photographed, said imaging device outputting a digital signal corresponding to said received image;

a data memory for storing a portion of said digital signal; and

a controller for controlling a transfer of a first portion of said digital signal from said imaging device to said data memory, said display device comprising:

an image memory for storing image data; and

a display for displaying an image corresponding to said image data stored in said image memory,

said controller monitoring an input from said display device for a predetermined signal indicating that said display device is attached to said digital camera, said controller transferring all of said digital signal to said image memory if a presence of said predetermined signal is detected; and

said digital camera further comprising a compression unit for compressing said digital signal, said compression unit receiving said digital signal from said image memory if said controller detects said predetermined signal.

5,534,922

IMAGE PICKUP DEVICE

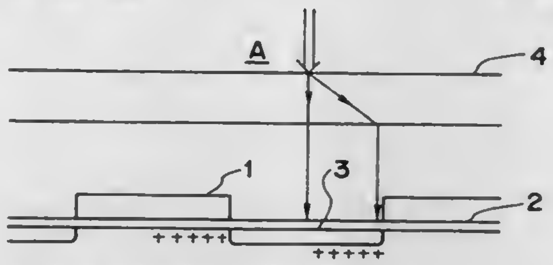
Nobuhiro Takeda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 942,095, Sep. 8, 1992, abandoned, which is a continuation of Ser. No. 577,508, Sep. 4, 1990, abandoned. This application Jan. 23, 1995, Ser. No. 376,684

Claims priority, application Japan, Sep. 7, 1989, 1-230333

Int. Cl.^{6} H04N *5/225*

U.S. Cl. 348—340 14 Claims



1. An image pickup device comprising:

a) solid-state image pickup means comprising a plurality of pixels for providing an image signal corresponding to a light incident from an object on said plurality of pixels, each pixel including a high sensitivity region and a low sensitivity region; and

b) means for compensating for a false signal caused by a sensitivity difference between said high sensitivity region and said low sensitivity region by forming two images, said compensating means shifting said images by one half of a width of said high sensitivity region.

5,534,923

VIDEO CAMERA APPARATUS

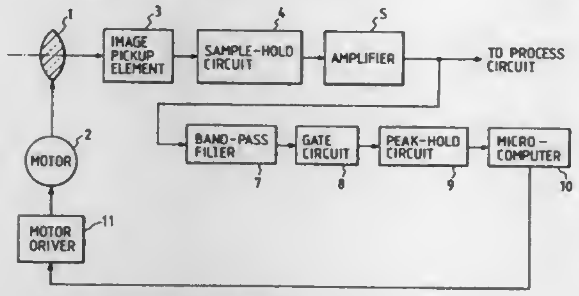
Hirofumi Suda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 74,944, Jun. 10, 1993, abandoned. This application Jun. 29, 1995, Ser. No. 496,812

Claims priority, application Japan, Jun. 11, 1992, 4-177422

Int. Cl.^{6} H04N *5/232*

U.S. Cl. 348—354 17 Claims



1. A video camera comprising;

extracting means for extracting a signal of a predetermined frequency from an image pickup signal generated from image pickup means to obtain a focus estimation value;

detecting means for detecting a difference between the maximum value and the minimum value of a luminance signal level in said image pickup signal;

normalizing means for normalizing the focus estimation value by dividing the focus estimation value extracted by said extracting means by the detection value detected by said detecting means; and

lens moving means for moving a focus adjusting lens to an in-focus point on the basis of the focus estimation value which has been normalized by said normalizing means.

5,534,924

METHOD AND DEVICE TO OBTAIN AN ELEMENT OF INFORMATION ON DEPTH IN THE FIELD SEEN BY PICTURE-SHOOTING DEVICE

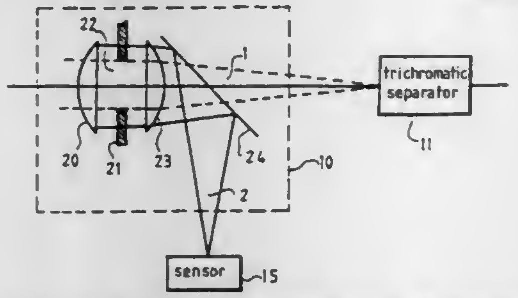
Olivier Florant, Epinay Sur Senart, France, assignor to Thomson Broadcast, Cergy St Christophe, France

Continuation of Ser. No. 842,534, Feb. 27, 1992, abandoned. This application Dec. 13, 1993, Ser. No. 165,574

Claims priority, application France, Mar. 5, 1991, 91 02604

Int. Cl.^{6} H04N *5/238*

U.S. Cl. 348—364 11 Claims



1. A device for obtaining a signal providing an indication of differentiation between foreground areas and background areas in images of a scene, comprising:

an optical device designed to receive, at input, light rays coming from the illuminated scene and to deliver, at output, first optical rays in the visible frequencies range and second optical rays in the frequency band Δf centered on a first frequency fc,

a trichromatic separator designed to separate the three spectral components, red, green and blue, of the first optical rays to constitute three primary rays,

four sensors designed to receive respectively the three primary rays corresponding to the three spectral components and the optical signal of the frequency band Δf and to deliver, at output, four corresponding electrical signals,

a device to compute said differentiation signal designed to receive, at input, the electrical signal corresponding to at least one of the primary rays and the electrical signal corresponding to the optical ray of the frequency band Δf,

a device for the shaping and phasing of said differentiation signal.

5,534,925

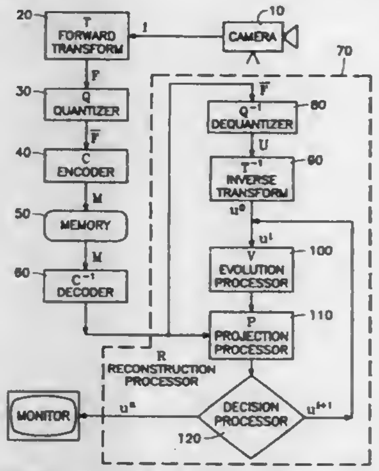
IMAGE COMPRESSION BY OPTIMAL RECONSTRUCTION

Sifen Zhong, Los Angeles, Calif., assignor to Cognitech Inc., Santa Monica, Calif.

Filed May 2, 1994, Ser. No. 237,594

Int. Cl.^{6} H04N *7/32*

U.S. Cl. 348—384 24 Claims



6. A method of compressing a source video image, comprising:

defining plural sub-transform operators corresponding to respective portions of a transform domain;

initializing an initial prediction image;

performing plural iterations corresponding to said plural sub-transform operators, each iteration comprising the following steps:

(a) subtracting the prediction image of the previous iteration from said source video image to produce a residual image;

(b) transforming said residual image with the sub-transform operator corresponding to the current iteration;

(c) quantizing the result of step (b) by associating it with quantization constraints to produce a quantized transform residual and outputting said quantized transform residual;

(d) dequantizing and inverse transforming said quantized transform residual;

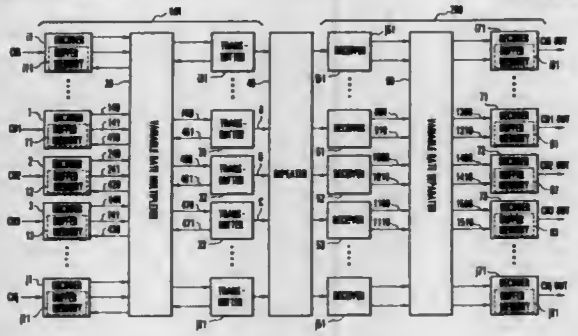
(e) adding the result of step (d) to the prediction image of the previous iteration to produce a current prediction image;

(f) reducing total variation in said current prediction image by reducing lengths of level pixel sets in the image as a function of spatial oscillation of each level set to produce a reduced variation current prediction image;

(g) subtracting the prediction image of the previous iteration from said reduced variation current prediction image to produce a revised current residual image;

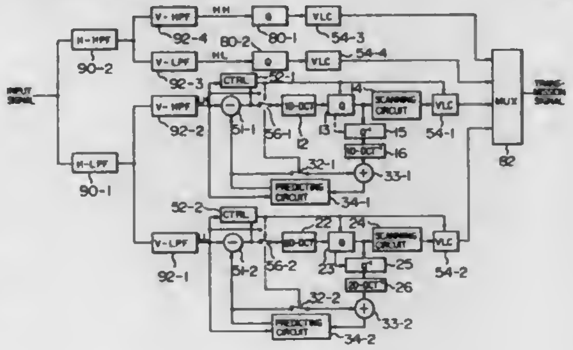
- (h) transforming said revised current residual image to produce a current residual transform and conforming said current residual transform with said quantization constraints of said transform residual of step (c) to produce a modified transform residual;
- (i) inverse transforming said modified transform residual to produce a modified residual image and adding said modified residual image to the prediction image of the previous iteration to produce the prediction image of the current iteration.

5,534,926
MULTIPLEX TRANSMISSION METHOD FOR MOTION PICTURE SIGNALS AND APPARATUS THEREFOR
Junichi Ohki, and Toshio Koga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Mar. 16, 1994, Ser. No. 213,588
Claims priority, application Japan, Mar. 17, 1993, 5-056645
Int. Cl.^{6} H04N *7/12*
U.S. Cl. 348—385 **15 Claims**



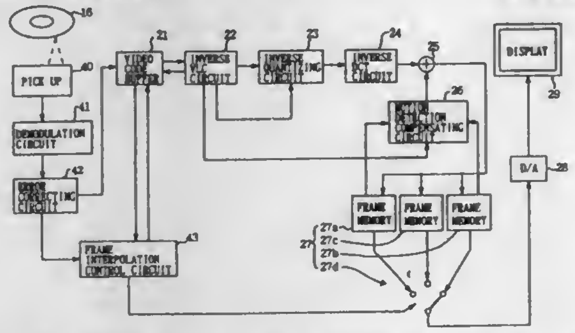
1. A multiplex transmission method for motion picture signals, comprising the steps of:
- preparing a transmission line constituted by a plurality of transmission channels having different carrier frequencies, one of the transmission channels having a transmission rate substantially equal to a long-term average of information generation speeds in encoding an arbitrary motion picture signal;
- encoding the input motion picture signal by using inter-frame and intra-frame correlations;
- relating the image channels in one-to-one correspondence with the transmission channels having the different carrier frequencies;
- outputting encoded information for each image channel and a generated information amount representing a generation speed of the encoded information;
- when an image channel of interest of the image channels exhibits a generated information amount, which represents the encoded information generation speed within a time interval, exceeding a predetermined transmission rate of said transmission line, performing adaptive multiplexing by designating output rates of the encoded information, supplying read clocks corresponding to the output rates, forming cells consisting of a plurality of bit strings of the encoded information, adding identification information indicating a relationship with the image channel to said cells, and, when at least one image channel of interest exhibits the generated information amount exceeding the predetermined transmission rate, dividing and distributing the cells of the image channel of interest to the transmission channels including the transmission channel of the image channel of interest; and
- transmitting the cells divided/distributed by the adaptive multiplexing for each allocated transmission channel.

5,534,927
METHOD OF PERFORMING HIGH EFFICIENCY CODING OF IMAGE SIGNAL AND SYSTEM THEREFOR
Yoshiaki Shishikui; Yukihiro Nishida; Eisuke Nakasu; Yoshimichi Ohtsuka, and Hiroshi Nakanishi, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan
Filed Nov. 12, 1992, Ser. No. 975,433
Claims priority, application Japan, Nov. 12, 1991, 3-295602; Jan. 27, 1992, 4-012118; Sep. 25, 1992, 4-256739
Int. Cl.^{6} H04N *7/30;7/32*
U.S. Cl. 348—400 **27 Claims**



18. A system for performing high efficiency coding of a video signal comprising:
- a dividing means for dividing an inputted video signal into at least four signal components including first to fourth video signal components based on frequency components in vertical and horizontal directions, wherein said first video signal component has a high horizontal frequency component and a high vertical frequency component, said second video signal component has a high horizontal frequency component and a low vertical frequency component, said third video signal component has a low horizontal frequency component and a high vertical frequency component, and said fourth video signal component has a low horizontal frequency component and a low vertical frequency component;
- a means for performing a quantization processing for said first video signal component, and coding a result of said quantization processing to generate a first code train which includes codes representing said first video signal component;
- a means for performing a quantization processing for said second video signal component, and coding a result of said quantization processing to generate a second code train which includes codes representing said second video signal component;
- a means for performing processing of a motion compensation prediction and a horizontal one-dimensional discrete cosine transform (1D-DCT) for said third video signal component, performing a quantization processing for a processing result, and coding results of said quantization processing to generate a third code train which includes codes representing said third video signal component;
- a means for performing processing of a motion compensation prediction and a two-dimensional discrete cosine transform (1D-DCT) for said fourth video signal component, performing a quantization processing for a processing result, and coding a result of said quantization processing to generate a fourth code train which includes codes representing said fourth video signal component; and
- an outputting means for outputting said first to fourth code trains in a predetermined order.

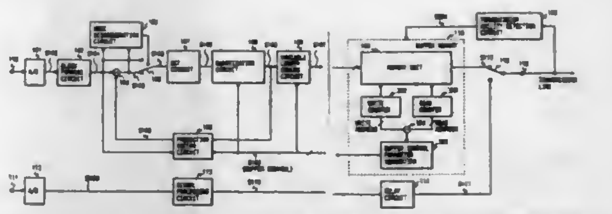
5,534,928
APPARATUS AND METHOD FOR DECODING A PLURALITY OF ENCODED VIDEO SIGNALS
Ryuichi Iwamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 13, 1993, Ser. No. 119,483
Claims priority, application Japan, Sep. 14, 1992, 4-272364
Int. Cl.^{6} H04N *7/34;7/68*
U.S. Cl. 348—401 **26 Claims**



1. An apparatus for decoding a sequence of encoded video signals each video signal included in the sequence being encoded by intra-coding (I), predictive-coding (P) or bidirectrionally-predictive coding (B) and each respectively representing one of an I, P and B coded video picture, with successive I coded signals being separated by plural B coded signals having at least one P coded signal interspersed between the B coded signals, and with B coded signals being encoded from P coded signals and selectively from I coded signals, and with P coded signals being selectively encoded from preceding I coded and P coded signals, said apparatus comprising:
- means responsive to said encoded video signals to produce error-corrected encoded video signals;
- decoding means for decoding said error-corrected encoded video signals and for using a decoded video signal as a reference for decoding error-corrected encoded video signals representing subsequent P and B coded video pictures;
- means for detecting errors in said encoded video signals, for determining if the detected errors are non-correctable and for inhibiting the decoding of an encoded video signal having a non-correctable error; and
- substituting means for substituting for display one of the decoded error-corrected video signals for an encoded video signal having at least one detected error determined to be non-correctable, such that if a B coded signal is detected as having a non-correctable error, said B coded signal is replaced by a decoded error-corrected P coded signal for display, and if a P coded signal is detected as having a non-correctable error, said P coded signal and those P coded and B coded signals encoded therefrom are selectively replaced by a preceding decoded error-corrected P coded signal or by a preceding decoded error-corrected I coded signal for display, and if an I coded signal is detected as having a non-correctable error, said I coded signal and those P coded and B coded signals encoded therefrom, are replaced by a decoded error-corrected P coded signal for display.

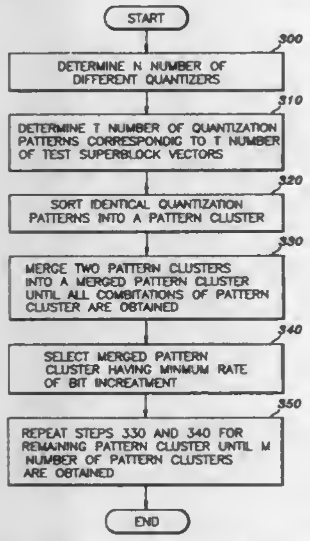
5,534,929
DATA PROCESSING APPARATUS
Mitsugu Tanaka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 30, 1994, Ser. No. 269,361
Claims priority, application Japan, Jul. 6, 1993, 5-166681
Int. Cl.^{6} H04N *7/50*
U.S. Cl. 348—405 **20 Claims**

1. A data processing apparatus comprising:
- a) coding means for coding information data which is input;
- b) memory means for storing the coded information data which was coded by said coding means;



- c) control means for controlling a data amount of coded information data which is output from said coding means in accordance with a data occupation ratio of said memory means; and
- d) change means for changing a real capacity of the memory means in accordance with a transmission rate when the coded information data is transmitted.

5,534,930
METHOD FOR CONSTRUCTING A QUANTIZATION PATTERN CODEBOOK
Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Sep. 12, 1994, Ser. No. 304,061
Int. Cl.^{6} H04N *7/50*
U.S. Cl. 348—405 **1 Claim**


START
300
DETERMINE N NUMBER OF DIFFERENT QUANTIZERS
310
DETERMINE T NUMBER OF QUANTIZATION PATTERNS CORRESPONDING TO T NUMBER OF TEST SUPERBLOCK VECTORS
320
SORT IDENTICAL QUANTIZATION PATTERNS INTO A PATTERN CLUSTER
330
MERGE TWO PATTERN CLUSTERS INTO A MERGED PATTERN CLUSTER UNTIL ALL COMBINATIONS OF PATTERN CLUSTER ARE OBTAINED
340
SELECT MERGED PATTERN CLUSTER HAVING MINIMUM RATE OF BIT INCREATMENT
350
REPEAT STEPS 330 AND 340 FOR REMAINING PATTERN CLUSTER UNTIL M NUMBER OF PATTERN CLUSTERS ARE OBTAINED
END

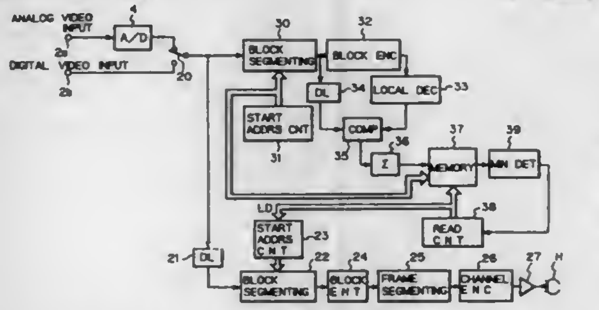
1. A method for constructing a quantization pattern codebook for use in an image coding apparatus, wherein the quantization codebook has M number of quantization patterns, each of the M quantization patterns having N number of different quantizers, each of the N quantizers including one or more quantization levels, with M and N being positive integers, which comprises the steps of:
- (a) selecting the N number of different quantizers wherein a higher quantizer includes all of the quantization levels in a lower quantizer;
- (b) forming T number of quantization patterns corresponding to T number of test superblock vectors using the selected N number of different quantizers, each of the quantization patterns having a minimum quantization error for each of the test superblock vectors, wherein T is a positive integer and greater than M;
- (c) sorting the T number of quantization patterns into a plurality of pattern clusters, wherein identical quantization patterns are grouped into a pattern cluster;
- (d) merging each pair of the pattern clusters into a merged pattern cluster;
- (e) repeating said step (d) until all of the combinable pairs of the pattern clusters are merged into their respective merged pattern clusters;

(f) calculating a rate of bit increment by subtracting the total number of quantization bits in said each pair of pattern clusters used in said step (d) from the total number of quantization bits in the merged pattern cluster derived from said each pair of pattern clusters;
(g) repeating said step (f) until all of the rates of bit increment for all of the merged pattern clusters are obtained;
(h) determining a merged pattern cluster having a minimum rate of bit increment;
(i) setting the determined merged pattern cluster as pattern cluster;
(j) repeating said steps (d) to (j) by using all of pattern clusters excepting the pair of pattern clusters used in forming the merged pattern cluster determined in said step (h) until M number of pattern clusters are obtained as said M number of quantization patterns to be used in the quantization pattern codebook.

5,534,931
ENCODING METHOD AND APPARATUS OF DIGITAL VIDEO SIGNAL

Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 13, 1994, Ser. No. 226,848
Claims priority, application Japan, Apr. 16, 1993, 5-114140
Int. Cl.⁶ H04N *5/76;7/12;11/02;11/04*
U.S. Cl. 348—420 **6 Claims**

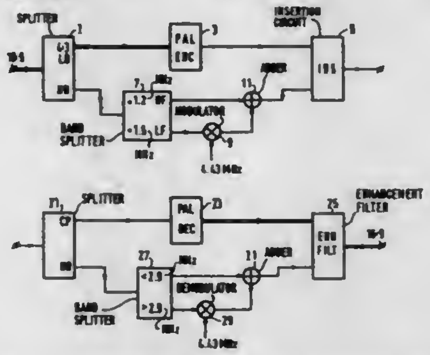


1. An encoding apparatus of a digital video signal, comprising:
first block segmenting means for converting an input scanning-sequence digital video signal into a block-structured signal;
first blocking encoding means for compressing and encoding the output of said first block segmenting means, block by block;
local decoding means for decoding the output of said first block encoding means;
comparing means for comparing the output of said local decoding means with the output of said first block segmenting means;
varying means for varying a block start address of said first block segmenting means, the block start address corresponding to a beginning of a block;
detecting means for cumulating the output of said comparing means for a predetermined time period when the block start address is varied by said varying means so as to detect the block start address with a minimum cumulated value;
second block segmenting means for block segmenting the input scanning-sequence digital video signal from the beginning thereof corresponding to the block start address with the minimum cumulated value; and
second block encoding means for compressing and encoding the output of said second block segmenting means.

5,534,932
LETTERBOX TELEVISION SYSTEM

Adrianus C. J. G. Van de Waterlaat, Adrianus; Franciscus Vreeswijk, and Theodora L. Hamann, both of Eindhoven, all of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 248,825, May 24, 1994, abandoned, which is a continuation of Ser. No. 106,094, Aug. 12, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 342,683
Claims priority, application European Pat. Off., Aug. 13, 1992, 92202496
Int. Cl.⁶ H04N *11/00*
U.S. Cl. 348—432 **13 Claims**



1. A method of transmitting an extended television signal including a wide aspect ratio picture between two horizontal bars which forms a standard aspect ratio picture, and wherein vertical resolution enhancement signals are transmitted to improve the vertical resolution upon display of said standard aspect ratio picture on an enhanced television receiver, said method comprising the steps of:
separating said vertical resolution enhancement signals into a low-frequency part and a high-frequency part;
modulating the low-frequency part onto a subcarrier; and
transmitting the modulated low-frequency part during said horizontal bars without transmitting the high-frequency part during said horizontal bars.

2. A transmission method as claimed in claim 1, further including the step of transmitting the high-frequency part during said horizontal bars, without modulating the high-frequency part onto the subcarrier.

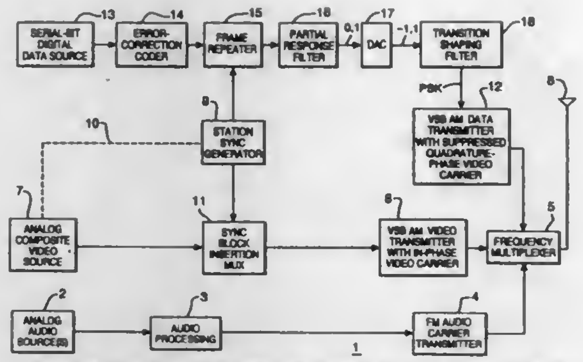
3. A transmission method as claimed in claim 2, further including the step of
expanding the modulated low-frequency part to reduce maximum differences between output values of the modulated low frequency part and a center output value of the modulated low frequency part for preventing an excessive amplitude of the vertical resolution enhancement signals at a transition frequency between the high-frequency part and the modulated low-frequency part.

5,534,933
APPARATUS FOR PROCESSING NTSC TV SIGNALS HAVING DIGITAL SIGNALS ON QUADRATURE-PHASE VIDEO CARRIER

Jian Yang, Bensalem, Pa., assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 26, 1993, Ser. No. 141,070
Int. Cl.⁶ H04N *7/04*
U.S. Cl. 348—433 **48 Claims**

31. A television signal manifested in physical form, said television signal comprising:
a video carrier wave amplitude-modulated in accordance with composite video signal; and
a binary phase-shift-keyed carrier wave of the same frequency as said video carrier wave and in quadrature phasing with said video carrier wave, the binary phase shift keying being done in accordance with a first bit-serial digital signal during at least trace portions of horizontal scan lines including those in which composite video signal is descriptive of television images.


13
SERIAL-BIT DIGITAL DATA SOURCE
14
ERROR-CORRECTION CODER
15
FRAME REPEATER
16
PARTIAL RESPONSE FILTER
0,1
17
DAC
-1,1
TRANSITION SHAPING FILTER
18
PSK
12
VSB AM DATA TRANSMITTER WITH SUPPRESSED QUADRATURE-PHASE VIDEO CARRIER
8
9
STATION SYNC GENERATOR
10
7
ANALOG COMPOSITE VIDEO SOURCE
11
SYNC BLOCK INSERTION MUX
6
VSB AM VIDEO TRANSMITTER WITH IN-PHASE VIDEO CARRIER
5
FREQUENCY MULTIPLEXER
2
ANALOG AUDIO SOURCE(S)
3
AUDIO PROCESSING
4
FM AUDIO CARRIER TRANSMITTER
1

33. A television signal manifested in physical form, said television signal comprising:
an audio carrier wave frequency-modulated in accordance with at least one audio signal;
a video carrier wave amplitude-modulated in accordance with composite video signal; and
a binary phase-shift-keyed carrier wave of the same frequency as said video carrier wave and in quadrature phasing with said video carrier wave, the binary phase shift keying being done in accordance with a bit-serial digital signal during at least trace portions of horizontal scan lines including those in which composite video signal is descriptive of television images.

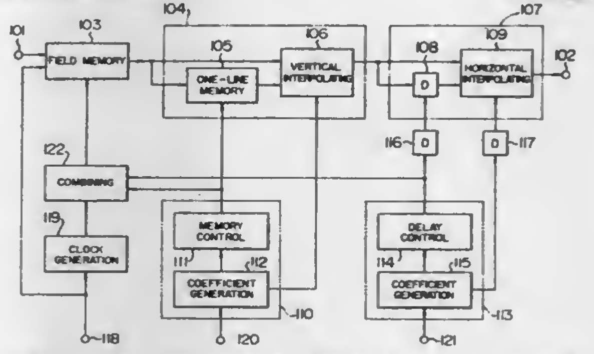
35. A television signal manifested in physical form, said television signal comprising:
a video carrier wave amplitude-modulated in accordance with composite video signal, wherein said composite video signal describes a succession of consecutive-in-time video frames each having a prescribed number of horizontal scan lines therein occurring at a prescribed scan line rate; and
a binary phase-shift-keyed carrier wave in quadrature phasing with said video carrier wave, the binary phase shift keying being done in accordance with a first bit-serial digital signal that occurs in a succession of consecutive-in-time data frames each of the same duration in time as each of said video frames, said data frames being considered for purposes of claiming to be consecutively ordinally numbered modulo-two in order of their occurrence in time, said first bit-serial digital signal in each even-numbered data frame comprising one's complements of said first bit-serial digital signal in an adjoining odd-numbered frame, such that said binary phase-shift-keyed carrier wave locally averages to zero over any even number of video frames.

40. A television signal manifested in physical form, said television signal comprising:
a video carrier wave amplitude-modulated in accordance with composite video signal, wherein said composite video signal describes a succession of consecutive-in-time video frames each having a prescribed number of horizontal scan lines therein occurring at a prescribed scan line rate; and
a binary phase-shift-keyed carrier wave in quadrature phasing with said video carrier wave, the binary phase shift keying being done in accordance with a first bit-serial digital signal that has a bit-rate that is a multiple of said prescribed scan line rate, so the bits of said first bit-serial digital signal are apportioned to data rows each co-extensive in time with at least trace portions of a respective horizontal scan line, said first bit-serial digital signal being the modulo-two sum of a second bit-serial signal and said second bit-serial signal as delayed by one row.

5,534,934
TELEVISION RECEIVER CAPABLE OF ENLARGING AND COMPRESSING IMAGE

Kenji Katsumata; Shigeru Hirahata; Toshinori Murata, all of Yokohama; Haruki Takata, Chigasaki; Shinobu Torikoshi; Takanori Eda, both of Yokohama, and Kouichi Ishibashi, Chigasaki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,576
Claims priority, application Japan, Jun. 18, 1993, 5-146674
Int. Cl.⁶ H04N *7/01*
U.S. Cl. 348—445 **6 Claims**



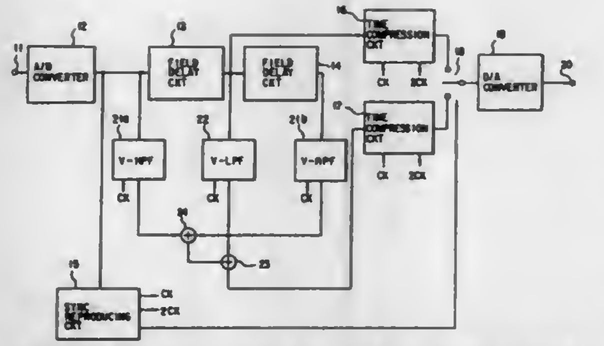
1. A television receiver capable of enlarging and compressing an image comprising:
a memory having a storage capacity not less than a given value which is controlled with at least a line period;
a clock generator generating a clock having a frequency not less than that of a write clock signal from a writing clock for writing a video signal in said memory and for outputting a read clock for reading said written video signal from said memory;
a vertical enlargement controller generating and outputting a signal for controlling said memory to repeatedly read the same line with a line period depending upon a first preset value when said video signal is read from said memory;
a horizontal enlargement controller generating and outputting a signal for controlling said memory to repeatedly read the same pixel from said memory with a predetermined pixel period depending upon a second preset value when said video signal is read from said memory;
means for combining the output signal from said vertical enlargement controller, the output signal from said horizontal enlargement controller and the read clock from said clock generator and for supplying said memory with a combined signal; to thereby provide a video signal representing an image which is compressed and enlarged in horizontal and vertical directions to a desired size as a video signal read from said memory.

5,534,935
PROCESSING APPARATUS FOR PROGRESSIVE SCAN GENERATION OF A TELEVISION SIGNAL

Kiyoyuki Kawai, Yokosuka; Yoshihide Kimata, Tokyo, and Masayuki Ishida, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Nippon Television Network Corporation, Tokyo, both of, Japan

Filed Oct. 27, 1994, Ser. No. 329,855
Claims priority, application Japan, Oct. 29, 1993, 5-271844
Int. Cl.⁶ H04N *7/015*
U.S. Cl. 348—448 **6 Claims**

1. A processing apparatus for converting a television scanning signal, comprising:
vertical low-frequency component extracting means for extracting a vertical low-frequency component from a first field of an interlaced scanning signal;



vertical high-frequency component extracting means for extracting a vertical high-frequency component from preceding and following fields of the first field of the interlaced scanning signal;
interpolation signal generating means for generating an interpolation scanning signal by adding together the vertical low-frequency component and vertical high-frequency component;
first means for time compressing the interlaced scanning signal;
second means for time compressing the interpolation scanning signal; and
selecting means for alternately selecting outputs of the first and second time compressing means and for providing a progressive scanning signal.

5,534,936
APPARATUS FOR REDUCING FLICKERS OF ENCODER WHEN DIGITALLY CONVERTING VIDEO SIGNALS FROM NON-INTERLACED TO INTERLACED FORMAT

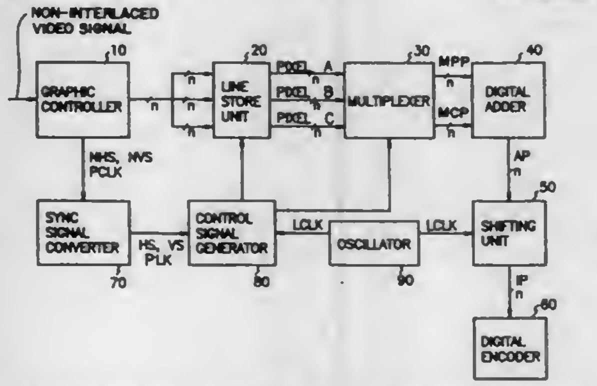
Hae Jong Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 17, 1995, Ser. No. 390,576

Claims priority, application Rep. of Korea, Feb. 17, 1994, 2810/1994

Int. Cl.^{6} H04N *7/01*

U.S. Cl. 348—448 **8 Claims**



1. An apparatus for reducing flickers of an encoder, comprising:
graphic control means for outputting pixel data corresponding to an analog output from a line scanning unit, and for outputting a pixel clock signal, a horizontal synchronous signal and a vertical synchronous signal;
synchronous signal covering means for converting a pixel clock signal, a non-interlaced horizontal synchronous signal and non-interlaced vertical synchronous signal outputted from the graphic control means to a pixel clock, a horizontal synchronous signal and a vertical synchronous signal of an interlace scanning method;
control signal generating means for outputting a control signal by receiving a pixel clock, a horizontal synchronous signal and a vertical synchronous signal of a interlace scanning method outputted from the synchronous signal converting means;
line store means for selecting pixel data corresponding to nth even scanning line of the pixel data from the graphic control means and for writing/reading the selected pixel data in accordance with a control signal of the control signal generating means;
multiplexing means for selecting and outputting a pixel data pair corresponding to adjacent scanning lines stored in the line store means;
digital addition means for adding pixels from a pixel data pair from the multiplexer;
shift means for computing average value of pixel data at a scanning line adjacent thereto by receiving an output signal of the digital addition means;
encoding means for encoding a signal outputted from the shift means; and
oscillating means for transmitting clocking signals to the control signal generator and the shifting unit.

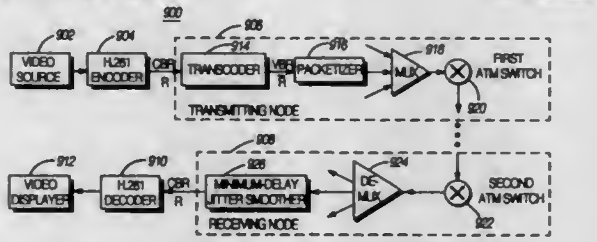
5,534,937
MINIMUM-DELAY JITTER SMOOTHING DEVICE AND METHOD FOR PACKET VIDEO COMMUNICATIONS

Qin-Fan Zhu, Stoughton, and Mei Yong, Canton, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 14, 1994, Ser. No. 227,438

Int. Cl.^{6} H04N *7/00*

U.S. Cl. 348—466 **35 Claims**



1. A device in a receiving node of a packet video communication system for converting a received digital video packet stream into a continuous bitstream for transmission to a video decoder, the device comprising:
(A) a video depacketizer, operably coupled to receive and depacketize digital video packets of the received digital video packet stream into video information bits;
(B) a video information buffer, operably coupled to the video depacketizer for storing the video information bits;
(C) a decoder buffer verifier (DBV), operably coupled to the video information buffer, for determining a number of transmitted information bits for a video frame, and for monitoring a fullness of a hypothetical decoder buffer (HDB);
(D) a bitstream generator, operably coupled to the video information buffer and to the DBV, for transmitting the video information bits from the video information buffer at a predetermined rate and for inserting a number of stuffing bits into the video information bitstream wherein the number of stuffing bits is determined according to a predetermined scheme for minimizing buffering jitter to provide a continuous bitstream with a substantially minimized smoothing delay.

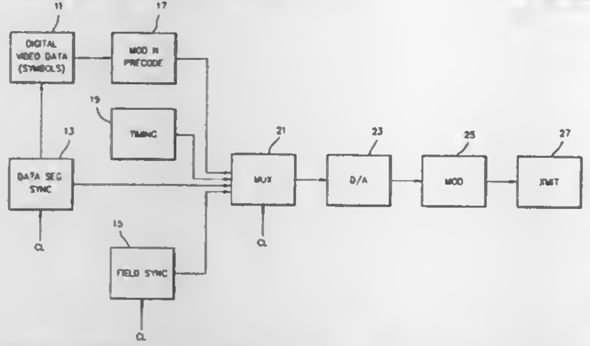
5,534,938
DIGITAL TV SYSTEM USING SEGMENT AND FIELD SYNC SIGNALS

Richard W. Citta, 739 N. Columbian, Oak Park, Ill. 60302; Gary J. Sgrignoli, 1139 Juniper La., Mount Prospect, Ill. 60056, and Rudolf Turner, 11 Winding Branch Rd., Hawthorn Woods, Ill. 60047

Continuation of Ser. No. 204,972, Mar. 2, 1994, which is a continuation-in-part of Ser. No. 894,406, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 732,368, Jul. 18, 1991, abandoned. This application Oct. 17, 1994, Ser. No. 324,054

Int. Cl.^{6} H04N *7/00;5/04*

U.S. Cl. 348—495 **26 Claims**



1. A method of operating a digital data transmission system comprising:
formatting digital data in the form of multilevel symbols in successive fields, each field comprising a fixed number of equal length repetitive data segments and a field segment of the same length;
providing fixed length segment sync information for each data and field segment;
providing field sync information, longer than said fixed length, in said field segment; and
transmitting the formatted fields of digital data.

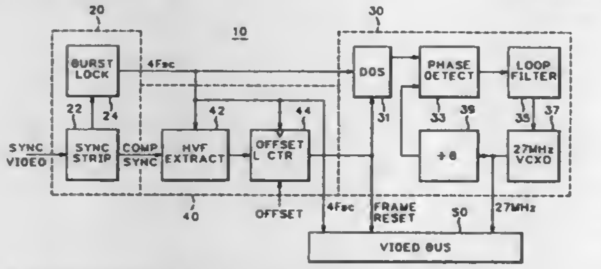
5,534,939
DIGITAL VIDEO CLOCK GENERATION SYSTEM

Michael D. Nakamura, Portland, and Howard A. Landsman, Beaverton, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Dec. 9, 1994, Ser. No. 352,641

Int. Cl.^{6} H04N *5/04*

U.S. Cl. 348—505 **4 Claims**



1. A digital clock generation system comprising:
means for generating from a composite synchronization video signal a digital composite clock signal and a composite sync signal;
means for generating from the digital composite clock signal a digital component clock signal; and
means for generating from the composite sync signal, the digital composite clock signal and an offset constant, a timing pulse for input to the digital component clock generating means to establish a known phase relationship between the digital composite and component clock signals.

5,534,940
APPARATUS AND METHOD FOR DRIVING A LIQUID CRYSTAL DISPLAY UTILIZING VARIOUS TELEVISION SYSTEM FORMATS

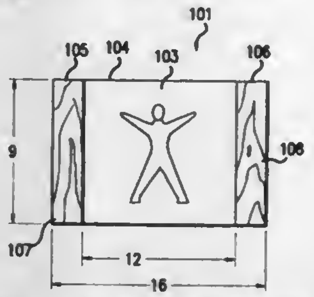
Masayori Sato, Saitama, and Kouichi Tago, Kanagawa-ken, both of, Japan, assignors to Kabushiki Kaisha Japan, Japan

Filed Dec. 9, 1993, Ser. No. 164,442

Claims priority, application Japan, Dec. 16, 1992, 4-336101

Int. Cl.^{6} H04N *3/14;5/40*

U.S. Cl. 348—556 **16 Claims**



1. An apparatus for controlling a liquid crystal display device, wherein the apparatus receives an image signal in one of at least two possible television system formats for displaying an image, each format having an aspect ratio, and displays the image signal on the liquid crystal display device, the apparatus comprising:
format switching means for receiving a format signal indicative of the television system format of the image signal being received, and for adjusting the apparatus to receive the image signal in accordance with the indicative television system format;
data accumulating means for receiving the image signal from said format switching means for directing the signal to the liquid crystal display device;
said data accumulating means comprising a plurality of data forwarding means wherein one or more data forwarding mean receives, in accordance with the aspect ratio of the television system format being received, a selected portion of the image signal to be directed to the liquid crystal display device; and
image generating mean for supplying said data accumulating means frame image data, wherein said frame image data is directed to selected portions of said liquid crystal display device.

5,534,941
SYSTEM FOR DYNAMIC REAL-TIME TELEVISION CHANNEL EXPANSION

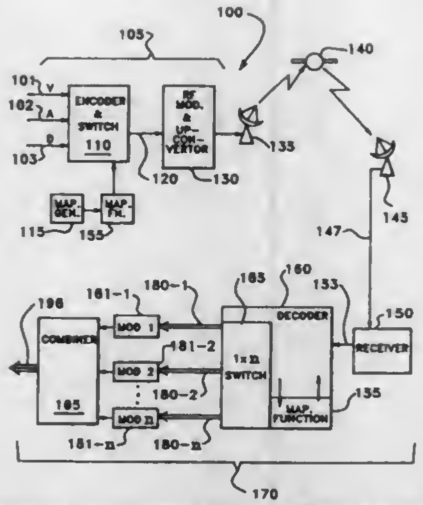
John J. Sie, Englewood, and Ganesh R. Basawapatna, Greenwood Village, both of Colo., assignors to Encore Media Corporation, Englewood, Colo.

Filed May 20, 1994, Ser. No. 245,596

Int. Cl.^{6} H04N *7/16*

U.S. Cl. 348—564 **13 Claims**

1. A method for enabling the viewing of one of a plurality of different screens on a TV set by transmitting a plurality of virtual television channels from a transmitting site to a viewing site within a bandwidth substantially equal to that of a single video channel, said method comprising the steps of:
(a) operating combining means for receiving a single selected active video signal from a source having a plurality of available video signals,
(b) operating said combining means for receiving a plurality of audio channels and data channels from said source;
(c) operating a controller means external to said combining means to generate a dynamically controllable mapping function to establish correspondence, at said viewing site, between said virtual television channels, and:
(1) said selected active video signal,
(2) said audio channels, and
(3) said data channels;



(d) transmitting said dynamically controllable mapping function along with said selected active video signal and said plurality of audio channels and data channels as separate and independent signals from said combining means to said viewing site using the bandwidth of only a single video channel; and

(e) dynamically combining onto at least one of said virtual television channels selected by said viewer, one of said audio channels and/or one of said data channels and said active video signal, in accordance with said dynamically controllable mapping function so that said selected active video signal is time shared with a plurality of said virtual channels whereby a virtual channel receives one of said data channels and/or one of said audio channels when not receiving said selected active video signal.

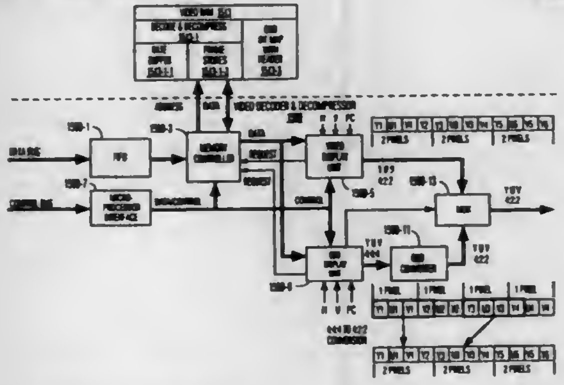
5,534,942
ON SCREEN DISPLAY ARRANGEMENT FOR DIGITAL VIDEO SIGNAL PROCESSING SYSTEM

Billy W. Beyers, Jr., Greenfield, and Harold Blatter, Indianapolis, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 261,623, Jun. 17, 1994. This application Feb. 15, 1995, Ser. No. 390,895

Int. Cl.^{6} H04N *5/262*

U.S. Cl. 348—569 **7 Claims**



1. Apparatus comprising:

a source of digital packets representing video images in compressed form;

a source of digital data representing graphic images;

a single memory for storing both of said video image representative digital packets and said graphic image representative digital data;

a video display unit for producing a sequence of digital words representing respective components of said video images in response to said video image representative digital packets;

a graphics display unit for producing a sequence of digital words representing respective components of said graphics images in response to said graphic image representative digital data; and

means coupled to said sources, said memory, and said display units for coupling said video image representative digital packets and said graphic image representative digital data to said memory from respective ones of said sources and to respective ones of said display units from said memory.

5,534,943
FREQUENCY MODULATION SYSTEM HAVING CONTROL OF A CARRIER FREQUENCY

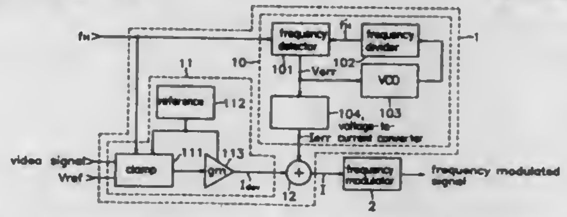
Myoungchun Hwang, Incheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Dec. 3, 1993, Ser. No. 160,873

Claims priority, application Rep. of Korea, Dec. 3, 1992, 92-23209

Int. Cl.^{6} H04N *5/922;5/92;5/40*

U.S. Cl. 348—724 **8 Claims**



1. A frequency modulation system for frequency-modulating an input signal with a predetermined carrier frequency, said frequency modulation system including an automatic frequency controller portion and a separate frequency modulator, said automatic frequency controller portion comprising:

a phase-locked loop comprising:

first voltage controlled oscillator means for generating a VCO frequency which is greater than a reference frequency signal, said VCO frequency varying in response to an error voltage signal input to said first voltage controlled oscillator means,

frequency divider means for dividing said VCO frequency into a frequency divided output having a lower frequency than said VCO frequency, and

frequency detecting means for comparing a first phase of said reference frequency signal with a second phase of said frequency divided output of said frequency divider means, said frequency detecting means generating said phase-locked loop error voltage signal; and

voltage-to-current converter means for converting said error voltage signal to an error current signal;

said separate frequency modulator being separate from a control loop of said phase-locked loop;

said separate frequency modulator providing an output modulated frequency in response to said error current signal; and

said separate frequency modulator including second voltage controlled oscillator means having substantially similar structure as said first voltage controlled oscillator means of said automatic frequency controller portion so that first frequency variations in said second voltage controlled oscillator means are compensated substantially by second frequency variations in said first voltage controlled oscillator means.

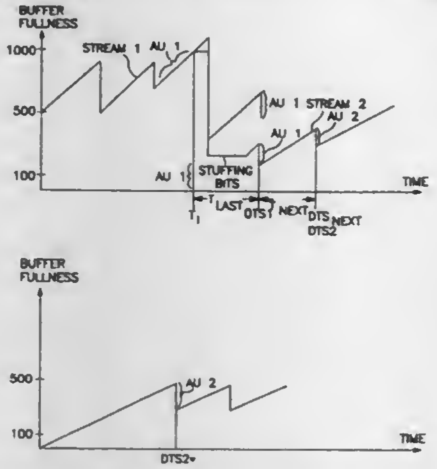
5,534,944
METHOD OF SPLICING MPEG ENCODED VIDEO

Ren Egawa, Princeton, N.J., and Edwin R. Meyer, Bensalem, Pa., assignors to Matsushita Electric Corporation of America, Secaucus, N.J.

Continuation-in-part of Ser. No. 276,515, Jul. 15, 1994. This application Jul. 21, 1995, Ser. No. 505,581

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—584 **16 Claims**



1. A method of splicing first and second data streams representing respective first and second encoded signals at a selected boundary in the first data stream using a buffer, wherein each of the first and second data streams has a plurality of decoding time stamps representing times at which data is retrieved from the buffer, the method comprising the steps of:

analyzing the first and second data streams to determine an amount of null information to be inserted in the first data stream after the selected boundary, wherein The amount of null data is determined from the decoding time stamps in the first and second data streams;

transmitting the first data stream, up to the selected boundary to the buffer;

transmitting the determined amount of null information to the buffer;

transmitting the second data stream to the buffer; and

retrieving the spliced data stream from the buffer.

5,534,945
SYSTEM AND METHOD FOR PROVIDING BLACK DIFFUSION IN VIDEO IMAGE PROCESSING

Albert D. Edgar, Travis, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1994, Ser. No. 358,228

Int. Cl.^{6} H04N *1/40*

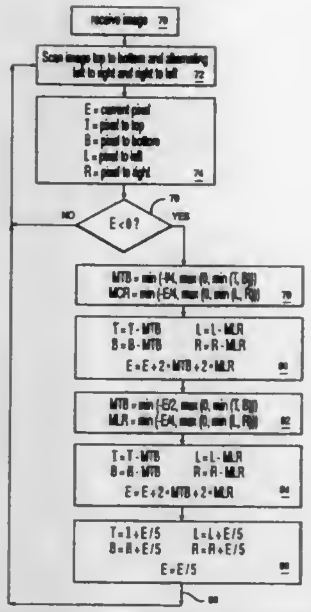
U.S. Cl. 348—615 **20 Claims**

1. A method for processing digitized image pixels of an image having corresponding pixel brightness magnitudes, comprising the steps of:

selecting an image brightness level as a black level wherein a first magnitude corresponding to a first of said pixels is less than said black level;

deriving a magnitude difference between said black level and said first magnitude;

selecting adjacent pixels proximal to said first pixel having corresponding proximal pixel brightness magnitudes; and



altering said proximal pixel brightness magnitudes as a function of said magnitude difference to generate altered pixels.

5,534,946
APPARATUS FOR PERFORMING MOTION-COMPENSATED PICTURE SIGNAL INTERPOLATION

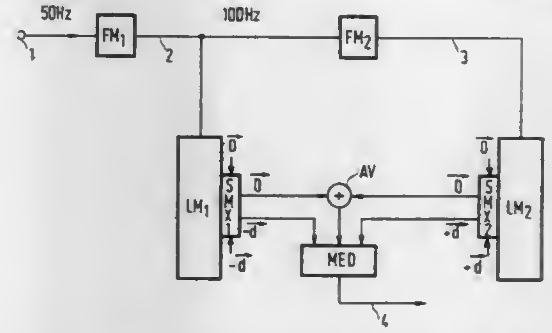
Gerard De Haan; Paul W. A. C. Biezen; Olukayode A. Ojo, and Hendrik Huijgen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 57,359, May 5, 1993. This application Nov. 3, 1994, Ser. No. 333,904

Claims priority, application European Pat. Off., May 15, 1992, 92201388

Int. Cl.^{6} H04N *5/44*

U.S. Cl. 348—619 **9 Claims**



7. A motion-compensated picture signal interpolation apparatus, comprising:

means for furnishing at least first and second motion vectors relating pixels in a first field to pixels in a second field;

means for determining first possible pixel values for an intermediate field between said first and second fields as motion-compensated pixels derived from said first motion vector and for determining second possible pixel values for said intermediate field as motion-compensated pixels derived from said second motion vector; and

means for producing interpolated pixel values for said intermediate field from said first and second possible pixel values.

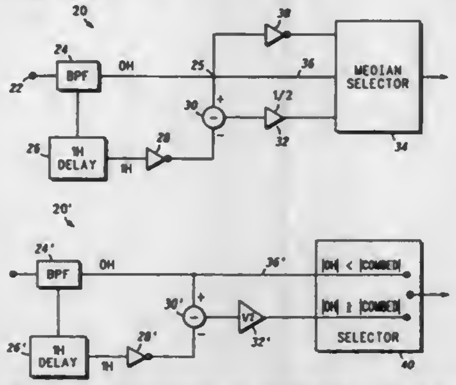
5,534,947
ADVANCED COMB FILTER

Osamu Saionji, Ibaraki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1994, Ser. No. 243,360

Int. Cl.^{6} H04N *9/78*

U.S. Cl. 348—664 **15 Claims**



1. A method of determining a chrominance element for pixel signals of an optical image, a first of said pixel signals being one scan line delayed from a second of said pixel signals, the method comprising the steps of:

filtering at least the second of said pixel signals through a band pass filter (BPF) to obtain a BPF chrominance component;

adding the first of said pixel signals to the second of said pixel signals to generate a combed chrominance component;

comparing the combed chrominance component to the BPF chrominance component;

outputting as the chrominance element the combed chrominance component if the value of the BPF chrominance component is greater than or equal to the value of the combed chrominance component; and

outputting as the chrominance element the BPF chrominance component if the value of the combed chrominance component is greater than the value of the BPF chrominance component.

5,534,948
METHOD AND APPARATUS FOR REDUCING THE EFFECT OF ALIAS COMPONENTS PRODUCED THROUGH NON-LINEAR DIGITAL SIGNAL PROCESSING, SUCH AS GAMMA CORRECTION, BY SELECTIVE ATTENUATION

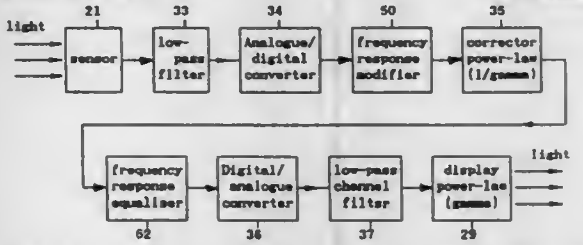
John L. E. Baldwin, Eastleigh, United Kingdom, assignor to Rank Cintel Limited, United Kingdom

Continuation of Ser. No. 195,567, Feb. 14, 1994, abandoned, which is a continuation of Ser. No. 834,578, Feb. 10, 1992, abandoned. This application Nov. 4, 1994, Ser. No. 334,761

Claims priority, application United Kingdom, Aug. 15, 1989, 8918560

Int. Cl.^{6} H04N *9/69;5/202*

U.S. Cl. 348—675 **20 Claims**


light
21
sensor
33
low-pass filter
34
Analogue/ digital converter
50
frequency response modifier
35
corrector power-law (1/gamma)
frequency response equaliser
62
Digital/ analogue converter
36
low-pass channel filter
37
display power-law (gamma)
29
light

1. A method of reducing the production of alias components arising in a video signal due to a digital gamma correction operation; the method comprising the steps of:

receiving a video input signal in baseband form, the input video signal being in the form of a red, green, blue or monochrome signal;

filtering the video input signal with a fixed filter function to modify the frequency spectrum by relatively attenuating high frequency signals at frequencies approaching or exceeding one-third of the sampling frequency and up to one-half of the sampling frequency fs, to provide a filtered signal;

subjecting the filtered signal to a digital gamma correction operation, to provide a gamma-corrected signal; and

compensating the overall frequency response of the gamma-corrected signal for said relative attenuation.

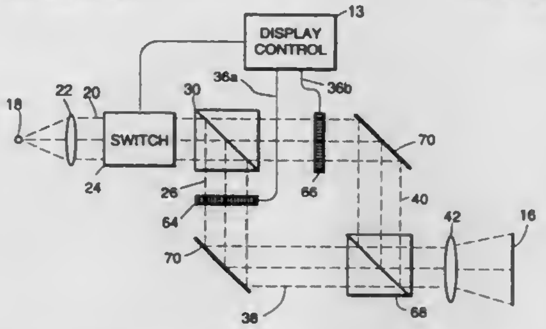
5,534,949
TWO CHANNEL FIELD SEQUENTIAL COLOR DISPLAY SYSTEM

Peter C. Baron, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 8, 1994, Ser. No. 224,912

Int. Cl.^{6} H04N *9/12*

U.S. Cl. 348—742 **16 Claims**



1. A two-channel field sequential color display system for generating a color image in response to electronic image signals, said two-channel field sequential color display system comprising:

a first active matrix liquid crystal light valve,

a second active matrix liquid crystal light valve, and

a controller for controlling said first and second active matrix liquid crystal light valves, to simultaneously display an image in a first and second color, respectively, during one part of a display frame, said images from said first and second image generators being superimposed on an image plane, and to display said image in a third color during a different part of said display frame, said image from said first and/or second image generators being displayed on said image plane during said different part of said display frame at the same location on said image plane as said images displayed during said one part of said display frame.

5,534,950
HIGH RESOLUTION IMAGE PROJECTION SYSTEM AND METHOD EMPLOYING LASERS

David E. Hargis, Cardiff, Calif.; Graham Flint, Albuquerque, N.M., and Shlomo Assa, Encinitas, Calif., assignors to Laser Power Corporation, San Diego, Calif.

Filed Oct. 4, 1993, Ser. No. 131,281

Int. Cl.^{6} H04N *5/74*

U.S. Cl. 348—758 **27 Claims**

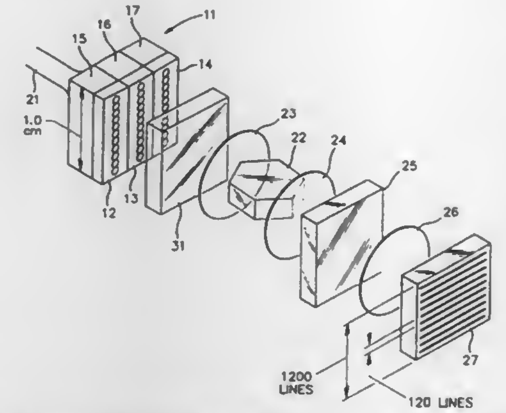
1. A high resolution image projection system comprising:

an array of a multiplicity of lasers for each of the three primary colors of the image projection system, each said laser producing a laser beam, each single laser in each array having a corresponding single laser in each of the other two arrays;

means for individually addressing each said laser in each said array;

means for modulating the power output of each said laser;

means for combining the outputs of each said three corresponding lasers so that those outputs are in precise registration with each other, there being a said multiplicity of combined laser outputs;



a common optical path for simultaneously scanning and projection of all said laser beams;

apparatus for two dimensional scanning of each said combined laser output; and

optical means for forming the scanned beams into a projection beam.

5,534,951
OPTICAL ASSEMBLY FOR TELEVISION FRONT SCREEN

Kai S. He, Shi Zhen, China, assignor to Chung Kin Lo, Hong Kong

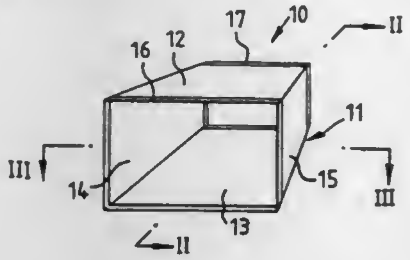
PCT No. PCT/GB92/01945, § 371 Date Aug. 17, 1994, § 102(e) Date Aug. 17, 1994, PCT Pub. No. WO93/08663, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 22, 1992, Ser. No. 211,937

Claims priority, application China, Oct. 23, 1991, 91221034.6

Int. Cl.^{6} H04N *5/74;5/72;* **G02B** *21/00;27/02*

U.S. Cl. 348—832 **19 Claims**



1. A television image processing device for use in front of a television screen having a diagonal dimension of S, which imaging processing device comprises four panels connected together to form a hollow body having a substantially rectangular open front side of width W and height H and a substantially rectangular open rear side of width W' and height H', the separation between the front and rear open sides being D and the inner sides of the panels being reflective, which image processing device further comprises front and rear lenses provided extending across the open front and rear sides, respectively, of the body, the front side of the rear lens being reflective, wherein the dimensions are related according to the following formulae:

(1) $W=[1+(W'/H'-B)]\cdot W'$

(2) $H=[1+(W'/H'-B)]\cdot H'$

(3) $D=K\cdot S$

Where:

(i) $B=(\sqrt{5}-1)/2$

(ii) $0.1<K<0.2$.

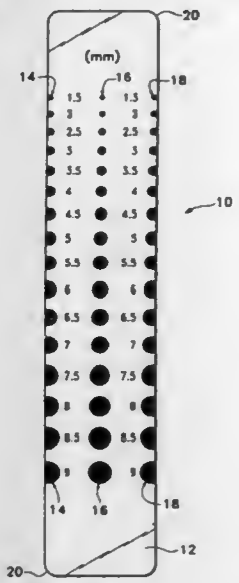
5,534,952
PUPILLOMETER

Denise Zanecchia; Ann M. Heinrich, both of Fort Worth, and Teresa Ustanik, Burleson, all of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 22, 1994, Ser. No. 362,381

Int. Cl.^{6} A61B *3/00;* **B42D** *15/00*

U.S. Cl. 351—200 **8 Claims**



1. A pupillometer, comprising:

a) a clear substrate; and

b) at least two sets of semicircular reference marks on opposite edges of the substrate arranged so as to align with a patient's left and right eye, respectively.

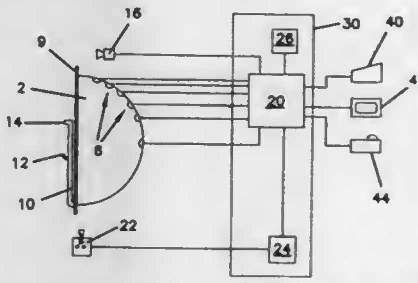
5,534,953
TRAINING DEVICE FOR THE THERAPY OF PATIENTS HAVING PERCEPTION DEFECTS

Fritz Schmielau, Schonbockener Strasse 30B, 23556 Lubeck, Germany

Filed Jul. 1, 1994, Ser. No. 269,697

Int. Cl.^{6} A61B *3/00;3/02*

U.S. Cl. 351—203 **23 Claims**



1. Training device for the therapy of, in particular, brain-damaged patients having perception defects, comprising:

—a large number of signalers arranged on one surface for the production of perceptual stimuli;

—a marking element that is firmly attached in a specific—and, in particular, central—location on the surface and on which the patient must focus his eyes during the therapy;

—a start-signaling device for producing a starting signal;

—a control mechanism that activates a start-signaling device at the beginning T_1 of an operating cycle; selects and activates a single signaler or a signaler group after the expiration of a first time interval t_1, randomized within specific predetermined limits; and initiates a subsequent operating cycle, after expiration of a second interval (t_2+t_3) following the time T_2 of the activation of the selected signaler or the selected signaler group, whereby the duration of the activation is shorter than the second time interval;

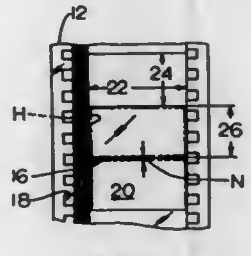
—a reaction-detecting device for detecting the reaction of the patient to the activation of the selected signaler or the selected signaler group by the control mechanism; and

—a time-determining device that measures the reaction time t_2 of the patient between the time T_2 of the activation of the selected signaler or the selected signal group and the time T_3 of the patient's reaction recorded by the reaction-detecting device,

whereby the control mechanism repeats the activation of the same signaler or signaler group and/or an immediately adjacent signaler or an immediately adjacent signaler group in the next operating cycle, or in one of the subsequent operating cycles, if the reaction time t_2 measured by the time-determining device is shorter than a predetermined minimum $t_{2\ min}$ in or longer than a predetermined maximum $t_{2\ max}$—which is shorter than the second time interval—or when the reaction of the patient detected by the reaction-detecting device is wrong according to a selection criterion keyed in beforehand.

5,534,954
MOTION PICTURE SYSTEM

Richard Vetter, Pacific Palisades, Calif., assignor to United Artists Theatre Circuit, Inc., West Los Angeles, Calif.
Continuation-in-part of Ser. No. 807,056, Dec. 2, 1991, abandoned. This application Mar. 31, 1994, Ser. No. 221,036
Int. Cl.⁶ G03C *1/76*
U.S. Cl. 352—79 **15 Claims**



2½ PERF/FRAME

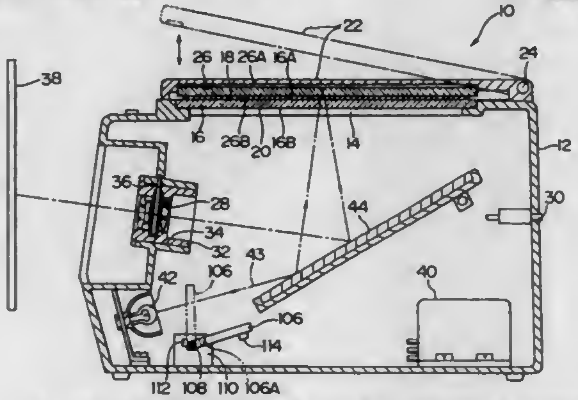
9. A method for producing and projecting a commercial motion picture image, by creating a new motion picture release film on substantially standard 35 mm film stock that has perforations spaced substantially 0.187 inch apart along the length of the film, and by projecting new film frames of said new release film on a screen using a projector of common construction that has film-engaging sprocket wheels that are mounted on shafts and that has at least one motor that turns each of said sprocket wheels by a predetermined fraction of a turn every twenty-fourth of a second, where said shafts each could hold current sprocket wheels with a predetermined number of sprocket teeth per 360° to project current film wherein the current film frames each have a length of about 0.46 inch and the current film frames have leading edges spaced four sprocket holes, or substantially 0.748 inch, along the length of the film, comprising:

creating said new motion picture film with new film frames, but with the leading edges of said new film frames spaced apart by a noninteger number of perforations that consists of 2.25, 2.50, and 2.75 perforations;

establishing sprocket wheels on said shafts, that each have sprocket teeth with a circumferential spacing of substantially 0.187 inch, and with the number of sprocket teeth per 360° being chosen to advance said film by said noninteger number of perforations every twenty-fourth second when said wheel turns by said predetermined fraction of a turn.

5,534,955
REFLECTION TYPE PROJECTOR

Michiro Tuchida, Kanagawa; Masaaki Nomura, Saitama; Soichiro Kimura, Saitama; Ko Aosaki, Saitama, and Tatsuo Kitami, Kanagawa, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 19, 1995, Ser. No. 424,635
Claims priority, application Japan, Apr. 21, 1994, 6-083462; May 16, 1994, 6-101268
Int. Cl.⁶ G03B *21/00*
U.S. Cl. 353—66 **11 Claims**



1. A reflection type projector which comprises a housing wherein an opening formed on its upper surface is covered with a light transmission plate and a stage surface is formed on which a transparent manuscript is placed, a reflection Fresnel lens which is provided in said housing in such a manner to overlap said light transmission plate and holds said transparent manuscript between said stage surface and itself, a projection lens provided on a side of said housing, a light source which is provided in said housing and illuminates said transparent manuscript, and a reflection mirror which is provided in said housing and reflects a projection light of the transparent manuscript illuminated by said light source toward said projection lens, comprising:

a shutter member which is provided in such a manner that it can move forward onto and retract from an optical axis of said light source and advances onto said optical axis, thereby cutting off a projection light given to said transparent manuscript by said light source;

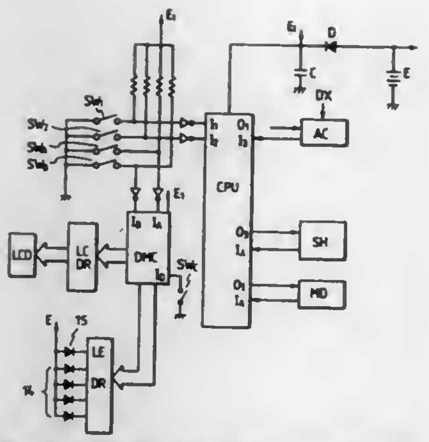
detecting means which detects whether said reflection Fresnel lens is opened or closed; and,

drive means which advances said shutter member onto the optical axis of the light source on the basis of an information from said detecting means that said reflection Fresnel lens is opened and retracts the shutter member from the optical axis of the light source on the basis of an information from said detecting means that said reflection Fresnel lens is closed.

5,534,956
PRINT CONTROL APPARATUS FOR EFFECTIVE MULTIPLE PRINTING OF IMAGES ONTO A COMMON PRINTING FRAME

Tomonori Iwashita, Yokohama; Akira Egawa, Machida, and Yoshiaki Sugiyama, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 829,381, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 681,637, Apr. 4, 1991, Pat. No. 5,086,310, which is a continuation of Ser. No. 455,784, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 349,528, May 5, 1989, abandoned. This application Nov. 7, 1994, Ser. No. 337,193
Claims priority, application Japan, May 9, 1988, 63-113275; Jun. 27, 1988, 63-159781; Jun. 27, 1988, 63-159782; Sep. 16, 1988, 63-231937
Int. Cl.⁶ G03B *29/00*
U.S. Cl. 354—76 **64 Claims**

1. A recording apparatus for a camera, comprising:



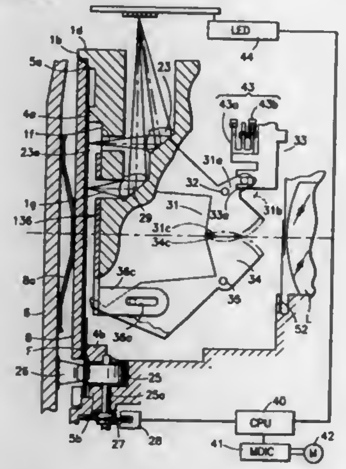
indication means for indicating a particular plurality of image recording medium frames to be multiply printed on a common printing frame; and

recording means for recording the information of said indication means,

wherein said indication means comprises priority setting means for setting an order of priority in which the plurality of image recording medium frames are to be printed on the common printing frame.

5,534,957
CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397. This application May 22, 1995, Ser. No. 447,233
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.⁶ G03B *17/24*
U.S. Cl. 354—106 **17 Claims**



1. A data imprinting device for use in a camera, comprising:

a light source;

a device for imprinting at at least two positions with light from said light source;

a selector for selecting said position to imprint:

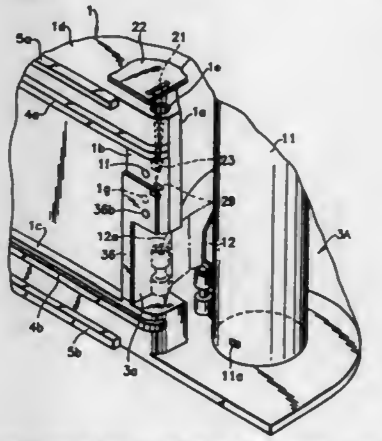
said device for imprinting having said light, directed at a selected one of said at least two positions, blocked responsive to said selector;

said device for imprinting including at least two optical elements; and

said selector occludes light from a selected one of said optical elements.

5,534,958
CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397. This application Jun. 7, 1995, Ser. No. 474,264
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.⁶ G03B *17/24*
U.S. Cl. 354—106 **6 Claims**



1. A data imprinting device for use in a camera comprising:

a light source for emitting imprinting light;

a first part of said device for focusing said imprinting light upon a photosensitive surface at at least two positions;

a second part of said device for selectively occluding said imprinting light from focusing upon at least one position of said at least two positions;

said first part including a first reflecting unit for reflecting incident light of said imprinting light upon a first position of said at least two positions;

said first part including a second reflecting unit for reflecting incident light of said imprinting light upon a second position of said at least two positions;

said first position being further from a center of said photosensitive surface than said second position;

said first and second reflecting units including first and second prisms respectively, each having lenses incorporated therein;

a camera body having a first aperture;

said first aperture permitting reflected imprinting light, of said first reflecting unit, to strike said photosensitive surface;

the camera body having a second aperture;

said second aperture permitting reflected imprinting light, of said second reflecting unit, to strike said photosensitive surface; and

said second part including a portion for covering at least one of said first and second apertures.

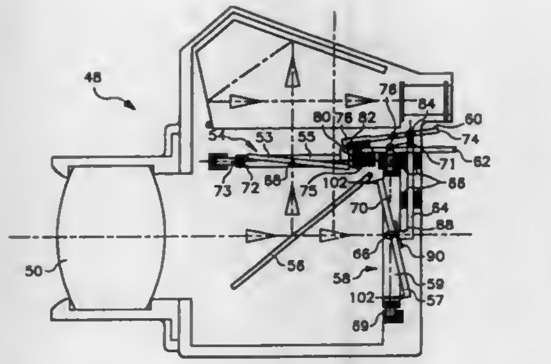
5,534,959
FILM PLANE ROTATION IN RIGID CAMERAS FOR DEPTH OF FIELD AND PERSPECTIVE CONTROL

Brian Keelan, Rochester, and Daniel Pagano, Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rocester, N.Y.
Filed Jun. 1, 1994, Ser. No. 251,888
Int. Cl.⁶ G03B *17/02;19/12*
U.S. Cl. 354—160 **19 Claims**

1. A rigid camera of the type having a camera body with a lens attachment plane which is spatially fixed in relation to the remainder of the camera and including a film holder and a focusing plate, said rigid camera comprising:

means for rotating said film holder about a first axis to control perspective and depth of field;

means for independently rotating said film holder about a second axis perpendicular to said first axis to control said perspective and depth of field;



means for rotating said focusing plate about a third axis in correspondence with rotation of said film holder about said first axis; and

means for independently rotating said focusing plate about a fourth axis perpendicular to said third axis in correspondence with rotation of said film holder about said second axis.

5,534,960
CAMERA CAPABLE OF WINDING AND REWINDING FILM BY REVOLUTION OF MOTOR

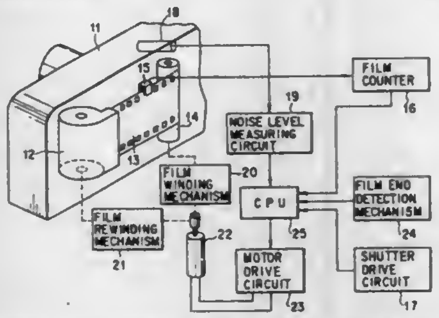
Masami Takase, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1994, Ser. No. 225,898

Claims priority, application Japan, Apr. 13, 1993, 5-086389

Int. Cl.^{6} G03B *1/18*

U.S. Cl. 354—173.1 **16 Claims**



1. A camera being capable of winding and rewinding a film by a revolution of a motor, comprising:

noise level measuring means for measuring a noise level of the surroundings of the camera;

noise level discriminating means for discriminating whether the noise level measured by said noise level measuring means is higher or lower than a predetermined value; and

control means for controlling a revolution speed of a motor for feeding a film based on the result of the level discriminated by said noise level discriminating means.

5,534,961
BELT DRIVE SHUTTER DEVICE

David R. Dowe, Holley, and Richard E. Albrecht, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1994, Ser. No. 238,114

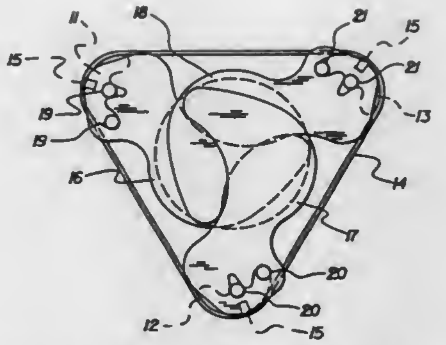
Int. Cl.^{6} G03B *9/22*

U.S. Cl. 354—264 **17 Claims**

1. A coupling device for controlling the shutter blades of a shutter, that are positioned in the proximity of a base and actuated by an actuating mechanism, said device characterized by:

two or more hubs that are each individually attached to one of the shutter blades such that no relative movement is allowed between each hub and its attached shutter blade, each of said hubs rolling on a different portion of the base; and

a belt for coupling said hubs to each other so that when one of said hubs rolls along a portion of the base and moves one of the shutter blades, said remaining hubs move the remaining shutter blades.



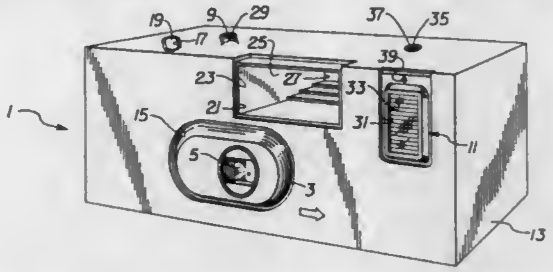
5,534,962
METHOD AND APPARATUS FOR PREVENTING UNAUTHORIZED RECYCLING OF SINGLE-USE CAMERA AND PERMITTING AUTHORIZED REUSE OF THE CAMERA

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1995, Ser. No. 369,960

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 354—289.12 **12 Claims**



1. A method of preventing unauthorized recycling of a single-use camera but permitting authorized reuse of the camera, comprising the steps of first determining that a particular event in the camera has occurred, then disabling a function of the camera to prevent unauthorized reuse of the camera, and then inputting a predetermined unique reset code to the camera to re-enable the function that has been disabled to permit authorized reuse of the camera, is characterized in that:

the reset code is inputted to the camera by positioning a separate code inputting device within sensing range of a built-in sensor device of the camera which otherwise serves a conventional sensing function for ordinary operation of the camera.

5,534,963
POSING STATION

John Adolphi, Eden Prairie, and Jeffrey J. Kipp, Minneapolis, both of Minn., assignors to Lifetouch Portrait Studios, Inc., Minneapolis, Minn.

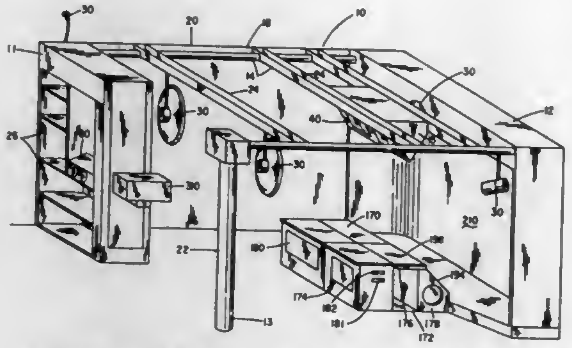
Continuation of Ser. No. 887,188, May 21, 1992, abandoned. This application Mar. 29, 1995, Ser. No. 412,595

Int. Cl.^{6} G03B *15/00*

U.S. Cl. 354—290 **15 Claims**

1. A photographic posing station for a photographic portrait studio, the portrait studio including a frame assembly for supporting lighting units and a camera, the combination comprising:

a stationary base connected to said frame assembly and resting on a floor of the studio, a rear support attached to the stationary base, and a first removable platform having an upper and bottom surface, said bottom surface resting on the stationary base with positioning means for releasably securing the first platform on the stationary base at a predetermined fixed location nearer to the camera than the rear support to thereby form an aisle in which a portrait subject may stand; and a span that is movable between a first extended position and a second stored position, the span being at least partially supported by both the first platform and the rear support when in the extended position and solely by the first platform when in the second stored position whereby the distances between the camera, lighting units and the first platform remain fixed, with the positing station in the field-of-view of the camera.



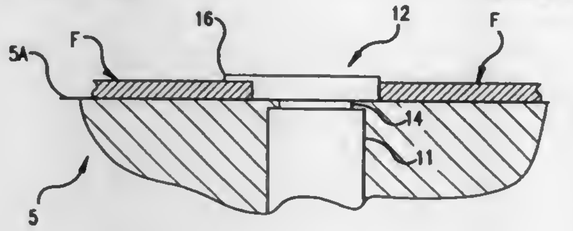
5,534,964
FILM LOADING PINS AND METHOD FOR EXTERNAL DRUM SCANNERS

Robert J. Kleckner, Yorktown Hgts., N.Y., and Sandra Graveson, Waterbury, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed May 4, 1995, Ser. No. 434,954

Int. Cl.^{6} G03D *13/14;* **G03G** *5/00*

U.S. Cl. 354—344 **18 Claims**



1. A registration pin for accurately positioning and holding a film on a rotating drum, the pin comprising:

a body; and

a head, wherein the head has a predetermined height and at least one protrusion, the at least one protrusion having at least one substantially constant thickness overlapping portion that overlaps a portion of the film and sandwiches the film between the at least one protrusion and the rotatable drum.

5,534,965
CAMERA

Riichi Higaki, Kawasaki; Hiroyuki Tsuru, Tokyo; Hiroshi Wakabayashi, Yokohama; Daiki Tsukahara, Hiratsuka; Yoshikazu Iida, Chigasaki, and Tadashi Ohtani, Ohtawara, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Nov. 3, 1994, Ser. No. 335,356

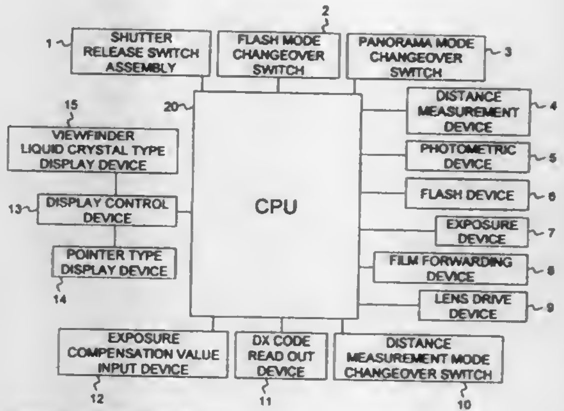
Claims priority, application Japan, Nov. 9, 1993, 5-279432; Nov. 9, 1993, 5-279433

Int. Cl.^{6} G03B *13/36;17/18*

U.S. Cl. 354—409 **6 Claims**

1. A camera comprising:

a photographic lens;


2
1
SHUTTER RELEASE SWITCH ASSEMBLY
FLASH MODE CHANGEOVER SWITCH
PANORAMA MODE CHANGEOVER SWITCH
3
15
20
DISTANCE MEASUREMENT DEVICE
4
VIEWFINDER LIQUID CRYSTAL TYPE DISPLAY DEVICE
PHOTOMETRIC DEVICE
5
CPU
FLASH DEVICE
6
13
DISPLAY CONTROL DEVICE
EXPOSURE DEVICE
7
POINTER TYPE DISPLAY DEVICE
FILM FORWARDING DEVICE
8
14
LENS DRIVE DEVICE
9
EXPOSURE COMPENSATION VALUE INPUT DEVICE
DX CODE READ OUT DEVICE
DISTANCE MEASUREMENT MODE CHANGEOVER SWITCH
12
11
10

a shutter release button;

a photometric device which measures the brightness of an object to be photographed, and which calculates an exposure value based upon this measured brightness;

a focus detection device which detects the focus adjustment state of said photographic lens;

a lens drive device which performs focus adjustment of said photographic lens based upon the focus adjustment state detected by said focus detection device;

a display device which displays said exposure value calculated by said photometric device and said focus adjustment state detected by said focus detection device; and:

a release switch assembly which outputs a preparation for photography signal when said shutter release button is depressed as far as a first stroke position thereof, and which outputs a photography command signal when said shutter release button is depressed past said first stroke position as far as a second stroke position thereof which is further than said first stroke position;

characterized by further comprising a control device which:

when said preparation for photography signal is input from said release switch assembly without said photography command signal being input therefrom, controls said photometric device to calculate said exposure value and controls said focus detection device to detect the focus adjustment state of said photographic lens, and then controls said display device to display said exposure value and said focus adjustment state; and, at the time point when this display of said exposure value and said focus adjustment state has been completed, if and only if said preparation for photography signal is still being input from said release switch assembly, controls said lens drive device to perform focus adjustment of said photographic lens.

5,534,966
CAMERA IN-FINDER DISPLAY DEVICE

Kosho Miura, Kamakura, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 327,400

Claims priority, application Japan, Nov. 24, 1993, 5-293314

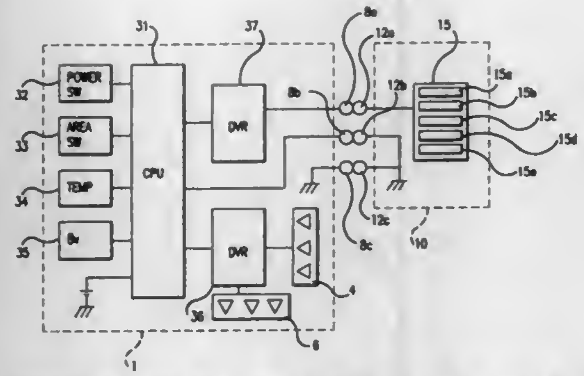
Int. Cl.^{6} G03B *13/18;17/20*

U.S. Cl. 354—409 **36 Claims**

1. A camera in-finder display device that displays a selected one of a plurality of areas within a viewfinder, comprising:

light-emitting display elements and light-darkening display elements that display said selected area in a viewfinder, said light-emitting display elements displaying said selected area by illumination, said light-darkening display elements displaying said selected area by reducing an amount of light that is transmitted through said selected area; and

control means for selectively activating said light-emitting display elements and said light-darkening display elements based on operating conditions.



wherein in a first mode one of said light-emitting display elements and said light-darkening display elements is activated, and

wherein in a second mode said light-emitting display elements and said light-darkening display elements are activated.

5,534,967
SHAKE DETECTION AND COMPENSATION SYSTEM USING HIGH-PASS FILTER ARITHMETIC MEANS

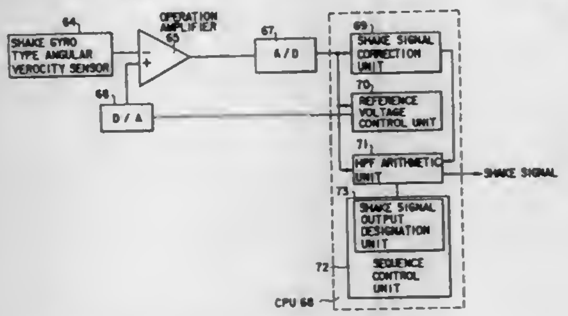
Yoshinori Matsuzawa, Hachiojl, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1995, Ser. No. 434,778

Claims priority, application Japan, May 10, 1994, 6-096446

Int. Cl.^{6} G03B *7/08*

U.S. Cl. 354—430 **27 Claims**


64
SHAKE GYRO TYPE ANGULAR VEROCITY SENSOR
OPERATION AMPLIFIER
65
67
A/D
66
D/A
69
SHAKE SIGNAL CORRECTION UNIT
70
REFERENCE VOLTAGE CONTROL UNIT
71
HPF ARITHMETIC UNIT
SHAKE SIGNAL
73
SHAKE SIGNAL OUTPUT DESIGNATION UNIT
72
SEQUENCE CONTROL UNIT
CPU 68

1. A shake detection apparatus comprising:

shake detection sensor means for detecting a shake state to output a shake detection signal;

high-pass filter arithmetic means for performing high-pass filter arithmetic processing, thereby removing drift and offset components contained in the shake detection signal output from said shake detection sensor means;

time constant increasing means for shifting an upper limit frequency for high-pass filter arithmetic processing by said high-pass filter arithmetic means from a high-frequency side to a low-frequency side;

large-shake-signal determination means for detecting a large shake signal state on the basis of an output from said high-pass filter arithmetic means; and

small-time-constant resetting means for shifting the upper limit frequency for high-pass filter arithmetic processing by said high-pass filter arithmetic means to the high-frequency side when the large shake signal state is detected by said large-shake-signal determination means.

5,534,968
CAMERA HAVING VARIABLE PHOTOMETRY CONDITIONS

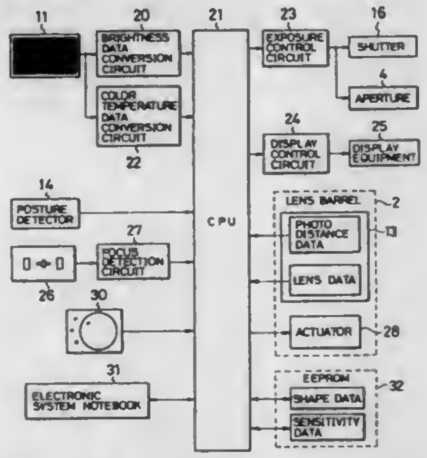
Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 11, 1994, Ser. No. 209,016

Claims priority, application Japan, Mar. 12, 1993, 5-052633

Int. Cl.^{6} G03B *7/08;17/00;29/00*

U.S. Cl. 354—432 **19 Claims**



8. A camera having a photometry system that measures light received by a photometry region of a subject field and that is capable of establishing a portion of the subject field as a photometry region from which photometry measurements are made, the photometry region being divided into multiple photometry areas, said camera comprising:

a boundary shape signal receiving device that receives a boundary shape instruction signal transmitted externally of the camera, said boundary shape instruction signal indicating a boundary shape to be established for the photometry region of the subject field;

a boundary shape establishment device, coupled to the boundary shape signal receiving device, that establishes the boundary shape of the photometry region based on the boundary shape instruction signal received by the boundary shape signal receiving device;

a sensitivity distribution instruction device that supplies a sensitivity distribution instruction to instruct sensitivity distribution of the photometry areas in the photometry region; and

a sensitivity distribution establishment device, coupled to said sensitivity distribution instruction device, that establishes the sensitivity distribution of the photometry areas in the photometry region based on the sensitivity distribution instruction supplied by the sensitivity distribution instruction device.

5,534,969
ALIGNMENT METHOD AND APPARATUS IN AN EXPOSING PROCESS

Eiichi Miyake, Hyogo-ken, Japan, assignor to Sanei Giken Co., Ltd., Amagasaki, Japan

Filed Jun. 2, 1994, Ser. No. 253,067

Claims priority, application Japan, Jun. 2, 1993, 5-131977; Sep. 6, 1993, 5-221374

Int. Cl.^{6} G03B *27/42;27/53*

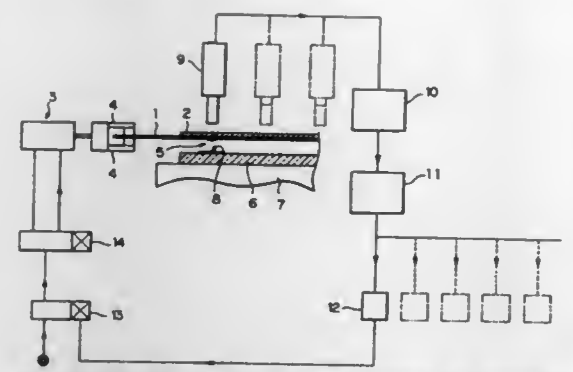
U.S. Cl. 355—53 **17 Claims**

1. An alignment apparatus for aligning a substrate having a plurality of positioning marks for exposure, said apparatus comprising:

a planar photo-mask having a pattern thereon, and both a plurality of positioning marks, corresponding to those of the substrate, and a plurality of apertures in the periphery thereof;

a substrate supporting member which is to support the substrate;

a plurality of actuator assemblies each including a connector having a protruding member which can be inserted into a respective one of the apertures of the photo-mask and engage the photo-mask at an edge thereof defining the periphery of the aperture, whereby the protruding members of the actuator assemblies hold the photo-mask at the periphery thereof;



detecting means for detecting errors in the relative positions between the positioning marks of a substrate supported by said substrate supporting member and the positioning marks of said photo-mask when held at the outer periphery thereof by the protruding members; and

said actuator assemblies also including a plurality of actuating means for moving the connectors in directions which elastically deform the photo-mask in its plane so as to correct the errors detected by said detecting means.

5,534,970
SCANNING EXPOSURE APPARATUS

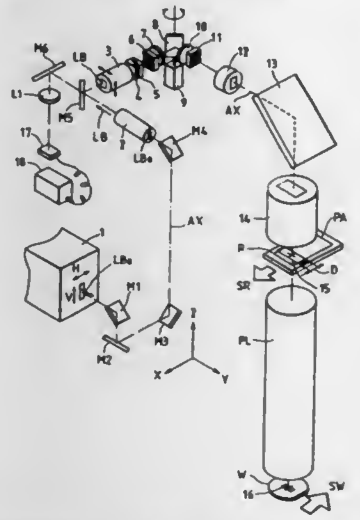
Toshiharu Nakashima, Kawasaki; Masato Hamatani, Kohnosu, and Ken Ozawa, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 7, 1994, Ser. No. 255,927

Claims priority, application Japan, Jun. 11, 1993, 5-141016; Nov. 19, 1993, 5-290478

Int. Cl.^{6} G02B *27/00*

U.S. Cl. 355—53 **18 Claims**



1. A scanning exposure apparatus comprising:

a light source for emitting a spatially coherent light beam;

an illumination optical system for radiating the light beam from said light source onto a mask so as to form an illumination area on a local area of the mask, said light beam having higher spatial coherence in one direction than in another direction of a cross-section of the beam in the illumination area; and

a device for synchronously moving the mask and a photosensitive substrate so as to transfer a pattern formed on the mask onto the photosensitive substrate,

wherein a direction of relative scanning of the illumination area and the mask upon movement of the mask substantially coincides with the direction with higher spatial coherence of the light beam.

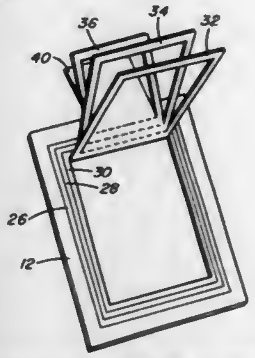
5,534,971
METHOD AND APPARATUS FOR SELECTIVELY COMPOSING THE CONTENT OF A PHOTOGRAPH

Ralph R. Gaetano, Bethel Park, Pa., assignor to Think, Inc., West Mifflin, Pa.

Continuation of Ser. No. 108,936, Aug. 18, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 342,821

Int. Cl.^{6} G03B *27/58*

U.S. Cl. 355—126 **20 Claims**



1. Apparatus for selectively masking a photographic proof to obtain a print of selected sight area comprising,

a base frame including four side portions connected in end to end relation to form a rectilinear aperture, said rectilinear aperture having a center point and an area corresponding to the unmasked area of a photographic proof positioned underlying said base frame,

a plurality of masking frames each having a four-sided configuration corresponding to said base frame including said four side portions, said rectilinear aperture, and said center point,

said apertures of said masking frames having areas less than said base frame aperture area, said masking frames progressively decrease in aperture area from an outer frame positioned within said base frame to an inner frame with a plurality of intermediate frames positioned between said outer frame and said inner frame,

said base frame, said outer frame, said intermediate frames, and said inner frame being concentrically positioned so that said center points are positioned in overlying relationship,

means for pivotally connecting said masking frames serially to one another from said outer frame to said inner frame for independent pivotal movement of said masking frames into and out of position exposing a selected print area of the photographic proof positioned beneath said base frame through said aperture of said respective masking frame,

said outer frame pivotally connected about a pivotal axis to said base frame where pivotal movement of said outer frame on said base frame pivots the remaining masking frames with said outer frame into and out of position concentrically positioned within said base frame,

said inner masking frame being concentrically positioned within said adjacent intermediate masking frame and pivotally connected thereto with the remaining intermediate masking frames concentrically positioned and serially pivotally connected to one another and finally to said outer masking frame, and

said masking frames each being selectively independently pivoted into and out of position for exposing a selected print area of the photographic proof to facilitate positioning a selected one of said masking frames into overlying relation with the proof for comparing the portion of the proof exposed through the opening of each masking frame.

5,534,972
IMAGE FORMING APPARATUS HAVING A ROTATABLE IMAGE BEARING MEMBER SUPPORTED AND POSITIONED RELATIVE TO A MAIN BODY OF THE APPARATUS BY A SHAFT AND IMAGE FORMING MEANS POSITIONED RELATIVE TO THE SHAFT

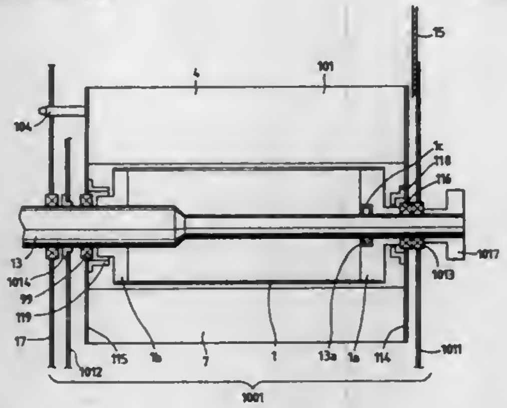
Akio Ohno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 170,780

Claims priority, application Japan, Dec. 24, 1992, 4-357299; Dec. 8, 1993, 5-308046

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 355—200 **24 Claims**



1. An image forming apparatus, comprising:
a rotatable image bearing member detachably mounted on a main body of said image forming apparatus;
a shaft for supporting and positioning said image bearing member relative to the main body;
image forming means for forming an image on said image bearing member, said image forming means comprising a frame having bearings for supporting said shaft and being detachably mounted on the main body and positioned relative to said shaft.

5,534,973
AUTOMATIC DOCUMENT FEEDER FOR PHOTOCOPIER AND FACSIMILE DEVICE

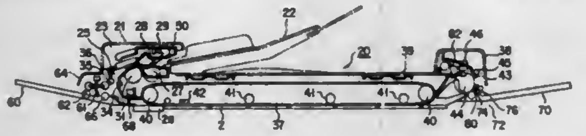
Kentaro Harada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1994, Ser. No. 205,960

Claims priority, application Japan, Mar. 24, 1993, 5-065254

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—202 **6 Claims**



1. An image forming apparatus, comprising:
first loading means for loading a first original document having a first plurality of sheets for photocopying;
second loading means for loading a second original document having a second plurality of sheets for facsimilling;
first detecting means for detecting the first original document on the first loading means;
second detecting means for detecting the second original document on the second loading means;
first feeding means for sequentially feeding each of the first plurality of sheets of the first original document loaded on the first loading means starting from a lowermost sheet of the first original document;
second feeding means for sequentially feeding each of the second plurality of sheets of the second original document loaded on the second loading means starting from a lowermost sheet of the second original document;
image scanning means for scanning the first original document fed by said first feeding means and the second original document fed by said second feeding means;
photocopying means for photocopying a scanned image of the first original document;
facsimile means for facsimilling a scanned image of the second original document; and
means for selectively activating one of the photocopying means and the facsimile means in accordance with detection by said first or second detecting means.

5,534,974
PRINTING APPARATUS PERFORMING BIDIRECTIONAL COMMUNICATION WITH A PLURALITY OF USER TERMINALS

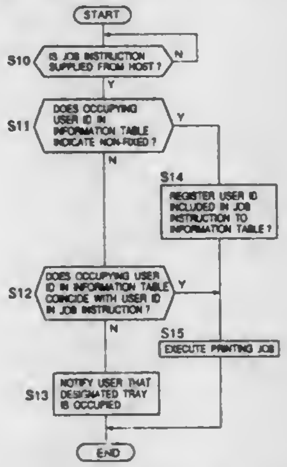
Hironobu Hasegawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 18, 1994, Ser. No. 324,686

Claims priority, application Japan, Oct. 20, 1993, 5-285718

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—202 **11 Claims**


START
S10
IS JOB INSTRUCTION SUPPLIED FROM HOST ?
N
Y
S11
DOES OCCUPYING USER ID IN INFORMATION TABLE INDICATE NON-FIXED ?
Y
N
S14
REGISTER USER ID INCLUDED IN JOB INSTRUCTION TO INFORMATION TABLE ?
S12
DOES OCCUPYING USER ID IN INFORMATION TABLE COINCIDE WITH USER ID IN JOB INSTRUCTION ?
Y
N
S15
EXECUTE PRINTING JOB
S13
NOTIFY USER THAT DESIGNATED TRAY IS OCCUPIED
END

1. A printing system used by a plurality of users, said printing system comprising a printing apparatus and at least one host apparatus communicating with said printing apparatus by means of bidirectional communication, said printing system comprising;
one or more paper-supplying trays for supplying recording papers to be printed;
tray-designating means for designating one of the paper-supplying trays, said one of the paper-supplying trays being designated by one of the users through said host apparatus, said one of the paper supplying-trays designated by said tray-designating means being exclusively used by said one of the users; and
notifying means for notifying another of the users through said host apparatus, when one of the paper-supplying trays currently being exclusively used is designated by said another of the users, the fact that the designated one of the paper-supplying trays is occupied.

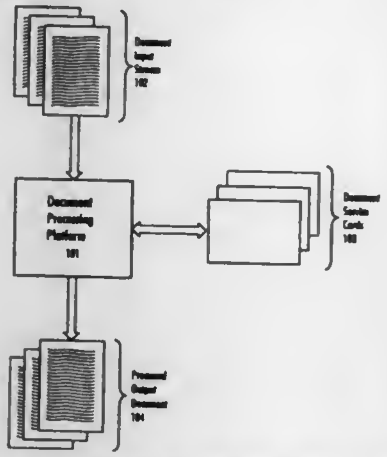
5,534,975
DOCUMENT PROCESSING SYSTEM UTILIZING DOCUMENT SERVICE CARDS TO PROVIDE DOCUMENT PROCESSING SERVICES

Mark J. Stefik, Woodside; Daniel M. Russell; Daniel G. Bobrow, both of Palo Alto, and D. Austin Henderson, Jr., La Honda, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1995, Ser. No. 451,937

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—202 **23 Claims**


Document Input Stream 102
Document Processing Platform 101
Document Service Cards 103
Processed Output Document 104

1. An extensible document processing arrangement comprising:
one or more document service cards each indicating one or more document services;
a document processing platform for creating a document output from a document input stream, said document processing platform comprising:
one or more slots, each of said one or more slots for receiving a document service card;
service registration means for marking document services as available in a service taxonomy responsive to detection of a document service card being received by one of said one or more slots;
service deregistration means for marking document services as unavailable in said service taxonomy;
input means for receiving a document input stream representing a document to be processed and control forms;
means for detecting and extracting control forms contained in said input stream;
a service dispatcher for receiving an instance of a control form and selecting a document service in said service taxonomy to process said instance of said control form; and
output generation means for reproducing said document input stream responsive to said selected document service.

5,534,976
METHOD FOR ELIMINATING A PAPER JAM OF AN IMAGE FORMING SYSTEM AND APPARATUS THEREFOR

Kyung-Yeol Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

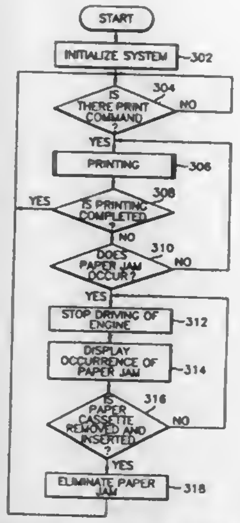
Filed Feb. 8, 1994, Ser. No. 202,971

Claims priority, application Rep. of Korea, Oct. 20, 1993, 21773/1993

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—207 **20 Claims**

1. A method for eliminating a paper jam in response to activation of a paper jam eliminating mode in an electrophotographic developing device having means for sensing removal and insertion of a paper cassette, said method comprising the steps of:
determining whether said paper cassette is removed and re-inserted upon occurrence of said paper jam; and
activating said paper jam eliminating mode in response to said paper cassette being removed and re-inserted to eliminate said paper jam by rotating a plurality of rollers positioned along a paper conveyance path within said device and expelling paper causing said paper jam to an exterior of said device.



5,534,977
IMAGE FORMING APPARATUS HAVING A FUNCTION TO CHARGE A PHOTORECEPTOR DRUM AT AN APPROPRIATE POTENTIAL

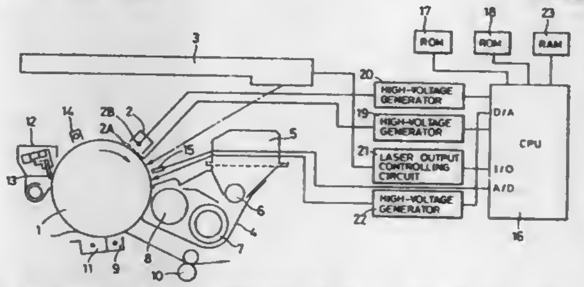
Yasushi Saitoh; Masashi Matsumoto; Takao Ichihashi, and Shuji Yamada, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1994, Ser. No. 213,530

Claims priority, application Japan, Mar. 22, 1993, 5-062199

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 355—208 **9 Claims**



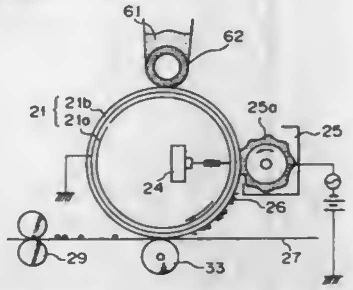
7. An image forming apparatus having a function to charge a surface of a photoreceptor at an appropriate potential prior to image formation, said image forming apparatus comprising:
a photoreceptor;
charging means for charging a surface of the photoreceptor;
detecting means for detecting a potential of the surface of the photoreceptor;
detection sensitivity correcting means for correcting a sensitivity of the detecting means;
charging controlling means for controlling a voltage applied to the charging means;
exposing means for exposing a charged surface of the photoreceptor to form a latent image; and
exposure controlling means for controlling a voltage applied to the exposing means,
wherein after a sensitivity correction of the detecting means, the surface of the photoreceptor is charged by the charging means by applying a predetermined voltage, a control of the applied voltage by the charging controlling means and the charging are repeated, an appropriate charging voltage to be applied to the charging means which generates an appropriate potential is found, and the surface of the photoreceptor is charged by the charging means by using the appropriate charging voltage, and thereafter, the surface of the photoreceptor is exposed by the exposing means by applying a predetermined voltage, a

control of the applied voltage by the exposure controlling means and the exposure are repeated, an appropriate exposing voltage to be applied to the exposing means which makes a potential of an exposed portion appropriate is found, and after the surface of the photoreceptor is charged by the charging means by using the appropriate charging voltage, a latent image is formed on the surface of the photoreceptor by the exposing means by using the appropriate exposing voltage.

5,534,978
IMAGING APPARATUS AND PHOTOCONDUCTOR

Yasushige Nakamura; Norio Sawatari; Fumio Takei; Toru Takahashi; Katsura Sakamoto, and Tsuneo Watanuki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 29, 1994, Ser. No. 365,802
Claims priority, application Japan, Mar. 2, 1994, 6-032474
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 355—211 **21 Claims**



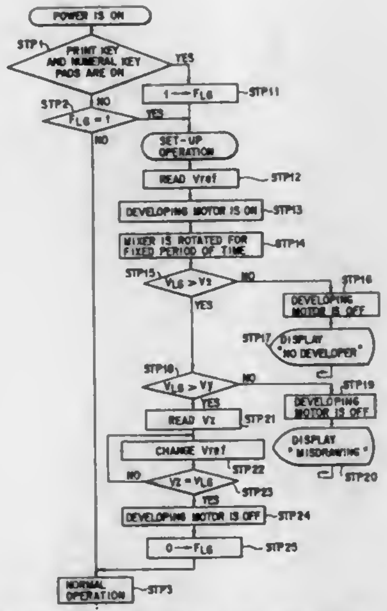
1. An imaging apparatus comprising a photoconductor prepared by laminating a transparent or semi-transparent substrate, a transparent or semi-transparent conductive layer and a photoconductive layer, a developing agent comprising a carrier and toner situated on the photoconductive layer side of said photoconductor, and image exposure means for image exposure, provided on the transparent or semi-transparent substrate side of said photoconductor and positioned opposite a developing means, which apparatus performs light exposure and developing with the developing agent roughly simultaneous with electrification of the photoconductor, characterized by having means for supplying an additional potential to said photoconductor, so that the absolute value of the surface potential (V_s) of the photoconductor either approaches the absolute value of a developing bias (V_b) applied to the developing means or is larger than the absolute value of said developing bias (V_b).

5,534,979
IMAGE FORMING APPARATUS

Fumito Ide, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Feb. 24, 1994, Ser. No. 201,375
Claims priority, application Japan, Mar. 19, 1993, 5-059779
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 355—208 **12 Claims**

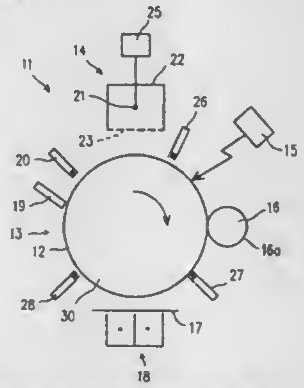
1. An image forming apparatus, comprising:
an image bearing member on which an electrostatic latent image corresponding to image information is formed;
means for developing the latent image by supplying toner particles onto the latent image formed on said image bearing member;
means for supplying carrier particles from an outer section of said developing means, the carrier particles for carrying the toner particles to the latent image on said image bearing member, said carrier particles providing a predetermined potential voltage to the toner particles;
means, arranged in said developing means, for monitoring a ratio of said carrier particles to the toner particles in said developing means and outputting a signal in accordance with said ratio; and
means for sensing an amount of said carrier particles supplied from the outer section of said developing means based on the signal outputted from said monitoring means.



5,534,980
ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS HAVING A CHARGE REMOVING MEANS

Nariaki Tanaka, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 10, 1995, Ser. No. 418,658
Claims priority, application Japan, May 31, 1994, 6-119322
Int. Cl.^{6} G03G *5/06;21/00*
U.S. Cl. 355—219 **12 Claims**

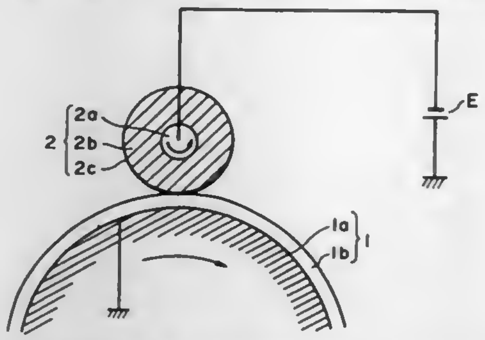


1. An image forming apparatus, comprising:
a rotatable photosensitive member including a conductive base and an organic photosensitive film located on a surface of the base and containing two charge generation materials which have different light absorbing characteristics from each other and different wavelengths showing a maximum light absorbance from each other;
charging means for charging the organic photosensitive film, the charging means being located in the vicinity of the photosensitive member;
exposing means for radiating light toward the organic photosensitive film charged by the charging means;
developing means located downstream with respect to the exposing means in a rotation direction of the photosensitive member; and
charge removing means including a light source for radiating light toward the organic photosensitive film to uniformize the potential of a surface of the organic photosensitive film, the light having a wavelength in the range between wavelengths corresponding to half of a maximum light absorption of at least one of the two charge generation materials.

5,534,981
IMAGE FORMING APPARATUS AND DEVELOPER FOR DEVELOPING ELECTROSTATIC IMAGES

Manabu Ohno; Hisayuki Ochi; Tetsuhito Kuwashima; Hiroyuki Suematsu, all of Yokoyama; Eiichi Imai, Narashino; Tsuyoshi Takiguchi, Yokohama; Koichi Tomiyama, Kawasaki; Tsutomu Kukimoto, Tokyo, and Hiroshi Yusa, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 558,097, Jul. 26, 1990, Pat. No. 5,307,122.
This application Aug. 19, 1993, Ser. No. 108,798
Claims priority, application Japan, Jul. 28, 1989, 1-194015; Jul. 28, 1989, 1-194016; Jul. 28, 1989, 1-194026; Jul. 28, 1989, 1-194028; Dec. 22, 1989, 1-331299
Int. Cl.^{6} G03G *15/08*
U.S. Cl. 355—245 **99 Claims**



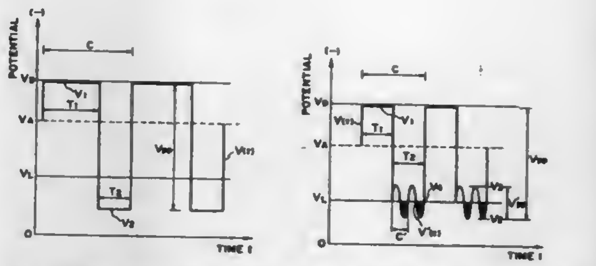
1. An image forming apparatus, comprising:
a member to be charged for carrying an electrostatic image,
a contact-charging means for charging the member to be charged in contact with the member to be charged, and
a developing means for developing the electrostatic image carried on the member to be charged, wherein the developing means includes a developer for developing the electrostatic image comprising a toner and hydrophobic inorganic fine powder having a hydrophobicity of 60% or higher,
wherein the toner comprises a colorant and a binder resin and has a volume-average particle size of 4–8 microns and a particle size distribution wherein 2.0 volume % or less of toner particles are 12.7 microns or larger; and the binder resin contains 3–30 wt. parts of polymerized units of a monomer having an acid group formed of a carboxyl group or its anhydride per 100 wt. parts of the binder resin and has an acid value of 1–70.

5,534,982
DEVELOPING APPARATUS

Katsuhiro Sakaizawa, Tokyo; Motoo Urawa, Yokohama; Tsutomu Kukimoto, Yokohama, and Satoshi Yoshida, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1994, Ser. No. 205,107
Claims priority, application Japan, Mar. 3, 1993, 5-042734; Jul. 22, 1993, 5-201249
Int. Cl.^{6} G03B *21/00;15/06*
U.S. Cl. 355—246 **9 Claims**

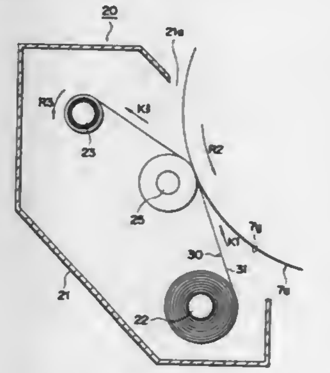
1. A developing apparatus comprising:
a developer carrying member for opposing an image bearing member bearing an electrostatic image and for carrying a developer to develop the electrostatic image on the image bearing member, the developer having a polarity which is the same as a charging polarity of the image bearing member; and
bias voltage applying means for applying an oscillating bias voltage to said developer carrying member;
wherein the bias voltage oscillates interposing an image portion potential of the image bearing member, wherein a time average voltage of the bias voltage is between the background portion potential of said image bearing member and the image portion potential of said image bearing member, and wherein an absolute value of a peak level of a bias voltage for moving the developer from said developer carrying member toward the image bearing member is smaller than an absolute value of a background portion potential.

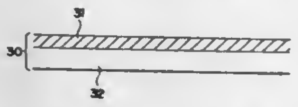


5,534,983
IMAGE FORMING APPARATUS HAVING A TRANSFER MEMBER CLEANING DEVICE

Takahiro Kubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 213,584, Mar. 16, 1994, abandoned.
This application Jan. 31, 1995, Ser. No. 381,288
Claims priority, application Japan, Mar. 19, 1993, 5-083782
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 355—271 **26 Claims**



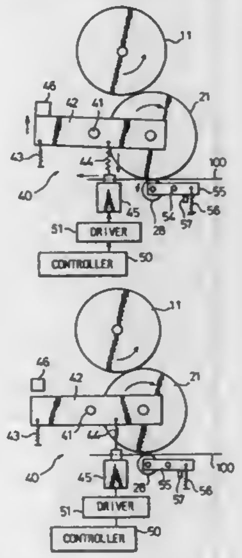


1. An image forming apparatus comprising:
first convey means for conveying a recording material to an image forming position where a toner image is formed on the recording material, said first convey means having a recording material bearing member for bearing the recording material;
fixing means for fixing the toner image onto the recording material, said fixing means having a pair of rotary members for pinching and conveying the recording material, and oil being adhered to said rotary members; and
second convey means for turning over the recording material after a fixing operation and for conveying the recording material to said recording material bearing member;
wherein cleaning means for cleaning said recording material bearing member is provided, said cleaning means having a surface contacting with said recording material bearing member, said surface comprising a non-woven cloth including

fibers having average thickness of below 10 μm and density of 0.05 to 0.80 g/cm^3, and 70% or more of said fibers having thickness of below 10 μm.

5,534,984
RECORDING APPARATUS HAVING A TRANSFER DRUM SHIFTING DEVICE

Hiroyuki Inoue, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 24, 1995, Ser. No. 393,680
Claims priority, application Japan, Mar. 2, 1994, 6-031718; Feb. 13, 1995, 7-024168
Int. Cl.^{6} G03G *15/16*
U.S. Cl. 355—271 **8 Claims**



1. A recording apparatus, comprising:

an intermediate transfer drum;

an image carrier, wherein a toner image on the image carrier is primarily transferred to the intermediate transfer drum and the toner image on the intermediate transfer drum is secondarily transferred to a recording medium;

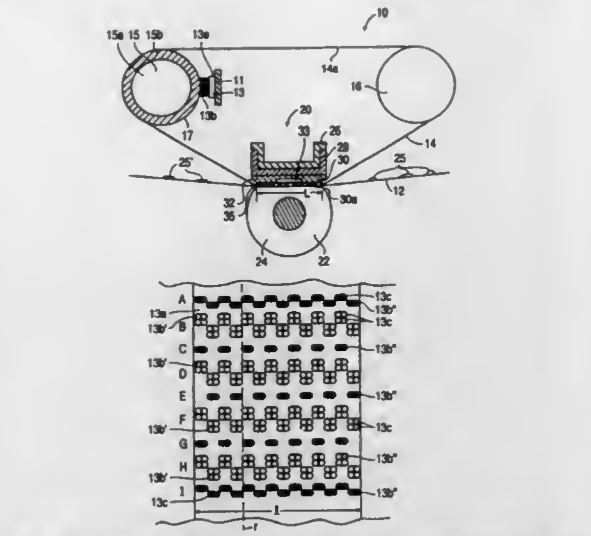
an intermediate transfer drum shifting device for shifting the intermediate transfer drum, during the primary transfer, into a first state wherein the intermediate transfer drum is brought into press-contact with the image carrier and is brought away from press-contact with the recording medium, and, during the secondary transfer, into a second state wherein the intermediate transfer drum is brought into press-contact with the recording medium and is brought away from press-contact with the image carrier.

5,534,985
CLEANING DEVICE FOR A FIXING UNIT

Luciano Rosso, and Antonio Saraceno, both of Turin, Italy, assignors to Olivetti-Canon Industriale, S.p.A., Ivrea, Italy
Filed Feb. 14, 1995, Ser. No. 388,419
Claims priority, application Italy, Feb. 21, 1994, T094A0102
Int. Cl.^{6} G03G *21/00; 13/20*
U.S. Cl. 355—283 **15 Claims**

1. A cleaning device for a fixing unit which is capable of removing contaminating particles from a surface of a drive roller which imparts motion to a belt for transporting an image support through said fixing unit, wherein said cleaning device is formed by a brush comprising:

a support;

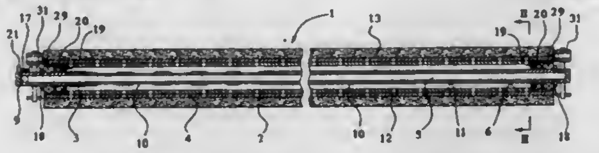


a first multiplicity of rigid bristles fixed to said support and capable of removing said particles; and,

a second multiplicity of flexible bristles fixed to said support for retaining said contaminating particles.

5,534,986
REPLACEABLE SEPARATING AGENT METERING DEVICE FOR A FUSER ROLLER

Otmar Irro, Feldkircben-Westerham, and Helmut Naeser, Munich, both of, Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellscbaft, Paderborn, Germany
PCT No. PCT/EP93/02845, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO94/09411, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 14, 1994, Ser. No. 428,172
Claims priority, application Germany, Oct. 22, 1992, 42 35 671.7; Feb. 26, 1993, 43 06 049.8
Int. Cl.^{6} G03G *15/20*
U.S. Cl. 355—284 **17 Claims**



1. A separating agent metering device for supplying separating agent to a surface of a fuser roller of a transfer-printing apparatus, the metering device comprising:

a) a separating agent metering tube with at least one separating agent metering opening arranged along its longitudinal extent;

b) a carrier tube rotatably mounted on the separating agent metering tube with plurality of circumferentially positioned passage openings for the separating agent;

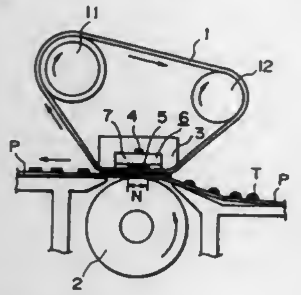
c) a replaceable applicator roller slidable axially over the carrier tube the applicator roller having:

an applicator sleeve which receives the carrier tube and has a plurality of passage openings for the separating agent which are at least partially congruent with the passage openings in the carrier tube; and

a layer of material which is permeable to the separating agent and is attached to the outer circumference of the applicator sleeve to apply the separating agent.

5,534,987
FIXING APPARATUS WITH VARIABLE FIXING TEMPERATURE

Yasumasa Ohtsuka; Shunji Nakamura, both of Yokohama; Takashi Soya, Kawasaki; Kouichi Okuda, Yokohama; Yohji Tomoyuki, Ichikawa; Akira Hayakawa, Tokyo; Manabu Takano, Tokyo; Daizo Fukuzawa, Tokyo; Hidenobu Suzuki, Kawasaki, and Atsuyoshi Abe, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 196,456, Feb. 15, 1994, abandoned.
This application Jul. 28, 1995, Ser. No. 508,416
Claims priority, application Japan, Feb. 16, 1993, 5-026809
Int. Cl.^{6} G03G *15/20*
U.S. Cl. 355—285 **9 Claims**



1. A fixing apparatus comprising:

a heating member;

a temperature detecting member for detecting the temperature of said heating member;

electric power supply controlling means for controlling an electric power supply to said heating member so that the temperature detected by said temperature detecting member during a fixing operation is maintained substantially constant at a predetermined fixing temperature; and

temperature determining means for determining the fixing temperature in response to both the temperature of said heating member before beginning of the electric power supply control during the fixing operation and a rate of the temperature change of said heating member upon supplying a predetermined amount of electric power to said heating member or upon turning it off.

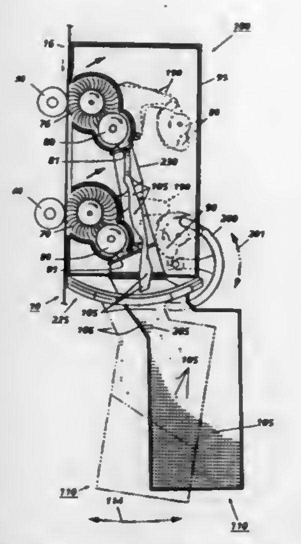
5,534,988
RETRACTION ACTIVATED WASTE BOTTLE MECHANISM FOR UNIFORM TONER DISTRIBUTION

Dennis G. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 7, 1995, Ser. No. 479,434
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 355—298 **20 Claims**

20. A method of cleaning particles from a cleaner subsystem having a device for removing the particles from a surface, the cleaner subsystem having bridging accumulation therein, comprising:

removing the particles from the surface using a cleaning device; and

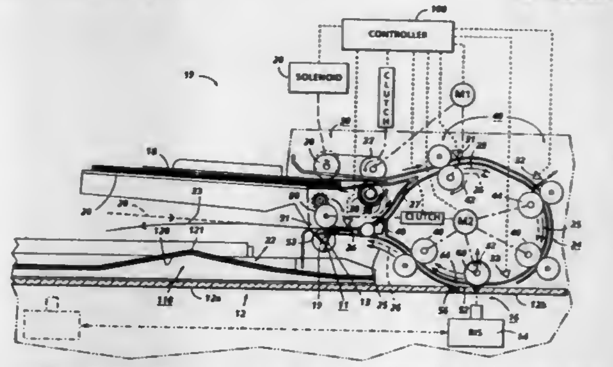
disturbing the bridging accumulation of the particles in the cleaner subsystem, to create uniform distribution of the particles therein, using a disturbing device activated during engaging and retracting of the cleaning device using a cam shaft coupled to the disturbing device and the cleaning device,



to simultaneously operate the cleaning device and the disturbing device.

5,534,989
SEPARATING DOCUMENT TRAYS IMAGING SYSTEM

Robert F. Rubscha, Fairport; Margaret C. Tsai, Rochester, and Mark H. Buddendeck, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 7, 1995, Ser. No. 485,952
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 355—309 **10 Claims**



1. A document imaging system for the imaging at a selected first or second imaging station of document sheets to be reproduced, including a pivotably mounted liftable automatic document handler with an integrally lifted input tray for said documents sheets to be loaded into and automatically fed from said input tray to said first imaging station, and a normally underlying output stacking tray into which said document sheets are ejected by said automatic document handler after imaging at said first imaging station for controlled stacking and retrieval, said second imaging station comprising a large imaging platen for manual placement thereon of document sheets to be scanned, and a large manual platen cover providing a document hold down lower surface normally overlying said large imaging platen, which platen cover is pivotably mounted to be liftable for said manual placement of document sheets on said large imaging platen; wherein said output stacking tray of said automatic document handler is integrally formed in said upper surfaces of said liftable large manual platen cover and is not mounted to said automatic document handler, and said output stacking tray is normally extending to closely adjacent to said automatic document handler; and wherein said automatic document handler is liftable independently of said output stacking tray in said platen cover to provide clear access to said output stacking tray, but wherein said automatic document handler is also liftable together with said manual platen cover.

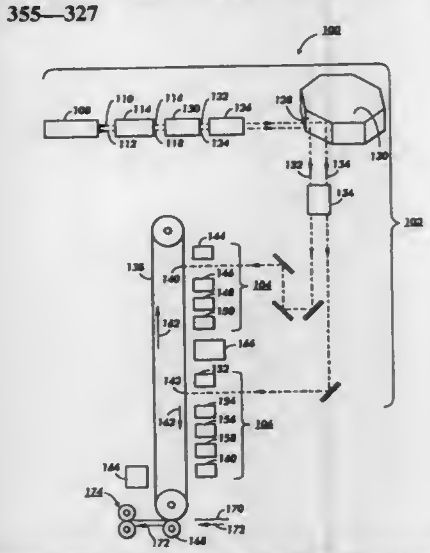
5,534,990
FULL COLOR PRINTING SYSTEM USING A PENTA-LEVEL XEROGRAPHIC UNIT

Ellis D. Harris, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1995, Ser. No. 422,197

Int. Cl.^{6} G03G *15/01*

U.S. Cl. 355—327 **12 Claims**



1. A single pass full color printing system comprising:
- a raster output scanner optical system for generating a first modulated beam and a second modulated beam,
- a photoreceptor means,
- a quad-level xerographic unit for charging said photoreceptor means, said photoreceptor means then being exposed to said first modulated beam, said quad-level xerographic unit having means for depositing a first color toner, a second color toner, and a third color toner on said photoreceptor means based on the charge, after exposure to said first modulated beam, and
- a penta-level xerographic unit for charging said photoreceptor means, subsequent to said quad-level xerographic unit, said photoreceptor means then being exposed to said second modulated beam, said penta-level xerographic unit having means for depositing a fourth color toner, a fifth color toner, a sixth color toner and a seventh color toner on said photoreceptor means based on the charge, after exposure to said second modulated beam, whereby said color toners produce pixels for black and white and all six primary colors.

5,534,991
ACTIVE DISTANCE MEASURING APPARATUS

Kazuyuki Maeda, and Hideo Taka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1993, Ser. No. 31,197

Claims priority, application Japan, Mar. 13, 1992, 4-088336; Jul. 10, 1992, 4-206196; Jul. 13, 1992, 4-206994

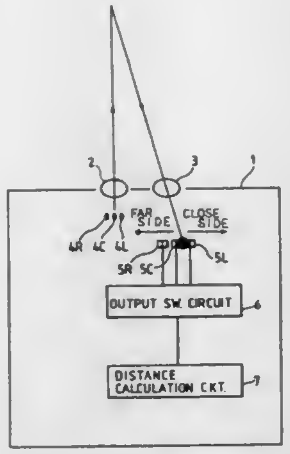
Int. Cl.^{6} G01C *3/00;5/00;* G03B *3/00*

U.S. Cl. 356—3.06 **11 Claims**

1. An apparatus for calculating at least one of distance and focus, said apparatus comprising:
- (a) projecting means for projecting light with respect to a plurality of different distance measuring axes;
- (b) light receiving means having a plurality of light receiving units, each provided in correspondence with one of the distance measuring axes, for receiving reflected light of light projected with respect to the corresponding one distance measuring axis; and
- (c) a calculation circuit having a first mode and a second mode,

wherein in the first mode, one of distance and focus information for each distance measuring axis is calculated on the basis of an output from the light receiving means corresponding to light projected to the respective one of the plurality of distance measuring axes, and

wherein in the second mode, one of distance and focus information are calculated on the basis of outputs, which are simultaneously generated from at least two of the light receiving unit for the light projection for a certain one of the plurality of distance measuring axes.



5,534,992
OPTICAL MEASURING APPARATUS

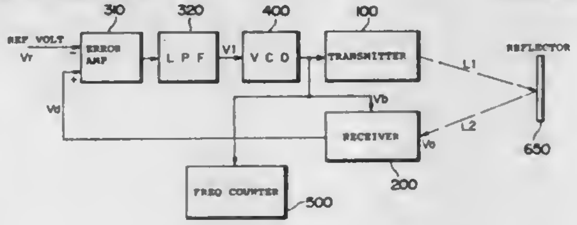
Akira Takeshima; Musubu Koishi; Yoshihisa Warashina, and Yoshihiko Mizushima, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Aug. 30, 1994, Ser. No. 298,554

Claims priority, application Japan, Aug. 30, 1993, 5-214199

Int. Cl.^{6} G01C *3/08*

U.S. Cl. 356—5.1 **13 Claims**



SCHEMATIC LAYOUT (1) OF THE INVENTION

1. An optical measuring apparatus, comprising:
- a light-transmitting portion for projecting light subjected to intensity modulation according to a modulation signal toward a target object;
- a photoconductive light-receiving element for receiving said modulation signal and light reflected by said target object said photoconductive light-receiving element directly calculating a product between said reflected light and said modulation signal and outputting a signal according to a value of a phase difference between said reflected light and said modulation signal;
- time-averaging means for receiving said output signal from said photoconductive light-receiving element and calculating a time averaged value of said output signal;
- frequency adjusting means for adjusting a frequency of said modulated light so as to keep an output signal from said photoconductive light-receiving element fixed at a reference value;
- frequency counting means for counting a fixed modulation frequency as adjusted by said frequency adjusting means; and
- processing means for obtaining a characteristic value of an optical path from said light-transmitting portion and said photoconductive light-receiving element to the target object, based on the frequency counted by said frequency counting means.

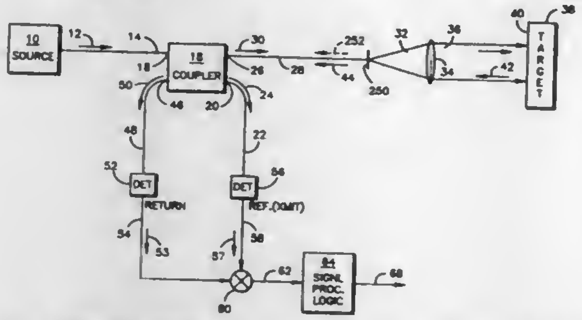
5,534,993
DUAL-WAVELENGTH FREQUENCY-CHIRPED MICROWAVE AMCW LADAR SYSTEM

Gary A. Ball, Simsbury, and Leon A. Newman, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1994, Ser. No. 260,136

Int. Cl.^{6} G01C *3/00*

U.S. Cl. 356—5.09 **4 Claims**



1. A dual-wavelength frequency-chirped microwave AMCW ladar system, comprising:
- a dual wavelength optical source, which provides an optical signal having a first wavelength and a second wavelength, said second wavelength being varied with time;
- a reference detector, which detects said optical signal and which provides a reference beat signal having a reference beat frequency indicative of the difference between said first and second wavelengths;
- a return detector, which detects said optical signal after said optical signal has traveled a predetermined distance and which provides a return beat signal having a return beat frequency indicative of the difference between said first and said second wavelengths; and
- the difference between said return beat frequency and said reference beat frequency at the time said return beat frequency is detected being a difference frequency, said difference frequency being related to the distance traveled by said optical signal.

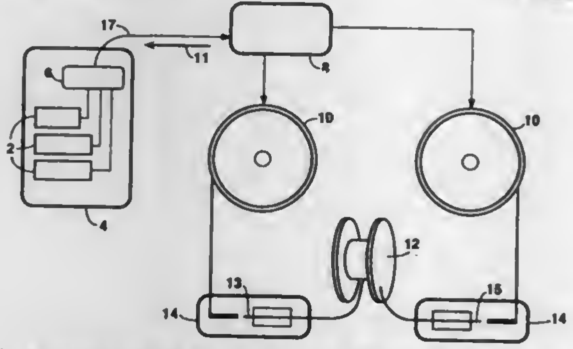
5,534,994
OPTICAL WAVEGUIDE SPECTRAL ATTENUATION USING AN OTDR

Thomas A. Hanson, Corning, N.Y.; William J. Kish; Jerome J. Novak, both of Wilmington, N.C., and Annette L. Vandervort, Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 29, 1994, Ser. No. 269,042

Int. Cl.^{6} G01N *21/27*

U.S. Cl. 356—73.1 **5 Claims**



1. A method of measuring spectral attenuation of an optical waveguide fiber, for a selected wavelength range, using an optical time domain reflectometer, comprising the steps of:
- Measuring attenuation at these selected wavelengths which are substantially 1310 nm, 1410 nm, and 1550 nm; and,
- analyzing the respective attenuations at said at least three wavelengths to produce a curve representing attenuation over the selected wavelength range.

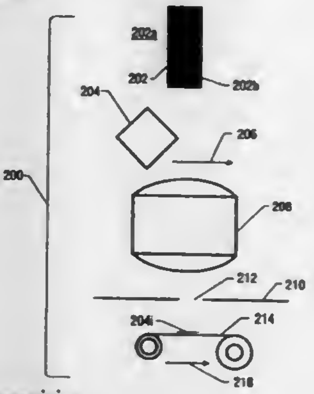
5,534,995
SCHLIEREN SYSTEM AND METHOD FOR MOVING OBJECTS

Leonard M. Weinstein, Newport News, Va., assignor to Space Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 14, 1995, Ser. No. 388,652

Int. Cl.^{6} G01N *21/45*

U.S. Cl. 356—129 **19 Claims**



1. A system comprising:
- an image recording medium;
- a mask having an aperture, said mask being placed in front of said image recording medium;
- an optical imaging system placed in front of said mask;
- an object moving along a path that crosses in front of said optical imaging system;
- a transition between a light field-of-view and a dark field-of-view, said transition located such that said object passes between said optical imaging system and said transition;
- said optical imaging system focusing an image of said transition at said mask such that said aperture causes a band of light to be defined on said image recording medium, said optical imaging system further focusing an image of said object through said aperture of said mask wherein said image of said object appears on said image recording medium;
- means for minimizing relative motion between said mask and said transition; and
- means for minimizing relative motion between said image recording medium and said image of said object, wherein said image of said object and density changes in a flow field surrounding said object are recorded on said image recording medium when said object crosses said transition.

5,534,996
MEASUREMENT APPARATUS FOR EVALUATING CHARACTERISTICS OF LIGHT EMITTING DEVICES

Hiroshi Mori, Ohizumi-machi, and Masatoshi Bendo, Gunma-ken, both of, Japan, assignors to Advantest Corporation, Tokyo, Japan

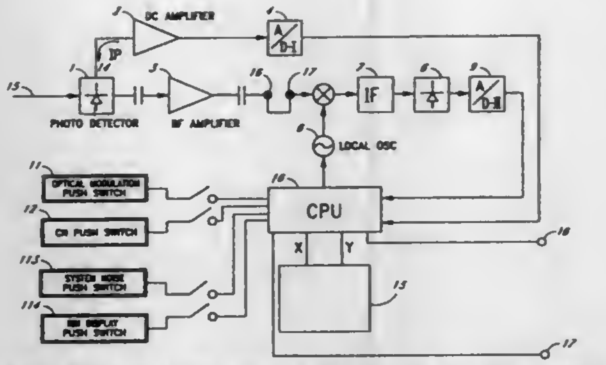
Filed Sep. 21, 1994, Ser. No. 309,904

Claims priority, application Japan, Sep. 21, 1993, 5-257622; Sep. 21, 1993, 5-257623; Sep. 30, 1993, 5-057924 U

Int. Cl.^{6} G01J *1/42*

U.S. Cl. 356—218 **6 Claims**

1. A measurement apparatus for evaluating a light emitting device, comprising:
- a photo detector for converting an input light signal from a light emitting device to an electric current;
- a DC amplifier for amplifying a DC component in said electric current from said photo detector;



- a first analog-to-digital convertor for digitizing an output of said DC amplifier;
- an RF amplifier for amplifying a high frequency component in said electric current;
- a detector for detecting an output of said RF amplifier;
- a second analog-to-digital convertor for digitizing an output of said detector;
- a controller for controlling sequences of automatic measuring operations, for reading measured data from said first and second analog-to-digital convertors, and for calculating said measured data for determining characteristics of said light emitting device;
- a display device, coupled to said controller, for displaying said characteristics of said light emitting device.

5,534,997

RAMAN SPECTROMETER USING A REMOTE PROBE WITH ENHANCED EFFICIENCY

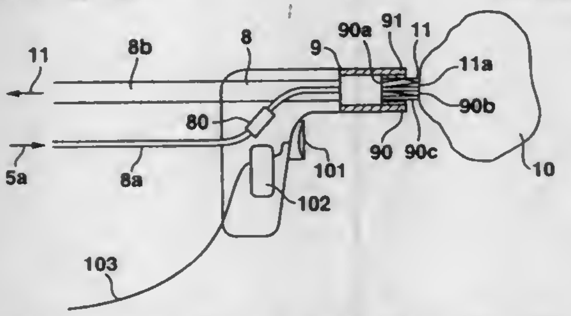
Bernhard Schrader, Essen-Heisingen, Germany, assignor to Bruker Analytische Messtechnik GmbH, Rheinstetten, Germany

Filed Sep. 20, 1994, Ser. No. 309,000

Claims priority, application Germany, Jul. 15, 1994, 9411467 U

Int. Cl.^{6} G01N *21/65*

U.S. Cl. 356—301 **21 Claims**



1. A Raman spectrometer of the kind having a remote probe, a sample, a laser, and an analysis means, the remote probe comprising:

- a first optical fiber means optically connected between the laser and the sample and adapted for transporting laser light to the sample for excitation of a Raman spectrum, the first fiber means comprising an optical filter unit to filter out Raman radiation generated by the laser in the first fiber means;
- a second optical fiber means optically connected between the sample and the analysis means and adapted for transporting Raman radiation emitted from the sample to the analysis means to be analysed into the Raman spectrum, the first and the second optical fiber means forming an optical fiber bundle having a planar end surface; and
- transparent optical means optically connected between the first optical fiber means and the sample and between the second optical fiber means and the sample for concentrating laser light from the first fiber means to a surface of the sample and for collecting and transporting Raman radiation from the sample to the second optical fiber means, the transparent optical means having a first planar surface which is one of attached to and imaged onto the planar end surface of the optical fiber bundle, a second surface adapted for contact to the surface of the sample, and a third enclosing surface which is one of covered with a reflecting coating and adapted as a total reflector, the transparent optical means adapted for connection to and detachment from the planar end surface of the optical fiber bundle.

5,534,998

SAMPLE NEBULIZER AND EVAPORATION CHAMBER FOR ICP AND MIP EMISSION OR MASS SPECTROMETRY AND SPECTROMETERS COMPRISING THE SAME

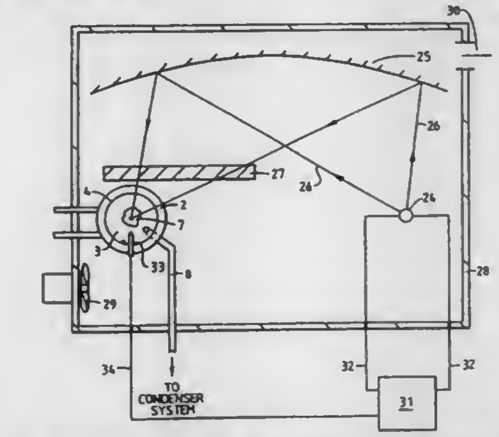
Alan R. Eastgate, La Praz, and Wilfried Vogel, Cully, both of, Switzerland, assignors to Fisons PLC, Ipswich, England

Filed Dec. 14, 1994, Ser. No. 290,822

Claims priority, application United Kingdom, Feb. 19, 1992, 9203463

Int. Cl.^{6} G0IN *1/00;21/73;* **H01J** *49/04*

U.S. Cl. 356—316 **30 Claims**



1. An apparatus for producing an aerosol of desolvated analyte particles comprising nebulizing means for producing droplets of a carrier liquid containing an analyte, evaporation chamber means bounded by a wall for receiving said aerosol, means for subjecting the droplets comprised in said aerosol in said evaporation chamber means to rapid radiative heating to evaporate said carrier liquid from said droplets during their passage through said evaporation chamber means, and cooling means for maintaining the temperature of said wall below the boiling point of said carrier liquid at the pressure inside said evaporation chamber means.

5,534,999

MONITORING SUB-MICRON PARTICLES

Hiroshi Koshizuka, Shiga-ken, and Takashi Kanatake, Saitama-ken, both of, Japan, assignors to Shinmikuni Kikai Ltd., Osaka, Japan

Continuation of Ser. No. 26,970, Mar. 5, 1993, abandoned.

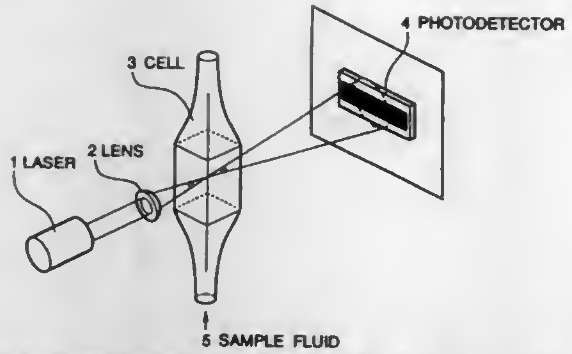
This application Feb. 1, 1995, Ser. No. 383,683

Int. Cl.^{6} G0IN *21/00;15/02*

U.S. Cl. 356—338 **16 Claims**

1. A method for measuring sub-micron particles in a fluid comprising

- converging a light beam from a coherent light source (1) so that the resulting focussed light passes through a stream (3) of fluid containing particles therein in such a manner that a focus of the focussed light is located in said stream (3) of fluid,
- receiving a light passed through said stream (3) and diffracted by said particles by means of a photo-detector (4) which is positioned at an opposite side of said coherent light source (1) with respect to said stream (3) and substantially on an optical axis of said light beam to produce electrical signals, and



- treating said electrical signals from said photo-detector (4) to count a number of particles in said stream by using a predetermined calibration curve; and wherein said focus is located in a focus portion of said stream of fluid which has a cross sectional area at least as great as a maximum cross sectional area in portions of said stream of fluid upstream and downstream relative to said focus portion.

5,535,000

OPTICAL INTERFEROMETER WITH SQUEEZED VACUUM AND REDUCED GUIDED-ACOUSTIC-WAVE BRILLOUIN SCATTERING NOISE

Masataka Shirasaki, 29 Foster Rd., Belmont, Mass. 02178

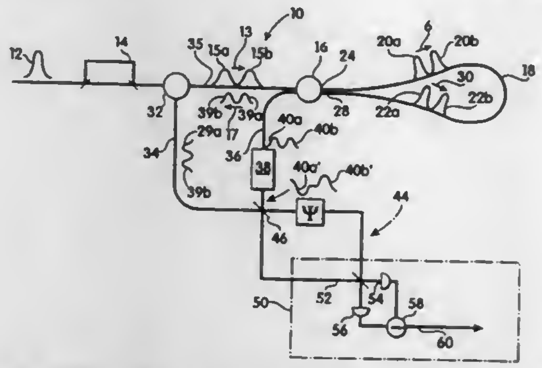
PCT No. PCT/US93/01421, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO94/05967, PCT Pub. Date Mar. 17, 1994

PCT Filed Feb. 17, 1993, Ser. No. 211,906

Claims priority, application United Kingdom, Aug. 27, 1992, 9218235

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **15 Claims**



1. A method for interferometrically detecting phase shift between two light beams in which the effect of GAWBS noise is reduced, said method comprising the steps of;

- (1) generating first and second initial optical pulses of equal amplitude and phase, said first and second initial pulses separated in time by a period less than the inverse spectral width of GAWBS noise,
- (2) splitting each of said pulses into first and second sub-pulses so as to form first and second pairs of sub-pulses, each of said sub-pulses of an amplitude sufficient to cause an optical fiber to exhibit non-linear refractive properties,
- (3) introducing said first pair of sub-pulses into a first end of an optical fiber loop such that said pulses travel through said loop in a first direction,
- (4) introducing said second pair of sub-pulses into a second end of said optical fiber loop such that said pulses travel through said loop in a second direction,
- (5) combining said first pair of sub-pulses and said second pair of sub-pulses of signals after traveling through said loop such that a local oscillator signal comprising first and second pulses and a squeezed vacuum signal also comprising first and second pulses are produced,
- (6) phase shifting one of said first and second pulses of one of said local oscillator and said squeezed vacuum signals by one-half of a wavelength,
- (7) interferometrically detecting relative phase shift between said pulses in a detector which has a response time greater than the inverse spectral width of GAWBS noise.

5,535,001

SYMMETRIC MACH-ZEHNDER ALL-OPTICAL DEVICE

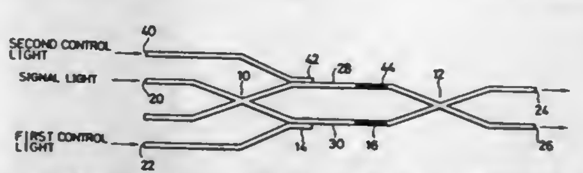
Kazuhito Tajima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 1, 1994, Ser. No. 269,575

Claims priority, application Japan, Jul. 2, 1993, 5-164455

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **12 Claims**



1. A Mach-Zehnder type all-optical device for controlling a signal light with a control light, comprising:

- first and second arms for constituting a Mach-Zehnder configuration, each of said arms having at least a portion thereof composed of nonlinear material having third order optical nonlinearity characteristics;
- first means introducing a first control light to said nonlinear portion of said first arm; and
- second means introducing a second control light, which has a time difference from said first control light, to said nonlinear portion of said second arm.

5,535,002

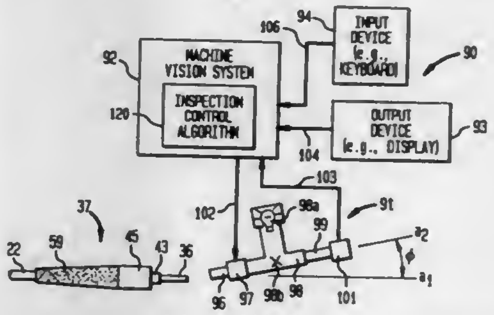
BAND MATCHING SYSTEM AND METHOD FOR ENABLING ACCURATE DETERMINATION OF A DISPARITY BETWEEN TWO SURFACES USING AN INTERFEROMETER

Andrei Csipkes, Lawrenceville, and John M. Palmquist, Lilburn, both of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Apr. 27, 1995, Ser. No. 429,996

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **20 Claims**


106
94
INPUT DEVICE (e.g., KEYBOARD)
90
92
MACHINE VISION SYSTEM
120
INSPECTION CONTROL ALGORITHM
OUTPUT DEVICE (e.g., DISPLAY)
93
104
103
37
102
98a
91
99
22
59
45
43
36
a2
ϕ
a1
96
97
98b
98
101

1. A band matching method for enabling accurate determination of a disparity between two surfaces using an interferometer, comprising the steps of:

- (a) capturing an image of first and second surfaces with a pattern of interferometric fringes superimposed over said image and over said surfaces;
- (b) identifying a discontinuity in a primary fringe that is used for said determination of said disparity;
- (c) moving a pixel value from an adjacent fringe to said primary fringe to fill in said discontinuity;

(d) arithmetically fitting first and second equations to portions of said primary fringe over said first and second surfaces respectively; and

(e) determining said disparity between said surfaces based upon said first and second equations.

5,535,003
WAVELENGTH STABILIZING LIGHT SOURCE APPARATUS BY MAINTAINING A CONSTANT PHASE DIFFERENCE

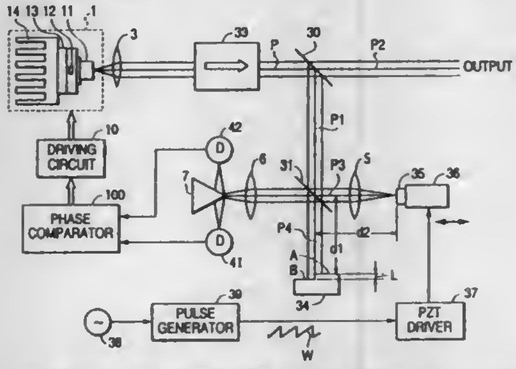
Hiroyuki Kawashima; Fumio Ohtomo; Susumu Saito, and Isao Minegishi, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Japan

Continuation of Ser. No. 61,558, May 17, 1993, Pat. No. 5,453,833. This application Mar. 30, 1995, Ser. No. 413,909

Claims priority, application Japan, May 20, 1992, 4-151133

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **3 Claims**



1. An optical path length difference forming device for forming a predetermined difference in length between a first optical path and a second optical path, said device comprising:

a first member located in said first optical path;

a second member located in said second optical path;

wherein the following mathematical expression is satisfied so as to keep constant the difference in length between said first optical path and said second optical path despite changes in temperature:

$$\{\Delta L2(n2+\Delta n2)-\Delta L1(n1+\Delta n1)\}+(\Delta n2L2-\Delta n1L1)=(n+\Delta n)\times(h1+\Delta L2-\Delta L1)-n\times h1$$

where,

L1 is the length of said first member,

ΔL1 is the amount of change, in length, of said first member upon a temperature change,

L2 is the length of said second member,

ΔL2 is the amount of change in length of said second member upon said temperature change,

n1 is the refractive index of said first member,

Δn1 is the amount of change in refractive index of said first member upon said temperature change,

n2 is the refractive index of said second member,

Δn2 is the amount of change in refractive index of said second member upon said temperature change,

n is the refractive index of the medium occupying the difference in length between said first member and said second member,

Δn is the amount of change in refractive index of the medium occupying the difference in length between said first member and said second member upon said temperature change, and

h1 is the difference in length between said member and said second member at a reference temperature;

wherein said refractive index n of said first member differs from said refractive index n2 of said second member and said predetermined difference in length between said first optical path and said second optical path is greater than zero.

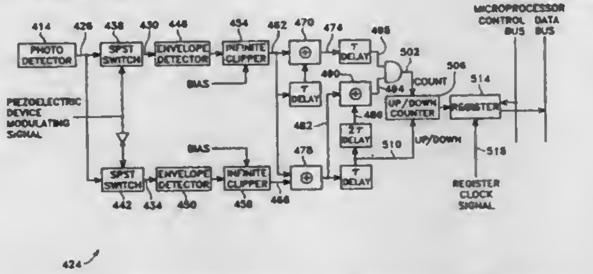
5,535,004
DISTANCE MEASURING INTERFEROMETER HAVING SPECIFIC CROSSINGS DETECTION CIRCUIT

Gregory E. Johnston, 400 Avenue G, Suite 22, Redondo Beach, Calif. 90277, and Robert E. Malm, 16624 Pequeno Pl., Pacific Palisades, Calif. 90272

Division of Ser. No. 890,699, May 29, 1992. This application Mar. 3, 1995, Ser. No. 398,494

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—358 **6 Claims**



1. A distance-measuring apparatus for measuring the distance to a light-reflecting surface, said apparatus comprising:

a means for generating a coherent planar light wave,

a means for splitting said light wave into a first light wave and a second light wave;

a means for directing said first light wave to said reflecting surface, said first light wave being reflected from said reflecting surface and returning to said distance-measuring apparatus;

a reference mirror;

a means for directing said second light wave to said reference mirror, said second light wave being reflected from said reference mirror;

a means for combining said reflected first light wave and said reflected second light wave into a combination plane wave, the amplitude of said combination plane wave being a function of the difference in phases of said reflected first and second waves at the point of said combining, the phases of said reflected first and second light waves being linearly related to first and second propagation times, said first propagation time being the time for said first light wave to travel from said splitting means to said reflecting surface and then to said combining means, said second propagation time being the time for said second light wave to travel from said splitting means to said reference mirror and then to said combining means;

a means for varying said second propagation time about an average value thereby causing the phase of said second reflected wave at the point of combination with said first reflected wave to shift back and forth between a first phase and a second phase;

a means for obtaining an electrical measure of the power of said combination plane wave;

a means for determining the changes in the difference in the phase of said first reflected light wave and the average phase of said second reflected light wave and for computing the algebraic sum of said changes from said power measure and said variations in said second propagation time comprising an electronic circuit for converting said power measure into a first square wave and a second square wave, the transitions between low and high values for said first square wave coinciding with average value crossings of said power measure if the phase of said second reflected light wave were constant and equal to said first phase, the transitions between low and high values for said second square wave coinciding with average value crossings of said power measure if the phase of said second reflected light wave were constant and equal to said second phase.

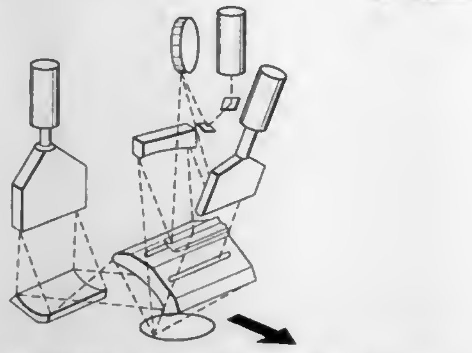
5,535,005
METHOD AND SYSTEM FOR INSPECTING POLISHED SURFACE TEXTURE

Moitreyee Mukherjee-Roy, Plano; Charles R. Pettersson, Sherman City, and Thomas G. Debner, Howe, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 25, 1994, Ser. No. 295,979

Int. Cl.^{6} G01B *11/30*

U.S. Cl. 356—371 **20 Claims**



1. A method for measuring the surface texture of a highly-polished surface using a directed-energy light source, comprising the steps of:

scattering directed-energy Light from the directed-energy light source from a plurality of known texture surfaces, said known texture surfaces having equivalent surface area and dimensions to those of the highly-polished surface;

measuring the scattered light from the directed-energy light source said measured scattered light to establish a threshold energy level measurement above which the measured scattered light varies according to differences in texture among said plurality of known texture surfaces;

establishing from variations in the measured scattered light based on said threshold energy level measurement a texture-light relationship that expresses expected changes in measured scattered light according to changes in texture in said plurality of known texture surfaces;

measuring scattered light from the highly-polished surface; and

generating a texture measurement by applying the texture-light relationship to said measured scattered light from the highly-polished surface.

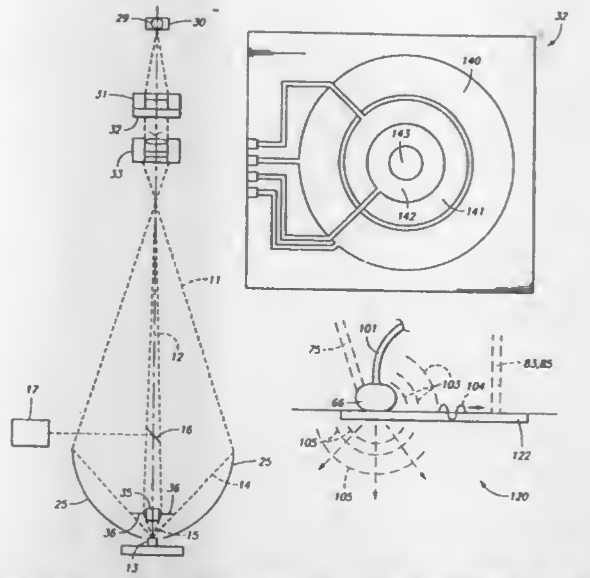
5,535,006
METHOD AND SYSTEM FOR EVALUATING INTEGRITY OF ADHERENCE OF A CONDUCTOR BOND TO A MATING SURFACE OF A SUBSTRATE

Kenneth L. Telschow, Idaho Falls, Id., and Bernard K. Siu, Diamond Bar, Calif., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Continuation-in-part of Ser. No. 25,441, Mar. 1, 1993, Pat. No. 5,420,689, and a continuation-in-part of Ser. No. 25,442, Mar. 1, 1993, Pat. No. 5,424,838, and a continuation-in-part of Ser. No. 914,541, Jul. 16, 1992, Pat. No. 5,302,836. This application May 26, 1994, Ser. No. 250,078

Int. Cl.^{6} G01B *11/24*

U.S. Cl. 356—394 **22 Claims**



1. A method of evaluating integrity of adherence of a conductor bond to a mating surface on a substrate, the method comprising the following steps:

providing a plurality of ring light sources for illuminating a substrate and components adhered thereto;

focusing the ring light sources onto the substrate at respective selected angles of incidence relative to the substrate;

switching from one of the ring light sources to another of the ring light sources to optimize contrast of different objects on the substrate against background reflections;

detecting optical reflective signatures emanating from the substrate resulting from the switching step;

determining location of a selected conductor bond on the substrate from the detected reflective signatures;

determining a target site on the selected conductor bond from the detected reflective signatures;

optically imparting an elastic wave through the selected conductor bond and into the substrate;

detecting an elastic wave signature emanating from the substrate resulting from the optically imparting step; and

determining integrity of adherence of the selected conductor bond to the substrate from the detected elastic wave signature emanating from the substrate.

5,535,007
METHOD AND DEVICE FOR ADJUSTING MAGNIFICATION OF IMAGE

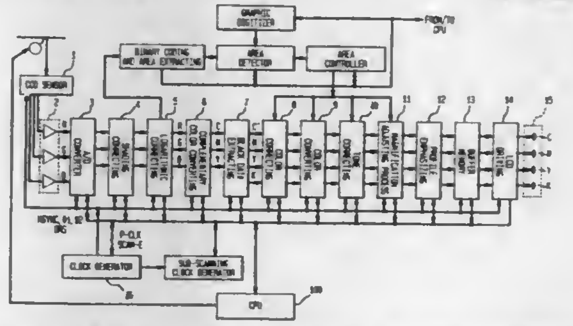
Eun J. Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Oct. 30, 1992, Ser. No. 968,815

Claims priority, application Rep. of Korea, Apr. 30, 1992, 92-7332

Int. Cl.^{6} H04N *1/393;* G06K *9/42*

U.S. Cl. 358—296 **10 Claims**



1. A method for adjusting magnification of an image, comprising the steps of:

designating image input parameters;

setting a desired magnification of an original image;

producing control factors for the desired magnification of the original image;

scheduling function information for the desired magnification of the original image in main and sub-scanning directions by using the image input parameters and the control factors to form a look-up table;

inserting a pixel and a scan line at a predetermined interval when an enlarging magnification of the original image is set corresponding to the function information; and removing a pixel and a scan line from the same scan line, at which a pixel and a scan line are inserted, at a predetermined interval when a reducing magnification of the original image is set corresponding to the function information.

5,535,008
METHOD FOR JUMP-REPRODUCING VIDEO DATA OF MOVING PICTURE CODED WITH HIGH EFFICIENCY

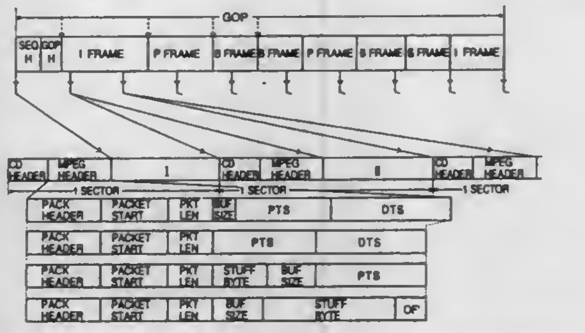
Toru Yamagishi; Ken Miyazaki, and Kentaro Yokouchi, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 16, 1994, Ser. No. 213,805

Claims priority, application Japan, Mar. 16, 1993, 5-081327; Mar. 17, 1993, 5-082782; Jan. 14, 1994, 6-016008

Int. Cl.⁶ H04N *5/781*

U.S. Cl. 358—342 **10 Claims**



1. A reproduction method for reproducing data from a plurality of data groups having at least a first data group and a second data group and having a plurality of compressed data arranged over a plurality of sectors of a disk, a leading sector out of said plurality of sectors including

a first data indicative of compression method and

a second data located directly after the first data and indicative of the presence of said data group,

wherein data compressed in the least amount is situated at the head of each data group, and said second data and said data group are arranged in said order, said method including the steps of:

detecting said first data in connection with the second data group in response to the reproduction of data compressed in the least amount within the first data group, and

reproducing said data compressed in the least amount within said second data group in response to the result of said detection.

5,535,009
COPIER/PRINTER OPERATING WITH INTERRUPTS

David R. Hansen, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1993, Ser. No. 174,106

Int. Cl.⁶ H04N *1/21;1/23;* **G03G** *21/00*

U.S. Cl. 358—296 **16 Claims**

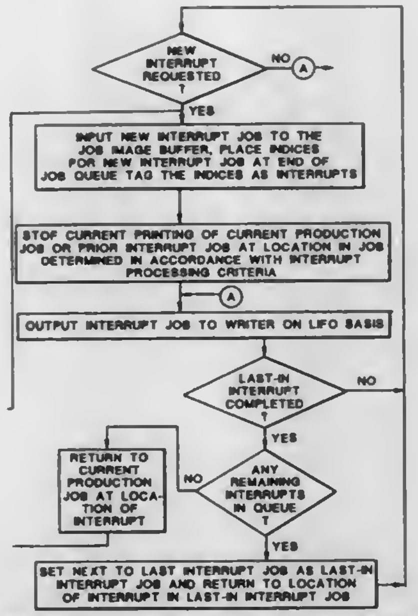
1. A reproduction apparatus, said apparatus comprising:

memory means for storing a plurality of production jobs for printing;

interrupt means for designating a plurality of production jobs to be stored in said memory means as interrupt jobs;

control means for controlling printing of normal production jobs in a first-in-first-out basis and for controlling printing of jobs designated as interrupt jobs so as to be printed on a last-in-first-out basis wherein a first interrupt job interrupts a current normal job and a second interrupt job interrupts the first interrupt job; and

printing means responsive to the control means for forming prints of the plurality of normal production jobs and the interrupt jobs whereby later in time interrupt jobs interrupt earlier in time interrupt jobs and a first later-in-time interrupt job interrupts an earlier-in-time "normal" production job.


NEW INTERRUPT REQUESTED
NO
A
YES
INPUT NEW INTERRUPT JOB TO THE JOB IMAGE BUFFER, PLACE INDICES FOR NEW INTERRUPT JOB AT END OF JOB QUEUE TAG THE INDICES AS INTERRUPTS
STOP CURRENT PRINTING OF CURRENT PRODUCTION JOB OR PRIOR INTERRUPT JOB AT LOCATION IN JOB DETERMINED IN ACCORDANCE WITH INTERRUPT PROCESSING CRITERIA
A
OUTPUT INTERRUPT JOB TO WRITER ON LIFO BASIS
LAST-IN INTERRUPT COMPLETED
NO
YES
ANY REMAINING INTERRUPTS IN QUEUE
NO
YES
RETURN TO CURRENT PRODUCTION JOB AT LOCATION OF INTERRUPT
SET NEXT TO LAST INTERRUPT JOB AS LAST-IN INTERRUPT JOB AND RETURN TO LOCATION OF INTERRUPT IN LAST-IN INTERRUPT JOB

5,535,010
PORTABLE IMAGE PROCESSING APPARATUS

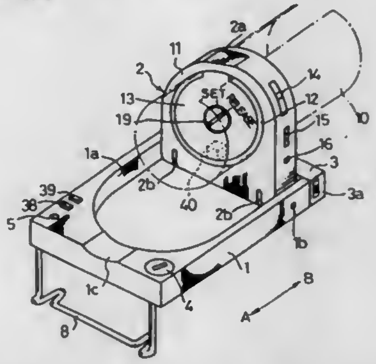
Hirokazu Izumi, Nara; Masanobu Deguchi, Kashiba; Koji Oku, Yamatokoriyama; Shuuhei Yamamoto, Yamatokoriyama, and Harumi Katayama, Yamatokoriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1995, Ser. No. 491,352

Claims priority, application Japan, Jul. 6, 1994, 6-154744

Int. Cl.⁶ B41J *13/00*

U.S. Cl. 358—296 **35 Claims**



1. A portable image processing apparatus comprising:

sheet holding means having a cylindrical section which is formed so as to have a substantially cylindrical shape, said sheet holding means holding a sheet along a side of the cylindrical section;

image processing means for carrying out an image process on the sheet held by said sheet holding means, said image processing means being fixed in an opposite position to the side of the cylindrical section of said sheet holding means;

rotating means for rotating said sheet holding means on an axis of the cylindrical section; and

sheet carrying means for carrying the sheet in a direction which is parallel to the axis of the cylindrical section of said sheet holding means.

5,535,011
RECORDING AND/OR REPRODUCING APPARATUS

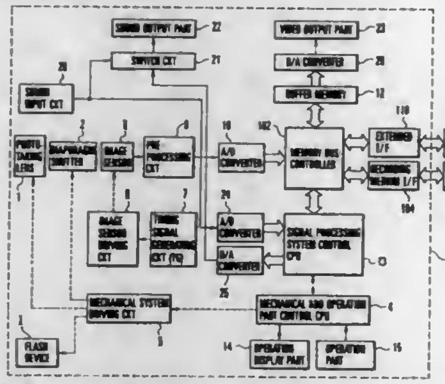
Taku Yamagami, Kanagawa-ken; Masao Suzuki, Tokyo, and Yuji Sakaegi, Kanagawa-ken, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,565

Claims priority, application Japan, Mar. 22, 1993, 5-085166

Int. Cl.⁶ H04N *5/77*

U.S. Cl. 358—335 **21 Claims**



1. A recording and/or reproducing apparatus comprising:

a) an optical system arranged to form an optical image;

b) photo-electric conversion means for converting the optical image formed by said optical system into an electrical signal;

c) A/D conversion means for converting the electrical signal into a digital signal;

d) recording and/or reproducing means arranged for mounting and demounting directly on or from said recording and/or reproducing apparatus through a signal interface and including a recording medium on which the digital signal obtained from said A/D conversion means is to be recorded and reproduced; and

e) signal processing means for processing and/or converting the digital signal, said signal processing means being arranged to be directly mountable and demountable on and from said recording and/or reproducing apparatus through a signal interface.

5,535,012
INFORMATION TRANSMIT/RECEIVE APPARATUS ONTO WHICH A SORTER CAN BE MOUNTED VIA AN ADAPTER

Hiroaki Matsumoto, Yokohama; Ikuo Sobue; Seishi Ejiri, both of Kawasaki; Masao Kiguchi; Yasuhiro Matsumoto, both of Yokohama, and Yoshiyuki Nakayama, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 280,705

Claims priority, application Japan, Jul. 31, 1993, 5-208745; Jul. 31, 1993, 5-208746; Jul. 31, 1993, 5-208748; Jul. 31, 1993, 5-298747

Int. Cl.⁶ G03G *21/00;* **H04N** *1/00;1/04;* **B65H** *43/00*

U.S. Cl. 358—400 **9 Claims**

1. An information transmit/receive apparatus comprising:

a printer having a sheet feed portion, a sheet discharge portion and a first sheet sensor disposed adjacent to the discharge portion;

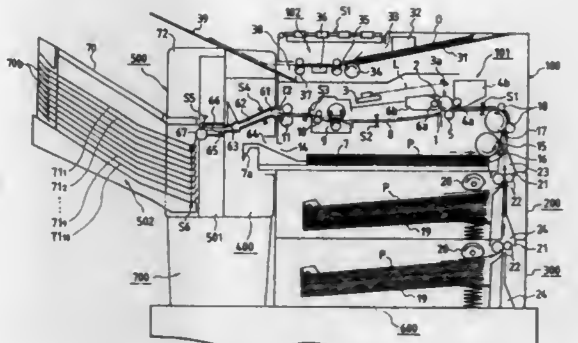
an original reader having a sheet feed portion and a sheet discharge portion;

a sorter having a sheet entrance port, second sheet sensor and a controller for controlling movement of the sorter, and connected to the sheet discharge portion of said printer via an adapter for coupling the sheet discharge portion and the sheet entrance port together;

said adapter having a path connecting the sheet discharge portion of said printer and the sheet entrance port of said sorter; and

control means for controlling said sorter and original reader to perform a receive operation and a transmit operation,

wherein said adapter includes a sheet passage detection sensor for informing said controller that the sheet is in the path of said adapter.



5,535,013
IMAGE DATA COMPRESSION AND EXPANSION APPARATUS, AND IMAGE AREA DISCRIMINATION PROCESSING APPARATUS THEREFOR

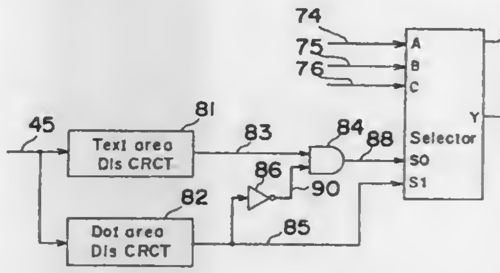
Kazuyuki Murata, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 870,458, Apr. 17, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 308,517

Claims priority, application Japan, Apr. 19, 1991, 3-088482

Int. Cl.⁶ H04N *1/40*

U.S. Cl. 358—432 **15 Claims**



7. An image area discrimination processing apparatus comprising:

a means for dividing image data into plural blocks;

an orthogonal transformation means for orthogonally transforming each block of divided image data and outputting a DC transformation coefficient and a plurality of AC transformation coefficients;

a summation means for calculating a sum of absolute values of AC transformation coefficients of low frequency components within a predetermined low frequency range, which are subset of the AC transformation coefficients;

a comparing means for comparing said sum with a predetermined threshold value; and

a text area discrimination means to identify a block type of each block as a text image block when the sum is greater than said predetermined threshold value.

removing a pixel and a scan line from the same scan line, at which a pixel and a scan line are inserted, at a predetermined interval when a reducing magnification of the original image is set corresponding to the function information.

5,535,008
METHOD FOR JUMP-REPRODUCING VIDEO DATA OF MOVING PICTURE CODED WITH HIGH EFFICIENCY

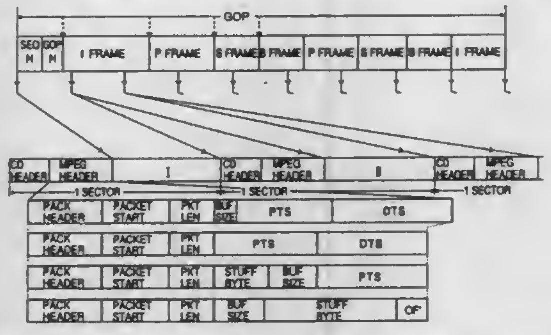
Toru Yamagishi; Ken Miyazaki, and Kentaro Yokouchi, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 16, 1994, Ser. No. 213,805

Claims priority, application Japan, Mar. 16, 1993, 5-081327; Mar. 17, 1993, 5-082782; Jan. 14, 1994, 6-016008

Int. Cl.^{6} H04N *5/781*

U.S. Cl. 358—342 **10 Claims**



1. A reproduction method for reproducing data from a plurality of data groups having at least a first data group and a second data group and having a plurality of compressed data arranged over a plurality of sectors of a disk, a leading sector out of said plurality of sectors including

a first data indicative of compression method and

a second data located directly after the first data and indicative of the presence of said data group,

wherein data compressed in the least amount is situated at the head of each data group, and said second data and said data group are arranged in said order, said method including the steps of:

detecting said first data in connection with the second data group in response to the reproduction of data compressed in the least amount within the first data group, and

reproducing said data compressed in the least amount within said second data group in response to the result of said detection.

5,535,009
COPIER/PRINTER OPERATING WITH INTERRUPTS

David R. Hansen, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1993, Ser. No. 174,106

Int. Cl.^{6} H04N *1/21;1/23;* **G03G** *21/00*

U.S. Cl. 358—296 **16 Claims**

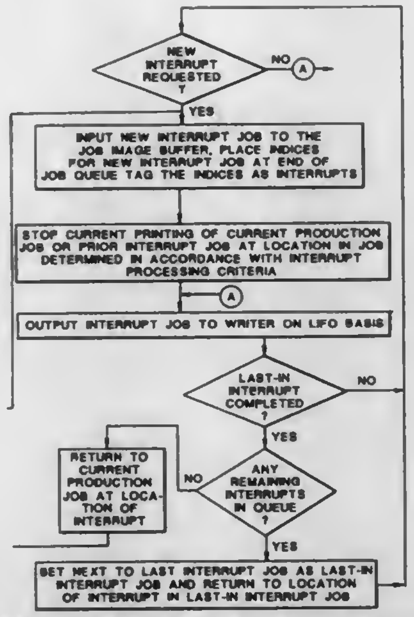
1. A reproduction apparatus, said apparatus comprising:

memory means for storing a plurality of production jobs for printing;

interrupt means for designating a plurality of production jobs to be stored in said memory means as interrupt jobs;

control means for controlling printing of normal production jobs in a first-in-first-out basis and for controlling printing of jobs designated as interrupt jobs so as to be printed on a last-in-first-out basis wherein a first interrupt job interrupts a current normal job and a second interrupt job interrupts the first interrupt job; and

printing means responsive to the control means for forming prints of the plurality of normal production jobs and the interrupt jobs whereby later in time interrupt jobs interrupt earlier in time interrupt jobs and a first later-in-time interrupt job interrupts an earlier-in-time "normal" production job.


NEW INTERRUPT REQUESTED ?
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OUTPUT INTERRUPT JOB TO WRITER ON LIFO BASIS
LAST-IN INTERRUPT COMPLETED ?
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RETURN TO CURRENT PRODUCTION JOB AT LOCATION OF INTERRUPT
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ANY REMAINING INTERRUPTS IN QUEUE ?
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SET NEXT TO LAST INTERRUPT JOB AS LAST-IN INTERRUPT JOB AND RETURN TO LOCATION OF INTERRUPT IN LAST-IN INTERRUPT JOB

5,535,010
PORTABLE IMAGE PROCESSING APPARATUS

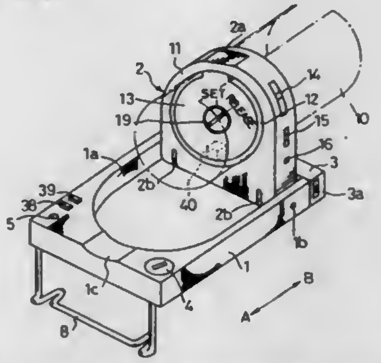
Hirokazu Izumi, Nara; Masanobu Deguchi, Kashiba; Koji Oku, Yamatokoriyama; Shuuhei Yamamoto, Yamatokoriyama, and Harumi Katayama, Yamatokoriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1995, Ser. No. 491,352

Claims priority, application Japan, Jul. 6, 1994, 6-154744

Int. Cl.^{6} B41J *13/00*

U.S. Cl. 358—296 **35 Claims**



1. A portable image processing apparatus comprising:

sheet holding means having a cylindrical section which is formed so as to have a substantially cylindrical shape, said sheet holding means holding a sheet along a side of the cylindrical section;

image processing means for carrying out an image process on the sheet held by said sheet holding means, said image processing means being fixed in an opposite position to the side of the cylindrical section of said sheet holding means;

rotating means for rotating said sheet holding means on an axis of the cylindrical section; and

sheet carrying means for carrying the sheet in a direction which is parallel to the axis of the cylindrical section of said sheet holding means.

5,535,011
RECORDING AND/OR REPRODUCING APPARATUS

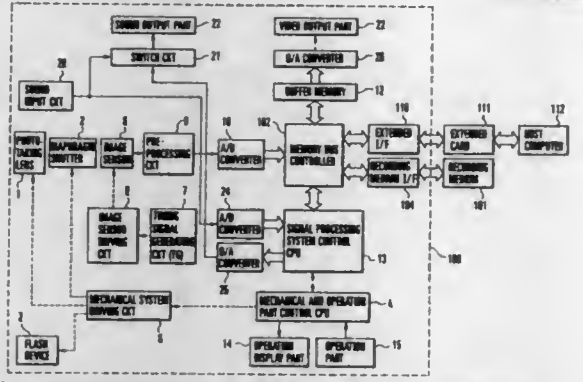
Taku Yamagami, Kanagawa-ken; Masao Suzuki, Tokyo, and Yuji Sakaegi, Kanagawa-ken, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,565

Claims priority, application Japan, Mar. 22, 1993, 5-085166

Int. Cl.^{6} H04N *5/77*

U.S. Cl. 358—335 **21 Claims**



1. A recording and/or reproducing apparatus comprising:

a) an optical system arranged to form an optical image;

b) photo-electric conversion means for converting the optical image formed by said optical system into an electrical signal;

c) A/D conversion means for converting the electrical signal into a digital signal;

d) recording and/or reproducing means arranged for mounting and demounting directly on or from said recording and/or reproducing apparatus through a signal interface and including a recording medium on which the digital signal obtained from said A/D conversion means is to be recorded and reproduced; and

e) signal processing means for processing and/or converting the digital signal, said signal processing means being arranged to be directly mountable and demountable on and from said recording and/or reproducing apparatus through a signal interface.

5,535,012
INFORMATION TRANSMIT/RECEIVE APPARATUS ONTO WHICH A SORTER CAN BE MOUNTED VIA AN ADAPTER

Hiroaki Matsumoto, Yokohama; Ikuo Sobue; Seishi Ejiri, both of Kawasaki; Masao Kiguchi; Yasuhiro Matsumoto, both of Yokohama, and Yoshiyuki Nakayama, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 280,705

Claims priority, application Japan, Jul. 31, 1993, 5-208745; Jul. 31, 1993, 5-208746; Jul. 31, 1993, 5-208748; Jul. 31, 1993, 5-298747

Int. Cl.^{6} G03G *21/00;* **H04N** *1/00;1/04;* **B65H** *43/00*

U.S. Cl. 358—400 **9 Claims**

1. An information transmit/receive apparatus comprising:

a printer having a sheet feed portion, a sheet discharge portion and a first sheet sensor disposed adjacent to the discharge portion;

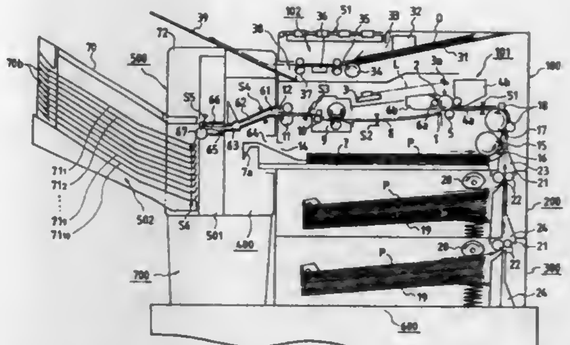
an original reader having a sheet feed portion and a sheet discharge portion;

a sorter having a sheet entrance port, second sheet sensor and a controller for controlling movement of the sorter, and connected to the sheet discharge portion of said printer via an adapter for coupling the sheet discharge portion and the sheet entrance port together;

said adapter having a path connecting the sheet discharge portion of said printer and the sheet entrance port of said sorter; and

control means for controlling said sorter and original reader to perform a receive operation and a transmit operation,

wherein said adapter includes a sheet passage detection sensor for informing said controller that the sheet is in the path of said adapter.



5,535,013
IMAGE DATA COMPRESSION AND EXPANSION APPARATUS, AND IMAGE AREA DISCRIMINATION PROCESSING APPARATUS THEREFOR

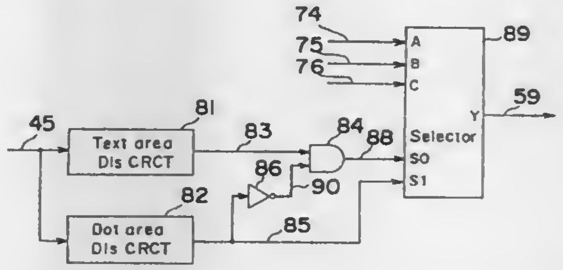
Kazuyuki Murata, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 870,458, Apr. 17, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 308,517

Claims priority, application Japan, Apr. 19, 1991, 3-088482

Int. Cl.^{6} H04N *1/40*

U.S. Cl. 358—432 **15 Claims**



7. An image area discrimination processing apparatus comprising:

a means for dividing image data into plural blocks;

an orthogonal transformation means for orthogonally transforming each block of divided image data and outputting a DC transformation coefficient and a plurality of AC transformation coefficients;

a summation means for calculating a sum of absolute values of AC transformation coefficients of low frequency components within a predetermined low frequency range, which are subset of the AC transformation coefficients;

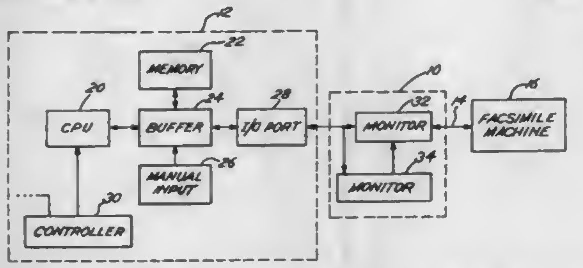
a comparing means for comparing said sum with a predetermined threshold value; and

a text area discrimination means to identify a block type of each block as a text image block when the sum is greater than said predetermined threshold value.

5,535,014
METHOD FOR MAINTAINING A COMMUNICATION LINK WITH A FACSIMILE MODEM

Gary W. Sommer, Skokie, Ill., assignor to U.S. Robotics, Inc., Skokie, Ill.

Filed Oct. 1, 1993, Ser. No. 130,361
Int. Cl.^{6} H04N *1/32;1/327*
U.S. Cl. 358—434 **4 Claims**



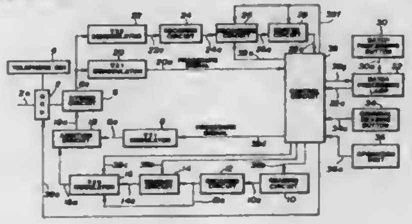
1. A method for data communication equipment to transmit message data from data terminal equipment to facsimile equipment, said message data including an end of line sequence and a return to control pattern to mark and end page segment and said data terminal equipment serially providing said message data to said data communication equipment said method comprises the steps of:
   establishing a communication link between said data communication equipment and facsimile equipment;
   monitoring said message data from said data terminal equipment for said end of line sequence and responsibly transmitting said message data upon detecting said end of line sequence;
   transmitting a buffer code to said facsimile machine before completely transmitting said end of sequence line;
   monitoring a second line segment of said message data from said data terminal equipment for a second end of line sequence;
   continuing to transmit said buffer code until such second end of line sequence is detected and responsively transmitting said second line segment of said message data upon detecting said second end of sequence;
   analyzing said message data adjacent to each said end of line sequence to determine whether said end of line sequence is included in said return to control pattern, and responsively transmitting said page segment of said message data upon determining that said end of line sequence is included in said return to control pattern.

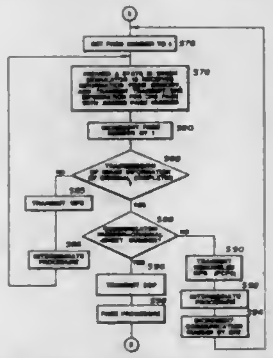
2. A method for data communication equipment to transmit message data from data terminal equipment to facsimile equipment, said message data including an end of line sequence and a return to control pattern to mark an end of a page segment and said data terminal equipment serially providing said message data to said data communication equipment, comprising, for each page segment of said message data, the steps of:
   establishing a communication link between said data communication equipment and facsimile equipment;
   detecting a first end of line sequence in said message data;
   transmitting a string of binary zeros to said facsimile equipment before completely transmitting said first end of line sequence to said facsimile equipment;
   monitoring a second line segment of said message data from said data terminal equipment for a second end of line sequence and continuing transmitting said string of binary zeros to said facsimile equipment until said second end of line sequence is detected;
   transmitting said second line segment of message data upon detecting said second end of line sequence; and
   analyzing said message data adjacent each said end of line sequence to determine whether said end of line sequence is included in said return to control pattern and responsively transmitting said page segment of said message data upon determining said end of line sequence is included in said return to control pattern.

5,535,015
FACSIMILE APPARATUS FOR TRANSMITTING A PLURALITY OF ORIGINALS IN A SINGLE COMMUNICATION

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1993, Ser. No. 32,329
Claims priority, application Japan, Mar. 19, 1992, 4-093702
Int. Cl.^{6} H04N *1/00*
U.S. Cl. 358—438 **18 Claims**





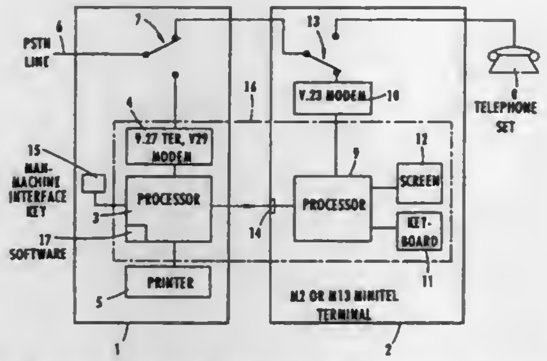
1. A facsimile apparatus for transmitting a plurality of groups of originals, each group comprising a plurality of originals, in a single communication operation, said apparatus comprising:
   reading means for reading images of originals;
   recognition means for recognizing a border between groups of originals read by said reading means; and
   transmission means for sequentially transmitting the images of the plurality of originals read by said reading means to a destination having a sorting function, and for transmitting a signal representing an instruction which activates the sorting function of the destination when a border between transmitted images of sheets corresponds to the border between the groups recognized by said recognition means.

5,535,016
STATION COMBINING A MINITEL-TYPE VIDEOTEX TERMINAL WITH A FACSIMILE MACHINE

Philippe Charbonnier, Yvelines, France, assignor to Societe D'Applications Generales D'Electricite Et De Mecanique Sagem, Paris, France

Filed Jan. 7, 1993, Ser. No. 1,716
Claims priority, application France, Jan. 14, 1992, 92 00298
Int. Cl.^{6} H04N *1/32*
U.S. Cl. 358—442 **8 Claims**

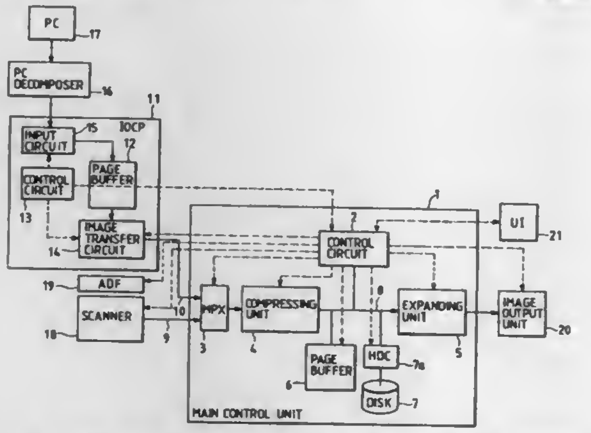
1. A station combining (a) a Minitel terminal comprising a processor, a V.23 modem, a keyboard, a screen, a port and a switch to link a public switching telephone network PSTN line either to a telephone set or to the V.23 modem, with (b) a PSTN facsimile machine comprising a processor, a V.27ter and V.29 modem, a printer, software implementing layers of a protocol and a switch to link the PSTN line either to the V.27ter and V.29 modem or to the telephone set, characterized in that (1) the processor of the Minitel terminal is linked to the modem of the facsimile machine by the processor of the facsimile machine and by the port of the Minitel terminal, (2) the software implementing the layers of the protocol of the facsimile machine comprises an X.32 layer and (3) the facsimile machine comprises means for switching from the modem of the Minitel terminal to the modem of the facsimile machine following link up of the PSTN line and the modem of the Minitel terminal.



5,535,017
PARALLEL IMAGE PROCESSING SYSTEM

Kashiwagi Hideaki, Kangagwa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 595,841, Oct. 10, 1990, abandoned. This application Jun. 19, 1992, Ser. No. 900,756
Int. Cl.^{6} H04N *1/40*
U.S. Cl. 358—444 **5 Claims**

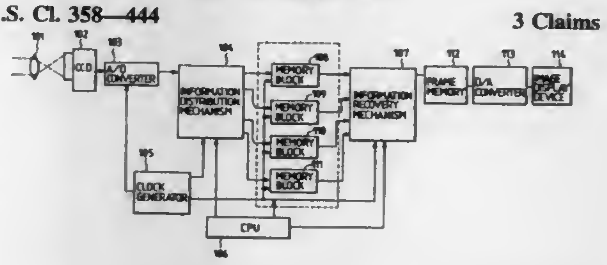


1. An image processing apparatus for processing in a parallel manner copy image data produced by an image reading unit and print image data produced by an external apparatus and providing the processed image data to an image output unit, said image processing apparatus comprising:
   transfer control means for controlling transfer of the print image data received from the external apparatus;
   means for switching image data between the copy image data from the image reading unit and the print image data from the transfer control means;
   means for compressing the image data provided from said switching means;
   means for storing the compressed image data from the compressing means;
   means for expanding the compressed image data and providing the expanded image data to the image output unit; and
   control means for controlling the switching means, compressing means storing means and expanding means;
   wherein the control means controls the switching means to allow the print image data to be input from the transfer control means during a scan return period of the image reading unit which is reading an original.

5,535,018
INFORMATION PROCESSING APPARATUS

Akihiko Yamano, Sagamihara; Katsunori Hatanaka, Yokohama; Kunihiro Sakai, Isehara; Takahiro Oguchi, Ebina, and Shunichi Shido, Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 961,385, Oct. 15, 1992, abandoned. This application Nov. 30, 1995, Ser. No. 565,013
Claims priority, application Japan, Oct. 15, 1991, 3-293906
Int. Cl.^{6} H04N *1/40*
U.S. Cl. 358—444 **3 Claims**



1. An information processing apparatus for storing and outputting a plurality of image information each consisting of $n_1 \times n_2$ pixels, comprising:
   a plurality of memory means each of which is adapted to independently store the information and output the stored information, each of the plurality of memory means including a probe and a recording medium arranged to face said probe;
   distributing means for dividing each image information consisting of the $n_1 \times n_2$ pixels into a plurality of image information each consisting of an $m_1 \times m_2$ $(n_1 \times n_2 > m_1 \times m_2,\ m_1 \geqq 2,\ m_2 \geqq 2)$ pixels unit, for further dividing each image information consisting of the $m_1 \times m_2$ pixels into a p $(m_1 \times m_2 > p)$ pixel unit, and for distributing the plurality of divided information each consisting of the p pixels to said plurality of memory means which are respectively assigned beforehand, wherein each of said plurality of memory means stores a plurality of image information each of which consists of the distributed p pixels and the resolution of which is lower than that of the image information consisting of the $n_1 \times n_2$ pixels; and
   collecting means for selectively collecting the information stored in said plurality of memory means in accordance with a required resolution upon output of the image information and for outputting the collected information.

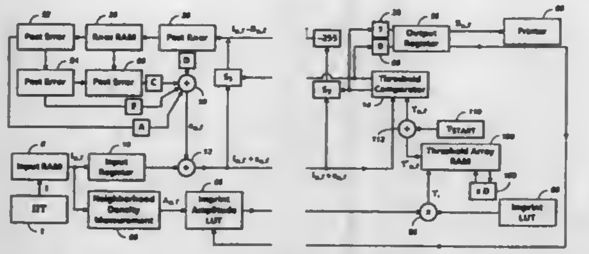
3. An information processing apparatus for storing and outputting a plurality of image information each consisting of $n_1 \times n_2$ pixels, comprising:
   a plurality of memory means each of which is adapted to independently store the information and output the stored information;
   distributing means for dividing each image information consisting of the $n_1 \times n_2$ pixels into a plurality of image information each consisting of an $m_1 \times m_2$ $(n_1 \times n_2 > m_1 \times m_2,\ m_1 \geqq 2,\ m_2 \geqq 2)$ pixel unit, for further dividing each image information consisting of the $m_1 \times m_2$ pixels into a p $(m_1 \times m_2 > p)$ pixel unit, and for distributing the plurality of divided information each consisting of the p pixels to said plurality of memory means which are respectively assigned beforehand, wherein each of said plurality of memory means stores a plurality of image information each of which consists of the distributed p pixels and the resolution of which is lower than that of the image information consisting of the $n_1 \times n_2$ pixels; and
   collecting means for selectively collecting the information stored in said plurality of memory means in accordance with a required resolution upon output of the image information and for outputting the collected information.

5,535,019
ERROR DIFFUSION HALFTONING WITH HOMOGENEOUS RESPONSE IN HIGH/LOW INTENSITY IMAGE REGIONS

Reiner Eschbach, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 15, 1994, Ser. No. 306,299
Int. Cl.^{6} H04N *1/40*

U.S. Cl. 358—456 **23 Claims**



1. A processing system for preparing an image derived originally with a device describing each image signal in terms of c levels, for output to an output device responding to output signals having d levels, where c>d>1 comprising:

an image generator, producing an input set of image signals representing optical density at discrete points therein, said input signals having magnitudes varying over c levels;

a signal adder having as inputs an image signal from the input set, and modifying the image signals with a previously determined error signal derived by processing previous input signals, if any;

a threshold comparator comparing each modified input signal with at least one reference signal to determine which of 'd' possible output signals best represents the modified input signal;

an output device, responsive to said output signals to reproduce the image in accordance therewith;

a difference circuit determining the difference between the determined output signal and the modified input signal, and generating at least one error signal responsive indicative thereof; and

a reference signal generator producing reference signals for each input signal, including

a) an intensity measurement circuit measuring intensity in an area including the input signal, and producing an intensity measurement signal indicative of measured intensity;

b) a memory, storing threshold imprint values, and outputting said values responsive to said intensity measurement signal and at least one previous output signal, if any;

c) a reference memory array, storing a set of reference signals for a previous scan line, updated by combining a stored reference signal and imprint signal to generate a reference signal for the image signal, and directing said reference signals to the threshold comparator;

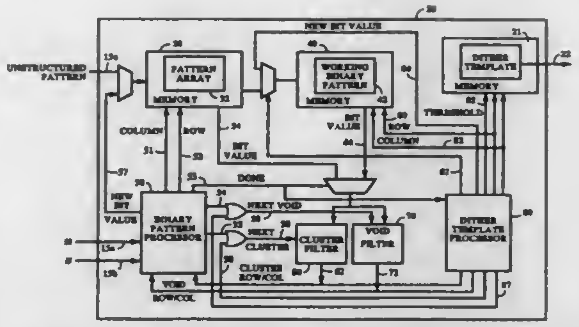
d) a threshold decay signal processor reducing the value of the reference signal stored in the threshold memory array after it is used at the threshold comparator.

5,535,020
VOID AND CLUSTER APPARATUS AND METHOD FOR GENERATING DITHER TEMPLATES

Robert A. Ulichney, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 15, 1992, Ser. No. 961,244
Int. Cl.^{6} G06K *9/36;* **G06F** *15/70*

U.S. Cl. 358—457 **49 Claims**



1. An apparatus comprising:

a memory device having locations corresponding to M rows and N columns of elements, said elements forming a binary bit pattern comprising majority type elements and minority type elements;

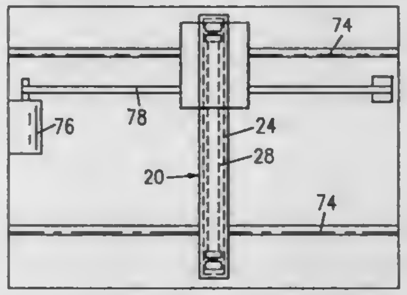
means for iteratively selecting and moving said minority type elements and said majority type elements between element locations within said pattern memory device, said minority type elements selected in relation to neighboring minority type elements according to a first spatial characteristic, and said majority type elements selected in relation to neighboring minority type elements according to a second, different spatial characteristic, until said minority type elements and said majority type elements have been uniformly distributed to locations within said pattern memory device to provide a modified pattern of first and second type bit elements having homogeneous attributes.

5,535,021
SCANNER LIGHT DIFFUSER

Don-Kai Chiang, and Roger F. Huang, both of Hsinchu, Taiwan, assignors to Microtek International, Inc., Hsinchu, Taiwan

Filed Jun. 6, 1994, Ser. No. 254,236
Int. Cl.^{6} H04N *1/04*

U.S. Cl. 358—474 **16 Claims**



1. An adjustable light-diffusing device adapted for use in a scanner having a scanner body and a light receiving device for generating electrical signals representative of an object to be mounted in said scanner body, said light diffusing device comprising:

a light diffusing seat movably connected to said scanner body proximate to said object;

a light source adapted for use emitting therefrom a light having a predetermined light intensity capable of being projected to intercept said object and to then intercept said light receiving device conveying the illuminance of said object; and

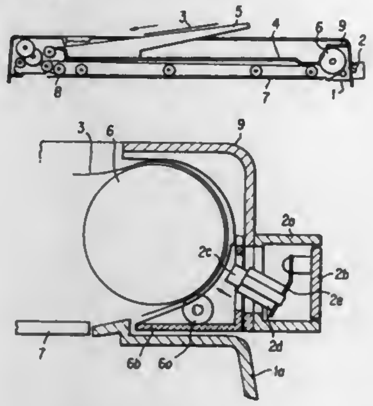
an adjustable light diffusing member connected to said light diffusing seat and adapted to transmit light between said light source and said object such that said light to said object is diffused thereby adjusting the illuminance of said object received by said light receiving device.

5,535,022
DOCUMENT FEEDER WITH STAMP IN DOCUMENT SCANNING APPARATUS

Minoru Itoigawa, Nakatugawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 12, 1994, Ser. No. 289,491
Claims priority, application Japan, Sep. 16, 1993, 5-230090
Int. Cl.^{6} H04N *1/00;1/04*

U.S. Cl. 358—496 **18 Claims**



1. An automatic document feeder in a document scanning apparatus, comprising:

an automatic document feeder cover enclosing means for feeding documents for the document scanning apparatus;

a stamp holder mounted outside of said automatic document feeder cover; and

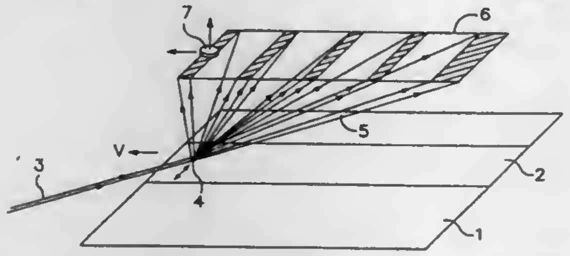
a stamp including a stamping face for marking on documents fed by the automatic document feeder and a stamping solenoid for moving said stamping face from a retracted position to a stamping position to mark documents, said stamp being mounted on said stamp holder.

5,535,023
METHOD OF READING HOLOGRAM INFORMATION

Satoshi Yamazaki, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 992,704, Dec. 18, 1992, abandoned. This application Mar. 25, 1994, Ser. No. 217,938
Claims priority, application Japan, Dec. 20, 1991, 3-338783
Int. Cl.^{6} G03H *1/00*

U.S. Cl. 359—2 **6 Claims**



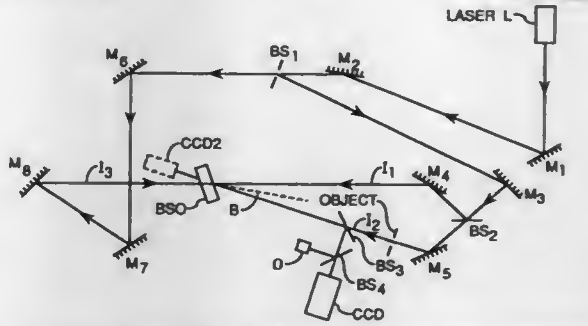
1. A method of photoelectrically reading recorded information in the form of a pattern comprising a plurality of parallel bars, recorded in a Fresnel hologram, said method comprising illuminating the hologram surface by scanning it with a beam of light having a cross-section smaller than a hologram recording region, wherein the same recorded information is reconstructed and read separately from different hologram regions and said light beam is moved to scan the hologram in a direction parallel to each bar as reconstructed, and moving said hologram relative to said light beam in a direction intersecting said scanning direction.

5,535,024
PHOTOREFRACTIVE HOLOGRAPHIC INTERFERENCE NOVELTY FILTER

Jihad Khoury, Somerville, and Charles L. Woods, Stow, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 6, 1992, Ser. No. 879,658
Int. Cl.^{6} G03H *1/02*

U.S. Cl. 359—7 **8 Claims**



1. Method of employing four wave mixing to display a changing image in a field of view comprising the steps of:

(a) providing a photorefractive crystal;

(b) writing a first phase conjugate grating within said photorefractive crystal by directing a first pump beam and a mutually coherent probe beam modulated by said image at said photorefractive crystal;

(c) writing a second phase conjugate grating within said photorefractive crystal by directing said mutually coherent probe beam at said photorefractive crystal and directing a second pump beam, coherent with, and counterpropogating with respect to said first pump beam at said photorefractive crystal;

(d) reading out the resulting interference pattern between the first and second phase conjugate gratings within said photorefractive crystal to produce an output beam;

(e) orienting said photorefractive crystal to bring the contributions to the output beam from the first and second phase conjugate gratings into destructive interference in the absence of motion of said image;

(f) and wherein said photorefractive crystal has a C axis, and including the step of producing positive and negative coupling coefficients of the gratings by choosing the projections of the C axis on the wave vectors of the first and second gratings to be of opposite sign.

5,535,025
HELMET MOUNTED OFF AXIS LIQUID CRYSTAL DISPLAY WITH A FIBER OPTIC WEDGE AND A CURVED REFLECTOR

Ronald G. Hegg, Vista, Calif., assignor to Hughes Training, Inc., Los Angeles, Calif.

Filed Feb. 1, 1994, Ser. No. 192,472

U.S. Cl. 359—40 **9 Claims**

1. An optical arrangement comprising:

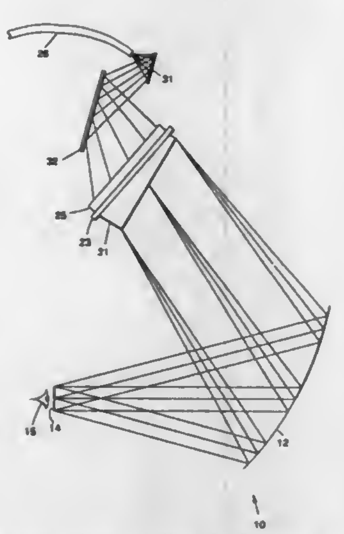
an input light source;

a liquid crystal display that is illuminated with collimated light from the input light source;

a fiber optic faceplate wedge optically coupled to the matrix liquid crystal display;

a curved reflector optically coupled to the faceplate wedge for producing an output image;

and wherein the fiber optic wedge corrects for anamorphic distortion exhibited in the reflector and directs light energy



into an off-axis entrance pupil to maintain high uniformity over the exit pupil without sacrificing brightness.

5,535,026
LIQUID CRYSTAL DISPLAY DEVICE WITH A POLYMER BETWEEN LIQUID CRYSTAL REGIONS MADE BY A HEATING AND COOLING PROCESS

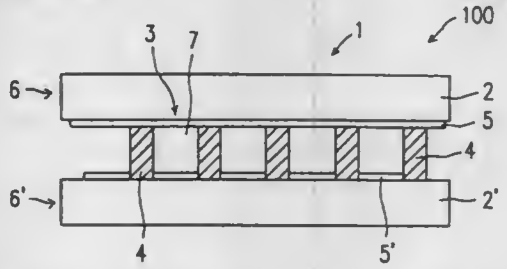
Koichi Fujimori, Nabari; Shinji Yamagishi, Osaka, and Tokihiko Shinomiya, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1995, Ser. No. 504,131

Claims priority, application Japan, Jul. 20, 1994, 6-168417

Int. Cl.^{6} G02F *1/13;1/1333*

U.S. Cl. 359—51 **10 Claims**



1. A liquid crystal display device including a pair of substrates provided with electrodes, at least one of the substrates being transparent, a liquid crystal region, and a polymeric wall surrounding the liquid crystal region, the liquid crystal region and the polymeric wall being interposed between the pair of substrates, the liquid crystal display device being produced by a process comprising the steps of:

heating a liquid crystal cell including a mixture containing a liquid crystal material and a photocurable resin interposed between the pair of substrates to a temperature higher than a transition temperature of the liquid crystal material in order to control a mobility of the liquid crystal material and the photocurable resin, the step of heating being performed at least once; and

cooling the heated liquid crystal cell to a temperature lower than the transition temperature in order to cause phase separation of the liquid crystal material from the photocurable resin and to form a liquid crystal region and a polymeric wall at desired locations, the step of cooling being performed at least once.

4. A method for producing a liquid crystal display device including a pair of substrates provided with electrodes, at least one of the substrates being transparent, a liquid crystal region, and a polymeric wall surrounding the liquid crystal region, the liquid crystal region and the polymeric wall being interposed between the pair of substrates, the method comprising the steps of:

heating a liquid crystal cell including a mixture containing a liquid crystal material and a photocurable resin interposed between the pair of substrates to a temperature higher than a transition temperature of the liquid crystal material in order to control a mobility of the liquid crystal material and the photocurable resin, the step of heating being performed at least once; and

cooling the heated liquid crystal cell to a temperature lower than the transition temperature in order to cause phase separation of the liquid crystal material from the photocurable resin and to form a liquid crystal region and a polymeric wall at desired locations, the step of cooling being performed at least once.

5,535,027
LIQUID CRYSTAL DISPLAY DEVICE WITH A PHOTOCONDUCTOR AT EACH INTERSECTION OF A LINEAR LUMINOUS SOURCE AND A LINEAR ELECTRODE

Naofumi Kimura; Yutaka Ishii, both of Nara; Masaru Yoshida, Ikoma; Masataka Matsuura, Tenri; Akitsugu Hatano, Nara; Yozo Narutaki, Nara; Sayuri Fujiwara, Nara; Yoshihiro Izumi, Kashihara, and Yoshitaka Yamamoto, Yamato-Koriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

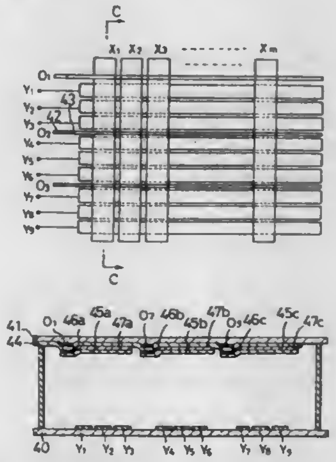
Continuation of Ser. No. 789,171, Nov. 6, 1991, abandoned.

This application Jun. 28, 1994, Ser. No. 267,556

Claims priority, application Japan, Nov. 9, 1990, 2-304891; Mar. 20, 1991, 3-57175; Oct. 4, 1991, 3-258110; Oct. 11, 1991, 3-263947

Int. Cl.^{6} G02F *1/135;1/136*

U.S. Cl. 359—58 **10 Claims**


C
X1 X2 X3 Xm
O1
Y1
43
Y2
42
Y3
O2
C
41
44
O1 46a 45a 47a O2 46b 45b 47b O3 46c 45c 47c
40
Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8 Y9

1. A display apparatus comprising:

a first substrate having transparent electrodes formed thereon;

a second substrate having

a plurality of linear luminous sources arranged in parallel with each other laminated thereon, each of said plurality of linear luminous sources being capable of emitting light,

a plurality of linear electrodes arranged in parallel with each other, being crossed with said plurality of linear luminous sources, structured and arranged so that a signal can be applied to a selected one of said plurality of linear electrodes, and

a plurality of photoconductive layers provided at crossed positions of said plurality of linear luminous sources and said plurality of linear electrodes, each photoconductive layer serving to perform an electrical switching operation in response to light applied from one of said plurality of linear luminous sources,

at least two members of a set including each of said plurality of linear electrodes,

each of said transparent electrodes, and each of said plurality of photoconductors defining respective planar structures; and

a liquid crystal layer arranged between said first substrate and said second substrate, said liquid crystal layer having pixels each to be driven by said signal applied through one of said photoconductive layers located at a crossed position of one of said plurality of linear electrodes to which said signal is applied and one of said plurality of linear luminous sources which emits the light,

wherein each of said linear luminous sources has a cut-away formed by etching treatment for increasing quantity of light emitted outside of said linear luminous source.

5,535,028
LIQUID CRYSTAL DISPLAY PANEL HAVING NONRECTILINEAR DATA LINES

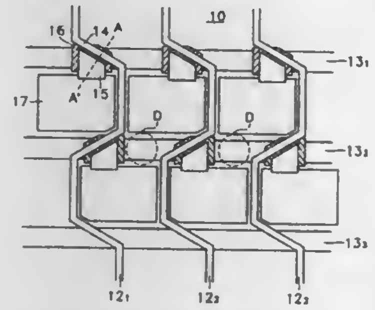
Byungseong Bae, Suwon; Kyungseop Kim, Seoul; Wonbong Yoon, Suwon, and Seogyul Lee, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 4, 1994, Ser. No. 221,962

Claims priority, application Rep. of Korea, Apr. 3, 1993, 93-5645

Int. Cl.^{6} G02F *1/1343*

U.S. Cl. 359—61 **14 Claims**



1. A liquid crystal display panel comprising:

a glass substrate;

a plurality of gate lines formed on said glass substrate;

an insulating layer formed over each of said plurality of gate lines;

a plurality of data lines each having slanted portions intersecting each of said plurality of gate lines at an oblique angle, each point of intersection between each of said plurality of data lines and each of said plurality of gate lines corresponding to a respective liquid crystal display cell which includes a respective thin film transistor, each of said respective thin film transistors comprising:

a gate formed from a portion of said corresponding intersecting one of said plurality of gate lines,

a source electrode formed from said slanted portion of said corresponding intersecting one of said plurality of data lines,

a channel region defined in a semiconductor pattern formed on said insulating layer at said intersection between said corresponding one of said plurality of gate lines and said corresponding one of said plurality of data lines, and

a drain electrode formed on said semiconductor pattern, said drain electrode having a first side parallel to and spaced apart from said source electrode; and

a plurality of pixel electrodes, each of said plurality of pixel electrodes being connected electrically to a corresponding drain electrode.

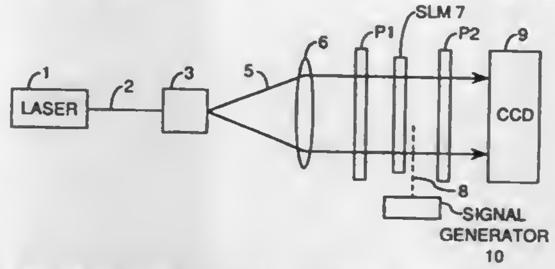
5,535,029
SPATIAL LIGHT MODULATOR HAVING AMPLITUDE COUPLED WITH BINARY PHASE MODE

Natalie Clark, Albuquerque, N.M., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 12, 1995, Ser. No. 371,898

Int. Cl.^{6} G02F *1/1335;1/135*

U.S. Cl. 359—63 **20 Claims**



1. An optical signal processor comprising:

(a) a polarization-modulating spatial light modulator (SLM) having an array of electrode means for controlling the degree of rotation of linearly polarized light passing through said SLM;

(b) an electrical signal generator for applying variable amplitude electrical signals to said electrode means for varying the degree of rotation of polarized light passing through said SLM;

(c) a first light input polarizer for directing linearly polarized light into said SLM;

(d) a second light output polarizer non-orthogonally oriented with respect to said first polarizer for enabling operation of said SLM in an amplitude coupled with binary phase mode.

5,535,030
LCD HAVING AN OVERCOAT FILM ONLY OVER A DISPLAY PORTION AND EITHER AN ELECTRODE TERMINAL OR A SEAL PORTION

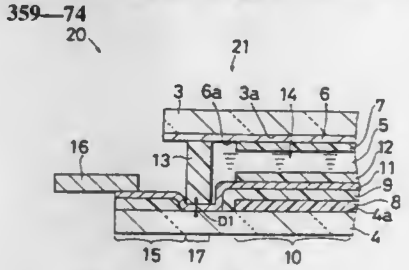
Masami Ogura, Kashihara, Japan, and Hiroshi Takanaski, Kyoto, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

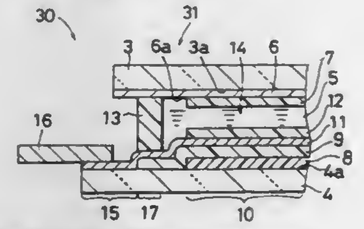
Filed Oct. 13, 1993, Ser. No. 134,885

Claims priority, application Japan, Nov. 30, 1992, 4-320473

Int. Cl.^{6} G02F *1/1333*

U.S. Cl. 359—74 **2 Claims**





1. A color liquid crystal display comprising:

an upper light permeable substrate having a first transparent electrode and a first orientation film formed on a surface thereof;

a lower light permeable substrate consisting at least of a display portion, a seal portion provided at a periphery of said display portion, and an electrode terminal portion extending further outward of said seal portion;

a seal member disposed between said upper light permeable substrate and said seal portion of said lower light permeable substrate;
a color filter formed on a surface of said display portion;
a single layer overcoat film formed over said color filter;
a second transparent electrode formed over said overcoat film and over said display portion, seal portion, and said electrode terminal portion of said lower light permeable substrate; wherein
said single layer overcoat film being formed only over said display portion and said electrode terminal portion.

2. A color liquid crystal display comprising:
an upper light permeable substrate having a first transparent electrode and a first orientation film formed on a surface thereof;
a lower light permeable substrate consisting at least of a display portion, a seal portion provided at a periphery of said display portion, and an electrode terminal portion extending further outward of said seal portion;
a seal member disposed between said upper light permeable substrate and said seal portion of said lower light permeable substrate;
a color filter formed on a surface of said display portion;
a single layer overcoat film formed over said color filter;
a second transparent electrode formed over said overcoat film and over said display portion, seal portion, and said electrode terminal portion of said lower light permeable substrate; and wherein
said single layer overcoat film being formed only over said display portion and said seal portion.

5,535,031
FIBER OPTIC INTERFACE AND SYSTEM

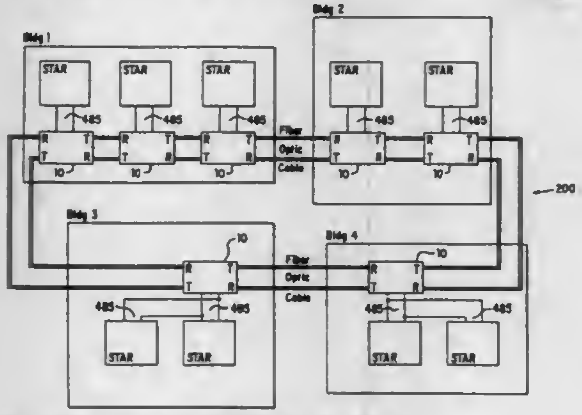
Warren Cecchini, Penn Hills, Pa., assignor to American Auto-Matrix, Inc., Export, Pa.

Continuation of Ser. No. 535,389, Jun. 8, 1990, Pat. No. 5,150,244. This application Jan. 7, 1992, Ser. No. 817,730

The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.

Int. Cl.^{6} H04B *10/24*

U.S. Cl. 359—113 **13 Claims**



7. A telecommunication system comprising:
a general communication network;
M half duplex communication networks, where M≧2 and is an integer, each of which have J devices, where J≧0 and is an integer, that are in connection with the respective half duplex network and which communicate with each other through the respective half-duplex communication network; and
M couplers, each of which is connected to a respective half-duplex communication network and connected to the general communication network such that the half-duplex communication networks can communicate with each other over the general communication network irrespective of protocol of the J devices of a given half duplex communication network.

5,535,032
OPTICAL PARALLEL-SERIAL CONVERTER AND OPTICAL SERIAL-PARALLEL CONVERTER

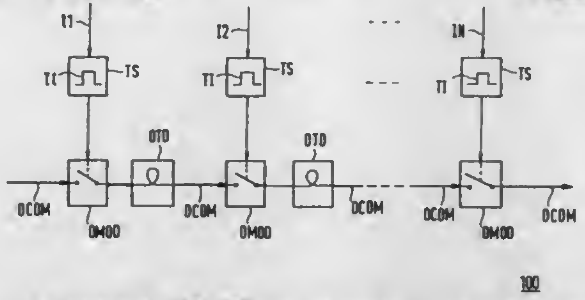
Dietrich Böttle, Salach, Germany, assignor to Alcatel N.V., Netherlands

Continuation of Ser. No. 46,773, Apr. 13, 1993. This application Aug. 23, 1995, Ser. No. 538,178

Claims priority, application Germany, Apr. 15, 1992, 42 12 603.7

Int. Cl.^{6} H04J *14/08*

U.S. Cl. 359—140 **4 Claims**



1. An apparatus (**100**, **100'**) for converting N synchronous data streams (I1, I2, . . . , IN) having a constant data pulse width (PW) from parallel to serial form for injection into an optical communication link (OCOM) by means of the following functionally cooperating elements:
(1) N optical modulators (OMOD) contained in the optical communication link (OCOM);
(2) each of the N optical modulators (OMOD) being controlled by one of the N synchronous data streams (I1, I2, . . . , IN) via a respective switching element (TS);
(3) each of the respective switching element (TS) being clocked by a synchronous timing signal having a timing pulse with a timing interval (TI) for reducing the constant data pulse width (PW) to the time interval (TI) which is not greater than the Nth fraction of the constant data pulse width;
(4) so that the N synchronous data streams are, according to (2) and (3), converted into a serial data sequence (Dn) of short optical pulses (D1, D2, . . . , D4) for injection into the optical communication link (OCOM), and
(5) each of the N optical modulators (OMOD) is followed by one of at least N−1 optical delay elements (OTD; OTD1, OTD2, . . .) which ensure nonoverlapping serial injection of the short optical pulses (D1, D2, . . . , D4) into the optical communication link (OCOM).

5,535,033
CONTACTLESS DATA TRANSMISSION DEVICE

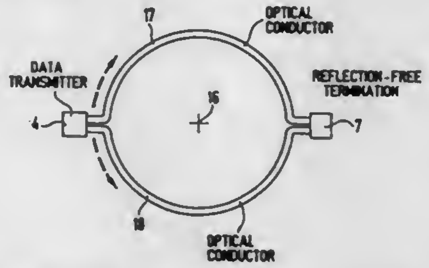
Reinhold Guempelein, Leutershausen, and Gerhard Roehrlein, Hoechstadt, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 12, 1994, Ser. No. 353,690

Claims priority, application Germany, Dec. 15, 1993, 43 42 778.2

Int. Cl.^{6} H04B *10/12*

U.S. Cl. 359—144 **5 Claims**



1. A contactless data transmission system comprising:
first and second system parts which are relatively movable with respect to each other;
an optical conductor and an electro-optical data transmitter coupled at one end of said optical conductor, disposed on one of said parts, said optical conductor being formed by a bundle of optical fibers and having a transparent cladding for laterally emitting an optical signal;
said optical conductor comprising a first semicircular optical conductor and second semicircular optical conductor, said first and second semicircular optical conductors being oriented to form a circle, and each semicircular optical conductor having a first end connected to a common data transmitter, and an opposite end connected to a common, reflection-free termination; and
an opto-electrical detector disposed at the other of said relatively movable parts for receiving the laterally emitted signals from said optical conductor.

5,535,034
OPTICAL TRANSCEIVER UNIT

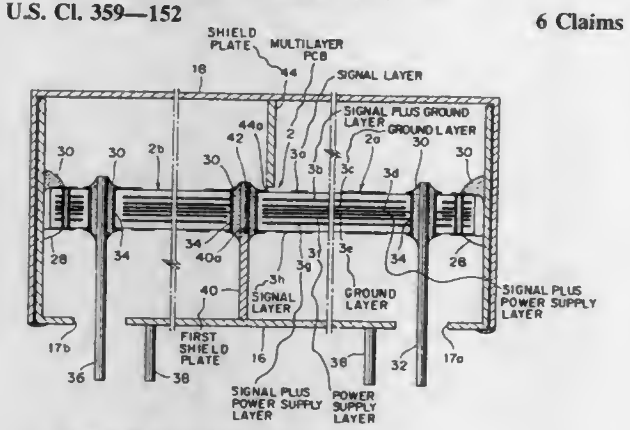
Shoji Taniguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1994, Ser. No. 273,805

Claims priority, application Japan, Dec. 8, 1993, 5-306934

Int. Cl.^{6} H04B *10/00;10/24*

U.S. Cl. 359—152 **6 Claims**



1. An optical transceiver unit comprising:
a multilayer printed circuit board having signal layers, power supply layers and ground layers, wherein a plurality of signal leads, power supply leads and ground leads are soldered in such a manner as to project downward, said multilayer printed circuit board having a first region and a second region;
a lower case for housing said multilayer printed circuit board therein;
an upper case so disposed as to cover said lower case to enclose said multilayer printed circuit board in an assembly of said two cases;
a light emitting element module attached to one side wall of said lower case and connected electrically to said multilayer printed circuit board so as to convert an electric signal into an optical signal;
a light receiving element module attached to the one side wall of said lower case substantially in parallel with said light emitting element module an connected electrically to said multilayer printed circuit board;
a transmitting circuit formed on both upper and lower surfaces in said first region of said multilayer printed circuit board so as to supply the modulated electric signal to said light emitting element module;
a receiving circuit formed on both upper and lower surfaces in said second region of said multilayer printed circuit board so as amplify the electric signal obtained through opto-electric conversion by said light receiving element module;
a first shield plate fixed to said lower case in a manner that its upper end is kept in contact with the lower surface of said multilayer printed circuit board so as to isolate said receiving circuit electromagnetically from said transmitting circuit; and
a second shield plate fixed to said upper case substantially in parallel with said first shield plate in a manner that its lower end is held in the proximity of the upper surface of said multilayer printed circuit board so as to isolate said receiving circuit electromagnetically from said transmitting circuit;
wherein said signal layer, said power supply layer and said ground layer of said transmitting circuit are completely isolated from those of said receiving circuit in said multilayer printed circuit board; and
wherein said first shield plate has a plurality of projections at its upper end, said projections being inserted into and soldered to plated through holes in said multilayer printed circuit board.

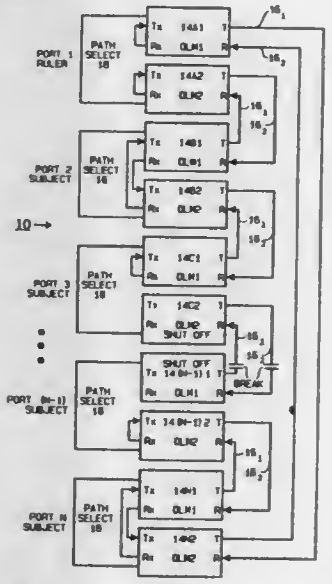
5,535,035
OPTICAL FIBER RING COMMUNICATING SYSTEM AND COMMUNICATIONS METHOD

Steven M. DeFoster, Rochester; Horst L. Truestedt, Pine Island, and Raymond J. Thatcher, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1994, Ser. No. 306,560

Int. Cl.^{6} H04B *10/08;10/12;10/20*

U.S. Cl. 359—161 **10 Claims**



1. An optical fiber ring communications system including multiple ports comprising:
first and second optical link modules (OLMs) coupled to each of said multiple ports;
first and second optical fibers extending between adjacent ports in the ring communications system and coupled at each end to one of said first and second OLMs;
said first and second optical fibers separately defining dual fiber channel arbitrated loops; and
wherein said optical fiber ring communications system includes a ruler port and multiple subject ports and wherein the each said OLM further includes means for detecting an open optical fiber and each port includes means responsive to a detected open optical fiber for sending a predetermined message to configure said system as a different pair of separate smaller fiber channel arbitrated loops, each of said pair of separate smaller fiber channel arbitrated loops including said ruler port.

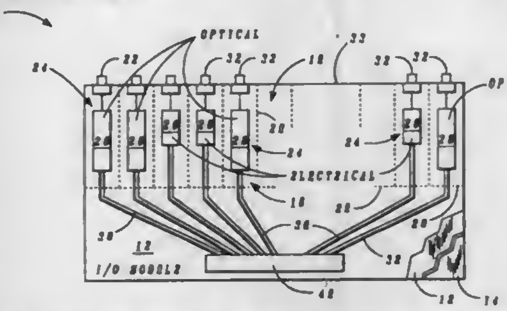
5,535,036
INPUT/OUTPUT MODULE PROVIDING MIXED OPTICAL AND ELECTRICAL SIGNAL CONNECTIVITY IN DATA COMMUNICATIONS EQUIPMENT

Robert E. Grant, Grass Valley, Calif., assignor to Lighthouse Digital Systems, Inc., Grass Valley, Calif.

Filed Jan. 18, 1995, Ser. No. 374,946

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—163 **8 Claims**



1. An optical and electrical communications system, comprising:

a mixed optical and electrical input/output communications device, comprising:

a circuit board;

a plurality of first circuits, each first circuit mounted to the circuit board and including means for interfacing the communications device to receive or transmit electrical signals;

a plurality of first connectors mounted to the circuit board, each first connector associated with one of the first circuits for providing a mechanical connection that electrically connects that first circuit to an electrical communications cable carrying the electrical signals;

a plurality of second circuits, each second circuit mounted to the circuit board and including means for interfacing the communications device to receive or transmit optical signals;

a plurality of second connectors mounted to the circuit board, each second connector associated with one of the second circuits for providing a mechanical connection that optically connects that second circuit to an optical communications cable carrying the optical signals;

a third connector mounted to the circuit board; and

electrical signaling links between the plurality of first and second circuits and the third connector; and

a switching circuit connected to the plurality of first and second circuits of the input/output communications device through the third connector for switching signals among and between the first and second circuits for transmission over the electrical and optical communications cables.

5,535,037
OPTICAL REPEATER

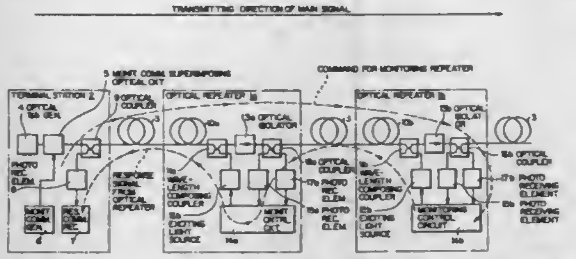
Kenichi Yoneyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,054

Claims priority, application Japan, Dec. 1, 1993, 5-329692

Int. Cl.^{6} H04B *10/02;10/16*

U.S. Cl. 359—177 **6 Claims**



1. An optical repeater for amplifying and repeating an optical signal transmitted from an optical signal source via an optical fiber, said optical signal being superimposed with monitoring information including repeater identification data, said repeater comprising:

an input terminal connected to said optical fiber and for inputting said optical signal transmitted from an upstream side of said optical repeater via said optical fiber;

an optical fiber amplifier means for amplifying the inputted optical signal by optical excitation;

an output terminal;

a unidirectional element for completely transferring the output of said optical fiber amplifier means to said output terminal; and

a monitoring processing circuit for processing the monitoring information having:

extracting means for extracting said monitoring information superimposed on the optical signal being output by said unidirectional element,

response signal generating means for generating a response signal when the repeater identification data in the extracted monitoring information matches with the repeater identification data of the optical repeater;

response signal reproducing means for reproducing a response signal transmitted from an optical repeater located at downstream side via said optical fiber; and

modulating means for modulating the exciting light of said optical fiber amplifier with said response signal;

wherein a residual light of said exciting light is transmitted in a direction opposite to said optical signal from said input terminal connected to said optical fiber via said optical fiber amplifier means.

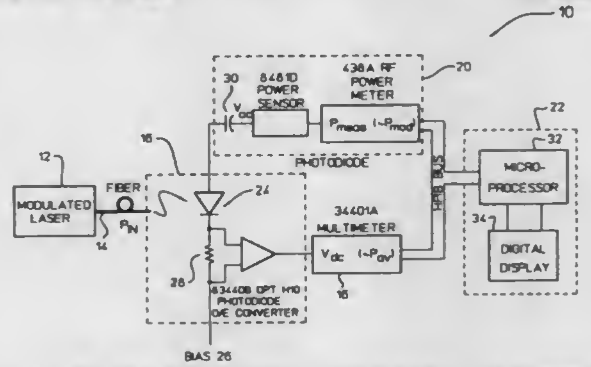
5,535,038
APPARATUS AND METHOD FOR DETERMINING EXTINCTION RATIO OF DIGITAL LASER TRANSMITTERS

Stephen W. Hinch, 4735 Burns Ct., Santa Rosa, Calif. 95405

Filed Jun. 17, 1994, Ser. No. 261,566

Int. Cl.^{6} H04B *10/04;* **H01S** *3/00*

U.S. Cl. 359—180 **12 Claims**



1. An apparatus for determining extinction ratio of a modulated optical signal produced by a modulated optical source, comprising:

optical-to-electrical (O/E) conversion means responsive to the modulated optical signal for generating an electrical signal, the O/E conversion means having a conversion gain, C;

first means connected to the O/E conversion means for measuring the electrical signal to provide a first signal, P_{AV}, corresponding to average optical power in the modulated optical signal;

second means having an input impedance, R, connected to the O/E conversion means for measuring the electrical signal to provide a second signal, P_{meas}, proportional to optical power, P_{MOD}, in the modulation signal, where:

$$P_{MOD}=\sqrt{\frac{R\,P_{meas}}{C^2}}\ ;\text{ and}$$

means connected to the first and second means for determining an extinction ratio value, ER, from the first and second signals corresponding to average optical power in the modulated optical signal and optical power in the modulation signal, where $ER=(P_{AV}+P_{MOD})/(P_{AV}-P_{MOD})$.

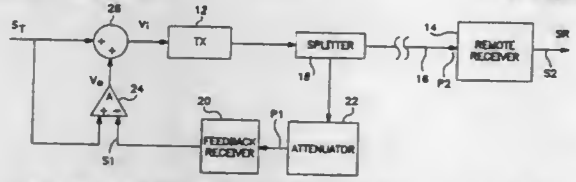
5,535,039
DIVERGENCE FEEDBACK IN A LINEAR FIBER OPTIC ANALOG TRANSMISSION SYSTEM AND METHOD

Donald K. Belcher, Melbourne, and David M. Thomas, Malabar, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 8, 1994, Ser. No. 355,168

Int. Cl.^{6} H04B *10/04;10/12*

U.S. Cl. 359—187 **10 Claims**



1. An apparatus for improving the linearity of an analog signal transmitted from a transmitter and received at a first receiver in a fiber optic transmission system, the apparatus comprising:

a splitter for providing two copies of a transmission of the analog signal from the transmitter, a first copy being provided to the first receiver and a second copy being provided to a local receiver, said local receiver being substantially similar in operation to the first receiver;

an optical attenuator for attenuating said splitter second copy so that when the second copy is received at said local receiver it has an optical power substantially similar to that of said splitter first copy when it is received at the first receiver, whereby said local receiver provides an output that is substantially similar to an output from the first receiver; and

an amplifier for subtractively combining said local receiver output and the analog signal to thereby provide a distortion correction signal for correcting an input to the transmitter.

5,535,040
LENS CHANGEABLE IMAGE SCANNER AND LENS POSITION CONTROL DEVICE IN THE SAME

Tadao Ohtsuka, and Masao Shoda, both of c/o Nippon Steel Corporation, 6-3, Ohtemachi 2-Chome, Chiyoda-Ku, Tokyo 100, Japan

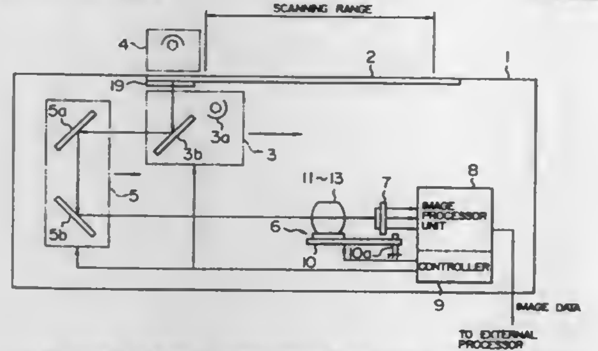
PCT No. PCT/JP94/00027, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO94/16518, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 12, 1994, Ser. No. 295,912

Claims priority, application Japan, Jan. 12, 1993, 5-019701; Jan. 12, 1993, 5-019702

Int. Cl.^{6} G02B *26/08;* **G03B** *27/52*

U.S. Cl. 359—210 **3 Claims**



1. An image scanner comprising a table on which an object is arranged to take in an image of the object by an image receiving element, scanning means for relatively scanning a surface of said table, a reflecting optical system for directing light from said scanning means toward said image receiving element so that it is parallel to said table, and a plurality of kinds of lenses having different magnification factors capable of being used in a change-over manner, wherein there is provided a base which is rotatable in a plane parallel to the surface of said table around a pivot provided on an optical path of said light, and said lenses are supported on said base so that the optical axes of the lenses are positioned on the same plane and intersect each other on said pivot, whereby one of said lenses to be used can be selected by rotating said base.

5,535,041
DEVICE FOR STABILIZING THE REFLECTIVITY OF MIRRORS HAVING PHASE CONJUGATION THROUGH STIMULATED BRILLOUIN SCATTERING AT HIGH PULSE REPETITION RATE

Jean-Luc Ayral, Antony; Pascal Tournois, and Jean-Pierre Huignard, both of Paris, all of, France, assignors to Thomson-CSF, Puteaux, France

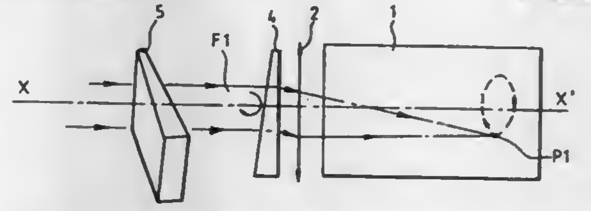
PCT No. PCT/FR91/00877, § 371 Date Jun. 18, 1992, § 102(e) Date Jun. 18, 1992, PCT Pub. No. WO92/09005, PCT Pub. Date May 29, 1992

PCT Filed Nov. 8, 1991, Ser. No. 859,707

Claims priority, application France, Nov. 16, 1990, 90 14286

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—211 **8 Claims**



1. A device for stabilizing the reflectivity of a phase conjugation mirror, said device comprising:

a focusing means for focusing an incident beam to be reflected onto a focusing point situated inside said phase conjugation mirror;

means for changing the direction of said incident beam;

displacing means for displacing said incident beam and thereby displacing said focusing point of the incident beam in the phase conjugation mirror.

5,535,042
LIGHT SCANNING DEVICE

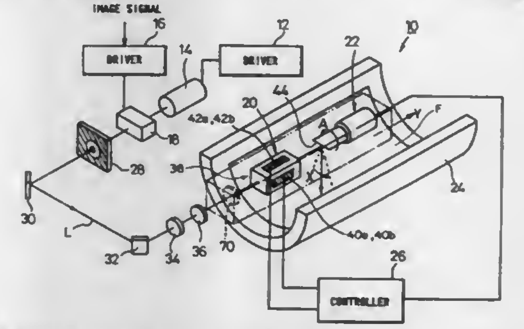
Norihisa Takada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1994, Ser. No. 261,945

Claims priority, application Japan, Jun. 17, 1993, 5-146544

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—212 **12 Claims**



1. A light scanning device comprising:

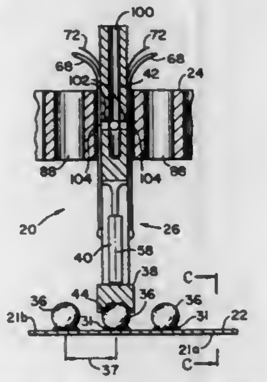
light beam generating means for generating a light beam;

a driven-mirror light deflector having a high speed rotating reflecting mirror surface for deflecting and leading the light beam generated by said light beam generating means onto a scanned medium;
deflecting position detecting means for detecting a rotational position of the reflecting mirror surface of said driven-mirror light deflector;
corrective signal generating means for generating corrective signals which compensate for a dynamic deformation of the reflecting mirror surface; and
light beam control means disposed between said light beam generating means and said light deflector for converging in the direction along one axis of said reflecting mirror surface and diverging in the direction along the other axis of said reflecting mirror surface the light beam applied to said reflecting mirror surface based on said corrective signals;
wherein the deformation of the reflecting mirror surface is produced by the high-speed rotation of said reflecting mirror surface.

5,535,043
REPLACEABLE ACTUATOR ASSEMBLY FOR OPTICAL MIRROR WITH KINEMATIC MOUNT

Carlo La Fiandra, New Canaan, and Gon-Yen Shen, Brookfield, both of Conn., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 22, 1994, Ser. No. 293,787
Int. Cl.^{6} C02B *26/08;5/08*
U.S. Cl. 359—224 **34 Claims**



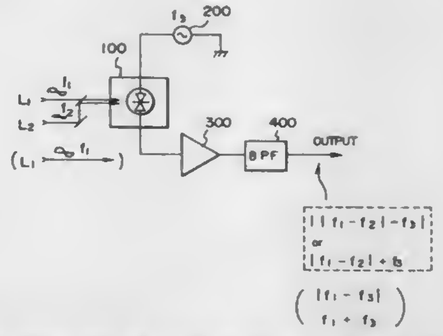
1. A deformable mirror assembly, comprising:
a deformable face plate;
a backing plate spaced from said deformable face plate;
at least one axially extendable actuator, fixed adjacent a first end to said backing plate, and at a second end, which is opposed to said first end, to said face plate by a kinematic joint such that no substantial forces are transmitted to said face plate by reason of said joint, said actuator being selectively removable from said assembly without causing deformation of said face plate.

5,535,044
OPTICAL FREQUENCY MIXING APPARATUS

Akira Takeshima, and Musubu Koishi, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jun. 7, 1995, Ser. No. 480,787
Claims priority, application Japan, Jul. 6, 1994, 6-154910
Int. Cl.^{6} H04B *10/06;* **G01C** *3/08*
U.S. Cl. 359—245 **9 Claims**

1. An optical frequency mixing apparatus comprising:
a signal generator for generating an AC electrical signal having a first frequency;

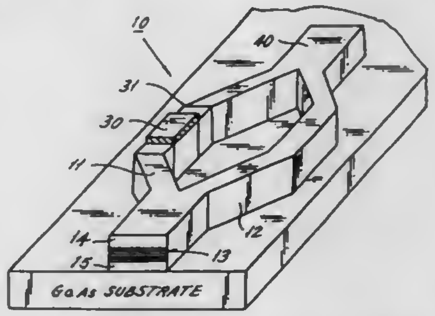


a signal supply unit for receiving the AC electrical signal output from said signal generator, converting the AC electrical signal into a predetermined output form, and outputting an electrical signal;
a photoconductive photodetector for receiving light to be measured including a component of a second frequency, the photoconductive photodetector having an electrical signal application terminal for receiving the electrical signal output from the signal supply unit;
a conversion amplification unit for outputting a voltage signal proportional to a current signal flowing through said photoconductive photodetector; and
a frequency selector for receiving the voltage signal output from said conversion amplification unit, selecting and passing one of a voltage signal having substantially the same frequency as that of a sum of the first frequency and the second frequency or a voltage signal having substantially the same frequency as that corresponding to an absolute value of a difference between the first frequency and the second frequency.

5,535,045
MODULATION DOPED QUANTUM WELL WAVEGUIDE MODULATOR

Mitra Dutta, Matawan, and Weimin Zhou, Eatontown, both of N.J., assignors to The United of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 17, 1994, Ser. No. 214,730
Int. Cl.^{6} G02F *1/03*
U.S. Cl. 359—248 **17 Claims**

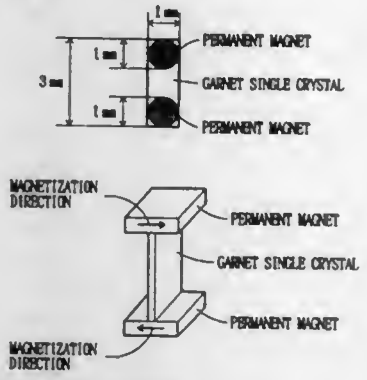


1. A modulation doped quantum well waveguide modulator comprising, in combination:
a) a first thin planar GaAs quantum well layer;
b) a second thin $Al_xGa_{1-x}As$ barrier layer disposed atop said GaAs quantum well layer;
c) a third thin AlGaAs barrier layer disposed atop said $Al_xGa_{1-x}As$ barrier layer, wherein x is equal to or greater than 20%;
d) a silicon doped N region disposed in the center of said $Al_xGa_{1-x}As$ barrier layer.

5,535,046
FARADAY ROTATOR

Kazushi Shirai, and Norio Takeda, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,344
Claims priority, application Japan, Oct. 5, 1993, 5-249523
Int. Cl.^{6} G02F *1/09*
U.S. Cl. 359—281 **6 Claims**

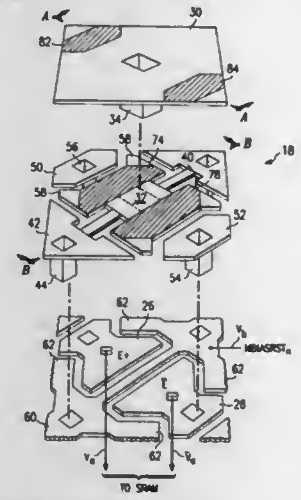


1. A Faraday rotator comprising:
a rare-earth iron garnet single-crystal film having a film surface; and
first means for reducing hysteresis in first curve direction in a magnetization curve of said film by constantly magnetizing a first part of said film in a first direction normal to said film surface, said first part being less than all of said film.

5,535,047
ACTIVE YOKE HIDDEN HINGE DIGITAL MICROMIRROR DEVICE

Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 18, 1995, Ser. No. 424,021
Int. Cl.^{6} G02B *26/00*
U.S. Cl. 359—295 **18 Claims**



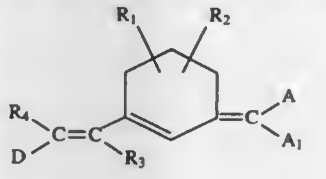
1. A spatial light modulator, comprising:
a) a substrate;
b) addressing circuitry comprising a first portion provided proximate said substrate and a second portion elevated above said substrate;
c) a yoke supported over said addressing circuitry first portion;
d) at least one hinge connected to said yoke and supporting said yoke, said hinge permitting deflection of said yoke; and
e) a pixel elevated above and supported by said yoke, said pixel positioned over said elevated addressing circuitry second portion.

5,535,048
NONLINEARLY OPTICALLY ACTIVE COMPOUNDS

Gerard Mignani, Lyon; Gerard Soula, Meyzieu, and Remi Meyrueix, Lyon, all of, France, assignors to Flamel Technologies, Venissieux Cedex, France

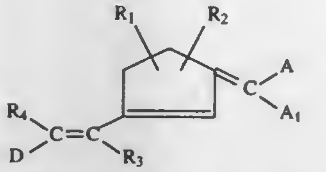
Division of Ser. No. 714,585, Jun. 13, 1991, Pat. No. 5,359,072, which is a continuation of Ser. No. 407,744, Sep. 15, 1989, abandoned. This application Mar. 21, 1994, Ser. No. 210,995
Claims priority, application France, Sep. 15, 1988, 88/12028
Int. Cl.^{6} C07D *451/02;* **G02F** *1/35*
U.S. Cl. 359—326 **21 Claims**

1. A hyperpolarizable organic compound displaying nonlinear optical activity and having one of the following formulae:



(I)

or



(II)

in which D is an electron donating group; A and A1, which may be identical or different, are each an electron accepting group; and R_1, R_2, R_3 and R_4 are each a lower alkyl radical or a hydrogen atom.

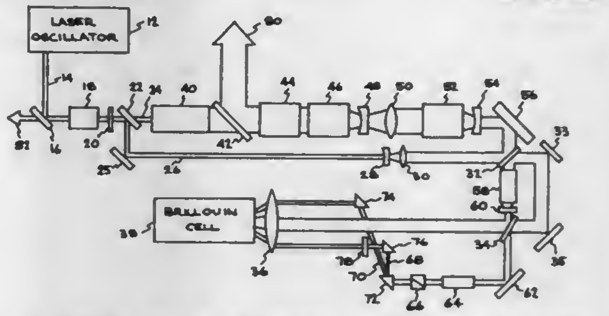
10. A nonlinearly optically active material comprising at least one compound as defined by claim **1.**

11. The nonlinearly optically active material as defined by claim **10**, capable of generating second order harmonics.

5,535,049
PHASE AND BIREFRINGENCE ABERRATION CORRECTION

Mark Bowers, Modesto, and Allen Hankla, Livermore, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 11, 1994, Ser. No. 240,898
Int. Cl.^{6} H01S *3/00*
U.S. Cl. 359—334 **20 Claims**



1. A method for the correction of phase and birefringence aberrations in a coherent beam of light, comprising:
initiating, with a polarized seed beam, the Brillouin effect in a phase conjugate cell;
amplifying a signal beam;
splitting, with a birefringent medium, the signal beam into a first polarized beam and a second polarized beam, wherein the polarization of the first polarized beam is parallel to the polarization of the seed beam, wherein the polarization of the second polarized beam is perpendicular to the polarization of the first polarized beam and the seed beam;

rotating the polarization of the second polarized beam to be parallel to the polarization of the seed beam and the first polarized beam;

focusing the first polarized beam and the second polarized beam into the phase conjugate cell.

5,535,050
OPTICAL AMPLIFIER AND OPTICAL COMMUNICATION SYSTEM WITH OPTICAL AMPLIFIER USING PUMPING LIGHT BEAM

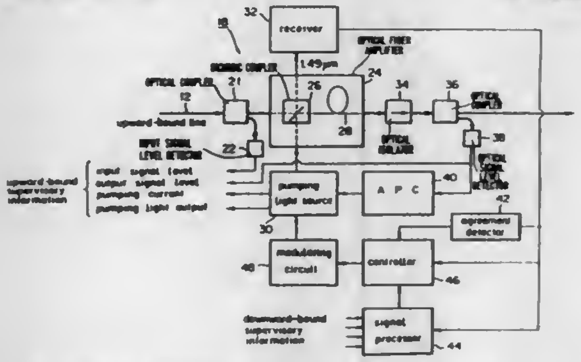
Masuo Suyama, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 189,841, Feb. 1, 1994, which is a continuation of Ser. No. 987,568, Dec. 8, 1992, Pat. No. 5,299,048, which is a continuation of Ser. No. 574,097, Aug. 29, 1990, abandoned. This application Mar. 8, 1995, Ser. No. 400,762

Claims priority, application Japan, Aug. 31, 1989, 1-223172

Int. Cl.^{6} H04B *10/00;10/16;* **G02B** *6/26*

U.S. Cl. 359—341 **18 Claims**



1. An optical amplifier amplifying a received optical signal, comprising:

a pumping light source outputting a first light beam for pumping and monitor information of a second light beam thereof;

an optical fiber, doped with a rare earth element, having an input and an output; and

a first optical coupler introducing a received optical signal and the first light beam to the input of said optical fiber,

the received optical signal being amplified from being propagated through the optical fiber and output from the output of said optical fiber.

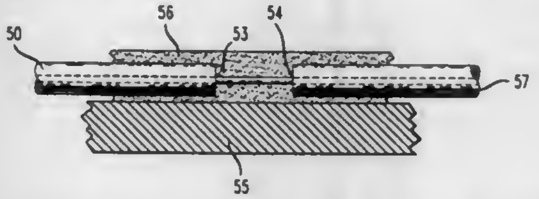
5,535,051
WDM OPTICAL FIBER SYSTEM USING CRYSTAL OPTICAL AMPLIFIER

Tasoltan T. Basiev, Moscow, Russian Federation; Paul M. Bridenbaugh, Somerville, and Gordon A. Thomas, Princeton, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jan. 24, 1995, Ser. No. 377,569

Int. Cl.^{6} H01S *3/00;3/14*

U.S. Cl. 359—342 **12 Claims**



1. Apparatus comprising a WDM optical amplifier, for simultaneous amplification of a plurality of WDM channels, incorporating a single crystal host substitutionally-doped with a rare-earth emitting dopant atom, CHARACTERIZED IN THAT

the host is of a defect composition selected from the group consisting of extrinsic substituent compositions, non-stoichiometric compositions and anti-site disordered compositions

whereby the amplification bandwidth associated with the emitting dopant atom is broadened from an inherent spectral width of less than 5.0 nm to a spectral width of at least 5.0 nm by variation in the local crystal electric field for sites occupied by individual doping atoms.

5,535,052
LASER MICROSCOPE

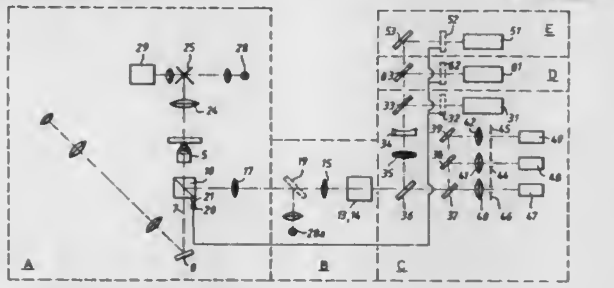
Reinhard Jörgens, Aalen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Jul. 14, 1993, Ser. No. 91,901

Claims priority, application Germany, Jul. 24, 1992, 42 24 376.9

Int. Cl.^{6} G02B *21/06;21/00*

U.S. Cl. 359—388 **19 Claims**



1. A microscope comprising:

a microscope stand having a front side and a rear side opposite said front side,

an objective attached to said microscope stand and defining an optical axis,

an ocular tube for visual observation arranged at said front side of said microscope stand,

a reflected light illumination beam path defined by an opening in said microscope stand leading from said rear side of said microscope stand to said optical axis, intersecting said optical axis and comprising at least a tube lens,

a radiation source at said rear side of said microscope stand for generating an illuminating radiation beam that is harmful to eyes of an observer, said illuminating radiation beam being coupled into said reflected light illumination beam path at said rear side of said microscope stand,

a mirror for deflecting said illuminating radiation beam in a direction toward said objective, said mirror being switchable into and out of said reflected light illumination beam path,

a shutter for interrupting and releasing said illuminating radiation beam, said shutter being positioned between said radiation source and said mirror, and

a sensor for detecting whether said mirror is switched into or out of said reflected light illumination beam path, said sensor generating a trigger signal coupled to said shutter for triggering said shutter to release said illuminating radiation beam when said mirror is switched into said reflected light illumination beam path and to interrupt said illuminating radiation beam when said mirror is switched out of said reflected light illumination beam path.

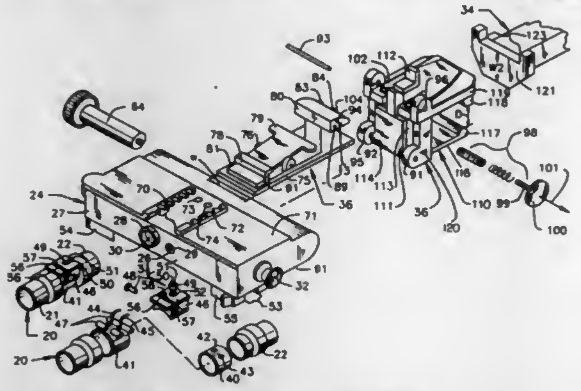
5,535,053
NIGHT VISION GOGGLE ASSEMBLY WITH INDEPENDANT MONOCULAR DEVICES

Albert M. Baril; Roy H. Holmes, both of Roanoke, and Mark R. Critzer, Salem, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 15, 1994, Ser. No. 290,249

Int. Cl.^{6} G02B *23/00;* **H01J** *40/14*

U.S. Cl. 359—409 **16 Claims**



1. A modular night vision device, comprising:

a support structure having a first region and a second region positionable proximate the eyes of a person, said support structure retaining an electrical power source, and having electrical contacts in said first region and said second region that are electrically coupled to said electrical power source;

at least one night vision monocular assembly, wherein said support structure and said at least one night vision monocular assembly have an attachment means disposed therebetween that enables said at least one night vision monocular assembly to be selectively attached to said first region and said second region, and engage said electrical contacts to selectively produce a monocular or binocular assembly, wherein said at least one night vision monocular assembly is empowered by said electrical power source.

5,535,054
ILLUMINATION OPTICAL SYSTEM

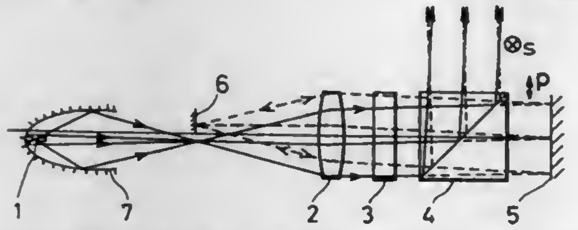
Masato Shibuya, Saitama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 28,984, Mar. 10, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 317,994

Claims priority, application Japan, Mar. 11, 1992, 4-086553

Int. Cl.^{6} G02B *5/30;27/28*

U.S. Cl. 359—487 **11 Claims**



1. An illumination optical system for supplying polarized illumination light to an object to be illuminated, said system comprising:

a light source;

polarizing light splitting means for separating light emitted from said light source into a first polarized light component as said illumination light and a second polarized light component which is different in polarizing direction from said first polarized light component;

a first reflecting optical member for reflecting said second polarized light component to return the same as backward light in the direction of said light source;

a polarizing element for changing a polarizing condition of said backward light from said first reflecting optical member;

a converging optical system arranged between said light source and said first reflecting optical member; and

a second reflecting optical member for reflecting said backward light, with the polarizing condition changed by said polarizing element, into rereflected light having the same direction as light emitted from said light source with

said polarizing light splitting means, said first reflecting optical member and said converging optical system being arranged relative to said light source such that an image of said light source due to said backward light from said first reflecting member is formed at a position apart from a position of said light source or conjugate position thereof with respect to a direction substantially perpendicular to an optical axis of said converging optical system to cause said first polarized light component and said second polarized light component to combine into uniformly polarized illumination light.

5,535,055
OPTICAL HEAD DEVICE AND BIREFRINGENT DIFFRACTION GRATING POLARIZER AND POLARIZING HOLOGRAM ELEMENT USED THEREIN

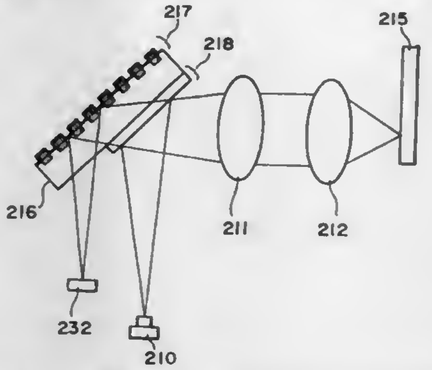
Yuzo Ono, and Akitomo Oba, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,187

Claims priority, application Japan, Feb. 16, 1993, 5-026376; Feb. 24, 1993, 5-033862

Int. Cl.^{6} G02B *5/30;5/18*

U.S. Cl. 359—495 **2 Claims**



1. A birefringent diffraction grating polarizer comprising:

a crystal plate having optically anisotropic characteristics;

an ion exchange region and a dielectric film which constitute a diffraction grating and which are formed periodically on a main surface of said crystal plate;

a total reflection film formed on a surface of said diffraction grating; and

a polarizing beam splitter layer on a partial region of a surface opposite to said main surface of said crystal plate.

5,535,056
METHOD FOR MAKING ELEMENTAL SEMICONDUCTOR MIRROR FOR VEHICLES

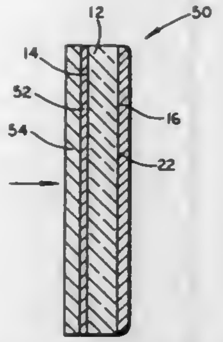
Gregory T. Caskey; Niall R. Lynam, both of Holland, Mich., and Bryant P. Hichwa, Santa Rosa, Calif., assignors to Donnelly Corporation, Holland, Mich.

Filed May 15, 1991, Ser. No. 700,760

Int. Cl.^{6} G02B *5/08;17/00*

U.S. Cl. 359—603 **7 Claims**

1. A method for manufacturing a glare-reducing mirror for vehicles comprising the steps of:



1) providing a sheet of flat glass having front and rear surfaces;
2) coating one surface of said sheet with a thin layer of an elemental semiconductor having an index of refraction of at least 3 to a desired optical thickness of at least about 275 angstroms;
3) heating said coated glass to a temperature sufficient to allow bending of said coated glass; and
4) bending said heated, coated glass to a desired curvature;

said coating step including coating said one sheet surface with an elemental semiconductor selected from the group including silicon and germanium; and

coating said layer of elemental semiconductor with a thin layer of dielectric material of optical thickness within the range of between about 1600 and 2800 angstroms prior to heating and bending said coated glass.

5,535,057
DRIVING DEVICE FOR ZOOM LENS BARREL

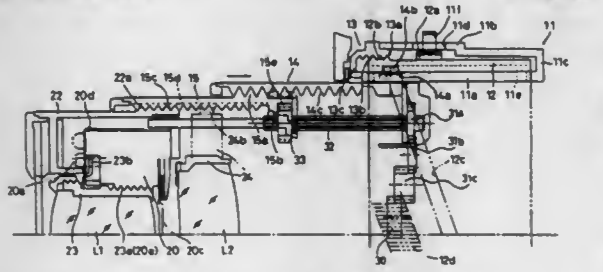
Hiroshi Nomura, and Takamitsu Sasaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1994, Ser. No. 353,211

Claims priority, application Japan, Dec. 3, 1993, 5-304142

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—694 **8 Claims**



7. A driving device for a zoom lens barrel, comprising:
- a movable cylinder linearly movable in a direction of an optical axis of a zoom lens and provided with a linear guide groove;
- a rotation cylinder rotatably fitted in said movable cylinder and provided with a circumferential gear;
- a movable member linearly moving in said optical axis direction and provided with a key engaging said linear guide groove;
- a pinion rotatably supported on said movable cylinder; and,
- a rotation transmitting shaft for transmitting a rotation thereof to said pinion, said pinion engaging said circumferential gear;

wherein said pinion is supported in a vicinity of said key.

5,535,058
FOCUS ERROR DETECTING ELEMENT AND OPTICAL HEAD USING THE SAME

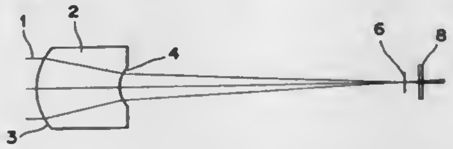
Yasuhiro Tanaka, Ashiya, and Michihiro Yamagata, Osaka, both of, Japan, assignors to Matsushta Electric Industrial Co., Ltd., Osaka, Japan

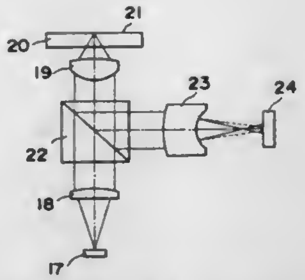
Filed Aug. 20, 1993, Ser. No. 109,532

Claims priority, application Japan, Oct. 26, 1992, 4-287334; Feb. 24, 1993, 5-035090

Int. Cl.^{6} G02B *13/18*

U.S. Cl. 359—711 **16 Claims**





1. A focus error detecting element which comprises a single lens element having first and second lens surfaces which are close to and remote from a source of incoming light, said first lens surface being a rotational surface having a positive power while said second lens surface is a toric surface having a negative power, wherein said single lens element satisfies the following relationship:

$$0.5<(WD+d)/f<0.9$$

wherein $1/f+(1/f_1+1/f_2)/2$ and $1/WD=(1/WD_1+1/WD_2)/2$, and wherein WD_1 and WD_2 represent respective distances from two focal points produced by the toric surface to the second lens surface, f_1 and f_2 represent respective focal lengths, and d represents the thickness of the lens element.

5,535,059
OBJECTIVE LENS DRIVE DEVICE AND COIL BOBBIN THEREOF

Koji Mitsumori; Takamichi Tomiyama, and Keiichi Shibata, all of Chiba, Japan, assignors to Sony Corporation, Tokyo, Japan

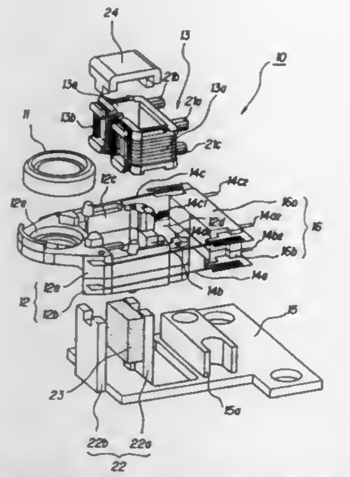
Filed Dec. 16, 1994, Ser. No. 357,711

Claims priority, application Japan, Dec. 22, 1993, 5-346121

Int. Cl.^{6} G02B *7/02*

U.S. Cl. 359—813 **10 Claims**

1. An objective lens drive device comprising:
- a lens holder for holding an objective lens having an optical axis;
- a plurality of elastic supporting members each having one end fixed to said lens holder and another end fixed to a fixed portion, said elastic supporting members movably supporting said lens holder in a direction parallel to the optical axis of said objective lens and in a horizontal direction orthogonal to the optical axis of said objective lens; and
- a coil bobbin around which is wound a focussing coil, at least one tracking coil being attached to said focusing coil, said coil bobbin being provided with a plurality of projecting terminals on which are wound the coil ends of said focussing coil and said tracking coil.



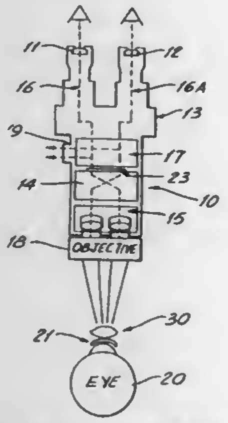
5,535,060
OPTICAL STEREOSCOPIC MICROSCOPE SYSTEM

Avi Grinblat, 25 Central Park West - Apt. 4V, New York, N.Y. 10023

Continuation of Ser. No. 907,676, Jul. 2, 1992, Pat. No. 5,438,456, which is a continuation-in-part of Ser. No. 651,788, Feb. 7, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,602

Int. Cl.^{6} G02B *5/04;21/22*

U.S. Cl. 359—835 **15 Claims**



1. A stereoscopic microscope system adapted for vitrectomy eye microsurgery comprising:
- (a) positioning means to position an eye to be viewed;
- (b) an aspherical lens system located adjacent the positioning means and comprising a first lens having convex-concave curved faces proximate the positioning means and a second lens having concave-convex faces and facing the first lens, with the concave faces of the first and second lenses facing each other, the aspherical lens system producing a single inverted image;
- (c) an image splitting means for splitting said inverted image from the aspherical lens system into separated left and right inverted images;
- (d) a prism system means to re-invert said separated left and right images from the image splitting means, said prism system means consisting of four prisms constituting two pairs of prisms, each pair of prisms being an Abbe's Modification of Porro prism system, each of the said four prisms being the same size and shape, the four prisms being cemented together to form top and bottom layers of a unitary prism cluster; and the prism system means reverting said left and right inverted images to produce left and right reverted images; and
- (e) binocular tubes and eyepiece means for viewing said left and right reverted images.

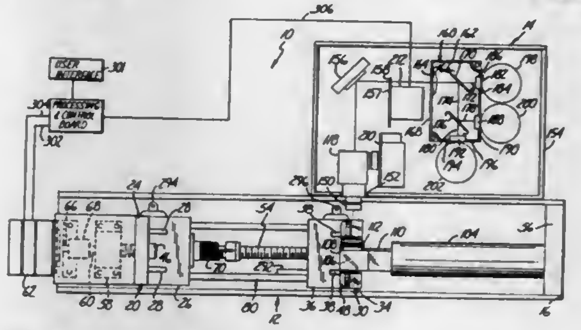
5,535,061
ROTARY SCANNER

Michael G. Johnson, Chanhassen, Minn., and George L. Lemasa, Brockton, Mass., assignors to Juno Enterprises, Inc., Minneapolis, Minn.

Filed Jan. 24, 1994, Ser. No. 186,006

Int. Cl.^{6} G02B *7/182;26/08;* **G03B** *21/26*

U.S. Cl. 359—872 **21 Claims**



17. An image scanner comprising:
- a drum for supporting an image source and having an axis of rotation;
- a light source for illuminating a selected portion of the image source;
- a frame;
- a way mounted to the frame;
- a headstock disposed and arranged to receive and support a first end of the rotary drum;
- a tailstock disposed and arranged to receive and support a second end of the rotary drum, the headstock and tailstock being independently mounted on the way for lineal movement along the axis of the drum;
- drum drive means for rotating the drum about the axis;
- headstock drive means for linearly moving the headstock along the axis in first and second opposite directions;
- a stop block supported by the frame to impede a linear movement of the tailstock in the second direction at a selected stop position;
- connecting means for connecting the headstock to the tailstock to cause the tailstock to move linearly along the axis in response the movement of the headstock, the connecting means including disengaging means to disengage the tailstock from the headstock when the tailstock is at the selected stop position to permit the headstock to continue to move in the second direction;
- a receiver lens for receiving and focusing light provided by the light source representative of the image source;
- aperture means for receiving and projecting the light focused by the receiver lens;
- a condenser lens for receiving and projecting light transmitted through the aperture means;
- light splitting means for splitting the light projected by the condenser lens into a plurality of light beams;
- a plurality of light filters for filtering selecting portions of the light spectrum from the plurality of light beams; and
- a plurality of photo-multiplier tubes corresponding to the plurality of light filters for receiving the plurality of light beams

filtered by the light filters, each photo-multiplier tube providing a voltage level based on the intensity of the incident filtered light beam.

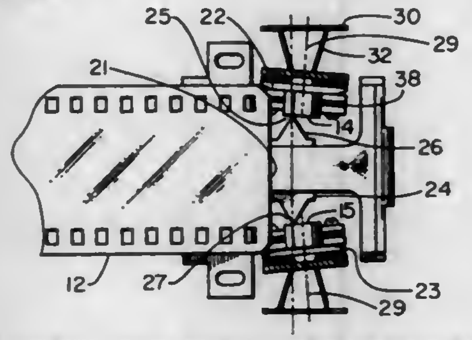
5,535,062
MAGNETIC READING AND/OR RECORDING APPARATUS FOR READING AND/OR RECORDING INFORMATION ON A MAGNETIC INFORMATION TRACK ON A PHOTOSENSITIVE MEDIUM

Robert J. Blackman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1992, Ser. No. 837,225

Int. Cl.⁶ G03B *51/00;* G11B *5/633*

U.S. Cl. 360—3 **1 Claim**



1. A magnetic reading and/or recording apparatus for reading and/or recording information on a magnetic information track on a photosensitive medium, said magnetic reading and/or recording apparatus comprising:

a magnetic reading and/or recording element;

a flexible member for supporting said magnetic reading and/or recording element for rotation about an axis perpendicular to a longitudinal axis of a photosensitive medium while restraining said magnetic reading and/or recording element from rotating about an axis parallel to the longitudinal axis of the photosensitive medium and an axis transverse to the longitudinal axis of the photosensitive medium;

means for supporting said magnetic reading and/or recording element for movement in a direction transverse to the longitudinal axis of a photosensitive medium while restraining said magnetic reading and/or recording element from moving in a direction perpendicular to the longitudinal and transverse axes of the photosensitive medium and in a direction parallel to the longitudinal axis of the photosensitive medium, and for supporting said reading and/or recording element for rotation about the axis perpendicular to the longitudinal axis of the photosensitive medium;

a rigid frame;

means connected to said magnetic reading and/or recording element for following a longitudinal edge of a photosensitive medium for maintaining proper registration between said magnetic reading and/or recording element and a magnetic information track on the photosensitive medium; and

wherein said flexible member comprises an upright portion attached to said rigid frame and two opposite leg portions extending from and normal to said upright portion, said leg portions are attached to said following means; and

said supporting means comprises a central portion attached to said rigid frame and two opposite arm portions extending downward from said central portion, said arm portions are attached to said following means.

5,535,063
REAL TIME USER INDEXING OF RANDOM ACCESS TIME STAMP CORRELATED DATABASES

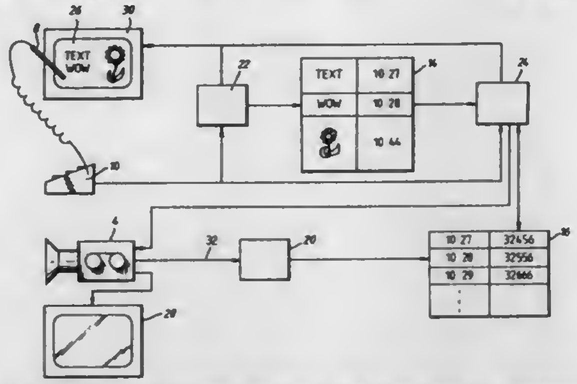
Michael G. Lamming, Cambridge, Great Britain, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 819,258, Jan. 10, 1992, abandoned. This application Jan. 26, 1995, Ser. No. 378,914

Claims priority, application United Kingdom, Jan. 14, 1991, 9100732

Int. Cl.⁶ G06F *19/00*

U.S. Cl. 360—4 **10 Claims**



1. A system for providing random access to a data set, preferably an audio and/or video data set, comprising:

means, including a user interface, for capturing of said indicia hand generated by a user during a serial rendition of said data set so that each indicium is time correlated with a respective part of said data set, such indicia being available for subsequent selection by a user; and

means for indexing into said data set to identify the part thereof that is time correlated with any indicium a user selects from said indicia; said system being characterized by including.

means for automatically time-stamping each indicium upon its generation by the user, and means for automatically time-stamping the part of said data set with which said indicium is time correlated substantially concurrently with the time-stamping of said indicium, with all such time-stamping being referenced to a common time base;

means for automatically storing, retrieving and displaying said user-generated indicia; and

means for determining the time-stamp of each user-selected indicium for use by said indexing means;

said user interface being adapted for electronically both capturing and displaying said user generated indicia.

5,535,064
INFORMATION SIGNAL RECORDING SYSTEM USING DIFFERENT COMPRESSING METHODS TO OBTAIN SIGNALS FOR RECORDING ALONG WITH A CORRESPONDING SIGNAL INDICATING THE METHOD OF COMPRESSION

Kenichi Nagasawa; Tadayoshi Nakayama; Koji Takahashi, and Masahiro Takei, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 27,869, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 798,035, Nov. 20, 1991, Pat. No. 5,198,940, which is a continuation of Ser. No. 625,627, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 434,532, Nov. 8, 1989, abandoned, which is a continuation of Ser. No. 258,120, Oct. 12, 1988, abandoned, which is a continuation of Ser. No. 881,823, Jul. 3, 1986, abandoned. This application Feb. 27, 1995, Ser. No. 395,297

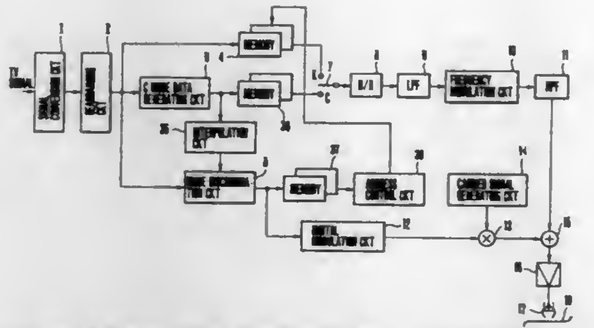
Claims priority, application Japan, Jul. 4, 1985, 60-148111

Int. Cl.⁶ H04N *5/78*

U.S. Cl. 360—9.100 **16 Claims**

1. An image data recording apparatus, comprising:

(a) blocking means for outputting input image data in a block composed of a plurality of image elements,



(b) data reducing means for reducing the amount of the block data, said means being capable of performing plural reducing methods,

(c) means for adding data indicating a data reducing method to the image data obtained by each of the data reducing methods, and

(d) recording means for recording each of the image data obtained by each of the data reducing methods on different areas on a recording medium.

5,535,065
RECORDING AND REPRODUCING APPARATUS HAVING MEANS FOR PERFORMING DIAGNOSTIC FUNCTIONS

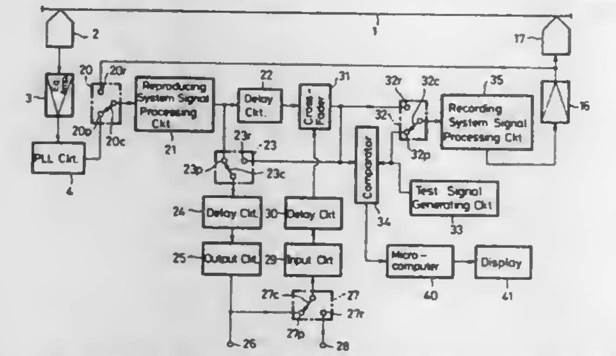
Seiji Tanizawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 14, 1993, Ser. No. 62,898

Claims priority, application Japan, May 14, 1992, 4-122212

Int. Cl.⁶ G11B *27/36;20/18*

U.S. Cl. 360—31 **15 Claims**



1. An apparatus for recording and reproducing a signal on and from a record medium comprising:

generating means for generating a predetermined test signal and supplying it to a diagnosis means for comparing said test signal with another signal;

recording system signal processing means for processing a signal supplied thereto;

supply means for supplying said predetermined signal from said generating means to said recording system signal processing means;

recording means for recording an output signal from said recording system signal processing means on said record medium;

reproducing means for reproducing a signal recorded on said record medium;

first switching means supplied with a reproduced signal reproduced by said reproducing means and said output signal from said recording system signal processing means and selectively outputting any of said two signals;

reproducing system signal processing means supplied with an output signal from said first switching means and processing the same;

output means for converting an output signal from said reproducing system signal processing means into a signal of a predetermined format and outputs the same;

second switching means for selectively switching between an externally supplied input signal and said output signal from said output means, for output to an input system signal processing means;

said input system signal processing means processes and outputs said output signal from said second switching means;

third switching means for selectively switching and outputting said output signal from said input system signal processing means or said output signal from said reproducing system signal processing means to said diagnosis means; and

said diagnosis means compares said output signal of said third switching means and said test signal from said generating means to diagnose a function on the basis thereof.

5,535,066
AUTOMATIC MONITORING METHOD FOR A VIDEO CASSETTE RECORDER

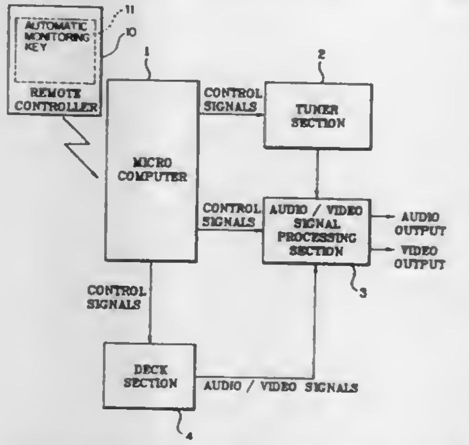
Byoung W. Min, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Nov. 1, 1993, Ser. No. 144,037

Claims priority, application Rep. of Korea, Nov. 27, 1992, 92-22556

Int. Cl.⁶ G11B *27/36*

U.S. Cl. 360—31 **3 Claims**



1. An automatic monitoring method for video cassette recorder having a microcomputer capable of selecting a reproduction picture of a video cassette and a picture of television broadcasting in accordance with control signals of a remote controller, the method comprising the steps of:

selecting a reproduction picture of a video cassette tape to be reproduced;

determining when the video cassette tape within a deck section is being reproduced under the control of the microcomputer;

determining whether an automatic monitoring function is turned on after recognizing reproduction of the video cassette tape;

determining whether a reproduction period for the video cassette tape has elapsed after recognizing turning-on of the automatic monitoring function;

selecting a broadcast television picture; and

after monitoring the broadcast television picture after elapse of said reproduction period, determining whether a television monitoring period has elapsed.

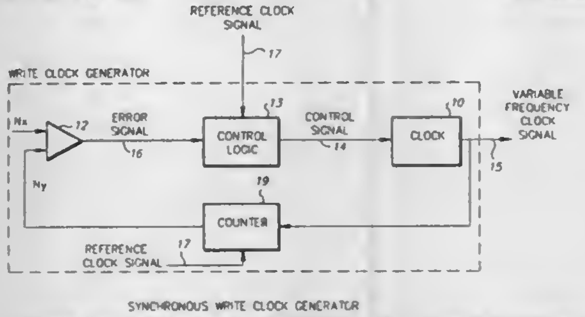
5,535,067
FREQUENCY CONTROLLED REFERENCE CLOCK GENERATOR

Matthew W. Rooke, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 60,291, May 10, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 400,621

Int. Cl.⁶ G11B *27/32*

U.S. Cl. 360—51 **28 Claims**



1. Apparatus for generating a clock signal of variable frequency comprising:

means for generating a single low frequency input reference signal having a reference period which may vary from a nominal period;

means for generating a clock signal having a number of clock cycles during the reference period corresponding to a predetermined bit spacing frequency;

means for counting the number of clock cycles generated during the reference period;

means for generating the difference between the number of clock cycles counted during the reference period and a predetermined number of clock cycles expected during the reference period for generating an error signal; and

means coupled to the clock signal generating means and responsive to the error signal for increasing or decreasing the clock signal frequency by a discrete amount for immediately synchronizing the clock signal frequency to said single low frequency input reference signal.

5,535,068
HELICAL SCAN METHOD AND APPARATUS FOR ADUSTING MEDIA SPEED TO READ NON-NATIVE FORMATS

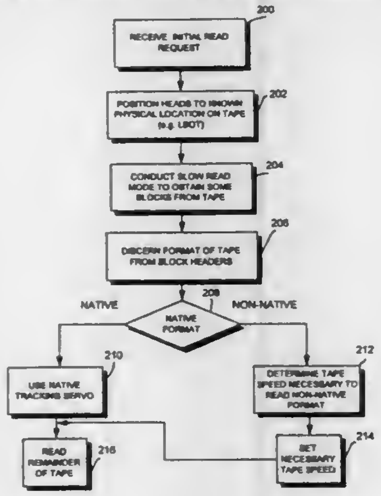
Timothy Hughes, Boulder, Colo., assignor to Exabyte Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 74,671, Jun. 10, 1993, Pat. No. 5,349,481. This application Jan. 12, 1994, Ser. No. 180,485

Int. Cl.⁶ G11B *15/46;15/48*

U.S. Cl. 360—73.04 **15 Claims**

1. A helical scan system which reads information recorded in helical stripes on a storage medium, the system comprising:


200
RECEIVE INITIAL READ REQUEST
202
POSITION HEADS TO KNOWN PHYSICAL LOCATION ON TAPE (e.g. LBOT)
204
CONDUCT SLOW READ MODE TO OBTAIN SOME BLOCKS FROM TAPE
206
DISCERN FORMAT OF TAPE FROM BLOCK HEADERS
208
NATIVE
NON-NATIVE
NATIVE FORMAT
210
USE NATIVE TRACKING SERVO
212
DETERMINE TAPE SPEED NECESSARY TO READ NON-NATIVE FORMAT
214
SET NECESSARY TAPE SPEED
216
READ REMAINDER OF TAPE

a medium transport which transports the storage medium along a transport path;

a rotating drum positioned proximate the transport path;

a read head mounted on the drum for obtaining information signals from the medium transported past the drum;

a controller which, in response to signals read by the read head, determines whether the medium is of a non-native track format for the system and which generates a signal to the medium transport so that the medium is transported at a speed at which the medium is read without resort to embedded servo information in the medium;

the non-native format being a format having tracks that deviate from at least one of the following nominal, predetermined parameters of the system reading the tape: track pitch, track angle, track length, and track straightness.

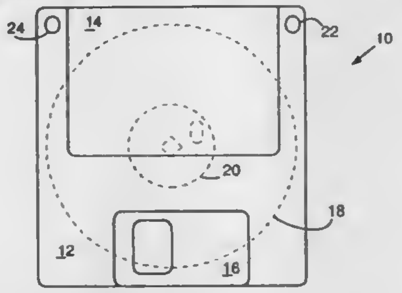
5,535,069
VERY HIGH-DENSITY DISKETTE FORMAT METHOD AND COMPUTER-IMPLEMENTED PROCESS

James Chiao, Saratoga; Jimmy D. Godwin, San Jose; Alton B. Otis, Jr., San Francisco; Andrew M. Rose, Mountain View; Roger O. Williams, Fremont; Stephen P. Williams, Morgan Hill, and Mark E. Strysko, San Jose, all of Calif., assignors to Insite Peripherals, Inc., San Jose, Calif.

Division of Ser. No. 111,778, Aug. 25, 1993, Pat. No. 5,515,212, which is a continuation of Ser. No. 611,420, Nov. 9, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,094

Int. Cl.⁶ G11B *5/596;5/82*

U.S. Cl. 360—77.03 **9 Claims**



1. A diskette, comprising:

a flat circular media having magnetic coating on a servo side and a nonservo side;

at least one media type code (MTC) cylinder that contains both an optically embossed track on the servo side of the media and at least one magnetically recorded track carrying information relating to the physical characteristics of the diskette;

at least one reference cylinder that contains both an optically embossed track on the servo side and a magnetically recorded track on at least one side of the media such that a magnetic read/write head may detect a centerline of said optically embossed track and then record said magnetically recorded track along the same centerline;

at least one disk mapping table (DMT) cylinder wherein a plurality of sectors each contain a substantially similar copy of a disk mapping table; and

a plurality of data cylinders each comprising a data track on the servo side and a data track on the nonservo side, said data tracks having a plurality of data sectors that are preceded by means to detect a centerline of the respective data track by analog means.

5,535,070
MAGNETIC RECORDING/REPRODUCING APPARATUS INCLUDING WINDBREAK MEMBERS FOR PREVENTING AIR FLOW BETWEEN HEAD DRUM AND TAPE

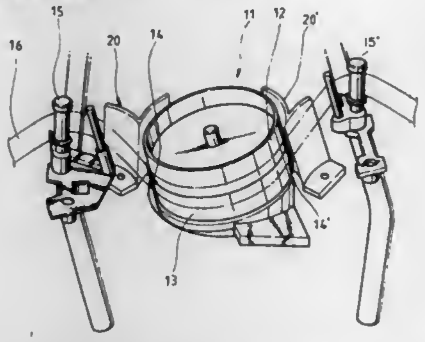
Jin-seung Choi, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation of Ser. No. 102,068, Aug. 4, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 428,847

Claims priority, application Rep. of Korea, Oct. 6, 1992, 92-19060

Int. Cl.⁶ G11B *15/61*

U.S. Cl. 360—84 **1 Claim**



1. A magnetic recording/reproducing apparatus having a guide mechanism which includes first and second guide rollers respectively positioned on opposite sides of a rotary head drum when said guide mechanism is in a tape loading position for guiding the run of a magnetic tape and loading said magnetic tape onto said rotary head drum comprising a rotary drum and a fixed drum, and first and second windbreak members for preventing the flow of air, due to the running of said magnetic tape and rotation of said rotary drum, from passing between said rotary head drum and said magnetic tape, wherein said first and second windbreak members are installed on the fixed drum of said rotary head drum and each of said windbreak members is formed in an open, hollow V shape which extends upwardly from said fixed drum such that one arm of the V shape has a curvature equal to that of said rotary head drum and is positioned proximate to said rotary drum but in a non-contacting relationship thereto, while the other arm of the V shape protrudes outwardly away from said rotary drum toward a corresponding one of said first and second guide rollers, when said guide mechanism is in the tape loading position, and is parallel to the travel path of said magnetic tape, wherein airflow between said rotary head drum and said magnetic tape is intercepted and prevented by said first and second windbreak members.

5,535,071
CASSETTE LOADING DEVICE FOR USE IN MAGNETIC RECORDING-REPRODUCTION APPARATUS

Hiromasa Yamagishi, Daito; Masahiko Takada, Hirakata; Takahiro Okuie, Nara; Osamu Takao, Kobe; Haruhiko Yoneda, Toyonaka, and Akihiro Suzuki, Nishinomiya, all of, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 26, 1994, Ser. No. 280,454

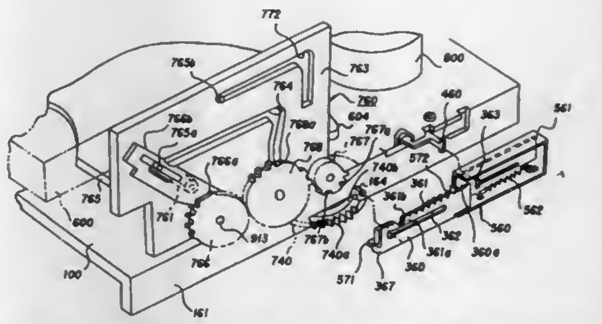
Claims priority, application Japan, Jul. 28, 1993, 5-185798; Jul. 29, 1993, 5-188015; Oct. 5, 1993, 5-249000

Int. Cl.⁶ G11B *5/008;5/027;15/00;17/00*

U.S. Cl. 360—96.5 **3 Claims**

1. A cassette loading device having a front mechanism for loading a cassette onto a chassis and unloading the cassette therefrom by slidingly moving a tray along guide grooves formed in side plates with the cassette placed on the tray, the cassette loading device comprising:

a drive cam gear rotatably supported by the chassis and integrally formed with a cylindrical portion, the cylindrical portion having a cutout in the side face thereof;



a holder having a projecting tooth engageable in the cutout during cassette loading and disengageable from the cutout upon completion of the cassette loading and rack teeth meshable with a pinion attached to the front mechanism;

a rotary gear attached to a side portion of the front mechanism and connected to the tray; and

an intermediate gear meshing with the rotary gear and the pinion, one of the intermediate gear and the rotary gear being provided on a side portion thereof with a protuberance having a smooth curved face, one of the rotary gear and the intermediate gear being provided on a side portion thereof with a recessed portion fittable to the protuberance to constitute a Geneva stop when the cassette is in a completely loaded position,

wherein the chassis is provided at one side thereof with an abutment plate generally orthogonal to the plane of the chassis, and a support guide holding a drive mechanism for slidingly moving the front mechanism is caused to protect from inside the chassis to the outside of the chassis through a cutout opening formed in the abutment plate, the support guide having an engaging piece engageable with an edge of the cutout opening, the support guide extending from a support portion rotatably provided on a lower surface of the chassis, the support guide and the support portion being molded on the chassis integrally with a fitting piece rotatably extending through the chassis and joined to the support portion and with a retaining piece in contact with an upper surface of the chassis and joined to an end of the fitting piece, the chassis having a through hole permitting an outer-end upper portion of the support guide to fit in and coinciding with a fitting position of the support guide as reversely rotated into the inside of the abutment plate, the support guide being caused to project from the abutment plate by being molded at the fitting position and thereafter being rotated about the fitting piece with its upper portion released from the through hole.

5,535,072
REMOVABLE CARTRIDGE DISK DRIVE WITH CARTRIDGE INTERLOCKING AND SPINDLE MOTOR TELESCOPING MECHANISMS

William F. Witt, Palo Alto, and Hans K. Tannert, Cupertino, both of Calif., assignors to Syquest Technology, Inc., Fremont, Calif.

Continuation of Ser. No. 723,452, Jun. 28, 1991, Pat. No. 5,317,464. This application Mar. 23, 1994, Ser. No. 216,694

Int. Cl.⁶ G11B *17/02;17/04*

U.S. Cl. 360—99.06 **19 Claims**

1. A disk drive comprising:

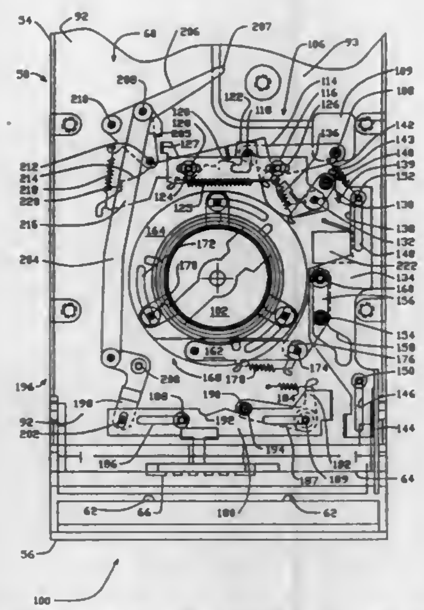
a housing;

a door pivotally mounted to said housing and movable between an opened position and a closed position;

means adapted for receiving in a receiving plane a removable cartridge containing a disk assembly for storing data;

motor means adapted for operably engaging and causing the disk assembly to spin at an appropriate speed;

means for movable mounting the motor means to the housing so that the motor means is moveable from a first position out of



engagement with the disk assembly to a second position operably engaged with the disk assembly;

ejecting means for engaging and lockingly holding the cartridge in place in the receiving means and for ejecting the cartridge from the receiving means;

means for enabling and disabling the motor means;

interlocking means for ensuring that the cartridge can not be removed from the receiving means while motor means is enabled and for ensuring that the motor means can not be enabled if the cartridge is not received in the receiving means;

wherein the ejecting means, the enabling and disabling means and the interlocking means substantially encircle the motor means;

wherein the interlocking means includes an interlock bar and the means for movable mounting the motor means includes a linkage arrangement that connects to the door such that movement of the door moves the motor; and

wherein the interlock bar can selectively block the linkage arrangement, thereby blocking movement of said door.

5,535,073

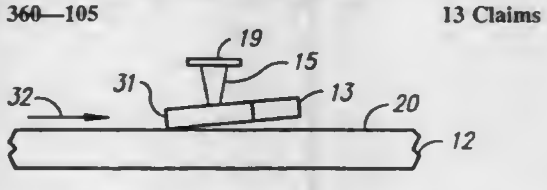
TRIBO-ATTRACTIVE CONTACT DATA STORAGE SYSTEM

Blasius Brezoczky, and Hajime Seki, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 210,188, Mar. 17, 1994, which is a continuation of Ser. No. 814,124, Dec. 24, 1991, Pat. No. 5,304,165. This application Mar. 31, 1995, Ser. No. 414,178

Int. Cl.^{6} G11B *15/64;17/00*

U.S. Cl. 360—105 **13 Claims**



1. A magnetic disk storage comprising:

a magnetic storage medium comprising a rigid substrate having a layer of magnetic storage material thereon;

a magnetic transducer and a contact slider for supporting said magnetic transducer in physical contact with said magnetic storage medium, said contact slider comprising a material having a high resistivity and a low coefficient of friction and a load versus friction characteristic that is non-linear in the negative load region;

means coupled to said magnetic storage medium for rotating said magnetic storage medium and producing relative motion between said magnetic storage medium and said contact slider up to a selected operating speed sufficient to generate an attractive force responsive to said load versus friction characteristic of said contact slider, said attractive force having a magnitude sufficient for attracting and maintaining a surface of said contact slider in substantially physical contact with said magnetic storage medium at said selected operating speed, such that said magnetic transducer is maintained in close proximity to said magnetic storage medium and data can be written or sensed without excessive wear to either said contact slider or said magnetic storage medium; and

an access arm and suspension means for suspending said contact slider, said suspension means including spring means adapted for supporting substantially all of said surface of said contact slider in substantially physical contact with said magnetic storage medium at said selected operating speed and for supporting said contact slider in spaced relationship adjacent said magnetic storage medium such that, with respect to the direction of said magnetic storage medium rotation, a leading portion of said surface of said contact slider is in physical contact with said magnetic storage medium when said magnetic storage medium is not rotating such that stiction forces between said contact slider and said magnetic storage medium are minimized at commencement of rotation of said magnetic storage medium, said leading portion of said contact slider in physical contact with said magnetic storage medium generating a triboelectric charge as physical contact with said magnetic storage medium generating a triboelectric charge as rotation of said magnetic storage medium commences, said triboelectric charge propagating over said surface of said contact slider thereby generating said attractive force, said attractive force increasing in magnitude as said relative motion increases to said selected operating speed to a magnitude sufficient to attract and pull said contact slider to said magnetic storage medium such that substantially the entire surface of said contact slider is in physical contact with said magnetic storage medium when said selected operating speed is obtained.

5,535,074

DISK DRIVE APPARATUS HAVING UP AND DOWN HEAD SUPSENSIONS INDEPENDENTLY LOADABLE INTO A SPACE BETWEEN IMMEDIATELY ADJACENT DISKS

Chak M. Leung, Palo Alto, Calif., assignor to Read-Rite Corporation, Milpitas, Calif.

Continuation of Ser. No. 43,640, Apr. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 878,225, May 4, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 370,479

Int. Cl.^{6} G11B *5/48;5/54;5/55*

U.S. Cl. 360—104 **11 Claims**

1. A disk drive apparatus comprising:

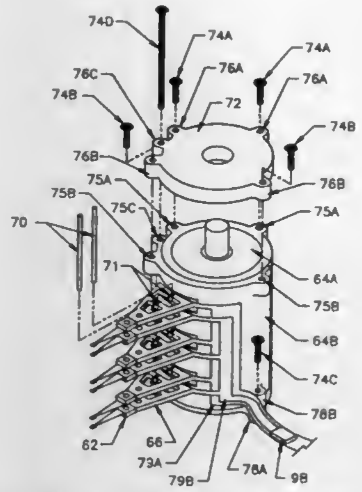
a plurality of disks disposed in a vertical space and having data storage tracks that rotate about a central axis;

a motor spindle for rotating said disks;

a multiplicity of magnetic head assemblies including suspensions for carrying head sliders and magnetic transducers;

a rotary actuator for bidirectionally transporting said head assemblies across said data tracks;

a headstack assembly including a first support structure for supporting a first number of said suspensions which carry only UP head sliders and a second support structure supporting a second number of said suspensions which carry only DOWN head sliders, said first number and said second number of said suspensions being the total number of said suspensions in said headstack assembly;



means coupling said headstack assembly to said actuator for rotating one of said first and second support structures independently of the other for loading and unloading said UP and DOWN sliders separately;

whereby said vertical space between said disks is effectively minimized by the sharing of said space by said suspensions supporting said UP sliders with said suspensions supporting said DOWN sliders.

5,535,075

SLIDING-TYPE MAGNETIC HEAD FOR MAGNETOOPTICAL RECORDING

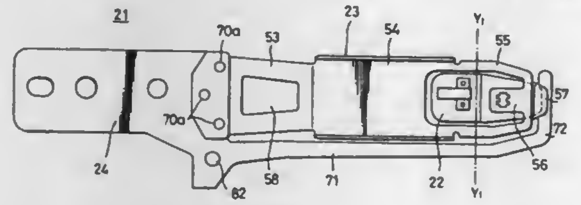
Tomoyuki Takahashi; Kazuhiro Kimura; Tadao Nishii; Kenji Yazawa; Kazutoshi Asada; Hideo Tanaka, and Michiaki Takeshi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

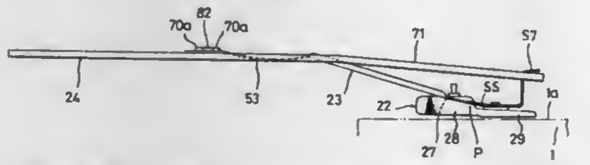
Filed Apr. 20, 1993, Ser. No. 48,895

Claims priority, application Japan, Apr. 20, 1992, 4-099999; Jun. 16, 1992, 4-157041; Oct. 28, 1992, 4-290415; Feb. 17, 1993, 5-028239

Int. Cl.^{6} G11B *5/48;21/24*

U.S. Cl. 360—105 **6 Claims**





1. A magnetic head for magnetooptically recording information on a magnetooptical recording medium in sliding contact therewith, comprising:

a head body arm portion having a sliding sole for sliding contact with a magnetooptical recording medium;

a leaf spring, said head body arm portion being supported by said leaf spring; and

a support member, said leaf spring having an end fixed to said support member;

said leaf spring comprising a first spring system joined to said support member, an inclined portion extending in a direction from said first spring system to said magnetooptical recording medium, a second spring system extending from said inclined portion, said second spring system having two spring means, and a third spring system extending from a distal end of said second spring system back toward said support member and arranged between said two spring means, said head body arm portion being supported by said third spring system;

said support member having a stopper which holds the distal end of said second spring system in a position to store a predetermined amount of recovery energy in said leaf spring, and said stopper including a stopper arm with a protrusion which extends from said head arm portion and said stopper arm running alongside said head arm portion and said leaf spring and a substantially perpendicular angle between said stopper arm and a stop which engages a locking hook.

5,535,076

HEAD DRIVING DEVICE HAVING A PLURALITY OF PINS ARRANGED FOR ENGAGEMENT WITH LEAD SCREW

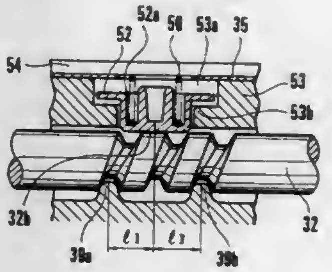
Noriaki Kamioka, and Akio Hoshi, both of Saitama-ken, Japan, assignors to Canon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1993, Ser. No. 132,752

Claims priority, application Japan, Oct. 16, 1992, 4-072349

Int. Cl.^{6} G11B *5/55*

U.S. Cl. 360—106 **20 Claims**



1. A head driving device comprising:

a) a head;

b) a head carriage arranged to carry said head and to be capable of moving in a radial direction of a recording medium;

c) a guide bar arranged to movably support said head carriage;

d) a lead screw arranged to drive said head carriage and parallel to said guide bar;

e) a motor arranged to drive and rotate said lead screw; and

f) a plurality of pins fixed to said head carriage and arranged to engage a lead groove formed in said lead screw, each pin coming into contact with the lead groove at a point.

5,535,077

MAGNETORESISTIVE HEAD HAVING MAGNETICALLY BALANCED MAGNETORESISTIVE ELEMENTS LAMINATED ON OPPOSITE SIDES OF AN ELECTRICALLY CONDUCTIVE FILM

Norio Saito, Miyagi, and Yutaka Soda, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1994, Ser. No. 356,533

Claims priority, application Japan, Dec. 28, 1993, 5-336267

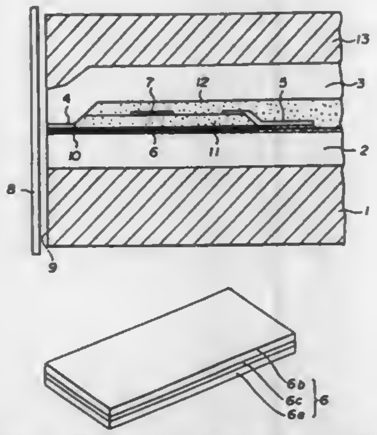
Int. Cl.^{6} G11B *5/39*

U.S. Cl. 360—113 **2 Claims**

1. A magnetoresistive effect magnetic head comprising:

a laminated magnetoresistive effect film comprising an electrically conductive intermediate film with unshorted first and second magnetoresistive effect elements laminated on opposite sides of the electrically conductive intermediate film, the laminated magnetoresistive effect film being substantially rectangular in shape, the electrically conductive intermediate film being made from material selected from the group consisting of stable metals that scarcely react with permalloy and carbon films capable of transmitting small currents therethrough;

a pair of shield magnetic members arranged so that such shield magnetic members are positioned on opposite sides of the



laminated magnetoresistive effect film in a direction of the thickness of the laminated magnetoresistive effect film with insulating layers positioned between the magnetoresistive effect film and each of said shield magnetic members;

a front electrode positioned on an end of said laminated magnetoresistive effect film designed to face a magnetic recording medium, said first electrode being positioned between one of the shield magnetic members and the laminated magnetoresistive effect film;

a rear electrode positioned on an end of the laminated magnetoresistive effect film opposite the end at which the front electrode is positioned, said rear electrode extending beyond the end of the laminated magnetoresistive effect film; and

a magnetic film biasing member operatively positioned for impressing a bias magnetic field on the laminated magnetoresistive effect film,

wherein,

the magnetoresistive head has a magnetic gap with a magnetic gap length of not more than 0.35"μ,

the intermediate film has a melting point not lower than a melting point of the first and second magnetoresistive effect elements, and

I_m represents current transmitted through the electrically conductive intermediate film and I_t represents current transmitted through the laminated magnetoresistive effect film in its entirety and the magnetoresistive effect film is configured such that I_m/I_t is greater than 0.1 thereby effective to maintain a magnetic balance between the first and second magnetoresistive elements. .

5,535,078

MAGNETIC MULTI-TRACK READ/WRITE HEAD WITH RECESSED CORE GAP STRUCTURE AND SHIELD ARRANGEMENT

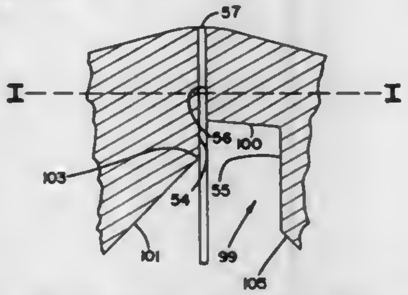
Dennis J. Warwick, Richfield, Minn., assignor to Data Card Corporation, Minnetonka, Minn.

Continuation of Ser. No. 16,965, Feb. 12, 1993, abandoned.

This application Jan. 17, 1995, Ser. No. 373,880

Int. Cl.^{6} G11B *5/23;5/115*

U.S. Cl. 360—119 **17 Claims**



14. A magnetic read/write head, recording information on both high coercivity and low coercivity magnetic stripe, the magnetic read/write head comprising:

a read/write core comprising a write head member having a write head end surface, a write head oblique surface obliquely extending from one end of the write head end surface, and a write head core winding surface upon which a write head coil is wound, and a read head member having a read head end surface, a read head oblique surface, a recess portion disposed between the read head end surface and the read head oblique surface, and a read head core winding surface upon which a read head coil is wound, said read/write head members being positioned adjacent to one another, said read and write head end surfaces forming a non-magnetic gap extending therebetween;

the recess portion including a vertical surface and an oblique surface, the vertical surface of the recess portion vertically extending between the oblique surface of the recess portion and the read head oblique surface, and the oblique surface of the recess portion obliquely extending between the vertical surface of the recess portion and the read head end surface at a predetermined angle;

the write head end surface, the read head end surface, and the vertical surface of the recess portion being substantially parallel to each other;

wherein the predetermined angle is approximately five degrees; and

wherein the one end of the write head end surface is located below the oblique surface of the recess portion and above the read head oblique surface with respect to a read/write head magnetic stripe facing surface.

5,535,079

INTEGRATED THIN FILM MAGNETIC HEAD

Toshio Fukazawa, 151-30-3C-909, Mukaijima-Ninomaru-cho, Fushimi-ku, Kyoto; Yoshihiro Tosaki, 12-404, Sohjijidai, Ibaraki; Kumiko Wada, 2-2-22, Seiwadai-higashi, Kawanishi; Satoru Mitani, 1-13-15, Shohdai-nakamachi, Hirakata, and Terumi Yanagi, 2-11-9-103, Noe, Joto-ku, Osaka, all of, Japan

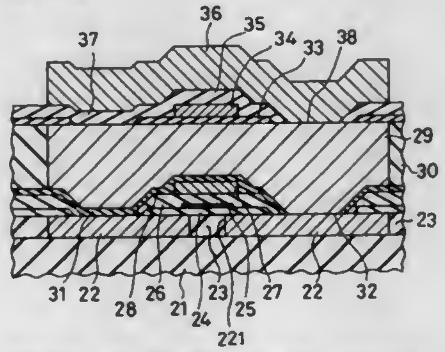
Continuation of Ser. No. 888,357, May 27, 1992, abandoned.

This application Nov. 1, 1994, Ser. No. 332,048

Claims priority, application Japan, May 30, 1991, 3-126316

Int. Cl.^{6} G11B *5/29;5/127;5/147*

U.S. Cl. 360—126 **1 Claim**



1. An integrated thin film magnetic head comprising:

a non-magnetic substrate;

a thin film read pole laminated in a surface-to-surface abutting relation on said non-magnetic substrate; and

a thin film write pole laminated on said thin film read pole opposite said non-magnetic substrate, said thin film read pole overlying said non-magnetic substrate, which is formed prior to said thin film read pole, and said thin film read pole underlying said thin film write pole, which is formed after said thin film read pole,

said thin film read pole comprising:

a first yoke laminated on said non-magnetic substrate in an abutting relation therewith such that said first yoke overlies said non-magnetic substrate, said first yoke having a gap defined therein,

a magneto-resistive effect element overlying said first yoke at a location adjacent to said gap,

a second yoke overlying said magneto-resistive effect element, said first yoke, said second yoke and said magneto-resistive effect element being magnetically coupled to form a first magnetic circuit,

a bias conductor overlying said magneto-resistive effect element at a location adjacent to said magneto-resistive effect element and underlying said second yoke, said bias conductor being operative to apply a biasing magnetic field on said magneto-resistive effect element, and

a first front gap member disposed between said first yoke and said second yoke, said first front gap member being disposed to face said recording medium during operation of said thin film magnetic head;

said thin film write pole comprising:

a first magnetic core,

a second magnetic core being magnetically coupled to said first magnetic core to form a second magnetic circuit,

an electrically-conductive coil disposed between said first magnetic core and said second magnetic core, and

a second front gap member disposed between said first magnetic core and said second magnetic core, said second front gap member being disposed to face a recording medium during operation of said thin film magnetic head;

said first yoke being first laminated on said non-magnetic substrate, said magneto-restrictive effect element being next laminated on said first yoke, said bias conductor being next laminated over said magneto-restrictive effect element, said second yoke being next laminated over said bias conductor, said electrically conductive coil being next laminated over said second yoke, and said second magnetic core being next laminated over said electrically conductive coil,

said non-magnetic substrate having a thickness and said magneto-resistive effect element being provided proximate to said non-magnetic substrate to minimize stresses induced in said magneto-resistive effect element during manufacture of said integrated thin film magnetic head, and said first magnetic core of said thin film write pole also constituting said second yoke of said thin film read pole, so that said first magnetic core and said second magnetic core of said thin film write pole and said first yoke and said second yoke of said thin film read pole are magnetically coupled with each other, thereby minimizing a thickness of said integrated thin film magnetic head.

5,535,080

MAGNETIC HEAD CONNECTING STRUCTURE HAVING TEMPORARILY RETAINING PAWLS

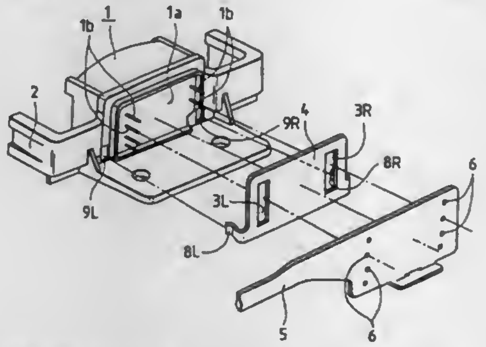
Naoto Inoue, and Kiyotaka Yamaguchi, both of Yamagata, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,563

Claims priority, application Japan, Dec. 25, 1993, 5-073917 U

Int. Cl.^{6} G11B *5/10*

U.S. Cl. 360—129 **18 Claims**



1. A magnetic head connecting structure comprising:

a tape guide having fixing holes formed in a back of said tape guide;

a magnetic head held by said tape guide;

a backshield covering a back of the magnetic head and comprising a metal strip and including openings;

a flexible board soldered to lead terminals of the magnetic head which project through said openings of the backshield; and

a pair of temporarily retaining pawls projecting toward the tape guide, which are arranged on the backshield, the temporarily retaining pawls being inserted and temporarily retained in corresponding ones of said fixing holes formed in a back of the tape guide,

wherein said temporarily retaining pawls are positioned at right angles to said backshield and are integrally formed with said backshield.

5,535,081

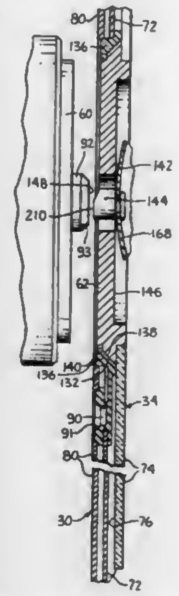
IMMOBILIZER FOR A DATA STORAGE DISK IN A CARTRIDGE USING AN OVERCENTER SPRING

Kenneth J. Nelson, Santa Clara; Michael C. McGrath, Pleasanton, and Timothy O. Avery, San Jose, all of Calif., assignors to Avatar Systems Corporation, Milpitas, Calif.

Filed Jan. 11, 1995, Ser. No. 371,422

Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—133 **20 Claims**



1. A cartridge for a data storage disk drive including:

a disk having:

a hub for engagement with a disk drive spindle; and

a disk parking abutment surface;

a housing containing said disk, said housing including:

a housing peripheral edge portion;

first and second housing side portions on opposite sides of said housing peripheral edge portion having:

a window area for read/write head access to said disk defined thereby, said second housing side portion also having:

an opening for said hub therein; and

a housing abutment surface about said opening in said second housing side portion facing said disk parking abutment surface and positioned for engagement therewith;

a shutter mounted to said housing having:

a first position covering said window area; and

a second position uncovering said window area; and

disk immobilization means to urge said disk parking abutment surface into abutment with said housing abutment surface when said shutter is in said first position, said disk immobilization means including:

a snap spring positioned adjacent said hub having:
  - a first stable position in contact with said hub wherein said snap spring urges said disk parking abutment surface into abutment with said housing abutment surface;
  - a second stable position wherein said snap spring is positioned out of contact with said hub.

5,535,082
TURN-ON CONTROL CIRCUIT FOR ELECTRIC DEVICES

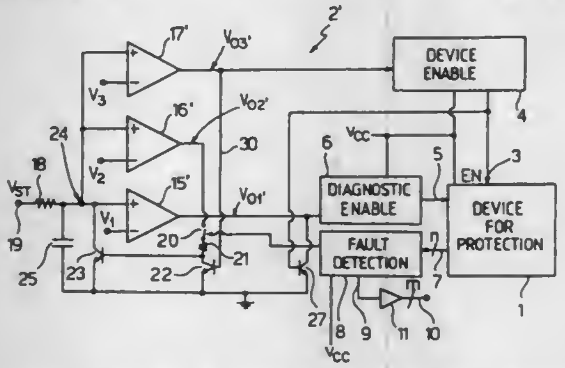
Edoardo Botti, 27029 Vigevano, Via Battú 16/D, Italy, and Andrea Fassina, 20155 Milano, Via Ercolano, 3, Italy

Filed May 28, 1993, Ser. No. 69,283

Claims priority, application European Pat. Off., May 29, 1992, 92830281

Int. Cl.^{6} H02H *7/00*

U.S. Cl. 361—18 **20 Claims**



1. A circuit for turn-on control of a device requiring protection against undesired conditions, comprising:
  - a turn-on input terminal supplying an electric turn-on control signal whose amplitude varies in value during turn-on;
  - a fault detecting stage connected to the device, the fault detecting stage generating a fault signal upon detecting an undesired condition;
  - first comparing means having an input connected to said turn-on input terminal, and an output connectable to said fault detecting stage, said first comparing means generating a diagnostic enabling signal at its output when said turn-on control signal presents a first value;
  - a clamping element having an enabling terminal supplied with a clamp enabling signal, and a clamping terminal connectable to said input of said first comparing means, for preventing said turn-on control signal from varying in the presence of said clamp enabling signal;
  - circuit means connectable to said fault detecting stage and connected to said enabling terminal of said clamping element, said circuit means providing said clamp enabling signal in the presence of said fault signal;
  - second comparing means having an input connected to said turn-on input terminal, and an output generating a device enabling signal when said turn-on control signal presents a second value higher than said first value; and
  - a device enabling stage having an input connected to the output of the second comparing means and output connected to said device, the device enabling stage turning on the device upon receiving the device enabling signal from the second comparing means.

5,535,083
MAGNETIC COIL ASSEMBLY WITH SURGE ABSORBER

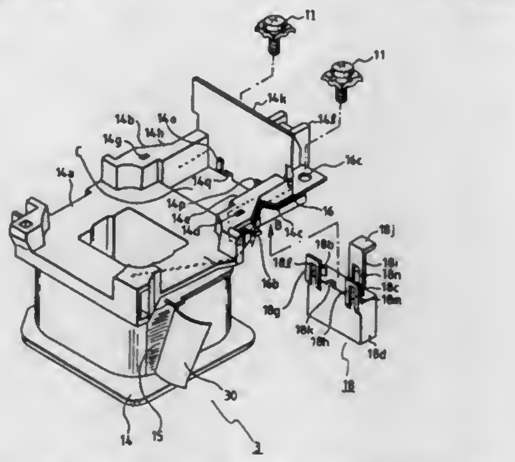
Yuji Sako, and Shigeharu Ootsuka, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1993, Ser. No. 10,358

Claims priority, application Japan, Aug. 27, 1992, 4-228547

Int. Cl.^{6} H02H *7/04*

U.S. Cl. 361—38 **21 Claims**



1. A magnetic coil for use with a surge absorber having absorber terminals in a magnetic coil assembly, wherein said magnetic coil comprises:
  - a coil spool;
  - a winding wound around said coil spool; and
  - coil terminals installed on said coil spool and electrically connected with said winding; and
  - wherein said surge absorber is releasably locked to at least one of said coil spool and said coil terminals by means integral with at least one of said surge absorber, said coil spool, and said coil terminals, wherein said surge absorber is releasably locked to said at least one of said coil spool and said coil terminals such that said surge absorber is automatically removed from said magnetic coil assembly when said magnetic coil is removed from said magnetic coil assembly, wherein the absorber terminals of said surge absorber are disposed to make contact with said coil terminals to electrically connect said coil terminals and said absorber terminals, and wherein said surge absorber may be disconnected from said magnetic coil solely by unlocking said means.

5,535,084
SEMICONDUCTOR INTEGRATED CIRCUIT HAVING PROTECTION CIRCUITS

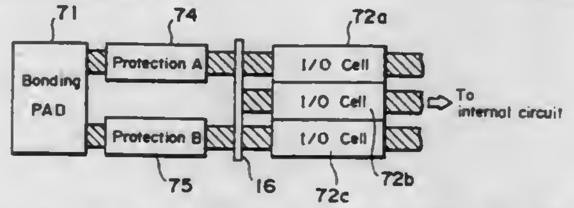
Osamu Nakayama, Utsunomiya, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jul. 23, 1993, Ser. No. 95,914

Claims priority, application Japan, Jul. 24, 1992, 4-198789

Int. Cl.^{6} H01L *23/62;* **H02H** *9/02*

U.S. Cl. 361—56 **12 Claims**



1. A semiconductor integrated circuit including at least one input/output circuit, each at least one input/output circuit comprising:
  - a bonding pad;
  - a plurality of input/output cells;
  - at least one wiring pattern extending between the bonding pad and the plurality of input/output cells, the at least one wiring pattern electrically connecting each of the plurality of input/output cells to the bonding pad; and
  - a plurality of protection circuits, the plurality of protection circuits including at least two types of protection circuits;
  - wherein each of the plurality of protection circuits is electrically connected to the at least one wiring pattern at a point between the bonding pad and the plurality of input/output cells, such that a propagation time of an excessive voltage pulse from the bonding pad to each of the plurality of protection circuits is substantially the same.

5,535,085
SNUBBER ENERGY RECOVERY CIRCUIT FOR PROTECTING SWITCHING DEVICES FROM VOLTAGE AND CURRENT

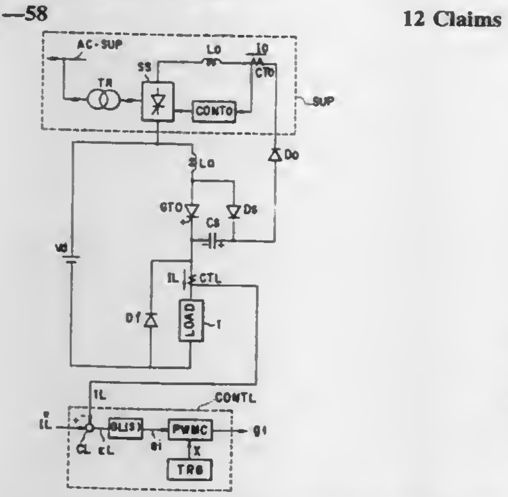
Shigeru Tanaka, and William Ofosu-Amaah, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 13,438, Feb. 4, 1993, Pat. No. 5,444,594. This application Apr. 17, 1995, Ser. No. 422,943

Claims priority, application Japan, Feb. 7, 1992, 4-21509; Feb. 20, 1992, 4-32476

Int. Cl.^{6} H02H *7/122*

U.S. Cl. 361—58 **12 Claims**



1. A snubber energy recovery circuit for protecting at least one switching device in a main circuit from excessive current or voltage supplied to said at least one switching device, said snubber energy recovery circuit comprising:
  - snubber means including at least one series circuit connected in parallel with said at least one switching device, each one of said at least one series circuit including a snubber diode and a snubber capacitor connected in series;
  - recovering means, coupled to each snubber capacitor, including at least one constant-current source for recovering energy stored in each snubber capacitor and outputting said recovered energy to the main circuit via said at least one constant-current source as a constant current, each of said at least one constant-current source connected to a node of a snubber capacitor so that each snubber diode is supplied with energy output from a corresponding snubber capacitor and for supplying constant current to the main circuit.

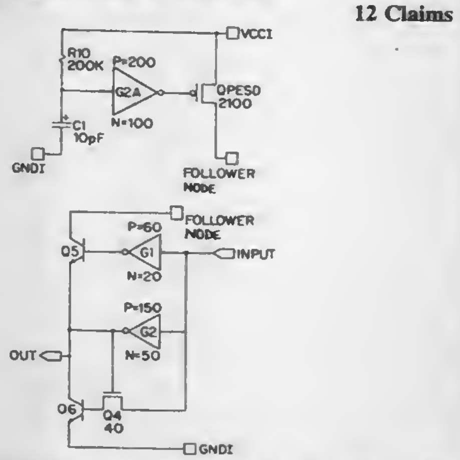
5,535,086
ESD PROTECTION CIRCUIT AND METHOD FOR BICMOS DEVICES

Ray A. Mentzer, Portland, Me., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Sep. 22, 1994, Ser. No. 310,646

Int. Cl.^{6} H02H *3/20;9/02*

U.S. Cl. 361—91 **12 Claims**



1. An ESD protection circuit for a BICMOS IC device for protecting an NMOS transistor of an internal CMOS gate from ESD events at a high potential power rail, said NMOS transistor being coupled between a pullup bipolar emitter follower transistor and a low potential power rail, comprising:
  - a PMOS current control transistor having a primary current path coupled between the high potential power rail and the bipolar emitter follower transistor for controlling current flow through said emitter follower transistor;
  - an RC time constant circuit coupled between said high potential power rail and low potential power rail, said RC time constant circuit being constructed with a time constant for following power up events but not for following the faster ESD events at the high potential power rail;
  - and an inverter gate coupled between the control gate node of the PMOS control transistor and the RC time constant circuit for turning off the PMOS current control transistor during ESD event at the high potential power rail thereby protecting NMOS transistors coupled to said emitter follower transistor.

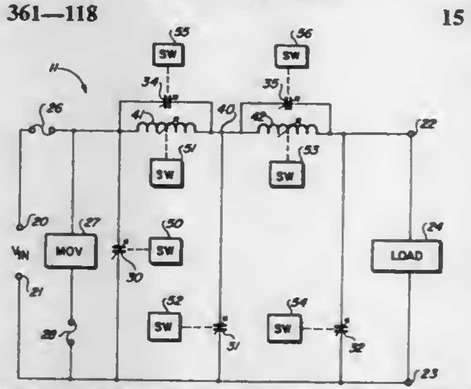
5,535,087
CIRCUIT FOR REDUCING EFFECTS OF TRANSIENT EVENTS ON ELECTRONIC EQUIPMENT

James D. Puckett; Edward K. Weiss, both of Phoenix; Paul E. Russell, Scottsdale, and J. Michael Pearson, Glendale, all of Ariz., assignors to Power Quality Engenieering, Inc., Phoenix, Ariz.

Filed Jan. 14, 1994, Ser. No. 181,854

Int. Cl.^{6} H03J *3/22*

U.S. Cl. 361—118 **15 Claims**



1. A circuit for reducing the effects of transient changes generated by a load and external power source on the waveforms of voltage and current provided at the load, said circuit comprising:

a) a pair of input terminals for coupling to an external power source;
b) a pair of output terminals for coupling to the load, one of said output terminals being coupled to one of said input terminals;
c) a plurality of inductive elements connected in series between one of said input terminals and one of said output terminals, said inductive elements being interconnected at an internal terminal;
d) first control means for individually varying the impedance of at least one of said inductive elements;
e) a plurality of first capacitive elements, each of said first elements being connected in parallel with one of the inductive elements;
f) second control means for individually varying the impedance of the first capacitive elements;
g) a plurality of filter capacitive elements, one of said filter capacitors being connected between said output terminals, another of said plurality being connected between the internal terminal and an output terminal; and
h) third control means for individually varying the impedance of the filter capacitive elements, said first, second and third control means varying the corresponding elements to reduce the effects of transient changes caused by the load and the external power source on the load.

5,535,088
CONTACTING CHARGING DEVICE FOR ELECTROSTATIC PHOTORECEPTOR DRUM

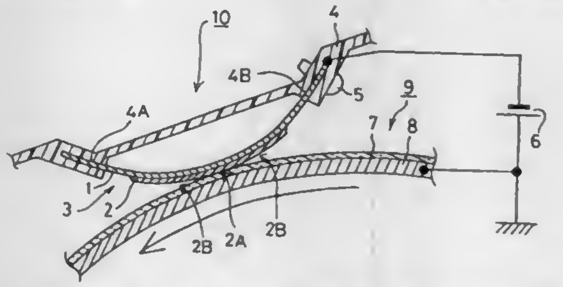
Shougo Sato; Ding-Yu Chen, and Makoto Suzuki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 31, 1994, Ser. No. 252,166

Claims priority, application Japan, Jun. 17, 1993, 5-032637 U; Jul. 15, 1993, 5-175181; Jul. 15, 1993, 5-175182

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 361—225 **20 Claims**



1. A contacting charging device contacting and charging a surface of a charge target and comprising:
- a sheet-shaped charging member having two opposite edges;
- a support member supporting said sheet-shaped charging member by grasping only the two opposite edges of the sheet-shaped charging member; and
- a voltage source supplying a charging voltage to said sheet-shaped charging member.

5,535,089
IONIZER

Joseph E. Ford, Cary; Ronald O. Hilger, Elmhurst, both of Ill., and Raymond Chan, Vancouver, Canada, assignors to Jing Mei Industrial Holdings, Ltd., Hong Kong, Hong Kong

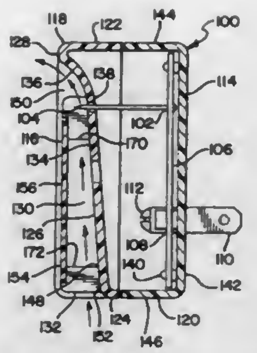
Filed Oct. 17, 1994, Ser. No. 323,751

Int. Cl.^{6} H01T *23/00*

U.S. Cl. 361—231 **12 Claims**

1. An ionizer, comprising:

ion emission means for emitting ions to ionize dust laden particles in a room;



housing means for at least partially enclosing and supporting said ion emission means;

cleaning means for substantially reducing the accumulation of ionized dust laden particles about said housing means;

wherein said cleaning means includes air ventilation means for circulating air past said ion emission means; and

wherein said air ventilation means comprises air channeling means defining an exhaust area about said ion emission means for egress of air and an entrance area spaced away from said ion emission means for ingress of air, said exhaust area having a smaller cross sectional than said entrance area to increase the flow rate of air flowing from the entrance area to the exhaust area past said ion emission means.

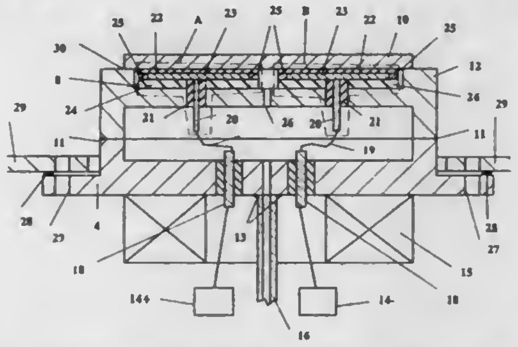
5,535,090
ELECTROSTATIC CHUCK

Arthur Sherman, 600 Sharon Park Dr., Suite C307, Menlo Park, Calif. 94025

Filed Mar. 3, 1994, Ser. No. 250,923

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **15 Claims**



1. An electrostatic chuck for holding an electrically conductive workpiece in a low pressure reactor, the chuck, comprising:
- a thermally-conductive base plate; a plurality of electrostatic structures disposed over the base plate, each electrostatic structure including:
- a first dielectric,
- an electrically conductive electrode forming a first capacitor plate in contact with the first dielectric, and
- a second dielectric in contact with the electrode, and
- a dielectric separator between the first and the second dielectrics and surrounding the electrode, wherein the electrically conductive workpiece forms a second capacitor plate and can be held against the first dielectric of at least one of the electrostatic structures under application of an electrical potential across the first and second capacitor plates.

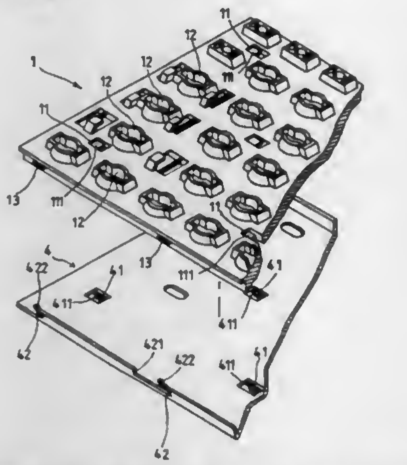
5,535,091
KEYBOARD STRUCTURE FOR MOBILE COMPUTERS

Michael Lee, 2F., No. 2, Lane 104, Ching-Hwa Street, Taipei, Taiwan

Filed Nov. 18, 1994, Ser. No. 341,121

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 361—680 **2 Claims**



1. A keyboard for a mobile computer comprising: a metal frame having two upright sides and a plurality of retainer rods defined between said two upright sides and a plurality of retaining grooves spaced on said upright sides; a membrane circuit supported on said metal frame, a rubber frame covered on said membrane circuit, and a key base frame covered on said rubber frame to hold a series of key switches, said key base frame comprising a plurality of locating holes, a plurality of locating rods respectively projecting into the locating holes and engaged with said retainer rods of said metal frame, and a plurality of retaining blocks at two opposite sides respectively fastened to said retaining grooves of said metal frame, wherein:

the retainer rods of said metal frame each have a respective front end terminating in an upwardly bent portion for guiding the locating rods of said key base frame into a position of engagement with the retainer rods of said metal frame; the upright sides of said metal frame comprises a plurality of openings of length slightly longer than that of said retaining blocks respectively extended from said retaining grooves for allowing said retaining blocks of said key base frame to be loaded on said metal frame vertically from the top into the openings on the upright sides of said metal frame and then moved sideways into engagement with said retaining grooves.

5,535,092
APPARATUS FOR REDUCING IMPACTS ON A HARD DISK ASSEMBLY

Kug-Hyeon Bang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

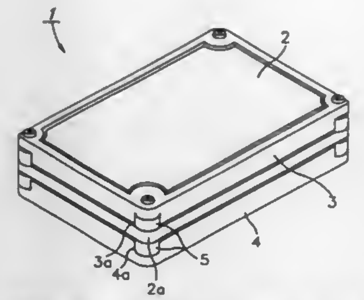
Filed Apr. 14, 1995, Ser. No. 422,526

Claims priority, application Rep. of Korea, Apr. 27, 1994, 9021/1994

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—685 **16 Claims**

9. An apparatus for reducing impact upon a hard disk assembly in a hard disk drive, said apparatus comprising:
- an upper frame;
- a lower frame;
- slots arcuately formed at corners of said upper frame and said lower frame;
- elastic elements for buffering the impacts, each one of said elastic elements having a hole formed at a center portion, said elastic elements being positioned within said slots arcuately formed at said corners of said upper frame and said lower frame;



- recesses arcuately formed at corners of said hard disk assembly for accommodating installation of said elastic elements at upper and lower portions of said corners of said hard disk assembly; and
- fastening means for attaching said elastic elements, said hard disk assembly, said lower frame and said upper frame together into a unitary structure so that said hard disk assembly has no direct contact with said upper frame and said lower frame.

5,535,093
PORTABLE COMPUTER DOCKING DEVICE HAVING A FIRST ROTATABLE CONNECTOR AND A SECOND CONNECTOR

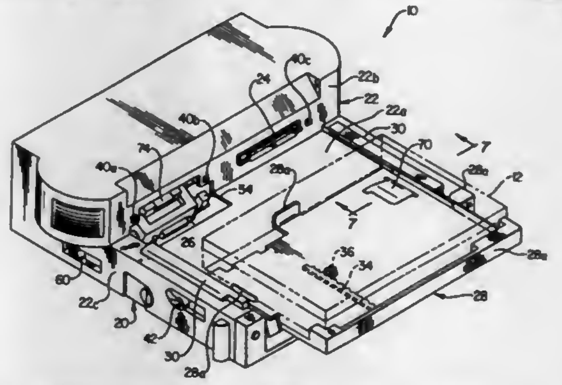
Hiroyuki Noguchi, Fujisawa; Hideyuki Usui, Chigasaki, and Kenshin Yonemochi, Kamakura, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1995, Ser. No. 416,391

Claims priority, application Japan, Jun. 20, 1994, 6-136968

Int. Cl.^{6} G06F *1/16;* H05K *7/10*

U.S. Cl. 361—686 **7 Claims**



1. A docking device for a portable computer, comprising:
- a body having a plurality of electronic components disposed therein which are adapted to be electrically connected to a portable computer;
- a surface supported by said body, wherein said surface is adapted to slidably receive a portable computer selected from among a plurality of portable computers having diverse sizes; and
- at least two electrical connectors disposed adjacent to said surface, wherein a first electrical connector is rotatably supported by said body and is rotatable between a first position and a second position, such that a selected portable computer may be electrically connected to said plurality of electronic components via only said first electrical connector when said first electrical connector is in said first position and may be electrically connected to said plurality of electronic components via only a second electrical connector when said first electrical connector is in said second position.

5,535,094

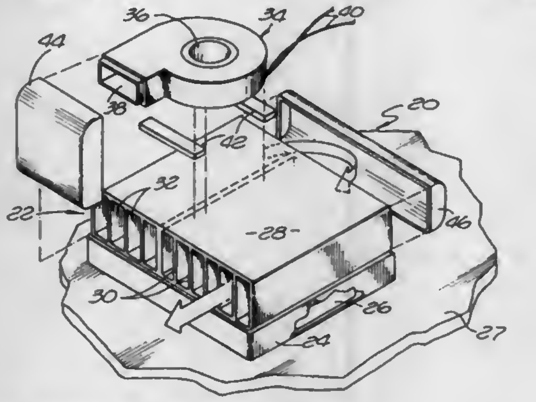
INTEGRATED CIRCUIT PACKAGE WITH AN INTEGRAL HEAT SINK AND FAN

Daryl J. Nelson, Beaverton; Muralidhar Tirumala, Portland; Peter Butler, Hillsboro, and Gerald A. Budelman, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 26, 1995, Ser. No. 429,079

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—697 **9 Claims**



1. An integrated circuit module, comprising:

an integrated circuit package that has a top surface;

a heat sink mounted to said top surface of said integrated circuit package, said heat sink having a plurality of channels that each have a longitudinal axis;

a blower that is mounted to said heat sink and which generates an airstream; and,

a manifold that is attached to said heat sink and said blower to direct the airstream so that the airstream flows in a direction essentially parallel with said top surface along the entire longitudinal axis of said channels.

5,535,095

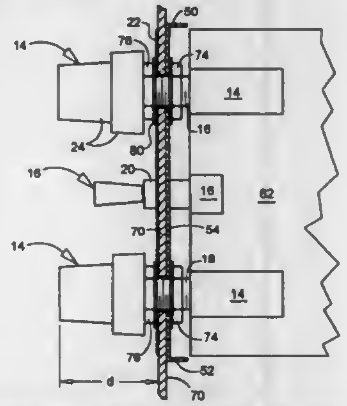
ADJUSTABLE CHASSIS FOR ELECTRONIC APPARATUS FOR INSTALLATION IN VARIABLE THICKNESS PANELS

R. Winston Slater, 48W938 Chandelle Dr., Hampshire, Ill. 60140, and Carl C. Sorensen, 905 S. Main St., Racine, Wis. 53403

Filed Apr. 15, 1994, Ser. No. 228,152

Int. Cl.^{6} H05K *1/18;7/14*

U.S. Cl. 361—725 **1 Claim**



1. An adjustable chassis enclosing electronic circuitry for mounting in an aircraft panel or other panel of uncertain and variable thickness, the electronic circuitry having control means rigidly affixed thereto and extending therefrom for insertion through a panel, the control means defining a longitudinal axis; the adjustable chassis having a base member and cover member, said members defining and completely enclosing an adjustable interior region which contains said electronic circuitry; the cover member defining a planar front wall and having at least one aperture therein adjustably repairing said control means therethrough; means rigidly affixing electronic circuitry to the base member within said adjustable interior region, the control means extending outwardly from within the interior region through the aperture, the longitudinal axis of the control means oriented perpendicularly to the planar front wall; means interconnecting the base and cover members for relative movement along the longitudinal axis between first contracted and second extended positions whereby when the base and cover members are contracted, the control means extends further outwardly of the cover front wall thereby permitting installation into panels of greater thickness and whereby when the base and cover members are extended, the control means does is not extended as far outwardly of the front wall thereby permitting installation in panels of lesser thickness.

5,535,096

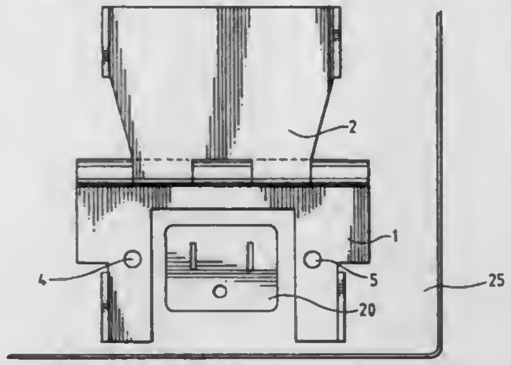
SAFETY LOCK-OUT DEVICE FOR ELECTRICAL APPLIANCES

Paul L. Cliff, Jr., Bloomingdale, Ill., assignor to Universities Research Association, Inc., Washington, D.C.

Filed Jan. 27, 1995, Ser. No. 379,270

Int. Cl.^{6} H02B *1/14*

U.S. Cl. 361—726 **2 Claims**



1. An apparatus for preventing delivery of electrical power to an electrical power cord receptacle of an electrical appliance, the apparatus comprising:

(a) an electrical appliance having an electrical power cord receptacle;

(b) a mounting plate fastened to said appliance, said mounting plate having an opening formed substantially in the central portion thereof and disposed over said receptacle, said mounting plate having a pair of first flange members extending substantially perpendicularly from adjacent said central opening, each of said first flange members having an opening formed therein;

(c) a cover plate hingedly attached to said mounting plate, said cover plate movable between a fist position and a second position such that, in said first position, said cover plate substantially covers said appliance receptacle, and in said second position, said appliance receptacle is substantially uncovered, said cover plate having a pair of second flange members extending substantially perpendicularly therefrom, each of said second flange members having an opening formed therein such that, in said first position, said second flange member openings align with said first flange member openings to permit the extension of a lock shank therethrough.

5,535,097

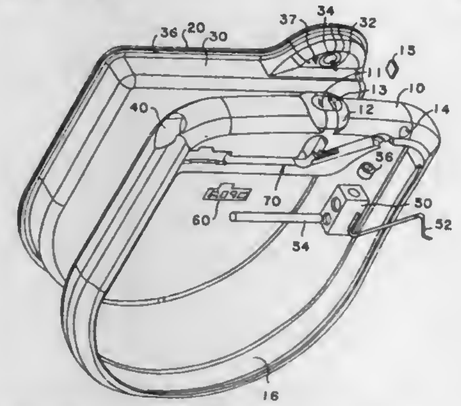
IMPLANTABLE MEDICAL DEVICE INCLUDING A FIRST ENCLOSURE PORTION HAVING A FEEDTHROUGH IN A SECOND INTERIOR SURFACE

David A. Ruben; Jeffrey L. Galvin, both of Mesa; Bill R. Simmons, Chandler; Lourdes O. Kline, Tempe, all of Ariz.; Lynn M. Seifried, Minneapolis, Minn.; Craig L. Wiklund, Bloomington, Minn.; John E. Nicholson, Blaine, Minn., and Thomas M. Nutzman, Andover, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 23, 1993, Ser. No. 158,066

Int. Cl.^{6} H05K *1/14;* **A61N** *1/18*

U.S. Cl. 361—736 **4 Claims**



1. An implantable medical device, comprising:

a first enclosure portion having a generally planar first, lower interior surface, a second interior surface generally parallel to said first, lower interior surface and displaced upward from said first, lower interior surface and a circumferential edge surface;

adhesive, located on said first, lower interior surface;

a battery having a terminal, said battery located on said adhesive;

an electronic circuit having a bonding pad, said electronic circuit located on said adhesive;

a wire, coupling said terminal to said bonding pad and wire bonded to said terminal and said pad;

a feedthrough, mounted to said first enclosure portion, extending through said second interior surface and extending from an exterior surface of said first enclosure portion;

a second enclosure portion mounted to said first enclosure portion to enclose said battery and circuit.

5,535,098

ELECTRICAL DEVICE, PARTICULARLY SWITCHING AND CONTROL DEVICE FOR MOTOR VEHICLES

Gert Jakob, Stuttgart; Erwin Liegl, Eberdingen-Hochdorf; Siegbert Luz, Waiblingen-Neustadt; Gerd Bohmwetsch, Marbach, and Martin Zywietz, Ludwigsburg, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/00416, § 371 Date Nov. 2, 1994, § 102(e) Date Nov. 2, 1994, PCT Pub. No. WO94/25310, PCT Pub. Date Nov. 10, 1994

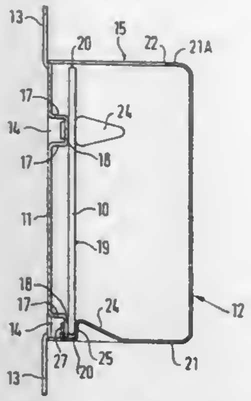
PCT Filed Apr. 15, 1994, Ser. No. 331,664

Claims priority, application Germany, Apr. 27, 1993, 43 13 429.7

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 361—752 **12 Claims**

1. An electrical device for vehicles, comprising at least one circuit board carrying an electronic circuit and having an edge of a predetermined total edge length; a housing in which said circuit board is arranged and which includes a housing cover part and a housing bottom part; and joining means which join said housing cover part, said housing bottom part and said circuit board with one another, said joining means including individual joints arranged at an edge of said circuit board, said joints having a length which is measured along said edge of said circuit board and is substantially smaller than said total edge length of said circuit board.



5,535,099

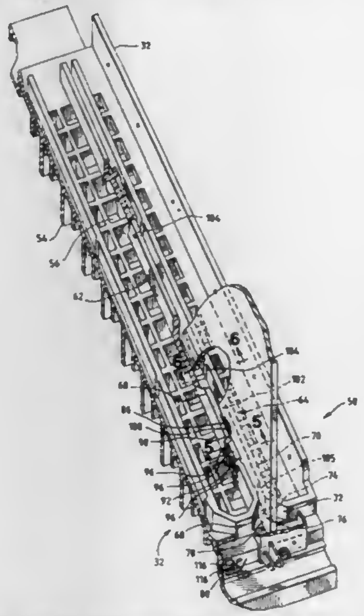
ENCLOSURE FOR ELECTRONIC MODULES

William F. McCarthy, Marblehead; Colin E. Brench, Stow, and Daniel M. Snow, Maynard, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 150,439, Nov. 10, 1993, abandoned, which is a division of Ser. No. 893,398, Jun. 4, 1992, Pat. No. 5,289,347. This application Nov. 28, 1994, Ser. No. 345,875

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—800 **8 Claims**



1. A Faraday shield for minimizing the leakage of electromagnetic interference and radio frequency interference of a maximum frequency and corresponding wavelength emanating from electronic components contained within the shield, said Faraday shield having a top, a bottom, a first side, a second side, a back and a front, said top having a top thickness and said bottom having a bottom thickness, wherein:

said top contains a plurality of top apertures each having at least one planar side surface and said bottom contains a plurality of bottom apertures each having at least one planar side surface, said top apertures and said bottom apertures being dimensioned to effectively block the escape of electromagnetic interference and radio frequency interference from said shield and to permit the flow of air to dissipate heat without generating acoustic noise;

said top thickness being at least one half of a diagonal length across the largest of said top apertures, said top apertures each having a longest top aperture side, the length of said longest top aperture side being less than one fourth of the wavelength of said maximum frequency; and

said bottom thickness being at least one half of a diagonal length across the largest of said bottom apertures, said bottom apertures each having a longest bottom aperture side, the length of said longest bottom aperture side being less than one fourth of the wavelength of said maximum frequency.

5,535,100

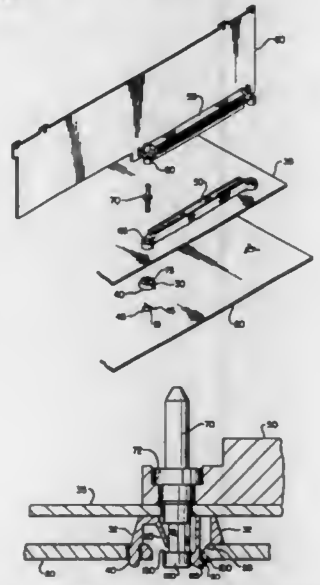
SNAP-TOGETHER/QUICK-RELEASE FASTENING ASSEMBLY FOR SUPPORTING A CIRCUIT CARD

Ken E. Lubahn, Byron, and Jim A. Melville, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,844

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—801 **8 Claims**



1. A fastening assembly for mounting a main circuit card a fixedly spaced distance from a mounting wall, comprising:

a pin having a lower end and an upper end, both centered about a center axis, the lower end having a bottom portion with a cross sectional area sized to pass through mounting apertures within the main circuit card and a main connector mounted to a top surface of the main circuit card that extend from the center axis at most a first distance, and wherein the bottom portion extends from the center axis at least a second distance, and further having a shaft portion fixedly spaced above and co-axial with the bottom portion that has a reduced cross sectional area such that at least a section of the shaft portion extends from the center axis a distance less then the second distance and such that a lip is formed by a side of the bottom portion where the bottom portion meets the shaft portion at the section, the upper end having a cross sectional area greater than the cross sectional area of the shaft portion and sized to pass through the mounting apertures, and the upper end including a flange extending out from the center axis a distance greater than the first distance such that the flange encounters the main connector when the pin is inserted in the mounting apertures; and

a support button having a head portion larger than the mounting apertures that contains a pin-receiving aperture centered about an axis, and having at least one locking spring arm with a flange at its end, the locking spring arm extending from the head along and parallel to the pin-receiving aperture and being adapted to be deflected toward the axis by a top surface of the mounting wall at the periphery of a mounting aperture in the mounting wall, thereby allowing the flange to pass through the mounting wall's mounting aperture, the flange having a locking surface that engages a bottom surface of the wall once the flange has passed through the mounting wall's mounting aperture to prohibit the flange from returning through the mounting wall's mounting aperture, and further wherein the support button has at least one retaining spring arm extending from the head at an angle downwardly into the pin-receiving aperture toward the axis, the retaining spring arm being adapted to be deflected away from the axis by the bottom portion of the pin upon insertion of the pin into the pin-receiving aperture and then engaging the lip to prevent the pin from returning through the pin-receiving aperture when the bottom portion has been inserted beyond the retaining spring arm;

wherein the pin and support button are thereby configured as a fastening assembly that securely mounts the main circuit card a fixedly spaced distance from the mounting wall when the support button has been snapped into the mounting aperture of the mounting wall and the pin has been inserted through the main connector and main circuit card mounting apertures and snapped into the support button's pin-receiving aperture.

5,535,101

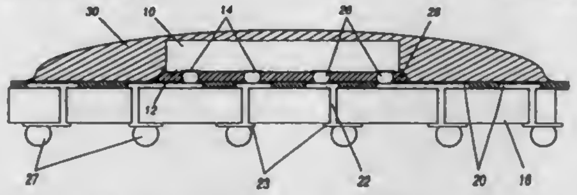
LEADLESS INTEGRATED CIRCUIT PACKAGE

Barry M. Miles, Plantation; Frank J. Juskey, Coral Springs, and Kingshuk Banerji, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1992, Ser. No. 970,901

Int. Cl.^{6} H05K *7/10*

U.S. Cl. 367—808 **8 Claims**



1. An integrated circuit package, comprising:

an integrated circuit chip having interconnection pads disposed on an active surface;

an organic substrate having two opposed sides, a first side having a circuitry pattern comprising bonding pads substantially corresponding to the integrated circuit chip interconnection pads and circuit traces coupled to the bonding pads, and a second side having a plurality of solder pads that are electrically connected to the bonding pads by plated through holes, most of the plated through holes located at a distance away from the corresponding bonding pads, the minimum spacing between the plurality of solder pads being greater than the minimum spacing between the integrated circuit chip bonding pads, at least some of the plated through holes being disposed in an area under the integrated circuit chip, and the substrate being substantially larger than the integrated circuit chip;

means for electrically and mechanically coupling the integrated circuit chip to the circuitry pattern, comprising bumps of electrically conducting material between the interconnection pads of the integrated circuit chip and the circuitry pattern;

an organic coupling agent disposed between the integrated circuit chip and the substrate, coveting at least a portion of the active surface; and

a glob top encapsulant covering the integrated circuit chip and substantially all of the first side of the substrate.

5,535,102

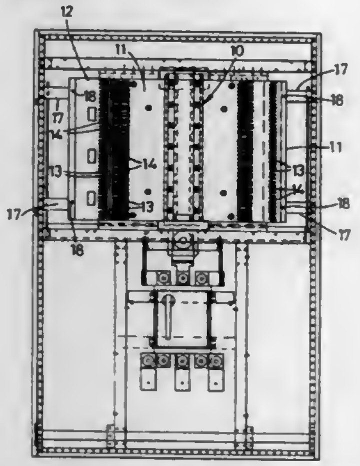
POWER DISTRIBUTION SWITCHBOARD ASSEMBLY

Kenneth Neill, and Keith W. Ball, both of Swibon, United Kingdom, assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 211,025, Jul. 19, 1994, abandoned. This application Feb. 24, 1995, Ser. No. 394,088

Int. Cl.^{6} H02B *1/04*

U.S. Cl. 361—832 **2 Claims**



1. A power distribution switchboard assembly capable of accepting plug-in outgoer base mechanical fixing/location arrangements or units having different sizes and format, said assembly comprising:

a framework support member disposed in said switchboard assembly; and

a first plate and a second plate secured to said framework support member, each formed with interspersed different format location apertures defined along a longitudinal direction, said first and second plates being located in juxtaposed relationship and being adjustable in a lateral direction so as to be capable of accepting different sized plug-in outgoer mechanical base fixing arrangements, wherein said second plate is adjustable from a position immediately adjacent to the edge of said first plate to different positions spaced at specified distances apart therefore by attaching said second plate to appropriate ones of a plurality of fixing apertures in said framework support member, said distances being sufficient to accommodate the mechanical location of the different outgoer units.

5,535,103

VEHICULAR HEADLAMP HAVING IMPROVED COVER MEMBER

Katsuhiko Iiyama, and Takaaki Nishizawa, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,805

Claims priority, application Japan, Apr. 26, 1994, 6-109137

Int. Cl.^{6} B60Q *1/068*

U.S. Cl. 362—66 **9 Claims**

1. A vehicular headlamp, comprising:

a lamp housing;

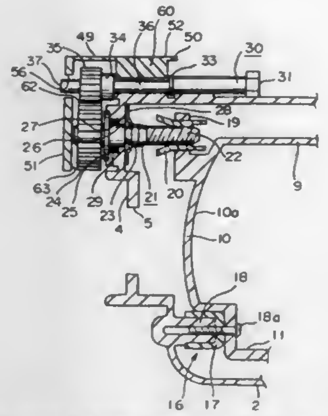
a reflector disposed within said lamp housing;

an aiming device comprising:

an aiming fulcrum tiltably supporting said reflector within said lamp housing;

an aiming screw, said aiming screw penetrating said lamp housing and being rotatably supported thereby, said aiming screw comprising a front end engaging with said reflector and a rear end protruding from said lamp housing;

a first gear secured to said rear end of said aiming screw;



an adjustment shaft rotatably supported by said lamp housing; and

a second gear secured to a rear end of said adjustment shaft, said second gear engaging with said first gear of said aiming device; and

a cover member covering both said first and second gears, said cover member being substantially bottomless so that any foreign matter that enters a gear section, including said first and second gears, will drop downwardly so as to exit said gear section.

5,535,104

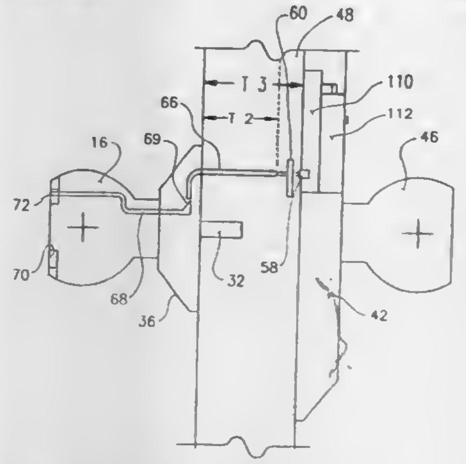
REMOTELY ACTUATED DOOR LOCK LIGHT

George E. Maffey, Dana Point, Calif.; David A. Saar, Lawrenceville, and Raymond W. Simpson, Hamilton Square, both of N.J., assignors to Emhart Inc., Newark, Del.

Filed Aug. 11, 1995, Ser. No. 514,281

Int. Cl.^{6} E05B *17/10*

U.S. Cl. 362—100 **10 Claims**



1. A door lock assembly comprising

a lock plug having a key receiving opening,

selectively operable light source means for illuminating said key receiving opening,

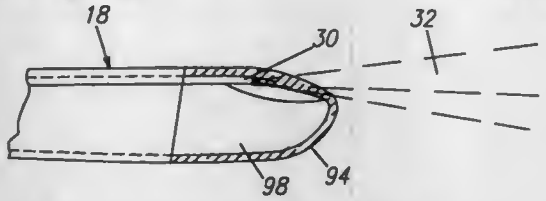
RF receiver means for reproducing a received pulsed RF signal and

means for determining whether said reproduced RF signal is within an acceptable range of asymmetric patterns of "on" pulse times followed by "off" times selected to include a plurality of different asymmetric patterns and

means for operating said light source means for a selected period of time when said determining means determines that said reproduced RF signal is within said acceptable range.

5,535,105
WORK GLOVE AND ILLUMINATOR ASSEMBLY

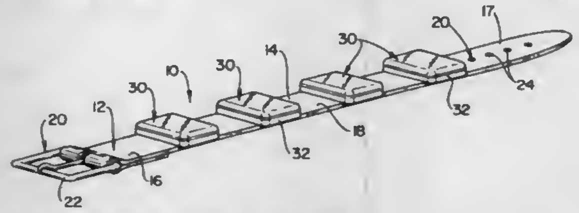
Howard P. Koenen, 1526 E. Lind St., Tuscon, Ariz. 85719
Continuation-in-part of Ser. No. 926,164, Aug. 5, 1992, Pat. No. 5,283,722. This application Dec. 10, 1993, Ser. No. 165,408
Int. Cl.^{6} F21L *15/10*
U.S. Cl. 362—103 **8 Claims**



1. A glove and illuminator assembly comprising:
(a) a glove defining an inside hand chamber and having a plurality of fingers; and
(b) illumination means comprising a light generator and a light projector, wherein the light projector is securely mounted proximate to one of the plurality of fingers and is oriented to project a light beam distally of the glove;
wherein one of the plurality of fingers has a fingertip which is at least translucent and wherein the light projector is oriented proximate to the translucent fingertip so as to project a light beam through the translucent fingertip.

5,535,106
HIGH VISIBILITY ANIMAL COLLAR

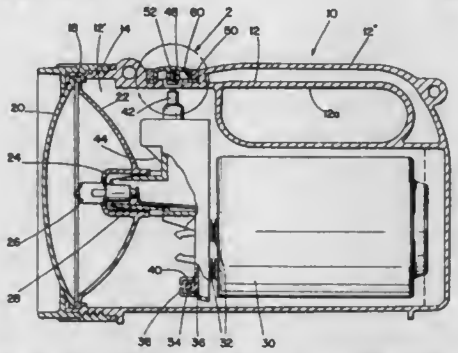
Amy J. Tangen, 1050 Jefferson Ave., Miami Beach, Fla. 33139
Filed Dec. 9, 1994, Ser. No. 353,552
Int. Cl.^{6} F21L *15/14*
U.S. Cl. 362—108 **1 Claim**



1. A collar for an animal comprising:
an elongate strap including an upper surface, a lower surface, a first distal end zone, an opposite second distal end zone, a mid-zone between said first and second distal end zones, and a plurality of apertures formed through said strap at spaced intervals along said mid-zone,
securing means on said opposite distal end zones of said strap for adjustably securing said strap on the animal,
a plurality of electrical light emitting and reflecting devices attachable to said elongate strap on said upper surface at spaced intervals along said mid-zone, each of said electrical light emitting and reflecting devices including:
a housing including a base having a bottom surface, and a cover formed of a rigid, translucent light reflective material including a top surface, said cover being removably attachable to said base to enclose an interior of said housing, and said base including a centrally disposed threaded bore formed in said bottom surface,
a light emitting source contained within the interior of said housing and including at least one light emitting diode,
conductor means defining a circuit for delivering an electrical current to said light emitting source,
switch means, exteriorly accessible on said housing, for opening and closing the circuit to operate said light emitting source, and
relay means for selective operation of said light emitting source between a continuous illuminated mode and an intermittent flashing mode, and
attachment means for individually and removably attaching each of said plurality of electrical light emitting and reflecting devices to said elongate strap and including a plurality of threaded fastening elements, each of said plurality of threaded fastening elements including a threaded stem structured and disposed for passage through a respective one of said plurality of apertures along said mid-zone of said strap for threaded engagement within said threaded bore of a respective one of said electrical light emitting and reflecting devices to hold said bottom surface of said base in mating engagement with said upper surface of said strap, each of said fastening elements further including an enlarged, flat head adapted for mating engagement with said lower surface of said strap in surrounding relation to said aperture, said flat head being substantially flush with said lower surface when said fastening element is attached to said respective electrical light emitting and reflecting device to thereby prevent uncomfortable protrusion against the animal.

5,535,107
COMBINATION GAS RECOMBINATION/VENTING MEANS FOR PORTABLE LIGHTING DEVICE

Robert A. Prok, Columbia Station, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Dec. 20, 1994, Ser. No. 359,594
Int. Cl.^{6} F21L *7/00*
U.S. Cl. 362—158 **10 Claims**

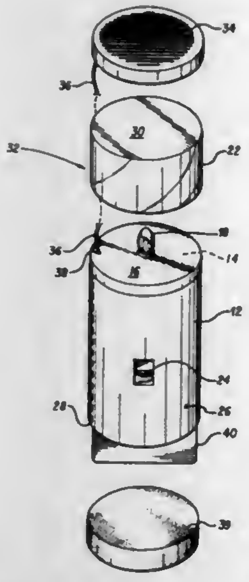


1. In an electrochemically operated device comprising a waterproof housing having an exterior and an interior enclosing at least one galvanic battery cell which evolves hydrogen gas, and a push button switch in said housing;
said housing having a shiftable boot exposed to said exterior and aligned on said interior with said switch;
a hydrogen recombination pellet in said housing, and a pellet retainer in said housing retaining said pellet;
said housing including an elastomeric septum between said interior and said exterior, said septum having a sphincter orifice therethrough of a size that said orifice is elastomerically squeezed closed except under a predetermined pressure differential thereacross, to thereby prevent water entry to said housing, but temporarily open to allow hydrogen gas escape from said housing at a pressure differential across said septum.

5,535,108
FLEET LIGHT

Dana K. Logsdon, 400½ W. Main St., Beardstown, Ill. 62618
Filed Mar. 3, 1995, Ser. No. 397,930
Int. Cl.^{6} F21L *7/00*
U.S. Cl. 362—183 **10 Claims**

1. A combination of a rechargeable barge light and a multiple barge fleet light recharging device for illuminating moored barges comprising:
a cylindrical barge fleet light unit including:

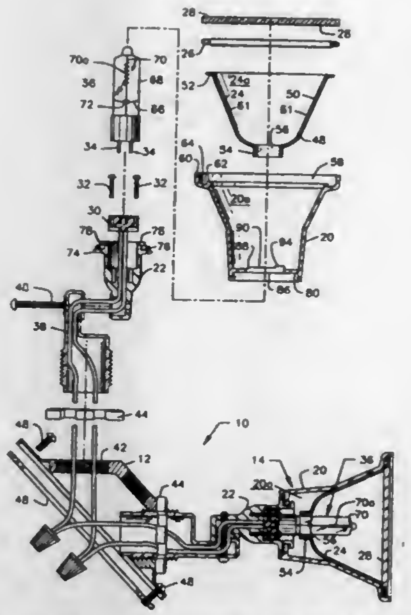


a cylindrical cover lens selected from plastic or glass having a flat top surface which is reflective, a clear cylindrical side and an open bottom;
a light bulb being centrally positioned inside said cover lens and horizontally illuminating 360°;
said light bulb being centrally positioned in and secured by a cylindrically shaped flat battery case cover;
said flat battery case cover having a reflective surface and being adapted to secure said cover lens and a cylindrical battery case; and
said battery case containing at least one rechargeable battery, whereby a moored barge fleet is adequately illuminated to warn any passing traffic; and
a multiple barge fleet light unit charger device comprising;
a rectangular direct current charger adapted to charge a fleet number of rechargeable barge fleet light units selected from twenty-four and forty-eight, and integrated with an A.C. to D.C. converter; whereby
the rechargeable barge fleet light units are recharged simultaneously for the next operation of illumination required.

5,535,109
QUARTZ HALOGEN FLOOD LIGHT ASSEMBLY HAVING IMPROVED HOUSING

Clyde R. Moore, Germantown; William A. Fredrick, Cordova, both of Tenn.; J. D. McIngvale, Hernando, Miss., and Mark T. Wedell, Germantown, Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.
Filed Apr. 29, 1994, Ser. No. 235,728
Int. Cl.^{6} F21V *21/14*
U.S. Cl. 362—267 **18 Claims**

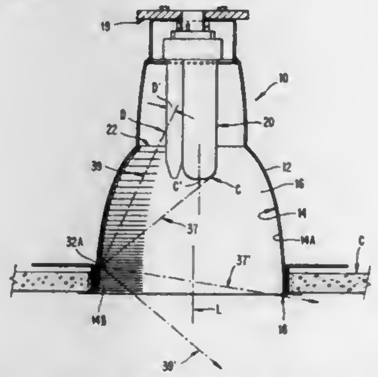
1. A sealed lighting assembly for attachment to a support structure, comprising:
a base, securable to said support structure;
a first housing member having longitudinally spaced distal and proximate ends, said distal end having an open face and said proximate end having a central hole formed therein, with a lens fixedly secured to said face;
a second housing member having a base end and a longitudinally opposed open connecting end, with a socket disposed therein for operatively retaining a lamp extending longitudinally through said open connecting end, said base end being adjustably securable to said base;
fastening means comprising cooperative keying means associated with said proximate end of said first housing member and said connecting end of said second housing member for removably interconnecting said first and second housing members, whereupon at least a portion of said lamp extends



through said hole in said proximate end and is disposed within said first housing member;
first sealing means operatively disposed intermediate said lens and said distal end of said first housing member; and
second sealing means operatively disposed intermediate said proximate end of said first housing member and said connecting end of said second housing member upon assembly thereof.

5,535,110
CEILING MOUNTED WALLWASH LIGHT FIXTURE

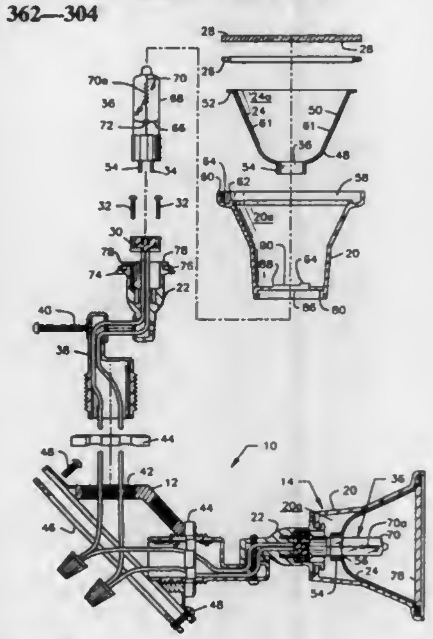
Geoffrey Ling, North Barrington, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 16, 1995, Ser. No. 389,403
Int. Cl.^{6} F21V *7/00*
U.S. Cl. 362—297 **20 Claims**



1. A recessed, ceiling-mount wallwash light fixture for use with a lamp, comprising a reflector body including an internal reflector surface forming a cavity; said reflector body having a lower edge defining a bottom opening of said cavity; said reflector surface including a wallwash segment extending around less than the entire inside perimeter of said reflector surface, said wallwash segment forming a plurality of vertically adjacent reflecting faces oriented at respective inclinations with respect to vertical for reflecting light below an opposite portion of said edge, said wallwash segment being vertically stepped in that each reflecting face is separated from a vertically adjacent reflecting face by a circumferentially extending non-reflecting step-defining face which interconnects a top edge of a reflecting face with a bottom edge of another reflecting face disposed thereabove.

5,535,111
QUARTZ HALOGEN FLOOD LIGHT ASSEMBLY HAVING IMPROVED LAMP AND REFLECTOR

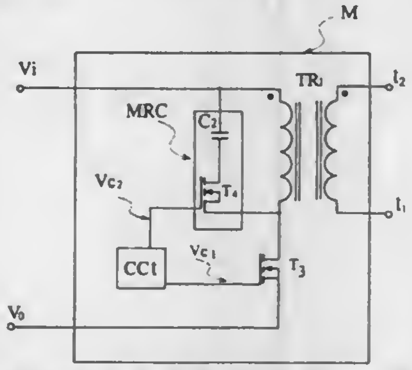
Mark T. Wedell, Germantown, Tenn., assignor to Thomas & Betts Corporation, Memphis, Tenn.
Filed Apr. 29, 1994, Ser. No. 235,445
Int. Cl.^{6} F21V *7/04*
U.S. Cl. 362—304 **7 Claims**



6. In combination:
a reflector defined by a generally cup-shaped surface forming a cavity therewithin including a curved bottom surface having a lower opening therethrough and diverging sidewalls terminating in a larger upper opening; and
a single-ended quartz halogen lamp comprising an envelope projecting through said reflector lower opening and a filament therein, said filament being disposed within said reflector cavity, said lamp including within said envelope a second reflector including a surface in substantial alignment with said reflector at said lower opening therein.

5,535,112
DC/DC CONVERSION CIRCUIT

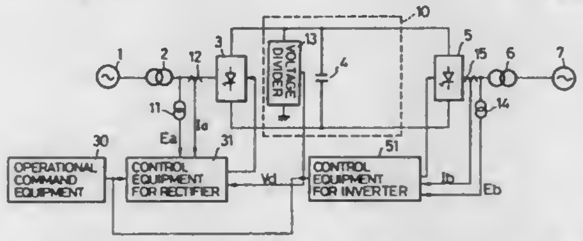
Manuel Vazquez Lopez, Tres Cantos; Enrique De La Cruz Moreno, Madrid, and Julio Rodriguez Perez, Fuenlabrada, all of, Spain, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed Mar. 30, 1994, Ser. No. 220,018
Claims priority, application Spain, Mar. 31, 1993, 9300668
Int. Cl.^{6} H02M *3/338*
U.S. Cl. 363—20 **7 Claims**



1. A DC/DC conversion circuit which comprises, in cascade: a DC/AC converter (M) receiving a DC supply voltage (Vi), a MOSFET self-driven synchronous rectifier (T1,T2) and a filter (L1,C1) producing a DC output voltage, wherein the DC/AC converter (M) includes means for generating an alternating signal with a square waveform having virtually no period of zero voltage.

5,535,113
CONTROL EQUIPMENT FOR HIGH VOLTAGE DIRECT CURRENT TRANSMISSION SYSTEM WITH EQUIPMENT OF SELF-COMMUTATED CONVERTER

Hiroo Konishi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 29, 1993, Ser. No. 11,352
Claims priority, application Japan, Jan. 30, 1992, 4-015012
Int. Cl.^{6} H02J *3/38;* **H02M** *5/45*
U.S. Cl. 363—35 **17 Claims**

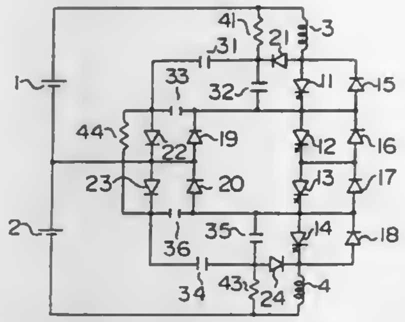

10
1
2
12
3
13
VOLTAGE DIVIDER
4
5
15
6
7
11
Ea
Id
31
14
30
51
OPERATIONAL COMMAND EQUIPMENT
CONTROL EQUIPMENT FOR RECTIFIER
Vd
CONTROL EQUIPMENT FOR INVERTER
Ib
Eb

1. A control equipment for a high voltage direct current (hvdc) transmission system having an equipment of self-commutated converter which comprises switching devices with a self-commutating function and is operated as a rectifier or an inverter, said control equipment comprising:
first control means for controlling a first equipment of self-commutated converter, operated as said rectifier, in such a manner as to hold the dc voltage of a dc system in said high voltage dc transmission system and the reactive power on the input side of said first equipment of self-commutated converter at specified values, and
second control means for controlling a second equipment of self-commutated converter, operated as said inverter, in such a manner as to hold the active power and the reactive power on the output side of said second equipment of self-commutated converter at specified values,
wherein said first control means includes first current control means for independently controlling each current signal for said first equipment derived from two-phase current signals transformed from three-phase alternating current signals, and said second control means includes second current control means for independently controlling each current signal for said second equipment derived from the two-phase current signals transformed from the three-phase alternating current signals.

5,535,114
POWER CONVERTER

Akira Horie; Yoshio Tsutsui; Takeshi Ando, all of Katsuta; Takayuki Matsui, Hitachi; Eiichi Toyota, and Syuuji Saitoo, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 964,892, Oct. 22, 1992, Pat. No. 5,461,556. This application Jun. 5, 1995, Ser. No. 462,530
Claims priority, application Japan, Oct. 22, 1991, 3-273716
Int. Cl.^{6} H02M *7/48*
U.S. Cl. 363—58 **14 Claims**

1. A power converter comprising:
a first self-quenching semiconductor switching element having a first terminal and a second terminal, the first terminal of the first switching element being connected to a first terminal of a power supply during operation of the power converter;
a second self-quenching semiconductor switching element having a first terminal and a second terminal, the first terminal of the second switching element being connected to the second terminal of the first switching element at a junction point between the first switching element and the second switching element, and the second terminal of the second switching element being connected to a second terminal of the power supply during operation of the power converter;

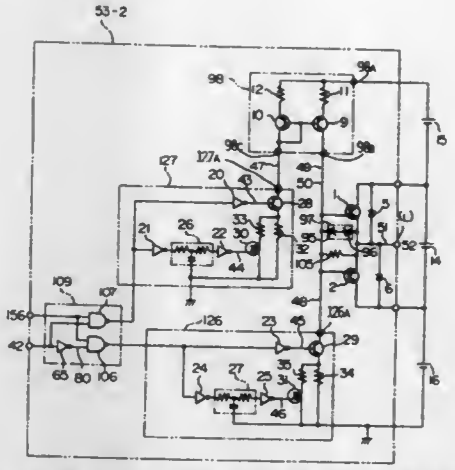


a first diode having a first terminal and a second terminal, the first terminal of the first diode being connected to the first terminal of the power supply during operation of the power converter;
a second diode having a first terminal and a second terminal, the second terminal of the second diode being connected to the second terminal of the power supply during operation of the power converter; and
a first capacitive element, a second capacitive element, and a third capacitive element connected to each other in either a delta configuration or a star configuration to form a capacitive circuit having a first terminal, a second terminal, and a third terminal, the first terminal of the capacitive circuit being connected to the second terminal of the first diode, the second terminal of the capacitive circuit being connected to the first terminal of the second diode, and the third terminal of the capacitive circuit being connected to the junction point between the first switching element and the second switching element;
wherein the first diode, the second diode, and the capacitive circuit constitute a snubber circuit for the first switching element and the second switching element;
wherein the capacitive circuit has a first equivalent capacitance constituting a first snubber capacitance for the first switching element and a second equivalent capacitance constituting a second snubber capacitance for the second switching element; and
wherein the first capacitive element, the second capacitive element, and the third capacitive element have respective capacitances selected such that the first snubber capacitance and the second snubber capacitance are substantially equal to each other.

5,535,115
OUTPUT CIRCUIT OF PWM INVERTER WHEREIN FLOATING TIME IS REDUCED

Toru Kishi, Yamatokoriyama, and Kazuyuki Takada, Hirakata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 143,504, Oct. 29, 1993, Pat. No. 5,347,444. This application Feb. 24, 1994, Ser. No. 201,232
Claims priority, application Japan, Oct. 30, 1992, 4-292472; Oct. 30, 1992, 4-292473; Dec. 8, 1992, 4-327769; Mar. 3, 1993, 5-042378
Int. Cl.^{6} H02M *5/44*
U.S. Cl. 363—98 **34 Claims**

1. An output circuit of a PWM inverter comprising:
first and second power elements;
first and second diodes;
first current control means having a current output terminal, said first current control means controlling a current flowing out from said current output terminal;



second current control means having a current input terminal, said second current control means controlling a current flowing in from said current input terminal; and .
a DC main power supply;
said first power element having a collector connected to a cathode of said first diode and a positive terminal of said DC main power supply;
said second power element having a collector connected to an anode of said second diode and a negative terminal of said DC main power supply;
said first power element having an emitter connected to an anode of said first diode, an emitter of said second power element and a cathode of said second diode;
said first power element having a control terminal connected to a control terminal of said second power element, said current output terminal of said first current control means and said current input terminal of said second current control means;
a resistor and voltage limit means exhibiting a zener phenomenon for positive and negative bidirectional voltages, said resistor and voltage limit means being connected in parallel between the control terminals and emitters of said first and second power elements;
said first and second current control means having:
- a first state in which a current flowing out from said current output terminal of said first current control means has a first current value and a current flowing in from said current input terminal of said second current control means has a seventh current value;
- a second state in which a current flowing out from said current output terminal of said first current control means has a second current value and a current flowing in from said current input terminal of said second current control means has an eighth current value;
- a third state in which a current flowing out from said current output terminal of said first current control means has a fifth current value and a current flowing in from said current input terminal of said second current control means has a third current value;
- a fourth state in which a current flowing out from said current output terminal of said first current control means has a sixth current value and a current flowing in from said current input terminal of said second current control means has a fourth current value; and
- a fifth state in which a current flowing out from said current output terminal of said first current control means has a ninth current value and a current flowing in from said current input terminal of said second current control means has also said ninth current value;

said first current value being larger than said seventh current value;
said second current value being larger than said eighth current value;
said third current value being larger than said fifth current value;

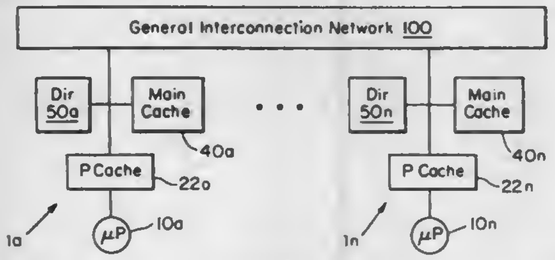
said fourth current value being larger than said sixth current value;
a difference between said first current value and said seventh current value being larger than a difference between said second current value and said eighth current value;
a difference between said third current value and said fifth current value being larger than a difference between said fourth current value and said sixth current value;
said first state being capable of proceeding to only said second and fifth states;
said second state being capable of proceeding to only said third and fifth states;
said third state being capable of proceeding to only said fourth and fifth states;
said fourth state being capable of proceeding to only said first and fifth states; and
said fifth state being capable of proceeding to at least said first and third states.

5,535,116

FLAT CACHE-ONLY MULTI-PROCESSOR ARCHITECTURES

Anoop Gupta, Menlo Park, and Truman Joe, Mountain View, both of Calif., assignors to Stanford University, Stanford, Calif.

Filed May 18, 1993, Ser. No. 63,628
Int. Cl.^{6} G05B *15/00*
U.S. Cl. 364—134 **38 Claims**



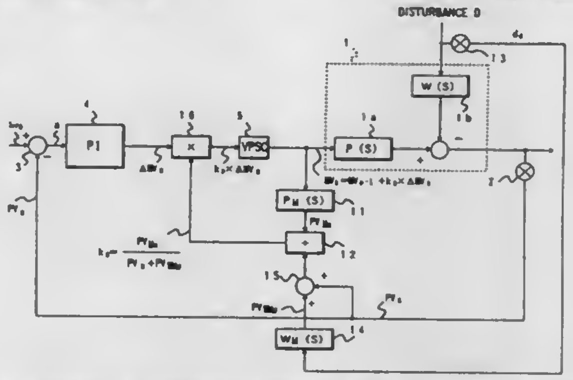
16. A shared-memory computer having a plurality of coupled processing nodes, comprising:
a) a global shared memory space organized in pages, each page having a plurality of respectively addressed data items;
b) a plurality of master processing nodes from the plurality of coupled processing nodes, each master processing node having stored therein a master copy of a data item in the global shared memory space;
c) a plurality of home processing nodes from the plurality of coupled processing nodes, each home processing node including:
  a data processor for executing software instructions;
  a main memory cache to the global shared memory space;
  a plurality of assigned data items, each assigned data item assigned to the assigned home processing node based on the address of the respective data item; and
  a directory memory for centralizing directory information for each data item assigned to the assigned home processing node, the directory information including an indication of the master processing node for the respective data item;
d) at least one data item having its home processing node differing from its master processing node; and
e) a general interconnection network for coupling the processing nodes.

5,535,117

METHOD AND APPARATUS FOR CONTROLLING A PROCESS HAVING A CONTROL LOOP USING FEEDBACK CONTROL

Kazuo Hiroi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 22, 1994, Ser. No. 215,576
Claims priority, application Japan, Mar. 22, 1993, 5-062158
Int. Cl.^{6} G05B *13/02*
U.S. Cl. 364—158 **16 Claims**



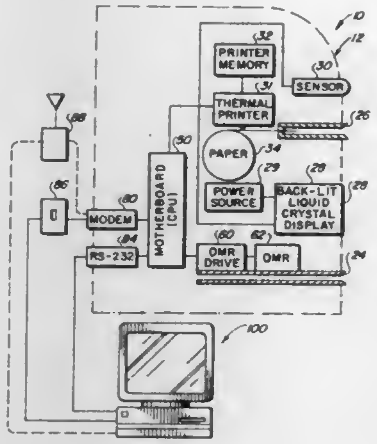
1. A method of controlling a process having a control loop using feedback control, comprising the steps of:
inputting a set point for controlling the process and a controlled variable from the process to calculate a deviation between the set point and the controlled variable;
performing one of PI (P: proportional, I: integral) adjustment calculation and PID (D: derivative) adjustment calculation in order to make the controlled variable from the process coincide with the set point and outputting a velocity-type adjustment calculating signal as a manipulated signal to the process;
inputting the manipulated signal and outputting a first approximation signal in accordance with a characteristics of an approximated controlled system;
receiving a disturbance signal to be added to the process and outputting a second approximation signal approximated to disturbance characteristics;
adding the second approximation signal and the controlled variable and outputting a result of addition;
calculating a gain correction ratio signal in accordance with a change in gain of a controlled system and a change in disturbance obtained upon a predetermined adjustment, on the basis of the result of addition and the first approximation signal; and
performing gain correction of the control loop by multiplying the gain correction ratio signal by the velocity-type adjustment calculating signal.

5,535,118

DATA COLLECTION DEVICE

Gregory R. Chumbley, 2999 Concorde Centre Dr., #902, Miami, Fla. 33180

Filed Feb. 22, 1995, Ser. No. 392,345
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—401 R **14 Claims**



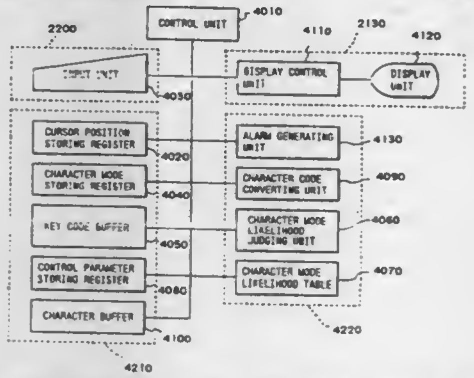
1. A device for collecting response data for a plurality of survey versions, said response data being collected from a data card of the type including an array of enclosed areas printed on the card in accordance with a predetermined positioning and arrangement thereof, the enclosed areas to be selectively darkened in response to one or more inquiries of a particular survey version, wherein each darkened area represents a response to a corresponding inquiry;
said device comprising:
  a housing including a front faced a back panel, a base, a first slot opening in said front face sized and configured for receipt of the data card therethrough and a second slot opening sized and configured for dispensing a predetermined length of a paper strip therefrom,
  a central processor unit within an interior of said housing and including control circuit means for controlling operation of said device, and primary memory means for storing data, including said response data, therein,
  visual display means on said housing for displaying information including instructional information relating to use and operation of said device,
  an optical mark reader positioned and disposed within said interior of said housing in communication with said first slot opening and structured to scan and read said data card to identify the darkened enclosed areas thereon and transmit said response data to said central processor unit corresponding with the location of each identified darkened area within said array relative to a fixed reference on said data card, said response data being stored in said primary memory means,
  said optical mark reader being further structured to scan and read indicia on said card identifying one of said plurality of survey versions, wherein said data card and said response data thereon correspond with said identified one of said plurality of survey versions,
  printer means supported within said housing interior and including a printer memory means for storing a plurality of pre-created coupons, each of said plurality of survey versions corresponding with at least one of said plurality of pre-created coupons, said printer means being actuated by said central processor unit to print indicia on said paper strip representing one of said plurality of pre-created coupons stored in said printer memory means, said one of said plurality of pre-created coupons printed by said printer means corresponding with said identified one of said plurality of survey versions, and
  said printer means being further structured to dispense a select length of said paper strip, with said one of said plurality of pre-created coupons printed thereon, through said second slot opening for retrieval by a user of said device.

5,535,119

CHARACTER INPUTTING METHOD ALLOWING INPUT OF A PLURALITY OF DIFFERENT TYPES OF CHARACTER SPECIES, AND INFORMATION PROCESSING EQUIPMENT ADOPTING THE SAME

Jun Ito, Yokohama; Yasumasa Matsuda, Tokyo-to; Hiroyuki Kumai, Yokohama; Akira Nakajima, Tokyo-to; Shigeki Taniguchi, Hitachi; Hirobumi Kashiwa, Hitachi; Toyokazu Suzuki, Hitachi; Masaki Kawase, Katsuta, and Hiromi Tomita, Hiratsuka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 901,236, Jun. 19, 1992. This application Jun. 11, 1993, Ser. No. 75,400
Claims priority, application Japan, Jun. 11, 1992, 4-152426; Jul. 2, 1992, 4-175769; Jul. 24, 1992, 4-198586
Int. Cl.^{6} G06F *17/28*
U.S. Cl. 364—419.03 **30 Claims**



CONTROL UNIT
4010
2200
4110
2130
4120
INPUT UNIT
4030
DISPLAY CONTROL UNIT
DISPLAY UNIT
CURSOR POSITION STORING REGISTER
4020
ALARM GENERATING UNIT
4130
CHARACTER MODE STORING REGISTER
4040
CHARACTER CODE CONVERTING UNIT
4090
KEY CODE BUFFER
4050
CHARACTER MODE LIKELIHOOD JUDGING UNIT
4060
CONTROL PARAMETER STORING REGISTER
4080
CHARACTER MODE LIKELIHOOD TABLE
4070
CHARACTER BUFFER
4100
4220
4210

1. An information processing equipment wherein character codes of a plurality of character species are held in correspondence with one key code; comprising:
an input means for entering key codes;
a translation means for translating each of said key codes entered from said input means, into character codes of said plurality of character species corresponding to said each of said key codes, and for delivering the translated character codes;
a display means including a first display area in which characters are displayed separately in the respective character species, for displaying in said first display area character strings corresponding to said translated character codes delivered from said translation means; and
a designation means for designating a desired character string part within a desired one of said character strings displayed in said first display area;
said display means including a second display area into which said character string part designated by said designation means is moved from said first display area.

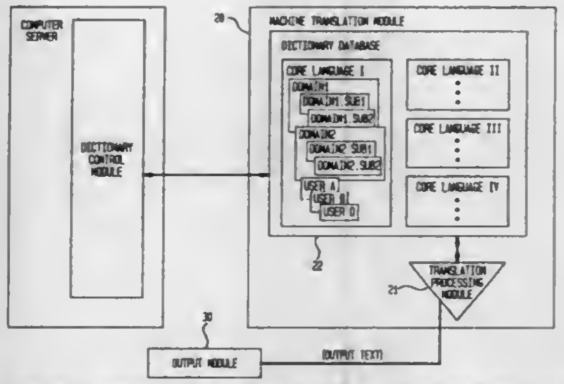
5,535,120

MACHINE TRANSLATION AND TELECOMMUNICATIONS SYSTEM USING USER ID DATA TO SELECT DICTIONARIES

Leighton K. Chong, New York, N.Y., and Christine K. Kamprath, Austin, Tex., assignors to Trans-International Corp., Honolulu, Hi.

Division of Ser. No. 312,440, Sep. 26, 1994, Pat. No. 5,497,319, which is a continuation of Ser. No. 920,456, Aug. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,400, Dec. 31, 1990, Pat. No. 5,175,684. This application Jun. 7, 1995, Ser. No. 487,450
Int. Cl.^{6} G06F *17/28*
U.S. Cl. 364—419.03 **3 Claims**

1. A machine translation system for translation of input texts sent from a plurality of different users, wherein each of said users may have a preferred sublanguage of text terminology used in the user's input text out of a plurality of possible sublanguages, and wherein a preferred sublanguage of a user is determinable from



one or more parameters of the user's identity, said machine translation system comprising:

(a) a receiving interface for receiving a series of translation jobs to be translated in sequence, each translation job comprising an input text and accompanying control input including user ID data identifying a user sending the input text, wherein said receiving interface includes means for identifying the input texts and accompanying control inputs for each one of the series of translation jobs and for queueing the input texts for translation in sequence;

(b) a machine translation module for performing machine translation of the input texts in sequence by translating each input text in a source language to an output text in a target language using a dictionary database containing entries for words of the source and target languages;

(c) a dictionary database including a core dictionary containing entries for generic words of the source and target languages, and a plurality of sublanguage dictionaries each containing entries for specialized words of a respective one of a plurality of sublanguages handled by said machine translation system for the source/target languages;

(d) a recognition module including a memory section for storing a plurality of user ID files each of which contains previously stored user sublanguage preference information which is indexed to user ID data for each respective user of said plurality of users, said user sublanguage preference information being indicative of a sublanguage of text terminology preferred by the respective user for translation of an input text from that user, wherein said recognition module is responsive to the user ID data received by said receiving interface to retrieve the user sublanguage preference information stored in the user ID file indexed to the user ID data;

(e) a dictionary control module responsive to the particular user sublanguage preference information retrieved by said recognition module for selecting a corresponding one of the plurality of sublanguage dictionaries of the dictionary database, and for causing the machine translation module to use the selected sublanguage dictionary along with the core dictionary for translation of the particular input text of each respective user; and

(f) an output module for outputting text in the target language translated by the machine translation module for each one of the input texts,

whereby said receiving interface identifies for each translation job in sequence the input text to be translated and the control input including user ID data identifying a particular user sending the particular input text and forwards the particular user ID data to the recognition module, the recognition module retrieves the particular user sublanguage preference information from the user ID files indexed to the particular user ID data and forwards it to the dictionary control module, and the dictionary control module selects the preferred sublanguage dictionary out of the plurality of sublanguage dictionaries that corresponds to the particular user sublanguage preference information for use by the machine translation module.

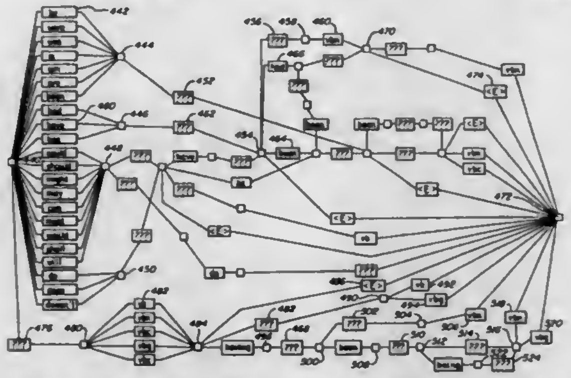
5,535,121
SYSTEM FOR CORRECTING AUXILIARY VERB SEQUENCES

Emmanuel Roche, Boston; Andrew R. Golding, Cambridge, and Yves Schabes, Boston, all of Mass., assignors to Mitsubishi Electric Research Laboratories, Inc., Cambridge, Mass.

Filed Jun. 1, 1994, Ser. No. 252,181

Int. Cl.^{6} G06F *17/27*

U.S. Cl. 364—419.08 **3 Claims**



1. In a grammar checking system in which sentences are first tagged as to parts of speech, a system for correcting incorrect auxiliary verb sequences having at least two verbs, comprising:

means responsive to said tags for detecting starting and ending points of said verb sequence;

means for identifying the verbs in said sequence;

a directed acyclic graph containing a set of auxiliary verb sequences;

means coupled to said directed acyclic graph for determining that said identified verbs are incorrect in accordance with the entries in said directed acyclic graph; and,

means for correcting said identified verbs determined to be incorrect.

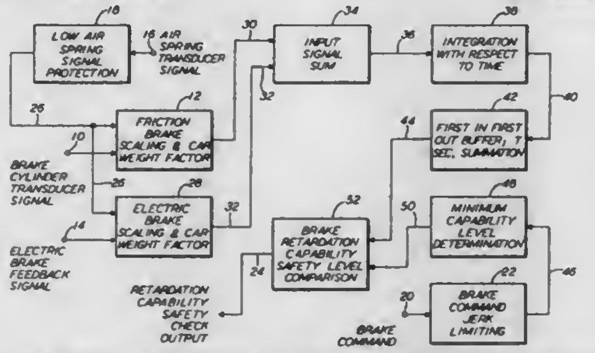
5,535,122
METHOD OF AND AN APPARATUS FOR PROVIDING A SAFETY CHECK OF THE BRAKE RETARDATION CAPABILITY OF A BRAKE SYSTEM ON A VEHICLE

James A. Wood, Spartanburg; David A. Greer, Simpsonville, and Richard J. Mazur, Greer, all of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 30, 1994, Ser. No. 219,778

Int. Cl.^{6} B60T *8/88;* **G06F** *7/70*

U.S. Cl. 364—426.01 **19 Claims**


18
LOW AIR SPRING SIGNAL PROTECTION
16 AIR SPRING TRANSDUCER SIGNAL
30
34
INPUT SIGNAL SUM
36
38
INTEGRATION WITH RESPECT TO TIME
26
12
FRICTION BRAKE SCALING & CAR WEIGHT FACTOR
10
BRAKE CYLINDER TRANSDUCER SIGNAL
32
40
42
44
FIRST IN FIRST OUT BUFFER, T SEC. SUMMATION
28
26
ELECTRIC BRAKE SCALING & CAR WEIGHT FACTOR
14
ELECTRIC BRAKE FEEDBACK SIGNAL
32
52
BRAKE RETARDATION CAPABILITY SAFETY LEVEL COMPARISON
24
50
48
MINIMUM CAPABILITY LEVEL DETERMINATION
46
22
20
BRAKE COMMAND JERK LIMITING
RETARDATION CAPABILITY SAFETY CHECK OUTPUT
BRAKE COMMAND

1. A method of providing a brake retardation capability safety check system for a passenger transit vehicle, said method comprising the steps of:

(a) determining a mass of said transit vehicle and generating a first output signal representative of said vehicle mass;

(b) inputting said first output signal generated in step (a) and a brake cylinder pressure signal to a unit capable of converting said first output signal and said brake cylinder pressure signal to a friction brake deceleration rate and generating a second output signal having a numerical value representative of said friction brake deceleration rate;

(c) inputting said first output signal generated in step (a) and an electric brake feedback signal to a unit capable of converting said first output signal and said feedback signal to an electric brake deceleration rate and generating a third output signal having a numerical value representative of said electric brake deceleration rate;

(d) inputting said numerical value of said second output signal generated in step (b) and said numerical value of said third output signal generated in step (c) to a first summation unit;

(e) adding said numerical values together and generating a fourth output signal having a numerical value representative of a vehicle deceleration rate;

(f) inputting said numerical value of said fourth output signal generated in step (e) to an integration unit;

(g) performing an integration thereof with respect to time and generating a fifth output signal having a numerical value representative of a process cycle speed reduction value;

(h) inputting and storing said numerical value of said fifth output signal generated in step (g) to and in, respectively, a second summation unit;

(i) adding said numerical value of said fifth output signal inputted into said second summation unit in step (h) to last predetermined number of seconds worth of process cycle speed reduction values and generating a sixth output signal having a numerical value representative of braking effort available in terms of speed reduction over said last predetermined number of seconds;

(j) inputting a brake command signal to a brake command jerk limiting unit;

(k) adding a delay value to said brake command signal and jerk limiting said brake command signal to provide a seventh output signal having a numerical value equal to a deceleration rate request value;

(l) inputting said seventh output signal generated in step (k) to a minimum capability level determination unit and generating an eighth output signal having a numerical value representative of minimum acceptable braking capability level in terms of speed reduction over said last predetermined number of seconds; and

(m) comparing said braking level available to said minimum acceptable braking capability level and generating a signal representative of a brake retardation capability safety check.

5,535,123
METHOD FOR CONTROLLING THE TRIGGERING SENSITIVITY OF A VEHICLE AUTOMATIC BRAKING PROCESS TO MATCH DRIVER BEHAVIOR

Siegfried Rump, Weinstadt, Germany; Manfred Steiner, Winnenden, and Brian Douglas, Stuttgart, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Nov. 8, 1994, Ser. No. 337,429

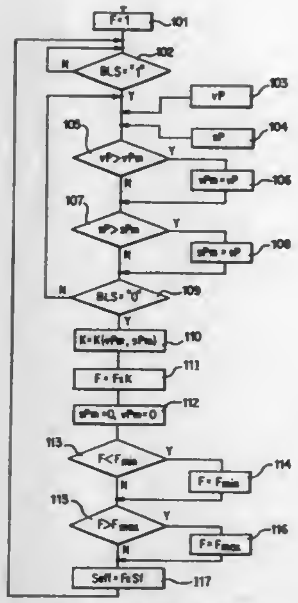
Claims priority, application Germany, Nov. 8, 1993, 43 38 068.9

Int. Cl.^{6} B60T *7/06*

U.S. Cl. 364—426.02 **10 Claims**

1. Method for controlling triggering sensitivity of a vehicle automatic braking system of the type in which automatic braking is commenced when a threshold value for brake pedal actuation speed is exceeded, a brake pressure greater than that which corresponds to the position of the brake pedal being generated automatically after triggering of the automatic braking process, said method comprising the steps of:

after each operation of vehicle brakes, determining a driver-dependent factor (F) as a function of a previous value of the driver-dependent factor (F), and pedal actuation speed (vP) and pedal travel (sP) of the vehicle brake pedal in said operation of vehicle brakes; and



multiplying said driver-dependent factor (F) by a predetermined fixed value (Sf) to determine a driver-dependent value (Seff) for said threshold value.

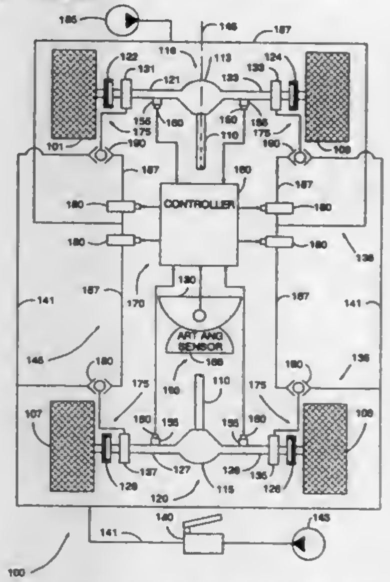
5,535,124
METHOD AND APPARATUS FOR CONTROLLING DIFFERENTIALLY DRIVEN WHEEL-SLIP FOR AN ARTICULATED MACHINE

Javad Hosseini, Edelstein; Michael A. Cobo, St. Charles; Noel J. Rytter, Peoria, and Andrew G. Verheyen, East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 915,996, Sep. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,005, Oct. 4, 1991, abandoned. This application Dec. 9, 1993, Ser. No. 164,675

Int. Cl.^{6} B60K *28/16;* **B60T** *8/32;8/62*

U.S. Cl. 364—426.03 **21 Claims**



1. An anti-spin apparatus for a vehicle, the vehicle having a horizontal axis, front and rear wheeled sections hinged together by an articulation mechanism for relative movement about the horizontal axis, and at least one axle set with at least two driven wheels, comprising:

braking means for controllably applying braking forces to each of said driven wheels;

means for producing a slip signal having a value responsive to the difference in rotational velocity between said wheels of said axle set;

means for producing an articulation signal having a value responsive to the angle of articulation of said vehicle;

control means for receiving said slip signal and said articulation signal and producing a braking control signal in response to the magnitudes of the slip and articulation signals; and

wherein said braking means receives said braking control signal and responsibly applies said braking forces to the faster rotating wheel.

5,535,125

NAVIGATION SYSTEM DATA RECORDABLE BY USER, RECORDING MEDIUM THEREOF, AND, METHODS FOR RECORDING/REPRODUCING TO/FROM THE SAME

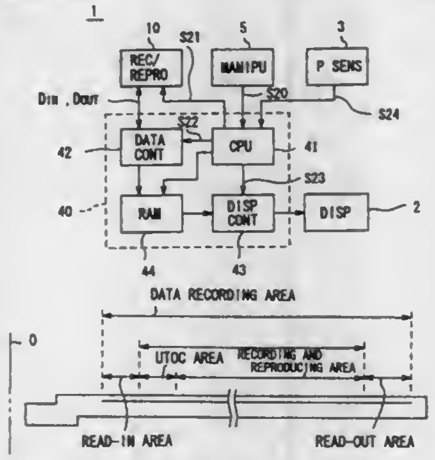
Masanobu Okabe, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 171,105, Dec. 21, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 425,301

Claims priority, application Japan, Dec. 30, 1992, 4-360202

Int. Cl.^{6} G06F ***165/00;*** **G11B** ***13/04***

U.S. Cl. 364—449 **44 Claims**



1. A navigation system comprising:

a position sensor for detecting a present position information upon receipt of a radio wave from a satellite and for outputting a position information signal;

user manipulation means for allowing the user to operate said system and for outputting first control signals;

navigation control means, responsive to the first control signals and the position information signal, for calculating a present display position and for generating second control signals and a present display position signal;

recording means, controlled by said second control signals, for recording user digital data from said navigation control means in a second area of an optical disc;

reproducing means, controlled by said second control signals, for reproducing map digital data which has been recorded preliminarily in a first area of said optical disc, and said user digital data recorded in said second area of said optical disc; and

display means for displaying a predetermined display image in accordance with a reproducing signal obtained from said reproducing means and the present display position signal obtained from said navigation control means.

5,535,126

METHOD OF CHECKING DAILY CONSUMPTION OF POSTAL CHARGES BY A POSTAGE METER AND A POSTAGE METER ENABLING SUCH MONITORING TO BE PERFORMED

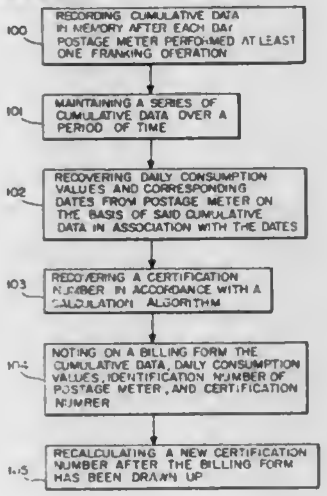
Bernard Mourgues, Paris, France, assignor to Neopost Industrie, Bagneux, France

Filed Feb. 15, 1994, Ser. No. 196,401

Claims priority, application France, Feb. 17, 1993, 93 01778

Int. Cl.^{6} G07B ***17/00***

U.S. Cl. 364—464.02 **6 Claims**


100
RECORDING CUMULATIVE DATA IN MEMORY AFTER EACH DAY POSTAGE METER PERFORMED AT LEAST ONE FRANKING OPERATION
101
MAINTAINING A SERIES OF CUMULATIVE DATA OVER A PERIOD OF TIME
102
RECOVERING DAILY CONSUMPTION VALUES AND CORRESPONDING DATES FROM POSTAGE METER ON THE BASIS OF SAID CUMULATIVE DATA IN ASSOCIATION WITH THE DATES
103
RECOVERING A CERTIFICATION NUMBER IN ACCORDANCE WITH A CALCULATION ALGORITHM
104
NOTING ON A BILLING FORM THE CUMULATIVE DATA, DAILY CONSUMPTION VALUES, IDENTIFICATION NUMBER OF POSTAGE METER, AND CERTIFICATION NUMBER
105
RECALCULATING A NEW CERTIFICATION NUMBER AFTER THE BILLING FORM HAS BEEN DRAWN UP

1. A method of checking daily consumption of postal charges by a postage meter, the method comprising the following steps:

recording cumulative data in a non-volatile memory of the postage meter after each day on which the postage meter has performed at least one franking operation, said data being representative of total consumption of postal charges metered by the meter up to said day, and being recorded in association with a date provided by a calendar circuit of the meter;

maintaining a series of such cumulative data in correspondence with respective dates in the non-volatile memory of the postage meter over a predetermined time of time;

recovering daily consumption values and corresponding dates from the postage meter on the basis of said cumulative data recorded in its non-volatile memory in association with said dates, each daily consumption value representing the consumption of postage charges metered by the meter for one day's use of the meter;

recovering from the postage meter, a certification number calculated by applying a calculation algorithm to said recovered daily consumption values, said cumulative data recorded over said period of time in the non-volatile memory, an encoding key, and an identification number of the postage meter previously recorded in the memory of the postage meter;

noting said cumulative data, daily consumption values, identification number of the postage meter, and certification number on a billing form for said predetermined period of time; and

after said billing form has been drawn up, recalculating a new certification number on the basis of the cumulative data, the daily consumption values, the identification number of the meter marked on the form and an encoding key identical to that recorded in the postage meter in order to verify whether the certification number remarked on the form is identical to the new certification number calculated in this way.

5,535,127

PROCESSING APPARATUS FOR MAIL WITH STAMPS

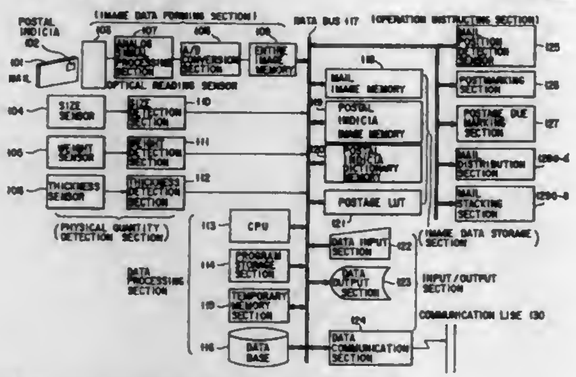
Teruhiko Uno, Tokyo; Toshio Hirasawa, Kawasaki; Toshio Sato; Kazuyo Nakagawa, both of Yokohama, and Hiroshi Takahashi, Okegawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 15, 1994, Ser. No. 275,420

Claims priority, application Japan, Jul. 16, 1993, 5-197744

Int. Cl.^{6} G07B ***17/00***

U.S. Cl. 364—464.02 **11 Claims**



10. A mail processing apparatus comprising:

physical quantity detecting means for detecting physical information serving as factors that determine processing charges for mail with a stamp, by quantifying the information to obtain physical quantities;

first means for storing a conversion table which shows a relationship between the physical quantities and the charges;

charge determining means for determining a processing charge for said mail with reference to said conversion table on the basis of said physical quantities;

extracting means for extracting image information including the stamp image of said mail;

second means for storing a plurality of reference image data indicating a plurality of stamp images;

means for determining the kind of said stamp image on the basis of the image information extracted by said extracting means using said reference image data;

postal indicia detecting means for detecting the postal indicia from said determined stamps image; and

means for verifying the processing charge for said mail obtained from said charge determining means with the postal indicia affixed on said mail obtained from said postal indicia detecting means.

5,535,128

HIERARCHICAL FEEDBACK CONTROL OF PULSED LASER DEPOSITION

Samuel J. P. Laube, Cincinnati, and Elizabeth F. Stark, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

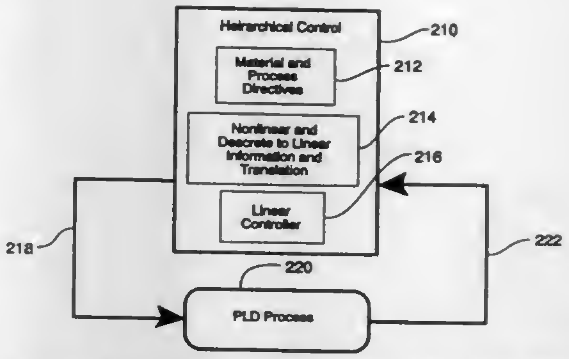
Filed Feb. 9, 1995, Ser. No. 386,368

Int. Cl.^{6} G06F ***17/00***

U.S. Cl. 364—468.26 **2 Claims**

1. A hierarchical control system for a Pulsed Laser Deposition (PLD) growth process in which a target of a given material and a substrate are located within a vacuum chamber, and a laser transmits a laser beam, beam control means for controlling the direction of the laser beam to scan the target to produce a plasma which coats the substrate, wherein there are sensors for the vacuum chamber, with data acquisition means coupled to at least one of the sensors;

a process control computer coupled via a bus to the laser, the beam control means, the data acquisition means, and at least some of the sensors;


Heirarchical Control
210
Material and Process Directives
212
Nonlinear and Descrete to Linear Information and Translation
214
216
Linear Controller
218
222
220
PLD Process

wherein said hierarchical control system comprises a multifeatured control system for the growth process, utilizing said sensors for sub process control, combined with a dynamical feedback control PLD process, having first, second and third levels of feedback control;

wherein the first level of feedback control includes means to improve the precision and tracking of sub process variables by linear observer based compensator control, wherein a plume species density per laser pulse and bulk substrate thickness from the sensors provide real time sub process data to an observer; and an observer based compensator means then directly calculates laser energy density per pulse and pulse repetition rate based on current values predicted by the linear model;

wherein the second level of feedback control provides the observer with a linear controller design, the second level of feedback control comprising a dynamical system design means and nonlinear process map, nonlinear mapping being used to design a new observer based compensator for each linearization point chosen by the third level of feedback control, wherein the second level of feedback control relies on a nonlinear first order multidimensional differential mapping of the process, this nonlinear dynamical model of the process being updated using automatic process identification experiments;

wherein the third level of feedback control comprises an expert system rulebase and command input means to achieve a desired product goal, the rulebase being general enough to be the basis of an expert system that deals with the interaction of any controller and process, wherein an expert controller decides whether or not the process linearized model used by the first level of feedback control is accurate enough to achieve the desired process goals, and based on controller-process performance, a controller re-design is commanded by the third level of feedback control to the second level of feedback control, and then implemented by the first level of feedback control.

5,535,129

FLATNESS CONTROL IN THE ROLLING OF STRIP

Olof Keijser, Västerås, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

PCT No. PCT/SE93/00501, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO94/00255, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 7, 1993, Ser. No. 343,506

Claims priority, application Sweden, Jun. 22, 1993, 9201911

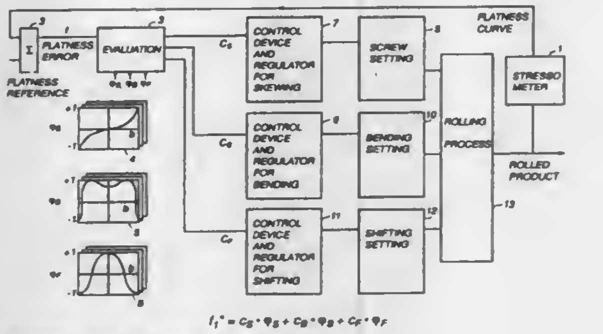
Int. Cl.^{6} B21B ***37/00***

U.S. Cl. 364—472 **5 Claims**

1. A method for generating input signals for operating control members to control the flatness of strip in a rolling mill in response to input signals $c=c_1, c_2 \ldots c_n$, wherein the stress distributions $\phi_1, \phi_2 \ldots \phi_m$, which arise across the strip when the respective control members are actuated, are known and wherein data $f(x_i)=f_1, f_2 \ldots f_m$ which indicate flatness errors across the strip are known, and further assuming the following function:

$f^*_n=c_1\phi_1+c_2\phi_2+\ldots c_n\phi_n$, said method comprising the steps of:

determining the input signals such that the squares of the deviations between $f(x_i)$ and f^* are minimized;


FLATNESS REFERENCE
FLATNESS ERROR
EVALUATION
FLATNESS CURVE
CONTROL DEVICE AND REGULATOR FOR SKEWING
CONTROL DEVICE AND REGULATOR FOR BENDING
CONTROL DEVICE AND REGULATOR FOR SHIFTING
SCREW SETTING
BENDING SETTING
SHIFTING SETTING
ROLLING PROCESS
STRESSO METER
ROLLED PRODUCT
C_S
C_B
C_F
1
3
4
5
6
7
8
9
10
11
12
13
$f_1^* = C_S \cdot \varphi_S + C_B \cdot \varphi_B + C_F \cdot \varphi_F$

forming the following matrices:

$$A=\begin{pmatrix} \cdot & & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \\ \phi_1 \cdot & \phi_2 \cdots & \phi_n \\ \cdot & & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{pmatrix}$$

with A=m·n,

where m=the number of measuring points equals the number of lines in A;

n=the number of base functions $\phi_1 \ldots \phi_n$=the number of columns in A;

$$C=\begin{pmatrix} c_1 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ c_n \end{pmatrix} \text{ and } f=\begin{pmatrix} f_1 \\ f_2 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ f_m \end{pmatrix}$$

further generating the input signals according to the following formula:

$$c=(A^TA)^{-1}\cdot A^T\cdot f= B\cdot f$$

where A^T is the transposed A-matrix; and

determining the matrix B as follows before commencing rolling the strip:

$$B=(A^TA)^{-1}\cdot A^T.$$

5,535,130

SYNCHRONIZATION OF PRERECORDED AUDIO/VIDEO SIGNALS WITH MULTI-MEDIA CONTROLLERS

Joseph D. Long, Greensboro, N.C., assignor to Gilbarco Inc., Greensboro, N.C.

Division of Ser. No. 959,844, Oct. 13, 1992. This application Mar. 20, 1995, Ser. No. 406,542

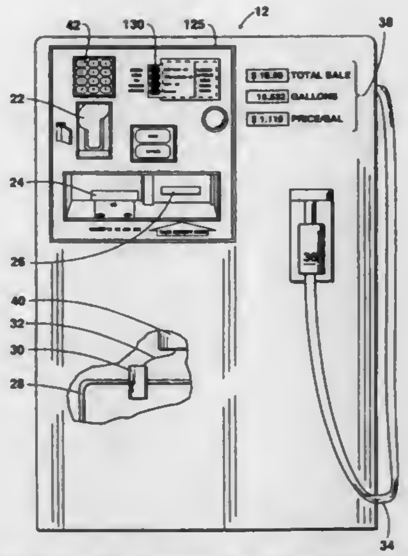
Int. Cl.^{6} G06F *17/60*

U.S. Cl. 364—479 **19 Claims**

11. A method of dispensing fuel comprising:

pumping fuel along a delivery path in a fuel dispenser,

recovering embedded multi-media control signals in a prerecorded program, the embedded multi-media control signals locating predetermined portions of the program signals,



directing video program signals in the prerecorded program to a video display according to the embedded multi-media control signals, and

displaying the video program signals on a video display associated with the fuel dispenser.

5,535,131

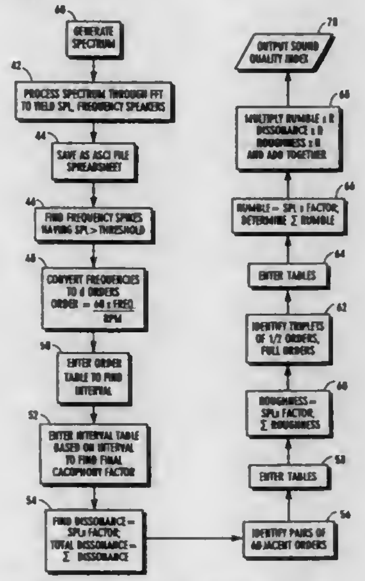
SYSTEM FOR ANALYZING SOUND QUALITY IN AUTOMOBILE USING MUSICAL INTERVALS

David L. Sanders, Oxford, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 22, 1995, Ser. No. 445,816

Int. Cl.^{6} G01R *23/16*

U.S. Cl. 364—487 **20 Claims**


40
GENERATE SPECTRUM
42
PROCESS SPECTRUM THROUGH FFT TO YIELD SPL, FREQUENCY SPEAKERS
44
SAVE AS ASCII FILE SPREADSHEET
46
FIND FREQUENCY SPIKES HAVING SPL > THRESHOLD
48
CONVERT FREQUENCIES TO 4 ORDERS ORDER = 60 x FREQ. / RPM
50
ENTER ORDER TABLE TO FIND INTERVAL
52
ENTER INTERVAL TABLE BASED ON INTERVAL TO FIND FINAL CACOPHONY FACTOR
54
FIND DISSONANCE = SPL x FACTOR; TOTAL DISSONANCE = Σ DISSONANCE
56
IDENTIFY PAIRS OF ADJACENT ORDERS
58
ENTER TABLES
60
ROUGHNESS = SPL x FACTOR, Σ ROUGHNESS
62
IDENTIFY TRIPLETS OF 1/2 ORDERS, FULL ORDERS
64
ENTER TABLES
66
RUMBLE = SPL x FACTOR, DETERMINE Σ RUMBLE
68
MULTIPLY RUMBLE x R DISSONANCE x D ROUGHNESS x R AND ADD TOGETHER
70
OUTPUT SOUND QUALITY INDEX

1. A program storage device readable by a digital processing apparatus and tangibly embodying a program of instructions executable by the digital processing apparatus to perform method steps for analyzing the quality of an automobile noise spectrum, wherein the spectrum is characterized by at least one fundamental sound frequency, the method steps comprising:

generating a noise spectrum representative of an automobile's sound;

identifying frequencies of elements of the spectrum having amplitudes equal to or greater than a predetermined amplitude;

relating the frequencies to the fundamental frequency to establish respective fundamental relationships;

correlating each fundamental relationship to a musical scale interval;

assigning a respective cacophony factor to each frequency based upon the musical scale interval; and

outputting a measure of the quality of the automobile noise spectrum in response to the assigning step.

5,535,132

VARIABLE SEQUENCE DETERMINING METHOD FOR A DICHOTOMY DETERMINATION GRAPH

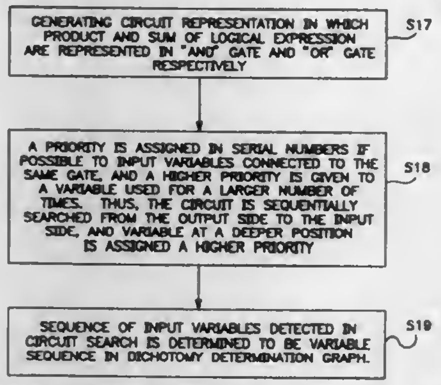
Masahiro Fujita, Kawasaki, Japan, and Yusuke Matsunaga, El-Cerrito, Calif., assignors to Fujitsu Limited, Japan

Filed Feb. 19, 1992, Ser. No. 836,850

Claims priority, application Japan, Feb. 20, 1991, 3-026388

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—489 **8 Claims**


GENERATING CIRCUIT REPRESENTATION IN WHICH PRODUCT AND SUM OF LOGICAL EXPRESSION ARE REPRESENTED IN "AND" GATE AND "OR" GATE RESPECTIVELY
S17
A PRIORITY IS ASSIGNED IN SERIAL NUMBERS IF POSSIBLE TO INPUT VARIABLES CONNECTED TO THE SAME GATE, AND A HIGHER PRIORITY IS GIVEN TO A VARIABLE USED FOR A LARGER NUMBER OF TIMES. THUS, THE CIRCUIT IS SEQUENTIALLY SEARCHED FROM THE OUTPUT SIDE TO THE INPUT SIDE, AND VARIABLE AT A DEEPER POSITION IS ASSIGNED A HIGHER PRIORITY
S18
SEQUENCE OF INPUT VARIABLES DETECTED IN CIRCUIT SEARCH IS DETERMINED TO BE VARIABLE SEQUENCE IN DICHOTOMY DETERMINATION GRAPH.
S19

1. A variable sequence determining method for generating a dichotomy determination graph representing a logical function of a two-step logical circuit, comprising the steps of:

converting a logical expression of variables representing a logical function of said two-step logical circuit to a sum-of-products format;

for each of said variables in said logical expression converted to said sum-of-products format, determining an arithmetic sum of positive and negative product terms in said sum-of-products format;

prioritizing each of said variables by assigning a higher priority to said variable having a higher said arithmetic sum;

determining a sequence of said variables based on said prioritized variables; and

generating said dichotomy determination graph based on said determined sequence of variables.

5,535,133

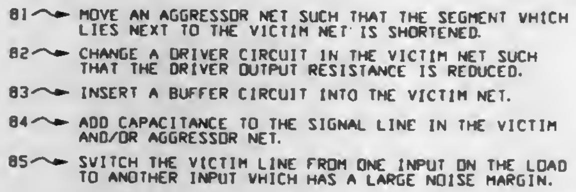
METHOD OF FABRICATING IC CHIPS WITH TABLE LOOK-UP ESTIMATED CROSSTALK VOLTAGES BEING LESS THAN NOISE MARGIN

Richard J. Petschauer, Edina, Minn.; Roland D. Rothenberger, Poway, Calif., and Paul G. Tumms, Fridley, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 9, 1995, Ser. No. 385,848

Int. Cl.^{6} G06F *17/50;17/10*

U.S. Cl. 364—489 **27 Claims**


81
MOVE AN AGGRESSOR NET SUCH THAT THE SEGMENT WHICH LIES NEXT TO THE VICTIM NET IS SHORTENED.
82
CHANGE A DRIVER CIRCUIT IN THE VICTIM NET SUCH THAT THE DRIVER OUTPUT RESISTANCE IS REDUCED.
83
INSERT A BUFFER CIRCUIT INTO THE VICTIM NET.
84
ADD CAPACITANCE TO THE SIGNAL LINE IN THE VICTIM AND/OR AGGRESSOR NET.
85
SWITCH THE VICTIM LINE FROM ONE INPUT ON THE LOAD TO ANOTHER INPUT WHICH HAS A LARGE NOISE MARGIN.

1. A method of fabricating an integrated circuit chip, which contains a victim net and a set of aggressor nets with each aggressor net having a line segment that lies next to said victim net, such that crosstalk voltages coupled to said victim net are within an acceptable level; said method including the steps of:

providing a trial layout for said victim net and said aggressor nets;

assigning to said trial layout of said victim net, the parameters of—a line capacitance per unit length, a line resistance per unit length, a total net length, and a driver output resistance; and assigning to said trial layout of each aggressor net, the parameters of— a coupling capacitance per unit length to said victim net, and a voltage transition;

reading from a table, for each aggressor net, a respective estimation of a peak crosstalk voltage per unit length which each aggressor net couples into said victim net due to said assigned parameters;

multiplying, for each aggressor net, said peak crosstalk voltage per unit length as read from said table with a length for said line segment;

modifying said trial layout and repeating said assigning, reading, and multiplying steps until a summation of the products from said multiplying step is within said acceptable level; and,

building said chip with the modified layout for which said summation is within said acceptable level.

5,535,134

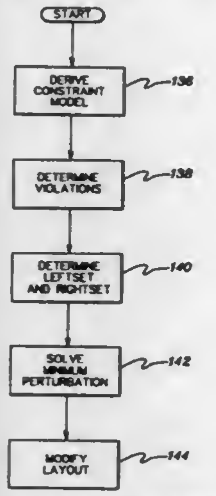
OBJECT PLACEMENT AID

John M. Cohn, Richmond, Vt., and Fook-Luen Heng, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1994, Ser. No. 253,898

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—491 **16 Claims**



1. A method for modifying a layout of a plurality of objects to be in compliance with a plurality of predetermined rules, said method comprising:

identifying within said layout at least one violation of said plurality of predetermined rules, wherein each of said plurality of objects is bounded by a plurality of edges;

identifying a first group of edges as all transitive edges beyond said at least one violation closest to a predetermined reference in a direction away from said predetermined reference;

identifying a second group of edges as all transitive edges beyond said at least one violation furthest away from said predetermined reference in a direction toward said predetermined reference; and

modifying said layout to remove said at least one violation such that perturbation, resulting from said modifying, of said plurality of objects is minimized, wherein said perturbation is a function of the sum of the distances of the edges in said first group of edges from the predetermined reference and the sum of the distances of the edges in said second group of edges from said predetermined reference.

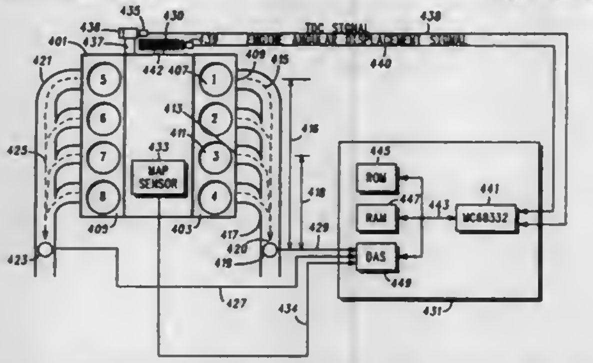
5,535,135
STATE ESTIMATOR BASED EXHAUST GAS CHEMISTRY MEASUREMENT SYSTEM AND METHOD

Kevin J. Bush, Northville; Sanjay Dua, Troy; Neil J. Adams, Novi, and Craig R. Markyvech, Romulus, all of Mich., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 24, 1993, Ser. No. 111,233

Int. Cl.^{6} G01N *27/62*

U.S. Cl. 364—496 **56 Claims**



1. A system for measuring a chemical concentration of a gas exhausted during exhaust cycles from a plurality of exhaust ports of a multi-cylinder internal combustion engine, said system comprising:

a gas chemistry sensor, responsively coupled to the collection point, for measuring the gas exhausted from each of the plurality of exhaust ports and for providing a sensory output signal dependent thereon; and

a state estimator, comprising state estimation coefficients associated with an engineering model of said gas chemistry sensor, the state estimator responsively coupled to the sensory output signal provided by said gas chemistry sensor, wherein said state estimator provides a constituent gas signal in response to the sensory output signal.

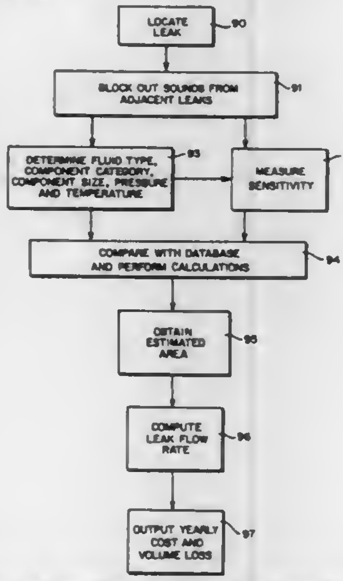
5,535,136
DETECTION AND QUANTIFICATION OF FLUID LEAKS

Larry R. Standifer, 414 Rutherford Rd., Hurtsboro, Ala. 36860

Filed May 17, 1994, Ser. No. 243,916

Int. Cl.^{6} G01M *3/00*

U.S. Cl. 364—510 **14 Claims**


LOCATE LEAK
90
BLOCK OUT SOUNDS FROM ADJACENT LEAKS
91
DETERMINE FLUID TYPE, COMPONENT CATEGORY, COMPONENT SIZE, PRESSURE AND TEMPERATURE
93
MEASURE SENSITIVITY
92
COMPARE WITH DATABASE AND PERFORM CALCULATIONS
94
OBTAIN ESTIMATED AREA
95
COMPUTE LEAK FLOW RATE
96
OUTPUT YEARLY COST AND VOLUME LOSS
97

1. A method for providing a database for use in determining the flow rate of a fluid at a leak site in a pressurized fluid system, said method comprising the steps of:

a) deriving attenuation level values corresponding to sound pressure level values for fluid leaks from known piping elements of known fluids at known pressures, temperatures, and leakage flow rates;

b) calculating an effective leakage site flow area corresponding with the derived attenuation level values; and

c) storing the derived attenuation levels and leakage site flow areas for the corresponding system elements and fluid conditions to provide a database for use in determining leakage flow areas and leakage flow rates in actual piping systems from measured sound pressure levels.

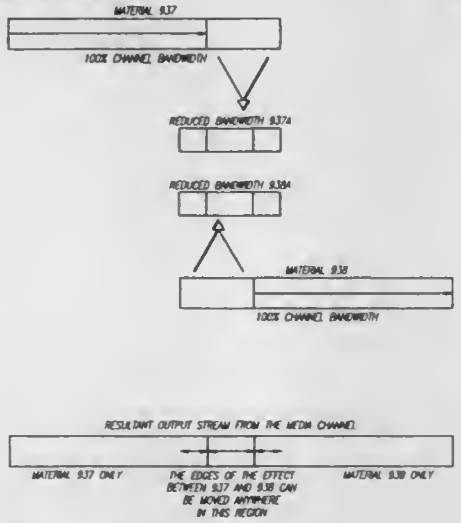
5,535,137
RANDOM ACCESS AUDIO/VIDEO PROCESSOR WITH COMPRESSED VIDEO RESAMPLING TO ALLOW HIGHER BANDWIDTH THROUGHPUT

David L. Rossmere; Robert S. Glenn, Jr., both of San Jose; William B. Brown, Los Gatos; John B. Carlucci, and Robert W. Duffy, both of Milpitas, all of Calif., assignors to Sony Corporation of Japan, and Sony Electronics, Inc., both of Park Ridge, N.J.

Filed Feb. 14, 1994, Ser. No. 196,038

Int. Cl.^{6} H04N *9/74;1/46*

U.S. Cl. 364—514 A **53 Claims**



1. An apparatus for overlapping at least one frame of a first video sequence with at least one frame of a second video sequence, comprising:

compressor means coupled to receive said first and second video sequences for compressing said first and second video sequences at a predetermined compression ratio;

decompression means coupled to receive said at least one frame of said first and second video sequences and decompressing said at least one frame of said first and second video sequences;

said decompressed at least one frame of said first and second video sequences coupled to said compressor means for re-compression at a predetermined compression ratio;

overlapping means for overlapping said re-compressed at least one frame of said first video sequence with said re-compressed at least one frame of said second video sequence, and appending said first and second video sequences together to form a third video sequence.

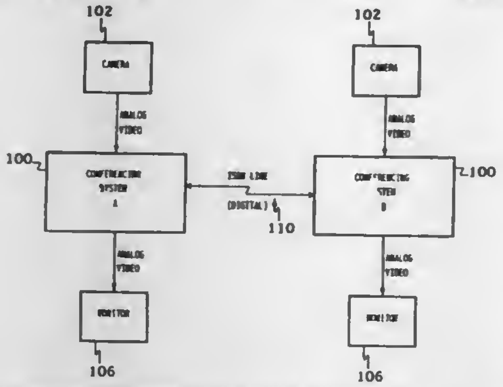
5,535,138
ENCODING AND DECODING VIDEO SIGNALS USING DYNAMICALLY GENERATED QUANTIZATION MATRICES

Michael Keith, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 234,973, Apr. 28, 1994, Pat. No. 5,493,513, which is a continuation-in-part of Ser. No. 158,855, Nov. 24, 1993. This application Sep. 8, 1994, Ser. No. 303,313

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—514 R **44 Claims**



1. A computer-implemented process for encoding video signals, comprising the steps of:

(a) generating a plurality of quantization matrices using one or more quantization matrix parameters;

(b) encoding video signals using the quantization matrices to generate encoded video signals; and

(c) generating an encoded bit stream comprising the encoded video signals and the quantization matrix parameters.

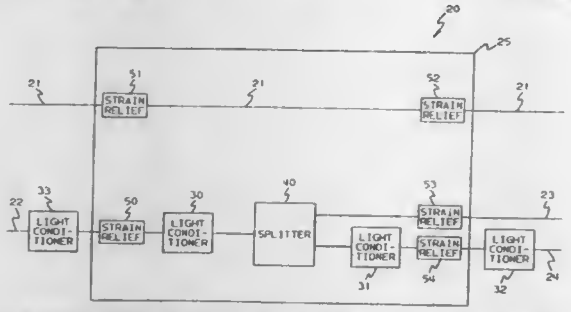
5,535,139
PORTABLE FIBER OPTIC SPLITTER TOOL FOR MULTIMODE OPTICAL FIBER CABLE LINK

Wayne A. Barringer, Wappingers Falls; Casimer M. Decusatis, Poughkeepsie, and Daniel J. Stigliani, Jr., Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1994, Ser. No. 222,754

Int. Cl.^{6} H04B *10/08*

U.S. Cl. 364—550 **15 Claims**



1. A light splitting apparatus which is insertable at one end of an optical fiber link to provide stable access to light being transmitted through said optical fiber link, said apparatus comprising:

at least one optical fiber cable defining a light transmission path, said optical fiber cable being distinct from optical fiber cable used in said optical fiber link;

light splitting means disposed in said light transmission path for accessing a portion of light transmitted through said optical fiber link; and

light conditioning means for attenuating higher order light propagation modes in said accessed light portion, said light conditioning means being disposed at a location selected from the group consisting of a location upstream of said light splitting means and a location downstream of said light splitting means, said upstream and downstream directions being determined relative to light propagation direction in said optical fiber link.

5,535,140
POLYNOMINAL-SET DERIVING APPARATUS AND METHOD

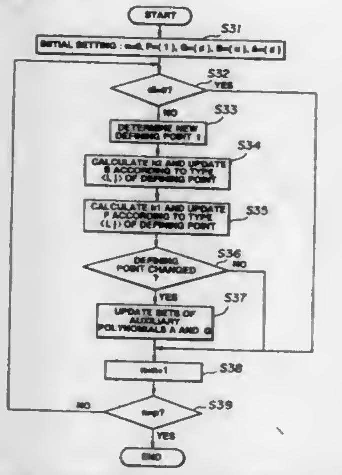
Keiichi Iwamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 183,969

Claims priority, application Japan, Jan. 22, 1993, 5-009333; Jan. 22, 1993, 5-009334

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 364—550 **17 Claims**


START
S31
INITIAL SETTING
S32
YES
NO
S33
DETERMINE NEW DEFINING POINT t
S34
CALCULATE k2 AND UPDATE B ACCORDING TO TYPE (i, j) OF DEFINING POINT
S35
CALCULATE k1 AND UPDATE F ACCORDING TO TYPE (i, j) OF DEFINING POINT
S36
DEFINING POINT CHANGED ?
NO
YES
S37
UPDATE SETS OF AUXILIARY POLYNOMIALS A AND G
S38
S39
NO
YES
END

6. A method for obtaining a set of minimal polynomials for generating a given multidimensional array, said method comprising the steps of:

setting initial values of a first set of polynomials to be obtained, a first set of auxiliary polynomials for the first set of polynomials, a second set of polynomials different from the first set of polynomials, and a second set of auxiliary polynomials for the second set of polynomials in a first, a second, a third and a fourth memory, respectively;

discriminating if the coefficient of a predetermined degree of each polynomial of the second set of polynomials stored in the third memory equals zero;

newly determining a defining point if a polynomial, in which the coefficient of a predetermined degree does not equal zero, is present as a result of the discrimination;

deriving polynomials which belong to the second set of polynomials based on the value of the determined defining point, the second set of polynomials stored in the third memory, and the second set of auxiliary polynomials stored in the fourth memory;

erasing all polynomials in which the coefficient of a predetermined degree does not equal zero, and updating the third memory by storing the polynomials derived by first derivation means;

deriving polynomials which belong to the first set of polynomials based on the value of the determined defining point, the first set of polynomials stored in the first memory, the first set of auxiliary polynomials stored in the second memory, and the coefficient of a polynomial of the second set of polynomials relating to the determined defining point;

erasing all polynomials corresponding to the polynomials erased by the updating operation of the third memory, and updating the first memory by storing the derived polynomials;

discriminating the presence of a change of the defining point;

updating the first set of auxiliary polynomials stored in the second memory based on the first set of auxiliary polynomials stored in the second memory, and the polynomials erased by the updating operation of the first memory, when it has been discriminated that the defining point has changed by the discrimination operation; and

updating the second set of auxiliary polynomials stored in the fourth memory based on the second set of auxiliary polynomials stored in the fourth memory, and the polynomials erased by the updating operation of the third memory, when it has been discriminated that the defining point has changed.

5,535,141
AUTOCLAVE

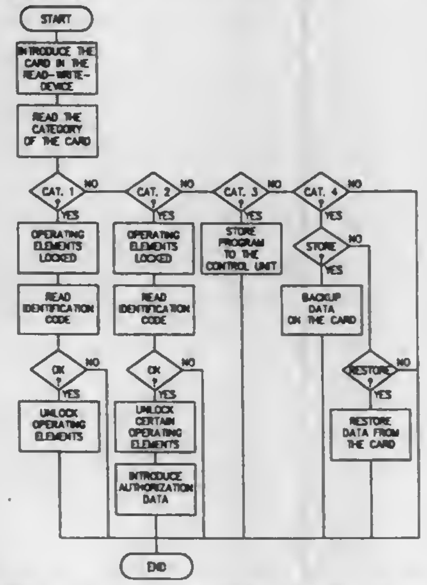
André Lüssi, Wabern, Switzerland, assignor to Sintra Holding AG, Sursee, Switzerland

Filed Jun. 9, 1994, Ser. No. 257,549

Claims priority, application European Pat. Off., Jun. 15, 1993, 93810429

Int. Cl.^{6} G05B *19/00*

U.S. Cl. 364—550 **9 Claims**


START
INTRODUCE THE CARD IN THE READ-WRITE-DEVICE
READ THE CATEGORY OF THE CARD
CAT. 1 ?
CAT. 2 ?
CAT. 3 ?
CAT. 4 ?
NO
YES
OPERATING ELEMENTS LOCKED
STORE PROGRAM TO THE CONTROL UNIT
STORE
READ IDENTIFICATION CODE
BACKUP DATA ON THE CARD
OK ?
RESTORE
UNLOCK OPERATING ELEMENTS
UNLOCK CERTAIN OPERATING ELEMENTS
INTRODUCE AUTHORIZATION DATA
RESTORE DATA FROM THE CARD
END

1. An autoclave, especially for articles used in medical treatment, comprising:

a sterilization chamber for treating articles according to a particular sterilization program;

a control unit to control and monitor various sterilization programs;

operating elements to input control signals to the control unit;

an indicator panel to guide a user and to display working conditions of the autoclave;

a computing means and a memory means each contained in the control unit;

a device for reading data intended for the control unit from a plurality external data carrier elements and writing data received from the control unit to said plurality of external data carrier elements, said device being electrically connectable to said data carrier elements and accessible from outside the autoclave;

a further memory means on each of said external data carrier elements having a non-volatile memory on which data to be read is stored and data to be written is storable; and

wherein each of said external data carrier elements is associated with a category of data carrier element and, depending on the category, enables using selected operating elements, starting and executing sterilization programs, or backing-up or restoring data.

5,535,142
CIRCUIT ARRANGEMENT FOR AN INDUCTIVE POSITION INDICATOR

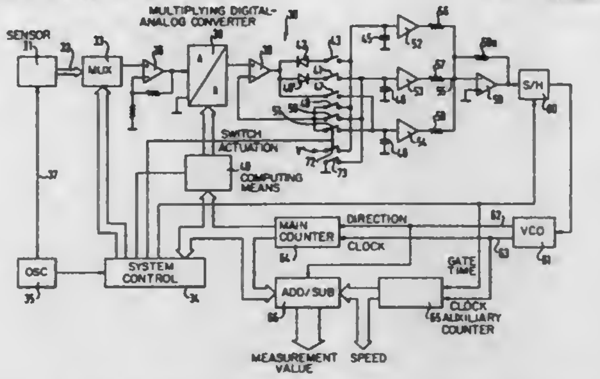
Walter Mehnert, Grillparzer Strasse 6, 85521 Ottobrunn, and Thomas Theil, Alte-Traubinger-Strasse 5, 82340 Feldafing, both of, Germany

Filed Jul. 21, 1993, Ser. No. 94,574

Claims priority, application Germany, Jul. 22, 1992, 42 24 225.8

Int. Cl.^{6} G01B *7/30*

U.S. Cl. 364—559 **17 Claims**



1. A circuit arrangement for an inductive position indicator which monitors a position to be monitored which a first one of two bodies being movable with respect to each other occupies with respect to a second one of said two bodies, said position indicator comprising

at least one exciter coil to which an ac voltage is fed to generate a magnetic flux,

a measurement coil arrangement having a plurality of measurement coils from which at least two different measurement coil signals can be taken simultaneously,

flux guide means of ferromagnetic material which guide the magnetic flux generated by said exciter coil such that the magnetic flux through at least one of said measurement coils and thereby at least one of said at least two different measurement coil signals varies in dependence on said position to be monitored, said circuit arrangement comprising

a multiplexer for taking both of said at least two different measurement coil signals and feeding them one by one to an input amplifier providing amplified measurement coil signals, said input amplifier being part of

a single-channel signal processing means providing a first single-channel output signal when a first one of said at least two different measurement coil signals is fed to said input amplifier and providing a second single-channel output signal when a second one of said at least two different measurement coil signals is fed to said input amplifier,

a de-multiplexer for taking said first and second single-channel output signals one by one and feeding said first one of them into a first signal channel and said second one of them into a second signal channel each of said first and second signal channels leading to one of two inputs of

a computing circuit means which requires said first and second single-channel output signals at the same time in order to produce a computing circuit output signal from which a measurement signal can be derived which represents said position to be monitored,

wherein at least said first signal channel comprises a circuit means for storing or delaying said first single-channel output signal fed thereto by said de-multiplexer until said second single-channel output signal is fed by said de-multiplexer to said second signal channel.

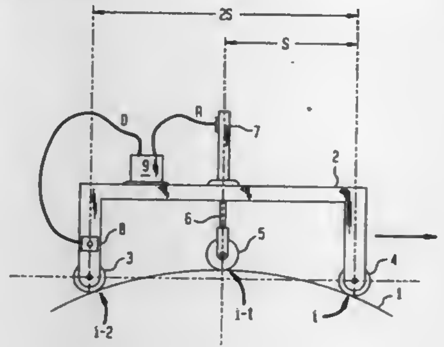
5,535,143
ROLLING DIGITAL SURFACE MEASUREMENT APPARATUS

Allen Face, 14 James Landing Rd., Newport News, Va. 23606

Filed Dec. 15, 1993, Ser. No. 166,861

Int. Cl.^{6} G01B *5/20*

U.S. Cl. 364—560 **3 Claims**



1. A surface measuring apparatus comprising:

a frame,

a plurality of wheels supported on said frame in rolling contact with a surface to be measured, said plurality of wheels including a pair of longitudinally aligned wheels mounted on said frame in predetermined spaced relation,

said plurality of wheels further including a floating wheel mounted on said frame midway between said pair of longitudinally aligned wheels and in contact with the surface to be measured with said floating wheel being capable of movement toward and away from said frame,

a linear position transducer connected to said floating wheel to produce a signal corresponding to the movement of said floating wheel toward and away from said frame,

an odometer mounted on said frame and connected to one of said pair of longitudinally aligned wheels for outputting a signal D directly proportional to a distance traveled by said one of said pair of longitudinally aligned wheels on the surface to be measured,

a computer to receive said signal D from said odometer to trigger said computer to record intermittent regularly spaced readings of said linear position transducer every time said one of said pair of longitudinally aligned wheels travels a distance S between the center of said one of said pair of longitudinally aligned wheels and the center of said floating wheel,

the following equations defining the relationship between point elevations on the surface to be measured which are designated by H_0, H_1 and H_j, where j is the index of the measurement point currently under consideration, R_i is the reading of said linear position transducer associated with a point i, and

N is the index of the final measurement point:

$$H_0=0$$

and

$$H_j = jH_1 - 2\sum_{i=2}^{j}(j+1-i)R_i + 2\frac{j(j+1)}{N(N-1)}\sum_{i=2}^{N}(N+1-i)R_i$$

5,535,144
DISTANCE DETECTION METHOD AND SYSTEM USING A STEREOSCOPICAL IMAGING APPARATUS

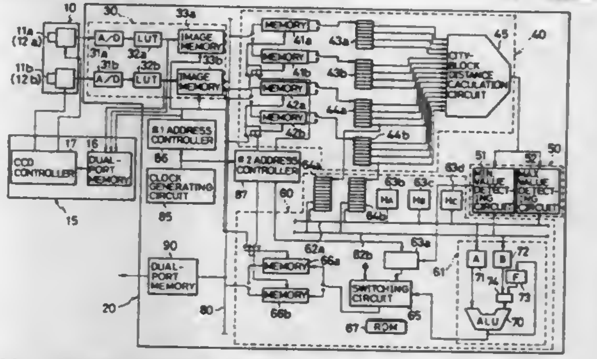
Katsuyuki Kise, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 18, 1994, Ser. No. 198,570

Claims priority, application Japan, Mar. 24, 1993, 5-065498; Dec. 24, 1993, 5-328802

Int. Cl.^{6} G01B *9/00*

U.S. Cl. 364—561 **16 Claims**



13. A distance detecting system, comprising:

a stereoscopical imaging apparatus for imaging an object from a plurality of different directions and for obtaining a plurality of pictures of an image of the object;

first memory means for storing image data making up said pictures so as to obtain distance distribution information for said image;

second memory means for storing said image data so as to control a present shutter speed of said imaging apparatus, said second memory means being connected to said imaging apparatus in parallel with said first memory means;

zone designating means for designating at least one particular zone in one of said pictures;

frequency distribution producing means for calculating a frequency of picture elements of said particular zone with a minimum brightness for said particular zone, and calculating a frequency of picture elements of said particular zone with a maximum brightness for said particular zone;

correction level calculating means responsive to said frequencies for calculating a correction level for said present shutter speed;

shutter speed correcting means for correcting said present shutter based upon said correction level;

coincidence calculation means for performing a high-speed calculation of a coincidence between at least two of said pictures for each of a plurality of required small regions for each of said at least two of said pictures;

maximum and minimum values detecting means for detecting a minimum value and a maximum value of a degree of coincidence between said at least two of said pictures;

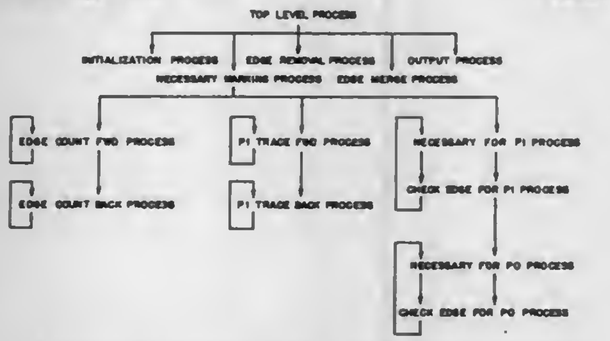
deviation amount determining means, which uses said minimum value for said degree of said coincidence for determining a deviation amount of a picture element corresponding to said plurality of said digital pictures with respect to a minimum value and a maximum value for said degree when a minimum value is equal to or less than a first predetermined value, when a difference between said maximum value and said minimum value is equal to or larger than a second predetermined value, and when a brightness change of a small portion of a required image out of said at least two of said pictures is a third predetermined value; and

a picture processing unit for outputting distance distribution information for said image based upon said deviation amounts determined by said deviation amount determining means.

5,535,145

DELAY MODEL ABSTRACTION

David J. Hathaway, Underhill, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 3, 1995, Ser. No. 383,338
Int. Cl.^{6} G06F *17/50*
U.S. Cl. 364—578 **17 Claims**



1. A delay abstraction system for a circuit network comprising:

a) an input device for inputting an original delay graph of said circuit network;

b) a marking device for marking with at least one type of necessary mark all delay edges in said original delay graph which contribute to at least one extreme delay path, each said path having a delay and originating from a primary input of said original delay graph and proceeding through, said circuit network;

c) a removing device for removing from said original delay graph all delay edges not marked as necessary by said marking device to produce a partially abstracted delay graph, wherein said partially abstracted delay graph includes at least one internal node having at least one in-edge and at least one out-edge from said marked delay edges;

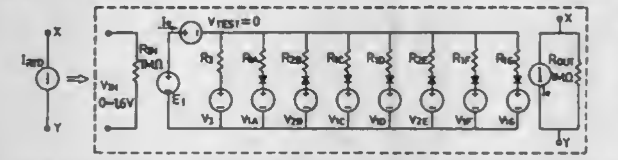
d) a merging device for merging said at least one in-edge with at least one out-edge of said internal node, said out-edge having at least one of the same said type of necessary mark as said in-edge, in said partially abstracted delay graph to form a new edge, if merging by said merging device decreases the number of said delay edges in said partially abstracted delay graph, to produce an abstracted delay graph, wherein said delay of each of said at least one extreme delay path is preserved; and

e) an outputting device for outputting said abstracted delay graph.

5,535,146

METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE USING LOGIC SIMULATION APPROACH AND SIMULATE A MULTI-PEAK RESONANT TUNNELING DIODE-BASED ELECTRONIC CIRCUIT AND A LARGE SIGNAL MULTI-PEAK RESONANT TUNNELING DIODE SPICE MODEL EMPLOYED IN THE LOGIC SIMULATION APP

Chih-Ynan Huang, Kaohsiung; Yan-Kuin Su, Tainan, both of, Taiwan, and James E. Morris, Binghamton, N.Y., assignors to National Science Council of R.O.C., Taipei, Taiwan
Filed Apr. 27, 1995, Ser. No. 429,573
Int. Cl.^{6} G06F *17/50;* **G06G** *7/48*
U.S. Cl. 364—578 **26 Claims**



1. A method for producing a semiconductor device using a logic simulation approach, comprising the steps of:

(a) providing a circuit model for a user-specified design of a multi-peak resonant tunneling diode-based electronic circuit which includes a plurality of circuit devices, one of the circuit devices being a multi-peak resonant tunneling diode which is modeled by a parasitic resistance in series with a parallel combination of a voltage-controlled current source and an intrinsic capacitance, the voltage-controlled current source having an equivalent circuit model with a function stage for realizing a current-voltage characteristic curve of the multi-peak resonant tunneling diode, the function stage including:

at least one first circuit branch having a resistor, a diode with an anode connected electrically to the resistor, and a voltage source with a positive terminal connected to a cathode of the diode;

at least one second circuit branch connected in parallel to the first circuit branch and having a resistor, a diode with a cathode connected electrically to the resistor of the second circuit branch, and a voltage source with a positive terminal connected to an anode of the diode of the second circuit branch; and

a third circuit branch connected in parallel to the first and second circuit branches and having a resistor and a voltage source with a positive terminal connected to the resistor of the third circuit branch;

the first and third circuit branches representing positive resistance sections, and the second and third circuit branches representing negative resistance sections of the current-voltage characteristic curve;

(b) providing design data, which specifies each of the circuit devices and connections of the circuit devices in the circuit model, to a computer loaded with a circuit simulation program in a format acceptable to the circuit simulation program;

(c) running the computer to simulate operation of the electronic circuit; and

(d) effecting a patterning of the electronic circuit on a semiconductor wafer to produce the semiconductor device after verifying, based on results of the simulation, that the electronic circuit will operate as intended;

wherein the current-voltage characteristic curve has starting and ending points and multiple breakpoints between the starting and ending points that are interconnected to form a series of linear segments which approximate the current-voltage characteristic curve, each of the first circuit branches being associated with a corresponding one of the breakpoints that is connected to adjacent upward linear segments, each of the second circuit branches being associated with a corresponding one of the breakpoints that is connected to adjacent downward linear segments.

5,535,147

METHOD AND APPARATUS FOR DOWNLOADING INFORMATION FROM A CONTROLLABLE LIGHT SOURCE TO A PORTABLE INFORMATION DEVICE

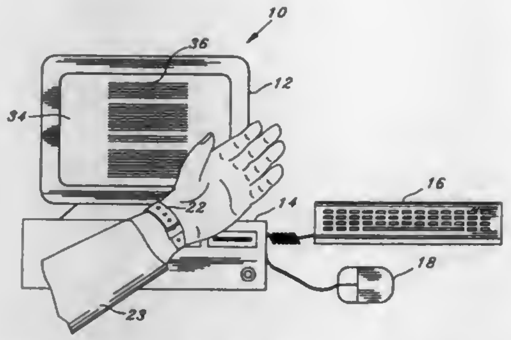
Michael A. Jacobs, Naugatuck, and Mark A. Insero, Waterbury, both of Conn., assignors to Timex Corporation, Middlebury, Conn.
Continuation of Ser. No. 155,326, Nov. 22, 1993, Pat. No. 5,488,571. This application Jun. 5, 1995, Ser. No. 471,868
Int. Cl.^{6} G06F *15/16;1/00*
U.S. Cl. 364—705.07 **35 Claims**

1. The method of transmitting data from a transmitter to a receiver, said transmitter including a display screen made up of a plurality of pixels arranged in a two-dimensional array that is scanned repeatedly to produce a spatially and temporally variable, two-dimensional, light image on the screen, and said receiver including a photosensor, which is much smaller than said screen, for detecting light impinging on the photosensor, said method comprising the steps of:

positioning the receiver so that the photosensor receives light from substantially the entirety of said screen;

operating the transmitter to modulate the light produced by said screen so that a plurality of successive light pulses emanate from said screen during each complete scanning of said screen, each of said light pulses being produced by sequentially illuminating a sub-plurality of said pixels, said light pulses representing said data and being characterized by a predetermined pulse rate which is substantially greater than the rate at which complete scannings of said screen are performed; and

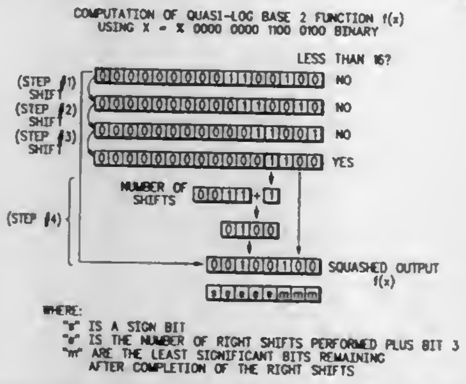
using the receiver to detect said light pulses via said photosensor and to thereby receive said data for use by said receiver.



5,535,148

METHOD AND APPARATUS FOR APPROXIMATING A SIGMOIDAL RESPONSE USING DIGITAL CIRCUITRY

Stephen G. Osborn, and L. Rodney Goke, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.
Continuation of Ser. No. 125,670, Sep. 23, 1993, abandoned. This application Dec. 18, 1995, Ser. No. 570,616
Int. Cl.^{6} G06F *1/02*
U.S. Cl. 364—718 **20 Claims**


COMPUTATION OF QUASI-LOG BASE 2 FUNCTION f(x)
USING X = X 0000 0000 1100 0100 BINARY
LESS THAN 16?
(STEP #1) SHIFT
(STEP #2) SHIFT
(STEP #3) SHIFT
(STEP #4)
0000000000001100 0100 NO
NO
NO
YES
NUMBER OF SHIFTS
SQUASHED OUTPUT f(x)
WHERE:
"s" IS A SIGN BIT
"e" IS THE NUMBER OF RIGHT SHIFTS PERFORMED PLUS BIT 3
"m" ARE THE LEAST SIGNIFICANT BITS REMAINING AFTER COMPLETION OF THE RIGHT SHIFTS

1. A method for approximating a sigmoidal response in a digital data processing system, the method comprising the steps of:

(a) receiving a binary input value having a sign bit, having a plurality of most significant data bits above a predetermined bit position, and having a plurality of least significant data bits below the predetermined bit position;

(b) determining if the binary input value has a logical one value above the predetermined bit position;

(c) if the binary input value has the logical one value above the predetermined bit position, right shifting the binary input value to produce a shifted binary input value;

(d) determining if the shifted binary input value has the logical one value above the predetermined bit position;

(e) if the shifted binary input value has the logical one value above the predetermined bit position, right shifting the shifted binary input value;

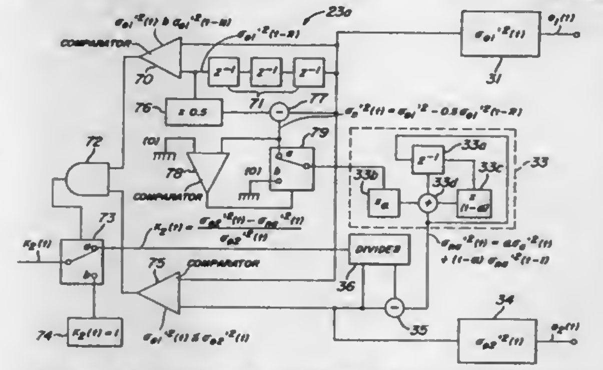
(f) repeating steps (d) and (e) until the shifted binary input value does not have a logical one value above the predetermined bit position; and

(g) generating an output value having a first bit field equal to the sign bit, having a second bit field determined by a number of times a right shift was performed, and having a third bit field equal to a plurality of least significant bits of a final shifted binary input value.

5,535,149

DUPLEX ADAPTIVE DIGITAL FILTER AND METHOD OF OPERATION

Shinsaku Mori, 1-31-6, Okuzawa, Setagaya-ku, Tokyo; Iwao Sasae, 2-20-32-602, Minowamachi, Kouhoku-ku, Yokohama-shi, Kanagawa-ken, and Kiyoshi Takahashi, Tokyo, all of, Japan, assignors to Shinsaku Mori, Tokyo; Iwao Sasase, Yokohamu, and TEAC Corporation, Tokyo, all of, Japan
Filed Jun. 20, 1994, Ser. No. 262,478
Claims priority, application Japan, Dec. 21, 1993, 5-345224
Int. Cl.^{6} G06F *17/00;* **H04J** *1/00;3/00;* **H04M** *1/00*
U.S. Cl. 364—724.19 **7 Claims**



I. A step gain circuit for providing rapid conversion while minimizing error convergence in an adaptive filter system having a step gain, the adaptive filter system being coupled to at least one system, the system being provided with an input signal and generating a reference signal therefrom, wherein the adaptive filter system comprises:

a first filter subsystem for receiving the input signal and the reference signal and for generating from the input signal and the reference signal, a first difference signal having an error component and a noise component;

a second filter subsystem for receiving the input signal and the reference signal and for generating from the input signal and the reference signal a second difference signal having an error component and a noise component;

the step gain circuit being a component of the second filter subsystem and comprising:

a first averaging means for averaging the first difference signal and providing an output defining a first average difference signal;

a delay means coupled to the first averaging means for delaying the first average difference signal to provide an output defining a delayed first average difference signal;

a first comparison means for determining whether the delayed first average difference signal is less than the first average difference signal and for generating an output signal indicative of the determination;

a second averaging means for averaging the second difference signal and providing an output defining a second average difference signal;

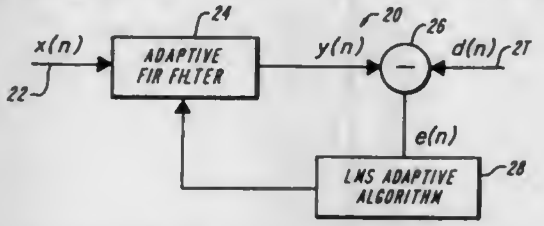
a second comparison means for determining whether the second average difference signal is greater than the first average difference signal and for generating an output signal indicative of the determination;

a third comparison means coupled to receive the output signals from the first comparison means and the second comparison means and for determining based on those output signals if the delayed first average difference signal is less than the first average difference signal and the second average difference signal is greater than the .first average difference signal, and if so, generating an output signal defining a constant switch signal, and if not, generating an output signal defining a variable switch signal; and

a step gain selector switching means coupled to the third comparison means for selecting between a constant step gain and a variable step gain based on the output signal generated by the third comparison means.

5,535,150
SINGLE CHIP ADAPTIVE FILTER UTILIZING UPDATABLE WEIGHTING TECHNIQUES

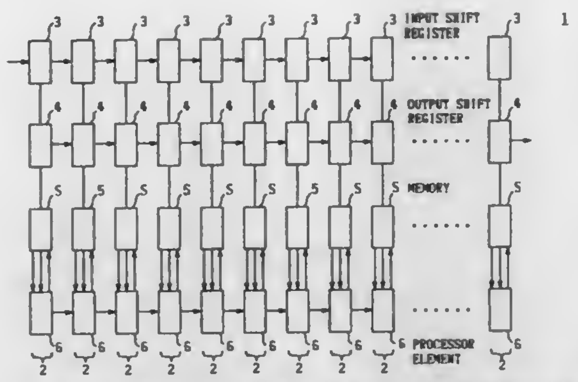
Alice M. Chiang, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 49,707, Apr. 20, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 388,170
Int. Cl.^{6} G06F *15/31*
U.S. Cl. 364—724.19 **40 Claims**



1. An adaptive filtering system comprising:
- a multi-stage signal input tapped delay line including a plurality of storage modules operable for successively shifting discrete samples of an input signal along said delay line;
- a plurality of parallel multipliers respectively coupled to each of said storage modules, each of said multipliers operable for generating an output corresponding to the product of the discrete sample of said input signal received from a respective storage module and an updatable weighting coefficient;
- a summation circuit operable for providing an output signal corresponding to the sum of said products generated from said multipliers; and
- a weighting coefficient updating circuit operable for simultaneously providing to each of said multipliers distinct and synchronized updatable weighting coefficients as the sum of a predetermined weighting coefficient and an updating factor, said updating factor corresponding to a product of discrete samples of said input signal and discrete portions of an error signal determined as the difference between said output signal and a predetermined reference signal, wherein
- said updating circuit comprises a second multi-stage signal input tapped delay line including a second plurality of storage modules operable for successively shifting discrete samples of said input signal along said second delay line, and a second plurality of multipliers respectively coupled to each of said second plurality of storage modules, each of said second multipliers operable for generating an output corresponding to the product of the discrete sample of said input signal received from a respective second storage module and said discrete portions of said error signal.

5,535,151
ELECTRONIC PROCESSOR FOR PERFORMING MULTIPLICATION

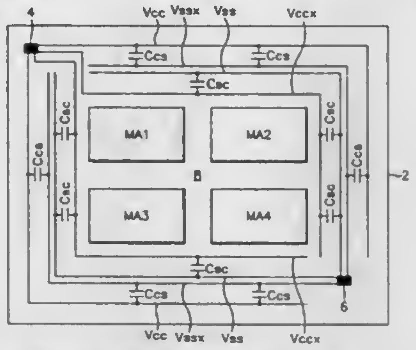
Masuyoshi Kurokawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 15, 1994, Ser. No. 340,854
Claims priority, application Japan, Nov. 19, 1993, 5-314508
Int. Cl.^{6} G06F *7/52*
U.S. Cl. 364—760 **9 Claims**



9. A processor which is composed of a plurality of signal processing stages, performing multiplication with multiplicand and multiplier, connected in parallel, wherein each of said signal processing stages comprising:
- a shift register for data input;
- a shift register for data output;
- memory means for storing said input data and a calculated result in a multiplication process; and
- partial product calculating means for performing a predetermined calculation on said multiplicand in accordance with a combination of neighboring three bits of said multiplier so as to obtain a partial product, and for storing the partial product in a predetermined area of said memory means.

5,535,152
SEMICONDUCTOR CHIP HAVING A LOW-NOISE POWER SUPPLY ARRANGEMENT

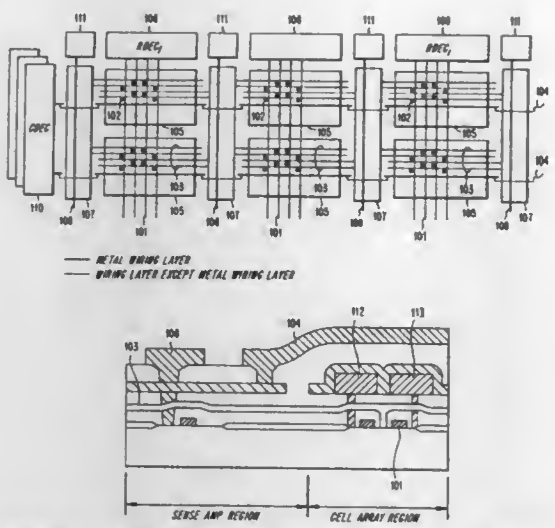
Yong-Joo Han, Seoul, and Myung-Ho Bae, Kyungki-do, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 17, 1994, Ser. No. 291,943
Claims priority, application Rep. of Korea, Sep. 6, 1993, 1993-17783
Int. Cl.^{6} H01L *27/10*
U.S. Cl. 365—51 **19 Claims**



1. A power supply arrangement, comprising:
- a first voltage line coupled to a first voltage;
- a second voltage line coupled to a second voltage having a level less than that of said first voltage;
- a third voltage line coupled to a third voltage having a level between that of said first and second voltages;
- a first noise reduction device connected between said first voltage line and said third voltage line; and
- a third voltage generator for generating said third voltage, said third voltage generator being coupled between said first voltage and said second voltage, said third voltage generator producing a substantially stable and noise-free voltage level.

5,535,153
SEMICONDUCTOR DEVICE

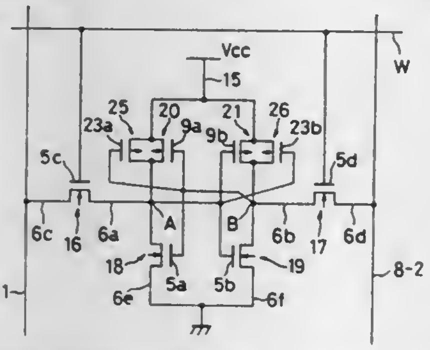
Takanori Saeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 13, 1994, Ser. No. 322,347
Claims priority, application Japan, Nov. 1, 1993, 5-273682
Int. Cl.^{6} G11C *5/06*
U.S. Cl. 365—72 **3 Claims**



1. A semiconductor device comprising:
- a plurality of cell arrays each comprising a plurality of memory cells each composed of a Metal Insulator Semiconductor transistor and a capacitor formed by a conductive layer;
- a plurality of word lines and bit lines which intersect each other at said memory cells;
- a plurality of sense amplifiers alternating with said cell arrays;
- a plurality of column decoders, each of said column decoders being connected to and shared by a plurality of said sense amplifiers; and
- a plurality of interconnections for transmitting selective signals from said word lines, said bit lines, and said column decoders, said interconnections for transmitting selective signals from said bit lines and said column decoders extending in a direction in which said cell arrays and said sense amplifiers are arrayed, said interconnections for transmitting selective signals from said word lines, said bit lines, and said column decoders being formed from four different layers, including said conductive layer for forming said capacitor, on the semiconductor device;
- wherein, said interconnections for transmitting selective signals from said column decoders are formed from a metallic layer on the cell arrays and are formed from a conductive layer, which is the same layer that forms plate electrodes of the capacitors, on the sense amplifiers.

5,535,154
SEMICONDUCTOR MEMORY DEVICE WITH CMOS-INVERTER STORAGE CELLS

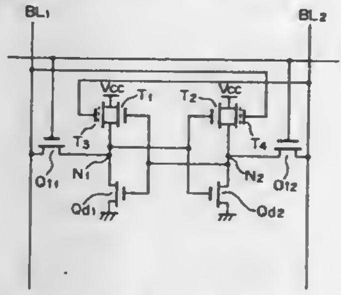
Junji Kiyono, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 22, 1994, Ser. No. 362,159
Claims priority, application Japan, Dec. 22, 1993, 5-324990
Int. Cl.^{6} G11C *11/40*
U.S. Cl. 365—145 **16 Claims**



9. In a semiconductor memory device containing a plurality of storage cells, each of said cells comprising:
- a first CMOS inverter having a first input end and a first output end;
- a second CMOS inverter having a second input end and a second output end;
- said first input end being connected with said second output end and said second input end being connected with said first output end;
- said first inverter and said second inverter constituting a flip-flop circuit;
- wherein
- said first CMOS inverter contains a first pair of thin-film transistors and said second CMOS inverter contains a second pair of thin-film transistors;
- and wherein
- said first pair of thin-film transistors having a first channel region formed between a first pair of source/drain regions, a first gate insulator film formed at one side of said first channel region, a first gate electrode formed on said first gate insulator film, a first ferroelectric insulator film formed at another side of said first channel region, and a first control electrode formed on said first ferroelectric insulator film;
- and wherein
- said second pair of thin-film transistors having a second channel region formed between a second first pair of source/drain regions, a second gate insulator film formed at one side of said second channel region, a second gate electrode formed on said second gate insulator film, a second ferroelectric insulator film formed at another side of said second channel region, and a second control electrode formed on said second ferroelectric insulator film;
- and wherein
- said first and second ferroelectric insulator films are dielectrically polarized by applying voltages to said first and second control electrodes, so that a threshold voltage difference is generated between said first and second pairs of thin-film transistors, maintaining a content of said storage cell due to said threshold voltage difference.

5,535,155
SRAM CELL HAVING LOAD THIN FILM TRANSISTORS

Kazuhiko Abe, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jul. 5, 1995, Ser. No. 498,173
Claims priority, application Japan, Jul. 5, 1994, 6-174882
Int. Cl.^{6} G11C *11/0;* **H01L** *27/02*
U.S. Cl. 365—154 **7 Claims**



1. A static random access memory device comprising:
- first and second power supply lines;
- a word line;
- first and second bit lines;
- first and second nodes;
- a first load thin film transistor connected between said first power supply line and said first node and having a gate electrode connected to said second node;
- a second load thin film transistor connected between said first power supply line and said second node and having a gate electrode connected to said first node;
- a first drive bulk transistor connected between said first node and said second power supply line and having a gate electrode connected to said second node;
- a second drive bulk transistor connected between said second node and said second power supply line and having a gate electrode connected to said first node;

a first transfer bulk transistor connected between said first bit line and said first node and having a gate electrode connected to said word line; and

a second transfer bulk transistor connected between said second bit line and said second node and having a gate electrode connected to said word line,

said second bit line being arranged in the proximity of said first load thin film transistor to create a first parasitic load thin film transistor,

said first bit line being arranged in the proximity of said second load thin film transistor to create a second parasitic load thin film transistor.

5,535,156

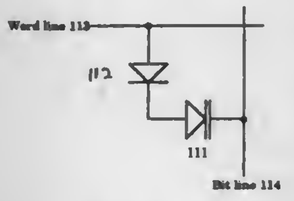
TRANSISTORLESS, MULTISTABLE CURRENT-MODE MEMORY CELLS AND MEMORY ARRAYS AND METHODS OF READING AND WRITING TO THE SAME

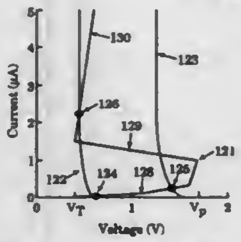
Harold J. Levy, Seal Beach, and Thomas C. McGill, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 5, 1994, Ser. No. 238,390

Int. Cl.^{6} G11C *11/00*

U.S. Cl. 365—175 **52 Claims**





1. A circuit for storing information as one of at least two possible bistable current states comprising:

a) at least a first cell comprising
  at least a first transistorless device exhibiting negative differential resistance characterized by a voltage-current relationship having multiple values of current for the same value of voltage; and
  at least a second transistorless device coupled to the first transistorless device;
b) at least a first word line having a first voltage level, the first word line being coupled to the first cell; and
c) at least a first bit line having a second voltage level, the first bit line being coupled to the first cell.

5,535,157

MONOLITHICALLY INTEGRATED STORAGE DEVICE

Giovanni Campardo, Bergamo; Raffaele Costa, Genova, and Piero Torricelli, Brianza, all of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy

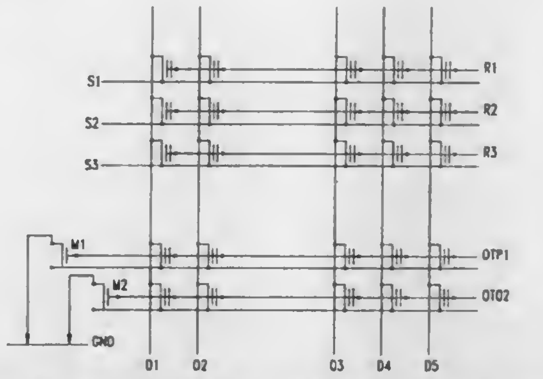
Filed Nov. 30, 1994, Ser. No. 347,653

Claims priority, application European Pat. Off., Nov. 30, 1993, 93830481

Int. Cl.^{6} G11C *7/00;17/00*

U.S. Cl. 365—185.05 **6 Claims**

1. A monolithically integrated storage device comprising electrically programmable non-volatile memory cells interconnected into a matrix configuration of cell rows and columns, with each cell having at least a first terminal connected to a control line for controlling the cell state from the row to which that cell is included, a second terminal connected to a section line for the column including the cell, and a selection terminal connected to a decoding line for the row including the cell, said cell matrix configuration having at least one row of electrically erasable read/write cells and at least one row of non-erasable read-only cells, characterized in that an electronic switch is connected between a reference potential and the control line controlling the state of the non-erasable read-only cells, said switch having a control terminal connected to the decoding line for the row of non-erasable read-only cells.



5,535,158

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR ERASURE AND PRODUCTION THEREOF

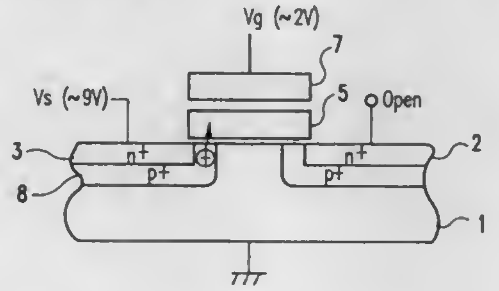
Yasushi Yamagata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 29, 1994, Ser. No. 350,978

Claims priority, application Japan, Dec. 1, 1993, 5-325787

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—185.29 **7 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate of a first conductivity type;

a plurality of memory cells, each of said memory cells including source and drain regions, of second conductive type opposite to said first conductivity type selectively formed in said semiconductor substrate to define a channel region therebetween,

a first gate insulating layer disposed on said channel region,

a first gate electrode disposed on said first gate insulating layer,

a second gate insulating layer disposed on said first gate electrode,

a second gate electrode disposed on said second gate insulating layer,

first and second regions of said first conductivity type having an impurity concentration higher than that of said semiconductor substrate and selectively formed in said channel region in contact respectively with said source and drain regions;

first means for performing on a selected one of said memory cells a data programming operation of applying first and second positive voltages respectively to said second gate electrode and said drain region while applying a reference voltage to said source region and said semiconductor substrate to thereby inject carriers into said first gate electrode, and

second means for performing on said selected one of said memory cells a data erasing operation of applying said reference voltage to said semiconductor substrate, applying a third positive voltage to said second gate electrode, bringing said drain region into an open state, and applying a fourth positive voltage to said source region so that an avalanche breakdown occurs between said source region and said first region and hot carriers generated by said avalanche breakdown are injected into said first gate electrode.

5,535,159

MULTIPORT MEMORY CELL CIRCUIT HAVING READ BUFFER FOR REDUCING READ ACCESS TIME

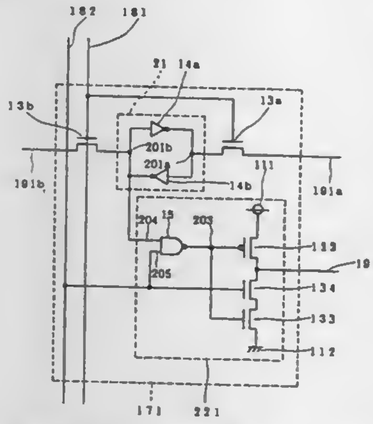
Koji Nii, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 105,629, Aug. 13, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 383,860

Claims priority, application Japan, Sep. 17, 1992, 4-247723

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.05 **34 Claims**



1. A memory cell circuit comprising:

memory means for storing memory logic taking either one of complementary first and second logical values, said memory means having a normal output end for outputting said memory logic; and

at least one read means coupled to said memory means,

each said read means including:

an output terminal,

a first potential corresponding to said first logical value,

a second potential corresponding to said second logical value,

a control terminal for providing a control signal for controlling whether said output terminal is supplied with output logic being identical to said memory logic or brought into a floating state,

a first MOS transistor having first and second current electrodes being connected to said first potential and said output terminal respectively, and a control electrode,

a second MOS transistor having a first current electrode, a second current electrode being connected to said output terminal, and a control electrode being supplied with said control signal, said second MOS transistor being driven by said control signal,

a third MOS transistor having a control electrode being supplied with an inverted memory logic being complementary to said memory logic, and first and second current electrodes being connected in series to said second MOS transistor between said second potential and said output terminal, and

a logic circuit being driven by said control signal for supplying a drive signal to said control electrode of said first MOS transistor on the basis of said memory logic for driving said first MOS transistor.

5,535,160

SEMICONDUCTOR INTEGRATED CIRCUIT

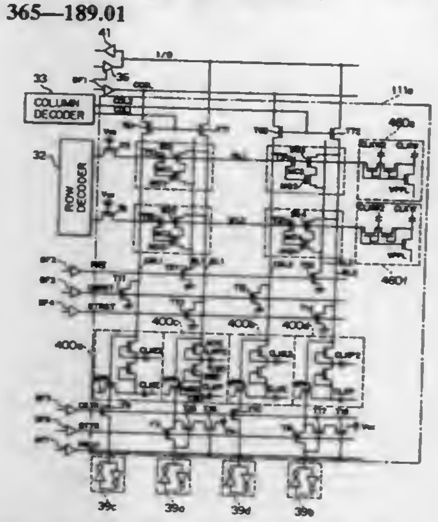
Atsuo Yamaguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,369

Claims priority, application Japan, Jul. 5, 1993, 5-165672

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.01 **3 Claims**



1. A semiconductor integrated circuit comprising:

an EEPROM memory cell array comprising a plurality of memory cells disposed in a matrix, each memory cell including a non-volatile memory transistor for electrically writing and erasing data;

means for generating a high voltage required to write data into and erase data from said memory cell array;

means for selectively supplying the high voltage to a memory cell; and

means for controlling said means for generating and said means for selectively supplying to control writing data into, reading data from, and erasing data from the memory cell array, said means for selectively supplying the high voltage to a memory cell including a plurality of switches, each switch having:
  a selection transistor;
  a plurality of charge pump transistors, each charge pump transistor having a drain and a gate connected to each other, at least one of the charge pump transistors being connected to said selection transistor; and
  a plurality of capacitors, wherein said plurality of charge pump transistors and said plurality of capacitors form a multi-stage charge pump.

5,535,161

SEMICONDUCTOR MEMORY DEVICE WITH BUILT-IN ACCESSING SYSTEM FOR REDUNDANT INFORMATION LESS AFFECTING DATA ACCESS SPEED IN STANDARD MODE

Yasushi Kato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,387

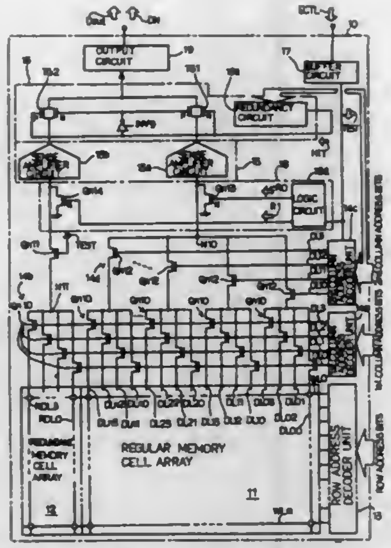
Claims priority, application Japan, Oct. 8, 1993, 5-275940

Int. Cl.^{6} G11C *7/00;29/00*

U.S. Cl. 365—200 **6 Claims**

1. A semiconductor memory device having at least a regular data access sequence for data bits and a redundant data access sequence for redundant data, comprising:

a) a regular memory cell array having a plurality of regular memory cells for storing said data bits, said plurality of regular memory cells being divided into a plurality of regular memory cell groups;
b) a plurality of redundant memory cells for storing selected data bits of said data bits, at least one of said plurality of regular memory cell groups being replaceable with said plurality of redundant memory cells;



- c) an addressing system coupled to said regular memory cell array and said plurality of redundant memory cells, and responsive to external address bits for selectively transferring said data bits to an output port in said regular data access sequence, said addressing system blocking said output port from said data bits in said redundant data access sequence;
- d) a sense amplifier unit associated with said regular memory cell array and said plurality of redundant memory cells, and operative to discriminate the logic level of each data bit selectively transferred to said output port in said regular data access sequence;
- e) a redundant data accessing unit enabled with a test signal indicative of a request for said redundant data access sequence, and producing an information signal indicative of said redundant data in cooperation with said sense amplifier unit in said redundant data access sequence;
- f) a redundancy unit storing said redundant data, and operative to discriminate an access to said at least one of said plurality of regular memory cell groups for selectively outputting said selected data bits instead of the data bits supplied from said at least one of said plurality of regular memory cell groups in said regular data access sequence, said redundancy unit being further operative to determine the logic level of said information signal in said redundant data access sequence; and g) an output circuit operative to selectively output said data bits in said regular data access sequence and to output a diagnostic signal indicative of the logic level of said information signal in said redundant data access sequence.

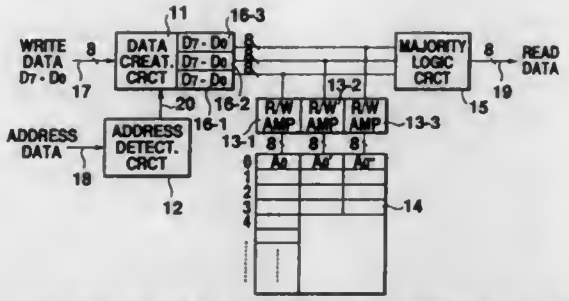
5,535,162
ELECTRICALLY ERASABLE READ ONLY MEMORY

Hiromi Uenoyama, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 114,183, Sep. 1, 1993, abandoned.
This application Dec. 22, 1994, Ser. No. 361,871
Claims priority, application Japan, Sep. 1, 1992, 4-233437
Int. Cl.^{6} G11C *16/00*
U.S. Cl. 365—200 **6 Claims**

1. An electrically erasable read only memory for storing a first type of data and a second type of data together, said first type of data being rewritten with high frequency and said second type of data being rewritten with low frequency, said memory comprising:

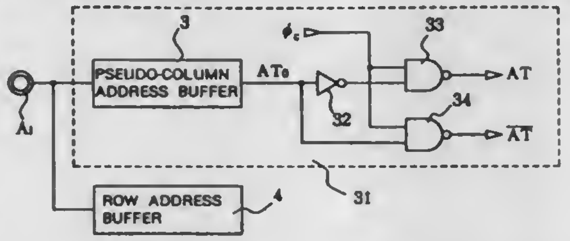
- (a) write address detecting means for detecting whether data to be written is of said first type by determining whether designated write addresses are within a predetermined range;
- (b) data writing means for adding an error correction code to said data and for writing said data to at least three memory cells when said data is determined to be of said first type, and for writing said data to a single memory cell when said data is determined to be of said second type; and
- (c) error correction means for reading said data written in said at least three memory cells when said predetermined range of addresses are designated during data reading, for selecting one of the read data, and for performing error correction based on said error correction code.



5,535,163
SEMICONDUCTOR MEMORY DEVICE FOR INPUTTING AND OUTPUTTING DATA IN A UNIT OF BITS

Yoshinori Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 1, 1994, Ser. No. 332,727
Claims priority, application Japan, Nov. 1, 1993, 5-273684
Int. Cl.^{6} G11C *11/34;* H01L *27/10*
U.S. Cl. 365—201 **7 Claims**



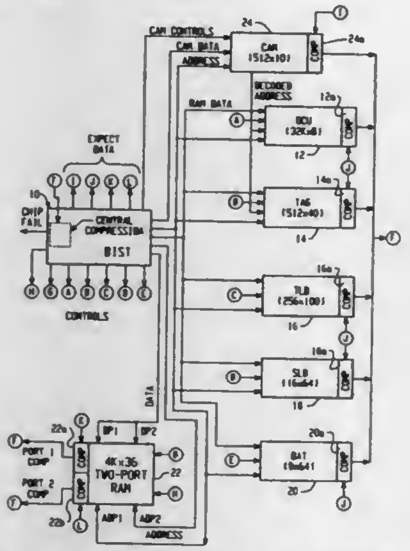
1. A multibit memory device comprising:

- a memory cell array composed of mixed memory cells corresponding to different IO bits;
- a plurality of data input/output terminals corresponding respectively to IO bits, for inputting and outputting data in a parallel fashion to and from said memory cell array, said data input/output terminals being classified into a first data input/output terminal and a second data input/output terminal;
- an address terminal for inputting an address;
- internal data buses associated respectively with the IO bits and connected to said memory cell array;
- test mode entry signal generating means for generating a test mode entry signal indicative of entry into a test mode;
- pseudo-address generating means connected to said address terminal, for generating a pseudo-address in said test mode; and
- connecting means responsive to said test mode entry signal for selecting one of said internal data buses depending on said pseudo-address and connecting the selected one of the internal data buses to said first data input/output terminal in said test mode.

5,535,164
BIST TESTER FOR MULTIPLE MEMORIES

Robert D. Adams, Essex Junction; John Connor, Burlington; Garrett S. Koch, Cambridge, all of Vt.; Stuart D. Rapoport, New York, N.Y., and Luigi Ternullo, Jr., Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,468
Int. Cl.^{6} G11C *7/00*
U.S. Cl. 365—201 **18 Claims**



1. A single built-in self-test device for testing a plurality of memories, at least two of which have different characteristics and require different test patterns, comprising;

- logic to generate test data in pre-selected test patterns specific to each type of memory and anticipated output compare data corresponding to said test data,
- logic to convey said test data to at least two of said memories simultaneously,
- logic to supply the address of the locations of said memory to be tested with said test data;
- logic to receive output data from said memory location and compare said output data with said anticipated output compare data to provide a comparison;
- control logic including;
  - write enable logic to selectively cause a write function of said test data on each said memory at each addressable location thereon to be tested; and
  - logic to selectively load the results of said comparison at each addressable location thereon to be tested.

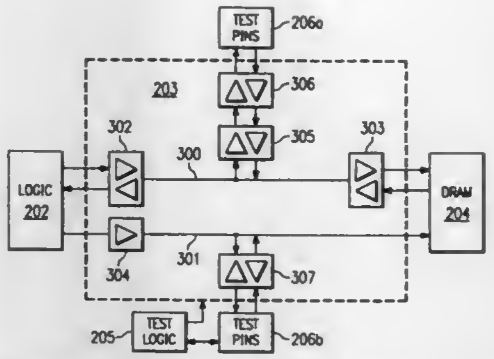
5,535,165
CIRCUITS, SYSTEMS AND METHODS FOR TESTING INTEGRATED CIRCUIT DEVICES INCLUDING LOGIC AND MEMORY CIRCUITRY

Phillip D. Davis, Lewisville; Sudhir Sharma, Plano, and Hal Long, Dallas, all of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jun. 30, 1995, Ser. No. 497,267
Int. Cl.^{6} G11C *7/00;29/00;* G01R *31/28*
U.S. Cl. 365—201 **23 Claims**

1. A single chip integrated circuit comprising:

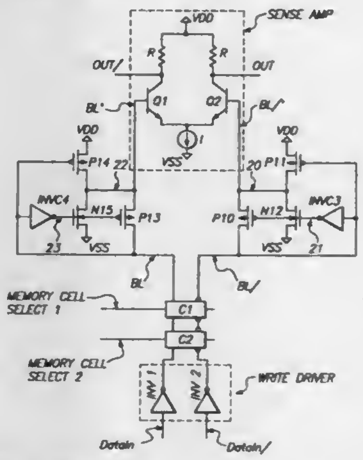
- logic circuitry;
- memory circuitry;
- a bus;
- first bus control circuitry for controlling the exchange of signals between said logic circuitry and said bus;
- second bus control circuitry for controlling the exchange of signals between said memory circuitry and said bus;
- third bus control circuitry for controlling the exchange of signals between said bus and at least one test pin; and
- mode control circuitry operable to:
  - in an operating mode, activate said first and second bus control circuitry;
  - in a memory test mode, activate said second and third bus control circuitry and deactivate said first bus control circuitry; and
  - in a logic test mode, activate said first and third bus control circuitry and deactivate said second bus control circuitry.



5,535,166
CIRCUIT FOR ISOLATING AND DRIVING INTERCONNECT LINES

Bruce L. Bateman, Danville, Calif., assignor to MicroUnity Systems Engineering, Inc., Sunnyvale, Calif.

Filed Jul. 25, 1994, Ser. No. 280,350
Int. Cl.^{6} G11C *7/02*
U.S. Cl. 365—208 **23 Claims**



14. A memory comprising:

- at least one memory cell for storing data;
- at least one bitline pair including a first bitline and a second bitline, each of said at least one bitline pair being coupled to said at least one memory cell;
- at least one write driver for driving said at least one bitline pair with program voltages so as to change the logic state of said data stored in said at least one memory cell during a write operation, said program voltages having an associated DC voltage level;
- at least one sense amplifier for sensing data in said at least one memory cell during a read operation, said at least one sense amplifier including first and second bipolar transistors, the base of said first transistor being coupled to said first bitline and the base of said second transistor being coupled to said second bitline, the emitters of said first and second transistors being commonly coupled to a current source;
- a first transmission gate having an input terminal, an output terminal and a control terminal, coupled in series between said base of said first bipolar transistor and said first bitline, said first transmission gate functioning such that when it is

enabled said first bitline is coupled to said base of said first bipolar transistor and when it is disabled said base of said first bipolar transistor is isolated from said first bitline;

a first means for sensing said associated DC voltage level of said program voltages, said first sensing means coupling a disable signal to said control terminal of said first transmission gate when said associated DC voltage level of said program voltages exceeds a first DC voltage level and said first sensing means coupling an enable signal to said control terminal of said first transmission gate when said associated DC voltage level of said program voltages does not exceed said first DC voltage level;

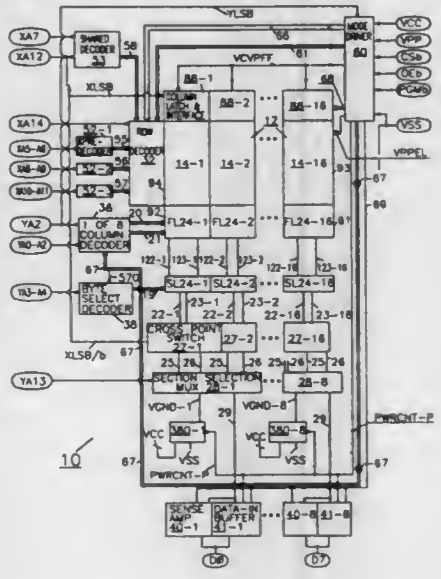
a first means for driving said base of said first bipolar transistor with a voltage corresponding to a second DC voltage level when said first transmission gate is disabled, said first driving means being enabled when said associated DC voltage level of said program voltages exceeds said first DC voltage level;

a second transmission gate having an input terminal, an output terminal and a control terminal, coupled in series between said base of said second bipolar transistor and said second bitline, said second transmission gate functioning such that when it is enabled said second bitline is coupled to said base of said second bipolar transistor and when it is disabled said base of said second bipolar transistor is isolated from said second bitline;

a second means for sensing said associated DC voltage level of said program voltages, said second sensing means coupling a disable signal to said control terminal of said second transmission gate when said associated DC voltage level of said program voltages exceeds said first DC voltage level and said second sensing means coupling an enable signal to said control terminal of said second transmission gate when said associated DC voltage level of said program voltages does not exceed said first DC voltage level;

a second means for driving said base of said second bipolar transistor with a voltage corresponding to said second DC voltage level when said second transmission gate is disabled, said second driving means being enabled when said associated DC voltage level of said program voltages exceeds said first DC voltage level.

5,535,167
NON-VOLATILE MEMORY CIRCUITS, ARCHITECTURE
Emanuel Hazani, 1210 Sesame Dr., Sunnyvale, Calif. 94087
Division of Ser. No. 179,587, Jan. 10, 1994, which is a division of Ser. No. 713,995, Jun. 12, 1991, Pat. No. 5,278,785. This application May 9, 1995, Ser. No. 436,168
Int. Cl.^{6} G11C *13/00*
U.S. Cl. 365—218 8 Claims



1. A non-volatile memory system for storing digital electrical data in the form of analog signals comprising:

address receiving means;

data input means;

data output means;

a memory array comprising plurality of memory cells arranged in plurality of rows and columns;

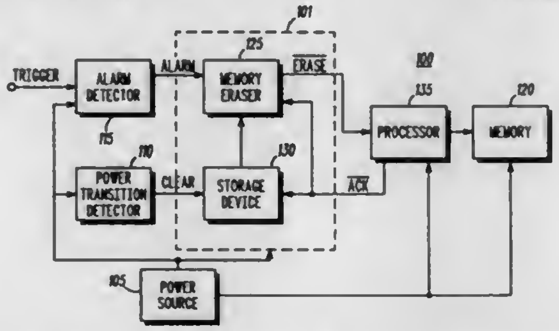
column address circuitry;

row address circuitry;

a digital to analog converter having an input that is hardware connected to said data input means to receive digital electrical data from said data input means and having an output that is hardware connected to said memory array to program analog data in said memory array; and

an analog to digital converter having an input that is hardware connected to said memory array to receive analog data from said memory array and having an output that is hardware connected to said output means to present digital electrical data at said output means.

5,535,168
METHOD AND APPARATUS FOR SELECTIVELY ERASING MEMORY TO EXTEND BATTERY LIFE
Esteban Yepez, III, Bartlett, and Giuseppe M. DiPrizio, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 1, 1994, Ser. No. 347,751
Int. Cl.^{6} G11C *13/00*
U.S. Cl. 365—227 20 Claims



1. In a device including a memory and a power source, a method of erasing the memory, the method comprising the steps of:

detecting an alarm-triggering event;

providing, responsive to the step of detecting, an alarm signal;

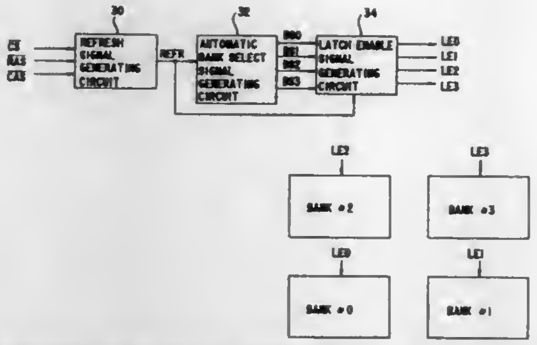
determining, responsive to the alarm signal, whether the memory has been erased; and

when the device determines that the memory has not been erased, erasing the memory.

5,535,169
SEMICONDUCTOR MEMORY DEVICE
Tetsuya Endo; Hirohiko Mochizuki; Yukinori Kodama, and Yoshihiro Takemae, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 13, 1994, Ser. No. 322,564
Claims priority, application Japan, Dec. 28, 1993, 5-337220
Int. Cl.^{6} G11C *8/00*
U.S. Cl. 365—230.03 11 Claims

1. A semiconductor memory device including a plurality of banks each having a memory cell array and sense amplifiers, a data input/output circuit and an address circuit, said semiconductor memory device comprising:

first means for receiving control signals from an outside of the semiconductor memory device and for generating a refresh signal therefrom;

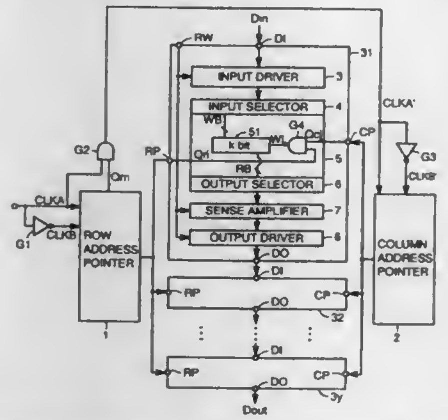

30
32
34
CE
RAS
CAS
REFRESH SIGNAL GENERATING CIRCUIT
REFR
AUTOMATIC BANK SELECT SIGNAL GENERATING CIRCUIT
BS0
BS1
BS2
BS3
LATCH ENABLE SIGNAL GENERATING CIRCUIT
LE0
LE1
LE2
LE3
BANK #2
BANK #3
BANK #0
BANK #1

second means for generating bank select signals in response to the refresh signal, the bank select signals being used to select the plurality of banks;

third means for receiving the bank select signals and generating latch enable signals therefrom, the latch enable signals driving the sense amplifiers provided in the plurality of banks,

a refresh operation being carried out by activating the sense amplifiers by the latch enable signals.

5,535,170
SEQUENTIAL ACCESS MEMORY THAT CAN HAVE CIRCUIT AREA REDUCED
Yukinaga Imamura; Kazuya Yamanaka; Shiro Hosotani, and Minobu Yazawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan
Filed May 11, 1995, Ser. No. 439,558
Claims priority, application Japan, May 27, 1994, 6-115371
Int. Cl.^{6} G11C *8/00;7/00*
U.S. Cl. 365—239 29 Claims



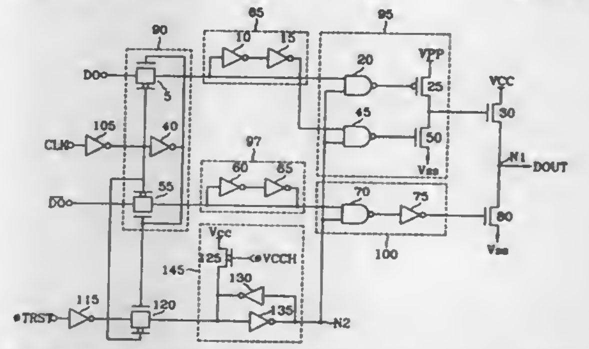
I. A sequential access memory storing y units of a data train of x words as one unit, comprising:

y memory cell arrays connected in series, each storing data of x words, and

an address pointer for providing a plurality of select signals to sequentially access said data of x words to each of said y memory cell arrays,

wherein each of said y memory cell arrays carries out data input and output for every x words in response to said select signals.

5,535,171
DATA OUTPUT BUFFER OF A SEMICONDUCTER MEMORY DEVICE
Chull-Soo Kim, Suwon, and Hyun-Soon Jang, Seoul, both of, Rep. of Korea, assignors to Samsung Electronic CO., Ltd., Suwon, Rep. of Korea
Filed Feb. 3, 1995, Ser. No. 383,767
Int. Cl.^{6} G11C *8/00*
U.S. Cl. 365—233 16 Claims



9. A data output buffer of a semiconductor memory device which operates in response to an external clock having a fixed period, comprising:

a data input circuit which receives input data, said data input circuit outputting said input data as synchronized input data in synchronization with said clock;

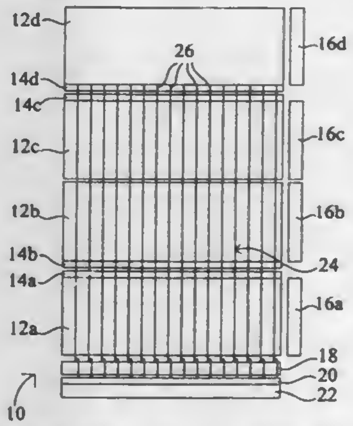
a data latch for latching said synchronized input data, said data latch outputting latch data;

a latch controller which includes a control latch that latches a control signal in synchronization with said clock, said control latch outputting an output control signal;

a data output driver which receives said latched data from said data latch, said data output driver controlling output of said latched data as output data using said output control signal; and

an output connected to said data output driver for outputting said output data.

5,535,172
DUAL-PORT RANDOM ACCESS MEMORY HAVING REDUCED ARCHITECTURE
Chitranjan N. Reddy, Milpitas, and Kenneth A. Poteet, San Jose, both of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.
Filed Feb. 28, 1995, Ser. No. 395,443
Int. Cl.^{6} G11C *7/00*
U.S. Cl. 365—230.03 16 Claims



1. A semiconductor memory device, comprising:

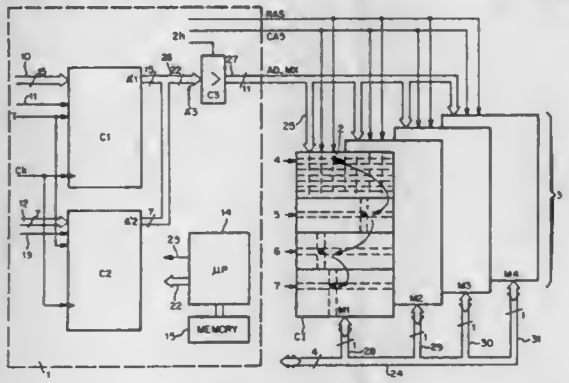
a plurality of array blocks, each array block including a plurality of memory cells disposed in rows and local columns;

row decoding means responsive to a row address for selecting one said row from said plurality of array blocks;

a sense amplifier row for each array block, each said sense amplifier row including a sense amplifier operatively coupled to one local column of the array block;
a random input/output latch;
a column decoder including a plurality of decoder input/outputs, said column decoder responsive to a column address for coupling a decoder input/output to said random input/output latch;
a row of latches, said row of latches including a latch for each local column in each array block;
a serial register operatively coupled to said row of latches for receiving data from said row of latches; and
a layer of interconnect disposed above the array blocks, said layer of interconnect connecting one sense amplifier from each sense amplifier row to one latch of said row of latches, and to one decoder input/output of said column decoder.

5,535,173
DATA-STORAGE DEVICE

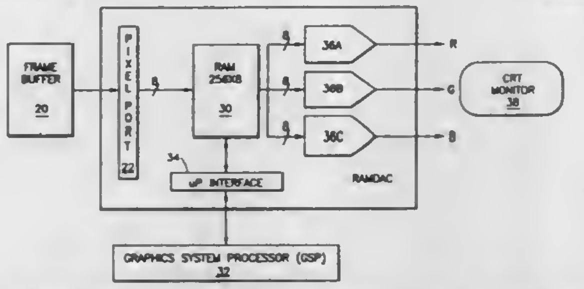
Laurent Carre, Voreppe, and Patrick Correard, Poisat, both of, France, assignors to SGS-Thomson Microelectronics S.A., Saint-Genis Pouilly, France
Filed Jul. 19, 1994, Ser. No. 277,259
Claims priority, application France, Jul. 19, 1993, 93 08832
Int. Cl.^{6} G11C *8/00;* **H04N** *7/167*
U.S. Cl. 365—230.09 **36 Claims**



1. A device for the storage of successive data elements in memory words of a random-access memory, comprising:
a generator of pseudo-random addresses including a first circuit for successively delivering pseudo-random P-bit binary words representing a first part of an address signal used to store the successive data elements, and a second circuit for successively delivering contiguous Q-bit binary words representing a second part of the address signal used to store the successive data elements;
synchronizing circuitry to synchronize a delivery of the P-bit and Q-bit binary words of the first and second circuits with the successive data elements; and
a concatenation circuit to concatenate the first part and the second part of the address signal to create a pseudo-random address of P+Q bits; whereby
the successive data elements are distributed pseudo-randomly within the memory.

5,535,174
RANDOM ACCESS MEMORY WITH APPARATUS FOR REDUCING POWER CONSUMPTION

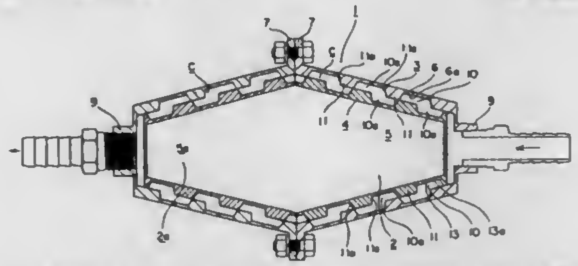
Stephen W. Harston, Limerick, Ireland, assignor to Analog Devices, Incorporated, Norwood, Mass.
Continuation-in-part of Ser. No. 986,146, Dec. 4, 1992, Pat. No. 5,343,196. This application Aug. 26, 1994, Ser. No. 296,739
Int. Cl.^{6} G11C *13/00*
U.S. Cl. 365—235 **7 Claims**



1. An integrated circuit (IC) chip formed with a plurality of memory cells arranged in a number of separate pages;
first addressing means for establishing access to selected sub-sections of said pages in response to first address signals;
signal lines for said memory cells;
second addressing means for establishing operative connection between said signal lines and the memory cells addressed by said first address signals and forming part of one of said pages selected in accordance with second address signals;
current sources connected to said signal lines and operable when supplying current thereto to condition said signal lines for signal transfer between the conditioned signal lines and associated memory cell; and
control means for turning on the current sources for the signal lines leading to the selected page of memory cells while turning off at least a portion of the current sources for signal lines of the remaining pages of memory cells.

5,535,175
STATIONARY TYPE MIXING APPARATUS

Tomio Niimi, Nagoya, Japan, and Tomio Niimi, Nagoya, Japan, assignors to Kankyokagakukogyo Kabushiki Kaisha, and Hitoshi Imai, both of Nagoya, Japan
Filed Aug. 22, 1995, Ser. No. 517,748
Claims priority, application Japan, Aug. 24, 1994, 6-224269
Int. Cl.^{6} B01F *13/00*
U.S. Cl. 366—336 **10 Claims**

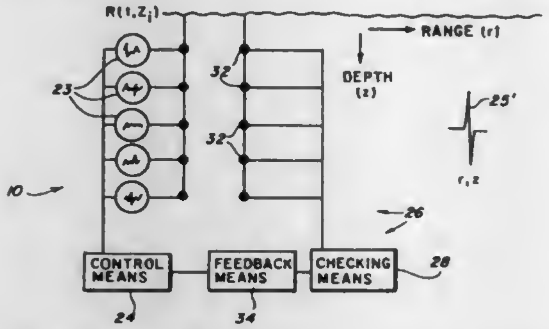


1. A stationary type mixing apparatus comprising a single fluid unit body composed of:
a frustoconical outer cylindrical unit body having a large diameter, said body including a frustoconical outer cylindrical body;
a frustoconical inner cylindrical unit body having a diameter being smaller than that of said outer cylindrical unit body, said body including a frustoconical inner cylindrical body;
wherein said inner cylindrical unit body is inserted concentrically in an inner space of said outer cylindrical unit body so as to form a passage space between said outer cylindrical unit body and said inner cylindrical unit body;

a first plurality of small chambers arranged on an inner peripheral surface of said outer cylindrical body and opened at fronts thereof, wherein width of each side wall forming each of said first plurality of small chambers is decreased toward an upper direction thereof;
a second plurality of small chambers arranged on an outer peripheral surface of said inner cylindrical body and opened at fronts thereof, wherein width of each side wall forming each of said second plurality-of small chambers is decreased toward an upper direction thereof; and
wherein said first plurality of small chambers and said second plurality of small chambers are arranged alternately face to face so as to communicate with one another in a state where said inner cylindrical unit body is concentrically inserted into said inner space of said outer cylindrical unit body.

5,535,176
METHOD AND SYSTEM FOR SENSING WITH AN ACTIVE ACOUSTIC ARRAY

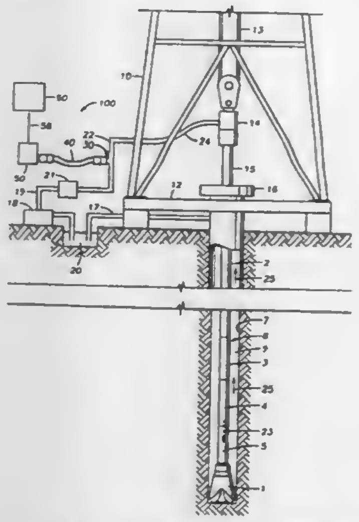
Tsih C. Yang, Great Falls, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 28, 1993, Ser. No. 82,648
Int. Cl.^{6} G06F *10/00;* **G01S** *15/00;* **H04B** *11/00*
U.S. Cl. 367—13 **13 Claims**



1. An active acoustic array system for sensing objects under the surface of a water body comprising:
a vertical source array of adjustable acoustic sources located in the water body, each said acoustic source producing a separate acoustic pulse;
a control means for controlling a phase and amplitude of the separate acoustic pulse generated by each said source such that a combined acoustic pulse with selective nodes focused to a desired depth or a desired range-and-depth cell is emitted from said source array; and
a calibration means located at a distance from said source array for calibrating the separate acoustic pulses emitted by said sources of said source array so that said source array emits a desired combined acoustic pulse, said calibration means including (a) a checking means for checking whether the emitted combined acoustic pulse from said source array conforms to the desired combined acoustic pulse and for calculating a deviation of the emitted combined acoustic pulse from the desired combined acoustic pulse and (b) a feedback means for feeding deviation information back to said control means which further controls each said acoustic source in accordance with the deviation information so that the desired combined acoustic pulse is produced by said source array.

5,535,177
MWD SURFACE SIGNAL DETECTOR HAVING ENHANCED ACOUSTIC DETECTION MEANS

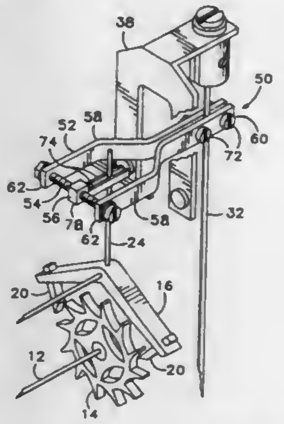
Wilson C. Chin, and Kenneth H. Hamlin, both of Houston, Tex., assignors to Halliburton Company, Houston, Tex.
Continuation of Ser. No. 292,090, Aug. 17, 1994, Pat. No. 5,459,697. This application Jun. 7, 1995, Ser. No. 477,987
Int. Cl.^{6} H04R *9/00*
U.S. Cl. 367—81 **35 Claims**



1. An apparatus for detecting pressure pulses communicated through drilling fluid contained in a conduit comprising:
an access port formed in the conduit;
a pressure transducer for determining the pressure at an input port to said transducer and converting said pressure to an electrical signal; and
a waveguide disposed between said access port in the conduit and said input port in said transducer, said wave guide operable to increase the amplitude of an acoustic signal transmitted therethrough.

5,535,178
ADJUSTABLE SUSPENSION FORK

Lubertus H. Hayenga, 1135 Morton St., Alameda, Calif. 94501
Filed Dec. 8, 1994, Ser. No. 352,387
Int. Cl.^{6} G04B *17/02*
U.S. Cl. 368—180 **19 Claims**



1. A suspension fork for a torsion pendulum clock, comprising:
(a) a first fork; and
(b) a tuning fork for coupling to an anchor pin of a torsion pendulum clock, the tuning fork adjustably connected to the first fork for translation relative thereto.

5,535,179

MAGNETO-OPTIC DISC APPARATUS WITH SIGNAL DETECTOR FOR DETECTING RECORDED SIGNALS BASED ON SPLIT BEAMS

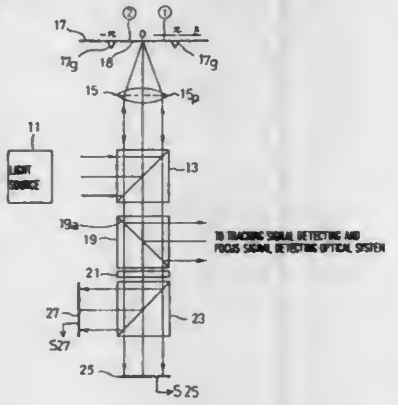
Masato Noguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1994, Ser. No. 286,197

Claims priority, application Japan, Aug. 10, 1993, 5-198529

Int. Cl.^{6} G11B *1/00;7/09*

U.S. Cl. 369—13 **14 Claims**


17
17a
18
17g
15
15p
11
LIGHT SOURCE
13
19a
19
TO TRACKING SIGNAL DETECTING AND FOCUS SIGNAL DETECTING OPTICAL SYSTEM
21
27
23
S27
25
S25

1. A magneto-optic disc apparatus in which detecting light is reflected by the recording track of a magneto-optic disc and split into at least two split beams which are received by respective sensors to detect signals recorded on the recording track, comprising:

three beam splitters that split said reflected light into at least a total of four split beams;

a split sensor that receives one of said four split beams, said split sensor comprising four split sensor areas which are divided by orthogonal axes in a diameter direction of said magneto-optic disc and in a track direction perpendicular to said diameter direction;

a calculator that multiples a predetermined difference signal from a plurality of detection signals outputted from said split sensor by a predetermined coefficient; and

a signal detector that detects a recorded signal in accordance with said difference signal which has been multiplied by said coefficient and said detection signals of said split sensor;

said calculator calculating an unbalanced signal Q between diagonally opposed sensor areas of said split sensor in accordance with the following equation:

$$Q=(S37_1+S37_4)-(S37_2+S37_3),$$

where $S37_1$ and $S37_2$ comprise detection signals of a first diagonally opposed sensor area pair of said split sensor, and $S37_3$ and $S37_4$ comprise detection signals of a second diagonally opposed sensor pair of said split sensor, and

said calculator multiplying said value of Q thus obtained by a predetermined coefficient k, so that said signal detecting means obtains a recorded signal based on the following equation:

$$(S31-S33)-kQ$$

where S31 and S33 comprise detection signals of a second and a third split sensor that receive other beams of said four split beams.

5,535,180

MAGNETO-OPTICAL TAPE RECORDING AND READING-OUT METHOD INVOLVING RUNNING TAPE IN FRONT OF AT LEAST A SINGLE POLE OF A MAGNET TO INITIALIZE OR ERASE INFORMATION

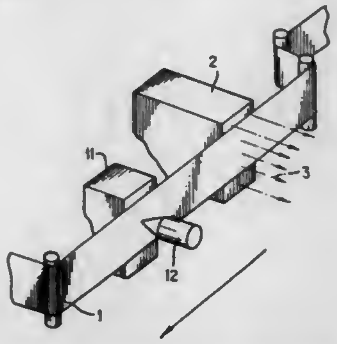
Takumi Shimamori, and Naoyuki Uchida, both of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 349,373

Claims priority, application Japan, Dec. 8, 1993, 5-308008

Int. Cl.^{6} G11B *11/00*

U.S. Cl. 369—13 **6 Claims**



1. A magneto-optical recording and reading-out method which comprises making a tape-type magneto-optical recording medium run in front of at least a single pole of a first magnet applying a magnetic field to said medium of not more than 640 kA/m at a position forwards of an optical head relative to the running direction of said recording medium, without contacting said first magnet so as to cross at a substantial right angle to magnetic force lines, thereby initializing said recording medium or erasing information therein,

said tape-type magneto-optical recording medium having at least a magneto-optical recording layer on one side of a base film having a thickness of not more than 50 μm; and

effecting recording of information onto the recording medium using said optical head under application of an external magnetic field of not more than 24 kA/m produced by a second magnet.

5,535,181

PERMANENT MAGNET DEVICE FOR SELECTIVELY INVERTING A MAGNETIC BIAS FIELD FOR MAGNETO-OPTIC RECORDING

Edward P. Furlani, Lancaster; Christopher C. Williams, and Syamal K. Ghosh, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

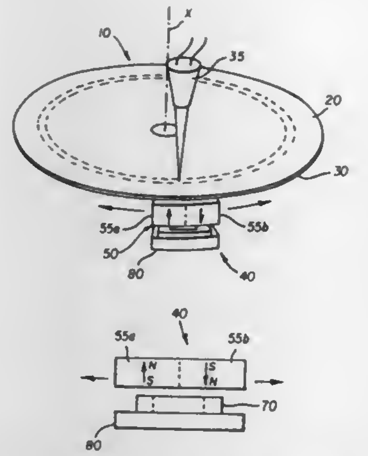
Filed Apr. 10, 1995, Ser. No. 419,574

Int. Cl.^{6} G11B *11/00*

U.S. Cl. 369—13 **12 Claims**

1. An apparatus for selectively inverting an external magnetic field in a magneto-optic recording system so that information is selectively recorded on or erased from a magneto-optic recording element of said system moving through said field, the apparatus comprising:

(a) a permanent magnet including a first and second portions positioned adjacent to each other and each portion having north and south poles oriented along their cross-sectional dimension, wherein the north pole of the first portion is abuttingly adjacent to the south pole of the second portion, and the south pole of the first portion is abuttingly adjacent to the north pole of the second portion; and



(b) a coil positioned adjacent to said magnet which, when energized, imparts a magnetic field to said permanent magnet for moving said permanent magnet.

5,535,182

OPTICAL DISK APPARATUS AND RECORDING/REPRODUCTION METHOD THEREFOR

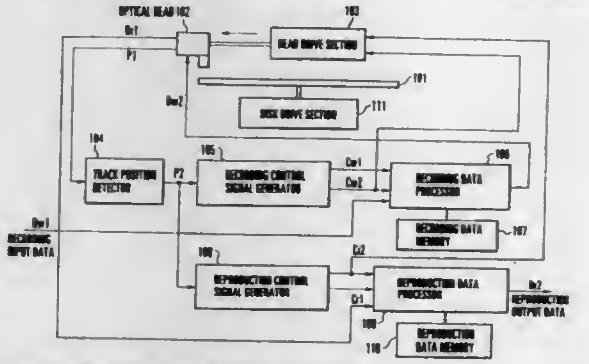
Satoshi Itoi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 4, 1994, Ser. No. 334,272

Claims priority, application Japan, Nov. 4, 1993, 5-275325; Dec. 28, 1993, 5-333945

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—32 **15 Claims**



1. An optical disk apparatus comprising:

an optical storage medium rotated at a constant angular velocity, said optical storage medium having a storage area constituted by track areas ranging from a 0th area on an innermost periphery to an nth area on an outermost periphery of the storage area, and the track areas being set by dividing the storage area into (n+1) equal areas (n is an integer satisfying n≧1) in a radial direction;

an optical head for optically recording and reproducing recording data on and from said optical storage medium with a constant wave length;

head drive control means for driving/controlling said optical head; and

data generating means for generating recording data such that a data amount is increased by ΔA (A is the amount of recording data per track when said optical head is located in the 0th track area) every time said optical head moves to a next track area, and outputting the recording data to said optical head,

wherein the recording data amount A and the increase ΔA are set such that a ratio between a track diameter in an mth track area (m is an integer satisfying n≧m≧0) and a recording data amount (A+ΔA×m) is made substantially constant.

5,535,183

OPTICAL DISK REPRODUCING DEVICE AND ITS SEEK OPERATION METHOD

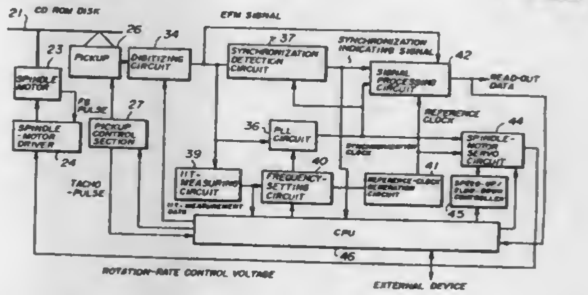
Tohru Miura; Mitsumasa Kubo, and Akira Mashimo, all of Tokyo, Japan, assignors to TEAC Corporation, Japan

Filed Nov. 29, 1994, Ser. No. 346,002

Claims priority, application Japan, Aug. 4, 1994, 6-183796

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—32 **4 Claims**



4. A seek operation method for moving an optical pickup to a target track of a disk and reproducing data on an optical disk device, comprising the steps of:

(a) moving said optical pickup to the target track, and during transition of the optical pickup in said seek operation, supplying a speed-up/slow-down signal to disk driving means to adjust a rotation rate of the disk to a target rotation rate;

(b) measuring a bit frequency of a reproduced digital signal which is reproduced from said disk with the optical pickup, after the adjustment of the rotation rate by said speed-up/slow-down signal;

(c) setting the measured bit frequency to a free-run frequency of a PLL circuit, and generating in a short time a synchronization clock which is synchronized to said reproduced digital signal based on the free-run frequency;

(d) supplying measured bit frequency information to a reference-clock generation means, and generating a reference clock which is used for reproducing the data from said reproduced digital signal;

(e) supplying a result of comparison of said synchronization clock with said reference clock as a linear-velocity control signal to said disk driving means instead of said speed-up/slow-down signal just after the synchronization of said PLL circuit, and controlling the rotation rate of the disk to keep a linear velocity defined by said reference clock;

(f) reproducing the data based on said reference clock;

(g) correcting said measured bit frequency by a given amount of correction so as to adjust the bit frequency of said reproduced digital signal to a specified bit frequency if there is a difference between said measured bit frequency and the specified bit frequency, and producing the corrected measured bit frequency as a correcting bit frequency information; and

(h) correcting the free-run frequency of said PLL circuit and the reference clock of said reference-clock generation means according to said correcting bit frequency information;

wherein the step (g) and the step (h) are repeated until a difference between said correcting bit frequency and said specified bit frequency is less than a given value.

5,535,184

REPRODUCING APPARATUS HAVING A SINGLE MICROPROCESSOR TO PERFORM DATA RETRIEVAL DISC REPRODUCTION CONTROL

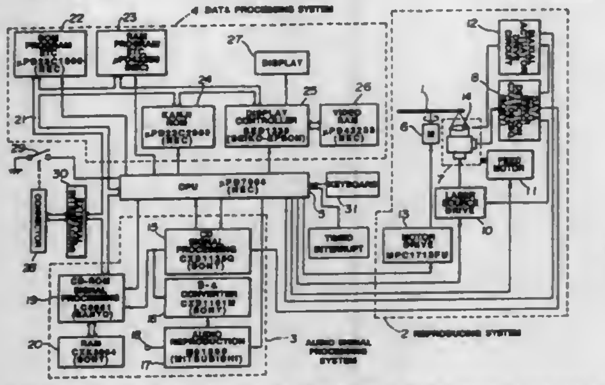
Yoshihiro Miura, Tokyo; Koji Takagi; Takashi Morita, both of Kanagawa, and Fumihiko Yoshii, Tokyo, all of, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 96,770, Jul. 23, 1993, Pat. No. 5,502,695, which is a division of Ser. No. 20,179, Feb. 22, 1993, Pat. No. 5,359,580, which is a continuation of Ser. No. 626,216, Dec. 12, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 460,645

Claims priority, application Japan, Jan. 9, 1990, 2-002149

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—32 **6 Claims**



1. A reproducing apparatus for an optical disc in which information data are recorded, the apparatus being capable of searching the information data recorded on the optical disc in response to a search parameter input by a user to locate at least one portion of the information data satisfying the search parameter, and of reproducing the at least one portion of the information data from the optical disc for display to the user, the reproducing apparatus comprising:

a main body section including:

disc reproducing means for reading the optical disc to provide reproduced data, the disc reproducing means including optical pickup means for reading the optical disc to generate a playback signal, signal processing means for processing the playback signal from the optical pickup means to provide the reproduced data, and disc rotating driving means for rotationally driving the optical disc, operation of the disc reproducing means to provide the reproduced data being servo controlled by reproduction control signals,

input means for receiving a user input from the user, the user input specifying the search parameter, and

one, and only one, central processing means, coupled to the disc reproducing means, the input means, and a display means; and

the display means mounted on the main body section for displaying the user input and for displaying the at least one portion of the information data reproduced from the optical disc by the disc reproducing means following a search in response to the user input;

the central processing means:

operating to perform a data retrieval operation in which the user input specifying the search parameter is received from the input means, the disc reproducing means is commanded to search the optical disc and to supply the reproduced data to the central processing means, the reproduced data are compared with the search parameter, and at least one part of the reproduced data satisfying the search parameter is selected for display by the display means as the at least one portion of the information data, and

operating in response to a timed interrupt to suspend the data retrieval operation and instead to perform a reproduction control operation in which the central processing means performs processing to generate the reproduction control signals controlling operation of the disc reproducing means.

5,535,185

INFORMATION RECORDING/REPRODUCTION APPARATUS USING PROBE

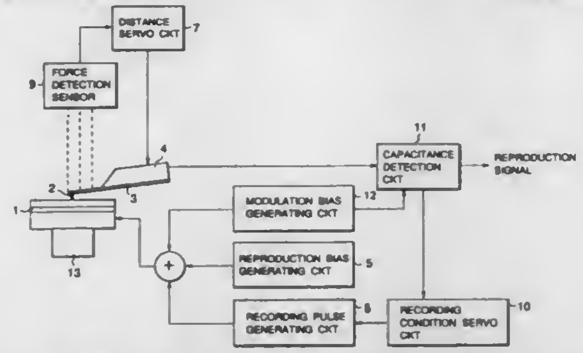
Etsuro Kishi, Sagamihara; Hisaaki Kawade, Yokohama; Kiyoshi Takimoto, Isehara, and Koji Yano, Zama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 183,816

Claims priority, application Japan, Jan. 21, 1993, 5-008473

Int. Cl.^{6} G11B *9/00;* G01N *23/00;* G21K *7/00;* G03G *13/00*

U.S. Cl. 369—126 **21 Claims**


DISTANCE SERVO CKT
7
9
FORCE DETECTION SENSOR
11
CAPACITANCE DETECTION CKT
REPRODUCTION SIGNAL
4
2
3
1
12
MODULATION BIAS GENERATING CKT
REPRODUCTION BIAS GENERATING CKT
5
13
6
RECORDING PULSE GENERATING CKT
RECORDING CONDITION SERVO CKT
10

1. An apparatus for at least one of recording information on and erasing information from a recording medium having a recording layer using a probe, comprising:

means for effecting relative movement of the probe and the medium so that the probe scans a surface of the recording layer;

means for at least one of recording a recording bit corresponding to the information on and erasing a recording bit corresponding to information from the recording layer;

means for detecting a physical quantity generated between the probe and the recording layer; and

means for correcting the at least one of the recording and erasing condition of said recording and erasing means on the basis of the detected physical quantity.

5,535,186

DISC RECORDING/REPRODUCING SYSTEM

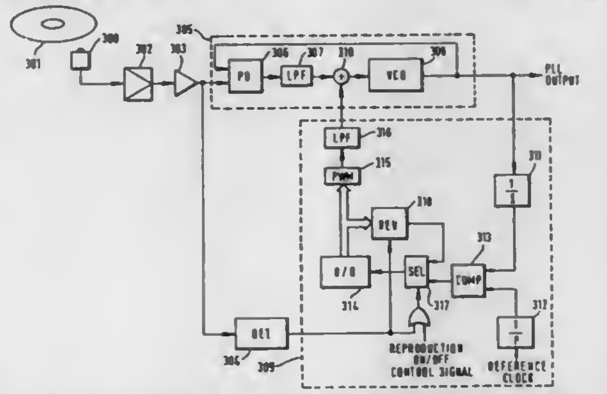
Yoshiyuki Ishizawa, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 26, 1994, Ser. No. 233,878

Claims priority, application Japan, Apr. 28, 1993, 5-102043

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—48 **5 Claims**



1. A disc recording/reproducing system wherein record tracks on a disc are divided in multiple zones in a radial direction of the disc and wherein the disc is rotated and driven at a constant angular velocity so that a recording/reproducing data rate changes stepwise for every zone on the disc or rotated and driven such that an angular velocity changes stepwise for every zone on the disc, the disc recording/reproducing system comprising:

a data rate control area provided at a boundary between a first zone and a second zone on said disc or controlling said recording/reproduced data rate;

a control area detecting means for detecting said data rate control area when data extends between said first and said second zones; and

a frequency control means for controlling a frequency of one of a recording/reproducing data extracting PLL and a recording reference frequency generating PLL when said data rate control area is detected, wherein said frequency control means comprises:

a reference clock;

a comparator that compares an output of said data extracting PLL and an output of said reference clock;

an up/down counter which is incremented or decremented based on an output of said comparator thereby outputting a count value; and

means for modifying said count value into a pulse width modulated signal and providing said pulse width modulated signal as an input to said data extracting PLL to control a frequency of said output of said data extracting PLL.

5,535,187

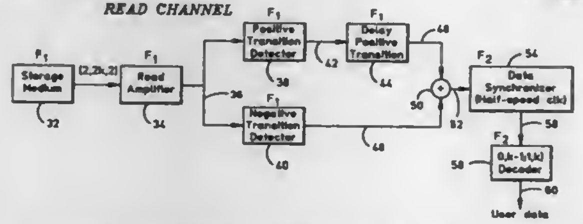
HIGH CAPACITY RUN-LENGTH-LIMITED CODING SYSTEM EMPLOYING ASYMMETRIC AND EVEN-SPACED CODES

Constantin M. Melas, Los Gatos; Daniel Rugar, Los Altos; Pantas Sutardja, San Jose, and Roger W. Wood, Gilroy, all of Calif., assignors to Intenational Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1993, Ser. No. 167,104

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 369—59 **59 Claims**



1. A method for operating a serial binary data channel wherein a first code signal represents a sequence of original data bits according to a first encoding alphabet constrained by an even-spaced RLL constraint M/N (2d, 2k, 2), wherein said first/code signal includes a sequence of code symbols occurring at a first binary data clock. rate F_1, said first code signal having a sequence of rising and falling signal transitions each representing a first said code symbol separated from one another by no fewer than a plurality 2d and no more than a plurality 2k of second said code symbols, wherein a plurality N of said code symbols represents a plurality M of said original data bits and d, k, M and N are positive integers, said method comprising the steps of:

(a) adding to said first code signal an odd integer quantity J of said second code symbols between each sequential pair of said first code symbols, thereby creating a second code signal representing a sequence of said code symbols occurring at a second binary data clock rate $F_2=F_1/2$, said second code signal having a sequence of rising and falling signal transitions each representing said first code symbol separated from one another by no fewer than a plurality D_1 and no more than a plurality K_1 of said second code symbols, wherein said run length pluralities (D_1, K_1) are non-negative integers having values that alternate between (D, K) and (D−1, K−1) and wherein a plurality N of said code symbols represent a plurality 2M of said original data bits according to a second encoding alphabet constrained by an asymmetrical RLL constraint 2M/N (D−1, K−1; D, K); and

(b) decoding said second code signal to recover said original data bit sequence.

5,535,188

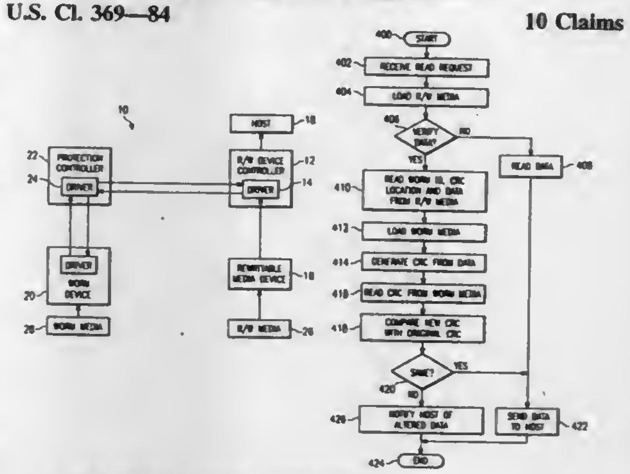
DATA SECURITY PROTECTION FOR INFORMATION RECORDED ON A REWRITABLE STORAGE MEDIUM USING A WRITE-ONCE READ-MANY STORAGE MEDIUM

Chi H. Dang, and Chi T. Dang, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1994, Ser. No. 316,997

Int. Cl.^{6} G11B *7/28;* H04L *9/00*

U.S. Cl. 369—84 **10 Claims**



1. A data storage system, comprising:

a code generator coupled to receive selected data to be recorded and for generating a first protective code therefrom;

a first recording device capable of recording the selected data onto rewritable media and for reading the selected data therefrom;

a second recording device capable of recording the first protective code on non-rewritable media and for reading the first protective code therefrom;

said code generator further coupled to receive the selected data read from said first recording device and for generating a second protective code therefrom; and

a code comparator coupled to receive the first protective code read from said second recording device and to receive the second protective code generated by said code generator and for generating an alert signal if the second protective code differs from the first protective code, indicating that the selected data was altered between the time it was first recorded onto the rewritable media and the time it was read therefrom.

5,535,189

OPTICAL INFORMATION SYSTEM WITH A BROAD NON-COHERENT IRRADIATING BEAM COUPLED WITH OPTICAL FIBER FROM A LASER SOURCE

Amir Alon, 5, 19th Street, Yahud; Shlomo Shapira, 27, Degel Reuven St, and Itzhak Katz, 7, Gilad Street, both of Petach Tikva, all of, Israel

Division of Ser. No. 43,254, Apr. 6, 1993, Pat. No. 5,426,623. This application Feb. 24, 1995, Ser. No. 393,802

Claims priority, application Israel, Apr. 10, 1992, 101570

Int. Cl.^{6} G11B *7/00*

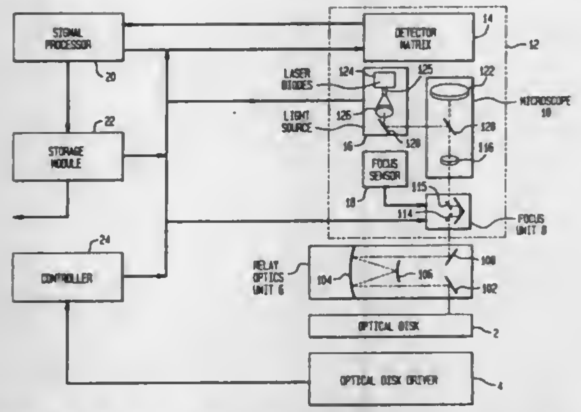
U.S. Cl. 369—102 **3 Claims**

1. An optical relay device for generating broad size non-coherent irradiating light to be projected on an optical disk rotating at a disk rotating speed, comprising:

a) one or more laser diodes;

b) one or more optical elements; and

c) fiber optics positioned with one end in front of the said laser diodes and at the other end in front of said optical elements,



wherein at least one of said optical elements is operative to project the non-coherent irradiating light received from said fiber optics onto the optical disk.

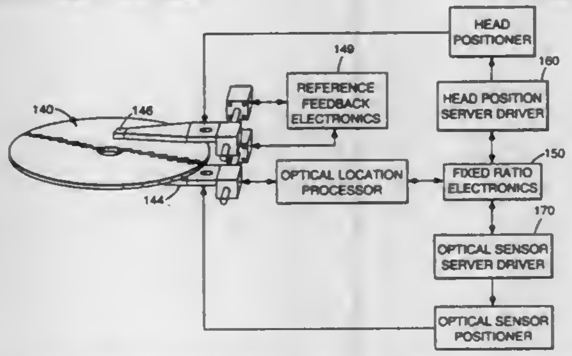
5,535,190
DRIVER SYSTEM FOR AN UPDATABLE OPTICAL STORAGE-OREDIA

Arthur R. Moore, Deer Park, Wis., and Donald E. Gustafson, North St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 218,619, Mar. 28, 1994, abandoned. This application May 15, 1995, Ser. No. 441,338

Int. Cl.^{6} G11B *21/00*

U.S. Cl. 369—295.200 **6 Claims**


HEAD POSITIONER
149
160
REFERENCE FEEDBACK ELECTRONICS
HEAD POSITION SERVER DRIVER
140
146
150
OPTICAL LOCATION PROCESSOR
FIXED RATIO ELECTRONICS
144
170
OPTICAL SENSOR SERVER DRIVER
OPTICAL SENSOR POSITIONER

1. A recording system for recording and playing back an information storage medium, comprising:
- an optical sensor;
- a magnetic recording/playback head;
- means for transporting an information storage medium past said sensor and said head; and
- an information storage medium, comprising:
- a substrate having a surface carrying a digitally encoded, detectable pattern in the form of replicated features, wherein said pattern comprises servo tracking signals and user data;
- a reflective layer adjacent said pattern for reflecting a beam of radiation modulated by said pattern; and
- a magnetizable, substantially radiation-transparent magnetic recording layer secured to said substrate;

wherein said optical sensor senses radiation directed through said magnetizable layer which is modulated and reflected by said reflective layer adjacent said pattern, said magnetic head records/plays back information in said magnetizable layer, and said servo tracking signals in said pattern enable independent control of both the optical sensor sensing said pattern and the magnetic recording head on said magnetic recording layer.

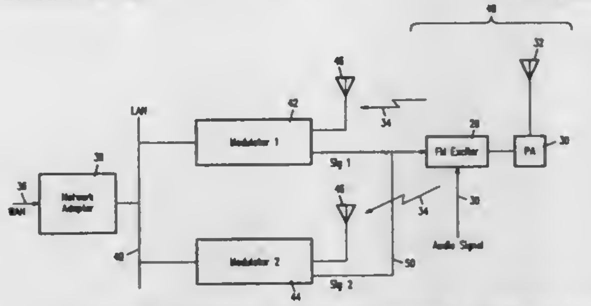
5,535,191
METHOD AND APPARATUS FOR SWITCHING BETWEEN REDUNDANT HARDWARE IN A WIRELESS DATA COMMUNICATION SYSTEM

Daniel J. Park, Beaverton, Oreg., assignor to Seiko Communications Systems, Inc., Beaverton, Oreg.

Filed Jun. 28, 1995, Ser. No. 495,367

Int. Cl.^{6} H04L *1/22*

U.S. Cl. 370—16 **19 Claims**



1. A system for switching between redundant hardware in a wireless communication system, comprising:
- a first modulator unit including a first signal generator outputting a first signal containing data and a first processor coupled to the first signal generator for enabling and disabling transmission of the first signal;
- a second redundant modulator unit including a second signal generator for outputting a second signal containing the same data and a second processor coupled to the second signal generator for enabling and disabling transmission of the second signal;
- a first receiver coupled to the first processor that independently initiates transmission of the first signal according to the transmission from one of said first and second signals; and
- a second receiver coupled to the second processor that independently initiates transmission of the second signal according to the transmission from one of said first and second signals.

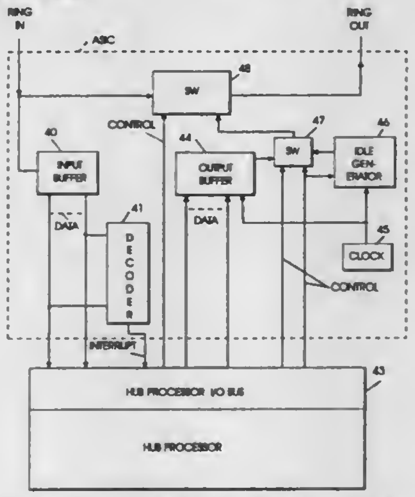
5,535,192
SERIAL NETWORK FAULT DETECTION, ISOLATION AND RESTORATIVE DEVICE

Bradley S. Trubey, Raleigh, and Anthony D. Walker, Rougemont, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1995, Ser. No. 381,695

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 370—16.1 **5 Claims**



1. In a serial communication network including at least one hub having a hub processor including an I/O bus, a plurality of station attachment ports, means at each port for detecting a unique media access control frame and for interrupting the hub processor upon

detection of the media access control frame; a fault isolation device under control of the hub processor comprising:
- an input buffer having a serial input connected to the serial communication network and having a parallel output connected to the I/O bus of the hub processor;
- a decoding circuit connected to the parallel output of the input buffer for detecting at least one media access control frame when present on the serial network and for providing an interrupt signal to the hub processor over the I/O bus upon detection of the at least one media access control frame;
- an output buffer having parallel inputs connected to said hub processor via said I/O bus for receiving a media access control frame from the hub processor and a serial output; and,
- means connected to the I/O bus and under control of the hub processor for transmitting the media access control frame stored in the output buffer via the output buffer serial output onto the serial network and for isolating the input buffer input from the output buffer output.

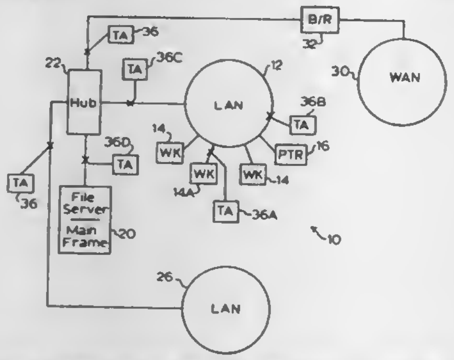
5,535,193
MULTIPORT ANALYZING WITH TIME STAMP SYNCHRONIZING

Jing Zhang, Durham, and Kenneth R. Gramley, Cary, both of N.C., assignors to Wandel & Goltermann Technologies, Inc., Swabia Court, N.C.

Filed Feb. 9, 1995, Ser. No. 385,900

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 370—17 **12 Claims**



6. A digital transmission network analyzer system for analyzing networks with multiple ports at which each packet of data appears sequentially around a loop (**12**) of such ports, the analyzers of said system having data packet analyzing capability, each analyzer of said system having a facility for analyzing, with synchronization of the clocking between the analyzers, the analyzer system comprising:
- a plurality of individual network analyzers, each having the capacity to store the header of a received packet of data, along with a time stamp representing when that packet arrived at the network analyzer, and each network analyzer also having a counter, responsive to received clock signals for indicating by its count the time elapsed since the counter was last reset, the output of the counter used to time stamp data packets received by the analyzer, each analyzer connected to a different port on the network;
- a control computer, separate from the analyzers but linked to each analyzer, said computer being programmed to cause the counters of all analyzers to be reset simultaneously prior to the start of a test; and
- a source of clock signals independent of the control computer and independent of at least one of the analyzers for advancing the counters of all of the analyzers in unison and in the same numerical direction.

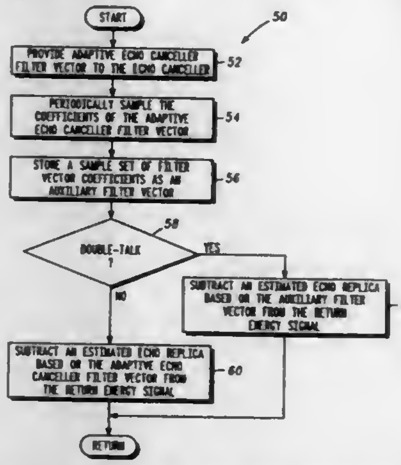
5,535,194
METHOD AND APPARATUS FOR ECHO CANCELING WITH DOUBLE-TALK IMMUNITY

James P. Ashley, Naperville, and Lee M. Proctor, Cary, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 14, 1994, Ser. No. 275,223

Int. Cl.^{6} H04B *3/23;* **H04L** *5/14*

U.S. Cl. 370—32.1 **16 Claims**


START
50
PROVIDE ADAPTIVE ECHO CANCELLER FILTER VECTOR TO THE ECHO CANCELLER
52
PERIODICALLY SAMPLE THE COEFFICIENTS OF THE ADAPTIVE ECHO CANCELLER FILTER VECTOR
54
STORE A SAMPLE SET OF FILTER VECTOR COEFFICIENTS AS AN AUXILIARY FILTER VECTOR
56
58
DOUBLE-TALK ?
YES
NO
SUBTRACT AN ESTIMATED ECHO REPLICA BASED ON THE AUXILIARY FILTER VECTOR FROM THE RETURN ENERGY SIGNAL
62
SUBTRACT AN ESTIMATED ECHO REPLICA BASED ON THE ADAPTIVE ECHO CANCELLER FILTER VECTOR FROM THE RETURN ENERGY SIGNAL
60
RETURN

1. A method of canceling an echo signal comprising the steps of:
- a) providing an adaptive echo canceller filter vector having a first set of vector coefficients;
- b) periodically sampling the first set of vector coefficients;
- c) storing a sampled set of vector coefficients as an auxiliary echo canceller filter vector;
- d) determining if double-talk is present;
- e) if double-talk is absent, subtracting an estimated echo replica based on the adaptive echo canceller filter vector from a return energy signal reflected back from a transmit path; and
- f) if double-talk is present, subtracting an estimated echo replica based on the auxiliary echo canceller filter vector from the return energy signal.

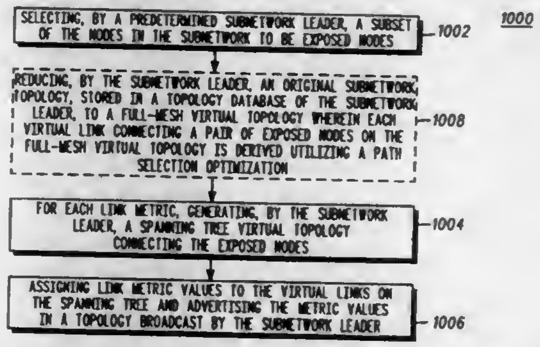
5,535,195
METHOD FOR EFFICIENT AGGREGATION OF LINK METRICS

Whay C. Lee, Cambridge, Mass., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1994, Ser. No. 239,178

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—54 **18 Claims**


1000
SELECTING, BY A PREDETERMINED SUBNETWORK LEADER, A SUBSET OF THE NODES IN THE SUBNETWORK TO BE EXPOSED NODES
1002
REDUCING, BY THE SUBNETWORK LEADER, AN ORIGINAL SUBNETWORK TOPOLOGY, STORED IN A TOPOLOGY DATABASE OF THE SUBNETWORK LEADER, TO A FULL-MESH VIRTUAL TOPOLOGY WHEREIN EACH VIRTUAL LINK CONNECTING A PAIR OF EXPOSED NODES ON THE FULL-MESH VIRTUAL TOPOLOGY IS DERIVED UTILIZING A PATH SELECTION OPTIMIZATION
1008
FOR EACH LINK METRIC, GENERATING, BY THE SUBNETWORK LEADER, A SPANNING TREE VIRTUAL TOPOLOGY CONNECTING THE EXPOSED NODES
1004
ASSIGNING LINK METRIC VALUES TO THE VIRTUAL LINKS ON THE SPANNING TREE AND ADVERTISING THE METRIC VALUES IN A TOPOLOGY BROADCAST BY THE SUBNETWORK LEADER
1006

1. A method for providing efficient aggregation of link metrics for a subnetwork in a communication network with an original subnetwork topology, comprising the steps of:
- 1A) selecting, by a predetermined subnetwork leader, a subset of nodes in the subnetwork to be exposed nodes,
- 1B) mapping, by the predetermined subnetwork leader, the original subnetwork topology, stored in a topology database of the subnetwork leader, to a full-mesh virtual topology wherein each virtual link connecting a pair of exposed nodes

on the full-mesh virtual topology is derived utilizing a predetermined oath selection optimization,

1C) for each link metric that characterizes a preselected plurality of information transfer of links in the subnetwork, generating, by the subnetwork leader, a spanning tree virtual topology connecting the exposed nodes,

1D) determining link metric values to the virtual links on the spanning tree and advertising the metric values in a topology broadcast to nodes outside the subnetwork, by the subnetwork leader, and

1E) estimating for each link metric, by nodes outside the subnetwork, link metric values for all virtual links on the full-mesh virtual topology connecting the exposed nodes based on the link metric values for the virtual links on a corresponding spanning tree, wherein a link metric value associated with each virtual link on the full-mesh virtual topology is an estimate of a link metric value associated with a corresponding virtual link in the original subnetwork topology.

5,535,196
POLICE SYSTEM OF ATM EXCHANGE

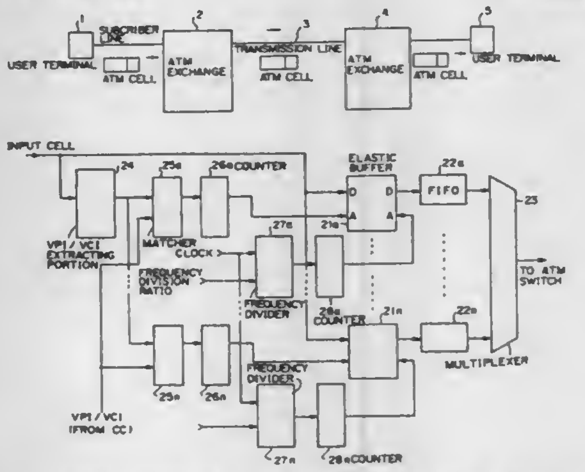
Naoki Aihara, and Tadashi Hoshino, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 28, 1992, Ser. No. 968,042

Claims priority, application Japan, Oct. 28, 1991, 3-280236

Int. Cl.^{6} H04J *3/22*

U.S. Cl. 370—60 **12 Claims**



1. A police system of ATM exchange for use in an ATM communication system with asynchronous transmission mode (ATM) cells, comprising:

an ATM exchange for exchanging said ATM cells; and

input cell speed limiting means disposed in an input side of said ATM exchange and having a plurality of elastic buffers with a read speed equivalent to a band designated to each of a plurality of subscribers accommodated in said exchange,

said elastic buffers being in accordance with said subscribers,

said input cell speed limiting means being arranged to limit the speeds of cells which are transmitted from each of said subscribers to said exchange to the band designated to each of said subscriber.

5,535,197
SHARED BUFFER SWITCHING MODULE

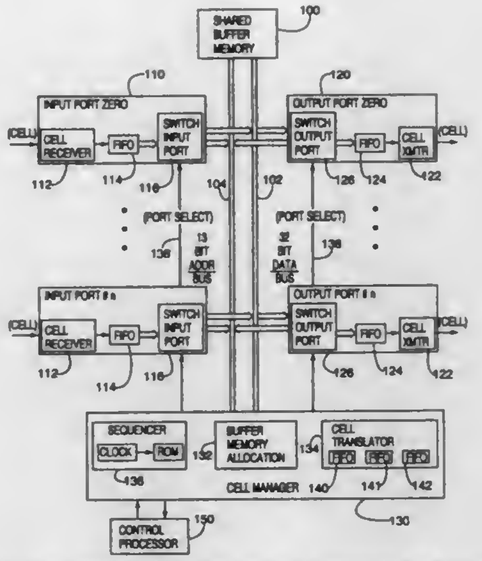
John M. Cotton, East Norwalk, Conn., assignor to IPC Information Systems, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 766,062, Sep. 26, 1991, abandoned. This application May 25, 1994, Ser. No. 249,792

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—60 **55 Claims**

1. A buffered communication switch for switching data cells between input ports and selected output ports, comprising:



one or more input ports for receiving incoming data cells;

a plurality of output ports;

a shared buffer memory for storing data cells received via said one or more input ports while awaiting transmission via one or more of said output ports;

a common bus interconnecting said input ports, said output ports, and said shared buffer memory;

means for examining said incoming data cells to select one or more of said output ports appropriate for transmission of the cell;

means for selecting a vacant address in said shared buffer memory for storing one of said incoming data cells;

means for storing said one of said incoming data cells to provide a stored data cell at said vacant address and for storing the address thereof at one or more of said output ports selected for transmission of said stored data cell;

means for retrieving said stored data cell when time is available for transmission thereof via said selected one or more output ports; and

wherein the transfer of an incoming data cell from said input ports to said shared buffer memory is interleaved via said common bus with the transfer of data cells from said shared buffer memory to said output ports.

5,535,198
ISDN BASIC RATE INTERFACE CENTRAL OFFICE STATION TERMINAL EMULATOR FOR CUSTOMER PREMISES EQUIPMENT

Albert D. Baker, Lincroft; Heribert J. Blach, Matawan; James Chen, Edison; Ellen L. Krischer, Teaneck; Maria Pashos, Freehold; Nancy Radics, Matawan, and Lee A. Vallone, Locust, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 3, 1994, Ser. No. 253,469

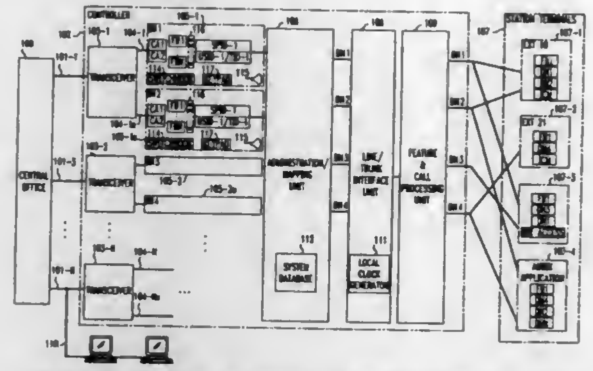
Int. Cl.^{6} H04J *3/12*

U.S. Cl. 370—60 **6 Claims**

1. Premises switching apparatus for providing a communications connection to a digital subscriber line (DSL) which is used to provide digital connectivity to a central office (CO) switch comprising,

termination means for providing a physical point-to-point connection to said DSL, wherein communications over said DSL utilize an ISDN basic rate interface (BRI) protocol and wherein the communications connection is intended to be between the DSI, and a plurality of user station terminals, and

means for controlling said termination means for emulating a plurality of BRI-compatible central office (CO) station terminals intended to be connected to said DSL so that user station terminals can access BRI services including central office supplementary services, said means for controlling including



means for effecting a plurality of initialization procedures in said premises switching apparatus to identify at least one of said plurality of emulated CO station terminals as a user station terminal and for storing relationships of user station terminal feature buttons and user station terminal call appearance buttons to corresponding virtual feature buttons and virtual call appearance buttons in associated ones of the emulated CO station terminals.

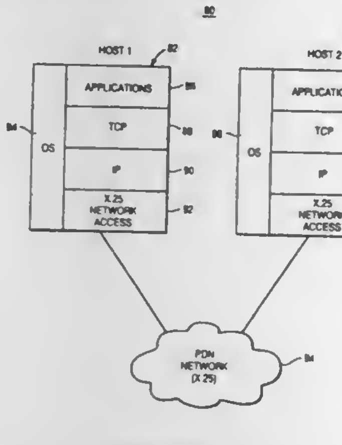
5,535,199
TCP/IP HEADER COMPRESSION X.25 NETWORKS

Adel Amri, and Thomas H. Hull, both of Meylan, France, assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Sep. 6, 1994, Ser. No. 301,449

Int. Cl.^{6} H04B *1/66;* **H04L** *9/00*

U.S. Cl. 370—60 **17 Claims**



TYPICAL PROTOCOL STACK

1. A method for using TCP/IP header compression/decompression in a communications network which uses an X.25 packet switching link, and which includes one or more nodes which support said header compression/decompression and one or more nodes which do not support said header compression/decompression, a node containing a computer system which includes a processor, memory and program instructions, the method being implemented by said program instructions and comprising the steps of:

initiating a first call request to a remote data terminal equipment (STE) over a TCP/IP/X. 25 network link, said first call request being issued by a local DTE, before the local DTE sends a plurality of compressed header data to said remote DTE;

using a specific protocol identifier (PID) in a user data field of a call request packet containing said first call request to indicate that said local DTE is using TCP/IP header compression/decompression;

returning a message by said remote DTE to said local DTE to indicate whether said remote DTE is adapted to support TCP/IP header compression/decompression; and

using said TCP/IP header compression/decompression in said TCP/IP X.25 network link if said remote DTE indicates that said remote DTE can support said TCP/IP header compression/decompression.

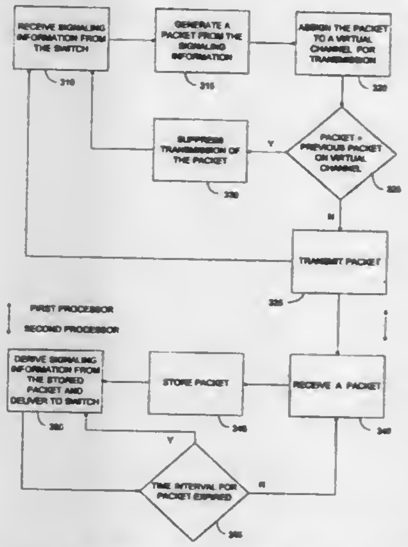
5,535,200
SIGNALING SYSTEM FOR A TELECOMMUNICATIONS NETWORK

Michael J. Gardner, Overland Park, Kans., assignor to Sprint Communications Company L.P., Kansas City, Mo.

Filed May 5, 1994, Ser. No. 238,761

Int. Cl.^{6} H04Q *11/04;* **H04J** *3/24*

U.S. Cl. 370—60 **20 Claims**


RECEIVE SIGNALING INFORMATION FROM THE SWITCH
310
GENERATE A PACKET FROM THE SIGNALING INFORMATION
315
ASSIGN THE PACKET TO A VIRTUAL CHANNEL FOR TRANSMISSION
320
SUPPRESS TRANSMISSION OF THE PACKET
PACKET = PREVIOUS PACKET ON VIRTUAL CHANNEL
Y
N
TRANSMIT PACKET
FIRST PROCESSOR
SECOND PROCESSOR
DERIVE SIGNALING INFORMATION FROM THE STORED PACKET AND DELIVER TO SWITCH
STORE PACKET
RECEIVE A PACKET
TIME INTERVAL FOR PACKET EXPIRED

1. A method of signaling in a telecommunications network wherein the telecommunications network is comprised of a plurality of network components that set-up connections for calls to the telecommunications network, and wherein the signaling transfers information between the network components to facilitate the set-up of the connections, wherein the method comprises the steps of:

(a) receiving signaling information from a first network component into a first processor connected to the first network component;

(b) generating packets in the first processor from the signaling information received from the first network component;

(c) assigning the generated packets to a virtual channel for packet transmission to a second network component;

(d) transmitting the packets over the assigned virtual channel to a second processor connected to the second network component, the transmission occurring unless the transmission is suppressed;

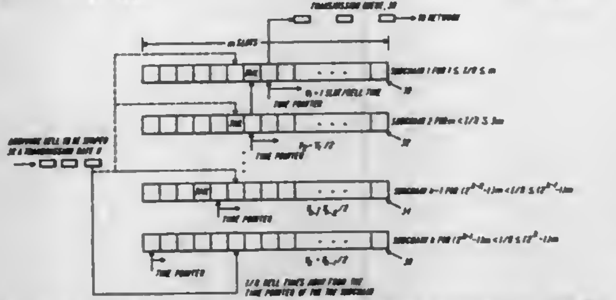
(e) suppressing the transmission of packets when the packets to be transmitted over the assigned virtual channel are duplicates of the previous packet transmitted over the assigned virtual channel;

(f) receiving packets transmitted from the first processor over the assigned virtual channel into the second processor, and replicating the previous packet received in the second processor over the assigned virtual channel during time intervals in which packet transmission is suppressed on the assigned virtual channel and until another packet is received over the assigned virtual channel; and

(g) deriving signaling information from the received and replicated packets in the second processor and delivering the signaling information to the second network component.

5,535,201
TRAFFIC SHAPING SYSTEM USING TWO DIMENSIONAL TIMING CHAINS

Qin Zheng, Belmont, Mass., assignor to Mitsubishi Electric Research Laboratories, Inc., Cambridge, Mass.
Filed May 10, 1995, Ser. No. 438,352
Int. Cl.⁶ H04Q *11/04*
U.S. Cl. 370—60.1 **13 Claims**

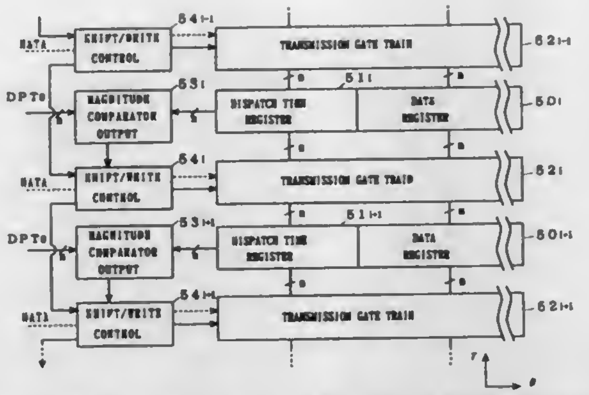


1. In a cell switched digital communication network in which cells of data are transmitted from a source end system to a destination end system at a rate no greater than a value specified by the network, said network having a highest data rate and a lowest data rate for which said network is designed, a traffic shaping system coupled to incoming traffic for controlling cell transmissions over said network comprising:
- a RAM having memory units, a series of memory units establishing a timing subchain each divided into slots with each slot adapted to receive a cell, said RAM having a number of said subchains arranged from highest to lowest to form highest and lowest subchains, each of said subchains having a timing pointer which moves from one slot to the next at a predetermined speed, with the arrival of said pointer at a slot enabling the transfer of a cell at said slot, said subchains being ordered by the speed from highest pointer speed to slowest pointer speed with which its associated pointer is driven, the fastest pointer speed associated with said highest data rate transmissions for which said network is designed denoting said highest subchain and said slowest pointer speed for said lowest data rate transmissions for which said network is designed denoting said highest subchain and said slowest pointer speed for said lowest data rate transmissions for which said network is designed denoting said lowest subchain;
- means coupled to the timing pointer for each of said subchains for transferring a cell from a pointer-selected slot; and,
- means for transferring incoming calls into slots of that subchain having a pointer speed corresponding to the data rate of said incoming cells.

5,535,202
PRIORITY PROCESSING OF ATM CELLS USING SHIFT REGISTER STAGES

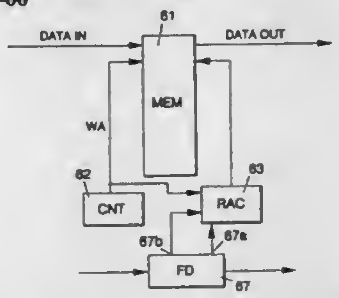
Harufusa Kondoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1995, Ser. No. 401,138
Claims priority, application Japan, Mar. 16, 1994, 6-045762
Int. Cl.⁶ H04L *12/56*
U.S. Cl. 370—60.1 **20 Claims**

1. A shift register having a priority processing function, comprising:
- a plurality of ordered register stages being provided for storing a plurality of data respectively and including regions for storing degrees of precedence of said data to be outputted;
- comparison means for comparing said degrees of precedence of said data stored in said register stages with that of newly inputted data; and
- control means for storing said newly inputted data in one of said register stages in a way that all said data including said newly inputted data are stored in said register stages successively according to said degrees of precedence in correspondence to the order of said register stages on the basis of results of said comparison in said comparison means, said register stages being forwardly shifted for outputting said data being stored therein in said order of said register stages.



5,535,203
METHOD FOR IMPLEMENTING TIME SWITCHING, AND A TIME SWITCH

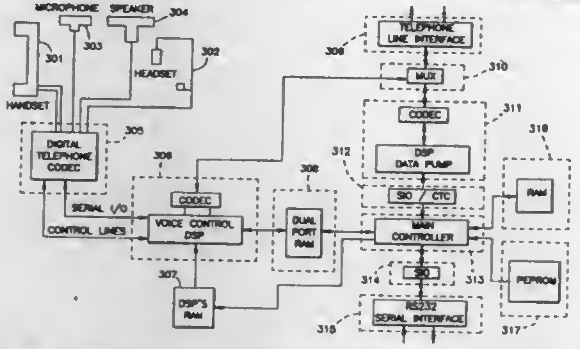
Hannu Alatalo, and Marko Kokko, both of Oulu, Finland, assignors to Nokia Telecommunications OY, Espoo, Finland
Filed Mar. 15, 1995, Ser. No. 367,269
Claims priority, application Finland, Jul. 17, 1992, 923295
Int. Cl.⁶ H04Q *11/08*
U.S. Cl. 370—66 **5 Claims**



1. A method for switching signals of a plurality of levels of hierarchy, which signals have a common frame structure which can be divided into blocks of different sizes, comprising:
- (a) writing the bytes of each of a succession of incoming ones of such signals into a memory block of a time switch, the memory block being at least twice as large as the largest frame block of a respective said incoming signal, said writing being performed continuously into said memory block at a succession of write addresses given by a counter which is in synchronization with a clock signal of said time switch but is not synchronized with frame blocks of said incoming signal, incrementing or decrementing the write address by one for each successive byte, so that writing of a frame block may start at any memory location of said memory block, thereby making floating use of said memory block;
- (b) supplying the write address given by the counter, to a subtractor unit of a read unit, and thereby generating a delay by subtracting a cross-connection delay of a given length which is at least as long as the duration of the largest frame block of said incoming signal, in bytes, to thereby obtain a read address;
- (c) supplying said read address to an adder which adds the read address to switching data obtained from an address control memory which has a given length of memory locations and is read cyclically, thereby giving switching data to each time slot to be cross-connected; and (d) reading contents from said memory block at a succession of read address locations indicated by said switching data, and providing the contents thereby read, as a data out signal having an outgoing frame structure.

5,535,204
RINGDOWN AND RINGBACK SIGNALLING FOR A COMPUTER-BASED MULTIFUNCTION PERSONAL COMMUNICATIONS SYSTEM

Ping Li, New Brighton, Minn., assignor to Multi-Tech Systems, Inc., Mounds View, Minn.
Continuation-in-part of Ser. No. 2,467, Jan. 8, 1993, Pat. No. 5,452,289. This application Oct. 25, 1993, Ser. No. 142,807
Int. Cl.⁶ H04J *3/12*
U.S. Cl. 370—76 **9 Claims**

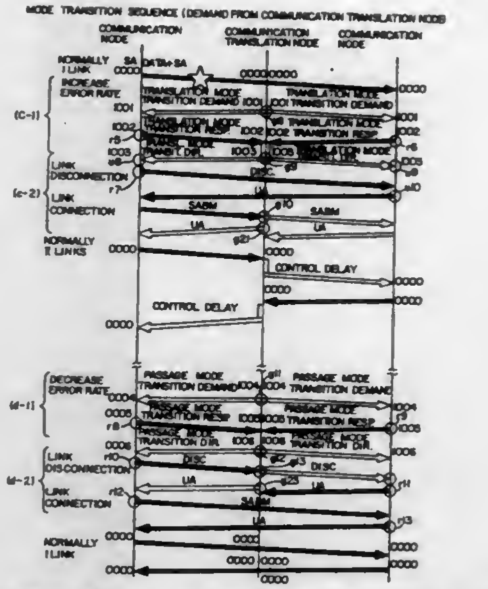


1. In a multi-function communications system, a method of switching from data only communication to simultaneous voice and data communication, comprising the steps of:
- invoking a data only communication connection between a local site equipped with a local modem and a remote site equipped with a remote modem;
- alerting the local modem of a desire to switch from data only mode to simultaneous voice and data mode by an action by a local user;
- sending a ringdown packet from the local modem to the remote modem;
- receiving the ringdown packet at the remote modem and sending in response thereto a ringback packet from the remote modem to the local modem; and
- enabling a simultaneous voice and data connection between the local modem and the remote modem in response to the receipt of the ringback packet by the local modem.

5,535,205
CELL STATION AND PERSONAL STATIONS IN A DIGITAL RADIO COMMUNICATION SYSTEM

Seiji Horii, Kashihara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 6, 1995, Ser. No. 417,918
Claims priority, application Japan, Sep. 10, 1992, 4-241618
Int. Cl.⁶ H04L *1/20*
U.S. Cl. 370—79 **36 Claims**

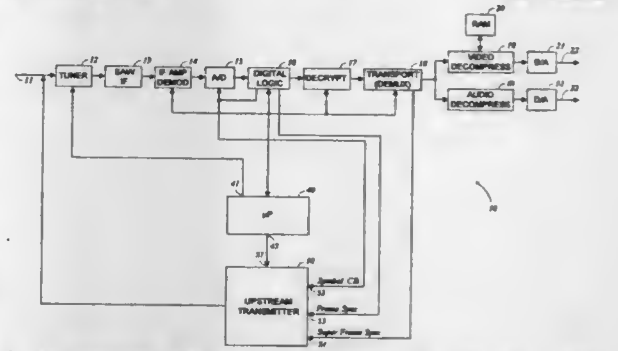
1. A cell station for relaying communication between a first personal station and a second personal station in a digital radio communication system, the digital radio communication system having a plurality of personal stations and the cell station, comprising:
- a first sending and receiving means for sending and receiving frames to and from the first personal station;
- a second sending and receiving means for sending and receiving frames to and from the second personal station;
- a first data link means for controlling a data link when the frames are sent and received to and from the first sending and receiving means and the first personal station by application of a transmit control procedure including error correction/detection control and frame re-transmit control for transmit errors;
- a second data link means for controlling a data link when the frames are sent and received to and from the second sending and receiving means and the second personal station by the application of the transmit control procedure including error correction/detection control and frame re-transmit control for transmit errors;


MODE TRANSITION SEQUENCE (DEMAND FROM COMMUNICATION TRANSLATION NODE)
COMMUNICATION NODE
COMMUNICATION TRANSLATION NODE
COMMUNICATION NODE
NORMALLY I LINK
SA
DATA+SA
INCREASE ERROR RATE
TRANSLATION MODE TRANSITION DEMAND
TRANSLATION MODE TRANSITION RESP.
(C-1)
(c-2)
LINK DISCONNECTION
LINK CONNECTION
DISC
UA
SABM
NORMALLY II LINKS
CONTROL DELAY
DECREASE ERROR RATE
PASSAGE MODE TRANSITION DEMAND
PASSAGE MODE TRANSITION RESP
PASSAGE MODE TRANSITION DIR.
(d-1)
(d-2)
NORMALLY I LINK

- a relay means for translating the frames alternatively between the first sending and receiving means and the second sending and receiving means;
- a switch judgement means for judging whether application of the transmit control procedure should be stopped or resumed, according to the condition of the frame sending and receiving between the first sending and receiving means and the first personal station, and between the second sending and receiving means and the second personal station; and
- a control means for controlling the first and the second data link means to stop application of the transmit control procedure when the switch judgement means judges the application of the transmit control procedure should be stopped, and to resume the application of the transmit control unit when the switch judgement means judges the application of the transmit control procedure should be resumed.

5,535,206
UPSTREAM DATA TRANSMISSION SYSTEM FOR CABLE TELEVISION

Caitlin B. Bestler, Chicago, and Khosro M. Rabii, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Continuation-in-part of Ser. No. 337,796, Nov. 14, 1994, abandoned. This application Feb. 7, 1995, Ser. No. 385,242
Int. Cl.⁶ H04L *5/22*
U.S. Cl. 370—79 **20 Claims**



1. An upstream data transmission system for use in a cable television system in which downstream data transmission is carried out using data frames and a periodic data frame synchronization signal via a cable network from a headend to a plurality of subscriber terminals, said upstream data transmission system comprising:
- time slot means for dividing said data frames into a plurality of time slots in response to a downloadable slot width signal;

superframe means for combining one or more of said data frames into a superframe interval in which each data frame is sequentially numbered in response to a downloadable superframe signal;

means for assigning a time slot to a subscriber terminal expressed as a time slot identifier having a frame number within said superframe and a slot number within said numbered frame; and

timing means for transmitting upstream data from a subscriber terminal to said headend during said assigned time slot.

5,535,207

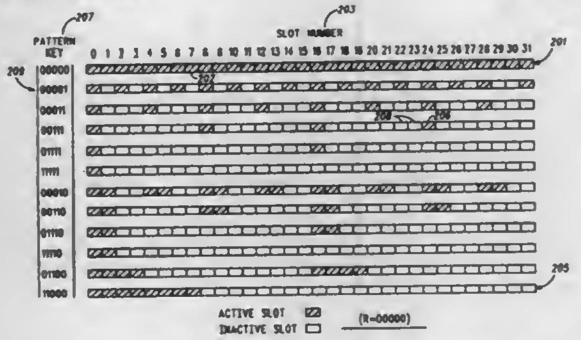
METHOD OF DYNAMICALLY ALLOCATING TIME SLOTS ON A PACKET DATA COMMUNICATIONS CHANNEL

Pierre Dupont, Whistler, Canada, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 20, 1994, Ser. No. 247,163

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—80 **16 Claims**



1. In a packet data communications system including a fixed network and user terminals, the system using a channel organized into time slots for scheduling data communications between the network and the user terminals, a method of dynamically allocating active time slots for a terminal including the steps of:

communicating, from the terminal, information identifying an active time slot pattern having a pattern key and a time slot identifier for the terminal to the network, the active time slot pattern defining a pattern of active time slots, during which the terminal is active to receive data being sent by the network to the terminal, and inactive time slots, during which the terminal is inactive so as not to receive data from the network; and

entering, at the terminal, an active mode during each active time slot of said active time slot pattern.

5,535,208

DATA TRANSMISSION SYSTEM AND METHOD

Yasunori Kawakami, Osaka; Hiroyuki Iitsuka; Takuya Nishimura, both of Katano; Shinji Hamai, Osaka, and Yasuyuki Sahara, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 7, 1995, Ser. No. 399,587

Claims priority, application Japan, Mar. 9, 1994, 6-038243; Mar. 22, 1994, 6-050262

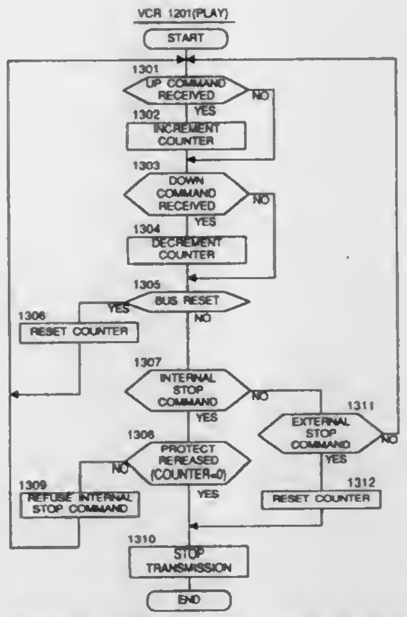
Int. Cl.^{6} H04J *3/17*

U.S. Cl. 370—84 **16 Claims**

1. A data transmission method for transmitting data over a bus requiring real-time processing of isochronous packets, at least one of a transmitting node and a receiving node comprising a plurality of nodes, the data being transmitted from the transmitter node to the receiver node, the data transmission method comprising the steps of:

assigning a node identifier to each node of the plurality of nodes that are connected to the bus when a bus reset occurs;.

adding the node identifier of the transmitter node transmitting isochronous packets to the transmitted isochronous packets;



detecting the node identifier added to the isochronous packet received at the receiver node;

generating a continue command, at the receiver node, to continue a predetermined operation of the receiver node;

generating a release command, at the receiver node, to release the predetermined operation of the receiver node;

setting the transmitter node to a protect state in response to the generation of the continue command to protect a predetermined operation of the transmitter node from being interrupted; and

releasing the protect state in response to the generation of the release command.

5,535,209

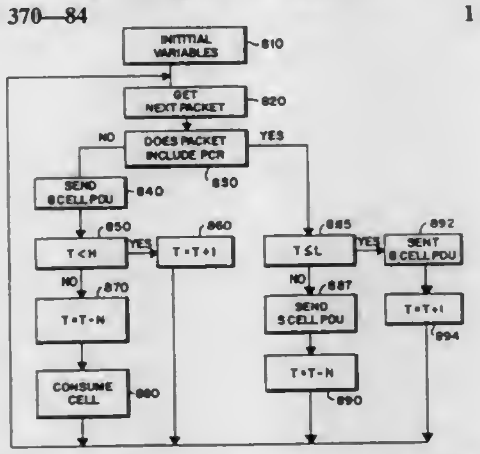
METHOD AND APPARATUS FOR TRANSPORTING TIMED PROGRAM DATA USING SINGLE TRANSPORT SCHEDULE

Stephen D. Glaser, Berlin; Robert E. Thomas, Hudson, and Robert J. Walsh, Ashland, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 10, 1995, Ser. No. 419,328

Int. Cl.^{6} H04J *3/24;* **H04N** *7/10*

U.S. Cl. 370—84 **1 Claim**



1. A method for conditioning program data for transport, the program data having a real time expressed in an encoding rate, the program data to be transported from a source over a network to a destination as a transport stream, the transport stream to be transported at a transport rate, the transport rate being dependent on a synchronous network clock and being independent of the encoding rate, comprising:

writing the program data to a cell buffer at a system rate, the system rate determined by a system clock, said system clock being independent of said synchronous network clock;

determining, while transporting said transport stream of the program data, if the program data is being transported ahead of the real time as expressed in the encoding rate of the program data; and

supplying, in response to said determining, idle data for said transport stream to have the program data arrive at the destination in the real time as expressed in the encoding rate of the program data.

5,535,210

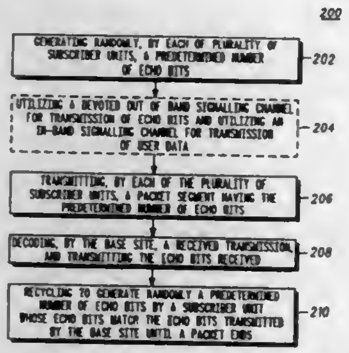
METHOD AND SYSTEM FOR RESOLUTION OF CHANNEL ACCESS IN DATA TRANSMISSION SYSTEMS

Jeffrey C. Smolinske, Hoffman Estates; Christopher L. Clanton, Chicago, and Phieu M. Tran, Lincolnwood, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1994, Ser. No. 283,124

Int. Cl.^{6} H04B *7/212;* **H04J** *3/12;* **H04Q** *7/20*

U.S. Cl. 370—85.2 **6 Claims**


200
GENERATING RANDOMLY, BY EACH OF PLURALITY OF SUBSCRIBER UNITS, A PREDETERMINED NUMBER OF ECHO BITS
202
UTILIZING A DEVOTED OUT OF BAND SIGNALLING CHANNEL FOR TRANSMISSION OF ECHO BITS AND UTILIZING AN IN-BAND SIGNALLING CHANNEL FOR TRANSMISSION OF USER DATA
204
TRANSMITTING, BY EACH OF THE PLURALITY OF SUBSCRIBER UNITS, A PACKET SEGMENT HAVING THE PREDETERMINED NUMBER OF ECHO BITS
206
DECODING, BY THE BASE SITE, A RECEIVED TRANSMISSION, AND TRANSMITTING THE ECHO BITS RECEIVED
208
RECYCLING TO GENERATE RANDOMLY A PREDETERMINED NUMBER OF ECHO BITS BY A SUBSCRIBER UNIT WHOSE ECHO BITS MATCH THE ECHO BITS TRANSMITTED BY THE BASE SITE UNTIL A PACKET ENDS
210

5. A method for resolving contention between a plurality of subscriber units for transmitting data packets to a base site using a channel in a slotted communication system, comprising the steps of:

each subscriber unit:

A) generating a predetermined number of random echo bits;

B) setting echo bits to be transmitted to the base site to the random echo bits for the subscriber unit and placing the echo bits in a next data segment to be transmitted, including utilizing a devoted out-of-band signaling channel for transmission of echo bits and transmit access requests;

C) transmitting the next data segment containing the random echo bits to the base site, including utilizing an in-band signaling channel for transmission of user data;

D) waiting to receive a response segment transmitted from the base site;

E) determining whether the response segment equals the random echo bits of the subscriber unit, and

where the response segment equals the random echo bits of the subscriber unit, recycling to step A;

where the response segment is unequal to the random echo bits of the subscriber unit, disabling a transmitter of the subscriber unit;

and

the base site, operating in parallel with the subscriber units:

F) waiting to receive a transmitted data segment containing the random echo bits from one of the plurality of subscriber units;

G) upon receiving the transmitted data segment, setting echo bits for the response segment equal to the random echo bits of the received data segment; and

H) transmitting the response segment with the random echo bits of the received data segment to the plurality of subscriber units wherein the random echo bits in the response segment are the random echo bits of the subscriber unit that is granted access to the channel, wherein the devoted out-of-band signaling channel is utilized for transmission of echo bits.

5,535,211

COMMUNICATIONS NETWORK CONTROL METHOD

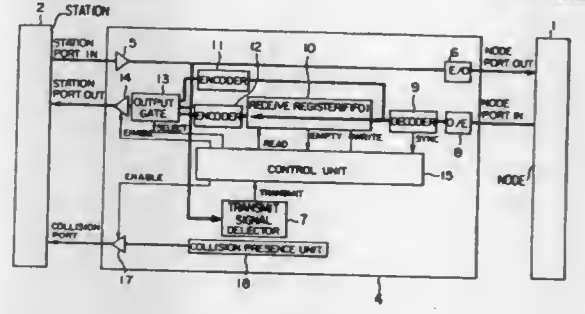
Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 29, 1992, Ser. No. 891,164

Claims priority, application Japan, May 30, 1991, 3-127070; Dec. 10, 1991, 3-324916; Mar. 13, 1992, 4-54034

Int. Cl.^{6} H04L *12/44*

U.S. Cl. 370—85.2 **5 Claims**



1. A method of controlling a communications network which includes a plurality of node devices connected so that a tree-like hierarchical structure is formed, each of said node devices having a single high-order direction port and a plurality of low-order direction ports, the communications network including a plurality of transmit/receive stations each being connected to one of the node devices via an interface device, each of the transmit/receive stations having an input port and an output port connected to the node devices via the interface and transmitting a signal when there is no signal at the input port, a highest-order node device out of the node devices in the communications network broadcasting a first-arrival signal which is received by said highest-order node device, said first-arrival signal being one of signals which are transmitted by some of transmit/receive stations at almost the same time, signals other than the first-arrival signal being discarded, said method comprising the steps of:

(a) storing, in a buffer provided in said interface device and arranged so as to receive a signal via said one of the node devices, a first input signal received by said interface device from said one of the node devices approximately concurrently with a second input signal received by said interface device from one of the plurality of transmit/receive stations; and

(b) transmitting the first input signal received from said one of the node devices and stored in said buffer in the step (a), to a destination transmit/receive station after the second input signal from said one of the plurality of transmit/receive stations is no longer received;

wherein the buffer comprises a FIFO memory and further comprising the steps of:

(c) storing said first input signal received from said one of the node devices into a first input of the FIFO memory provided in the interface device, said FIFO memory having a second input parallel to the first input;

(d) writing a space signal into the second input of the FIFO after the first input signal ends;

(e) transmitting a collision presence signal from the interface device to said one of the transmit/receive stations which transmits the second input signal when the first input and the second input signal arrive at the interface device at almost the same time; and

(f) transmitting the first input signal written into the first FIFO input to said one of the plurality of transmit/receive stations which transmits the second input signal in response to receipt of the collision presence signal.

5,535,212

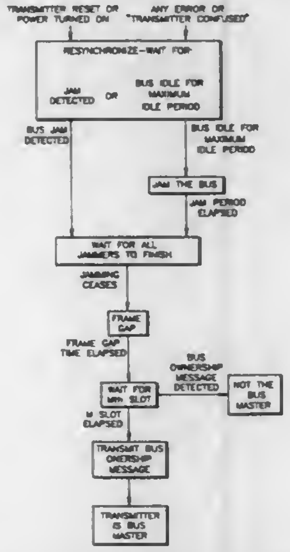
IMPLICIT TOKEN MEDIA ACCESS PROTOCOL WITHOUT COLLISION DETECTION

Philip J. Koopman, Hebron, and David C. Brajczewski, Vernon, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 992,877, Dec. 21, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,944

Int. Cl.^{6} H04L *5/22;* **H04J** *3/06*

U.S. Cl. 370—85.6 **7 Claims**


TRANSMITTER RESET OR POWER TURNED ON
ANY ERROR OR "TRANSMITTER CONFUSED"
RESYNCHRONIZE—WAIT FOR
JAM DETECTED OR BUS IDLE FOR MAXIMUM IDLE PERIOD
BUS JAM DETECTED
BUS IDLE FOR MAXIMUM IDLE PERIOD
JAM THE BUS
JAM PERIOD ELAPSED
WAIT FOR ALL JAMMERS TO FINISH
JAMMING CEASES
FRAME GAP
FRAME GAP TIME ELAPSED
BUS OWNERSHIP MESSAGE DETECTED
WAIT FOR M'th SLOT
NOT THE BUS MASTER
M SLOT ELAPSED
TRANSMIT BUS OWERSHIP MESSAGE
TRANSMITTER IS BUS MASTER

1. A method for synchronizing a plurality of transceivers interconnected by a communications medium consisting of a single signal line, said plurality of transceivers being peers in that none is a predetermined central bus master, comprising:

assigning message transmission time slots uniquely to each of said transceivers;

when said communications medium is idle, providing a jam signal from one or more of said transceivers onto said communications medium, such that no message other than said jam signal may exist on said communications medium;

receiving said jam signal at said transceivers; and

transmitting, onto said communications medium, a communications medium ownership message from one of said transceivers that provided said jam signal, in a time slot associated with said one transceiver which is a first or subsequent time slot immediately following the end of said jam signal.

5,535,213

RING CONFIGURATOR FOR SYSTEM INTERCONNECTION USING FULLY COVERED RINGS

Shien-Tai Pan, Travis County, Tex.; Ting Cheng, Putnam County; Christos J. Georgiou, Westchester County, both of N.Y.; George W. Nation, Olmsted County, Minn., and Chung-Sheng Li, Westchester County, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1994, Ser. No. 355,862

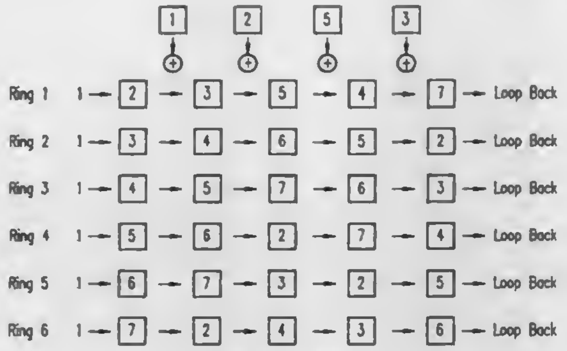
Int. Cl.^{6} H04J *15/00*

U.S. Cl. 370—85.15 **9 Claims**

5. A method for adaptively configuring a network composed of a plurality of nodes interconnected by a plurality of edges wherein data packets are transmitted from an origination node to a destination node, said method comprising the steps of:

supplying to each node in the network information defining the number of nodes, the number of edges on each node and a unique identification number to each node in the network;

at network initialization, running a program at each node of the network to generate a consistent set of routing tables for routing said data packets within said network; and



Edge–Disjoint Rings

storing at each node information from the generation of said routing tables from which routing decisions can be made for data packets received at the node.

5,535,214

TIMELY PROCESSING OF TRANSMISSION AND RECEPTION REQUESTS IN A MULTI-NODE COMMUNICATION NETWORK

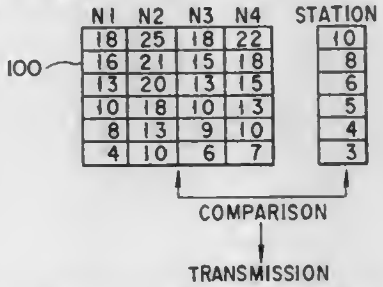
Yasuhisa Shiobara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1993, Ser. No. 60,041

Claims priority, application Japan, Jun. 18, 1992, 4-159725

Int. Cl.^{6} H04L *12/433*

U.S. Cl. 370—85.6 **35 Claims**



7. A method of transmitting data from one station in a plurality of stations to another station in said plurality of stations, said transmitting being in response to a a priority given to said data in said one station, said plurality of stations being operatively interconnected and each of said plurality of stations having an own communication device associated therewith, said method comprising the steps of:

comparing, in an own communication device associated with said one station, said priority of said data in said one station with a priority given to data in other stations of said plurality of stations; and

transmitting said data in said one station when the priority of said data in said one station is higher than the priority of said data in said other stations.

5,535,215

METHOD AND APPARATUS FOR PROVIDING CONTROL CHANNELS AND MESSAGE CHANNELS IN A RADIO COMMUNICATION SYSTEM

William R. Hieatt, III, Colleyville, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1995, Ser. No. 432,352

Int. Cl.^{6} H04J *3/16;4/00*

U.S. Cl. 370—95.1 **16 Claims**

7. A controller in a radio communication system comprising a plurality of portable receivers, the controller for providing a plurality of control channels that are transmitted in simulcast from a plurality of transmitters in a coverage area and for providing a plurality of message channels that are transmitted in coverage zones within the coverage area, wherein each coverage zone is covered by a transmitter having a peak output power, and wherein the control channels and the message channels are transmitted within the coverage area on a synchronized time-division multiplex (TDM) basis, and wherein the plurality of control channels exceed a transmission capacity of a single transmitter, the controller comprising:

a processor for controlling operation of the controller;

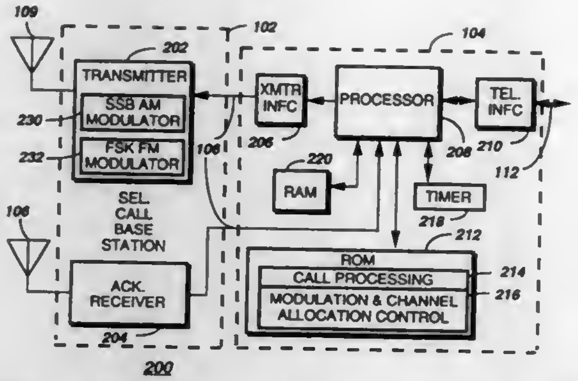
a telephone interface coupled to the processor for accepting messages intended for the portable receivers;

a transmitter interface coupled to the processor for communicating with the plurality of transmitters to transmit control signals for the portable receivers on the control channels and to transmit the messages for the portable receivers on the message channels;

a first modulation control element coupled to the processor for controlling the plurality of transmitters to employ a first modulation technique to generate each of the message channels at a first average output power that is substantially less than the peak output power of the transmitter;

a second modulation control element coupled to the processor for controlling the plurality of transmitters to employ a second modulation technique to generate each of the control channels at a second average output power approximately equal to the peak output power of the transmitter, thereby increasing usable coverage distance from the transmitter for the control channel compared to the usable coverage distance achieved for the message channel; and

an allocation element coupled to the processor for allocating the plurality of control channels to the coverage zones in a staggered geographic pattern such that reception of the plurality of control channels is maintained substantially throughout the coverage area.



5,535,216

MULTIPLEXED GAPPED CONSTANT BIT RATE DATA TRANSMISSION

Matthew S. Goldman, Marlborough, and Jeffrey B. Mendelson, Shrewsbury, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 17, 1995, Ser. No. 373,727

Int. Cl.^{6} H04J *3/06;* **H04N** *7/13*

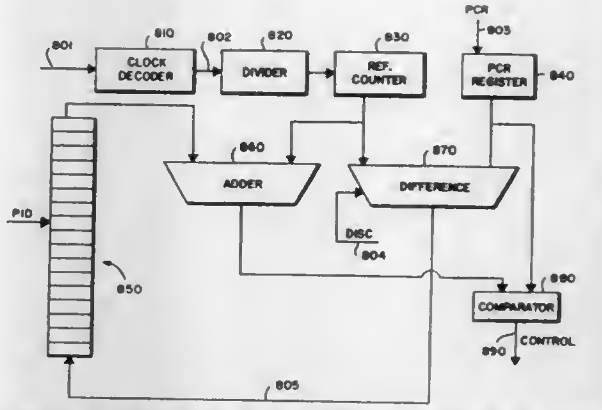
U.S. Cl. 370—100.1 **4 Claims**

3. An apparatus for controlling the communication of a bit stream over a synchronous communications network, the network to communicate the bit stream at a rate which is synchronized to network clock signals, comprising:

a decoder generating local clock reference signals, the local clock reference signals derived from the network clock signals;

a counter connected to the decoder, the counter incremented by the local clock reference signals;

means for receiving the bit stream while generating the local clock reference signals, the bit stream including program clock reference signals, the program clock reference signals being independent of the network clock signals;



means for extracting the program clock reference signals from the bit stream;

means for storing the program clock reference signals extracted from the bit stream while receiving the bit stream;

means for normalizing the program clock reference signals with respect to the local clock reference signals;

a comparator to compare, after normalization, the program clock reference signals with the local clock reference signals to generate delta clock reference values, the delta clock reference values being a relative difference between the program clock reference signals and the local clock reference signals;

means, responsive to the timing values being positive, for transporting the bit stream over the network; and

means, responsive to the timing values being negative, for suspending transport of the bit stream over the network.

5,535,217

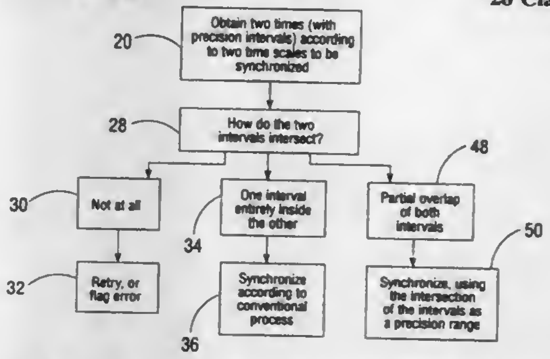
METHOD AND APPARATUS FOR PROBABILISTIC CLOCK SYNCHRONIZATION WITH INTERVAL ARITHMETIC

Yiu M. Cheung; Kenneth K. W. Ng, both of Scarborough, Canada, and Hovey R. Strong, Jr., San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1994, Ser. No. 363,421

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—100.1 **28 Claims**


20
Obtain two times (with precision intervals) according to two time scales to be synchronized
28
How do the two intervals intersect?
48
30
Not at all
One interval entirely inside the other
Partial overlap of both intervals
50
34
32
Retry, or flag error
Synchronize according to conventional process
Synchronize, using the intersection of the intervals as a precision range
36

1. For use with a system including a node coupled to a communication network, the node maintaining an internal time representation, a method for synchronizing the internal time representation with a remote time representation maintained elsewhere in the system, each of the internal and remote time representations including an instantaneous time and a precision range about the instantaneous time, the method comprising the steps, executed by the node, of:

identifying a first time for the internal time representation of the node and a second time for the remote time representation, the precision range of the first and second times forming respective first and second time intervals, the synchronization to be performed based on the first and second time intervals; and synchronizing the internal time representation, in terms of a new instantaneous time and a new precision range thereabout, the precision range thereabout being based on an intersection between the first and second time intervals.

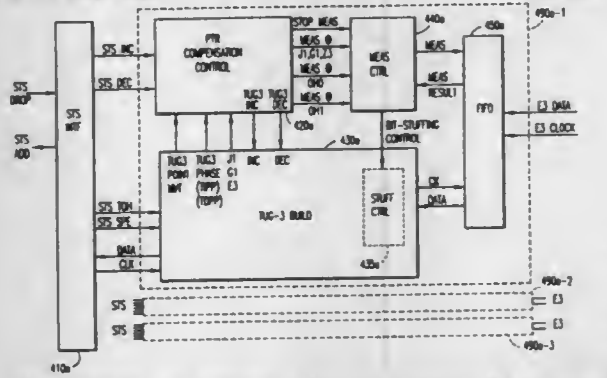
5,535,218

APPARATUS AND METHOD FOR LIMITING JITTER IN A TELECOMMUNICATIONS SIGNAL WHICH IS BEING MAPPED IN ANOTHER SUCH SIGNAL BY TEMPORARILY SUSPENDING MEASUREMENT OF AVAILABLE DATA

Tat K. Ng, and Michael D'Jamoos, both of Derby, Conn., assignors to TranSwitch Corporation, Shelton, Conn.

Continuation of Ser. No. 253,383, Jun. 3, 1994, abandoned.
This application Jul. 18, 1995, Ser. No. 503,737
Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—102 **28 Claims**



10. Apparatus for mapping a first telecommunications signal having a first frame into a second telecommunications signal having a second frame, said first telecommunications signal having a first payload envelope and a first overhead, said first overhead including a first pointer which points to the location of the start of the said payload envelope, and said second telecommunications signal having a second payload envelope and a second overhead, said second overhead including a second pointer which points to the location of the start of said second payload envelop wherein movement of said second pointer moves causes a stuff or destuff in said second telecommunications signal, said apparatus comprising:

a) storage means for storing data of said first telecommunications signal awaiting mapping into said second telecommunications signal;

b) storage fullness indication means for providing an indication regarding the amount of data located in said data storage means;

c) first pointer movement means for generating stuffs or destuffs of data into said first telecommunications signal based on said indication;

d) second pointer movement detection means for receiving said second telecommunications signal and detecting that said second pointer has moved in a first direction, wherein said first pointer movement means generates a pointer movement in a second direction opposite said first direction when said second pointer movement detection means detects that said second pointer has moved in said first direction;

e) means for suspending said first pointer movement means from generating stuffs or destuffs of data based on said indication from a first point in time between when said second pointer movement detection means detects that said second pointer has moved in said first direction and when said indication is provided, to a second point in time between when said first pointer movement means stuffs or destuffs data into said first telecommunications signal pursuant to said pointer movement in said second direction and when said indication is provided.

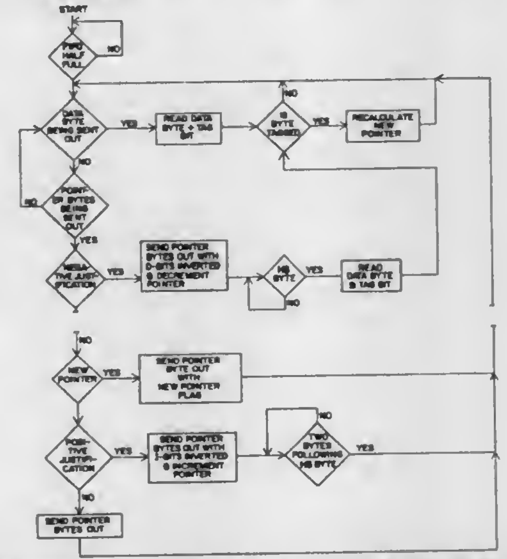
5,535,219

SONET/SDH POINTER CALCULATION CIRCUIT

Oscar W. Freitas, Cape Elizabeth, Me., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jun. 14, 1995, Ser. No. 490,236
Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—105.1 **12 Claims**


START
FIFO HALF FULL
NO
DATA BYTE BEING SENT OUT
YES
READ DATA BYTE + TAG BIT
IS BYTE TAGGED
RECALCULATE NEW POINTER
POINTER BYTES BEING SENT OUT
NEGATIVE JUSTIFICATION
SEND POINTER BYTES OUT WITH D-BITS INVERTED & DECREMENT POINTER
H3 BYTE
READ DATA BYTE & TAG BIT
NEW POINTER
SEND POINTER BYTE OUT WITH NEW POINTER FLAG
POSITIVE JUSTIFICATION
SEND POINTER BYTES OUT WITH I-BITS INVERTED & INCREMENT POINTER
TWO BYTES FOLLOWING H3 BYTE
SEND POINTER BYTES OUT

7. A method of calculating a new pointer in a pointer processing circuit for a SONET/SDH frame, said pointer processing circuit comprising a pointer interpreter (PI), a first in first out memory (FIFO), and a pointer generator (PG), said SONET/SDH frame having transport overhead byte locations including a pointer (H1 H2) followed by a negative justification data holding byte location (H3) and data payload byte locations with a trace byte J1 indicating the start of the data payload bytes for a specified frame, comprising:

receiving an incoming frame at the pointer interpreter (PI) and interpreting the pointer (H1 H2) value to indicate the location of the start of the data payload bytes for said frame starting at the trace byte J1;

sending the pointer value information directly to the pointer generator (PG);

tagging the next data byte after the pointer and negative justification data holding byte location (H3) on the incoming frame and sending the tagged data byte directly to the FIFO;

forming an outgoing frame at the pointer generator (PG), reading out the tagged data byte from the FIFO, and determining the position of the tagged data payload relative to the outgoing frame;

calculating a new pointer value for the outgoing frame based upon the previous pointer value for the incoming frame sent directly to the PG from the PI and the relative position of the tagged data byte in the outgoing frame without waiting to count to the trace byte J1 of the incoming frame thereby reducing delay in changing pointers to a maximum one frame delay.

5,535,220

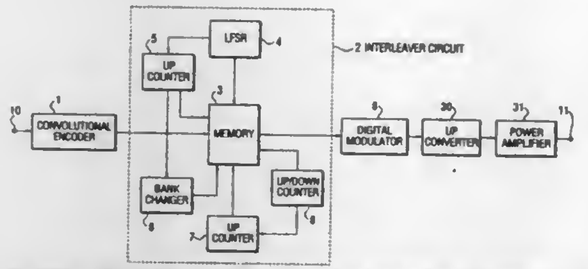
FORWARD ERROR CORRECTING TRANSMITTER AND RECEIVER

Ippei Kanno; Seiji Sakashita, both of Hirakata; Hiroaki Ozeki, Neyagawa; Daisuke Hayashi, Osaka, and Todd S. Bowser, Itami, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1994, Ser. No. 182,830
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—2.1 **6 Claims**

1. A forward error correcting transmitter which comprises:



an error correcting encoder, said error correcting encoder error-correcting-encoding a digital signal to obtain an error-correcting-encoded signal;

an interleaver comprising:

a memory, composed of rows and columns, for permitting the reading and writing of said error-correcting-encoded signal; and

a memory controller, said memory controller controlling said memory, when writing in said memory, so as to write said error-correcting-encoded signal on a row by row basis in a predetermined random sequence in each row, and controls said memory, when reading out from said memory, so as to read out said error-correcting-encoded signal written in said memory in one direction in each column, alternately reversing the direction on a column by column basis;

a modulator, said modulator modulating said error-correcting-encoded signal read out from said memory to obtain a modulated signal; and

a transmitter, said transmitter providing a transmitted signal from said modulated signal.

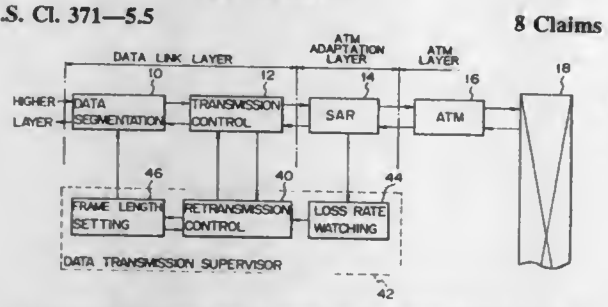
5,535,221

FRAME LENGTH CONTROL IN DATA TRANSMISSION USING ATM NETWORK

Toshiyuki Hijikata, and Tetsuo Tachibana, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 13, 1992, Ser. No. 928,709
Claims priority, application Japan, Aug. 15, 1991, 3-204515
Int. Cl.^{6} H04J *3/16*

U.S. Cl. 371—5.5 **8 Claims**



1. A method of controlling a length of an information frame in a data transmission system, wherein transmitted data are divided into information frames and the information frames are further divided into fixed length data blocks to which routing data are added to form cells in order to be transmitted on a network, comprising the steps of:

(i) detecting the rate of cells lost in the transmission on the network;

(ii) determining the length of the information frame to operatively reduce the rate detected in step (i); and

(iii) using the length determined in step (ii) as the length of the information frame.

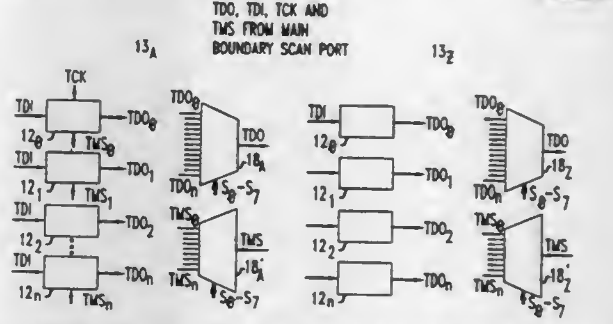
5,535,222

METHOD AND APPARATUS FOR CONTROLLING A PLURALITY OF SYSTEMS VIA A BOUNDARY-SCAN PORT DURING TESTING

Duy K. Le, Levittown, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 23, 1993, Ser. No. 173,732
Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—223 **7 Claims**



1. A method for controlling the testing of a plurality of systems, comprising the step of selecting one of the systems for testing in accordance with a stream of test values present on a four-wire Boundary-Scan port, wherein the selecting step comprises the steps of:

shifting the stream of test values present at the Boundary-Scan port through at least one Boundary-Scan buffer which generates a control signal varying in accordance with the test values; and

applying the control signal from the Boundary-Scan buffer to at least one multiplexer and one demultiplexer which collectively select a separate one of the systems for testing in accordance with the control signal received by the multiplexer and the demultiplexer from the buffer.

5,535,223

METHOD AND APPARATUS FOR THE VERIFICATION AND TESTING OF ELECTRICAL CIRCUITS

Jens Horstmann, Sunnyvale, and James Testa, Mountain View, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 68,985, May 28, 1993, abandoned.
This application Feb. 17, 1995, Ser. No. 390,827
Int. Cl.^{6} G01R *31/28;* **G06G** *7/48*

U.S. Cl. 371—27 **24 Claims**

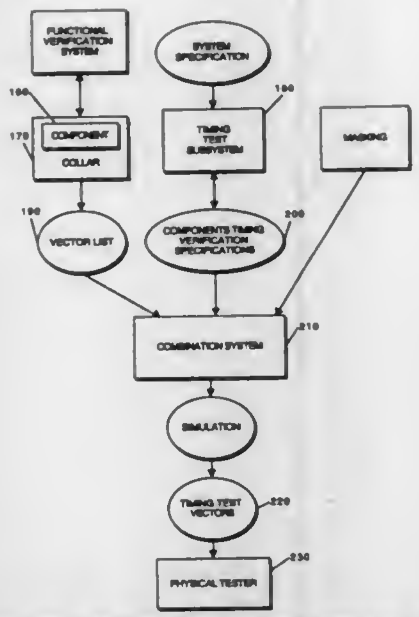
1. A process for testing electrical circuits comprising at least one circuit component comprising at least one element and comprising a plurality of input/output pins, each circuit having at least one timing envelope specification associated with the electrical circuit which identifies timing requirements of the components, said process comprising the steps of:

performing a timing verification of the electrical circuit in a system environment wherein timing for processing each component is compared to the timing envelope specification to determine that each pin of each component meets timing requirements specified by the timing envelope specification;

performing a functional verification of the electrical circuit wherein each component is assumed to process an electrical signal within a unit delay of a reference clock, said step of performing a functional verification verifies that logic elements of the electrical circuit logically operate as intended;

during the step of performing a functional verification, extracting a state of the input/output pins at each reference clock to generate a vector list identifying the state of each input/output pin at each reference clock;

combining the vector list and information from the timing envelope specification to generate a core data structure comprising data identifying the state of the input/output pins of the components at each time period when the input/output pins



change state, said step of combining comprises the steps of, for each reference clock,

identifying a state change time the reference clock occurs relative to a start time,

for each pin that changes state at the reference clock, adjusting the state change time for each pin in accordance with the information in the timing envelope specification for each pin such that for each pin that changes state an adjusted state change time is identified for accurate identification of occurrence of a change of state relative to the start time, and

storing in the core data structure timing vectors comprising the state of each pin and the adjusted state change time;

wherein the timing vectors are utilized as inputs to a test device which physically tests electrical circuits fabricated is generated from the core data structure.

5,535,224

AUTOMATIC PERFORMING SYSTEM CAPABLE OF DETECTION AND CORRECTION OF ERRORS IN PERFORMANCE INFORMATION

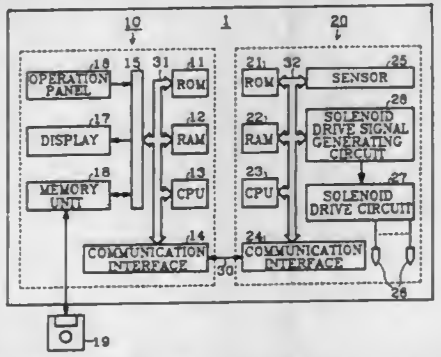
Tetsusai Kondo, and Haruhiko Matsui, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Continuation of Ser. No. 232,451, Apr. 22, 1994, which is a continuation of Ser. No. 948,294, Sep. 21, 1992. This application May 8, 1995, Ser. No. 436,872

Claims priority, application Japan, Dec. 9, 1991, 3-324776

Int. Cl.^{6} G08C *25/02;* **H04L** *1/18*

U.S. Cl. 371—32 **11 Claims**



1. An automatic performing system having a performance reproducing mode for reproducing a pre-recorded musical performance stored in a memory, said system comprising: a main controller and a key controller and, in order for said system to be operable in said reproducing mode,

(I) said main controller comprising:

(a) a main controller communication interface being coupled to a key controller communication interface of said key controller via a communication line; and

(b) said memory, being coupled to said main controller communication interface, for permanently storing pre-recorded musical performance as performance information and for supplying said performance information to said main controller communication interface;

said main controller communication interface including:

(1) main controller transmitting means, being coupled to said communication line, for transmitting said performance information to said key controller via said communication line;

(2) main controller holding means, being coupled to said main controller transmitting means, for temporarily storing said performance information transmitted to said key controller;

(3) main controller receiving means, being coupled to said communication line, for receiving information from said key controller;

(4) main controller determining means, being coupled to said main controller receiving means, said main controller transmitting means, and said main controller holding means, for determining whether transmitted performance information is correctly received by said key controller; and

(5) main controller retransmitting means, being coupled to said main controller determining means and said communication line, for transmitting an instruction concerning the performance information received by said key controller in response to an output of said main controller determining means;

(II) said key controller, including said key controller communication interface for receiving and transmitting information, said key controller communication interface comprising:

(1) key controller receiving means, being coupled to said communication line, for receiving said transmitted performance information from said main controller;

(2) key controller holding means, being coupled to key controller receiving means and said communication line, for temporarily storing said performance information received from said main controller via said communication line; and

(3) key controller transmitting means, being coupled to said communication line and said key controller receiving means, for returning to said main controller said performance information received by said key controller;

(III) wherein, during operation in said reproducing mode:

(a) said main controller determining means, upon receipt of said performance information returned to said main controller, determines whether said performance information is correctly received by said key controller by comparing the performance information stored in said main controller holding means with the performance information returned to said main controller;

(b) said main controller retransmitting means, only in response to a determination by said main controller determining means that said performance information is incorrectly received by said key controller, transmits an instruction to said key controller holding means to discard said performance information temporarily stored in said key controller holding means and said main controller transmitting means retransmits the performance information to said key controller receiving means; and

(c) said main controller transmitting means, only in response to a determination by said main controller determining means that said performance information is correctly received by said key controller, transmits further performance information to said key controller receiving means.

5,535,225

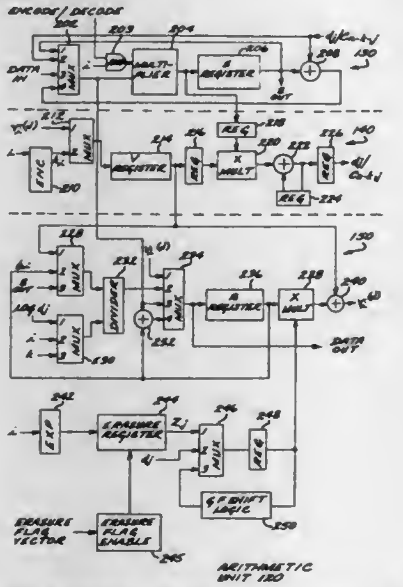
TIME DOMAIN ALGEBRAIC ENCODER/DECODER

Gregory L. Mayhew, and Henry E. Huey, both of Fullerton, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 12, 1993, Ser. No. 135,778

Int. Cl.^{6} H03M *13/00;* **G06F** *7/00;15/00*

U.S. Cl. 371—37.1 **4 Claims**



1. A decoder apparatus responsive to a received data vector having a plurality of symbols and being based on a predetermined encoding polynomial, comprising:

first processing means responsive to the received data vector

for iteratively calculating intermediate components of a time domain syndrome vector, and for calculating locations and counts of erasures in the received data vector,

and further for iteratively extending the time domain syndrome vector in response to a discrepancy constant to provide an extended syndrome vector,

wherein the final extended syndrome vector represents an error vector;

second processing means responsive to the extended time domain syndrome vector components, to intermediate components of an errata vector, and to the erasure locations and counts

for iteratively calculating components of the errata vector and for storing said iteratively calculated components of the errata vector,

and further for calculating a discrepancy constant based on each iteration of said intermediate extended syndrome vector components and said errata vector components; third processing means,

responsive to the erasure locations and counts, for iteratively calculating intermediate components of an erasure vector and for storing said intermediate erasure vector components, and

responsive to the erasure vector components and the erasure locations and counts, for iteratively calculating said intermediate errata vector components, and

responsive to the received data vector and the error vector for providing a corrected output signal; and

control means for controlling the operations of said first, second, and third processing means.

5,535,226

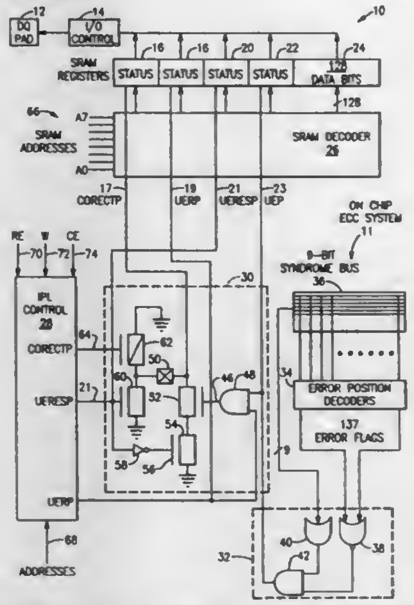
ON-CHIP ECC STATUS

Charles E. Drake; John A. Fifield, both of Underhill, Vt.; Richard D. Wheeler, Millerton, N.Y., and Barry J. Wolford, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1994, Ser. No. 251,056

Int. Cl.^{6} G06F *11/10;* **G11C** *29/00*

U.S. Cl. 371—40.1 **18 Claims**



3. A memory device employing error correction, wherein said error correction is capable of correcting a predetermined number of simultaneous errors, said memory device comprising:

means for activating said error correction;

means for deactivating said error correction;

means for determining a status for said error correction; and

means for determining whether a given error includes more than said predetermined number of simultaneous errors, wherein said error determining means comprises:

a bus for communicating a coded error position indicator;

a decoder coupled to said bus for decoding said error position indicator; and

logic circuitry coupled to said bus and said decoder for determining whether said error correction is capable of correcting said given error.

5,535,227

DIGITAL INFORMATION ERROR CORRECTING APPARATUS FOR SINGLE ERROR CORRECTING (SEC), DOUBLE ERROR DETECTING (DED), SINGLE BYTE ERROR DETECTING (SBED), AND ODD NUMBERED SINGLE BYTE ERROR CORRECTING (OSBEC)

Cristina Silvano, Milan, Italy, assignor to Bull HN Information Systems Italia S.p.A., Turin, Italy

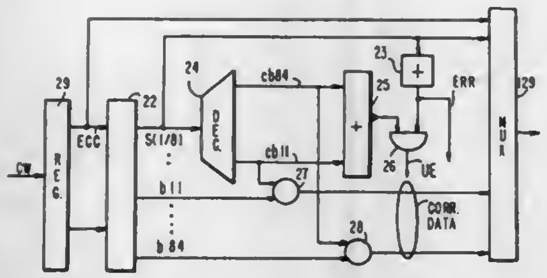
Filed May 23, 1994, Ser. No. 248,140

Claims priority, application European Pat. Off., Jun. 10, 1993, 93830254

Int. Cl.^{6} G06F *11/10*

U.S. Cl. 371—40.4 **7 Claims**

1. Error correcting apparatus (SEC-DED-SBED-OSBEC) for the correction of errors in digital information comprising a plurality of bytes, each of b bits, for correcting single errors (SEC), at least part of all possible odd numbers of errors in a single byte (OSBEC) and detecting double errors (DED) and multiple errors in a single byte (SBED), the digital information being constituted by a codeword of $n=r+k$ bits with k data bits and r error correction and check bits, the said r check bits, where $r \geq 2$, being obtained from r separate summations, modulo 2, of a plurality of data bits selected in accordance with a parity check bit generation matrix having r



rows and bK columns, with non-zero column vectors distinct from one another, at least a portion of the said matrix given by

$$B(r\times bK)=|B1, \ldots Bi \ldots BK|$$

that is from the juxtaposition of K non-zero and distinct submatrices, in which the submatrices Bi(r×b) having r rows and b columns, are each formed by the vertical superimposition of a submatrix I_b of b rows and b columns with a single 1 element per row and column and a submatrix Hi or r−b rows and b columns, the said submatrices Hi each being constituted by an even number ≧2 of all 1 rows, and the remaining rows having all 0 elements, said error correcting apparatus comprising first logical circuits receiving the said codeword at their input to generate a syndrome code having r bits by means of r distinct modulo 2 sums of a plurality of code bits selected in accordance with a syndrome generation matrix, at least a portion of the said syndrome generation matrix being given by

$$H=|B(r\times bK)\ Ir|$$

where B (r×bK) is the parity check bit generation matrix, and Ir is a r row and r column identity submatrix adjacent to the matrix B (r×bK), said error correcting apparatus comprising:

second logic circuits receiving the said r bit syndrome at its input to identify from the said syndrome the presence in the said codeword of a single error and its position in the codeword, a double error, an odd number of errors in the same byte and their position in the said codeword, and multiple errors in the same byte, and

third logic circuits receiving k bits of data of the said codeword at their input, controlled by the said second logic circuit to correct the said single or odd number of errors within a byte, identified in number and position in the said k bits of the codeword.

5,535,228

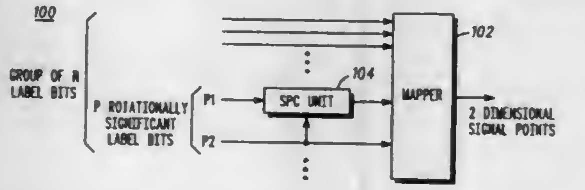
DEVICE AND METHOD FOR ACHIEVING ROTATINAL INVARIANCE IN A MULTI-LEVEL TRELLIS CODING SYSTEM

Ping Dong, Canton; M. Vedat Eyuboglu, Concord, and George D. Forney, Jr., Cambridge, all of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 19,723, Feb. 19, 1993, abandoned. This application Aug. 22, 1995, Ser. No. 518,128

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—49.1 **50 Claims**


100
GROUP OF N LABEL BITS
P ROTATIONALLY SIGNIFICANT LABEL BITS
P1
P2
SPC UNIT
104
MAPPER
102
2 DIMENSIONAL SIGNAL POINTS

1. A device for encoding a sequence of groups of label bits into a sequence of two-dimensional signal points, comprising:

(A) a mapper for mapping at least a group of n label bits into a sequence of two-dimensional signal points selected from a two-dimensional signal constellation according to a labelling wherein rotation of the signal constellation affects only p rotationally-significant label bits (2≦p<n; p, n integers) of the n label bits,

(B) a convolutional encoder for a trellis code, operably coupled to receive and encode selected input bits, wherein a second rotationally-significant label bit is a coded bit for the trellis code, and

(C) single-parity check code (SPC) means for generating a parity check bit for a first rotationally-significant label bit to allow the receiver to detect parallel transition errors in the trellis code, wherein the parallel transition errors are two-symbol errors, and wherein the parity-check bit is computed based on at least a second rotationally-significant label bit, such that the parity bit provides a means for detecting errors in the first rotationally-significant label bit even when the signal points are rotated by an unknown amount.

5,535,229

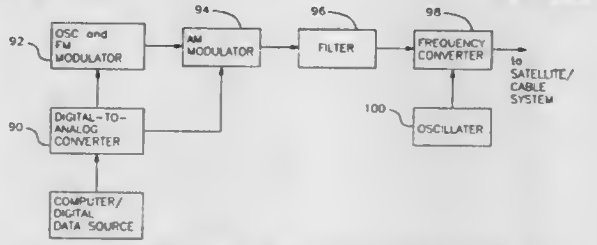
DIGITAL DATA TRANSFER SYSTEM FOR USE ESPECIALLY WITH ADVERTISEMENT INSERTION SYSTEMS

John A. Hain, Jr., Giles, and -H. G. Rusty Thornhill, Cumberland, both of Tenn., assignors to Global Interconnect, Corp., Crossville, Tenn.

Filed May 10, 1993, Ser. No. 59,902

Int. Cl.^{6} G06F *11/10*

U.S. Cl. 371—53 **16 Claims**


92
94
96
98
OSC and FM MODULATOR
AM MODULATOR
FILTER
FREQUENCY CONVERTER
to SATELLITE/CABLE SYSTEM
90
DIGITAL-TO-ANALOG CONVERTER
100
OSCILLATOR
COMPUTER/DIGITAL DATA SOURCE

1. A system for transferring digital data from a sending site to at least one receiving site, said system comprising:

a central processor for receiving selected data and converting said data to a digital format;

a transmission processor for affixing at least one integrity monitoring indicator to said data for transmission with said data, said transmission processor including a device for converting said digital data to an analog signal, an FM modulator for modulating a portion of said analog signal to an FM signal, an AM modulator for modulating said FM signal with a remainder of said analog signal to an AM signal, a filter to limit a bandwidth of said FM signal and said AM signal, a frequency converter for converting said FM signal to a first center frequency and said AM signal to said first center frequency, and an oscillator for oscillating said FM signal and said AM signal simultaneously within a single bandwidth;

a transmission medium;

a receiver for receiving said data transmitted through said transmission medium and for examining said integrity monitoring indicator to determine whether said data was properly transmitted; and

a master processor for communicating with said transmission processor to indicate any portion of said data received improperly and to indicate when said data is properly and completely received.

5,535,230

ILLUMINATING LIGHT SOURCE DEVICE USING SEMICONDUCTOR LASER ELEMENT

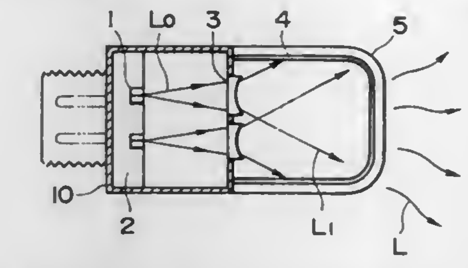
Tadashi Abe, Shiroishi, Japan, assignor to Shogo Tzuzuki, Kanagawa, Japan

Filed Jan. 3, 1995, Ser. No. 368,552

Claims priority, application Japan, Apr. 6, 1994, 6-068595

Int. Cl.^{6} H01S *3/18;* **H05B** *33/00*

U.S. Cl. 372—43 **10 Claims**



1. An illuminating light source device, comprising:

a semiconductor laser element for outputting a laser beam having a particular wavelength in the range from infrared rays to ultraviolet rays;

a diffusion lens for diffusing the laser beam from said semiconductor laser element; and

a fluophor for converting the diffused laser beam from said diffusion lens into visible light.

5,535,231

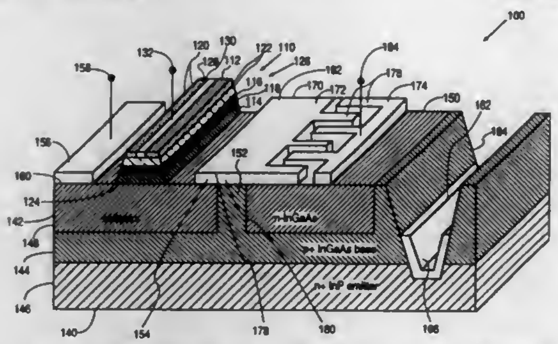
OPTOELECTRONIC CIRCUIT INCLUDING HETEROJUNCTION BIPOLAR TRANSISTOR LASER AND PHOTODETECTOR

KwyRo Lee, Taejon, Rep. of Korea; Michael Shur, Charlottesville, and Stephen H. Jones, Afton, both of Va., assignors to Samsung Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 8, 1994, Ser. No. 336,027

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—50 **49 Claims**



1. A monolithic optoelectronic integrated circuit comprising:

an emitter-down heterostructure bipolar transistor having a planar surface and having a buried emitter layer, a surface collector layer separated into a plurality of surface regions and a medial base layer coupled between the emitter layer and the collector layer and having a region extending between collector layer surface regions to the planar surface;

a laser overlying and coupled to a first collector surface region of the plurality of collector surface regions; and

a metal layer of a metal-semiconductor-metal photodetector overlying and coupled to a portion of the planar surface including part of the first collector surface region, the base layer surface region and a second collector surface region.

5,535,232

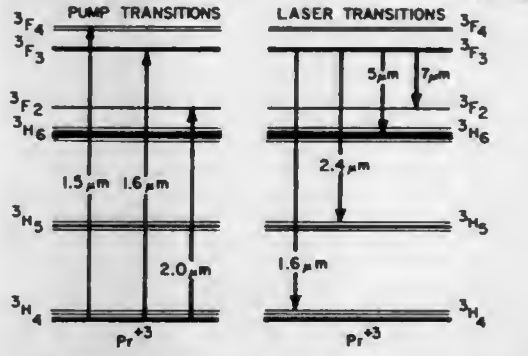
OPTICALLY PUMPED, PRASEODYMIUM BASED SOLID STATE LASER

Steven R. Bowman, Davidsonville; Joseph Ganem, Reisterstown, both of Md., and Barry J. Feldman, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1995, Ser. No. 381,243

Int. Cl.^{6} H01S *3/091;3/092*

U.S. Cl. 372—70 **30 Claims**



1. A solid state laser having an output at about 5 μm, comprising:

a laser cavity defined by a first mirror and an opposing second mirror, wherein said mirrors are at least partially reflective at about b 5μm;

a laser medium disposed in said laser cavity, consisting essentially of a low phonon energy host material, doped with an amount of praseodymium ions sufficient to produce a longitudinal mode laser emission from the transition of said praseodymium ions from the $^3F_3$ excited state to the $^3H_6$ excited state when said laser medium is pumped by pumping means; and

means for pumping said laser medium.

5,535,233

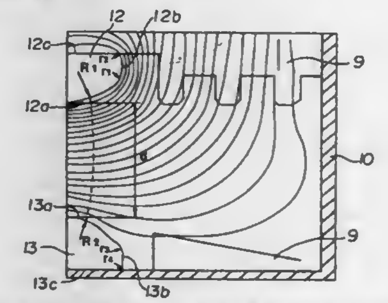
LASER DEVICE

Hakaru Mizoguchi; Yoshibo Amada, and Noritoshi Ito, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 937,611, Aug. 28, 1992. This application Oct. 4, 1993, Ser. No. 131,530

Int. Cl.^{6} H01S *3/097*

U.S. Cl. 372—87 **7 Claims**



1. A laser device of the type in which an electric discharge takes place between a pair of electrodes to excite a laser gas in a laser chamber thereby producing a laser beam, wherein a part of a contour shape of a section perpendicular to the longitudinal axis of the laser chamber in at least one of the pair of electrodes, which part confronts the other one of the electrodes, has a shape of a circular arc, wherein the contour shape includes a straight line portion, and wherein straight line portions which are not parallel with each other or a straight line portion and the circular arc are connected to each other by a circular arc with a radius smaller than that of the first-mentioned circular arc.

5,535,234
PROCESS FOR THE SIMULTANEOUS SMELTING OF DUST AND INCINERATOR SLAG

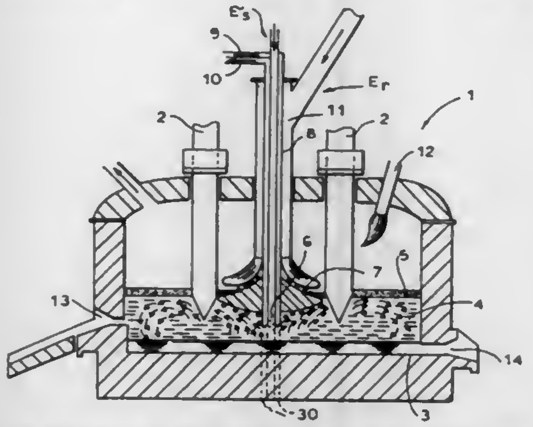
Guido Bullmann, Essen, Germany, assignor to RWE Energie Aktiengesellschaft, Essen, and Mannesmann Aktiengesellshcaft, Dusseldorf, both of, Germany

Filed Feb. 28, 1995, Ser. No. 396,202

Claims priority, application Germany, Mar. 3, 1994, 44 06 898.0

Int. Cl.^{6} F27D *17/00*

U.S. Cl. 373—8 **19 Claims**



1. A process for simultaneously smelting a smeltable dust and pieces of a grate slag from a garbage incinerator, comprising the steps of:
   - (a) providing a molten slag bath covered with a layer of coke above a hearth of a closed low-shaft electric furnace having at least one electrode dipping into said bath;
   - (b) introducing a smeltable dust into said molten slag bath below said layer of coke through a feed tube having a discharge end immersed in said molten slag bath;
   - (c) contemporaneously with the introduction of said smeltable dust, feeding pieces of grate slag from a garbage incinerator into said furnace through a feed pipe terminating above said molten slag bath;
   - (d) operating said electric furnace by electrically energizing said electrode while maintaining reducing conditions in said molten slag bath by controlling a carbon balance between carbon introduced in said smeltable dust, carbon introduced in said grate slag and carbon consumed in said bath;
   - (e) tapping liquid slag from said molten slag bath;
   - (f) solidifying tapped liquid slag to a slag glass capable of landfill disposal; and
   - (g) controlling proportion of said smeltable dust and said grate slag supplied to said furnace to limit leaching of an eluate from said slag glass.

5,535,235
MELTING FURNACE HAVING PREHEATING VESSEL

Norio Ao, and Hirotsugu Kubo, both of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

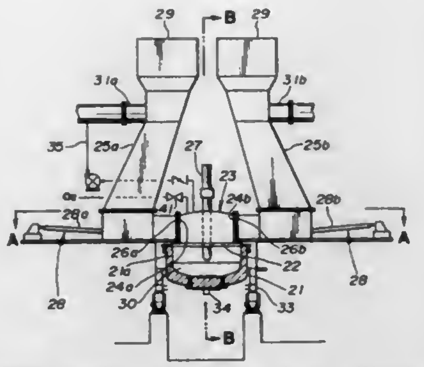
Filed Mar. 16, 1995, Ser. No. 405,182

Claims priority, application Japan, Mar. 18, 1994, 6-049482

Int. Cl.^{6} F27D *23/00*

U.S. Cl. 373—78 **12 Claims**

1. A melting furnace comprising:
   - preheating vessels for preheating raw material to produce a preheated raw material;
   - a melting furnace body having tilting means for tilting the melting furnace body and heating means for heating the preheated raw material;
   - a furnace roof for covering an upper part of the melting furnace body;
   - a combustion chamber, arranged on the furnace roof, for burning a gas generated in the melting furnace body;



   - feed openings, arranged at side faces of the combustion chamber, for feeding the preheated raw material into the melting furnace body, said side faces of the combustion chamber being positioned at a right angle to a tilting direction of the melting furnace body;
   - supply openings, arranged at lower ends of the preheating vessels, for supplying the preheated raw material through the feed openings to the melting furnace body; and
   - connecting means for movably connecting the supply openings with the feed openings when the melting furnace body is tilted by said tilting means.

5,535,236
PREHEATING DEVICE

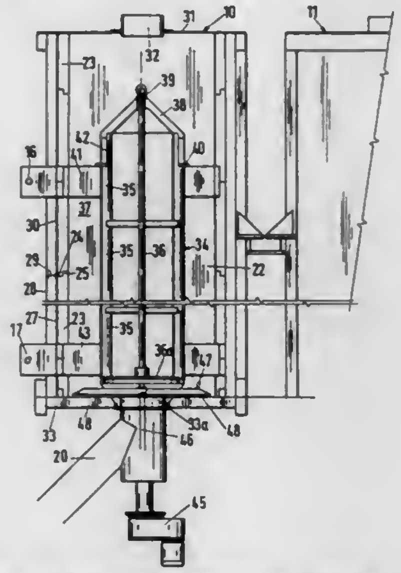
Werner Fischer, Venthöne, Switzerland, assignor to Maschinenfabrik Gustav Eirich, Germany

Filed Apr. 29, 1994, Ser. No. 235,487

Claims priority, application Switzerland, May 10, 1993, 01431/93

Int. Cl.^{6} H05B *7/09*

U.S. Cl. 373—89 **8 Claims**



1. A device for electrical preheating of a dry material for manufacture of green masses for electrodes comprising a silo housing, a core, a top and a bottom electrode, a concentric feed pipe, an eccentric feed pipe, and a rotating removal tool, said silo housing having a top end, a bottom end, a circumferentially extending wall, and a longitudinal axis, said core located substantially within said silo housing extending substantially along said longitudinal axis to define a hollow annular space, said top electrode provided between said wall of said silo housing and said core, located proximate said top end of said silo housing, and said

bottom electrode provided between said wall of said silo housing and said core, located proximate said bottom end of said silo housing, said electrodes connected to a power source, said concentric feed pipe located proximate said top end for feeding said dry material into said annular space, said eccentric feed pipe located proximate said bottom end, said rotating removal tool located in a lower end of said annular space proximate said eccentric feed pipe, wherein said rotating removal tool provides a means to convey said material for manufacture from the annular space into said eccentric feed pipe.

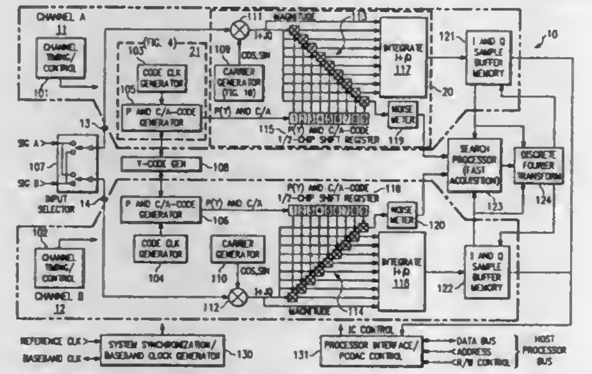
5,535,237
METHOD AND SYSTEM FOR A MULTI CHANNEL AND SEARCH GLOBAL POSITION SYSTEM SIGNAL PROCESSOR

Leonard J. LaPadula, III; George W. Pawlowski, both of Carrollton; David W. Rekieta, Allen, all of Tex.; Hugh L. Scott, Colorado Springs, Colo.; Chyi H. Lu, Plano, Tex.; John P. Volpi, Garland, Tex., and Mitchel B. Stiles, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 663,968, Feb. 28, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 192,210

Int. Cl.^{6} H04B *1/69;1/707;* G01S *5/02*

U.S. Cl. 375—200 **73 Claims**



59. A device for tracking and acquiring global positioning system (GPS) signals from multiple satellites, said device comprising, on a single integrated circuit:
   - Y-code generator circuitry;
   - two P(Y) and C/A-code channels;
   - a search processor for fast signal acquisition;
   - support circuitry means for processing null zone signals;
   - said channels each comprising:
   - a carrier generator;
   - a code clock generator;
   - a P-code generator;
   - a C/A-code generator;
   - eight predetection integration accumulators; and
   - a noise meter;
   - said search processor comprising:
   - a discrete fourier transform circuit;
   - first circuitry means for performing frequency bin interpolation;
   - second circuitry means for implementing a Robertson approximation for envelope calculation;
   - third circuitry means for implementing a Tong detection algorithm to determine if signal is present;
   - a threshold calculator which uses measurements from said noise meter;
   - fourth circuitry means for calculating a second search threshold for the interpolated frequency bins;
   - fifth circuitry means for advancing or retarding code state as required during search;
   - a mush counter which counts Tong detection iterations for a specific code state and either forces a new code state or stops search; and
   - a hit counter which counts hits associated with a specified number of discrete fourier transform cycles and reports the most current value.

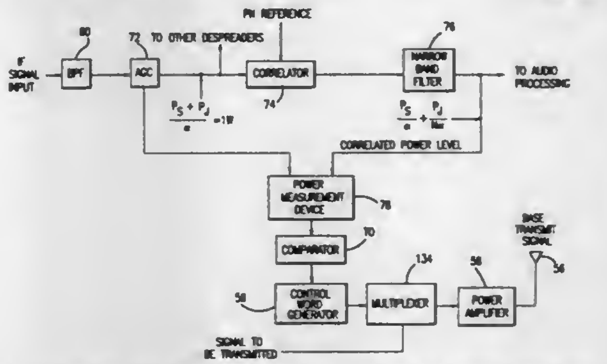
5,535,238
SPREAD SPECTRUM ADAPTIVE POWER CONTROL COMMUNICATIONS SYSTEM AND METHOD

Donald L. Schilling, Sands Point, N.Y.; Joseph Garodnick, Centerville, Mass.; Gary Lomp, Centerport, and Timothy F. Moore, III, New York, both of N.Y., assignors to InterDigital Technology Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 792,869, Nov. 19, 1991, Pat. No. 5,299,226. This application Mar. 28, 1994, Ser. No. 218,198

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 375—200 **21 Claims**



1. A system for adaptive-power control of a spread-spectrum transmitter of a mobile station operating in a cellular-communications network using spread-spectrum modulation, comprising:
   - said mobile station having a mobile transmitter coupled to a mobile antenna for transmitting a first spread-spectrum signal using radio waves;
   - a base station having
     - an automatic-gain-control (AGC) circuit, responsive to a received signal, for generating an AGC-output signal, with the received signal including the first spread-spectrum signal and an interfering signal;
     - a base correlator coupled to said AGC circuit for despreading the AGC-output signal;
     - a power-measurement circuit coupled to said base-correlator, for processing the despread AGC-output signal as a received-power level;
     - a comparator coupled to said power-measurement circuit for generating a comparison signal by comparing the received-power level to a threshold level;
     - a power-command circuit coupled to said comparator and responsive to the comparison signal for generating a power-command signal;
     - an antenna;
     - a transmitter coupled to said antenna and to said power-command circuit for transmitting the power-command signal as a second spread-spectrum signal; and
   - said mobile station further including
     - a mobile correlator coupled to said mobile antenna for despreading the power-command signal from the second spread-spectrum signal as a power-adjust signal; and
     - a variable-gain device coupled to said mobile correlator, responsive to the power-adjust signal indicating an increase in power necessary to reach a desired power level, for geometrically increasing a transmitter-power level of the first spread-spectrum signal transmitted from said mobile-transmitter until the transmitter-power level exceeds the desired power level and then for geometrically decreasing the transmitter-power level of the first spread-spectrum

signal until the transmitter-power level falls below the desired power level, said variable-gain device alternatingly geometrically increasing to a point of excess power and geometrically decreasing to a point of insufficient power, with diminishing margins of error in excess and insufficiency, until the desired power level is obtained.

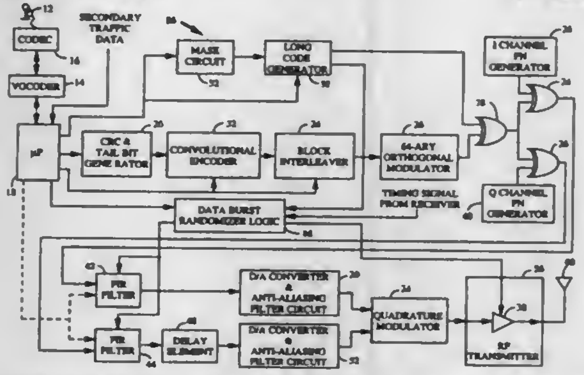
5,535,239
DATA BURST RANDOMIZER

Roberto Padovani; Yu-Cheun Jou; Daniel R. Kindred; John G. McDonough, all of San Diego, and Timothy I. Rueth, Cardiff-by-the-Sea, all of Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 194,823, Feb. 14, 1994, which is a continuation of Ser. No. 846,312, Mar. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 543,496, Jun. 25, 1990, Pat. No. 5,103,459. This application Aug. 16, 1994, Ser. No. 291,231

Int. Cl.^{6} H04J *13/02;* **H04B** *1/69*

U.S. Cl. 375—205 **76 Claims**



1. A spread spectrum modulator for modulating variable rate digital data generated in data frames of a predetermined time duration with each frame of data having a number of data bits which is a predetermined multiple of data bits in a frame of a least number of data bits, comprising:

encoder means for receiving and convolutionally encoding a frame of variable rate digital data, and generating a frame of symbol data with said symbol data in a first ordered sequence;

interleaver means for reordering said symbol data in said frame and generating said frame of symbol data in a second ordered sequence, and if said frame of symbol data corresponds to a frame of variable rate digital data having a number of data bits less than a frame maximum of data bits said interleaver means generating said symbol data and a predetermined number of repeats of said symbol data in said frame of symbol data in said second ordered sequence to generate a predetermined frame maximum number of symbols in said frame of sequence symbol data in said second ordered sequence;

symbol encoder means for determining from a value of each one of consecutive portions of said frame of symbol data in said second ordered sequence an modulation symbol of a set of modulation symbols, and generating an output frame of function data;

first spreading means for generating a first pseudorandom noise (PN) code;

first combining means for combining said frame of modulation symbol data and said first PN code, and generating an output frame of first PN spread data;

randomizer logic means responsive to said first PN code and an indication of a data rate of said frame variable rate digital data for generating a mask signal; and

filter means for responsive to said mask signal for filtering out portions of said first PN spread data in said frame of first PN spread data.

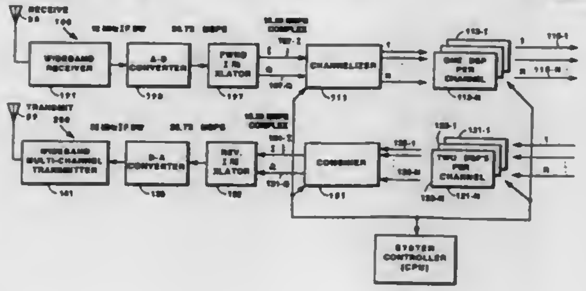
5,535,240
TRANSCEIVER APPARATUS EMPLOYING WIDEBAND FFT CHANNELIZER AND INVERSE FFT COMBINER FOR MULTICHANNEL COMMUNICATION NETWORK

Ronald R. Carney, Palm Bay, and Terry L. Williams, Melbourne Beach, both of Fla., assignors to AirNet Communications Corporation, Melbourne, Fla.

Filed Oct. 29, 1993, Ser. No. 146,364

Int. Cl.^{6} H04B *1/38;* **H04L** *5/16*

U.S. Cl. 375—219 **72 Claims**



1. A transceiver apparatus for a wireless communication network containing multiple frequency communication channels for supporting real time communications among a plurality of geographically distributed first sites, by way of one or more transceiver sites, said transceiver apparatus being installable at a respective one of said one or more transceiver sites and comprising:

a receiver unit which is operative to receive a plurality of signals from a contiguous set of said multiple frequency communication channels and output a digital composite receiver signal representative of the signals received from said plurality of multiple frequency communication channels;

a Fourier transform based channelizer unit which is coupled to receive the digital composite receiver signal from said receiver unit and is operative to output, in real time, respective digital channel signals representative of the contents of respective ones of the signals received from the plurality of communication channels received by said receiver unit;

a first plurality of signal processor units, respectively associated with said digital channel signals output by said Fourier transform based channelizer unit and being operative to process respective ones of said digital channel signals and to supply processed ones of said digital channel signals at respective output ports thereof;

a second plurality of signal processor units, respectively associated with respective ones of a plurality of incoming communication signals to be transmitted over a respectively different contiguous set of multiple frequency communication channels of said network, and being operative to process respective ones of said plurality of incoming communication signals and to supply processed ones of said incoming communication signals at respective output ports thereof;

a Fourier transform-based combiner unit which is coupled to receive said processed ones of said communication signals processed by said second plurality of digital signal processor units and to output in real time, a digital combined transmit signal representative of the contents of the incoming communication signals processed by said second plurality of digital signal processor units; and

a transmitter unit which is operative to transmit a multiple frequency communication channel signal in accordance with the digital combined transmit signal output by said Fourier transform-based combiner unit.

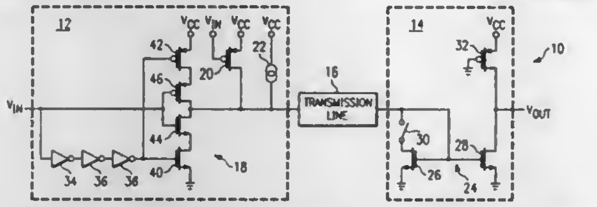
5,535,241
SIGNAL TRANSMISSION SYSTEM AND METHOD OF OPERATION

Shivaling S. Mahant-Shetti, Richardson, and Robert J. Landers, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1994, Ser. No. 250,984

Int. Cl.^{6} H04B *1/38;* **H04L** *5/16*

U.S. Cl. 375—219 **10 Claims**



1. A signal transmission operable to communicate a current mode signal through a transmission line disposed in an integrated circuit, comprising:

a transmission circuit coupled to the transmission line and comprising a steady state current source operable to generate a steady state current and to output the steady state current to the transmission line, the transmitter system further comprising an active current source coupled to the input signal and operable to generate an active current and to output the active current to the transmission line responsive to the input signal; and

a receiver circuit operable to receive a current level from the transmission line and to alter an output voltage responsive to the level of current received from the transmission line, the level of current received from the transmission line by the receiver circuit responsive to the amount of current input into the transmission line by the steady state current source and the active current source of the transmitter circuit;

wherein the transmission circuit further comprises a boost circuit coupled to the transmission line and operable to enhance a charging and discharging of the transmission line immediately following transitions in the input signal, said boost circuit comprising:

a first complementary pair of transistors comprising a first p-channel field effect transistor and a first n-channel field effect transistor coupled in parallel between the input signal and the transmission line;

a delay element coupled to the input signal and having an output; and

a second complementary pair of transistors comprising a second p-channel field effect transistor and a second n-channel field effect transistor each coupled in parallel between the output of the delay element and the first pair of complementary transistors.

5,535,242
METHOD AND SYSTEM FOR MODEM COMMAND PROCESSING DURING DATA TRANSFER

David J. Brigida, Boca Raton; Victor S. Moore, Delray Beach, and Thomas K. Pate, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

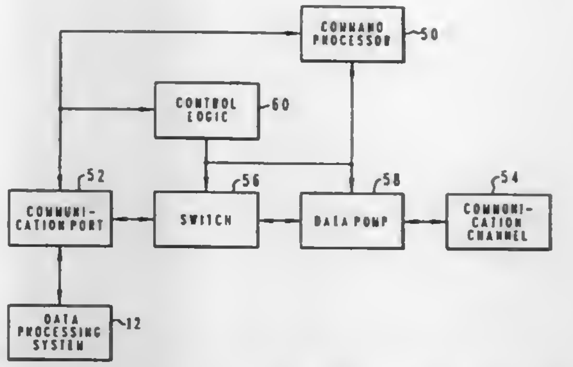
Continuation of Ser. No. 860,383, Mar. 30, 1992. This application Apr. 25, 1995, Ser. No. 427,768

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 375—222 **7 Claims**

1. A method in a data processing system for enhancing the efficiency of operation of a modem coupled between a communication channel and said data processing system, said modem having a command processor, a data transfer mode and a command mode, said method comprising the steps of:

coupling a stream of data from said data processing system to said modem while said modem is operating in said data transfer mode;



selectively inserting within said stream of data a preselected escape character followed by a selected command sequence which initiates a communication channel status query;

detecting said preselected escape character within said stream of data; and

automatically processing said selected command sequence within said command processor of said modem in response to a detection of said preselected escape character while said modem continues to operate in said data transfer mode and is directly connected to the data processing system such that communication channel status may be determined during data transfer.

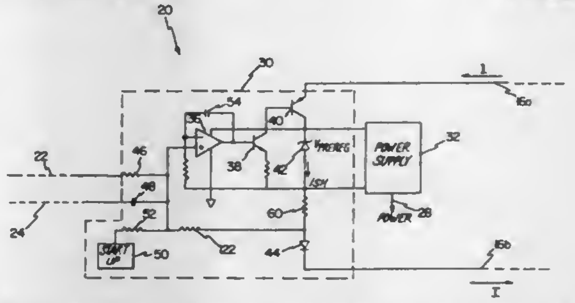
5,535,243
POWER SUPPLY FOR FIELD MOUNTED TRANSMITTER

Kevin D. Voegele, Shakopee, and Todd A. Piechowski, Buffalo, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Jul. 13, 1994, Ser. No. 274,385

Int. Cl.^{6} H04L *27/04;27/12;27/20*

U.S. Cl. 375—259 **9 Claims**



1. A transmitter for use in a two-wire process control loop, comprising:

a sensor which senses a process variable and provides an output signal representative of the process variable;

measurement circuitry coupled to the sensor to receive the output signal, the measurement circuitry transmitting a signal over the two-wire process control loop indicative of a value of the process variable;

power supply circuitry coupled to the measurement circuitry, the power supply circuitry receiving a loop current from the two-wire process control loop and providing an energizing current to the measurement circuitry, the power supply circuitry comprising:

- an inductive element coupled to the measurement circuitry; and
- a switch selectively electrically connecting the inductive element to the two-wire process control loop to receive current from the two-wire process control loop;
- a capacitor for storing charge;

modulation circuitry coupled to the measurement circuitry and the two-wire process control loop which responsively controls current through the two-wire process control loop; and startup circuitry coupled to the modulation circuitry which controls the modulation circuitry to cause an increase in control loop current during a startup condition whereby the capacitor in the power supply circuit is charged.

5,535,244

DIGITAL MODULATING/DEMODULATING APPARATUS AND A DIGITAL DEMODULATING APPARATUS

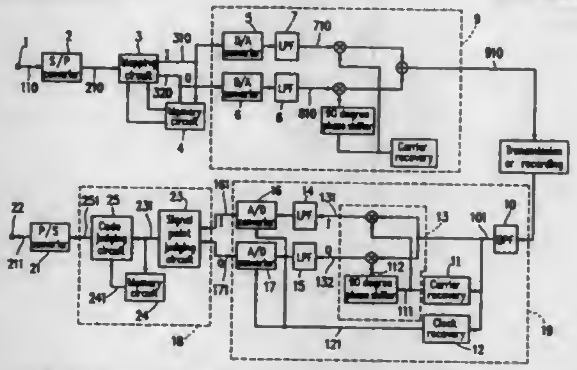
Etsuto Nakatsu, Hirakata; Hiroshi Higashitani, Habikino, and Haruo Ohta, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 2, 1994, Ser. No. 252,902

Claims priority, application Japan, Jun. 7, 1993, 5-135786; Aug. 6, 1993, 5-195871

Int. Cl.^{6} H04L *5/12*

U.S. Cl. 375—261 **19 Claims**



1. A digital modulating/demodulating apparatus comprising:
encoding means for outputting a code having a value in response to a digital signal of N bits, a previous code and a current code being output from said encoding means in this order, wherein N is an integer satisfying $N \geqq 1$;
mapping means for mapping said current code to one of 2^N code points arranged on at least one circle having the same center of origin of a constellation plane in accordance with a code point corresponding to said previous code and a value of said current code, and for outputting a positional signal indicating a position of a code point mapped by said mapping means;
quadrature modulating means for modulating said positional signal into a modulated signal;
demodulating means for demodulating said modulated signal into a demodulated positional signal in response to a receipt of said modulated signal, said demodulating means providing as an output a previous demodulated positional signal and a current demodulated positional signal in this order; and
decoding means for decoding said demodulated positional signal into a digital signal of N bits;
wherein a previous signal point on said constellation plane is defined by said previous demodulated positional signal, a current signal point on said constellation plane is defined by said current demodulated positional signal, and said previous and current signal points each has an amplitude and a phase,
said decoding means outputs a digital signal of N bits, based on said amplitude and said phase of said previous signal point and said amplitude and said phase of said current signal point,
said 2^N code points are arranged on a plurality of circles having the same center of origin of said constellation plane, adjacent code points of said 2^N code points on each circle being away from each other by an angle greater than $(360/2^N)$ degrees, and
said mapping means maps a code having a value of M to a code point having a phase shifted by $(360/2^N \times M)$ degrees with respect to a code point corresponding to said previous code, and M is an integer satisfying $0 \leqq M \leqq 2^N-1$, wherein said decoding means comprises:
means for determining a previous code point corresponding to said previous signal point in accordance with said amplitude and said phase of said previous signal point and for determining a current code point corresponding to said current signal point in accordance with said amplitude and said phase of said current signal point; and
means for outputting a code in accordance with a phase difference between said previous code point and said current code point.

5,535,245

MODULATION/DEMODULATION CIRCUIT FOR A DIGITAL SIGNAL RECORDER/REPRODUCER

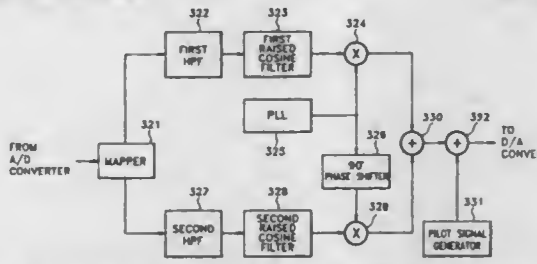
Soon T. Kim, Kumi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Sep. 28, 1994, Ser. No. 314,420

Claims priority, application Rep. of Korea, Sep. 28, 1993, 93-20333

Int. Cl.^{6} H04L *5/12*

U.S. Cl. 345—261 **15 Claims**



1. A modulation circuit for a digital signal recorder/reproducer for modulating an input coded first multi-level digital signal having a first magnitude to thereby selectively record or transmit a modulated digital signal, said modulation circuit comprising:
a mapper for separately outputting in-phase (I) and quadrature phase (Q) channel data by simultaneously processing said first multi-level digital signal in parallel to a degree required to permit generation of a predetermined number of bits so that a large coding gain is obtained during a subsequent decoding operation;
first and second high-pass filters for removing respective direct current components from said I and said Q channel data output from said mapper;
first and second waveform shaping filters for performing waveform shaping and band limiting on respective outputs of said first and second high-pass filters;
carrier signal generator generating a carrier signal;
modulation means for performing a quadrature amplitude and phase modulation on respective outputs of said first and said second waveform shaping filters using said carrier signal generated by said carrier signal generator; and
pilot signal mixing means for generating a pilot signal, and for mixing said pilot signal with the output of said modulation means to thereby generate the modulated digital signal.

5,535,246

METHOD OF VIDEO NOISE REDUCTION USING NON-LINEAR PRE/DE-EMPHASIS

Brian H. Beech, Hampshire, United Kingdom, assignor to National Transcommunications Limited, Winchester, United Kingdom

PCT No. PCT/GB92/01003, § 371 Date Feb. 3, 1993, § 102(e) Date Feb. 3, 1993, PCT Pub. No. WO92/22136, PCT Pub. Date Dec. 10, 1992

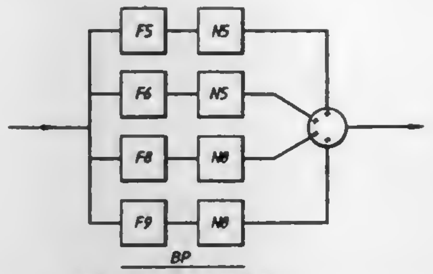
PCT Filed Jun. 4, 1992, Ser. No. 972,458

Claims priority, application United Kingdom, Jun. 4, 1991, 9111926

Int. Cl.^{6} H04N *5/21*

U.S. Cl. 375—285 **12 Claims**

1. A method of pre-emphasizing a signal comprising the steps of:
a) receiving the signal as an input;
b) applying the input signal to a signal processing system comprising a plurality of parallel signal processing paths each comprising a non-linear phase filter and a non-linearity, the plurality of parallel signal processing paths including at least one pair of parallel signal processing paths in which the non-linear phase filters have substantially equal but opposite phase responses and substantially equal magnitude responses;
(c) said applying step further comprises combining the respective outputs of the plurality of parallel signal processing paths to produce a raw pre-emphasized signal, wherein the plurality of parallel signal processing paths operate on different frequency bands; and wherein the input signal undergoes a non-linear dynamic range compression which is phase linear; and
d) applying a pre-correction by de-emphasizing the raw pre-emphasized signal, subtracting the de-emphasized signal from the input signal to produce an error signal, and combining the error signal with the raw pre-emphasized signal to form a pre-emphasized signal with one degree of pre-correction.



PRE-EMPHASIS BUILDING BLOCK

5,535,247

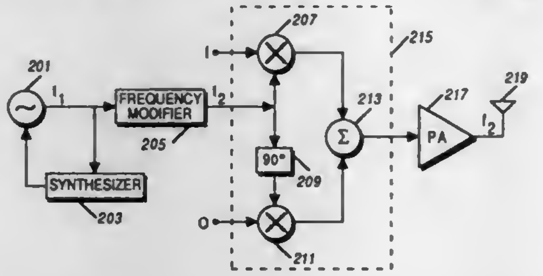
FREQUENCY MODIFIER FOR A TRANSMITTER

Paul H. Gailus, Prospect Heights; Mark A. Gannon, Sleepy Hollow, and Steven F. Gillig, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1993, Ser. No. 126,479

Int. Cl.^{6} H04K *1/02*

U.S. Cl. 375—297 **25 Claims**



25. A transmitter comprising:
a voltage-controlled oscillator arranged and constructed to operate at frequency k multiplied by f_c and having an output at output frequency k multiplied by f_c, wherein k is a scaling factor;
a frequency modifier, coupled to the voltage-controlled oscillator and having an output, arranged and constructed to modify the voltage-controlled oscillator output frequency by factor 1/k, producing a signal at frequency f_c at the frequency modifier output; and
a vector modulator, coupled to the frequency modifier output, arranged and constructed to produce a vector modulated output signal substantially centered at frequency f_c.

5,535,248

DIGITAL RADIO COMMUNICATION SYSTEM

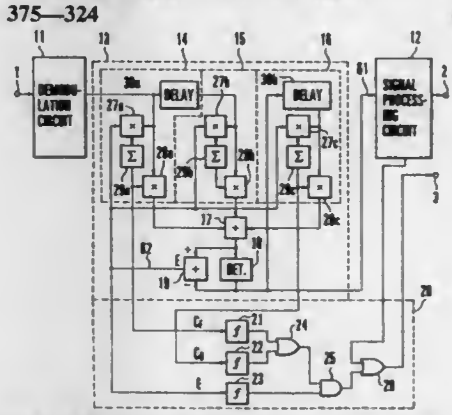
Yuzo Kurokami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 363,313

Claims priority, application Japan, Dec. 28, 1993, 5-334261

Int. Cl.^{6} H04L *27/06;1/02;* **H03H** *7/30*

U.S. Cl. 375—324 **6 Claims**



1. A digital radio communication system comprising:
a first demodulator for receiving a signal from a first antenna to output demodulated data and a line quality degradation signal;
a second demodulator for receiving a signal from a second antenna to output demodulated data and a line quality degradation signal;
a non-break switch for receiving the demodulated data output from said first and second demodulators and selecting and outputting one of the demodulated data; and
a switching controller for receiving line quality degradation signals output from said first and second demodulators to output a switching control signal to said non-break switch on the basis of the received line quality degradation signals,
wherein said first and second demodulators each comprises alarm circuit means for respectively outputting the line quality degradation signals before the demodulated data are set in an interrupt state when abrupt frequency selective fading occurs.

5,535,249

PRECISE DETECTION OF FREQUENCY ERROR FOR BURSTS MODULATED BY PREDETERMINED SYMBOL SEQUENCE

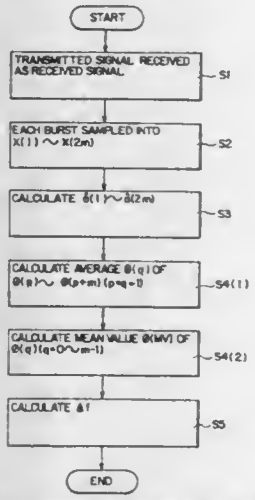
Toshikazu Miyashita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 498,750

Claims priority, application Japan, Jul. 6, 1994, 6-154579

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 375—344 **18 Claims**


START
TRANSMITTED SIGNAL RECEIVED AS RECEIVED SIGNAL
S1
EACH BURST SAMPLED INTO X(1) ~ X(2m)
S2
CALCULATE θ(1) ~ θ(2m)
S3
CALCULATE AVERAGE θ(q) OF θ(p) ~ θ(p+m) (p=q=1)
S4(1)
CALCULATE MEAN VALUE θ(MV) OF θ(q) (q=0 ~ m-1)
S4(2)
CALCULATE Δf
S5
END

1. A frequency error detecting method of detecting, in quadrature demodulation of a received signal derived from a transmitted

signal subjected to digital angle modulation by a symbol sequence to have a constant phase difference in each symbol period, a frequency error of a locally generated frequency relative to a reception frequency of said received signal, said frequency error detecting method comprising the steps of sampling said received signal by a sampling signal at a sampling period into sampled vectors 2m in number, where m represents a predetermined integer, calculating zeroth through (2m–2)-th phase errors, each phase error accompanying a phase difference between two adjacent ones of said sampled vectors, calculating a dividend by using said zeroth through said (2m–2)-th phase errors, and dividing said dividend by a divisor comprising said sampling period, wherein said dividend calculating step comprises the steps of:

calculating zeroth through (m–1)-th averages, each average as regards m consecutive ones of said zeroth through said (2m–2)-th phase errors starting at a q-th phase error of said zeroth through said (2m–2)-th phase errors with q varied between zero and (m–1), both inclusive; and

calculating as said dividend a mean value of said zeroth through said (m–1)-th averages.

5,535,250

DEVICE FOR MANIPULATING A SYNCHROTRON BEAM BUNDLE

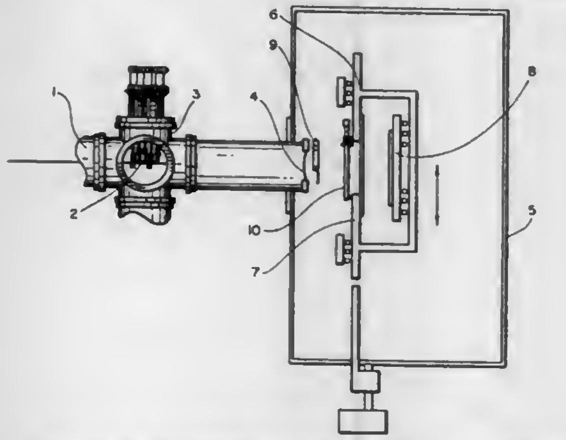
Bernd Seher; Frank Reuther, and Lutz Mueller, all of Jena, Germany, assignors to Jenoptik Technologie GmbH, Jena, Germany

Filed Jan. 18, 1995, Ser. No. 375,415

Claims priority, application Germany, Jul. 9, 1994, 44 24 274.3

Int. Cl.⁶ G21K *1/02*

U.S. Cl. 378—34 **6 Claims**



1. A device for manipulating a synchrotron beam bundle, in irradiating apparatuses for deep X-ray lithography containing within a vacuum chamber an object table for receiving an object to be irradiated, comprising:

a vacuum chamber having a window for allowing a synchrotron beam bundle to enter said chamber;

an object table disposed within said vacuum chamber for receiving an object to be irradiated, said object being adjustable by a scanning movement relative to said synchrotron beam bundle;

a filter chamber connected upstream of the vacuum chamber and containing filters which can be inserted into the synchrotron beam bundle;

pairs of diaphragms which are displaceable relative to one another being provided between said object table and said window and adjacent to said filter chamber; and

wherein a pair of said pairs of diaphragms for which the direction of relative displacement of the diaphragms coincides with the scanning movement is coupled with the scanning movement.

5,535,251

SYSTEM FOR SYNCHRONIZING REAL TIME CLOCK BY TRANSMITTED REAL TIME INFORMATION

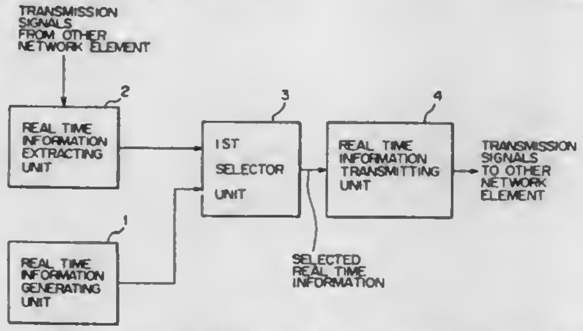
Eiji Sugawara, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 17, 1994, Ser. No. 210,238

Claims priority, application Japan, Sep. 17, 1993, 5-231125

Int. Cl.⁶ H04L *7/00;7/02;* **H04J** *3/06*

U.S. Cl. 375—356 **11 Claims**


TRANSMISSION SIGNALS FROM OTHER NETWORK ELEMENT
2
REAL TIME INFORMATION EXTRACTING UNIT
3
1ST SELECTOR UNIT
4
REAL TIME INFORMATION TRANSMITTING UNIT
TRANSMISSION SIGNALS TO OTHER NETWORK ELEMENT
1
REAL TIME INFORMATION GENERATING UNIT
SELECTED REAL TIME INFORMATION

1. A real time clock synchronizing system, provided in each of a plurality of synchronous transmission network apparatuses in a synchronous transmission network, each said synchronous transmission network apparatus receiving synchronous signals from another of the plurality of synchronous transmission network apparatuses and transmitting synchronous signals to yet another one of the plurality of synchronous transmission network apparatuses, the synchronous signals conveying a transmission frame, and the transmission frame includes an area containing reference real time information indicating a real time in the synchronous transmission network;

the real time clock synchronizing system comprising:

a real time information generating means for generating, based on a reference clock, self-generated real time information indicating a self-generated real time in the synchronous transmission network apparatus;

a real time information extracting means for extracting the reference real time information contained in the area containing reference real time information in the synchronous signals received by each said synchronous transmission network apparatus;

a first selector means for selecting as the reference real time information to be transmitted from the synchronous transmission network apparatus, one of the self-generated real time information and the reference real time information extracted by the real time information extracting means; and

a real time information inserting means for inserting the reference real time information selected by the first selector means, in the area containing reference real time information in the synchronous signals to be transmitted from each said synchronous transmission network apparatus.

5,535,252

CLOCK SYNCHRONIZATION CIRCUIT AND CLOCK SYNCHRONIZING METHOD IN BASEBAND DEMODULATOR OF DIGITAL MODULATION TYPE

Takahiro Kobayashi, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

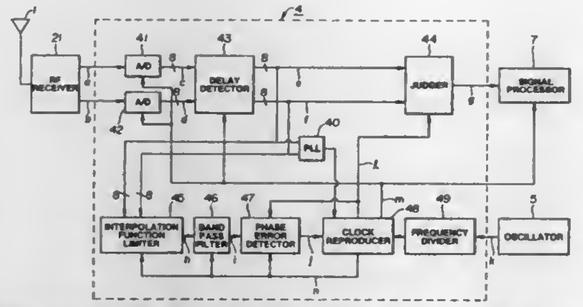
Filed Mar. 22, 1994, Ser. No. 215,818

Claims priority, application Japan, Mar. 29, 1993, 5-070284

Int. Cl.⁶ H04L *7/00;27/22;* **H03D** *3/22*

U.S. Cl. 375—371 **20 Claims**

1. A clock synchronization circuit for use in a baseband demodulator wherein a baseband signal modulated based on a 4-value digital modulation system is sampled at a rate corresponding to twice a modulation rate or more to be converted into a digital data signal, the digital data signal is detected to obtain a detection output, and the detection output is judged based on a judgement timing clock signal to obtain a demodulation data signal, the clock synchronization circuit comprising:



an interpolation function limiter for subjecting the detection output to an interpolating operation with respect to at least one point between adjacent two sample points of the detection output to output interpolated point data as interpolation value data of one bit indicative of a positive or negative value;

digital band pass filter of one bit input type tuned to a modulation frequency for band-limiting an output of the interpolation function limiter;

a phase error detector for detecting a phase error in the judgement timing clock signal on the basis of an output of the digital band pass filter; and

a clock reproducer for dividing a clock signal received from an oscillator with respect to frequency to generate the judgement timing clock signal and for controlling a phase of the judgement timing clock signal on the basis of a phase error signal received from the phase error detector.

5,535,253

METHOD AND DEVICE FOR DETECTING LEAKS IN PENETRATIONS OF A NUCLEAR REACTOR VESSEL HEAD DURING OPERATION

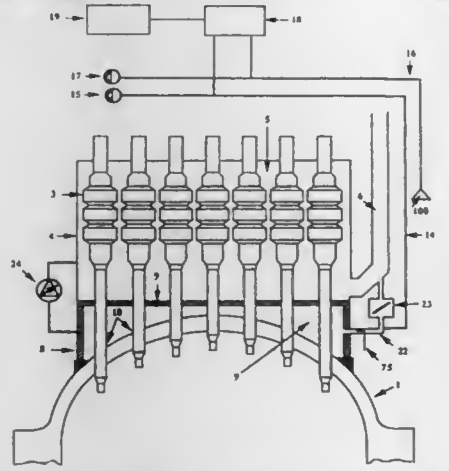
François Loisy, Rueil Malmaison, and Jean-Luc Germain, Chatou, both of, France, assignors to Electricite de France - Service National, Paris, France

Filed Sep. 2, 1994, Ser. No. 256,302

Claims priority, application France, Nov. 6, 1992, 92 13417

Int. Cl.⁶ G21C *17/00*

U.S. Cl. 376—250 **15 Claims**



1. Device for detecting leaks in penetrations (**2**) of a nuclear power station vessel head (**1**), characterized in that it comprises a circuit for picking off the air flowing in the volume of the chamber (**7**) where possible leaks (**10**) emerge, before this air is diluted in the cooling circuit (**4, 5, 6**) of the control mechanisms (**3**) of the control rod clusters of the reactor.

5,535,254

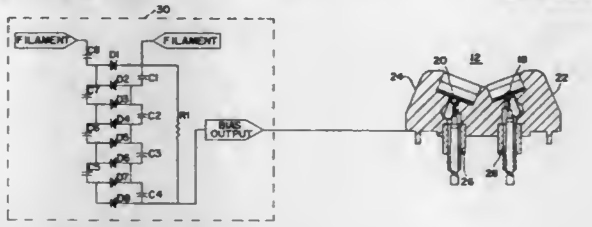
X-RAY TUBE WITH SELF-BIASING DECK

Todd R. Carlson, 4516 Lilac Ave., Glenview, Ill. 60025

Filed May 17, 1995, Ser. No. 443,288

Int. Cl.⁶ H01J *35/14*

U.S. Cl. 378—113 **8 Claims**



1. An X-ray tube comprising:

a vacuum envelope;

a rotating anode target placed within said envelope;

a cathode assembly placed within said envelope for generating a beam of electrons to strike a surface of said anode target facing said cathode assembly, said cathode assembly having at least one filament mounted in a cup-shaped electrode to focus said electron beam and form a focal spot on said surface of said anode target;

a high voltage source for maintaining a potential between said anode target and said cathode assembly to cause said electron beam to strike said anode target with sufficient energy to generate X-rays;

an AC source coupled to said filaments to provide heating of said filament to the temperature required for thermal emissions;

a self-biasing deck having a voltage multiplier, said deck mounted outside said vacuum envelope in proximity to said cathode assembly, said voltage multiplier electrically connected between said AC source and said cup-shaped electrodes for applying a DC bias voltage to control a geometry of said focal spot on said surface of said anode target.

5,535,255

SYSTEM FOR THE COOLING OF AN ANODE FOR AN X-RAY TUBE IN A RADIOGENIC UNIT WITHOUT HEAT EXCHANGER

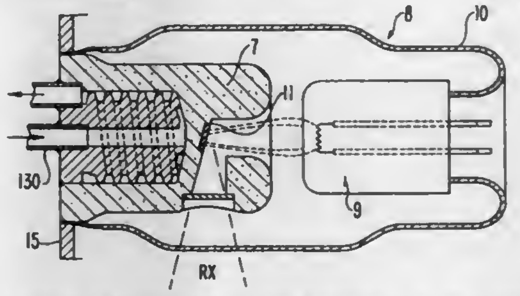
Emile Gabbay, Paris, France, assignor to GE Medical Systems S.A., Buc, France

Filed Nov. 24, 1993, Ser. No. 156,632

Claims priority, application France, Nov. 27, 1992, 92 14334

Int. Cl.⁶ H01J *35/10*

U.S. Cl. 378—200 **4 Claims**



1. A system for cooling a fixed anode for an X-ray tube, working within a radiogenic unit with a metallic wall mounted at one end of a yoke having the shape of an arc of a circle or a U, said fixed anode of said X-ray tube being made out of a copper block into which there is fitted a pellet made of a refractory material with a high atomic number, comprising a cooling circuit in which circulates a cooling fluid that passes into said anode, wherein said cooling circuit is constituted by several tubings made of metal and soldered to said wall of said yoke bearing said radiogenic unit.

5,535,256

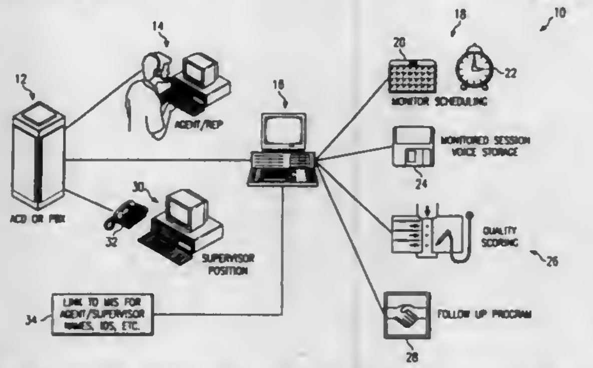
METHOD AND SYSTEM FOR AUTOMATICALLY MONITORING THE PERFORMANCE QUALITY OF CALL CENTER SERVICE REPRESENTATIVES

Michael J. Maloney, Plano, Tex., and David T. McCalmont, San Jose, Calif., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Continuation of Ser. No. 126,080, Sep. 22, 1993, abandoned. This application May 3, 1995, Ser. No. 434,261

Int. Cl.^{6} H04M *3/22*

U.S. Cl. 379—34 **17 Claims**



6. A system for monitoring a plurality of service representatives in servicing customer calls, the system comprising:

a processor for executing a plurality of computer implemented instructions comprising:

instructions for determining a time interval within which to monitor conversations between the service representatives and the customers; and

instructions for determining for each service representative to be monitored a duration of time to monitor the service representative in responding to customer calls;

scheduler means for randomly determining for each service representative to be monitored a time period within the time interval to individually monitor the service representative during customer conversations for the representative's duration of time; and

a recorder for recording each representative's customer conversations during the representative's time period in a memory in digital format.

5,535,257

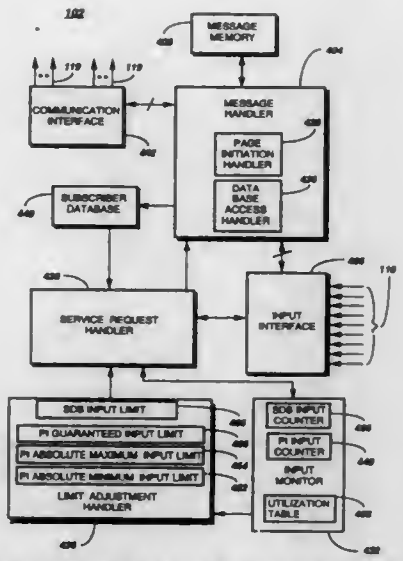
METHOD AND APPARATUS FOR MANAGING TELEPHONE CALLS IN A SELECTIVE CALL RADIO SYSTEM CONTROLLER

Steven J. Goldberg, Coral Springs, Fla., and Hugh Paterson, Ft. Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 7, 1994, Ser. No. 192,535

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—57 **16 Claims**



1. A method for use in a radio communication system controller which manages connections of telephone calls, each of the telephone calls being one of a plurality of call types, said method comprising the steps of:

handling a request for phone call service by establishing a telephone call connection of a call type to one of a plurality of message handlers according to the call type and an input limit for the call type;

monitoring telephone call connections of each of the plurality of call types, wherein said step of monitoring comprises the steps of:

adjusting a count in an input counter when a telephone call connection changes, thereby maintaining the count of telephone call connections in use for a particular call type;

updating a loading factor for the particular call type by averaging the count in the input counter over a predetermined past time period; and

deriving a utilization factor for the particular call type from the loading factor; and

adjusting one or more input limits in response to the utilization factor derived in said monitoring step and a predetermined priority for the particular call type.

5,535,258

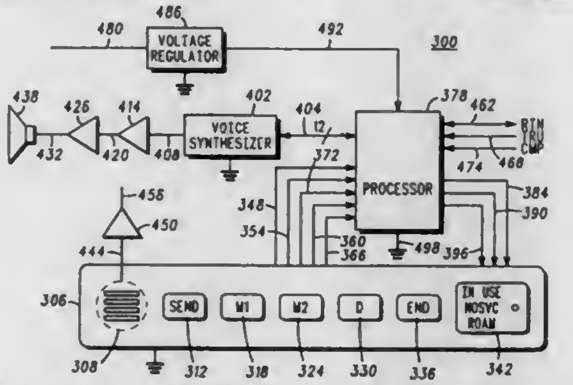
RADIO TELEPHONE INTERFACE APPARATUS FOR SPEED-DIALING OF TELEPHONE NUMBERS

Manohar A. Joglekar, Long Grove; Joseph F. Cramer, Jr., Crystal Lake, and George M. Korycan, Union, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 62,478, May 11, 1993, abandoned, which is a continuation of Ser. No. 733,914, Jul. 22, 1991, abandoned. This application Sep. 12, 1994, Ser. No. 304,638

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—58 **14 Claims**



1. An interface apparatus for a transceiver of a radio telephone for speed-dialing telephone numbers to effectuate a telephonic communication link with a remote location defined by specific ones of the telephone numbers, the interface apparatus comprising:

a main directory having a plurality of main directory locations, each one of the plurality of main directory locations containing a mnemonic and a corresponding telephone number;

a plurality of subdirectories, each one of said plurality of subdirectories containing a subset of the plurality of main directory locations assigned by a user to include any of said plurality of main directory locations, said subset of the plurality of main directory locations being ordered for access by a user in a user assigned order and wherein each one of said plurality of main directory locations can be assigned to more than one of said plurality of subdirectories;

a processor operatively coupled to said main directory, said subdirectories, and the transceiver to:

(a) generate a sequential-access directory pointer for sequentially accessing the main directory locations of the main directory; and

(b) generate an interrupt-access directory pointer for non-sequentially accessing any of the main directory locations which form the subset of the main directory locations;

a sequential-access actuation switch actuatable to cause sequential accessing by the sequential-access directory pointer of the main directory locations; and

an interrupt-access actuation switch actuatable to cause non-sequential accessing by the interrupt-access directory pointer of the main directory locations; and

wherein said processor transmits the telephone number accessed by either of said sequential-access actuation switch or said interrupt-access actuation switch to effectuate thereby the telephonic communication link with the remote location.

5,535,259

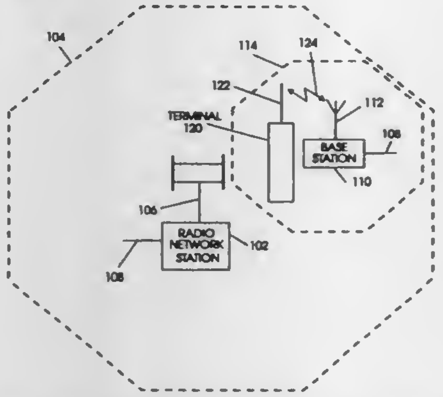
RADIO PERSONAL COMMUNICATIONS SYSTEM AND METHOD FOR ALLOCATING FREQUENCIES FOR COMMUNICATIONS BETWEEN A CELLULAR TERMINAL AND A BASE STATION

Paul W. Dent, Stebag, and Jacobus C. Haartsen, Staffanstorp, both of, Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 148,828, Nov. 4, 1993, Pat. No. 5,428,668. This application Mar. 29, 1995, Ser. No. 412,719

Int. Cl.^{6} H04Q *7/30;7/22*

U.S. Cl. 379—59 **14 Claims**



1. A radio personal communications system for operation within a wide area cellular network, which uses a plurality of frequencies within a spectrum, and within a base region linked to a wire telephone network, which base region overlaps with said cellular network, comprising:

a battery powered radio terminal operating within the cellular spectrum;

a telephone base station located within said base region and connected to said wire telephone network;

said telephone base station including power line connecting means;

detecting means electrically connected to said power line connecting means for detecting if the electrical connection of said power line connecting means to an external power source has been lost;

channel selecting means within at least one of said radio terminal and said telephone base station, and responsive to said detecting means, for selecting an available channel within said cellular spectrum for communications between said radio terminal and said telephone base station when said radio terminal is within said base region;

said telephone base station further comprising first transceiving means, electrically connected to said wire telephone network, and responsive to said channel selecting means, for communicating with said radio terminal using said selected channel when said radio terminal is within said base region; and

said radio terminal further comprising second transceiving means, for communicating with said wide area cellular network when said radio terminal is not within said base region and for communicating with said first transceiving means using said selected channel when said radio terminal is within said base region;

wherein said channel selecting means is contained within said radio terminal and wherein said telephone base station comprises means for receiving said radio terminal and providing an electrical interface with said channel selecting means.

5,535,260

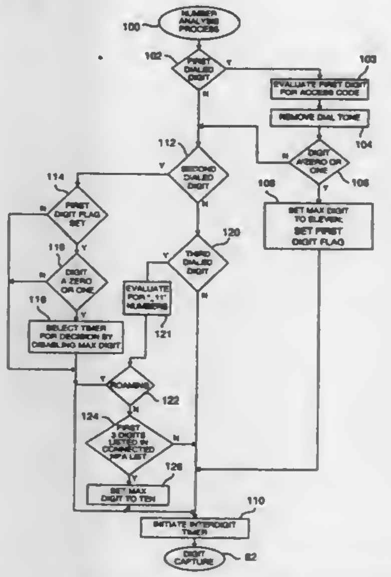
CELLULAR RADIOTELEPHONE WITH DIALED NUMBER ANALYSIS

Robert G. Zicker, and John K. Dion, both of Roswell, Ga., assignors to GTE Mobile Communictions Services, Atlanta, Ga.

Continuation-in-part of Ser. No. 201,445, Feb. 24, 1994. This application Sep. 29, 1994, Ser. No. 315,014

Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 379—63 **16 Claims**



1. A method of operating a cellular radiotelephone which is authorized to operate with a home cellular system that provides cellular services in a first geographical NPA area to originate a call, said method comprising the steps of:

identifying the entry of a first three dialed digits and a later dialed digit, said first three digits being dialed prior to said later digit;

determining, in response to said first three digits, whether said later digit is a final digit of a phone number by evaluating said first three digits to determine whether said first three digits define a connected NPA code which is remotely programmed into said radiotelephone, said connected NPA code corresponding to a geographical NPA area which overlaps or is adjacent to said first geographical NPA area; and

automatically transmitting an origination message when said later digit is said final digit of said phone number, said origination message conveying said phone number to a telecommunication network.

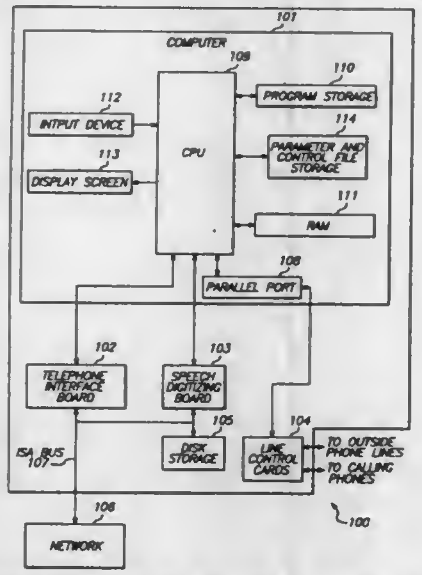
5,535,261
SELECTIVELY ACTIVATED INTEGRATED REAL-TIME RECORDING OF TELEPHONE CONVERSATIONS

Barry D. Brown, Mesquite, and Paul A. J. Wakefield, Carrollton, both of Tex., assignors to Gateway Technologies, Inc., Carrollton, Tex.

Filed Aug. 20, 1993, Ser. No. 109,830

Int. Cl.^{6} H04M *3/22;1/66;3/38*

U.S. Cl. 379—67 **25 Claims**



1. A telephone system for selectively blocking or recording outgoing telephone calls, comprising:

a parameter input device for specifying one or more block parameters to identify unauthorized calls and one or more record parameters to identify calls for recording;

a processor coupled to the input device and to a telephone line of the telephone system, the processor including a control program for continuously monitoring the telephone line for call parameters and comparing the specified block and record parameters with detected call parameters;

switching means coupled to the processor, the telephone line, and outside telephone lines for blocking an outgoing telephone call when a detected call parameter matches a specified block parameter; and

a recording device coupled to the processor for recording conversations on the telephone line when a detected call parameter matches a specified record parameter and no detected call parameter matches a specified block parameter.

5,535,262
ELECTRONIC PRIVATE EXCHANGE SYSTEM HAVING TALKING RECORDING FUNCTION

Sinichi Kanzawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 9, 1994, Ser. No. 239,545

Claims priority, application Japan, May 10, 1993, 5-108423

Int. Cl.^{6} H04M *1/64*

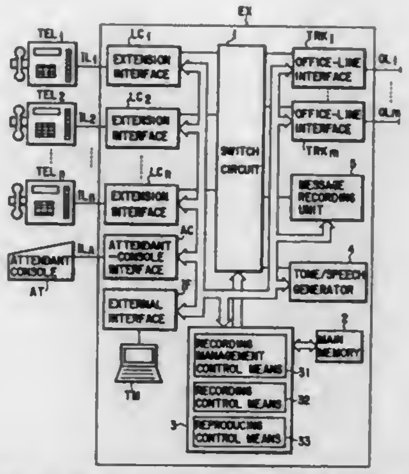
U.S. Cl. 379—67 **32 Claims**

1. An electronic private branch exchange system with a message recording function comprising:

a private branch exchange with at least one office line and a plurality of extensions for selectively switching to provide connections between said office line and respective extensions of said plurality of extensions and to provide connections between respective extensions of said plurality of extensions;

a plurality of extension telephones connected to said extensions; and

a recording unit for recording speech transmitted and received by said extension telephones, wherein



at least one of said extension telephones includes request input means for inputting requests including requests for recording speech and request informing means for informing said electronic private branch exchange of the contents of said requests inputted from said request input means; and

said electronic private branch exchange further comprises recording management control means for controlling said recording unit according to said requests, said recording management control means including means for starting recording at the time a called terminal responds to a call from said central office line, if said request informing means is informed of a request for recording from at least one of said plurality of extension telephones connected by the call.

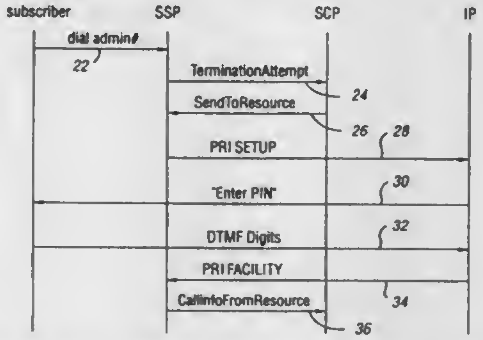
5,535,263
METHOD FOR RECORDING SUBSCRIBER SPECIFIC MESSAGES IN AN ADVANCED INTELLIGENT NETWORK

Mark S. Blumhardt, Niwot, Colo., assignor to U S WEST Technologies, Inc., Boulder, Colo.

Filed Oct. 13, 1994, Ser. No. 322,647

Int. Cl.^{6} H04M *1/64;3/42*

U.S. Cl. 379—67 **18 Claims**



1. For use in cooperation with an Advanced Intelligent Network (AIN) Service Switching Point (SSP), said SSP connected to each of a subscriber, an AIN Service Control Point (SCP) and an Intelligent Peripheral (IP), a method for recording a subscriber specific message in a telephone call for use in telephone services, comprising:

generating a CallInfoToResource message at said SCP for receipt by said SSP and said IP, said CallInfoToResource message instructing said SSP to establish a connection to said IP and further instructing said IP to record a subscriber message;

generating a PRIFACILITY message at said SSP for receipt by said IP, said PRIFACILITY message instructing said IP to play an announcement and begin recording;

playing an announcement at said IP instructing said subscriber to begin speaking;

recording said subscriber's message;

generating a RELEASE message at said SSP for receipt by said IP, said release message instructing said IP to tear down the call;

generating a ResourceClear message at said SSP for receipt by said SCP, said ResourceClear message indicating the status of the recording and an identification corresponding to said announcement to be used by said SCP in other services; and

generating a Disconnect message at said SCP for receipt by said SSP, said Disconnect message instructing said SSP to tear down the call.

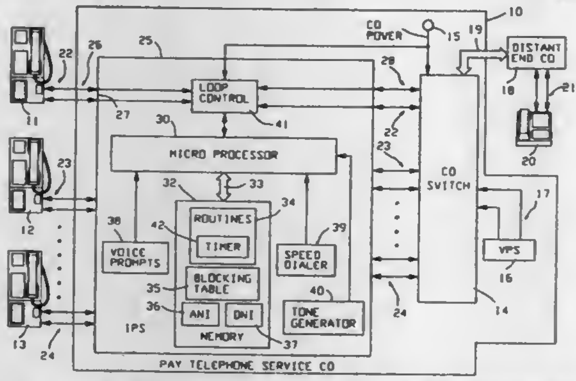
5,535,264
PROMPT ISSUING PROTOCOL FOR AN INTERCEPT VOICE MESSAGING SYSTEM

Mark T. Starr, Fort Washington; Craig J. Mento, West Chester, both of Pa.; Carl R. Faix, Cherry Hill, N.J.; Robert A. Pressman, Narberth, Pa., and Albert B. Cooper, New York City, N.Y., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 283,489, Aug. 1, 1994, abandoned, which is a continuation of Ser. No. 16,588, Feb. 10, 1993, abandoned. This application Nov. 2, 1995, Ser. No. 561,227

Int. Cl.^{6} H04M *1/64*

U.S. Cl. 379—89 **2 Claims**



1. In a voice messaging system for use in a telecommunications network of a telephone company, said system providing a voice store and forward service to a caller at a telephone of said network whereby said caller can record a voice message that the system will deliver to an intended recipient at a telephone number of said intended recipient, said network including a central office and a line connection coupling said telephone to said central office, said system including an Intercept Processing Subsystem (IPS) interposed in said line connection, said IPS being operative to control said line connection by controllably maintaining a straight through condition between said telephone and said central office or by splitting said line connection, said IPS including prompt issuance means for issuing voice prompts to said caller over said line connection, said IPS including a speed dialer for dialing telephone numbers to said central office over said line connection, said IPS including detection means for detecting when said caller has gone off-hook, said system further including a Voice Processing Subsystem (VPS) for recording said voice message and delivering said voice message to said intended recipient,

a voice messaging service method offering and providing said caller with two opportunities to accept said voice store and forward service, a first opportunity occurring when said caller goes off-hook at said telephone before said caller dials said telephone number of said intended recipient to place a call thereto and a second opportunity occurring after said caller dials said telephone number of said intended recipient and said call is advanced through said central office, said voice messaging service method operating to offer and provide said voice store and forward service to said caller without said system detecting if said call by said caller to said intended recipient results in a busy or no-answer condition, said method comprising:

A)' maintaining, by said IPS, said line connection in said straight through condition,

B) detecting, by said detection means, when said caller has gone off-hook at said telephone,

C) issuing a voice prompt to said caller by said prompt issuance means in response to said caller going off-hook so as to provide said voice prompt to said caller prior to said caller dialing said telephone number of said intended recipient, said voice prompt being issued as follows:

YOU ARE PROVIDED WITH TWO OPTIONS—FIRST OPTION—IF THE NUMBER YOU INTEND TO CALL IS BUSY OR DOES NOT ANSWER, BY PRESSING THE STAR KEY AT THAT TIME YOU MAY RECORD A MESSAGE FOR LATER DELIVERY TO THAT NUMBER—SECOND OPTION—YOU MAY INSTEAD, WITHOUT PUTTING THE CALL THROUGH, RECORD THE MESSAGE FOR LATER DELIVERY TO THE NUMBER BY PRESSING THE STAR KEY NOW,

D) said voice prompt being arranged to advise said caller of availability of said voice store and forward service,

E) said voice prompt being further arranged to advise said caller that, as a first of two options, said voice store and forward service can be accepted by said caller upon pressing said star key if said caller detects that said call placed by said caller to said telephone number of said intended recipient results in said busy or no-answer condition,

F) said voice prompt being further arranged to advise said caller that, as a second of said two options, said voice store and forward service can be accepted by said caller by pressing said star key without putting said call through to said telephone number of said intended recipient,

G) said voice prompt alerting said caller to said availability of said voice store and forward service prior to said caller dialing said telephone number of said intended recipient so that said caller can accept said voice store and forward service upon pressing said star key before dialing said telephone number of said intended recipient as well as after dialing said telephone number of said intended recipient when said caller detects said busy or no-answer condition,

H) said voice prompt defining a call contract exclusively between said telephone company and said caller where said telephone company offers said caller said voice store and forward service, said caller accepting said voice store and forward service by pressing said star key either before said caller dials said telephone number of said intended recipient or after said caller dials said telephone number of said intended recipient and detects that said call to said telephone number of said intended recipient has resulted in said busy or no-answer condition,

I) if said caller accepts said voice store and forward service pursuant to said second option,

- I1) splitting, by said IPS, said line connection,
- I2) prompting said caller by said IPS, using said prompt issuance means, to dial said telephone number of said intended recipient,
- I3) storing, in said IPS, said telephone number of said intended recipient dialed by said caller pursuant to step I2,
- I4) speed dialing said VPS by said IPS using said speed dialer,
- I5) transmitting call parameters to said VPS from said IPS including said telephone number of said intended recipient stored in said IPS,
- I6) re-establishing, by said IPS, said line connection to said straight through condition whereby said caller at said telephone can record said voice message in said VPS for delivery to said intended recipient,

J) if said caller does not accept said voice store and forward service pursuant to said second option,

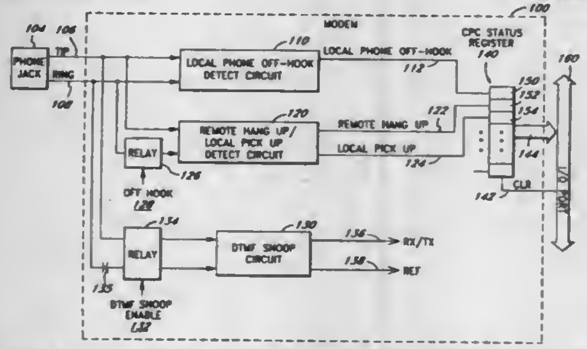
- J1) dialing, by said caller, said telephone number of said intended recipient to extend said call through said central office,
- J2) storing said telephone number of said intended recipient in said IPS dialed pursuant to step J1,

K) if said caller detects said busy or no-answer condition and accepts said voice store and forward service pursuant to said first option,
  K1) splitting, by said IPS, said line connection,
  K2) speed dialing said VPS by said IPS using said speed dialer,
  K3) transmitting call parameters to said VPS from said IPS including said telephone number of said intended recipient stored in said IPS,
  K4) re-establishing, by said IPS, said line connection to said straight through condition whereby said caller at said telephone can record said voice message in said VPS for delivery to said intended recipient.

5,535,265
METHOD AND CIRCUITRY FOR CONTROLLING VOICE MAIL, CALL LOGGING AND CALL BLOCKING FUNCTIONS USING A MODEM

Johannes H. Suwandhaputra, Fort Worth, Tex., assignor to AST Research, Inc., Irvine, Calif.

Filed Nov. 15, 1993, Ser. No. 152,837
Int. Cl.^{6} H04M *11/00*
U.S. Cl. 379—97 **14 Claims**



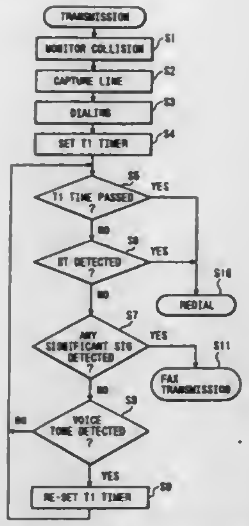
13. A method of using a MODEM to selectively block calls placed from a local phone, said MODEM and said local phone connected to a common telephone line, said method comprising the steps of:
  detecting when said local phone is off hook;
  monitoring tones on said telephone line while said local phone is off hook to detect a telephone number of an outgoing call placed from said local phone, said step of monitoring performed without placing a DC load on said telephone line so that said MODEM remains on hook;
  comparing said telephone number to at least one predetermined number; and
  blocking said outgoing call when said telephone number matches said predetermined number.

5,535,266
DATA COMMUNICATION APPARATUS HAVING AN AUTO-CALLING FUNCTION

Teruyuki Nishii, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1993, Ser. No. 13,055
Claims priority, application Japan, Feb. 5, 1992, 4-054285
Int. Cl.^{6} H04M *11/06*
U.S. Cl. 379—100 **8 Claims**

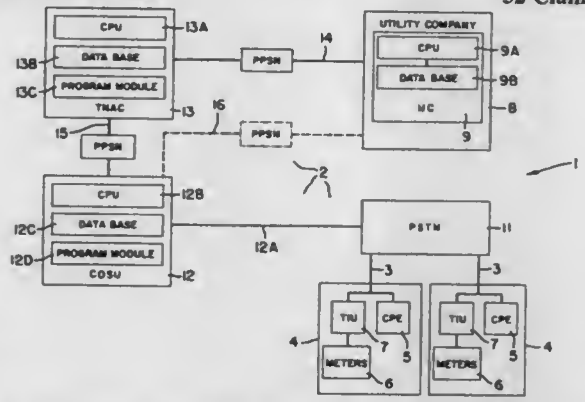
1. A data communication apparatus having an auto-calling function, for monitoring, by using timer, the reception of a procedure signal related to a data communication for a predetermined period after the auto-calling and effecting the data communication in response to the reception of said procedure signal, comprising:
  detection means for detecting a voice signal; and
  means for extending said predetermined period for monitoring the procedure signal by re-setting the timer in accordance with the detection by said detection means.



5,535,267
TELEMETRY SYSTEM WITH IMPROVED VERIFICATION OF TELEMETRY INTERFACE UNIT INSTALLATION

Jerome W. Schull, Marietta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Filed Apr. 22, 1994, Ser. No. 231,282
Int. Cl.^{6} H04M *11/00*
U.S. Cl. 379—106 **52 Claims**



1. A telemetry system for monitoring entity equipment associated with a monitoring entity, said entity equipment being disposed at a subscriber location, comprising:
  a telemetry interface unit disposed at the subscriber location for permitting access to said entity equipment at said subscriber location, the telemetry interface unit having a telemetry interface unit identifier;
  a telephone system for providing telephone communication to said subscriber location, said telephone system further providing selective communication over said telephone system with said telemetry interface unit and being further adapted to automatically identify the telephone number of said subscriber location in response to a call from said subscriber location to a preselected telephone number and to undertake at least a part of a verification procedure for verifying installation of said telemetry interface unit at said subscriber location using said identified subscriber location telephone number.

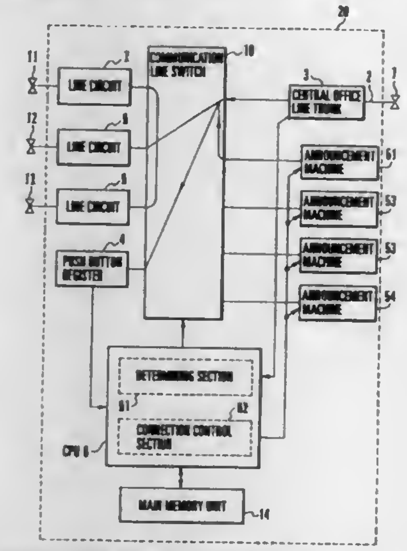
5,535,268

Patent Not Issued For This Number

5,535,269
ADDITIONAL DIRECT INWARD DIALING CONNECTION SYSTEM

Takumu Hamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,956
Claims priority, application Japan, Feb. 28, 1994, 6-029927
Int. Cl.^{6} H04M *7/00;1/64;3/00;3/42*
U.S. Cl. 379—233 **9 Claims**



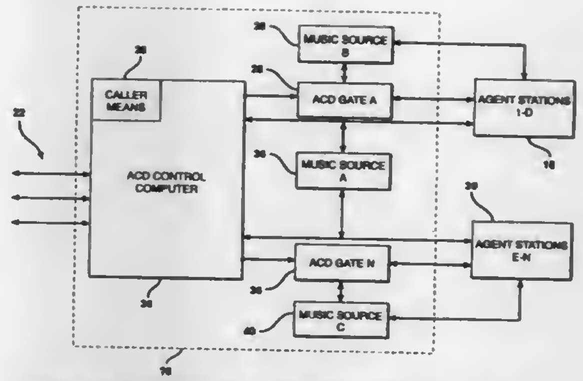
1. A call connection system, comprising:
  a determining means for determining, on the basis of status data for a called station terminal, whether termination to the called station terminal can be established and for selectively identifying a station terminal for which termination can be established when termination to the called station terminal cannot be established;
  a notifying means, responsive to said determining means, for notifying a caller of a reason for disabled termination when an output from said determining means indicates that termination to the called station terminal cannot be established and for notifying said caller of a number corresponding to the station terminal for which a termination can be established; and
  a connection control means for connecting a call from the caller to a station terminal corresponding to a number dialed by said caller.

5,535,270
AUTOMATIC CALL DISTRIBUTOR HAVING MULTIPLE AUDIO SOURCES

Lonnie R. Doremus, Schaumburg, and David L. Blaha, Aurora, both of Ill., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 6, 1994, Ser. No. 303,257
Int. Cl.^{6} H04Q *3/64;* H04M *3/00;1/64;15/00*
U.S. Cl. 379—266 **19 Claims**

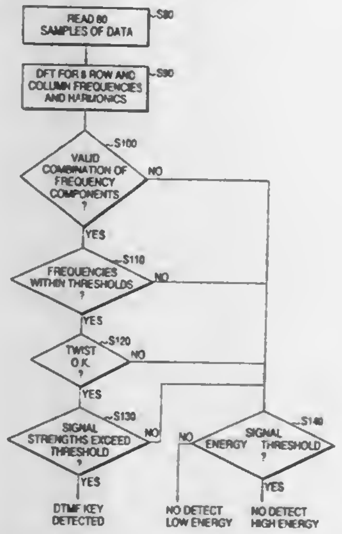
1. An automatic call distributor comprising:
  a plurality of gates for interconnecting incoming telephone calls from external callers with selected ones of a plurality of agents;
  a control computer for receiving the incoming telephone calls and for routing each of the incoming telephone calls to a selected one of the gates;
  a plurality of audio sources each of which generates a predetermined type of audio communication, each of the audio sources is connected to the control computer and is associated with at least one of the plurality of gates to automatically provide the predetermined type of audio communication to the incoming telephone calls routed through the at least one associated gate; and
  wherein the control computer detects when one of the telephone calls is placed on hold by one of the agents and activates one of the audio sources to provide an audio communication to the caller, the audio communication provided to the caller on hold being capable of being different than the predetermined type of audio communication associated with the at least one associated gate.



5,535,271
APPARATUS AND METHOD FOR DUAL TONE MULTIFREQUENCY SIGNAL DETECTION

Shrirang Jangi, Germantown, and Jie Chen, North Potomac, both of Md., assignors to Hughes Electronics, Los Angeles, Calif.

Filed May 27, 1994, Ser. No. 250,783
Int. Cl.^{6} H04M *1/00*
U.S. Cl. 379—351 **14 Claims**

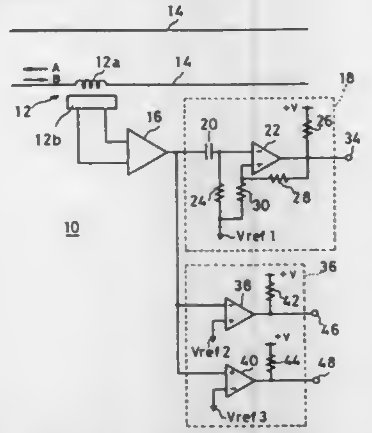

READ 80 SAMPLES OF DATA
S80
DFT FOR 8 ROW AND COLUMN FREQUENCIES AND HARMONICS
S90
VALID COMBINATION OF FREQUENCY COMPONENTS ?
S100
NO
YES
FREQUENCIES WITHIN THRESHOLDS ?
S110
NO
YES
TWIST O.K. ?
S120
NO
YES
SIGNAL STRENGTHS EXCEED THRESHOLD ?
S130
NO
YES
SIGNAL ENERGY THRESHOLD ?
S140
NO
YES
DTMF KEY DETECTED
NO DETECT LOW ENERGY
NO DETECT HIGH ENERGY

10. A method of determining whether a received signal contains a valid dual tone multifrequency (DTMF) digit comprising the steps of:
  taking samples of the received signal;
  testing said samples to determine whether any of said samples qualify as a potential DTMF digit;
  identifying said samples as having a DTMF-digit-detect state if said testing reveals that said samples qualify as a potential DTMF digit;
  if said testing reveals that any of said samples do not qualify as a potential DTMF digit, measuring an energy level of said samples that do not qualify;

determining that said samples that do not qualify are in a no-detect high-energy state if said energy level exceeds a predefined threshold, and determining that said samples that do not qualify are in a no-detect low-energy state if said energy level is below a predefined threshold;
identifying a DTMF digit corresponding to one of said samples in said DTMF-digit-detect state; and
identifying a valid said DTMF digit when at least a first predetermined number of said samples are in the DTMF-digit detect state or in a predetermined combination of said states as follows: (1) at least half of the first predetermined number of said samples are in the DTMF-digit-detect state and correspond to the same DTMF digit; (2) no two sequential said samples are in a state other than the DTMF-digit-detect state; and (3) no two sequential said samples in the DTMF-digit-detect state correspond to one or more DTMF digits other than the DTMF digit corresponding to at least half of the first predetermined number of said samples.

5,535,272
SENSOR CIRCUIT FOR A TELEPHONE LINE

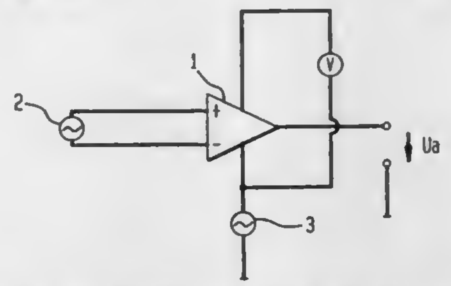
Masaaki Sugiyama, and Hiroyuki Ohta, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Continuation of Ser. No. 319,095, Oct. 6, 1994, abandoned, which is a continuation of Ser. No. 183,567, Jan. 19, 1994, abandoned, which is a continuation of Ser. No. 68,590, May 27, 1993, abandoned, which is a continuation of Ser. No. 907,340, Jul. 1, 1992, abandoned. This application Jun. 28, 1995, Ser. No. 496,222
Claims priority, application Japan, Jul. 1, 1991, 3-050552 U
Int. Cl.^{6} H04M *3/22*
U.S. Cl. 379—373 **4 Claims**



1. A sensor circuit for a telephone line, comprising:
magnetically sensing means coupled to a telephone line for magnetically sensing an electric signal which flows in said telephone line, said magnetically sensing means including magnetic signal generating means for generating a magnetic signal according to said electronic signal, and magnetic signal detecting means isolated from said magnetic signal generating means for detecting said magnetic signal generated by said magnetic signal generating means to output a detection signal;
amplifying means coupled to said magnetic signal generating means for amplifying said detection signal from said magnetic signal generating means;
calling signal detecting means for detecting a calling signal component included in said amplified detection signal, said calling signal detection means including a capacitor for cutting-off a direct current component included in the amplified signal and pulse signal generating means for generating a pulse signal on the basis of an alternating current component included in said amplified signal; and
line current supervisor means for detecting a line current component included in said amplified signal.

5,535,273
CIRCUITRY FOR SUPERIMPOSING SMALL, LOW ENERGY SIGNALS AND LARGE, ESSENTIALLY HIGHER ENERGY SIGNALS

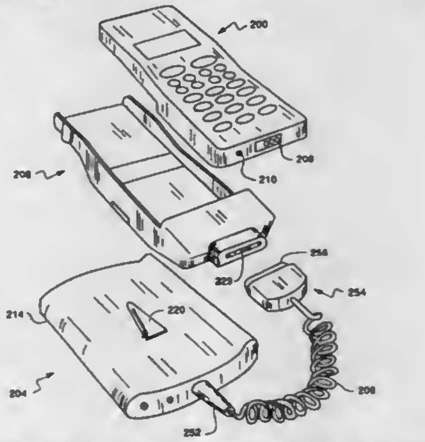
Wilfried Kausel; Hannes Kremser; Hermann Stallbaumer, and Werner Wlnkler, all of Vienna, Austria, assignors to SEMCOTEC Handelsgesellschaft m.b.H., Vienna, Austria
PCT No. PCT/AT93/00035, § 371 Date Oct. 27, 1994, § 102(e) Date Oct. 27, 1994, PCT Pub. No. WO93/15353, PCT Pub. Date Aug. 5, 1993
PCT Filed Mar. 3, 1993, Ser. No. 295,766
Claims priority, application Austria, Mar. 4, 1992, 414/92
Int. Cl.^{6} H04N *9/08*
U.S. Cl. 379—399 **39 Claims**



1. A circuitry for superimposing a small, low energy signal from a first source and large, essentially higher energy signals from a second source, the first and second sources each having respective first and second poles, more particularly for transmitting speech signals with a direct signal for remotely supplying a load comprising a receiving circuit or with a high energy alternating signal, with the circuitry including an operational amplifier having first and second inputs, having the first input connected to a first pole of the first source, and having supply voltage inputs connected to a voltage supply source, characterized in that a second pole of the first source is connected with the second input of the operational amplifier and in that one pole of the second source is connected with a pole of the voltage supply source.

5,535,274
UNIVERSAL CONNECTION FOR CELLULAR TELEPHONE INTERFACE

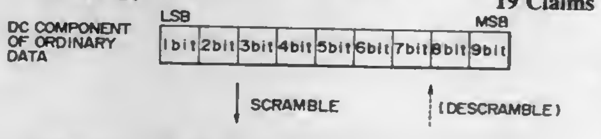
Michael F. Braitberg; Patrick J. Kennedy; Lester B. Hatcher; Davide Andrea, and Gregory D. Volan, all of Boulder, Colo., assignors to Cellport Labs, Inc., Boulder, Colo.
Continuation-in-part of Ser. No. 773,840, Oct. 9, 1991, Pat. No. 5,333,177. This application Apr. 19, 1994, Ser. No. 229,956
Int. Cl.^{6} H04M *1/00*
U.S. Cl. 379—446 **19 Claims**



1. An apparatus for use with a selected one of a plurality of cellular telephones, comprising:
a first pocket device having a body with a receiving section and an electrical interface, said receiving section for use in holding a first cellular telephone and having a first physical configuration including first dimensions, said electrical interface including a number of signal output conductors that have a predetermined physical arrangement;
a second pocket device having a body with a receiving section and an electrical interface, said receiving section for use in holding a second cellular telephone and having a second physical configuration including second dimensions that are different from said first physical configuration and said dimensions of said receiving section of said first pocket device and in which said receiving section of said second pocket device is unable to properly hold the first cellular telephone and said receiving section of said first pocket device is unable to properly hold the second cellular telephone, said electrical interface of said second pocket device including a number of signal output conductors that have a predetermined physical arrangement that is the same as said predetermined physical arrangement of said signal output conductors of said electrical interface of said first pocket device;
a common connector connectable to each of said electrical interfaces of each of said first and said second pocket devices, with said common connector being selected for connection to said electrical interface of said first pocket device using said predetermined physical arrangement of said signal output conductors;
a common device for providing at least a first predetermined function associated with a plurality of cellular telephones including the first cellular telephone and the second cellular telephone, said common device being detachably connected to said body of said first pocket device; and
communication means for providing electrical communication between said common device and said electrical interface of said first pocket device using said common connector;
wherein when said body of said first pocket device, while properly holding the first cellular telephone, is detached from said common device, said number of signal output conductors are also detached with said body while said communication means maintains electrical communication between said first pocket device and said common device.

5,535,275
APPARATUS AND METHOD FOR PRODUCING SCRAMBLED DIGITAL VIDEO SIGNALS

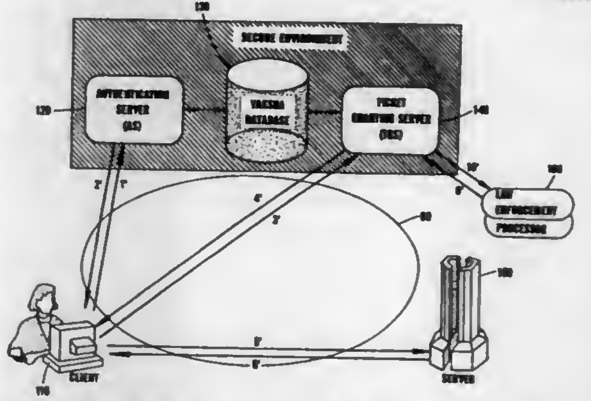
Kiminori Sugisaki, and Kelji Kanota, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jun. 21, 1994, Ser. No. 263,423
Claims priority, application Japan, Jul. 8, 1993, 5-193218
Int. Cl.^{6} H04N *7/167;* H04L *9/34*
U.S. Cl. 380—10 **19 Claims**



14. In a method of recording a digital video signal with compression-encoding that includes dividing each frame of said digital video signal into rectangular blocks of data, forming macroblocks from said rectangular blocks of data by aggregating a predetermined number of said blocks of data to form each of said macroblocks, shuffling positions of said macroblocks within said frame of the digital video signal, and performing discrete cosine transform processing block-by-block on said rectangular blocks of data making up said shuffled macroblocks, the improvement comprising the step of scrambling said digital video signal by interchanging at least some bits of a particular component of said discrete cosine transform processed data.

5,535,276
YAKSHA, AN IMPROVED SYSTEM AND METHOD FOR SECURING COMMUNICATIONS USING SPLIT PRIVATE KEY ASYMMETRIC CRYPTOGRAPHY

Ravi Ganesan, Arlington, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.
Filed Nov. 9, 1994, Ser. No. 338,128
Int. Cl.^{6} H04K *1/00*
U.S. Cl. 380—25 **37 Claims**

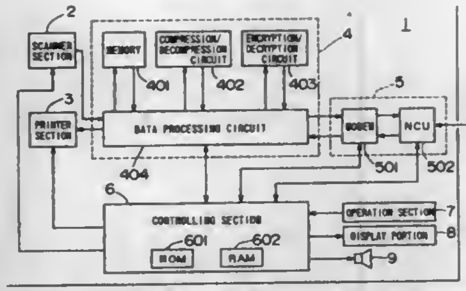

130
SECURE ENVIRONMENT
120
AUTHENTICATION SERVER (AS)
YAKSHA DATABASE
TICKET GRANTING SERVER (TGS)
140
LAW ENFORCEMENT PROCESSOR
CLIENT
SERVER

1. A method for securing communications over a system having a plurality of system users, each said user having an associated asymmetric crypto-key with a public key portion and a corresponding private key portion, each public key portion being accessible to the plurality of system users, each private key portion having a first private key portion known only to the associated user and a corresponding second private key portion, said method for securing communications between at least a first and second of said plurality of users comprising the steps of:
generating, for the first user, a temporary asymmetric crypto-key having a first temporary key portion and an associated second temporary key portion;
encrypting said second temporary key portion with the first private key portion of a first user crypto-key associated with the first user to form a first encrypted message;
obtaining, for a third user, the second temporary key portion by applying the second private key portion of the first user crypto-key to the first encrypted message, thereby authenticating the first user to a third user;
further encrypting the first encrypted message with the second private key portion of the first user crypto-key to form a second encrypted message; and
obtaining, for the first user, the second temporary key portion by applying the public key portion of the first user crypto-key to decrypt the second encrypted message and thereby authenticating the third user to the first user.

5,535,277
ENCRYPTION COMMUNICATION APPARATUS

Kobichi Shibata, and Mitsuhiro Nakamura, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Mar. 7, 1995, Ser. No. 399,583
Claims priority, application Japan, Mar. 10, 1994, 6-039984; Mar. 29, 1994, 6-059166
Int. Cl.^{6} H04L *9/28*
U.S. Cl. 380—28 **9 Claims**

1. An encryption communication apparatus for encrypting and transmitting data having binary-coded data strings of plural bits, said apparatus comprising:
data dividing means for dividing the data strings into a plurality of data units, each data unit representing image data for a sheet of data of a predetermined sheet size;
designating means for designating, for each data unit, one or more bit positions within a front blank portion of the data unit having a predetermined bit number, with the designated bit positions being different for each data unit;



- bit data inverting means for inverting binary-coded data in the bit positions of the data unit designated by said designating means;
- encrypting means for generating encrypted data by subjecting each data unit, including the binary-coded data inverted by the bit data inverting means, to a predetermined encryption process; and
- transmitting means for transmitting the encrypted data to a communication line.

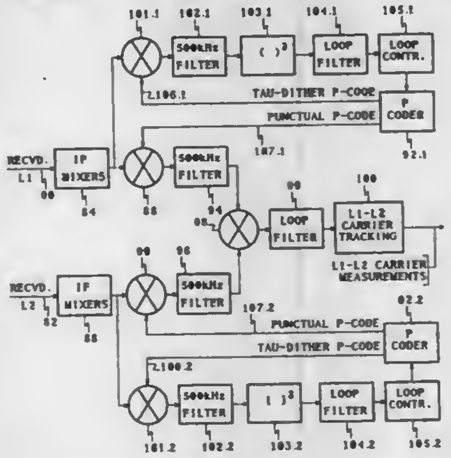
5,535,278
GLOBAL POSITIONING SYSTEM (GPS) RECEIVER FOR RECOVERY AND TRACKING OF SIGNALS MODULATED WITH P-CODE

Charles R. Cahn, Manhattan Beach; Richard G. Keegan, Torrance; Jerry E. Knight, Long Beach, and Thomas A. Stansell, Jr., Rancho Palos Verdes, all of Calif., assignors to Magnavox Electronic Systems Company, Fort Wayne, Ind.

Filed May 2, 1994, Ser. No. 236,291

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—49 **29 Claims**



1. A method for processing received signals in a satellite based positioning system, to generate a carrier difference signal having a frequency that is equivalent to the difference between first and second carrier signals that have been modulated with an encrypted P-code signal, the method comprising the following steps performed for each of a plurality of satellites:

- receiving first and second signals transmitted from a satellite, the signals containing an encrypted version of a pseudorandom code sequence known as P code;
- independently generating replicas of the P-code pseudorandom code sequence without encryption;
- correlating each of the received first and second signals containing the encrypted P-code sequence with the locally generated replicas of the P-code sequence, to obtain two resultant signals, each having a frequency spectrum with a peak, the amplitude of which is indicative of the timing relationship between the received encrypted P-code sequence and the locally generated P-code sequence;
- bandpass filtering each of the resultant signals from the correlating step;
- cross-correlating the resultant signals after bandpass filtering, to obtain a carrier signal at a frequency equivalent to the difference between the frequencies of the first and second signals, with a desirably high signal-to-noise ratio; and
- controlling the step of generating the replicas of the P-code sequence, to closely align each of the P-code replicas with a corresponding P-code component in the first and second signals.

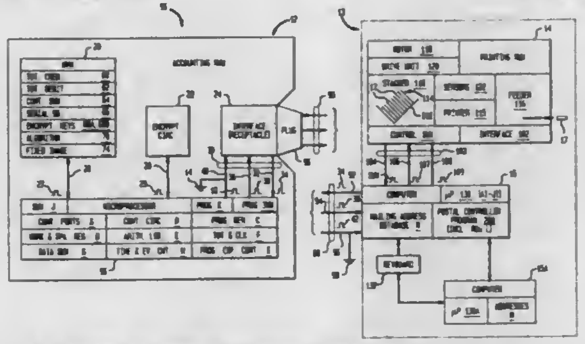
5,535,279
POSTAGE ACCOUNTING SYSTEM INCLUDING MEANS FOR TRANSMITTING A BIT-MAPPED IMAGE OF VARIABLE INFORMATION FOR DRIVING AN EXTERNAL PRINTER

Frank E. Seestrom, Weston, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 15, 1994, Ser. No. 356,747

Int. Cl.^{6} G06F *15/20*

U.S. Cl. 380—55 **9 Claims**



1. A postage accounting system comprising:
- (a) secure means for accounting for postage;
- (b) non-secure printing means externally of the accounting means, the printing means including a printing module and computer means for controlling the printing module, the printing module including printing apparatus and means for sequentially feeding each item of a predetermined plurality thereof to the printing apparatus for printing thereon, the computer means including means programmed for sequentially transmitting variable information for each item to the accounting means, the variable information including at least a portion of a mailing address for each item;
- (c), the postage accounting means including means for connecting the accounting module in communication with the printing means, the accounting means including means for sequentially encrypting the variable information received for each item, the accounting means including a microprocessor, the microprocessor including means programmed for transmitting a bit-mapped image of fixed information to the printing means for printing on each item, and the microprocessor including means programmed for separately sequentially transmitting a bit-mapped image of the encrypted information for each item to the printing means for printing thereon.

5,535,280
CIRCUIT FOR REMOVING IGNITION NOISE FROM A MULTIPLEX SIGNAL

Djahanyar Chahabadi, Hildesheim, and Lothar Vogt, Hohenhameln, both of, Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

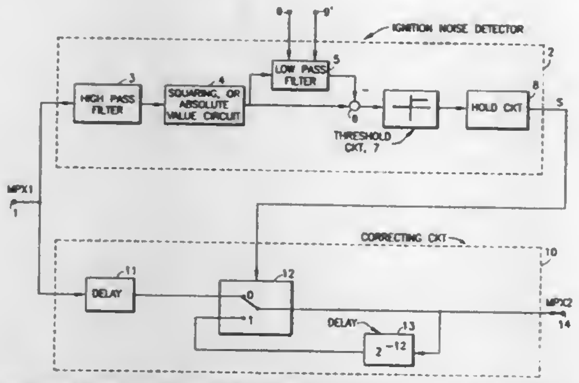
Filed Aug. 10, 1994, Ser. No. 288,554

Claims priority, application Germany, Sep. 11, 1993, 43 30 892.9

Int. Cl.^{6} H04H *5/00*

U.S. Cl. 381—13 **10 Claims**

1. A digital circuit for removing ignition noise from a multiplex signal in a vehicle radio receiver,



- having a multiplex signal input terminal (**1**), a noise detection stage (**2**), and a correcting stage (**10**),
- wherein, in accordance with the invention,
- said noise detection stage operates at a sampling frequency which is a multiple of the frequency of a pilot tone forming part of said multiplex signal, and said noise detection stage includes
- a high-pass filter (**3**) connected to said input terminal (**1**),
- a circuit (**4**) connected to the output of said high-pass filter,
- means (**5**, **6**) for comparing the high-pass filtered and squared multiplex signal to a short-time mean value of the high-pass filtered and squared multiplex signal; and
- means (**7**, **8**) for generating a control signal (S) of predetermined duration when deviations from said mean value occur that are greater than a predetermined amount;
- wherein said correcting stage (**10**) has a first input connected to said multiplex signal input terminal (**1**) and a second input connected to the output (S) of said noise detection stage (**2**); and
- wherein said correcting stage is responsive to said control signal (S) to replace sampling values of said multiplex signal received during application of said control signal (S), and thus indicated to contain ignition noise, by sampling values occurring during a previous period of the pilot tone, thereby generating an ignition-noise-free multiplex output signal (**14**).

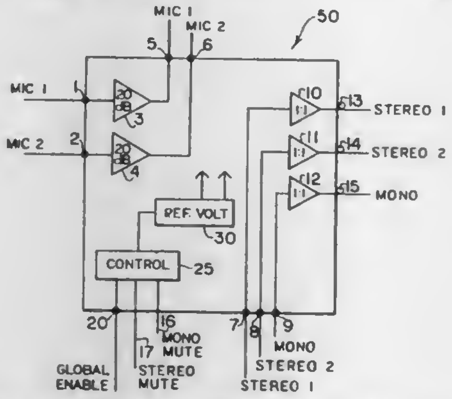
5,535,281
ANALOG INTEGRATED CIRCUIT

Dale Gulick, Austin, Tex., assignor to Advanced Micro Devices, Inc., Austin, Tex.

Filed Jun. 24, 1994, Ser. No. 264,883

Int. Cl.^{6} H04S *3/00*

U.S. Cl. 381—28 **13 Claims**



1. A monolithic analog integrated circuit comprising:
- a mono analog input terminal;
- a mono analog output terminal;
- a plurality of stereo input terminals;
- a plurality of stereo output terminals;
- at least one microphone input terminal;
- at least one microphone output terminal;
- an isolation amplifier circuit disposed between each said stereo input terminals and output terminals and between said mono analog input terminal and output terminal;
- an operational amplifier circuit disposed between said microphone input terminal and output terminal; and
- a control circuit connected to control signals input to said analog integrated circuit which causes power supplied to said isolation amplifier circuit and operational amplifier circuits to be reduced.

5,535,282
IN-THE-EAR HEARING AID

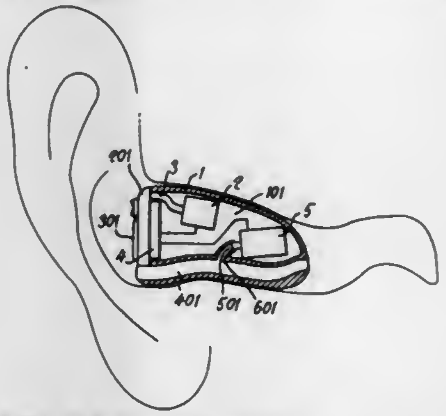
Racca Luca, Genova, Italy, assignor to Ermes S.r.l., Genova, Italy

Filed May 22, 1995, Ser. No. 445,956

Claims priority, application Italy, May 27, 1994, GE94A0067

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—168.6 **13 Claims**



1. An in-the-ear bearing aid comprising:
- an ogival body which is removably inserted into an acoustic meatus of an external ear of a user, said ogival body having a vertical cross-sectional shape of an ogive, an internal apex end and an external cut off end;
- a microphone located in said ogival body which communicates with an external environment through the external end;
- an amplifier located in said ogival body and having an input connected to said microphone and an output;
- an electro-acoustic transducer connected to the output of said amplifier and having an output for acoustic waves which is directed toward the external end of said ogival body;
- a housing for at least one battery which powers said microphone, said amplifier and said transducer;
- a through duct extending through said body along a longitudinal axis from the internal end to the external end;
- a branch duct communicating with the externally directed output of said transducer and with said through duct, said branch duct being branched off upwardly from said through duct and inclined relative to the longitudinal axis of said through duct toward the internal end of said ogival body.

5,535,283
ACTIVE NOISE ATTENUATING DEVICE

Susumu Saruta, Hirakata, and Yasuyuki Sekiguchi, Takatsuki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

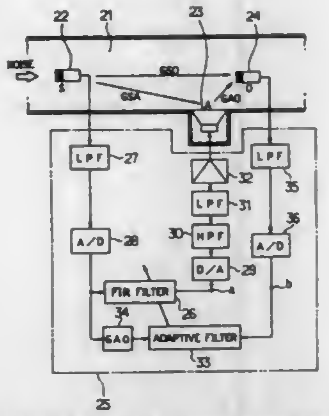
Filed Dec. 28, 1993, Ser. No. 174,004

Claims priority, application Japan, Dec. 28, 1992, 4-349088

Int. Cl.^{6} G10K *11/16*

U.S. Cl. 381—71 **14 Claims**

1. An active noise attenuating device comprising:
- a microphone provided in a propagation path of a noise which detects the noise and generates a detection signal;
- a loudspeaker provided in the propagation path of the noise;



- control means for producing a control signal on the basis of the detection signal supplied by the microphone, the control signal being supplied to the loudspeaker so that the loudspeaker produces an interference sound having the same amplitude as the noise detected by the microphone and a phase opposite to the noise at a control point in the noise propagation path; and
- a high pass filter connected in the path of the control signal between the control means and the loudspeaker, the high pass filter having a cut-off frequency within a low frequency range that the loudspeaker is unable to reproduce and which corresponds to a frequency component of the control signal at which a coherence value is rapidly reduced, the coherence value indicating linearity between input and output of the active noise attenuating device.

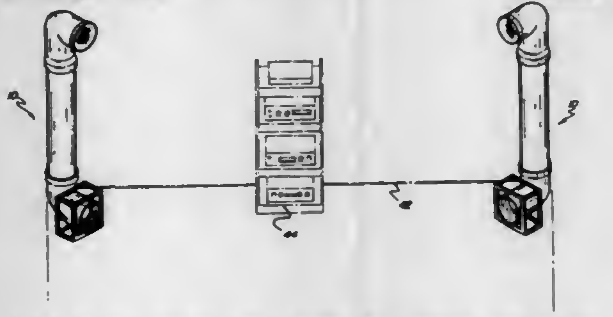
5,535,284
WOOFER SPEAKER AND ACOUSTICALLY COUPLED SUB-WOOFER SPEAKER SYSTEM

James A. Thornhill, and Charlotte Thornhill, both of 2112 S. Beacon St., Muncie, Ind. 47302

Filed Aug. 3, 1994, Ser. No. 285,274

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 381—154 **2 Claims**



1. A woofer speaker and acoustically coupled sub-woofer speaker system for transmitting audible low frequency acoustic energy comprising, in combination:

- a tubular enclosure with a diameter between about 6 inches to 15 inches, the tubular enclosure having a lower elbow with an open lower end facing sideward, an open and beveled upper end facing upward, and a generally perpendicular bend therebetween, an upper elbow with an open and beveled lower end facing downward, an open upper end facing sideward in the same direction as the lower end of the lower elbow, and a generally perpendicular bend therebetween, and a linear extension tube with an open lower end frictionally and removably coupled within the upper end of the lower elbow and an open upper end frictionally and removably coupled within the lower end of the upper elbow to define a transmission channel with the distance between the centroid of the lower end of the lower elbow and the centroid of the upper end of the upper elbow is between about 6 feet to 11 feet;
- a woofer speaker with a diameter between about 6 inches to 15 inches coupled to the lower end of the lower elbow and comprising means for allowing the woofer speaker to be electrically energized for projecting a low frequency sound therefrom;
- a barrier screen formed of a sound-penetrable material coupled across the transmission channel between the upper end of the lower elbow and the woofer speaker;
- a polyester fiber material in an amount of ½ pound per cubic foot packed in the transmission channel between the barrier screen and the upper end of the upper elbow;
- a grill formed of a sound-penetrable material coupled across the transmission channel at the upper end of the upper elbow for containing the fiber material within the transmission channel; and
- a rigid and cube-shaped stand having a horizontal and rectangular upper frame positioned directly above the lower elbow between the lower end and the bend thereof, a horizontal and rectangular lower frame positioned directly below the lower elbow and aligned with the upper frame, and four vertical side legs each coupled between a separate corner of the upper frame and a separate corner of the lower frame, the stand thereby allowing the tubular enclosure to be supported upon an external surface with the upper end of the upper elbow positioned directly above the lower end of the lower elbow;

whereby when the woofer speaker is electrically energized at its terminal and emits audible sounds between about 20 Hz and about 30 Hz, audible sounds are back-propagated, acoustically coupled through the transmission channel and fiber material, and then projected from the grill in phase with those of the woofer speaker, thereby creating a sub-woofer speaker.

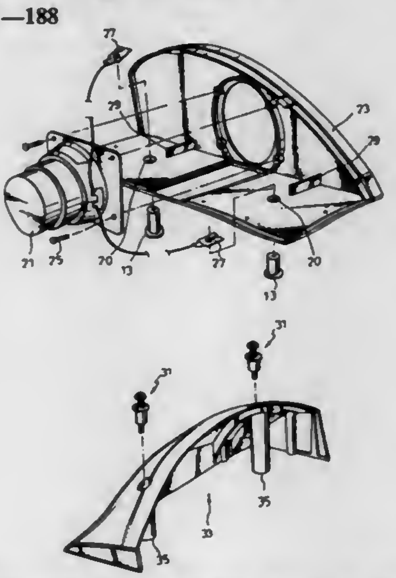
5,535,285
FIXATION OF SPEAKER TO A MONITOR

Chun J. Jwo, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taoyuan, Taiwan

Filed Aug. 18, 1995, Ser. No. 516,821

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—188 **3 Claims**



1. A speaker connectable to a monitor device, the monitor device having an intermediate frame with two holes, each of said two holes allowing passage of a first connector means, the first connector means being coupled to one of positive and negative polarities of an audio input, the speaker comprising:

- a speaker housing having two bosses extending from an inside surface of the housing and two corresponding apertures, the boss having an entire-depth hole corresponding to one of two holes of the intermediate frame and one of the two apertures;
- a speaker body received in the speaker housing, the speaker body being connected to a first and a second signal terminals, each of the signal terminals having a hole thereon which corresponds and aligns to the entire-depth hole of the boss and one of the two apertures;
- a second connector means, received in the entire-depth hole of the boss, for connecting with the first connector device such that the speaker is connected to the intermediate frame and for connecting said one of polarities of the audio input to one of the signal terminals.

5,535,286
ERROR DETECTION IN SEISMIC DATA

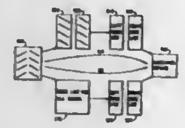
John B. Ibbotson, Southampton; John M. Knapman, Chandler's Ford; Colin L. Bird, Fair Oak; Sydney G. Chapman, Winchester, and Ian Henderson, Bedford, all of, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1994, Ser. No. 266,919

Claims priority, application United Kingdom, Jul. 2, 1993, 9313682

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—109 **16 Claims**



1. Apparatus for detecting errors in frames of seismic data capable of being presented as images, such images being expected to exhibit an inherent symmetry about an axis, the apparatus comprising:

- a storage device for storing a frame of seismic data capable of being presented as an image;
- a selection device for selecting an axis within the image as the axis of symmetry;
- a divider for dividing the data about the axis of symmetry to create first and second sets of data, wherein the divider includes a mirroring means for re-ordering the data in the first set of data so that it can be presented by an image which would be the mirror image of the image previously representing the set; and
- a comparison means for comparing the re-ordered first set of data and second set of data according to preselected matching criteria to determine, based on the degree of matching, whether the extent of mismatch in the frame of data is within a predetermined tolerance and, if it is, to indicate the frame of seismic data is valid.

5,535,287
METHOD OF AND APPARATUS FOR SEPARATING IMAGE

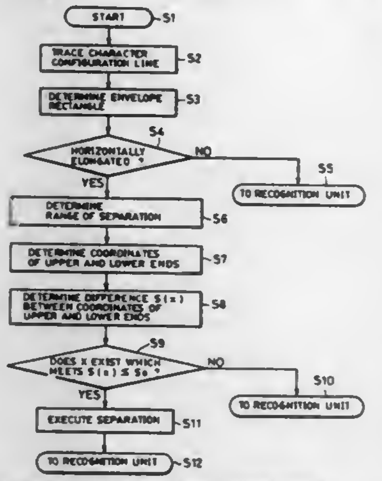
Touru Niki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 753,985, Sep. 3, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 203,483

Claims priority, application Japan, Sep. 3, 1990, 2-230600

Int. Cl.^{6} G06K *9/34*

U.S. Cl. 382—178 **20 Claims**


START
S1
TRACE CHARACTER CONFIGURATION LINE
S2
DETERMINE ENVELOPE RECTANGLE
S3
S4
HORIZONTALLY ELONGATED ?
NO
S5
YES
TO RECOGNITION UNIT
DETERMINE RANGE OF SEPARATION
S6
DETERMINE COORDINATES OF UPPER AND LOWER ENDS
S7
DETERMINE DIFFERENCE S(x) BETWEEN COORDINATES OF UPPER AND LOWER ENDS
S8
S9
DOES x EXIST WHICH MEETS S(x) ≤ So ?
NO
S10
YES
TO RECOGNITION UNIT
EXECUTE SEPARATION
S11
TO RECOGNITION UNIT
S12

1. An image separation apparatus, comprising:

- configuration tracing means for tracing coordinate information concerning a configuration of an image of input image data;
- distance computing means for computing, on the basis of the coordinate information traced by said configuration tracing means, distance information relating to distances between an upper y coordinate end and a lower y coordinate end of the traced configuration as measured in a direction perpendicular to a train of characters represented by the input image data, for successive points along a line parallel to the train of characters; and
- separation position determining means for determining, on the basis of the distance information obtained by said distance computing means, a position where the image data is to be cut into separate images,
- wherein said separation position determining means determines, as the position where the image of interest is to be cut, a position where a distance between the ends of the configuration as computed by said distance computing means is equal to or smaller than a predetermined threshold value, and wherein, when no distance information computed by said distance computing means is equal to or below the threshold value, said separation position determining means conducts again its position determining operation after varying the threshold value.

5,535,288
SYSTEM AND METHOD FOR CROSS CORRELATION WITH APPLICATION TO VIDEO MOTION VECTOR ESTIMATOR

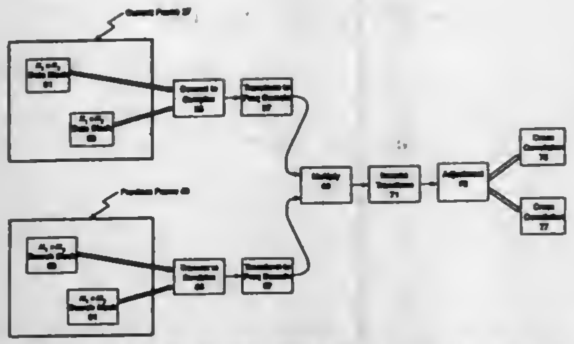
Chih-Kang Chen, and Jerome F. Duluk, Jr., both of Santa Clara County, Calif., assignors to Silicon Engines, Inc., Palo Alto, Calif.

Continuation of Ser. No. 891,940, Jun. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 885,163, May 18, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 388,181

Int. Cl.^{6} H04N *7/50*

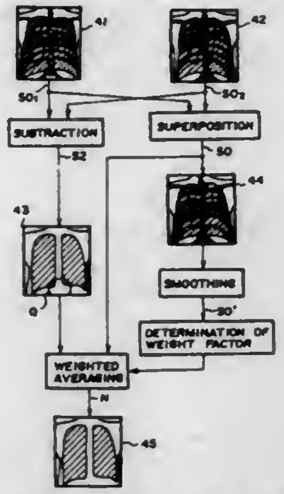
U.S. Cl. 382—236 **16 Claims**

1. A data compression method for compressing first image data representing a first image signal and having a plurality of data blocks stored in a memory, each data block representing a portion of said first image data, the steps of the method comprising:



- (a) selecting first and second input data blocks from said plurality of data blocks in said first image;
- (b) converting the input data blocks to a complex data block by making the first data block a real part and the second data block an imaginary part of said complex data block;
- (c) transforming said complex data block to a complex frequency domain data block;
- (d) converting said complex frequency domain data block into a first frequency domain data block representing said first input data block and a second frequency domain data block representing said second input data block;
- (e) providing data representing a second image having a plurality of search blocks, and selecting first and second input search blocks from said data representing said second image, the input search blocks corresponding to a portion of said second image most likely to contain a best match to the input data blocks;
- (f) converting the input search blocks to a complex search block having real and imaginary pads by making the first search block the real pad and the second search block the imaginary pad of said complex search block;
- (g) transforming said complex search block to a complex first frequency domain search block;
- (h) converting said complex frequency domain search block to a first frequency domain search block representing said first input search block and a second frequency domain search block representing said second input search block;
- (i) multiplying the first frequency domain blocks to form a first resultant block and multiplying the second frequency domain blocks to form a second resultant block;
- (j) converting said resultant blocks into a complex resultant block;
- (k) inverse transforming the complex resultant block to a resultant spatial block having real and imaginary pads;
- (l) determining first and second cross-correlations between said input data blocks and said input search blocks by separating the real and imaginary pads of said resultant spatial block wherein said real part is the first cross-correlation between the first input data and search blocks and said imaginary pad is the second cross-correlation between the second input data and search blocks;
- (m) finding said best match for said first and second input data blocks from the cross-correlations calculated in step (l) based on predetermined criteria;
- (n) repeating steps (a) through (m) for other of said plurality of data blocks so as to generate a plurality of best matches;
- (o) generating a stream of compressed second image data representing a second image signal and corresponding to at least a portion of said first image signal and having substantially the same visual information content as said first image signal but representing said first image signal with less data than said first image data, said representation in accordance with said plurality of best matches; and
- (p) transmitting said generated stream of compressed second image data to a receiver.

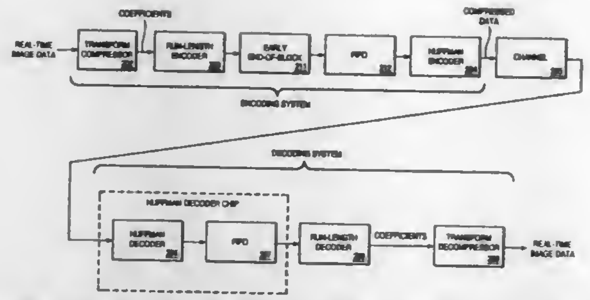
5,535,289
METHOD FOR REDUCING NOISE IN ENERGY SUBTRACTION IMAGES
Wataru Ito, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 13, 1994, Ser. No. 305,391
Claims priority, application Japan, Sep. 13, 1993, 5-226843
Int. Cl.^{6} G06K *9/40*
U.S. Cl. 382—130 **11 Claims**



1. A method for processing an energy substraction image in energy subtraction processing, comprising the steps of:
reading image data representing at least two radiation images of an object from at least two recording media, respectively, on which different images of at least a part of the object have been recorded, to obtain at least two analog original image signals, each of which is made up of a series of image signal components;
converting said at least two analog original image signals into original digital image signals, respectively;
subtracting image signal components of one of said original image signals from image signal components of the other one of said original digital image signals to obtain a difference signal representing an image of a specific structure of the object;
carrying out a smoothing process on one of said original digital image signals to obtain a smoothed image signal;
weighting and averaging image signal components of said difference signal and said image signal components of said one of said original digital image signals such that the weight given to said one of said original digital image signals is made larger as an image density represented by said smoothed image signal with respect to a picture element becomes lower; and
reproducing a visible radiation image of the object utilizing a composite image signal obtained from said weighting and averaging step.

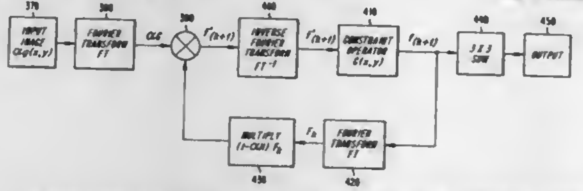
5,535,290
METHOD AND APPARATUS FOR LIMITING THE NUMBER OF A COMPRESSED OUTPUT TYPE IN A COMPRESSION/DECOMPRESSION SYSTEM
James D. Allen, Castro Valley, Calif., assignor to Ricoh Corporation, Menlo Park, Calif., and Ricoh Company Ltd., Tokyo, Japan
Continuation of Ser. No. 107,376, Aug. 17, 1993, abandoned.
This application Sep. 11, 1995, Ser. No. 526,758
Int. Cl.^{6} G06K *9/36*
U.S. Cl. 382—250 **27 Claims**

1. A method of compressing a plurality of coefficients divided into a plurality of units in a data compression system, said method comprising the steps of:
presenting a predetermined number of coefficients to an encoder in a zig-zag order;



lossy encoding the plurality of coefficients into a plurality of tokens, including limiting the plurality of tokens corresponding to non-zero coefficients for each of the plurality of units to a predetermined number based on memory size used in decoding, such that tokens corresponding to non-zero coefficients that are generated after the predetermined number has been reached for each of the plurality of units are discarded in the zig-zag order; and
lossless encoding tokens into a plurality of a second type of symbol to compress the data.

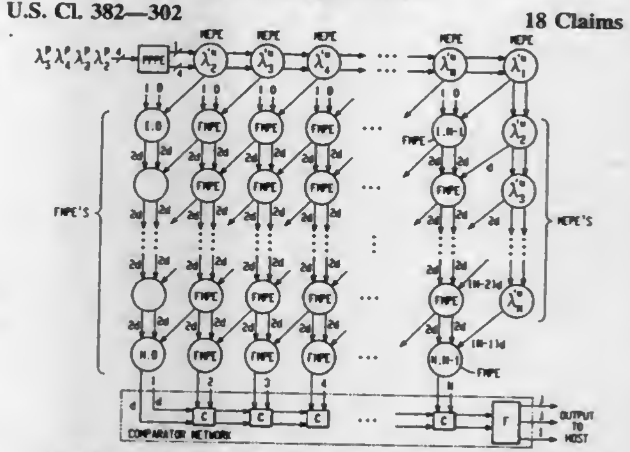
5,535,291
SUPERRESOLUTION IMAGE ENHANCEMENT FOR A SIMD ARRAY PROCESSOR
George L. Spencer, Longwood; Herbert A. Duvoisin, III, and Jean Vasicek, both of Orlando, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.
Filed Feb. 18, 1994, Ser. No. 198,288
Int. Cl.^{6} G06K *9/40*
U.S. Cl. 382—254 **30 Claims**



1. A superresolution processor for generating a restored image from an input image, comprising:
means for inputting the input image as an initial image space domain image;
a processor that is responsive to control signals for processing dam in accordance therewith; and
control means for generating control signals, including:
- (a) means for generating first control signals that cause the processor to combine the initial image space domain image with a predetermined image space domain image to generate a first nonconstrained estimate of the restored image;
- (b) means for generating second control signals that cause the processor to generate a constrained image space domain image from the first nonconstrained estimate of the restored image;
- (c) means for generating third control signals that cause the processor to use the constrained image space domain image to generate a next predetermined image space domain image;
- (d) means for generating fourth control signals that cause the processor to combine the next predetermined image space domain image with the initial image space domain image to generate a next nonconstrained estimate of the restored image for use as the first nonconstrained estimate of the restored image during a next iteration; and
- (e) means for repeating the generation of tile second, third and fourth control signals until the constrained image space domain image converges to the restored image,

wherein the means for inputting the input image as an initial image space domain image comprises:
means for receiving the input image as a first registered image from a sensor that includes a sensor focal plane;
means for adjusting the sensor to cause the input image to shift to a new position on the sensor focal plane, and receiving from the sensor a shifted input image; and
means in the processor for re-registering the shifted input image so that pixels in the shifted input image coincide with corresponding pixels in the first registered image, and then combining the re-registered input image with the first registered image to produce the initial image space domain image.

5,535,292
VLSI ARCHITECTURES FOR POLYGON RECOGNITION
Nagarajan Ranganathan, and Raghu Sastry, both of Tampa, Fla., assignors to University of South Florida, Tampa, Fla.
Filed Dec. 30, 1993, Ser. No. 174,302
Int. Cl.^{6} G06K *9/54;9/60*
U.S. Cl. 382—302 **18 Claims**



1. A method for use in identifying an unknown two dimensional contour as corresponding to one or more of a plurality of known two dimensional polygon contours, comprising the steps of:
- (a) providing a plurality of identifiers for each known two dimensional polygon contour, the identifiers for each known two dimensional polygon contour comprising a plurality of edge length ratios and corresponding threshold values for each of the edges of each known two dimensional polygon contour,
- (b) providing a plurality of identifiers for the unknown two dimensional contour, comprising a plurality of edge length ratios and corresponding threshold values for each of the edges of the unknown contour,
- (c) providing a systolic processing system comprising a plurality of matrix element processing elements (MEPEs), and an array of feasible match processing elements (FMPEs) interconnected with selected MEPEs and with each other in a predetermined configuration,
- (d) inputing to the plurality of MEPEs, in a predetermined sequence, pairs of edge length ratios and corresponding threshold values for consecutive edges of the unknown contour and for each of the known polygon contours, each MEPE being configured to
  - (i) receive the edge length ratios and corresponding threshold values for a pair of edges of the unknown contour and a known polygon contour,
  - (ii) determine a dissimilarity value for the pair of edges, and
  - (iii) direct the dissimilarity value to a selected FMPE of the array, the dissimilarity value for a pair of edges being determined as a function of the absolute differences between respective edge length ratios and corresponding threshold values for the pair of edges, and the array of FMPEs being in a configuration which determines feasible matches between pairs of consecutive edges of the unknown contour and the known prototype contours and delivers outputs related thereto, and
- (e) comparing such outputs and delivering a final output which is indicative of the longest number of consecutive edges,

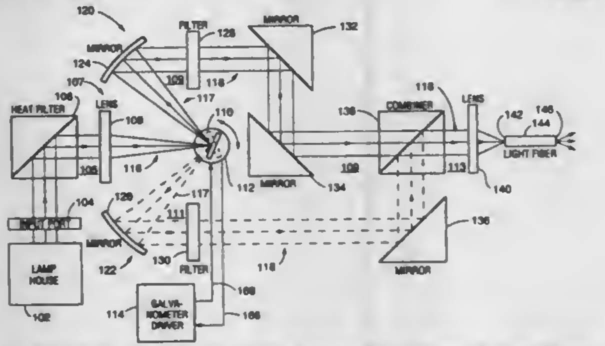
above a predetermined minimum, for which feasible matches have occurred between the unknown contour and a known polygon contour.

5,535,293
HIGH-SPEED ELECTRO-OPTICAL MODULATOR, CHOPPER, AND MULTIPLEXER/DEMULTIPLEXER

Michael P. Buchin, 723 Southampton Dr., Palo Alto, Calif. 94303

Filed Dec. 9, 1994, Ser. No. 353,532
Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—18 **15 Claims**



1. Apparatus for spectrally modulating an excitation light beam, the apparatus comprising:
- input port means for receiving light from a light source;
- focussing means for focussing the light from the input port means at a focal point;
- a mirror rotatably mounted at or near the focal point;
- first means for receiving light from the focussing means after reflection by the mirror at a first angle of incidence, and for converting the light reflected by the mirror into a first light beam;
- second means for receiving light from the focussing means after reflection by the mirror at a second angle of incidence, different from the first angle of incidence, and for convening the light reflected by the mirror into a second light beam;
- modifying means, disposed in the first light beam, for modifying the light received by the input port means;
- combining means for combining the first light beam with the second light beam to provide a combined light beam; and
- motor means, coupled to the mirror, for rotating the mirror over an angular range including the first angle of incidence and the second angle of incidence.

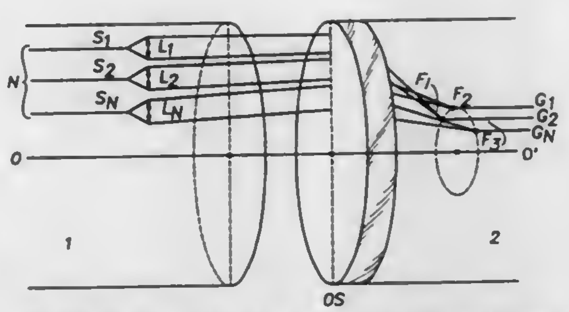
5,535,294
CONNECTOR FOR MULTICHANNEL TRANSMISSION OF OPTICAL SIGNALS THROUGH ROTATING INTERFACE

Alexander M. Kamuz, Kiev, Ukraine; Sergej G. Krivoshlykov, Moscow, Russian Federation, and Pavel F. Oleksenko, Kiev, Ukraine, assignors to Ceram Optec Industries, Inc., Longmeadow, Mass.

Filed May 8, 1995, Ser. No. 436,166
Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—25 **5 Claims**

1. A system for optical connection between at least two input and two output optical channels comprising:
- an input platform;
- an output platform;
- an axis around which at least one of the platforms can be rotated;
  - said input and output channels are fixed with respect to said input and output platforms respectively and at least one of said platforms has an optical system linking said channels in a permanent manner independent of the relative rotation of the platforms, wherein: said optical system generally comprises:
- an input and an output part fixed on corresponding input and output platforms;
- said input part of said optical system collects light beams coming from each individual input channel of said input platform and projects them onto non-overlapping beam spots on an input optical plane of said output rotating platform which is perpendicular to said axis;
- centers of each said beam spots on said input optical plane are located at certain distances from said axis of connector so that said beam spots move along rings in said input optical plane concentric with said axis of the connector as said platforms are mutually rotated;
- said output part of said optical system fixed on said output rotating platform collects all light beams coming from said rings in said input optical plane of said output platform and focuses each of them into non-overlapping output beam spots located along a circle in an output optical plane, where said circle is concentric with said axis of connector, such that, positions of said output spots remain independent of relative rotation of said input and output platforms; light of each said output beam spots is finally coupled into a corresponding output channel of said rotating output platform.

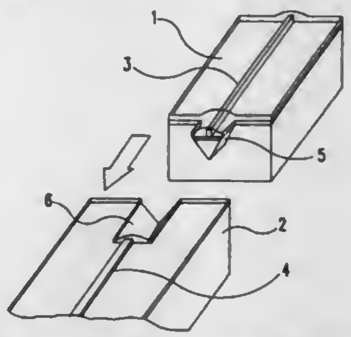


5,535,295
COUPLING STRUCTURE FOR WAVEGUIDE CONNECTION AND PROCESS OF FORMING THE SAME

Kiyoto Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,452
Claims priority, application Japan, Oct. 28, 1993, 5-271048
Int. Cl.^{6} G02B *6/30*

U.S. Cl. 385—49 **12 Claims**



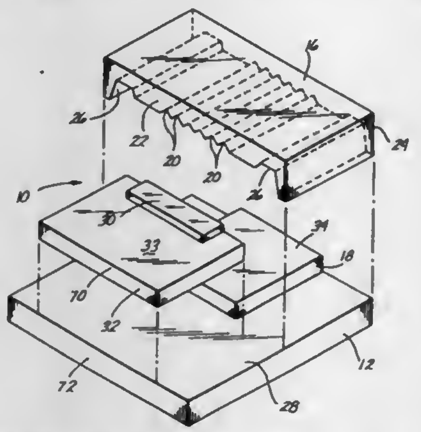
1. A coupling structure for an optical-waveguide connection, comprising:
- a first optical waveguide positioned on a surface of a first substrate;
- a tenon positioned at an end portion of said first substrate;
- a second optical waveguide positioned on a surface of a second substrate; and
- a groove formed at an end portion of said second substrate, said tenon for fitting into said groove,
- wherein said first substrate and second substrate comprise silicon substrates, and
  - a cross-section of said groove having a V-shape with a vertical angle and a cross-section of said tenon having a triangular shape with said vertical angle.

5,535,296
INTEGRATED OPTOELECTRONIC COUPLING AND CONNECTOR

Toshi K. Uchida, San Pedro, Calif., assignor to Optobahn Corporation, Torrance, Calif.

Filed Sep. 28, 1994, Ser. No. 313,765
Int. Cl.^{6} G02B *6/42*

U.S. Cl. 385—89 **31 Claims**



5. An integrated mounting assembly for coupling an optoelectronic device to optical fiber, comprising:
- a plurality of optical fibers supported between a first substrate grooved to define fiber containing channels open on opposite sides of the grooved substrate and a second substrate assembled to said first substrate for clamping said optical fibers therebetween, a base substrate assembled to said first and said second substrates, said optical fibers in said channels terminating in fiber ends on one of said sides, said base substrate being enlarged to define a base surface, and a submount on said base surface supporting a laser diode in substantial optical alignment with said fiber ends;
- reference means configured and adapted for positioning said submount with said laser diode thereon in substantially precise relationship to said base whereby substantially precise optical alignment of the laser diode with said fiber ends is achieved without referencing the laser diode to said fiber ends.

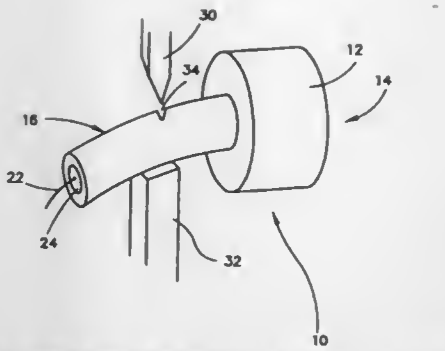
5,535,297
MICRO-ALIGNMENT METHOD

Randy P. Goettsche, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

. Filed Dec. 16, 1993, Ser. No. 168,831
Int. Cl.^{6} G02B *6/42*

U.S. Cl. 385—90 **24 Claims**

1. An apparatus comprising:
- light supplying means for supplying light;
- light receiving means for receiving light from the light supplying means; and,
- coupling means for coupling the light supplying means and the light receiving means in an alignment so that the light receiving means receives light from the light supplying means, the coupling means being deformed by a nick so as to align the light supplying means and the light receiving means.

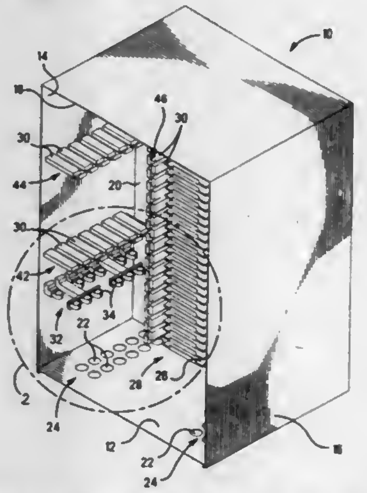


5,535,298
PEDESTAL FOR FIBER OPTIC CABLE

Matthew J. Fasnacht, Mechanicsburg, and Ronald R. Schaffer, Harrisburg, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 30, 1995, Ser. No. 380,876
Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—135 **18 Claims**



1. A pedestal for interconnection of fiber optic members within fiber optic cable articles, comprising:
- an enclosure including side walls, a rear wall and top and bottom walls and having an array of fiber splicing trays disposed centrally of said side walls, one of said top and bottom walls including openings therethrough defining cable entrances at cable entry regions;
- said enclosure further including at least one array of holders adjacent each said side wall proximate a respective said cable entry region, each said holder defining a receiving slot oriented to hold a row of said fiber optic cable articles in vertical orientations and extending toward an opposed said side wall from a respective said side wall to a slot entrance, and said holders of each said at least one array positioned from front to back within said enclosure to hold pluralities of fiber optic cable articles in parallel rows upon insertion thereinto from said slot entrance, all defining a pair of cable routing regions between each said side wall and said fiber splicing tray array; and
- said enclosure further including at least one array of said holders adjacent said fiber splicing tray array alongside each said cable routing region, each said holder extending forwardly from said rear wall to a slot entrance and defining a receiving slot oriented to hold a row of said fiber optic cable articles in horizontal orientations upon insertion thereinto from forwardly thereof, such that fiber optic members to be spliced with associated fiber optic members of other fiber optic cables

concluding in the enclosure are generally aligned with a splicing surface of a respective said splice tray in said fiber splicing array for splicing upon being broken out from said fiber optic cables exiting ends of said plurality of fiber optic cable articles.

5,535,299

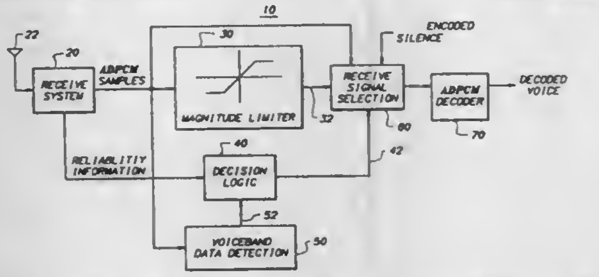
ADAPTIVE ERROR CONTROL FOR ADPCM SPEECH CODERS

Neal K. Riedel, Encinitas, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.

Filed Nov. 2, 1993, Ser. No. 146,612

Int. Cl.⁶ G10L *3/02;9/00*

U.S. Cl. 395—2.21 **22 Claims**



1. A method of improving a perceived voice quality of an ADPCM encoded signal having segments received from an imperfect communications channel, said method comprising the steps of:

a) converting a received segment of the ADPCM encoded signal to ADPCM samples;

b) determining the magnitude of the ADPCM samples;

c) replacing the value of a one ADPCM sample with a first predetermined value if the magnitude of the one ADPCM sample is greater than a second predetermined value, the magnitude of the first predetermined value being greater than zero; and

d) after step c), decoding the ADPCM samples using a ADPCM decoder.

5,535,300

PERCEPTUAL CODING OF AUDIO SIGNALS USING ENTROPY CODING AND/OR MULTIPLE POWER SPECTRA

Joseph L. Hall, II, Basking Ridge, and James D. Johnston, Warren, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 109,867, Aug. 20, 1993, Pat. No. 5,341,457, which is a continuation of Ser. No. 962,151, Oct. 16, 1992, abandoned, which is a continuation of Ser. No. 844,967, Feb. 28, 1992, abandoned, which is a continuation of Ser. No. 292,598, Dec. 30, 1988, abandoned. This application Aug. 2, 1994, Ser. No. 284,324

Int. Cl.⁶ G10L *7/06*

U.S. Cl. 395—2.36 **6 Claims**

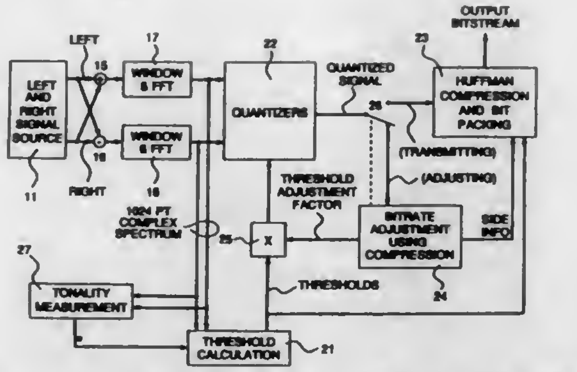
1. A method for encoding signals representing an ordered time sequence of audio signals partitioned into a set of ordered blocks, each said block having a discrete frequency spectrum comprising a first set of frequency coefficients, the method comprising, for each of said blocks, the steps of:

(a) partitioning said audio signals into a plurality of channel signals, each said channel signal existing during a set of time intervals;

(b) for each said time interval, forming a set of power spectra signals for each said plurality of channel signals;

grouping said first set of frequency coefficients into at least one group, each group comprising at least one frequency coefficient;

(d) combining said sets of power spectra signals to generate at least one noise masking threshold;



(e) quantizing at least one frequency coefficient in said at least one group resulting in at least one group of at least one quantized frequency coefficient, said quantizing based upon said at least one noise masking threshold; and

(f) coding said at least one group of at least one quantized frequency coefficient using an entropy code such that the average number of bits required to represent said at least one group of at least one quantized frequency coefficient is less than the average number of bits required to represent said at least one group of at least one quantized frequency coefficient with a non-entropy coder.

5,535,301

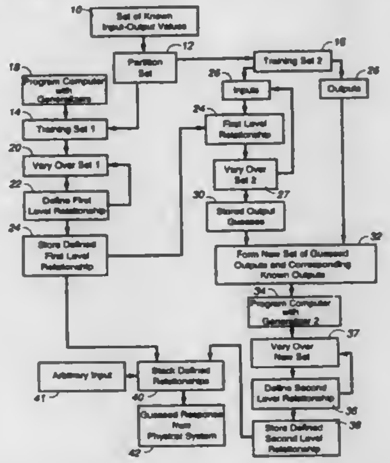
METHOD FOR GUESSING THE RESPONSE OF A PHYSICAL SYSTEM TO AN ARBITRARY INPUT

David H. Wolpert, Santa Fe, N.M., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 35,326, Mar. 23, 1993, abandoned. This application Dec. 30, 1993, Ser. No. 366,413

Int. Cl.⁶ G06F *15/18;* **G06E** *1/00*

U.S. Cl. 395—20 **6 Claims**


10
Set of Known Input-Output Values
12
Partition Set
16
Training Set 2
18
Program Computer with Generalizers
26
Inputs
28
Outputs
14
Training Set 1
24
First Level Relationship
20
Vary Over Set 1
Vary Over Set 2
22
27
Define First Level Relationship
30
Stored Output Guesses
24
Store Defined First Level Relationship
32
Form New Set of Guessed Outputs and Corresponding Known Outputs
34
Program Computer with Generalizer 2
37
Vary Over New Set
Arbitrary Input
Stack Defined Relationships
Define Second Level Relationship
41
40
36
Guessed Response from Physical System
38
Store Defined Second Level Relationship
42

1. A process for estimating a response of a physical system to an arbitrary input where there is a known set of input values and related output values, comprising the steps of:

programming a computer with a first program having at least one generalizer to learn at least one first level relationship between said input values and said related output values;

partitioning said known set of input values and related output values into first and second subsets;

repetitively running said first program on said computer using input and output values from said first subset to generate guessed output values to define said at least one first level relationship;

storing said at least one first level relationship in said computer;

inputting input values in said second subset to said at least one first level relationship stored in said computer to generate second guessed output values;

storing said second guessed output values in said computer;

inputting to said computer a set of first defined values having a specified relationship with said second guessed values, said input values in said second subset, and said input and output values in said first subset;

inputting to said computer a set of second defined values having a specified relationship with said second guessed output values and said related output values in said second subset;

programming said computer with a second program having a second generalizer to learn a second level relationship between said first defined values and said second defined values;

repetitively running said second program on said computer using said first defined values as input values and said second defined values as output values to learn said second level relationship;

storing said at least one first level relationship and said second level relationship in a stack arrangement effective to form a computer learned relationship for predicting said response of said physical system to an arbitrary input; and

inputting to said computer-learned relationship an arbitrary input value for said physical system and guessing an output value for said physical system.

5,535,302

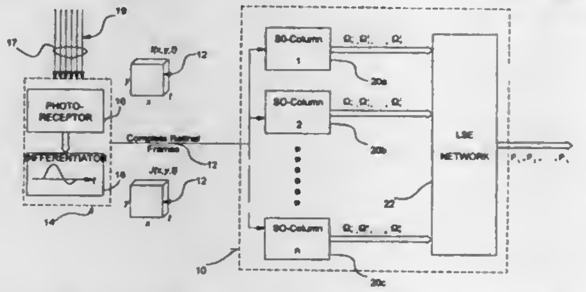
METHOD AND APPARATUS FOR DETERMINING IMAGE AFFINE FLOW USING ARTIFICAL NEURAL SYSTEM WITH SIMPLE CELLS AND LIE GERMS

Tien-Ren Tsao, 12405 Venice Pl., Silver Spring, Md. 20904

Filed Dec. 1, 1994, Ser. No. 352,140

Int. Cl.⁶ G06E *1/00;3/00;* **G06T** *7/20*

U.S. Cl. 395—21 **20 Claims**



1. An artificial neural system for extracting local image affine flow information from visual stimuli comprising:

a) time differentiation means for receiving time-varying image intensity signal and providing image time-derivative signal;

b) hypercolumn (HC) reference frame means coupled to said time differentiation means for receiving said image time-derivative signal and providing HC-time-derivative signal;

c) hypercolumn (HC) Lie differentiation means for receiving image intensity signal and providing six HC-Lie-derivative signals;

d) least square error fitting means coupled to said HC-reference frame means and said HC-Lie differentiation means for receiving HC-time-derivative signal and six HC-Lie-derivative signals and determining local affine flow.

5,535,303

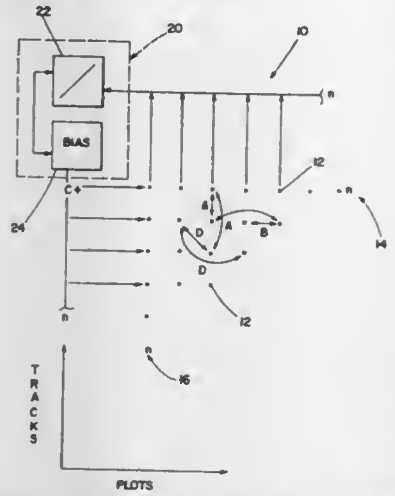
"BAROMETER" NEEURON FOR A NEURAL NETWORK

Leon K. Ekchian, Northridge; David D. Johnson, Simi Valley, and William F. Smith, Los Angeles, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 844,217, Mar. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 509,174, Apr. 16, 1990, abandoned. This application Feb. 22, 1994, Ser. No. 202,708

Int. Cl.⁶ G06G *7/12*

U.S. Cl. 395—24 **2 Claims**



1. A "barometer" neuron for a track-while-scan neural network that has a plurality of interconnected neurons positioned in a row-and-column orientation where the neural network generates at least one input signal which represents an imbalance or instability between neural network excitation and inhibition, CHARACTERIZED IN THAT the "barometer" neuron comprises:

a) first means for generating a standard level of inhibition signal which represents the level of inhibition of a "perfect" pair of interconnected track and plot neurons having a total distance therebetween equal to zero,

b) said first means for further measuring both the neural network input signal and said standard level of inhibition signal, and for generating a first output signal having a value that represents the difference in values between the neural network input signal and said standard level of inhibition signal, and

c) second means for generating a second output signal having a value equal to the difference between said standard level of inhibition signal and said first output signal to adjust the neural network.

5,535,304

INFERENCE SYSTEM HAVING A FRAME STRUCTURE AND METHOD OF STORING INFORMATION THEREIN

Minako Sanjoh, Yokohama; Shoichi Kojima, Fujisawa, and Naomichi Sueda, Isehara, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 962,009, Oct. 15, 1992, abandoned, which is a continuation of Ser. No. 616,259, Nov. 20, 1990, abandoned. This application Apr. 4, 1994, Ser. No. 222,342

Claims priority, application Japan, Nov. 22, 1989, 1-305022

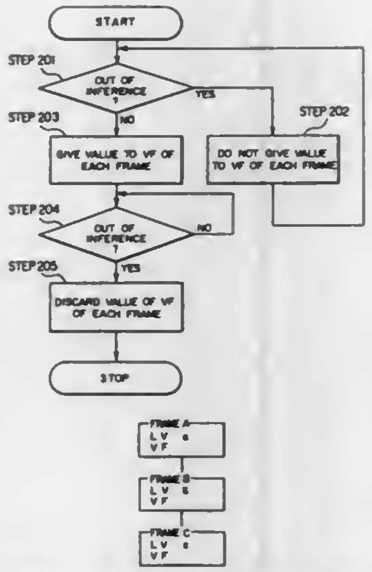
Int. Cl.⁶ G06F *17/00;15/18*

U.S. Cl. 395—62 **4 Claims**

4. A knowledge storing method for use in an inference system using a plurality of frames in a hierarchical structure which have a relationship of a parent frame being higher in the hierarchical structure than a child frame thereof, said knowledge storing method comprising the steps of:

storing only information intrinsic to a frame in the hierarchical structure into a first memory area of one of said frames when the inference system is in a knowledge editing mode;

storing into said one of said frames both information intrinsic to a second memory area of said one of said frames, and infor-



mation inherited by at least said one of said frames from frames higher in the hierarchical structure than said one of said frames when the inference system is in an inference mode;

referencing only said first memory area of said one of said frames when said knowledge editing mode is selected by said mode selecting means; and

referencing only said second memory area of said one of said frames when said inference mode is selected by said mode selecting means.

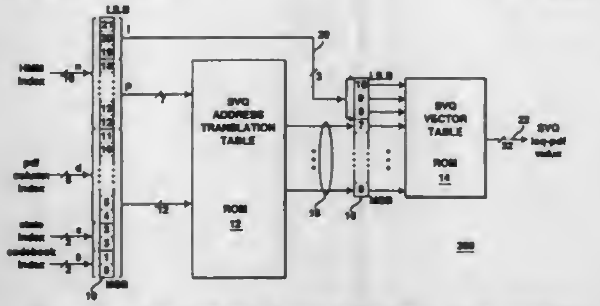
5,535,305
SUB-PARTITIONED VECTOR QUANTIZATION OF PROBABILITY DENSITY FUNCTIONS

Aleiandro Acero, Madrid, Spain; Yen-Lu Chow, and Kai-Fu Lee, both of Saratoga, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 31, 1992, Ser. No. 999,293

Int. Cl.^{6} G10L *5/06*

U.S. Cl. 395—2.65 **25 Claims**



1. A method for creating a subpartitioned vector quantized memory for the storage of hidden Markov model (HMM) log-probability density functions (log-pdfs) corresponding to a phoneme model having at least one code-book and one state, comprising the following steps:

a) organizing the HMM log-pdfs of each code-book by column and grouped by state so that corresponding log-pdf values of each of the HMM log-pdfs form a set of log-pdf value columns;

b) subpartitioning the log-pdf value columns into an integer number of equal length packets each packet identified by an associated packet index;

c) vector quantizing the subpartitioned packets, creating a set of subpartitioned vector quantization (SVQ) encoding vectors and associated SVQ encoding vector indices;

d) constructing an address translation table that is addressable by the packet indices, listing the SVQ encoding vector indices associated with each packet index, for generating, at output, an encoding index corresponding to the packet index used to address the address translation table; and

e) constructing a SVQ vector table for storing the set of SVQ encoding vectors in accordance with the associated SVQ encoding vector indices.

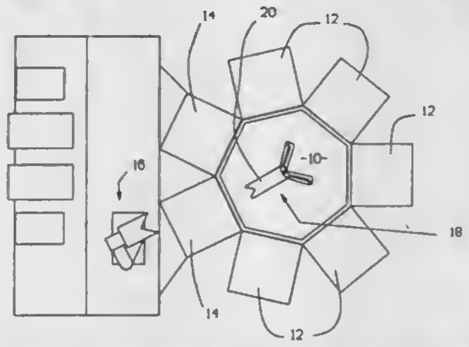
5,535,306
SELF-CALIBRATION SYSTEM FOR ROBOT MECHANISMS

Craig L. Stevens, Felton, Calif., assignor to Applied Materials Inc., Santa Clara, Calif.

Continuation of Ser. No. 11,043, Jan. 28, 1993, abandoned. This application Feb. 14, 1995, Ser. No. 389,090

Int. Cl.^{6} G05B *19/04;19/42;19/18*

U.S. Cl. 395—89 **10 Claims**



1. A method for automatically calibrating a robot capable of movement in two position axes and installed in a robot chamber, comprising the steps of:

moving a robot component to a position adjacent to a fixed sensor in the robot chamber;

moving the robot component along a selected position axis and across the fixed sensor;

detecting when at least one feature of the robot component trips the fixed sensor, and recording a robot position in the selected position axis along which the robot was moved across the fixed sensor;

computing the difference between the robot position recorded in the immediately preceding recording step and a predicted robot position at which the fixed sensor should be tripped;

applying the difference value computed in the immediately prior computing step to calibrate the robot in the selected position axis; and

repeating all of the foregoing steps for another selected position axis of the robot.

5,535,307
PRINTING OF VARIABLE DOT SIZES DEPENDENT UPON IMAGE DENSITY FOR IMPROVED GRAPHICS

Stephen K. Glass, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 16, 1994, Ser. No. 291,230

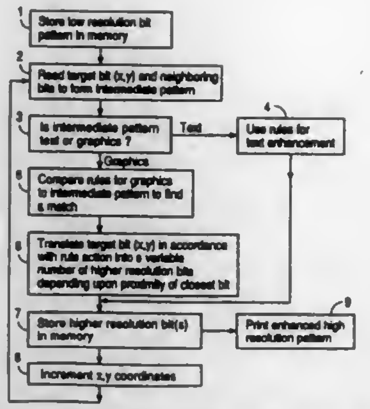
Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—108 **20 Claims**

1. A method for enhancing an initial graphics pattern, said initial graphics pattern comprising a pattern of dots, said method comprising the steps of:

storing said initial graphics pattern as a pattern of bits in first memory locations, one or more of said bits corresponding to a single dot in said initial graphics pattern;

outputting a subset of said initial graphics pattern from said first memory locations to create an intermediate pattern, said intermediate pattern containing one or more target bits representing one or more target dots in said initial graphics pattern for enhancement and containing bits representing dots neighboring said one or more target dots in said initial graphics pattern;


1
Store low resolution bit pattern in memory
2
Read target bit (x,y) and neighboring bits to form intermediate pattern
3
Is intermediate pattern text or graphics ?
Text
4
Use rules for text enhancement
Graphics
5
Compare rules for graphics to intermediate pattern to find a match
6
Translate target bit (x,y) in accordance with rule action into a variable number of higher resolution bits depending upon proximity of closest bit
7
Store higher resolution bit(s) in memory
9
Print enhanced high resolution pattern
8
Increment x,y coordinates

determining whether said intermediate pattern matches a rule pattern, said rule pattern being one of a plurality of rule patterns;

applying at least one rule action from a plurality of rule actions to said intermediate pattern, based on a match between a bit pattern in said intermediate pattern and a rule pattern, to modify said one or more target bits in said intermediate pattern to create an enhanced pattern of bits, said rule action being based upon a density of dots represented in said intermediate pattern;

storing said enhanced pattern of bits in second memory locations; and

displaying an enhanced pattern of dots corresponding to said enhanced pattern of bits.

5,535,308
PRINTING METHOD FOR USE WITH DOT PRINTER

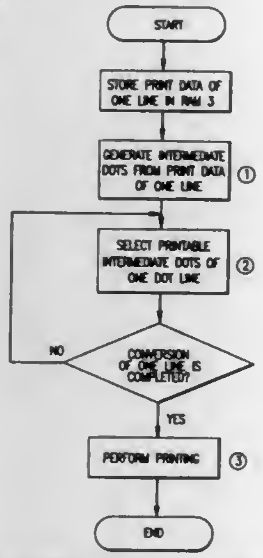
Mikio Hayashi; Hiroshi Sato; Masahiro Nishida, and Keiichiro Takahashi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 190,770, Feb. 2, 1994, which is a continuation of Ser. No. 985,519, Dec. 2, 1992, which is a continuation of Ser. No. 697,125, May 8, 1991, which is a division of Ser. No. 622,992, Dec. 6, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,219

Claims priority, application Japan, Dec. 6, 1989, 1-316964

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—108 **10 Claims**


START
STORE PRINT DATA OF ONE LINE IN RAM 3
GENERATE INTERMEDIATE DOTS FROM PRINT DATA OF ONE LINE
①
SELECT PRINTABLE INTERMEDIATE DOTS OF ONE DOT LINE
②
NO
CONVERSION OF ONE LINE IS COMPLETED?
YES
PERFORM PRINTING
③
END

1. A method for printing wherein a printhead is successively scanned in a line direction to print a plurality of dots extending in said line direction, and a recording medium is fed at right angles to said line direction, comprising the steps of:

receiving and storing in a memory original dot data representative of an original dot pattern for a given line, in said line direction, said original dot pattern including one of fonts and graphics;

said original dot data being representative of the original dot pattern having individual original dots spaced from a preceding individual original dot by integer multiples of a minimum interval d_1;

converting each portion of said original dot data representative of said individual original dots and blanks into a portion of secondary dot data representing $n(n \geqq 2)$ secondary dots and blanks respectively, arranged in the line direction in the given line;

said portions of second dot data representing said second dots and spaced by secondary intervals equal to d_1/n, and occupying intervals d_1 of said given line having a position associated with respective ones of said individual original dots in said given line;

storing said portions of secondary dot data in said memory in locations corresponding to associated positions in said given line;

selecting ones of said secondary dot data representing dots occurring adjacent every m^{th} one of said secondary intervals in said given line wherein n and m are integers, $(2n-1)\geqq_{m}\geqq(n+1)$, and said selected m^{th} ones of said secondary dots having a minimum selected interval d_2 between said selected dots, wherein $d_2=m/n \times d_1$;

storing in said memory secondary dot data for said given line representing blanks in memory locations associated ones of said secondary dot data which are not selected; and

printing using said secondary dot data the selected ones of said secondary dots.

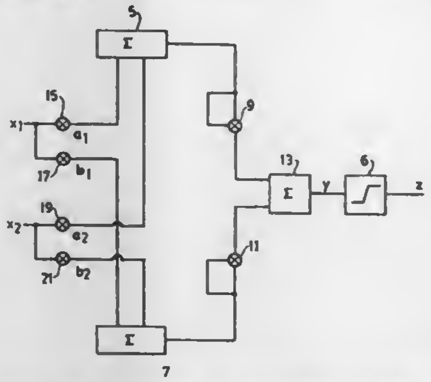
5,535,309
SINGLE LAYER NEURAL NETWORK CIRCUIT FOR PERFORMING LINEARLY SEPARABLE AND NON-LINEARLY SEPARABLE LOGICAL OPERATIONS

Yong-Chul Shin, Amherst, and Ramalingam Sridhar, East Amherst, both of N.Y., assignors to The Research Foundation, State University of New York at Buffalo, Buffalo, N.Y.

Continuation of Ser. No. 957,099, Oct. 5, 1992, Pat. No. 5,355,436. This application Aug. 11, 1994, Ser. No. 289,055

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—24 **15 Claims**



1. A method for performing a non-linearly separable operation off three or more input electrical signals, comprising the steps of:

receiving said input electrical signals in a single artificial neuron circuit;

weighting said input electrical signals with one or more complex weights to produce weighted signals, said complex weights each having a real component with a scalar value and an imaginary component with a scalar value, the scalar values of said real and imaginary components determining a type of nonlinearly separable operation on said three or more input electrical signal; and generating an output electrical signal representative of the results of the non-linearly separable operation performed on said input electrical signals.

5,535,310

RECORDING/REPRODUCTION ARRANGEMENT FOR DATA AND COMMAND PROTOCOLS IN EDP SYSTEM PERIPHERALS

Uwe Michel, Königsbrunn, Germany, assignor to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

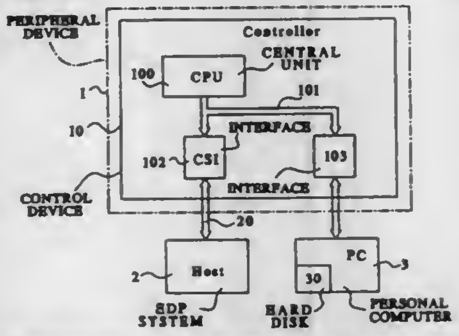
PCT No. PCT/DE92/00599, § 371 Date Feb. 10, 1994, § 102(e) Date Feb. 10, 1994, PCT Pub. No. WO93/03433, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 24, 1992, Ser. No. 193,178

Claims priority, application Germany, Aug. 9, 1991, 41 26 465.7

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—113 12 Claims



1. A recording/reproduction arrangement for data and command logs in peripheral devices of EDP systems, comprising: an EDP system coupled to a control device of a peripheral device for transmitting data and commands, the control device of the peripheral device having a bus system and a central unit, a separate storage device for recording data and command logs, the storage device being connected to the central unit via the bus system, the recorded data and command logs of an on-line operation of the peripheral device that is stored in the storage device being information via which the peripheral device can be operated off-line in an operation of the peripheral device that duplicates operation of the peripheral device during said on-line operation.

5,535,311

METHOD AND APPARATUS FOR IMAGE-TYPE DETERMINATION TO ENABLE CHOICE OF AN OPTIMUM DATA COMPRESSION PROCEDURE

Gary Zimmerman, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1994, Ser. No. 282,399

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—114 9 Claims

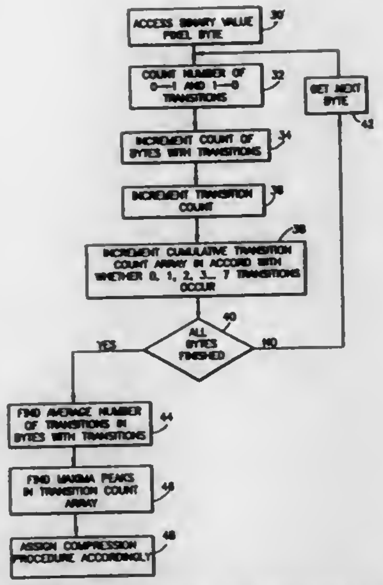
1. A method for identifying an image type of a multi-pixel image and assigning a compression procedure therefor, said method performed by apparatus that includes multiple data compression procedures, said method analyzing an image portion comprising plural data segments, each data segment including plural binary pixel values, said method comprising the steps of:

counting a number of transitions of binary value in each said data segment;

finding an average number of transitions of binary value over all data segments that include at least one transition;

determining for all data segments in said multipixel image, a transition array comprising cumulative sums of data segments having like numbers of transitions of binary value; and

employing said average number of transitions of binary value and said cumulative sums of pixels from said transition array to identify said image type.


ACCESS BINARY VALUE PIXEL BYTE
30
COUNT NUMBER OF 0→1 AND 1→0 TRANSITIONS
32
GET NEXT BYTE
42
INCREMENT COUNT OF BYTES WITH TRANSITIONS
34
INCREMENT TRANSITION COUNT
36
INCREMENT CUMULATIVE TRANSITION COUNT ARRAY IN ACCORD WITH WHETHER 0, 1, 2, 3... 7 TRANSITIONS OCCUR
38
40
ALL BYTES FINISHED
YES
NO
FIND AVERAGE NUMBER OF TRANSITIONS IN BYTES WITH TRANSITIONS
44
FIND MAXIMA PEAKS IN TRANSITION COUNT ARRAY
46
ASSIGN COMPRESSION PROCEDURE ACCORDINGLY
48

5,535,312

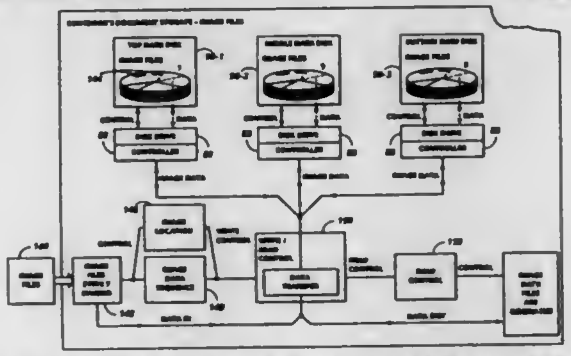
APPARATUS AND METHOD FOR MANAGING MEMORY IN A PRINTING SYSTEM

Tim D. Hammer, Ontario; Colleen R. Enzien, Penfield; Juan C. Acebo, Webster; M. John Ludlow, Rochester, and Keith A. May, Palmyra, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1993, Ser. No. 10,104

Int. Cl.^{6} H04N *1/21*

U.S. Cl. 395—115 9 Claims



1. In a printing system with memory for storing and buffering image data for use in producing a group of prints with each print being based on a portion of the stored and buffered image data, the printing system allocating memory space of the memory to one or more of a plurality of clients, one of which clients includes an image output terminal, communicating with the memory, for producing the group of prints, a memory management system, for optimizing memory allocation to the image output terminal, comprising:

a marking manager, communicating with the image output terminal, for determining maximum memory allocation required to store image data for producing a selected subgroup of the group of prints, said marking manager determining the maximum memory allocation by reading a group of memory allocation requests at selected time intervals, the group of memory allocation requests varying prior to or after at least one of the selected time intervals so that said determination of maximum memory allocation is dynamic;

a memory manager, communicating with the memory and said marking manager, for allocating memory space to the clients based on current demand for memory space by the clients, said marking manager requesting a memory allocation based on the determined maximum memory allocation; and

said memory manager determining whether the requested memory allocation from said marking manager is feasible based on current demand for memory space by the clients and, when the requested memory allocation from said marking manager is feasible, said memory manager granting the requested memory allocation from said marking manager so that memory space for storing image data corresponding with a portion of the group of prints is made available for the image output terminal.

5,535,313

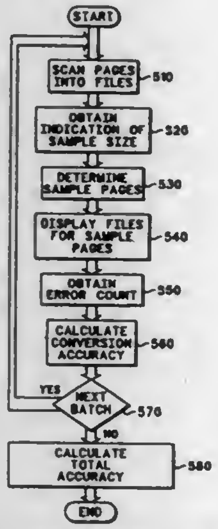
AUTOMATED QUALITY CONTROL IN A DOCUMENT CONVERSION SYSTEM

Suzanne E. Schwab, Apache Junction, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1994, Ser. No. 276,372

Int. Cl.^{6} G06K *9/03*

U.S. Cl. 395—118 7 Claims



1. A method of providing automated quality control in a document conversion system having a computer coupled to a scanner and a monitor, the method comprising the steps of:

(a) the scanner scanning one or more printed documents and converting the printed documents into digital data;

(b) the computer storing the digital data into one or more files;

(c) the computer obtaining from an operator an indication of a sample size;

(d) the monitor displaying to the operator a number of the files representing a number of sample pages of the printed documents, the number of sample pages being equal to the sample size indicated in step (c);

(e) the computer obtaining an error count from the operator observed by comparing the files displayed in step (d) to the printed documents scanned; and

(f) the computer calculating a conversion accuracy based on the error count obtained in step (e);

wherein step (c) comprises

(c1) calculating a page count of pages of the printed documents scanned,

(c2) obtaining a sample percentage from the operator, and

(c3) calculating the sample size based on the sample percentage applied to the page count; and

wherein step (d) comprises

(d1) applying a random number generator function to the page count to produce a number of randomly selected identifiers of the pages scanned, the number of randomly selected page identifiers being equal to the sample size, and

(d2) displaying the files representing the sample pages identified by the page identifiers.

5,535,314

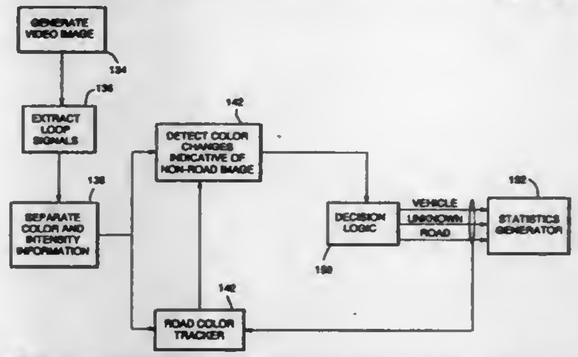
VIDEO IMAGE PROCESSOR AND METHOD FOR DETECTING VEHICLES

James F. Alves, Camarillo; Gerry R. Cacnio, Los Angeles, and David R. Stevens, Simi Valley, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 4, 1991, Ser. No. 787,200

Int. Cl.^{6} G06T *7/40*

U.S. Cl. 395—131 20 Claims



10. A method for detecting the presence of vehicles, said method comprising the steps of:

generating a plurality of multi-spectral video images of a scene;

superimposing an electronic video loop over said generated video images to define designated areas for extracting color data;

converting a plurality of analog color data contained in said generated video images to a plurality of digital color data for subsequent signal processing;

extracting said digital color data from said designated areas of said generated video images;

separating said digital color data from a plurality of digital intensity data within a digital signal processor and providing said digital color data to a central processing unit;

accumulating a histogram of roadway color data within a storage array for providing an estimate of a plurality of background roadway color data;

detecting color changes within said generated video images when compared to said estimate of background roadway color data; and

determining if a detected color change in a generated video image indicates a color other than said estimated background roadway color data and the presence of a vehicle.

5,535,315

GRAPHIC COLORING SYSTEM IN A GRAPHIC-DISPLAY SYSTEM HAVING SEPARATELY STORED SHAPE/POSITIONAL DATA AND COLOR DATA SELECTIVELY COMBINABLE TO FORM DESIRED IMAGES OF DIFFERING SHAPES AND COLORS

Yasunari Itoh, Yamato, Japan, assignor to PFU Limited, Kahoku, Japan

PCT No. PCT/JP92/01651, § 371 Date Aug. 13, 1993, § 102(e) Date Aug. 13, 1993, PCT Pub. No. WO93/12504, PCT Pub. Date Jun. 4, 1993

PCT Filed Dec. 18, 1992, Ser. No. 104,090

Claims priority, application Japan, Dec. 18, 1991, 3-334893

Int. Cl.^{6} G06T *11/60*

U.S. Cl. 395—131 4 Claims

1. A graphic display system having a display unit and selectively producing images, variously of the same shape and different colors and of the same color and different shapes, for display on the display unit and comprising:

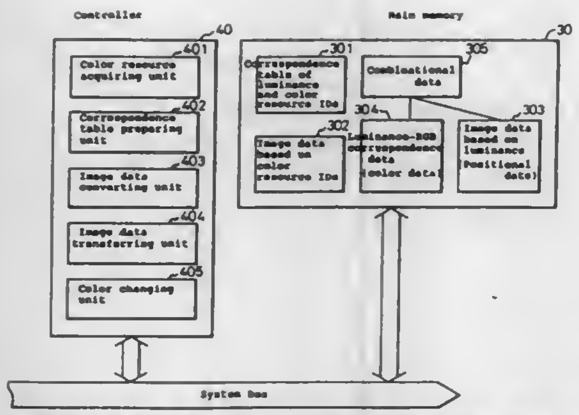
a main memory storing:

a correspondence table of luminance values and color resource identifiers,

image data based on color resource identifiers,

luminance-position data,

luminance-color correspondence data, and


Controller
Main memory
40
401
Color resource acquiring unit
402
Correspondence table preparing unit
403
Image data converting unit
404
Image data transferring unit
405
Color changing unit
30
301
Correspondence table of luminance and color resource IDs
305
Combinational data
302
Image data based on color resource IDs
304
Luminance-RGB correspondence data (color data)
303
Image data based on luminance (positional data)
System bus

combinational data of the luminance-position data and luminance-color data;

a controller;

a system bus interconnecting the controller, the main memory, the image memory and the display unit; and

the controller accessing the main memory through the system bus:

to obtain luminance-position image data in accordance with the combinational data,

to obtain the luminance of a given position in the image in accordance with the luminance-position image data,

to determine whether or not the correspondence table of luminance and color resource identifiers contains a color resource corresponding to the luminance for the given position, and

if the correspondence table contains the color resource, to obtain color values from the luminance-color correspondence data thereupon to write the color resource identifier to a corresponding point in the image data based on color resource identifiers but, if the correspondence table does not contain the color resource, then, to obtain the color resource and add it to the correspondence table to obtain color values from the luminance-color correspondence data and to set the color values for the color resource, and

the controller continuing the above steps until all positions in the image have been processed, thereupon to transfer the image data based on color resource identifiers to a video random access memory to be accessed for producing an image display on the display unit.

5,535,316

COMPUTER PROGRAM PRODUCT FOR SEARCHING LINE DATA IN GRAPHIC DATA BASE SYSTEM

Sakura Shinoaki, Fujisawa; Hiroto Sato, and Kyozo Tanaka, both of Tokyo, all of, Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan

Division of Ser. No. 19,707, Feb. 19, 1993. This application Oct. 3, 1995, Ser. No. 538,227

Claims priority, application Japan, Feb. 24, 1992, 4-72953

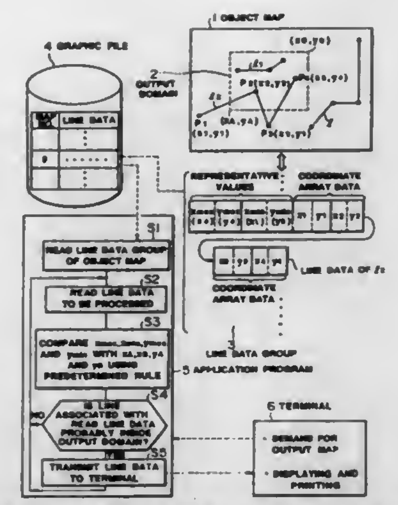
Int. Cl.^{6} G06T *15/00*

U.S. Cl. 395—134 **1 Claim**

1. A computer program product for use with a line data search system having a host computer and a terminal which is capable of communicating with the host computer, said host computer including a graphic file storing a plurality of line segments each of which is formed by arranging coordinates of characteristic points defining said line segments sequentially, said computer program product comprising:

first computer readable program code means for causing said host computer to read first line data representing a set of said line segments included in an object map from the graphic file;

second computer readable program code means for causing said host computer to store coordinates of setting points defining a rectangular output domain which is arbitrarily set in said object map;



third computer readable program code means for causing said host computer to obtain, for each of said first line data, maximum values and minimum values of said characteristic points constituting said first line data, each said maximum value and minimum value being obtained for each coordinate axis of said coordinates, thereby obtaining a rectangle defined by said maximum and minimum values;

fourth computer readable program code means for causing said host computer to compare each of said maximum values and minimum values with coordinates of said setting points to determine whether said rectangular output domain overlaps with said rectangle;

fifth computer readable program code means for causing said host computer to select said first line data associated with the rectangle which overlaps with said rectangular output domain as second line data;

sixth computer readable program code means for causing said host computer to transmit said second line data to an external terminal; and

a storing medium usable by said host computer and storing said first to sixth computer readable program code means.

5,535,317

GRAPH DISPLAY APPARATUS FOR DIFFERENT COORDINATE SYSTEMS

Hidekazu Tanaka; Kazuhiko Arikawa, both of Fussa; Yoshinori Asayama, Hamura; Syunsuke Akaza, Fussa; Kyoko Lin; Osamu Negishi, both of Akishima, and Mitsuru Okano, Fussa, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 343,770

Claims priority, application Japan, Nov. 25, 1993, 5-295068; Nov. 30, 1993, 5-299488

Int. Cl.^{6} G06T *11/00*

U.S. Cl. 395—140 **13 Claims**

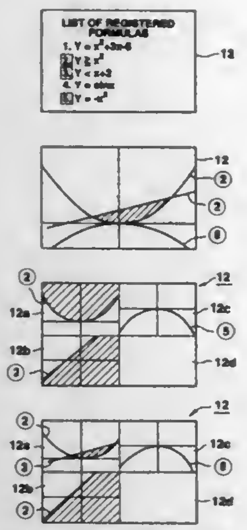
1. A graph display apparatus comprising:

graph display means capable of displaying a graph;

a plurality of display range data storage means for storing display range data of a plurality of formulas whose graphs are displayed on said graph display means;

display mode selection means for selecting one of a display mode for displaying graphs of the plurality of formulas on a single coordinate system and a display mode for displaying graphs of the plurality of formulas on different coordinate systems;

first display control means for, when said display mode selection means selects the display mode for displaying graphs of the plurality of formulas on a single coordinate system, displaying coordinate axes based on display range data stored in one of said plurality of display range data storage means on said graph display means, and displaying graphs of the plurality of formulas in correspondence with the coordinate axes; and



second display control means for, when said display mode selection means selects the display mode for displaying graphs of the plurality of formulas on different coordinate systems, reading out display range data corresponding to the plurality of formulas from said plurality of display range data storage means, and simultaneously displaying graphs of the plurality of formulas in corresponding display ranges.

5,535,318

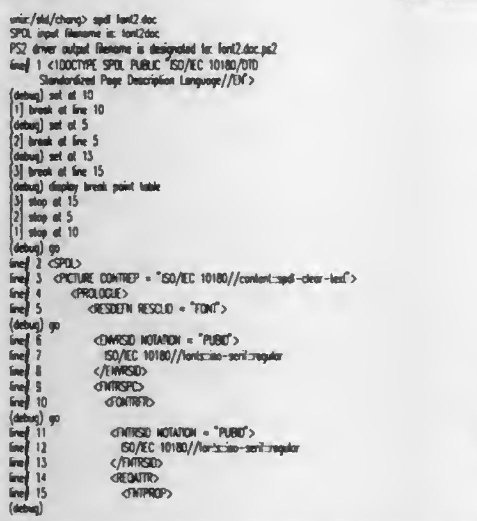
DEBUGGING SYSTEM FOR A HIERARCHICALLY STRUCTURED PAGE DESCRIPTION LANGUAGE

Tetsuro Motoyama, and Yueh-Lin Chang, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 146,724, Nov. 2, 1993, Pat. No. 5,422,992, and a continuation-in-part of Ser. No. 119,930, Sep. 10, 1993, Pat. No. 5,446,837, each which is a continuation-in-part of Ser. No. 87,571, Jul. 2, 1993, which is a continuation-in-part of Ser. No. 931,808, Aug. 11, 1992, Pat. No. 5,416,896, which is a continuation-in-part of Ser. No. 876,601, Apr. 30, 1992, Pat. No. 5,319,748, and a continuation-in-part of Ser. No. 876,251, Apr. 30, 1992, Pat. No. 5,325,484. This application Jan. 11, 1994, Ser. No. 180,015

Int. Cl.^{6} G06F *11/32*

U.S. Cl. 395—145 **16 Claims**



```
unix:/sld/chang> spdl font2.doc
SPDL input filename is: font2.doc
PS2 driver output filename is designated to: font2.doc.ps2
line# 1 <!DOCTYPE SPDL PUBLIC "ISO/IEC 10180/DTD
      Standardized Page Description Language//EN">
(debug) set at 10
[1] break at line 10
(debug) set at 5
[2] break at line 5
(debug) set at 13
[3] break at line 15
(debug) display break point table
[3] stop at 15
[2] stop at 5
[1] stop at 10
(debug) go
line# 2 <SPDL>
line# 3  <PICTURE CONTREP = "ISO/IEC 10180//content:spdl-clear-text">
line# 4     <PROLOGUE>
line# 5       <RESDEFN RESCLID = "FONT">
(debug) go
line# 6         <ENVRSID NOTATION = "PUBID">
line# 7          ISO/IEC 10180//fonts:iso-serif:regular
line# 8         </ENVRSID>
line# 9         <FNTRSPC>
line# 10          <FONTREF>
(debug) go
line# 11            <FNTRSID NOTATION = "PUBID">
line# 12             ISO/IEC 10180//fonts:iso-serif:regular
line# 13            </FNTRSID>
line# 14            <REQATTR>
line# 15              <FNTPROP>
(debug)
```

1. A method for implementation in a computer of processing and debugging a hierarchically structured document, comprising the steps of:

setting a break point at a line of the document;

creating a data structure for keeping track of hierarchical levels of the document;

inputting an element indicating a beginning of a first hierarchical level of the document;

creating a plurality of references for an entry A in said data structure for keeping track of hierarchical levels, said plurality of references for the entry A being used to keep track of information of the first hierarchical level of the document including references used for keeping track of at least one of defined resources, declared resources, and dictionaries which are used during processing of the document;

inputting an element at the first hierarchical level indicating that a first of said at least one of defined resources, declared resources, and dictionaries is to be used during processing of the document;

changing at least one of the references for the entry A used for keeping track of information to refer to said first of said at least one of defined resources, declared resources, and dictionaries;

inputting an element indicating a beginning of a second hierarchical level of the document which is below the first hierarchical level in the hierarchical structure of the document;

creating a plurality of references for an entry B in said data structure for keeping track of hierarchical levels, the entry B being different from the entry A in said data structure for keeping track of hierarchical levels, said plurality of references for the entry B being used to keep track of information of the second hierarchical level of the document including references used for keeping track of at least one of defined resources, declared resources, and dictionaries which are used during processing of the document;

inputting an element at the second hierarchical level indicating that a second of said at least one of defined resources, declared resources, and dictionaries is to be used during processing of the second hierarchical level, in addition to said first of said at least one of defined resources, declared resources, and dictionaries;

changing the reference used for keeping track of said at least one of defined resources, declared resources, and dictionaries for the entry B to refer first to said second of said at least one of defined resources, declared resources, and dictionaries and subsequently to said first of said at least one of defined resources, declared resources, and dictionaries;

accessing said at least one of defined resources,, declared resources, and dictionaries by using first the reference to the second of said at least one of defined resources, declared resources, and dictionaries and if a desired parameter is not found, using subsequently the subsequent reference to the second of said at least one of defined resources, declared resources, and dictionaries, without referring to said plurality of references for the entry A;

suspending processing of the document when said break point is processed;

inputting a debugging command after processing has been suspended; and

processing said debugging command.

5,535,319

METHOD OF CREATING AND DETECTING DEVICE INDEPENDENT CONTROLS IN A PRESENTATION DATA STREAM

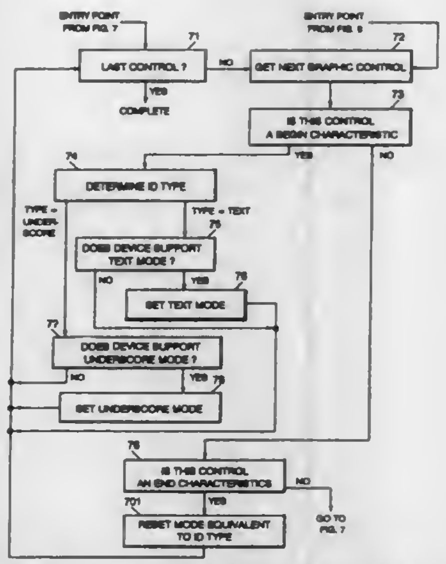
Robert A. Pascoe, Grapevine, and David L. Ehnebuske, Irving, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1990, Ser. No. 509,261

Int. Cl.^{6} G06F *17/22*

U.S. Cl. 395—148 **5 Claims**

1. A method of interpreting a presentation data stream having limitations created by a generator employing a specific process, so



that a plurality of receivers adaptable to the limitations of said presentation data stream achieves the most efficient presentation of said presentation data stream for a selected one of said receivers; said method comprising the steps of:

detecting a begin data characteristic control indicating the beginning of limitations within said presentation data stream and an end data characteristic control indicating the end of limitations within said presentation data stream;

detecting an identification field for said begin data characteristic control and said end data characteristic control defining the specific process used to generate the limitations within said presentation data stream;

determining for said selected one of said receivers a presentation mode based on the limitations within said identification field in said presentation data stream; and

outputting said presentation data stream in said presentation mode for said selected one of said receivers.

5,535,320

METHOD OF GENERATING A VISUAL DESIGN

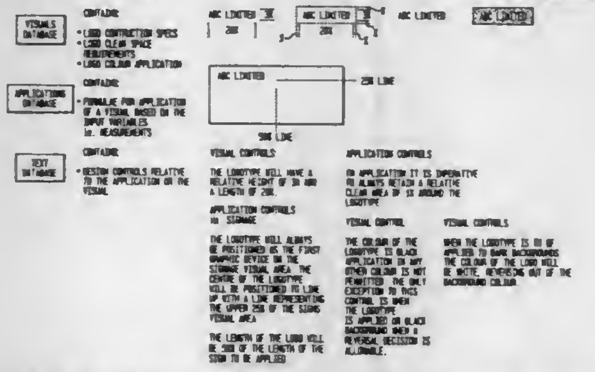
Clive H. Gay, Riverside Three, Albert Wharf, Hester Road, Battersea, London, SW11 4AN, England, and Henri W. Frencken, 26 The Farthings, Brunswick Road, Kingston-Upon-Thames, London, England

Filed Jul. 1, 1994, Ser. No. 268,613

Claims priority, application United Kingdom, Jul. 2, 1993, 9313761

Int. Cl.^{6} G06F *15/62*

U.S. Cl. 395—150 **20 Claims**



1. A method of generating a representation of a visual design comprising:

storing data defining a plurality of visual design elements;

storing data defining a plurality of predetermined design parameters;

selecting one of a plurality of predetermined visual design applications, wherein each one of said plurality of predetermined visual design applications is associated with one or more of said plurality of predetermined design parameters;

selecting at least one visual design element for inclusion in the visual design;

generating a visual design utilizing the selected visual design element, the size and position of the element in the visual design being determined by the predetermined design parameters associated with the selected design application; and

generating a representation of the visual design.

5,535,321

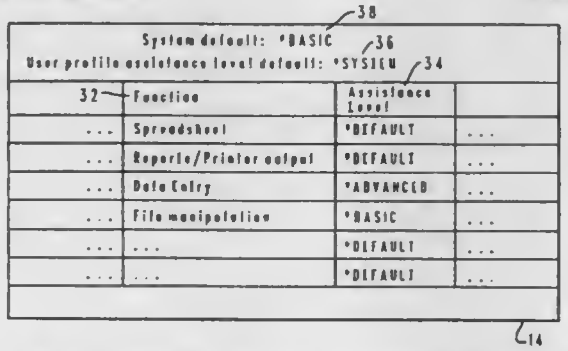
METHOD AND APPARATUS FOR VARIABLE COMPLEXITY USER INTERFACE IN A DATA PROCESSING SYSTEM

Timothy J. Massaro, and Dennis J. Schmidt, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,870

Int. Cl.^{6} G06T *1/00*

U.S. Cl. 395—155 **7 Claims**


38
36
34
32
14

System default: *BASIC
User profile assistance level default: *SYSVAL

	Function	Assistance Level	
...	Spreadsheet	*DEFAULT	...
...	Reports/Printer output	*DEFAULT	...
...	Data Entry	*ADVANCED	...
...	File manipulation	*BASIC	...
...	...	*DEFAULT	...
...	...	*DEFAULT	...

1. A method in a data processing system for an enhanced user interface for use with a multiple function application, said method comprising the steps of:

establishing multiple user interfaces for each of a plurality of functions within said multiple function application, each of said multiple user interfaces having a differing level of complexity;

creating a user profile for at least one user within said data processing system, said user profile specifying a different desired level of complexity for said at least one user with respect to each of at least two of said plurality of functions within said multiple function application;

selectively altering said user profile in response to an occurrence of a selected event;

determining if said user profile specifies a level of complexity for a particular function within said multiple function application in response to a selection of said particular function by said at least one user;

utilizing said user profile to automatically select a particular one of said multiple user interfaces for said particular function if said user profile specifies a level of complexity for said particular function within said multiple function application; and

automatically selecting a default user interface from said multiple user interfaces in response to a failure of said user profile to specify a level of complexity for said particular function within said multiple function application.

5,535,322

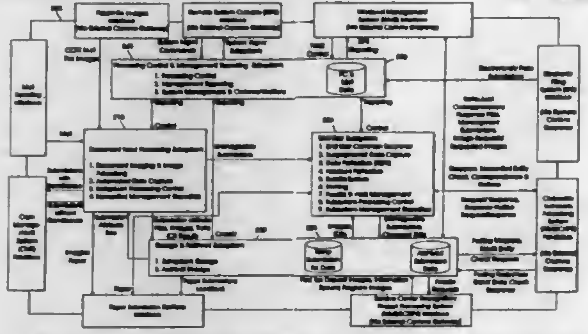
DATA PROCESSING SYSTEM WITH IMPROVED WORK FLOW SYSTEM AND METHOD

Matthew S. Hecht, Potomac, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1992, Ser. No. 967,090

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 395—155 **16 Claims**



1. In a data processing system, a method for managing and controlling the flow of imaged documents comprising work items from one function to the next in an application process to achieve the complete processing of said work items, comprising the steps of:

assigning in the data processing system, a unique submission identifier to each incoming submission;

establishing in the data processing system, a repository for work-in-process (WIP) submissions, having an attribute-based file system for WIP submission attributes, and an attribute-based file system for said WIP submission contents;

establishing in the data processing system, a data base of WIP submission attributes that for each submission includes a current state attribute;

storing in the data processing system, said WIP submission contents as files in a distributed file system;

establishing in the data processing system, a repository for archived submissions, having an attribute-based file system for archived submission attributes, and an attribute-based file system for archived submission contents;

defining in the data processing system, when to archive submission contents, when to archive submission attributes, and when to erase submissions from the repository of WIP submissions;

partitioning in the data processing system, an application process into distributed software services and defining a remote procedure call (RPC) interface for each component application service;

defining in the data processing system, an application work flow process with:

a state transition diagram (STD) that uses said application work flow process;

a list of the STD-using application work flow processes;

a service-specific structure of work queues;

for each service, a structure of the work queue, and

policy parameters for the assignment of work queues to services;

executing in the data processing system, a software, work flow, system architecture with functions for a WIP manager, to process incoming work items in priority order from a recoverable priority queue and to move WIP submissions through STD defined states;

a work queue manager, to manage application and service-specific, recoverable work queues and a work queue assignment table, and to assign work queues to services;

a WIP submission attributes data base manager, to maintain the state of each WIP submission; and

performing in the data processing system, a common pull system protocol for the WIP manager and work queue manager together to communicate with application services.

5,535,323

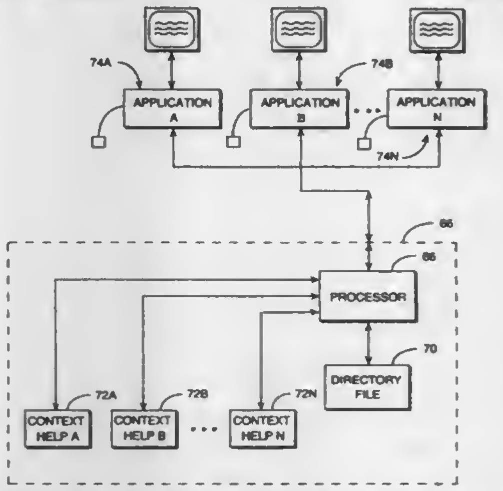
METHOD OF AND SYSTEM FOR DISPLAYING CONTEXT SENSITIVE AND APPLICATION INDEPENDENT HELP INFORMATION

James S. Miller, Arlington, Mass., and Jagadeesan Ganapathi, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 906,233, Jun. 29, 1992, abandoned. This application Aug. 9, 1995, Ser. No. 513,143

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—155 **8 Claims**



1. A method for displaying help information using a help information program to a user of a first application running on a computer having an identifiable active context, said help information program being external to said first application, and a second non-running application, said second application baving a non-active context said second application being external to said help information program and said first application, said method comprising the steps of:

identifying said active context corresponding to said first application and identifying said non-active context corresponding to said second application;

identifying a user selection about which help information is sought;

determining whether said user selection corresponds to said active or said non-active context;

constructing a help information menu corresponding to said user selection; and

displaying said help information menu to the user without interrupting said first application.

5,535,324

METHOD AND SYSTEM FOR DRAGGING AND PLOTTING NEW DATA ONTO AN EMBEDDED GRAPH

Cesar Alvarez, and Lisa R. James, both of Kirkland, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Sep. 22, 1994, Ser. No. 310,644

Int. Cl.^{6} G06F *3/14*

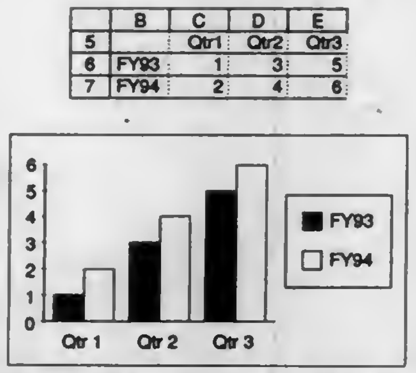
U.S. Cl. 395—161 **12 Claims**

1. A method for selecting new data contained in a computer's memory and displayed in cells forming a first tabular chart on said computer's display screen and graphically plotting said selected new data onto an existing non-tabular chart created from data displayed in cells forming a second tabular chart, comprising the steps of:

selecting said new data displayed in cells forming said first tabular chart on said computer screen, said selected new data to be incorporated into said existing non-tabular chart;

determining a bounding box quadrant of said second tabular chart, said bounding box encompassing said second tabular chart;

determining the quadrant in which said selected new data is located;



determining whether said bounding box quadrant and said quadrant in which said selected new data is located are the same or adjoining quadrants; and

integrating said selected new data into said existing non-tabular chart if said selected new data is in the same or an adjoining quadrant to said bounding box quadrant.

5,535,325

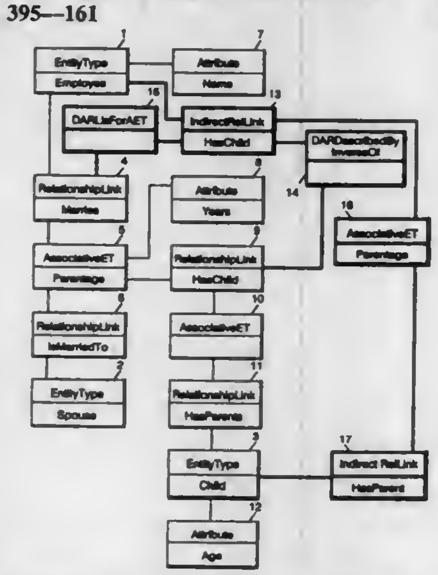
METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING DATABASE DEFINITIONS OF INDIRECT FACTS FROM ENTITY-RELATIONSHIP DIAGRAMS

Kevin T. Cattell, Garner; William R. Cromer, Raleigh, both of N.C.; Shihta Lin, San Jose, Calif.; Bruce E. Neuchterlein, Cary, and Thomas E. Potok, Apex, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1994, Ser. No. 358,273

Int. Cl.^{6} G06F *15/00;7/00;15/40*

U.S. Cl. 395—161 **10 Claims**



1. In a computer system comprising a computer processor, a database storage, a display and input means, a program memory and a program loaded therein wherein said loaded program automatically generates and displays on said display a database definitional plan for indirect facts associated with the database entity data, a computer process comprising steps performed in said computer of:

generating in said processor of said computer and displaying on said display means a first graphical placeholder block in a database definitional diagram for a user identified target indirect fact regarding a user identified target entity in an entity-relationship (ER) model of the user's business environment;

generating in said processor and displaying on said display means a second graphical placeholder block in a database definitional diagram for an indirect fact derivation argument;

generating in said processor and displaying on said display means a third graphical placeholder block in a database definitional diagram for an indirect fact derivation argument for an associative entity type relationship link;

generating in said processor and displaying on said display means a graphical path connecting said first graphical placeholder block to the said base entity of said database definitional diagram;

generating in said processor and displaying on said display means a graphical path connecting said second graphical placeholder block to said first graphical placeholder block;

generating in said processor and displaying on said display means a graphical path connecting said third graphical placeholder block to said first graphical placeholder block;

generating in said processor and displaying on said display means a graphical path connecting said third graphical placeholder block to the first relationship link representational block in said database definitional diagram encountered in a traverse of said diagram from said base entity of said diagram to said first graphical placeholder block; and

generating in said CPU and displaying on said display means a graphical path connecting said second graphical placeholder block to said user identified target entity.

5,535,326

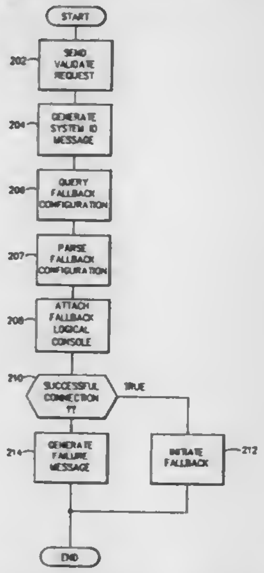
SYSTEM AND METHOD FOR LOGICAL CONSOLE VERIFICATION AND FEEDBACK

Michael E. Baskey, Wappingers Falls, N.Y.; Colette A. Mastrangelo, Danbury, and Paul M. Mayer, Middlebury, both of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 246,380, May 20, 1994, abandoned, which is a continuation of Ser. No. 922,907, Jul. 31, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,375

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—182.02 **20 Claims**



1. In an information handling system in which a resource is coupled to a primary logical console via a primary control path and to a fallback logical console via a fallback control path, said resource being normally controlled by said primary logical console via said primary control path but being switchable to said fallback control path for control by said fallback logical console, said fallback logical console being accessible to said resource via said fallback control path independently of whether said resource is being controlled by said fallback logical console, a method of handling the switching of said resource from said primary control path to said fallback control path, comprising the steps of:

prior to switching said resource to said fallback control path, transmitting a verification message from said resource to said fallback logical console via said fallback control path;

determining whether said verification message has been received by said fallback logical console;

switching said resource to said fallback control path in response to a determination that said verification message has been received by said fallback logical console; and

terminating fallback processing without switching said resource to said fallback control path in response to a determination that said verification message has not been received by said fallback logical console.

5,535,327

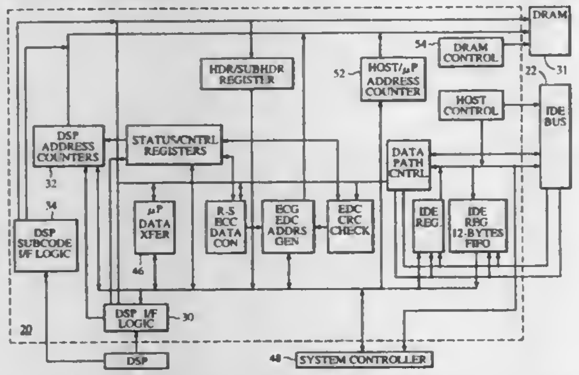
METHOD AND APPARATUS FOR COMMUNICATING FORMATTED DATA FROM A MENU STORAGE DEVICE TO A HOST COMPUTER

Phil Verinsky, and Gene Weddle, both of San Jose, Calif., assignors to Oak Technology, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 264,600, Jun. 23, 1994. This application Jul. 21, 1995, Ser. No. 505,557

Int. Cl.^{6} G06F *11/10;3/08;* **G11B** *21/10*

U.S. Cl. 395—182.03 **9 Claims**



1. A method for communicating formatted data from a mass storage device to a host computer comprising the steps of:

sequentially receiving a multiplicity of formatted data sectors front the mass storage device, each of the formatted data sectors comprising a user data section and an auxiliary data section, the auxiliary data section including an EDC data field and an ECC data field;

defining a user data storage area and a separate auxiliary data storage area within a memory means;

defining the user data storage area to comprise a multiplicity of sequentially organized user data storage blocks, each of the user data storage blocks for storing a user data section;

defining the auxiliary data storage area to comprise a plurality of sequentially organized auxiliary data storage blocks, each of the auxiliary data storage blocks for storing an auxiliary data section;

sequentially separating each of the multiplicity of formatted data sectors into a user data section and an auxiliary data section;

sequentially storing each of the user data sections in the user data storage blocks, such that a first one of the user data sections is stored in a first one of the first user data storage blocks and each subsequent user data section is stored in each subsequent user data storage block;

sequentially storing each of the auxiliary data sections in the auxiliary data storage blocks, such that a first one of the auxiliary data sections is stored in a first one of the auxiliary data storage blocks and each subsequent auxiliary data section is stored in each subsequent auxiliary data storage block;

generating a multiplicity of sequential block numbers, such that a first one of the block numbers indicates the starting address of the first user data storage block, and each subsequent block number indicates the starting address of each subsequent user data storage block;

sequentially transmitting predetermined block numbers of the multiplicity of sequential block numbers to the host computer;

sequentially performing error detection and error correction operations on each of the user data sections, the error detection and error correction operations comprising the steps of;

(a) reading the EDC data field and the ECC data field of the auxiliary data section stored in the first auxiliary data block and transmitting the data to an EDC and ECC circuit;

(b) reading the user data section stored the first user data storage block and transmitting the data section to the EDC and ECC circuit;

(c) performing EDC and ECC operations on the user data section using the EDC data and ECC data from the auxiliary data section to provide error corrected user data;

(d) writing the error corrected user data to the first user data storage block;

(e) reading the EDC data field and the ECC data field of the auxiliary data section stored in a subsequent auxiliary data block and transmitting the data to the EDC and ECC circuit;

(f) reading the user data section stored in a subsequent user data storage block and transmitting the data section to the EDC and ECC circuit;

(g) performing EDC and ECC operations on the subsequent user data section using the EDC data and ECC data from the subsequent auxiliary data section to provide error corrected user data;

(h) writing the error corrected user data to the subsequent user data storage block; and

(i) repeating steps e to h for each subsequent user data section until each subsequent user data section has been error corrected and written to its user data storage block;

when requested by the host computer, communicating the first block number to the host computer for transmitting a predetermined portion of the user data section stored in the first user data storage block to the host computer; and

when requested by the host computer, communicating subsequent block numbers to the host computer for transmitting a predetermined portion of subsequent user data sections stored in subsequent user data storage blocks to the host computer, whereby, when requested by the host computer, each subsequent block number is transmitted to the host computer for transmitting a predetermined portion of each subsequent user data section stored in each subsequent user data storage block to the host computer for transmitting user data to the host computer.

5,535,328

NON-VOLATILE MEMORY SYSTEM CARD WITH FLASH ERASABLE SECTORS OF EEPROM CELLS INCLUDING A MECHANISM FOR SUBSTITUTING DEFECTIVE CELLS

Eliyahou Harari, Los Gatos; Robert D. Norman, San Jose, and Sanjay Mehrotra, Milpitas, all of Calif., assignors to SanDisk Corporation, Santa Clara, Calif.

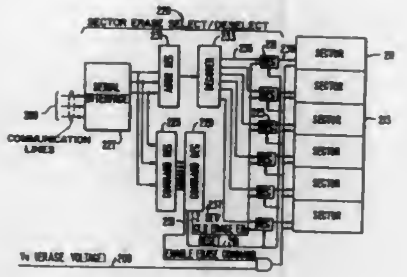
Continuation of Ser. No. 174,768, Dec. 29, 1993, which is a continuation of Ser. No. 963,838, Oct. 20, 1992, Pat. No. 5,297,148, which is a division of Ser. No. 337,566, Apr. 13, 1989, abandoned. This application Feb. 23, 1995, Ser. No. 393,569

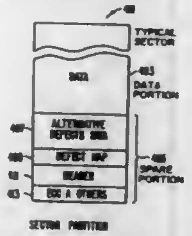
Int. Cl.^{6} G06F *12/00;11/16*

U.S. Cl. 395—182.05 **14 Claims**

5. A method of operating a computer system including a processor and a memory system, wherein the memory system includes an array of non-volatile floating gate memory cells partitioned into a plurality of sectors that individually include a distinct group of said array of memory cells that are erasable together as a unit, comprising:

providing said memory array and a memory controller within a card that is removably connectable to the computer system,





said controller being connectable to said processor for controlling operation of the array when the card is connected to the computer system,

reserving a portion of the memory cells within the individual sectors as spare cells, remaining cells of the individual sectors being designated for storing data,

enabling the controller to detect when a cell within the data portion of a sector becomes defective,

causing the controller to store an address of such a detected defective cell, and

thereafter causing the controller to substitute for the defective cell a redundant cell from the spare cells of the sector in which the defective cell is detected.

5,535,329

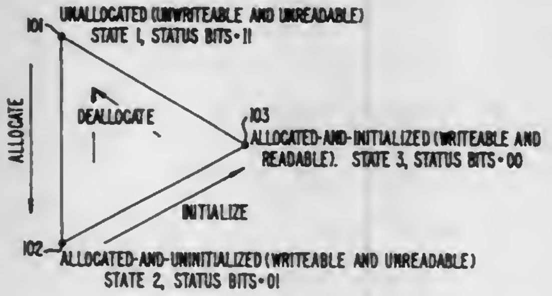
METHOD AND APPARATUS FOR MODIFYING RELOCATABLE OBJECT CODE FILES AND MONITORING PROGRAMS

Reed Hastings, La Honda, Calif., assignor to Pure Software, Inc., Sunnyvale, Calif.

Division of Ser. No. 246,438, May 20, 1994, which is a division of Ser. No. 970,315, Nov. 2, 1992, Pat. No. 5,335,344, which is a continuation of Ser. No. 718,573, Jun. 21, 1991, Pat. No. 5,193,180. This application May 26, 1995, Ser. No. 452,452

Int. Cl.^{6} C06F *11/00*

U.S. Cl. 395—183.11 **13 Claims**


101
UNALLOCATED (UNWRITEABLE AND UNREADABLE) STATE 1, STATUS BITS=11
ALLOCATE
DEALLOCATE
103
ALLOCATED-AND-INITIALIZED (WRITEABLE AND READABLE). STATE 3, STATUS BITS=00
INITIALIZE
102
ALLOCATED-AND-UNINITIALIZED (WRITEABLE AND UNREADABLE) STATE 2, STATUS BITS=01

1. A computer implemented method for generating machine instructions including memory access monitoring instructions, said method comprising the steps of:

receiving as input a first set of machine instructions, said first set of machine instructions being specific to a computer processor with each machine instruction of said first set corresponding to an instruction executable by said computer processor, said first set of machine instructions including memory access instructions that access a region of memory; and

generating a second set of machine instructions from said first set of machine instructions and having additional machine instructions that are memory monitoring instructions, said memory monitoring instructions checking memory status information for said region of memory accessed by said memory access instructions, said memory status information including an allocated state and an unallocated state.

5,535,330

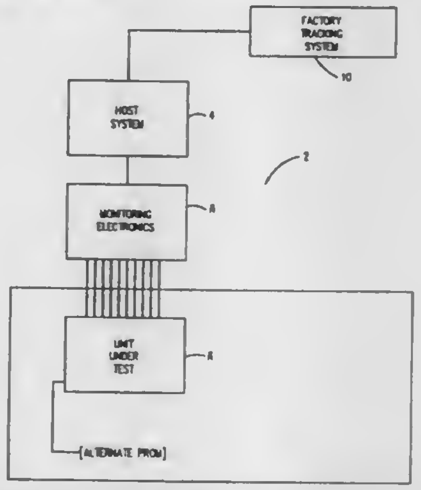
SYSTEM AND METHOD FOR ERROR LOCATION IN PRINTED WIRE ASSEMBLIES BY EXTERNAL POWER ON SELF TEST (POST) COMMANDS

James S. Bell, Cedar Park, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jul. 22, 1994, Ser. No. 279,759

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—183.12 **18 Claims**



1. A system for detecting and locating failure errors in a printed wire assembly contained in a device performing a power on self test comprised of testing subroutines, said testing subroutines are location detection subroutines, said printed wire assemblies being tracked through a manufacturing process by a factory tracking system, comprising:

circuitry for monitoring said device to determine whether a run error results on execution of said power on self test, said .circuitry for monitoring being in communication with said device;

circuitry for generating a command to said device in response to detection of said run error by said circuitry for monitoring, said circuitry for generating being in communication with said circuitry for monitoring and wherein said circuitry for generating is external to said device and said command is input to said device and alerts said power on self test to separately execute each of said testing location detection subroutines;

circuitry for causing said power on self test to separately execute said testing location detection subroutines, said circuitry for causing being in communication with said circuitry for generating and being activated to begin separately executing said testing location detection subroutines of said power on self test upon receipt by said device of said command from said circuitry for generating;

circuitry for signalling said system when a subroutine run error occurs during separate execution of said testing location detection subroutines, said circuitry for signalling being in communication with said system.

5,535,331

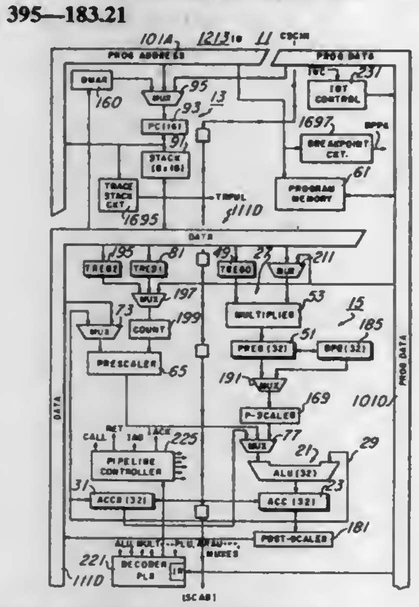
PROCESSOR CONDITION SENSING CIRCUITS, SYSTEMS AND METHODS

Gary L. Swoboda, Sugar Land, and Peter N. Ehlig, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 388,286, Jul. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 93,463, Sep. 4, 1987, abandoned, Ser. No. 140,055, Dec. 31, 1987, Pat. No. 5,109,494, Ser. No. 140,192, Dec. 31, 1987, Pat. No. 5,101,498, Ser. No. 347,968, May 4, 1989, abandoned, Ser. No. 347,969, May 4, 1989, abandoned, Ser. No. 347,605, May 4, 1989, abandoned, Ser. No. 347,596, May 4, 1989, Pat. No. 5,072,418, Ser. No. 347,615, May 4, 1989, Pat. No. 5,142,677, Ser. No. 347,966, May 4, 1989, Pat. No. 5,155,812, and Ser. No. 347,967, May 4, 1989, abandoned. This application Feb. 3, 1992, Ser. No. 830,110

Int. Cl.^{6} G06F *11/267;11/34*

U.S. Cl. 395—183.21 **16 Claims**



1. A data processing device comprising:

a program counter, a program counter stack, a trace stack and means for causing the program counter to count through a series of addresses; and

a control circuit for entering a jump address into said program counter in substitution for a current address in the series, thereby establishing a discontinuity, said control circuit including means for pushing the current address onto the program counter stack and the jump address onto the trace stack.

5,535,332

SHARED-DATA ALTERATION STATUS MANAGEMENT APPARATUS

Eiji Ishida, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 82,967, Jun. 29, 1993, abandoned. This application Sep. 26, 1995, Ser. No. 533,941

Claims priority, application Japan, Jun. 30, 1992, 4-194707

Int. Cl.^{6} G06F *15/40*

U.S. Cl. 395—200.01 **17 Claims**

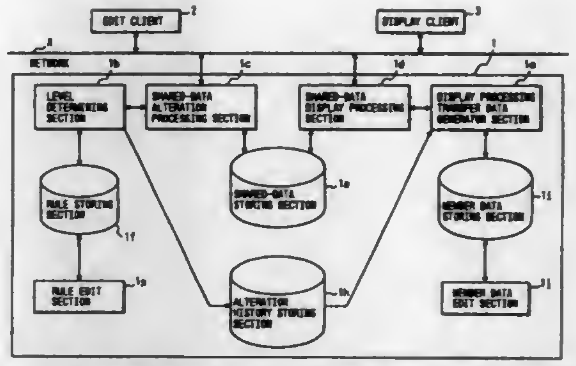
1. A shared-data alteration status management system in which different group members have different first levels of editing interest, said system comprising:

editing means for editing data shared by group members;

the group members being assigned with respective editing interest levels;

shared means for controlling the shared data and alteration status data having one or more pieces of information, each piece of information representative of a status of an alteration of said shared data by each editing operation of the editing means by a group member, said shared means generating alteration status data for display in accordance with a first editing interest level of a group member who issues a display request, the generated alteration status data for the respective editing interest levels having respective representations of pieces of the information in correspondence to the level of interest; and

display means for changing said shared data progressively in accordance with said generated alteration status data received from said shared-data control means, said display means progressively displaying the changing shared data.


EDIT CLIENT
2
DISPLAY CLIENT
3
NETWORK
1b
1c
1d
1
1e
LEVEL DETERMINING SECTION
SHARED-DATA ALTERATION PROCESSING SECTION
SHARED-DATA DISPLAY PROCESSING SECTION
DISPLAY PROCESSING TRANSFER DATA GENERATOR SECTION
RULE STORING SECTION
1f
SHARED-DATA STORING SECTION
MEMBER DATA STORING SECTION
RULE EDIT SECTION
1g
ALTERATION HISTORY STORING SECTION
1h
MEMBER DATA EDIT SECTION

5,535,333

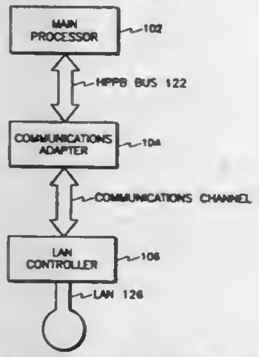
ADAPTER FOR INTERLEAVING SECOND DATA WITH FIRST DATA ALREADY TRANSFERRED BETWEEN FIRST DEVICE AND SECOND DEVICE WITHOUT HAVING TO ARBITRATE FOR OWNERSHIP OF COMMUNICATIONS CHANNEL

James J. Allen, Jr.; Ronald J. Cooper; Douglas H. Cox, all of Raleigh; William L. McNeil, Cary; Herbert Rivera-Sanchez, Durham, and Terri L. Tomlinson, Louisburg, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1993, Ser. No. 40,317

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.03 **18 Claims**



1. A communications adapter for coupling a first device, coupled to said communications adapter by a communications channel, to a second device, coupled to said communications adapter by a data bus, for interleaving second data with first data already being transferred between the first device and the second device, wherein the communications channel and the data bus may operate at different speeds, comprising:

first means for transferring the first data between the first and second devices;

second means for receiving the second data from one of the first and second devices, wherein the received second data is to be transferred to the other one of the first and second devices; and

third means, coupled to said first and second means, for interleaving the received second data with the first data already being transferred;

wherein the second data is transferred without having to arbitrate for ownership of the communications channel or data bus over which said data transfer between the first and second device is occurring.

5,535,334

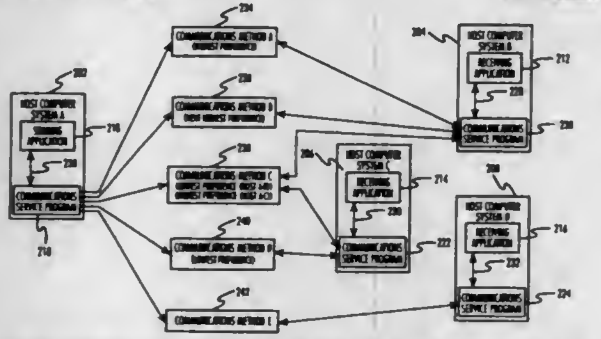
FAULT-TOLERANT SYSTEM-TO-SYSTEM COMMUNICATIONS SYSTEM AND METHOD UTILIZING MULTIPLE COMMUNICATIONS METHODS TO TRANSFER A SINGLE MESSAGE

Kevin L. Merkley, Longmont; Kurt G. Schumacher, and Alan R. Sutton, both of Boulder, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 10,793, Jan. 29, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,236

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.15 **21 Claims**



17. A computer-based communications system having a plurality of host computer systems for enabling communications between a sending application program residing on a sending host computer system and a receiving application program residing on a receiving host computer system via a plurality of communications methods, said communications system comprising:

first communications servicing means associated with the sending host computer system for processing communications requests from the sending application program, said first communications servicing means comprising,

initialization means for determining which of the plurality of communications methods supporting communications between the sending host computer system and the receiving host computer system are available, and for prioritizing said available communications methods based on user-assigned preferences;

selecting means for selecting a selected communications method having a protocol and an error detection capability, for communications with said receiving host computer system, said selected communications method being a highest priority communications method of said available communications methods;

selected communications method means for communicating over said selected communications method using said protocol of said selected communications method and for determining if an error occurred in said sending of said data using said error detection capability of said selected communications method;

communications method switching means for automatically selecting an alternative communications method from said available communications methods, said alternative communications method having a next-lower priority than said selected communications method; and

notification means for notifying said receiving host computer system via said alternative communications method that future communications between the sending host computer system and the receiving host computer system shall occur via said alternative communications method; and

second communications servicing means associated with the receiving host computer system for receiving said data from the sending host computer system over the plurality of host communications methods, said second communications servicing means comprising,

communications polling means for periodically attempting to establish and maintain communications with the sending host computer system via each of the plurality of communications methods using the protocol of the each of said communications methods;

communications method receiving means for receiving data over the plurality of communications methods using the protocol of each of said plurality of communications methods; and

first notification processing means for receiving and processing said notification from said first communications service means via said alternative communications method.

5,535,335

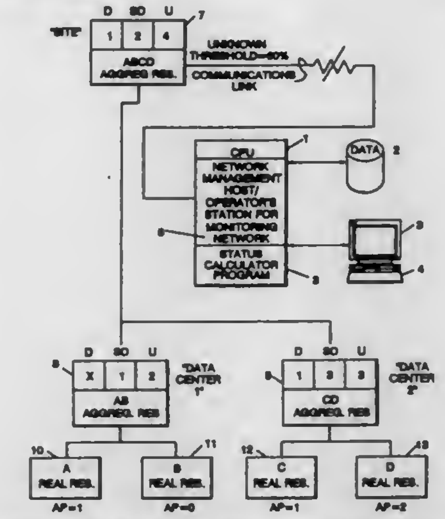
METHOD AND SYSTEM FOR REPORTING THE STATUS OF AN AGGREGATE RESOURCE RESIDING IN A NETWORK OF INTERCONNECTED REAL RESOURCES

David E. Cox, Raleigh; Karl D. Gottschalk, Durham; Craig M. Lawton; John F. Linton, both of Raleigh, and John P. Whitfield, Apex, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 995,602, Dec. 22, 1992, abandoned. This application May 5, 1995, Ser. No. 435,558

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—200.11 **8 Claims**



1. A computer implemented method for determining the operational status of an aggregate resource residing in a network of interconnected real resources, said aggregate resource being defined as a logical resource including a plurality of real resources and represented by a configuration record stored in a database wherein said configuration record contains a list of said real resources and a current operational status and an aggregation priority value for each said real resource and further contains a plurality of predefined parameter values that are used to determine the operational status of said aggregate resource, said method being executed by a monitoring computer and comprising the steps of:

determining from said configuration record the number of real resources contained within said aggregate resource and having an operational status of a first type;

comparing said number of real resources having the operational status of said first type with said plurality of predefined parameter values and assigning said aggregate resource an operational status corresponding to the largest of said predefined parameter values that is equalled or exceeded by said number of real resources having the operational status of said first type; and

if said number of real resources having the operational status of said first type is less than the smallest of said predefined parameter values, determining if any of said real resources having the operational status of said first type also has a non-zero aggregation priority value, such that:

for each said real resource having the operational status of said first type and said non-zero aggregation priority value, determining if the operational status of said real resource should be assigned as said operational status of said aggregate resource;

if the operational status of any of each said real resource should be assigned as the operational status of said aggregate resource, assigning said operational status of said real resource to said operational status of said aggregate resource; and

if the status of each said real resource should not be reflected in said operational status of said aggregate resource, assigning said aggregate resource an operational status of satisfactory.

5,535,336

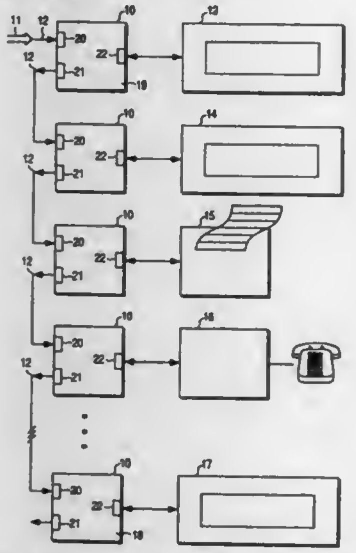
APPARATUS AND METHOD FOR ENABLING A NETWORK INTERFACE TO DYNAMICALLY ASSIGN AN ADDRESS TO A CONNECTED COMPUTER AND TO ESTABLISH A VIRTUAL CIRCUIT WITH ANOTHER NETWORK INTERFACE

Ralph S. Smith, Forest Grove, Oreg., and William J. Kruegeer, Redmond, Wash., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 97,327, Jul. 26, 1993, abandoned, which is a continuation of Ser. No. 939,399, Aug. 31, 1992, abandoned, which is a continuation of Ser. No. 585,309, Sep. 19, 1990, abandoned. This application May 1, 1995, Ser. No. 431,477

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.06 **15 Claims**



1. A computer network interface device for connecting a node with a computer network and providing distributed control of said computer network, said computer network interface device comprising:

a. means for communicating with another computer network interface device using network signals and network commands, said means for communicating including,
  i. a network daisy chain interface for use during initialization and self identification of said computer network interface device, and
  ii. a network bus interface for performing information transfers over said computer network;

b. a controller for interpreting and responding to said network signals and network commands, said controller coupled to said network daisy chain interface and said network bus interface, said controller further including,
  iii. dynamic self-identification means including means for determining a unique address of said computer network interface device in relation to another computer network interface device in said computer network, said means for determining including means for determining if said computer network interface device is a first computer network interface device in said computer network and mean for determining if said computer interface device is a last computer interface device, said first computer network interface device having no other computer network interface device connected to a self-identification input of said network daisy chain interface, said means for determining a unique address referencing said unique address from a dynamically generated address of said first computer network interface device, said dynamic self-identification means further including means for receiving an address of said computer network interface device via said network bus interface as dynamically generated by said another computer network interface device, said computer network interface device further including means for responding only to said network commands having said address dynamically generated by said another computer network interface device,
  iv. means for generating a transmit authority command in the form of a token with which said computer network interface obtains the right to transmit data on said computer network via said network bus interface after said address of said computer network interface device has been received by said means for receiving,
  v. means for issuing said transmit authority command to any other computer network interface device of said computer network, and
  vi. means for interpreting a transmit authority command generated by said any other computer network interface device of said computer network, and
  vii. means for granting permission to transmit information on said computer network in response to interpreting said transmit authority command;
  viii. means for associating a default destination with the computer network interface device;
  ix. means for establishing a virtual circuit between the computer network interface device and a destination when the computer network interface device has the transmit authority
  x. means for maintaining the virtual circuit after issuing the transmit authority to another computer network interface device; and

c. a node interface for transferring information between said computer network and said node.

5,535,337

PORT CIRCUIT FOR A TOKEN RING CONCENTRATOR HAVING PHASE LOCK LOOP TIMING RECOVERY WITH ADDITIONAL CIRCUITRY TO VERIFY APPROPRIATE SIGNALS

Thomas C. Hogan, Holden, and Peter K. Williams, Newton, both of Mass., assignors to 3COM Corporation, Santa Clara, Calif.

Filed Dec. 22, 1992, Ser. No. 994,672

Int. Cl.^{6} H01J *13/00*

U.S. Cl. 395—200.19 **9 Claims**

1. A token ring concentrator comprising

a port Control circuit, and

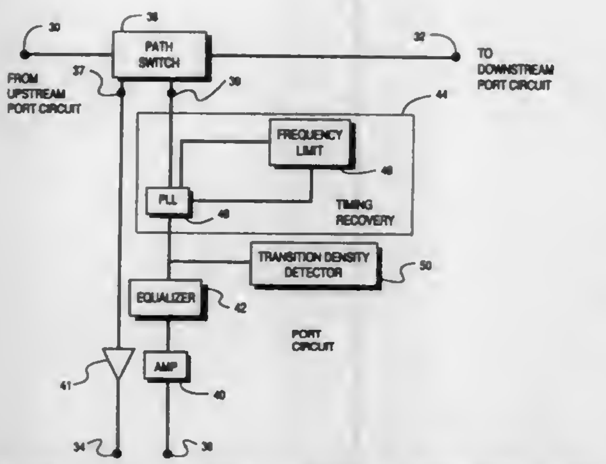
a plurality of port circuits connected to said port control circuit to receive timing and control signals from said port control circuit, said port circuits being connected to each other in an endless loop via unidirectional, serial data transmission lines, each said port circuit comprising

an upstream data node for receiving data from an upstream port circuit,

a downstream data node for providing data to a downstream port circuit,

a station receiver node for providing data from said upstream port circuit to a station device connected to said port,

a station transmitter node for receiving data from said station,



a path switch configured to selectively either connect said upstream data node directly to said downstream data node or connect said upstream node to provide said data from an upstream port circuit to said station receiver node and connect said station transmitter node to provide said data from said station to said downstream data node,

a timing recovery circuit that derives a recovered clock from data from said station and reclocks said data with said recovered clock before transmitting said data to said downstream data node,

an amplifier and equalizer between said station transmitter node add Said timing recovery circuit, and

a transition density detector that senses the output of said equalizer to verify that appropriate signals are being received from said station transmitter node.

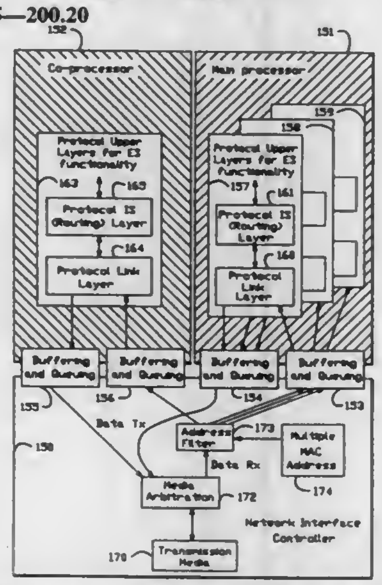
5,535,338
MULTIFUNCTION NETWORK STATION WITH NETWORK ADDRESSES FOR FUNCTIONAL UNITS

Jeffrey Krause, Los Altos; Niles E. Strohl, Tracy; Michael J. Seaman, San Jose; Steven P. Russell, Menlo Park, and John H. Hart, Saratoga, all of Calif., assignors to 3Com Corporation, Santa Clara, Calif.

Division of Ser. No. 98,616, Jul. 28, 1993. This application May 30, 1995, Ser. No. 452,498

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.20 **23 Claims**



8. A computer system to be connected with a plurality of network transmission media, the computer system comprising:

a shared network interface including a connector coupled to a first network transmission medium, and including at least a first processor interface having a first assigned network address and a second processor interface having a second assigned network address;

a first processor coupled to the first processor interface, the first processor including network end system resources; and

a second processor coupled to the second processor interface, the second processor including a second network interface coupled to a second network transmission medium and intermediate system resources for transporting frames between the shared and the second network interfaces for transmission across the first and second network transmission media;

wherein the shared network interface includes:

a medium access control device, coupled to the connector, to receive and transmit frames of data through the connector, the medium access control device including a first data channel to the first processor interface and a second data channel to the second processor interface, memory to store the first and second assigned network addresses, and address filtering logic, coupled to the first and second data channels and to the memory, which passes and blocks frames received through the connector for the first and second data channels in response to the assigned network addresses.

5,535,339
DUAL PROCESSOR CONTROLLED COMPACT DISK-INTERACTIVE SYSTEM

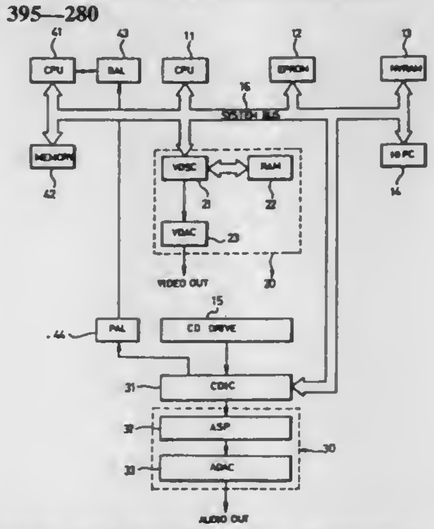
Cheol Y. Kim, Suwon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 24, 1995, Ser. No. 394,036

Claims priority, application Rep. of Korea, Feb. 25, 1994, 94-34173

Int. Cl.^{6} G06F *13/36;* **G11B** *7/00*

U.S. Cl. 395—280 **2 Claims**



1. A compact disk-interactive system comprising:

a first central processing unit for controlling the operation of said system;

a compact disk drive for reading and storing data on a compact disk;

video and audio output means for outputting video and audio signals under the control of said first central processing unit;

a compact disk interface control means;

a system bus;

a second central processing unit, connected to said system bus, for decoding data read out from a compact disk-read only memory programmed using a code different from that of said compact disk;

a memory for storing an operating system of said second central processing unit;

a bus arbitration logic means, connected between said first and second central processing units, for arbitrating the operation priority of said system bus therebetween; and

a programmable array logic means, connected between said compact disk interface control means and said bus arbitration logic means, for controlling said bus arbitration logic means in accordance with a code type of said data reproduced through said compact disk drive.

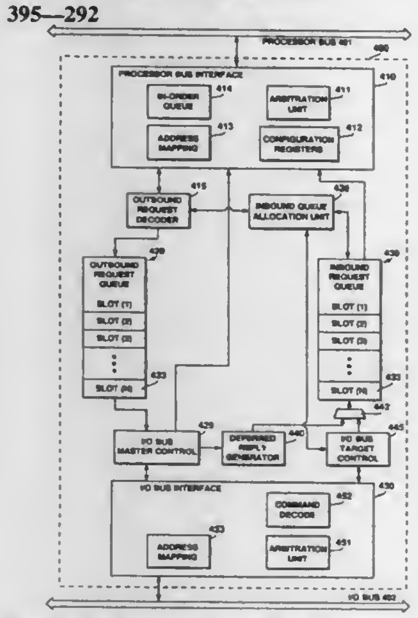
5,535,340
METHOD AND APPARATUS FOR MAINTAINING TRANSACTION ORDERING AND SUPPORTING DEFERRED REPLIES IN A BUS BRIDGE

D. Michael Bell, Beaverton; Mark A. Gonzales, Portland, and Susan S. Meredith, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 20, 1994, Ser. No. 247,026

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—292 **37 Claims**



13. A bus bridge for transferring data between a first bus and a second bus in a computer system, the bus bridge comprising:

a first bus interface coupled to the first bus for receiving data from and placing data onto the first bus;

a second bus interface coupled to the second bus for receiving data from and placing data onto the second bus;

an inbound request queue and an outbound request queue coupled to the first bus interface and the second bus interface, wherein the inbound request queue has a plurality of inbound slots, and wherein each slot of the plurality of inbound slots stores information corresponding to requests issued by agents coupled to the first bus or the second bus; and

decoding circuitry coupled to the inbound request queue and the outbound request queue for placing requests in the outbound request queue and for issuing a deferred response to the first bus interface to be placed on the first bus based on available space in the inbound request queue, wherein the decoding circuitry determines whether to issue the deferred response to the first bus interface based on whether each inbound slot of the plurality of inbound slots contains information, the decoding circuitry issuing the deferred response to the first bus interface if an inbound slot does not contain information.

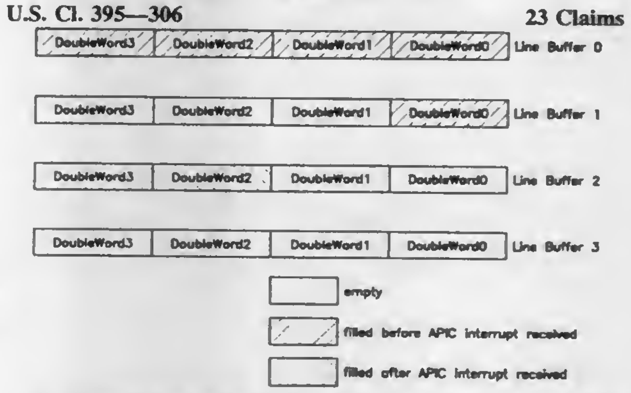
5,535,341
APPARATUS AND METHOD FOR DETERMINING THE STATUS OF DATA BUFFERS IN A BRIDGE BETWEEN TWO BUSES DURING A FLUSH OPERATION

Nilesh Shah, and Rajeev Prasad, both of Folsom, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 24, 1994, Ser. No. 201,819

Int. Cl.^{6} G06F *3/04;13/00*

U.S. Cl. 395—306 **23 Claims**



23. A method of flushing a plurality of data buffers used to transfer information between a first bus and a second bus in a computer system comprising the steps of:

detecting that an interrupt of a presenting-running operation has occurred,

determining the state of the buffers when the interrupt occurs, and

flushing only those buffers of the plurality of buffers which had stored information for transfer when the interrupt occurred.

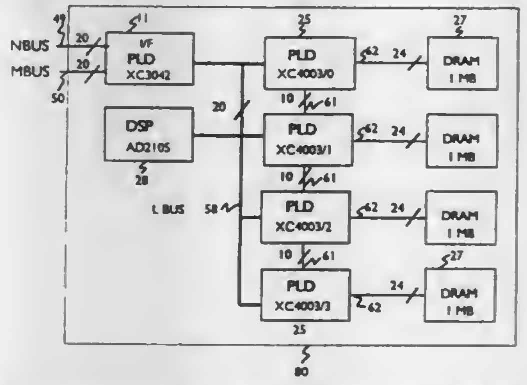
5,535,342
PLD CONNECTOR FOR MODULE HAVING CONFIGURATION OF EITHER FIRST PLD OR SECOND PLD AND RECONFIGURABLE BUS FOR COMMUNICATION OF TWO DIFFERENT BUS PROTOCOLS

Brad Taylor, Oakland, Calif., assignor to Giga Operations Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 972,933, Nov. 5, 1992, abandoned. This application Sep. 28, 1993, Ser. No. 128,501

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—307 **17 Claims**



1. A programmable logic device (PLD) connector module capable of receiving a plurality of signals from a selectable plurality of signal sources and forwarding said plurality of signals to a selectable plurality of signal destinations; said module comprising:

a printed circuit board having two generally flat sides as a top and a bottom, plus front, back, left and right edges,

two top connectors on said top and two bottom connectors on said bottom,
a first of said top connectors on said top, adjacent to and approximately centered along said front edge,
a second of said top connectors on said top, adjacent to and approximately centered along said back edge,
a first of said bottom connectors on said bottom, adjacent to and approximately centered along said front edge,
a second of said bottom connectors on said bottom, adjacent to and approximately centered along said back edge,
each said connector having a plurality of connection locations in a substantially uniform array,
a first PLD connected for communication with at least a first portion of said connection locations,
a second PLD connected for communication with said first PLD and to at least a second portion of said connection locations to connect said first portion and said second portion through a reconfigurable bus,
wherein configuration of either of said first or second PLDs allows a first connection location of said first portion of said connection locations to be connected for communication with a second connection location of said second portion of said connection locations at a first time to communicate a first signal using a first bus protocol and said first connection location to be connected to said second connection location at a second time to communicate a second signal using a second bus protocol where at least one of said first signal and said second signal or said first bus protocol and said second bus protocol are not the same.

5,535,343

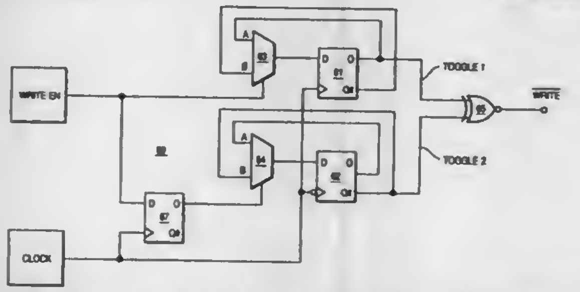
METHOD AND APPARATUS FOR GENERATING WRITE SIGNALS

Jerry Verseput, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 7, 1994, Ser. No. 207,378

Int. Cl.^{6} H04L *7/033*

U.S. Cl. 395—308 **16 Claims**



1. An apparatus for generating a write pulse signal, comprising:
a first flip flop providing a first flip flop output signal in response to a clock signal and a first flip flop input signal;
a first multiplexor for selecting the first flip flop input signal from one of the first flip flop output signal and a complement of the first flip flop output signal in response to a write enable signal;
a second flip flop providing a second flip flop output signal in response to a complement of the clock signal and a second flip flop input signal;
a second multiplexor for selecting the second flip flop input signal from one of the second flip flop output signal and a complement of the second flip flop output signal in response to a control signal;
a third flip flop providing the control signal in response to the clock signal and the write enable signal; and
a logic gate generating the write pulse signal from the first flip flop output signal and the complement of the second flip flop output signal.

5,535,344

DEVICE FOR THE CONNECTION OF AN APPARATUS TO A TRANSMISSION CHANNEL

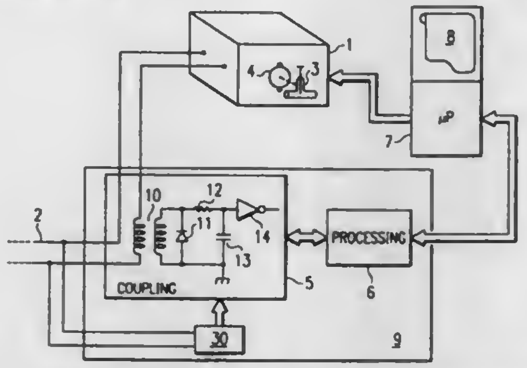
Maurice G. Le Van Snu, Romainville, France, assignor to SGS-Thomson Microelectronics, S.A., France

Filed Dec. 8, 1993, Ser. No. 164,890

Claims priority, application France, Dec. 14, 1992, 92-15039

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 395—309 **42 Claims**



1. A device for the connection of an apparatus to a signal transmission channel to transmit and receive signals, comprising:
a first coupling circuit to electrically couple the device to the signal transmission channel in reception and in transmission;
a second circuit electrically coupled to the first coupling circuit, said second circuit to process bits received or sent and to check conformity between the signals received or transmitted with a pre-set standard; and
a third circuit electrically coupled to the second circuit and to the apparatus, said third circuit to manage transmitted signals as a function of a use proper to the apparatus; wherein
the second circuit comprises a control register corresponding to a type of the signals transmitted or to be transmitted, and a buffer memory to receive the signals transmitted or to be transmitted, said buffer memory electrically coupled to said control register, said control register having a state;
the third circuit comprises a microprocessor carrying out, on the signals transmitted or to be transmitted, instructions loaded into a program memory of said microprocessor as a function of the state of said control register;
said device comprising, between the second and the third circuit, a fourth interface circuit to match the control protocol specific to a microprocessor of the third circuit with a control protocol of the second circuit, said fourth interface circuit having a multiplexer, said multiplexer programmable by two selection signals sent by said microprocessor of said third circuit.

5,535,345

METHOD AND APPARATUS FOR SEQUENCING MISALIGNED EXTERNAL BUS TRANSACTIONS IN WHICH THE ORDER OF COMPLETION OF CORRESPONDING SPLIT TRANSACTION REQUESTS IS GUARANTEED

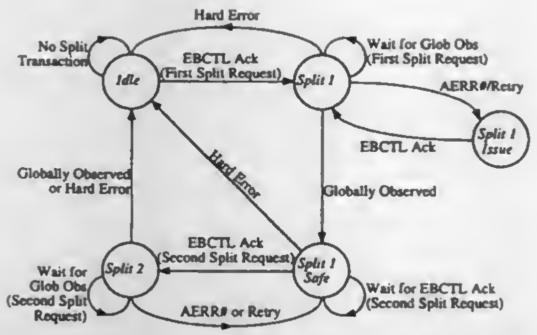
Matthew A. Fisch; James M. Brayton, both of Beaverton, and Ajay Malhotra, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 12, 1994, Ser. No. 241,964

Int. Cl.^{6} H01J *13/00*

U.S. Cl. 395—309 **20 Claims**

1. In a microprocessor having an associated bus interface unit with control logic for coupling the microprocessor to an external bus and processing external bus transaction requests on the external bus, a method is provided for sequencing misaligned bus transaction requests on the external bus, each of said misaligned bus transaction request forming a memory access crossing a data bus width boundary of the external bus, the method comprising the steps of:


Hard Error
No Split Transaction
Idle
EBCTL Ack (First Split Request)
Split 1
Wait for Glob Obs (First Split Request)
AERR#/Retry
Split 1 Issue
EBCTL Ack
Globally Observed or Hard Error
Hard Error
Globally Observed
EBCTL Ack (Second Split Request)
Split 2
Split 1 Safe
Wait for Glob Obs (Second Split Request)
Wait for EBCTL Ack (Second Split Request)
AERR# or Retry

said bus interface unit of said microprocessor separating each misaligned bus transaction request into at least first and second split transaction requests, with each split request forming a memory access that does not cross a data bus width boundary of the external bus;
issuing the first split request to the control logic of the bus interface unit for processing of the first split request on the external bus;
determining whether a global observation has been issued for said first split request;
in response to said global observation of said first split request issuing the second split request to the control logic of the bus interface unit for processing of the second split request on the external bus;
determining whether a global observation has been issued for said second split request; and
in response to said global observation of said second split request, completing processing of the second split request on the external bus in order with respect to issuance of the first split request.

5,535,346

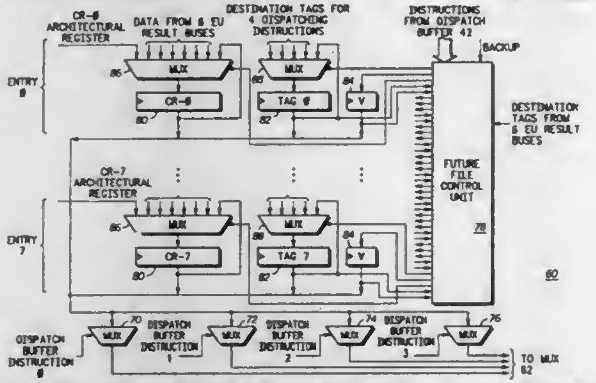
DATA PROCESSOR WITH FUTURE FILE WITH PARALLEL UPDATE AND METHOD OF OPERATION

Thomas L. Thomas, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,342

Int. Cl.^{6} G06F *9/34*

U.S. Cl. 395—375 **20 Claims**


CR-0 ARCHITECTURAL REGISTER
DATA FROM 6 EU RESULT BUSES
DESTINATION TAGS FOR 4 DISPATCHING INSTRUCTIONS
INSTRUCTIONS FROM DISPATCH BUFFER 42
BACKUP
ENTRY 0
MUX
CR-0
TAG 0
V
DESTINATION TAGS FROM 6 EU RESULT BUSES
FUTURE FILE CONTROL UNIT
78
CR-7 ARCHITECTURAL REGISTER
ENTRY 7
CR-7
TAG 7
60
80
82
84
86
88
70
72
74
76
DISPATCH BUFFER INSTRUCTION 0
DISPATCH BUFFER INSTRUCTION 1
DISPATCH BUFFER INSTRUCTION 2
DISPATCH BUFFER INSTRUCTION 3
TO MUX 62

1. A data processor with a future file providing operand data to an execution unit, the data processor comprising:
a plurality of architectural registers;
an execution unit executing an instruction of a series of instructions, the instruction designating a specific one of the plurality of architectural registers as a destination;
a rename buffer coupled to the plurality of architectural registers and to the execution unit, the rename buffer buffering results generated by the series of instructions, the rename buffer storing a result of the instruction, the rename buffer copying the result to the specific one of the plurality of architectural registers at a specific time, the specific time responsive to an order of the instruction within the series of instructions; and
a future file comprising a plurality of entries coupled to the execution unit, the future file providing a single source lookup for instruction operands, each one of the plurality of entries storing a most recent value of a differing one of the plurality of architectural registers with respect to the series of instructions, each one of the plurality of entries providing the most recent value to the execution unit responsive to the instruction, each one of the plurality of entries coupled to a differing one of the plurality of architectural registers, each one of the plurality of entries simultaneously storing a value of a differing one of the plurality of architectural registers responsive to an occurrence of an exception condition via a differing one of a plurality of future file buses.

5,535,347

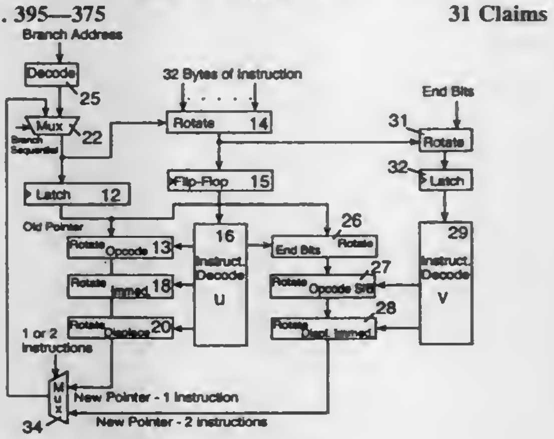
ROTATORS IN MACHINE INSTRUCTION LENGTH CALCULATION

Edward Grochowski, San Jose; Ahmad Zaidi, Santa Clara, and James Lan, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 831,825, Feb. 6, 1992, abandoned. This application Nov. 7, 1994, Ser. No. 335,305

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—375 **31 Claims**



1. A superscalar processor, comprising:
first channel rotator that stores a set of instruction bytes of a set of variable length instructions;
register that stores a bit vector having a set of bits corresponding to the instruction bytes in the first channel rotator such that only one of the bits in the bit vector indicates which one of the instruction bytes corresponds to a starting byte of a first variable length instruction of the variable length instructions;
first channel decoder that decodes a set of fields of the first variable length instruction and that generates a length specified by the fields;
first channel rotator circuitry that generates a first updated bit vector by shifting the bit vector according to the length generated by the first channel decoder such that the first updated bit vector indicates which one of the instruction bytes in the first channel rotator corresponds to a starting byte of a second variable length instruction of the variable length instructions;
second channel rotator that receives the instruction bytes from the first channel rotator and that aligns the second variable length instruction of the variable length instructions by shifting instruction bytes according to a set of end bits generated by the first channel decoder wherein the end bits indicate the length of the first variable length instruction;
second channel decoder that decodes a set of fields of the second variable length instruction and that generates a length specified by the fields of the second variable length instruction;
second channel rotator circuitry that generates a second updated bit vector by shifting the first updated bit vector according to the length generated by the second channel decoder such that the second updated bit vector indicates which one of the instruction bytes in the first channel rotator corresponds to a

starting byte of a next variable length instruction of the variable length instructions.

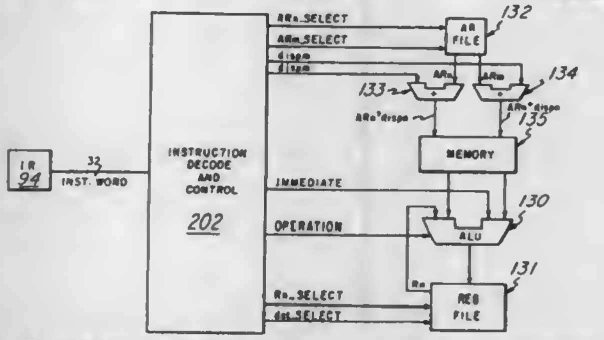
5,535,348
BLOCK INSTRUCTION

Jerald G. Leach, Houston; Joseph A. Coomes; Steve P. Marshall, both of Missouri City, and Laurence R. Simar, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 326,677, Oct. 20, 1994, which is a continuation of Ser. No. 590,372, Sep. 28, 1990, Pat. No. 5,390,304. This application Apr. 12, 1995, Ser. No. 420,932

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—375 **3 Claims**



1. A method of operating a data processing device comprising the steps of:

generating pulses establishing instruction cycles;

accessing a storage circuit by assertion of addresses;

performing an arithmetic operation on data;

decoding a program instruction providing control signals to control the operations of the data processing device within each instruction cycle;

accessing said storage circuit by the contents of a program register to obtain a program instruction; and

initiating a block sequence responsive to an instruction code having a block instruction wherein said block sequence comprises the steps of:

generating a block end address by combining the contents of the program register and data decoded from the block instruction;

storing the block end address in an end register;

storing the contents of the program register in a repeat start register; and

accessing said storage circuit with the program register containing a program address of a first instruction of a block of instructions.

5,535,349
DATA PROCESSING SYSTEM AND METHOD FOR PROVIDING CHIP SELECTS TO PERIPHERAL DEVICES

Shachar Boaz, Givataim; Yelvin Yoram, Petch-Tikva, and Rudin Yehuda, Netanya, all of, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 9, 1994, Ser. No. 257,493

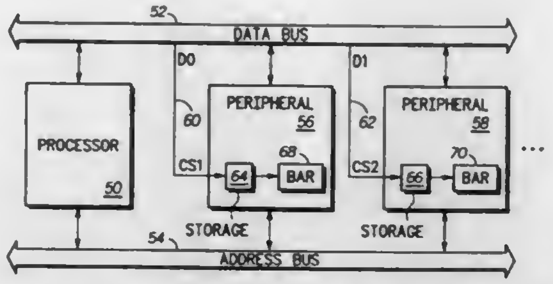
Int. Cl.^{6} G06F *12/02*

U.S. Cl. 395—401 **29 Claims**

1. A method for providing a chip select from a data processor to a selected peripheral, the method comprising the steps of:

sending a data value from the data processor to the selected peripheral via a data bus wherein the data bus is coupled between the data processor and the selected peripheral, the data value having at least one asserted bit and at least one unasserted bit;

receiving, within the selected peripheral, the at least one asserted bit communicated via the data bus, the at least one asserted bit enabling a control line within the selected peripheral, the at least one asserted bit being transmitted via a first data bit line from the data bus wherein the first data bit line is coupled to an input of the selected peripheral, the at least one asserted bit functioning as a chip select signal for the selected peripheral and being stored within the selected peripheral; and



providing both: (1) an address to the selected peripheral via an address bus coupled between the data processor and the selected peripheral and (2) a register data value to the selected peripheral via the data bus coupled between the data processor and the selected peripheral, wherein the address corresponds to a register within the selected peripheral and the register data value is stored into the register in response to the asserted control line.

5,535,350
CACHE MEMORY UNIT INCLUDING A REPLACEMENT ADDRESS REGISTER AND ADDRESS UPDATE CIRCUITRY FOR REDUCED CACHE OVERHEAD

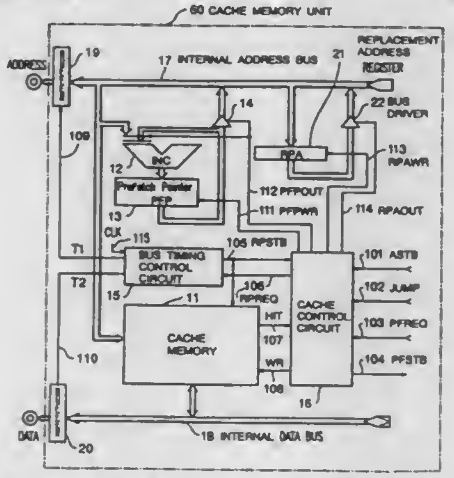
Kouji Maemura, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1992, Ser. No. 907,920

Claims priority, application Japan, Jul. 5, 1991, 3-165850

Int. Cl.^{6} G06F *12/12;13/00*

U.S. Cl. 395—403 **9 Claims**



6. A cache memory unit to be incorporated in a microprocessor comprising:

a cache memory,

a first register means for storing an address for retrieval of data from said cache memory,

an address updating means for updating the address stored in said first register means,

a second register means for storing an address which caused a cache miss when a cache miss occurs, and

a replacement control means for selectively updating the address stored in the first register means while said second register means supplies the address to said cache memory simultaneously.

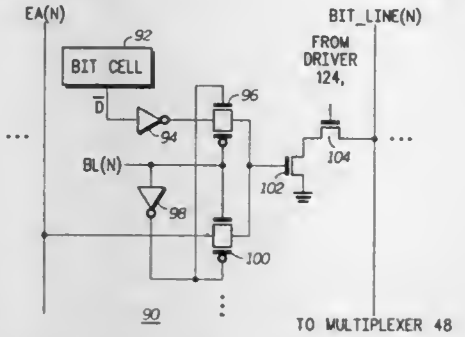
5,535,351
ADDRESS TRANSLATOR WITH BY-PASS CIRCUIT AND METHOD OF OPERATION

Chih-Jui Peng, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 222,783

Int. Cl.^{6} G06F *12/10;* G11C *15/00*

U.S. Cl. 395—417 **8 Claims**



1. An address translator with a by-pass circuit comprising:

a plurality of entries, the plurality of entries translating a received effective address into one of a plurality of real addresses, the received effective address and the one of the plurality of real addresses each comprising J bits, where J is an integer, an Nth bit of the one of the plurality of real addresses output on an Nth one of J bit lines, where N is an integer index ranging from 1 to J; and

J by-pass circuits, an Nth one of the J by-pass circuits coupled to the Nth bit line, the Nth one of the J by-pass circuits receiving a periodic clocking signal, a control signal and an Nth bit of the received effective address, the Nth one of the J by-pass circuits coupling either a first voltage level or a second voltage level corresponding to the Nth bit of the received effective address to the Nth bit line if the control signal corresponds to a first logic state.

5,535,352
ACCESS HINTS FOR INPUT/OUTPUT ADDRESS TRANSLATION MECHANISMS

K. Monroe Bridges, Fremont; Robert Brooks, Roseville; William R. Bryg, Saratoga; Stephen G. Burger, Santa Clara; Eric W. Hamilton, Mountain View; Helen Nusbaum, Sacramento; Brendan A. Voge, Granite Bay, all of Calif., and Michael L. Ziegler, Whitinsville, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 24, 1994, Ser. No. 217,587

Int. Cl.^{6} G06F *12/10;13/00*

U.S. Cl. 395—418 **9 Claims**

1. A computing system, comprising:

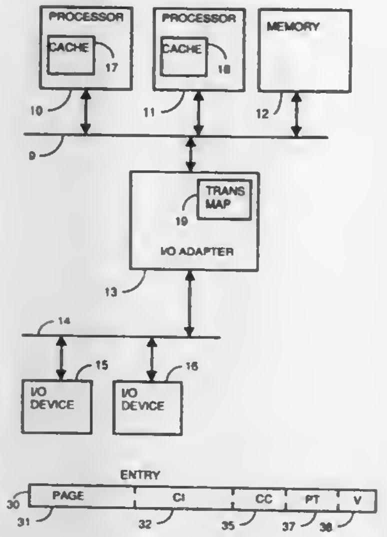
an interconnect means for providing information transfer:

a main memory coupled to the interconnect means;

an input/output adapter, coupled to the interconnect means, the input/output adapter including a translation map. the translation map mapping input/output page numbers to memory address page numbers, each entry in the translation map including an address of a data page in the main memory and transaction configuration information which is utilized by the input/output adapter during data transactions to and from the data page,

wherein the transaction configuration information for each entry includes an indicator indicating whether data within the data page is sequential; and,

a processor, coupled to the interconnect means, the processor including a cache and instruction execution means for generating the transaction configuration information and storing the transaction configuration information in the translation map.



5,535,353
ADDRESS GENERATING CIRCUIT FOR DATA COMPRESSION

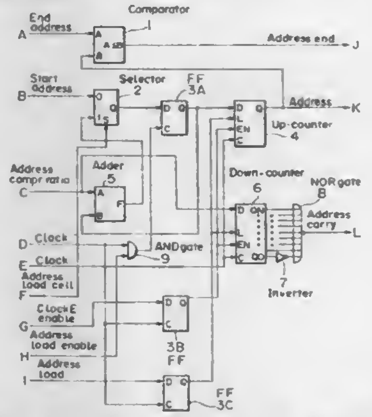
Keiji Tanabe, and Makoto Kikuchi, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1993, Ser. No. 74,096

Claims priority, application Japan, Jun. 30, 1992, 4-196123

Int. Cl.^{6} G06F *11/20*

U.S. Cl. 395—421.1 **1 Claim**



1. An address generating circuit for data compression, which comprises an X-address generating circuit (**10**), a Y-address generating circuit (**20**), an XY-address generation control circuit (**30**) and a defect analyzing memory (**40**);

each of said X-address generating circuit (**10**) and Y-address generating circuit (**20**) being comprised of a selector (**2**) for selecting either a start address signal B or an output of an adder (**5**), the selector (**2**) being under the direction of an address load cell signal F generated from the XY-address generation control circuit (**30**), a flip-flop (**3A**) for holding as a datum the selected signal from the selector (**2**), an up-counter (**4**) having as a load datum the datum held in the flip-flop (**3A**) and generating an incremental address K. said adder (**5**) adding an address compression ratio signal C to the datum held in the flip-flop (**3A**). a down-counter (**6**) having as a load datum the address compression ratio signal C and operating simultaneously with said up-counter (**4**) to output an address carry signal L, a comparator (**1**) for comparing an end address A and the incremental address K from the up-counter (**4**) to detect a last address end signal J;

said XY-address generation control circuit (**30**) having as inputs address end signals J and address carry signals L from both the X-address generating circuit (**10**) and Y-address generating circuit (**20**) to control the X-address address generating circuit (**10**) and Y-address generating circuit (**20**); and

the defect analyzing memory (**40**) having as inputs address signals K from both the X-address generating circuit (**10**) and the Y-address generating circuit (**20**).

5,535,354

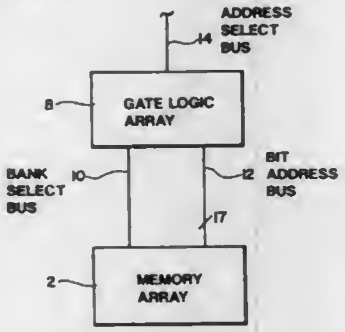
METHOD FOR ADDRESSING A BLOCK ADDRESSABLE MEMORY USING A GRAY CODE

Francis H. Reiff, Manitou Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Continnation of Ser. No. 667,465, Mar. 11, 1991, abandoned. This application Feb. 22, 1994, Ser. No. 200,931

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 395—421.07 **3 Claims**



1. A method of addressing block-addressable data in a memory array, said memory array having a plurality of memory units arranged in individually addressable banks, each memory unit in said memory array having a plurality of randomly accessible blocks and each block having a plurality of individually addressable rows of bits, the method comprising the steps of:

transmitting from a data requestor a memory address request for reading a randomly accessible block of data from said memory array or writing said randomly accessible block of data into said memory array;

receiving from said data requestor said memory address request;

converting said received memory address request into a bank select address and a memory unit row address, said bank select address corresponding to one of said individually addressable banks of memory units and said row address corresponding to a first row of said randomly accessible block of data from said memory array;

transmitting said bank select address to said memory array for selecting one of said individually addressable banks of memory units; and

sequentially transmitting a sequence of Gray coded memory unit row addresses to selected one of said individually addressable banks of memory units beginning at said converted memory unit row address to sequentially change said memory unit row address according to a Gray code until all said data in said one block of said plurality of blocks has been read from said memory array or written into said memory army such that all of said individually addressable rows of bits within said one block are exclusively read or exclusively written according to said memory address request, without an intervening memory operation to said one block.

5,535,355

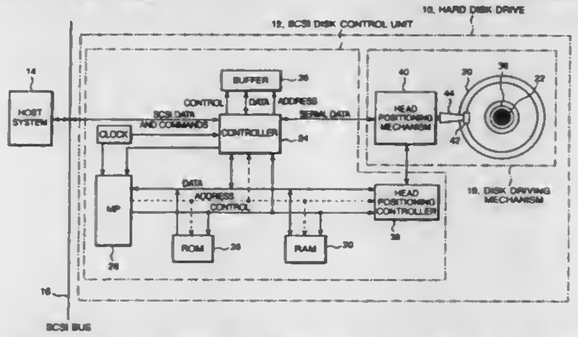
CONTROLLER FOR A STORAGE DEVICE WHICH ALLOWS EITHER PRESTORED OR USER DEFINED FIRMWARE TO BE EXECUTED

William F. Scales, San Juan Capistrano, Calif., assignor to Kabushiki Kaisha Toshiba, Kawagawa-ken, Japan

Continuation of Ser. No. 333,974, Apr. 6, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 679,179

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—428 **7 Claims**



1. Apparatus for controlling a storage device, haivng a medium on which data may be written and read by at least one read/write device, comprising:

access means for moving at least one of said read/write device and said medium relative to each other, said moving being in accordance with an incoming access signal;

first memory means, coupled to said storage device, for storing initializing firmware;

second memory means, coupled to said storage device, for storing additional firmware; and

controller means, coupled to said access means and said first and second memory means, for:

1) accessing said first memory means and executing said initializing firmware,
2) accessing said second memory means and executing said additional firmware,
3) generating said access signal and providing it to said access means for a read/write operation in response to a read/write command, and
4) changing said additional firmware stored in said second memory means in accordance with a special change command different from said read/write command; wherein

said initializing firmware is for initializing said storage device and said controller means; and

said additional firmware is for controlling operations of said storage device.

5,535,356

DIGITAL DATA RECORDING/PLAYBACK SYSTEM UTILIZING EEPROM AND ROM MEMORIES AS A STORAGE MEDIUM

Suk-ki Kim; Hyeong-keon An, both of Pucheon-city; Tae-sik Joo, and Suk-jung Lee, both of Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon-city, Rep. of Korea

Filed Sep. 9, 1992, Ser. No. 942,059

Claims priority, application Rep. of Korea, Sep. 9, 1991, 91 15669; Feb. 14, 1992, 92 2220

Int. Cl.^{6} G06F *12/00;* **H01J** *3/00*

U.S. Cl. 395—430 **4 Claims**

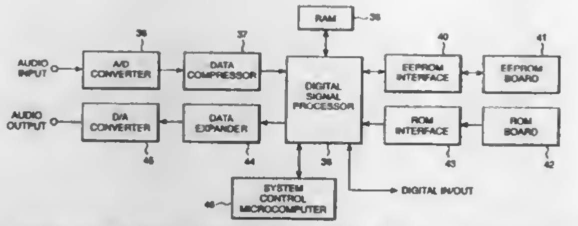
1. A digital data storage system, comprising:

a first semiconductor digital data storage device comprised of at least one ROM;

a second semiconductor digital data storage device comprised of at least one EEPROM;

a first memory interface unit connected to said first semiconductor digital data storage device;

a digital signal processor connected to said first memory interface unit;



a RAM connected to said digital signal processor, wherein said RAM serves as a temporary data storage device for said digital signal processor;

a second memory interface unit coupled between said second semiconductor digital data storage device and said digital signal processor;

a system control microcomputer for generating control signals;

an analog-to-digital converter for converting an analog input signal into an input digital data signal;

a data compressor interposed between said analog-to-digital converter and said digital signal processor, for compressing said input digital data signal;

wherein said digital signal processor is responsive to said control signals for reading out read-out digital data stored in said first semiconductor digital data storage device, via said first memory interface, and further, for decoding said read-out digital data, to thereby produce decoded read-out digital data;

a digital-to-analog converter for converting said decoded read-out digital data into an analog output signal;

wherein said digital signal processor is further responsive to said control signals for writing said input digital data signal into said second semiconductor digital data storage device, via said second memory interface unit;

wherein said digital signal processor includes a digital I/O controller for detecting sync signals included in said read-out digital data and for generating sync signals for inclusion in said input digital data signal; and

a digital phase-locked loop responsive to said sync signals for synchronizing the reading and writing operations of said digital signal processor.

5,535,357

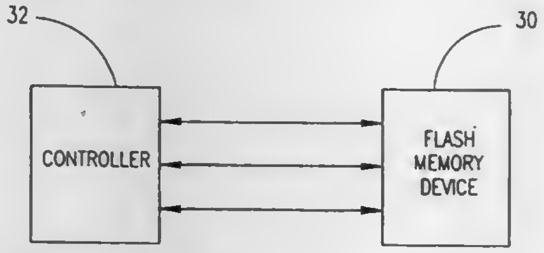
FLASH MEMORY SYSTEM PROVIDING BOTH BIOS AND USER STORAGE CAPABILITY

Dov Moran, Kfar Saba; Rony Levy, Tel Aviv; David Deitcher, Raanana; Arie Mergui; Amir Ban, both of Tel Aviv, and Anatoly Yurtsev, Ramat Gan, all of, Israel, assignors to M-Systems Flash Disk Pioneers Ltd., Tel Aviv, Israel

Continuation of Ser. No. 31,713, Mar. 15, 1993. This application Jun. 5, 1995, Ser. No. 465,023

Int. Cl.^{6} G06F *12/00;* **G11C** *8/00*

U.S. Cl. 395—430 **19 Claims**



1. A system, comprising:

system memory means for storing user data;

central processing means connected to said system memory means for providing control functions of said system;

a system bus for communicating data between said system memory means, said central processing means and an integrated circuit package;

said integrated circuit package comprising:

flash memory means for storing both BIOS routines and said user data; and controller means for interfacing said flash memory means and said system bus, said flash memory means storing emulation means for allowing a portion of said flash memory means to emulate a hard disk and said controller means including means for intercepting a BIOS boot process to install said emulation means in said system memory.

5,535,358

CACHE MEMORY CONTROL CIRCUIT AND METHOD FOR CONTROLLING READING AND WRITING REQUESTS

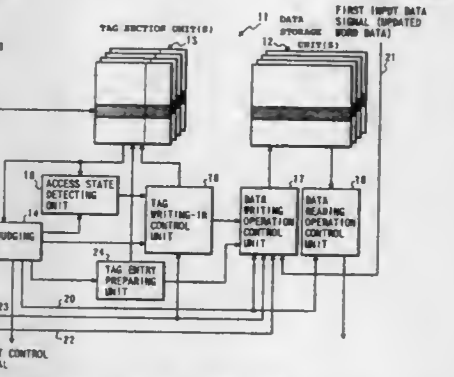
Kozo Kimura, and Tokuzo Kiyohara, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1994, Ser. No. 364,277

Claims priority, application Japan, Dec. 27, 1993, 5-333864

Int. Cl.^{6} G06F *12/00;12/02;13/00*

U.S. Cl. 395—445 **11 Claims**



1. A cache memory control circuit, comprising:

data storing means for storing pieces of word data in each of a plurality of data entries, N pieces of word data being stored in each of the data entries, each of the word data being stored in M data addresses, and a set of M data addresses for a piece of word data functioning as an administrative unit;

tag means for registering a plurality of tag addresses in a plurality of tag entries and a plurality of entry states respectively determined for a unit of M tag addresses, M×N tag addresses being registered in each of the tag entries, N entry states being determined in each of the tag entries, the tag entries corresponding to the data entries in one-to-one correspondence, the tag addresses corresponding to one of the data addresses in one-to-one correspondence, the entry states being classified into an effective state, an invalid state and an access state, the effective state set for a unit of M tag addresses indicating that a piece of word data stored in M data addresses corresponding to the unit of M tag addresses is effective, the invalid state set for a unit of M tag addresses indicating that a piece of word data stored in M data addresses corresponding to the unit of M tag addresses is invalid, and the access state for a unit of M tag addresses indicating that an external access for searching for a piece of external word data expected to be stored in M data addresses corresponding to the unit of M tag addresses is under performance;

hit judging means for judging whether an entry state registered in the tag means is set in the effective state or the invalid state, outputting an external access request to request an external access for the purpose of obtaining N pieces of external word data to be stored in a first remarked data entry of the data storing means corresponding to a first remarked tag entry of the tag means which is designated by a first input tag address relating to a reading request in cases where it is judged that an entry state of a first remarked unit of M tag addresses represented by the first input tag address is set in the invalid state, outputting a first hit signal in cases where it is judged that an entry state of the first remarked unit of M tag addresses represented by the first input tag address is set in the effective state, and outputting a second hit signal in cases where it is judged that an entry state of a second remarked unit of M tag addresses represented by a second input tag address relating to a writing request is set in the effective state;

tag entry preparing means for preparing the first remarked tag entry in which the first remarked unit of M tag addresses and other three remarked units of M tag addresses are respectively set in the access state in the tag means in cases where it is judged by the hit judging means that the entry state of the first remarked unit of M tag addresses represented by the first input tag address is set in the invalid state;

access state detecting means for detecting whether or not the second remarked unit of M tag addresses is set in the access state in cases where it is judged by the hit judging means that the entry state of the second remarked unit of M tag addresses is not set in the effective state, and detecting whether or not the first remarked unit of M tag addresses prepared by the tag entry preparing means is set in the access state in cases where the external access requested by the hit judging means is finished, the second remarked unit of M tag addresses being set in the access state in cases where the second remarked unit of M tag addresses agrees with the first remarked unit of M tag addresses or the other three remarked units of M tag addresses registered in the first remarked tag entry on condition that the external access requested by the hit judging means is not finished, and the first remarked unit of M tag addresses prepared by the tag entry preparing means being maintained in the access state in cases where the external access requested by the hit judging means is not finished;

tag writing-in control means for changing the entry state of the second remarked unit of M tag addresses from the access state to the effective state in cases where it is judged by the access state detecting means that the second remarked unit of M tag addresses is set in the access state, and changing the entry state of the first remarked unit of M tag addresses from the access state to the effective state in cases where it is judged by the access state detecting means that the first remarked unit of M tag addresses is set in the access state on condition that the external access requested by the hit judging means is finished;

data writing operation control means for writing the N external word data obtained according to the external access request of the hit judging means in the first remarked data entry of the data storing means in cases where it is detected by the access state detecting means that each of the remarked units of M tag addresses in the first remarked tag entry prepared by the tag entry preparing means is set in the access state, writing a piece of first updated word data in a second remarked unit of data addresses of the data storing means corresponding to the second remarked unit of M tag addresses in cases where the second hit signal output from the hit judging means is received, and writing a piece of second updated word data in a second remarked unit of M data addresses of the data storing means corresponding to the second remarked unit of M tag addresses in cases where it is judged by the access state detecting means that the second remarked unit of tag addresses is set in the access state; and

data reading operation control means for reading one of the N external word data which is obtained according to the external access request of the hit judging means and is stored in a first remarked unit of M data addresses of the data storing means corresponding to the first remarked unit of M tag addresses in cases where the N external word data are written in the first remarked data entry of the data storing means by the data writing operation control means, and reading a piece of required word data stored in a first remarked unit of M data addresses of the data storing means corresponding to the first remarked unit of M tag addresses in cases where the first hit signal output from the hit judging means is received.

5,535,359
COMPUTER SYSTEM WITH CACHE MEMORY HAVING ADDRESS MASK REGISTER

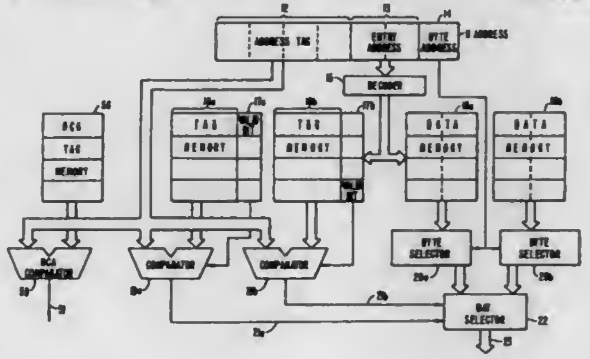
Masayuki Hata; Hiromasa Nakagawa, and Tatsuo Yamada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyugo-Ken, Japan

Continuation of Ser. No. 23,743, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 444,474, Dec. 1, 1989, abandoned. This application Feb. 13, 1995, Ser. No. 387,980

Claims priority, application Japan, Dec. 2, 1988, 63-306531; Dec. 14, 1988, 63-316930; Dec. 14, 1988, 63-316931

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—446 **12 Claims**



1. In a computer system having a CPU, a main memory, a data bus and an address bus, a cache architecrure comprising:

a plurality of set associative cache memories wherein each of said plurality of set associative cache memories is coupled to the address bus for receiving a main memory address having at least a TAG portion;

each of said plurality of set associative cache memories having:

- (a) an address storage means including:
  - (i) a programmable address register for storing said main memory address, said programmable address register having an address value; and
  - (ii) a programmable address mask register coupled to said programmable address register and having a masked value, said programmable address mask register outputting a masked TAG address corresponding to said masked value and said address value of said programmable address register, said masked TAG address masking bits in at least said TAG portion of said main memory address to establish a set of TAG addresses defining data to be cached and wherein the address value of each programmable address register is correlated with the masked value of each programmable address mask register such that each one of said plurality of set associative cache memories stores a different set of TAG addresses than any remaining ones of said plurality of set associative cache memories;
- (b) a TAG memory, coupled to said address storage means, having a plurality of TAG storage locations for storing said set of TAG addresses;
- (c) a data memory, coupled to said TAG memory and to the data bus, and having a plurality of storage locations, wherein each storage location corresponds to a TAG location of one of the TAG storage locations in the TAG memory; and
- (d) means, coupled to the data bus and to said data memory, for outputting to the data bus a data word stored at a data location corresponding to said TAG location when said TAG location corresponds to the TAG portion of said main memory address.

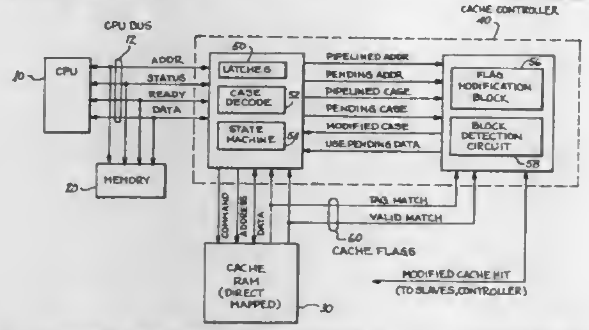
5,535,360
DIGITAL COMPUTER SYSTEM HAVING AN IMPROVED DIRECT-MAPPED CACHE CONTROLLER (WITH FLAG MODIFICATION) FOR A CPU WITH ADDRESS PIPELINING AND METHOD THEREFOR

David K. Cassetti, Tempe, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 31, 1994, Ser. No. 298,989

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—467 **10 Claims**



1. A digital computer system having a cache controller subsystem thereof comprising, in combination:

a central processing unit (CPU) having means for address pipelining;

cache random access memory (RAM) means coupled to said CPU for:

- (a) providing temporary storage of portions of information for submission to said CPU upon request by said CPU,
- (b) providing cache flags for each command received for signalling whether a cache hit or a cache miss occurred and
- (c) reducing an amount of time required for said CPU to access said portions of information;

memory means coupled to said CPU and said cache RAM means for storing information for selection by said CPU and for providing information to said cache RAM means after said CPU encounters a read miss in said cache RAM means; and

cache controller means coupled to said cache RAM means and said CPU for comparing an address of a pipelined CPU cycle to an address of a current CPU cycle and for modifying said cache flags provided by said cache RAM means when a pipelined read command is to a same block as said current CPU cycle for controlling the transmission of said portions of information between said cache RAM means and said CPU for both said current CPU cycle and a subsequent, pipelined CPU cycle prior to completing said current CPU cycle.

5,535,361
CACHE BLOCK REPLACEMENT SCHEME BASED ON DIRECTORY CONTROL BIT SET/RESET AND HIT/MISS BASIS IN A MULTIHEADING MULTIPROCESSOR ENVIRONMENT

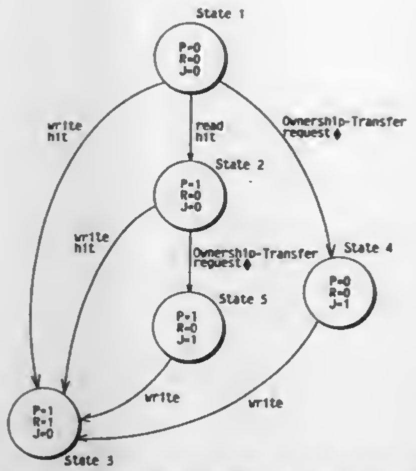
Hiroaki Hirata, Kyoto, and Kozo Kimura, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1993, Ser. No. 66,709

Claims priority, application Japan, May 22, 1992, 4-130442

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 395—472 **8 Claims**



1. A cache controller for a multithreading multiprocessor which suspends an ongoing execution of a thread and starts an execution of another thread when a cache miss happens. the cache controller comprising:

a directory unit for storing management information indicating data blocks. which are loaded from a main memory into a cache, the management information including a thread number field for storing thread reference numbers of threads which use the data blocks in the cache;

a data block replacing means for determining a data block having a highest replacing priority among the data blocks in the cache and replacing the data block having the highest replacing priority with a data block in the main memory;

an access control unit including a first input/output port and a second input/output port, the first input/output port transmitting and receiving an access requesting message which is one of a write requesting message and a read requesting message to and from said multithreading multiprocessor, and the second input/output port transmitting and receiving the access requesting message to and from the main memory and another cache controller,

said access control unit for, on receiving the access requesting message from said multithreading multiprocessor, comparing a received thread reference number included in the received access requesting message with a thread reference number stored in said thread number field, and starting said data block replacing means by lowering a replacing priority of the data block indicated by the received thread reference number in a case where the thread refcrence numbers match.

5,535,362
DATA TRANSFER CONTROL APPARATUS WHEREIN A TIME VALUE IS COMPARED TO A CLOCKED TIMER VALUE WITH A COMPARISON OF THE VALUES CAUSING THE TRANSFER OF BUS USE RIGHT

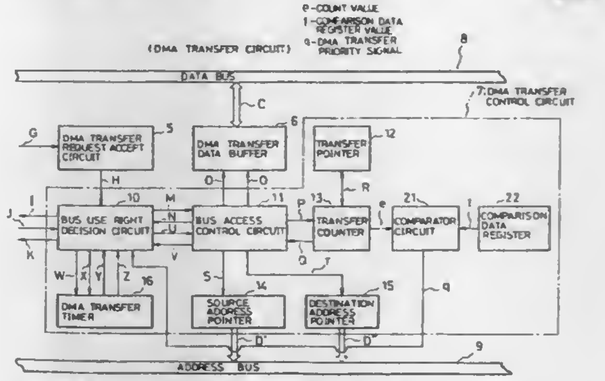
Yasuhiro Ami, and Takeshi Fujii, both of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1993, Ser. No. 13,450

Claims priority, application Japan, Mar. 6, 1992, 4-084517

Int. Cl.^{6} B06F *13/00*

U.S. Cl. 395—474 **3 Claims**



3. A data transfer control system including

a data bus;

a central processing unit coupled to the data bus;

a memory coupled to the data bus;

a plurality of peripheral functional circuits;

a DMA transfer circuit, coupled to the data bus, for transferring data between said plurality of peripheral functional circuits and said memory upon acquiring a right to use the data bus from said central processing unit in response to a DMA transfer request signal from said plurality of peripheral function circuits; and

decision means for alternately selecting which of said central processing unit or said DMA transfer circuit is to be granted a bus use right and for granting, after the receipt of said DMA transfer request and during a DMA transfer cycle, said bus use right to a selected one of said central processing unit or DMA transfer circuit in every cycle time counted by means of a system clock;

wherein said decision means comprises:

- a counter for counting cycle time by means of said system clock,
- a first timer register for setting an execution cycle time for said central processing unit, a setting value for said time being supplied by an external terminal or software,
- a second timer register for setting a DMA transfer cycle time for said DMA transfer circuit, a setting value for said time being supplied by an external terminal or software,
- a coincidence decision circuit receiving the count value by said counter and the value set in said first timer register or in said second timer register and outputting a coincidence signal at the time when said count value coincides with said set value,
- a bus use right change control circuit receiving said coincidence signal and outputting a request signal for changing said bus use right,
- a bus use right decision circuit for forcing said DMA transfer circuit to acquire said bus use right by stopping the operation of said central processing unit or forcing said central processing unit to acquire said bus use right by stopping the operation of said DMA transfer circuit in response to said request signal for changing said bus use right.

5,535,363

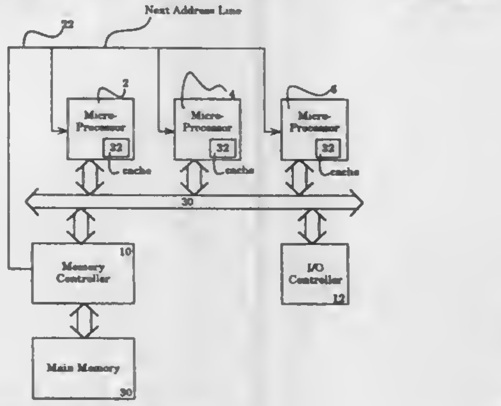
METHOD AND APPARATUS FOR SKIPPING A SNOOP PHASE IN SEQUENTIAL ACCESSES BY A PROCESSOR IN A SHARED MULTIPROCESSOR MEMORY SYSTEM

Paul E. Prince, Tigard, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 12, 1994, Ser. No. 273,723

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—474 **20 Claims**



1. A computer system comprising:

a system bus;

a plurality of microprocessors coupled to said system bus, said plurality of microprocessors including a first microprocessor that generates successive transaction requests including a first transaction request having a first device ID and a first address followed by a second transaction request having a second device ID and a second address;

a first storage element which contains said first device ID and said first address;

a first comparator circuit coupled to said first storage element, said first comparator circuit provides a positive result when said second device ID equals said first device ID and said second address equals said first address; and

a driver circuit coupled to said first comparator circuit, said driver circuit provides a signal indicating to said plurality of microprocessors that said second transaction request may proceed without waiting for a snoop to be performed if said first comparator circuit provides said positive result.

5,535,364

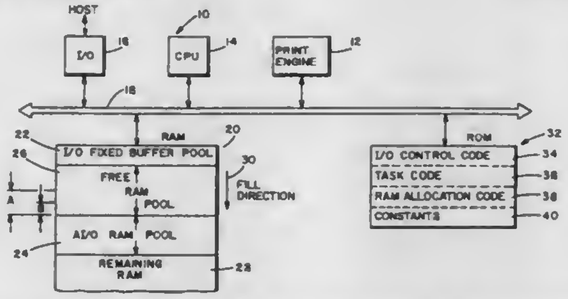
ADAPTIVE METHOD FOR DYNAMIC ALLOCATION OF RANDOM ACCESS MEMORY TO PROCEDURES HAVING DIFFERING PRIORITIES BASED ON FIRST AND SECOND THRESHOLD LEVELS OF FREE RAM

Mark F. Resman; William E. Egbert, and Dale A. Mack, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 12, 1993, Ser. No. 46,688

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 395—478 **7 Claims**



1. An adaptive method for allocating random access memory (RAM) in a data processing system, said data processing system performing procedures having higher and lower priorities, said RAM having non-assigned storage including a first portion and a second portion, said first portion available for assignment to higher priority procedure and said second portion available for assignment to a lower priority procedure, said higher priority procedure able to access said second portion, said adaptive method performed by said data processing system and comprising the steps of:

(a) responding to a request for allocation of RAM to a higher priority procedure by determining if RAM is available for allocation from said first portion and, if not, allocating RAM from said second portion to said higher priority procedure; and

(b) enabling allocation of RAM from said second portion to a lower priority procedure when RAM that is available for allocation in said first portion exceeds a first threshold level, and continuing the enablement until said RAM that is available for allocation in said first portion falls below a lower, second threshold level, at which point said allocation to a lower priority procedure is inhibited.

5,535,365

METHOD AND APPARATUS FOR LOCKING SHARED MEMORY LOCATIONS IN MULTIPROCESSING SYSTEMS

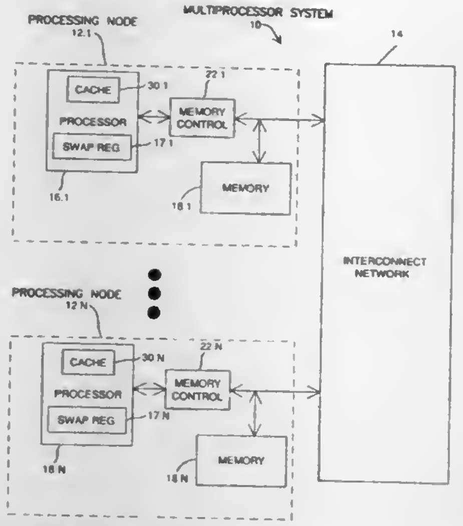
Frank R. Barriuso, Apple Valley; Douglas M. Pase, Burnsville, and David J. Sielaff, St. Paul, all of Minn., assignors to Cray Research, Inc., Eagan, Minn.

Filed Oct. 22, 1993, Ser. No. 141,259

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—482 **5 Claims**

2. In a computer system having a plurality of processor nodes connected through an interconnect network, wherein the plurality of processor nodes includes first and second processor nodes and wherein each processor node includes a local swap register for storing a lock value, a method of protecting data stored on the first processor node when that data is being accessed by a process on said second processor node, the method comprising the steps of:



a) defining a lock value;

b) writing the lock value in the local swap register of the second processor node;

c) providing a hash table having a plurality of hash table cells, including a first hash table cell, wherein the first hash table cell contains a lock entry for a protected memory location;

d) selecting said first hash table cell from the plurality of hash table cells, wherein the step of selecting comprises calculating a hash value;

e) reading the lock entry at the selected first hash table cell, wherein the step of reading the lock entry comprises the step of atomically swapping the lock value stored in the local swap register of the second processor node with the lock entry at the selected first hash table cell;

f) comparing the lock entry read from the selected first hash table cell to the defined lock value; and

g) if the lock entry read does equal the defined lock value, repeating steps e–g.

5,535,366

METHOD OF AND CIRCUIT ARRANGEMENT FOR FREEING COMMUNICATIONS RESOURCES, PARTICULARLY FOR USE BY A SWITCHING ELEMENT

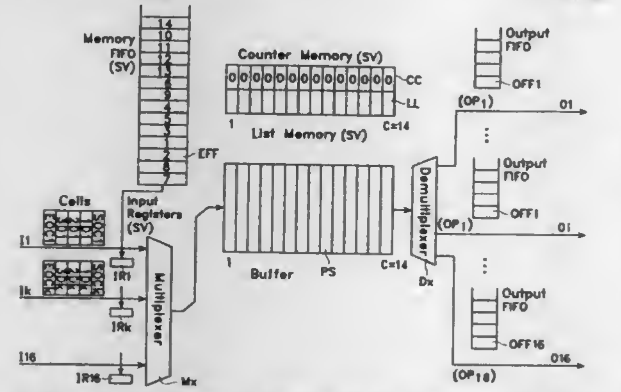
Bodo Pfeiffer, Schwieberdingen; Thomas Banniza, Hemmingen; Bozo Cesar, Stuttgart; Stefan Wahl, and Klaus-Dieter Menk, both of Hemmingen, all of, Germany, assignors to Alcatel N. V., Amsterdam, Netherlands

Filed Mar. 6, 1991, Ser. No. 665,788

Claims priority, application Germany, Mar. 12, 1990, 40 07 747.0; Apr. 7, 1990, 40 11 357.4

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—486 **17 Claims**



1. Method of dedicating a data unit from a plurality of such data units for a one-time specific use in a digital communication system, comprising the steps:

providing an electronic memory whose contents indicate which of said data units have previously been dedicated for a respective said one-time specific use and have not yet been freed for any other use and are therefor unavailable,

determining when each unavailable said data unit was last dedicated to the corresponding said one-time specific use,

updating said contents to indicate as free for other uses, each unavailable said unit which was last dedicated to a respective specific use longer than a predetermined time ago,

using said contents to identify a free unit, and dedicating said free unit to said one-time specific use, wherein each said one-time specific use is receiving storing and transmitting a single block of data.

5,535,367

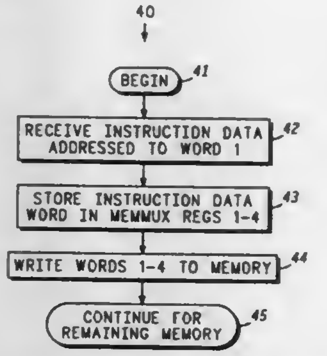
DEMULTIPLEXING INITIALIZATION DATA TO BE TRANSFERRED TO MEMORY THROUGH A PLURALITY OF REGISTERS WITH ERROR DETECTION DATA

Eugene H. Gruender, Jr., and Ralph E. Snowden, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 683,537, Mar. 4, 1991, abandoned. This application Mar. 16, 1994, Ser. No. 214,083

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—493 **4 Claims**


40
BEGIN
41
RECEIVE INSTRUCTION DATA ADDRESSED TO WORD 1
42
STORE INSTRUCTION DATA WORD IN MEMMUX REGS 1-4
43
WRITE WORDS 1-4 TO MEMORY
44
CONTINUE FOR REMAINING MEMORY
45

1. A method of initializing a memory in a computer system, the computer system having multiple registers provided for holding data words stored in the memory at sequential memory addresses, and the method comprising the steps of:

reading into the multiple registers a group of data words stored in the memory at a group of the sequential memory addresses;

modifying a single data word of the group of data words to become an initialization data word;

storing the initialization data word in each of the multiple registers; and

writing the initialization data word stored in each of the multiple registers to the memory at the group of sequential memory addresses.

5,535,368

AUTOMATICALLY-CONFIGURING MEMORY SUBSYSTEM

Wen-Jei Ho, Los Gatos, Calif.; Michael J. Stember, Raleigh, and Steven L. Vanderlinden, Chapel Hill, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

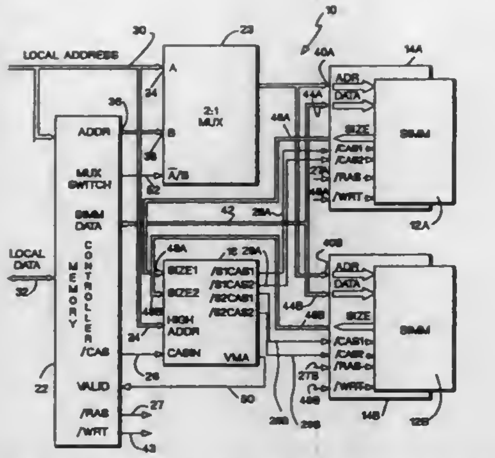
Continuation of Ser. No. 790,992, Nov. 12, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,228

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 395—497.01 **8 Claims**

1. A configurable memory subsystem for use with a computer system having a central processing unit with a memory address output, said configurable memory subsystem comprising:

a plurality of memory devices, each memory device having a size output indicative of its respective memory size;



means for receiving one or more of said memory devices, said memory devices being insertable and removable from said receiving means without intervening said central processing unit;

a programmable logic device (PLD) having inputs for receiving said size outputs, having an input for receiving said memory address output, having means for determining the acceptable range of memory address outputs, providing output indicative as to whether said memory address output is valid, and providing an enabling output for selectively enabling one of said memory devices, said enabling output being based upon said memory address output and upon said size outputs from said memory devices,

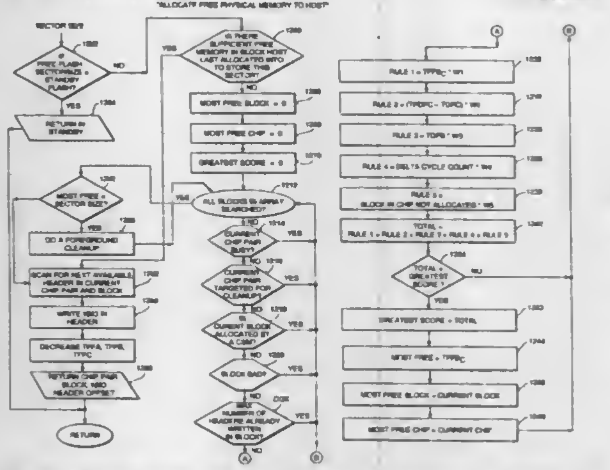
whereby one of said memory devices may be inserted into said receiving means or may be removed from said receiving means without indicating such insertion or removal to said central processing unit.

5,535,369

METHOD FOR ALLOCATING MEMORY IN A SOLID STATE MEMORY DISK

Steven Wells, Citrus Heights; Robert N. Hasbun, Shingle Springs, both of Calif.; Sara Domonkos, Portage, Mich., and Steven S. Barbarich, Carmichael, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 969,138, Oct. 30, 1992, abandoned.
This application Jun. 7, 1995, Ser. No. 485,661
Int. Cl.^{6} G06F *12/02*
U.S. Cl. 395—497.02 **12 Claims**



1. In a solid state memory having a plurality of blocks of memory wherein a portion of each block is located in at least one associated nonvolatile memory device, a method of allocating free memory to a calling process for a unit of data having a variable given size, the method comprising the steps of:

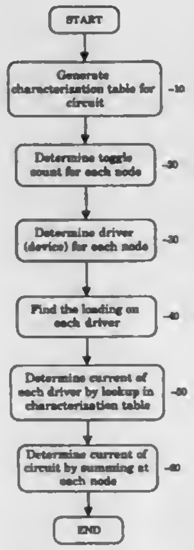
- A) selecting as a selected block a first block of memory to which data was last allocated if the first block has an amount of free memory equal to or greater than the given size;
- B) if the amount of free memory in the first block is less than the given size, then
  - 1) for each appropriate block of memory:
    - a) generating a first number corresponding to an amount of free memory in that block;
    - b) generating a second number corresponding to an amount of memory containing invalid data in that block; and
    - c) summing the first and second numbers to generate a score;
  - 2) selecting a second block having a greatest score as the select, block, if an amount of free memory in the selected block is not less than the given size; and
- C) reserving the given size of free memory in the selected block.

5,535,370

METHOD AND APPARATUS FOR REALISTIC CURRENT AND POWER CALCULATION USING SIMULATION WITH REALISTIC TEST VECTORS

Rajesh Raman, Fair Oaks; Chin S. Tan, and Yung M. Chang, both of Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 22, 1993, Ser. No. 173,773
Int. Cl.^{6} G06F *9/455*
U.S. Cl. 395—500 **24 Claims**


START
Generate characterization table for circuit
10
Determine toggle count for each node
20
Determine driver (device) for each node
30
Find the loading on each driver
40
Determine current of each driver by lookup in characterization table
50
Determine current of circuit by summing at each node
60
END

1. A method for determining current through cells of a circuit comprising at least one cell, each cell comprising at least one device, said method comprising the processor implemented steps of:

generating an average current value for each cell;

generating a toggle count for each cell during a predetermined sample time period, said toggle count indicative of a number of signal transitions during the sample time period;

determining an activity factor for each cell to be equal to the toggle count divided by the number of clock cycles during the sample time period;

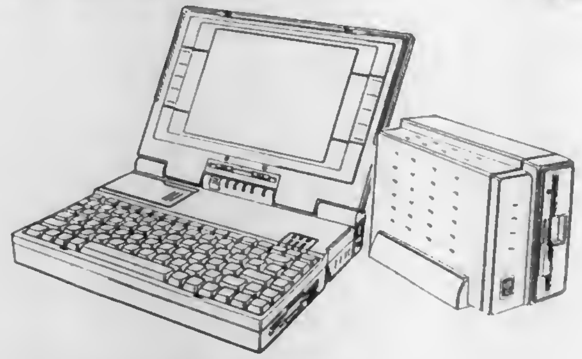
computing the current through a cell to be equal to the average current value for the cell multiplied by the activity factor.

5,535,371

PORTABLE COMPUTER WITH AUTOMATIC ADAPTION TO DIFFERENT DEVICE TYPES ON A STANDARD PORT

Gregory N. Stewart, and Anthony L. Overfield, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 831,217, Feb. 7, 1992, abandoned.
This application Jun. 22, 1994, Ser. No. 264,226
Int. Cl.^{6} G06F *13/00*
U.S. Cl. 395—500 **17 Claims**



1. A computer system, comprising:

a system chassis including therein
  at least one central processing unit (CPU);
  at least one externally accessible multi-pin data connector which conforms to a mechanical and electrical specification of a standard connector format;
  port interface circuits connected to sense and to drive plural pins of said externally accessible data connector;
  a disk drive controller coupled to plural pins of said externally accessible data connector; and
  multiplexing logic coupled to said externally accessible data connector, said port interface circuits, and said disk drive controller;

a first cable incorporating multiple data wires, and having a first multi-pin connector thereon which matches both mechanical and electrical specifications of said standard multi-pin connector format;

a first external input/output device, which is physically separate from said system chassis, and which is connected to said first cable to provide bidirectional data communication using a first protocol, through said first cable and said first connector thereof and said externally accessible connector on said chassis, to and from said port interface circuits, said first external input/output device is a printer device;

a second cable incorporating multiple data wires such that each of said multiple data wires is connected to a respective pin of a second multi-pin connector, said second multi-pin connector matches both mechanical and electrical specifications of said standard multi-pin connector format, except that a first pin of said second connector of said second cable, which carries a fixed voltage in the electrical specifications of said standard format, is electrically connected to a second pin of said second connector of said second cable so that said second pin also carries said fixed voltage, and the presence of said fixed voltage on said second pin is noncompliant with the electrical specifications of said standard format;

a second external input/output device, which is physically separate from said system chassis, and which is connected to each of said multiple data wires of said second cable to provide bidirectional data communication using a second protocol, through said second cable and said second connector thereof and said externally accessible connector on said chassis, to and from said port interface circuits, said second external input-output device is a different device type than said printer device; and

wherein said CPU includes means for querying said port interface circuits to ascertain the voltage of a second pin of said externally accessible connector on said chassis, such that said CPU can automatically switch to said first protocol when said first cable and first external device are connected to said externally accessible connector on said chassis, and can automatically switch to said second protocol when said second cable and second external device are connected to said externally accessible connector on said chassis,

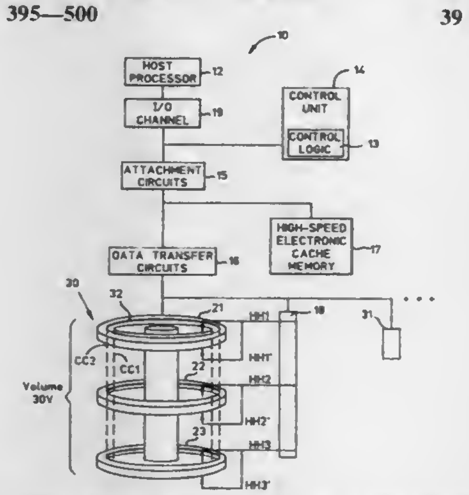
wherein said multiplexing logic electrically connects said externally accessible data connector and said port interface circuits when said first cable and first external device are connected to said externally accessible connector on said chassis, and said multiplexing logic electrically connects said externally accessible data connector and said disk drive controller when said second cable and second external device are connected to said externally accessible connector on said chassis.

5,535,372

METHOD AND APPARATUS FOR EFFICIENT UPDATING OF CKD DATA STORED ON FIXED BLOCK ARCHITECTURE DEVICES

Michael T. Benhase; David A. Burton; John N. McCauley, Jr., and Robert L. Morton, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1994, Ser. No. 271,335
Int. Cl.^{6} G11B *5/09*
U.S. Cl. 395—500 **39 Claims**



1. In a control unit in communication with a host processor, an input/output (I/O) channel, and at least one Fixed Block Architecture (FBA) data storage device, the control unit provided with electronic memory for data storage and transfer means for bilateral communication of data between the electronic memory and the FBA storage device, a method for locating and updating a host request for a specified CKD format record stored on the FBA device, wherein the host specified CKD format record is specified according to a location on a CKD emulated track which identifies a cylinder number (CC) and a head number (HH) and is further specified by a location on an emulated CKD volume, the method comprising the unordered machine-executed steps of:

- (a) storing in this electronic memory one or more Track Format Descriptors (TFDs) which describe the format of each CKD emulated track on the emulated CKD volume identified as the location of the host specified record, without storing an image of the CKD emulated track in the electronic memory;
- (b) storing in this electronic memory a Volume Specification containing cylinder number information for each record in the emulated CKD volume;
- (c) constructing an emulated CKD COUNT field for the CKD emulated track which is identified as the location of the host specified record, the emulated CKD COUNT field based on the host specified location, and the Volume Specification information, and further based on the description in one Track Format Descriptor (TFD) which describes the format of the CKD emulated track; and
- (d) locating and updating the host specified record by using the emulated CKD COUNT field in step (c).

5,535,373

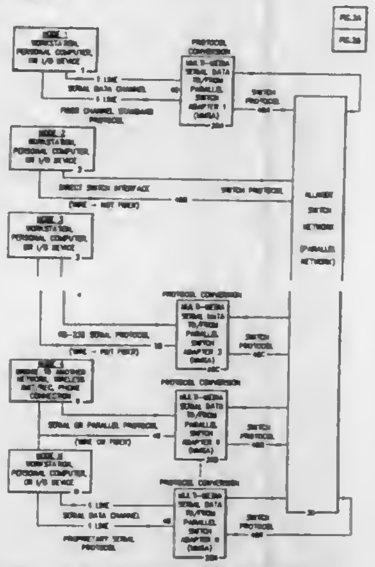
PROTOCOL-TO-PROTOCOL TRANSLATOR FOR INTERFACING DISPARATE SERIAL NETWORK NODES TO A COMMON PARALLEL SWITCHING NETWORK

Howard T. Olnowich, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 799,602, Nov. 27, 1991, abandoned. This application Feb. 15, 1995, Ser. No. 390,893

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—500 **18 Claims**



1. A protocol to protocol translator comprising:

serial receiving means for receiving a complete serial data message transmitted serially under a serial protocol from a node coupled to the translator;

a storage device including translation data corresponding to the serial protocol, the translation data including data useful for decoding data fields of the complete serial data message;

serial translation means coupled to the serial receiving means and to the storage device for translating the complete serial data message from the serial protocol into a parallel protocol in response to the translation data and for storing into a send buffer a translated complete parallel data message, the serial translation means including means for inserting into the translated complete parallel data message preselected header information used by a switch network for routing the translated complete parallel data message, the parallel protocol including an N bit wide parallel format where N is a positive integer greater than one;

parallel sending means coupled to the send buffer for sending a stored complete data message in the parallel protocol to a coupled input port of the switch network, the coupled input port comprising N parallel data paths for receiving an N bit wide parallel data message; and

a switch network, comprising:

a plurality of bufferless switching apparatus cascaded into a plurality of stages, said switching apparatus each including a plurality of switch inputs and a plurality of switch outputs, of the switch outputs included on each of said switching apparatus each coupled to a different one of the switching apparatus via a switch input of said different one of the switching apparatus, switch outputs of last stage switching apparatus each comprising a network output port and switch inputs of first stage switching apparatus each comprising a network input port;

the network output ports each coupled to a network input port through one of a plurality of nodes, each of said nodes comprising means for receiving a data message from a coupled network output port and means for sending a data message to a coupled network input port, said data message to a coupled network input port including a path connection request; and

said switching apparatus each further comprising

connection means for establishing a point-to-point communication path between any one of the network input ports and any one of the network output ports in response to said connection request received at said any one of the network input ports, said communication path for transmitting a data message received at said any one of the network input ports to said any one of the network output ports,

said connection means including asynchronous connection means for establishing asynchronously a plurality of simultaneously active point-to-point communication paths between a plurality of network input ports and a plurality of network output ports in response to a plurality of connection requests received separately or simultaneously at said plurality of network input ports, said simultaneously active communication paths for transmitting concurrently a plurality of data messages received separately or simultaneously at said plurality of network input ports to said plurality of network output ports.

5,535,374

METHOD AND APPARATUS FOR GENERATING IMAGES SIMULATING NON-HOMOGENEOUS FOG EFFECTS

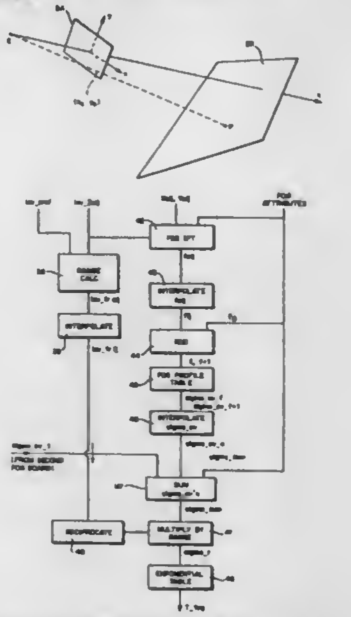
Graham J. Olive, West Sussex, England, assignor to Rediffusion Simulation Limited, Sussex, England

Continuation of Ser. No. 915,999, Aug. 3, 1992, Pat. No. 5,412,796. This application Apr. 17, 1995, Ser. No. 423,210

Claims priority, application United Kingdom, May 12, 1990, 9010703; Jun. 1, 1990, 9012229

Int. Cl.^{6} G09B *9/08*

U.S. Cl. 395—500 **13 Claims**



10. Apparatus for simulating the effects of non-homogeneous fog in an image displayed on a screen, the image being intended to represent the appearance of a model defined in a database in world space coordinates from an eyepoint position in said world space coordinates, and the model being defined in terms of a plurality of features predetermined attributes wherein said apparatus comprises:

a) means for defining a non homogeneous fog structure in world space coordinates as a series of parallel strata of predetermined extinction coefficients,

b) means for determining a position relative to the defined parallel strata of the eyepoint,

c) means for determining a position relative to the defined parallel strata of a feature which may contribute to the image,

d) means for determining a distance from the eyepoint to the feature,

e) means for calculating an average value of the extinction coefficient between the eyepoint and the feature from the defined parallel strata located between the eyepoint and the feature,

f) means for modulating said attributes as a function of said distance and a calculated average value of the extinction coefficient,

said means for calculating an average value including:

means for calculating and storing average extinction coefficient values for each of a series of distances from the eyepoint in a direction perpendicular to the parallel strata,

means for calculating the distance from the eyepoint to the feature in the direction perpendicular to the parallel strata, and

means for looking up the stored average extinction coefficient corresponding to said distance from eyepoint to feature,

the non-homogeneous fog structure being defined in the model by a series of sample extinction coefficients, each corresponding to the extinction coefficient at a respective one of a series of parallel equally spaced sample planes,

the non-homogeneous fog structure being redefined with reference to the eyepoint by a series of average extinction coefficients each corresponding to the average extinction coefficient between the eyepoint and a respective resample plane, the resample planes being parallel to and equally spaced to the said sample planes and one of the resample planes passing through the eyepoint, and

each resampled average extinction coefficient being stored at an address corresponding to a distance from the eyepoint to the resample plane to which that coefficient is related.

5,535,375

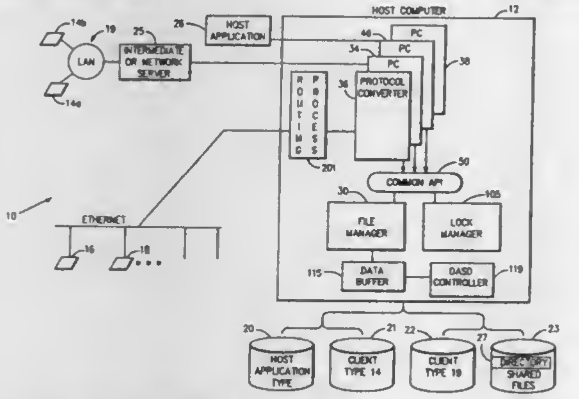
FILE MANAGER FOR FILES SHARED BY HETEROGENEOUS CLIENTS

Marc M. Eshel, Tarrytown; Guerney D. Hunt, Ithaca; Donald N. Jones; Christopher Meyer, both of Vestal, and Frederick A. Schwartz, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 871,204, Apr. 20, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 320,768

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 391—500 **11 Claims**



1. A computer comprising:

means for storing in a common storage area a multiplicity of data objects having at least two different data formats and a directory listing said data objects;

first and second protocol converter means, coupled to receive requests exhibiting first and second different protocols from first and second clients, respectively to read said directory, for converting said requests into a common protoco, said first and second clients having respective first and second, different data formats;

file manger means, coupled to receive the converted requests exhibiting said common protocol from both protocol converters, for furnishing to each of said first and second clients a respective list of data objects having names compatible with the respective data format and not furnishing to each of said first and second clients a respective list of data objects not having names compatible with the respective data format;

said first protocol converter means converts and said file manager means executes a request exhibiting said first protocol from said first client to rename a data object in said directory from a name having a data format compatible with the data format of said first client but incompatible with the data format of said second client to another name having a data format compatible with both said first and second clients such that said first and second clients can access said data object with said other name after the renaming.

5,535,376

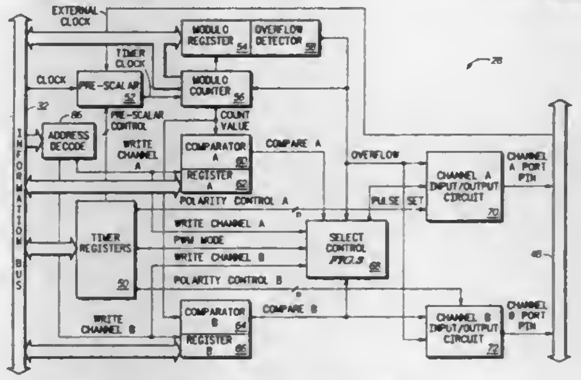
DATA PROCESSOR HAVING A TIMER CIRCUIT FOR PERFORMING A BUFFERED PULSE WIDTH MODULATION FUNCTION AND METHOD THEREFOR

Michael I. Catherwood, Austin, Tex.; Kevin Kilbane, Costa Mesa, Calif., and Laura M. Dobbs, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 18, 1993, Ser. No. 62,625

Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—550 **15 Claims**



1. A timer in a data processor, comprising:

decode means for selectively generating a first write channel signal and a second write channel signal;

a counter for generating a count value;

a first storage means for selectively storing a first pulse width value when the first write channel signal is a first value, the first storage means being coupled to the decode means for receiving the first write channel signal;

a first comparator for comparing the count value with the first pulse width value, the first comparator asserting a first comparison signal when the count value is the same as the first pulse width value, the first comparator having a first input coupled to the counter for receiving the count value, the first comparator having a second input coupled to the first storage means for receiving the first pulse width value;

a second storage means for selectively storing a second pulse width value when the second write channel signal is a second value, the second storage means being coupled to the decode means for receiving the second write channel signal;

a second comparator for comparing the count value with the second pulse width value, the second comparator asserting a second comparison signal when the count value is the same as the second pulse width value, the second comparator having a first input coupled to the counter for receiving the count value, the second comparator having a second input coupled to the second storage means for receiving the second pulse width value;

a select circuit for selecting an output pulse width value, the select signal selecting the first comparison signal as the output pulse width value when the first write channel signal is the first logic value and the select signal selecting the second comparison signal as the output pulse width value when the second write channel signal is the second logic value, the select circuit having a first input coupled to the first comparator for receiving the first comparison value, a second input coupled to the second comparator for receiving the second comparison value, a third input coupled to the decode means for receiving the first write channel signal, and a fourth input coupled to the decode means for receiving the second write channel signal; and

an output circuit for providing a pulse having an output pulse width determined by the output pulse width value, the output circuit being coupled to the select circuit for receiving the output pulse value.

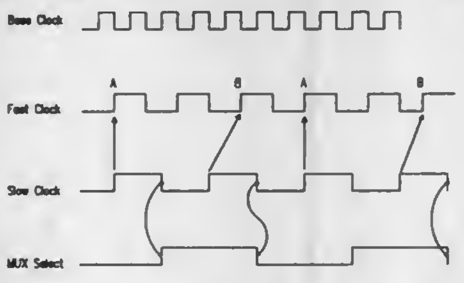
5,535,377

METHOD AND APPARATUS FOR LOW LATENCY SYNCHRONIZATION OF SIGNALS HAVING DIFFERENT CLOCK SPEEDS

Terry Parks, Round Rock, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jan. 31, 1994, Ser. No. 191,671
Int. Cl.^{6} G06F *1/12*

U.S. Cl. 395—550 15 Claims



Signal From Slow Clock Side to Fast Clock Side

1. An apparatus for synchronizing signals based on different clock frequencies, comprising:

a first logic portion including a first clock signal having a first frequency, wherein said first logic portion operates at said first frequency;

a second logic portion coupled to said first logic portion, wherein said second logic portion receives a second clock signal having a second frequency, wherein said second logic portion operates at said second frequency, wherein said second frequency is different than said first frequency, and wherein said first logic portion generates signals which travel to said second logic portion and said second logic portion generates signals which travel to said first logic portion;

signal synchronization logic coupled between said first logic portion and said second logic portion, said synchronization logic comprising:

a clock generator for generating a base clock signal having a frequency which is a multiple of said first and said second frequencies, wherein said clock generator generates said second clock signal received by said second logic portion, wherein said second clock signal is generated from said base clock signal, and wherein said second clock signal has a substantially fixed phase relationship with said first clock signal;

first to second signal synchronization logic which receives a first signal generated by the first logic portion and generates a synchronized version of said first signal to the second logic portion, wherein said first to second signal synchronization logic uses said base clock signal to generate said synchronized version of said first signal, and wherein said synchronized version of said first signal is sampled by the second logic portion; and

second to first signal synchronization logic which receives a second signal generated by the second logic portion and generates a synchronized version of said second signal to the first logic portion, wherein said second to first signal synchronization logic uses said base clock signal to generate said synchronized version of said second signal, and wherein said synchronized version of said second signal is sampled by the first logic portion.

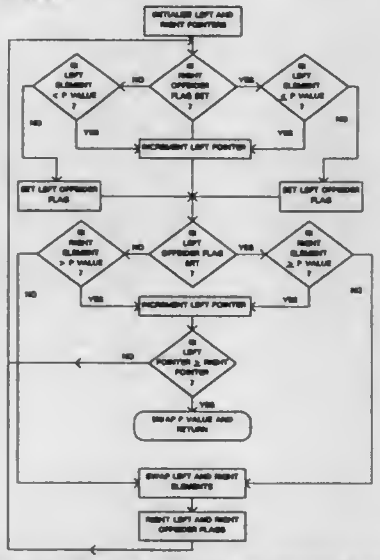
5,535,378

BALANCED AND STABILIZED QUICKSORT METHOD

William D. Arnold, 5459 Hedgerow Dr., Indianapolis, Ind. 46226-1625

Filed Jan. 4, 1994, Ser. No. 177,289
Int. Cl.^{6} G06F *7/08*

U.S. Cl. 395—600 9 Claims



1. An improved quicksort method for sorting arrays of values, wherein the method comprises the steps of:

a. selecting an element of the array to serve as a pvalue,

b. positioning the pvalue element of the array in its final sorted position within the array such that all array values on a first side of the final pvalue array position are less than or equal to the final pvalue array position and all array values on a second side of the final pvalue array position are greater than or equal to the pvalue, and wherein the step of positioning the pvalue element of the array in its final sorted position comprises the steps of:

1. providing a first index representing the first position of the array,
2. providing a second index representing the last position of the array,
3. incrementing the first index until the array element represented by the first index is greater than the pvalue,
4. decrementing the second index until the array element represented by the second index is less than the pvalue,
5. after the incrementing and decrementing of the first and second indices of substeps (b)(3) and (b)(4) occurs, swapping the array elements represented by the first and second index, and
6. repeating substeps (b)(3)–(b)(5) until the first index and second index are equal and the pvalue is exchanged, and

c. recursively repeating steps a. and b. for each subarray comprising the array elements on opposing sides of the ending location of pvalue;

the improvement comprising:

in substep (b)(3), incrementing the first index only after either: (a) the second index has been decremented since the last time the first index has been incremented, or (b) the array element represented by the second index is greater than the pvalue; and

in substep (b)(4), decrementing the second index only after either: (a) the first index has been incremented since the last time the second index has been decremented; or (b) the array element represented by the first index is less than the pvalue.

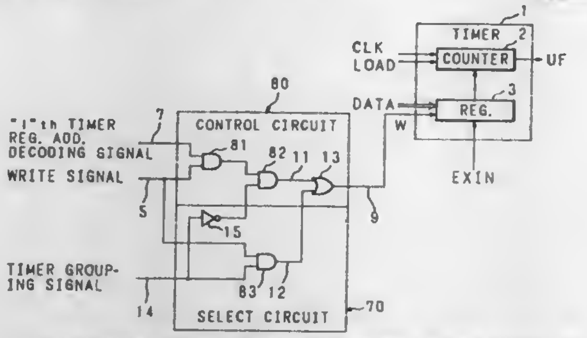
5,535,379

TIMER APPARATUS CAPABLE OF WRITING IDENTICAL DATA TO A PLURALITY OF TIMERS BUILT IN A MICROCOMPUTER

Masato Koura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1994, Ser. No. 289,449
Claims priority, application Japan, Aug. 23, 1993, 5-207782
Int. Cl.^{6} H03K *21/02*

U.S. Cl. 395—550 7 Claims



1. A timer apparatus built in a microcomputer having a CPU and generating an internal clock signal comprising:

a plurality of timers each having a register for holding data supplied from the CPU and a counter for counting the internal clock signal, said counter receiving said data held in the register as an initial count value;

a plurality of control circuits, each provided corresponding to a respective timer for generating a control signal instructing the register of the respective timer to write and hold the data supplied from the CPU; and

a selection circuit for generating an output signal to said plurality of control circuits,

respective control circuit having a first signal input line for receiving a first signal generated by said CPU for specifying writing of data to the registers, a second signal input line for receiving a second signal generated by said CPU for specifying a certain one of said plurality of timers, and a third signal input line for receiving the output signal from said selection circuit, and said selection circuit having a first signal input line for receiving said first signal and a second signal input line for receiving a third signal specifying single writing mode or group writing mode, wherein

when said first signal is generated and said third signal specifies single writing mode, the control circuit corresponding to the timer specified by said second signal generates the control signal instructing the register of the corresponding timer to write and hold the data supplied from the CPU, and

when said first signal is generated and said third signal specifies group writing mode, the output signal of said selection circuit instructs each of said plurality of control circuits to generate the control signal instructing the register of the corresponding timer to write and hold the data supplied from the CPU.

5,535,380

SYSTEM TO REDUCE LATENCY FOR REAL TIME INTERRUPTS

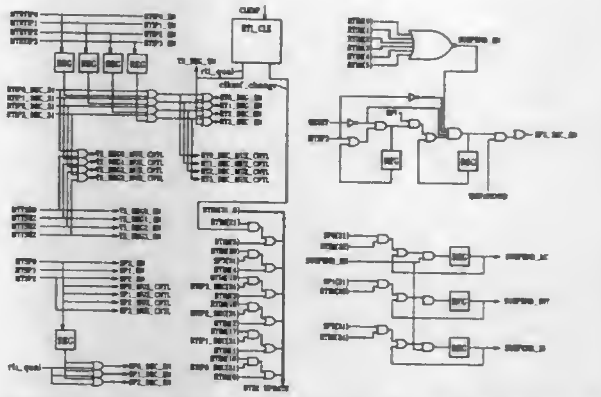
John J. Bergkvist, Jr., Williston, Vt.; Donald E. Carmon, and Michael T. Vanover, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1994, Ser. No. 357,888
Int. Cl.^{6} G06F *9/46*

U.S. Cl. 395—550 20 Claims

1. A system for providing a time-based interrupt signal to a processor for executing a real time interrupt event with reduced interrupt latency, comprising:

first means for storing a first count value defining an interrupt period in terms of the number of count cycles until the time for executing a real time interrupt event;



first means for counting said count cycles and producing an interrupt signal when the cycle count reaches said number of count cycles defining an interrupt period, said interrupt signal indicating the time for executing a real time interrupt event;

second means for storing a second count value indicative of the number of count cycles until the time for executing a type or class of event which must be suppressed in order to minimize the latency of executing an associated real time interrupt event on time;

second means for counting said count cycles and producing an indicative signal when the cycle count reaches said number of count cycles indicating the time for executing said type or class of event; and

means, responsive to said interrupt signal and said indicative signal, for suppressing the execution of any type or class of event to be suppressed when an indicative signal occurs before an associated interrupt signal for indicating the time for executing said real time interrupt event.

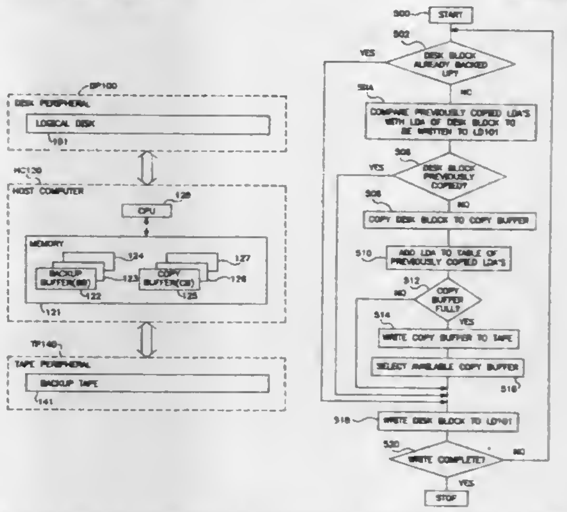
5,535,381

APPARATUS AND METHOD FOR COPYING AND RESTORING DISK FILES

David J. Kopper, Shrewsbury, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Jul. 22, 1993, Ser. No. 95,878
Int. Cl.^{6} G06F *11/22;15/00*

U.S. Cl. 395—600 9 Claims


DP100
DISK PERIPHERAL
LOGICAL DISK
101
HC120
HOST COMPUTER
CPU
128
MEMORY
124
127
BACKUP BUFFER(BB)
123
COPY BUFFER(CB)
126
122
125
121
TP140
TAPE PERIPHERAL
BACKUP TAPE
141
500
START
502
YES
DISK BLOCK ALREADY BACKED UP?
NO
504
COMPARE PREVIOUSLY COPIED LDA'S WITH LDA OF DISK BLOCK TO BE WRITTEN TO LD101
YES
DISK BLOCK PREVIOUSLY COPIED?
NO
COPY DISK BLOCK TO COPY BUFFER
510
ADD LDA TO TABLE OF PREVIOUSLY COPIED LDA'S
512
NO
COPY BUFFER FULL?
514
YES
WRITE COPY BUFFER TO TAPE
SELECT AVAILABLE COPY BUFFER
516
518
WRITE DISK BLOCK TO LD101
520
WRITE COMPLETE?
NO
YES
STOP

8. In a data processing system having a CPU, a memory, a disk peripheral and a tape peripheral, and wherein information from the disk peripheral has been stored on the tape peripheral in logical tape records, each said logical tape record having an identifier and containing (i) a plurality of disk blocks of information, (ii) a like plurality of logical disk addresses for said disk blocks, each said logical disk address being associated with one of said plurality of disk blocks of information and (iii) means for indicating if the tape record contains file structure information, a method of restoring a

selected portion of the information from the tape peripheral to the disk peripheral comprising the steps of:

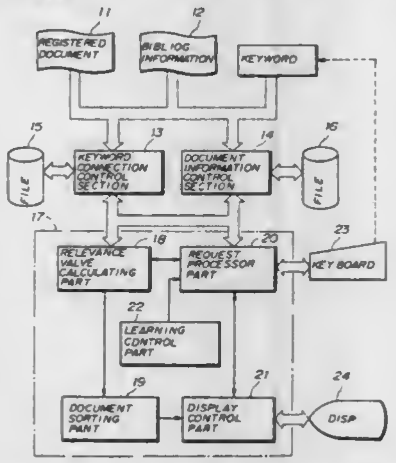
(a) reading a tape record from the tape peripheral into the memory and examining each disk block in the tape record;
(b) if a disk block contains file structure information, placing the disk block into a file structure file in memory;
(c) if a disk block contains other than file structure information, entering the identifier of the tape record and the logical disk address of the disk block into a table in memory;
(d) repeating steps a–c for each tape record;
(e) identifying the logical disk addresses of the disk blocks making up the selected portion of the information to be restored;
(f) identifying the tape records which contain one or more of the disk blocks identified in step (e) and creating a sequential list in memory of the identified tape records;
(g) reading a tape record identified in step (f) and writing to the disk peripheral all disk blocks identified in step (e) for the tape record;
(h) repeating step (g) until all tape records identified in step (e) have been processed.

5,535,382

DOCUMENT RETRIEVAL SYSTEM INVOLVING RANKING OF DOCUMENTS IN ACCORDANCE WITH A DEGREE TO WHICH THE DOCUMENTS FULFILL A RETRIEVAL CONDITION CORRESPONDING TO A USER ENTRY

Yasushi Ogawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 565,311, Jul. 27, 1990, abandoned.
This application Nov. 17, 1993, Ser. No. 153,279
Claims priority, application Japan, Jul. 31, 1989, 1-196639
Int. Cl.^{6} G06F *17/30;15/18*
U.S. Cl. 395—600 **16 Claims**



1. A document retrieval system for retrieving documents from documents registered in a document database responsive to a retrieval condition designated by a user, said document retrieval system comprising:

a) query converting means for converting said retrieval condition designated by the user into a query having a predetermined normal form in which keywords and at least one type of logical operation out of logical operations AND, OR and NOT are connected;
b) bibliographical information indicating means for indicating at least information concerning which keywords correspond to each document of the documents registered in said document database;
c) a keyword connection table having relationship values, each of the relationship values representing a degree of relationship between keywords;
d) ranking means for ranking documents in accordance with relevance values, each relevance value indicating a degree to which a document fulfills the retrieval condition corresponding to the query, each of said relevance values being calculated for the document using the relationship values provided in said keyword connection table, wherein connected keywords are obtained with reference to the information indicated by said bibliographical indicating means as (1) keywords corresponding to the document and (2) keywords included in the query obtained by said query converting means;
e) outputting means for outputting, as a retrieval result, the documents ranked by said ranking means;
f) inputting means for inputting evaluation information indicating a degree to which each of the documents output by said outputting means is relevant to a document required by the user; and
g) learning means for modifying one or a plurality of said relationship values in said keyword connection table based on the evaluation information input by said inputting means;

wherein said query converting means includes first means for generating a first query in a conjunctive normal form, said first query in the conjunctive normal form having subqueries which are connected with each other only by logical AND operations, each of said subqueries being expressed by at least one keyword connected by at least one of logical OR and NOT operations; and

wherein said ranking means includes:

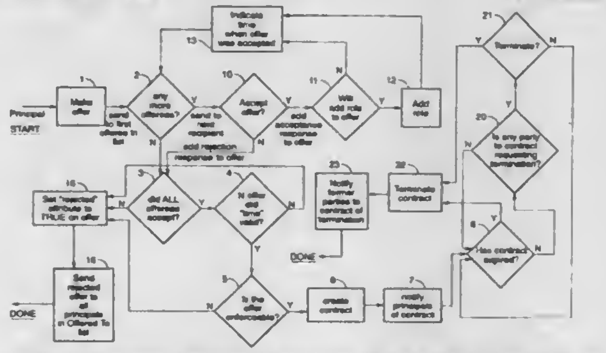
1) first calculation means for calculating a sub-relevance value for each of said subqueries, said sub-relevance value indicating a degree to which each document fulfills each of said subqueries; and
2) second calculation means for calculating a relevance value for each of the documents using said sub-relevance value calculated for each of said subqueries by said first calculation means.

5,535,383

DATABASE SYSTEM WITH METHODS FOR CONTROLLING OBJECT INTERACTION BY ESTABLISHING DATABASE CONTRACTS BETWEEN OBJECTS

Stefan F. Gower, Fremont, Calif., assignor to Sybase, Inc., Emeryville, Calif.

Filed Mar. 17, 1994, Ser. No. 214,375
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—600 **30 Claims**



1. In a computer system comprising a database of objects, a computer-implemented method for controlling objects of said database so that interaction between the objects occurs within constraints specified by the objects themselves, the method comprising:

defining a database contract to comprise a set of constraints which govern interaction of one object with another in said computer system;

initiating a database contract between first and second objects of said database, by sending an offer object from said first object to said second object, said offer object including conditions which must be met before a database contract can exist between the two objects;

if said conditions are acceptable to said second object, sending an acceptance object from said second object to said first object;

determining by a monitor of said computer system whether said first and second objects each has sufficient authority to enter into said database contract, said monitor having no authority over said first and second objects other than monitoring authority of objects to enter database contracts and monitoring compliance of objects which have entered database contracts;

upon receipt by said first object of an acceptance object with sufficient authority, establishing said database contract between said first and second objects of said database, so that interaction between said first and second objects is controlled by said set of constraints of said database contract, said set of constraints of said database contract being enforced by said monitor; and

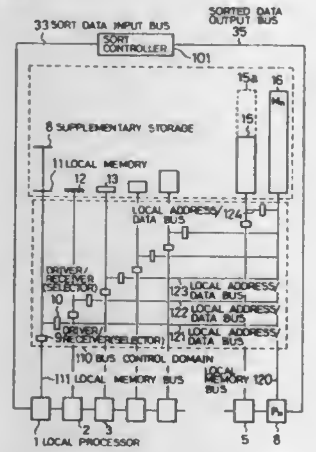
monitoring by said monitor compliance of each of said first and second objects with said set of constraints to ensure each object's performance of the database contract.

5,535,384

METHOD AND APPARATUS FOR CONTROLLING A HARDWARE MERGE SORTER TO SORT A PLURALITY OF RECORDS GREATER THAN 2^N

Yasunori Kasahara, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1994, Ser. No. 255,375
Claims priority, application Japan, Jul. 13, 1993, 5-173167
Int. Cl.^{6} G06F *7/14;7/16*
U.S. Cl. 395—600 **22 Claims**



1. A sorting system for sorting a plurality ($N \leqq 2^{n+1}$) of records, comprising:

a hardware merge sorter, including:

a plurality n of local processors cascaded in series, wherein each of said local processors (p^i where $i=0,1 \ldots n-1$) receives two strings of 2^{i-1} records, merges and sorts the two strings into a sorted data-string of 2^i records, and outputs said sorted data-string so that said hardware merge sorter produces a first sorted data-string of 2^n records and a second sorted data string of $N-2^n$ records during a first sorting through the hardware merge sorter;

a memory having a storage capacity of 2^n number of records, including a plurality of local memories;

a plurality of selectors, each selector coupled to and between one of the plurality of local memories and a respective local processor, for coupling the plurality of local memories to the plurality of local processors during said first sorting, and for coupling the plurality of local memories to one local processor of the plurality of local processors for a second sorting; and

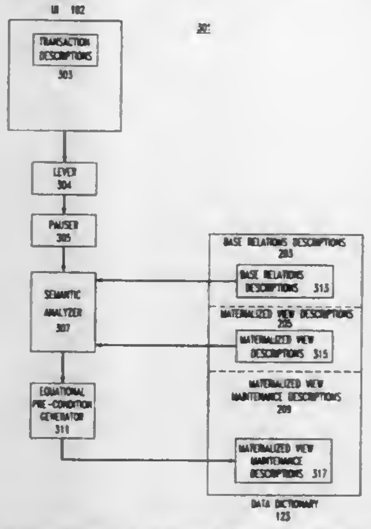
a controller for controlling said plurality of local processors and said plurality of selectors so that said hardware merge sorter produces the sorted data-strings of N number of records during said first sorting, and produces an output sorted data-string of 2N number of records during said second sorting.

5,535,385

DEALING WITH SIDE EFFECTS OF TRANSACTIONS IN DATA BASE SYSTEMS USING A MULTI-SET ALGEBRA

Timothy G. Griffin, Berkeley Heights, and Leonid Libkin, Basking Ridge, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed May 19, 1995, Ser. No. 444,467
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—600 **37 Claims**


102
TRANSACTION DESCRIPTIONS
303
LEXER
304
PARSER
305
SEMANTIC ANALYZER
307
EQUATIONAL PRE-CONDITION GENERATOR
311
BASE RELATIONS DESCRIPTIONS
203
BASE RELATIONS DESCRIPTIONS 313
MATERIALIZED VIEW DESCRIPTIONS
205
MATERIALIZED VIEW DESCRIPTIONS 315
MATERIALIZED VIEW MAINTENANCE DESCRIPTIONS
209
MATERIALIZED VIEW MAINTENANCE DESCRIPTIONS 317
DATA DICTIONARY
125

1. A method employed in a data base system of determining a side effect on the data base system of a transaction on a relation in the data base system, the method comprising the steps of:

receiving a description of the transaction in terms of the relation;

transforming the description in accordance with a set of change propagation equations which correctly deal with duplicates to produce a pre-expression which specifies the side effect; and

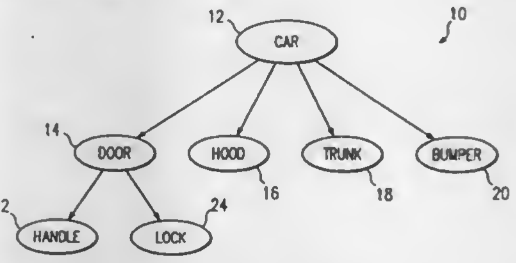
responding to the transaction by producing the side effect specified in the pre-expression.

5,535,386

TRANSACTION AND VERSION MANAGEMENT SYSTEM

Chung C. Wang, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 81,483, Jun. 22, 1993, which is a continuation of Ser. No. 569,360, Aug. 17, 1990, abandoned.
This application Jun. 7, 1995, Ser. No. 484,619
Int. Cl.^{6} G06F *17/30*
U.S. Cl. 395—600 **3 Claims**



1. A method of managing versions and configurations of a plurality of objects comprising the steps of:

providing a database which includes a plurality of data elements represented by four-tuples, said four-tuples comprising a unique identifier, a timestamp, a branch name, and a data value;

generating a version graph which represents relationships among said elements;

generating an object graph which represents a particular configuration of a portion of said elements;

accessing said portion of said elements in said database in accordance with a first context, a second context, and said unique identifier in response to operations requested by an application program on said object graph using a storage manager.

5,535,387

UNIFORM LOAD DISTRIBUTING METHOD FOR USE IN EXECUTING PARALLEL PROCESSING IN PARALLEL COMPUTER

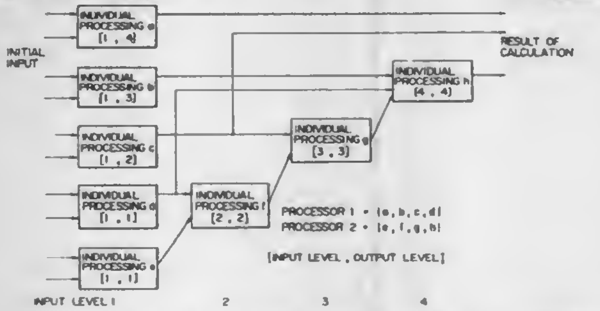
Hidetoshi Matsuoka, and Fumiyasu Hirose, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 7, 1993, Ser. No. 43,808

Claims priority, application Japan, Apr. 10, 1992, 4-91016

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 395—650 **23 Claims**


INDIVIDUAL PROCESSING a [1, 4]
INITIAL INPUT
INDIVIDUAL PROCESSING b [1, 3]
INDIVIDUAL PROCESSING c [1, 2]
INDIVIDUAL PROCESSING d [1, 1]
INDIVIDUAL PROCESSING e [1, 1]
INDIVIDUAL PROCESSING f [2, 2]
INDIVIDUAL PROCESSING g [3, 3]
INDIVIDUAL PROCESSING h [4, 4]
RESULT OF CALCULATION
PROCESSOR 1 = {a, b, c, d}
PROCESSOR 2 = {e, f, g, h}
[INPUT LEVEL, OUTPUT LEVEL]
INPUT LEVEL 1
2
3
4

1. A uniform load distributing method for use in executing a plurality of individual processings in a parallel manner in a series of steps in a parallel computer having a plurality of processors for executing the individual processings, a network for conducting inter-processor communication, and a synchronizing mechanism to synchronize the plurality of processors by issuing an executing start command for a next step to all the processors when an indication of the completion of the individual processings performed in a current step is received from all the processors and the inter-processor communication related to the current step has been completed, said method comprising:

executing, by the plurality of processors in a current step of the series, the plurality of respective individual processings having the necessary input data and whose output data is needed in a next step of the series;

sending an indication of the completion of the execution, by each of the plurality of processors, to the synchronizing mechanism, immediately after the execution has been completed; and

executing, until the execution start command for the next step is given by the synchronizing mechanism, the individual processings whose input data is ready and whose output data will be required at an earliest time following the completion of the next step.

5,535,388

APPARATUS FOR DYNAMICALLY COLLECTING AND EDITING MANAGEMENT INFORMATION DURING A SOFTWARE DEVELOPMENT PROCESS

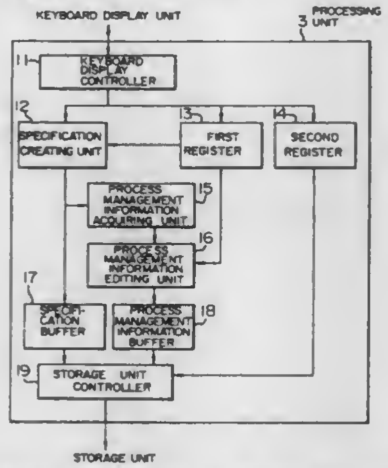
Shigeru Takeda, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 926,342, Aug. 6, 1992, abandoned. This application Jun. 9, 1994, Ser. No. 257,934

Claims priority, application Japan, Aug. 21, 1991, 3-234038

Int. Cl.^{6} G06F *9/44*

U.S. Cl. 395—650 **2 Claims**


KEYBOARD DISPLAY UNIT
3 PROCESSING UNIT
11
KEYBOARD DISPLAY CONTROLLER
12
SPECIFICATION CREATING UNIT
13
FIRST REGISTER
14
SECOND REGISTER
PROCESS MANAGEMENT INFORMATION ACQUIRING UNIT
15
PROCESS MANAGEMENT INFORMATION EDITING UNIT
16
17
SPECIFICATION BUFFER
PROCESS MANAGEMENT INFORMATION BUFFER
18
19
STORAGE UNIT CONTROLLER
STORAGE UNIT

1. An apparatus for collecting management information concurrently while a plurality of operators create and develop computer programs and specification documents which describe aspects of said computer programs, the apparatus comprising:

storage means for designating sets of management information data items to be collected, said management information data items including an identification of each specification document, a name of each operator that works on each specification documents date and hour information indicating time period and amounts of work performed producing each specification document, and editing rules for editing said collected management information data items into selected formats;

a destination storing means for storing destination storage unit information which specifies a locations for said management information data items to be stored in a plurality of destination storage units;

a specification means for outputting (i) said generated specification documents as well as (ii) said sets of said management information data items designated by said storage means concurrently while said operators are creating said specification documents;

a management information acquiring means for monitoring said specification means and collecting said sets of said management information data items output by said specification means;

a management information editing means for editing said management information data items collected by said management information acquiring means in accordance with said editing rules stored in said storage means, said management information editing means storing said management information data items in said destination storage units periodically; and

a storing time means for defining times at which said management information editing means stores edited management information data items in said destination storage units, said storing time means being connected with at least one of said destination storage units and said management information editing means such that said timing means enables said management information editing means to store said management information data items in said destination storage units at said designated storing times.

5,535,389

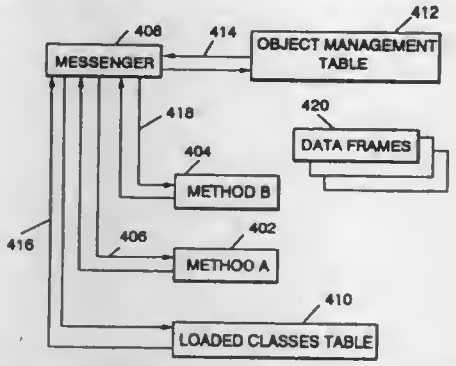
BUSINESS PROCESS OBJECTS WITH ASSOCIATED ATRIBUTES SUCH AS VERSION IDENTIFIER

David B. Elder, Alpharetta; Stephen P. Krosner, Marietta; Paul E. Miller, Atlanta, all of Ga., and Harold R. Skinner, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1993, Ser. No. 9,170

Int. Cl.^{6} G06F *9/44*

U.S. Cl. 395—700 **9 Claims**



1. A method for storing and executing a plurality of object and action pairs as a business process in an object oriented computing environment, said method adapted to operate on one or more computer platforms and comprising the steps of:

generating a business process object instance;

defining execution parameters for said business process object instance, said step of defining execution parameters for said business process object instance including receiving and responding to a first input from the user interface assigning a name to said business process object instance and assigning a version identifier to said business process object instance in response to a second input;

responding to an interactive user selection of object and action pairs to be executed in said business process;

storing said selected object and action pairs and placing them in said business process object instance; and executing said business process object instance by selecting said business process object instance through a user interface and specifying a method to be performed by said business process object instance; and

executing said business process object instance by selecting said business process object instance through a user interface and specifying a method to be performed by said business process object instance.

5,535,390

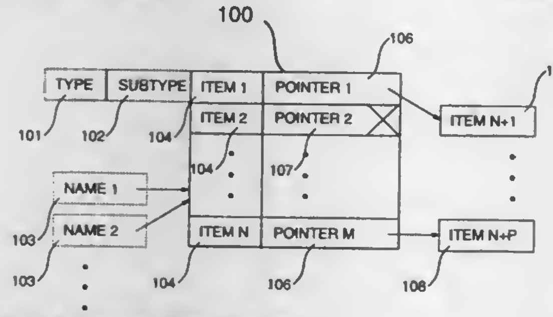
METHOD FOR REUSING TEMPORARIES AND RECLAIMING SHARED MEMORY

Thomas H. Hildebrandt, 1704 Sequoia Ct., Allentown, Pa. 18104-1718

Filed Jul. 22, 1994, Ser. No. 279,466

Int. Cl.^{6} G06F *9/45*

U.S. Cl. 395—700 **17 Claims**



8. In a computer system having:

memory means;

means for allocating and deallocating objects comprising at least zero elements within said memory means;

means for creating and deleting identifiers comprising pointers to objects within said memory means;

means for retrieving an object given an identifier which points to said object;

a null identifier;

means for copying memory elements from one object to another object; and

at least one process running in said computer system,

a method for creating, reusing and destroying objects comprising the steps of:

(A) adding to said computer system means for labelling an identifier with a subtype; and then

(B) in response to requests by ones of said processes to create a first object of a given size:

(i) allocating a second object at least as large as said given size;

(ii) creating a first identifier which points to said second object;

(iii) labelling said first identifier with a first subtype; and then

(iv) returning said first identifier to said requesting process;

(C) in response to requests by ones of said processes to create a reference copy of a first given object, said request comprising a second identifier which points to said first given object:

(i) creating a third identifier equal to said second identifier, and then

(ii) labelling said third identifier with a second subtype, and then;

(iii) returning said third identifier to said requesting process;

(D) in response to requests by ones of said processes to create a verbatim copy of a second given object, said request comprising a fourth identifier which points to said second given object:

(i) requesting the creation of a third object at least as large as said second given object, and then;

(ii) for each element in said second given object: copying said element into said third object;

(iii) creating a fifth identifier which points to said third object;

(iv) labelling said fifth identifier with said first subtype; and then

(v) returning said fifth identifier to said requesting process;

(E) in response to requests by ones of said processes to destroy a third given object, said request comprising a sixth identifier which points to said third given object:

(i) if said sixth identifier is not said null identifier:

(a) if said sixth identifier is labelled with said first subtype: deallocating said third given object;

(b) deleting said sixth identifier.

5,535,391

SYSTEM AND METHODS FOR OPTIMIZING OBJECT-ORIENTED COMPILATIONS

Anders Hejlsberg, Aptos; Jeffrey Stock, Scotts Valley; Peter Kukol, Aptos, and Alex Shtaygrud, San Jose, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 894,706, Jun. 5, 1992, Pat. No. 5,481,708. This application Feb. 15, 1995, Ser. No. 388,851

Int. Cl.^{6} G06F *9/45*

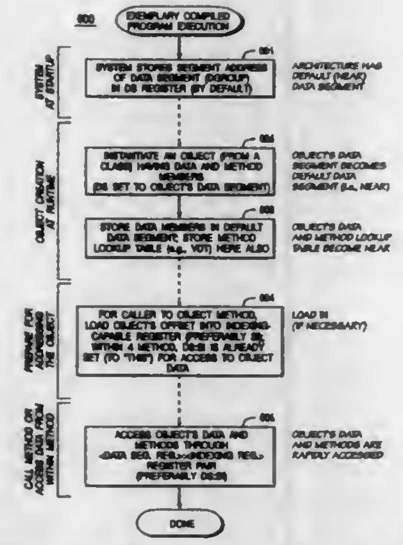
U.S. Cl. 395—700 **19 Claims**

1. In a system for compiling C++ source listings into code for operating a computer, the source listings including C++ objects instantiated from C++ classes defining class methods and data members, the system including a memory and a processor having registers for loading segment and offset addresses of memory locations, a method for controlling access to said methods and data members, the method comprising:

(a) defining a class of objects, said class including data members and methods operative on said data members;

(b) creating an object of said defined class by storing data members for said object at a default data segment in said memory;

(c) maintaining a segment address for said data segment in a data segment addressing register of said processor; and


800
EXEMPLARY COMPILED PROGRAM EXECUTION
SYSTEM AT STARTUP
SYSTEM STORES SEGMENT ADDRESS OF DATA SEGMENT (DGROUP) IN DS REGISTER (BY DEFAULT)
ARCHITECTURE HAS DEFAULT (NEAR) DATA SEGMENT
OBJECT CREATION AT RUNTIME
INSTANTIATE AN OBJECT (FROM A CLASS) HAVING DATA AND METHOD MEMBERS (DS SET TO OBJECT'S DATA SEGMENT)
OBJECT'S DATA SEGMENT BECOMES DEFAULT DATA SEGMENT (i.e., NEAR)
STORE DATA MEMBERS IN DEFAULT DATA SEGMENT; STORE METHOD LOOKUP TABLE (e.g., VDT) HERE ALSO
OBJECT'S DATA AND METHOD LOOKUP TABLE BECOME NEAR
PREPARE FOR ACCESSING THE OBJECT
FOR CALLER TO OBJECT METHOD, LOAD OBJECT'S OFFSET INTO INDEXING-CAPABLE REGISTER (PREFERABLY SI); WITHIN A METHOD, DS:SI IS ALREADY SET (TO "THIS") FOR ACCESS TO OBJECT DATA
LOAD IN (IF NECESSARY)
CALL METHOD OR ACCESS DATA FROM WITHIN METHOD
ACCESS OBJECT'S DATA AND METHODS THROUGH <DATA SEG. REG.>:<INDEXING REG.> REGISTER PAIR (PREFERABLY DS:SI)
OBJECT'S DATA AND METHODS ARE RAPIDLY ACCESSED
DONE

(d) accessing said data members by loading an offset into a selected register, whereupon said data members are accessed by combining said segment address stored in said data segment address register with said offset stored in said selected register.

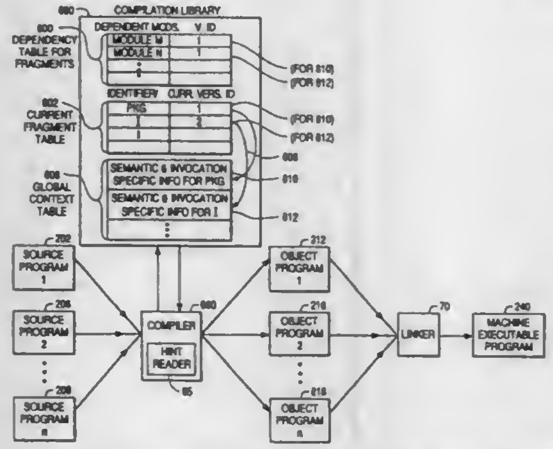
5,535,392
USING HINT GENERATION TO CAUSE PORTIONS OF OBJECT FILES TO REMAIN THE SAME

Bevin R. Brett, Merrimack, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 222,560, Apr. 1, 1994, which is a continuation of Ser. No. 905,929, Jun. 26, 1992. This application Mar. 10, 1995, Ser. No. 406,754

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—700 **15 Claims**



1. A method executed in a computer system with a memory, the method comprising the steps of:

translating a first program to produce a first translation result and first nondeterministic invocation specific information which characterizes the first translation result;

placing the first translation result into the memory;

translating a second program to produce a second translation result by directly using the first nondeterministic invocation specific information which characterizes the first translation result in order to minimize differences between said first translation result and said second translation result, said step of translating said second program including the steps of:

reading a code generation hint describing a portion of said first translation result with said code generation hint being included in said first nondeterministic information, and

using said code generation hint to produce a portion of said second translation result for those portions of said second translation result having corresponding portions in said first translation result; and

placing said second translation result into the memory.

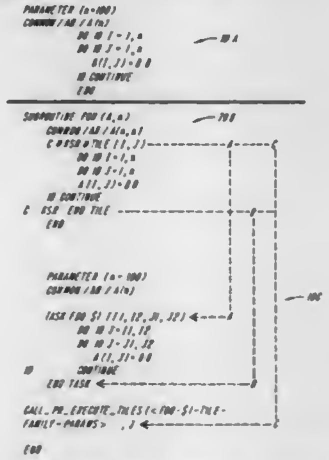
5,535,393
SYSTEM FOR PARALLEL PROCESSING THAT COMPILES A FILED SEQUENCE OF INSTRUCTIONS WITHIN AN ITERATION SPACE

Christopher L. Reeve, 18 Salisbury Rd., Brookline, Mass. 02146; Tani Shavit, One Seaborn Pl., Lexington, Mass. 02173; James B. Rothnie, Jr., 47 Monmouth St., Brookline, Mass. 02146; Timothy G. Peters, 11 Wilbur St., Waltham, Mass. 02154; Linda Q. Lee, 28 Hurlbut St., Cambridge, Mass. 02138; William F. Mann, 23 Checkerberry Cir., Sudbury, Mass. 01776, and Jacklin Kotikian, 540 Barrett's Mill Rd., Concord, Mass. 01742

Continuation of Ser. No. 763,507, Sep. 20, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 461,178

Int. Cl.⁶ G06F *9/06*

U.S. Cl. 395—700 **72 Claims**



1. In a parallel processor digital data processing apparatus of the type having

a plurality of processing units, each for executing instructions,

memory means coupled to said processing units for storing at least one of data and instructions,

interprocessor communication means coupled to said processing units for transferring information therebetween,

the improvement for processing an iterative sequence of instructions wherein:

A. said memory means includes means for storing a tiled sequence of instructions representing the iterative sequence, and each of said plural processing units includes means for signalling its availability to execute said tiled sequence over a portion of an iteration space associated with said iterative sequence, said portion being referred to as a tile,

B. said apparatus includes next-tile means coupled to said processing units for responding to each of at least selected such signallings by those processing units for generating a signal representing boundaries of a tile over which to execute said tiled sequence, wherein each such tile does not overlap any other tile, wherein each such tile covers a portion less than a whole of said iteration space, and wherein all such tiles together cover said iteration space,

C. each said processing unit including means for responding to a boundary-representative signal generated in response to signalling by that processing unit for executing said tiled sequence over the corresponding tile.

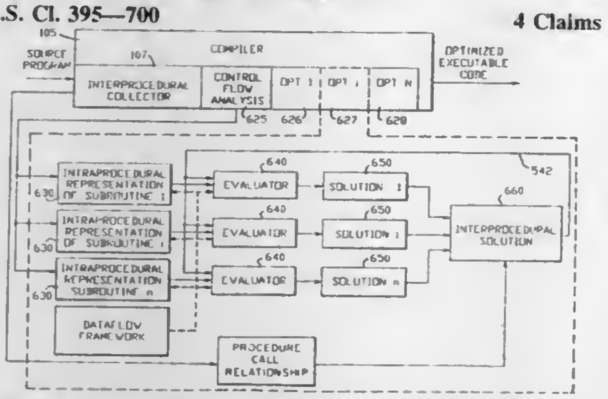
5,535,394
METHODS FOR DISTINGUISHING DYNAMICALLY ALLOCATED STORAGE ALONG DIFFERENT CALL PATHS AND FOR PROVIDING A COMPACT REPRESENTATION OF ALIAS ANALYSIS

Michael G. Burke, Yonkers, N.Y.; Paul R. Carini, Sherman, Conn., and Jong-Deck Choi, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 139,484, Oct. 20, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 540,420

Int. Cl.⁶ G06F *9/44*

U.S. Cl. 395—700 **4 Claims**


105
SOURCE PROGRAM
107
COMPILER
INTERPROCEDURAL COLLECTOR
CONTROL FLOW ANALYSIS
OPT 1
OPT i
OPT N
OPTIMIZED EXECUTABLE CODE
625
626
627
628
INTRAPROCEDURAL REPRESENTATION OF SUBROUTINE 1
INTRAPROCEDURAL REPRESENTATION OF SUBROUTINE i
INTRAPROCEDURAL REPRESENTATION SUBROUTINE n
630
640
EVALUATOR
650
SOLUTION 1
SOLUTION i
SOLUTION n
542
660
INTERPROCEDURAL SOLUTION
DATAFLOW FRAMEWORK
PROCEDURE CALL RELATIONSHIP

1. In a computer processor executing a computer compiler, a compile-time method for interprocedurally distinguishing dynamically allocated storage locations within a computer application that is implemented within the computer compiler, comprising the steps of:

a. constructing a Program Call Graph of the computer application, the Program Call Graph having a plurality of Program Call Graph nodes and edges, each Program Call Graph node representing a procedure in the computer application, the procedure having one or more statements, and each Program Call Graph edge connecting two Program Call Graph nodes, a source node being a calling Program Call Graph node and a target node being a called Program Call Graph node and a Program Call Graph edge having a forward direction from the calling Program Call Graph node to the called Program Call Graph node, each of the Program Call Graph edges having an edge name;

b. constructing a representation of each procedure in the computer application, each of the procedures having a representation with an entry node, an exit node, and zero or more call site nodes, zero or more of the procedures being a calling procedure with one or more call site nodes, each call site node of the calling procedure designating a called procedure and each call site node of the calling procedure having a return point, the return point indicating a point of return of a control flow of the called procedure back to the calling procedure;

c. for each procedure in the computer application, initializing an entry alias solution with an entry alias solution value for the entry node and an exit alias solution with an with alias solution value for the exit node, the entry alias solution value and the exit alias solution value capable of having zero or more names, zero or more of the names being dynamically allocated object names, each dynamically allocated object name identifying a dynamically allocated storage location;

d. during an interprocedural alias analysis, performing the following steps:

d1. adding all procedures in the computer application to a visit list;

d2. removing one of the procedures, being a visited procedure, from the visit list;

d3. identifying each statement in the visited procedure which allocates one or more of the dynamically allocated storage locations and associating each dynamically allocated storage location with a root name, the root name being all or part of the dynamically allocated object name of the respective dynamically allocated storage location;

d4. performing an intraprocedural alias analysis on the visited procedure using the entry alias solution value to compute a call site alias solution value at each call site of the visited procedure and a new exit alias solution value;

d5. propagating, in the forward direction, the call site alias solution value from each call site within the visited procedure to the entry node of the called procedure being called by the respective call site of the visited procedure, the call site alias solution value including zero or more of the dynamically allocated object names, the dynamically allocated object names being unchanged during this step;

d6. propagating the new exit alias solution value from the exit node of the visited procedure in a backward direction to the return points of the procedures calling the visited procedure and adding the edge name of the Program Call Graph edge to each dynamically allocated object name being propagated in the backward direction;

d7. repeating steps d2 through d6 while the visit list is not empty; e. repeating steps d1 through d7 until all the entry alias solution values and all the exit alias solution values do not change;

f. identifying a first and a second dynamically allocated object name as identical if the first dynamically allocated object name is a substring of the second dynamically allocated object name and distinguishing a first and a second dynamically allocated storage location if the first and the second dynamically allocated object names of the respective dynamically allocated storage locations are not identical.

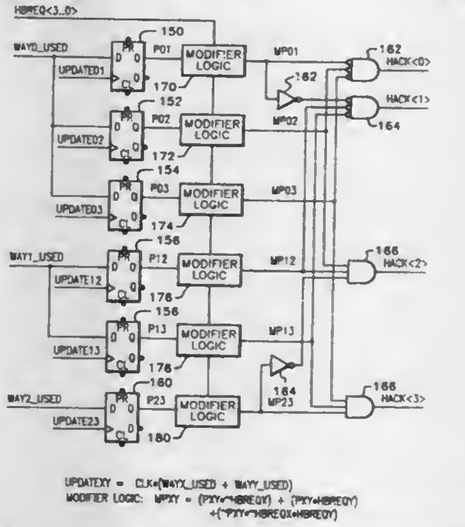
5,535,395
PRIORITIZATION OF MICROPROCESSORS IN MULTIPROCESSOR COMPUTER SYSTEMS

Roger E. Tipley, Houston; Michael Moriarty, Spring, and Mark Taylor, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 955,499

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—729 **8 Claims**



1. A system for prioritizing a plurality of elements, said plurality of elements numbering n, wherein the least recently used element attains the highest priority, the system comprising:

means for providing a plurality of element used signals, each said element used signal having a value indicative of whether a corresponding element has been recently used;

a plurality of relative priority storage means, each said relative priority storage means corresponding to a unique pair of said plurality of elements, each said unique pair being formed by combining a first element with a second element, each element being paired n−1 times, each element combining with a different element, each said relative priority storage means for providing a relative priority signal indicative of the relative priority between said elements of said corresponding unique pair, each said relative priority storage means receiving said element used signal corresponding to the first said element of said unique pair, each said relative priority storage means including an update input receiving an update signal for indicating that said value of said element used signal is to be stored, said stored value indicating the relative priority between said elements of said corresponding unique pair;

means receiving the plurality of element used signals for providing an update signal to a particular relative priority storage means storage update input when either of said elements corresponding to said unique pair of elements of said particular relative priority storage means has been used based on said plurality of element used signals; and

means receiving all of said relative priority signals for combining said relative priority signals relating to each individual element and for indicating that a particular element has the highest priority of all of said plurality of elements if all of said relative priority signals for said particular element indicate said particular element has priority relative to the other element of said unique pair.

5,535,396
MODULATOR DATA/CONTROL EQUIPMENT

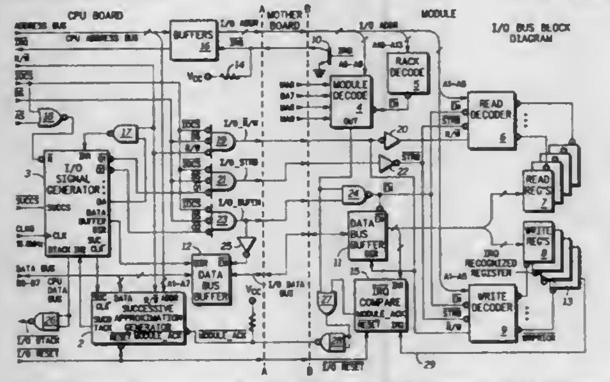
Yitzak Cohen, Yahud; Rafael Brody, Ganei–Tikva; Tzvika Magril, and Dan Eshet, both of Netanya, all of, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 174,582, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 907,493, Jul. 1, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,475

Claims priority, application United Kingdom, Jul. 6, 1991, 9114660

Int. Cl.^{6} G06F *13/36*

U.S. Cl. 395—733 **15 Claims**



1. Modular equipment for data acquisition/control of a system, the modular equipment comprising:

a) a central unit having successive approximation generator means, the successive approximation generator means arranged for generating a plurality of interrupt priority values and having a parallel data output for outputting said priority values and an interrupt service request result input for receiving an interrupt service request result, the successive approximation generator means being arranged to select and output an interrupt priority value, receive an interrupt service request result and selectively output an increased or decreased interrupt priority value depending on the interrupt service request result and successive interrupt service request results;

b) a plurality of input/output modules, each input/output module arranged for acquiring information from/administering control of said system, wherein each of said plurality of input/output modules has means for storing a unique interrupt priority value, thus forming a stored interrupt priority value, and has a parallel data input for receiving an interrupt priority value from the central unit, thus forming a received interrupt priority value, comparison means for comparing the received interrupt priority value with the stored interrupt priority value and an interrupt service request result output for providing an interrupt service request result in response to said comparison of the received interrupt priority value with the stored interrupt priority value and

c) a bus, coupled between said plurality of input/output modules and said central unit, having an interrupt control line, for requesting an interrupt service, responsive to a request for interrupt service generated by a requesting input/output module, said bus having parallel data lines for connecting the parallel data output of the central unit to the parallel data inputs of the plurality of input/output modules and having an interrupt service request result line for connecting the interrupt service request result outputs of the plurality of input/output modules to the interrupt service request result input of the central unit; and,

identification means, responsive to said successive approximation generator means, for identifying the requesting input/output module;

wherein said request for interrupt service is devoid of the stored interrupt priority value of the requesting input/output module.

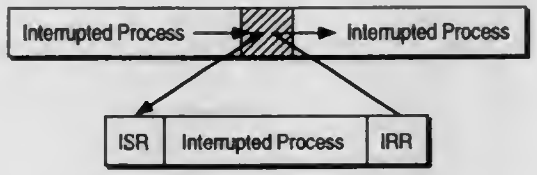
5,535,397
METHOD AND APPARATUS FOR PROVIDING A CONTEXT SWITCH IN RESPONSE TO AN INTERRUPT IN A COMPUTER PROCESS

Richard J. Durante, Citrus Heights, and Keith F. Underwood, Orangevale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1993, Ser. No. 85,409

Int. Cl.^{6} G06F *9/46*

U.S. Cl. 395—740 **19 Claims**



1. In a processor system executing processes, a method for interrupting processes, comprising:

associating a specific interrupt start routine (ISR) and interrupt return routine (IRR) with each process, said ISR comprising steps, when executed, to safely suspend execution of the corresponding process without corruption of the system or data and enable an interrupting process to execute, and said IRR comprising steps, when executed, to safely resume execution of the corresponding process without corruption of the system or data;

executing a first process, said first process associated with a first ISR and first IRR;

upon receipt of an interrupt during execution of the first process, executing the first ISR to safely suspend execution of the first process;

upon completion of execution of the first ISR, servicing the interrupt by executing a corresponding interrupt process;

upon completion of execution of the interrupting process, executing the first IRR to safely return to execution of the first process; and

upon completion of execution of the first IRR, continuing execution of the first process.

5,535,398
METHOD AND APPARATUS FOR PROVIDING BOTH POWER AND CONTROL BY WAY OF AN INTEGRATED CIRCUIT TERMINAL

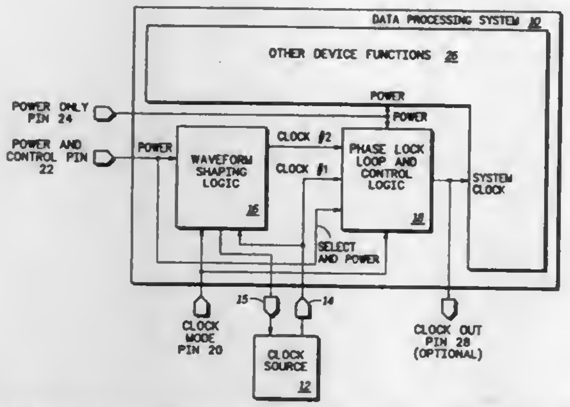
Terry L. Biggs, Dripping Springs; Donald L. Tietjen, and Jesse R. Wilson, both of Austin, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 28, 1992, Ser. No. 842,951

Int. Cl.^{6} G06F *1/16;1/08*

U.S. Cl. 395—750 **27 Claims**

21. An integrated circuit, comprising:


DATA PROCESSING SYSTEM 10
OTHER DEVICE FUNCTIONS 26
POWER
POWER
POWER ONLY PIN 24
POWER AND CONTROL PIN 22
POWER
WAVEFORM SHAPING LOGIC 16
CLOCK ϕ2
CLOCK ϕ1
PHASE LOCK LOOP AND CONTROL LOGIC 18
SYSTEM CLOCK
SELECT AND POWER
15
14
CLOCK MODE PIN 20
CLOCK SOURCE 12
CLOCK OUT PIN 28 (OPTIONAL)

a first power conductor for providing control information to the integrated circuit and for providing power to the integrated circuit;

a second power conductor for providing power to the integrated circuit; and

a reference conductor for providing a reference voltage to the integrated circuit;

wherein a first portion of the integrated circuit comprises:

a first power input coupled to said first power conductor for receiving power; and

a first reference input coupled to said reference conductor;

and wherein a second portion of the integrated circuit comprises:

a second power input coupled to said second power conductor for receiving power;

a second reference input coupled to said reference conductor; and

a control input coupled to said first power conductor for receiving said control information.

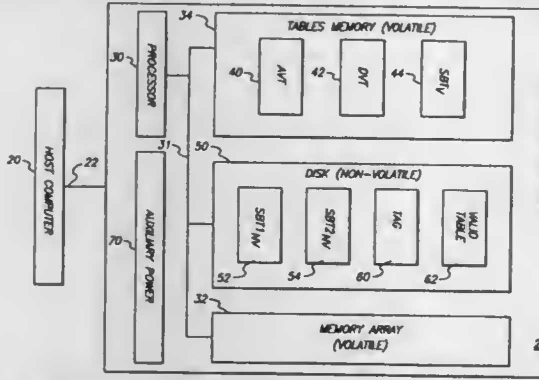
5,535,399
SOLID STATE DISK DRIVE UNIT HAVING ON-BOARD BACKUP NON-VOLATILE MEMORY

Martin C. Blitz, Worcester; James C. Stegeman, and Peter B. Bareham, both of Acton, all of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Filed Sep. 30, 1993, Ser. No. 130,047

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—750 **27 Claims**



1. A self contained, solid state disk drive data storage apparatus for storing and retrieving blocks of user data received from a host computer via an external bus and comprising:

a non-volatile memory comprising at least one disk drive for storing data blocks by logical block addresses and having a predetermined data storage capacity of at least 100 megabytes of user data;

volatile memory means for storing data blocks by logical block addresses transferred from corresponding logical block addresses of said non-volatile memory and having a predetermined data storage capacity approximately equal to the capacity of the non-volatile memory;

a processing means for transferring data between said non-volatile memory means and said volatile memory means via an internal bus structure, and

first status means within said volatile memory means for indicating that data stored in said volatile memory means has been modified by said host computer after said data stored in said volatile memory was transferred from said non-volatile memory.

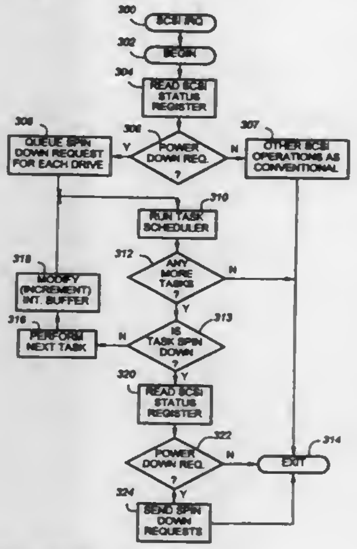
5,535,400
SCSI DISK DRIVE POWER DOWN APPARATUS

Brian V. Belmont, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jan. 28, 1994, Ser. No. 188,400

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—750 **5 Claims**



1. A computer system, comprising:

a SCSI bus;

a SCSI disk drive coupled to said SCSI bus, said SCSI disk drive operative to a plurality of commands, including a spin down command;

a SCSI controller coupled to said SCSI bus, including:

means for transferring received commands to said SCSI bus;

means for monitoring activity on said SCSI bus and for providing a SCSI activity signal indicative thereof; and

a SCSI interrupt status register receiving a power down request signal and providing an interrupt signal in response to the receipt of said power down request signal;

a power management device coupled to said SCSI controller for monitoring a plurality of computer system activity conditions, said power management device including means for receiving said SCSI activity signal and for providing said power down request signal if said SCSI activity signal indicates that said SCSI bus has been inactive for a predetermined period of time; and

a CPU coupled to said SCSI controller and said power management device, said CPU including means for receiving said SCSI interrupt signal and for executing a SCSI device driver routine in response, wherein said SCSI device driver routine causes said CPU to read said SCSI interrupt status register and determine if a power down condition is indicated by said power down signal, and to provide a spin down command to said SCSI controller to spin down said SCSI disk drive if said power down signal is present.

5,535,401

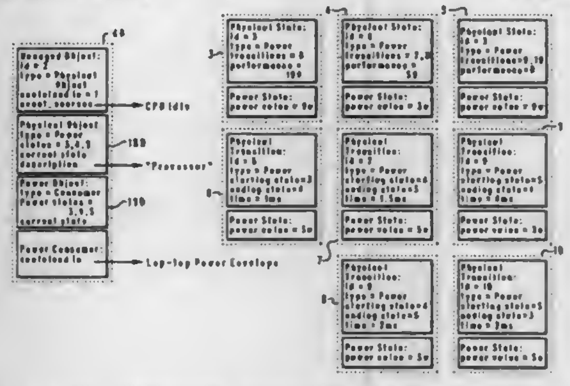
METHOD AND SYSTEM OF POWER AND THERMAL MANAGEMENT FOR A DATA PROCESSING SYSTEM USING OBJECT-ORIENTED PROGRAM DESIGN

Freeman L. Rawson, III, Boca Raton, and Guy G. Sotomayor, Jr., West Palm Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1994, Ser. No. 223,498

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—750 **38 Claims**



1. A power management architecture in a data processing system, comprising:

a plurality of physical devices, each being either power consumers or power suppliers, wherein each physical device bas at least two possible states and a current state which is one of the possible states, and further wherein each state has a corresponding power value, and further wherein the system state is the set of current states for the plurality of physical devices;

a plurality of software objects, each corresponding to a physical device, wherein an object contains information about the power requirements of each possible state for that physical device and the current state of that physical device, the allowed state transitions from each possible state to another, and the power requirements of all possible state transitions;

event means for generating signals indicative of an event;

a policy module containing rules that direct an action, the rules being a function of events and of object information; and

a controller, in communication with the physical devices, the objects, the event means and the policy module, for changing the state of any one of the plurality of physical devices in response to a signal indicating an event, the controller determining whether to change a physical device state based on the policy module rules, event signals, and object information, including the power requirements of possible state transitions.

5,535,402

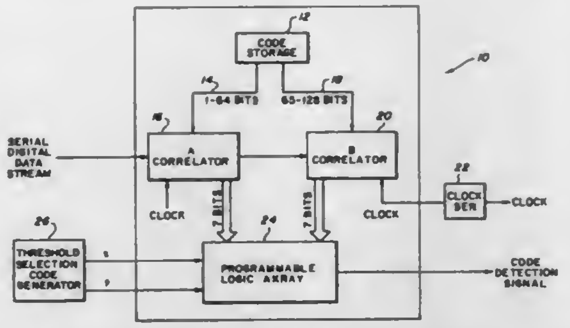
SYSTEM FOR (N•M)-BIT CORRELATION USING N M-BIT CORRELATORS

Lawrence M. Leibowitz, Fairfax, and Tuan A. Mai, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1992, Ser. No. 876,151

Int. Cl.^{6} G06F *15/336*

U.S. Cl. 395—800 **20 Claims**



1. A digital threshold circuit comprising:

means for storing a preselected code word having first and second digital code portions;

first means responsive to said first digital code portion from said storing means and to an input serial digital data stream passing through said first means for periodically producing a first multibit number representative of the number of bit agreements between the bits in the serial digital data stream and the bits in said first digital code portion;

second means responsive to said second digital code portion from said storing means and to the serial digital data stream passing through said second means from said first means for periodically producing a second multibit number representative of the number of bit agreements between the bits in the serial digital data stream from said first means and the bits in said second digital code portion;

means for developing a preselected threshold number; and

means responsive to said first multibit number from said first means, to said second multibit number from said second means and to said preselected threshold number from said developing means for generating an output signal when the number of bit agreements in both of said first and second multibit numbers is at least equal to the preselected threshold number.

5,535,403

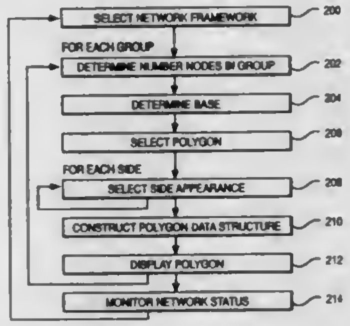
METHOD AND APPARATUS FOR DISPLAYING CLUSTERS ON A COMPUTER NETWORK

Shih-Gong Li, and David Y. Chang, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1993, Ser. No. 46,608

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 395—800 **2 Claims**



1. A monitoring apparatus for monitoring a group of nodes in a computer network comprising:

a computer system including a processor, a memory and a display coupled to the network;

means for selecting a polygon to represent the number of nodes in the group from a plurality of possible polygons, each of the polygons having a respective number of sides and each of the sides having a respective appearance, the number of sides and the appearance of sides in each polygon indicating the number of nodes in the group, the selected polygon selected according to a selected description, wherein the selecting means includes means for constructing a data structure for the selected polygon from data selected from a table according to the selected description;

means for presenting an icon of the selected polygon on the display using the constructed data structure;

wherein the selecting, constructing and presenting means reside in the memory and are acted by the processor according to programmed instructions.

5,535,404

MICROPROCESSOR STATUS REGISTER HAVING PLURAL CONTROL INFORMATION REGISTERS EACH SET AND CLEARED BY ON AND OFF DECODERS RECEIVING THE SAME CONTROL DATA WORD

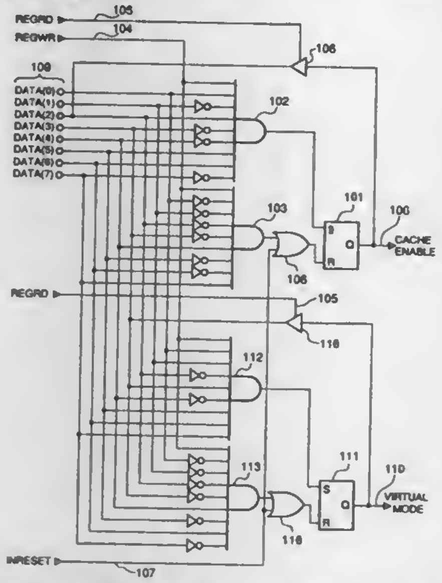
Masashi Tsubota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 514,141, Apr. 25, 1990, abandoned. This application Dec. 21, 1993, Ser. No. 170,987

Claims priority, application Japan, Apr. 25, 1989, 1-106254

Int. Cl.^{6} G06F *1/06;1/24;9/308*

U.S. Cl. 395—800 **8 Claims**



1. A status register apparatus in a microprocessor for holding a control word constituting a plurality of bits, comprising:

a control information register for holding one of said bits of said control word;

a first decoder connected to receive said control word for generating a first signal to said control information register when said first decoder detects a first bit pattern in said control word for setting said control information register into an ON condition; and

a second decoder connected to receive said control word for generating a second signal to said control information register when said second decoder detects a second bit pattern different from said first bit pattern in said control word for setting said control information register into an OFF condition;

wherein when said first bit pattern is detected by said first decoder, said control information register is set to said ON condition in response to said first signal,

wherein when said second bit pattern is detected by said second decoder, said control information register is set to said OFF condition in response to said second signal,

wherein when neither said first bit pattern nor said second bit pattern is detected, said control information register maintains its preceding condition, and

wherein said first and second decoders are connected to receive a write signal so that each of said first and second decoders is activated only when said write signal is active.

5,535,405

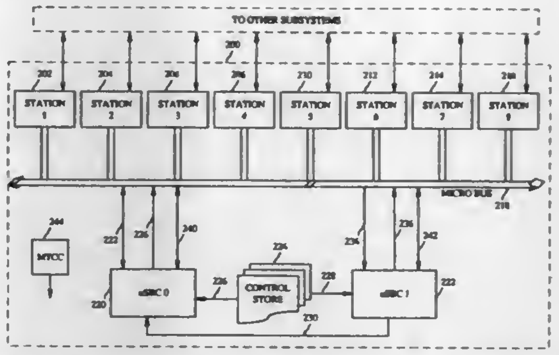
MICROSEQUENCER BUS CONTROLLER SYSTEM

Larry L. Byers, Apple Valley; Joseba M. De Subijana, Minneapolis, and Wayne A. Michaelson, Circle Pines, all of Minn., assignors to UNISYS Corporation, Blue Bell, Pa.

Filed Dec. 23, 1993, Ser. No. 172,657

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—800 **32 Claims**



1. In a computer system having a plurality of different classes of digital data processing subsystems arranged for performing differing functions, one of the digital data processing subsystems being a microsequencer bus controller subsystem, the microsequencer bus controller subsystem comprising:

a control store including addressable memory wherein predetermined instructions are stored;

first and second microprocessors coupled to said control store, said first and second microprocessors functioning to simultaneously execute in parallel said predetermined instructions fetched from said control store, said first microprocessor producing a first result from executing each of said predetermined instructions and said second microprocessor producing a second result from executing each of predetermined instructions,

error detection circuitry to compare said first result of said first microprocessor's execution of each of said predetermined instructions with said second result of said second microprocessor's execution of each of said predetermined instructions to detect an error occurring during the execution of each of said predetermined instructions by either said first microprocessor or said second microprocessor;

a bi-directional bus connected to said first and second microprocessors, said bi-directional bus transferring data signals in either a first selected size of data words or a second selected size of data words, said first selected size of data words modulo said second selected size of data words being nonzero; and

a plurality of independent processing units connected to said bi-directional bus and to the plurality of digital data processing subsystems, each of said plurality of independent processing units selectively performing predetermined functions including transferring data between said independent processing units and transferring data between said independent processing units and the plurality of digital data processing subsystems, wherein a first predetermined number of said independent processing units is controlled by said first microprocessor and a second predetermined number of said independent processing units is controlled by said second microprocessor.

5,535,406

VIRTUAL PROCESSOR MODULE INCLUDING A RECONFIGURABLE PROGRAMMABLE MATRIX

Alexander Kolchinsky, 48 Gray Rd., Andover, Mass. 01810

Filed Dec. 29, 1993, Ser. No. 175,303

Int. Cl.^{6} G06F *15/00*

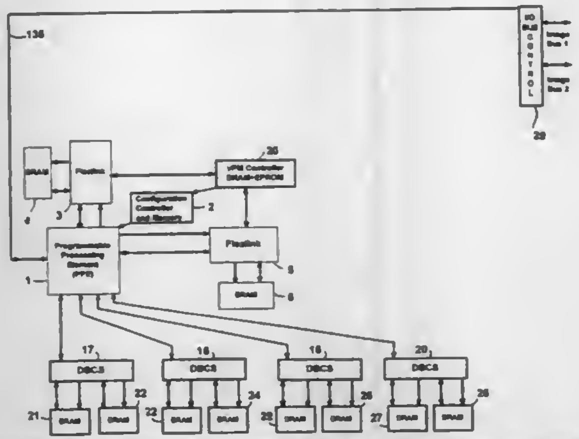
U.S. Cl. 395—800 **20 Claims**

1. A Virtual Processor Module comprising the following components:

a reconfigurable, programmable logic matrix array for processing data in accord with a hardware encoded algorithm;

a memory for storing a plurality of hardware configuration files for the programmable logic matrix array, each configuration file for programming an algorithm to be executed by the matrix array;

an input/output bus under control of the matrix array for supplying data to the matrix array for processing and for obtaining processed data from the matrix array;



a memory device for storing data under control of the matrix array for storing and retrieving data during processing by the programmable matrix array without involvement of an external host;

a virtual processor module controller for controlling an overall operation of the virtual processor module including providing operation sequence maps, providing parameters for specific operations, providing status information, and receiving feedback signals from the matrix array;

a data bus controller under control of the matrix array for controlling a data flow to the matrix array for processing; and

a configuration controller for controlling a sequence of reconfiguration of the matrix array to process data by a specific sequence of algorithms.

5,535,407

DATA PROCESSING SYSTEM FOR LOCALLY UPDATING CUSTOMER DATA DISTRIBUTED BY A HOST COMPUTER TO A REMOTE FACILITY AND FOR RETURNING THE UPDATED CUSTOMER DATA TO THE HOST COMPUTER

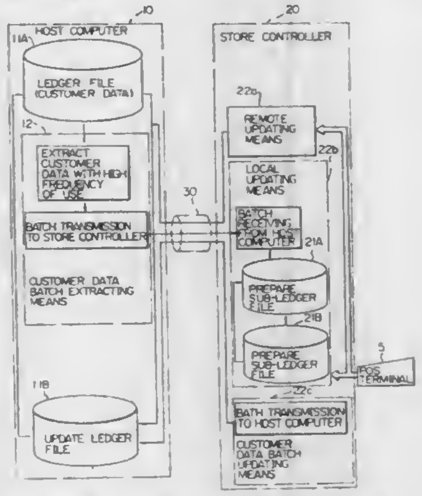
Atsuyuki Yanagawa, and Hisao Shimizu, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 530,185, May 29, 1990, abandoned. This application Feb. 25, 1994, Ser. No. 201,712

Claims priority, application Japan, May 30, 1989, 1-134506

Int. Cl.^{6} G06F *15/16;17/60*

U.S. Cl. 395—800 **3 Claims**


10
HOST COMPUTER
11A
LEDGER FILE (CUSTOMER DATA)
12
EXTRACT CUSTOMER DATA WITH HIGH FREQUENCY OF USE
BATCH TRANSMISSION TO STORE CONTROLLER
CUSTOMER DATA BATCH EXTRACTING MEANS
11B
UPDATE LEDGER FILE
30
20
STORE CONTROLLER
22a
REMOTE UPDATING MEANS
22b
LOCAL UPDATING MEANS
BATCH RECEIVING FROM HOST COMPUTER
21A
PREPARE SUB-LEDGER FILE
21B
PREPARE SUB-LEDGER FILE
POS TERMINAL
22c
BATH TRANSMISSION TO HOST COMPUTER
CUSTOMER DATA BATCH UPDATING MEANS

1. A customer data processing system, comprising:

a host computer for managing customer data for a plurality of customers, the customer data for each customer including first data representative of a record of transactions by the respective customer;

a first processor for processing customer data; and

a telecommunications line for interconnecting the first processor and the host computer,

wherein the host computer includes
  first storage means for storing the customer data,
  data extracting means for extracting, from the first storage means, customer data for customers who have made transactions at a frequency higher than a predetermined level, and
  transmission means for transmitting the extracted customer data in a batch over the telecommunications line to the first processor,

wherein the first processor includes
  second storage means for storing the customer data transmitted by the transmission means,
  terminal means, interconnected with the second storage means, for entering second data representative of a transaction desired by a particular customer,
  local updating means, operative in response to entry of the second data if the particular customer is a customer whose customer data is stored in the second storage means, for updating the customer data stored for the particular customer in the second storage means,
  remote updating means, operative in response to entry of the second data if the particular customer is not a customer whose customer data is stored in the second storage means, for communicating with the host computer through the telecommunications line so that the customer data for the particular customer can be updated in the first storage means, and
  batch updating means for transmitting customer data that has been updated by the local updating means in a batch over the telecommunications line to the host computer,

wherein the customer data for each customer further includes third data representing a credit balance for the respective customer,

wherein the customer data processing system further comprises at least one second processor interconnected to the host computer by another telecommunications line, each of the at least one second processors including a second storage means, an input means, a local updating means, a remote updating means and a batch updating means,

wherein the customer data for each customer further includes fourth data representative of a first limited amount up to which the respective customer is allowed to establish a transaction,

wherein the data extracting means of the host computer further comprises means for distributing the first limited amount for each customer to a plurality of second limited amounts each assigned to one of the first and the at least one second processors, the second limited amounts being included in the customer data and being transmitted to each of the first and the at least one second processors by the transmission means, and

wherein the local updating means of a processor subtracts the second data entered by the terminal means for a particular customer from the second limited amount for the particular customer to update customer data stored in the second storage means of the particular processor within the second limited amount.

5,535,408

PROCESSOR CHIP FOR PARALLEL PROCESSING SYSTEM

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Continuation of Ser. No. 626,362, Dec. 12, 1990, abandoned, which is a division of Ser. No. 478,082, Feb. 9, 1990, Pat. No. 5,152,000, which is a division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,008,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application May 2, 1994, Ser. No. 237,981

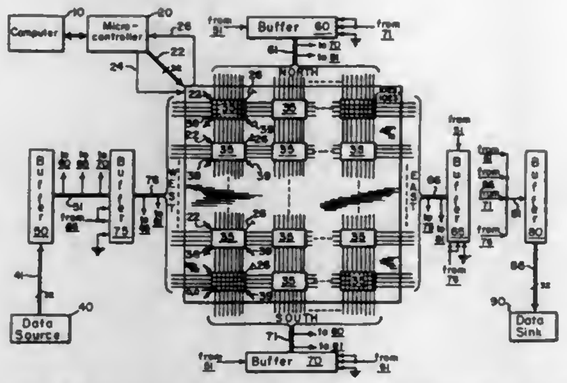
Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—800 **8 Claims**

1. A parallel computer system comprising:

A. a processor array comprising a plurality of integrated circuit chips each comprising a plurality of processor circuits and a plurality of memory circuits, each processor circuit having an associated memory circuit, said processor circuit for processing data received from its associated memory circuit in accordance with processor control signals to generate processed data, each said memory circuit including a plurality of registers for storing data, each register including at least one data storage cell including at least one dynamic memory data bit store for storing a data bit, said memory circuits being responsive to memory control signals and register address signals to
  (i) transmit stored data from correspondingly-addressed registers, as identified by the register address signals, to their associated processors for processing during a read operation, and to store processed data received from their associated processors in correspondingly-addressed registers, as identified by said register address signals during a write operation; and
  (ii) perform a refresh operation concurrently with said write operations in connection with registers which are not identified by the register address signals; and

B. a host for generating said processor contro! signals, said memory control signals and said register address signals for controlling the operations of the processor circuits and the memory circuits of said processor array in parallel.



5,535,409

APPARATUS FOR AND METHOD OF PREVENTING CHANGES OF COMPUTER CONFIGURATION DATA BY UNAUTHORIZED USERS

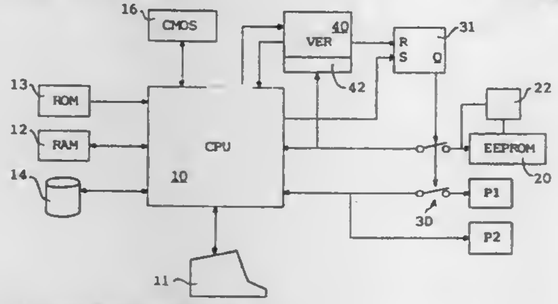
Jean-François Larvoire, Meylan; Thierry Ribollet, Grenoble, and Bertrand Hays, Echirolles, all of, France, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 868,499, Apr. 15, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,840

Claims priority, application France, Apr. 16, 1991, 91 04898

Int. Cl.^{6} G06F *12/00*

U.S. Cl. 395—800 **8 Claims**



1. A computer comprising:

a first memory of a type which is conventionally provided for storing computer configuration data including user defined configuration data, said first memory having a standard access mode and storing user defined computer configuration data;

a-non-volatile second memory;

programming means for reprogramming the non-volatile second memory, the second non-volatile memory having an access mode different from the standard access mode of the first memory, the second non-volatile memory storing said computer configuration data and user defined confidential data;

a central processing unit coupled with the first and second memory and the programming means for accessing both said first and non-volatile second memories for updating the computer configuration data in the first memory with the computer configuration data of the non-volatile second memory during power-on of the computer, the computer configuration data adjusting the computer configuration so the computer is correctly coupled with its peripheric devices;

switch means coupled with the central processing unit and the second non-volatile memory for normally enabling access between the central processing unit and the second non-volatile memory, the switch means being operative following further updating of the configuration data in the first memory for cutting access of the central processing unit to the non-volatile second memory and to peripheral devices specified by the user defined configuration data;

a verifying circuit coupled with the central processing unit and a third memory coupled with the verifying circuit and arranged so it can be read out and written into only through the verifying circuit, the verifying circuit having:

means coupled with the central processing unit for communicating with the central processing unit;

means coupled with the central processing unit and activated at power-on for writing into the third memory a stored password included in said user defined confidential data; and

a comparator coupled with the central processing unit, the third memory and the switch means for comparing an input password provided by a user through the central processing unit with the stored password written into the third memory and for operating the switch means for re-establishing access of the central processing unit at least to the second memory in response to the input password provided by the user being the same as the stored password written into the third memory.

5,535,410

PARALLEL PROCESSOR HAVING DECODER FOR SELECTING SWITCH FROM THE GROUP OF SWITCHES AND CONCURRENTLY INPUTTING MIMD INSTRUCTIONS WHILE PERFORMING SIMD OPERATION

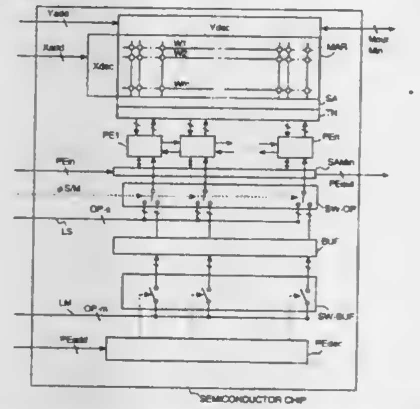
Takao Watanabe, Inagi; Tetsuya Nakagawa, Koganei, and Yoshinobu Nakagome, Hamura, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 335,680

Claims priority, application Japan, Nov. 19, 1993, 5-290468

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800 **3 Claims**



1. A parallel processor formed on a semiconductor substrate, comprising:

a memory for storing data;

a plurality of processing elements for parallel processing the data in said memory;

a first bus for transferring at least one common instruction to said plurality of processing elements;

an instruction buffer for storing a plurality of instructions;

a plurality of second buses for transferring said plurality of instructions stored from said instruction buffer to said plurality of processing elements, respectively;

at least one switch for switching between a connection of said plurality of processing elements with (i) said first bus and (ii) said plurality of second buses;

a means for inputting new instructions into said instruction buffer concurrently with the plurality of processing elements executing parallel processing of the data from the memory based on said at least one common instruction;

a third bus for transferring the plurality of instructions;

a group of switches connected between said instruction buffer and said third bus; and

a decoder for selecting a switch of said group of switches.

5,535,411

REDUNDANT COMPUTER SYSTEM WHICH BOOTS ONE SYSTEM AS THE PRIMARY COMPUTER FROM A SHARED DRIVE

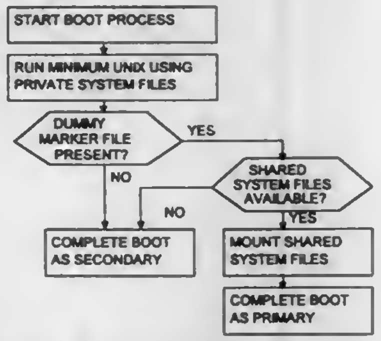
Paul F. Speed, Sandbach, and Richard N. Taylor, Congleton, both of, England, assignors to International Computers Limited, London, United Kingdom

Filed Mar. 10, 1995, Ser. No. 401,962

Claims priority, application United Kingdom, Apr. 28, 1994, 9408405

Int. Cl.^{6} G06F *15/00;15/76;9/445*

U.S. Cl. 395—800 **8 Claims**


START BOOT PROCESS
RUN MINIMUM UNIX USING PRIVATE SYSTEM FILES
DUMMY MARKER FILE PRESENT?
YES
NO
SHARED SYSTEM FILES AVAILABLE?
NO
YES
COMPLETE BOOT AS SECONDARY
MOUNT SHARED SYSTEM FILES
COMPLETE BOOT AS PRIMARY

1. A fault-tolerant computer system comprising:

(a) a first processor and a second processor;

(b) a first private disk drive coupled to said first processor, said first private disk drive holding first system files for establishing said first processor as a secondary processor;

(c) a second private disk drive coupled to said second processor, said second private disk drive holding second system files for establishing said second processor as a secondary processor; and

(d) a shared disk drive, coupled to said first processor and also coupled to said second processor, said shared disk drive holding shared system files for establishing either said first or said second processor as a primary processor;

(e) said first processor comprising:

- (i) means operative upon failure of said second processor, for creating an indication that said first processor is to be established as a primary processor;
- (ii) means for initiating a bootup process in said first processor, by first establishing a minimum operating system in said first processor, using said first system files from said first private disk drive, and then checking whether said indication that said first processor is to be established as a primary processor is present;
- (iii) means operative when said indication that said first processor is to be established as a primary processor is absent, for using said first system files from said first private disk drive for completing said bootup process in said first processor; and
- (iv) means operative when said indication that said first processor is to be established as a primary processor is present, for using said shared system files from said shared disk drive for completing said bootup process in said first processor;

(f) and said second processor comprising:

- (i) means operative upon failure of said first processor, for creating an indication that said second processor is to be established as a primary processor;
- (ii) means for initiating a bootup process in said second processor, by first establishing a minimum operating system in said second processor, using said second system files from said second private disk drive, and then checking whether said indication that said second processor is to be established as a primary processor is present;
- (iii) means operative when said indication that said second processor is to be established as a primary processor is absent, for using said second system files from said second private disk drive for completing said bootup process in said second processor; and
- (iv) means operative when said indication that said second processor is to be established as a primary processor is present, for using said shared system files from said shared disk drive for completing said bootup process in said second processor.

5,535,412

CIRCULAR BUFFER CONTROLLER

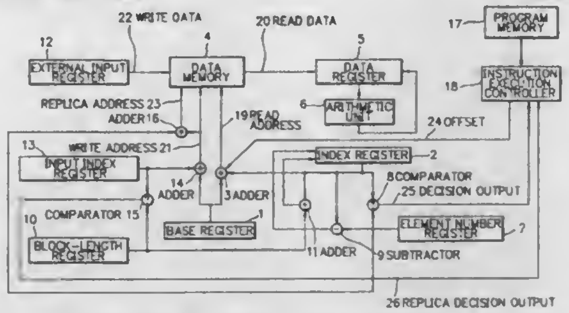
Kouhei Nadehara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 520,182

Claims priority, application Japan, Aug. 26, 1994, 6-201653

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 395—800 **3 Claims**



1. A circular buffer controller, comprising:

a base register for keeping therein a first address of a circular buffer;

an index register for indicating data as a current object of operation;

a first adder for adding a value of the base register, a value of the index register, and a value of offset from an instruction execution controller and thereby deciding a read address of data as an object of operation;

a data memory for storing therein data as an object of operation;

a data register for storing therein data read from the data memory according to the read address;

an arithmetic unit for conducting an arithmetic operation for the data stored in the data register;

an element number register for keeping therein a number of elements in the circular buffer;

a block-length register for keeping therein a number of elements to be processed at a time;

a second adder operative after the arithmetic operation is executed n times (n being associated with the value of the block-length register) for adding the value of the block-length register to that of the index register;

a first comparator operative after the value of the block-length register is added to that of the index register for comparing the value of the element number register with that of the index register;

a first subtracter for subtracting the value of the element number register from that of the index register when the value of the index register is equal to or more than that of the element number register;

an external input register for keeping therein a new value to be inputted to the circular buffer;

an index register for keeping therein a position in the circular buffer in which the value of the external input register is inputted;

a third adder for adding the value of the input index register to that of the base register and determining an address in the data memory at which the value of the external input register is to be written;

a second comparator for deciding that the value of the input index register is less than that of the block-length register;

a fourth adder operative when the second comparator produces an output of "truth" for adding the value of the element number register to the write address, thereby producing an address;

a program memory for storing therein software controlling an overall operation of the circular buffer controller; and

an instruction execution controller for referencing contents of the program memory and signals outputted respectively from the first and second comparators and for controlling the overall operation.

5,535,413

SYSTEM INCLUDING PLURALITY OF DATA DRIVEN PROCESSORS CONNECTED TO EACH OTHER

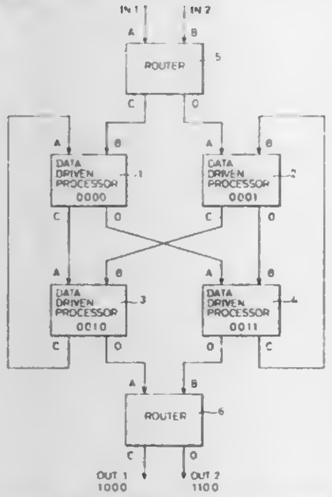
Yutaka Ishikawa, Tenri, and Shinichi Yoshida, Kashihara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 207,155, Mar. 8, 1994, abandoned. This application Sep. 26, 1995, Ser. No. 533,860

Claims priority, application Japan, Mar. 10, 1993, 5-049189

Int. Cl.^{6} G06F *15/62*

U.S. Cl. 395—800 **21 Claims**


IN 1
IN 2
A
B
ROUTER
5
C
D
A
B
DATA DRIVEN PROCESSOR 0000
1
A
B
DATA DRIVEN PROCESSOR 0001
2
C
D
C
D
A
B
DATA DRIVEN PROCESSOR 0010
3
A
B
DATA DRIVEN PROCESSOR 0011
4
C
D
D
C
A
B
ROUTER
6
C
D
OUT 1 1000
OUT 2 1100

1. A system having a plurality of system inputs and a plurality of system outputs, said system inputs receiving a data packet having processor information to carry out a predetermined data processing and provide a resultant data packet at said plurality of system outputs, comprising:

a plurality of data driven processor means, each having a plurality of inputs and a plurality of outputs,

processing means for processing according to a predetermined data flow program the data packet having processor information specifying one of said data driven processor means, and

output means for providing said resultant data packet having processor information specifying another data driven processor means from the data packet received at said inputs of the data driven processor means and for directing said resultant data packet provided by said output means to an output selected from said outputs of the data driven processor means according to a predetermined condition;

input path selecting means having a plurality of inputs respectively connected to said system inputs and a plurality of outputs, for connecting one of the inputs to one of the outputs according to the processor information of the data packet and a predetermined condition to direct the data packet therefrom; and

transmission path means for connecting said outputs of the input path selecting means to said plurality of data driven processor means and for connecting said plurality of data driven processor means to said system outputs, so that there exists at least one data packet path directly or indirectly from said outputs of the input path selecting means to any of said plurality of data driven processor means, and from any of said plurality of data driven processor means to said system outputs

the input path selecting means selecting a shortest path to be taken by a data packet, to a desired processing means at which the data packet is to be processed, through the system by selecting one of the outputs of said input path selecting means according to a value of the least significant bit of the processor information of the data packet.

5,535,414

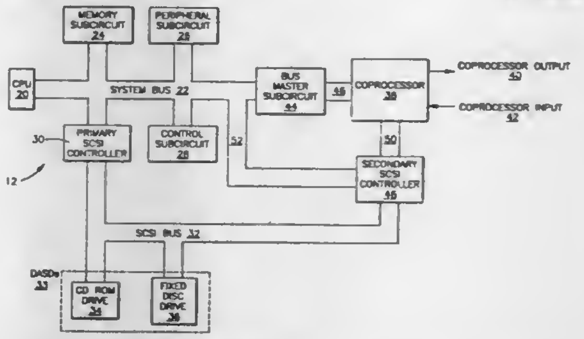
SECONDARY DATA TRANSFER MECHANISM BETWEEN COPROCESSOR AND MEMORY IN MULTI-PROCESSOR COMPUTER SYSTEM

Benjamin D. Burge, Shaker Hts., Ohio, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1992, Ser. No. 975,860

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—827 **18 Claims**



1. A computer system comprising:

a system bus having connected thereto at least a central processing unit (CPU), a coprocessor for receiving coprocessing commands from said CPU over said system bus, and at least one subcircuit for providing data to said CPU over said system bus, said system bus including system bus data signals and system bus address signals;

a primary bus controller connecting said system bus to a transfer bus, said transfer bus having a storage device connected thereto, said transfer bus including transfer bus data signals and transfer bus address signals; and

a secondary transfer bus controller for transferring data between said coprocessor and said storage device, independently of said system bus, simultaneously while said CPU is receiving data from said subcircuit over said system bus, said secondary transfer bus controller connected to said storage device by said transfer bus and connected to said coprocessor by a secondary transfer bus, said secondary transfer bus including secondary transfer bus data signals and secondary transfer bus address signals.

5,535,415

METHOD FOR AUTOMATICALLY SETTING THE INTERNAL AND EXTERNAL PORT CONFIGURATION OF A COMPUTER SYSTEM

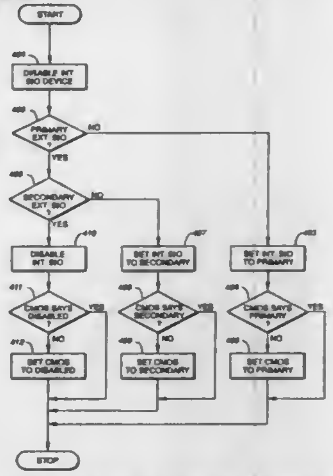
Yoshimasa Kondou; Masaaki Hanaoka; Shinji Nakamura, and Fumiaki Doi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Continuation of Ser. No. 666,291, Mar. 8, 1991, Pat. No. 5,247,682. This application Jul. 12, 1993, Ser. No. 90,861

Claims priority, application Japan, Mar. 9, 1990, 2-58343; Sep. 28, 1990, 2-260181; Feb. 12, 1991, 3-18789

Int. Cl.^{6} G06F *9/445*

U.S. Cl. 395—828 **2 Claims**



1. A process of configuring a computer system having an internal port, and at least one external port, said ports having internal control registers wherein said control registers store information indicative of the designation of the corresponding port as primary, secondary, or disabled, and a non-volatile memory for storing a user's designation of each of said ports as either primary, secondary, or disabled, comprising the steps of:

a) disabling said internal port;

b) determining whether any of said at least one external ports has been designated as primary in its corresponding control register;

c) setting said internal port control register designation to be primary, if the determination of step (b) is negative;

d) determining if said non-volatile memory contains information indicative of said internal port being designated as primary, said process being complete if the determination of step (d) is affirmative;

e) setting said non-volatile memory to contain information indicative of said internal port being designated as primary if the determination of step (d) is negative, said process being complete after the setting of step (e);

f) determining whether any of said at least one external ports has been designated as secondary in its corresponding control register if the determination of step (b) is affirmative;

g) setting said internal port control register designation to be secondary, if the determination of step (f) is negative;

h) determining if said non-volatile memory contains information indicative of said internal port being designated as secondary, said process being complete if the determination of step (h) is affirmative;

i) setting said non-volatile memory to contain information indicative of said internal port being designated as secondary if the determination of step (h) is negative, said process being complete after the setting of step (i);

j) disabling said internal port if the determination of step (f) is affirmative;

k) determining if said non-volatile memory contains information indicative of said internal port being designated as disabled, said process being complete if the determination of step (k) is affirmative; and

l) setting said non-volatile memory to contain information indicative of said internal port being designated as disabled if the determination of step (k) is negative, said process being complete after the setting of step (l).

5,535,416

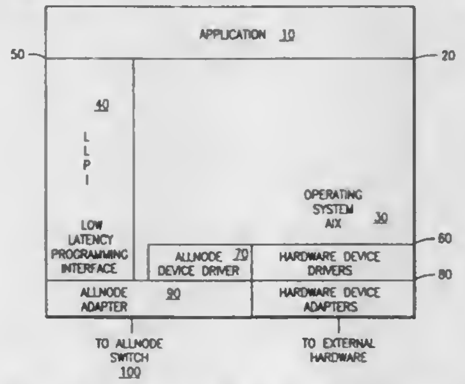
METHOD FOR ALLOWING APPLICATION PROGRAM IN COMPUTER SYSTEM TO ACCESS DEVICE DIRECTLY IN EXCLUSIVE MODE BY BYPASSING OPERATING SYSTEM AND BLOCKING REQUESTS FROM OTHER PROGRAMS

James W. Feeney, Endicott, and George W. Wilhelm, Jr., Endwell, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 17,197, Feb. 12, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 459,014

Int. Cl.^{6} G06F *15/40*

U.S. Cl. 395—834 **8 Claims**



1. A method for operating a device of a computer system, comprising the steps of:

(a) an operating system of the computer system managing operation of any devices of the computer system;

(b) processing by the operating system (kernel) requests from concurrent applications executing programs to access the device in a first (shared, or general user) mode, said operating system preventing conflicts between applications concurrently requesting access in the first mode to the device, said applications' access to the device controlled by the operating system;

(c) processing by the operating system a request by one of the application programs for access to the device in a second (exclusive) mode, said processing of the request for access in the second mode including the steps of:

(1) distinguishing said request for access to the device in the second mode, generated by said one of the application programs, from a request for access to the device in the first mode;

(2) passing said request for access to the device in the second mode to a device driver;

(3) blocking by the device driver requests from others of the application programs for access to the device in either the first mode or the second mode; and

(4) entirely bypassing the operating system and accessing the device directly by the application program that issued the request for access in the second mode, without interruption for both input and output access, after step (2), by any operating system processes or interfaces between the device and the application program, until the application program completes its direct accessing.

5,535,417

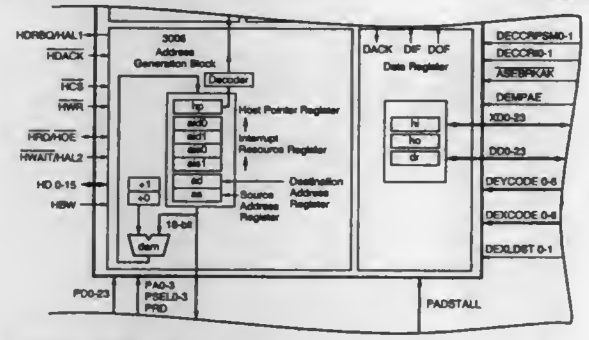
ON-CHIP DMA CONTROLLER WITH HOST COMPUTER INTERFACE EMPLOYING BOOT SEQUENCING AND ADDRESS GENERATION SCHEMES

Toru Baji, San Jose, Calif., and Atsushi Kiuchi, Kunitachi, Japan, assignors to Hitachi America, Inc., Tarrytown, N.Y.

Filed Sep. 27, 1993, Ser. No. 127,429

Int. Cl.^{6} G06F *13/28*

U.S. Cl. 395—842 **12 Claims**



1. A single chip digital signal processor (DSP), comprising:

a multiplicity of memory mapped resources, said memory mapped resources including:

memory locations in a data memory for storing DSP data,

memory locations in a program memory for storing DSP instructions, and

a plurality of on-chip peripheral interfaces for interfacing the DSP with peripheral devices external to said DSP;

a DSP core coupled to said data memory and program memory for executing said stored DSP instructions;

a direct memory access (DMA) controller, said DMA controller including a host processor interface for coupling the DSP to a host processor; said DMA controller coupled to said data memory, program memory, DSP core and on-chip peripheral interfaces for performing local data transfers between specified ones of said memory mapped resources and for performing host data transfers between said host processor and said memory mapped resources; and

a plurality of data and address bus pairs coupled to said data memory, program memory, DSP core and DMA controller, a first of said data and address bus pairs being dedicated to data transfers controlled by said DMA controller for transferring data between the host processor, said memory mapped resources and said peripheral devices, and a second of said data and address bus pairs dedicated to data transfers controlled by said DSP core for transferring data to and from said DSP core;

said DMA controller including a first set of registers for local data transfers between said memory mapped resources and a second set of registers in said host processor interface for host data transfers; said first set of registers including a data transfer register, an address source register and an address destination register; said second set of registers including a host input register for receiving data from said host processor, a host output register for holding data to be sent to said host processor, a host command register for storing commands received from said host processor, a host pointer register for receiving an address from said host processor wherein said received address specifies one of said memory mapped resources;

said host processor interface including a host address bus and host data bus interface for enabling said host processor to directly access said second set of registers at predefined host address bus addresses; and

said DMA controller including a controller for executing said command stored in said host command register, wherein said command stored in said host command register is selected from a predefined set of host commands that include commands for reading and writing any specified one of said memory mapped resources, commands for initiating burst data transfers between said host processor and a set of said memory mapped resources at a sequence of addresses, and commands for initiating cycle stealing data transfers between said host processor and a set of said memory mapped resources at a sequence of addresses wherein each cycle stealing data transfer is interleaved with any local data transfer that said DMA controller is performing.

5,535,418

INFORMATION PROCESSING SYSTEM WITH SELECTION OF INPUT/OUTPUT PROCESSING CONTROL ACCORDING TO PRECALCULATED INPUT/OUTPUT PROCESSING TIME

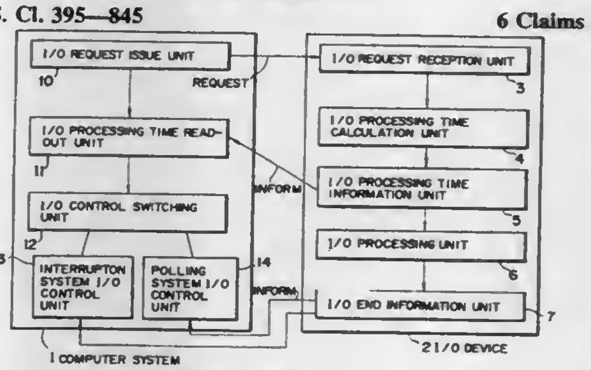
Shigeo Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,272, Jun. 29, 1993, abandoned. This application Aug. 22, 1995, Ser. No. 517,654

Claims priority, application Japan, Jun. 30, 1992, 4-196159

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—845 **6 Claims**


I/O REQUEST ISSUE UNIT
10
REQUEST
I/O PROCESSING TIME READ-OUT UNIT
11
I/O CONTROL SWITCHING UNIT
12
13
INTERRUPTON SYSTEM I/O CONTROL UNIT
POLLING SYSTEM I/O CONTROL UNIT
14
1 COMPUTER SYSTEM
INFORM
INFORM
I/O REQUEST RECEPTION UNIT
3
I/O PROCESSING TIME CALCULATION UNIT
4
I/O PROCESSING TIME INFORMATION UNIT
5
I/O PROCESSING UNIT
6
I/O END INFORMATION UNIT
7
2 I/O DEVICE

1. An information processing system comprising:

a computer system (1) and an input/output device (2),

said input/output device (2) comprising:

reception means (3) for receiving an input/output request from said computer system (1),

processing means (6) for processing the input/output request received by said reception means (3),

estimation means (4) for calculating a processing time estimated to be required for processing the received input/output request by said processing means (6) in advance of actually processing the received input/output request,

first information means (5) for informing the processing time calculated by said estimation means (4) to said computer system (1), and

second information means (7) for informing an end of the processing of the received input/output request by said processing means (6) to said computer system (1); and

said computer system (1) comprising:

issue means (10) for issuing the input/output request to said input/output device (2),

first control means (13) for controlling said computer system (I) in accordance with an interruption system during the processing of the input/output request and when the end of the processing is informed from said second information means (7),

second control means (14) for controlling said computer system (1) in accordance with a polling system during the processing of the input/output request and when the end of the processing is informed from said second information means (7), and

selection means (12) for selecting one of said first control means (13) or said second control means (14) for controlling said computer system (1), in accordance with the processing time informed from said input/output device (2).

5,535,419

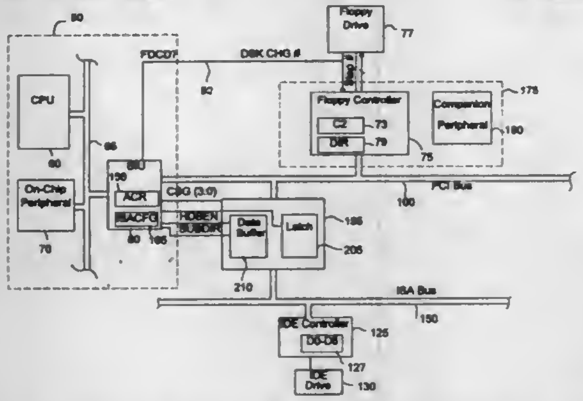
SYTEM AND METHOD FOR MERGING DISK CHANGE DATA FROM A FLOPPY DISK CONTROLLER WITH DATA RELATING TO AN IDE DRIVE CONTROLLER

Rita M. O'Brien, Austin, Tex., assignor to Advanced Micro Devices, Sunnyvale, Calif.

Filed May 27, 1994, Ser. No. 250,294

Int. Cl.^{6} G06F *13/00;13/14*

U.S. Cl. 395—856 **28 Claims**



1. A system for merging data from a first register in a first component together with data from a second register in a second component, wherein the first register and the second register have the same address value, comprising:

- a bus interface unit connected to said first component and to said second component by a bus line;
- a CPU connected to said bus interface unit by a local bus;
- an address control register associated with said bus interface unit, said address control register including a dedicated bit to indicate the location of said second component;
- a configuration register also associated with said bus interface unit, said configuration register including a dedicated bit to indicate whether the bus interface unit is to perform the data merger between said first register and said second register; and
- a second configuration register in said first component, said second configuration register including a bit indicating whether said first component is authorized to respond to an access to said address value.

5,535,420

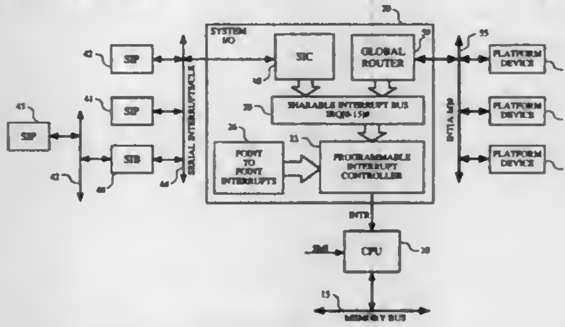
METHOD AND APPARATUS FOR INTERRUPT SIGNALING IN A COMPUTER SYSTEM

James Kardach, San Jose; Sung S. Cho, Sunnyvale; Nicholas B. Peterson, and Thomas R. Lane, both of San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 14, 1994, Ser. No. 356,131

Int. Cl.^{6} G06F *13/24*

U.S. Cl. 395—868 **11 Claims**



1. A computer system comprising:

- a central processing unit (CPU) for executing an interrupt service routine in response to an interrupt pending signal;
- an interrupt controller coupled to provide said interrupt pending signal to said CPU in response to an interrupt request signal received over any one of a plurality of interrupt request signal lines;
- an interrupt bus having a plurality of interrupt signal lines for system components to signal interrupt signals over; and
- an interrupt mapping mechanism coupled to said interrupt bus to receive said interrupt signals and coupled to provide said interrupt request signal to said interrupt controller over one of said plurality of interrupt request signal lines responsive to said interrupt signals received over said interrupt bus, said interrupt mapping mechanism including a first set of programmable memory elements for corresponding each of said plurality of interrupt signal lines with a corresponding interrupt request signal line, said interrupt mapping mechanism allowing a plurality of interrupt signal lines to be mapped to a single interrupt request signal line to said interrupt controller.

5,535,421

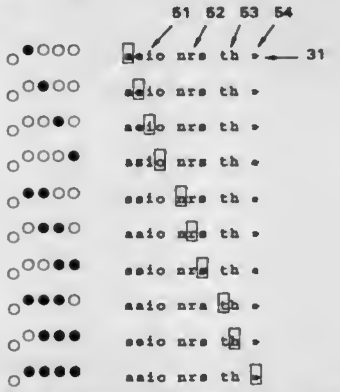
CHORD KEYBOARD SYSTEM USING ONE CHORD TO SELECT A GROUP FROM AMONG SEVERAL GROUPS AND ANOTHER CHORD TO SELECT A CHARACTER FROM THE SELECTED GROUP

Michael Weinreich, 39 Oneida Rd., Acton, Mass. 01720

Filed Mar. 16, 1993, Ser. No. 33,098

Int. Cl.^{6} G06F *3/023*

U.S. Cl. 395—887 **12 Claims**



7. A method for the input of characters to a computer or other device with a chord keyboard having 4 keys operated by four fingers, one key per finger, and also having at least one additional key, comprising the steps of:

- presenting the set of characters that may be entered as an arrangement of groups and of characters within the groups wherein each of said groups comprises a set of ten of the characters;
- arranging said set of ten characters in the form of four subgroups wherein a first subgroup has four characters, a second subgroup has three characters, a third subgroup has two characters and a fourth subgroup has one character;
- choosing an active group from among the presented groups with a stroke of a chord using said at least one additional key; and
- choosing a character from said four subgroups having said set of ten characters of said active group with a subsequent stroke of a chord using at least one of said four keys, said step of choosing a character comprises one of the following steps:
  - choosing one of the four characters from said first subgroup with a chord of just one of said four fingers;
  - choosing one of the three characters from said second subgroup with a chord of two adjacent fingers of said four fingers;
  - choosing one of the two characters from said third subgroup with a chord of three adjacent fingers of said four fingers;
  - choosing the character of said fourth subgroup with a chord of all of said four fingers;
- inputting a character corresponding to said subsequent stroke of a chord to said computer or other device.

5,535,422

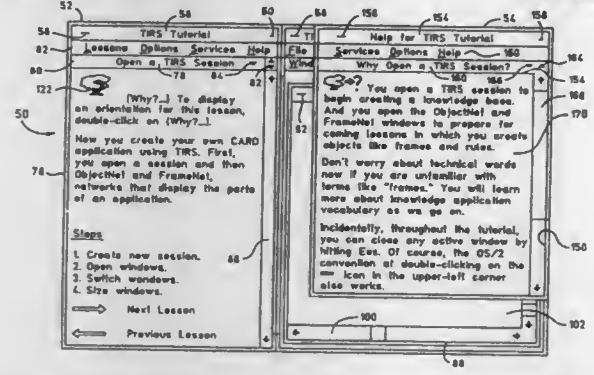
INTERACTIVE ONLINE TUTORIAL SYSTEM FOR SOFTWARE PRODUCTS

Alice Chiang, Portola Valley; Kevin M. McBride, Menlo Park, and Calvin C. Yee, Fremont, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 858,295, Mar. 26, 1992, abandoned. This application Oct. 20, 1994, Ser. No. 326,792

Int. Cl.^{6} G09B *7/00*

U.S. Cl. 395—155 **25 Claims**



(Why?...) To display an orientation for this lesson, double-click on (Why?...).

Now you create your own CARD application using TIRS. First, you open a session and then ObjectNet and FrameNet, networks that display the parts of an application.

Steps

1. Create new session.
2. Open windows.
3. Switch windows.
4. Size windows.

Next Lesson

Previous Lesson

You open a TIRS session to begin creating a knowledge base. And you open the ObjectNet and FrameNet windows to prepare for coming lessons in which you create objects like frames and rules.

Don't worry about technical words now if you are unfamiliar with terms like "frames." You will learn more about knowledge application vocabulary as we go on.

Incidentally, throughout the tutorial, you can close any active window by hitting Esc. Of course, the OS/2 convention of double-clicking on the — icon in the upper-left corner also works.

1. An interactive online tutorial system product operable in conjunction with a digital processing apparatus for providing instruction in the use of a software product operating on said digital processing apparatus, the data processing apparatus including a CPU, a data storage resource, an input system for receiving input from a user via a mouse or keyboard input device, and an output system for generating output images on a video display, and a multitasking operating system, said tutorial system comprising:

- a data storage medium operable in conjunction with said digital processing apparatus;
- a tutorial control module encoded on said medium having a window control interface;
- a lesson control file encoded on said medium providing input to said tutorial control module;
- an information presentation module encoded on said medium and adapted for communication with said tutorial control module via said window control interface;
- a lesson display file encoded on said medium providing input to said information presentation module;
- first display control means provided by said tutorial control module, said window control interface and said information presentation module for generating a tutorial window in a first portion of the video display;
- second display control means provided by said tutorial control module for generating a product window in a second portion of the video display concurrently with said tutorial window;
- application execution means provided by said tutorial control module for commencing execution of said software product in said product window;
- tutorial presentation means provided by said tutorial control module, said window control interface, said information presentation module and said lesson display file for generating in said tutorial window a plurality of tutorial text panels, said tutorial text panels including one or more lesson panels and one or more step panels corresponding to each lesson panel, said lesson panels and step panels displaying instructional text illustrating a predetermined sequence of operations to be performed on said software product;
- lesson control means provided by said tutorial control module for dynamically adjusting a lesson control pointer in said lesson control file based on lessons displayed in said tutorial text panels;
- tutorial panel linking means provided by said information presentation module and said lesson control file for linking said lesson panels through a series of sequential links and for linking said lesson panels and their corresponding step panels through a series of hierarchical links; and
- tutorial panel selection means provided by said tutorial control module, said window control interface, said information presentation module and said lesson display file for selectively activating from a lesson or step panel a link to another lesson or step panel in order to display the panel so linked.

5,535,423

METHOD OF EXCHANGING DATA BETWEEN A BASE TRANSCEIVER STATION OF A MOBILE RADIO NETWORK AND A MOBILE IN THE NETWORK

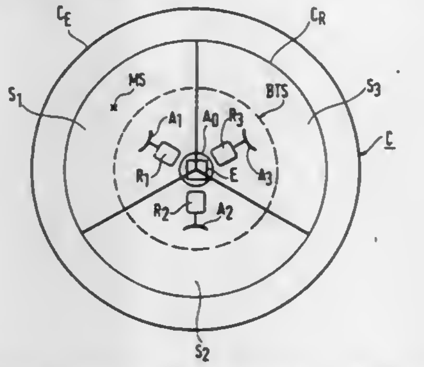
Pierre Dupuy, Paris, France, assignor to Societe Anonyme Dite Alcatel Radiotelephone, Paris, France

Filed May 26, 1994, Ser. No. 249,833

Claims priority, application France, May 28, 1993, 93 06426

Int. Cl.^{6} H04Q *7/00;9/00*

U.S. Cl. 455—33.1 **7 Claims**



1. A method of exchanging data between a base transceiver station of a cellular mobile radio network and a mobile, wherein:

- said base transceiver station and said mobile exchange data by radio in a delimited geographical area called a main cell which has a plurality of sectors, each corresponding to a specific portion of said main cell, and each associated with a receiver having a directional antenna;
- said base transceiver station has only a single transmitter having an omni-directional antenna and providing transmit radio coverage for all said sectors;
- said exchange of data occurs on a radio link between said mobile and said base transceiver station;
- said radio link is defined by a traffic channel on an upward traffic frequency and a traffic channel on a downward traffic frequency which are assigned to said mobile for transmission of speech or computer data; and said method comprises the following operations:
  - transmitting at least one access request from said mobile to said base transceiver station on a specific access channel on an upward control channel,
  - determining at a base station controller controlling said base transceiver station, for each of said receivers, the quality of the access signal constituted by said request and received at each of said receivers,
  - selecting whichever of said receivers for which the access signal has the best quality as the receiver to be used for speech or computer data signals transmitted by said mobile,
  - assigning an upward traffic channel to said mobile for its exclusive use on said upward traffic frequency, and
  - assigning a respective downward traffic channel to said mobile on said downward traffic frequency, said downward traffic channel being shifted in time relative to said upward traffic channel,
- wherein each of the other mobiles in said main cell and connected to said base transceiver station is associated with a downward traffic channel on said downward traffic frequency shifted in time relative to all the traffic channels assigned to the other mobiles on said downward traffic frequency and to an upward traffic channel on said upward traffic frequency shifted in time relative to all the traffic channels assigned to the other mobiles on said upward traffic frequency.

5,535,424

METHOD ENABLING A MOBILE STATION OF A CELLULAR MOBILE RADIO SYSTEM WITH MORE THAN ONE TYPE OF CELL TO DETERMINE THE TYPE OF CELL IT IS ACCESSING, AND MOBILE STATION AND BASE TRANSCEIVER STATION FOR IMPLEMENTING THIS METHOD

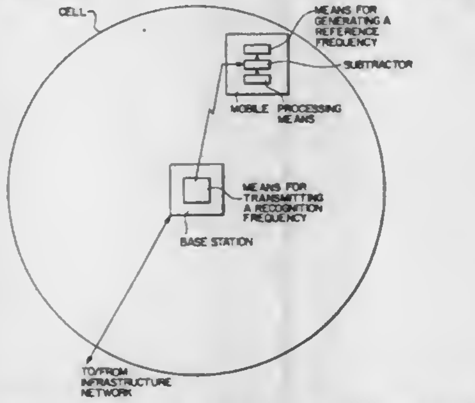
Fabrice de Seze, and Frédéric Gourgue, both of Paris, France, assignors to Alcatel Mobile Communication France, Paris, France

Filed Sep. 9, 1994, Ser. No. 303,944

Claims priority, application France, Sep. 10, 1993, 93 01788

Int. Cl.⁶ H04B *7/26;* H04Q *7/22*

U.S. Cl. 455—33.1 **20 Claims**


CELL
MEANS FOR GENERATING A REFERENCE FREQUENCY
SUBTRACTOR
MOBILE
PROCESSING MEANS
MEANS FOR TRANSMITTING A RECOGNITION FREQUENCY
BASE STATION
TO/FROM INFRASTRUCTURE NETWORK

1. A method of determining, in a cellular mobile radio system with more than one type of cell, which type of cell a mobile station is accessing, said method including the steps of:

transmitting a signalling message that defines a recognition message from a base station of said mobile radio system to said mobile station, wherein said signalling message is in the form of a sinusoid having a frequency which (1) defines a recognition frequency, and (2) differs from a reference frequency that is known to or determinable by said mobile station, the difference between said reference frequency and said recognition frequency being characteristic of the cell type,

determining, by said mobile station, said recognition frequency,

calculating, by said mobile station, the difference between said reference frequency and said recognition frequency,

basing a determination by said mobile station, as to the cell type, on said difference.

5,535,425

CHANNEL SWITCHING CONTROL IN MOBILE TELECOMMUNICATION SYSTEM

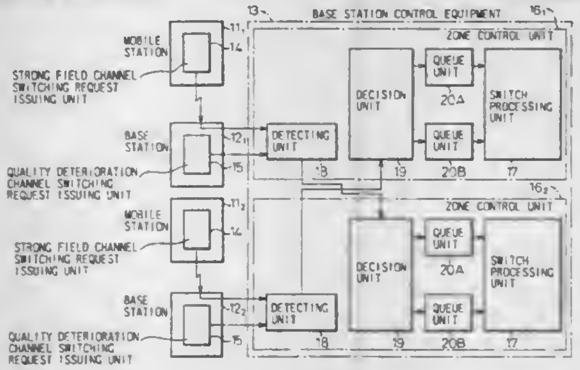
Keizo Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 26, 1995, Ser. No. 378,396

Claims priority, application Japan, Mar. 1, 1994, 6-030745

Int. Cl.⁶ H04Q *7/00;9/00*

U.S. Cl. 455—33.2 **11 Claims**



1. A channel switching control system for a mobile telecommunication system provided with base stations of zones for engaging in radio communication with mobile stations and base station control equipment for controlling the base stations, wherein

the base station control equipment performs priority processing for a request channel switching due to deterioration of quality among a request for channel switching to a stronger field from a mobile station, caused when it is detected that there is another zone in which the received level would be higher than the received level of the zone of the base station which the mobile station is engaged in communication with, and a request for channel switching due to deterioration of quality from a base station, caused when the quality of service between the base station and the mobile station falls below a predetermined value.

5,535,426

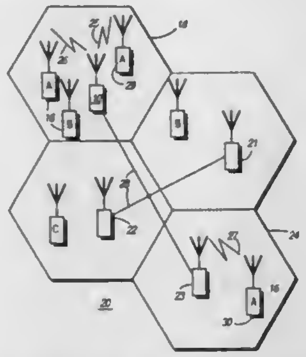
METHOD AND APPARATUS FOR MOVING PRIMARY CONTROL OF A CALL IN A MULTIPLE SITE COMMUNICATION SYSTEM

Todd A. Leigh, Rolling Meadows; Michael D. Sasuta, Mundelein, and John K. Hefferan, Lombard, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 13, 1993, Ser. No. 166,586

Int. Cl.⁶ H04Q *7/00*

U.S. Cl. 455—34.1 **11 Claims**



5. A communication system that includes a plurality of communication resource controllers, comprising:

a) a first communication resource controller that controls allocation of communication resources in a first site, wherein the first communication resource controller selectively supports calls as a primary controller and as a secondary controller;

b) a second communication resource controller that controls allocation of communication resources in a second site, wherein the second communication resource controller selectively supports calls as a primary controller and as a secondary controller, and wherein when the first communication resource controller is supporting a call as a primary controller, the second communication resource controller is supporting the call as a secondary controller; and

c) a communication link coupling the first communication resource controller and the second communication resource controller, wherein the communication link provides a medium through which the first communication resource controller instructs the second communication resource controller to allocate a communication resource in the second site to support the call.

5,535,427

RADIO RECEIVER REMOTELY CONTROLLABLE TO INHIBIT THE DISPLAY OF A RECEIVED MESSAGE

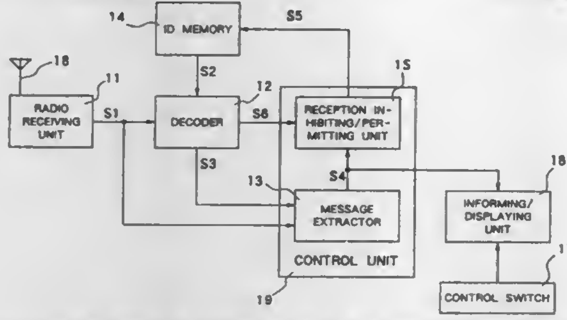
Mafumi Miyashita, and Ichiro Ozaki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 23, 1994, Ser. No. 264,325

Claims priority, application Japan, Jun. 30, 1993, 5-187206

Int. Cl.⁶ H04Q *7/18*

U.S. Cl. 455—38.2 **17 Claims**



1. A radio selective calling receiver for receiving and demodulating a modulated wave containing a selective calling number and a message, and displaying the message if the received selective calling number corresponds to a preset assigned selective calling number of a plurality of preset assigned selective calling numbers, said radio selective calling receiver comprising:

receiving means for receiving and demodulating a modulated wave;

storage means for storing information relative to each of the assigned selective calling numbers, said storage means further storing a selective calling number dedicated to remote control;

referring means for determining whether a received selective calling number agrees with any one of the assigned selective calling numbers; and

control means for decoding a message associated with the received selective calling number and updating the information stored in said storage means based on the decoded message if the received selective calling number correspond to said selective calling number dedicated to remote control.

5,535,428

METHOD AND APPARATUS FOR SELECTIVELY RETAINING MESSAGES RECEIVED BY A RADIO RECEIVER BASED UPON MESSAGE CONTENT

Gerald R. King, Ft. Lauderdale; Robert D. Lloyd, Boca Raton, and Leonard E. Nelson, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1994, Ser. No. 281,878

Int. Cl.⁶ H04Q *1/00*

U.S. Cl. 455—38.4 **12 Claims**

1. A method, in a radio receiver, for processing a message including information about a sports event, the method comprising the steps of:

locating, within the message, a final flag indicative of a status of the sports event within the message by referencing a memory to determine a predetermined location for the final flag within the message and retrieving the final flag at the predetermined location within the message;

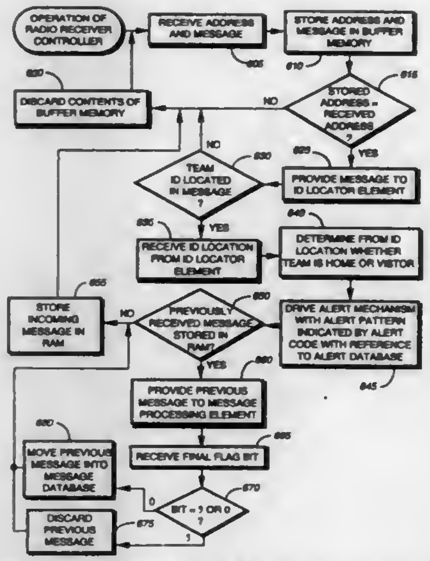
determining whether the final flag is equivalent to a first or a second value;

determining that a score indicated by the message is a non-final score when the final flag is equivalent to the first value and that the score is a final score when the final flag is equivalent to the second value;

storing the message in the memory;

receiving a further message;

storing the further message in the memory and discarding the message when the score indicated by the message is a non-final score; and


OPERATION OF RADIO RECEIVER CONTROLLER
RECEIVE ADDRESS AND MESSAGE
605
STORE ADDRESS AND MESSAGE IN BUFFER MEMORY
610
615
STORED ADDRESS = RECEIVED ADDRESS ?
NO
YES
620
DISCARD CONTENTS OF BUFFER MEMORY
NO
630
TEAM ID LOCATED IN MESSAGE ?
625
PROVIDE MESSAGE TO ID LOCATOR ELEMENT
YES
635
RECEIVE ID LOCATION FROM ID LOCATOR ELEMENT
640
DETERMINE FROM ID LOCATION WHETHER TEAM IS HOME OR VISTOR
655
STORE INCOMING MESSAGE IN RAM
NO
650
PREVIOUSLY RECEIVED MESSAGE STORED IN RAM?
DRIVE ALERT MECHANISM WITH ALERT PATTERN INDICATED BY ALERT CODE WITH REFERENCE TO ALERT DATABASE
645
YES
660
PROVIDE PREVIOUS MESSAGE TO MESSAGE PROCESSING ELEMENT
680
665
MOVE PREVIOUS MESSAGE INTO MESSAGE DATABASE
RECEIVE FINAL FLAG BIT
0
670
BIT = 1 OR 0 ?
DISCARD PREVIOUS MESSAGE
675
1

storing the further message in the memory without discarding the message when the score indicated by the message is a final score.

5,535,429

METHOD OF DISCONNECTING AN ESTABLISHED COMMUNICATION CONNECTION IN A MOBILE RADIO SYSTEM

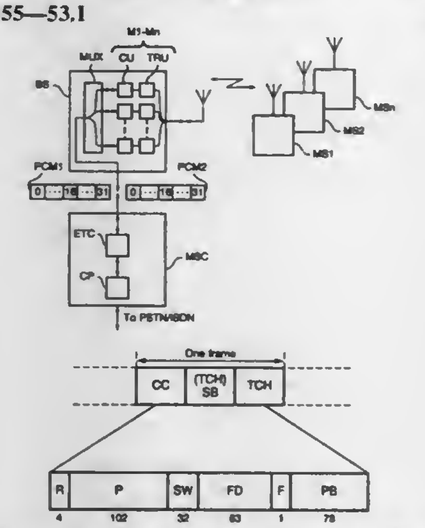
Lars H. Bergenlid, Sollentuna, and Ulf C. Eklund, Uppsala, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 27, 1994, Ser. No. 186,918

Claims priority, application Sweden, Jan. 27, 1993, 9300244

Int. Cl.⁶ H04B *1/00*

U.S. Cl. 455—53.1 **6 Claims**



1. A method of disconnecting a communications connection established between a mobile station and a network in a mobile radio system in which communication between the network and a plurality of mobile stations takes place over a number of communications channels and in which communication over an allocated communications channel between the network and a given mobile station is commenced and terminated in response to normal signalling from the network to the mobile station, comprising the steps of:

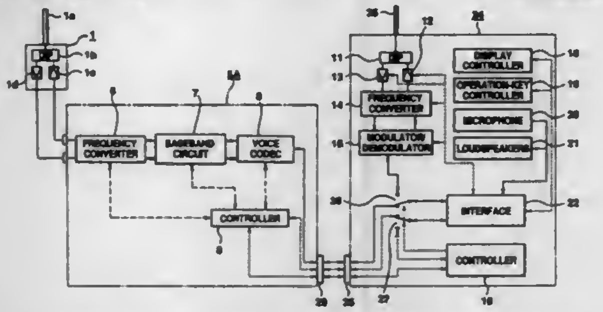
detecting, in the network, a state of the allocated communications channel which indicates that communication on the allocated channel has been degraded and therefore shall be disconnected;

sending a first signal from the network to the mobile station;
sending, upon receipt of the first signal, an acknowledgement signal from the mobile station to the network and activating a time monitoring process;
sending, upon receipt of the acknowledgement signal, a second signal from the network to the mobile station;
wherein the second signal, when received by the mobile station, prevents the time monitoring process from stopping, whereby the mobile station relinquishes the allocated communications channel; and
sending a second acknowledgement signal responsive to the relinquish from the mobile station to the network in order to inform the network about the relinquished communications channel.

5,535,430
MOBILE COMMUNICATION TERMINAL EQUIPMENT USABLE FOR BOTH SATELLITE AND TERRESTRIAL COMMUNICATIONS

Katsuhiko Aoki; Makio Tsuchiya, and Selya Inoue, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1994, Ser. No. 208,707
Claims priority, application Japan, Mar. 18, 1993, 5-058612
Int. Cl.^{6} H04Q *7/32*
U.S. Cl. 455—54.1 **18 Claims**

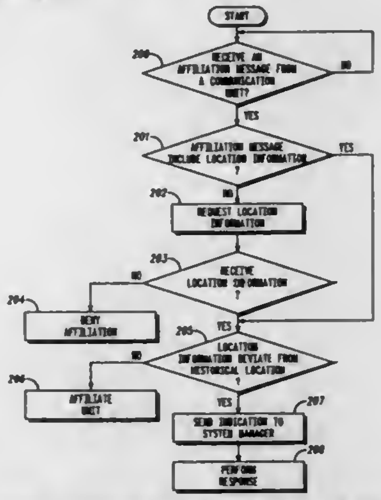


1. A mobile communication terminal equipment mountable in a vehicle comprising:
a satellite transceiver mountable in said vehicle and including a satellite transmission/reception circuit for transmitting and receiving signals through a satellite wireless communication system; and
a portable set disconnectable from the satellite transceiver so that the set can be carried by a user, said portable set comprising:
a terrestrial transmission/reception circuit for transmitting and receiving signals through a terrestrial wireless communication system;
a signal input/output circuit for inputting signals from the user and for outputting signals to the user;/and
a connection controller and switching means for selectively connecting the signal input/output circuit to one of the satellite transceiver and terrestrial transmission/reception circuits when said portable set is connected to said satellite transceiver and for connecting said signal input/output circuit to said terrestrial transmission/reception circuit when said portable set is disconnected from said satellite transceiver.

5,535,431
METHOD OF DETECTING UNAUTHORIZED USE OF A COMMUNICATION UNIT

Gary W. Grube, 157 Cedarwood Ct., Palatine, Ill. 60067, and Timothy W. Markison, 555 Northview La., Hoffman Estates, Ill. 60194

Filed Apr. 5, 1994, Ser. No. 222,986
Int. Cl.^{6} H04B *7/00*
U.S. Cl. 455—54.1 **9 Claims**


START
200
RECEIVE AN AFFILIATION MESSAGE FROM A COMMUNICATION UNIT?
NO
YES
201
AFFILIATION MESSAGE INCLUDE LOCATION INFORMATION ?
YES
NO
202
REQUEST LOCATION INFORMATION
203
RECEIVE LOCATION INFORMATION ?
NO
204
DENY AFFILIATION
YES
205
LOCATION INFORMATION DEVIATE FROM HISTORICAL LOCATION ?
NO
206
AFFILIATE UNIT
YES
207
SEND INDICATION TO SYSTEM MANAGER
208
PERFORM RESPONSE

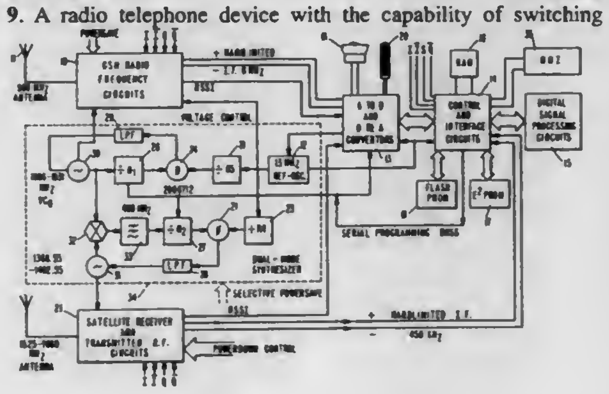
1. In a wireless communication system, a method for detecting unauthorized use of a communication unit, the method comprising the steps of:
a) transmitting, by the communication unit, an affiliation message to a central controller via the wireless communication system;
b) determining, by the central controller, whether a location information is included in the affiliation message;
c) when the location message is not included in the affiliation message, transmitting, by the central controller, a request for the location information to the communication unit via the wireless communication system;
d) determining, by the central controller, whether the location information of the communication unit deviates from a historical location pattern of the communication unit; and
e) when the location information deviates from the historical location pattern, indicating, by the central controller, that the communication unit is a potential unauthorized communication unit.

5,535,432
DUAL-MODE SATELLITE/CELLULAR PHONE WITH A FREQUENCY SYNTHESIZER

Paul W. Dent, Stehags, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Sep. 14, 1994, Ser. No. 305,780
Int. Cl.^{6} H04B *1/40*
U.S. Cl. 455—77 **22 Claims**

9. A radio telephone device with the capability of switching

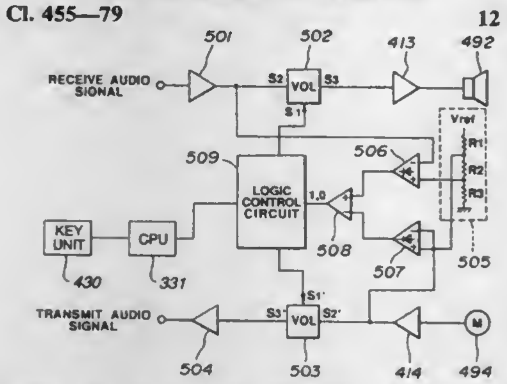

GSM RADIO FREQUENCY CIRCUITS
A TO D AND D TO A CONVERTERS
CONTROL AND INTERFACE CIRCUITS
DIGITAL SIGNAL PROCESSING CIRCUITS
RAM
LPF
VOLTAGE CONTROL
FLASH PROM
SERIAL PROGRAMMING BUSS
DUAL-MODE SYNTHESIZER
SATELLITE RECEIVER AND TRANSMITTER R.F. CIRCUITS
SELECTIVE POWERSAVE
POWERDOWN CONTROL
HARDLIMITED I.F.

between operating through a land-based cellular network and an orbiting satellite system, comprising;
first antenna and first radio frequency means for receiving transmitted signals from said land-based cellular network and forming first conditioned signals for subsequent numerical decoding;
second antenna and second radio frequency means for receiving transmitted signals from said orbiting satellite system and forming second conditioned signals for subsequent numerical decoding;
numerical decoding for processing either said first conditioned signals or said second conditioned signals;
dual-loop radio frequency synthesizer means comprising a first phase lock loop to generate a first output signal at a first output frequency connected to said first radio frequency means, said first output frequency being programmable to determine reception on a desired land-based cellular network channel frequency and a second phase lock loop to generate a second output signal at a frequency programmably offset from said first output frequency and connected to said second radio frequency means in order to determine reception on a desired channel frequency of said orbiting satellite system.

5,535,433
HANDS-FREE CIRCUITRY PROVIDING AUDIO SIGNAL ADJUSTMENT BASED ON SPEAKER VOLUME VALUE

Osamu Kurokawa, Hino, and Buntaro Sawa, Sagamihara, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 896,616, Jun. 10, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,380
Claims priority, appilcation Japan, Jun. 11, 1991, 3-139226
Int. Cl.^{6} H04B *1/38;* **H04M** *9/08*
U.S. Cl. 455—79 **12 Claims**

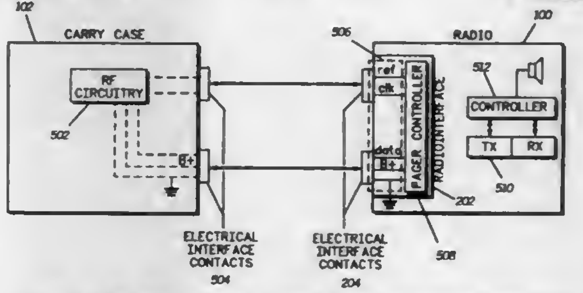


1. Hands-free circuitry for controlling the application of a receive audio signal from a communication path to a speaker and the application of a transmit audio signal from an audio signal source to the communication path, comprising:
first adjusting means for varying a transmit attenuation factor, thereby adjusting the transmit audio signal;
second adjusting means for varying a receive attenuation factor, thereby adjusting the receive audio signal;
comparing means for comparing a level of the transmit audio signal with a level of the receive audio signal;
input means for generating a volume value for the speaker, the volume value being used for changing the level of the receive audio signal to be applied to the speaker; and
control means for activating one of the first adjusting means and the second adjusting means in response to the comparing means so as to control an adjustment of the activated one of the first adjusting means and the second adjusting means by continuously decreasing the attenuation factor of the activated adjusting means with a value of such attenuation factor before the activation of one of the first and second adjusting means being taken as a reference as the volume value of the speaker received from the input means decreases.

5,535,434
CARRY CASE HAVING PAGING CIRCUITRY SECTION

Craig F. Siddoway, Davie, and Gerald L. Giacomino, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 24, 1994, Ser. No. 185,333
Int. Cl.^{6} H04B *1/08;1/16*
U.S. Cl. 455—89 **4 Claims**

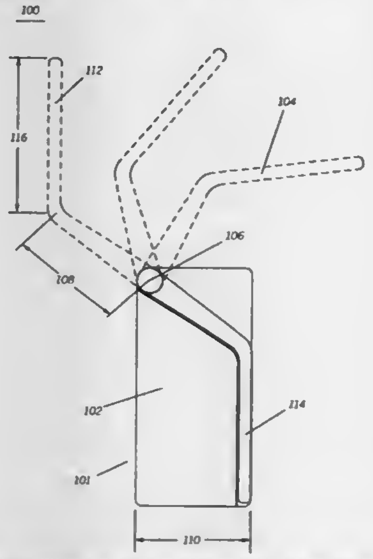


1. A carry case and electronic device in combination, wherein a first pager section and a second pager section form a pager that is fully functional, the combined carry case and electronic device comprising:
the carry case including,
the first pager section, the first pager section including a pager controller and
electrical interface contacts for interfacing to the electronic device; and the electronic device including,
an interface portion having the second pager section and electrical interface contacts for coupling to the carry case's electrical interface contacts, the second pager section including RF circuitry.

5,535,435
COMMUNICATION DEVICE USING ANTENNA HAVING AN OFFSET

Quirino Balzano; Scott H. Richards, both of Plantation, and Bruce A. Claxton, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 11, 1994, Ser. No. 272,472
Int. Cl.^{6} H04B *1/38*
U.S. Cl. 455—89 **18 Claims**



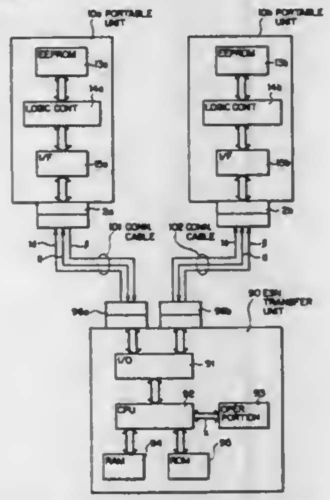
1. A radio communication device having a transmit mode and a receive mode of operation, comprising:
a housing having a first major surface, a second surface, a width, and a microphone located on the first major surface;
a transmitter substantially situated within the housing;

an antenna having a deployed position and a second position and being pivotally coupled to the housing and comprising:
a radiating portion;
an offset portion coupled to the radiating portion; and
attachment means for pivotally attaching the offset portion of the antenna to the housing so that the radiating portion is away from the housing in a plane parallel to the first major surface a distance substantially equal to the length of the offset portion when in the deployed position and resting on the second surface of the housing when in the second position.

5,535,436
PORTABLE TRANSCEIVER AND ESN TRANSFER SYSTEM THEREFOR

Ikio Yoshida, Tokyo, and Masahiro Ishigami, Saitama, both of, Japan, assignors to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 735,735, Jul. 25, 1991, abandoned. This application Feb. 13, 1995, Ser. No. 387,384
Claims priority, application Japan, Jul. 25, 1990, 2-196794
Int. Cl.^{6} H04B *1/40*

U.S. Cl. 455—89 **19 Claims**

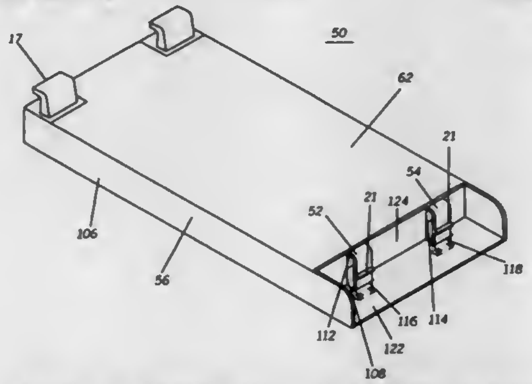


12. An electronic serial number (ESN) transfer unit comprising:
ESN reading means for reading, via a first external connector housed in the casing of a first portable transceiver in a car telephone system, a first ESN stored in a first EEPROM mounted on said first portable transceiver and used for identifying said portable transceiver;
judging means for judging whether or not an ESN transfer of a specific part of said first ESN read out by said ESN reading means is enabled;
transfer means for transferring, only when the specific part of said first ESN is judged correct, said first ESN read out by said ESN reading means to a second EEPROM in a second portable transceiver in said car telephone system via a second external connector housed in the casing of said second portable transceiver; and
rewriting means for rewriting, when the ESN transfer of the specific part of said first ESN is judged enabled, the specific part of the first ESN stored in said first EEPROM to a content which is to be judged that the ESN transfer is inhibited.

5,535,437
PORTABLE RADIO BATTERY LATCH

David H. Karl, Tamarac; Randall P. Chambers, Davie, and Vito Dionisio, Jr., Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 113,579, Aug. 27, 1993, abandoned, which is a continuation of Ser. No. 848,593, Mar. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 709,045, Jun. 3, 1991, abandoned. This application Mar. 13, 1995, Ser. No. 402,723
Int. Cl.^{6} H04B *1/38*

U.S. Cl. 455—90 **3 Claims**



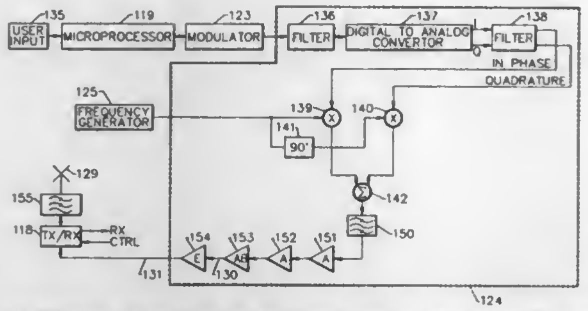
1. A housing for an energy source for powering an electronic device when said energy source is attached to said electronic device, said electronic device having a chassis with two ends, the first end of the chassis having two hook receivers, the second end of the chassis having an interior wall extending substantially perpendicular therefrom, a protrusion extending from the wall located remotely from the chassis, said housing comprising:
a cover portion having two ends;
two hooks extending from said cover at the first end thereof for engaging said two hook receivers;
an outward side parallel to the cover portion, the outward side defining a plane;
an inner wall formed between the outward side and the cover portion having a downwardly sloped portion;
a protective sheath extending from the outward side along the same plane, two finger recesses on the outward side each having a slot located therein, the protective sheath aligns with the interior wall of the chassis when the housing is in a latched position;
two latches extending from the cover portion over the downwardly sloped portion of the inner wall, each of said latches having a resilient support arm, an outer end located remotely from the support arm, and a sloped portion disposed intermediate the support arm and outer end for engaging the protrusion of the interior wall of the chassis, the outer end extending through the slot in the protective sheath so as to limit over travel of said latches; and
the engagement of the two hooks with the two hook receivers provides a pivotal support so that the housing can be pivoted into the latched position.

5,535,438
PHASE LINEAR CLASS E AMPLIFIER FOR A SATELLITE COMMUNICATION TERMINAL WHICH COMMUNICATES WITH A LOW EARTH ORBITING SATELLITE

John F. Sevic, Scottsdale, Ariz., assignor to Panasonic Technologies, Inc., Princeton, N.J.
Filed May 10, 1994, Ser. No. 240,912
Int. Cl.^{6} H04B *1/04;* H03F *21/00*

U.S. Cl. 455—110 **14 Claims**

1. A terminal for communicating with a low earth orbiting satellite comprising:
data signal generation means for generating a data signal for transmission to a low earth orbiting satellite;

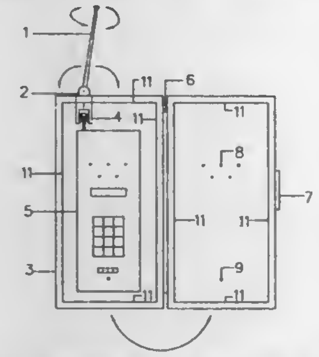


modulation means, having an input and an output, said input being electrically connected to said data signal generation means for converting the data signal into a phase modulated data signal;
a class E switching amplifier, having an input and an output, said input of said class E switching amplifier being electrically connected to said output of said modulation means, said class E switching amplifier amplifying the phase modulated data signal into a phase modulated signal at frequencies between 148 and 150 MHz; and
an antenna, electrically connected to said output of said class E switching amplifier, for transmitting the phase modulated signals at frequencies between 148 and 150 MHz to the low earth orbiting satellite.

5,535,439
CELLULAR TELEPHONE AND MARINE BAND USER'S PROTECTIVE DEVICE

Joseph M. Katz, 11 Meadow Rd., Old Westbury, N.Y. 11568
Continuation of Ser. No. 13,399, Feb. 4, 1993, Pat. No. 5,336,896. This application Aug. 4, 1994, Ser. No. 285,798
Int. Cl.^{6} H01Q *11/12;* H01B *1/04*

U.S. Cl. 455—117 **15 Claims**

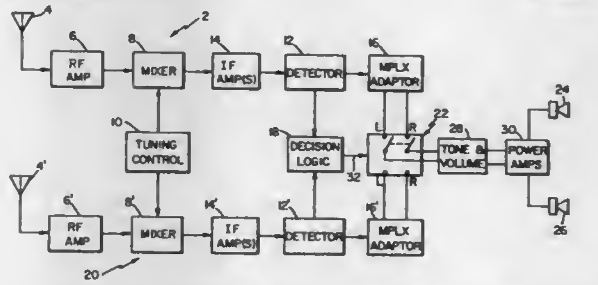


1. An assembly for attenuating the passage of electromagnetic and microwave radiation emitted from cellular and marine band telephones, said assembly comprising:
a) a box including at least two portions and having four sides, a top and a bottom, said at least two box portions being hinged such that said box portions are movable between open and closed positions to open and close the box, said box being configured to receive a cellular or marine band telephone therein;
b) electromagnetic and microwave radiation shielding affixed to the inside of said four sides, said top and said bottom;
c) a handle mounted to an outside of said box, said handle behag positioned to facilitate carrying said assembly;
d) a telescoping antenna connected to a tilt and swivel base connector, said base connector being attached to at least one of said at least two box portions and penetrating therethrough and said electromagnetic and microwave radiation shielding, said tilt and swivel base connector being connected to an antenna connector positioned within said box and said electromagnetic and microwave shielding to form an antenna circuit; and
e) at least one hole being provided through said box and said shielding for talking into and listening from said cellular or maxine band telephone.

5,535,440
FM RECEIVER ANTI-FADING METHOD AND SYSTEM

Robert R. Clappier, 910 Lido Cir., Discovery Bay, Calif. 94514
Continuation of Ser. No. 595,402, Oct. 11, 1990, abandoned. This application Jan. 10, 1995, Ser. No. 370,820
Int. Cl.^{6} H04B *7/08*

U.S. Cl. 455—134 **5 Claims**

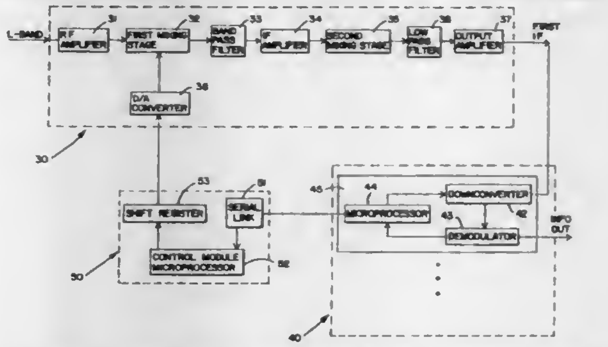


1. A system for reducing audio output signal fading in FM receivers intended to be transported to various locations while in use comprising
a first FM receiver having a multiplex adapter,
a second FM receiver having a multiplex adapter,
means for concurrently tuning both said FM receivers to the same radio station and maintaining them turned on,
an audio output circuit,
a switch circuit for switching said audio output circuit between first and second receivers downstream of the multiplex adapters in response to signal strengths produced by said FM receivers relative to each other and to a threshold voltage,
said switch circuit including
at least a first and a second switch each having an input terminal,
each switch connected to receive on its input terminal the audio output signal from a different one of said receivers, and
a network for establishing essentially identical dc biasing voltages on said input terminals.

5,535,441
METHOD AND DEVICE FOR CANCELING FREQUENCY OFFSETS

Tom Jackson, Frederick; Henry Eck, Germantown, and Ray Lowe, Gaithersburg, all of Md., assignors to Hughes Electronics Corp., Los Angeles, Calif.
Filed Sep. 30, 1994, Ser. No. 316,027
Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—182.2 **14 Claims**



1. A device for canceling frequency offsets in received modulated signals, the device comprising:
a downconverter module receiving the modulated signals in a predetermined frequency range, and shifting the modulated signals to a first IF; and

a channel unit receiving the first IF, said channel unit comprising at least one channel decoder, and each of the channel decoders generating an information signal and a frequency offset output, said frequency offset output coupled to the downconverter for adjusting the downconverter to compensate for any frequency offset, wherein the channel unit shifts the first IF to a second IF, demodulates the second IF, and generates an information signal.

5,535,442

FM TUNER HAVING IMPROVED TUNING SPEED

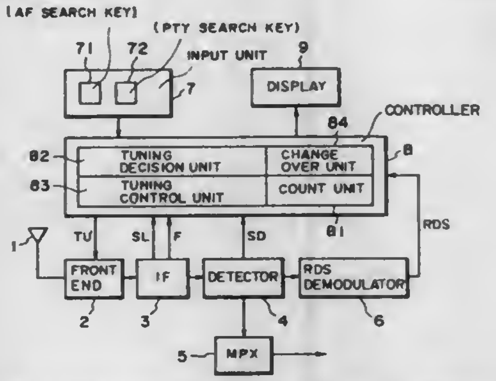
Kazuhiro Kishi, Hanno, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation of Ser. No. 168,206, Dec. 17, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,055

Claims priority, application Japan, Dec. 25, 1992, 4-357951

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—134.1 **2 Claims**



1. An FM tuner comprising a tuner circuit (2) controlled by a tuning signal (TU); an intermediate frequency amplifier (3) for amplifying an intermediate frequency signal, a detector (4) for demodulating a FM signal in the intermediate frequency signal amplified by said intermediate frequency amplifier to generate a tuning indicating signal (SD), control means in response to a first search signal which indicates that said tuner circuit sequentially tunes to unknown receiving radio frequencies (8) for taking a count (F) of the frequency in the intermediate frequency signal when the tuning indicating signal (SD) is generated and in accordance with the count rendering said tuner circuit tuned to a receiving radio frequency signal, and means (7) for generating a second search signal which indicates that said tuner circuit sequentially tunes to a plurality of receiving radio frequencies previously stored in a list, wherein said control means in response to the second search signal controls said tuner circuit in accordance with a tuning indicating signal (SD) from said detector without using the count.

5,535,443

NEGATIVE FEEDBACK CONTROL CIRCUIT HAVING A COMMON LINE FOR INPUT AND OUTPUT SIGNAL

Leroy S. Wignot, 7505 Fieldstone Ct., Indianapolis, Ind. 46254

Continuation of Ser. No. 937,488, Aug. 28, 1992, abandoned. This application Feb. 9, 1995, Ser. No. 386,246

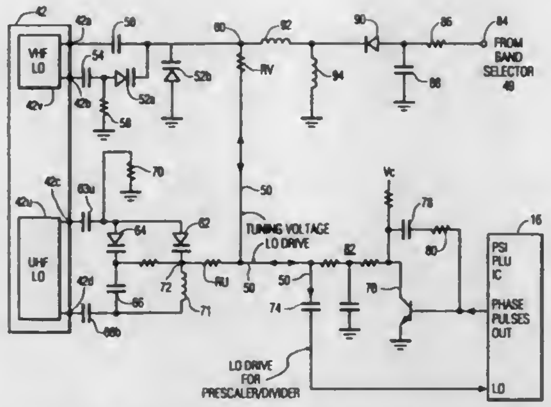
Int. Cl.^{6} H04B *1/26*

U.S. Cl. 455—196.1 **11 Claims**

1. An apparatus comprising:

a first oscillator for generating a first oscillator signal including a first frequency control variable impedance responsive to a control signal for controlling the frequency of the first oscillator, and

a control means for generating said control signal in response to the frequency of the first oscillator signal, said first oscillator signal being coupled from the first oscillator to the control means and said control signal being coupled from the control means to the first oscillator entirely through a single common electrically conductive path directly connected to the first frequency control variable impedance of said first oscillator.



5,535,444

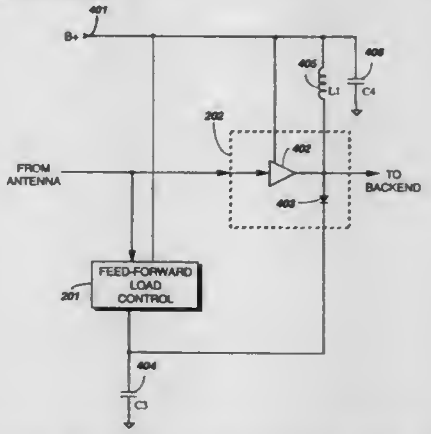
DIODE LOADED FEED-FORWARD RADIO FREQUENCY AMPLIFIER POWER CONTROL

Walter Grandfield, 8376 Morning Star Rd., Lake Worth, Fla. 33467

Continuation-in-part of Ser. No. 334,092, Nov. 4, 1994. This application Mar. 7, 1995, Ser. No. 400,226

Int. Cl.^{6} H04B *1/06;7/00*

U.S. Cl. 455—232.1 **9 Claims**



1. A selective call receiver including a radio frequency amplifier having an output power level that is controllable in an unconditionally stable manner, the selective call receiver comprising:

a loading diode coupled to an output of the radio frequency amplifier; and

a feed-forward load control coupled to an input of the radio frequency amplifier for detecting an input signal strength and regulating conduction of a current through the loading diode in response to the input signal strength substantially reaching or exceeding a predetermined activation threshold corresponding with a predetermined input signal strength and a maximum output power level, the current causing an impedance of the loading diode to vary in a manner that causes the output power level to remain substantially constant.

5,535,445

MIXER CIRCUIT

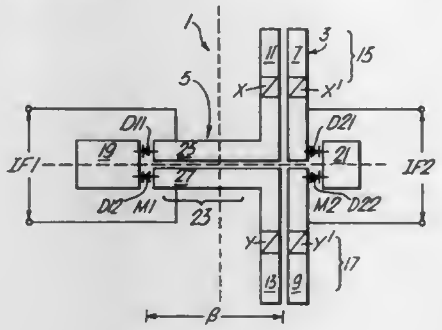
David J. Gunton, Stakeford, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 8, 1984, Ser. No. 623,162

Claims priority, application United Kingdom, May 9, 1983, 8312704

Int. Cl.^{6} H04B *1/26*

U.S. Cl. 455—327 **7 Claims**



1. A mixer circuit comprising:

a supportive substrate;

first and second dipoles, each of planar metal and lying upon the substrate, these dipoles intersecting and being arranged orthogonal to one another;

first and second mixer elements, each element being connected across a gap in the dipole metal of the first dipole and of the second dipole respectively, and each being fed by both dipoles;

the first dipole being split along a portion of its length and affording thereby a two conductor transmission delay line extending between the first mixer element and the region of dipole-dipole intersection;

the second dipole being split along a portion of its length and affording thereby a pair of isolated conductors extending between the region of dipole-dipole intersection and an open end of the second dipole; and,

a connective link joining one of the line conductors to one of the isolated conductors, this link lying outside of the envelope of the line but within the envelope of the second dipole, this link thus permitting the extraction of intermediate frequency signal (ie signal developed across the first mixer) via the two isolated conductors.

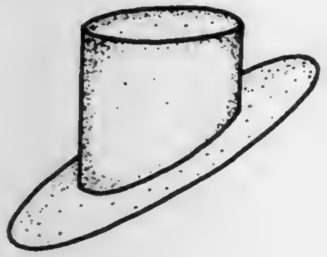
DESIGNS

JULY 9, 1996

371,451

HAT

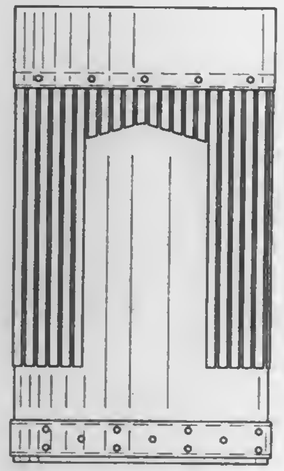
Cyril P. Foray, 470 H Euclid Ave., Lancaster, Pa. 17603
Filed Mar. 25, 1994, Ser. No. 20,391
Term of patent 14 years
U.S. Cl. D2—886



371,452

LEGGING

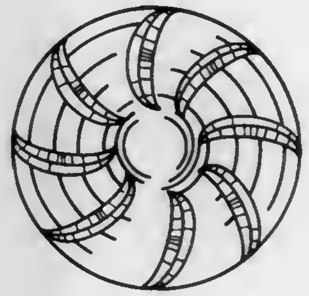
Nettie H. Graves, 4735 Crossbend Rd., McLeansville, N.C. 27301
Filed Jul. 25, 1994, Ser. No. 26,342
Term of patent 14 years
U.S. Cl. D2—901



371,453

WINTER GOLF SPIKE

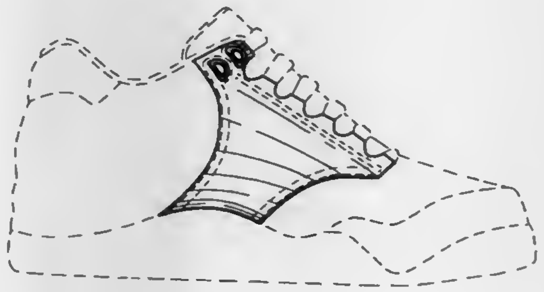
Ernie L. Deacon, 319 Meadowbrook Dr., Nampa, Id. 83686, and Faris W. McMullin, 7614 E. Lemhi, #1, Boise, Id. 83709
Continuation-in-part of Ser. No. 872,819, Apr. 24, 1992, Pat. No. 5,259,129. This application Aug. 13, 1993, Ser. No. 11,730
Term of patent 14 years
U.S. Cl. D2—962



371,454

ELEMENT FOR AN ATHLETIC SHOE UPPER

Steven B. Nichols, Los Angeles, Calif., assignor to K-Swiss, Inc., Chatsworth, Calif.
Filed Aug. 5, 1994, Ser. No. 26,816
Term of patent 14 years
U.S. Cl. D2—972



371,455

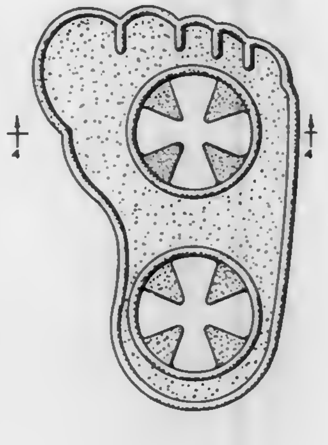
SOCK HOLDER

Laurence M. Ronson, and John Kaye, both of London, England, assignors to Kenfort Limited dba MIA, London, England

Filed Apr. 21, 1995, Ser. No. 37,840

Term of patent 14 years

U.S. Cl. D3—201



371,456

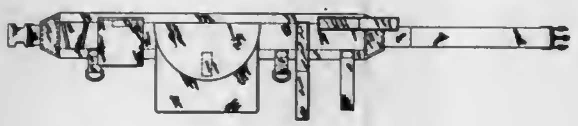
FISHERMAN'S GEAR BELT

Dennis L. Champlin, 1702 Hagny; Charles D. Curless, 201 Walnut, and Russell W. Logan, 101 Poplar, all of Lamar, Mo. 64759

Filed May 27, 1994, Ser. No. 23,594

Term of patent 14 years

U.S. Cl. D3—224



371,457

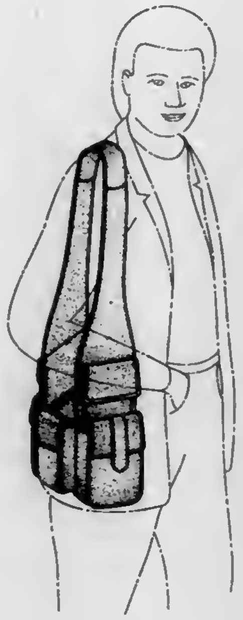
SHOULDER STRAP BAG

Gail Jacobs, 279 Concord Rd., Wayland, Mass. 01778

Filed May 9, 1995, Ser. No. 38,620

Term of patent 14 years

U.S. Cl. D3—231



371,458

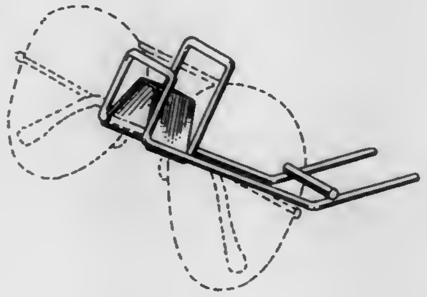
EYEWEAR PRODUCTS SUPPORT FOR A DISPLAY TRAY

William H. Valls, Harwinton; David W. Schweitzer, West Hartford, and Jonathan C. Hamilton, Tariffville, all of Conn., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 4, 1995, Ser. No. 37,140

Term of patent 14 years

U.S. Cl. D3—266



371,459

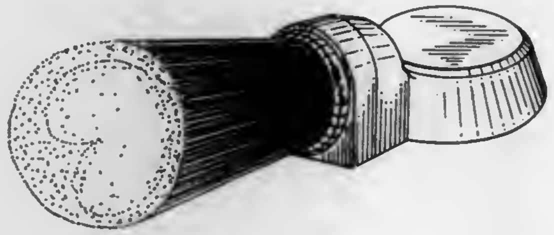
BRUSH HEAD

Brian H. J. Cameron, 293 Hemlock Road, Rockcliffe Park, Ontario, Canada

Continuation-in-part of Ser. No. 202,544, Feb. 28, 1994, abandoned. This application Jan. 19, 1995, Ser. No. 33,752

Term of patent 14 years

U.S. Cl. D4—127



371,460

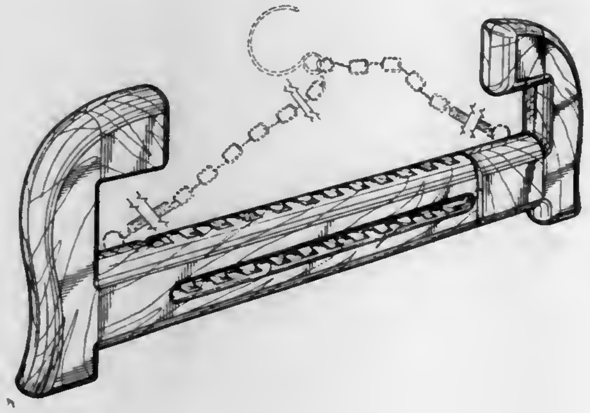
KILT AND COAT HANGER

George H. Ferguson, 2289 Harkness Ct., Biloxi, Miss. 39532-3126

Filed Sep. 27, 1994, Ser. No. 28,967

Term of patent 14 years

U.S. Cl. D6—328



371,461

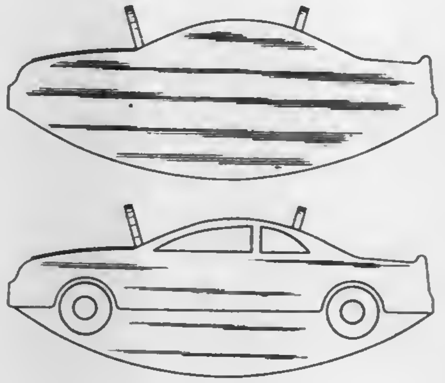
TOY ROCKER

Richard F. bly, and Kent S. Wilson, both of Kane, Pa., assignors to Holgate Toy Company, Kane, Pa.

Filed Feb. 16, 1995, Ser. No. 34,998

Term of patent 14 years

U.S. Cl. D6—345



371,462

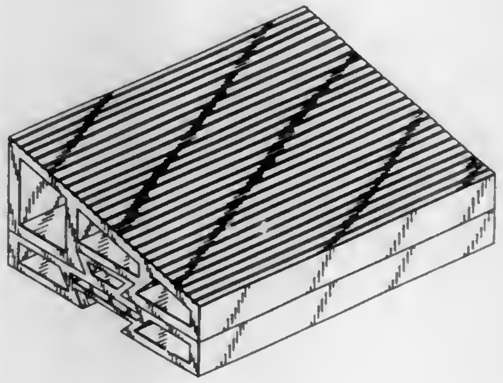
ELEVATABLE ERGONOMIC, INTERLOCKING FOOT REST

Edward J. Grossmith, 6503 Little Falls Dr., San Jose, Calif. 95120

Filed Mar. 3, 1995, Ser. No. 35,643

Term of patent 14 years

U.S. Cl. D6—349



371,463

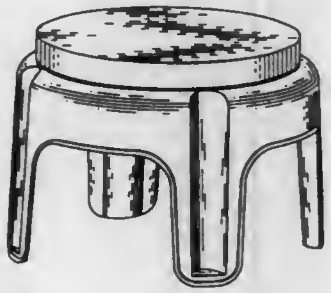
PADDED STOOL

Edward P. Cohan, and Mary E. Cohan, both of 10052 Stone Arch Dr., Grass Valley, Calif. 95949

Filed Aug. 23, 1995, Ser. No. 43,142

Term of patent 14 years

U.S. Cl. D6—349



371,464

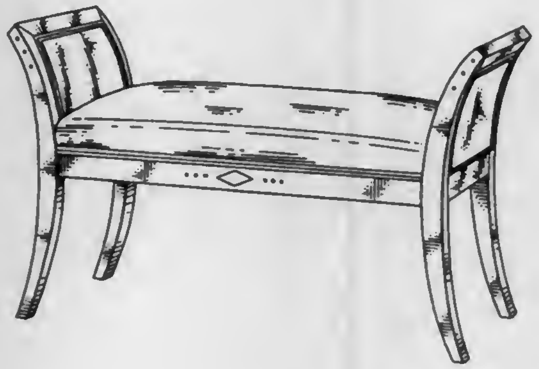
BENCH

Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086

Division of Ser. No. 16,874, Dec. 28, 1993, Pat. No. Des. 316,442. This application May 30, 1995, Ser. No. 39,550

Term of patent 14 years

U.S. Cl. D6—355



371,465

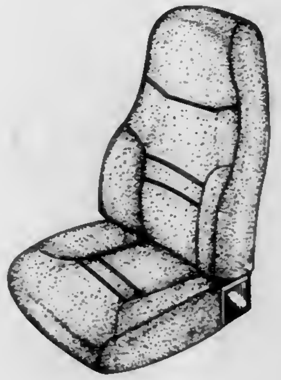
SEAT

Edward Stulik, Granite Bay, Calif., assignor to Sears Manufacturing Company, Davenport, Iowa

Filed Aug. 11, 1995, Ser. No. 42,475

Term of patent 14 years

U.S. Cl. D6—356



371,466

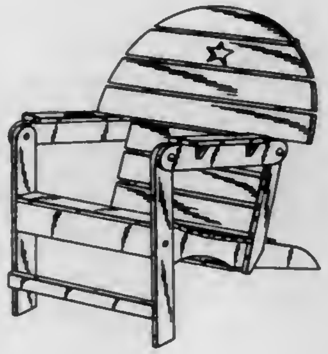
LAWN CHAIR

Judi Boisson, 134 Mariner Dr., Southampton, N.Y. 11968

Filed Aug. 25, 1995, Ser. No. 43,123

Term of patent 14 years

U.S. Cl. D6—370



371,467

ARTICULATED BEDSPRING

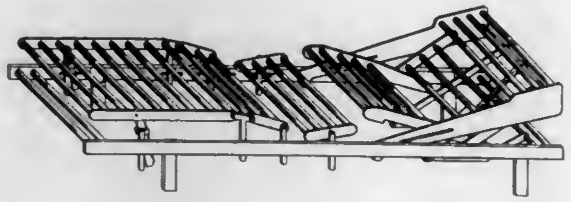
Henri Biefnot, Grand Route 22, Mons, Belgium; Marius Boonants, rue due Vallon 21, Eugies, Belgium, and Marcel Hubert, rue des Francs 69, Marcinelle, Belgium

Filed Oct. 24, 1994, Ser. No. 30,227

Claims priority, application Benelux TM/Des. Off., Apr. 25, 1994, 05563-00

Term of patent 14 years

U.S. Cl. D6—392



371,468

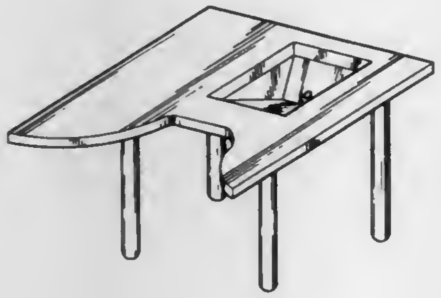
COMPUTER TABLE

Fred K. Sittel, Ortonville; Randal L. Knee, Romeo, and Angelo Parisi, Jr., Rochester Hills, all of Mich., assignors to The Budd Company, Troy, Mich.

Filed Feb. 17, 1995, Ser. No. 36,615

Term of patent 14 years

U.S. Cl. D6—422



371,469

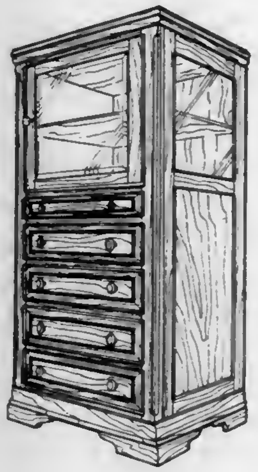
CHEST

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Feb. 24, 1995, Ser. No. 35,298

Term of patent 14 years

U.S. Cl. D6—436



371,470

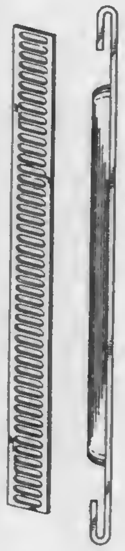
DESIGN FOR A DISPLAY FIXTURE RAIL

Kurt Kainz, Them, Denmark, assignor to AM System Silkeborg A/S, Them, Denmark

Filed Nov. 17, 1993, Ser. No. 15,418

Term of patent 14 years

U.S. Cl. D6—469



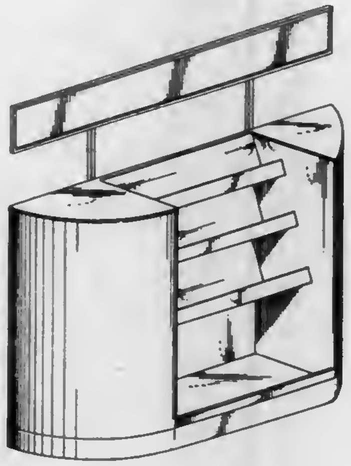
371,471
MAGAZINE DISTRIBUTION RACK

Marvin L. Sloan, Lilburn, and Barry V. Cohen, Marietta, both of Ga., assignors to Network Publications Incorporated, Lawrenceville, Ga.

Filed Apr. 18, 1995, Ser. No. 37,672

Term of patent 14 years

U.S. Cl. D6—475



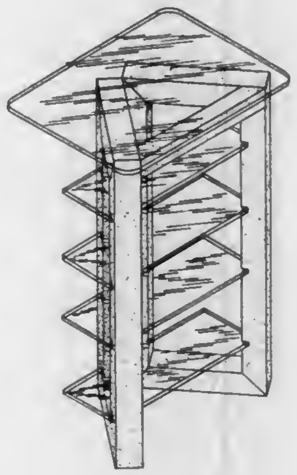
371,472
ENTERTAINMENT SYSTEM STAND

Jon P. Herbst, 2890 Skyline Dr., Eagan, Minn. 55121

Filed Mar. 6, 1995, Ser. No. 35,755

Term of patent 14 years

U.S. Cl. D6—479



371,473
OVAL TABLE

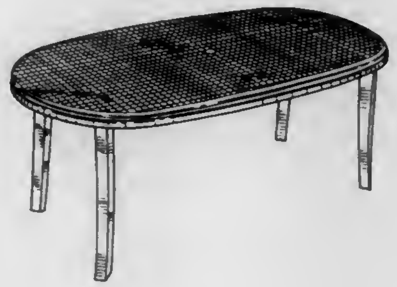
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France

Filed Dec. 8, 1994, Ser. No. 32,159

Claims priority, application WIPO, Jun. 9, 1994, DMA/002538

Term of patent 14 years

U.S. Cl. D6—480



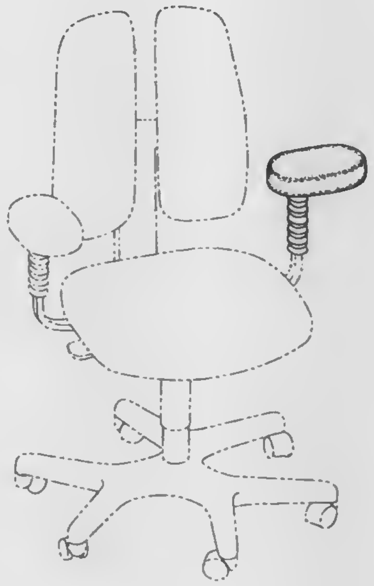
371,474
ERGONOMIC ARM SUPPORT FOR A CHAIR

Karl-Heinz Koopman, Voigtei 99, D31595 Steyerberg, Germany, assignor to Grahl Industries, Inc., Coldwater, Mich.

Filed Mar. 13, 1995, Ser. No. 36,068

Term of patent 14 years

U.S. Cl. D6—501



371,475
ARMREST

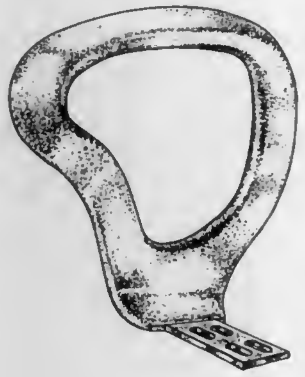
Romeo Tedesco, Downsview, Canada, assignor to Global Upholstery Company, Ontario, Canada

Filed Jul. 12, 1994, Ser. No. 25,812

Claims priority, application Canada, Jan. 12, 1994, 1994-0057

Term of patent 14 years

U.S. Cl. D6—501



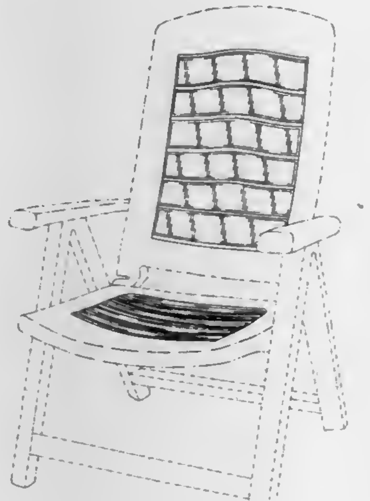
371,476
COMBINED BACKREST AND SEAT PANELS FOR A CHAIR

Thomas Sauvage, Saint Martin d'Uriage, France, assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.

Filed May 23, 1994, Ser. No. 23,341

Term of patent 14 years

U.S. Cl. D6—502



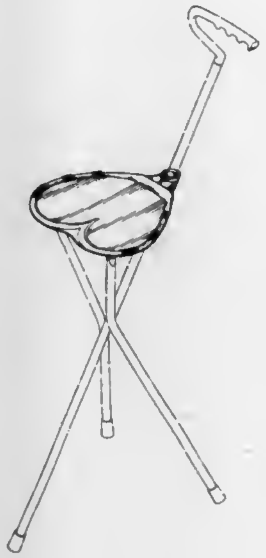
371,477
SEATING PORTION OF COLLAPSIBLE CHAIR

Te-Chen Lee, P.O. Box 96-405,, Taipei, Taiwan

Filed Jun. 22, 1995, Ser. No. 41,147

Term of patent 14 years

U.S. Cl. D6—502



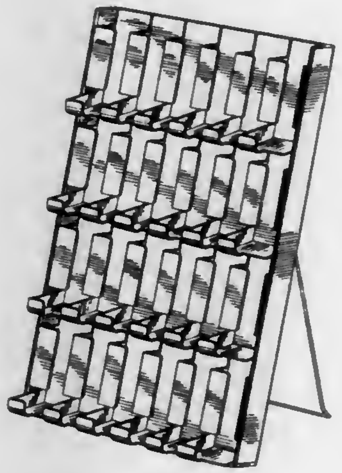
371,478
COMBINED DISPLAY AND DISPENSING RACK FOR COSMETIC PRODUCTS

Robert T. Yates, La Costa, Calif., assignor to Creative Nail Design, Inc., Vista, Calif.

Filed Aug. 17, 1995, Ser. No. 42,787

Term of patent 14 years

U.S. Cl. D6—515



371,479

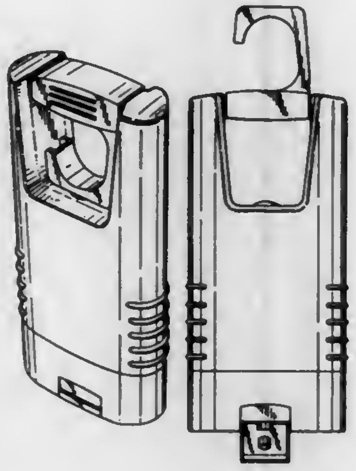
SHOWER DISPENSER

Kenneth W. Hirst, New York, N.Y., assignor to The Gillette Company, Boston, Mass.

Filed May 18, 1995, Ser. No. 38,997

Term of patent 14 years

U.S. Cl. D6—542



371,480

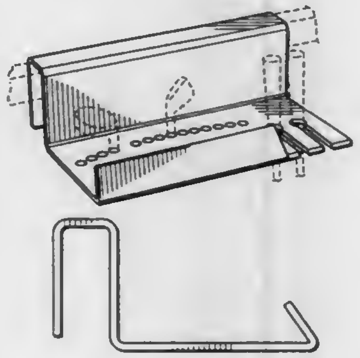
RACK FOR DISPLAYING GOLF CLUB HEADS AND GOLF CLUBS ASSEMBLED WITH ONE OF THE DISPLAYED GOLF CLUB HEADS

Pohcye Seng, 64 South Buena Vista Road, Unit #03-5, Singapore, Singapore

Filed Feb. 22, 1995, Ser. No. 35,193

Term of patent 14 years

U.S. Cl. D6—552



371,481

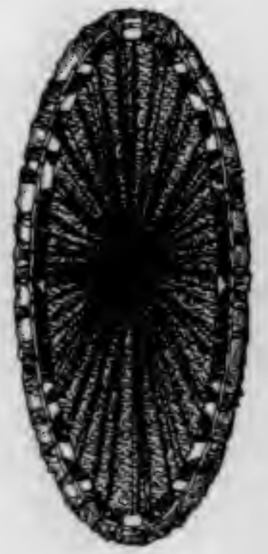
WINDOW COVER

Eva Lyon, 2164 State Rte. 947, Morganfield, Ky. 42437

Filed Mar. 20, 1995, Ser. No. 36,455

Term of patent 14 years

U.S. Cl. D6—575



371,482

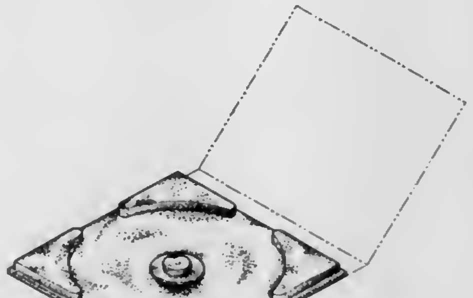
COMPACT DISC HOLDER

J. R. Cole, Sr., 435 Minuet Lane, Charlotte, N.C. 28217

Filed Apr. 10, 1995, Ser. No. 37,301

Term of patent 14 years

U.S. Cl. D6—626



371,483

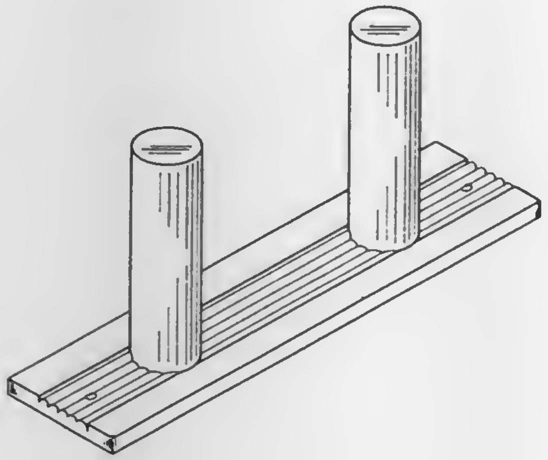
TOILET TISSUE STORAGE RACK

Gerald E. Haarmeyer, and Nancy M. Haarmeyer, both of 900 Intracoastal Dr. #8, Ft. Lauderdale, Fla. 33304

Filed Mar. 20, 1995, Ser. No. 36,405

Term of patent 14 years

U.S. Cl. D6—520



371,484

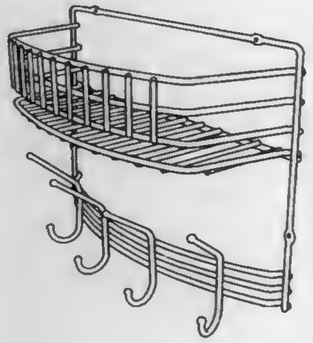
SHELF WITH HOOKS

Raul Munoz, Chicago, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Aug. 9, 1995, Ser. No. 42,368

Term of patent 14 years

U.S. Cl. D6—566



371,485

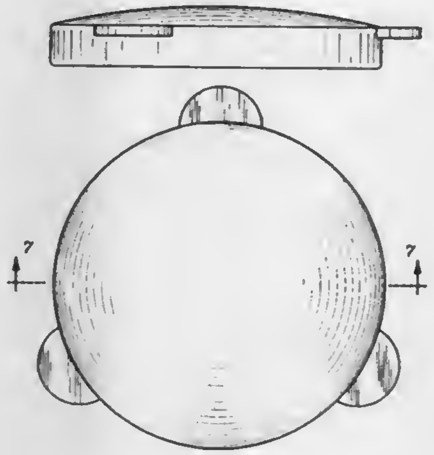
BUG GUARD DRINK COVER

David W. Hickey, 15709 Lillja, Houston, Tex. 77060-4419

Filed Sep. 21, 1994, Ser. No. 44,396

Term of patent 14 years

U.S. Cl. D7—392.1



371,486

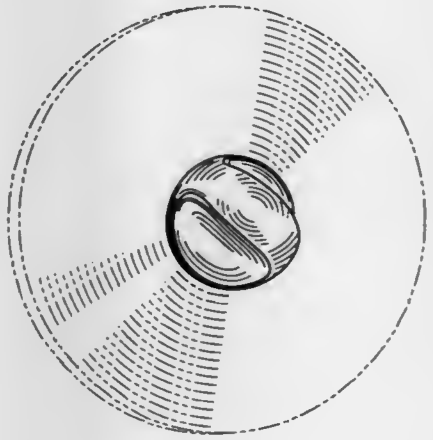
LID HANDLE

Eric P. Chan, New York, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Mar. 25, 1994, Ser. No. 20,385

Term of patent 14 years

U.S. Cl. D7—393



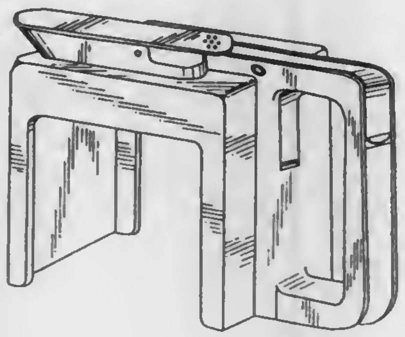
371,487
LIQUID DISPENSER

Sune Envall, Vasteras, Sweden, assignor to AB Konstruktions-Bakelit, Orkelljunga, Sweden

Filed Aug. 23, 1994, Ser. No. 27,488

Term of patent 14 years

U.S. Cl. D7—397



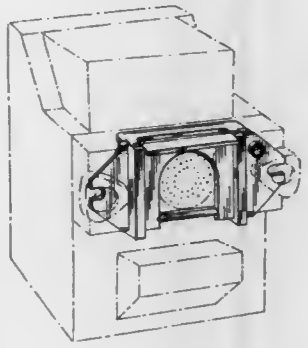
371,488
PASTA CUTTER

Paul Brefka, Southborough, Mass., assignor to Creative Technologies Corp., Brooklyn, N.Y.

Filed Apr. 29, 1994, Ser. No. 22,181

Term of patent 14 years

U.S. Cl. D7—412



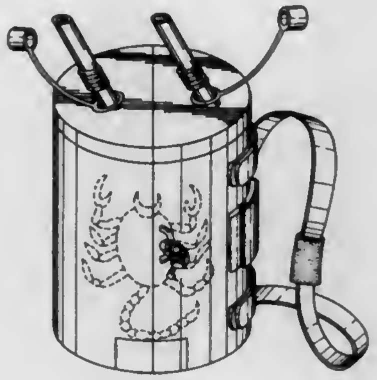
371,489
DECORATED WATER CONTAINER WITH CARRYING STRAP

Jeffrey Deltoro, P.O. Box 1335, Shirley, Mass. 01464

Filed Mar. 13, 1995, Ser. No. 36,066

Term of patent 14 years

U.S. Cl. D7—513



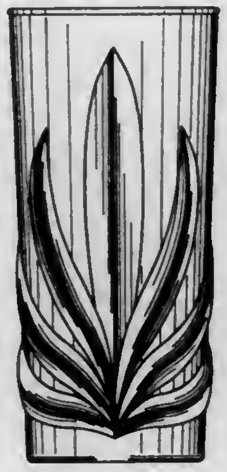
371,490
BEVERAGE GLASS

Lorelei K. Wilson, Toledo, Ohio, assignor to Libbey Glass Inc., Toledo, Ohio

Filed Jan. 24, 1995, Ser. No. 33,951

Term of patent 14 years

U.S. Cl. D7—521



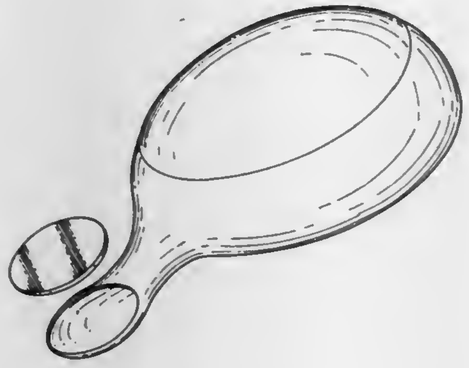
371,491
BABY FOOD STORING AND DISPENSING SPOON

Stanley A. Stein, 513 14th St. N., Great Falls, Mont. 59401

Filed Feb. 24, 1994, Ser. No. 19,179

Term of patent 14 years

U.S. Cl. D7—643



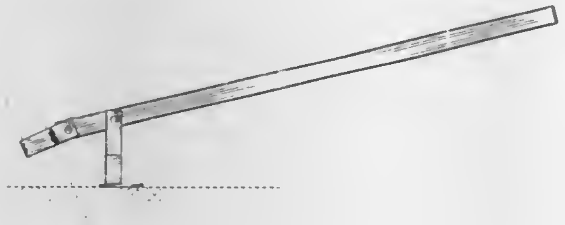
371,492
STAKE PULLER FOR CONCRETE FORMS

Ronnie D. Pfeil, 114 Doeskin Dr., Boerne, Tex. 78006, and Lester J. Martin, Rte. 2, Box 228, Helotes, Tex. 78023

Filed Dec. 15, 1994, Ser. No. 32,294

Term of patent 14 years

U.S. Cl. D8—14



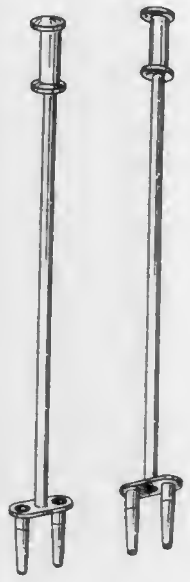
371,493
HAND TOOL FOR AERATING TURF

Dale Beaulieu, Beamsville, Canada, assignor to B.M.M.D. Inc., Beamsville, Canada

Filed May 3, 1995, Ser. No. 38,303

Term of patent 14 years

U.S. Cl. D8—7



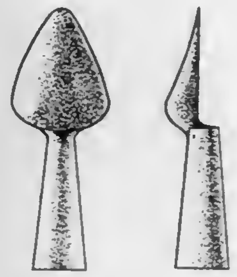
371,494
COMBINATION CAULKING TUBE CAP AND APPLICATOR

David E. Groene, Centerville, Ohio, and Earl E. Hoyt, Franklin Lakes, N.J., assignors to DAP Products, Inc., Tipp City, Ohio

Division of Ser. No. 6,707, Apr. 5, 1993, Pat. No. Des. 355,576. This application Oct. 13, 1994, Ser. No. 29,673

Term of patent 14 years

U.S. Cl. D8—14.1



371,495

STAPLER

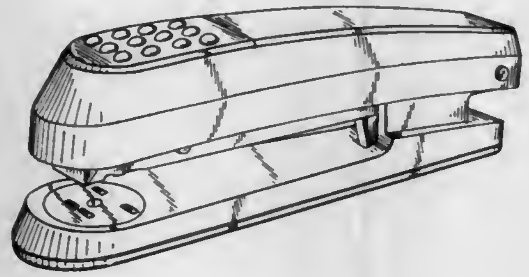
Walter B. Herbst, Evanston; Mikael Backstrom, Chicago, and Ralph Lazar, Skokie, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Jun. 27, 1994, Ser. No. 25,063

The portion of the term of this patent subsequent to May 14, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8—50



371,496

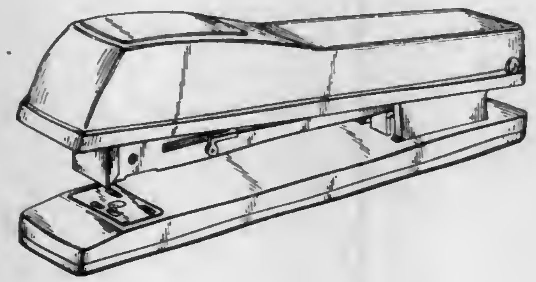
STAPLER

Walter B. Herbst, Evanston; Mikael Backstrom, Chicago, and Ralph Lazar, Skokie, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Jun. 27, 1994, Ser. No. 25,073

Term of patent 14 years

U.S. Cl. D8—50



371,497

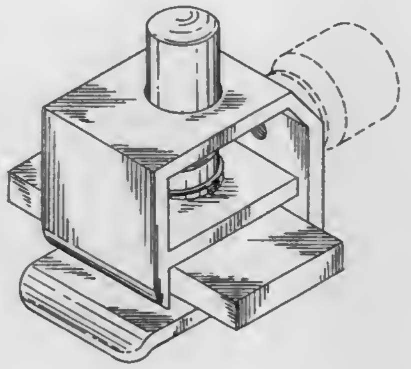
CLAMP FOR COMPUTER PAPER TAB STRIPPER

James F. Cottone, 2001 Jefferson Davis Hwy., Arlington, Va. 22202

Filed Apr. 15, 1994, Ser. No. 21,388

Term of patent 14 years

U.S. Cl. D8—72



371,498

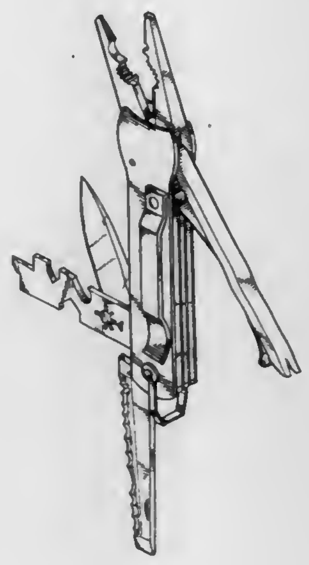
COMBINATION HAND TOOL

Dung-Ching Lai, P.O. Box 53-8, Taichung, Taiwan

Filed May 22, 1995, Ser. No. 39,155

Term of patent 14 years

U.S. Cl. D8—105



371,499

TOOL HANDLE

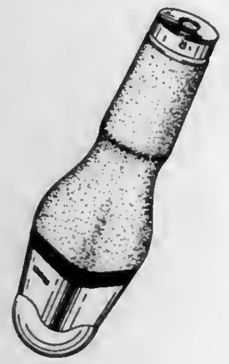
Hervé G. Gomas, St. Fargeau, France, assignor to Facom, Morangis, France

Filed Jul. 15, 1994, Ser. No. 25,899

Claims priority, application France, Jan. 26, 1994, 940421

Term of patent 14 years

U.S. Cl. D8—107



371,500

FRONT PORTION OF A PADDLE HANDLE ASSEMBLY

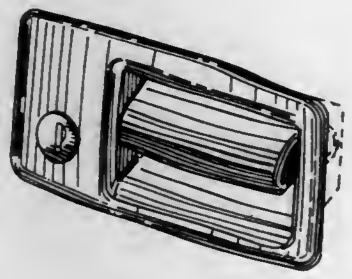
Kenneth L. McConnell, and Mark B. Brown, both of New Hampton, Iowa, assignors to Tri/Mark Corporation, New Hampton, Iowa

Filed Feb. 23, 1994, Ser. No. 19,092

The portion of the term of this patent subsequent to Apr. 23, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8—302



371,501

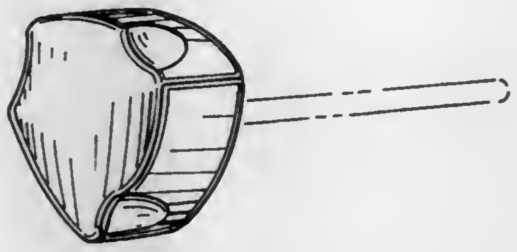
CONTROL KNOB

Paul A. James, Rochester, N.Y., assignor to The Gunlocke Company, Wayland, N.Y.

Filed Jun. 9, 1995, Ser. No. 40,117

Term of patent 14 years

U.S. Cl. D8—307



371,502

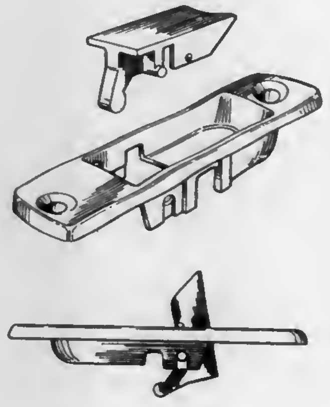
LATCH FOR SASH WINDOWS

Peter M. Morris, Indooroopilly, Australia, assignor to Whitco Pty. Limited, Queensland, Australia, and Peachtree Doors, Gainsville, Ga.

Filed Jul. 12, 1994, Ser. No. 25,813

Term of patent 14 years

U.S. Cl. D8—331



371,503
AUXILIARY LOCK

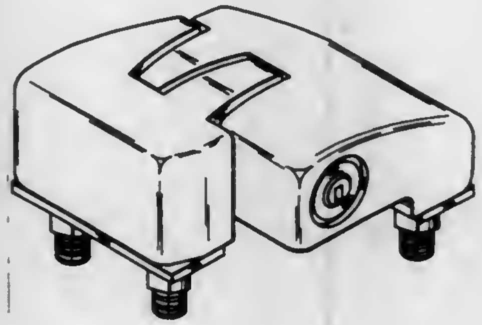
Yoshio Nakano, Tokyo, Japan, assignor to Sanpou Lock Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 35,119

Claims priority, application Japan, Nov. 2, 1994, 6-269396

Term of patent 14 years

U.S. Cl. D8—331



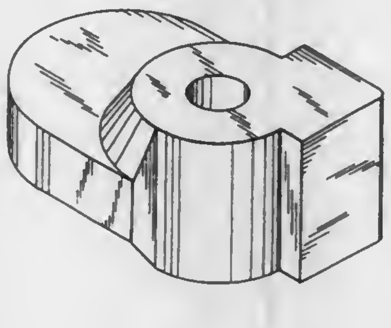
371,504
MOUNTING CLIP

Joseph E. Massie, Benton Harbor, Mich., assignor to E. I. Partners, Eau Claire, Mich.

Filed Aug. 5, 1994, Ser. No. 26,791

Term of patent 14 years

U.S. Cl. D8—349



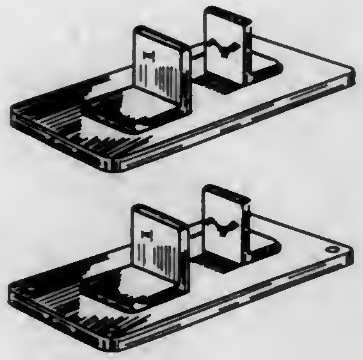
371,505
PIPE WRENCH SUPPORT STAND

John Young, 3605 Arctic #1882, Anchorage, Ak. 99503

Filed Feb. 13, 1995, Ser. No. 34,806

Term of patent 14 years

U.S. Cl. D8—349



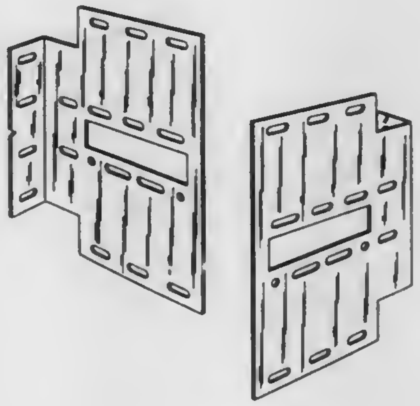
371,506
UNIVERSAL BEARING BRACKET

Edward L. Nofziger, Wauseon, Ohio, assignor to Nofziger Doors International, Inc., Archbold, Ohio

Filed Nov. 4, 1994, Ser. No. 30,667

Term of patent 14 years

U.S. Cl. D8—354



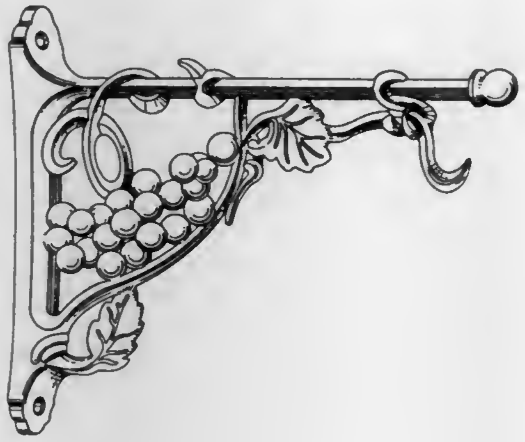
371,507
PLANT BRACKET

Fred Hollinger, Kings Park, N.Y., assignor to American Tack & Hardware Co., Inc., Monsey, N.Y.

Filed Jun. 8, 1995, Ser. No. 40,038

Term of patent 14 years

U.S. Cl. D8—373



371,508
CONNECTING UNIT FOR SHELF SUPPORT POLES

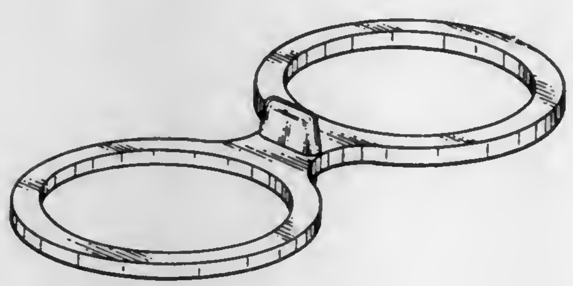
Sami Sagol, Ramat Hasharon, Israel, assignor to Keter Plastic Ltd., Jaffa, Israel

Filed Jun. 6, 1994, Ser. No. 23,968

Claims priority, application Israel, Dec. 6, 1993, 21803

Term of patent 14 years

U.S. Cl. D8—396



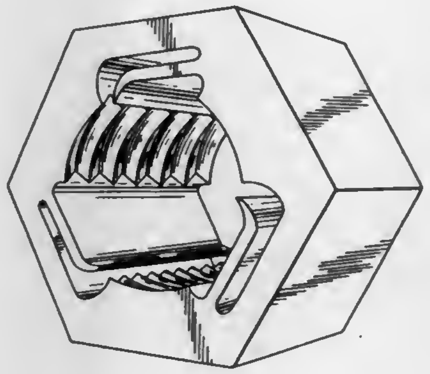
371,509
THREADED NUT

Robert J. DiStacio, Valhalla, N.Y., assignor to PermaThread Technologies, Inc., Massapequa, N.Y.

Filed Sep. 7, 1994, Ser. No. 28,122

Term of patent 14 years

U.S. Cl. D8—397



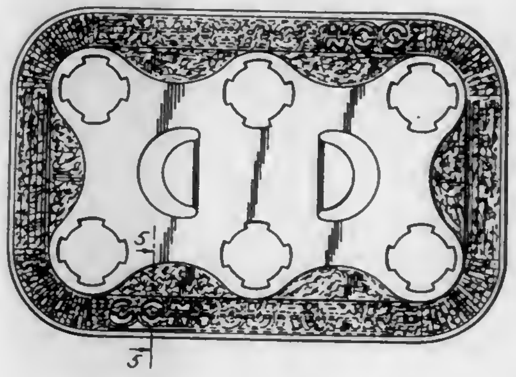
371,510
BOTTLE CARRIER

Dennis R. Marsh, Toledo, Ohio, assignor to Owens-Illinois Labels Inc., Toledo, Ohio

Filed May 16, 1994, Ser. No. 22,925

Term of patent 14 years

U.S. Cl. D9—344



371,511
CONTAINER FOR FROZEN FOOD

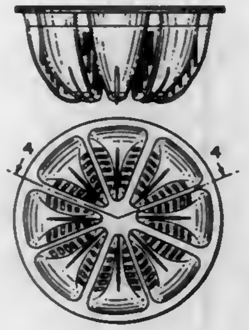
Salvatore Giarracca, Via Mario Schipa 100, Napoli, Italy

Filed Mar. 15, 1994, Ser. No. 19,935

Claims priority, application WIPO, Sep. 17, 1993, DM/027.326

Term of patent 14 years

U.S. Cl. D9—345



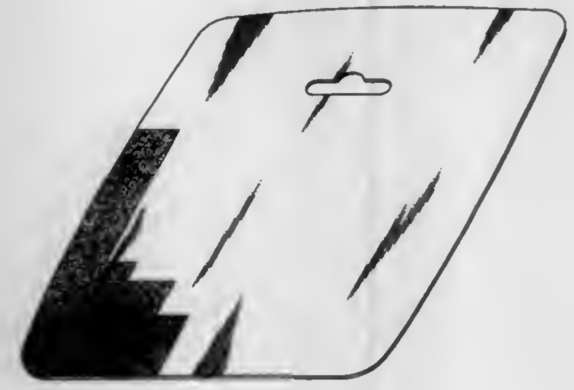
371,512
BASE BOARD FOR A PACKAGE

Takashi Morita, Tokyo, Japan, assignor to Aiwa Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 26,389

Term of patent 14 years

U.S. Cl. D9—415



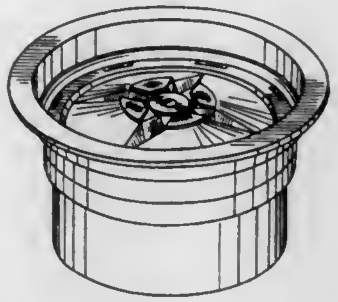
371,513
END CAP FOR A CONTAINER

James A. Scudder, San Diego, and James L. Berntsen, Ramona, both of Calif., assignors to Insta-Heat, Inc., San Diego, Calif.

Filed Jul. 5, 1994, Ser. No. 25,518

Term of patent 14 years

U.S. Cl. D9—434



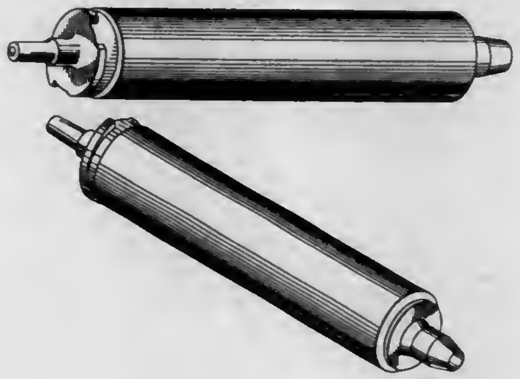
371,514
GENERIC PUMP FOR A SOAP DISPENSER

Warren S. Daansen, P.O. Box 614, Nashua, N.H. 03061

Continuation-in-part of Ser. No. 23,579, May 27, 1994. This application Mar. 15, 1995, Ser. No. 36,202

Term of patent 14 years

U.S. Cl. D9—448



371,515
REMOTE STATION UNIT FOR GEOPHYSICAL DATA ACQUISITION AND PROCESSING SYSTEM

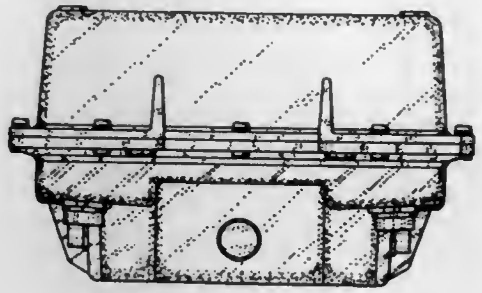
Yumio Iwaki, Odawara; Yoshihiro Sekino, Ichihara, and Yoshitaka Watanabe, Nagareyama, all of, Japan, assignors to Japex Geoscience Institute, Inc., Tokyo, Japan

Filed Dec. 2, 1994, Ser. No. 32,273

Claims priority, application Japan, Jun. 3, 1994, 6-16281

Term of patent 14 years

U.S. Cl. D10—46



371,516
ENCLOSURE FOR A BRIGHTNESS SENSOR

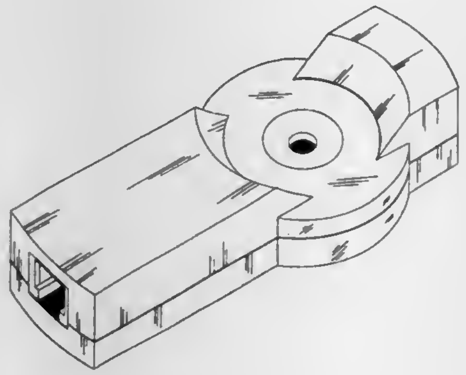
Wolfgang Guber, Ludwigsburg, and Volker Boettinger, Sindelfingen, both of, Germany, assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 20, 1995, Ser. No. 41,832

Claims priority, application Germany, Dec. 21, 1994, 94 09 927.8

Term of patent 14 years

U.S. Cl. D10—75



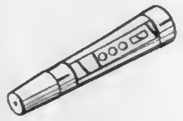
371,517
HAND-HELD WATERPROOF LIQUID TESTING METER

Bhaskar Narayanan, Singapore, Singapore, assignor to Eutech Cybernetics Pte. Ltd., Ayer Rajah Crescent, Singapore

Filed Jul. 6, 1995, Ser. No. 41,121

Term of patent 14 years

U.S. Cl. D10—81



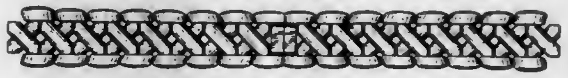
371,518
WATCH BRACELET

Francoise H. Droz, Grandson, Switzerland, assignor to Titan Industries Limited, Bangalore, Ind.

Filed May 25, 1994, Ser. No. 23,428

Term of patent 14 years

U.S. Cl. D11—25



371,519
FLOWER POT COVER

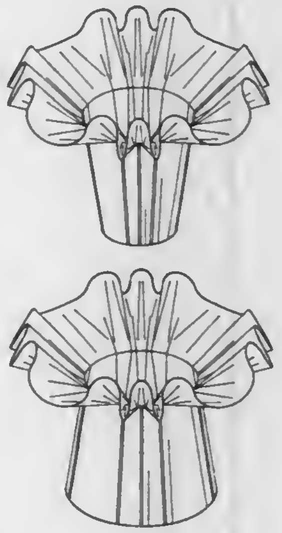
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 808,560, Dec. 16, 1991, Pat. No. Des. 358,566, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 5, 1993, Ser. No. 3,340

The portion of the term of this patent subsequent to Nov. 28, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,520
FLOWER POT COVER

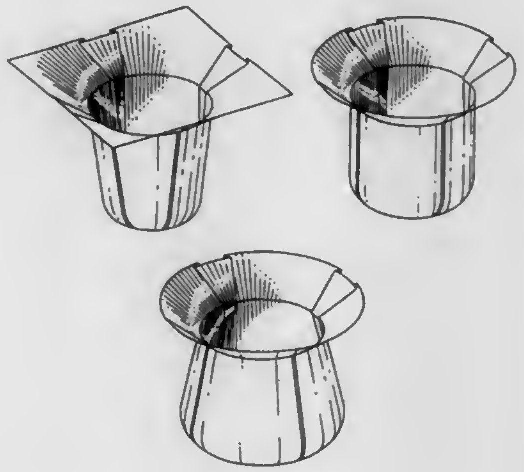
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 809,080, Dec. 16, 1991, Pat. No. Des. 361,961, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,245, Sep. 22, 1989, abandoned, and Ser. No. 411,247, Sep. 22, 1989, and a continuation of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113. This application Jan. 13, 1993, Ser. No. 3,682

The portion of the term of this patent subsequent to Aug. 29, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



371,521
FLOWER POT COVER

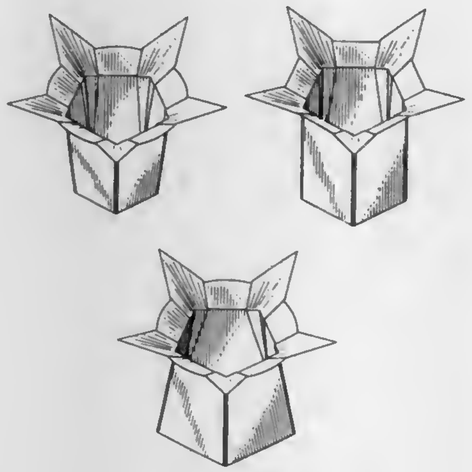
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 808,548, Dec. 16, 1991, Pat. No. Des. 355,395, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 21, 1993, Ser. No. 3,869

The portion of the term of this patent subsequent to Dec. 14, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



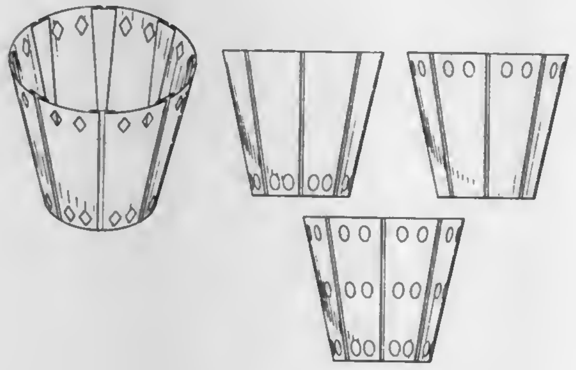
371,522
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 807,671, Dec. 16, 1991, Pat. No. Des. 363,047, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jul. 12, 1995, Ser. No. 41,338

Term of patent 14 years

U.S. Cl. D11—164



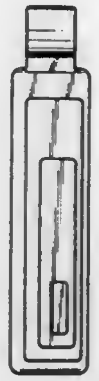
371,523
PULL TAB OF SLIDE FASTENER

Chikako Ikehara, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 11, 1995, Ser. No. 38,760

Term of patent 14 years

U.S. Cl. D11—221



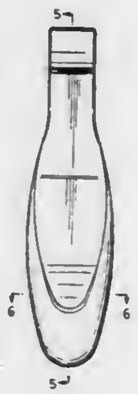
371,524
PULL TAB OF SLIDE FASTENER

Chikako Ikehara, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed May 11, 1995, Ser. No. 38,762

Term of patent 14 years

U.S. Cl. D11—221



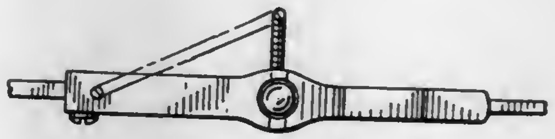
371,525
BELT BUCKLE

Kelly Ryan, and Alain Bao, both of New York, N.Y., assignors to The Donna Karan Company, New York, N.Y.

Filed Nov. 3, 1994, Ser. No. 30,622

Term of patent 14 years

U.S. Cl. D11—231



371,526

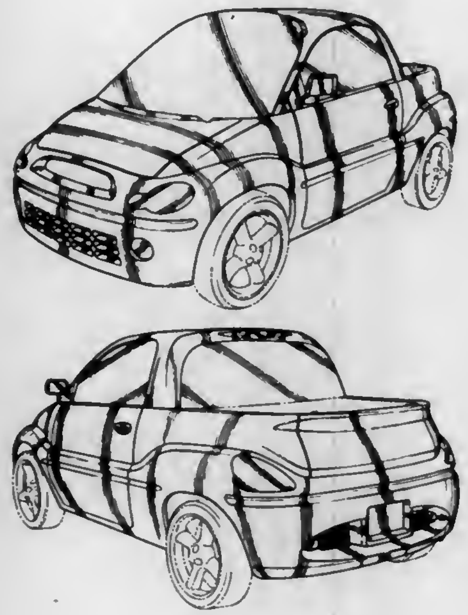
VEHICLE BODY

Kevin R. Verduyn, Oceanside; Thomas G. Tremont, San Diego, both of Calif., and David Smith, Detroit, Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 27, 1994, Ser. No. 32,735

Term of patent 14 years

U.S. Cl. D12—86



371,527

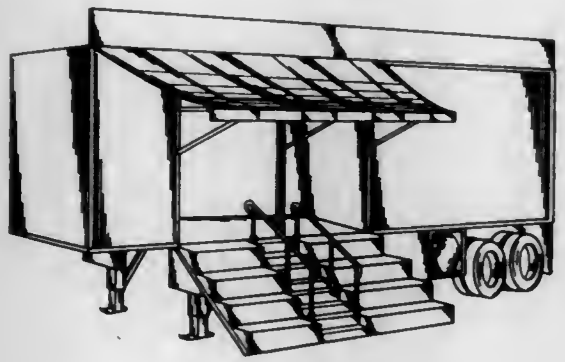
MULTIPLE-UNIT MOBILE DISPLAY PAVILION

Jack R. Wright, P.O. Box DD, Kimberly, Id. 83341

Continuation-in-part of Ser. No. 117,768, Sep. 7, 1993, which is a continuation-in-part of Ser. No. 81,010, Jun. 21, 1993, Pat. No. 5,375,899. This application May 17, 1994, Ser. No. 23,058

Term of patent 14 years

U.S. Cl. D12—97



371,528

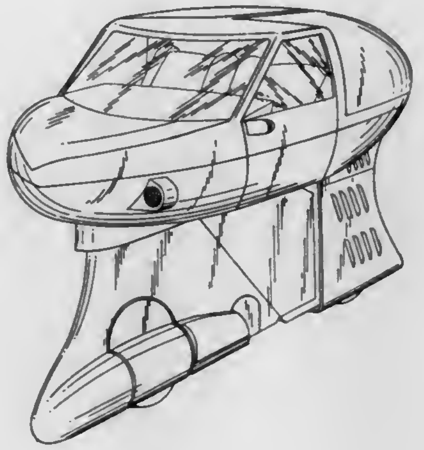
TWO WHEELED VEHICLE

Thompson W. Speck, 104 Spruce Dr., Marshall, Minn. 56258

Filed May 16, 1994, Ser. No. 22,893

Term of patent 14 years

U.S. Cl. D12—107



371,529

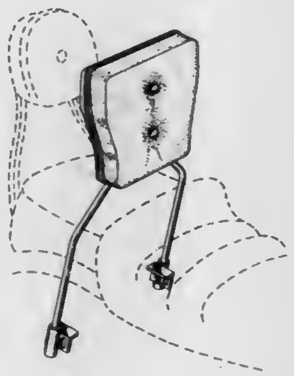
RETROFIT MOTORCYCLE BACKREST

Harold G. Potter, 113 Richard St., P.O. Box 42, Iva, S.C. 29655

Filed Jun. 20, 1994, Ser. No. 24,731

Term of patent 14 years

U.S. Cl. D12—114



371,530

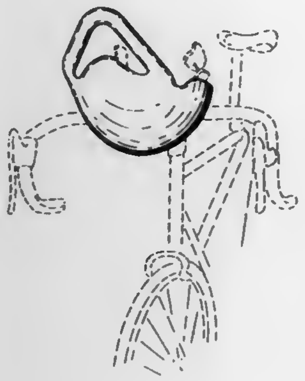
AUXILIARY HANDLE BAR FOR BICYCLE

Robert Trepanier, 3720 Mentana, Montreal, Quebec, Canada

Filed Sep. 7, 1993, Ser. No. 12,782

Term of patent 14 years

U.S. Cl. D12—178



371,531

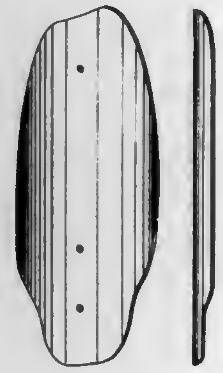
BICYCLE SPLASH GUARD

Raymond E. Colton, Tonica, Ill., assignor to RACO USA Incorporated, Tonica, Ill.

Filed Jul. 27, 1994, Ser. No. 26,409

Term of patent 14 years

U.S. Cl. D12—186



371,532

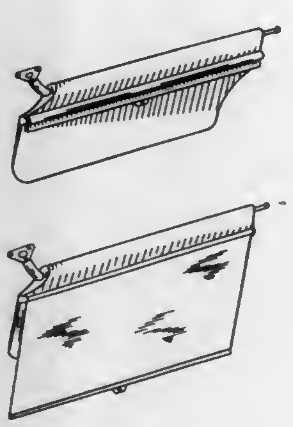
AUTOMOBILE SUN VISOR AND SCREEN COMBINATION

Vitaly G. Raevsky, 401 Cranford Rd., Cherry Hill, N.J. 08003, and Valery Shishkin, 801 Cooper landing Rd. Apt. 202B, Cherry Hill, N.J. 08002

Filed Nov. 25, 1994, Ser. No. 31,401

Term of patent 14 years

U.S. Cl. D12—191



371,533

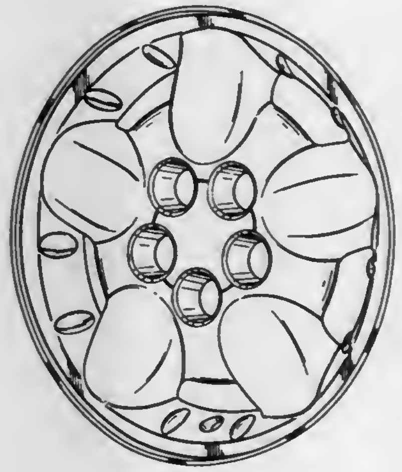
VEHICLE WHEEL FRONT FACE SEGMENT

Micheal R. Castiglione, Carlsbad, Calif., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed May 30, 1995, Ser. No. 39,409

Term of patent 14 years

U.S. Cl. D12—209



371,534

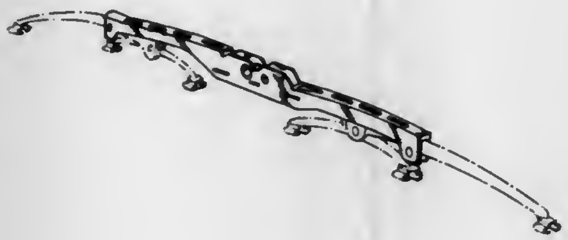
FRAME FOR A VEHICLE WINDSHIELD WIPER UNIT

Albert Lee, 232 Margate Rd., Timonium, Md. 21093

Filed Sep. 7, 1994, Ser. No. 28,109

Term of patent 14 years

U.S. Cl. D12—220



371,535

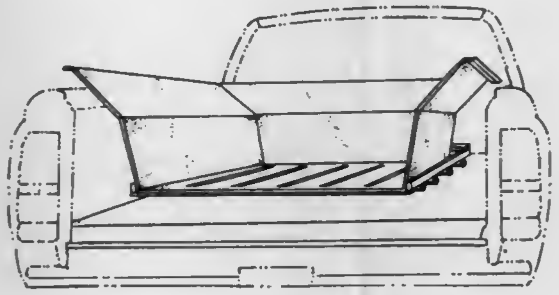
MOMENTUM REMOVABLE BED FOR PICKUP TRUCK

Roger L. Young, 2515 Highschool Dr., Brentwood, Mo. 63144

Filed May 19, 1995, Ser. No. 39,195

Term of patent 14 years

U.S. Cl. D12—221



371,536

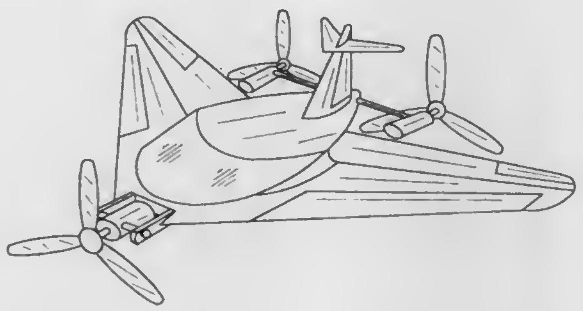
AIRCRAFT

Steven L. Jones, 989 Victoria #A-5, Costa Mesa, Calif. 92627

Filed Sep. 14, 1994, Ser. No. 26,376

Term of patent 14 years

U.S. Cl. D12—333



371,537

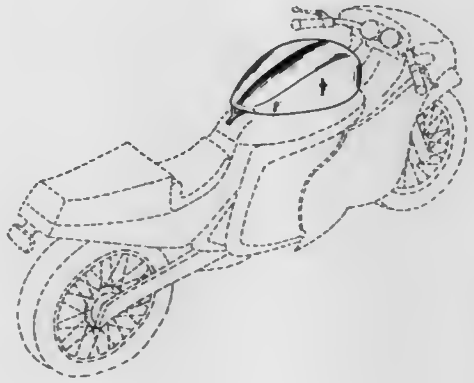
MOTORCYCLE TANK BAG

Kurt Jennings, Auburn, Nebr., assignor to Rogue, Inc., Auburn, Nebr.

Filed Sep. 6, 1995, Ser. No. 43,602

Term of patent 14 years

U.S. Cl. D12—409



371,538

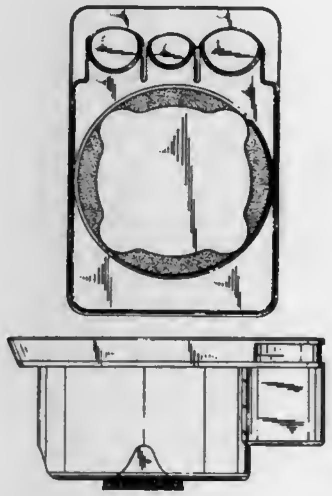
CUP HOLDER

Paul J. Ferrigan, Charlotte, N.C., assignor to Saratoga Technologies, Inc., Charlotte, N.C.

Filed Jul. 25, 1995, Ser. No. 41,811

Term of patent 14 years

U.S. Cl. D12—419



371,539

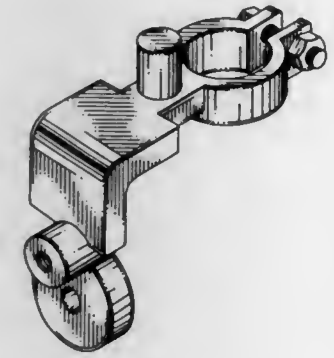
BATTERY POST CABLE ATTACHMENT

Lanny D. O'Glee, 166 Bobby Davis Rd., Shongaloo, La. 71072

Filed Mar. 17, 1995, Ser. No. 36,308

Term of patent 14 years

U.S. Cl. D13—120



371,540

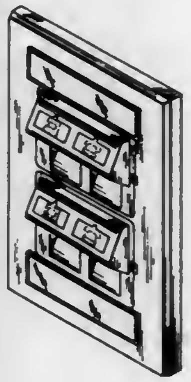
CONNECTOR ASSEMBLY

John A. Siemon, Woodbury, and Randall J. Below, Cheshire, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Division of Ser. No. 14,696, Oct. 28, 1993, and a continuation of Ser. No. 993,480, Dec. 18, 1992, Pat. No. 5,295,869. This application Oct. 12, 1994, Ser. No. 29,646

Term of patent 14 years

U.S. Cl. D13—146



371,541

ELECTRICAL CONNECTOR

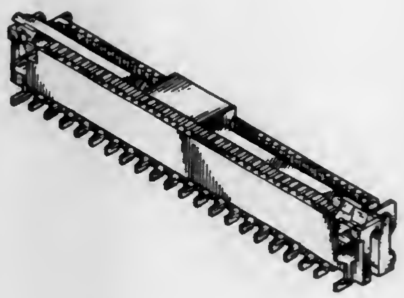
Masakazu Ezaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 39,663

Claims priority, application Japan, Feb. 3, 1995, 7-2417

Term of patent 14 years

U.S. Cl. D13—147



371,542
ELECTRICAL CONNECTOR

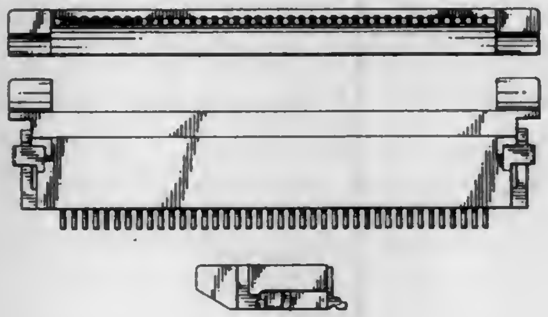
Ryuichi Takayasu, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 39,664

Claims priority, application Japan, Jan. 27, 1995, 7-1540

Term of patent 14 years

U.S. Cl. D13—147



371,543
MULTIPLE SPEAKER CONTROL SWITCH WITH A LIQUID CRYSTAL DISPLAY FOR A VEHICULAR RADIO RECEIVER AND CASSETTE PLAYER

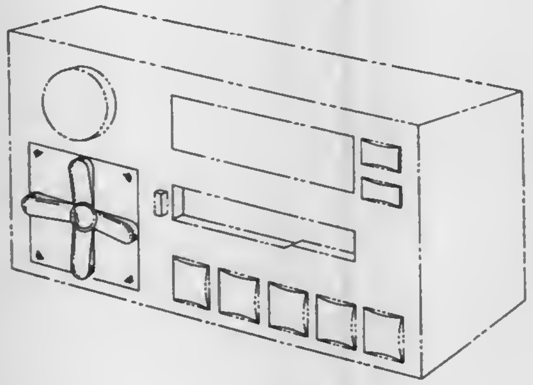
James E. Van Hout, Auburn Hills, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 31, 1994, Ser. No. 27,893

The portion of the term of this patent subsequent to Jan. 9, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D13—162



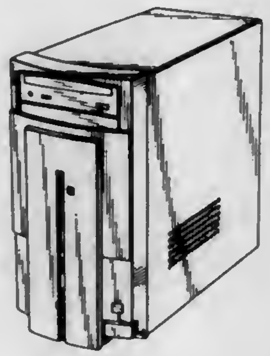
371,544
TOWER CENTRAL PROCESSING UNIT

Sohrab Vossoughi, Portland, Oreg., assignor to Prisma Graphic System, Inc., Taipei, Taiwan

Filed Jun. 21, 1995, Ser. No. 40,533

Term of patent 14 years

U.S. Cl. D14—100



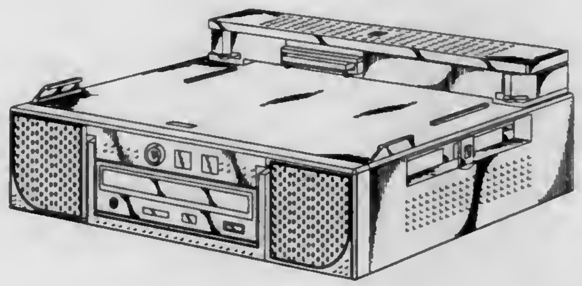
371,545
PORTABLE MULTIMEDIA UNIT FOR A PORTABLE PERSONAL COMPUTER

Peter A. Ojeda, St. Joseph, Mich., assignor to Zenith Data Systems Corporation, Buffalo Grove, Ill.

Filed Sep. 12, 1994, Ser. No. 28,322

Term of patent 14 years

U.S. Cl. D14—107



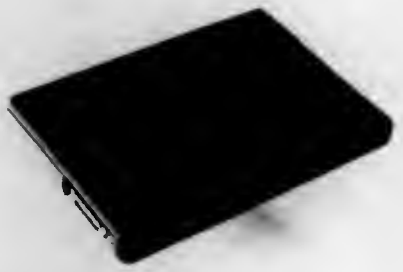
371,546
FLOPPY DISK DRIVE

Motoharu Kaneko, Yokohama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1994, Ser. No. 24,076

Term of patent 14 years

U.S. Cl. D14—109



371,547
MONITOR

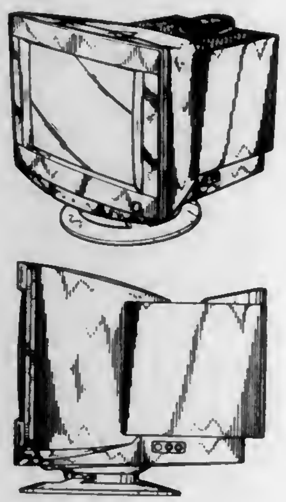
Il K. Kim, Suwon; Chung S. Chae, Seoul, and Hee I. Chae, Yongin-gun, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Jun. 9, 1995, Ser. No. 40,076

Claims priority, application Rep. of Korea, Dec. 10, 1994, 1994-26636

Term of patent 14 years

U.S. Cl. D14—113



371,548
OPTICAL DISK CARTRIDGE

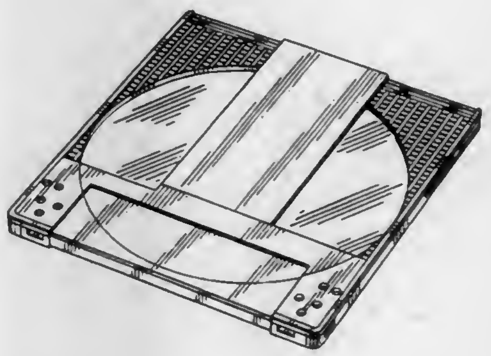
Tokuzo Yamamoto, Sagamihara, and Nobuhiro Yamane, Yokohama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 23,643, May 27, 1994. This application Feb. 28, 1995, Ser. No. 35,475

Claims priority, application Japan, Nov. 30, 1993, 5-36142; Nov. 30, 1993, 5-36143; Nov. 30, 1993, 5-36145

Term of patent 14 years

U.S. Cl. D14—114



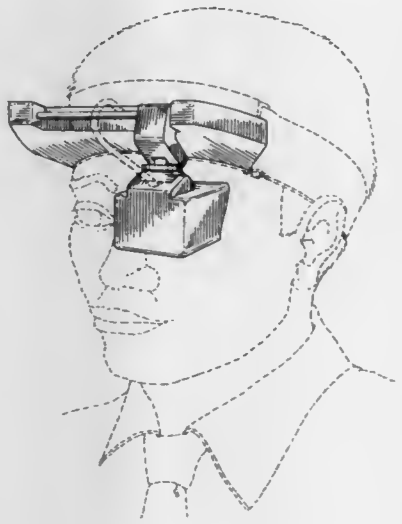
371,549
HEAD-MOUNTED DISPLAY DEVICE

Peter A. Ronzani, Los Gatos, and Stephen Pombo, Campbell, both of Calif., assignors to Kopin Corporation, Taunton, Mass.

Continuation-in-part of Ser. No. 288,063, Aug. 9, 1994, Ser. No. 288,062, Aug. 9, 1994, Ser. No. 327,113, Oct. 21, 1994, and Ser. No. 409,321, Mar. 23, 1995, which is a continuation-in-part of Ser. No. 216,817, Mar. 23, 1994. This application Apr. 4, 1995, Ser. No. 37,109

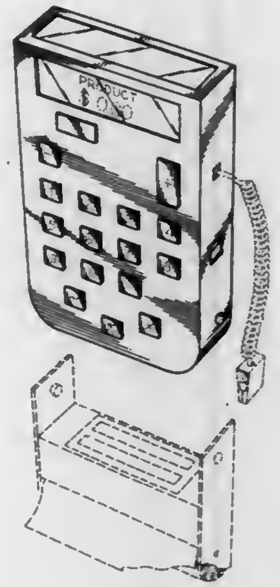
Term of patent 14 years

U.S. Cl. D14—114



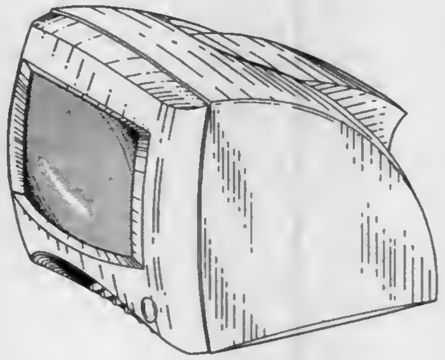
371,550
HAND HELD PERSONAL SCANNER

Jean V. Tomkowicz, 1405 Cinnaminson Ave., Cinnaminson, N.J. 08077
Filed Jan. 24, 1995, Ser. No. 33,939
Term of patent 14 years
U.S. Cl. D14—116



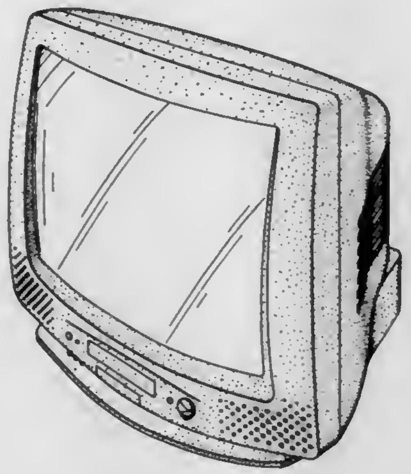
371,551
PORTABLE TELEVISION

Thomas E. Renk, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Jul. 6, 1995, Ser. No. 41,162
Term of patent 14 years
U.S. Cl. D14—126



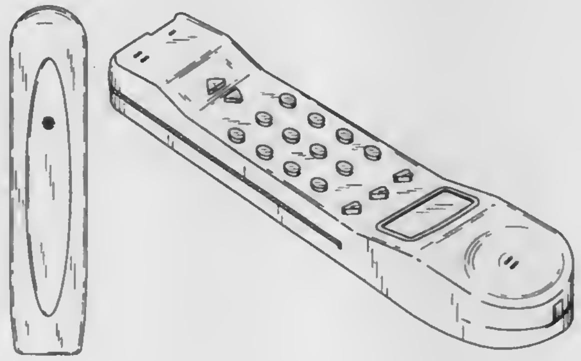
371,552
COMBINED TELEVISION SET AND VIDEO TAPE RECORDER

Osamu Akiyama; Yoshito Fujii; Kazuo Tsujimoto; Kazumi Osaka, and Keiichi Koyama, all of Tochigi-ken, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 10, 1995, Ser. No. 38,715
Claims priority, application Japan, Dec. 19, 1994, 6-38783
Term of patent 14 years
U.S. Cl. D14—129



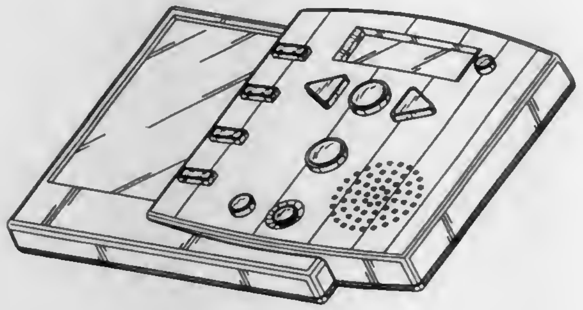
371,553
TELEPHONE HANDSET

Richard A. Shields, Jr., Bellview; Patrick M. Gallagher, Seattle, both of Wash.; Carl Engelbrecht, Los Gatos; Doug Jones, Felton, both of Calif.; Steve Flynn, Peachtree City, Ga., and David P. Moriconi, Ben Lomond, Calif., assignors to Claircom Communications Group, Inc., Seattle, Wash.
Filed Mar. 10, 1995, Ser. No. 35,969
Term of patent 14 years
U.S. Cl. D14—147



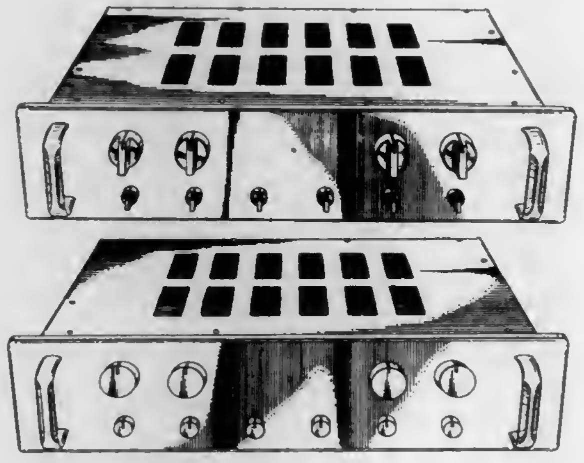
371,554
COMBINED PORTABLE AUDIO MESSAGE RECORDING AND PLAYBACK STATION

Scott T. Shimatsu, Alhambra; Spencer L. Mackay, Agoura Hills, and Cleve A. Graham, Simi Valley, all of Calif., assignors to Voice It Worldwide, Inc., Fort Collins, Colo.
Filed Jun. 28, 1995, Ser. No. 40,831
Term of patent 14 years
U.S. Cl. D14—160



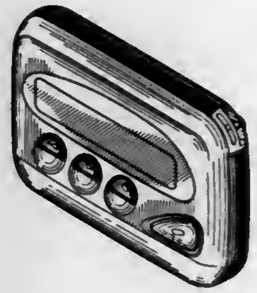
371,555
PREAMPLIFIER

Vladimir V. Shushurin, 3015 Brighton 13th St., Suite 3J, Brooklyn, N.Y. 11235
Filed Jun. 1, 1994, Ser. No. 23,770
Term of patent 14 years
U.S. Cl. D14—188



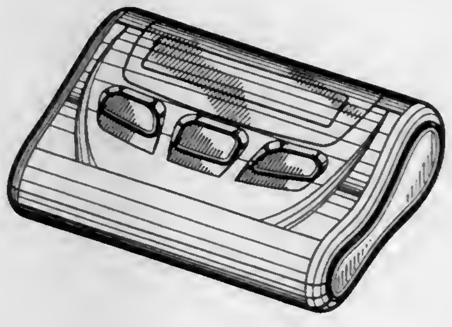
371,556
SELECTIVE CALL RECEIVER

Bee L. Khoo, Johor Bahru, Malaysia, assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 8, 1994, Ser. No. 28,134
Term of patent 14 years
U.S. Cl. D14—191



371,557
SELECTIVE CALL RECEIVER

Moo H. Hon, Johor, Malaysia; Kian T. Tan, and Tuck M. Wong, both of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 3, 1995, Ser. No. 37,097
Term of patent 14 years
U.S. Cl. D14—191



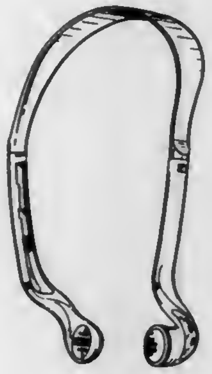
371,558
HEADPHONE

Nanase Yoshizawa, Tokyo, Japan, assignor to Sony Corporation

Filed Mar. 23, 1995, Ser. No. 36,593

Term of patent 14 years

U.S. Cl. D14—205



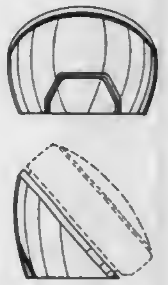
371,559
SPEAKER HOUSING ELEMENT

Charles Rozier, and James Petronio, both of New York, N.Y., assignors to Boston Acoustics, Inc., Peabody, Mass.

Filed Jun. 27, 1994, Ser. No. 25,119

Term of patent 14 years

U.S. Cl. D14—224



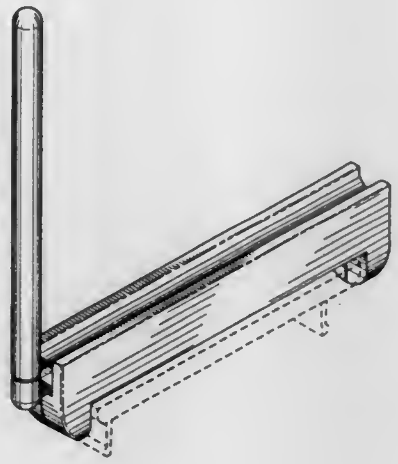
371,560
ANTENNA MODULE

William E. Fenton, Coquitlam, and Brian Redman, Richmond, both of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1994, Ser. No. 27,895

Term of patent 14 years

U.S. Cl. D14—230



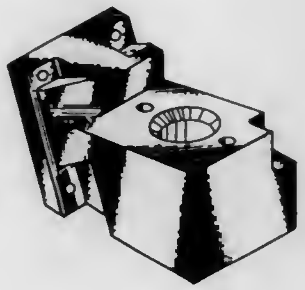
371,561
CARBURETOR ADAPTER

Kenneth A. Layre, 103 Independence Dr., Morrisville, Pa. 19067

Filed Apr. 24, 1995, Ser. No. 37,891

Term of patent 14 years

U.S. Cl. D15—6



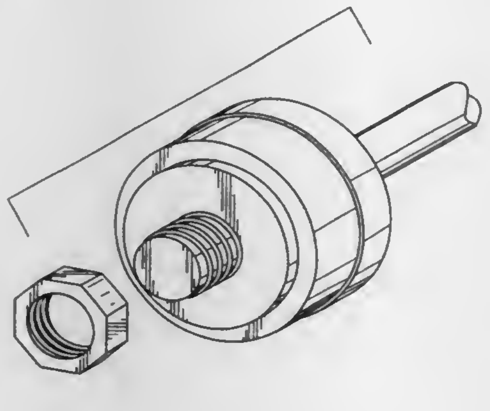
371,562
PUMP PISTON

Randy Rushfeldt, P.O. Box 419, Oxbow, SK, Canada

Filed Sep. 6, 1994, Ser. No. 27,984

Term of patent 14 years

U.S. Cl. D15—7



371,563
DAYLIGHT CAMERA WITH COVER LABEL

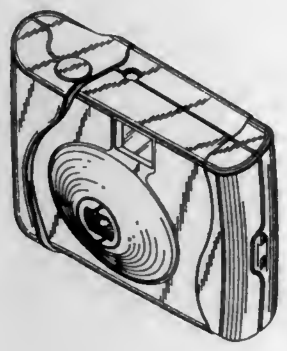
Steven S. Chapman, Corfu; Daniel C. Jackson; John K. McBride, both of Rochester; James G. Rydelek, Henrietta, and Joseph E. Yokajty, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 30,422

The portion of the term of this patent subsequent to Nov. 28, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D16—218



371,564
LCD PROJECTOR

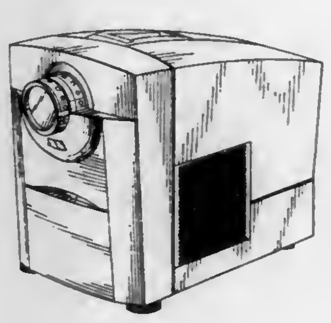
Kouichi Sunada, Tokyo, Japan; Naoto Fukasawa, San Francisco, Calif.; Tim Brown, San Francisco, Calif., and Sigi Moeslinger, San Francisco, Calif., assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 26,008

Claims priority, application Japan, Jan. 31, 1994, 6-1873

Term of patent 14 years

U.S. Cl. D16—231



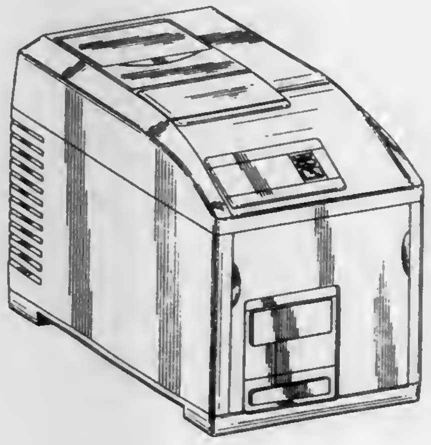
371,565
AUTOMATIC FILM PROCESSOR FOR SELF-DEVELOPING PEEL-APART FILM

John H. Betts, New York, N.Y., and Gary E. Kinnear, East Weymouth, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 9, 1994, Ser. No. 30,832

Term of patent 14 years

U.S. Cl. D16—246



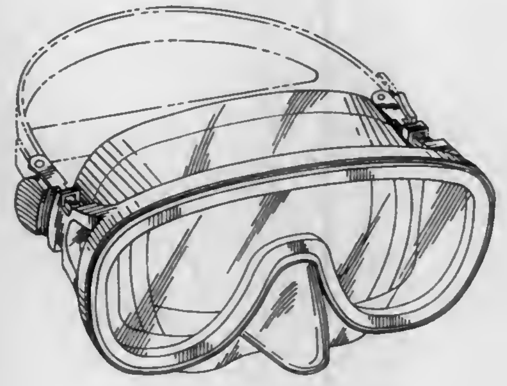
371,566
DIVING MASK

Paul Kolada, Bexley, Ohio; James Ferrero, Chicago, and James R. Lutz, Elk Grove Village, both of Ill., assignors to Dacor Corporation, Northfield, Ill.

Filed Mar. 25, 1994, Ser. No. 20,424

Term of patent 14 years

U.S. Cl. D16—311



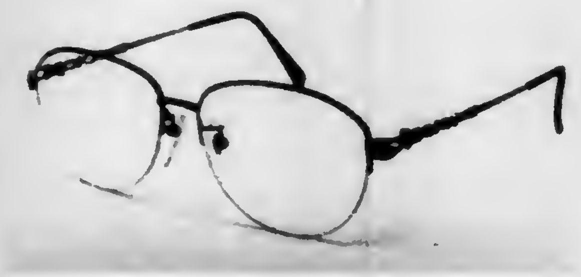
371,567
EYEGLASSES

Takayoshi Fukuchi, Kita-ku, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 20, 1995, Ser. No. 36,402

Term of patent 14 years

U.S. Cl. D16—315



371,568
TEMPLE FOR EYEGLASSES

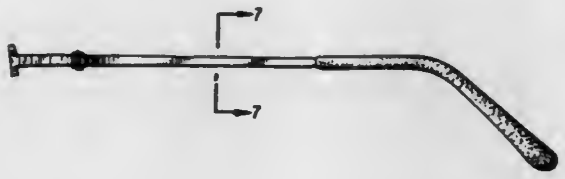
Kayoko Nakabayashi, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 32,148

Claims priority, application Japan, Jun. 16, 1994, 6-17824

Term of patent 14 years

U.S. Cl. D16—335



371,569
TEMPLE FOR EYEGLASSES

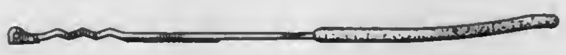
Tetsuo Mikame, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 32,150

Claims priority, application Japan, Jun. 13, 1994, 6-17312

Term of patent 14 years

U.S. Cl. D16—335



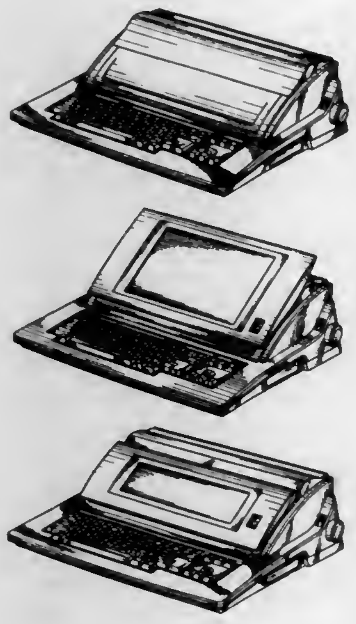
371,570
WORD PROCESSOR

Hyunsoo Hong, and Yuzo Fukunaga, both of Cordova, Tenn., assignors to Brother International Corporation, Somerset, N.J.

Filed Nov. 8, 1994, Ser. No. 30,149

Term of patent 14 years

U.S. Cl. D18—1



371,571
TYPEWRITER

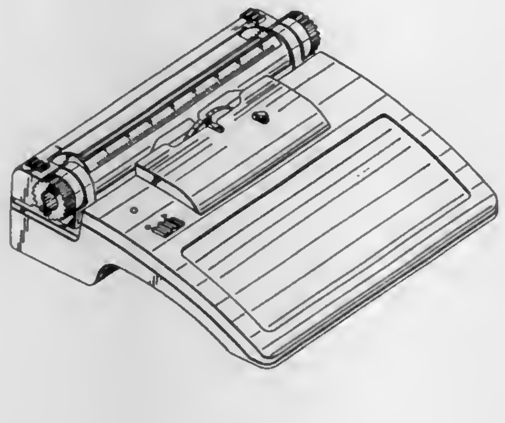
Sergio Gobbo, Izola, and Dragica Samsa, Hirska Districa, both of, Slovenia, assignors to MEHANO, proizvodnja in prodaja igrač, pisarniških potrebsčin, kovinskih in plastičnih izdelkov, d.o.o.

Filed Nov. 10, 1994, Ser. No. 31,189

Claims priority, application Slovenia, May 13, 1994, M-9450074

Term of patent 14 years

U.S. Cl. D18—1



371,572
DATE/TIME STAMPER

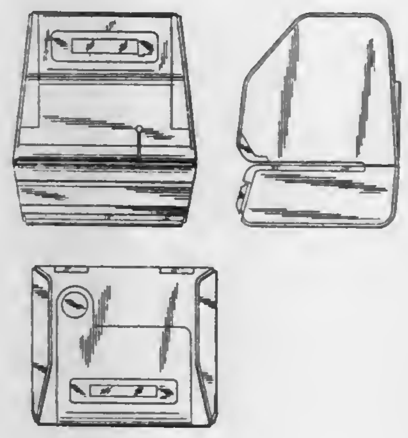
Kawashima Tsunemi, and Kudo Kenichi, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed May 24, 1994, Ser. No. 23,398

Claims priority, application Japan, Dec. 17, 1993, 5-38336

Term of patent 14 years

U.S. Cl. D18—14



371,573
ELECTRONIC COPYING MACHINE

Masaki Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

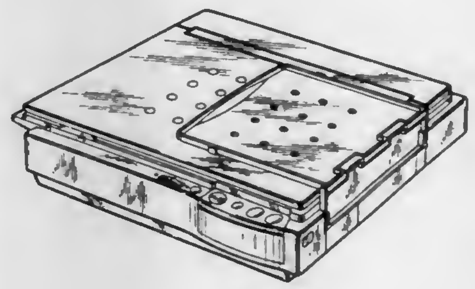
Filed Jan. 11, 1995, Ser. No. 33,362

Claims priority, application Japan, Oct. 6, 1994, 6-30444

The portion of the term of this patent subsequent to Feb. 6, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D18—36



371,574

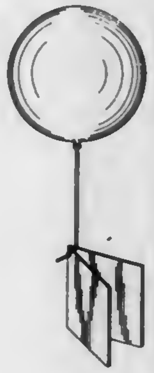
COMBINED BALLOON AND CARD BALLAST

Leslie W. Barton, Carrollton, and Freddie L. Karr, Cedar Hill, both of Tex., assignors to Classic Balloon Corp., Carrollton, Tex.

Filed Apr. 7, 1994, Ser. No. 21,011

Term of patent 14 years

U.S. Cl. D19—2



371,575

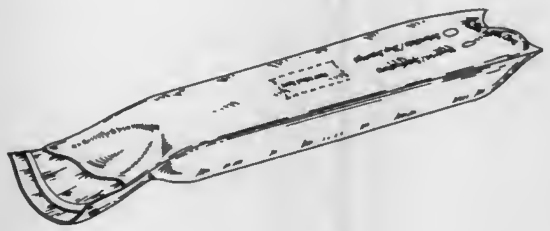
SHIPMENT POUCH

Colleen Spinarski, 14 Leon La. West, Prospect Heights, Ill. 60070

Filed May 16, 1994, Ser. No. 22,938

Term of patent 14 years

U.S. Cl. D19—3



371,576

BALL-POINT PEN

Philippe Compte, Paris, France, assignor to S.T. Dupont S.A., Paris, France

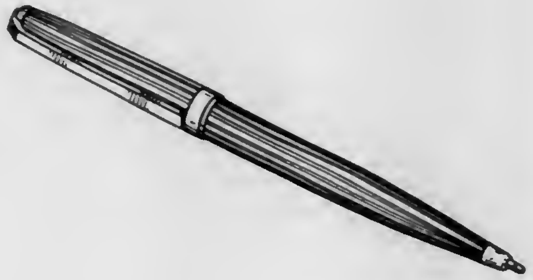
Filed Sep. 13, 1994, Ser. No. 28,385

Claims priority, application France, Mar. 17, 1994, 94 1562

The portion of the term of this patent subsequent to Nov. 7, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D19—49



371,577

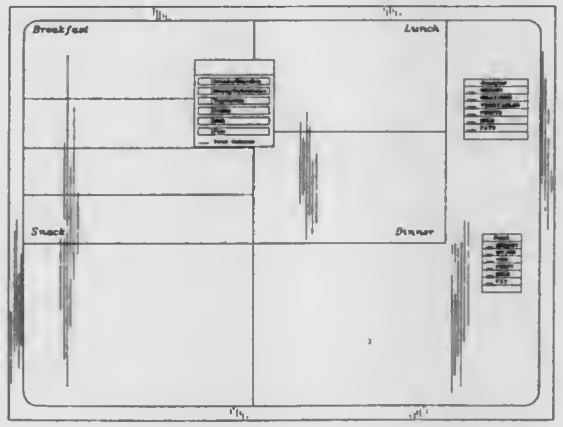
COMBINED DIET CONTROL BOARD AND DIET KIT

Cindy Ferrucci, 126 MacRae Dr., Grove City, Pa. 16127

Division of Ser. No. 853,483, Mar. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 503,757, Apr. 3, 1990, abandoned. This application Feb. 16, 1994, Ser. No. 18,867

Term of patent 14 years

U.S. Cl. D20—42



371,578

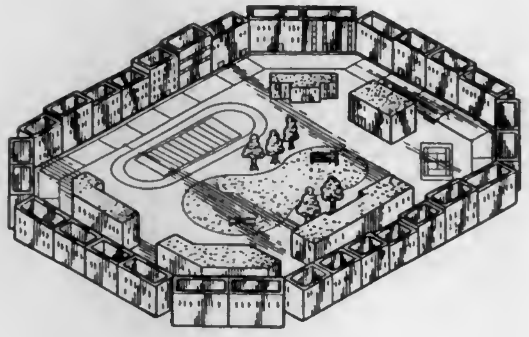
GAME BOARD

Darryn K. Henderson, 7600 Manchester St. Apt. 1116, Playa Del Rey, Calif. 90293

Filed Apr. 28, 1995, Ser. No. 38,179

Term of patent 14 years

U.S. Cl. D21—31



371,579

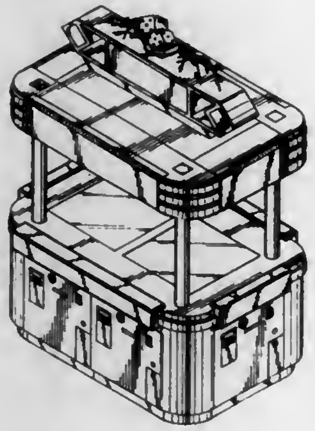
VIDEO CRAPS TABLE WITH A PROGRESSIVE FEATURE

Cory J. Hanscom, New Hope, Minn., assignor to Innovative Gaming Corporation of America, Plymouth, Minn.

Filed Sep. 22, 1994, Ser. No. 28,793

Term of patent 14 years

U.S. Cl. D21—37



371,580

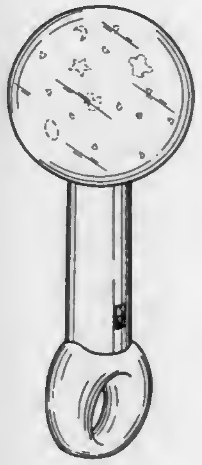
INFANT'S MUSICAL TOY

Gloria Venecia, P.O. Box 135 4th St. West King, La Joya, Tex. 78560

Filed Jun. 22, 1995, Ser. No. 40,641

Term of patent 14 years

U.S. Cl. D21—64



371,581

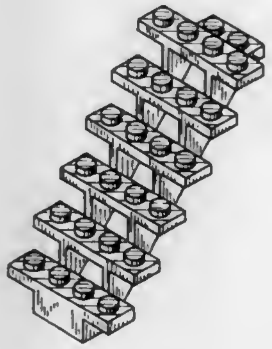
TOY STAIRCASE

Claes-Runo A. Järnros, Billund, Denmark, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,916

Term of patent 14 years

U.S. Cl. D21—108



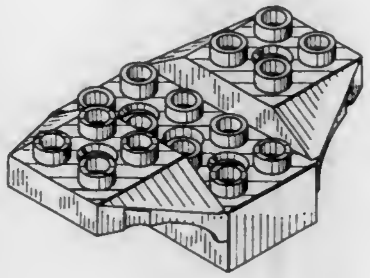
371,582
TOY BUILDING ELEMENT

flemming H. Olsen, Espergærde, and Per Brømsø, Copenhagen, both of, Denmark, assignors to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,917

Term of patent 14 years

U.S. Cl. D21—108



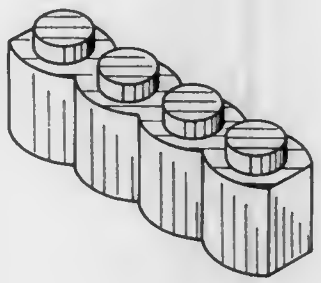
371,583
TOY BUILDING ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,967

Term of patent 14 years

U.S. Cl. D21—108



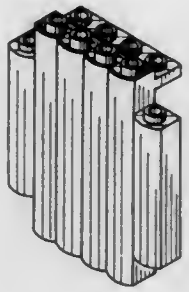
371,584
TOY BUILDING ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 14, 1995, Ser. No. 43,969

Term of patent 14 years

U.S. Cl. D21—108



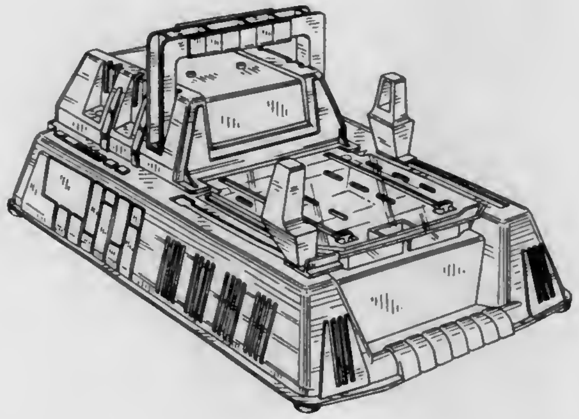
371,585
TOY MOLDING APPARATUS

Steven Lebensfeld, Woodsburgh, N.Y., assignor to Toymax Inc., Westbury, N.Y.

Filed Feb. 4, 1994, Ser. No. 18,478

Term of patent 14 years

U.S. Cl. D21—124



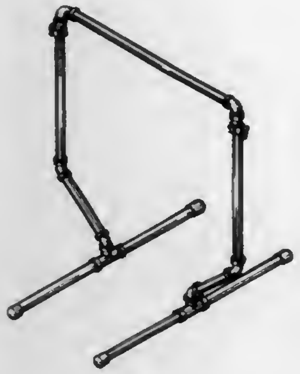
371,586
EXERCISE SUPPORT STAND

Marnie Snyder, 10877 Bill Point Cir., Bainbridge Island, Wash. 98110

Filed Sep. 8, 1994, Ser. No. 27,527

Term of patent 14 years

U.S. Cl. D21—191



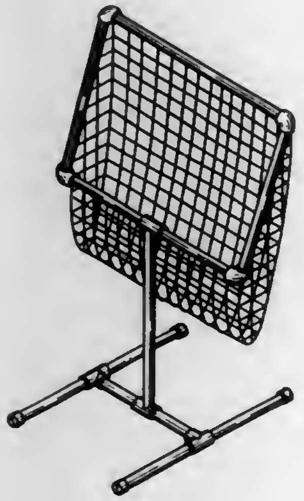
371,587
GOAL FOR FOOTBALL PRACTICE

David L. Braun, 26 Heritage Dr., Negaunee, Mich. 49866

Filed Mar. 20, 1995, Ser. No. 36,384

Term of patent 14 years

U.S. Cl. D21—200



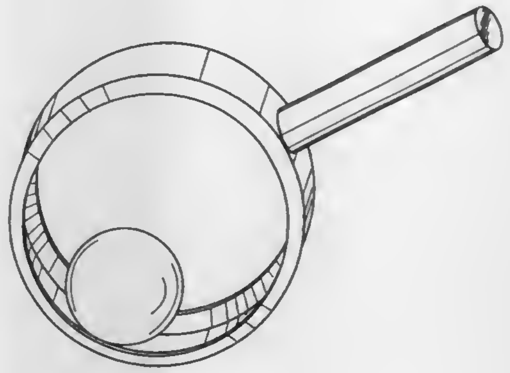
371,588
COMBINED HOOP TOY AND BALL

Rick Myers, Rte. 1, Box 57, West Blocton, Ala. 35184

Filed May 26, 1995, Ser. No. 39,479

Term of patent 14 years

U.S. Cl. D21—210



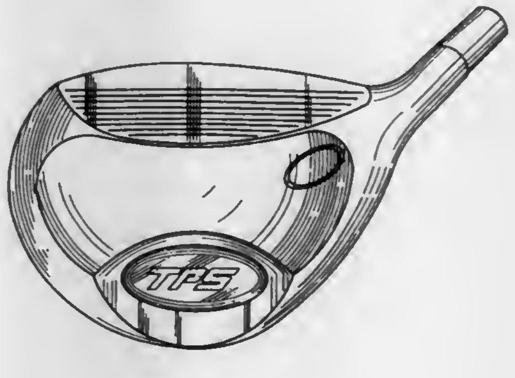
371,589
COMBINED GOLF CLUB HEAD AND HOLOGRAPHIC INSERT

Brian E. Fortini, Prospect, Ky., assignor to Hillerich & Bradsby Co., Louisville, Ky.

Filed Feb. 28, 1995, Ser. No. 35,469

Term of patent 14 years

U.S. Cl. D21—214



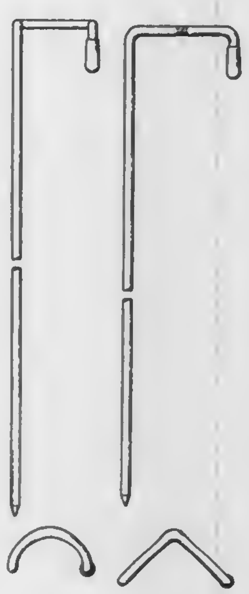
371,590
GOLF CLUB HOLDER

David A. Ludwig, 496 Ridgewood Dr., Rochester, Mich. 48306-2645

Filed Apr. 14, 1995, Ser. No. 37,454

Term of patent 14 years

U.S. Cl. D21—234



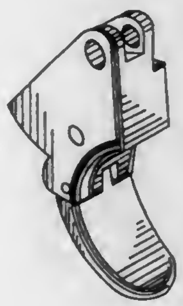
371,591
TWO-PIECE TRIGGER

Lee M. Lenkarski, Ware, and Pardip K. Vaid, Northampton, both of Mass., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Feb. 25, 1994, Ser. No. 19,216

Term of patent 14 years

U.S. Cl. D22—108



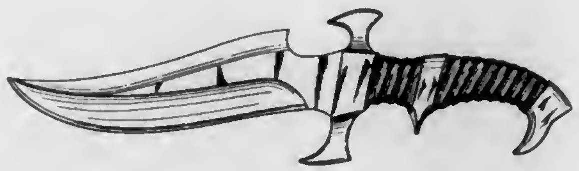
371,592
KNIFE

David K. Hall, Kodak, Tenn., and Gil Hibben, LaGrange, Ky., assignors to United Cutlery Corporation, Sevierville, Tenn.

Filed Jul. 23, 1993, Ser. No. 10,834

Term of patent 14 years

U.S. Cl. D22—118



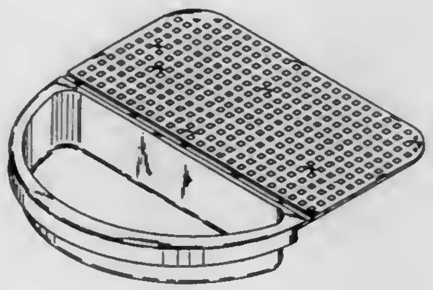
371,593
BUCKET TOP FISHING BAIT TRAY

Ulrich K. Boehnke, Fort Myers, Fla., assignor to Diemoid Machine Company, Inc., Fort Myers, Fla.

Filed Dec. 29, 1994, Ser. No. 32,838

Term of patent 14 years

U.S. Cl. D22—136



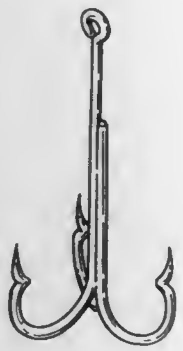
371,594
FISHING HOOK

Joseph Drapak, 5517 W. Sunnyside, Chicago, Ill. 60630, and Paulette J. Sanders, 1929 Berwyn Ave., Chicago, Ill. 60640

Filed Apr. 10, 1995, Ser. No. 37,269

Term of patent 14 years

U.S. Cl. D22—144



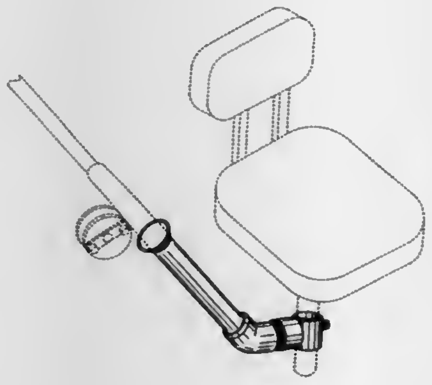
371,595
SEAT ATTACHABLE FISHING ROD SUPPORT

Raymond J. Pieper, St. Louis, and Robert Sieland, Wright City, both of Mo., assignors to Boat-A-System, Inc., St. Louis, Mo.

Filed Sep. 20, 1994, Ser. No. 28,709

Term of patent 14 years

U.S. Cl. D22—147



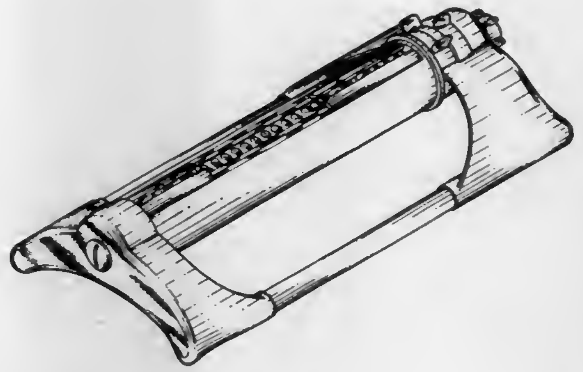
371,596
OSCILLATING SPRINKLER

Sergio G. Simonetti, Westport, Conn., assignor to Melnor Inc., Winchester, Va.

Filed Apr. 3, 1995, Ser. No. 37,048

Term of patent 14 years

U.S. Cl. D23—216



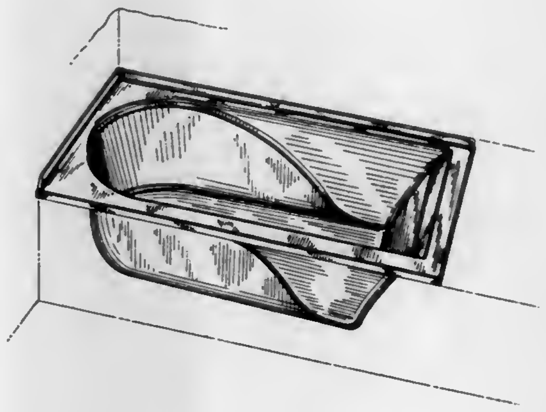
371,597
TUB FOR BATHING

Todd D. Dannenberg, Sheboygan, and Carter J. Thomas, Port Washington, both of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jan. 25, 1995, Ser. No. 33,974

Term of patent 14 years

U.S. Cl. D23—280.3



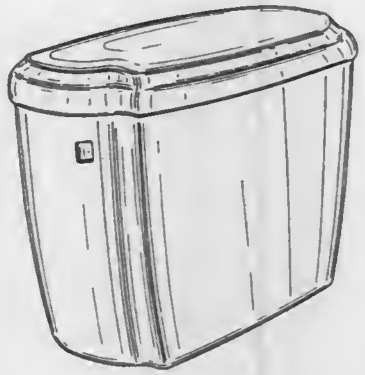
371,598
COMBINED TOILET TANK AND COVER

Jack N. Kaiser, Danville, Ky., assignor to American Standard Inc., Piscataway, N.J.

Filed Apr. 20, 1995, Ser. No. 37,983

Term of patent 14 years

U.S. Cl. D23—313



371,599
OUTDOOR UNIT OF AN AIR CONDITIONER

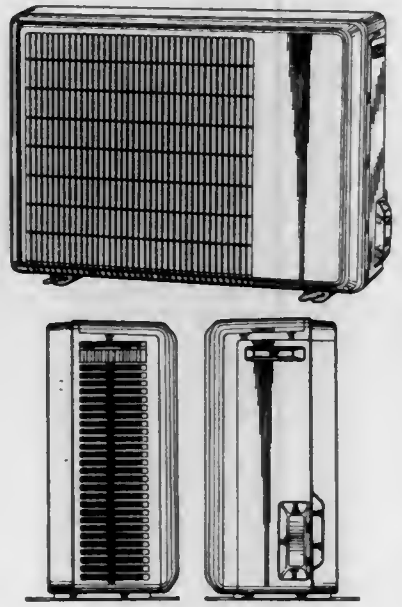
Satoshi Nanjo, Tokyo, Japan, assignor to Fujitsu General Limited, Japan

Filed Nov. 29, 1994, Ser. No. 31,492

Claims priority, application Japan, Sep. 22, 1994, 6-28990

Term of patent 14 years

U.S. Cl. D23—351



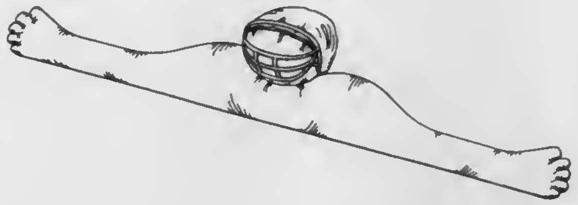
371,600
DRAFT PREVENTER FOR WINDOWS AND DOORS

Stephen M. Henry, Fletcher, N.C., assignor to The Item Company, Inc., Skyland, N.C.

Filed Mar. 23, 1994, Ser. No. 20,297

Term of patent 14 years

U.S. Cl. D23—386



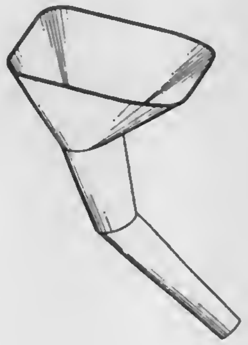
371,601
FEMALE URINAL FUNNEL

Elmer C. Markles, Hemet, Calif., assignor to JEB Products, Inc., Hemet, Calif.

Filed Mar. 28, 1994, Ser. No. 20,480

Term of patent 14 years

U.S. Cl. D24—122



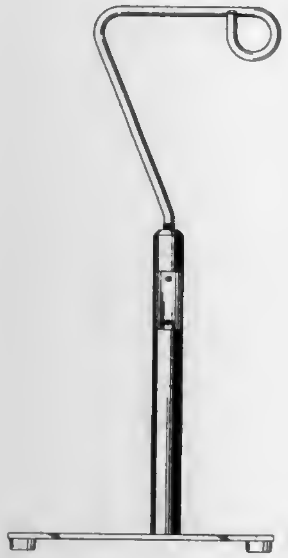
371,602
TABLE TOP I.V. POLE

Raymond A. LoTurco, 11506 W. Youth Camp Rd., Columbus, Ind. 47201-9270

Filed Mar. 8, 1994, Ser. No. 19,678

Term of patent 14 years

U.S. Cl. D24—128



371,603
ANESTHETIC BOTTLE PIERCER

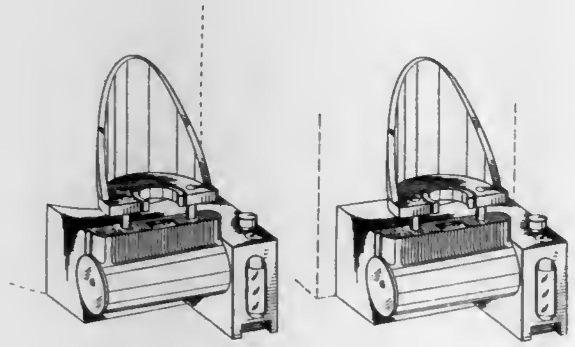
Maurice Laviomodiere, Barrie, Canada, assignor to Southmedic Inc., Barrie, Canada

Filed Jul. 20, 1994, Ser. No. 26,155

Claims priority, application Canada, Apr. 11, 1994, 1994-0710

Term of patent 14 years

U.S. Cl. D24—129



371,604
SUTURELESS CLOSURE FOR A WOUND

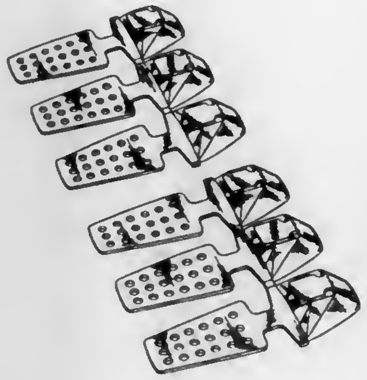
Garry Savage, Montreal, and Michel Swift, Outremont, Canada, assignors to Theratechnologies Inc., Montreal, Canada

Filed Feb. 15, 1995, Ser. No. 34,882

Claims priority, application Canada, Oct. 6, 1994, 1994-1995

Term of patent 14 years

U.S. Cl. D24—145



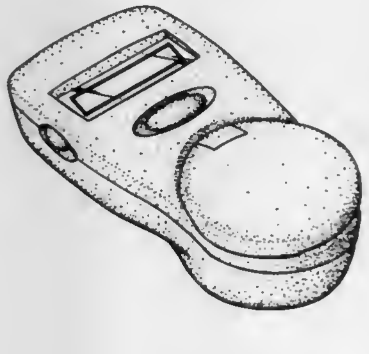
371,605
COMBINED BLOOD COLLECTION AND ANALYSIS INSTRUMENT

Gilbert Y. Wong, San Francisco; Max K. Yoshimoto, San Mateo, and John C. Edson, Mountain View, all of Calif., assignors to Avocet Medical, Inc., Los Gatos, Calif.

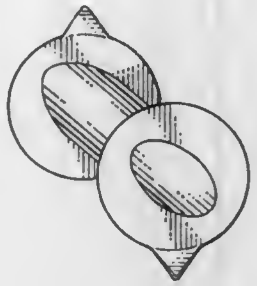
Filed Oct. 26, 1994, Ser. No. 30,326

Term of patent 14 years

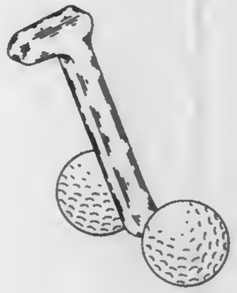
U.S. Cl. D24—169



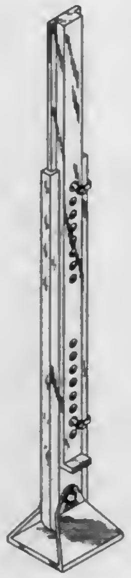
371,606
EAR VENTILATION TUBE
Donald E. Doyle, 4105 Hospital Rd., Pascagoula, Miss. 39581
Filed Aug. 8, 1994, Ser. No. 26,845
Term of patent 14 years
U.S. Cl. D24—173



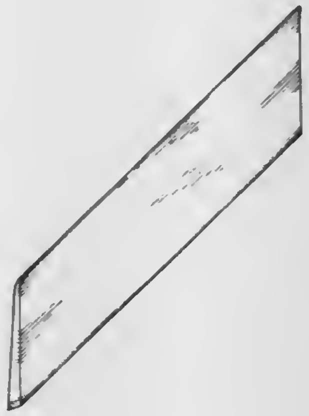
371,607
MASSAGER
Joe A. Taylor, P.O. Box 178 S. J. & E. Rd., Auberry, Calif. 93602
Filed Jan. 30, 1995, Ser. No. 34,184
Term of patent 14 years
U.S. Cl. D24—211



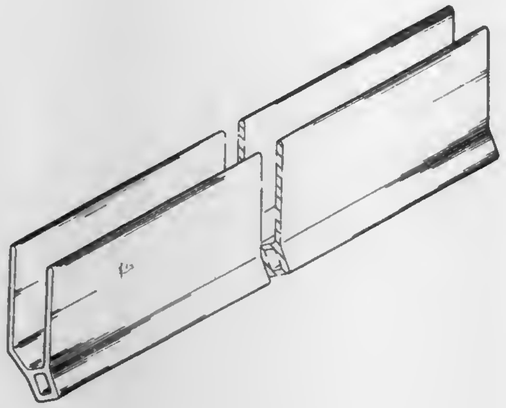
371,608
LADDER LEVELER
Johnny R. Mintz, 48 Wilder St., Munford, Ala. 36268, and Timothy L. Champion, 356 Ingram Cir., Lincoln, Ala. 35096
Filed Jun. 2, 1995, Ser. No. 39,709
Term of patent 14 years
U.S. Cl. D25—68



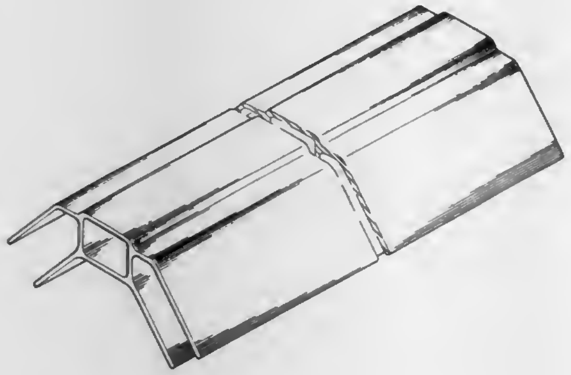
371,609
COVE BASE
Lee J. Pelosi, and Frank Pelosi, Jr., both of 625 E. Chapel Ave., Cherry Hill, N.J. 08034
Filed Aug. 19, 1993, Ser. No. 11,981
Term of patent 14 years
U.S. Cl. D25—119



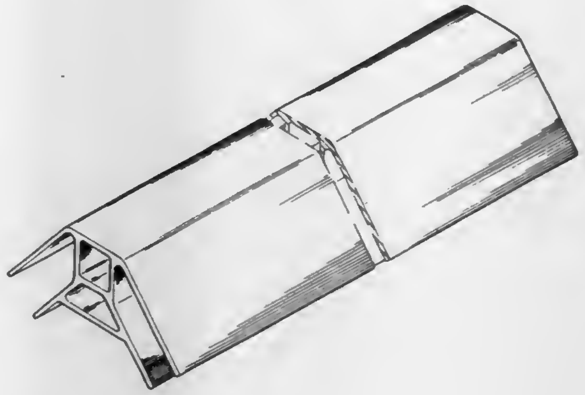
371,610
EXTRUDED ALUMINUM FRAME FOR GOLF CART
Fang-Jung Hsiao, 58, Ma Yuan West St., Taichung, Taiwan
Filed Sep. 8, 1995, Ser. No. 43,673
Term of patent 14 years
U.S. Cl. D25—124



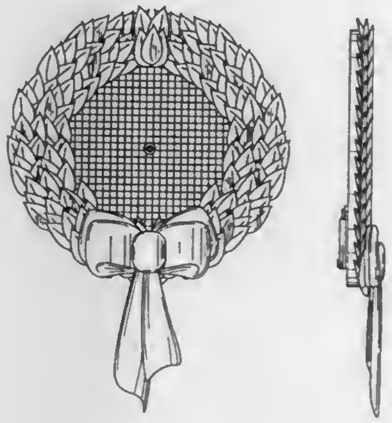
371,611
EXTRUDED ALUMINUM FRAME FOR GOLF CART
Fang-Jung Hsiao, 58, Ma Yuan West St., Taichung, Taiwan
Filed Sep. 8, 1995, Ser. No. 43,674
Term of patent 14 years
U.S. Cl. D25—124



371,612
EXTRUDED ALUMINUM FRAME FOR GOLF CART
Fang-Jung Hsiao, 58, Ma Yuan West St., Taichung, Taiwan
Filed Sep. 8, 1995, Ser. No. 43,675
Term of patent 14 years
U.S. Cl. D25—124



371,613
DECORATIVE LIGHT FIXTURE
Kay Moore, 5264 Muckinaw, Saginaw, Mich. 48603
Filed Feb. 24, 1995, Ser. No. 35,304
Term of patent 14 years
U.S. Cl. D26—4



371,614
LAMP

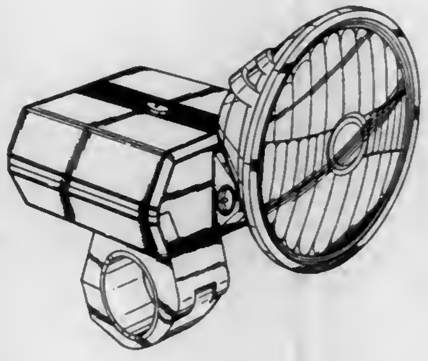
Ming Y. Lai, Flat A, 2nd Fl., Block 17, Provident Centre, North Point, Hong Kong

Filed May 17, 1994, Ser. No. 23,017

Claims priority, application United Kingdom, Nov. 30, 1993, 2035567

Term of patent 14 years

U.S. Cl. D26—28



371,615
LAMP

Ming Y. Lai, Flat A, 2nd Floor, Block 17, Provident Centre, North Point, Hong Kong

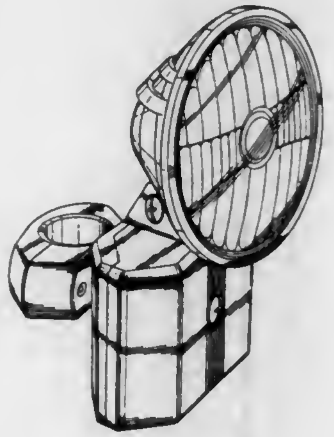
Filed May 18, 1994, Ser. No. 23,135

Claims priority, application United Kingdom, Nov. 30, 1993, 2035568

The portion of the term of this patent subsequent to Jul. 9, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D26—28



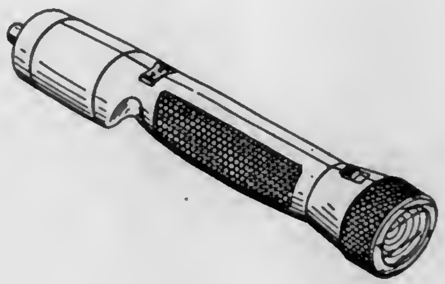
371,616
COMBINED FLASHLIGHT AND DRIVER TOOL

Christopher H. Porth, Bloomingdale, and James S. Stanley, Willowbrook, both of Ill., assignors to Wen Products, Inc., Naperville, Ill.

Filed Mar. 21, 1995, Ser. No. 36,540

Term of patent 14 years

U.S. Cl. D26—38



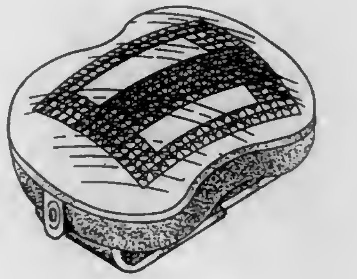
371,617
CONCAVE SIDED PORTABLE SAFETY LIGHT

Nicholas T. Gustav, London, England, assignor to Dynatec, Ltd., London, England

Filed Mar. 25, 1994, Ser. No. 20,490

Term of patent 14 years

U.S. Cl. D26—39



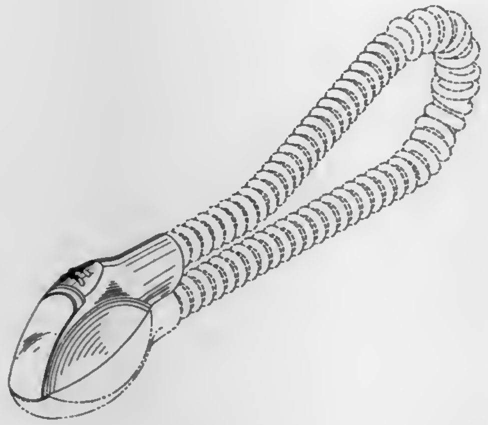
371,618
HEAD FOR A FLEXIBLE FLASHLIGHT

Patrick B. Nolan, Westport, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 17, 1995, Ser. No. 37,601

Term of patent 14 years

U.S. Cl. D26—43



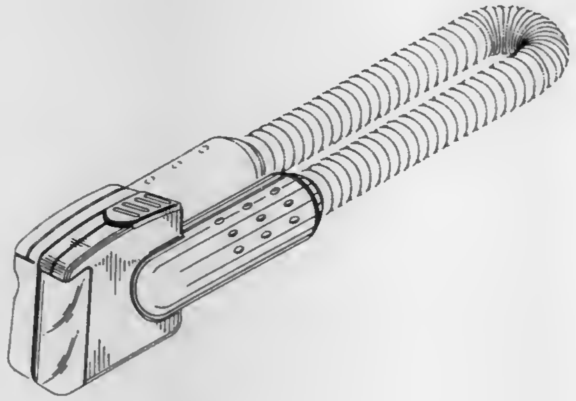
371,619
HEAD FOR A FLEXIBLE FLASHLIGHT

Aaron Szymanski, Bristol, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 17, 1995, Ser. No. 37,605

Term of patent 14 years

U.S. Cl. D26—43



371,620
OUTDOOR LIGHT

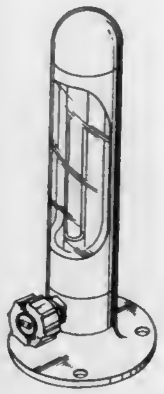
Daniel Cool, C.P. 19, St. Isidore, New Brunswick, Canada

Filed Apr. 26, 1994, Ser. No. 21,987

Claims priority, application Canada, Oct. 27, 1993, 27-10-93-4

Term of patent 14 years

U.S. Cl. D26—68



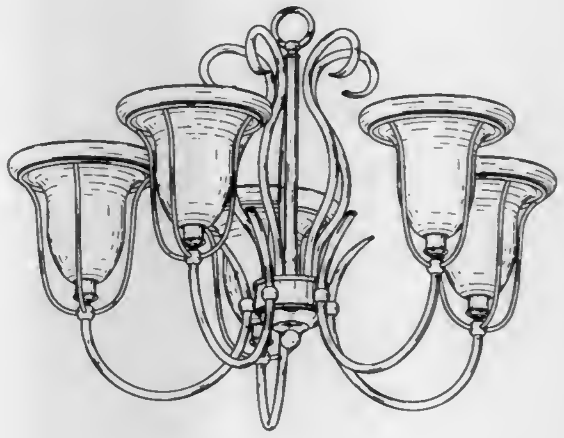
371,621
CHANDELIER

David H. Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio

Filed Jan. 5, 1995, Ser. No. 33,117

Term of patent 14 years

U.S. Cl. D26—81



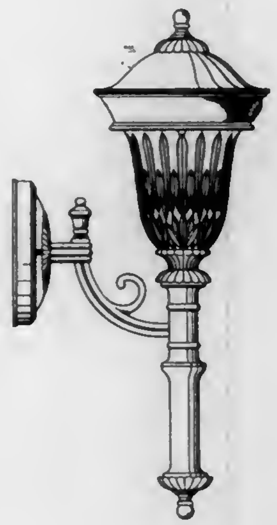
371,622
WALL-MOUNTED LAMP

Ken Hsu, Taichung City, Taiwan, assignor to Bright Yin Huey Co., Ltd., Taichung City, Taiwan

Filed Aug. 8, 1995, Ser. No. 42,401

Term of patent 14 years

U.S. Cl. D26—87



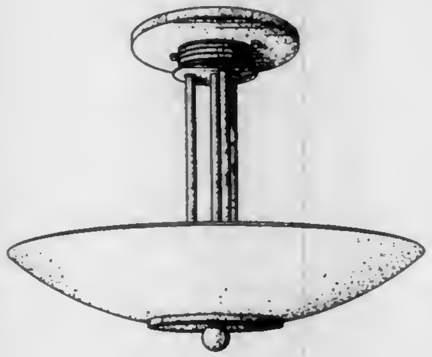
371,623
BOWL-SHAPED CHANDELIER

Simon Benghozi, Montreal, Canada, assignor to Bazz Inc., Montreal

Filed Aug. 26, 1994, Ser. No. 27,652

Term of patent 14 years

U.S. Cl. D26—88



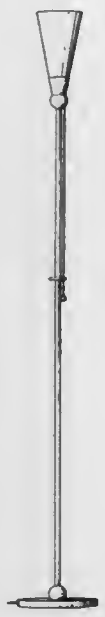
371,624
FLOOR LAMP WITH CONICAL SHADE

Simon Benghozi, Montreal, Canada, assignor to Bazz Inc., Montreal, Canada

Filed Aug. 26, 1994, Ser. No. 27,655

Term of patent 14 years

U.S. Cl. D26—110



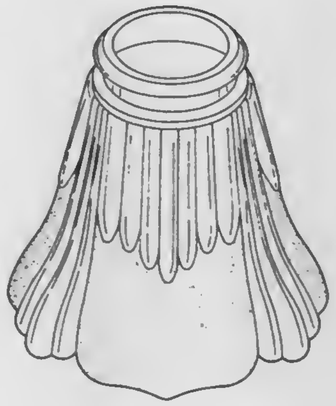
371,625
GLASS SHADE

Jyh-Horng Jen, 3rd F., No. 23, Yuan Huang West road, Fung Yung, Taichung, Taiwan

Filed Jul. 11, 1995, Ser. No. 41,293

Term of patent 14 years

U.S. Cl. D26—133



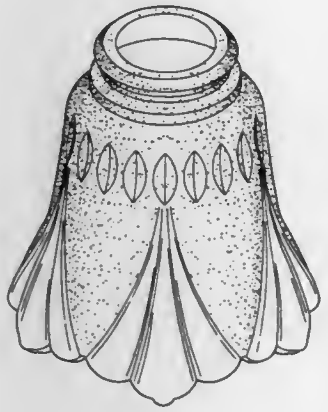
371,626
GLASS SHADE

Jyh-Horng Jen, 3rd F., No. 23, Yuan Huang West Road, Fung Yung, Taichung, Taiwan

Filed Jul. 11, 1995, Ser. No. 41,294

Term of patent 14 years

U.S. Cl. D26—133



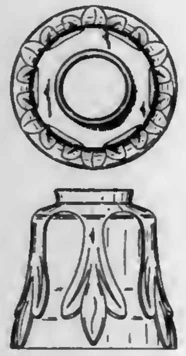
371,627
LIGHT SHADE

Jan Jaspers-Fayer, Idyllwild, Calif., assignor to Minka Lighting Inc., Corona, Calif.

Division of Ser. No. 24,411, Jun. 14, 1994. This application Jul. 11, 1995, Ser. No. 41,297

Term of patent 14 years

U.S. Cl. D26—133



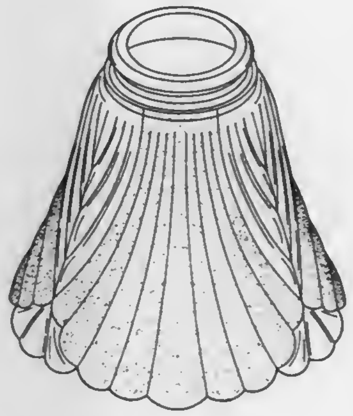
371,628
GLASS SHADE

Jyh-Horng Jen, 3rd F., No. 23, Yuan Huang West Road, Fung Yung, Taichung, Taiwan

Filed Jul. 11, 1995, Ser. No. 41,302

Term of patent 14 years

U.S. Cl. D26—133



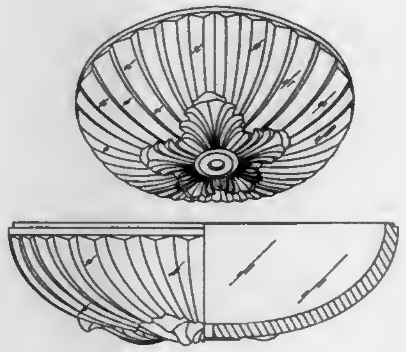
371,629
GLASS SHADE FOR A LIGHTING FIXTURE

Pasquale Miranda, Briarcliff Manor, N.Y., assignor to Murray Feiss Import Corp., Bronx, N.Y.

Filed Mar. 3, 1995, Ser. No. 35,651

Term of patent 14 years

U.S. Cl. D26—134



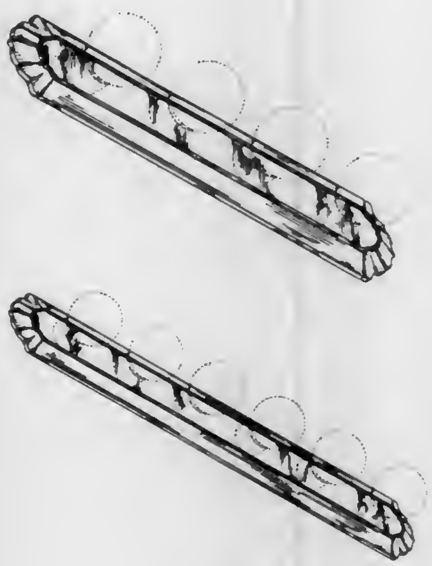
371,630
LIGHTING FIXTURE BACKING PLATE

Libbe A. Milicia, Garfield Heights, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio

Filed Jun. 19, 1995, Ser. No. 40,449

Term of patent 14 years

U.S. Cl. D26—142



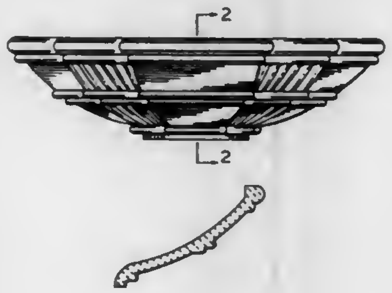
371,631
BOBECHE FOR A LIGHTING FIXTURE

Mark A. Pickett, Louisville, Ky., and Stephen E. Blackman, Scotch Plains, N.J., assignors to Thomas Industries, Inc., Louisville, Ky.

Filed Jan. 5, 1995, Ser. No. 33,112

Term of patent 14 years

U.S. Cl. D26—149



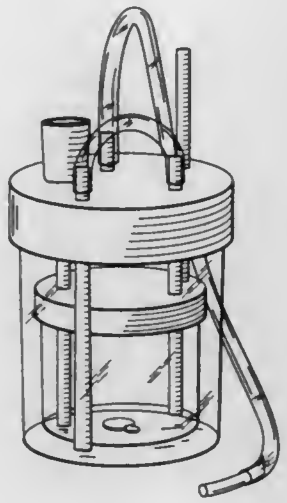
371,632
SMOKING PIPE

Michael T. Truelove, 7641 Victor Pike, Bloomington, Ind. 47403

Filed Apr. 29, 1994, Ser. No. 22,099

Term of patent 14 years

U.S. Cl. D27—163



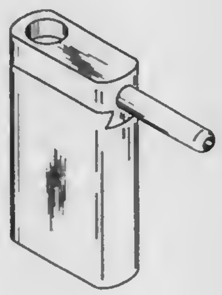
371,633
SMOKING PIPE

Paul E. Chenard, Largo, Fla., assignor to New Tradition Pipe Co., Pinellas Park, Fla.

Filed Aug. 31, 1995, Ser. No. 43,478

Term of patent 14 years

U.S. Cl. D27—163



371,634
COMB

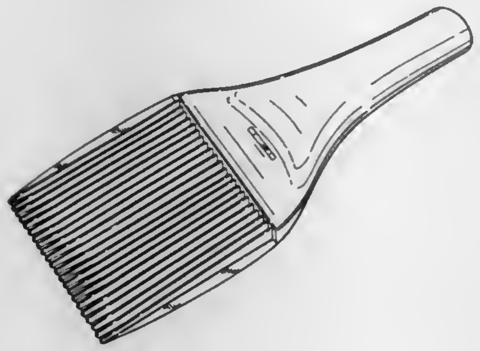
Martin R. Darbyshire, London, and Brian J. Drumm, East Lothian, both of, United Kingdom, assignors to Brian Drumm Flattopper (U.K.) Limited, Edinburgh, United Kingdom

Filed Feb. 22, 1994, Ser. No. 19,041

Claims priority, application United Kingdom, Sep. 2, 1993, 2033519

Term of patent 14 years

U.S. Cl. D28—31



371,635
COMBINED SHAVING HEAD FRAME AND SHAVING FOIL

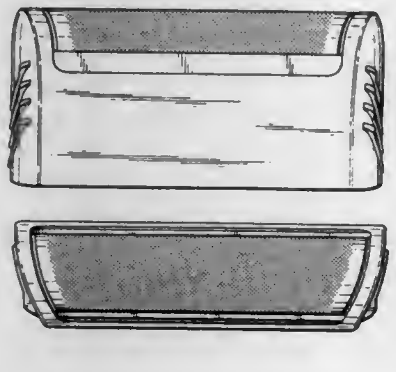
Roland Ullmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

Filed Feb. 1, 1994, Ser. No. 18,251

Claims priority, application WIPO, Aug. 9, 1993, DMA/002255

Term of patent 14 years

U.S. Cl. D28—51



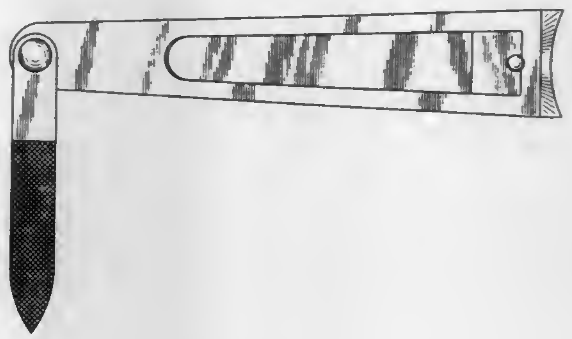
371,636
NAIL CLIPPER

Harold H. O'Neal, 709 Farish St., Opelika, Ala. 36801

Filed Jun. 26, 1995, Ser. No. 40,754

Term of patent 14 years

U.S. Cl. D28—60



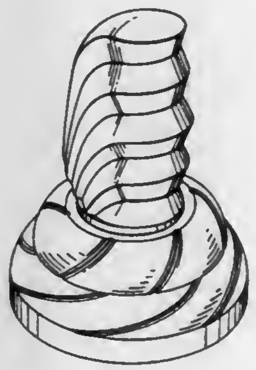
371,637
LIPSTICK CASE

Chin-Yi Huang, No. 4, Lane 155, Tan Pei Road, Yueh Mei Li, Ho Mei Chen, Chang Hua Hsien, Taiwan

Filed Aug. 1, 1995, Ser. No. 42,125

Term of patent 14 years

U.S. Cl. D28—85



371,638
SPORTS HELMET

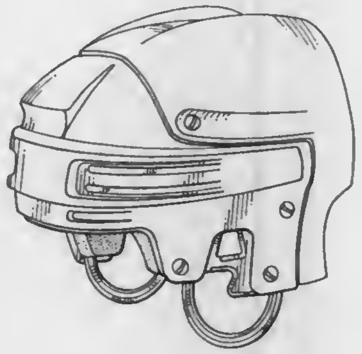
T. Blaine Hashizaki, Montreal West; Rene Bourque, Laval, and Bernard Daoust, Montreal, all of, Canada, assignors to Canstar Sports Group Inc., Ville Mont-Royal, Canada

Filed May 19, 1993, Ser. No. 8,530

Claims priority, application Canada, Dec. 2, 1992, 02-12-92-3

Term of patent 14 years

U.S. Cl. D29—106



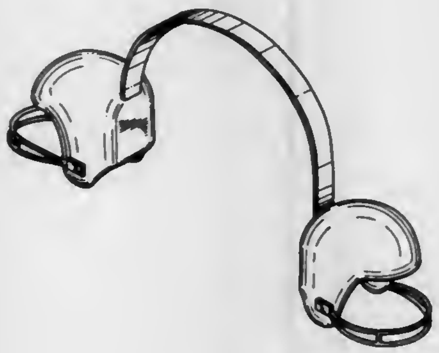
371,639
FOOTBALL HELMET EAR MUFFS

Brett A. Schmitt, 6408 Hilltop, Shawnee, Kans. 66226

Filed Feb. 14, 1994, Ser. No. 18,629

Term of patent 14 years

U.S. Cl. D29—112



371,640
GOLF GLOVE HAVING A REINFORCED THUMB PORTION

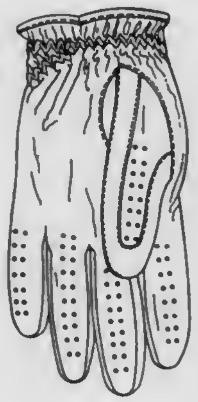
David D. Boone, El Toro, Calif., assignor to Lynx Golf Inc., Industry, Calif.

Filed Jan. 7, 1994, Ser. No. 17,204

The portion of the term of this patent subsequent to Jan. 24, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D29—117



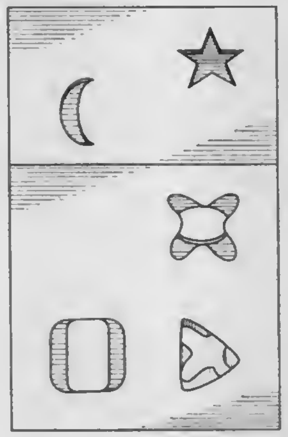
371,641
PLAYHOUSE FOR CATS

Alline Crowley, 156 Old W. Point Rd., Garrison, N.Y. 10524

Filed Apr. 18, 1994, Ser. No. 21,461

Term of patent 14 years

U.S. Cl. D30—108



371,642

Patent Not Issued For This Number

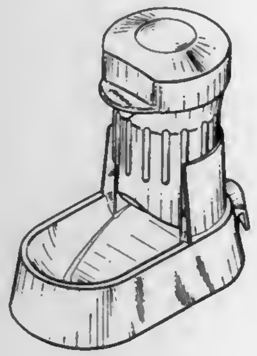
371,643
AUTOMATIC FEEDER FOR ANIMALS

Stig Lillelund, Gentofte, and Mikael Koch, Copenhagen, both of, Denmark, assignors to Dart Industries Inc., Deerfield, Ill.

Filed Mar. 16, 1995, Ser. No. 36,001

Term of patent 14 years

U.S. Cl. D30—122



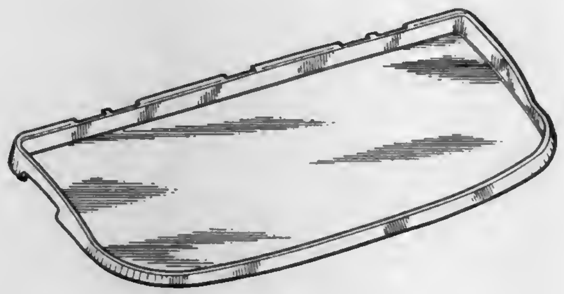
371,644
PET FEEDER TRAY

Stig Lillelund, Garderhøjvej, and Mikael Koch, Classensgade, both of, Denmark, assignors to Dart Industries Inc., Deerfield, Ill.

Filed Mar. 16, 1995, Ser. No. 36,003

Term of patent 14 years

U.S. Cl. D30—133



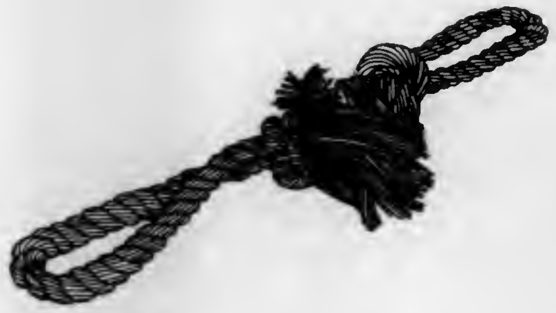
371,645
DOG CHEW TOY

Richard L. Lawson, Sanger, Calif., assignor to Products Carousel, Incorporated, Fresno, Calif.

Filed Nov. 18, 1994, Ser. No. 31,157

Term of patent 14 years

U.S. Cl. D30—160



371,646

Patent Not Issued For This Number

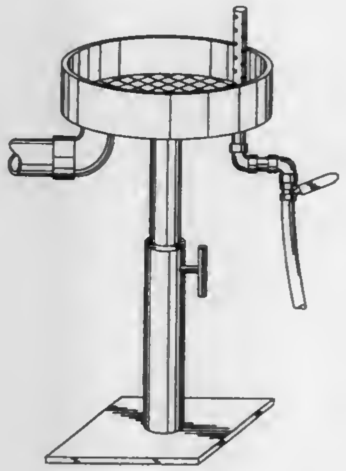
371,647
RECEPTACLE RINSER

F. Henry Overmyer, 2596 County Rd., 127, Lindsey, Ohio 43442

Filed Jan. 20, 1995, Ser. No. 33,793

Term of patent 14 years

U.S. Cl. D32—1



371,648
WALLPAPER STRIPPER

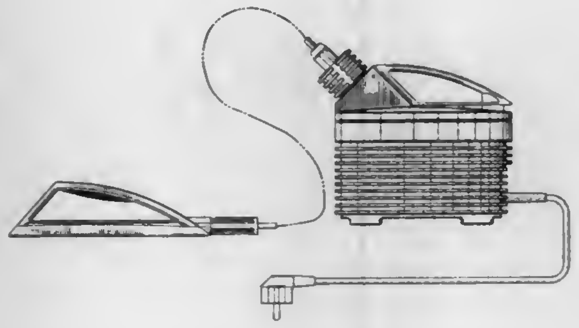
Guido Zimmermann, and Klaus Buttenbender, both of Friedrichshafen, Germany, assignors to J. Wagner GmbH, Friedrichshafen, Germany

Filed Sep. 8, 1993, Ser. No. 12,688

Claims priority, application Germany, Mar. 23, 1993, M92302413.4

Term of patent 14 years

U.S. Cl. D32—15



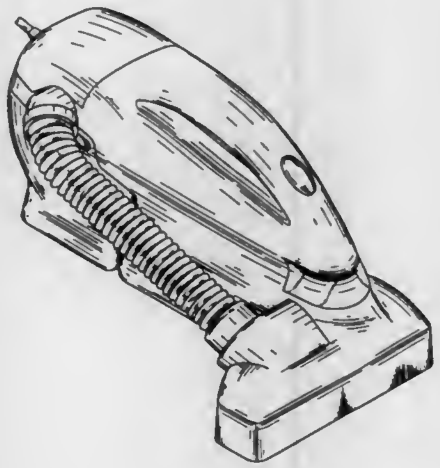
371,649
COMBINED WET/DRY HAND-HELD VACUUM CLEANER

Amir M. Neshat, Jonesboro, and Clifford E. Hufstedler, Walnut Ridge, both of Ark., assignors to The Scott Fetzer Company, Westlake, Ohio

Filed Aug. 8, 1994, Ser. No. 26,877

Term of patent 14 years

U.S. Cl. D32—18



371,650
VACUUM CLEANER

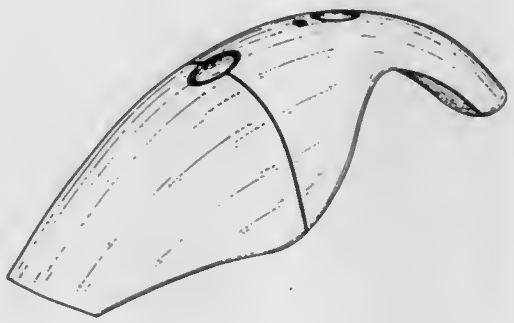
Saskia H. P. M. Dingelstad, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1995, Ser. No. 33,308

Claims priority, application WIPO, Aug. 15, 1994, DMA/002605

Term of patent 14 years

U.S. Cl. D32—18



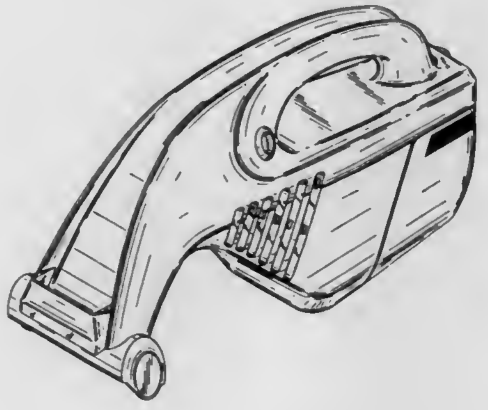
371,651
VACUUM CLEANER

Charles J. Bass, Somerville, Ala.; John W. Goodin, Coto De Caza; Mark W. LeBeau, Long Beach, both of Calif.; Carl E. Prindle, Boston, Mass., and William C. Tyler, Rainbow City, Ala., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 13, 1995, Ser. No. 33,446

Term of patent 14 years

U.S. Cl. D32—18



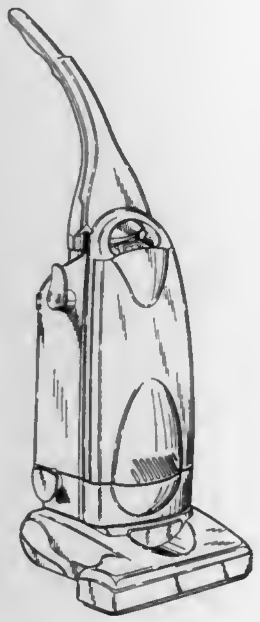
371,652
VACUUM CLEANER

Steven Umbach, East Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.

Filed Feb. 14, 1994, Ser. No. 18,742

Term of patent 14 years

U.S. Cl. D32—22



371,653
VACUUM CLEANER

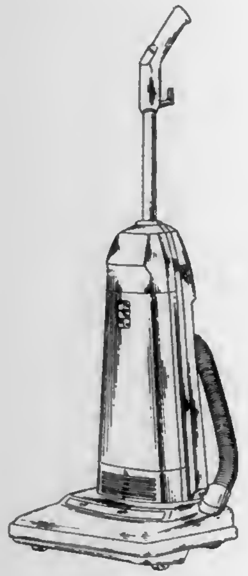
Toshihide Nagamine, and Susumu Yamaguchi, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Oct. 4, 1994, Ser. No. 29,368

Claims priority, application Japan, Apr. 4, 1994, 6-9465

Term of patent 14 years

U.S. Cl. D32—22



371,654
VACUUM CLEANER

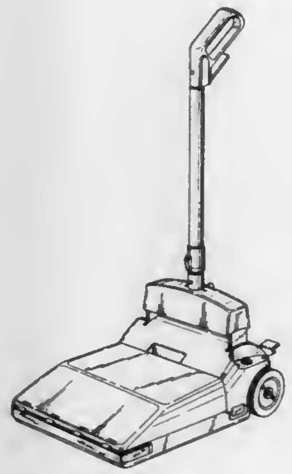
Peter Wöwag, Romanshorn, Switzerland, assignor to Firma Fedag, Romanshorn, Switzerland

Filed Sep. 16, 1994, Ser. No. 28,782

Claims priority, application Germany, Mar. 23, 1994, M9402490.1

Term of patent 14 years

U.S. Cl. D32—22



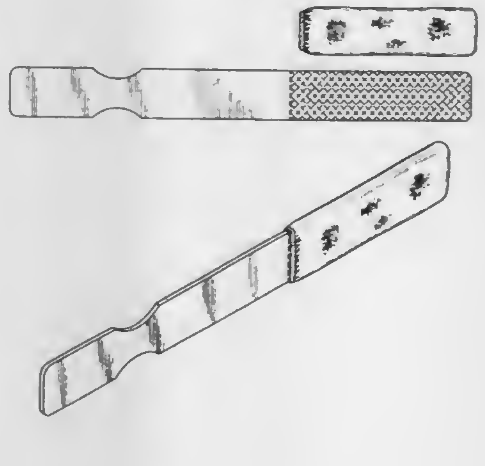
371,655
LOUVERED DOOR CLEANER

Elaine S. Weston, Rte. 1, Box 3744, Jacksboro, Tenn. 37757

Filed Jan. 21, 1994, Ser. No. 17,668

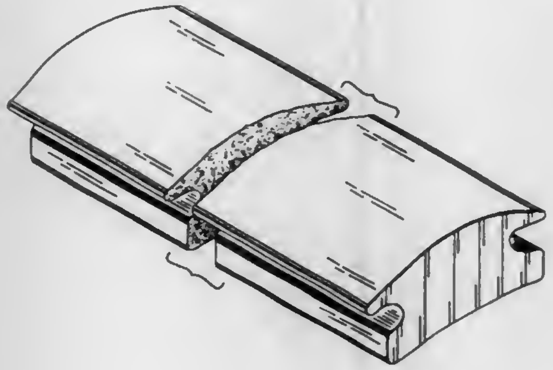
Term of patent 14 years

U.S. Cl. D32—40



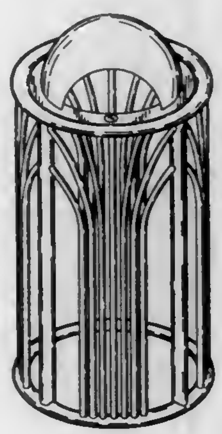
371,656
ELONGATED INSERT STRIP FOR ADHESIVELY FASTENING FABRIC TO A FRAME

William H. Mason, III, St. Paul, and David B. Lamps, Woodbury, both of Minn., assignors to Uncommon Conglomerates, Inc., St. Paul, Minn.
Filed Oct. 21, 1994, Ser. No. 30,046
Term of patent 14 years
U.S. Cl. D32—41



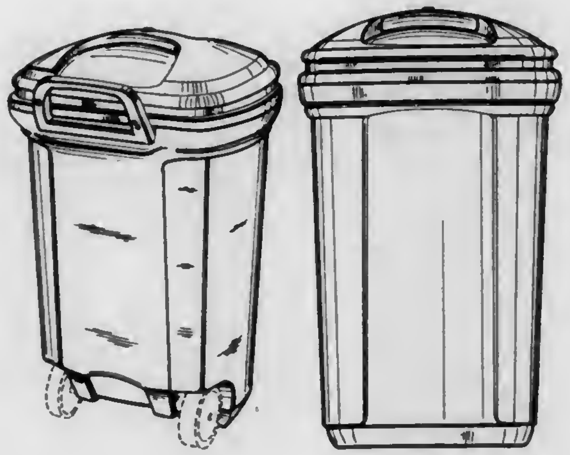
371,657
LITTER CONTAINER

S. Kenneth Kirn, Vancouver, Wash., and Michael B. Fox, Aloha, Oreg., assignors to Columbia Cascade Company, Portland, Oreg.
Filed Jun. 20, 1995, Ser. No. 40,520
Term of patent 14 years
U.S. Cl. D34—1



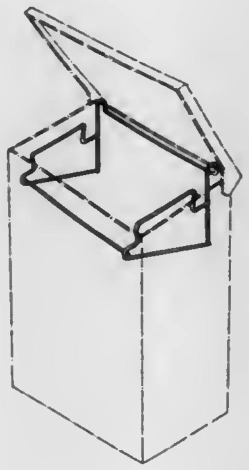
371,658
INDUSTRIAL CONTAINER

Timothy S. Cassel, Arlington, Mass., assignor to Tucker Housewares, Leominster, Mass.
Filed Jan. 13, 1995, Ser. No. 34,989
Term of patent 14 years
U.S. Cl. D34—5



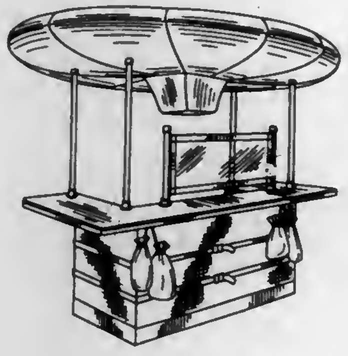
371,659
GARBAGE BAG HOLDER

Ralph Goldman, 249 Kenaston Ave., Mount Royal, Que., Canada
Filed Feb. 13, 1995, Ser. No. 34,819
Term of patent 14 years
U.S. Cl. D34—6



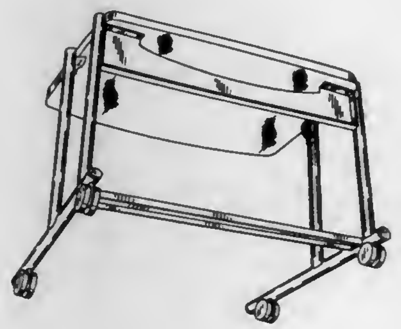
371,660
SERVICE CART FACADE

Scott A. Wilson, 608 S. Nevada St., Oceanside, Calif. 92054
Filed Jun. 19, 1995, Ser. No. 40,457
Term of patent 14 years
U.S. Cl. D34—14



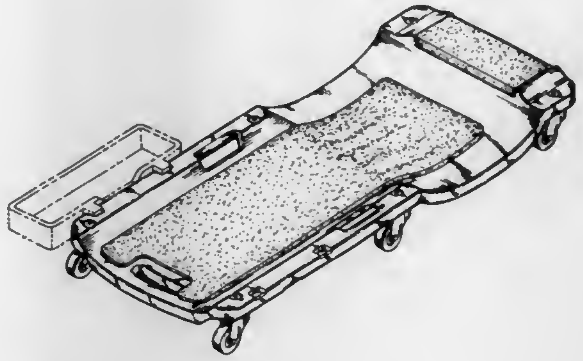
371,661
CHILDREN'S CART

Steven E. Linder, Portland, Oreg., assignor to Anthro Corporation, Tualatin, Oreg.
Filed Jun. 16, 1995, Ser. No. 40,409
Term of patent 14 years
U.S. Cl. D34—21



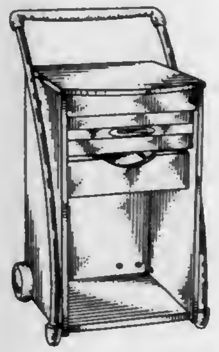
371,662
MECHANIC'S CREEPER

Jack Vosbikian; Mark S. Wellner, both of Cherry Hill, N.J., and Chris Ladewig, Littleton, N.C., assignors to International Rollforms Inc., Deptford, N.J.
Filed Aug. 10, 1995, Ser. No. 42,436
Term of patent 14 years
U.S. Cl. D34—23



371,663
CART

Wolfgang Muller-Deisig, Berlin, Germany, and H. A. M. Dankers Alexander, Berkel-Enshot, Netherlands, assignors to Assenburg B.V., Ea Tilburg, Netherlands
Filed Apr. 18, 1995, Ser. No. 37,647
Claims priority, application Benelux TM/Des. Off., Oct. 19, 1994, 70186-01/11
Term of patent 14 years
U.S. Cl. D34—25



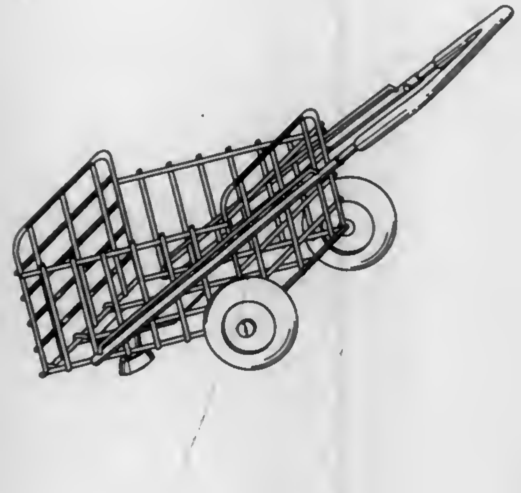
371,664
COLLAPSIBLE UTILITY CART

Cheryl Pooce, 7 Richmond Blvd., Centereach, N.Y. 11720, and Lorraine Wilson, 10 Hargrove Dr., Stony Brook, N.Y. 11790

Filed Jul. 24, 1995, Ser. No. 41,768

Term of patent 14 years

U.S. Cl. D34—25



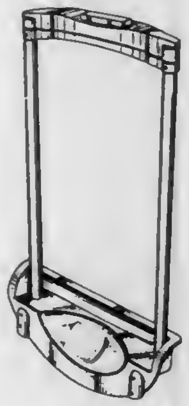
371,665
HANDLE OF A CART

Cheng-Hsien Tsai, No. 103, Da-Ming 1st Rd., Tien-Tzu Hsiang, Taichung Hsien, Taiwan

Filed Jun. 26, 1995, Ser. No. 40,717

Term of patent 14 years

U.S. Cl. D34—27



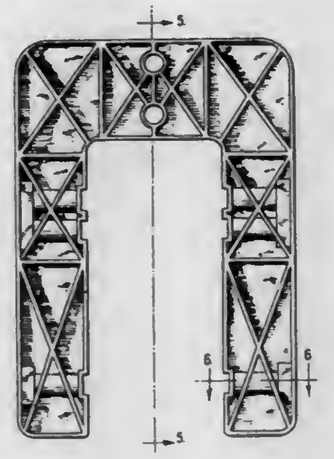
371,666
CONVEYOR YOKE

Robert Kubsik, West Bloomfield; Robert Goryca, Farmington Hills; James P. Johnson, Howell, and Eric T. Nemeth, Pinckney, all of Mich., assignors to Jervis B. Webb Company, Farmington, Mich.

Filed Dec. 21, 1994, Ser. No. 32,553

Term of patent 14 years

U.S. Cl. D34—29



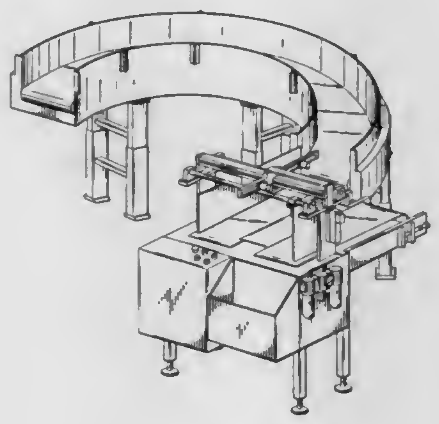
371,667
PRODUCT TRANSFER, SELECTIVE PAIRING, AND TURNING ASSEMBLY

Bryan H. Poole, Lawrenceville, Ga., assignor to All-Pak Machinery Systems, Inc., Decatur, Ga.

Filed Jun. 22, 1995, Ser. No. 40,579

Term of patent 14 years

U.S. Cl. D34—29



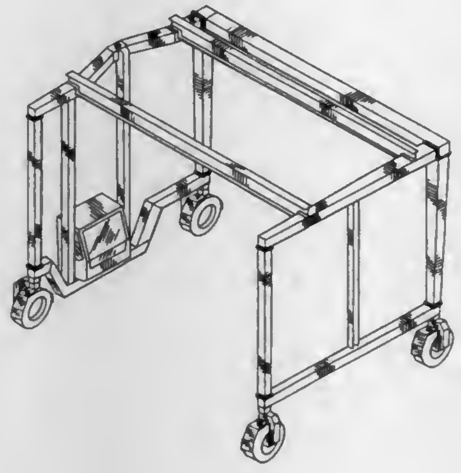
371,668
GANTRY CRANE WITH ELEVATING OPERATOR CAB

Thomas Feider; Norbert Lenius, both of Sturgeon Bay; Edward Lazzeroni, and Ronald Dir, both of Racine, all of Wis., assignors to Marine Travelift, Inc., Sturgeon Bay, Wis.

Filed May 26, 1995, Ser. No. 39,360

Term of patent 14 years

U.S. Cl. D34—33



371,669
FORK LIFT TRUCK

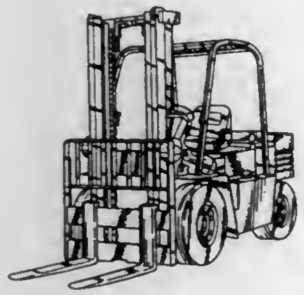
Young-bin Yoon, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 27, 1994, Ser. No. 25,013

Claims priority, application Rep. of Korea, Dec. 27, 1993, 93-26735

Term of patent 14 years

U.S. Cl. D34—34



371,670
PALLET

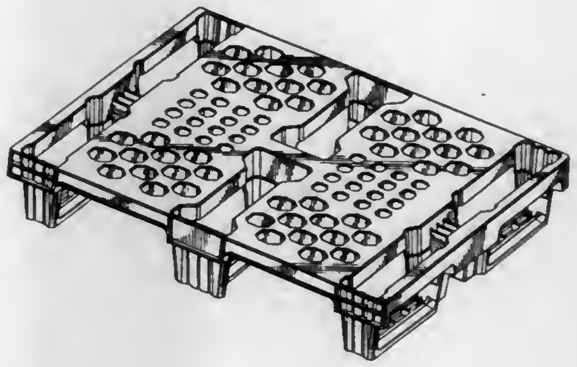
Robin Carlsson, Västerås, Sweden, assignor to Perstorp AB, Perstorp, Sweden

Filed Dec. 20, 1994, Ser. No. 32,516

Claims priority, application Sweden, Jun. 22, 1994, 941403

Term of patent 14 years

U.S. Cl. D34—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9th DAY OF JULY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*
  - Hyppänen, Timo, 5,533,471, Cl. 122-4.00D.
- A Et S Biovecteurs: *See—*
  - Samain, Daniel; and Gibilaro, Joëlle, 5,534,501, Cl. 514-60.000.
- A. O. Smith Corporation: *See—*
  - Johnson, J. Herbert, 5,534,736, Cl. 310-91.000.
- ABB Flakt AB: *See—*
  - Aurell, Eskil, 5,533,706, Cl. 251-44.000.
- ABB Lummus Global Inc.: *See—*
  - Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Bartley, Burton H., 5,534,135, Cl. 208-120.000.
- Abbott Laboratories: *See—*
  - Or, Yat S.; and Luly, Jay R., 5,534,632, Cl. 540-456.000.
  - Piontek, Carl J.; Mazer, Terrence B.; Walton, Joseph E.; and Geckle, Ronita K., 5,533,973, Cl. 604-83.000.
- Abbott, Ronald G.: *See—*
  - Randolph, Bruce B.; Abbott, Ronald G.; Child, Jonathan E.; and Del Rossi, Kenneth J., 5,534,657, Cl. 585-723.000.
- Abe, Akira: *See—*
  - Yoshida, Kiyohide; Muramatsu, Gyo; Abe, Akira; and Miyadera, Tatsuo, 5,534,237, Cl. 423-239.100.
- Abe, Atsuyoshi: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Abe, Hiroshi, to Hon Hai Precision Industry Co., Ltd. Memory card connector. 5,533,906, Cl. 439-159.000.
- Abe, Karl-Heinz: *See—*
  - Harms, Thomas; and Abe, Karl-Heinz, 5,533,783, Cl. 297-195.130.
- Abe, Kazuhiko, to NEC Corporation. SRAM cell having load thin film transistors. 5,535,155, Cl. 365-154.000.
- Abe, Tadashi, to Tzuzuki, Shogo. Illuminating light source device using semiconductor laser element. 5,535,230, Cl. 372-43.000.
- Abe, Takao; Isoda, Takeshi; Sato, Chisato; Mihira, Ado; Tamai, Satoshi; and Kumagai, Toshio, to Lederle (Japan), Ltd. 2-[1-(1,3-thiazolin-2-yl)azetidin-3-yl]thio-carbapenem derivatives. 5,534,510, Cl. 514-210.000.
- Abe, Takeya: *See—*
  - Kambara, Yoshihiko; Uehara, Yoshikazu; Abe, Takeya; and Asao, Koichi, 5,534,655, Cl. 564-127.000.
- Abe, Tetsuya; Ishii, Kazuhiko; and Yokoshima, Minoru, to Nippon Kayaku Kabushiki Kaisha. Onium salt, photopolymerization initiator, energy ray-curing composition containing the initiator, and cured product. 5,534,557, Cl. 522-15.000.
- Abe, Yoshihiko, to Fuji Photo Film Co., Ltd. Chemical analysis film cartridge. 5,534,224, Cl. 422-63.000.
- Abe, Yoshikazu: *See—*
  - Maruyama, Teruo; and Abe, Yoshikazu, 5,533,887, Cl. 418-201.300.
- Abildskov, Dale, deceased (by Tracy Collins Bank & Trust, legal representative.), to Edo Corporation. Three dimensional woven fabric connector. 5,533,693, Cl. 244-131.000.
- Abraham, Michelle M., to TRW Vehicle Safety Systems Inc. Apparatus for restraining a vehicle occupant and method of making the apparatus. 5,533,753, Cl. 280-739.000.
- Acebo, Juan C.: *See—*
  - Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., 5,535,312, Cl. 395-115.000.
- Acer Peripherals, Inc.: *See—*
  - Jwo, Chun J., 5,535,285, Cl. 381-188.000.
- Acero, Alejandro; Chow, Yen-Lu; and Lee, Kai-Fu, to Apple Computer, Inc. Sub-partitioned vector quantization of probability density functions. 5,535,305, Cl. 395-2.650.
- Ackermann, Manfred; Nguyen, Ngoc-Thach; Schustek, Siegfried; and Tran, Quang-Ngoc, to Robert Bosch G.m.b.H. Starter apparatus for an internal combustion engine. 5,533,415, Cl. 74-7.00E.
- Acksel, Ione. Suturing guide and clamp. 5,534,008, Cl. 606-148.000.
- AcroMed Corporation: *See—*
  - Navarro, Richard R.; McMillin, Carl R.; and Zimmers, Karl B., 5,534,030, Cl. 623-17.000.
- Adachi, Kumiko: *See—*
  - Matsuo, Takashi; Adachi, Kumiko; and Yahagi, Kazuyuki, 5,534,248, Cl. 424-70.280.
- Adachi, Seiji: *See—*
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
- Adam, Gérard: *See—*
  - Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
- Adam, Peter: *See—*
  - Bamberg, Joachim; Steinhauser, Ludwig; Bayer, Erwin; and Adam, Peter, 5,534,308, Cl. 427-454.000.
- Adams, Edgar E.; Ellis, Darwin L.; and Stelle, Gerald E., to Aluminum Company of America. Quick-change center star assembly for a capping machine. 5,533,608, Cl. 198-478.100.
- Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., to Ecomed, Inc.; and Steris Corp. Method for disposal of biological waste. 5,534,162, Cl. 210-781.000.
- Adams, Neil J.: *See—*
  - Bush, Kevin J.; Dua, Sanjay; Adams, Neil J.; and Markyvech, Craig R., 5,535,135, Cl. 364-496.000.
- Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Ternullo, Luigi, Jr., to International Business Machines Corporation. BIST tester for multiple memories. 5,535,164, Cl. 365-201.000.
- Adel, Jörg; and Dyllick-Brenzinger, Rainer, to BASF Aktiengesellschaft. Carriers doubly coated with metal oxide and intended for electrophotography. 5,534,378, Cl. 430-106.600.
- Adir Et Compagnie: *See—*
  - Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
- Adler, Felix, to Teleflex, Inc. Cable locator/retainer. 5,533,419, Cl. 74-502.400.
- Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, to Mannesmann Aktiengesellschaft. Non-trackbound vehicle with an electrodynamic converter and a throttle. 5,533,583, Cl. 80-65.400.
- Adolphi, John; and Kipp, Jeffrey J., to Lifetouch Portrait Studios, Inc. Posing station. 5,534,963, Cl. 354-290.000.
- Adrian, Adolf; and Angermann, Rolf, to August Bilstein GmbH & Co. KG. Hydraulic shock absorber for motor vehicles. 5,533,598, Cl. 188-322.170.
- Adroit Systems, Inc.: *See—*
  - Diefes, Debra L.; Fan, Leopold C.; and Rodgers, Charles E., 5,534,875, Cl. 342-357.000.
- Advanced Cardiovascular Systems, Inc.: *See—*
  - Muni, Ketan P.; and Sirhan, Motasim M., 5,533,968, Cl. 604-96.000.
- Advanced Licensing Limited Partnership: *See—*
  - Wolfberg, Larry; and Harper, John, 5,533,453, Cl. 101-485.000.
- Advanced Micro Devices: *See—*
  - O'Brien, Rita M., 5,535,419, Cl. 395-856.000.
- Advanced Micro Devices, Incorporated: *See—*
  - Cheung, Robin W., 5,534,731, Cl. 257-759.000.
  - Gulick, Dale, 5,535,281, Cl. 381-28.000.
  - Liu, David K. Y., 5,534,455, Cl. 437-43.000.
  - Norris, David, 5,534,844, Cl. 340-146.200.
  - Woo, Ann K., 5,534,804, Cl. 327-143.000.
  - Wu, Chih-Siung; and Lai, Po-Shen, 5,534,801, Cl. 327-72.000.
- Advanced Peptides and Biotechnology Sciences: *See—*
  - Pert, Candace B.; and Ruff, Michael R., 5,534,495, Cl. 514-16.000.
- Advanced Systems Automation Pte Ltd: *See—*
  - Kiat, Ho B.; and Choy, Tan H., 5,533,336, Cl. 60-533.000.
- Advantest Corporation: *See—*
  - Mori, Hiroshi; and Bendo, Masatoshi, 5,534,996, Cl. 356-218.000.
- Aebersold, Rudolf H.; and Bures, Edward J., to Biomedical Research Centre Limited. Compounds and methods for sequencing amino acids. 5,534,440, Cl. 436-89.000.
- Aeroquip Corporation: *See—*
  - Rogers, Russell L.; and Turk, Rodney E., 5,534,024, Cl. 623-1.000.
- Aerospatiale Societe Nationale Industrielle: *See—*
  - Solntsev, Stanislav S.; Tjurin, Vladimir M.; Izaeva, Natalia V.; Bersenev, Alexei Y.; and Solovjeva, Galina A., 5,534,300, Cl. 427-376.200.
- AESOP, Inc.: *See—*
  - Slocum, Alexander H., 5,533,814, Cl. 384-123.000.
- Affinity Technology, Inc.: *See—*
  - Krupey, John, 5,534,597, Cl. 525-327.600.

Agar, Brian E.: *See—*
  Baker, Gary L.; Jakubiec, Steven M.; Agar, Brian E.; and Brom, Erik, 5,533,353, Cl. 62-227.000.
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Agri Tech Incorporated: *See—*
  Tao, Yang, 5,533,628, Cl. 209-580.000.
Agro, Marc; Auer, Wolfgang; Hilt, Gerard; Peters, Henning; and Rust, Sabine, to Gebr. Happich GmbH. Sun visor for motor vehicles. 5,533,776, Cl. 296-97.900.
Ahl, David K.; Swanson, Roger M.; Apolito, James D.; and Wafler, Walter F., to Xerox Corporatioo. Sheet control baffle for use in an electrophotographic printing machine. 5,533,720, Cl. 271-225.000.
Ahlers, Egon, to Krones AG. Bottle filling machine and a cleansing system accessory including an operator therefor. 5,533,552, Cl. 141-144.000.
Ahrens, Michael G.: *See—*
  Phillips, Christopher E.; Ahrens, Michael G.; Nolan, Joseph G., III; and Cooke, Laurence H., 5,534,798, Cl. 326-108.000.
Aihara, Ken; Kitagawara, Yutaka; and Takenaka, Takao, to Shin-Etsu Handotai Co., Ltd. Method of evaluating silicon wafers. 5,533,387, Cl. 73-105.000.
Aihara, Naoki; and Hoshino, Tadashi, to Fujitsu Limited. Police system of ATM exchange. 5,535,196, Cl. 370-60.000.
Air Liquide America Corporation: *See—*
  Schvester, Pascal; and Sauer, Richard A., 5,533,341, Cl. 62-50.100.
Air-Lite Transport, Inc.: *See—*
  Malecha, Michael R., 5,533,866, Cl. 417-44.900.
Air Products and Chemicals, Inc.: *See—*
  Carolan, Michael F.; and Dyer, Paul N., 5,534,471, Cl. 502-4.000.
  Howard, Lee J.; and Rowles, Howard C., 5,533,437, Cl. 95-42.000.
Air System Products, Inc.: *See—*
  Robinson, Larry P., 5,533,545, Cl. 137-195.000.
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  Carney, Ronald R.; and Williams, Terry L., 5,535,240, Cl. 375-219.000.
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  Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
Aiston, Finlay D.: *See—*
  Allen, Adrian S.; and Aiston, Finlay D., 5,534,035, Cl. 8-94.210.
Aizawa, Satoshi: *See—*
  Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.
Ajinomoto Co., Inc.: *See—*
  Hayashi, Sadao; Nakanishi, Eiji; Kurita, Yasuyuki; and Okunishi, Masahiko, 5,534,508, Cl. 514-206.000.
  Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.
AK Steel Corporation: *See—*
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Akai, Takahiro: *See—*
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Akasu, Michinori: *See—*
  Ono, Minoru; Tamura, Yuka; and Akasu, Michinori, 5,534,523, Cl. 514-308.000.
Akaza, Syunsuke: *See—*
  Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
Akimoto, Takayuki: *See—*
  Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
Akiyama, Shin-Ichiro, to NEC Corporation. Compact flag control circuit capable of producing a zero flag in a short time. 5,534,799, Cl. 327-20.000.
Akiyama, Takehiro; Shimomura, Katsuya; Takekawa, Kouzi; and Doi, Takehito, to Fujitsu Limited. Charge pump circuits for PLL frequency synthesizer. 5,534,821, Cl. 331-8.000.
Akiyama, Teruo: *See—*
  Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
Aktiebolaget Astra: *See—*
  Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori Péter, Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
Akzo Nobel N.V.: *See—*
  Maderek, Eugeniusz; and Brandau, Friedhelm, 5,533,210, Cl. 2-93.000.
Akzo Nobel NV: *See—*
  Geursen, Herman J.; and Willemsen, Stephanus, 5,534,304, Cl. 427-389.900.
Alatalo, Hannu; and Kokko, Marko, to Nokia Telecommunications OY. Method for implementing time switching, and a time switch. 5,535,203, Cl. 370-66.000.
Alberola, Marcel P. G.; Marchal de Corny, René G. M.; and Alexandre, Georges M., to Alu Livry. Die casting foundry machine adapted in particular to the production of metal parts in small and medium series. 5,533,564, Cl. 164-342.000.
Albert, Christine C.: *See—*
  Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., 5,534,040, Cl. 48-197.00R.
Albert, Eckehard, to Witels Apparate-Maschinen Albert GmbH & Co KG. Preforming head for making ropes and cable armor. 5,533,327, Cl. 57-311.000.
Albrecht, Richard E.: *See—*
  Dowe, David R.; and Albrecht, Richard E., 5,534,961, Cl. 354-264.000.
Alcatel Mobile Communication France: *See—*
  de Seze, Fabrice; and Gourgue, Frédéric, 5,535,424, Cl. 455-33.100.
Alcatel N.V.: *See—*
  Böttle, Dietrich, 5,535,032, Cl. 359-140.000.
  Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, 5,535,366, Cl. 395-486.000.
  Vazquez Lopez, Manuel; De La Cruz Moreno, Enrique; and Rodriguez Perez, Julio, 5,535,112, Cl. 363-20.000.
Alcon Laboratories, Inc.: *See—*
  Zanecchia, Denise; Heinrich, Ann M.; and Ustanik, Teresa, 5,534,952, Cl. 351-200.000.
Aldea, Gabriel S., to Trustees of Boston University. Method of tissue retroperfusion. 5,533,957, Cl. 600-16.000.
Aldred, Jeffrey K.: *See—*
  Platter, Sanford; Aldred, Jeffrey K.; and Kraemer, Richard J., 5,534,145, Cl. 210-90.000.
Alexander, Hannah: *See—*
  Moriarty, Ann M.; Alexander, Hannah; and Lerner, Richard A., 5,534,405, Cl. 435-5.000.
Alexandre, Georges M.: *See—*
  Alberola, Marcel P. G.; Marchal de Corny, René G. M.; and Alexandre, Georges M., 5,533,564, Cl. 164-342.000.
Ali, Mahfuza B.: *See—*
  Ali, M. Zaki; and Ali, Mahfuza B., 5,534,381, Cl. 430-156.000.
Ali, M. Zaki; and Ali, Mahfuza B., to Minnesota Mining and Manufacturing Company. Acetal polymers useful in photosensitive compositions. 5,534,381, Cl. 430-156.000.
Ali, M. Zaki, to Minnesota Mining and Manufacturing Company. Aminoketone sensitizers for photopolymer compositions. 5,534,633, Cl. 546-196.000.
Alker, David; Cross, Peter E.; and Wallis, Robert M., to Pfizer Inc. 1-arylethyl-3-substituted piperidines. 5,534,626, Cl. 544-360.000.
Alldredge, Phillip D.: *See—*
  Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., 5,534,873, Cl. 342-165.000.
Allegranza, Anthony C.: *See—*
  Tupper, George I. F.; Allegranza, Anthony C.; and Doherty, Phillip J., 5,534,820, Cl. 330-149.000.
Allen, Adrian S.; and Aiston, Finlay D., to Allied Colloids Limited. Leather treatment compositions. 5,534,035, Cl. 8-94.210.
Allen Engineering Corporation: *See—*
  Allen, J. Dewayne, 5,533,831, Cl. 404-114.000.
Allen, James D., to Ricoh Corporation; and Ricoh Company Ltd. Method and apparatus for limiting the number of a compressed output type in a compression/decompression system. 5,535,290, Cl. 382-250.000.
Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., to International Business Machines Corporation. Adapter for interleaving second data with first data already transferred between first device and second device without having to arbitrate for ownership of communications channel. 5,535,333, Cl. 395-200.030.
Allen, J. Dewayne, to Allen Engineering Corporation. Obstacle bypass system for concrete finishing tools. 5,533,831, Cl. 404-114.000.
Allen, Joy: *See—*
  Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
Allen United: *See—*
  Sampson, Gerald A.; Sanden, Gordon J.; and Sampson, Harold D., 5,533,468, Cl. 119-524.000.
Allergan: *See—*
  Chandraratna, Roshantha A. S., 5,534,516, Cl. 514-253.000.
  Song, Tae K.; and Chandraratna, Roshantha A., 5,534,641, Cl. 549-416.000.
Allergan, Inc.: *See—*
  Zaleski, Edward R.; and Cole, Mark S., 5,533,976, Cl. 604-153.000.
Alliance Semiconductor Corporation: *See—*
  Reddy, Chitranjan N.; and Poteet, Kenneth A., 5,535,172, Cl. 365-230.030.
Allied Colloids Limited: *See—*

  Allen, Adrian S.; and Aiston, Finlay D., 5,534,035, Cl. 8-94.210.
AlliedSignal Inc.: *See—*
  Dybro, Niels; and Miller, Harold J., III, 5,533,756, Cl. 280-806.000.
  Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., 5,534,588, Cl. 524-730.000.
  Nalewajek, David; Eibeck, Richard E.; and Thomas, Raymond H. P., 5,534,176, Cl. 252-68.000.
  Zupancic, Joseph J.; Conrad, Jeffrey P.; Konicek, Jiri D.; and Tungare, Aroon V., 5,534,565, Cl. 523-454.000.
Almey, Noel: *See—*
  De Ruyter, Peter W.; Almey, Noel; Slanik, Josef; and Teich, Wesley W., 5,534,278, Cl. 426-237.000.
Alon, Amir; Shapira, Shlomo; and Katz, Itzhak. Optical information system with a broad non-coherent irradiating beam coupled with optical fiber from a laser source. 5,535,189, Cl. 369-102.000.
Alpha, Béatrice: *See—*
  Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, 5,534,622, Cl. 534-15.000.
Alpha Enterprises, Inc.: *See—*
  Koch, Richard C., 5,533,702, Cl. 248-442.200.
Alpha, James W.; and Borrelli, Nicholas F., to Corning Incorporated. Disk substrate for magnetic memory devices. 5,534,321, Cl. 428-64.200.
Alteon Inc.: *See—*
  Ulrich, Peter C.; and Wagle, Dilip R., 5,534,540, Cl. 514-425.000.
Alu Livry: *See—*
  Alberola, Marcel P. G.; Marchal de Corny, René G. M.; and Alexandre, Georges M., 5,533,564, Cl. 164-342.000.
Aluminum Company of America: *See—*
  Adams, Edgar E.; Ellis, Darwin L.; and Stelle, Gerald E., 5,533,608, Cl. 198-478.100.
Alvarez, Cesar; and James, Lisa R., to Microsoft Corporation. Method and system for dragging and plotting new data onto an embedded graph. 5,535,324, Cl. 395-161.000.
Alves, James F.; Cacnio, Gerry R.; and Stevens, David R., to Hughes Aircraft Company. Video image processor and method for detecting vehicles. 5,535,314, Cl. 395-131.000.
Alvord-Polk, Inc.: *See—*
  Boyer, David C., 5,533,232, Cl. 16-114.00R.
ALZA Corporation: *See—*
  Gyory, J. Richard; and Peery, John R., 5,533,972, Cl. 604-20.000.
  Phipps, Joseph B., 5,533,971, Cl. 604-20.000.
  Wong, Patrick S.-L.; Edgren, David E.; Dong, Liang C.; and Ferrari, Vincent J., 5,534,263, Cl. 424-473.000.
Amada, Yoshiho: *See—*
  Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, 5,535,233, Cl. 372-87.000.
Amaike, Takeshi: *See—*
  Shirai, Yoshimitsu; Murakami, Haruji; and Amaike, Takeshi, 5,534,210, Cl. 264-171.130.
Amatsu, Hiroyuki: *See—*
  Ushikubo, Takashi; Oshima, Kazunori; Ihara, Tatsuya; and Amatsu, Hiroyuki, 5,534,650, Cl. 558-319.000.
Ambrose, Frederic C. Keyboard positioning system. 5,533,820, Cl. 400-472.000.
American Auto-Matrix, Inc.: *See—*
  Cecchini, Warren, 5,535,031, Cl. 359-113.000.
American Cyanamid Company: *See—*
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,483, Cl. 504-221.000.
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,484, Cl. 504-235.000.
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,485, Cl. 504-246.000.
American Film Technologies, Inc.: *See—*
  Sandrew, Barry B., 5,534,915, Cl. 348-29.000.
American Registry of Pathology: *See—*
  Lo, Shyh-Ching; Wang, Richard Y.; and Hayes, Michael M., 5,534,413, Cl. 435-7.320.
American Research Corporation: *See—*
  Varshney, Usha; and Decker, Lawrence H., 5,534,071, Cl. 118-726.000.
American Standard Inc.: *See—*
  Baldwin, Joe M.; and Cotton, Dale C., 5,533,348, Cl. 62-129.000.
  Crum, Daniel R.; Simmons, Bill P.; Teegarden, Arlo F.; Rood, Jerry A.; and Kotlarek, Peter A., 5,533,875, Cl. 417-368.000.
  Roth, Robert J., 5,533,345, Cl. 62-77.000.
American Sterilizer Company: *See—*
  Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
Amero, Willard F., Jr.: *See—*
  Hwang, B. Chester; Fernandez, Jose M.; Meadows, Vernon; Thomas, Simon; and Amero, Willard F., Jr., 5,534,366, Cl. 429-91.000.
Ami, Yasuhiro; and Fujii, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Data transfer control apparatus wherein a time value is compared to a clocked timer value with a comparison of the values causing the transfer of bus use right. 5,535,362, Cl. 395-474.000.
Ammermann, Eberhard: *See—*
  Wagner, Oliver; Eicken, Karl; Götz, Norbert; Rang, Harald; Ammermann, Eberhard; and Lorenz, Gisela, 5,534,653, Cl. 564-32.000.
Amrein, Thomas: *See—*
  Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, 5,534,001, Cl. 606-61.000.
Amri, Adel; and Hull, Thomas H., to Sun Microsystems, Inc. TCP/IP header compression X.25 networks. 5,535,199, Cl. 370-60.000.
Amway Corporation: *See—*
  Faber, Robert D.; and Jackson, Ronald C., 5,534,173, Cl. 508-203.000.
An, Hyeong-keon: *See—*
  Kim, Suk-ki; An, Hyeong-keon; Joo, Tae-sik; and Lee, Suk-jung, 5,535,356, Cl. 395-430.000.
Analog Devices, Incorporated: *See—*
  Harston, Stephen W., 5,535,174, Cl. 365-235.000.
  Moreland, Carl W., 5,534,794, Cl. 326-63.000.
Anazawa, Takashi: *See—*
  Kambara, Hideki; Anazawa, Takashi; Takahashi, Satoshi; and Murakami, Katsuhiko, 5,534,703, Cl. 250-458.100.
Anderson, Alan C., to Dresser-Rand Company. Walled precombustion chamber unit. 5,533,476, Cl. 123-267.000.
Anderson, Charles C.; Niemeyer, David A.; and Jennings, David F., to Eastman Kodak Company. Electron beam recording film with low visual and ultraviolet density. 5,534,397, Cl. 430-530.000.
Anderson, Daniel W.: *See—*
  Leonard, Timothy J.; and Anderson, Daniel W., 5,533,749, Cl. 280-728.300.
Anderson, David: *See—*
  Gunter, Brad D.; Anderson, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, 5,534,819, Cl. 327-553.000.
Anderson, David G.; and Claflin, Alfred J., to Xerox Corporation. Ink jet maintenance subsystem. 5,534,897, Cl. 347-32.000.
Anderson, Howard C.: *See—*
  Gunter, Brad D.; Anderson, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, 5,534,819, Cl. 327-553.000.
Anderson, Kathryn T.: *See—*
  McLarty, George C., III; Waldrop, Anthony R.; and Anderson, Kathryn T., 5,533,789, Cl. 297-452.640.
Anderson, M. Neil: *See—*
  Brumfield, David L.; Anderson, M. Neil; and Luque, Eduardo R., 5,534,002, Cl. 606-61.000.
Anderson, Neal R.: *See—*
  Erickson, Bart J.; and Anderson, Neal R., 5,534,876, Cl. 342-387.000.
Anderson, Patricia P.: *See—*
  Thompson, Dennis P.; Anderson, Patricia P.; and Slick, Donald, 5,534,608, Cl. 528-12.000.
Andersson, Bengt: *See—*
  Franke, Rickard; Brandstrom, Per; Kaneko, Yutaka; and Andersson, Bengt, 5,533,550, Cl. 141-51.000.
Ando Electric Co., Ltd.: *See—*
  Tanabe, Keiji; and Kikuchi, Makoto, 5,535,353, Cl. 395-421.100.
Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, to Warner-Lambert Company. (R)-(Z)-1-azabicyclo [2.2.1] heptan-3-one,O-[3-(3-methoxyphenyl)-2-propynyl] oxime maleate as a pharmaceutical agent. 5,534,522, Cl. 514-299.000.
Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, to Toto Ltd. Membraneless water electrolyzer. 5,534,120, Cl. 205-464.000.
Ando, Takeshi: *See—*
  Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
Andrea, Davide: *See—*
  Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., 5,535,274, Cl. 379-446.000.
Andre De La Porte, Gilles; and Swinkels, Cornelis T. J. M., to Parabeam Industrie-en Handelsonderneming B.V. Hollow fiber-reinforced plastic body. 5,534,318, Cl. 428-36.900.
Andreiko, Craig A.; and Payne, Mark A., to Ormco Corporation. Orthodontic appliance and group standardized brackets therefor and methods of making, assembling and using appliance to straighten teeth. 5,533,895, Cl. 433-24.000.
Andrew, Susan: *See—*
  Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., 5,534,438, Cl. 435-320.100.
Andrews, Philip C.: *See—*
  Wakefield, Thomas W.; Stanley, James C.; and Andrews, Philip C., 5,534,619, Cl. 530-324.000.
Andrews, Stanley B.: *See—*
  Moshier, Mark W.; Haley, John C.; Haley, Bobby Z.; and Andrews, Stanley B., 5,533,343, Cl. 62-63.000.
Andritz-Patentverwaltungs-Gesellschaft m.b.H.: *See—*
  Cadek, Walter; Kappel, Johannes; and Neuhold, Rudolf, 5,534,139, Cl. 210-96.100.
Andrus, James S., to United Technologies Corporation. Method for making a cobalt-boride dispersion-strengthened copper. 5,534,086, Cl. 148-513.000.
Andrus, Ronald I.; and MacDowell, John F., to Corning Incorporated. Lithium aluminoborate glass-ceramics. 5,534,470, Cl. 501-32.000.
Anelva Corporation: *See—*
  Mizuno, Shigeru; Katsumata, Yoshihiro; and Takahashi, Nobuyuki, 5,534,072, Cl. 118-728.000.
Angeion Corporation: *See—*
  Kroll, Mark W.; and Brewer, James E., 5,534,015, Cl. 607-7.000.
Angeler, Alois; Kaune, Harald; and Scheuten, Theo, to Didier-Werke AG. Gas and/or solid material blasting device for a metallurgical vessel and method of manufacture thereof. 5,533,713, Cl. 266-218.000.

- Angelette, A. M. Railroad crossing signal foundation and method of producing and erecting the same. 5,533,835, Cl. 405-229.000.
- Angermann, Rolf: *See—*
  - Adrian, Adolf; and Angermann, Rolf, 5,533,598, Cl. 188-322.170.
- Anglin, Mark E.: *See—*
  - Ott, James H.; Anglin, Mark E.; and Henderson, James P., 5,533,347, Cl. 62-115.000.
- Ansell, Steve, to University of British Columbia, The. Lipophilic drug derivatives for use in liposomes. 5,534,499, Cl. 514-25.000.
- Antebi, Charlie S.: *See—*
  - Goldenberg, Lior; Antebi, Charlie S.; and Hecht, Oded R., 5,534,690, Cl. 250-222.100.
- Anzai, Kazuo: *See—*
  - Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, 5,534,204, Cl. 264-102.000.
- Ao, Norio; and Kubo, Hirotsugu, to NKK Corporation. Melting furnace having preheating vessel. 5,535,235, Cl. 373-78.000.
- Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, to Nissei Plastic Industrial Co., Ltd. Method of injection molding polyethylene terephthalate. 5,534,204, Cl. 264-102.000.
- Aoki, Katsuhiko; Tsuchiya, Makio; and Inoue, Seiya, to Mitsubishi Denki Kabushiki Kaisha. Mobile communication terminal equipment usable for both satellite and terrestrial communications. 5,535,430, Cl. 455-54.100.
- Aoki, Nobuo: *See—*
  - Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, 5,534,255, Cl. 424-141.100.
- Aoki, Shigenori; Kamezaki, Hiroshi; Hida, Masaharu; and Yokouchi, Kishio, to Fujitsu Limited. Method of manufacturing a multi-layered ceramic circuit board containing layers of reduced dielectric constant. 5,534,331, Cl. 428-209.000.
- Aono, Kenji: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Aosaki, Ko: *See—*
  - Tuchida, Michiro; Nomura, Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, 5,534,955, Cl. 353-66.000.
- Aoyama, Seiki: *See—*
  - Watanabe, Takamoto; and Aoyama, Seiki, 5,534,809, Cl. 327-269.000.
- Apolito, James D.: *See—*
  - Ahl, David K.; Swanson, Roger M.; Apolito, James D.; and Wafler, Walter F., 5,533,720, Cl. 271-225.000.
- Appel, Wolfgang; Ebmeyer, Frank; Metzenthin, Tobias; and Siegemund, Günter, to Hoechst AG. Process for preparing trifluoroethyl sulfur compounds from thiolates and 1-chloro-2,2,2-trifluoroethane. 5,534,634, Cl. 546-303.000.
- Apple Computer, Inc.: *See—*
  - Acero, Alejandro; Chow, Yen-Lu; and Lee, Kai-Fu, 5,535,305, Cl. 395-2.650.
  - Hansen, Daniel J., Jr.; Gough, Michael L.; and Hollowell, J. Rhoads, 5,534,893, Cl. 345-179.000.
- Appleton Papers Inc.: *See—*
  - Wadzinski, Michael, 5,533,244, Cl. 29-90.100.
- Applied Materials, Inc.: *See—*
  - Qian, Xue-Yu; Yin, Gerald; Hills, Graham W.; and Steger, Robert, 5,534,108, Cl. 156-643.100.
  - Shamouilian, Shamouil; and Clark, Daniel O., 5,533,923, Cl. 451-41.000.
  - Stevens, Craig L., 5,535,306, Cl. 395-89.000.
- Aqui, Derek G.: *See—*
  - Borden, Peter G.; Aqui, Derek G.; and Evanko, Matt A., 5,534,706, Cl. 250-574.000.
- Aquino, Agostino: *See—*
  - Pappas, Chris; Koppa, Daniel A.; Skeels, Roger E.; and Aquino, Agostino, 5,534,281, Cl. 426-383.000.
- Ara, Yoji: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Arad, Abraham A.; Pitrone, Anne; and Jeffway, Robert W., Jr., to Toy Biz, Inc. Self-propelled musical toy ball. 5,533,920, Cl. 446-409.000.
- Arad, Shoshana (Malis); and Cohen, Ephraim, to Negev, Ben-Gurion University of the. Microorganism growth apparatus. 5,534,417, Cl. 435-67.000.
- Arai, Atsushi: *See—*
  - Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, 5,534,898, Cl. 347-33.000.
- Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, to Konica Corporation. Processing method of black-and-white light-sensitive silver halide photographic material and processing agent for the same. 5,534,389, Cl. 430-401.000.
- Arai, Tsuyoshi: *See—*
  - Nakamura, Nobuyuki; and Arai, Tsuyoshi, 5,533,884, Cl. 425-145.000.
- Arai, Yoshihisa: *See—*
  - Johno, Masahiro; Yui, Tomoyuki; Matsumoto, Takahiro; and Arai, Yoshihisa, 5,534,190, Cl. 252-299.650.
- Arbeiter, Jason R.: *See—*
  - Nobel, Gary M.; Wilson, Arthur K.; Brown, Patricia S.; and Arbeiter, Jason R., 5,533,904, Cl. 439-67.000.
- Archer, Stephen T., to Ventritex, Inc. High input impedance gate driver circuit with Miller protection and delayed turnoff. 5,534,814, Cl. 327-427.000.
- ARCO Chemical Technology, L.P.: *See—*
  - Guo, Shao-Hua, 5,534,598, Cl. 525-329.200.
- Arctco, Inc.: *See—*
  - Thompson, Kevin D., 5,533,586, Cl. 180-193.000.
- Argandona, Toby. Locking cover assembly. 5,533,641, Cl. 220-323.000.
- Aries Electronics, Inc.: *See—*
  - Sinclair, William Y.; and Walter, James P., 5,533,665, Cl. 228-180.100.
- Arikawa, Kazuhiko: *See—*
  - Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke, Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
- Arima, Ryoji: *See—*
  - Yamada, Keiki; Ohnishi, Masaru; Odai, Yoshiaki; and Arima, Ryoji, 5,534,906, Cl. 347-171.000.
- Arinaga, Kenji: *See—*
  - Fujiwara, Koji; Sudo, Gen; and Arinaga, Kenji, 5,534,109, Cl. 156-643.100.
- Aristech Chemical Corporation: *See—*
  - Smeal, Thomas W.; and Brownell, George L., 5,534,211, Cl. 264-308.000.
- Arita, Hitoshi: *See—*
  - Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, 5,534,654, Cl. 564-90.000.
- Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., to IBM Corporation. Method for fabricating multi-layer thin film structure having a separation layer. 5,534,094, Cl. 156-155.000.
- Armstrong, Joseph D., III: *See—*
  - Chartrain, Michel; and Armstrong, Joseph D., III, 5,534,422, Cl. 435-118.000.
- Armstrong World Industries, Inc.: *See—*
  - Brown, David S., 5,534,095, Cl. 156-209.000.
- Arn, Robert W., to Petroleum Containment, Inc. Bulkhead entry filling. 5,533,547, Cl. 137-360.000.
- Arney, Michelle: *See—*
  - Pray, James R.; Cornelius, Richard G.; and Arney, Michelle, 5,533,987, Cl. 604-280.000.
- Arnold, Finn: *See—*
  - Kamen, Dean L.; Seale, Joseph B.; Briggs, Joseph; and Arnold, Finn, 5,533,389, Cl. 73-149.000.
- Arnold, William D. Balanced and stabilized quicksort method. 5,535,378, Cl. 395-600.000.
- Arrau, Agustin H., to Bio-Waste Technologies, International, Ltd. Co-composting process and apparatus for treating solid waste and sewage sludge. 5,534,437, Cl. 435-290.300.
- Arriza, Jeffrey: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Artann Corporation: *See—*
  - Sarvazyan, Armen; and Ponomarev, Viktor, 5,533,402, Cl. 73-645.000.
- Asaba, Tetsuo, to Canon Kabushiki Kaisha. Method of manufacturing titanium silicide containing semiconductors. 5,534,453, Cl. 437-41.000.
- Asaba, Tetsuo: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Asada, Kazutoshi: *See—*
  - Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, 5,535,075, Cl. 360-105.000.
- Asahi Denka Kogyo Kabushiki Kaisha: *See—*
  - Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, 5,534,643, Cl. 554-227.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  - Matsuzaki, Hiromi; Ojima, Satoshi; and Nakamura, Masashi, 5,534,031, Cl. 623-17.000.
  - Noguchi, Masato, 5,535,179, Cl. 369-13.000.
  - Nomura, Hiroshi; and Sasaki, Takamitsu, 5,535,057, Cl. 359-694.000.
  - Sawanobori, Keiji, 5,534,921, Cl. 348-333.000.
- Asano, Erika: *See—*
  - Kisu, Hiroki; Ohkubo, Masaharu; Sakurai, Kazushige; Yamazaki, Michihito; Asano, Erika; Shimizu, Yasushi; and Ogata, Hiroaki, 5,534,344, Cl. 428-323.000.
- Asano, Takanobu, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Notch position aligning apparatus and process for using the apparatus to independently align individual wafers in a wafer cassette. 5,533,243, Cl. 29-25.010.
- Asanuma, Tadashi; Matsuzawa, Hiroshi; Sasaki, Tateyo; and Kawanishi, Kaoru, to Mitsui Toatsu Chemicals, Inc. Syndiotactic propylene copolymer, preparation of the same, and resin composition containing the same. 5,534,595, Cl. 525-326.500.

- Asao, Koichi: *See—*
  - Kambara, Yoshihiko; Uehara, Yoshikazu; Abe, Takeya; and Asao, Koichi, 5,534,655, Cl. 564-127.000.
- Asayama, Yoshinori: *See—*
  - Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
- Asea Brown Boveri AB: *See—*
  - Keijser, Olof, 5,535,129, Cl. 364-472.000.
- Ashbrook, Clifford L., to Quinetics Corporation. Bullet puller. 5,533,246, Cl. 29-275.000.
- Ashley, James P.; and Proctor, Lee M., to Motorola, Inc. Method and apparatus for echo canceling with double-talk immunity. 5,535,194, Cl. 370-32.100.
- Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., to Du Pont de Nemours, E. I., and Company. Integrated chemical processing apparatus and processes for the preparation thereof. 5,534,328, Cl. 428-166.000.
- ASICS Corporation: *See—*
  - Kataoka, Akira; Mimura, Hitoshi; Kuramoto, Manabu; and Tukita, Ryuichi, 5,533,282, Cl. 36-129.000.
  - Mitsui, Shigeyuki; and Hase, Yoshiaki, 5,533,279, Cl. 36-50.100.
- Asirvatham, Edward T.: *See—*
  - Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., 5,534,588, Cl. 524-730.000.
- Askle: *See—*
  - Sebag, Albert; and Benguigui, Paul, 5,533,220, Cl. 5-654.000.
- Aso, Kazuyoshi; Noguchi, Masami; Kobayashi, Katsumi; and Yamagishi, Takeshi, to Nippon Denkai, Ltd. Non-cyanide copper-zinc electroplating bath, method of surface treatment of copper foil for printed wiring board using the same and copper foil for printed wiring board. 5,534,128, Cl. 205-176.000.
- Aspenson, Daniel L. Construction panel sections with concealed open regions. 5,533,306, Cl. 52-144.000.
- Assa, Shlomo: *See—*
  - Hargis, David E.; Flint, Graham; and Assa, Shlomo, 5,534,950, Cl. 348-758.000.
- Assistance Proto Industrie France: *See—*
  - Carmona, Henri, 5,533,762, Cl. 285-101.000.
- AST Research, Inc.: *See—*
  - Suwandhaputra, Johannes H., 5,535,265, Cl. 379-97.000.
- Astec Industries, Inc.: *See—*
  - Campbell, Thomas R., 5,533,828, Cl. 404-75.000.
  - Campbell, Thomas R., 5,533,829, Cl. 404-81.000.
- Aston, Roger; and Kovalev, Igor E., to Peptech (UK) Limited. Muramyl peptide for the treatment of toxicity. 5,534,492, Cl. 514-8.000.
- Astra Aktiebolag: *See—*
  - Källstrand, Göran; and Nilsson, Per-Gunnar, 5,533,505, Cl. 128-203.150.
- AT&T Corp.: *See—*
  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
  - Basiev, Tasoltan T.; Bridenbaugh, Paul M.; and Thomas, Gordon A., 5,535,051, Cl. 359-342.000.
  - Csipkes, Andrei; and Palmquist, John M., 5,535,002, Cl. 356-345.000.
  - Frye, Robert C.; and Tai, King L., 5,534,465, Cl. 437-209.000.
  - Griffin, Timothy G.; and Libkin, Leonid, 5,535,385, Cl. 395-600.000.
  - Gross, George F., Jr.; McPartland, Richard J.; and Viswanathan, Thayamkulangara R., 5,534,862, Cl. 341-144.000.
  - Hall, Joseph L., II; and Johnston, James D., 5,535,300, Cl. 395-2.360.
  - Le, Duy K., 5,535,222, Cl. 371-22.300.
  - Logan, Shawn M., 5,534,826, Cl. 331-158.000.
  - Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,534,913, Cl. 348-7.000.
  - Massini, Anthony L., Jr.; and Shepard, Roy D., 5,533,663, Cl. 228-103.000.
  - McPartland, Richard J., 5,534,797, Cl. 326-105.000.
  - Razavi, Behzad, 5,534,802, Cl. 327-94.000.
  - Shibib, Muhammed A., 5,534,721, Cl. 257-339.000.
  - Wheary, David, 5,533,264, Cl. 30-90.100.
- Atanasyan, Alain A., to Siemens Automotive, S.A. Method and device for verifying the operating condition of a system for recovering vapors originating from the fuel tank of a motor vehicle. 5,533,493, Cl. 123-698.000.
- Atkinson, Gordon E.; and Solomon, Thomas J., to Vernay Laboratories, Inc. Medical coupling site valve body. 5,533,708, Cl. 251-149.100.
- Atlantic Richfield Company: *See—*
  - Brady, Jerry L.; Gerlek, Stephen; Lagerlef, David L.; and Wydrinski, Raymond, 5,533,572, Cl. 166-250.050.
  - Pullar, Gregory T.; Christensen, Robin B.; and Okonek, Lester J., 5,533,333, Cl. 60-327.000.
  - Streich, Steven G.; Crook, Ronald J.; and Jones, Richard R., 5,533,570, Cl. 166-153.000.
- Atobe, Mitsuro: *See—*
  - Ohno, Yoshihiro; Atobe, Mitsuro; and Tanbo, Hitoshi, 5,534,900, Cl. 347-54.000.
- Attridge, Russell G., Jr. Remotely trippable and resettable damper. 5,533,929, Cl. 454-369.000.
- Aubee, Norman D. J.: *See—*
  - Taylor, Joseph W.; Goyal, Shivendra K.; Aubee, Norman D. J.; and Bohnet, Nick K. K., 5,534,572, Cl. 524-275.000.
- Auer, Wolfgang: *See—*
  - Agro, Marc; Auer, Wolfgang; Hilt, Gerard; Peters, Henning; and Rust, Sabine, 5,533,776, Cl. 296-97.900.
- August Bilstein GmbH & Co. KG: *See—*
  - Adrian, Adolf; and Angermann, Rolf, 5,533,598, Cl. 188-322.170.
- August Lotz Co., Inc.: *See—*
  - Schlichter, Mark E.; and Barton, Mark S., 5,534,295, Cl. 427-284.000.
- Auratek Security Inc.: *See—*
  - Harman, Robert K., 5,534,869, Cl. 342-27.000.
- Aurell, Eskil, to ABB Flakt AB. Valve arrangement. 5,533,706, Cl. 251-44.000.
- Austin, John A.: *See—*
  - Zlotnik, Arnold H.; Austin, John A.; and Zlotnik, Milton, 5,533,705, Cl. 248-645.000.
- Automatic Handling, Inc.: *See—*
  - McHenry, Earl E., 5,533,859, Cl. 414-772.000.
- Avatar Systems Corporation: *See—*
  - Nelson, Kenneth J.; McGrath, Michael C.; and Avery, Timothy O., 5,535,081, Cl. 360-133.000.
- Avery Dennison Corporation: *See—*
  - Smith, Mark T., 5,534,587, Cl. 524-575.000.
- Avery, Timothy O.: *See—*
  - Nelson, Kenneth J.; McGrath, Michael C.; and Avery, Timothy O., 5,535,081, Cl. 360-133.000.
- Avey, Alfred A., Jr.: *See—*
  - Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., 5,534,312, Cl. 427-533.000.
- Avignon, Bruno; Barre, Charles; and Canal, Yves, to Thomson - CSF. Anticollision device, notably for motor vehicles. 5,534,870, Cl. 342-70.000.
- Awai, Takashi; and Sasai, Keizo, to Canon Kabushiki Kaisha. Curl correction apparatus. 5,533,821, Cl. 400-619.000.
- Awai, Takashi: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Axis Bicycle Incorporated: *See—*
  - Peart, Stephen, 5,533,742, Cl. 280-281.100.
- Axtell, James C.: *See—*
  - Nalos, Ervin J.; and Axtell, James C., 5,534,824, Cl. 331-81.000.
- Aydin, Oral; Kröner, Hubertus; Wistuba, Eckehardt; and Fickeisen, Peter, to BASF Aktiengesellschaft. Preparation of solvent-free aqueous polymer and tackifier dispersions. 5,534,571, Cl. 524-272.000.
- Aydt, Matthias: *See—*
  - Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
- Ayorinde, Emmanuel O.: *See—*
  - Gibson, Ronald F.; and Ayorinde, Emmanuel O., 5,533,399, Cl. 73-579.000.
- Ayral, Jean-Luc; Tournois, Pascal; and Huignard, Jean-Pierre, to Thomson-CSF. Device for stabilizing the reflectivity of mirrors having phase conjugation through stimulated brillouin scattering at high pulse repetition rate. 5,535,041, Cl. 359-211.000.
- Az Company: *See—*
  - Fujiki, Satoshi; and Kamata, Hideo, 5,534,305, Cl. 427-393.000.
- Azuhata, Shigeru: *See—*
  - Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
- Azumai, Mitsuo: *See—*
  - Takaki, Kouichi; Azumai, Mitsuo; and Ishii, Hiroshi, 5,534,808, Cl. 327-261.000.
- Baba, Akira; Sugimura, Kazuo; Miwa, Satoshi; Yamamoto, Keizo; and Saito, Masayuki, to Yazaki Corporation. Photo SI thyristor driving circuit and its protection circuit. 5,534,735, Cl. 307-117.000.
- Baba, Ichiro: *See—*
  - Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, 5,534,362, Cl. 429-32.000.
- Babcock & Wilcox Company, The: *See—*
  - Johnson, Dennis W.; and Schulze, Karl H., 5,534,230, Cl. 422-173.000.
  - Kung, Steven C.; and Gleixner, Richard A., 5,534,313, Cl. 427-543.000.
- Bacardi, Jean M.; Camerer, Robert L.; Huey, Andrew M.; and Shirley, Arthur R., Jr. Granulation of phosphorus pentasulfide with a predetermined reactivity. 5,534,349, Cl. 428-403.000.
- Bachina, Tatyana A.: *See—*
  - Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.
- Bacon, Forrest C.; and Highberger, Gary G., to Kliklok Corporation. Continuous vertical form-fill-seal packaging machine with constant motion carriage. 5,533,322, Cl. 53-451.000.
- Badger, John S.: *See—*
  - McGuckin, Hugh G.; Carli, Jerel R.; Badger, John S.; and Waffle, Stephen J., 5,534,396, Cl. 430-463.000.
- Badorc, Alain: *See—*
  - Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, 5,534,530, Cl. 514-361.000.

- Badval, Rajeev, to Hewlett-Packard Company. Switching circuit for signal sampling with reduced residual charge effects. 5,534,815, Cl. 327-437.000.
- Bae, Byungseong; Kim, Kyungseop; Yoon, Wonbong; and Lee, Seogyul, to Samsung Electronics Co., Ltd. Liquid crystal display panel having non-rectilinear data lines. 5,535,028, Cl. 359-61.000.
- Bae, Myung-Ho: *See*—
  - Han, Yong-Joo; and Bae, Myung-Ho, 5,535,152, Cl. 365-51.000.
- Baer, Ronald W., to Unique Industries, Inc. High pressure hot water chemical washer. 5,533,671, Cl. 239-10.000.
- Bagwell, Johnny. Method and device for determining the straightness and balance of an arrow. 5,533,272, Cl. 33-506.000.
- Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., to Copeland Corporation. Forced air heat exchanging system with variable fan speed control. 5,533,352, Cl. 62-180.000.
- Bahrabadi, Casey K., to Kroy, Inc. Tape cartridge for a printing device. 5,533,818, Cl. 400-208.000.
- Bai, Yang-Fong. Concealable caster of baggage. 5,533,231, Cl. 16-34.000.
- Bailey, Edward D., Jr., to Cobale Company, L.L.C. Thermoset reinforced corrosion resistant laminates. 5,534,337, Cl. 428-236.000.
- Bailly, Christiaan M. E.; and Koevoets, Christiaan H. J., to General Electric Company. Extrudable thermoplastic composition comprising a compatibilized polyphenylene ether polyamide resin blend. 5,534,600, Cl. 525-397.000.
- Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., to Ecolab Inc. Perforated, stable, water soluble film container for detersive compositions. 5,534,178, Cl. 510-367.000.
- Baines, Stephen J.; and Hayward, Barry, to Unilever Patent Holdings BV. Emulsion binders. 5,534,341, Cl. 428-288.000.
- Baji, Toru; and Kiuchi, Atsushi, to Hitachi America, Inc. On-chip DMA controller with host computer interface employing boot sequencing and address generation schemes. 5,535,417, Cl. 395-842.000.
- Bakanowski, Stephen M.: *See*—
  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
- Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., to AT&T Corp. ISDN basic rate interface central office station terminal emulator for customer premises equipment. 5,535,198, Cl. 370-60.000.
- Baker, Gary L.; Jakubiec, Steven M.; Agar, Brian E.; and Brom, Erik, to Chrysler Corporation. Method and apparatus for controlling the clutch of an air conditioner system. 5,533,353, Cl. 62-227.000.
- Baker Hughes Incorporated: *See*—
  - Jordan, Henry J., Jr.; McNair, Robert J.; Emerson, Alan B.; Kennedy, Brian S.; and Zimmerman, Patrick J., 5,533,573, Cl. 166-313.000.
  - Tibbitts, Gordon A., 5,533,582, Cl. 175-430.000.
- Baker, Joffre; Chien, Kenneth; King, Kathleen; Pennice, Diane; and Wood, William, to Genentech, Inc.; and University of California, The Regents of the. Cardiac hypertrophy factor and uses therefor. 5,534,615, Cl. 530-350.000.
- Baker, Ronald J.: *See*—
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- Baldi, Livio, to SGS-Thomson Microelectronics S.r.l. Process for realizing P-channel MOS transistors having a low threshold voltage in semiconductor integrated circuits for analog applications. 5,534,448, Cl. 437-34.000.
- Baldwin, Joe M.; and Cotton, Dale C., to American Standard Inc. Average air temperature sensor. 5,533,348, Cl. 62-129.000.
- Baldwin, John L. E., to Rank Cintel Limited. Method and apparatus for reducing the effect of alias components produced through non-linear digital signal processing, such as gamma correction, by selective attenuation. 5,534,948, Cl. 348-675.000.
- Ball, Gary A.; and Newman, Leon A., to United Technologies Corporation. Dual-wavelength frequency-chirped microwave AMCW ladar system. 5,534,993, Cl. 356-5.090.
- Ball, Gary E.; and Eby, Edward D., to Hughes Electronics. Infrared imaging system for enhancing the perception of a scene by a vehicle operator. 5,534,694, Cl. 250-330.000.
- Ball, Keith W.: *See*—
  - Neill, Kenneth; and Ball, Keith W., 5,535,102, Cl. 361-832.000.
- Balmer, David C.: *See*—
  - Tremblay, Jules M.; Balmer, David C.; and Ruff, Helmut, 5,533,594, Cl. 187-201.000.
- Balzano, Quirino; Richards, Scott H.; and Claxton, Bruce A., to Motorola, Inc. Communication device using antenna having an offset. 5,535,435, Cl. 455-89.000.
- Balzer, Wolfgang R.: *See*—
  - Neunhoeffer, Hans; Gerstung, Stefan; Clausen, Thomas; and Balzer, Wolfgang R., 5,534,267, Cl. 424-701.000.
- Bamberg, Joachim; Steinhauser, Ludwig; Bayer, Erwin; and Adam, Peter, to MTU Motoren-Und Turbinen-Union München GmbH. Ceramic, Heat insulation layer on metal structural part and process for its manufacture. 5,534,308, Cl. 427-454.000.
- Bambury, Ronald E.; and Choo, Dong J., to Bausch & Lomb Incorporated. Hydrophilic oxygen permeable polymers. 5,534,605, Cl. 526-260.000.
- Bamji, Soli S.; and Bulinski, A. T., to National Research Council of Canada. Measurement of crosslinking by-products in crosslinked polyethylene. 5,533,807, Cl. 374-45.000.
- Ban, Amir: *See*—
  - Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.
- Bán, Károly: *See*—
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Ildikó; Kovari, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Ban, Yasuaki: *See*—
  - Sugita, Ryuji; Tohma, Kiyokazu; Ishida, Tatsuaki; and Ban, Yasuaki, 5,534,324, Cl. 428-694.00T.
- Banerji, Kingshuk: *See*—
  - Miles, Barry M.; Juskey, Frank J.; and Banerji, Kingshuk, 5,535,101, Cl. 367-808.000.
- Bang, Kug-Hyeon, to SamSung Electronics Co., Ltd. Apparatus for reducing impacts on a hard disk assembly. 5,535,092, Cl. 361-685.000.
- Banniza, Thomas: *See*—
  - Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, 5,535,366, Cl. 395-486.000.
- Bansod, Snehal M.: *See*—
  - Rele, Meenakshi V.; Bansod, Snehal M.; and Srinivasan, Mandayam C., 5,534,429, Cl. 435-200.000.
- Bao, Qi-Bin; and Higham, Paul A., to Howmedica, Inc. Hydrogel intervertebral disc nucleus with diminished lateral bulging. 5,534,028, Cl. 623-17.000.
- Bapat, Swati, to Warner-Lambert Company. Clear non-alcoholic sinus and allergy medication. 5,534,552, Cl. 514-667.000.
- Baptista, Laura J.: *See*—
  - Tomlinson, Roger R.; and Baptista, Laura J., 5,533,947, Cl. 482-6.000.
- Barak, Dov: *See*—
  - Fisher, Abraham; Karton, Yishai; Marciano, Daniele; Barak, Dov; and Meshulam, Haim, 5,534,520, Cl. 514-278.000.
- Barbarich, Steven S.: *See*—
  - Wells, Steven; Hasbun, Robert N.; Domonkos, Sara; and Barbarich, Steven S., 5,535,369, Cl. 395-497.020.
- Barbier, Bruno; Lach, Patrick; and Leger, Alain, to Sextant Avionique. Device to check the setting of the position and orientation of a helmet with respect to the helmet wearer's head. 5,534,689, Cl. 250-206.200.
- Bareham, Peter B.: *See*—
  - Blitz, Martin C.; Stegeman, James C.; and Bareham, Peter B., 5,535,399, Cl. 395-750.000.
- Barelli, Alfredo; and DePlano, Stefano, to Iritecna Societa per l'Impiantistica Industriale e l'Assetto del Territorio P.A. Walking-beam furnace for the accelerated heating of billets or the like. 5,533,893, Cl. 432-122.000.
- Barichello, Luiji, to Barikell S.r.l. Float finish machine. 5,533,830, Cl. 404-96.000.
- Barikell S.r.l.: *See*—
  - Barichello, Luiji, 5,533,830, Cl. 404-96.000.
- Baril, Albert M.; Holmes, Roy H.; and Critzer, Mark R., to ITT Corporation. Night vision goggle assembly with independant monocular devices. 5,535,053, Cl. 359-409.000.
- Barker, David L.: *See*—
  - Bashkin, John S.; Barker, David L.; and Johnston, Richard F., 5,534,123, Cl. 204-455.000.
- Barker, John M.: *See*—
  - Metcalf, Gerald L.; Poff, Bradley C.; and Barker, John M., 5,533,977, Cl. 604-164.000.
- Barkley, Thomas: *See*—
  - Springer, Marlin D.; Burns, William C.; and Barkley, Thomas, 5,534,659, Cl. 588-227.000.
- Barnard, Willard C.: *See*—
  - Bradbury, Rod J.; Barnard, Willard C.; and Wysong, Joel F., 5,534,854, Cl. 340-648.000.
- Barnett, William C.: *See*—
  - Hulse, David K.; and Barnett, William C., 5,533,607, Cl. 198-448.000.
- Baron, Peter C., to Hughes Aircraft Company. Two channel field sequential color display system. 5,534,949, Cl. 348-742.000.
- Barr, Arthur; Sturgill, Lewis; and De Jesus Munoz Contreras, Jose, to Foamex L.P. Three dimensional surface shaping of synthetic foam pads by continuous rotary process. 5,534,208, Cl. 264-160.000.
- Barrasso, Michael J.: *See*—
  - Lee, Ron C.; Heil, Michael D.; Downey, Michael T.; and Barrasso, Michael J., 5,533,338, Cl. 62-638.000.
- Barre, Charles: *See*—
  - Avignon, Bruno; Barre, Charles; and Canal, Yves, 5,534,870, Cl. 342-70.000.
- Barrett, Stephen D.: *See*—
  - Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, 5,534,522, Cl. 514-299.000.
- Barringer, Wayne A.; Decusatis, Casimer M.; and Stigliani, Daniel J., Jr., to International Business Machines Corporation. Portable fiber optic splitter tool for multimode optical fiber cable link. 5,535,139, Cl. 364-550.000.
- Barriuso, Frank R.; Pase, Douglas M.; and Sielaff, David J., to Cray Research, Inc. Method and apparatus for locking shared memory locations in multiprocessing systems. 5,535,365, Cl. 395-482.000.
- Barsamian, James G.: *See*—

  - Bass, Robert, Jr.; and Barsamian, James G., 5,533,523, Cl. 128-859.000.
- Barth, Walter; Fuchs, Rudolf; Langenfelder, Frank; and Martinez, David M., to Robert Bosch GmbH. Electric hand tool, in particular drill. 5,533,581, Cl. 173-216.000.
- Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased (by Regine Nonnenmacher, legal representative); and Weiss, Helga, to International Business Machines Corporation. Calibration standard for 2-D and 3-D profilometry in the sub-nanometer range and method of producing it. 5,534,359, Cl. 428-688.000.
- Bartholin, Niels: *See*—
  - Brade, Claus B.; and Bartholin, Niels, 5,533,391, Cl. 73-170.190.
- Bartley, Burton H.: *See*—
  - Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Bartley, Burton H., 5,534,135, Cl. 208-120.000.
- Barton, Mark S.: *See*—
  - Schlichter, Mark E.; and Barton, Mark S., 5,534,295, Cl. 427-284.000.
- Basawapatna, Ganesh R.: *See*—
  - Sie, John J.; and Basawapatna, Ganesh R., 5,534,941, Cl. 348-564.000.
- BASF Aktiengesellschaft: *See*—
  - Adel, Jörg; and Dyllick-Brenzinger, Rainer, 5,534,378, Cl. 430-106.600.
  - Aydin, Oral; Kröner, Hubertus; Wistuba, Eckehardt; and Fickeisen, Peter, 5,534,571, Cl. 524-272.000.
  - Bergmann, Udo; Schlueter, Harald; and Schmitt, Michael, 5,534,627, Cl. 546-30.000.
  - Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, 5,534,166, Cl. 8-557.000.
  - Hinz, Werner; Zschiesche, Ruth; Lutter, Heinz-Dieter; and Bruchmann. Bernd, 5,534,185, Cl. 252-182.220.
  - Wagner, Oliver; Eicken, Karl; Götz, Norbert; Rang, Harald; Ammermann, Eberhard; and Lorenz, Gisela. 5,534,653, Cl. 564-32.000.
- BASF Corporation: *See*—
  - Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., 5,534,183, Cl. 510-434.000.
  - Hodan, John A.; and Ilg, Otto M., 5,533,883, Cl. 425-131.500.
- BASF Lacke + Farben, AG: *See*—
  - Krause, Siegfried; and Kiriazis, Leonidas, 5,534,582, Cl. 524-441.000.
  - Röckrath, Ulrike; Betz, Peter; Poth, Ulrich; and Wigger, Georg, 5,534,306, Cl. 427-407.100.
- Bashkin, John S.; Barker, David L.; and Johnston, Richard F., to Molecular Dynamics. Denaturing separation matrix having hydroxyethyl cellulose for nucleic acid electrophoresis. 5,534,123, Cl. 204-455.000.
- Basiev, Tasoltan T.; Bridenbaugh, Paul M.; and Thomas, Gordon A., to AT&T Corp. WDM optical fiber system using crystal optical amplifier. 5,535,051, Cl. 359-342.000.
- Baskey, Michael E.; Mastrangelo, Colette A.; and Mayer, Paul M., to International Business Machines Corporation. System and method for logical console verification and feedback. 5,535,326, Cl. 395-182.020.
- Bass, Robert, Jr.; and Barsamian, James G. Medical mouthpiece. 5,533,523, Cl. 128-859.000.
- Basteck, Andreas. Alignment adapter. 5,533,847, Cl. 409-234.000.
- Bastioli, Catia; and Bellotti, Vittorio, to Novamont S.P.A. Selectively-permeable membrane and the use thereof. 5,534,150, Cl. 210-640.000.
- Bateman, Bruce L., to MicroUnity Systems Engineering, Inc. Circuit for isolating and driving interconnect lines. 5,535,166, Cl. 365-208.000.
- Bates, Cary L.; Ryan, Jeffrey M.; and Watts, Byron T., to International Business Machines Corporation. Locator icon mechanism. 5,534,887, Cl. 345-120.000.
- Battelle Memorial Institute: *See*—
  - Fassbender, Alexander G., 5,533,868, Cl. 417-53.000.
- Bauer, Gunther. Process for the separation and reutilization of fabric materials from polyurethane adhesive bonded composite laminates. 5,534,556, Cl. 521-49.000.
- Baum, Charles S., to Baum Research & Development Company, The. Composite baseball bat with cavitied core. 5,533,723, Cl. 273-72.00R.
- Baum Research & Development Company, The: *See*—
  - Baum, Charles S., 5,533,723, Cl. 273-72.00R.
- Baurand, Gilles: *See*—
  - Duchemin, Pierre; Baurand, Gilles; and Leglaye, Dominique, 5,534,832, Cl. 335-16.000.
- Baurhenn, Charles: *See*—
  - Boeck, Harold W.; Wargnier, David M.; and Baurhenn, Charles, 5,533,378, Cl. 72-302.000.
- Bausch & Lomb Incorporated: *See*—
  - Bambury, Ronald E.; and Choo, Dong J., 5,534,605, Cl. 526-260.000.
- Baxter, Daniel J.: *See*—
  - Wahlstrand, John D.; Baxter, Daniel J.; Ecker, R. Michael; Greeninger, Daniel R.; and Yerich, Charles G., 5,534,018, Cl. 607-27.000.
- Baxter International Inc.: *See*—
  - Jerman, John H.; Toth, Ronald E.; Winchell, David A.; and Pennington, David W., 5,533,412, Cl. 73-861.950.
  - Mandro, Marc; and Bellerose, Jean, 5,533,981, Cl. 604-208.000.
  - Murphey, Randy; Bellotti, Marc; Lo, Ying-Cheng; and Edwards, Scott, 5,533,996, Cl. 604-283.000.
- Bayer Aktiengesellschaft: *See*—
  - Gerdes, Peter; Gayer, Herbert; Dutzmann, Stefan; and Dehne, Heinz-Wilhelm, 5,534,550, Cl. 514-620.000.
  - Heiliger, Ludger, 5,534,630, Cl. 534-752.000.
  - Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.
  - Mennicke, Winfried; and Hassenrück, Karin, 5,534,052, Cl. 106-22.00D.
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Bayer Aktiengsellschaft: *See*—
  - Eisen, Norbert; and Godthardt, Lutz-Peter, 5,534,299, Cl. 427-373.000.
- Bayer Corporation: *See*—
  - Gerson, Herman; and Sattar, Abdul, 5,534,055, Cl. 106-413.000.
  - Tice, Joseph B.; Diaz, Antonio A.; and Manning, Dennis P., 5,534,319, Cl. 428-36.910.
- Bayer, Erwin: *See*—
  - Bamberg, Joachim; Steinhauser, Ludwig; Bayer, Erwin; and Adam, Peter, 5,534,308, Cl. 427-454.000.
- Bayer, Thomas: *See*—
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
- Bayerische Motoren Werke AG: *See*—
  - Harms, Thomas; and Abe, Karl-Heinz, 5,533,783, Cl. 297-195.130.
- Bayly, Brian P.; Lucas, Gary M.; and Stuart, Van W., to General Electric Company. Solventless two component primer composition for improved adhesion of RTV silicone elastomers to substrates. 5,534,610, Cl. 528-38.000.
- Beach, David B., to International Business Machines Corporation. Supersaturated rare earth doped semiconductor layers formed by chemical vapor deposition. 5,534,079, Cl. 148-33.000.
- Beach, William F.; Wary, John; and Olson, Roger A., to Specialty Coating Systems, Inc. Parylene deposition apparatus including a tapered deposition chamber and dual vacuum outlet pumping arrangement. 5,534,068, Cl. 118-719.000.
- Beam, Edward A., III; and Seabaugh, Alan C., to Texas Instruments Incorporated. Integrated field effect transistor and resonant tunneling diode. 5,534,714, Cl. 257-25.000.
- Beaver, Robert I., II; and Sehestedt, William H., to Quadlux, Inc. Apparatus for automated food handling. 5,534,679, Cl. 219-413.000.
- Beck, Stephen D.: *See*—
  - Lybarger, Michael A.; and Beck, Stephen D., 5,533,367, Cl. 68-3.00R.
- Becker, Daniel P.: *See*—
  - Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.
- Becker, Erich: *See*—
  - Von Der Heyde, Richard; Becker, Erich; and Riedlinger, Heinz, 5,533,886, Cl. 418-1.000.
- Becker, Ralf-Jürgen; Gürtzgen, Stefan; and Kutschera, Dirk, to Witco GmbH. Process for preparing aluminoxane on inert support material. 5,534,474, Cl. 502-152.000.
- Becker, Theodore A.: *See*—
  - Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., 5,533,311, Cl. 52-309.900.
- Beckman Instruments, Inc.: *See*—
  - Glen, Stefan J.; and Carstens, Bradley D., 5,533,644, Cl. 220-414.000.
  - Oh, Chan S.; and Kearns, Elizabeth K., 5,534,620, Cl. 530-413.000.
  - Pentoney, Stephen L., 5,534,707, Cl. 204-452.000.
- Becton, Dickinson and Company: *See*—
  - Berger, Howard S.; Odell, Robert B.; and Gyure, Sandor, 5,533,970, Cl. 604-110.000.
  - Lahm, William; and Stevens, Timothy A., 5,534,227, Cl. 422-102.000.
  - Sweeney, Niall; Caizza, Richard J.; Gravel, Marian H.; and Walters, Bronwen L., 5,533,980, Cl. 604-192.000.
  - Vogler, Erwin A., 5,533,518, Cl. 128-760.000.
  - Woodard, Daniel L.; and Howard, Adriann J., 5,534,054, Cl. 106-287.110.
- Becton Dickinson France S.A.: *See*—
  - Meyer, Gabriel, 5,533,994, Cl. 604-416.000.
- Beech, Brian H., to National Transcommunications Limited. Method of video noise reduction using non-linear pre/de-emphasis. 5,535,246, Cl. 375-285.000.
- Beeley, Micheal G., to LMC Operating Corp. Belt construction for vehicle endless track. 5,533,796, Cl. 305-188.000.
- Beerstecher, Lutz: *See*—
  - Sutter, Ralf; Beerstecher, Lutz; Hruza, David; Stetter-Alle, Raimund; and Trackl, Karl, 5,533,539, Cl. 134-95.200.
- Beesley, Daryl S., to Flexon, Inc. Check valve with internal longitudinally displaceable sleeve valve. 5,533,707, Cl. 251-129.150.
- Beeson and Sons Limited: *See*—
  - King, Roger M., 5,533,633, Cl. 215-252.000.
- Beeteson, John; and Knox, Andrew, to International Business Machines Corporation. Electric field emission reduction system. 5,534,756, Cl. 315-370.000.
- Begneu, Michel, to Giat Industries. Method and system for supplying a device with a volume of hydraulic fluid whose predetermined value according to operating conditions. 5,533,434, Cl. 89-7.000.
- Behr GmbH & Co.: *See*—
  - Fischinger, Claus-Dieter; Hizli, Adem; Rose, Wolfgang; and Waldmann, Heinrich, 5,533,704, Cl. 248-603.000.
- Behringwerke Aktiengesellschaft: *See*—
  - Pollner, Reinhold; Noah, Michael; and Nau, Günther, 5,534,414, Cl. 435-794.000
- BEI Electronics, Inc.: *See*—
  - Wan, Lawrence A., 5,533,394, Cl. 73-504.010.

  - Wan, Lawrence A., 5,533,395, Cl. 73-504.010.
- Beighle, Phillip L.: *See*—
  - Bodager, Gregory A.; and Beighle, Phillip L., 5,534,387, Cl. 430-325.000.
- Bekki, Toshihiko: *See*—
  - Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, 5,534,894, Cl. 346-134.000.
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Belarde, John F. Apparatus for forming concrete barriers. 5,533,888, Cl. 425-64.000.
- Belcher, Donald K.; and Thomas, David M., to Harris Corporation. Divergence feedback in a linear fiber optic analog transmission system and method. 5,535,039, Cl. 359-187.000.
- Belger, Peter: *See*—
  - Strauch, Dieter; and Belger, Peter, 5,533,678, Cl. 241-16.000.
- Belko, William R.: *See*—
  - Rainwater, Jewel G.; Benson, Paul; Belko, William R.; Deffeyes, Robert J.; Carlson, Arne B., deceased, 5,534,290, Cl. 427-97.000.
- Bell Atlantic Network Services, Inc.: *See*—
  - Ganesan, Ravi, 5,535,276, Cl. 380-25.000.
  - Kostreski, Bruce W., 5,534,912, Cl. 348-6.000.
- Bell, D. Michael; Gonzales, Mark A.; and Meredith, Susan S., to Intel Corporation. Method and apparatus for maintaining transaction ordering and supporting deferred replies in a bus bridge. 5,535,340, Cl. 395-292.000.
- Bell, James S., to Dell USA, L.P. System and method for error location in printed wire assemblies by external power on self test (post) commands. 5,535,330, Cl. 395-183.120.
- Bell, Jonathan M.: *See*—
  - Bell, Michael; and Bell, Jonathan M., 5,533,277, Cl. 36-7.600.
- Bell, Michael; and Bell, Jonathan M., to Bell, Michael. Footwear with adherent material release grooves. 5,533,277, Cl. 36-7.600.
- Bellerose, Jean: *See*—
  - Mandro, Marc; and Bellerose, Jean, 5,533,981, Cl. 604-208.000.
- Bello, Louis. Tow ball and shin protector. 5,533,743, Cl. 280-507.000.
- Bellotti, Marc: *See*—
  - Murphey, Randy; Bellotti, Marc; Lo, Ying-Cheng; and Edwards, Scott, 5,533,996, Cl. 604-283.000.
- Bellotti, Vittorio: *See*—
  - Bastioli, Catia; and Bellotti, Vittorio, 5,534,150, Cl. 210-640.000.
- BellSouth Corporation: *See*—
  - Schull, Jerome W., 5,535,267, Cl. 379-106.000.
- Belmont, Brian V., to Compaq Computer Corporation. SCSI disk drive power down apparatus. 5,535,400, Cl. 395-750.000.
- Beloit Technologies, Inc.: *See*—
  - Bielagus, Joseph B., 5,533,684, Cl. 241-222.000.
  - Meyer, Walter G., 5,533,659, Cl. 226-189.000.
  - Roerig, Arnold J., 5,534,117, Cl. 162-358.300.
- Belting Industries Co., Inc.: *See*—
  - Heim, William D., 5,533,941, Cl. 474-267.000.
- Bendo, Masatoshi: *See*—
  - Mori, Hiroshi; and Bendo, Masatoshi, 5,534,996, Cl. 356-218.000.
- Benecke, Jurgen; Cieplik, Arthur; and Burmester, Thomas, to Nordson Corporation. Apparatus for applying discrete coatings. 5,533,675, Cl. 239-413.000.
- Benedict, Robert B.; and Kiger, Terry L., to Production Tube, Inc. Apparatus having replaceable shoes for positioning and gripping tubing. 5,533,658, Cl. 226-172.000.
- Benfaremo, Nicholas: *See*—
  - Derosa, Thomas F.; Benfaremo, Nicholas; Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,534,171, Cl. 508-231.000.
- Benford, Howard L.: *See*—
  - Martin, Berthold; and Benford, Howard L., 5,533,945, Cl. 475-276.000.
- Benguigui, Paul: *See*—
  - Sebag, Albert; and Benguigui, Paul, 5,533,220, Cl. 5-654.000.
- Benhase, Michael T.; Burton, David A.; McCauley, John N., Jr.; and Morton, Robert L., to International Business Machines Corporation. Method and apparatus for efficient updating of CKD data stored on fixed block architecture devices. 5,535,372, Cl. 395-500.000.
- Bennett, Cynthia; Brekner, Michael-Joachim; Herrmann-Schoenherr, Otto; and Osan, Frank, to Hoechst Aktiengesellschaft. Rigid cycloolefin copolymer film. 5,534,606, Cl. 526-281.000.
- Benowitz, Michael: *See*—
  - McDonald, Kevin B.; Pierce, Stephen W.; Benowitz, Michael; and Terrett, David S., 5,534,849, Cl. 340-517.000.
- Ben-Slimane, Rachid: *See*—
  - Reddin, Lorin D.; Hepworth, Malcolm T.; Ben-Slimane, Rachid; and Welch, Glenn D., 5,534,234, Cl. 423-50.000.
- Benson, Paul: *See*—
  - Rainwater, Jewel G.; Benson, Paul; Belko, William R.; Deffeyes, Robert J.; Carlson, Arne B., deceased, 5,534,290, Cl. 427-97.000.
- Bensoussan, Marcel: *See*—
  - Nissim, Yves; and Bensoussan, Marcel, 5,534,444, Cl. 437-5.000.
- Bergenlid, Lars H.; and Eklund, Ulf C., to Telefonaktiebolaget LM Ericsson. Method of disconnecting an established communication connection in a mobile radio system. 5,535,429, Cl. 455-53.100.
- Berger, Howard S.; Odell, Robert B.; and Gyure, Sandor, to Becton, Dickinson and Company. Retractable needle syringe. 5,533,970, Cl. 604-110.000.
- Bergkvist, John J., Jr.; Carmon, Donald E.; and Vanover, Michael T., to International Business Machines Corporation. System to reduce latency for real time interrupts. 5,535,380, Cl. 395-550.000.
- Bergland, Norman R.; Wisor, Donald R.; and Portillo, Netza, to Deere & Company. Seed tube for an agricultural seeding machine. 5,533,458, Cl. 111-200.000.
- Bergmann, Udo; Schlueter, Harald; and Schmitt, Michael, to BASF Aktiengesellschaft. Polycyclic vat dyes. 5,534,627, Cl. 546-30.000.
- Berman, Jonathan: *See*—
  - Page, Phillip E.; Berman, Jonathan; Pence, Janet M.; and Minish, Sharon K., 5,534,551, Cl. 514-634.000.
- Bernardin, Frederick E.; and Peterson, Ronald L., to Vulcan Peroxidation Systems, Inc. Flow-reversing system for series connected reaction chambers. 5,534,142, Cl. 210-141.000.
- Bernstein Brothers Marketing Corp.: *See*—
  - Bernstein, Richard, 5,534,272, Cl. 426-3.000.
- Bernstein, Richard, to Bernstein Brothers Marketing Corp. Appetite suppressant chewing gum containing chromic picolinate. 5,534,272, Cl. 426-3.000.
- Berryhill, Ross C.: *See*—
  - Socci, Vincent P.; Berryhill, Ross C.; Bradley, Eric K.; and Schenk, Charles R., 5,533,489, Cl. 123-571.000.
- Bersch, Danny A.: *See*—
  - Gunter, Brad D.; Anderson, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, 5,534,819, Cl. 327-553.000.
- Bersenev, Alexei Y.: *See*—
  - Solntsev, Stanislav S.; Tjurin, Vladimir M.; Izaeva, Natalia V.; Bersenev, Alexei Y.; and Solovjeva, Galina A., 5,534,300, Cl. 427-376.200.
- Bertrand, Jacques C.: *See*—
  - Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., 5,534,379, Cl. 430-106.000.
- Besnier, Joseph, to Compagnie Generale Des Matieres Nucleaires. Assembly for taking liquid samples in jugs sealed by screw gaps. 5,533,407, Cl. 73-864.250.
- Bessho, Mikio: *See*—
  - Tsugai, Masahiro; Bessho, Mikio; and Sesekura, Takashi, 5,534,773, Cl. 324-105.000.
- Best, Donn A.: *See*—
  - Cone, Fred P.; Prece, Stephen V.; and Best, Donn A., 5,534,085, Cl. 148-336.000.
- Bestler, Caitlin B.; and Rabii, Khosro M., to Zenith Electronics Corporation. Upstream data transmission system for cable television. 5,535,206, Cl. 370-79.000.
- Betz, Peter: *See*—
  - Röckrath, Ulrike; Betz, Peter; Poth, Ulrich; and Wigger, Georg, 5,534,306, Cl. 427-407.100.
- Beverle, Michael T.: *See*—
  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
- Beyers, Billy W., Jr.; and Blatter, Harold, to Thomson Consumer Electronics, Inc. On screen display arrangement for digital video signal processing system. 5,534,942, Cl. 348-569.000.
- Biasoli, Giovanni: *See*—
  - Mongelli, Nicola; Biasoli, Giovanni; Mariani, Mariangela; and Sola, Francesco, 5,534,539, Cl. 514-422.000.
- Bielagus, Joseph B., to Beloit Technologies, Inc. Wood chip strand splitter. 5,533,684, Cl. 241-222.000.
- Bielecki, James J., to Mark Solutions, Inc. Treatment booth for infectious patients. 5,533,305, Cl. 52-79.100.
- Biezen, Paul W. A. C.: *See*—
  - De Haan, Gerard; Biezen, Paul W. A. C.; Ojo, Olukayode A.; and Huijgen, Hendrik, 5,534,946, Cl. 348-619.000.
- Biggs, Terry L.; Tietjen, Donald L.; and Wilson, Jesse R., to Motorola Inc. Method and apparatus for providing both power and control by way of an integrated circuit terminal. 5,535,398, Cl. 395-750.000.
- Bilder, Wayne H.; Granata, Richard D.; and Leidheiser, Henry, Jr., to Competitive Technologies Inc. Structural crack monitoring technique. 5,534,289, Cl. 427-8.000.
- Bildhauer, Michael; Kupfer, Rainer; Siebott, Günther; Mees, Bernhard; and Friedrich, Herbert, to Hoechst. Copolymers based on ethylenically unsaturated dicarboxylic anhydrides, long-chain olefins and fluoroolefins. 5,534,604, Cl. 526-253.000.
- Bill, Ralph J. Automated printing machine and process. 5,533,445, Cl. 101-123.000.
- Billman, Fred L., to S. C. Johnson & Son, Inc. Carpet cleaning and restoring composition. 5,534,167, Cl. 510-280.000.
- Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., to Illinois Tool Works Inc. Method of forming a head on a fastener. 5,533,379, Cl. 72-316.000.
- Binney & Smith Inc.: *See*—
  - Volk, Robert S., 5,533,900, Cl. 434-87.000.
- Bio Merieux: *See*—
  - Orenga, Sylvain, 5,534,415, Cl. 435-34.000.
- Bio-Virus Research Incorporated: *See*—

  - Golubev, Daniel B.; and Chaihorsky, Alexander, 5,534,258, Cl. 424-231.100.
- Bio-Waste Technologies, International, Ltd.: *See*—
  - Arrau, Agustin H., 5,534,437, Cl. 435-290.300.
- Biogaia AB: *See*—
  - Casas, Ivan A.; and Mollstam, Bo, 5,534,253, Cl. 424-93.450.
- Biomedical Polymers, Inc.: *See*—
  - Fay, John E.; and Faulkner, Michael, 5,533,683, Cl. 241-169.000.
- Biomedical Research Centre Limited: *See*—
  - Aebersold, Rudolf H.; and Bures, Edward J., 5,534,440, Cl. 436-89.000.
- Birchfield, Jerry W.: *See*—
  - Issa, Darrell E.; Birchfield, Jerry W.; Busse, Glenn R.; Perdue, Sidney B.; and Ward, Kenneth A., 5,534,845, Cl. 340-425.500.
- Bird, Colin L.: *See*—
  - Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, 5,535,286, Cl. 382-109.000.
- Bird, Robert E.: *See*—
  - Ladner, Robert C.; Bird, Robert E.; and Hardman, Karl, 5,534,621, Cl. 530-413.000.
- Birkenbeil, Hans; Brand, Ulrich; Goor, Gustaaf; and Kunkel, Wolfgang, to Degussa Aktiengesellschaft. Method of separating catalyst-free working solution from the hydrogenation cycle of the anthraquinone method for the production of hydrogen peroxide. 5,534,149, Cl. 210-636.000.
- Bishop, Clinton L.: *See*—
  - Thomas, Danny L.; and Bishop, Clinton L., 5,534,217, Cl. 264-516.000.
- Bizek, Donald R., to Stocker Hinge Manufacturing Company. Torsion hinge with tubular pivot pin. 5,533,234, Cl. 16-308.000.
- Bizen, Tatsuo: *See*—
  - Goma, Shinji; and Bizen, Tatsuo, 5,534,825, Cl. 331-117.00R.
- Bjerke, William M.: *See*—
  - Majnaric, Anton B.; and Bjerke, William M., 5,533,221, Cl. 14-73.000.
- Blach, Heribert J.: *See*—
  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
- Black, Larry J.; and Cullinan, George J., to Eli Lilly and Company. Methods for inhibiting bone loss by treating with aroylbenzothiophenes and estrogen. 5,534,527, Cl. 514-333.000.
- Blackman, Robert J., to Eastman Kodak Company. Magnetic reading and/or recording apparatus for reading and/or recording information on a magnetic information track on a photosensitive medium. 5,535,062, Cl. 360-3.000.
- Blaha, David L.: *See*—
  - Doremus, Lonnie R.; and Blaha, David L., 5,535,270, Cl. 379-266.000.
- Blair, Sharon L.: *See*—
  - Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., 5,534,312, Cl. 427-533.000.
- Blair, Thomas H.: *See*—
  - Lebby, Michael S.; Blair, Thomas H.; and Witting, Gary F., 5,534,888, Cl. 345-121.000.
- Blaisdell, Charles T.: *See*—
  - Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
- Blaszak, Sue E.: *See*—
  - Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., 5,534,379, Cl. 430-106.000.
- Blatter, Harold: *See*—
  - Beyers, Billy W., Jr.; and Blatter, Harold, 5,534,942, Cl. 348-569.000.
- Blaupunkt-Werke GmbH: *See*—
  - Chahabadi, Djahanyar; and Vogt, Lothar, 5,535,280, Cl. 381-13.000.
- Blevins, Robert E.: *See*—
  - Mays, David S.; and Blevins, Robert E., 5,533,605, Cl. 194-206.000.
- Bliton, Richard J.: *See*—
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- Blitz, Martin C.; Stegeman, James C.; and Bareham, Peter B., to Quantum Corporation. Solid state disk drive unit having on-board backup nonvolatile memory. 5,535,399, Cl. 395-750.000.
- Blom, Anton C.; and Slegers, Frans, to U.S. Philips Corporation. High-pressure discharge lamp igniting circuit in which the voltage-raising network includes inductors. 5,534,753, Cl. 315-244.000.
- Blueprint Automation, Inc.: *See*—
  - Van Dam, Aaldert C.; and Honings, Kenneth C., 5,533,315, Cl. 53-53.000.
- Blumhardt, Mark S., to U S West Technologies, Inc. Method for recording subscriber specific messages in an advanced intelligent network. 5,535,263, Cl. 379-67.000.
- Board of Regents acting on behalf of University of Michigan, The: *See*—
  - Wakefield, Thomas W.; Stanley, James C.; and Andrews, Philip C., 5,534,619, Cl. 530-324.000.
- Board of Regents, The University of Texas System: *See*—
  - Bonewald, Lynda; Mundy, G. R.; and Gallwitz, Wolf E., 5,534,524, Cl. 514-314.000.
  - Kilbourn, Robert G.; Griffith, Owen W.; and Gross, Steven S., 5,534,545, Cl. 514-565.000.
  - Li, Ching; Gaynor, Richard B.; and Nirula, Ajay, 5,534,631, Cl. 536-23.100.
- Boatella I Riera, Josep; Rafecas I Martinez, Magdalena; Codony I Salcedo, Rafael; Minguell I Juncosa, Genaro; and Cases I Sellart, Josep, to Gemi Aliment, S.A. Process for producing a low sodium meat product. 5,534,279, Cl. 426-266.000.
- Boaz, Shachar; Yoram, Yeivin; and Yehuda, Rudin, to Motorola, Inc. Data processing system and method for providing chip selects to peripheral devices. 5,535,349, Cl. 395-401.000.
- Bobrow, Daniel G.: *See*—
  - Stefik, Mark J.; Russell, Daniel M.; Bobrow, Daniel G.; and Henderson, D. Austin, Jr., 5,534,975, Cl. 355-202.000.
- BOC Group, Inc., The: *See*—
  - Lee, Ron C.; Heil, Michael D.; Downey, Michael T.; and Barrasso, Michael J., 5,533,338, Cl. 62-638.000.
- BOC Group plc, The: *See*—
  - Clare, Stephen R.; Higginbotham, Paul; and Stuart, David M., 5,533,339, Cl. 62-654.000.
- Bock, Manfred: *See*—
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Bodager, Gregory A.; and Monroe, Bruce M., to Du Pont de Nemours, E. I., and Company. Process of forming a colored image utilizing aqueous-processable imaging element tonable at room temperature before and after exposure to actinic radiation. 5,534,380, Cl. 430-143.000.
- Bodager, Gregory A.; and Beighle, Phillip L., to Du Pont de Nemours, E. I., and Company. Transfer process for forming a colored image utilizing a non-photosensitive/photosensitive combination. 5,534,387, Cl. 430-325.000.
- Bodenseewerk Geratiteschnik GmbH: *See*—
  - Giesenberg, Peter; Stadler, Rolf; and Lang, Wilfried, 5,533,433, Cl. 89-1.806.
- Boeck, Harold W.; Wargnier, David M.; and Baurhenn, Charles, to Chrysler Corporation. Vehicle header alignment apparatus. 5,533,378, Cl. 72-302.000.
- Boehm, Alfred; Messerschmidt, Werner; and Sedlmair, Gerhard, to Marker Deutschland GmbH. Ski brake spur. 5,533,744, Cl. 280-605.000.
- Boehm, George L. Fish landing net with telescoping handle. 5,533,293, Cl. 43-12.000.
- Boehm, William J.; and Dinkel, Gunter E., to Connector Manufacturing Company. Electrical connector including molded plastic body. 5,533,913, Cl. 439-810.000.
- Boeing Company, The: *See*—
  - Gregg, Paul S.; Kistner, Matthew G.; and Will, Jeff D., 5,534,354, Cl. 428-593.000.
  - Nalos, Ervin J.; and Axtell, James C., 5,534,824, Cl. 331-81.000.
  - Stephenson, Ronald R., 5,534,468, Cl. 501-12.000.
- Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., to Polaroid Corporation. Process for thermochemical generation of acid and for thermal imaging. 5,534,393, Cl. 430-348.000.
- Böhm, Christian: *See*—
  - Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, 5,534,046, Cl. 75-446.000.
- Böhmler, Klaus: *See*—
  - Maiwald, Helmut; and Böhmler, Klaus, 5,533,588, Cl. 180-282.000.
- Bohmwetsch, Gerd: *See*—
  - Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, 5,535,098, Cl. 361-752.000.
- Bohnet, Nick K. K.: *See*—
  - Taylor, Joseph W.; Goyal, Shivendra K.; Aubee, Norman D. J.; and Bohnet, Nick K. K., 5,534,572, Cl. 524-275.000.
- Boigegrain, Robert: *See*—
  - Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, 5,534,530, Cl. 514-361.000.
- Boland, James W., to Mitchell Arms Corp. Firearm capable of operation with different capacity magazines. 5,533,291, Cl. 42-7.000.
- Bolen, Charles E.: *See*—
  - Roberts, Michael G.; and Bolen, Charles E., 5,534,303, Cl. 427-385.500.
  - Roberts, Michael G.; and Bolen, Charles E., 5,534,583, Cl. 524-476.000.
- Bonaldi, Jeffrey P. Combination wallet with removeable clip. 5,533,656, Cl. 224-667.000.
- Bóné, István: *See*—
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Ildikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Bonewald, Lynda; Mundy, G. R.; and Gallwitz, Wolf E., to Board of Regents, The University of Texas System. Suppression of bone resorption by quinolines. 5,534,524, Cl. 514-314.000.
- Bonissone, Piero P.; Schutten, Michael J.; and Chiang, Kenneth H.-C., to General Electric Company. Fuzzy logic power supply controller. 5,534,766, Cl. 323-235.000.
- Bonne, Ulrich; Honda, Nobuaki; Kubisiak, David; and Ohnstein, Thomas R., to Honeywell Inc. Determination of dew point or absolute humidity. 5,533,393, Cl. 73-355.020.
- Bonutti, Peter M. Method and apparatus for anchoring a suture. 5,534,012, Cl. 606-232.000.
- Boone, Thomas A.: *See*—

- Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., 5,533,512, Cl. 128-719.000.
- Bøorretzen, Bernt: *See—*
  - Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Bøorretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, 5,534,531, Cl. 514-365.000.
- Boquet, Paul; Boulain, Jean-Claude; Ducancel, Frederic; Gillet, Daniel; and Ménez, André, to Commissariat a l'Energie Atomique. Hybrid proteins between an extracytoplasmic enzyme and at least another protein, method for preparing them and also their applications. 5,534,223, Cl. 422-61.000.
- Borden, Peter G.; Aqui, Derek G.; and Evanko, Matt A., to High Yield Technology, Inc. Particle monitor for throttled pumping systems. 5,534,706, Cl. 250-574.000.
- Bordighon, Marcos A.; and Januzelli, Jose L. L., to Ethicon, Inc. Folding package for surgical products. 5,533,611, Cl. 206-63.300.
- Borland International, Inc.: *See—*
  - Hejlsberg, Anders; Stock, Jeffrey; Kukol, Peter; and Shtaygrud, Alex, 5,535,391, Cl. 395-700.000.
- Borland, William; Hayakawa, Keiichiro; Sato, Takeshi; and Smith, Jerome, to Du Pont de Nemours, E. I., and Company. Thick film resistor composition containing pyrochlore and silver-containing binder. 5,534,194, Cl. 252-518.000.
- Borowski, Richard, to Garlock Inc. Seals with particle exclusion means. 5,533,737, Cl. 277-23.000.
- Borrelli, Nicholas F.: *See—*
  - Alpha, James W.; and Borrelli, Nicholas F., 5,534,321, Cl. 428-64.200.
- Borsig Kugelhahn GmbH: *See—*
  - Hoffmann, Michael, 5,533,738, Cl. 277-27.000.
- Boston Scientific Corporation: *See—*
  - Sahatjian, Ronald A., 5,533,516, Cl. 128-749.000.
- Bott, Glenn: *See—*
  - Wu, Samuel C., 5,533,853, Cl. 413-31.000.
- Botti, Edoardo; and Fassina, Andrea. Turn-on control circuit for electric devices. 5,535,082, Cl. 361-18.000.
- Böttle, Dietrich, to Alcatel N.V. Optical parallel-serial converter and optical serial-parallel converter. 5,535,032, Cl. 359-140.000.
- Boucherie, Bart G., to G.B. Boucherie N.V. Brush making machine. 5,533,791, Cl. 300-4.000.
- Boucherie, Leonel, to Firma G.B. Boucherie, Naamloze Vennootschap. Method and device for manufacturing brushes. 5,533,792, Cl. 300-11.000.
- Boulain, Jean-Claude: *See—*
  - Boquet, Paul; Boulain, Jean-Claude; Ducancel, Frederic; Gillet, Daniel; and Ménez, André, 5,534,223, Cl. 422-61.000.
- Boumarafi, Mohamed: *See—*
  - Karlow, James P.; Kumkoski, James M.; Boumarafi, Mohamed; and Hurford, Jonathan P., 5,533,750, Cl. 280-730.200.
- Boute, Willem, to Vitatron Medical, B.V. Dual chamber pacing system and method utilizing detection of ventricular fusion for adjustment of the atrial-ventricular delay as therapy for hypertrophic obstructive cardiomyopathy. 5,534,016, Cl. 607-9.000.
- Bowcock, Matthew P.: *See—*
  - Laing, Simon G.; and Bowcock, Matthew P., 5,534,857, Cl. 340-825.340.
- Bowerman, Harold: *See—*
  - Patel, Indrajit; Bowerman, Harold; Rosenbaum, Larry; Mennenoh, Rich; and Ryan, Pat, 5,533,992, Cl. 604-403.000.
- Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., to Polygen Holding Corporation. Polypeptide compounds having growth hormone releasing activity. 5,534,494, Cl. 514-16.000.
- Bowers, Mark; and Hankla, Allen, to University of California, The Regents of the. Phase and birefringence aberration correction. 5,535,049, Cl. 359-334.000.
- Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., to General Electric Company. Oven with improved self-cleaning cycle. 5,534,678, Cl. 219-396.000.
- Bowman, Steven R.; Ganem, Joseph; and Feldman, Barry J., to United States of America, Navy. Optically pumped, praseodymium based solid state laser. 5,535,232, Cl. 372-70.000.
- Bowman, Wayne A.; Shuttleworth, Leslie; and Weber, Helmut, to Eastman Kodak Company. Thermal dye transfer system with polyester ionomer receiver. 5,534,478, Cl. 503-227.000.
- Bowman, Wayne A.: *See—*
  - Shuttleworth, Leslie; Bowman, Wayne A.; and Weber, Helmut, 5,534,479, Cl. 503-227.000.
- Bowser, Todd S.: *See—*
  - Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., 5,535,220, Cl. 371-2.100.
- Boyd, Craig A. Method and apparatus for sealing applied scent slurry during the printing process. 5,534,105, Cl. 156-324.000.
- Boyer, David C., to Alvord-Polk, Inc. Hand lever assembly. 5,533,232, Cl. 16-114.00R.
- BP Chemicals Limited: *See—*
  - Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 5,534,607, Cl. 526-88.000.
- Bradbury, Rod J.; Barnard, Willard C.; and Wysong, Joel F. Fan failure alert for electronic equipment. 5,534,854, Cl. 340-648.000.
- Brade, Claus B.; and Bartholin, Niels, to V. Kann Rasmussen Industri A/S. Electric rain sensor and method of manufacturing a sensor member thereto. 5,533,391, Cl. 73-170.190.
- Bradley, Eric K.: *See—*
  - Socci, Vincent P.; Berryhill, Ross C.; Bradley, Eric K.; and Schenk, Charles R., 5,533,489, Cl. 123-571.000.
- Bradshaw, Richard L., to International Business Machines Corporation. Magnetic recording medium having an inorganic filler on which a glassy polymer has been adsorbed. 5,534,345, Cl. 428-323.000.
- Brady, Jerry L.; Gerlek, Stephen; Lagerlef, David L.; and Wydrinski, Raymond, to Atlantic Richfield Company. System and method for measuring corrosion in well tubing. 5,533,572, Cl. 166-250.050.
- Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., to Cellport Labs, Inc. Universal connection for cellular telephone interface. 5,535,274, Cl. 379-446.000.
- Brajczewski, David C.: *See—*
  - Koopman, Philip J.; and Brajczewski, David C., 5,535,212, Cl. 370-85.600.
- Bran, Mario E., to Verteg, Inc. Megasonic cleaning system. 5,534,076, Cl. 134-1.000.
- Brand, Ulrich: *See—*
  - Birkenbeil, Hans; Brand, Ulrich; Goor, Gustaaf; and Kunkel, Wolfgang, 5,534,149, Cl. 210-636.000.
- Brandau, Friedhelm: *See—*
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- Brandstrom, Per: *See—*
  - Franke, Rickard; Brandstrom, Per; Kaneko, Yutaka; and Andersson, Bengt, 5,533,550, Cl. 141-51.000.
- Brandt, Randy L., to Rockwell International. Orthogonal-field electrically variable magnetic device. 5,534,837, Cl. 336-155.000.
- Bras, Jean-Pierre: *See—*
  - Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, 5,534,530, Cl. 514-361.000.
- Braun Aktiengesellschaft: *See—*
  - Safont, Vicente; Millan, Jose; Rebordosa, Antonio; and Hernandez, Alejandro, 5,533,801, Cl. 366-249.000.
- Braun, Jörg; and Paulus, Peter, to Flachglas Aktiengesellschaft. Electrical connector for vehicle window. 5,534,879, Cl. 343-713.000.
- Brayton, James M.: *See—*
  - Fisch, Matthew A.; Brayton, James M.; and Malhotra, Ajay, 5,535,345, Cl. 395-309.000.
- Brekner, Michael-Joachim: *See—*
  - Bennett, Cynthia; Brekner, Michael-Joachim; Herrmann-Schoenherr, Otto; and Osan, Frank, 5,534,606, Cl. 526-281.000.
- Brench, Colin E.: *See—*
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- Brennan, Joseph T., to Terra International, Inc. Pesticide sticker-extender comprising maleic anhydride, sulfuric acid, turpentine, butanol, and alkanolamines. 5,534,480, Cl. 504-116.000.
- Brenneman, Rodney: *See—*
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- Brett, Bevin R., to Digital Equipment Corporation. Using hint generation to cause portions of object files to remain the same. 5,535,392, Cl. 395-700.000.
- Breunsbach, Rex. Method for cleaning electronic assemblies. 5,534,078, Cl. 134-10.000.
- Brewer, James E.: *See—*
  - Kroll, Mark W.; and Brewer, James E., 5,534,015, Cl. 607-7.000.
- Brezoczky, Blasius; and Seki, Hajime, to International Business Machines Corporation. Tribo-attractive contact data storage system. 5,535,073, Cl. 360-105.000.
- Brico Engineering Limited: *See—*
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- Bridenbaugh, Paul M.: *See—*
  - Basiev, Tasoltan T.; Bridenbaugh, Paul M.; and Thomas, Gordon A., 5,535,051, Cl. 359-342.000.
- Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., to Hewlett-Packard Company. Access hints for input/output address translation mechanisms. 5,535,352, Cl. 395-418.000.
- Bridgestone Corporation: *See—*
  - Etoh, Akiko, 5,534,569, Cl. 524-99.000.
- Brier, Daniel L.: *See—*
  - Moretz, Herbert L.; and Brier, Daniel L., 5,533,212, Cl. 2-409.000.
- Brierton, Dennis M. Ball transfer cube. 5,533,604, Cl. 193-35.0MD.
- Briggs, Joseph: *See—*
  - Kamen, Dean L.; Seale, Joseph B.; Briggs, Joseph; and Arnold, Finn, 5,533,389, Cl. 73-149.000.
- Brigida, David J.; Moore, Victor S.; and Pate, Thomas K., to International Business Machines Corporation. Method and system for modem command processing during data transfer. 5,535,242, Cl. 375-222.000.
- British Broadcasting Corporation: *See—*
  - Tupper, George I. F.; Allegranza, Anthony C.; and Doherty, Phillip J., 5,534,820, Cl. 330-149.000.
- British Technology Group Limited: *See—*
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- Brizzi, Marco: *See—*
  - Minarelli, Alessandro; and Brizzi, Marco, 5,533,613, Cl. 206-268.000.
- Brock, Andrew J.: *See—*

  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Brockway, David L.: *See—*
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- Brody, Rafael: *See—*
  - Cohen, Yitzak; Brody, Rafael; Magril, Tzvika; and Eshet, Dan, 5,535,396, Cl. 395-733.000.
- Brom, Erik: *See—*
  - Baker, Gary L.; Jakubiec, Steven M.; Agar, Brian E.; and Brom, Erik, 5,533,353, Cl. 62-227.000.
- Bronkal, Bernhard, to Robert Bosch GmbH. Fuel injection device for internal combustion engines. 5,533,485, Cl. 123-456.000.
- Brooks, Louie J. Brake safety system for vehicles with seat and door control. 5,533,795, Cl. 303-6.100.
- Brooks, Robert: *See—*
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Brother Kogyo Kabushiki Kaisha: *See—*
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- Brown, Arthur K., Jr. Rectangular sponge mop with wringer assembly. 5,533,226, Cl. 15-119.200.
- Brown, Barry D.; and Wakefield, Paul A. J., to Gateway Technologies, Inc. Selectively activated integrated real-time recording of telephone conversations. 5,535,261, Cl. 379-67.000.
- Brown, David S., to Armstrong World Industries, Inc. Two layered composite embossed board. 5,534,095, Cl. 156-209.000.
- Brown, David W. Elastomeric shoe for attachment to an equidae hoof. 5,533,575, Cl. 168-4.000.
- Brown, Jeffrey D.: *See—*
  - Mackin, Sean M.; and Brown, Jeffrey D., 5,534,839, Cl. 336-192.000.
- Brown, Lloyd S.: *See—*
  - Gruskin, Elliott A.; Lee, Daniel R.; and Brown, Lloyd S., 5,534,288, Cl. 427-2.310.
- Brown, Louis R.; and Steffens, Charles F., Jr., to TRW Vehicle Safety Systems Inc. Apparatus for restraining movement of an occupant of a vehicle. 5,533,752, Cl. 280-739.000.
- Brown, Patricia S.: *See—*
  - Nobel, Gary M.; Wilson, Arthur K.; Brown, Patricia S.; and Arbeiter, Jason R., 5,533,904, Cl. 439-67.000.
- Brown, Roger J.; Giese, Erik O.; and Racosky, Michael D., to Comfort Products, Ltd. Elastomeric connecting means for footwear. 5,533,281, Cl. 36-118.200.
- Brown, Russell L.: *See—*
  - Evans, Le Andra E.; White, Robert J.; Brown, Russell L.; Galliher, Kenneth R.; and Carlson, Mark E., 5,534,759, Cl. 318-139.000.
- Brown, Thomas W.: *See—*
  - Young, Harvey J.; Brown, Thomas W.; Devine, Sara W.; and Perfetti, Thomas A., 5,533,530, Cl. 131-370.000.
- Brown, William B.: *See—*
  - Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., 5,535,137, Cl. 364-514.00A.
- Brownell, George L.: *See—*
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- Brownlie, Helen A.: *See—*
  - Purnell, Charles G.; Mahmoud, Mohammad S.; and Brownlie, Helen A., 5,534,220, Cl. 419-45.000.
- Bruce, Johnny M., to Endeavor Surgical Products, Inc. Laser fiber apparatus having a contact tip and adjacent diffuser element and surgical methods for using same. 5,534,000, Cl. 606-15.000.
- Bruce, Robert C.: *See—*
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- Bruchmann, Bernd: *See—*
  - Hinz, Werner; Zschiesche, Ruth; Lutter, Heinz-Dieter; and Bruchmann, Bernd, 5,534,185, Cl. 252-182.220.
- Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, to BASF Aktiengesellschaft. Preparation of condensates of arenesulfonic acids and formaldehyde and use thereof. 5,534,166, Cl. 8-557.000.
- Bruker Analytische Messtechnik GmbH: *See—*
  - Schrader, Bernhard, 5,534,997, Cl. 356-301.000.
- Bruker-Franzen Analytik GmbH: *See—*
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- Bruker Instruments, Inc.: *See—*
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- Brumbach, Henry: *See—*
  - Lenz, Eric H.; and Brumbach, Henry, 5,534,110, Cl. 156-643.100.
- Brumfield, David L.; Anderson, M. Neil; and Luque, Eduardo R., to Danek Medical, Inc. Spinal fixation system. 5,534,002, Cl. 606-61.000.
- Brummond, Robert A.; Scheel, Roger; and Heidner, James L., to Envirex, Inc. Bar screen having compound fine screen bar rack. 5,534,140, Cl. 210-106.000.
- Brunck, Terence K.; Pepe, Michael G.; Pearson, Daniel A.; and Webb, Thomas R., to Corvas International, Inc. Trypsin inhibitors. 5,534,498, Cl. 514-19.000.
- Brune, Kenneth D.: *See—*
  - Surjaatmadja, Jim B.; Brune, Kenneth D.; and Kabinoff, Ken B., 5,533,571, Cl. 166-222.000.
- Bryg, William R.: *See—*
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Buch, William L. Apparatus for archery target formation and insert therefor. 5,533,430, Cl. 83-171.000.
- Buchanan, Justin M.: *See—*
  - Kallenbach, Thomas J.; Buchanan, Justin M.; Goodrich, Matthew H.; Skinner, Ronald V.; Poncelet, Greg R.; and Kallenbach, Trina J., 5,534,147, Cl. 210-605.000.
- Buchin, Michael P. High-speed electro-optical modulator, chopper, and multiplexer/demultiplexer. 5,535,293, Cl. 385-18.000.
- Buchmann, Andrea: *See—*
  - Platzer, Stephan J. W.; Buchmann, Andrea; and Buhr, Gerhard, 5,534,373, Cl. 430-15.000.
- Buddendeck, Mark H.: *See—*
  - Rubscha, Robert F.; Tsai, Margaret C.; and Buddendeck, Mark H., 5,534,989, Cl. 355-309.000.
- Budelman, Gerald A.: *See—*
  - Nelson, Daryl J.; Tirumala, Muralidhar; Butler, Peter; and Budelman, Gerald A., 5,535,094, Cl. 361-697.000.
- Buhr, Gerhard: *See—*
  - Platzer, Stephan J. W.; Buchmann, Andrea; and Buhr, Gerhard, 5,534,373, Cl. 430-15.000.
- Bulinski, A. T.: *See—*
  - Bamji, Soli S.; and Bulinski, A. T., 5,533,807, Cl. 374-45.000.
- Bull HN Information Systems Italia S.p.A.: *See—*
  - Silvano, Cristina, 5,535,227, Cl. 371-40.400.
- Bullmann, Guido, to RWE Energie Aktiengesellschaft; and Mannesmann Aktiengesellshcaft. Process for the simultaneous smelting of dust and incinerator slag. 5,535,234, Cl. 373-8.000.
- Bunimovich, Haim; and Loersky, Tatyana. Composite structure. 5,534,329, Cl. 428-192.000.
- Bunnelle, William L.: *See—*
  - Foster, Mary E.; Simmons, Eugene R.; Lindquist, Lowell G.; and Bunnelle, William L., 5,534,575, Cl. 524-270.000.
- Burdick, Robert A., to Hi-Shear Corporation. Self-locking nut for a wheel bearing. 5,533,849, Cl. 411-120.000.
- Bures, Edward J.: *See—*
  - Aebersold, Rudolf H.; and Bures, Edward J., 5,534,440, Cl. 436-89.000.
- Burge, Benjamin D., to International Business Machines Corporation. Secondary data transfer mechanism between coprocessor and memory in multi-processor computer system. 5,535,414, Cl. 395-827.000.
- Burger, Stephen G.: *See—*
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Burke, Michael G.; Carini, Paul R.; and Choi, Jong-Deok, to International Business Machines Corporation. Methods for distinguishing dynamically allocated storage along different call paths and for providing a compact representation of alias analysis. 5,535,394, Cl. 395-700.000.
- Burkhart, Larry J.: *See—*
  - Schuster, Don A.; Liang, Hongmei; Burkhart, Larry J.; and Wedlake, Gary D., 5,533,568, Cl. 165-1.000.
- Burlington Industries, Inc.: *See—*
  - Cross, David M.; Hueneke, Manfred H. K.; Farris, Ronald A.; McConnell, Bobby L.; and Newman, Robert M., 5,534,298, Cl. 427-358.000.
- Burmester, Thomas: *See—*
  - Benecke, Jurgen; Cieplik, Arthur; and Burmester, Thomas, 5,533,675, Cl. 239-413.000.
- Burndy Corporation: *See—*
  - Perugini, Michael N.; and Crilly, Thomas I., III, 5,533,255, Cl. 29-758.000.
- Burns, Arthur G.: *See—*
  - Kreisinger, Robert D.; Burns, Arthur G.; and Fernandez, Jose M., 5,534,765, Cl. 320-30.000.
- Burns, Mark E.: *See—*
  - Steele, Robert E.; Burns, Mark E.; and Felden, David M., 5.534,848, Cl. 340-517.000.
- Burns, Paul A.: *See—*
  - Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Burns, Paul A.; and Weber, Lynda D., 5,534,401, Cl. 430-558.000.
- Burns, William C.: *See—*
  - Springer, Marlin D.; Burns, William C.; and Barkley, Thomas, 5,534,659, Cl. 588-227.000.
- Burr-Brown Corporation: *See—*
  - Lillis, William J.; and McEldowney, Justin A., 5,534,792, Cl. 326-30.000.
- Burroughs Wellcome Co.: *See—*
  - Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., 5,534,535, Cl. 514-394.000.
- Burrus, Thomas N., to Natural Resource Recovery, Inc. Method and apparatus for forming an article from recyclable plastic materials. 5,534,207, Cl. 264-150.000.
- Burton, David A.: *See—*
  - Benhase, Michael T.; Burton, David A.; McCauley, John N., Jr.; and Morton, Robert L., 5,535,372, Cl. 395-500.000.

Busenhart, Peter: *See—*
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Buser, John W.: *See—*
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Bush, Kevin J.; Dua, Sanjay; Adams, Neil J.; and Markyvech, Craig R., to Motorola, Inc. State estimator based exhaust gas chemistry measurement system and method. 5,535,135, Cl. 364-496.000.
Bush, M. Elizabeth: *See—*
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Busin, Tiziano; and Faccio, Enrico, to Zhermack S.p.A. Compound for the correct taking of dental impressions. 5,534,560, Cl. 523-109.000.
Busse, Glenn R.: *See—*
Issa, Darrell E.; Birchfield, Jerry W.; Busse, Glenn R.; Perdue, Sidney B.; and Ward, Kenneth A., 5,534,845, Cl. 340-425.500.
Butler, Joseph H., Jr., to Emhart Inc. Methods of using an acceleration responsive device. 5,533,386, Cl. 73-65.010.
Butler, Kevin H.: *See—*
Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
Butler, Peter: *See—*
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Button, Donald D.; Wyatt, William D.; and McGrath, James F., to Gabriel Electronics Incorporated. Stacked biconical omnidirectional antenna. 5,534,880, Cl. 343-774.000.
Buzzard, Jon: *See—*
Schenkel, Howard M.; Buzzard, Jon; and Ronan, Jeffrey J., 5,534,836, Cl. 335-284.000.
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., to UNISYS Corporation. Microsequencer bus controller system. 5,535,405, Cl. 395-800.000.
BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Grundler, Gerhard, 5,534,515, Cl. 514-248.000.
Byron Enterprises, Inc.: *See—*
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Parmigiani, Corrado Jr, 5,533,984, Cl. 604-263.000.
Cableco, Poumey, Gaz de Bordeaux and General Export Industries - Sogexi: *See—*
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Cadek, Walter; Kappel, Johannes; and Neuhold, Rudolf, to Andritz-Patentverwaltungs-Gesellschaft m.b.H. Apparatus for controlling solids-liquid separation. 5,534,139, Cl. 210-96.100.
Cadman, Gary R., to Scully Signal Company. Vehicle identification and verification system. 5,534,856, Cl. 340-825.340.
Cahn, Charles R.; Keegan, Richard G.; Knight, Jerry E.; and Stansell, Thomas A., Jr., to Magnavox Electronic Systems Company. Global positioning system (GPS) receiver for recovery and tracking of signals modulated with P-code. 5,535,278, Cl. 380-49.000.
Caignard, Daniel-Henri: *See—*
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Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
Cailey, Fred L., to Navistar International Transportation Corp. Dynamic enhancement of EGR flow in an internal combustion engine. 5,533,487, Cl. 123-568.000.
Cairns, James W., to Nolu Plastics, Inc. Clamping arrangement for securing guide rails with respect to a conveyor system. 5,533,826, Cl. 403-389.000.
Caizza, Richard J.: *See—*
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Calgon Corporation: *See—*
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California Institute of Technology: *See—*
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Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., to International Business Machines Corporation. Method for directly joining a chip to a heat sink. 5,533,256, Cl. 29-840.000.
Callaghan, Robert P., Jr. Long range sliding ball bar test gage. 5,533,271, Cl. 33-502.000.
Callisto, Sandra L. Pierced earring converter. 5,533,363, Cl. 63-14.100.
Cama, Lovji D.; and Heck, James V., to Merck & Co., Inc. 3-aryl or heteroaryl-7-heteroaralkylamido cephalosporin compounds, compositions and methods of use. 5,534,507, Cl. 514-206.000.
Camerer, Robert L.: *See—*
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Campardo, Giovanni; Costa, Raffaele; and Torricelli, Piero, to SGS-Thomson Microelectronics S.r.l. Monolithically integrated storage device. 5,535,157, Cl. 365-185.050.
Campbell, Hugh P., to Xerox Corporation. Optically switched high voltage distributor. 5,533,473, Cl. 123-146.50A.
Campbell, John G.; and Ruttle, Daniel W., to Kaiser Marquardt, Inc. Safe propulsion system for missile divert thrusters and attitude control thrusters and method for use of same. 5,533,331, Cl. 60-204.000.
Campbell, Robert W.: *See—*
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Campbell, Thomas R., to Astec Industries, Inc. Paving machine with mixing device and discharge conveyor assembly for remixing segregated paving materials. 5,533,829, Cl. 404-81.000.
Campina Melkunie B.V.: *See—*
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Cann, Steve: *See—*
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Canon Kabushiki Kaisha: *See—*
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Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, 5,534,894, Cl. 346-134.000.
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Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, 5,535,012, Cl. 358-400.000.
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Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
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Cantiani, Robert, to Lubrizol Corporation, The. Copolymers of unsaturated fatty esters, their use as viscosity improver and lubricating oil containing said copolymers. 5,534,175, Cl. 508-469.000.
Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., to International Business Machines Corporation. Communication between chips having different voltage levels. 5,534,812, Cl. 327-333.000.
Cappel, Jerome P.: *See—*
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Cardiac Pathways Corporation: *See—*
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Carey, Sheri; and Carey, Thomas F. Creative purse with interchangeable decorative covering. 5,533,558, Cl. 150-105.000.
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Carlson, Todd R. X-ray tube with self-biasing deck. 5,535,254, Cl. 378-113.000.
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Carmona, Henri, to Assistance Proto Industrie France. Assembly device of an element on a part presenting a fluid channel. 5,533,762, Cl. 285-101.000.
Carney, Ronald R.; and Williams, Terry L., to AirNet Communications Corporation. Transceiver apparatus employing wideband FFT channelizer and inverse FFT combiner for multichannel communication network. 5,535,240, Cl. 375-219.000.
Carolan, Michael F.; and Dyer, Paul N., to Air Products and Chemicals, Inc. Ion transport membranes with catalyzed mixed conducting porous layer. 5,534,471, Cl. 502-4.000.
Carothers, James L.: *See—*
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Carre, Laurent; and Correard, Patrick, to SGS-Thomson Microelectronics S.A. Data-storage device. 5,535,173, Cl. 365-230.090.
Carrier Corporation: *See—*
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Casas, Ivan A.; and Mollstam, Bo, to Biogaia AB. Method of treating enteropathogenic bacterial infections in poultry. 5,534,253, Cl. 424-93.450.
Case Corporation: *See—*
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Cases I Sellart, Josep: *See—*
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Cash Guard AB: *See—*
Nordqvist, Leif. 5,533,627, Cl. 209-534.000.
Casio Computer Co., Ltd.: *See—*
Kita, Kazunori, 5,534,872, Cl. 342-146.000.
Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., to Donnelly Corporation. Method for making elemental semiconductor mirror for vehicles. 5,535,056, Cl. 359-603.000.
Caspers, Carl A. Prosthetic polyurethane liner and sleeve for amputees. 5,534,034, Cl. 623-32.000.
Cassetti, David K., to VLSI Technology, Inc. Digital computer system having an improved direct-mapped cache controller (with flag modification) for a CPU with address pipelining and method therefor. 5,535,360, Cl. 395-467.000.
Castillo Cervantes, Salavador: *See—*
Miramontes Cardenas, Luis E.; Castillo Cervantes, Salavador; and Moran Pineda, Florencia M., 5,534,475, Cl. 502-304.000.
Castonguay, Roger N.; Smith, James J.; and Murphy, Thomas A., to General Electric Company. Circuit breaker remote closing operator. 5,534,833, Cl. 335-68.000.
Castrol North America Automotive Inc.: *See—*
Henkel, Herbert W.; Kaplan, Elisabeth; and Hall, Philip G., 5,534,181, Cl. 510-423.000.
Caterpillar Inc.: *See—*
Grant, Shannon G., 5,533,548, Cl. 137-540.000.
Hosseini, Javad; Cobo, Michael A.; Rytter, Noel J.; and Verheyen, Andrew G., 5,535,124, Cl. 364-426.030.
Johnson, Thomas R., 5,533,584, Cl. 180-415.000.
Steffen, Mark A.; Sutton, Lynn A.; Stuckey, Gregory K.; and Johnsen, Rex N., 5,533,590, Cl. 180-332.000.
Catherwood, Michael I.; Kilbane, Kevin; and Dobbs, Laura M., to Motorola, Inc. Data processor having a timer circuit for performing a buffered pulse width modulation function and method therefor. 5,535,376, Cl. 395-550.000.
Cattell, Kevin T.; Cromer, William R.; Lin, Shihta; Neuchterlein, Bruce E.; and Potok, Thomas E., to International Business Machines Corporation. Method and apparatus for automatically generating database definitions of indirect facts from entity-relationship diagrams. 5,535,325, Cl. 395-161.000.
Cavanaugh, James C. Vehicle exterior body panel seat. 5,533,774, Cl. 296-66.000.
Cavazza, Claudio: *See—*
Tinti, Maria O.; Misiti, Domenico; Cavazza, Claudio; and Scafetta, Nazareno, 5,534,549, Cl. 514-551.000.
Cecchini, Warren, to American Auto-Matrix, Inc. Fiber optic interface and system. 5,535,031, Cl. 359-113.000.
Cedraeus, Hugo: *See—*
Söderholm, Jan; and Cedraeus, Hugo, 5,533,624, Cl. 206-524.300.

- Cella, Stephen D.: *See—*
  - McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, 5,534,835, Cl. 335-172.000.
- Cellport Labs, Inc.: *See—*
  - Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., 5,535,274, Cl. 379-446.000.
- CelsiusTech Electronics AB: *See—*
  - Johansson, Stefan; and Sandström, Unto, 5,534,696, Cl. 250-330.000.
- Cemu Bioteknik AB: *See—*
  - Uhlen, Mathias; and Lundeberg, Joakim, 5,534,424, Cl. 435-91.200.
- Ceram Optec Industries, Inc.: *See—*
  - Kamuz, Alexander M.; Krivoshlykov, Sergej G.; and Oleksenko, Pavel F., 5,535,294, Cl. 385-25.000.
- Cerboni, Renzo, to Carle & Montanari S.p.A. Method for pouring quantities of chocolate into molds. 5,534,283, Cl. 426-515.000.
- Cesar, Bozo: *See—*
  - Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, 5,535,366, Cl. 395-486.000.
- CG-Chemie GmbH: *See—*
  - Lesmann, Jörg; and Schäfer, Hermann G., 5,534,624, Cl. 544-196.000.
- Chaguturu, Munirathnam K.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
- Chahabadi, Djahanyar; and Vogt, Lothar, to Blaupunkt-Werke GmbH. Circuit for removing ignition noise from a multiplex signal. 5,535,280, Cl. 381-13.000.
- Chaihorsky, Alexander: *See—*
  - Golubev, Daniel B.; and Chaihorsky, Alexander, 5,534,258, Cl. 424-231.100.
- Chalfant, Michael G. Bandage winding machine. 5,533,689, Cl. 242-532.500.
- Chalupa, William F.; and Sanderson, George R., to Monsanto Company. No-fat gellan gum spread. 5,534,286, Cl. 426-573.000.
- Chambers, Randall P.: *See—*
  - Karl, David H.; Chambers, Randall P.; and Dionisio, Vito, Jr., 5,535,437, Cl. 455-90.000.
- Chan, Raymond: *See—*
  - Ford, Joseph E.; Hilger, Ronald O.; and Chan, Raymond, 5,535,089, Cl. 361-231.000.
- Chandraratna, Roshantha A.: *See—*
  - Song, Tae K.; and Chandraratna, Roshantha A., 5,534,641, Cl. 549-416.000.
- Chandraratna, Roshantha A. S., to Allergan. Acetylenes disubstituted with a heteroaromatic group and a 2-substituted chromanyl, thiochromanyl or 1, 2, 3, 4-tetrahydroquinolinyl group having retinoid-like activity. 5,534,516, Cl. 514-253.000.
- Chang, Ching F.: *See—*
  - Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., 5,534,133, Cl. 208-39.000.
- Chang, Ching H.: *See—*
  - Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534,494, Cl. 514-16.000.
- Chang, Chin-Hai: *See—*
  - Pouletty, Philippe; and Chang, Chin-Hai, 5,534,412, Cl. 435-7.240.
- Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., to International Business Machines Corporation. Method and system for adaptively building a static Ziv-Lempel dictionary for database compression. 5,534,861, Cl. 341-79.000.
- Chang, Chun-Hsiung. Equilibrium breaking type load carrying means for use in a treadmill. 5,533,951, Cl. 482-54.000.
- Chang, David Y.: *See—*
  - Li, Shih-Gong; and Chang, David Y., 5,535,403, Cl. 395-800.000.
- Chang, Fa-Sheng, to Hsi-Huang LIN. LED package structure of LED display. 5,534,718, Cl. 257-98.000.
- Chang, Jung-Jen: *See—*
  - Lin, Chung-Kuang; and Chang, Jung-Jen, 5,533,535, Cl. 135-20.100.
- Chang, Yueh-Lin: *See—*
  - Motoyama, Tetsuro; and Chang, Yueh-Lin, 5,535,318, Cl. 395-145.000.
- Chang, Yung M.: *See—*
  - Raman, Rajesh; Tan, Chin S.; and Chang, Yung M., 5,535,370, Cl. 395-500.000.
- Chapman, Benjamin E.; and Creedon, Michael T., to Procter & Gamble Co., The. Process for making particles comprising lactam bleach activators. 5,534,195, Cl. 510-444.000.
- Chapman, Benjamin E.; and Creedon, Michael T., to Procter & Gamble Co., The. Process for making lactam bleach activator containing particles. 5,534,196, Cl. 252-186.270.
- Chapman, Sydney G.: *See—*
  - Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, 5,535,286, Cl. 382-109.000.
- Chapple-Sokol, Jonathan D.. *See—*
  - O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, 5,534,066, Cl. 118-663.000.
- Charbonnier, Philippe, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Station combining a minitel-type videotex terminal with a facsimile machine. 5,535,016, Cl. 358-442.000.
- Charles Machine Works, Inc., The: *See—*
  - Martin, J. Scott; and Carothers, James L., 5,533,939, Cl. 474-206.000.
- Chartered Semiconductor Manufacturing Pte. Ltd.: *See—*
  - Man, Chiu-Kwan, 5,533,635, Cl. 216-67.000.
- Chartrain, Michel; and Armstrong, Joseph D., III, to Merck & Co., Inc. Bioconversion of beta keto-ester to (R) hydroxyester. 5,534,422, Cl. 435-118.000.
- Chavannes, Theodore E.; and Walsworth, Richard L., to Harris Corporation. Regulated power supply having wide input AC/DC voltage range. 5,534,768, Cl. 323-267.000.
- Cheema-Dhadli, Surinder: *See—*
  - Halperin, Mitchell L.; and Cheema-Dhadli, Surinder, 5,533,964, Cl. 604-4.000.
- Cheever, John D.: *See—*
  - Patterson, Sam H.; Cheever, John D.; and Larson, Michael W., 5,533,937, Cl. 474-80.000.
- Chem-Pro: *See—*
  - Rundhaug, Patrick A., 5,534,124, Cl. 588-204.000.
- Chemie Linz GmbH: *See—*
  - Seufer-Wasserthal, Peter; Mayrhofer, Herbert; Wirth, Irma; and Pöchlauer, Peter, 5,534,436, Cl. 435-280.000.
- Chen, Chih-Kang; and Duluk, Jerome F., Jr., to Silicon Engines, Inc. System and method for cross correlation with application to video motion vector estimator. 5,535,288, Cl. 382-236.000.
- Chen, Chin-Fu; Lu, Wen-Hwa; and Chueh, Shan-Chang, to Industrial Technology Research Institute. Method for making seamless tubes from hollow billets. 5,533,375, Cl. 72-254.000.
- Chen, Chi-Shiang. Rail joint for expansion between rails with inverted T-shaped base holder. 5,533,670, Cl. 238-187.000.
- Chen, Ding-Yu: *See—*
  - Sato, Shougo; Chen, Ding-Yu; and Suzuki, Makoto, 5,535,088, Cl. 361-225.000.
- Chen, Hui-Huang. Compact disk assembly rack. 5,533,630, Cl. 211-40.000.
- Chen, James: *See—*
  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
- Chen, Jiann-Hsing: *See—*
  - Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., 5,534,347, Cl. 428-375.000.
- Chen, Jie: *See—*
  - Jangi, Shrirang; and Chen, Jie, 5,535,271, Cl. 379-351.000.
- Chen, Kuo N. Manual driven valved piston reciprocating liquid pump. 5,533,879, Cl. 417-553.000.
- Chen, Shang C.: *See—*
  - Kuo, Po C.; Huang, Jin H.; and Chen, Shang C., 5,534,080, Cl. 148-121.000.
- Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., to Eastman Kodak Company. Fusing roll having a fluorocarbon-silicone barrier layer. 5,534,347, Cl. 428-375.000.
- Cheney, Henry H., III; and Vecchione, Michael. Instant reusable compress. 5,534,020, Cl. 607-108.000.
- Cheng, Jonathan; and Chou, Luk. Automatic umbrella with multiple operation modes. 5,533,541, Cl. 135-22.000.
- Cheng, Ting: *See—*
  - Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, 5,535,213, Cl. 370-85.150.
- Cheu, S. Scot: *See—*
  - Morris, Jerry L.; McAleavey, Michael E.; and Cheu, S. Scot, 5,534,368, Cl. 429-152.000.
- Cheung, Robin W., to Advanced Micro Devices, Incorporated. Layered low dielectric constant technology. 5,534,731, Cl. 257-759.000.
- Cheung, Yiu M.; Ng, Kenneth K. W.; and Strong, Hovey R., Jr., to International Business Machines Corporation. Method and apparatus for probabilistic clock synchronization with interval arithmetic. 5,535,217, Cl. 370-100.100.
- Chiang, Alice; McBride, Kevin M.; and Yee, Calvin C., to International Business Machines Corporation. Interactive online tutorial system for software products. 5,535,422, Cl. 395-155.000.
- Chiang, Alice M., to Massachusetts Institute of Technology. Single chip adaptive filter utilizing updatable weighting techniques. 5,535,150, Cl. 364-724.190.
- Chiang, Don-Kai; and Huang, Roger F., to Microtek International, Inc. Scanner light diffuser. 5,535,021, Cl. 358-474.000.
- Chiang, Kenneth H.-C.: *See—*
  - Bonissone, Piero P.; Schutten, Michael J.; and Chiang, Kenneth H.-C., 5,534,766, Cl. 323-235.000.
- Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., to Insite Peripherals, Inc. Very high-density diskette format method and computer-implemented process. 5,535,069, Cl. 360-77.030.
- Chien, Henry: *See—*
  - Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,534,456, Cl. 437-43.000.
- Chien, Kenneth: *See—*
  - Baker, Joffre; Chien, Kenneth; King, Kathleen; Pennice, Diane; and Wood, William, 5,534,615, Cl. 530-350.000.
- Child, Jonathan E.: *See—*
  - Randolph, Bruce B.; Abbott, Ronald G.; Child, Jonathan E.; and Del Rossi, Kenneth J., 5,534,657, Cl. 585-723.000.
- Chin, Eiten: *See—*
  - Masukawa, Junichi; Isshiki, Nobuyuki; Ohji, Nobunori; Chin, Eiten; and Numata, Toshiharu, 5,534,065, Cl. 118-410.000.

- Chin, Wilson C.; and Hamlin, Kenneth H., to Halliburton Company. MWD surface signal detector having enhanced acoustic detection means. 5,535,177, Cl. 367-81.000.
- Chiron Corporation: *See—*
  - Huston, James S.; Houston, L. L.; Ring, David B.; and Oppermann, Hermann, 5,534,254, Cl. 424-135.100.
- Chisso Corporation: *See—*
  - Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, 5,534,291, Cl. 427-221.000.
  - Miyazawa, Kazutoshi; Matsui, Shuichi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,187, Cl. 252-299.010.
  - Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,189, Cl. 252-299.630.
- Chiyoda Corporation: *See—*
  - Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, 5,534,233, Cl. 422-191.000.
- Cho, Sung S.: *See—*
  - Kardach, James; Cho, Sung S.; Peterson, Nicholas B.; and Lane, Thomas R., 5,535,420, Cl. 395-868.000.
- Cho, Toshitsura: *See—*
  - Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, 5,534,649, Cl. 558-277.000.
- Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, to Tama Chemicals Co., Ltd.; and Moses Lake Industries, Inc. Process for preparing dialkyl carbonates. 5,534,649, Cl. 558-277.000.
- Choi, Chung-Hing, to Hing Fat Toys Manufacturer Limited. Sport rackets. 5,533,724, Cl. 273-73.00C.
- Choi, Jin-seung, to Samsung Electronics Co., Ltd. Magnetic recording/reproducing apparatus including windbreak members for preventing air flow between head drum and tape. 5,535,070, Cl. 360-84.000.
- Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., to Lucky Ltd. Starting materials for prepartion of sulfonylurea derivarives and process for preparing the same. 5,534,637, Cl. 548-374.100.
- Choi, Jong-Deok: *See—*
  - Burke, Michael G.; Carini, Paul R.; and Choi, Jong-Deok, 5,535,394, Cl. 395-700.000.
- Chokappa, Kalyansundaram D.; and Naik, Vijay M., to Lever Brothers Company, Division of Conopco,Inc. Process for the manufacture of soap bars and apparatus for use in same process. 5,534,212, Cl. 264-211.110.
- Chong, Leighton K.; and Kamprath, Christine K., to Trans-Link International Corp. Machine translation and telecommunications system using user ID data to select dictionaries. 5,535,120, Cl. 364-419.030.
- Choo, Dong J.: *See—*
  - Bambury, Ronald E.; and Choo, Dong J., 5,534,605, Cl. 526-260.000.
- Chou, Luk: *See—*
  - Cheng, Jonathan; and Chou, Luk, 5,533,541, Cl. 135-22.000.
- Chou, Robert V.: *See—*
  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
- Chow, Jessie. Ratchet wrench having ratchet teeth of higher strength. 5,533,427, Cl. 81-63.200.
- Chow, Yen-Lu: *See—*
  - Acero, Alejandro; Chow, Yen-Lu; and Lee, Kai-Fu, 5,535,305, Cl. 395-2.650.
- Choy, Tan H.: *See—*
  - Kiat, Ho B.; and Choy, Tan H., 5,533,336, Cl. 60-533.000.
- Christensen, Richard N.: *See—*
  - Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,533,362, Cl. 62-476.000.
- Christensen, Robin B.: *See—*
  - Pullar, Gregory T.; Christensen, Robin B.; and Okonek, Lester J., 5,533,333, Cl. 60-327.000.
- Christy, Don: *See—*
  - Petersen, Robert V.; Hsu, Tsung-Min; Lee, Han-Chen; and Christy, Don, 5,534,260, Cl. 424-448.000.
- Chrysler Corporation: *See—*
  - Baker, Gary L.; Jakubiec, Steven M.; Agar, Brian E.; and Brom, Erik, 5,533,353, Cl. 62-227.000.
  - Boeck, Harold W.; Wargnier, David M.; and Baurhenn, Charles, 5,533,378, Cl. 72-302.000.
  - Damerow, Robert L.; and Zedan, David M., 5,533,421, Cl. 74-563.000.
  - Larson, Pamela E.; and Nulty, John D., 5,533,780, Cl. 296-194.000.
  - Lee, Anscn; and Pyko, Jan S., 5,534,781, Cl. 324-380.000.
  - Martin, Berthold; and Benford, Howard L., 5,533,945, Cl. 475-276.000.
  - Sanders, David L., 5,535,131, Cl. 364-487.000.
  - Sands, Richard H.; Harkey, Jerry P.; and Pace, J. Gary, 5,533,472, Cl. 123-41.350.
- Chu, Chu-Hui W.: *See—*
  - Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., 5,534,312, Cl. 427-533.000.
- Chu, Eric. Shock preventive pneumatic tool as automatically shut off under no load condition. 5,533,579, Cl. 173-17.000.
- Chuang, Louis. Hand air pump having two actuators. 5,533,436, Cl. 92-146.000.
- Chuck, Alice S. Y.: *See—*
  - Palsson, Bernhard Ø.; Clarke, Michael F.; and Chuck, Alice S. Y., 5,534,423, Cl. 435-172.100.
- Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., to DNA Plant Technology Corporation. Ph genes and their uses. 5,534,660, Cl. 800-205.000.
- Chueh, Shan-Chang: *See—*
  - Chen, Chin-Fu; Lu, Wen-Hwa; and Chueh, Shan-Chang, 5,533,375, Cl. 72-254.000.
- Chumbley, Gregory R. Data collection device. 5,535,118, Cl. 364-401.00R.
- Chung, Bum-Goo; and Kim, Myung-Ho, to Hyundai Motor Co., Ltd. Method for producing a reinforcing stainless steel wire-aluminum alloy composite structure and a product thereof. 5,534,083, Cl. 148-218.000.
- Chung, In B.: *See—*
  - Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,534,637, Cl. 548-374.100.
- Chung Kin Lo: *See—*
  - He, Kai S., 5,534,951, Cl. 348-832.000.
- Chung, Lee H.-C. Electric hand drill set. 5,533,843, Cl. 408-241.00R.
- Church, Jeffrey D.: *See—*
  - Fillinger, David R.; and Church, Jeffrey D., 5,533,912, Cl. 439-521.000.
- Chuujou, Takao; Kobayashi, Ieyasu; Hamano, Hisashi; and Etchu, Masami, to Teijin Limited. Biaxially oriented film of polyethylene-2,6-naphtalenedicarboxylate for magnetic recording floppy disks. 5,534,323, Cl. 428-65.300.
- Ciba-Geigy Corporation: *See—*
  - Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,534,629, Cl. 544-78.000.
  - Groner, Bernd; Gouilleux, Fabrice; and Wakao, Hiroshi, 5,534,409, Cl. 435-6.000.
  - Leppard, David G.; Köhler, Manfred; and Misev, Ljubomir, 5,534,559, Cl. 522-64.000.
  - Quotschalla, Udo; and Linhart, Helmut, 5,534,645, Cl. 558-71.000.
  - Shum, Sai P., 5,534,646, Cl. 558-80.000.
  - Steinmann, Alfred, 5,534,618, Cl. 528-419.000.
  - Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, 5,534,566, Cl. 524-27.000.
- Ciccarelli, Roger N.: *See—*
  - Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., 5,534,379, Cl. 430-106.000.
- Ciccarello, Charles: *See—*
  - Correia, Horacio; and Ciccarello, Charles, 5,533,837, Cl. 405-262.000.
- Ciccarone, Terrence M.; MacTough, Suzanne C.; and Williams, Theresa M., to Merck & Co., Inc. Prodrugs of inhibitors of farnesyl-protein transferase. 5,534,537, Cl. 514-397.000.
- Cieplik, Arthur: *See—*
  - Benecke, Jurgen; Cieplik, Arthur; and Burmester, Thomas, 5,533,675, Cl. 239-413.000.
- Cimini, Catherine M.: *See—*
  - Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.
- Cino, Paul M.: *See—*
  - Johnston, Robert M.; Goldberg, Steven L.; and Cino, Paul M., 5,534,427, Cl. 435-198.000.
- Cirrus Logic, Inc.: *See—*
  - Davis, Phillip D.; Sharma, Sudhir; and Long, Hai, 5,535,165, Cl. 365-201.000.
- Citta, Richard W.; Sgrignoli, Gary J.; and Turner, Rudolf. Digital TV system using segment and field sync signals. 5,534,938, Cl. 348-495.000.
- Claflin, Alfred J.: *See—*
  - Anderson, David G.; and Claflin, Alfred J., 5,534,897, Cl. 347-32.000.
- Claiborne, Jimmy D.: *See—*
  - Wethington, Glenn; Claiborne, Jimmy D.; and Strain, Mark R., 5,533,461, Cl. 112-278.000.
- Clairson, Inc.: *See—*
  - Remmers, Lee, 5,533,851, Cl. 411-344.000.
- Clanton, Christopher L.: *See—*
  - Smolinske, Jeffrey C.; Clanton, Christopher L.; and Tran, Phieu M., 5,535,210, Cl. 370-85.200.
- Clappier, Robert R. FM receiver anti-fading method and system. 5,535,440, Cl. 455-134.000.
- Clare, Stephen R.; Higginbotham, Paul; and Stuart, David M., to BOC Group plc, The. Air separation. 5,533,339, Cl. 62-654.000.
- Clark, Daniel O.: *See—*
  - Shamouilian, Shamouil; and Clark, Daniel O., 5,533,923, Cl. 451-41.000.
- Clark, Natalie, to United States of America, Air Force. Spatial light modulator having amplitude coupled with binary phase mode. 5,535,029, Cl. 359-63.000.
- Clark, Randall J.: *See—*
  - Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.
- Clark, Richard N. Single cut clipper for nails. 5,533,262, Cl. 30-29.000.
- Clarke, Michael F.: *See—*
  - Palsson, Bernhard Ø.; Clarke, Michael F.; and Chuck, Alice S. Y., 5,534,423, Cl. 435-172.100.
- Clausen, Thomas: *See—*
  - Neunhoeffer, Hans; Gerstung, Stefan; Clausen, Thomas; and Balzer, Wolfgang R., 5,534,267, Cl. 424-701.000.
- Clausmeyer, Horst; Hoffmann, Dieter; and Weber, Wolfgang, to MAN Gutehoffnungshütte Aktiengesellschaft. High-strength solid wheels and tires for railroad traction vehicles and cars. 5,533,770, Cl. 295-1.000.
- Claxton, Bruce A.: *See—*

  - Balzano, Quirino; Richards, Scott H.; and Claxton, Bruce A., 5,535,435, Cl. 455-89.000.
- Clerkin, Thomas, to Wire Technologies, Inc. Abrasion tester. 5,533,382, Cl. 73-7.000.
- Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., to Exxon Chemical Patents Inc. Preparation of overbased magnesium sulphonates. 5,534,168, Cl. 508-396.000.
- Cliff, Paul L., Jr., to Universities Research Association, Inc. Safety lock-out device for electrical appliances. 5,535,096, Cl. 361-726.000.
- Clifford, John W.: *See—*
  - Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
- Climate Master, Inc.: *See—*
  - Rawlings, John P., 5,533,355, Cl. 62-260.000.
- Co-Operative Facility For Aging Tester Development: *See—*
  - Kaneko, Kazuo; Katayama, Masayasu; and Kochi, Kiyoshi, 5,534,786, Cl. 324-760.000.
- Coale, Christopher F. Fuel separator apparatus. 5,534,138, Cl. 210-86.000.
- Coatex S.A.: *See—*
  - Egraz, Jean-Bernard; Mongoin, Jacques; and Ravet, Georges, 5,534,586, Cl. 524-547.000.
- Cobale Company, L.L.C.: *See—*
  - Bailey, Edward D., Jr., 5,534,337, Cl. 428-236.000.
- Cobo, Michael A.: *See—*
  - Hosseini, Javad; Cobo, Michael A.; Rytter, Noel J.; and Verheyen, Andrew G., 5,535,124, Cl. 364-426.030.
- Coca-Cola Company, The: *See—*
  - Plester, George, 5,533,373, Cl. 72-84.000.
- Codony I Salcedo, Rafael: *See—*
  - Boatella I Riera, Josep; Rafecas I Martinez, Magdalena; Codony I Salcedo, Rafael; Minguell I Juncosa, Genaro; and Cases I Sellart, Josep, 5,534,279, Cl. 426-266.000.
- Cody, Wayne L.: *See—*
  - Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534,494, Cl. 514-16.000.
- Cognitech Inc.: *See—*
  - Zhong, Sifen, 5,534,925, Cl. 348-384.000.
- Cohen, Daniel E.: *See—*
  - Doubek, William J.; Cohen, Daniel E.; and Johnson, Bruce C., 5,533,503, Cl. 128-200.240.
- Cohen, Ephraim: *See—*
  - Arad, Shoshana (Malis); and Cohen, Ephraim, 5,534,417, Cl. 435-67.000.
- Cohen, Yitzak; Brody, Rafael; Magril, Tzvika; and Eshet, Dan, to Motorola, Inc. Modulator data/control equipment. 5,535,396, Cl. 395-733.000.
- Cohn, John M.; and Heng, Fook-Luen, to International Business Machines Corporation. Object placement aid. 5,535,134, Cl. 364-491.000.
- Coke, Jay E., to Westvaco Corporation. Basal nutrient medium for in vitro cultures of loblolly pines. 5,534,433, Cl. 435-240.540.
- Coke, Jay E., to Westvaco Corporation. Basal nutrient medium for in vitro cultures of loblolly pines. 5,534,434, Cl. 435-240.540.
- Cole, Edwin L. Sign for stranded vehicles. 5,533,287, Cl. 40-591.000.
- Cole, Herbert S., Jr.: *See—*
  - Lupinski, John H.; and Cole, Herbert S., Jr., 5,534,602, Cl. 525-432.000.
- Cole, H. Lee. Method of removing hair from a localized area of skin by surface electrolysis. 5,534,003, Cl. 606-36.000.
- Cole, Mark S.: *See—*
  - Zaleski, Edward R.; and Cole, Mark S., 5,533,976, Cl. 604-153.000.
- Coleman Company, Inc., The: *See—*
  - Long, Norris R., 5,533,892, Cl. 431-264.000.
- Coley, Helen M.: *See—*
  - Jarman, Michael; and Coley, Helen M., 5,534,625, Cl. 544-196.000.
- Colgate-Palmolive Co.: *See—*
  - Erilli, Rita; and Galvez, Maria, 5,534,200, Cl. 510-396.000.
  - Vesborg, Steen, 5,533,553, Cl. 141-319.000.
- Coller, John A.; Nappi, Bruce; and Lane, Alan J., to Foster-Miller; and Lahey Clinic Medical Center. Solid state sphincter myometers. 5,533,515, Cl. 128-748.000.
- Collette, Wayne N.; and Krishnakumar, Suppayan M., to Continental PET Technologies, Inc. Apparatus for forming a strain-hardenable thermoplastic container. 5,533,881, Cl. 425-525.000.
- Collins Bank & Trust, Tracy, legal representative.: *See—*
  - Abildskov, Dale, deceased, 5,533,693, Cl. 244-131.000.
- Columbia Gas of Ohio, Inc.: *See—*
  - Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,533,362, Cl. 62-476.000.
- Columbia University: *See—*
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  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
- Comfort Products, Ltd.: *See—*
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- Commissariat a l'Energie Atomique: *See—*
  - Boquet, Paul; Boulain, Jean-Claude; Ducancel, Frederic; Gillet, Daniel; and Ménez, André, 5,534,223, Cl. 422-61.000.
  - Leger, Jean-Michel; and Guttin, Christophe, 5,534,776, Cl. 324-304.000.
  - Leroux, Thierry; and Meyer, Robert, 5,534,744, Cl. 313-309.000.
- Compagnie Generale Des Matieres Nucleaires: *See—*
  - Besnier, Joseph, 5,533,407, Cl. 73-864.250.
- Compagnie Oris Industrie, SA: *See—*
  - Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, 5,534,622, Cl. 534-15.000.
- Compaq Computer Corporation: *See—*
  - Belmont, Brian V., 5,535,400, Cl. 395-750.000.
  - Reents, Daniel B.; Cooper, Patrick R.; Garrett, James H.; and McKenzie, Philip J., 5,534,889, Cl. 345-132.000.
  - Tipley, Roger E.; Moriarty, Michael; and Taylor, Mark, 5,535,395, Cl. 395-729.000.
- Competitive Technologies Inc.: *See—*
  - Bilder, Wayne H.; Granata, Richard D.; and Leidheiser, Henry, Jr., 5,534,289, Cl. 427-8.000.
- Compusci, Inc.: *See—*
  - Pugh, William C.; and McNally, John M., 5,534,734, Cl. 307-38.000.
- Comsat: *See—*
  - Sorbello, Robert M.; and Zaghloul, Amir I., 5,534,877, Cl. 343-700.0MS.
- Cone, Fred P.; Prece, Stephen V.; and Best, Donn A., to United Technologies Corporation. Low temperature forging process for Fe-Ni-Co low expansion alloys and product thereof. 5,534,085, Cl. 148-336.000.
- Cone, Richard E., II, to Cosco, Inc. Child restraint apparatus for a child seat. 5,533,786, Cl. 297-256.150.
- Conley, Rick A. Multi-purpose lawn care machine. 5,533,676, Cl. 239-663.000.
- Connector Manufacturing Company: *See—*
  - Boehm, William J.; and Dinkel, Gunter E., 5,533,913, Cl. 439-810.000.
- Connolly, Thomas: *See—*
  - Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
- Connor, Daniel S.: *See—*
  - Scheibel, Jeffrey J.; Connor, Daniel S.; and Fu, Yi-Chang, 5,534,197, Cl. 510-356.000.
- Connor, John: *See—*
  - Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Ternullo, Luigi, Jr., 5,535,164, Cl. 365-201.000.
- Conrad, Jeffrey P.: *See—*
  - Zupancic, Joseph J.; Conrad, Jeffrey P.; Konicek, Jiri D.; and Tungare, Aroon V., 5,534,565, Cl. 523-454.000.
- Conrad, Peter E.; and Saunders, Timothy W., to Stamet, Inc. Hopper with moving wall and method of making and using the same. 5,533,650, Cl. 222-161.000.
- Consolidated Technology Corp.: *See—*
  - Freeman, John O.; Howse, Richard H.; and Reinhart, Tim, 5,533,346, Cl. 62-89.000.
- Conti, Richard A.: *See—*
  - O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, 5,534,066, Cl. 118-663.000.
- Continental American Corporation: *See—*
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- Continental PET Technologies, Inc.: *See—*
  - Collette, Wayne N.; and Krishnakumar, Suppayan M., 5,533,881, Cl. 425-525.000.
- Controlled Power Limited Partnership: *See—*
  - Nourse, George R., 5,534,782, Cl. 324-500.000.
- Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., to Columbia Gas of Ohio, Inc. Heat transfer apparatus for heat pumps. 5,533,362, Cl. 62-476.000.
- Cook, John E.; and Perry, Paul D., to Siemens Electric Ltd. Vacuum sustaining valve. 5,533,488, Cl. 123-568.000.
- Cooke, Laurence H.: *See—*
  - Phillips, Christopher E.; Ahrens, Michael G.; Nolan, Joseph G., III; and Cooke, Laurence H., 5,534,798, Cl. 326-108.000.
- Coomes, Joseph A.: *See—*
  - Leach, Jerald G.; Coomes, Joseph A.; Marshall, Steve P.; and Simar, Laurence R., 5,535,348, Cl. 395-375.000.
- Cooper, Albert B.: *See—*
  - Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., 5,535,264, Cl. 379-89.000.
- Cooper Industries, Inc.: *See—*
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  - Ling, Geoffrey, 5,535,110, Cl. 362-297.000.
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  - Reents, Daniel B.; Cooper, Patrick R.; Garrett, James H.; and McKenzie, Philip J., 5,534,889, Cl. 345-132.000.
- Cooper, Ronald J.: *See—*
  - Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., 5,535,333, Cl. 395-200.030.
- Copeland Corporation: *See—*
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Cordis Corporation: *See—*
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- Cordova, Jackie: *See—*
  - Polch, Ewaryst Z.; Williams, Carl D.; and Cordova, Jackie, 5,533,811, Cl. 384-107.000.

- Corish, John; and Corrigan, Owen I., to Elan Corporation, plc. Passive transdermal device with controlled drug delivery. 5,533,995, Cl. 604-890.100.
- Cornelius, Richard G.: *See—*
  - Pray, James R.; Cornelius, Richard G.; and Arney, Michelle, 5,533,987, Cl. 604-280.000.
- Cornell Research Foundation, Inc.: *See—*
  - Kilbourn, Robert G.; Griffith, Owen W.; and Gross, Steven S., 5,534,545, Cl. 514-565.000.
- Corning Incorporated: *See—*
  - Alpha, James W.; and Borrelli, Nicholas F., 5,534,321, Cl. 428-64.200.
  - Andrus, Ronald I.; and MacDowell, John F., 5,534,470, Cl. 501-32.000.
  - Hanson, Thomas A.; Kish, William J.; Novak, Jerome J.; and Vandervort, Annette L., 5,534,994, Cl. 356-73.100.
  - Havens, Thomas G.; Kerko, David J.; and Morrell, JoAnn, 5,534,041, Cl. 65-30.100.
  - Johnson, Ronald E.; Lock, William E.; and Shoup, Robert D., 5,533,447, Cl. 101-211.000.
- Correale, Anthony, Jr.; and Hendrickson, Gary T., to International Business Machines Corporation. Process insensitive off-chip driver. 5,534,803, Cl. 327-108.000.
- Correard, Patrick: *See—*
  - Carre, Laurent; and Correard, Patrick, 5,535,173, Cl. 365-230.090.
- Correia, Horacio; and Ciccarello, Charles. Anchor for retaining wall formed of superimposed concrete blocks. 5,533,837, Cl. 405-262.000.
- Corrigan, Owen I.: *See—*
  - Corish, John; and Corrigan, Owen I., 5,533,995, Cl. 604-890.100.
- Corrigan, Patrick J.; and Howie, John K. Nondigestible fat compositions containing solid polyol polyester polymer for passive oil loss control. 5,534,284, Cl. 426-531.000.
- Cortes, John F.: *See—*
  - Pierpont, Robert L.; Cortes, John F.; Fabrisi, Michael J.; and Ryder, Kenneth F., 5,533,823, Cl. 401-98.000.
- Corvas International, Inc.: *See—*
  - Brunck, Terence K.; Pepe, Michael G.; Pearson, Daniel A.; and Webb, Thomas R., 5,534,498, Cl. 514-19.000.
- Cosco, Inc.: *See—*
  - Cone, Richard E., II, 5,533,786, Cl. 297-256.150.
- Costa, Larry J. Two-axis cartesian robot. 5,533,858, Cl. 414-751.000.
- Costa, Raffaele: *See—*
  - Campardo, Giovanni; Costa, Raffaele; and Torricelli, Piero, 5,535,157, Cl. 365-185.050.
- Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, to Kabushiki Kaisha Toshiba. Apparatus for processing semiconductor wafers. 5,534,106, Cl. 156-636.100.
- Cotler, Tina J.: *See—*
  - O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, 5,534,066, Cl. 118-663.000.
- Cotton, Dale C.: *See—*
  - Baldwin, Joe M.; and Cotton, Dale C., 5,533,348, Cl. 62-129.000.
- Cotton, John M., to IPC Information Systems, Inc. Shared buffer switching module. 5,535,197, Cl. 370-60.000.
- Coulter, Thomas W. Fishing rod holder. 5,533,294, Cl. 43-15.000.
- Council of Scientific & Industrial Research: *See—*
  - Rele, Meenakshi V.; Bansod, Snehal M.; and Srinivasan, Mandayam C., 5,534,429, Cl. 435-200.000.
- Courtaulds Fibres (Holdings) Limited & Buss AG: *See—*
  - Quigley, Michael C.; and Naef, Rainer F., 5,534,113, Cl. 159-49.000.
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- Courtaulds PLC: *See—*
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- Courtney-Gutterson, Neal: *See—*
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- Courty, Philippe: *See—*
  - Travers, Christine; Courty, Philippe; and Sarrazin, Patrick, 5,534,658, Cl. 585-738.000.
- Covington, Michael J.; and Richman, Kevin S., to Case Corporation. Method and apparatus for compacting cotton within basket. 5,533,932, Cl. 460-119.000.
- Cox, David E.; Gottschalk, Karl D.; Lawton, Craig M.; Linton, John F.; and Whitfield, John P., to International Business Machines Corporation. Method and system for reporting the status of an aggregate resource residing in a network of interconnected real resources. 5,535,335, Cl. 395-200.110.
- Cox, Douglas H.: *See—*
  - Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., 5,535,333, Cl. 395-200.030.
- Cox, Lewis D., to Falcon Products, Inc. Leveling mechanism adjustable glide. 5,533,457, Cl. 100-150.000.
- Coyle, Joseph P.: *See—*
  - Gist, William B.; and Coyle, Joseph P., 5,534,811, Cl. 327-309.000.
- Craig, Franklin J.: *See—*
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- Cramer Coil & Transformer Co., Inc.: *See—*
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- Cramer, Joseph F., Jr.: *See—*
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- Crandall, Thomas L.; Strout, Donald W.; and Hansen, Eigil, to A'Gramkow A/S. Refrigerant recovering system. 5,533,358, Cl. 62-292.000.
- Crane, David O.; Golding, Ian B.; and Crann, Robin, to Crane Electronics Limited. Torque wrench with angular motion detector. 5,533,409, Cl. 73-862.230.
- Crane Electronics Limited: *See—*
  - Crane, David O.; Golding, Ian B.; and Crann, Robin, 5,533,409, Cl. 73-862.230.
- Crann, Robin: *See—*
  - Crane, David O.; Golding, Ian B.; and Crann, Robin, 5,533,409, Cl. 73-862.230.
- Crawford, Alan W.: *See—*
  - Ellis, James; and Crawford, Alan W., 5,533,454, Cl. 102-202.100.
- Cray Research, Inc.: *See—*
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- Creative BioMolecules, Inc.: *See—*
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- Creative Integration & Design, Inc.: *See—*
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  - Johnson, Bruce C., 5,533,499, Cl. 128-200.240.
- Creedon, Michael T.: *See—*
  - Chapman, Benjamin E.; and Creedon, Michael T., 5,534,195, Cl. 510-444.000.
  - Chapman, Benjamin E.; and Creedon, Michael T., 5,534,196, Cl. 252-186.270.
- Creekmore, Veron R.; and Davis, John E., to Rockwell International Corporation. Electro-optical sensor system for use in observing objects. 5,534,697, Cl. 250-332.000.
- Crilly, Thomas I., III: *See—*
  - Perugini, Michael N.; and Crilly, Thomas I., III, 5,533,255, Cl. 29-758.000.
- Crippa, Ugo. Mechanism for movements of prefixed path, referable as of elliptical shape. 5,534,761, Cl. 318-568.100.
- Critzer, Mark R.: *See—*
  - Baril, Albert M.; Holmes, Roy H.; and Critzer, Mark R., 5,535,053, Cl. 359-409.000.
- Critzer, W. Larry, to Lucas, Rick P.; and Terry, Allan D. Signal responsive vehicle disabling system. 5,533,589, Cl. 180-287.000.
- Crivellaro, Guglielmo: *See—*
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- Cromwell, Arthur H., to Willamette Industries Inc. Octagonal box structure. 5,533,666, Cl. 229-109.000.
- Crook, Ronald J.: *See—*
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- Crosby, Robert D. Fishing lure container. 5,533,297, Cl. 43-57.100.
- Crosby, Samuel C.: *See—*
  - Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., 5,533,311, Cl. 52-309.900.
- Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., to American Cyanamid Company. (2-imidazolin-2-yl) fused heteropyridine compounds intermediates for the preparation of and use of said compounds as herbicidal agents. 5,534,483, Cl. 504-221.000.
- Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., to American Cyanamid Company. Novel (2-imidazolin-2yl)fused heteropyridine compounds intermediates for the preparation of and use of said compounds and herbicidal agents. 5,534,484, Cl. 504-235.000.
- Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., to American Cyanamid Company. (2-imidazolin-2-yl) fused heteropyridine compounds, intermediates for the preparation of and use of said compounds as herbicidal agents. 5,534,485, Cl. 504-246.000.
- Cross, David M.; Hueneke, Manfred H. K.; Farris, Ronald A.; McConnell, Bobby L.; and Newman, Robert M., to Burlington Industries, Inc. Stiff fabric and method of forming the stiff fabric. 5,534,298, Cl. 427-358.000.
- Cross, Peter E.: *See—*
  - Alker, David; Cross, Peter E.; and Wallis, Robert M., 5,534,626, Cl. 544-360.000.
- Crosspoint Solutions, Inc.: *See—*
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- Crowfoot, Catherine B. Case for motor bike. 5,533,616, Cl. 206-335.000.
- Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., to Roll Systems, Inc. Stacker jam detector. 5,533,719, Cl. 270-52.090.

Crum, Daniel R.; Simmons, Bill P.; Teegarden, Arlo F.; Rood, Jerry A.; and Kotlarek, Peter A., to American Standard Inc. Scroll compressor having a frame and open sleeve for controlling gas and lubricant flow. 5,533,875, Cl. 417-368.000.

Csipkes, Andrei; and Palmquist, John M., to AT&T Corp. Band matching system and method for enabling accurate determination of a disparity between two surfaces using an interferometer. 5,535,002, Cl. 356-345.000.

Cuingnet, Patrick, to Schneider Electric SA. Control and/or indicator unit. 5,534,840, Cl. 337-1.000.

Cullen, Thomas G.: *See—*

Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.

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Cunningham, Brian C.; Lowman, Henry; and Wells, James A., to Genentech, Inc. Human growth hormone variants having greater affinity for human growth hormone receptor at site 1. 5,534,617, Cl. 530-399.000.

Curtis, Charles T.: *See—*

Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.

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Cutright, Edwin L.; Scott, G. Robert; and Vogt, Howard W., Jr., to Philip Morris Incorporated. Method and apparatus for applying a material to a web. 5,534,114, Cl. 162-139.000.

Cyliax, Uwe. Restraining system for foldable rear-seat back rests in motor vehicles. 5,533,775, Cl. 296-68.100.

Cypress Semiconductor Corp.: *See—*

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CytoTherapeutics, Inc.: *See—*

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Daewoo Electronics Co., Ltd.: *See—*

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Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Bartley, Burton H., to ABB Lummus Global Inc. Synthesis of zeolites. 5,534,135, Cl. 208-120.000.

Daihen Corporation: *See—*

Okuda, Kouji; Nishi, Tokumitsu; Takai, Hiroshi; and Hoshino, Hisakiyo, 5,534,091, Cl. 156-89.000.

Daiichi Pharmaceutical Co., Ltd.: *See—*

Takano, Toshiya; and Ko, Minoru S. H., 5,534,419, Cl. 435-691.000.

Daiichi Techno Co., Ltd.: *See—*

Iwata, Noboru, 5,533,878, Cl. 417-477.300.

Daikin Industries, Ltd.: *See—*

Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.

Dailey, James H.; Morgan, John R.; and Saad, Karim I., to Novamax Technologies, Inc. Tin coating composition and method. 5,534,048, Cl. 106-1.220.

Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., to Xerox Corporation. Environmentally friendly toner composition. 5,534,379, Cl. 430-106.000.

Dalferth, Hans H., to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Pocket chain wheel. 5,533,938, Cl. 474-164.000.

Daluge, Susan M.: *See—*

Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., 5,534,535, Cl. 514-394.000.

Daly, Daniel T.: *See—*

Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., 5,534,039, Cl. 44-367.000.

Dam, Robert: *See—*

Gierut, Joseph J.; Suvada Rutkowski, Julie; and Dam, Robert, 5,534,671, Cl. 200-52.00R.

Damerow, Robert L.; and Zedan, David M., to Chrysler Corporation. Integrated plastic brake/clutch pedal. 5,533,421, Cl. 74-563.000.

Damhus, Ture: *See—*

Godtfredsen, Sven E.; Kirk, Ole; and Damhus, Ture, 5,534,435, Cl. 435-262.500.

Dandrea, Tamara H. Child's safety barrier for railing systems. 5,533,715, Cl. 256-45.000.

Danek Medical, Inc.: *See—*

Brumfield, David L.; Anderson, M. Neil; and Luque, Eduardo R., 5,534,002, Cl. 606-61.000.

Dang, Chi H.; and Dang, Chi T., to International Business Machines Corporation. Data security protection for information recorded on a rewritable storage medium using a write-once read-many storage medium. 5,535,188, Cl. 369-84.000.

Dang, Chi T.: *See—*

Dang, Chi H.; and Dang, Chi T., 5,535,188, Cl. 369-84.000.

Daniels, Paul H.: *See—*

Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., 5,534,652, Cl. 560-98.000.

Danielson, Arvin D., to Norand Corporation. Portable optical reader with motion sensing system and method. 5,534,684, Cl. 235-472.000.

Dappen, Michael S.: *See—*

Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.

Dassen, Antonius G. M.; and Hagg, Franklin, to Stork Product Engineering B.V. Wind turbine. 5,533,865, Cl. 416-228.000.

Data Card Corporation: *See—*

Warwick, Dennis J., 5,535,078, Cl. 360-119.000.

Data General Corporation: *See—*

Kopper, David J., 5,535,381, Cl. 395-600.000.

Daubenbüchel, Werner; and Jira, Alfred, to Krupp Kautex Maschinenbau GmbH. Process for the production of a hollow body of thermoplastic material. 5,534,218, Cl. 264-516.000.

Davis, Franklin J.: *See—*

Mullooly, John F.; Davis, Franklin J.; Madden, Thomas J.; and Wright, Richard R., 5,533,330, Cl. 60-39.320.

Davis, John E.: *See—*

Creekmore, Veron R.; and Davis, John E., 5,534,697, Cl. 250-332.000.

Davis, Michael, to Snugabye Inc. Convertible wearing apparel. 5,533,209, Cl. 2-60.000.

Davis, Oliver M. Payload tie-down system. 5,533,848, Cl. 410-105.000.

Davis, Phillip D.; Sharma, Sudhir; and Long, Hai, to Cirrus Logic, Inc. Circuits, systems and methods for testing integrated circuit devices including logic and memory circuitry. 5,535,165, Cl. 365-201.000.

Davison, Brian H.: *See—*

Scott, Charles D.; Petersen, James N.; and Davison, Brian H., 5,534,153, Cl. 210-661.000.

Davoll, Gregory L.: *See—*

Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.

Dawson, Keith; and Hayhurst, Robert, to W. L. Gore & Associates (UK) Ltd. Oil reservoir. 5,534,062, Cl. 118-60.000.

Dayco Products, Inc.: *See—*

Thomas, Danny L.; and Bishop, Clinton L., 5,534,217, Cl. 264-516.000.

DCM Tech, Inc.: *See—*

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De Nora Permelec S.p.A.: *See—*

Traini, Carlo; and Meneghini, Giovanni, 5,534,122, Cl. 204-266.000.

Deane, Daniel, to Perkins Limited. Engine and gear drive combination. 5,533,475, Cl. 123-198.00C.

Deans, William S. Electrical connector assembly. 5,533,915, Cl. 439-678.000.

Deavenport, Joe E.; and Naive, Joel A., to Hughes Aircraft Company. System for providing a constant current to a fluorescent tube. 5,534,755, Cl. 315-307.000.

Dehabov, Vladimir G.: *See—*

Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.

Debner, Thomas G.: *See—*

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DeBoer, David M.: *See—*

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Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., to Eli Lilly and Company. Biotransformation of glycopeptide antibiotics. 5,534,420, Cl. 435-71.300.

DeBrosse, John K.; Lary, Jenifer E.; and Sprogis, Edmund J., to International Business Machines Corporation. Single twist layout and method for paired line conductors of integrated circuits. 5,534,732, Cl. 257-776.000.

DeCanio, Stephen J.: *See—*

Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., 5,534,040, Cl. 48-197.00R.

De Castro, Lan, to NanoSystems LLC. Method of preparing stable drug nanoparticles. 5,534,270, Cl. 424-490.000.

Deckel Maho GmbH: *See—*

Geissler, Alfred, 5,533,846, Cl. 409-201.000.

Decker, Lawrence H.: *See—*

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Deckner, George E.: *See—*

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Decusatis, Casimer M.: *See—*

Barringer, Wayne A.; Decusatis, Casimer M.; and Stigliani, Daniel J., Jr., 5,535,139, Cl. 364-550.000.

Deere & Company: *See—*

Bergland, Norman R.; Wisor, Donald R.; and Portillo, Netza, 5,533,458, Cl. 111-200.000.

Friesen, Henry; and Oka, Ken K., 5,533,856, Cl. 414-711.000.

De Faria-Correa, Marco A. M.; and Hochberg, Julio, to Very Inventive Physicians, Inc. Endoscopic technique particularly suited for exploratory surgery. 5,533,496, Cl. 128-898.000.

Deffeyes, Robert J.: *See—*

Rainwater, Jewel G.; Benson, Paul; Belko, William R.; Deffeyes, Robert J.; Carlson, Arne B., deceased, 5,534,290, Cl. 427-97.000.

DeFoster, Steven M.; Truestedt, Horst L.; and Thatcher, Raymond J., to International Business Machines Corporation. Optical fiber ring communications system and communications method. 5,535,035, Cl. 359-161.000.

de Gier, Gertrudis M. G.; van Doornmalen, Adrianus M. C. M.; and Wingens, Hendrikus T. J. J., to Methold 's-Hertogenbosch B.V. Device for crushing and/or cutting material. 5,533,682, Cl. 241-101.730.

Degroot, Paul J.: *See—*

Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., 5,534,873, Cl. 342-165.000.

Deguchi, Masanobu: *See—*

Izumi, Hirokazu; Deguchi, Masanobu; Oku, Koji; Yamamoto, Shuuhei; and Katayama, Harumi, 5,535,010, Cl. 358-296.000.

Degussa Aktiengesellschaft: *See—*

Birkenbeil, Hans; Brand, Ulrich; Goor, Gustaaf; and Kunkel, Wolfgang, 5,534,149, Cl. 210-636.000.

Drauz, Karlheinz; Knaup, Günter; and Groeger, Ulrich, 5,534,538, Cl. 514-19.000.

Drauz, Karlheinz; and Martens, Jürgen, 5,534,541, Cl. 514-448.000.

Hoffacker, Gerd; Kaiser, Hasso; Reissmueller, Klaus; and Wirth, Guenter, 5,534,129, Cl. 205-241.000.

De Haan, Gerard; Biezen, Paul W. A. C.; Ojo, Olukayode A.; and Huijgen, Hendrik, to U.S. Philips Corporation. Apparatus for performing motion–compensated picture signal interpolation. 5,534,946, Cl. 348-619.000.

Dehne, Heinz-Wilhelm: *See—*

Gerdes, Peter; Gayer, Herbert; Dutzmann, Stefan; and Dehne, Heinz-Wilhelm, 5,534,550, Cl. 514-620.000.

Deitcher, David: *See—*

Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.

De Jesus Munoz Contreras, Jose: *See—*

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Deka Products Limited Partnership: *See—*

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De La Cruz Moreno, Enrique: *See—*

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Delco Electronics Corporation: *See—*

Koglin, Dennis M.; and Kearney, Mark B., 5,534,816, Cl. 327-513.000.

Dell USA, L.P.: *See—*

Bell, James S., 5,535,330, Cl. 395-183.120.

Parks, Terry, 5,535,377, Cl. 395-550.000.

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DeLorme, Pierre: *See—*

Pierfine, Michel; and DeLorme, Pierre, 5,534,701, Cl. 250-363.040.

Del Raso, Americo. Adjustable clamping strap. 5,533,717, Cl. 269-42.000.

Del Rossi, Kenneth J.: *See—*

Randolph, Bruce B.; Abbott, Ronald G.; Child, Jonathan E.; and Del Rossi, Kenneth J., 5,534,657, Cl. 585-723.000.

Delucia, Mary L.: *See—*

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DeMar, Lawrence E., to Williams Electronics Games, Inc. Audit and pricing system for coin-operated games. 5,533,727, Cl. 463-23.000.

DeMasters, Jimmie G., to Phillips Petroleum Company. In-ground conduit system for geothermal applications. 5,533,356, Cl. 62-260.000.

DeMejo, Lawrence P.: *See—*

Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., 5,534,347, Cl. 428-375.000.

Demeritt, Debra E.: *See—*

Demeritt, Kevin D.; and Demeritt, Debra E., 5,534,014, Cl. 606-236.000.

Demeritt, Kevin D.; and Demeritt, Debra E. Pillow pacifier. 5,534,014, Cl. 606-236.000.

DeMicheli, Marco, to SGS-Thomson Microelectronics S.r.l. Anti-logarithmic converter with temperature compensation. 5,534,813, Cl. 327-346.000.

Denaro, Rinaldo: *See—*

Rinaldi, Fernando; Crivellaro, Guglielmo; and Denaro, Rinaldo, 5,534,676, Cl. 219-124.340.

Denes, Ferencz S.; and Young, Raymond A., to Wisconsin Alumini Research Foundation. Apparatus for reactions in dense-medium plasmas. 5,534,232, Cl. 422-186.260.

Denney, Peter J. Dueling disc game. 5,533,735, Cl. 273-411.000.

Dennison, Charles H.; and Helm, Mark, to Micron Technology, Inc. Methods of forming complementary metal oxide semiconductor (CMOS) integrated circuitry. 5,534,449, Cl. 437-34.000.

Dent, Paul W.; and Haartsen, Jacobus C., to Ericsson Inc. Radio personal communications system and method for allocating frequencies for communications between a cellular terminal and a base station. 5,535,259, Cl. 379-59.000.

Dent, Paul W., to Ericsson GE Mobile Communications Inc. Dual-mode satellite/cellular phone with a frequency synthesizer. 5,535,432, Cl. 455-77.000.

Denyer, John S. H., to Medic-Aid Limited. Nebuliser. 5,533,501, Cl. 128-200.210.

De Paoli, Tomás; and Hager, Alfredo A., to Ferroni, Juan Carlos; and Lipotech S.A. Liposomes containing bioavailable iron (II) and process for obtaining them. 5,534,268, Cl. 424-450.000.

Deplano, Stefano; Melis, Eugenio; and Millone, Roberto, to Iritecna Societa per l'Impiantistica Industriale e l'Assetto del Territorio p.A. Method and device for quenching, particularly for steel tubes or similar. 5,533,716, Cl. 266-114.000.

DePlano, Stefano: *See—*

Barelli, Alfredo; and DePlano, Stefano, 5,533,893, Cl. 432-122.000.

Depreux, Patrick: *See—*

Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.

Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.

Deremo, Edwin J.: *See—*

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Derosa, Thomas F.; Benfaremo, Nicholas; Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., to DSM Copolymer Inc. Process fur making a polymeric lubricant additive designed to enhance anti-wear, anti-oxidancy, and dispersancy thereof. 5,534,171, Cl. 508-231.000.

De Ruyter, Peter W.; Almey, Noel; Slanik, Josef; and Teich, Wesley W. Process and apparatus for making meat analogs. 5,534,278, Cl. 426-237.000.

Desai, Sureshchandra G.: *See—*

Casamassina, Thomas; Morales, Florencio, Jr.; Salka, Barry A.; Fallon, John; Desai, Sureshchandra G.; and McCurry, Patrick M., Jr., 5,534,500, Cl. 252-353.000.

Deschenaux, Robert: *See—*

Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, 5,534,622, Cl. 534-15.000.

Des Courieres, Thierry: *See—*

Fajula, François; Patarin, Joel; Des Courieres, Thierry; and Fitoussi, Fredj, 5,534,239, Cl. 423-713.000.

de Seze, Fabrice; and Gourgue, Frédéric, to Alcatel Mobile Communication France. Method enabling a mobile station of a cellular mobile radio system with more than one type of cell to determine the type of cell it is accessing, and mobile station and base transceiver station for implementing this method. 5,535,424, Cl. 455-33.100.

Desohry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, to Ciba-Geigy Corporation. α-aminoacetophenones as photoinitiators. 5,534,629, Cl. 544-78.000.

Despeyroux, Pierre: *See—*

Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, 5,534,530, Cl. 514-361.000.

DeStefano, Donald. Method for recovering water from fruit. 5,534,274, Cl. 426-66.000.

De Subijana, Joseba M.: *See—*

Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,535,405, Cl. 395-800.000.

Deutsch, Alina: *See—*

Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.

Devenyi, Gabor, to Hughes Aircraft Company. Leadscrew assembly. 5,533,417, Cl. 74-424.80R.

Devine, Sara W.: *See—*

Young, Harvey J.; Brown, Thomas W.; Devine, Sara W.; and Perfetti, Thomas A., 5,533,530, Cl. 131-370.000.

Devon Industries, Inc.: *See—*

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Devtech Corporation: *See—*

Ricketts, David J., 5,534,266, Cl. 424-672.000.

Diaz, Antonio A.: *See—*

Tice, Joseph B.; Diaz, Antonio A.; and Manning, Dennis P., 5,534,319, Cl. 428-36.910.

Diaz, Eusebio M. Positionable sunglasses and cap combination. 5,533,207, Cl. 2-10.000.

Dible, Robert D.: *See—*

Lenz, Eric H.; and Dible, Robert D., 5,534,751, Cl. 315-111.710.

- Dickerson, Charles W.; Overton, Richard A.; and Luther, Ronald B., to Luther Medical Products, Inc. Over-the-needle catheter. 5,533,988, Cl. 604-282.000.
- Didier-Werke AG: *See—*
  - Angeler, Alois; Kaune, Harald; and Scheuten, Theo, 5,533,713, Cl. 266-218.000.
- Diefes, Debra L.; Fan, Leopold C.; and Rodgers, Charles E., to Adroit Systems, Inc. Attitude determining system for use with global positioning system. 5,534,875, Cl. 342-357.000.
- Dietliker, Kurt: *See—*
  - Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,534,629, Cl. 544-78.000.
- Digital Equipment Corporation: *See—*
  - Brett, Bevin R., 5,535,392, Cl. 395-700.000.
  - Gist, William B.; and Coyle, Joseph P., 5,534,811, Cl. 327-309.000.
  - Glaser, Stephen D.; Thomas, Robert E.; and Walsh, Robert J., 5,535,209, Cl. 370-84.000.
  - Goldman, Matthew S.; and Mendelson, Jeffrey B., 5,535,216, Cl. 370-100.100.
  - McCarthy, William F.; Brench, Colin E.; and Snow, Daniel M., 5,535,099, Cl. 361-800.000.
  - Miller, James S.; and Ganapathi, Jagadeesan, 5,535,323, Cl. 395-155.000.
  - Reiff, Francis H., 5,535,354, Cl. 395-421.070.
  - Shockley, William R.; and Gajnak, George E., 5,534,855, Cl. 340-825.300.
  - Ulichney, Robert A., 5,535,020, Cl. 358-457.000.
- Dildine, Charles N. Golf cart ball dispenser. 5,533,646, Cl. 221-185.000.
- DiMarco, Bernard: *See—*
  - McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, 5,534,835, Cl. 335-172.000.
- Diniz, Milton E.: *See—*
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- Dinkel, Gunter E.: *See—*
  - Boehm, William J.; and Dinkel, Gunter E., 5,533,913, Cl. 439-810.000.
- Dion, John K.: *See—*
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- Dionisio, Vito, Jr.: *See—*
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- Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, to Adir Et Compagnie. (Aryl(alkyl)carbonyl)-heterocyclic compounds and their use in the treatment of anxiety and depression. 5,534,517, Cl. 514-253.000.
- DiPrizio, Giuseppe M.: *See—*
  - Yepez, Esteban, III; and DiPrizio, Giuseppe M., 5,535,168, Cl. 365-227.000.
- Dirnbeck, Ronald J. Sports goal. 5,533,733, Cl. 273-400.000.
- Diversified Technologies, Inc.: *See—*
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- Dix, Johannes P.: *See—*
  - Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, 5,534,166, Cl. 8-557.000.
- Dixon, Cloyd, Jr.; and Hunter-Rinderle, Stephen J., to Procter & Gamble Company, The. Aqueous oral compositions. 5,534,243, Cl. 424-49.000.
- Dixon, Lloyd J., to Valvtec Pty Limited. Assembly for prevention of backflow in valves. 5,533,546, Cl. 137-218.000.
- Dixson, John A.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
- Dizerega, Gere S.: *See—*
  - Rodgers, Kathleen E.; and Dizerega, Gere S., 5,534,261, Cl. 424-450.000.
- D'Jamoos, Michael: *See—*
  - Ng, Tat K.; and D'Jamoos, Michael, 5,535,218, Cl. 370-102.000.
- DNA Plant Technology Corporation: *See—*
  - Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., 5,534,660, Cl. 800-205.000.
- Doany, Fuad E.: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Dobbs, Laura M.: *See—*
  - Catherwood, Michael I.; Kilbane, Kevin; and Dobbs, Laura M., 5,535,376, Cl. 395-550.000.
- Dobrotvorsky, Anatoly E.; Rozputnyak, Yaroslav A.; Khuchua, Galina N.; and Komissarova, Irina A. Pharmaceutical granulated composition and method for preparing same. 5,534,262, Cl. 424-464.000.
- Doehner, Robert F., Jr.: *See—*
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,483, Cl. 504-221.000.
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,484, Cl. 504-235.000.
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,485, Cl. 504-246.000.
- Doherty, Phillip J.: *See—*
  - Tupper, George I. F.; Allegranza, Anthony C.; and Doherty, Phillip J., 5,534,820, Cl. 330-149.000.
- Doi, Fumiaki: *See—*
  - Kondou, Yoshimasa; Hanaoka, Masaaki; Nakamura, Shinji; and Doi, Fumiaki, 5,535,415, Cl. 395-828.000.
- Doi, Takehito: *See—*
  - Akiyama, Takehiro; Shimomura, Katsuya; Takekawa, Kouzi; and Doi, Takehito, 5,534,821, Cl. 331-8.000.
- Doi, Yoshiyuki: *See—*
  - Seto, Yoshihiro; and Doi, Yoshiyuki, 5,534,225, Cl. 422-64.000.
- Doiron, Daniel R., to PDT Systems, Inc. Vivo dosimeter for photodynamic therapy. 5,533,508, Cl. 128-634.000.
- Dolan, Shawn E.: *See—*
  - Dollman, David Y., deceased; Dolan, Shawn E.; and Steinbrecher, Lester E., 5,534,082, Cl. 148-247.000.
- Dollman, Betty, executrix: *See—*
  - Dollman, David Y., deceased; Dolan, Shawn E.; and Steinbrecher, Lester E., 5,534,082, Cl. 148-247.000.
- Dollman, David Y., deceased (by Betty Dollman, executrix); Dolan, Shawn E.; and Steinbrecher, Lester E., to Henkel Corporation. Composition and process for treating metal. 5,534,082, Cl. 148-247.000.
- Domonkos, Sara: *See—*
  - Wells, Steven; Hasbun, Robert N.; Domonkos, Sara; and Barbarich, Steven S., 5,535,369, Cl. 395-497.020.
- Donahue, Frederick A.: *See—*
  - Lindenfelser, William M.; and Donahue, Frederick A., 5,534,895, Cl. 347-19.000.
- Dong, Liang C.: *See—*
  - Wong, Patrick S.-L.; Edgren, David E.; Dong, Liang C.; and Ferrari, Vincent J., 5,534,263, Cl. 424-473.000.
- Dong, Ping; Eyuboglu, M. Vedat; and Forney, George D., Jr., to Motorola, Inc. Device and method for achieving rotational invariance in a multi-level trellis coding system. 5,535,228, Cl. 371-49.100.
- Donnelly Corporation: *See—*
  - Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,535,056, Cl. 359-603.000.
- Dooner, Hugo K.: *See—*
  - Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., 5,534,660, Cl. 800-205.000.
- Doremus, Lonnie R.; and Blaha, David L., to Rockwell International Corporation. Automatic call distributor having multiple audio sources. 5,535,270, Cl. 379-266.000.
- Dorner, John R.: *See—*
  - McAnaney, David W.; and Dorner, John R., 5,534,141, Cl. 210-110.000.
- Dornish, John M.: *See—*
  - Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Bøorretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, 5,534,531, Cl. 514-365.000.
- Doubek, William J.; Cohen, Daniel E.; and Johnson, Bruce C., to Creative Integration & Design, Inc. Nasal dilator. 5,533,503, Cl. 128-200.240.
- Douglas, Brian: *See—*
  - Rump, Siegfried; Steiner, Manfred; and Douglas, Brian, 5,535,123, Cl. 364-426.020.
- Dow Chemical Company, The: *See—*
  - Faley, Timothy L.; Mills, Michael E.; Teramoto, Yoshihiko; Turek, Douglas E.; and Yabuki, Kazuyuki, 5,534,205, Cl. 264-103.000.
  - O'Briem, James J.; and Woo, Edmund P., 5,534,614, Cl. 528-183.000.
- Dow, Paul W.; and Dow, Steven S., to Byron Enterprises, Inc. Track vehicles and power drive apparatus for motivating tracked vehicles. 5,533,587, Cl. 180-235.000.
- Dow, Steven S.: *See—*
  - Dow, Paul W.; and Dow, Steven S., 5,533,587, Cl. 180-235.000.
- Dowa Mining Co., Ltd.: *See—*
  - Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.
- Dowe, David R.; and Albrecht, Richard E., to Eastman Kodak Company. Belt drive shutter device. 5,534,961, Cl. 354-264.000.
- Downey, Michael T.: *See—*
  - Lee, Ron C.; Heil, Michael D.; Downey, Michael T.; and Barrasso, Michael J., 5,533,338, Cl. 62-638.000.
- Doyle, Kevin J.; and Eastlund, Gary N., to Minnesota Mining and Manufacturing Company. Mandrel with twist lock apparatus. 5,533,691, Cl. 242-597.400.
- Dr. Ing. h.c.F. Porsche AG: *See—*
  - Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
  - Stehle, Heinz; and Hoebel, Peter, 5,533,423, Cl. 74-606.00R.
- Drach, John C.: *See—*
  - Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., 5,534,535, Cl. 514-394.000.
- Drake, Charles E.; Fifield, John A.; Wheeler, Richard D.; and Wolford, Barry J., to International Business Machines Corporation. On-chip ECC status. 5,535,226, Cl. 371-40.100.
- Drake, Donald J., to Xerox Corporation. Ink jet printhead having a flat surface heater plate. 5,534,901, Cl. 347-63.000.
- Drauz, Karlheinz; Knaup, Günter; and Groeger, Ulrich, to Degussa Aktiengesellschaft. N-acyl dipeptides and their compositions. 5,534,538, Cl. 514-19.000.

- Drauz, Karlheinz; and Martens, Jürgen, to Degussa Aktiengesellschaft. Compounds for combating plant disease. 5,534,541, Cl. 514-448.000.
- Dresser-Rand Company: *See—*
  - Anderson, Alan C., 5,533,476, Cl. 123-267.000.
- Drewes, Rolf: *See—*
  - Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, 5,534,566, Cl. 524-27.000.
- Drexl, Hans-Jürgen: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- DSM Copolymer Inc.: *See—*
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- Du Pont de Nemours, E. I., and Company: *See—*
  - Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
  - Bodager, Gregory A.; and Monroe, Bruce M., 5,534,380, Cl. 430-143.000.
  - Bodager, Gregory A.; and Beighle, Phillip L., 5,534,387, Cl. 430-325.000.
  - Borland, William; Hayakawa, Keiichiro; Sato, Takeshi; and Smith, Jerome, 5,534,194, Cl. 252-518.000.
  - Ferretti, August; and Van Buskirk, Oral R., 5,533,465, Cl. 117-224.000.
  - Grot, Walther G., 5,534,576, Cl. 524-377.000.
  - Jacobson, Howard W., 5,534,193, Cl. 252-518.000.
  - Lee, Kung H., 5,534,151, Cl. 210-640.000.
  - Summers, John D.; and Tam, Wilson, 5,534,201, Cl. 252-582.000.
- Du Pont (UK) Limited: *See—*
  - Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,534,623, Cl. 534-560.000.
- Dua, Sanjay: *See—*
  - Bush, Kevin J.; Dua, Sanjay; Adams, Neil J.; and Markyvech, Craig R., 5,535,135, Cl. 364-496.000.
- Ducancel, Frederic: *See—*
  - Boquet, Paul; Boulain, Jean-Claude; Ducancel, Frederic; Gillet, Daniel; and Ménez, André, 5,534,223, Cl. 422-61.000.
- Duchemin, Pierre; Baurand, Gilles; and Leglaye, Dominique, to Telemecanique. Switch. 5,534,832, Cl. 335-16.000.
- Duff, James M.: *See—*
  - Mayo, James D.; Duff, James M.; Hamer, Gordon K.; and Gardner, Sandra J., 5,534,376, Cl. 430-59.000.
- Duffy, Robert W.: *See—*
  - Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., 5,535,137, Cl. 364-514.00A.
- Duffy, William J., Jr.: *See—*
  - Touchton, Scott F.; Peinetti, Donald L.; and Duffy, William J., Jr., 5,533,469, Cl. 119-721.000.
- Dugger, Howard W., to Dugger, Warren E. Oil spill containment and recovery system. 5,533,832, Cl. 405-63.000.
- Dugger, Warren E.: *See—*
  - Dugger, Howard W., 5,533,832, Cl. 405-63.000.
- Duh, Shi-Chin. Method for rapidly solidifying water in a container. 5,533,344, Cl. 62-66.000.
- Duluk, Jerome F., Jr.: *See—*
  - Chen, Chih-Kang; and Duluk, Jerome F., Jr., 5,535,288, Cl. 382-236.000.
- Duncan, Richard L.: *See—*
  - Wert, Joseph D.; and Duncan, Richard L., 5,534,795, Cl. 326-81.000.
- Dunlap, Joel M.: *See—*
  - Goman, Gerald E.; Fay, Malachy; and Dunlap, Joel M., 5,533,326, Cl. 56-7.000.
  - Sallstrom, Steve A.; Goman, Gerald E.; and Dunlap, Joel M., 5,533,325, Cl. 56-7.000.
- Dupont, Jeffrey S.: *See—*
  - Heinzman, Stephen W.; Dupont, Jeffrey S.; and Tettenhorst, William C., 5,534,642, Cl. 554-98.000.
- Dupont, Pierre, to Motorola, Inc. Method of dynamically allocating time slots on a packet data communications channel. 5,535,207, Cl. 370-80.000.
- Dupuy, Pierre, to Societe Anonyme Dite Alcatel Radiotelephone. Method of exchanging data between a base transceiver station of a mobile radio network and a mobile in the network. 5,535,423, Cl. 455-33.100.
- Duque, Elder F. Pocket liberator holster system. 5,533,655, Cl. 224-602.000.
- Dura Automotive Holding, Inc.: *See—*
  - Perisho, Randal J., 5,533,420, Cl. 74-512.000.
- Duraframe Window Shutter Systems, Inc.: *See—*
  - Fullwood, James, 5,533,308, Cl. 52-204.500.
- Durametallic Corporation: *See—*
  - Sedy, Josef, 5,533,739, Cl. 277-81.00R.
- Durante, Richard J.; and Underwood, Keith F., to Intel Corporation. Method and apparatus for providing a context switch in response to an interrupt in a computer process. 5,535,397, Cl. 395-740.000.
- Durham, Chris: *See—*
  - Mottola, Jim; Nelson, Arlin D.; and Durham, Chris, 5,533,986, Cl. 604-264.000.
- Durocher, David T.: *See—*
  - Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., 5,534,183, Cl. 510-434.000.
- Dutta, Mitra; and Zhou, Weimin, to United States of America, Army. Modulation doped quantum well waveguide modulator. 5,535,045, Cl. 359-248.000.
- Dutta, Satyajit: *See—*
  - Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., 5,534,812, Cl. 327-333.000.
- Dutzmann, Stefan: *See—*
  - Gerdes, Peter; Gayer, Herbert; Dutzmann, Stefan; and Dehne, Heinz-Wilhelm, 5,534,550, Cl. 514-620.000.
- Duvoisin, Herbert A., III: *See—*
  - Spencer, George L.; Duvoisin, Herbert A., III; and Vasicek, Jean, 5,535,291, Cl. 382-254.000.
- Dvoretzky, Israel; and Kuleza, John E. Heating pad for providing heat therapy. 5,534,021, Cl. 607-112.000.
- Dybro, Niels; and Miller, Harold J., III, to AlliedSignal Inc. Seat belt retractor with energy absorbing lock wheels. 5,533,756, Cl. 280-806.000.
- Dyer, Paul N.: *See—*
  - Carolan, Michael F.; and Dyer, Paul N., 5,534,471, Cl. 502-4.000.
- Dyllick-Brenzinger, Rainer: *See—*
  - Adel, Jörg; and Dyllick-Brenzinger, Rainer, 5,534,378, Cl. 430-106.600.
- Dynlacht, Brian D.: *See—*
  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
- Dziark, John J.: *See—*
  - Lin, Chiu-Sing; and Dziark, John J., 5,534,563, Cl. 523-122.000.
- E. J. Brooks Company: *See—*
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- E. R. Squibb & Sons, Inc.: *See—*
  - Johnston, Robert M.; Goldberg, Steven L.; and Cino, Paul M., 5,534,427, Cl. 435-198.000.
- E. S. Originals, Inc.: *See—*
  - Stein, Michael, 5,533,278, Cl. 36-11.500.
- Eagan, Bruce P., to Schlage Lock Company. Means for, and a method of, adjusting a cylindrical lockset for door thickness-sizing. 5,533,368, Cl. 70-374.000.
- Easom Engineering and Manufacturing Corporation: *See—*
  - Mabee, Brian D., 5,533,425, Cl. 74-661.000.
- Eastgate, Alan R.; and Vogel, Wilfried, to Fisons PLC. Sample nebulizer and evaporation chamber for ICP and MIP emission or mass spectrometry and spectrometers comprising the same. 5,534,998, Cl. 356-316.000.
- Eastham, John F.: *See—*
  - Young, Ian R.; and Eastham, John F., 5,534,779, Cl. 324-319.000.
- Eastlund, Gary N.: *See—*
  - Doyle, Kevin J.; and Eastlund, Gary N., 5,533,691, Cl. 242-597.400.
- Eastman Chemical Company: *See—*
  - Shih, Wayne K.; and Light, Ronald R., 5,534,570, Cl. 524-114.000.
- Eastman Kodak Company: *See—*
  - Anderson, Charles C.; Niemeyer, David A.; and Jennings, David F., 5,534,397, Cl. 430-530.000.
  - Blackman, Robert J., 5,535,062, Cl. 360-3.000.
  - Bowman, Wayne A.; Shuttleworth, Leslie; and Weber, Helmut, 5,534,478, Cl. 503-227.000.
  - Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., 5,534,347, Cl. 428-375.000.
  - Dowe, David R.; and Albrecht, Richard E., 5,534,961, Cl. 354-264.000.
  - Furlani, Edward P.; Williams, Christopher C.; and Ghosh, Syamal K., 5,535,181, Cl. 369-13.000.
  - Hansen, David R., 5,535,009, Cl. 358-296.000.
  - Jeffers, Frederick J., 5,533,759, Cl. 283-70.000.
  - Keelan, Brian; and Pagano, Daniel, 5,534,959, Cl. 354-160.000.
  - McGuckin, Hugh G.; Carli, Jerel R.; Badger, John S.; and Waffle, Stephen J., 5,534,396, Cl. 430-463.000.
  - Shuttleworth, Leslie; Bowman, Wayne A.; and Weber, Helmut, 5,534,479, Cl. 503-227.000.
  - Spahn, Robert G., 5,534,385, Cl. 430-270.130.
  - Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Burns, Paul A.; and Weber, Lynda D., 5,534,401, Cl. 430-558.000.
  - Zander, Dennis R., 5,534,962, Cl. 354-289.120.
- Eaton Corporation: *See—*
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- Eble, Erhard: *See—*
  - Stiegelmann, René; Eble, Erhard; and Siegel, Helmut, 5,533,800, Cl. 366-142.000.
- Ebmeyer, Frank: *See—*
  - Appel, Wolfgang; Ebmeyer, Frank; Metzenthin, Tobias; and Siegemund, Günter, 5,534,634, Cl. 546-303.000.
- Eby, Edward D.: *See—*
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- ECC International Limited: *See—*
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- Echochem International, Inc.: *See—*
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- Eck, Henry: *See—*
  - Jackson, Tom; Eck, Henry; and Lowe, Ray, 5,535,441, Cl. 455-182.200.
- Ecker, R. Michael: *See—*
  - Wahlstrand, John D.; Baxter, Daniel J.; Ecker, R. Michael; Greeninger, Daniel R.; and Yerich, Charles G., 5,534,018, Cl. 607-27.000.
- Eckles, Robert D.: *See—*

  - Middendorf, Lyle R.; Bruce, Robert C.; and Eckles, Robert D., 5,534,125, Cl. 204-618.000.
- Ecochem Aktiengesellschaft: *See—*
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- Ecolab Inc.: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Ecomed, Inc.: *See—*
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis L; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Econoden Inc.: *See—*
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- Economikos, Laertis: *See—*
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- Ecotone of Broward, Inc.: *See—*
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- Eda, Takanori: *See—*
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- Eddy, John W.; Hutchinson, David F.; and Needham, Kelly S., Sr. Universal adapter for liquid dispensers. 5,533,651, Cl. 222-185.100.
- Eden, Douglas H.: *See—*
  - Roberts, R. Lee; Eden, Douglas H.; and Taylor, Andrew S., 5,534,202, Cl. 261-122.100.
- Edgar, Albert D., to International Business Machines Corporation. System and method for providing black diffusion in video image processing. 5,534,945, Cl. 348-615.000.
- Edgren, David E.: *See—*
  - Wong, Patrick S.-L.; Edgren, David E.; Dong, Liang C.; and Ferrari, Vincent J., 5,534,263, Cl. 424-473.000.
- Edo Corporation: *See—*
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- Edwards, Glenn R.; Rothenberg, Stuart J.; and Oberman, Mark L., to Greenleaf Medical Systems. Electronically aligned man-machine interface. 5,533,531, Cl. 128-782.000.
- Edwards, Scott: *See—*
  - Murphey, Randy; Bellotti, Marc; Lo, Ying-Cheng; and Edwards, Scott, 5,533,996, Cl. 604-283.000.
- Edwards, Stephen W., to Intergraph Corporation. Self-clocking pipeline register. 5,534,796, Cl. 326-93.000.
- Egawa, Akira: *See—*
  - Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,534,956, Cl. 354-76.000.
- Egawa, Ren; and Meyer, Edwin R., to Matsushita Electric Corporation of America. Method of splicing MPEG encoded video. 5,534,944, Cl. 348-584.000.
- Egawa, Saku: *See—*
  - Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, 5,534,740, Cl. 310-309.000.
- Egbert, William E.: *See—*
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- Egeyama, Harumi: *See—*
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- Egraz, Jean-Bernard; Mongoin, Jacques; and Ravet, Georges, to Coatex S.A. Grinding and/or dispersing agent containing polymers and/or copolymers partially neutralized by magnesium for aqueous suspensions of mineral substances, to be used in pigmentary applications. 5,534,586, Cl. 524-547.000.
- Ehlig, Peter N.: *See—*
  - Swoboda, Gary L.; and Ehlig, Peter N., 5,535,331, Cl. 395-183.210.
- Ehnebuske, David L.: *See—*
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- Ehrhart, Peter: *See—*
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- Eibeck, Richard E.: *See—*
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- Eicken, Karl: *See—*
  - Wagner, Oliver; Eicken, Karl; Götz, Norbert; Rang, Harald; Ammermann, Eberhard; and Lorenz, Gisela, 5,534,653, Cl. 564-32.000.
- Eidos Lizenzverwertungs GmbH: *See—*
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- Eigel, Rolf: *See—*
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- Eisen, Norbert; and Godthardt, Lutz-Peter, to Bayer Aktiengsellschaft. Process for insulating pipes. 5,534,299, Cl. 427-373.000.
- Ejiri, Seishi: *See—*
  - Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, 5,535,012, Cl. 358-400.000.
- Ekchian, Leon K.; Johnson, David D.; and Smith, William F., to Litton Systems, Inc. "Barometer" neuron for a neural network. 5,535,303, Cl. 395-24.000.
- Ekleberry, Donald A. Travelling platen with extended axis. 5,533,844, Cl. 409-159.000.
- Eklund, Ulf C.: *See—*
  - Bergenlid, Lars H.; and Eklund, Ulf C., 5,535,429, Cl. 455-53.100.
- Elam, Zedrick T. Electrical cord to plug tension relief adapter and wire. 5,533,911, Cl. 439-459.000.
- Elan Corporation, plc: *See—*
  - Corish, John; and Corrigan, Owen I., 5,533,995, Cl. 604-890.100.
- Elder, David B.; Krosner, Stephen P.; Miller, Paul E.; and Skinner, Harold R., to International Business Machines Corporation. Business process objects with associated attributes such as version identifier. 5,535,389, Cl. 395-700.000.
- Electricite de France - Service National: *See—*
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- Electronic Development Inc.: *See—*
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- Elephant Chain Block Company Limited: *See—*
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- Elf Sanofi: *See—*
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- Eli Lilly and Company: *See—*
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  - Cullinan, George J., 5,534,526, Cl. 514-324.000.
  - Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., 5,534,420, Cl. 435-71.300.
  - Hoffmann, James A., 5,534,488, Cl. 514-3.000.
- Ellinger, Sylvester M.; and Kline, Bruce R., to Simmonds Precision Products Inc. Optical fuel/air/water sensor and detector circuit. 5,534,708, Cl. 250-577.000.
- Ellis, Darwin L.: *See—*
  - Adams, Edgar E.; Ellis, Darwin L.; and Stelle, Gerald E., 5,533,608, Cl. 198-478.100.
- Ellis, Howard F. Club tub - golf club washer. 5,533,225, Cl. 15-104.920.
- Ellis, James; and Crawford, Alan W., to Western Atlas International, Inc. Alternating current activated firing circuit for EBW detonators. 5,533,454, Cl. 102-202.100.
- Ellison, Samuel J.: *See—*
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- Elmer, John W.; and O'Brien, Dennis W., to University of California, Regents of the. Electron beam machining using rotating and shaped beam power distribution. 5,534,677, Cl. 219-121.350.
- El-Ruby, Mohamed H.: *See—*
  - Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
- Emerson, Alan B.: *See—*
  - Jordan, Henry J., Jr.; McNair, Robert J.; Emerson, Alan B.; Kennedy, Brian S.; and Zimmerman, Patrick J., 5,533,573, Cl. 166-313.000.
- Emerson Electric Co.: *See—*
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  - Meagher, James P., 5,534,672, Cl. 200-61.890.
  - Riley, Wayne C., 5,533,681, Cl. 241-56.000.
- Emhart Inc.: *See—*
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  - Higgins, Lawrence J., 5,533,237, Cl. 24-289.000.
  - Maffey, George E.; Saar, David A.; and Simpson, Raymond W., 5,535,104, Cl. 362-100.000.
- Encore Media Corporation: *See—*
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- Endeavor Surgical Products, Inc.: *See—*
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- Endo, Keiichi: *See—*
  - Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
- Endo, Takayoshi; Yagi, Sakai; and Nagano, Toru, to Yazaki Corporation. Screw clamp type connector with terminal protecting plate. 5,533,909, Cl. 439-381.000.
- Endo, Tetsuya; Mochizuki, Hirohiko; Kodama, Yukinori; and Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device. 5,535,169, Cl. 365-230.030.
- Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, to Nippon Paint Co., Ltd.; and Asahi Denka Kogyo Kabushiki Kaisha. Surface-treating agent for metal can and method for treating metal cansurface. 5,534,643, Cl. 554-227.000.
- Endres, Paul: *See—*
  - Newman, Walter; and Endres, Paul, 5,533,916, Cl. 439-801.000.
- Endress + Hauser Flowtec AG: *See—*

  - Oldenziel, Daniel; and Griessmann, Marcel, 5,533,408, Cl. 73-861.180.
- Energy Conversion Devices, Inc.: *See—*
  - Ovshinsky, Stanford R.; Strand, David A.; Czubatyj, Wolodymyr; and Klersy, Patrick, 5,534,711, Cl. 257-3.000.
  - Ovshinsky, Stanford R.; Strand, David A.; and Klersy, Patrick, 5,534,712, Cl. 217-3.000.
- Ennis, Gary D., to W. R. Grace & Co.-Conn. Bone-in meat containers. 5,534,276, Cl. 426-127.000.
- Enomoto, Youichi: *See—*
  - Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, 5,534,715, Cl. 257-33.000.
- Envirex, Inc.: *See—*
  - Brummond, Robert A.; Scheel, Roger; and Heidner, James L., 5,534,140, Cl. 210-106.000.
- Environmental Products Amalgamated Pty. Ltd.: *See—*
  - Muston, Robert L.; and Matkowitch, Mario, 5,533,359, Cl. 62-292.000.
- Envirotech Consulting Inc.: *See—*
  - Ignasiak, Teresa, 5,534,158, Cl. 210-703.000.
- Enzien, Colleen R.: *See—*
  - Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., 5,535,312, Cl. 395-115.000.
- Enzon Labs, Inc.: *See—*
  - Ladner, Robert C.; Bird, Robert E.; and Hardman, Karl, 5,534,621, Cl. 530-413.000.
- EOS GmbH Electro Optical Systems: *See—*
  - Langer, Hans J.; and Reichle, Johannes, 5,534,104, Cl. 156-275.500.
- Epling, Marvin E. Injection molded limb for compound bow. 5,534,213, Cl. 264-328.100.
- Epple, Anton; Pfeiffer, Martin; Kruse, Martin; and Volz, Wolfgang, to Mercedes-Benz AG. Vehicle body. 5,533,779, Cl. 296-192.000.
- Erickson, Bart J.; and Anderson, Neal R., to Motorola, Inc. Multipath tolerant location system and method therefor. 5,534,876, Cl. 342-387.000.
- Erico International Corp.: *See—*
  - Fillinger, David R.; and Church, Jeffrey D., 5,533,912, Cl. 439-521.000.
  - Laughlin, Raymond S.; and Golonka, Kenneth A., Sr., 5,533,696, Cl. 248-74.200.
  - Stidham, Curtis R.; McPherson, Robert, Jr.; and Singer, Richard E., 5,533,662, Cl. 228-33.000.
- Ericsson GE Mobile Communications Inc.: *See—*
  - Dent, Paul W., 5,535,432, Cl. 455-77.000.
- Ericsson Inc.: *See—*
  - Dent, Paul W.; and Haartsen, Jacobus C., 5,535,259, Cl. 379-59.000.
- Erikson, Evans W., to Hampton Electronics. Remotely activated opposing/aiding air flow control register. 5,533,668, Cl. 236-49.300.
- Erilli, Rita; and Galvez, Maria, to Colgate-Palmolive Co. Gelled microemulsion cleaning composition. 5,534,200, Cl. 510-396.000.
- Ermes S.r.l.: *See—*
  - Luca, Racca, 5,535,282, Cl. 381-68.600.
- Esch, Uwe, to O&K Orenstein & Koppel AG. Earth-moving machine with revolving tower and adjustable counterweight. 5,533,284, Cl. 37-348.000.
- Eschbach, Reiner, to Xerox Corporation. Error diffusion halftoning with homogeneous response in high/low intensity image regions. 5,535,019, Cl. 358-456.000.
- Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., to International Business Machines Corporation. File manager for files shared by heterogeneous clients. 5,535,375, Cl. 391-500.000.
- Eshet, Dan: *See—*
  - Cohen, Yitzak; Brody, Rafael; Magril, Tzvika; and Eshet, Dan, 5,535,396, Cl. 395-733.000.
- Eshima, Taizo: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Esselte Meto International Produktions GmbH: *See—*
  - Krug, Heidrun; Kunert, Jürgen; Schoon, Jürgen; and Walter, Horst, 5,534,890, Cl. 346-100.000.
- Essemaeker, Paul: *See—*
  - Hoyos, Marc; Robberechts, Marcel; and Essemaeker, Paul, 5,534,115, Cl. 162-65.000.
- Etchu, Masami: *See—*
  - Chuujou, Takao; Kobayashi, Ieyasu; Hamano, Hisashi; and Etchu, Masami, 5,534,323, Cl. 428-65.300.
- Ethicon, Inc.: *See—*
  - Bordighon, Marcos A.; and Januzelli, Jose L. L., 5,533,611, Cl. 206-63.300.
  - Main, Lauren O.; and Grant, Richard L., 5,533,661, Cl. 227-176.100.
- Ethyl Petroleum Additives, Inc.: *See—*
  - Harstick, Christian S.; and Henderson, Kenneth O., 5,534,174, Cl. 508-543.000.
- Etoh, Akiko, to Bridgestone Corporation. Rubber composition. 5,534,569, Cl. 524-99.000.
- Etron Technology, Inc.: *See—*
  - Ting, Tah-Kang J., 5,534,789, Cl. 326-21.000.
- Evanko, Matt A.: *See—*
  - Borden, Peter G.; Aqui, Derek G.; and Evanko, Matt A., 5,534,706, Cl. 250-574.000.
- Evans, John M., to Pilkington Barnes Hind, Inc. Tinting hydrogel materials with vat dyes. 5,534,038, Cl. 8-507.000.
- Evans, Le Andra E.; White, Robert J.; Brown, Russell L.; Galliher, Kenneth R.; and Carlson, Mark E., to United States of America, Navy. Electric vehicle monitoring system. 5,534,759, Cl. 318-139.000.
- Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., to Salk Institute for Biological Studies, The. Controlled expression of recombinant proteins. 5,534,418, Cl. 435-69.100.
- Eveready Battery Company, Inc.: *See—*
  - Prok, Robert A., 5,535,107, Cl. 362-158.000.
- Everhart, Dennis S.; Delucia, Mary L.; Timmons, Terry K.; and Wright, Robert D., to Kimberly-Clark Corporation. Nonwoven fabric formed from alloy fibers. 5,534,335, Cl. 428-224.000.
- Everitt, James W.; and Takatori, Hiroshi, to Level One Communications, Inc. Low resolution, high linearity digital-to-analog converter without trim. 5,534,863, Cl. 341-150.000.
- Exabyte Corporation: *See—*
  - Hughes, Timothy C., 5,535,068, Cl. 360-73.040.
- Exxon Chemical Patents Inc.: *See—*
  - Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., 5,534,168, Cl. 508-396.000.
  - Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., 5,534,652, Cl. 560-98.000.
  - Watts, Raymond F., 5,534,170, Cl. 508-161.000.
- Eyuboglu, M. Vedat: *See—*
  - Dong, Ping; Eyuboglu, M. Vedat; and Forney, George D., Jr., 5,535,228, Cl. 371-49.100.
- Faber, Robert D.; and Jackson, Ronald C., to Amway Corporation. Light duty lubricant composition and method of use. 5,534,173, Cl. 508-203.000.
- Fabrisi, Michael J.: *See—*
  - Pierpont, Robert L.; Cortes, John F.; Fabrisi, Michael J.; and Ryder, Kenneth F., 5,533,823, Cl. 401-98.000.
- Faccio, Enrico: *See—*
  - Busin, Tiziano; and Faccio, Enrico, 5,534,560, Cl. 523-109.000.
- Face, Allen. Rolling digital surface measurement apparatus. 5,535,143, Cl. 364-560.000.
- Fahy, Arthur J. Cushioning devices. 5,533,218, Cl. 5-636.000.
- Faiks, Frederick S.: *See—*
  - Feldpausch, Thomas G.; Carino, Phillip D.; Faiks, Frederick S.; DeBoer, David M.; Ellison, Samuel J.; and Siegrist, Daniel N., 5,533,798, Cl. 312-219.000.
- Fairhurst, John R.: *See—*
  - Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
- Faison, James E. Hub lock. 5,533,794, Cl. 301-105.100.
- Faix, Carl R.: *See—*
  - Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., 5,535,264, Cl. 379-89.000.
- Fajula, François; Patarin, Joel; Des Courieres, Thierry; and Fitoussi, Fredj, to Societe Nationale Elf Aquitaine. Process for the synthesis of a silica enriched crystalline aluminosilicate having the offretite structure, the aluminosilicate obtained and its use as a catalyst for the conversion of hydrocarbons. 5,534,239, Cl. 423-713.000.
- Falcon Products, Inc.: *See—*
  - Cox, Lewis D., 5,533,457, Cl. 100-150.000.
- Faley, Timothy L.; Mills, Michael E.; Teramoto, Yoshihiko; Turek, Douglas E.; and Yabuki, Kazuyuki, to Dow Chemical Company, The. Method for preparing polybenzoxazole or polybenzothiazole fibers. 5,534,205, Cl. 264-103.000.
- Fallin, Thomas W.: *See—*
  - Tokish, Leonard J., Jr.; Fallin, Thomas W.; and Schryver, Jeff, 5,534,005, Cl. 606-80.000.
- Fallon, John: *See—*
  - Casamassina, Thomas; Morales, Florencio, Jr.; Salka, Barry A.; Fallon, John; Desai, Sureshchandra G.; and McCurry, Patrick M., Jr., 5,534,500, Cl. 252-353.000.
- Fallon, Timothy R.; and Tanner, Walter K., Jr. Luminous electric sign. 5,533,286, Cl. 40-545.000.
- Family Trust U/I/A, The: *See—*
  - Weder, Donald E., 5,533,320, Cl. 53-399.000.
- Family Trust U/T/A, The: *See—*
  - Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,533,301, Cl. 47-72.000.
  - Weder, Donald E., 5,533,319, Cl. 53-397.000.
- Fan, Leopold C.: *See—*
  - Diefes, Debra L.; Fan, Leopold C.; and Rodgers, Charles E., 5,534,875, Cl. 342-357.000.
- Fankhauser, Daniel: *See—*
  - Frischknecht, Bruno; Messerli, Peter; Fankhauser, Daniel; Roder, Rudolf; and Eigel, Rolf, 5,533,371, Cl. 72-21.100.
- Fanuc Ltd.: *See—*
  - Terawaki, Fumikazu; Ikeda, Yoshitaka; and Makihata, Yuuki, 5,534,705, Cl. 250-559.290.
- Färber, Manfred, to Webasto Karosseriesysteme GmbH. Fuel tank lock system for a gasoline tank filler neck of a motor vehicle. 5,533,766, Cl. 292-144.000.
- Farmitalia Carlo Erba S.r.l.: *See—*
  - Mongelli, Nicola; Biasoli, Giovanni; Mariani, Mariangela; and Sola, Francesco, 5,534,539, Cl. 514-422.000.
- Farrell, Larry J.: *See—*
  - Gisko, Jerry A.; and Farrell, Larry J., 5,534,047, Cl. 95-24.000.

- Farris, Ronald A.: *See—*
  - Cross, David M.; Hueneke, Manfred H. K.; Farris, Ronald A.; McConnell, Bobby L.; and Newman, Robert M., 5,534,298, Cl. 427-358.000.
- Fasano, Clarice; and Frelich, Jeffrey J., to Lear Corporation. Method of bonding a seat trim cover to a foam cushion utilizing magnetic induction bonding. 5,534,097, Cl. 156-214.000.
- Fasnacht, Matthew J.; and Schaffer, Ronald R., to Whitaker Corporation, The. Pedestal for fiber optic cable. 5,535,298, Cl. 385-135.000.
- Fassbender, Alexander G., to Battelle Memorial Institute. Apparatus and method for batch-wire continuous pumping. 5,533,868, Cl. 417-53.000.
- Fassina, Andrea: *See—*
  - Botti, Edoardo; and Fassina, Andrea, 5,535,082, Cl. 361-18.000.
- Faulkner, Michael: *See—*
  - Fay, John E.; and Faulkner, Michael, 5,533,683, Cl. 241-169.000.
- Favre, Michel: *See—*
  - Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,534,439, Cl. 435-320.100.
- Fawn Engineering Corporation: *See—*
  - Wittern, Francis A., Jr.; Walke, Gary L.; and Nerly, Joseph F., 5,533,645, Cl. 221-76.000.
- Fay, John E.; and Faulkner, Michael, to Biomedical Polymers, Inc. Tissue grinding system. 5,533,683, Cl. 241-169.000.
- Fay, Malachy: *See—*
  - Goman, Gerald E.; Fay, Malachy; and Dunlap, Joel M., 5,533,326, Cl. 56-7.000.
- Fearing, Oliver H., Jr.; Green, Peter J.; and Kirby, Richard E., to Service Machine Co. Explosion proof power supply enclosure for hazardous atmosphere lighting systems. 5,534,664, Cl. 174-50.000.
- FED Corporation: *See—*
  - Jones, Gary W.; and Zimmerman, Steven M., 5,534,743, Cl. 313-309.000.
- Federici, Edmondo. Articulating device with automatic adaptation. 5,533,896, Cl. 433-64.000.
- Fedorovva, Aaveilova O.: *See—*
  - Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.
- Feeney, James W.; and Wilhelm, George W., Jr., to International Business Machines Corp. Method for allowing application program in computer system to access device directly in exclusive mode by bypassing operating system and blocking requests from other programs. 5,535,416, Cl. 395-834.000.
- Fehr, Walter R.; and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Soybeans having low linolenic acid content and method of production. 5,534,425, Cl. 435-172.100.
- Felce, Andrew G.: *See—*
  - Van Putten, Maurice H. P. M.; and Felce, Andrew G., 5,533,567, Cl. 165-1.000.
- Felden, David M.: *See—*
  - Steele, Robert E.; Burns, Mark E.; and Felden, David M., 5,534,848, Cl. 340-517.000.
- Feldman, Barry J.: *See—*
  - Bowman, Steven R.; Ganem, Joseph; and Feldman, Barry J., 5,535,232, Cl. 372-70.000.
- Feldpausch, Thomas G.; Carino, Phillip D.; Faiks, Frederick S.; DeBoer, David M.; Ellison, Samuel J.; and Siegrist, Daniel N., to Steelcase Inc. Lock system for casegoods. 5,533,798, Cl. 312-219.000.
- Feng, Genquan. Method of and arrangement for optimizing disease diagnosis. 5,533,522, Cl. 128-731.000.
- Fernandez, Jose M.: *See—*
  - Hwang, B. Chester; Fernandez, Jose M.; Meadows, Vernon; Thomas, Simon; and Amero, Willard F., Jr., 5,534,366, Cl. 429-91.000.
  - Kreisinger, Robert D.; Burns, Arthur G.; and Fernandez, Jose M., 5,534,765, Cl. 320-30.000.
- Ferrari, Vincent J.: *See—*
  - Wong, Patrick S.-L.; Edgren, David E.; Dong, Liang C.; and Ferrari, Vincent J., 5,534,263, Cl. 424-473.000.
- Ferrell, Barton G.: *See—*
  - Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., 5,534,873, Cl. 342-165.000.
- Ferretti, August; and Van Buskirk, Oral R., to Du Pont de Nemours, E. I., and Company. Hydrothermal crystallization vessels. 5,533,465, Cl. 117-224.000.
- Ferris, Alice T., to United States of America, National Aeronautics and Space Administration. Automatic force balance calibration system. 5,533,380, Cl. 73-1.00B.
- Ferrone, Rock A. Turntable for manipulating paper rolls. 5,533,857, Cl. 414-757.000.
- Ferroni, Juan Carlos: *See—*
  - De Paoli, Tomás; and Hager, Alfredo A., 5,534,268, Cl. 424-450.000.
- Ferry, James A., to National Electrostatics Corp. Device for separating and recombining charged particle beams. 5,534,699, Cl. 250-396.00R.
- Feyrer, Wolfgang; and Schmon, Ewald, to Herberts GmbH. Drying nozzle. 5,533,674, Cl. 239-288.500.
- Fichtel & Sachs AG: *See—*
  - Patzenhauer, Andree; Geilhausen, Winfried; and Schneider, Rolf, 5,533,596, Cl. 188-299.000.
  - Schierling, Bernhard; Göbel, Hilmar; and Carlson, Cora, 5,533,815, Cl. 384-482.000.
- Fickeisen, Peter: *See—*
  - Aydin, Oral; Kröner, Hubertus; Wistuba, Eckehardt; and Fickeisen, Peter, 5,534,571, Cl. 524-272.000.
- Fields, Garry L.: *See—*
  - Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., 5,534,472, Cl. 502-116.000.
- Fifield, John A.: *See—*
  - Drake, Charles E.; Fifield, John A.; Wheeler, Richard D.; and Wolford, Barry J., 5,535,226, Cl. 371-40.100.
- Fikentscher, Rolf: *See—*
  - Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, 5,534,166, Cl. 8-557.000.
- Fillinger, David R.; and Church, Jeffrey D., to Erico International Corp. Submersible electrical set screw connector. 5,533,912, Cl. 439-521.000.
- Finch, William C.: *See—*
  - Rokowski, Joseph M.; and Finch, William C., 5,534,310, Cl. 427-494.000.
- Fineblum, Solomon S. Constant volume regenerative heat exchanger. 5,533,566, Cl. 165-1.000.
- Fiordalice, Robert W.; Maniar, Papu D.; Klein, Jeffrey L.; and Roman, Bernard J., to Motorola, Inc. Method for forming a plug and semiconductor device having the same. 5,534,462, Cl. 437-190.000.
- Fiordeliso, James J.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
- Fiore, Deborah M.: *See—*
  - Laurance, Megan E.; Knaack, David; Fiore, Deborah M.; and Hegre, Orion D., 5,534,404, Cl. 435-3.000.
- Firma Carl Freudenberg: *See—*
  - Jörder, Kurt; Schäfer, Werner; and Hettenbach, Hans, 5,534,325, Cl. 428-102.000.
- Firma G.B. Boucherie, Naamloze Vennootschap: *See—*
  - Boucherie, Leonel, 5,533,792, Cl. 300-11.000.
- Fisch, Matthew A.; Brayton, James M.; and Malhotra, Ajay, to Intel Corporation. Method and apparatus for sequencing misaligned external bus transactions in which the order of completion of corresponding split transaction requests is guaranteed. 5,535,345, Cl. 395-309.000.
- Fischer, Dan E.: *See—*
  - Jensen, Steven D.; and Fischer, Dan E., 5,534,562, Cl. 523-118.000.
- Fischer, Edward F., to Oak Tree Packaging Corporation. Nestable tray with destacking feature. 5,533,623, Cl. 206-518.000.
- Fischer, Stephen A.: *See—*
  - Incorvia, Michael J.; and Fischer, Stephen A., 5,534,192, Cl. 252-500.000.
- Fischer, Werner, to Maschinenfabrik Gustav Eirich. Preheating device. 5,535,236, Cl. 373-89.000.
- fischerwerks Artur Ficher GmbH & Co.: *See—*
  - Ziegler, Christiane, 5,533,619, Cl. 206-387.120.
- Fischinger, Claus-Dieter; Hizli, Adem; Rose, Wolfgang; and Waldmann, Heinrich, to Behr GmbH & Co. Holder for an electric motor, especially for a fan of a heater of air conditioner. 5,533,704, Cl. 248-603.000.
- Fisher, Abraham; Karton, Yishai; Marciano, Daniele; Barak, Dov; and Meshulam, Haim. Spiro compounds containing five-membered rings. 5,534,520, Cl. 514-278.000.
- Fisher & Paykel Limited: *See—*
  - Williams, John J. A.; and Gianni, Christian J. W., 5,534,763, Cl. 318-799.000.
- Fisher Controls International, Inc.: *See—*
  - Good, Stanley R.; and Gaarder, Barry L., 5,533,544, Cl. 137-85.000.
- Fisher, Douglas G.: *See—*
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- Fisher, Lance K.: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Fiske, John M.: *See—*
  - Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
- Fisons PLC: *See—*
  - Eastgate, Alan R.; and Vogel, Wilfried, 5,534,998, Cl. 356-316.000.
- Fitoussi, Fredj: *See—*
  - Fajula, François; Patarin, Joel; Des Courieres, Thierry; and Fitoussi, Fredj, 5,534,239, Cl. 423-713.000.
- Fitzburgh, Brian. Apparatus for waxing snowboards, skis and the like. 5,534,061, Cl. 118-59.000.
- Flachglas Aktiengesellschaft: *See—*
  - Braun, Jörg; and Paulus, Peter, 5,534,879, Cl. 343-713.000.
- Flackett, Dale R.: *See—*
  - Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., 5,534,588, Cl. 524-730.000.
- Flamel Technologies: *See—*
  - Mignani, Gerard; Soula, Gerard; and Meyrueix, Remi, 5,535,048, Cl. 359-326.000.
- Fletcher, James R.; and Krull, Mark A., to Krull, Mark A.; and Fletcher, James R. Mouse pad with beverage holder. 5,533,697, Cl. 248-146.000.
- Flexon, Inc.: *See—*

  - Beesley, Daryl S., 5,533,707, Cl. 251-129.150.
- Flint, Graham: *See—*
  - Hargis, David E.; Flint, Graham; and Assa, Shlomo, 5,534,950, Cl. 348-758.000.
- Flohr, Daniel P.; and Ross, Stuart, to Target Technologies, Inc. Videoconferencing system. 5,534,914, Cl. 348-15.000.
- Florant, Olivier, to Thomson Broadcast. Method and device to obtain an element of information on depth in the field seen by picture-shooting device. 5,534,924, Cl. 348-364.000.
- Fluidyne, Incorporated: *See—*
  - Kallenbach, Thomas J.; Buchanan, Justin M.; Goodrich, Matthew H.; Skinner, Ronald V.; Poncelet, Greg R.; and Kallenbach, Trina J., 5,534,147, Cl. 210-605.000.
- Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., to G. D. Searle & Co. Benzimidazole compounds. 5,534,521, Cl. 514-290.000.
- FMC Corporation: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
  - Veltman, Joost, 5,533,438, Cl. 99-360.000.
- Foamex L.P.: *See—*
  - Barr, Arthur; Sturgill, Lewis; and De Jesus Munoz Contreras, Jose, 5,534,208, Cl. 264-160.000.
- FOCKE & CO. (GmbH & Co.): *See—*
  - Focke, Heinz, 5,533,612, Cl. 206-268.000.
  - Focke, Heinz; and Mutschall, Hugo, 5,533,854, Cl. 414-412.000.
- Focke, Heinz, to FOCKE & CO. (GmbH & Co.). Hinge-lid pack for cigarettes. 5,533,612, Cl. 206-268.000.
- Focke, Heinz; and Mutschall, Hugo, to Focke & Co. (GmbH & Co.). Apparatus for the handling of blank stacks having a band. 5,533,854, Cl. 414-412.000.
- Fontana, Sharon M., to Moore Business Forms, Inc. Method of constructing bedding tags. 5,533,459, Cl. 112-475.080.
- Food and Agrosystems, Inc.: *See—*
  - Parks, Thomas R., 5,533,444, Cl. 99-476.000.
- Ford, Joseph E.; Hilger, Ronald O.; and Chan, Raymond, to Jing Mei Industrial Holdings, Ltd. Ionizer. 5,535,089, Cl. 361-231.000.
- Ford Motor Company: *See—*
  - Willey, Raymond L.; and Vermiglio, Ezio N., 5,533,492, Cl. 123-681.000.
- Forehand, L. Langstroth, IV. Garage door security system. 5,533,561, Cl. 160-188.000.
- Forintek Canada Corporation: *See—*
  - McAfee, Brenda J.; and Gignac, Manon, 5,534,252, Cl. 424-93.500.
- Forney, George D., Jr.: *See—*
  - Dong, Ping; Eyuboglu, M. Vedat; and Forney, George D., Jr., 5,535,228, Cl. 371-49.100.
- Foster, Charles H.: *See—*
  - Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534,494, Cl. 514-16.000.
- Foster, Mary E.; Simmons, Eugene R.; Lindquist, Lowell G.; and Bunnelle, William L., to H. B. Fuller Licensing & Financing, Inc. Hot melt adhesive composition. 5,534,575, Cl. 524-270.000.
- Foster-Miller: *See—*
  - Coller, John A.; Nappi, Bruce; and Lane, Alan J., 5,533,515, Cl. 128-748.000.
- Fowler, Daniel L.: *See—*
  - Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 5,534,680, Cl. 219-505.000.
- Fowler, Timothy J.; McManus, Richard L.; and Deckner, George E., to Procter & Gamble Company, The. Thickened nonabrasive personal cleansing compositions. 5,534,265, Cl. 424-489.000.
- France Telecom: *See—*
  - Nissim, Yves; and Bensoussan, Marcel, 5,534,444, Cl. 437-5.000.
- Franjac, David; and Caradonna, John, to Maybelline Intermediate Co. Mascara composition. 5,534,247, Cl. 424-707.000.
- Franke, Jeffrey S.: *See—*
  - Garrison, Daniel A.; and Franke, Jeffrey S., 5,533,869, Cl. 417-234.000.
- Franke, Rickard; Brandstrom, Per; Kaneko, Yutaka; and Andersson, Bengt, to Tetra Laval Holdings & Finance S.A. Tank venting apparatus for a packaging machine. 5,533,550, Cl. 141-51.000.
- Franz Plasser Bahnbaumaschinen-Industriegessellschaft m.b.H: *See—*
  - Theurer, Josef; and Peitl, Friedrich, 5,533,455, Cl. 104-12.000.
- FRE Composites Inc.: *See—*
  - Shama, Elie W.; Legrand, Bertrand; and Kluyskems, Dominique, 5,533,340, Cl. 62-45.100.
- Fredrick, William A.: *See—*
  - Moore, Clyde R.; Fredrick, William A.; McIngvale, J. D.; and Wedell, Mark T., 5,535,109, Cl. 362-267.000.
- Freed, Brian S.: *See—*
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,636, Cl. 548-228.000.
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,640, Cl. 549-80.000.
- Freeman, Gary M.: *See—*
  - Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., 5,534,057, Cl. 106-486.000.
- Freeman, John O.; Howse, Richard H.; and Reinhart, Tim, to Consolidated Technology Corp. Heat pump and method. 5,533,346, Cl. 62-89.000.
- Freese, Manfred; Reimer, Peter; and Lasser, Theo, to Carl-Zeiss-Stiftung. Apparatus and method for laser cyclo-photocoagulation. 5,533,998, Cl. 606-4.000.
- Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, to Elf Sanofi. 5-acylamino-1,2,4-thiadiazoles, their preparation and pharmaceutical compositions containing them. 5,534,530, Cl. 514-361.000.
- Freightliner Corporation: *See—*
  - Qutub, Ibrahim, 5,533,486, Cl. 123-541.000.
- Freilich, Joseph, to M. Fabrikant & Sons, Ltd. Facing marquis halves to form a marquis stone. 5,533,364, Cl. 63-32.000.
- Freitas, Oscar W., to National Semiconductor Corp. Sonet/SDH pointer calculation circuit. 5,535,219, Cl. 370-105.100.
- Frelich, Jeffrey J.: *See—*
  - Fasano, Clarice; and Frelich, Jeffrey J., 5,534,097, Cl. 156-214.000.
- Frencken, Henri W.: *See—*
  - Gay, Clive H.; and Frencken, Henri W., 5,535,320, Cl. 395-150.000.
- Fresenius AG: *See—*
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- Friedl, Joel G.: *See—*
  - Veltrop, Loren; Friedl, Joel G.; and Nevarez, Roberto, 5,533,806, Cl. 366-347.000.
- Friedman, Michael, to Norton Performance Plastics Corporation. Polymethylpentene/polypropylene blend and film. 5,534,593, Cl. 525-240.000.
- Friedmann, Günter; Wiehan, Helmut; and Knott, Erwin, to Stockert Instrumente GmbH. Hose fastening arrangement for roller pumps. 5,533,877, Cl. 417-477.100.
- Friedrich, Herbert: *See—*
  - Bildhauer, Michael; Kupfer, Rainer; Siebott, Günther; Mees, Bernhard; and Friedrich, Herbert, 5,534,604, Cl. 526-253.000.
- Friesen, Henry; and Oka, Ken K., to Deere & Company. Combined loaded self-leveling and implement tilt linkages for effecting true level and enhanced roll back and dump characteristics throughout lift range of loader. 5,533,856, Cl. 414-711.000.
- Frievalt, William. Package seal integrity testing device and method of operation thereof. 5,533,385, Cl. 73-49.300.
- Frigg, Robert: *See—*
  - Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, 5,534,001, Cl. 606-61.000.
- Frings, Hubert: *See—*
  - Krapp, Hans-Dieter; Hanek, Martin; and Frings, Hubert, 5,534,742, Cl. 313-113.000.
- Frischknecht, Bruno; Messerli, Peter; Fankhauser, Daniel; Roder, Rudolf; and Eigel, Rolf, to Lauener Engineering, Ltd. Measurement device for roll gap control and process for its operation. 5,533,371, Cl. 72-21.100.
- Friske, Craig A.: *See—*
  - Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
- Frye, Robert C.; and Tai, King L., to AT&T Corp. Method for making multichip circuits using active semiconductor substrates. 5,534,465, Cl. 437-209.000.
- FSI International: *See—*
  - Gray, David C.; and Butterbaugh, Jeffery W., 5,534,107, Cl. 156-643.100.
- Fu Tai Umbrella Works, Ltd.: *See—*
  - Lin, Chung-Kuang; and Chang, Jung-Jen, 5,533,535, Cl. 135-20.100.
- Fu, Yi-Chang: *See—*
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- Fuchs, Rudolf: *See—*
  - Barth, Walter; Fuchs, Rudolf; Langenfelder, Frank; and Martinez, David M., 5,533,581, Cl. 173-216.000.
- Fuderer, Miha; and Van Ormondt, Dirk, to U.S. Philips Corporation. Method and apparatus for magnetic resonance imaging by radially scanning through frequency space and employing a correction image derived from an edge image. 5,534,777, Cl. 324-309.000.
- Fuji Electric Co., Ltd.: *See—*
  - Hikita, Hiroshi; Kohriyama, Tetsuo; Nozawa, Yutaka; and Sugino, Yoshito, 5,534,307, Cl. 427-421.000.
- Fuji Jukogyo Kabushiki Kaisha: *See—*
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- Fuji Photo Film Co., Ltd.: *See—*
  - Abe, Yoshihiko, 5,534,224, Cl. 422-63.000.
  - Furukawa, Masahiko; Masuda, Toshio; and Kenmotsu, Toru, 5,533,324, Cl. 53-469.000.
  - Hasegawa, Kazuhiro; Takahashi, Kenji; and Kojima, Yasushi, 5,534,191, Cl. 252-301.40H.
  - Ishikawa, Takatoshi; Ueda, Shinji; Sasaki, Hirotomo; and Kojima, Tetsuro, 5,534,394, Cl. 430-393.000.
  - Ito, Wataru, 5,535,289, Cl. 382-130.000.
  - Kamada, Katsushige; and Yoshida, Kazuaki, 5,534,395, Cl. 430-400.000.
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  - Kuno, Koichi; and Mifune, Hiroyuki, 5,534,402, Cl. 430-596.000.
  - Mihayashi, Keiji, 5,534,399, Cl. 430-553.000.
  - Nishigaki, Junji; and Kato, Takashi, 5,534,403, Cl. 430-585.000.
  - Seto, Nobuo; Yoshioka, Yasuhiro; and Morigaki, Masakazu, 5,534,390, Cl. 430-551.000.
  - Seto, Yoshihiro; and Doi, Yoshiyuki, 5,534,225, Cl. 422-64.000.

  - Suzuki, Hideki, 5,534,710, Cl. 250-588.000.
  - Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, 5,534,148, Cl. 210-605.000.
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  - Takahashi, Yonosuke; Imamura, Naoya; Nakamura, Hideyuki; and Kawabata, Kouya, 5,534,383, Cl. 430-201.000.
  - Takahashi, Yonosuke; and Shinozaki, Fumiaki, 5,534,905, Cl. 347-171.000.
  - Tuchida, Michiro; Nomura, Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, 5,534,955, Cl. 353-66.000.
  - Yasuda, Tomokazu; Karino, Yukio; Sakurai, Seiya; and Ogawa, Masataka, 5,534,398, Cl. 430-545.000.
- Fuji Xerox Co., Ltd.: *See—*
  - Hideaki, Kashiwagi, 5,535,017, Cl. 358-444.000.
  - Ishida, Eiji, 5,535,332, Cl. 395-200.010.
  - Makino, Hiroshi; and Sata, Teiji, 5,533,813, Cl. 384-115.000.
- Fujii, Satoru: *See—*
  - Ito, Mitsuhiro; Tamashige, Takamiki; and Fujii, Satoru, 5,533,629, Cl. 209-714.000.
- Fujii, Takeshi: *See—*
  - Ami, Yasuhiro; and Fujii, Takeshi, 5,535,362, Cl. 395-474.000.
- Fujii, Toshiro; Iwama, Kazuaki; Kato, Yuichi; and Ohyama, Katsuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Reciprocating piston compressor. 5,533,872, Cl. 417-269.000.
- Fujikawa, Masaru; Tsuda, Kazunori; and Honda, Munenobu, to Elephant Chain Block Company Limited. Electric hoist and traction apparatus. 5,533,712, Cl. 254-362.000.
- Fujiki, Satoshi; and Kamata, Hideo, to Az Company. Wood processing composition, processed wood and a method of processing wood. 5,534,305, Cl. 427-393.000.
- Fujimaki, Nobuyoshi: *See—*
  - Fusegawa, Izumi; Yamagishi, Hirotoshi; Fujimaki, Nobuyoshi; and Karasawa, Yukio, 5,534,112, Cl. 156-662.100.
- Fujimori, Koichi; Yamagishi, Shinji; and Shinomiya, Tokihiko, to Sharp Kabushiki Kaisha. Liquid crystal display device with a polymer between liquid crystal regions made by a heating and cooling process. 5,535,026, Cl. 359-51.000.
- Fujimura, Naoto: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Fujinaga, Chikako; Tosaka, Akio; Kato, Toshiyuki; and Sato, Kaku, to Kawasaki Steel Corporation. Method of manufacturing small planar anisotropic high-strength thin can steel plate. 5,534,089, Cl. 148-603.000.
- Fujino, Ken-ichi: *See—*
  - Namba, Hiroaki; and Fujino, Ken-ichi, 5,534,577, Cl. 524-377.000.
- Fujisawa, Koichi: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188, Cl. 252-299.610.
- Fujita, Masahiro; and Matsunaga, Yusuke, to Fujitsu Limited. Variable sequence determining method for a dichotomy determination graph. 5,535,132, Cl. 364-489.000.
- Fujita, Osamu: *See—*
  - Hasegawa, Hideo; Tateno, Kikuhei; Kuwata, Tamotsu; Yamamoto, Yoshiro; Hiraishi, Kumiko; Fujita, Osamu; and Narabayashi, Isamu, 5,534,240, Cl. 424-9.360.
- Fujita, Shigeru: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Fujitsu Limited: *See—*
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  - Akiyama, Takehiro; Shimomura, Katsuya; Takekawa, Kouzi; and Doi, Takehito, 5,534,821, Cl. 331-8.000.
  - Aoki, Shigenori; Kamezaki, Hiroshi; Hida, Masaharu; and Yokouchi, Kishio, 5,534,331, Cl. 428-209.000.
  - Endo, Tetsuya; Mochizuki, Hirohiko; Kodama, Yukinori; and Takemae, Yoshihiro, 5,535,169, Cl. 365-230.030.
  - Fujita, Masahiro; and Matsunaga, Yusuke, 5,535,132, Cl. 364-489.000.
  - Fujiwara, Koji; Sudo, Gen; and Arinaga, Kenji, 5,534,109, Cl. 156-643.100.
  - Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, 5,534,740, Cl. 310-309.000.
  - Hijikata, Toshiyuki; and Tachibana, Tetsuo, 5,535,221, Cl. 371-5.500.
  - Inoue, Hiroyuki, 5,534,984, Cl. 355-271.000.
  - Matsuoka, Hidetoshi; and Hirose, Fumiyasu, 5,535,387, Cl. 395-650.000.
  - Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, 5,534,978, Cl. 355-211.000.
  - Sugawara, Eiji, 5,535,251, Cl. 375-356.000.
  - Suyama, Masuo, 5,535,050, Cl. 359-341.000.
  - Takashimizu, Yoshihiro, 5,533,721, Cl. 271-109.000.
  - Taniguchi, Atsuki; and Yamamoto, Chiyoko, 5,534,822, Cl. 331-2.000.
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  - Watanabe, Keizo, 5,535,425, Cl. 455-33.200.
  - Yoshimoto, Shinichi; and Namiki, Fumihiro, 5,534,709, Cl. 250-588.000.
  - Yoshizaki, Tsutomu; Maruyama, Shigeyuki; and Ohno, Tsuyoshi, 5,534,785, Cl. 324-758.000.
- Fujiwara, Koji; Sudo, Gen; and Arinaga, Kenji, to Fujitsu Limited. Method for etching HgCdTe substrate. 5,534,109, Cl. 156-643.100.
- Fujiwara, Nobuo: *See—*
  - Okudaira, Tomonori; Kuroiwa, Takeharu; Fujiwara, Nobuo; and Kashihara, Keiichiro, 5,534,458, Cl. 437-52.000.
- Fujiwara, Sayuri: *See—*
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- Fukaya, Sueo, to Sumitomo Heavy Industries Ltd. Speed change gears adopting internal-meshing planetary gear construction. 5,533,942, Cl. 475-178.000.
- Fukazawa, Toshio; Tosaki, Yoshihiro; Wada, Kumiko; Mitani, Satoru; and Yanagi, Terumi. Integrated thin film magnetic head. 5,535,079, Cl. 360-126.000.
- Fukuda, Tatsuo: *See—*
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- Fukuda, Tsuguhiro: *See—*
  - Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, 5,534,898, Cl. 347-33.000.
- Fukuda, Yasuji, to Kanesan Manufacturing Co., Ltd. Hose clamp device. 5,533,235, Cl. 24-20.00R.
- Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, to Chisso Corporation. Process for producing a melamine-coated ammonium polyphosphate. 5,534,291, Cl. 427-221.000.
- Fukuoka Kagaku Ltd.: *See—*
  - Fukuoka, Masahiro, 5,533,784, Cl. 297-217.100.
- Fukuoka, Masahiro, to Fukuoka Kagaku Ltd. Apparatus for vibrating seats. 5,533,784, Cl. 297-217.100.
- Fukushima, Katsuaki: *See—*
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- Fukushima, Yoshifumi: *See—*
  - Nikaya, Toshiki; Fukushima, Yoshifumi; and Kikuta, Teruo, 5,534,579, Cl. 524-460.000.
- Fukuzawa, Daizo: *See—*
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- Fulker, Philip H.; and Smith, Trevor A., to Electrovert USA Corp. Spraying system for spraying printed circuit boards. 5,534,067, Cl. 118-681.000.
- Fullwood, James, to Duraframe Window Shutter Systems, Inc. Storm shutter window frame system. 5,533,308, Cl. 52-204.500.
- Funahashi, Makoto: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro. 5,533,943, Cl. 475-198.000.
- Furlani, Edward P.; Williams, Christopher C.; and Ghosh, Syamal K., to Eastman Kodak Company. Permanent magnet device for selectively inverting a magnetic bias field for magneto-optic recording. 5,535,181, Cl. 369-13.000.
- Furman, Bruce K.: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Furukawa, Masahiko; Masuda, Toshio; and Kenmotsu, Toru, to Fuji Photo Film Co., Ltd. Method for loading liquids into containers made of resins. 5,533,324, Cl. 53-469.000.
- Fusegawa, Izumi; Yamagishi, Hirotoshi; Fujimaki, Nobuyoshi; and Karasawa, Yukio, to Shin-Etsu Handotai Co., Ltd. Method for testing electrical properties of silicon single crystal. 5,534,112, Cl. 156-662.100.
- Futaya, Ryuji: *See—*
  - Ozawa, Hiroyoshi; Kamiya, Noboru; and Futaya, Ryuji, 5,534,591, Cl. 525-194.000.
- G.B. Boucherie N.V.: *See—*
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- G. D. Searle & Co.: *See—*
  - Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.
- G. D S.p.A.: *See—*
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- Gaarder, Barry L.: *See—*
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- Gaba, Rodolfo, to Devon Industries, Inc. Locking safety cover for sharp instruments. 5,533,974, Cl. 604-110.000.
- Gabbay, Emile, to GE Medical Systems S.A. System for the cooling of an anode for an X-ray tube in a radiogenic unit without heat exchanger. 5,535,255, Cl. 378-200.000.
- Gabel, Robert K.: *See—*
  - Huddleston, David A.; and Gabel, Robert K., 5,534,611, Cl. 528-129.000.
- Gabriel Electronics Incorporated: *See—*

  - Button, Donald D.; Wyatt, William D.; and McGrath, James F., 5,534,880, Cl. 343-774.000.
- Gabriel, William L.: *See—*
  - Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., 5,533,379, Cl. 72-316.000.
- Gadient, Fulvio, to Sandoz Ltd. 2'-O, N^6-disubstituted and 2'-O, N^6, 2-trisubstituted adenosines and their medicinal uses. 5,534,503, Cl. 514-46.000.
- Gaetano, Ralph R., to Think, Inc. Method and apparatus for selectively composing the content of a photograph. 5,534,971, Cl. 355-126.000.
- Gailus, Paul H.; Gannon, Mark A.; and Gillig, Steven F., to Motorola, Inc. Frequency modifier for a transmitter. 5,535,247, Cl. 375-297.000.
- Gajnak, George E.: *See—*
  - Shockley, William R.; and Gajnak, George E., 5,534,855, Cl. 340-825.300.
- Galandrino, Agostino, to Robino & Galandrino S.p.A. Rolling head for applying sealing caps on bottles in general. 5,533,317, Cl. 53-334.000.
- Galbreath, Inc.: *See—*
  - Kruzick, Kent, 5,533,643, Cl. 220-331.000.
- Gale, Gregory, to PERF-PAK. Separable modular containers. 5,533,667, Cl. 229-120.010.
- Gall, Allen M. Adjustable compound cable beam profile clip. 5,533,239, Cl. 24-339.000.
- Galleguillos, Ramiro; Radd, Billie L.; and Jadav, Anjana K., to Helene Curtis, Inc. Antiperspirant deodorant compositions. 5,534,245, Cl. 424-66.000.
- Galliher, Kenneth R.: *See—*
  - Evans, Le Andra E.; White, Robert J.; Brown, Russell L.; Galliher, Kenneth R.; and Carlson, Mark E., 5,534,759, Cl. 318-139.000.
- Gallo, Esdras; and Diniz, Milton E., to Whitaker Corporation, The. Tool for applying wedge type electrical connectors to the conductors of electrical distribution networks. 5,533,254, Cl. 29-750.000.
- Gallwitz, Wolf E.: *See—*
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- Galsten Trading, Inc.: *See—*
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  - Erilli, Rita; and Galvez, Maria, 5,534,200, Cl. 510-396.000.
- Galvin, Jeffrey L.: *See—*
  - Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.
- Gamberini, Antonio: *See—*
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- Gambino, Richard J.; McElfresh, Michael W.; McGuire, Thomas R.; and Plaskett, Thomas S., to International Business Machines Corporation. Amorphous uranium alloy and use thereof. 5,534,360, Cl. 428-694.0ML.
- Gambro KK: *See—*
  - Larsson, Ake; and Uno, Kiyoshi, 5,533,804, Cl. 366-274.000.
- Gämmerler, Hagen. Rotatable stacking chamber in a right-angle feeder for printed products. 5,533,860, Cl. 414-789.000.
- Ganapathi, Jagadeesan: *See—*
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- Ganem, Joseph: *See—*
  - Bowman, Steven R.; Ganem, Joseph; and Feldman, Barry J., 5,535,232, Cl. 372-70.000.
- Ganesan, Ravi, to Bell Atlantic Network Services, Inc. Yaksha, an improved system and method for securing communications using split private key asymmetric cryptography. 5,535,276, Cl. 380-25.000.
- Gang, Meng: *See—*
  - Ueda, Hideo; Hiromoto, Mitsuo; Gang, Meng; and Yamasaki, Yutaka, 5,533,513, Cl. 128-719.000.
- Gannon, Mark A.: *See—*
  - Gailus, Paul H.; Gannon, Mark A.; and Gillig, Steven F., 5,535,247, Cl. 375-297.000.
- Gao, Meihua: *See—*
  - Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., 5,534,312, Cl. 427-533.000.
- Garaczy, Sándor: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Ildikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Gardner, Michael J., to Sprint Communications Company L.P. Signaling system for a telecommunications network. 5,535,200, Cl. 370-60.000.
- Gardner, Sandra J.: *See—*
  - Mayo, James D.; Duff, James M.; Hamer, Gordon K.; and Gardner, Sandra J., 5,534,376, Cl. 430-59.000.
- Garganese, Richard S. Paint can accessory. 5,533,802, Cl. 366-256.000.
- Garlock Inc.: *See—*
  - Borowski, Richard, 5,533,737, Cl. 277-23.000.
- Garner, Bryan E.: *See—*
  - Ware, Douglas R.; and Garner, Bryan E., 5,534,271, Cl. 426-2.000.
- Garnjost, Kenneth D.; and Stegner, James C., to Moog Inc. Arcade amusement ride motion simulator system. 5,533,933, Cl. 472-60.000.
- Garodnick, Joseph: *See—*
  - Schilling, Donald L.; Garodnick, Joseph; Lomp, Gary; and Moore, Timothy F., III, 5,535,238, Cl. 375-200.000.
- Garrett, James H.: *See—*
  - Reents, Daniel B.; Cooper, Patrick R.; Garrett, James H.; and McKenzie, Philip J., 5,534,889, Cl. 345-132.000.
- Garrison, Daniel A.; and Franke, Jeffrey S., to Homelite, Inc. Power tool exhaust cooling system. 5,533,869, Cl. 417-234.000.
- Garrity, Doug: *See—*
  - Gunter, Brad D.; Anderson, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, 5,534,819, Cl. 327-553.000.
- Garthaffner, Martin T.; and Honaker, Ronald D., to Philip Morris Incorporated. Apparatus and method for forming combined filter tipped cigarettes. 5,533,610, Cl. 198-458.000.
- Garwood, Anthony J. M., to Seawell North America Inc. Packing perishable goods. 5,534,282, Cl. 426-396.000.
- Gasch, Robert; and Liao, Mingfu, to Carl Schenck AG. Process for the early detection of a crack in a rotating shaft. 5,533,400, Cl. 73-593.000.
- Gateway Technologies, Inc.: *See—*
  - Brown, Barry D.; and Wakefield, Paul A. J., 5,535,261, Cl. 379-67.000.
- Gau, Tien-Ho; and Peng, Yu-Yin, to Industrial Technology Research Institute. Engine air intake system having a bypass current control valve. 5,533,483, Cl. 123-308.000.
- Gaubatz, Donald C.: *See—*
  - Greene, David A.; Greene, Rosemary A.; and Gaubatz, Donald C., 5,533,383, Cl. 73-40.50A.
- Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, to International Technidyne Corporation. Portable test apparatus and associated method of performing a blood coagulation test. 5,534,226, Cl. 422-73.000.
- Gawron, Gregory F.: *See—*
  - Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 5,534,680, Cl. 219-505.000.
- Gay, Clive H.; and Frencken, Henri W. Method of generating a visual design. 5,535,320, Cl. 395-150.000.
- Gayer, Herbert: *See—*
  - Gerdes, Peter; Gayer, Herbert; Dutzmann, Stefan; and Dehne, Heinz-Wilhelm, 5,534,550, Cl. 514-620.000.
- Gaynor, Richard B.: *See—*
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- GE Medical Systems S.A.: *See—*
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- Gebr. Happich GmbH: *See—*
  - Agro, Marc; Auer, Wolfgang; Hilt, Gerard; Peters, Henning; and Rust, Sabine, 5,533,776, Cl. 296-97.900.
  - Volkers, Jan; Wick, Volkhard; and Dabringhaus, Volker, 5,533,772, Cl. 296-37.900.
- Geckle, Ronita K.: *See—*
  - Piontek, Carl J.; Mazer, Terrence B.; Walton, Joseph E.; and Geckle, Ronita K., 5,533,973, Cl. 604-83.000.
- Gee, Michael A.; and Olsen, Ib I. Battery with fusible solid electrolyte. 5,534,365, Cl. 429-62.000.
- Geerts, Rolf L.: *See—*
  - Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,534,473, Cl. 502-117.000.
- Geilhausen, Winfried: *See—*
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- Geis, Philip A.: *See—*
  - Pilosof, David; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark Lee; Trinh, Toan; and Zwerdling, Susan S., 5,534,165, Cl. 252-8.910.
- Geise, Hans-Ulrich, to Bruker-Franzen Analytik GmbH. Virtual impactor. 5,533,406, Cl. 73-863.220.
- Geisler, Jeffrey D.: *See—*
  - Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., 5,533,512, Cl. 128-719.000.
- Geissler, Alfred, to Deckel Maho GmbH. Universal milling and drilling machine. 5,533,846, Cl. 409-201.000.
- Gel Sciences, Inc.: *See—*
  - Walker, David H.; Gold, Harris; McKinney, George W., III; McCoy, John F., III; and Yu, Xiaohong, 5,534,186, Cl. 252-194.000.
- Gelber, Barry S. Kitchen, bar and restaurant appliance housing. 5,533,797, Cl. 312-138.100.
- Gemi Aliment, S.A.: *See—*
  - Boatella I Riera, Josep; Rafecas I Martinez, Magdalena; Codony I Salcedo, Rafael; Minguell I Juncosa, Genaro; and Cases I Sellart, Josep, 5,534,279, Cl. 426-266.000.
- Gemplus Card International: *See—*
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- Genentech, Inc.: *See—*
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  - Cunningham, Brian C.; Lowman, Henry; and Wells, James A., 5,534,617, Cl. 530-399.000.
- General Director of National Research Institute for Metals: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.

- General Electric Company: *See—*
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  - Bayly, Brian P.; Lucas, Gary M.; and Stuart, Van W., 5,534,610, Cl. 528-38.000.
  - Bonissone, Piero P.; Schutten, Michael J.; and Chiang, Kenneth H.-C., 5,534,766, Cl. 323-235.000.
  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
  - Castonguay, Roger N.; Smith, James J.; and Murphy, Thomas A., 5,534,833, Cl. 335-68.000.
  - Gilmore, Robert S., 5,533,401, Cl. 73-622.000.
  - Greene, David A.; Greene, Rosemary A.; and Ganbatz, Donald C., 5,533,383, Cl. 73-40.50A.
  - Lin, Chiu-Sing; and Dziark, John J., 5,534,563, Cl. 523-122.000.
  - Lupinski, John H.; and Cole, Herbert S., Jr., 5,534,602, Cl. 525-432.000.
  - Lybarger, Michael A.; and Beck, Stephen D., 5,533,367, Cl. 68-3.00R.
  - Stone, Timothy D., 5,533,825, Cl. 403-359.000.
  - Thompson, Dennis P.; Anderson, Patricia P.; and Slick, Donald, 5,534,608, Cl. 528-12.000.
- General Hospital Corporation, The: *See—*
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- General Motors Corporation: *See—*
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- Genet, Alain: *See—*
  - Junino, Alex; Lagrange, Alain; and Genet, Alain, 5,534,036, Cl. 8-411.000.
  - Junino, Alex; Genet, Alain; and Lagrange, Alain, 5,534,037, Cl. 8-411.000.
- Georgiou, Christos J.: *See—*
  - Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, 5,535,213, Cl. 370-85.150.
- Georgopoulos, George; and Lundberg, George A., Jr., to E. J. Brooks Company. Seal. 5,533,767, Cl. 292-320.000.
- Gerbasi, Dennis G., to Xerox Corporation. Retraction activated waste bottle mechanism for uniform toner distribution. 5,534,988, Cl. 355-298.000.
- Gerdes, Peter; Gayer, Herbert; Dutzmann, Stefan; and Dehne, Heinz-Wilhelm, to Bayer Aktiengesellschaft. 2-Oximino-2phenyl-acetamides. 5,534,550, Cl. 514-620.000.
- Gerlek, Stephen: *See—*
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- Germain, Jean-Luc: *See—*
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- Gerry Baby Products Company: *See—*
  - Newman, Perran V. L.; Zeller, Niel P.; and Ifland, Dwight D., 5,533,959, Cl. 600-28.000.
- Gerson, Herman; and Sattar, Abdul, to Bayer Corporation. Process for alpha-phase metal phthalocyanine pigments. 5,534,055, Cl. 106-413.000.
- Gerstung, Stefan: *See—*
  - Neunhoeffer, Hans; Gerstung, Stefan; Clausen, Thomas; and Balzer, Wolfgang R., 5,534,267, Cl. 424-701.000.
- Gessner, Dieter; and Osterode, Martin, to Husky Injection Molding Systems Ltd. Hot runner valve gated system. 5,533,882, Cl. 425-564.000.
- Geursen, Herman J.; and Willemsen, Stephanus, to Akzo Nobel NV. Process for treating a substrate with a superabsorbent material. 5,534,304, Cl. 427-389.900.
- Ghosh, Syamal K.: *See—*
  - Furlani, Edward P.; Williams, Christopher C.; and Ghosh, Syamal K., 5,535,181, Cl. 369-13.000.
- Giacomino, Gerald L.: *See—*
  - Siddoway, Craig F.; and Giacomino, Gerald L., 5,535,434, Cl. 455-89.000.
- Gianni, Christian J. W.: *See—*
  - Williams, John J. A.; and Gianni, Christian J. W., 5,534,763, Cl. 318-799.000.
- Giat Industries: *See—*
  - Begneu, Michel, 5,533,434, Cl. 89-7.000.
- Gibilaro, Joëlle: *See—*
  - Samain, Daniel; and Gibilaro, Joëlle, 5,534,501, Cl. 514-60.000.
- Gibson, Ronald F.; and Ayorinde, Emmanuel O., to Wayne State University. Method and apparatus for non-destructive measurement of elastic properties of structural materials. 5,533,399, Cl. 73-579.000.
- Gierut, Joseph J.; Suvada Rutkowski, Julie; and Dam, Robert, to Illinois Tool Works Inc. Switch for computer pen. 5,534,671, Cl. 200-52.00R.
- Giese, Erik O.: *See—*
  - Brown, Roger J.; Giese, Erik O.; and Racosky, Michael D., 5,533,281, Cl. 36-118.200.
- Giesecke & Devrient GmbH: *See—*
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- Giesenberg, Peter; Stadler, Rolf; and Lang, Wilfried, to Bodenseewerk Geratiteschnik GmbH. Locking assembly in a launcher for missiles. 5,533,433, Cl. 89-1.806.
- Giga Operations Corporation: *See—*
  - Taylor, Brad, 5,535,342, Cl. 395-307.000.
- Gignac, Manon: *See—*
  - McAfee, Brenda J.; and Gignac, Manon, 5,534,252, Cl. 424-93.500.
- Giguere, Vincent: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Gilbarco Inc.: *See—*
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- Gilder, Bernard, to Gillette Company, The. Razors. 5,533,263, Cl. 30-87.000.
- Gilleskie, Gary L.: *See—*
  - Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., 5,534,133, Cl. 208-39.000.
- Gillet, Daniel: *See—*
  - Boquet, Paul; Boulain, Jean-Claude; Ducancel, Frederic; Gillet, Daniel; and Ménez, André, 5,534,223, Cl. 422-61.000.
- Gillette Company, The: *See—*
  - Gilder, Bernard, 5,533,263, Cl. 30-87.000.
- Gillham, Robert W., to University of Waterloo. System for cleaning contaminated soil. 5,534,154, Cl. 210-668.000.
- Gillig, Steven F.: *See—*
  - Gailus, Paul H.; Gannon, Mark A.; and Gillig, Steven F., 5,535,247, Cl. 375-297.000.
- Gilmore, Robert S., to General Electric Company. Multizone ultrasonic inspection method and apparatus. 5,533,401, Cl. 73-622.000.
- Girobank A?S: *See—*
  - Wallström, Eva; Lund, Peter B.; and Helgesen, Arne, 5,534,049, Cl. 106-22.00R.
- Gironda, Kevin F., to Rohm and Haas Company. Stabilization of 3-isothiazolone solutions. 5,534,487, Cl. 504-290.000.
- Gisko, Jerry A.; and Farrell, Larry J. Vertical continuous polymer concrete degassing apparatus and method. 5,534,047, Cl. 95-24.000.
- Gist, William B.; and Coyle, Joseph P., to Digital Equipment Corporation. Integrated I/O bus circuit protection for multiple-driven system bus signals. 5,534,811, Cl. 327-309.000.
- Gjessing, Dag K.; and Hjelmstad, Jens F., to Susar A/S. Method and system for the detection and measurement of air phenomena and transmitter and receiver for use in the system. 5,534,868, Cl. 342-26.000.
- Glaser, Stephen D.; Thomas, Robert E.; and Walsh, Robert J., to Digital Equipment Corporation. Method and apparatus for transporting timed program data using single transport schedule. 5,535,209, Cl. 370-84.000.
- Glass, Stephen K., to Hewlett-Packard Company. Printing of variable dot sizes dependent upon image density for improved graphics. 5,535,307, Cl. 395-108.000.
- Glassberg, Paul R.: *See—*
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- Gleason Corporation: *See—*
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- Gleixner, Richard A.: *See—*
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- Glen, Stefan J.; and Carstens, Bradley D., to Beckman Instruments, Inc. Hybrid centrifuge container. 5,533,644, Cl. 220-414.000.
- Glenn, Robert S., Jr.: *See—*
  - Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., 5,535,137, Cl. 364-514.00A.
- Global Interconnect, Corp.: *See—*
  - Hain, John A., Jr.; and Thornhill, H. G. Rusty, 5,535,229, Cl. 371-53.000.
- Glover, John A. Milling machine. 5,533,845, Cl. 409-175.000.
- Gluckman, Peter D.; and Mellor, David J., to Pharmacia AB. Use of growth factor IGF-I or IGF-II. 5,534,493, Cl. 514-12.000.
- Göbel, Hilmar: *See—*
  - Schierling, Bernhard; Göbel, Hilmar; and Carlson, Cora, 5,533,815, Cl. 384-482.000.
- Godtfredsen, Sven E.; Kirk, Ole; and Damhus, Ture, to Novo Nordisk A/S. Process for decomposing peroxycarboxylic acids. 5,534,435, Cl. 435-262.500.
- Godthardt, Lutz-Peter: *See—*
  - Eisen, Norbert; and Godthardt, Lutz-Peter, 5,534,299, Cl. 427-373.000.
- Godwin, Jimmy D.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Goettsche, Randy P., to Honeywell Inc. Micro-alignment method. 5,535,297, Cl. 385-90.000.
- Goetz, Richard J.: *See—*
  - Hager, Patrick J.; and Goetz, Richard J., 5,534,589, Cl. 525-57.000.
- Goke, L. Rodney: *See—*
  - Osborn, Stephen G.; and Goke, L. Rodney, 5,535,148, Cl. 364-718.000.
- Gold, Harris: *See—*
  - Walker, David H.; Gold, Harris; McKinney, George W., III; McCoy, John F., III; and Yu, Xiaohong, 5,534,186, Cl. 252-194.000.
- Goldberg, Henry: *See—*
  - Wallace, Ronald; Goldberg, Henry; Mitchell, James; and Grosser, Harald, 5,533,528, Cl. 131-304.000.
- Goldberg, Larry H., to Goldberg's United Service Company. Method and apparatus for non-surgical treatment of carpal tunnel syndrome. 5,533,526, Cl. 128-878.000.
- Goldberg, Marvin E.: *See—*
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- Goldberg, Paul: *See—*
  - Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., 5,534,438, Cl. 435-320.100.

- Goldberg, Steven J.; and Paterson, Hugh, to Motorola, Inc. Method and apparatus for managing telephone calls in a selective call radio system controller. 5,535,257, Cl. 379-57.000.
- Goldberg, Steven L.: *See—*
  - Johnston, Robert M.; Goldberg, Steven L.; and Cino, Paul M., 5,534,427, Cl. 435-198.000.
- Goldberg's United Service Company: *See—*
  - Goldberg, Larry H., 5,533,526, Cl. 128-878.000.
- Goldenberg, Lior; Antebi, Charlie S.; and Hecht, Oded R. Methods and apparatus for counting thin stacked objects. 5,534,690, Cl. 250-222.100.
- Golding, Andrew R.: *See—*
  - Roche, Emmanuel; Golding, Andrew R.; and Schabes, Yves, 5,535,121, Cl. 364-419.080.
- Golding, Ian B.: *See—*
  - Crane, David O.; Golding, Ian B.; and Crann, Robin, 5,533,409, Cl. 73-862.230.
- Goldman, Mark L. Device for storing and displaying materials on a stadium armrest. 5,533,782, Cl. 297-188.180.
- Goldman, Matthew S.; and Mendelson, Jeffrey B., to Digital Equipment Corporation. Multiplexed gapped constant bit rate data transmission. 5,535,216, Cl. 370-100.100.
- Goldstar Co., Ltd.: *See—*
  - Kim, Cheol Y., 5,535,339, Cl. 395-280.000.
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- Goldstar Electron Co., Ltd.: *See—*
  - Hur, Ki R., 5,534,725, Cl. 257-434.000.
- Golley, Christopher R. L., to ECC International Limited. Grinding alkaline earth metal pigments. 5,533,679, Cl. 241-17.000.
- Golonka, Kenneth A., Sr.: *See—*
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- Golubev, Daniel B.; and Chaihorsky, Alexander, to Bio-Virus Research Incorporated. Polypeptides to prevent atherosclerotic plaque. 5,534,258, Cl. 424-231.100.
- Goma, Shinji; and Bizen, Tatsuo, to Murata Manufacturing Co., Ltd. Volage-controlled oscillation circuit with an impedance element for carrier-to-noise compensation. 5,534,825, Cl. 331-117.00R.
- Goman, Gerald E.; Fay, Malachy; and Dunlap, Joel M., to Toro Company, The. Reel mower. 5,533,326, Cl. 56-7.000.
- Goman, Gerald E.: *See—*
  - Sallstrom, Steve A.; Goman, Gerald E.; and Dunlap, Joel M., 5,533,325, Cl. 56-7.000.
- Gönczi, Csaba: *See—*
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- Gonzales, Mark A.: *See—*
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- Gonzalez, Romulo, to Shell Oil Company. Dual concentric string high pressure riser. 5,533,574, Cl. 166-358.000.
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- Good, Steven S.: *See—*
  - Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., 5,534,535, Cl. 514-394.000.
- Goodrich, Matthew H.: *See—*
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- Goodyear Tire & Rubber Company, The: *See—*
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  - Marks, Patrick D.; and Smith, Michael W., 5,534,093, Cl. 156-128.600.
  - Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., 5,534,574, Cl. 524-262.000.
  - Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., 5,534,599, Cl. 525-342.000.
  - Schulz, Gerald O.; and Klemmensen, Daniel F., 5,534,568, Cl. 524-69.000.
  - Wideman, Lawson G.; and Sandstrom, Paul H., 5,534,578, Cl. 524-396.000.
- Goor, Gustaaf: *See—*
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- Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., to BASF Corporation. Stable, aqueous concentrated liquid detergent compositions containing hydrophilic copolymers. 5,534,183, Cl. 510-434.000.
- Gordon, Abe. Semi-automated cryostat. 5,533,342, Cl. 62-51.100.
- Gorman, Mary J. Remote control caddy. 5,533,809, Cl. 383-11.000.
- Goto, Yasuyuki: *See—*
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- Gough, Michael L.: *See—*
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- Gouilleux, Fabrice: *See—*
  - Groner, Bernd; Gouilleux, Fabrice; and Wakao, Hiroshi, 5,534,409, Cl. 435-6.000.
- Gould, Donald D. Small pet car seat. 5,533,785, Cl. 297-250.100.
- Gourgue, Frédéric: *See—*
  - de Seze, Fabrice; and Gourgue, Frédéric, 5,535,424, Cl. 455-33.100.
- Gower, Stefan F., to Sybase, Inc. Database system with methods for controlling object interaction by establishing database contracts between objects. 5,535,383, Cl. 395-600.000.
- Gowni, Shiva P.; and White, Allen R., to Cypress Semiconductor Corp. Pull-down access for an output buffer. 5,534,806, Cl. 327-170.000.
- Goyal, Shivendra K.: *See—*
  - Taylor, Joseph W.; Goyal, Shivendra K.; Aubee, Norman D. J.; and Bohnet, Nick K. K., 5,534,572, Cl. 524-275.000.
- Graco Childrens Products, Inc.: *See—*
  - Julien, Christine E.; and Tuckey, Peter R., 5,533,936, Cl. 472-118.000.
- Graef, Harry T.; and Harty, Michael J., to InterBold. Article depositing apparatus. 5,534,682, Cl. 235-379.000.
- Graham, Wayne B. Sheet roll up. 5,533,214, Cl. 4-502.000.
- Gramley, Kenneth R.: *See—*
  - Zhang, Jing; and Gramley, Kenneth R., 5,535,193, Cl. 370-17.000.
- Grammer AG: *See—*
  - Grassl, Johann; and Herbert, Dietmar, 5,533,703, Cl. 248-550.000.
- Granata, Richard D.: *See—*
  - Bilder, Wayne H.; Granata, Richard D.; and Leidheiser, Henry, Jr., 5,534,289, Cl. 427-8.000.
- Grancher, Raymond, to L'Hydraulique Chateaudun. Pressure regulating servovalve. 5,533,551, Cl. 137-625.620.
- Grandfield, Walter. Diode loaded feed-forward radio frequency amplifier power control. 5,535,444, Cl. 455-232.100.
- Granger, Richard N., to United States Surgical Corporation. Interchangeable tissue measuring device. 5,533,521, Cl. 128-774.000.
- Grant, Richard L.: *See—*
  - Main, Lauren O.; and Grant, Richard L., 5,533,661, Cl. 227-176.100.
- Grant, Robert E., to Lighthouse Digital Systems, Inc. Input/output module providing mixed optical and electrical signal connectivity in data communications equipment. 5,535,036, Cl. 359-163.000.
- Grant, Shannon G., to Caterpillar Inc. Valving interface for a poppet valve. 5,533,548, Cl. 137-540.000.
- Gras, Jürgen; Hertzler, Siegfried; and Tjoa, Jan-Tian, to Robert Bosch GmbH. Control system for metering fuel to an internal combustion engine. 5,533,491, Cl. 123-676.000.
- Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., to Polaroid Corporation. Process for generation of acid and for imaging, and imaging medium for use therein. 5,534,388, Cl. 430-338.000.
- Grasshoff, Jurgen M.: *See—*
  - Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.
- Grassl, Johann; and Herbert, Dietmar, to Grammer AG. Sprung vehicle seat. 5,533,703, Cl. 248-550.000.
- Grattan, David A.: *See—*
  - Payne, Charles C.; and Grattan, David A., 5,534,053, Cl. 106-236.000.
- Gravel, Marian H.: *See—*
  - Sweeney, Niall; Caizza, Richard J.; Gravel, Marian H.; and Walters, Bronwen L., 5,533,980, Cl. 604-192.000.
- Graven, Robert E.: *See—*
  - Lynch, Carroll L.; Graven, Robert E.; and Graven, Robert L., 5,533,302, Cl. 47-82.000.
- Graven, Robert L.: *See—*
  - Lynch, Carroll L.; Graven, Robert E.; and Graven, Robert L., 5,533,302, Cl. 47-82.000.
- Graveson, Sandra: *See—*
  - Kleckner, Robert J.; and Graveson, Sandra, 5,534,964, Cl. 354-344.000.
- Gray, David C.; and Butterbaugh, Jeffery W., to FSI International. UV-enhanced dry stripping of silicon nitride films. 5,534,107, Cl. 156-643.100.
- Gray, Henry F.: *See—*
  - Shaw, Jonathan L.; and Gray, Henry F., 5,534,311, Cl. 427-526.000.
- Gray, Stephen B. Workpiece holder. 5,533,718, Cl. 269-296.000.
- Graybeal, John M.: *See—*
  - Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., 5,533,512, Cl. 128-719.000.
- Green, Michael R.; Zapp, Maria L.; and Stern, Seth, to University Of Massachusetts Medical Center. 2-deoxystreptamine aminoglycoside inhibition of HIV RRE/Rev binding. 5,534,408, Cl. 435-5.000.
- Green, Peter J.: *See—*
  - Fearing, Oliver H., Jr.; Green, Peter J.; and Kirby, Richard E., 5,534,664, Cl. 174-50.000.
- Greene, David A.; Greene, Rosemary A.; and Gaubatz, Donald C., to General Electric Company. Integrated acoustic leak detection processing system. 5,533,383, Cl. 73-40.50A.

- Greene, George R., Jr.; and Brenneman, Rodney, to Vesica Medical, Inc. Method and apparatus for threading a suture anchor. 5,534,011, Cl. 606-232.000.
- Greene, Rosemary A.: *See—*
  - Greene, David A.; Greene, Rosemary A.; and Gaubatz, Donald C., 5,533,383, Cl. 73-40.50A.
- Greeninger, Daniel R.: *See—*
  - Wahlstrand, John D.; Baxter, Daniel J.; Ecker, R. Michael; Greeninger, Daniel R.; and Yerich, Charles G., 5,534,018, Cl. 607-27.000.
- Greenleaf Medical Systems: *See—*
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- Greer, David A.: *See—*
  - Wood, James A.; Greer, David A.; and Mazur, Richard J., 5,535,122, Cl. 364-426.010.
- Gregg, Paul S.; Kistner, Matthew G.; and Will, Jeff D., to Boeing Company, The. Multiple density sandwich structures. 5,534,354, Cl. 428-593.000.
- Greschl, Gerald L.: *See—*
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Greschner, Johann: *See—*
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
- Gretz, Ronald D.: *See—*
  - Tippins, George W.; Thomas, John E.; Tippins, William H.; and Gretz, Ronald D., 5,533,248, Cl. 29-527.700.
- Griessmann, Marcel: *See—*
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- Griffin, Timothy G.; and Libkin, Leonid, to AT&T Corp. Dealing with side effects of transactions in data base systems using a multi-set algebra. 5,535,385, Cl. 395-600.000.
- Griffith, Owen W.: *See—*
  - Kilbourn, Robert G.; Griffith, Owen W.; and Gross, Steven S., 5,534,545, Cl. 514-565.000.
- Griggs, E. Sean; and Roder, William R., to Reilly Industries, Inc. Process for de-ashing coal tar. 5,534,137, Cl. 208-425.000.
- Grinblat, Avi. Optical stereoscopic microscope system. 5,535,060, Cl. 359-835.000.
- Grinnell Corporation: *See—*
  - Mears, James W., 5,533,576, Cl. 169-90.000.
- Grochowski, Edward; Zaidi, Ahmad; and Lan, James, to Intel Corporation. Rotators in machine instruction length calculation. 5,535,347, Cl. 395-375.000.
- Groeger, Ulrich: *See—*
  - Drauz, Karlheinz; Knaup, Günter; and Groeger, Ulrich, 5,534,538, Cl. 514-19.000.
- Groleau, Rodney J.: *See—*
  - Wurst, Richard; and Groleau, Rodney J., 5,533,404, Cl. 73-756.000.
- Gromala, Joseph R.; and Nguyen, Yu T., to Robertshaw Controls Company. Determination of ambient air temperature outside of an appliance. 5,533,349, Cl. 62-129.000.
- Gromala, Joseph R.; and Nguyen, Vu T., to Robertshaw Controls Company. Defrost control of a refrigeration system utilizing ambient air temperature determination. 5,533,350, Cl. 62-155.000.
- Groneberg, Robert A.; Regan, John R.; Neuenschwander, Kent W.; and Scotese, Anthony C., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Aliphatic amino bis-aryl squalene synthase inhibitors. 5,534,532, Cl. 514-367.000.
- Groner, Bernd; Gouilleux, Fabrice; and Wakao, Hiroshi, to Ciba-Geigy Corporation. Cytokine regulated transcription factor. 5,534,409, Cl. 435-6.000.
- Groshens, Pierre, to Lainiere de Picardie S.A. Thermobonding interlining comprising a layer of fibers intermingled with textured weft yarns and its production method. 5,534,330, Cl. 428-198.000.
- Gross, George F., Jr.; McPartland, Richard J.; and Viswanathan, Thayamkulangara R., to AT&T Corp. Resistor string with equal resistance resistors. 5,534,862, Cl. 341-144.000.
- Gross, Steven S.: *See—*
  - Kilbourn, Robert G.; Griffith, Owen W.; and Gross, Steven S., 5,534,545, Cl. 514-565.000.
- Grosser, Harald: *See—*
  - Wallace, Ronald; Goldberg, Henry; Mitchell, James; and Grosser, Harald, 5,533,528, Cl. 131-304.000.
- Grot, Walther G., to Du Pont de Nemours, E. I., and Company. Sealant for electrochemical cells. 5,534,576, Cl. 524-377.000.
- Groves, James F.: *See—*
  - Wadley, Haydn N. G.; and Groves, James F., 5,534,314, Cl. 427-585.000.
- Grubbs, Roy C.: *See—*
  - Lam, Clive C.; Curtis, William W., Jr.; and Grubbs, Roy C., 5,534,775, Cl. 324-216.000.
- Grube, Gary W.; and Markison, Timothy W. Method of detecting unauthorized use of a communication unit. 5,535,431, Cl. 455-54.100.
- Gruber, Robert L.: *See—*
  - Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., 5,534,379, Cl. 430-106.000.
- Gruender, Eugene H., Jr.; and Snowden, Ralph E., to Motorola, Inc. Demultiplexing initialization data to be transferred to memory through a plurality of registers with error detection data. 5,535,367, Cl. 395-493.000.
- Gründl, Andreas: *See—*
  - Heidelberg, Götz; Gründl, Andreas; and Ehrhart, Peter, 5,534,739, Cl. 310-179.000.
- Grundler, Gerhard, to BYK Gulden Lomberg Chemische Fabrik GmbH. Pyrrolopyridazines having gastrointestinal protective effects. 5,534,515, Cl. 514-248.000.
- Gruskin, Elliott A.; Lee, Daniel R.; and Brown, Lloyd S., to United States Surgical Corporation. Infection-resistant surgical devices and methods of making them. 5,534,288, Cl. 427-2.310.
- GTE Mobile Communictions Services: *See—*
  - Zicker, Robert G.; and Dion, John K., 5,535,260, Cl. 379-63.000.
- Guardiola-Lemaitre, Beatrice: *See—*
  - Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.
- Guempelein, Reinhold; and Roehrlein, Gerhard, to Siemens Aktiengesellschaft. Contactless data transmission device. 5,535,033, Cl. 359-144.000.
- Guess, Ronald W.: *See—*
  - Szynal, Joseph M.; and Guess, Ronald W., 5,533,360, Cl. 62-298.000.
- Guglielmi, Elio. Non-toxic, environmentally benign fire extinguishants. 5,534,164, Cl. 252-8.000.
- Guiney, Kathleen M.: *See—*
  - Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., 5,534,183, Cl. 510-434.000.
- Gulick, Dale, to Advanced Micro Devices, Inc. Analog integrated circuit. 5,535,281, Cl. 381-28.000.
- Gully, Danielle: *See—*
  - Frehel, Daniel; Gully, Danielle; Boigegrain, Robert; Badorc, Alain; Bras, Jean-Pierre; and Despeyroux, Pierre, 5,534,530, Cl. 514-361.000.
- Gundlach, Kurt B., to Xerox Corporation. Thermal ink jet composition. 5,534,050, Cl. 106-20.00R.
- Gunter, Brad D.; Anderson, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, to Motorola, Inc. Circuit and method for reducing voltage error when charging and discharging a variable capacitor through a switch. 5,534,819, Cl. 327-553.000.
- Guntly, Leon A.: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Gunton, David J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Mixer circuit. 5,535,445, Cl. 455-327.000.
- Guo, Shao-Hua, to ARCO Chemical Technology, L.P. Hydroxy-functional acrylate resins. 5,534,598, Cl. 525-329.200.
- Gupta, Anoop; and Joe, Truman, to Stanford University. Flat cache-only multi-processor architectures. 5,535,116, Cl. 364-134.000.
- Gupta, Rakesh K.; and Legare, Richard J., to Hercules Incorporated. Nonwoven materials comprising 0.5 to 1.2 decitex cardable polyolefin fibers and having liquid strike through resistance as well as air permeability. 5,534,340, Cl. 428-286.000.
- Gürtzgen, Stefan: *See—*
  - Becker, Ralf-Jürgen; Gürtzgen, Stefan; and Kutschera, Dirk, 5,534,474, Cl. 502-152.000.
- Gustafson, Donald E.: *See—*
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- Gustavsson, Bengt G.: *See—*
  - Spears, Colin P.; and Gustavsson, Bengt G., 5,534,519, Cl. 814-274.000.
- Guttin, Christophe: *See—*
  - Leger, Jean-Michel; and Guttin, Christophe, 5,534,776, Cl. 324-304.000.
- Guzzo, Giovanni: *See—*
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- Gwinn, Kenneth W.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- Győri, Péter: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Gyory, J. Richard; and Peery, John R., to ALZA Corporation. Iontophoretic delivery device and method of hydrating same. 5,533,972, Cl. 604-20.000.
- Gyüre, Károl: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Gyure, Sandor: *See—*
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- H. B. Fuller Licensing & Financing, Inc.: *See—*
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- Haager, Volker. Device for camouflaging military equipment. 5,533,542, Cl. 135-125.000.

- Haartsen, Jacobus C.: *See—*
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- Habu, Takeshi: *See—*
  - Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.
- Hachiya, Tadashi; Takahashi, Yukitoshi; and Kohara, Yuji, to Tokyo Kikai Seisakusho, Ltd. Ink fountain apparatus for printing press. 5,533,450, Cl. 101-365.000.
- Haeg, Steven R.; Leska, Paul J., Sr.; and Zieman, Ricky L., to MTS Systems Corporation. Loading assembly for a vehicle spindle test fixture. 5,533,403, Cl. 73-669.000.
- Haegele, Glen T.: *See—*
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- Hager, Alfredo A.: *See—*
  - De Paoli, Tomás; and Hager, Alfredo A., 5,534,268, Cl. 424-450.000.
- Hager, Patrick J.; and Goetz, Richard J., to Minnesota Mining and Manufacturing Company. Repulpable plastic films. 5,534,589, Cl. 525-57.000.
- Hagg, Franklin: *See—*
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- Haggerty, Kevin J.: *See—*
  - Cann, Ronald; Cann, Steve; Lee, Robert; and Haggerty, Kevin J., 5,533,955, Cl. 493-342.000.
- Hahn, Winfried. Device for removing hair from hairbrushes. 5,533,229, Cl. 15-310.000.
- Haight, Sidney C., Jr. Flexible one-piece scope ring. 5,533,267, Cl. 33-245.000.
- Haimbaugh Enterprises, Inc.: *See—*
  - Kesler, Robert H., 5,533,300, Cl. 47-48.500.
- Hain, John A., Jr.; and Thornhill, H. G. Rusty, to Global Interconnect, Corp. Digital data transfer system for use especially with advertisement insertion systems. 5,535,229, Cl. 371-53.000.
- Haining, Michael L. Valved medical connector. 5,533,983, Cl. 604-249.000.
- Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.; Henning, Steven K.; and Lucas, Danielle, to Goodyear Tire & Rubber Company, The. High performance blend for tire treads. 5,534,592, Cl. 525-236.000.
- Haley, Bobby Z.: *See—*
  - Moshier, Mark W.; Haley, John C.; Haley, Bobby Z.; and Andrews, Stanley B., 5,533,343, Cl. 62-63.000.
- Haley, John C.: *See—*
  - Moshier, Mark W.; Haley, John C.; Haley, Bobby Z.; and Andrews, Stanley B., 5,533,343, Cl. 62-63.000.
- Hall, Joseph L., II; and Johnston, James D., to AT&T Corp. Perceptual coding of audio signals using entropy coding and/or multiple power spectra. 5,535,300, Cl. 395-2.360.
- Hall, Philip G.: *See—*
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- Hall, Robert G.: *See—*
  - Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., 5,534,121, Cl. 204-459.000.
- Hall, Robert L. Dressing holder. 5,533,963, Cl. 602-75.000.
- Halliburton Company: *See—*
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  - Streich, Steven G.; Crook, Ronald J.; and Jones, Richard R., 5,533,570, Cl. 166-153.000.
  - Surjaatmadja, Jim B.; Brune, Kenneth D.; and Kabinoff, Ken B., 5,533,571, Cl. 166-222.000.
- Halliday, David. Footwear with interchangeable components. 5,533,280, Cl. 36-101.000.
- Halperin, Mitchell L.; and Cheema-Dhadli, Surinder, to Rossmark Medical Publishers Inc. Apparatus for removal of excess hydrogen ions from humans. 5,533,964, Cl. 604-4.000.
- Halpern, Samuel J. Insulated grocery cart cooler. 5,533,361, Cl. 62-457.200.
- Hama, Kenji; Hiroe, Nobutake; and Kuroda, Junko, to Toray Industries, Inc. Base fabric for ink ribbons. 5,534,334, Cl. 428-224.000.
- Hamada, Giichi: *See—*
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- Hamada, Takumu, to NEC Corporation. Additional direct inward dialing connection system. 5,535,269, Cl. 379-233.000.
- Hamaguchi, Isao: *See—*
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- Hamai, Shinji: *See—*
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- Hamamatsu Photonics K.K.: *See—*
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  - Takeshima, Akira; and Koishi, Musubu, 5,535,044, Cl. 359-245.000.
- Hamann, Theodora L.: *See—*
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- Hamano, Hisashi: *See—*
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- Hamatani, Masato: *See—*
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- Hamer, Gordon K.: *See—*
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- Hamer, Russell R. L.: *See—*
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,636, Cl. 548-228.000.
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,640, Cl. 549-80.000.
- Hamilton, Eric W.: *See—*
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Hamlin, Kenneth H.: *See—*
  - Chin, Wilson C.; and Hamlin, Kenneth H., 5,535,177, Cl. 367-81.000.
- Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., to Xerox Corporation. Apparatus and method for managing memory in a printing system. 5,535,312, Cl. 395-115.000.
- Hammond, Earl G.: *See—*
  - Fehr, Walter R.; and Hammond, Earl G., 5,534,425, Cl. 435-172.100.
- Hampton Electronics: *See—*
  - Erikson, Evans W., 5,533,668, Cl. 236-49.300.
- Han, Yong-Joo; and Bae, Myung-Ho, to Samsung Electronics Co., Ltd. Semiconductor chip having a low-noise power supply arrangement. 5,535,152, Cl. 365-51.000.
- Hanabusa, Tadashi; and Kuwabara, Nobuyuki, to Canon Kabushiki Kaisha. Recording apparatus regulating thermal head power and ink sheet peeling angle. 5,534,909, Cl. 347-216.000.
- Hanabusa, Tadashi: *See—*
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- Hanaoka, Akihiro: *See—*
  - Ito, Youichi; Hanaoka, Akihiro; and Tezuka, Kenichi, 5,534,273, Cl. 426-18.000.
- Hanaoka, Masaaki: *See—*
  - Kondou, Yoshimasa; Hanaoka, Masaaki; Nakamura, Shinji; and Doi, Fumiaki, 5,535,415, Cl. 395-828.000.
- Hanek, Martin: *See—*
  - Krapp, Hans-Dieter; Hanek, Martin; and Frings, Hubert, 5,534,742, Cl. 313-113.000.
- Hankla, Allen: *See—*
  - Bowers, Mark; and Hankla, Allen, 5,535,049, Cl. 359-334.000.
- Hansen, Daniel J., Jr.; Gough, Michael L.; and Hollowell, J. Rhoads, to Apple Computer, Inc. Method and apparatus for using stylus-tablet input in a computer system. 5,534,893, Cl. 345-179.000.
- Hansen, David R., to Eastman Kodak Company. Copier/printer operating with interrupts. 5,535,009, Cl. 358-296.000.
- Hansen, Eigil: *See—*
  - Crandall, Thomas L.; Strout, Donald W.; and Hansen, Eigil, 5,533,358, Cl. 62-292.000.
- Hanson, Thomas A.; Kish, William J.; Novak, Jerome J.; and Vandervort, Annette L., to Corning Incorporated. Optical waveguide spectral attenuation using an OTDR. 5,534,994, Cl. 356-73.100.
- Harada, Kentaro, to Kabushiki Kaisha Toshiba. Automatic document feeder for photocopier and facsimile device. 5,534,973, Cl. 355-202.000.
- Haraga, Hisato: *See—*
  - Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, 5,534,120, Cl. 205-464.000.
- Harari, Eliyahou; Norman, Robert D.; and Mehrotra, Sanjay, to SanDisk Corporation. Non-volatile memory system card with flash erasable sectors of EEprom cells including a mechanism for substituting defective cells. 5,535,328, Cl. 395-182.050.
- Harari, Eliyahou: *See—*
  - Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,534,456, Cl. 437-43.000.
- Harder, John W.: *See—*
  - Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Burns, Paul A.; and Weber, Lynda D., 5,534,401, Cl. 430-558.000.
- Hardman, Karl: *See—*
  - Ladner, Robert C.; Bird, Robert E.; and Hardman, Karl, 5,534,621, Cl. 530-413.000.
- Hargis, David E.; Flint, Graham; and Assa, Shlomo, to Laser Power Corporation. High resolution image projection system and method employing lasers. 5,534,950, Cl. 348-758.000.
- Harkey, Jerry P.: *See—*
  - Sands, Richard H.; Harkey, Jerry P.; and Pace, J. Gary, 5,533,472, Cl. 123-41.350.
- Harland, Richard J.: *See—*
  - Potter, Andrew A.; and Harland, Richard J., 5,534,256, Cl. 424-184.100.
- Harman, Robert K., to Auratek Security Inc. Open transmission line locating system. 5,534,869, Cl. 342-27.000.
- Harmon Industries, Inc.: *See—*
  - Heggestad, Robert E.; and Schaefer, Donald B., Jr., 5,533,695, Cl. 246-62.000.
- Harms, Thomas; and Abe, Karl-Heinz, to Bayerische Motoren Werke AG. Divided seat for a motor vehicle. 5,533,783, Cl. 297-195.130.
- Harper, John: *See—*

- Wolfberg, Larry; and Harper, John, 5,533,453, Cl. 101-485.000.
- Harris Corporation: *See—*
  - Belcher, Donald K.; and Thomas, David M., 5,535,039, Cl. 359-187.000.
  - Chavannes, Theodore E.; and Walsworth, Richard L., 5,534,768, Cl. 323-267.000.
- Harris, Ellis D., to Xerox Corporation. Full color printing system using a penta-level xerographic unit. 5,534,990, Cl. 355-327.000.
- Harris, Raymond D.: *See—*
  - Longo, Mary C.; Smith, Michael D.; and Harris, Raymond D., 5,534,428, Cl. 435-199.000.
- Harris, Richard H.; Kinney, Michael J.; and Vorhees, Kevin H., to International Business Machines Corporation. Biaxial printer. 5,533,817, Cl. 400-124.280.
- Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., to J. M. Huber Corporation. Process for treating kaolin clays for pitch control and the treated clays. 5,534,057, Cl. 106-486.000.
- Harrison, Paul M.: *See—*
  - Parker, James W.; Harrison, Paul M.; and Peall, Robert G., 5,534,442, Cl. 437-2.000.
- Harstick, Christian S.; and Henderson, Kenneth O., to Ethyl Petroleum Additives, Inc. Graft copolymer comprising a star-shaped polymer and an n-allyl amide. 5,534,174, Cl. 508-543.000.
- Harston, Stephen W., to Analog Devices, Incorporated. Random access memory with apparatus for reducing power consumption. 5,535,174, Cl. 365-235.000.
- Hart, John H.: *See—*
  - Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., 5,535,338, Cl. 395-200.200.
- Harty, Michael J.: *See—*
  - Graef, Harry T.; and Harty, Michael J., 5,534,682, Cl. 235-379.000.
- Harvey, Robert B. Downspout water conservation diversion adaptor. 5,533,303, Cl. 52-16.000.
- Hasbun, Robert N.: *See—*
  - Wells, Steven; Hasbun, Robert N.; Domonkos, Sara; and Barbarich, Steven S., 5,535,369, Cl. 395-497.020.
- Hase, Yoshiaki: *See—*
  - Mitsui, Shigeyuki; and Hase, Yoshiaki, 5,533,279, Cl. 36-50.100.
- Hasebe, Masahiro: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
- Hasegawa, Hideo; Tateno, Kikuhei; Kuwata, Tamotsu; Yamamoto, Yoshiro; Hiraishi, Kumiko; Fujita, Osamu; and Narabayashi, Isamu, to Meiji Milk Products Company, Ltd. Unchelated manganese composition for MRI of the gastrointestinal tract. 5,534,240, Cl. 424-9.360.
- Hasegawa, Hironobu, to Ricoh Company, Ltd. Printing apparatus performing bidirectional communication with a plurality of user terminals. 5,534,974, Cl. 355-202.000.
- Hasegawa, Kazuhiro; Takahashi, Kenji; and Kojima, Yasushi, to Fuji Photo Film Co., Ltd. Tetradecahedral rare earth activated alkaline earth metal fluorohalide phosphor and radiaiton image storage panel. 5,534,191, Cl. 252-301.40H.
- Hasegawa, Koichi: *See—*
  - Murasato, Shigetaka; and Hasegawa, Koichi, 5,534,717, Cl. 257-94.000.
- Hasegawa, Takanori; and Shoji, Hideo, to Riso Kagaku Corporation. Motor-type ink sensor. 5,533,449, Cl. 101-350.000.
- Hashiba, Hitoshi: *See—*
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Hashimoto, Shinichi: *See—*
  - Yamamoto, Seiichi; and Hashimoto, Shinichi, 5,534,758, Cl. 318-112.000.
- Hashimoto, Susumu: *See—*
  - Okuno, Shiho; Hashimoto, Susumu; Yusu, Keiichiro; and Inomata, Koichiro, 5,534,355, Cl. 428-611.000.
- Hashimoto, Yuichi: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, to Nissha Printing Co., Ltd. Thin-film forming apparatus and thin-film forming method. 5,533,446, Cl. 101-150.000.
- Hassenrück, Karin: *See—*
  - Mennicke, Winfried; and Hassenrück, Karin, 5,534,052, Cl. 106-22.00D.
- Hastings, Reed, to Pure Software, Inc. Method and apparatus for modifying relocatable object code files and monitoring programs. 5,535,329, Cl. 395-183.110.
- Hata, Masayuki; Nakagawa, Hiromasa; and Yamada, Tatsuo, to Mitsubishi Denki Kabushiki Kaisha. Computer system with cache memory having address mask register. 5,535,359, Cl. 395-446.000.
- Hatakenaka, Makoto: *See—*
  - Miyazaki, Yukio; Okitaka, Takenori; Hatakenaka, Makoto; and Mano, Junji, 5,534,805, Cl. 327-144.000.
- Hatanaka, Atsushi: *See—*
  - Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.
- Hatanaka, Katsunori: *See—*
  - Yamano, Akihiko; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; and Shido, Shunichi, 5,535,018, Cl. 358-444.000.
- Hatano, Akitsugu: *See—*
  - Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
- Hatcher, Lester B.: *See—*
  - Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., 5,535,274, Cl. 379-446.000.
- Hathaway, David J., to International Business Machines Corporation. Delay model abstraction. 5,535,145, Cl. 364-578.000.
- Hattori, Kenneth M.: *See—*
  - Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., 5,533,311, Cl. 52-309.900.
- Hattori, Yoshifumi: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Haugland, Richard P.: *See—*
  - Millard, Paul J.; Roth, Bruce L.; Yue, Stephen T.; and Haugland, Richard P., 5,534,416, Cl. 436-34.000.
- Hauser, Erwin, to KNF Neuberger GmbH. Stand for a pump. 5,533,874, Cl. 417-360.000.
- Havens, Thomas G.; Kerko, David J.; and Morrell, JoAnn, to Corning Incorporated. Method of making laser eyewear protection. 5,534,041, Cl. 65-30.100.
- Hawkins, Geoffrey R.; and Goldberg, Marvin E., to Revlon Consumer Products Corporation. Permanent wave compositions and methods. 5,533,532, Cl. 132-204.000.
- Hayakawa, Akira: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Hayakawa, Ichiro: *See—*
  - Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
- Hayakawa, Keiichiro: *See—*
  - Borland, William; Hayakawa, Keiichiro; Sato, Takeshi; and Smith, Jerome, 5,534,194, Cl. 252-518.000.
- Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, to Seikosha Co., Ltd. Ink jet head. 5,534,903, Cl. 347-71.000.
- Hayakawa, Yuzo; Hirai, Tsuneo; and Katayama, Tsutao, to Takeda Chemical Industries, Ltd. Molding apparatus having a movable die and a counter roll. 5,533,880, Cl. 425-328.000.
- Hayashi, Chihiro: *See—*
  - Kuroda, Kouichi; Imamura, Youichi; Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,533,370, Cl. 72-12.500.
- Hayashi, Daisuke: *See—*
  - Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., 5,535,220, Cl. 371-2.100.
- Hayashi, Masaaki, to Nippon Electric Glass Co., Ltd. Low temperature non-crystallizing sealing glass. 5,534,469, Cl. 501-15.000.
- Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, to Seikosha Co., Ltd. Printing method for use with dot printer. 5,535,308, Cl. 395-108.000.
- Hayashi, Noriki; and Yoshida, Noriyuki, to Sumitomo Electric Industries, Ltd. Method of fabricating oxide superconducting films by laser deposition. 5,534,489, Cl. 505-474.000.
- Hayashi, Sadao; Nakanishi, Eiji; Kurita, Yasuyuki; and Okunishi, Masahiko, to Katayama Seiyakusyo Co., Ltd.; and Ajinomoto Co., Inc. Cephem compounds and antimicrobial agents. 5,534,508, Cl. 514-206.000.
- Hayashi, Satoshi: *See—*
  - Ito, Ryu; Kaneko, Kenji; Hayashi, Satoshi; and Terai, Akiko, 5,533,227, Cl. 15-167.100.
- Hayashida, Shigeru: *See—*
  - Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
- Hayasi, Shigeo: *See—*
  - Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, 5,534,477, Cl. 503-227.000.
- Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., to University of British Columbia; and HSC Research & Development Ltd. Process for isolating genes and the gene causative of Huntington's disease and differential 3' polyadenylation in the gene. 5,534,438, Cl. 435-320.100.
- Hayenga, Lubertus H. Adjustable suspension fork. 5,535,178, Cl. 368-180.000.
- Hayes, Michael M.: *See—*
  - Lo, Shyh-Ching; Wang, Richard Y.; and Hayes, Michael M., 5,534,413, Cl. 435-7.320.
- Hayes Wheels International, Inc.: *See—*
  - Kemmerer, James H., 5,533,261, Cl. 29-894.322.
- Hayhurst, Robert: *See—*
  - Dawson, Keith; and Hayhurst, Robert, 5,534,062, Cl. 118-60.000.
- Hays, Bertrand: *See—*

  - Larvoire, Jean-François; Ribollet, Thierry; and Hays, Bertrand, 5,535,409, Cl. 395-800.000.
- Hayward, Barry: *See—*
  - Baines, Stephen J.; and Hayward, Barry, 5,534,341, Cl. 428-288.000.
- Hazani, Emanuel. Non-volatile memory circuits, architecture. 5,535,167, Cl. 365-218.000.
- Hazeltine Corporation: *See—*
  - Lopez, Alfred R., 5,534,882, Cl. 343-891.000.
- He, Chaoying: *See—*
  - Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., 5,534,121, Cl. 204-459.000.
- He, Kai S., to Chung Kin Lo. Optical assembly for television front screen. 5,534,951, Cl. 348-832.000.
- Hecht, Matthew S., to International Business Machines Corporation. Data processing system with improved work flow system and method. 5,535,322, Cl. 395-155.000.
- Hecht, Oded R.: *See—*
  - Goldenberg, Lior; Antebi, Charlie S.; and Hecht, Oded R., 5,534,690, Cl. 250-222.100.
- Heck, James V.: *See—*
  - Cama, Lovji D.; and Heck, James V., 5,534,507, Cl. 514-206.000.
- Heck, Jean-Marie, to Magotteaux International. Centrifugal impact crusher. 5,533,685, Cl. 241-275.000.
- Hefferan, John K.: *See—*
  - Leigh, Todd A.; Sasuta, Michael D.; and Hefferan, John K., 5,535,426, Cl. 455-34.100.
- Hegg, Ronald G., to Hughes Training, Inc. Helmet mounted off axis liquid crystal display with a fiber optic wedge and a curved reflector. 5,535,025, Cl. 359-40.000.
- Heggestad, Robert E.; and Schaefer, Donald B., Jr., to Harmon Industries, Inc. Incremental train control system. 5,533,695, Cl. 246-62.000.
- Hegre, Orion D.: *See—*
  - Laurance, Megan E.; Knaack, David; Fiore, Deborah M.; and Hegre, Orion D., 5,534,404, Cl. 435-3.000.
- Heidelberg, Götz; Gründl, Andreas; and Ehrhart, Peter, to Magnet-Motor Gesellschaft für magnetmotorische Technik mbH. Electric machine. 5,534,739, Cl. 310-179.000.
- Heidenreiter, Thomas; and Schmidbauer, Ute, to J. S. Staedtler GmbH & Co. Writing or drafting instrument with exchangeable writing medium container. 5,533,824, Cl. 401-133.000.
- Heidner, James L.: *See—*
  - Brummond, Robert A.; Scheel, Roger; and Heidner, James L., 5,534,140, Cl. 210-106.000.
- Heil, Michael D.: *See—*
  - Lee, Ron C.; Heil, Michael D.; Downey, Michael T.; and Barrasso, Michael J., 5,533,338, Cl. 62-638.000.
- Heiliger, Ludger, to Bayer Aktiengesellschaft. Biologically active initiators for radical polymerization. 5,534,630, Cl. 534-752.000.
- Heim, William D., to Belting Industries Co., Inc. Belt and method of manufacture. 5,533,941, Cl. 474-267.000.
- Heine, Gunter: *See—*
  - Leuthold, Hans; Jennings, David J.; Heine, Gunter; and Nagarathnam, Lakshman, 5,533,812, Cl. 384-112.000.
- Heinrich, Ann M.: *See—*
  - Zanecchia, Denise; Heinrich, Ann M.; and Ustanik, Teresa, 5,534,952, Cl. 351-200.000.
- Heinzman, Stephen W.; Dupont, Jeffrey S.; and Tettenhorst, William C., to Procter & Gamble Company, The. Synthesis of amido acids from carboxylic acids and lactams. 5,534,642, Cl. 554-98.000.
- Héja, Gergely: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Hejlsberg, Anders; Stock, Jeffrey; Kukol, Peter; and Shtaygrud, Alex, to Borland International, Inc. System and methods for optimizing object-oriented compilations. 5,535,391, Cl. 395-700.000.
- Helene Curtis, Inc.: *See—*
  - Galleguillos, Ramiro; Radd, Billie L.; and Jadav, Anjana K., 5,534,245, Cl. 424-66.000.
  - Herb, Craig A.; Sun, Wei-Mei; Walling, Priscilla M.; and Stiffe, Susan A., 5,534,246, Cl. 424-66.000.
- Helgesen, Arne: *See—*
  - Wallström, Eva; Lund, Peter B.; and Helgesen, Arne, 5,534,049, Cl. 106-22.00R.
- Hella KG Hueck & Co.: *See—*
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- Helm, Mark: *See—*
  - Dennison, Charles H.; and Helm, Mark, 5,534,449, Cl. 437-34.000.
- Hemström, Bengt; Persson, Johan; and Karlsson, Rolf, to Vattenfall Utveckling AB. Tubular filter arrangement with liquid distributing casing. 5,534,144, Cl. 210-193.000.
- Hendel, Horst, to Siemens Aktiengesellschaft. Armature mount for an electromagnetic relay. 5,534,834, Cl. 335-78.000.
- Henderson, D. Austin, Jr.: *See—*
  - Stefik, Mark J.; Russell, Daniel M.; Bobrow, Daniel G.; and Henderson, D. Austin, Jr., 5,534,975, Cl. 355-202.000.
- Henderson, Ian: *See—*
  - Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, 5,535,286, Cl. 382-109.000.
- Henderson, James P.: *See—*
  - Ott, James H.; Anglin, Mark E.; and Henderson, James P., 5,533,347, Cl. 62-115.000.
- Henderson, Kenneth O.: *See—*
  - Harstick, Christian S.; and Henderson, Kenneth O., 5,534,174, Cl. 508-543.000.
- Hendrick, Louis W.: *See—*
  - Young, Frederick A.; Hendrick, Louis W.; and Loi, Keith N., 5,534,881, Cl. 343-776.000.
- Hendrickson, Gary T.: *See—*
  - Correale, Anthony, Jr.; and Hendrickson, Gary T., 5,534,803, Cl. 327-108.000.
- Heng, Fook-Luen: *See—*
  - Cohn, John M.; and Heng, Fook-Luen, 5,535,134, Cl. 364-491.000.
- Henkel Corporation: *See—*
  - Casamassina, Thomas; Morales, Florencio, Jr.; Salka, Barry A.; Fallon, John; Desai, Sureshchandra G.; and McCurry, Patrick M., Jr., 5,534,500, Cl. 252-353.000.
  - Dollman, David Y., deceased; Dolan, Shawn E.; and Steinbrecher, Lester E., 5,534,082, Cl. 148-247.000.
  - Incorvia, Michael J.; and Fischer, Stephen A., 5,534,192, Cl. 252-500.000.
- Henkel, Herbert W.; Kaplan, Elisabeth; and Hall, Philip G., to Castrol North America Automotive Inc. Aqueous hard surface cleaning compositions having improved cleaning properties. 5,534,181, Cl. 510-423.000.
- Henkes, Jerome P.: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Henley, Julian L. Fluid filled prosthesis excluding gas-filled beads. 5,534,023, Cl. 623-8.000.
- Henning, John C.: *See—*
  - Kohus, Louis M.; Henning, John C.; Huang, Chow-Chi; and Walter, Glen V., 5,533,466, Cl. 119-459.000.
- Henning, Steven K.: *See—*
  - Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.; Henning, Steven K.; and Lucas, Danielle, 5,534,592, Cl. 525-236.000.
- Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., to FMC Corporation. Insecticidal substituted-2,4-diaminoquinazolines. 5,534,518, Cl. 514-260.000.
- Henry, Randall R.; Moyer, William P.; and Skotek, David A., to Whitaker Corporation, The. Latch and mounting member for a surface mounted electrical connector. 5,533,908, Cl. 439-329.000.
- Henry, Richard A. Lidocaine-vasoconstrictor aerosol preparation. 5,534,242, Cl. 424-45.000.
- Heo, Tae H.: *See—*
  - Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,534,637, Cl. 548-374.100.
- Hepworth, Malcolm T.: *See—*
  - Reddin, Lorin D.; Hepworth, Malcolm T.; Ben-Slimane, Rachid; and Welch, Glenn D., 5,534,234, Cl. 423-50.000.
- Heraeus Amersil, Inc.: *See—*
  - Koons, John J., 5,534,074, Cl. 118-728.000.
- Herb, Craig A.; Sun, Wei-Mei; Walling, Priscilla M.; and Stiffe, Susan A., to Helene Curtis, Inc. Topically-effective compositions. 5,534,246, Cl. 424-66.000.
- Herbert, Dietmar: *See—*
  - Grassl, Johann; and Herbert, Dietmar, 5,533,703, Cl. 248-550.000.
- Herberts GmbH: *See—*
  - Feyrer, Wolfgang; and Schmon, Ewald, 5,533,674, Cl. 239-288.500.
- Hercules Incorporated: *See—*
  - Gupta, Rakesh K.; and Legare, Richard J., 5,534,340, Cl. 428-286.000.
- Hergemoeller, Rainer: *See—*
  - Wetzels, Walter; and Hergemoeller, Rainer, 5,533,376, Cl. 72-283.000.
- Heritage Environmental Services, Inc.: *See—*
  - Steward, Frederick A., 5,534,043, Cl. 71-32.000.
- Herman, James N.; and Hiltner, James E., to Owens-Illinois Plastic Products Inc. Plastic container made from a fusion blend of post consumer plastic and ethylene polymers. 5,534,317, Cl. 428-35.700.
- Her-Mou, Lin. Helmet with an air filtering device. 5,533,500, Cl. 128-201.250.
- Hernandez, Alejandro: *See—*
  - Safont, Vicente; Millan, Jose; Rebordosa, Antonio; and Hernandez, Alejandro, 5,533,801, Cl. 366-249.000.
- Herrmann, Manfred: *See—*
  - Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, 5,534,166, Cl. 8-557.000.
- Herrmann-Schoenherr, Otto: *See—*
  - Bennett, Cynthia; Brekner, Michael-Joachim; Herrmann-Schoenherr, Otto; and Osan, Frank, 5,534,606, Cl. 526-281.000.
- Herroon, Gregory P.: *See—*
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Hershberger, Troy W.: *See—*
  - Radke, John C.; Ryan, Gregory J.; and Hershberger, Troy W., 5,533,519, Cl. 128-777.000.

- Hertzler, Siegfried: *See—*
  - Gras, Jürgen; Hertzler, Siegfried; and Tjoa, Jan-Tian, 5,533,491, Cl. 123-676.000.
- Hettenbach, Hans: *See—*
  - Jörder, Kurt; Schäfer, Werner; and Hettenbach, Hans, 5,534,325, Cl. 428-102.000.
- Hewlett-Packard Company: *See—*
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  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
  - Glass, Stephen K., 5,535,307, Cl. 395-108.000.
  - Koch, Albert F., III; and Prater, David M., 5,533,510, Cl. 128-660.070.
  - Larvoire, Jean-François; Ribollet, Thierry; and Hays, Bertrand, 5,535,409, Cl. 395-800.000.
  - Lauw, Hiang P., 5,534,051, Cl. 106-22.00R.
  - Nobel, Gary M.; Wilson, Arthur K.; Brown, Patricia S.; and Arbeiter, Jason R., 5,533,904, Cl. 439-67.000.
  - Osborne, William S., 5,534,896, Cl. 347-29.000.
  - Resman, Mark F.; Egbert, William E.; and Mack, Dale A., 5,535,364, Cl. 395-478.000.
  - Trutna, William R., Jr.; and Williamson, James B., 5,534,702, Cl. 250-484.400.
  - Zimmerman, Gary, 5,535,311, Cl. 395-114.000.
- Hexacomb Corporation: *See—*
  - Komarek, Dale W.; Moser, Paul; and Wroblewski, George T., Sr., 5,533,956, Cl. 493-355.000.
- Hi-Shear Corporation: *See—*
  - Burdick, Robert A., 5,533,849, Cl. 411-120.000.
- Hibi, Masahiko: *See—*
  - Karin, Michael; Hibi, Masahiko; and Linn, Anning, 5,534,426, Cl. 435-194.000.
- Hichwa, Bryant P.: *See—*
  - Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,535,056, Cl. 359-603.000.
- Hickey, Mickey F.: *See—*
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Hida, Masaharu: *See—*
  - Aoki, Shigenori; Kamezaki, Hiroshi; Hida, Masaharu; and Yokouchi, Kishio, 5,534,331, Cl. 428-209.000.
- Hidaka, Keiki; and Suzuki, Yoichiro, to Mitsubishi Precision Co., Ltd. Apparatus for measuring physical quantity related to relative movement between two objects. 5,534,871, Cl. 342-113.000.
- Hideaki, Kashiwagi, to Fuji Xerox Co., Ltd. Parallel image processing system. 5,535,017, Cl. 358-444.000.
- Hieatt, William R., III, to Motorola, Inc. Method and apparatus for providing control channels and message channels in a radio communication system. 5,535,215, Cl. 370-95.100.
- Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, to Nikon Corporation. Camera. 5,534,965, Cl. 354-409.000.
- Higashiguchi, Masaharu: *See—*
  - Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, 5,534,370, Cl. 429-198.000.
- Higashii, Takayuki: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188, Cl. 252-299.610.
- Higashitani, Hiroshi: *See—*
  - Nakatsu, Etsuto; Higashitani, Hiroshi; and Ohta, Haruo, 5,535,244, Cl. 375-261.000.
- Higginbotham, Paul: *See—*
  - Clare, Stephen R.; Higginbotham, Paul; and Stuart, David M., 5,533,339, Cl. 62-654.000.
- Higgins, Lawrence J., to Emhart, Inc. Grommet fastener assembly for automobiles. 5,533,237, Cl. 24-289.000.
- High Yield Technology, Inc.: *See—*
  - Borden, Peter G.; Aqui, Derek G.; and Evanko, Matt A., 5,534,706, Cl. 250-574.000.
- Higham, Paul A.: *See—*
  - Bao, Qi-Bin; and Higham, Paul A., 5,534,028, Cl. 623-17.000.
- Highberger, Gary G.: *See—*
  - Bacon, Forrest C.; and Highberger, Gary G., 5,533,322, Cl. 53-451.000.
- Higuchi, Kazuyoshi: *See—*
  - Yada, Yukihiko; and Higuchi, Kazuyoshi, 5,534,316, Cl. 428-31.000.
- Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, to Fujitsu Limited; and Higuchi, Toshiro. Electrostatic actuator and method of controlling the same. 5,534,740, Cl. 310-309.000.
- Hijikata, Toshiyuki; and Tachibana, Tetsuo, to Fujitsu Limited. Frame length control in data transmission using ATM network. 5,535,221, Cl. 371-5.500.
- Hikita, Hiroshi; Kohriyama, Tetsuo; Nozawa, Yutaka; and Sugino, Yoshito, to Fuji Electric Co., Ltd. Resin impregnating method for fibrous substrate. 5,534,307, Cl. 427-421.000.
- Hildebrandt, Thomas H. Method for reusing temporaries and reclaiming shared memory. 5,535,390, Cl. 395-700.000.
- Hilger, Ronald O.: *See—*
  - Ford, Joseph E.; Hilger, Ronald O.; and Chan, Raymond, 5,535,089, Cl. 361-231.000.
- Hill, David T.: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., to Simon Fraser University. Method for directly depositing metal containing patterned films. 5,534,312, Cl. 427-533.000.
- Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, to American Sterilizer Company. Device and system for sterilizing objects. 5,534,221, Cl. 422-33.000.
- Hillis, W. Daniel, to Thinking Machines Corporation. Processor chip for parallel processing system. 5,535,408, Cl. 395-800.000.
- Hills, Graham W.: *See—*
  - Qian, Xue-Yu; Yin, Gerald; Hills, Graham W.; and Steger, Robert, 5,534,108, Cl. 156-643.100.
- Hilt, Gerard: *See—*
  - Agro, Marc; Auer, Wolfgang; Hilt, Gerard; Peters, Henning; and Rust, Sabine, 5,533,776, Cl. 296-97.900.
- Hilti Aktiengesellschaft: *See—*
  - Meier, Peter, 5,533,660, Cl. 227-147.000.
- Hiltner, James E.: *See—*
  - Herman, James N.; and Hiltner, James E., 5,534,317, Cl. 428-35.700.
- Hinch, Stephen W. Apparatus and method for determining extinction ratio of digital laser transmitters. 5,535,038, Cl. 359-180.000.
- Hing Fat Toys Manufacturer Limited: *See—*
  - Choi, Chung-Hing, 5,533,724, Cl. 273-73.00C.
- Hinz, Werner; Zschiesche, Ruth; Lutter, Heinz-Dieter; and Bruchmann, Bernd, to BASF Aktiengesellschaft. Process for the preparation of fluorochlorohydrocarbon-free low density polyurethane soft foams and soft elastic polyurethane molding foams and polyisocyanate mixtures modified with urethane groups and diphenylmethane-diisocyanate base. 5,534,185, Cl. 252-182.220.
- Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, to Sumitomo Wiring Systems, Ltd.; and Sumitomo Electric Industries, Ltd. Unit integrated system and connector. 5,533,905, Cl. 439-76.200.
- Hirabayashi, Hiromitsu: *See—*
  - Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, 5,534,898, Cl. 347-33.000.
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Hirabayashi, Izumi: *See—*
  - Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
- Hirabayashi, Shigeto; and Sugita, Shuichi, to Konica Corporation. Silver halide color photographic light-sensitive material. 5,534,400, Cl. 430-558.000.
- Hiragami, Kouji: *See—*
  - Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, 5,534,357, Cl. 428-629.000.
- Hirahata, Shigeru: *See—*
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
- Hirai, Tsuneo: *See—*
  - Hayakawa, Yuzo; Hirai, Tsuneo; and Katayama, Tsutao, 5,533,880, Cl. 425-328.000.
- Hiraishi, Kumiko: *See—*
  - Hasegawa, Hideo; Tateno, Kikuhei; Kuwata, Tamotsu; Yamamoto, Yoshiro; Hiraishi, Kumiko; Fujita, Osamu; and Narabayashi, Isamu, 5,534,240, Cl. 424-9.360.
- Hiraki, Mitsuru; Sasaki, Yasuhiko; Seki, Koichi; and Matsuura, Tatsuji, to Hitachi, Ltd. Sense amplifier, SRAM, and microprocessor. 5,534,800, Cl. 327-57.000.
- Hiramatsu, Osamu: *See—*
  - Takenaka, Kenji; Kayukawa, Hiroaki; Murao, Kazushige; and Hiramatsu, Osamu, 5,533,871, Cl. 417-269.000.
- Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, to Canon Kabushiki Kaisha. Ink jet recording medium discharging mechanism including resilently biased follower roller. 5,534,894, Cl. 346-134.000.
- Hirao, Yasuhiro: *See—*
  - Kobayashi, Yasumi; Takeuchi, Kousuke; Hirao, Yasuhiro; and Shibata, Kenichi, 5,534,829, Cl. 333-126.000.
- Hirasawa, Toshio: *See—*
  - Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, 5,535,127, Cl. 364-464.020.
- Hirata, Hiroaki; and Kimura, Kozo, to Matsushita Electric Industrial Co., Ltd. Cache block replacement scheme based on directory control bit set/reset and hit/miss basis in a multiheading multiprocessor environment. 5,535,361, Cl. 395-472.000.
- Hiroe, Nobutake: *See—*
  - Hama, Kenji; Hiroe, Nobutake; and Kuroda, Junko, 5,534,334, Cl. 428-224.000.
- Hirohama, Seiya: *See—*

  - Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, 5,534,233, Cl. 422-191.000.
- Hiroi, Kazuo, to Kabushiki Kaisha Toshiba. Method and apparatus for controlling a process having a control loop using feedback control. 5,535,117, Cl. 364-158.000.
- Hiromoto, Mitsuo: *See—*
  - Ueda, Hideo; Hiromoto, Mitsuo; Gang, Meng; and Yamasaki, Yutaka, 5,533,513, Cl. 128-719.000.
- Hirose, Fumiyasu: *See—*
  - Matsuoka, Hidetoshi; and Hirose, Fumiyasu, 5,535,387, Cl. 395-650.000.
- Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, to Showa Electric Wire & Cable Co., Ltd.; and General Director of National Research Institute for Metals. Method of producing Cu - Ag alloy based conductive material. 5,534,087, Cl. 148-554.000.
- Hiroyuki, Okabe: *See—*
  - Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, 5,534,513, Cl. 514-249.000.
- Hiruta, Yoichi: *See—*
  - Sasaki, Mamoru; Takubo, Chiaki; and Hiruta, Yoichi, 5,533,664, Cl. 228-180.100.
- Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, to Dowa Mining Co., Ltd. Ferromagnetic metal powder. 5,534,361, Cl. 428-694.0RE.
- Hitachi America, Inc.: *See—*
  - Baji, Toru; and Kiuchi, Atsushi, 5,535,417, Cl. 395-842.000.
- Hitachi Chemical Co., Ltd.: *See—*
  - Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
  - Takada, Kenzo; Tochikura, Akiko; and Yamaki, Mitsuo, 5,534,430, Cl. 435-240.200.
- Hitachi Construction Machinery Co., Ltd.: *See—*
  - Koiwa, Masaichi, 5,533,411, Cl. 73-598.000.
- Hitachi, Ltd.: *See—*
  - Hiraki, Mitsuru; Sasaki, Yasuhiko; Seki, Koichi; and Matsuura, Tatsuji, 5,534,800, Cl. 327-57.000.
  - Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
  - Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.
  - Kambara, Hideki; Anazawa, Takashi; Takahashi, Satoshi; and Murakami, Katsuhiko, 5,534,703, Cl. 250-458.100.
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
  - Konishi, Hiroo, 5,535,113, Cl. 363-35.000.
  - Kusayama, Yosio, 5,533,337, Cl. 60-656.000.
  - Masaki, Ryoso; Mutoh, Nobuyoshi; and Obara, Sanshiro, 5,534,764, Cl. 318-802.000.
  - Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
  - Ono, Koichi; Nejime, Yoshito; and Yamamoto, Etsuji, 5,534,864, Cl. 341-156.000.
  - Suzuki, Tomohiro; and Sakuta, Toshiyuki, 5,534,817, Cl. 327-545.000.
  - Takeda, Shigeru, 5,535,388, Cl. 395-650.000.
  - Watanabe, Takao; Nakagawa, Tetsuya; and Nakagome, Yoshinobu, 5,535,410, Cl. 395-800.000.
- Hitachi Maxell, Ltd.: *See—*
  - Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, 5,534,370, Cl. 429-198.000.
- Hitachi Metals, Ltd.: *See—*
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- Hitachi VLSI Engineering Corp.: *See—*
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- Hival Ltd.: *See—*
  - Nagaura, Toru, 5,534,369, Cl. 429-161.000.
- Hizli, Adem: *See—*
  - Fischinger, Claus-Dieter; Hizli, Adem; Rose, Wolfgang; and Waldmann, Heinrich, 5,533,704, Cl. 248-603.000.
- Hjelmstad, Jens F.: *See—*
  - Gjessing, Dag K.; and Hjelmstad, Jens F., 5,534,868, Cl. 342-26.000.
- HMT, Inc.: *See—*
  - Jolly, Ronald P., 5,533,640, Cl. 220-216.000.
- Ho, Huang C. Cleaning sweeper having an adhesive roller. 5,533,223, Cl. 15-104.002.
- Ho, Wen-Jei; Stember, Michael J.; and Vanderlinden, Steven L., to International Business Machines Corporation. Automatically-configuring memory subsystem. 5,535,368, Cl. 395-497.010.
- Hochberg, Julio: *See—*
  - De Faria-Correa, Marco A. M.; and Hochberg, Julio, 5,533,496, Cl. 128-898.000.
- Hochberger, Daniel. Fishing pole holder. 5,533,295, Cl. 43-21.200.
- Hocker, G. Benjamin; Holmen, James O.; and Johnson, Robert G., to Honeywell Inc. Thermal isolation microstructure. 5,534,111, Cl. 216-15.000.
- Hodan, John A.; and Ilg, Otto M., to BASF Corporation. Spin pack for spinning synthetic polymeric fibers. 5,533,883, Cl. 425-131.500.
- Hodorek, Robert A., to Zimmer, Inc. Method for providing a barrier to the advancement of wear debris in an orthopaedic implant assembly. 5,534,027, Cl. 623-16.000.
- Hodorek, Robert A., to Zimmer, Inc. Orthopaedic implant assembly. 5,534,032, Cl. 623-18.000.
- Hoebel, Peter: *See—*
  - Stehle, Heinz; and Hoebel, Peter, 5,533,423, Cl. 74-606.00R.
- Hoebener, Christian M.: *See—*
  - Skistimas, James A.; and Hoebener, Christian M., 5,533,285, Cl. 40-584.000.
- Hoechst: *See—*
  - Bildhauer, Michael; Kupfer, Rainer; Siebott, Günther; Mees, Bernhard; and Friedrich, Herbert, 5,534,604, Cl. 526-253.000.
- Hoechst AG: *See—*
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- Hoechst Aktiengesellschaft: *See—*
  - Bennett, Cynthia; Brekner, Michael-Joachim; Herrmann-Schoenherr, Otto; and Osan, Frank, 5,534,606, Cl. 526-281.000.
  - Platzer, Stephan J. W.; Nuernberger, Siegfried; and Maerz, Karin, 5,534,384, Cl. 430-260.000.
  - Profé, Hans J., 5,533,242, Cl. 28-107.000.
- Hoechst Marion Roussel, Inc.: *See—*
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- Hoechst Roussel Pharmaceuticals Inc.: *See—*
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,636, Cl. 548-228.000.
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,640, Cl. 549-80.000.
- Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
  - Kindl, Gerhard, 5,533,873, Cl. 417-295.000.
- Hoerrmann, Wilhelm. Drug containing fatty amino alcohols or derivatives thereof. 5,534,553, Cl. 514-669.000.
- Hoesch Federn GmbH: *See—*
  - Vondracek, Hans, 5,534,088, Cl. 148-580.000.
- Hoesly, David D., to Xerox Corporation. Holddown structures for recording medium having curl. 5,534,902, Cl. 347-104.000.
- Hoey, Timothy: *See—*
  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
- Hoffacker, Gerd; Kaiser, Hasso; Reissmueller, Klaus; and Wirth, Guenter, to Degussa Aktiengesellschaft. Cyanidic-alkaline baths for the galvanic deposition of copper-tin alloy coatings, uses thereof, and metallic bases coated with said copper-tin alloy coating. 5,534,129, Cl. 205-241.000.
- Hoffman, Peter, to I.D. Lite, Inc. Illuminated sign. 5,533,289, Cl. 40-544.000.
- Hoffmann, Dieter: *See—*
  - Clausmeyer, Horst; Hoffmann, Dieter; and Weber, Wolfgang, 5,533,770, Cl. 295-1.000.
- Hoffmann, Drew A.; and Bush, M. Elizabeth, to Ventritex, Inc. Lead having an integrated defibrillation/sensing electrode. 5,534,022, Cl. 607-122.000.
- Hoffmann, James A., to Eli Lilly and Company. Insulin formulation. 5,534,488, Cl. 514-3.000.
- Hoffmann-La Roche Inc.: *See—*
  - Scalone, Michelangelo; and Vogt, Peter, 5,534,635, Cl. 546-323.000.
- Hoffmann, Michael, to Borsig Kugelhahn GmbH. Pressure controlled apparatus for sealing shutoff devices located in pipelines. 5,533,738, Cl. 277-27.000.
- Hogan, Thomas C.; and Williams, Peter K., to 3COM Corporation. Port circuit for a token ring concentrator having phase lock loop timing recovery with additional circuitry to verify appropriate signals. 5,535,337, Cl. 395-200.190.
- Hohne, Hans J.: *See—*
  - Mista, Kresimir; and Hohne, Hans J., 5,533,366, Cl. 66-205.000.
- Holdaway, Charles R.; and Warner, Eric A., to IVAC Corporation. System for determining pumping mechanism position while limiting volume of fluid pumped. 5,534,691, Cl. 250-231.140.
- Holder, Joseph P.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- Holdredge, Terry K. Pneumatic wheel chair cushion for reducing ischemic injury. 5,533,217, Cl. 5-453.000.
- Hollenberg, Stanley M.: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Hollowell, J. Rhoads: *See—*
  - Hansen, Daniel J., Jr.; Gough, Michael L.; and Hollowell, J. Rhoads, 5,534,893, Cl. 345-179.000.
- Holmen, James O.: *See—*
  - Hocker, G. Benjamin; Holmen, James O.; and Johnson, Robert G., 5,534,111, Cl. 216-15.000.
- Holmes, Michael A.: *See—*

  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Holmes, Roy H.: *See*—
  - Baril, Albert M.; Holmes, Roy H.; and Critzer, Mark R., 5,535,053, Cl. 359-409.000.
- Holst, Mark R.; Martin, Richard J.; Stilger, John D.; and Yee, Samson C., to Thermatrix, Inc. Method and apparatus for control of fugitive VOC emissions. 5,533,890, Cl. 431-5.000.
- Holty, Anton G.; Wilson, Frederick J.; and Sozinho, Edward D. Support apparatus. 5,533,654, Cl. 224-155.000.
- Homelite, Inc.: *See*—
  - Garrison, Daniel A.; and Franke, Jeffrey S., 5,533,869, Cl. 417-234.000.
- Hon Hai Precision Industry Co., Ltd.: *See*—
  - Abe, Hiroshi, 5,533,906, Cl. 439-159.000.
- Honaker, Ronald D.: *See*—
  - Garthaffner, Martin T.; and Honaker, Ronald D., 5,533,610, Cl. 198-458.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See*—
  - Kawano, Shizuo; and Nagata, Tadaaki, 5,533,585, Cl. 180-190.000.
  - Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, 5,534,362, Cl. 429-32.000.
  - Takagi, Yosiaki; Takizawa, Jun; and Fukushima, Katsuaki, 5,534,081, Cl. 148-325.000.
  - Watanabe, Satoshi; and Nakayama, Hitoshi, 5,534,364, Cl. 429-61.000.
- Honda, Munenobu: *See*—
  - Fujikawa, Masaru; Tsuda, Kazunori; and Honda, Munenobu, 5,533,712, Cl. 254-362.000.
- Honda, Nobuaki: *See*—
  - Bonne, Ulrich; Honda, Nobuaki; Kubisiak, David; and Ohnstein, Thomas R., 5,533,393, Cl. 73-355.020.
- Honeywell Inc.: *See*—
  - Bonne, Ulrich; Honda, Nobuaki; Kubisiak, David; and Ohnstein, Thomas R., 5,533,393, Cl. 73-355.020.
  - Goettsche, Randy P., 5,535,297, Cl. 385-90.000.
  - Hocker, G. Benjamin; Holmen, James O.; and Johnson, Robert G., 5,534,111, Cl. 216-15.000.
- Hong, Gary, to United Microelectronics Corporation. Process for fabricating MOS LDD transistor with pocket implant. 5,534,447, Cl. 437-27.000.
- Hong, John. Adjustable cane for physical therapy. 5,533,536, Cl. 135-65.000.
- Hong, Seungok: *See*—
  - Marancik, William G.; Hong, Seungok; and Zhou, Rouyi, 5,534,219, Cl. 419-4.000.
- Hong, Young H.; Roh, Jae H.; and Woo, Sang M., to Lucky Metals Corporation. Method for the re-treatment of residue generated from the removal of fluorine dissolved in waste water. 5,534,160, Cl. 210-710.000.
- Honings, Kenneth C.: *See*—
  - Van Dam, Aaldert C.; and Honings, Kenneth C., 5,533,315, Cl. 53-53.000.
- Hood, Larry; and Mendez G., Antonio, to Refractec, Inc. Method and apparatus for modifications of visual acuity by thermal means. 5,533,999, Cl. 606-5.000.
- Hooper, Steven C.; and Skjonsby, Jon E., to Lamb-Grays Harbor Co. Method and apparatus for wrapping, crimping and heading paper rolls at a single station. 5,533,321, Cl. 53-415.000.
- Hori, Kiyótaka: *See*—
  - Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, 5,534,148, Cl. 210-605.000.
- Hori, Yozo: *See*—
  - Ohtani, Mitsuaki; Kato, Toshiyuki; and Hori, Yozo, 5,534,533, Cl. 514-372.000.
- Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, to Hitachi, Ltd. Power converter. 5,535,114, Cl. 363-58.000.
- Horiguchi, Takashi: *See*—
  - Sakamoto, Nobuyuki; Kobayashi, Takehiko; and Horiguchi, Takashi, 5,534,214, Cl. 264-333.000.
- Horii, Seiji, to Matsushita Electric Industrial Co., Ltd. Cell station and personal stations in a digital radio communication system. 5,535,205, Cl. 370-79.000.
- Horiie, Takafumi, to Sanyo Chemical Industries, Ltd. Polymer composite, its molded article and laminate. 5,534,590, Cl. 525-71.000.
- Hornbeck, Larry J., to Texas Instruments Incorporated. Active yoke hidden hinge digital micromirror device. 5,535,047, Cl. 359-295.000.
- Hornsby, Gary L., to Self Industries, Inc. Apparatus for compressing and positioning the sealing components of an open head drum. 5,533,316, Cl. 53-137.200.
- Horstmann, Jens; and Testa, James, to Sun Microsystems, Inc. Method and apparatus for the verification and testing of electrical circuits. 5,535,223, Cl. 371-27.000.
- Hoshi, Akio: *See*—
  - Kamioka, Noriaki; and Hoshi, Akio, 5,535,076, Cl. 360-106.000.
- Hoshino Gakki Co., Ltd.: *See*—
  - Hoshino, Yoshiki, 5,533,405, Cl. 73-760.000.
- Hoshino, Hisakiyo: *See*—
  - Okuda, Kouji; Nishi, Tokumitsu; Takai, Hiroshi; and Hoshino, Hisakiyo, 5,534,091, Cl. 156-89.000.
- Hoshino, Tadashi: *See*—
  - Aihara, Naoki; and Hoshino, Tadashi, 5,535,196, Cl. 370-60.000.
- Hoshino, Yoshiki, to Hoshino Gakki Co., Ltd. Sound comparison device for a drum. 5,533,405, Cl. 73-760.000.
- Hosotani, Shiro: *See*—
  - Imamura, Yukinaga; Yamanaka, Kazuya; Hosotani, Shiro; and Yazawa, Minobu, 5,535,170, Cl. 365-239.000.
- Hosseini, Javad; Cobo, Michael A.; Rytter, Noel J.; and Verheyen, Andrew G., to Caterpillar Inc. Method and apparatus for controlling differentially driven wheel-slip for an articulated machine. 5,535,124, Cl. 364-426.030.
- Houston, L. L.: *See*—
  - Huston, James S.; Houston, L. L.; Ring, David B.; and Oppermann, Hermann, 5,534,254, Cl. 424-135.100.
- Howard, Adriann J.: *See*—
  - Woodard, Daniel L.; and Howard, Adriann J., 5,534,054, Cl. 106-287.110.
- Howard, Lee J.; and Rowles, Howard C., to Air Products and Chemicals, Inc. Recovery of hydrocarbons from polyalkene product purge gas. 5,533,437, Cl. 95-42.000.
- Howie, John K.: *See*—
  - Corrigan, Patrick J.; and Howie, John K., 5,534,284, Cl. 426-531.000.
- Howmedica, Inc.: *See*—
  - Bao, Qi-Bin; and Higham, Paul A., 5,534,028, Cl. 623-17.000.
- Howse, Richard H.: *See*—
  - Freeman, John O.; Howse, Richard H.; and Reinhart, Tim, 5,533,346, Cl. 62-89.000.
- Hoyos, Marc; Robberechts, Marcel: and Essemaeker, Paul, to Interox International (Société anonyme). Process for preserving the mechanical strength properties of chemical paper pulps. 5,534,115, Cl. 162-65.000.
- Hozumi, Yuuji: *See*—
  - Miyoshi, Tetsuo; Hozumi, Yuuji; Yamagishi, Akira; and Koizumi, Kaoru, 5,534,695, Cl. 250-330.000.
- Hruska, Paul E.: *See*—
  - Tornquist, Gerald E.; and Hruska, Paul E., 5,533,863, Cl. 415-229.000.
- Hruza, David: *See*—
  - Sutter, Ralf; Beerstecher, Lutz; Hruza, David: Stetter-Alle, Raimund; and Trackl, Karl, 5,533,539, Cl. 134-95.200.
- HSC Research & Development Ltd.: *See*—
  - Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., 5,534,438, Cl. 435-320.100.
- Hsi-Huang LIN: *See*—
  - Chang, Fa-Sheng, 5,534,718, Cl. 257-98.000.
- Hsu, Chun-Hsiung: *See*—
  - Tseng, Liang-Chuan, 5,533,236, Cl. 24-67.500.
- Hsu, Tsung-Min: *See*—
  - Petersen, Robert V.; Hsu, Tsung-Min; Lee, Han-Chen; and Christy, Don. 5,534,260, Cl. 424-448.000.
- Hsu, Wen-Liang: *See*—
  - Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.: Henning, Steven K.; and Lucas, Danielle, 5,534,592, Cl. 525-236.000.
- Hua-Chu, Chung, to Taiwan Semiconductor Manufacturing Company. Shutter linkage for an ion implantation apparatus. 5,534.752, Cl. 315-111.810.
- Huang, Andy C.-P. Mobile lifter. 5,533,593, Cl. 182-141.000.
- Huang, Chih-Yuan; Su, Yan-Kuin; and Morris, James E., to National Science Council of R.O.C. Method for producing a semiconductor device using logic simulation approach to simulate a multi-peak resonant tunneling diode-based electronic circuit and a large signal multi-peak resonant tunneling diode spice model employed therefore. 5,535,146, Cl. 364-578.000.
- Huang, Chow-Chi: *See*—
  - Kohus, Louis M.; Henning, John C.; Huang, Chow-Chi; and Walter, Glen V., 5,533,466, Cl. 119-459.000.
- Huang, Jin H.: *See*—
  - Kuo, Po C.; Huang, Jin H.; and Chen, Shang C., 5,534,080, Cl. 148-121.000.
- Huang, Ming: *See*—
  - Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.
- Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., to Lubrizol Corporation, The. Organometallic complex-antioxidant combinations, and concentrates and diesel fuels containing same. 5,534,039, Cl. 44-367.000.
- Huang, Roger F.: *See*—
  - Chiang, Don-Kai; and Huang, Roger F., 5,535,021, Cl. 358-474.000.
- Huang, Tien-Tsai. Coupling device for coupling an indicator needle to an actuating unit in a pressure gauge. 5,533,414, Cl. 73-866.100.
- Hubbell Incorporated: *See*—
  - Williams, Howard M., Jr., 5,533,637, Cl. 220-3.800.
- Hubbs, John C.: *See*—
  - Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534.494, Cl. 514-16.000.
- Huber, Michael S.: *See*—
  - Landi, Curtis L.; Wilson, Susan L.; and Huber, Michael S., 5,534,343, Cl. 428-313.500.
- Huddleston, David A.; and Gabel, Robert K., to Nalco Chemical Company. Sulfonated and carboxylated aminoethylenephosphonic acid and aminobis (methylene) phosphinic acid. 5,534,611, Cl. 528-129.000.
- Hudson, Thomas H. Delimbing apparatus having selective closable guide arms. 5,533,555, Cl. 144-24.130.
- Hueneke, Manfred H. K.: *See*—
  - Cross, David M.; Hueneke, Manfred H. K.; Farris, Ronald A.; McConnell, Bobby L.; and Newman, Robert M., 5,534,298, Cl. 427-358.000.
- Huey, Andrew M.: *See*—

  - Bacardi, Jean M.; Camerer, Robert L.; Huey, Andrew M.; and Shirley, Arthur R., Jr., 5,534,349, Cl. 428-403.000.
- Huey, Henry E.: *See*—
  - Mayhew, Gregory L.; and Huey, Henry E., 5,535,225, Cl. 371-37.100.
- Hufendiek, Ernst-Wilhelm; Kerschbaum, Walter; and Werner, Johannes, to Mercedes-Benz AG. Lubricating-oil device for an internal combustion engine. 5,533,474, Cl. 123-196.0AB.
- Hughes Aircraft Company: *See*—
  - Alves, James F.; Cacnio, Gerry R.; and Stevens, David R., 5,535,314, Cl. 395-131.000.
  - Baron, Peter C., 5,534,949, Cl. 348-742.000.
  - Deavenport, Joe E.; and Naive, Joel A., 5,534,755, Cl. 315-307.000.
  - Devenyi, Gabor, 5,533,417, Cl. 74-424.80R.
  - La Fiandra, Carlo; and Shen, Gon-Yen, 5,535,043, Cl. 359-224.000.
  - Mayhew, Gregory L.; and Huey, Henry E., 5,535,225, Cl. 371-37.100.
  - McGlynn, Charles L.; and Shu, Ker L., 5,534,700, Cl. 250-353.000.
  - Troup-Packman, Sue, 5,534,358, Cl. 428-648.000.
  - Young, Frederick A.; Hendrick, Louis W.; and Loi, Keith N., 5,534,881, Cl. 343-776.000.
- Hughes Electronics: *See*—
  - Ball, Gary E.; and Eby, Edward D., 5,534,694, Cl. 250-330.000.
  - Jangi, Shrirang; and Chen, Jie, 5,535,271, Cl. 379-351.000.
- Hughes Electronics Corp.: *See*—
  - Jackson, Tom; Eck, Henry; and Lowe, Ray, 5,535,441, Cl. 455-182.200.
- Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, to Modine Manufacturing Co. Method of making an evaporator or evaporator/condenser. 5,533,259, Cl. 29-890.043.
- Hughes, Timothy C., to Exabyte Corporation. Helical scan method and apparatus for adjusting media speed to read non-native formats. 5,535,068, Cl. 360-73.040.
- Hughes Training, Inc.: *See*—
  - Hegg, Ronald G., 5,535,025, Cl. 359-40.000.
- Huignard, Jean-Pierre: *See*—
  - Ayral, Jean-Luc; Tournois, Pascal; and Huignard, Jean-Pierre, 5,535,041, Cl. 359-211.000.
- Huijgen, Hendrik: *See*—
  - De Haan, Gerard; Biezen, Paul W. A. C.; Ojo, Ólukayode A.; and Huijgen, Hendrik, 5,534,946, Cl. 348-619.000.
- Hull, Thomas H.: *See*—
  - Amri, Adel; and Hull, Thomas H., 5,535,199, Cl. 370-60.000.
- Hulse, David K.; and Barnett, William C., to Royal Doulton (UK) Limited. Article handling apparatus. 5,533,607, Cl. 198-448.000.
- Hulse, David K., to Royal Doulton (UK) Limited. Foot wiping apparatus for ceramic ware. 5,533,609, Cl. 198-415.000.
- Hultdin Invest AB: *See*—
  - Örnberg, Rolf, 5,533,432, Cl. 83-819.000.
- Humbert, Robert D.; Saldanha, Leila; and Kepplinger, John, to Kellogg Company. Foodstuffs containing a cereal ingredient and ferric EDTA. 5,534,275, Cl. 426-74.000.
- Hunt, Donald J.: *See*—
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Hunt, Guerney D. H.: *See*—
  - Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., 5,535,375, Cl. 391-500.000.
- Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., to Whitaker Corporation, The. Electrical connector with contact alignment member. 5,533,901, Cl. 439-79.000.
- Hunter-Rinderle, Stephen J.: *See*—
  - Dixon, Cloyd, Jr.; and Hunter-Rinderle, Stephen J., 5,534,243, Cl. 424-49.000.
- Hur, Ki R., to Goldstar Electron Co., Ltd. Resin molded charge coupled device package and method for preparation thereof. 5,534,725, Cl. 257-434.000.
- Hurford, Jonathan P.: *See*—
  - Karlow, James P.; Kumkoski, James M.; Boumarafi, Mohamed; and Hurford, Jonathan P., 5,533,750, Cl. 280-730.200.
- Husk, Richard W. Washer game. 5,533,734, Cl. 273-402.000.
- Husky Injection Molding Systems Ltd.: *See*—
  - Gessner, Dieter; and Osterode, Martin, 5,533,882, Cl. 425-564.000.
- Hüsler, Rinaldo: *See*—
  - Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,534,629, Cl. 544-78.000.
- Hussey, Brett: *See*—
  - Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.
- Huston, James S.; Houston, L. L.; Ring, David B.; and Oppermann, Hermann, to Chiron Corporation; and Creative BioMolecules, Inc. Biosynthetic binding proteins for immuno-targeting. 5,534,254, Cl. 424-135.100.
- Huston, Larry L.: *See*—
  - Trokhan, Paul D.; Van Phan, Dean; and Huston, Larry L., 5,534,326, Cl. 428-131.000.
- Huszár, Csaba: *See*—
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Hutchinson, David F.: *See*—
  - Eddy, John W.; Hutchinson, David F.; and Needham, Kelly S., Sr., 5,533,651, Cl. 222-185.100.
- Huynh, Bachvan; and Masenas, Charles J., Jr., to International Business Machines Corporation. Current transition rate control circuit. 5,534,790, Cl. 326-27.000.
- Hwang, B. Chester; Fernandez, Jose M.; Meadows, Vernon; Thomas, Simon; and Amero, Willard F., Jr., to Motorola, Inc. Modular battery pack. 5,534,366, Cl. 429-91.000.
- Hwang, Chyh-Wen. Hand-muscle developer with music producing means. 5,533,949, Cl. 482-47.000.
- Hwang, Myoungchun, to Samsung Electronics Co., Ltd. Frequency modulation system having control of a carrier frequency. 5,534,943, Cl. 348-724.000.
- Hwang, Yun-Ic, to Samsung Electronics Co., Ltd. Microwave oven with electric heater adjustable to different positions. 5,534,681, Cl. 219-685.000.
- Hydra Tools International PLC: *See*—
  - Reynolds, Paul A., 5,533,840, Cl. 407-41.000.
- Hydro-Quebec: *See*—
  - Shama, Elie W.; Legrand, Bertrand; and Kluyskens, Dominique, 5,533,340, Cl. 62-45.100.
- Hydronic Components, Inc.: *See*—
  - Sherman, John C., 5,533,549, Cl. 137-557.000.
- Hyppänen, Timo, to A. Ahlstrom Corporation. fluidized bed reactor and method of operation thereof. 5,533,471, Cl. 122-4.00D.
- Hyundai Electronics Industries Co., Ltd.: *See*—
  - Kim, Jae K., 5,534,450, Cl. 437-34.000.
- Hyundai Motor Co., Ltd.: *See*—
  - Chung, Bum-Goo; and Kim, Myung-Ho, 5,534,083, Cl. 148-218.000.
- I.D. Lite, Inc.: *See*—
  - Hoffman, Peter, 5,533,289, Cl. 40-544.000.
- Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, to International Business Machines Corporation. Error detection in seismic data. 5,535,286, Cl. 382-109.000.
- IBM Corporation: *See*—
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- IC Sensors, Inc.: *See*—
  - Jerman, John H.; Toth, Ronald E.; Winchell, David A.; and Pennington, David W., 5,533,412, Cl. 73-861.950.
- Ichihara, Masamitsu: *See*—
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Ichihashi, Takao: *See*—
  - Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,534,977, Cl. 355-208.000.
- Ichikawa, Yataro: *See*—
  - Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, 5,534,255, Cl. 424-141.100.
- Ichiki, Shiro; and Ryan, Thomas B., to Zexel Torsen Inc. Differential with outwardly directed planetary gear separating forces. 5,533,944, Cl. 475-252.000.
- Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, to Toyota Jidosha Kabushiki Kaisha; and Aisin Aw Co., Ltd. Planetary gear device including planetary gears each having integrally formed large and small pinions. 5,533,943, Cl. 475-198.000.
- ICO, Inc.: *See*—
  - Lam, Clive C.; Curtis, William W., Jr.; and Grubbs, Roy C., 5,534,775, Cl. 324-216.000.
- Ide, Fumito, to Kabushiki Kaisha Toshiba. Image forming apparatus. 5,534,979, Cl. 355-208.000.
- Idemitsu Petrochemical Co., Ltd.: *See*—
  - Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, 5,534,327, Cl. 428-151.000.
- Ifland, Dwight D.: *See*—
  - Newman, Perran V. L.; Zeller, Niel P.; and Ifland, Dwight D., 5,533,959, Cl. 600-28.000.
- Igarashi, Masato: *See*—
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Igari, Yasutaka; Yamamoto, Kazumichi; Okamoto, Kayoko; and Yamagata, Yutaka, to Takeda Chemical Industries, Ltd. Method of producing sustained-release preparation. 5,534,269, Cl. 424-489.000.
- Ignasiak, Teresa, to Envirotech Consulting Inc. Method for clean-up of soils or refuse materials contaminated with highly viscous coal or petroleum derived tars/oils. 5,534,158, Cl. 210-703.000.

- Ihara Chemical Industry Co., Ltd.: *See—*
  - Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
- Ihara, Tatsuya: *See—*
  - Ushikubo, Takashi; Oshima, Kazunori; Ihara, Tatsuya; and Amatsu, Hiroyuki, 5,534,650, Cl. 558-319.000.
- Iida, Yoshikazu: *See—*
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
- Iitsuka, Hiroyuki: *See—*
  - Kawakami, Yasunori; Iitsuka, Hiroyuki; Nishimura, Takuya; Hamai, Shinji; and Sahara, Yasuyuki, 5,535,208, Cl. 370-84.000.
- Iiyama, Katsuhiko; and Nishizawa, Takaaki, to Koito Manufacturing Co., Ltd. Vehicular headlamp having improved cover member. 5,535,103, Cl. 362-66.000.
- Iiyama, Michitomo: *See—*
  - Nakamura, Takao; and Iiyama, Michitomo, 5,534,491, Cl. 505-500.000.
- Ikado, Masaharu: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Ikeda, Keiichi; and Mizoguchi, Yoshiyuki, to Canon Kabushiki Kaisha. Thermal recording method and recording apparatus using the same. 5,533,816, Cl. 400-120.070.
- Ikeda, Masahiro, to Jidosha Kiki Co., Ltd. Muffler for booster. 5,534,670, Cl. 181-230.000.
- Ikeda, Yoshitaka: *See—*
  - Terawaki, Fumikazu; Ikeda, Yoshitaka; and Makihata, Yuuki, 5,534,705, Cl. 250-559.290.
- Ikei, Kazunori: *See—*
  - Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
- Ilg, Otto M.: *See—*
  - Hodan, John A.; and Ilg, Otto M., 5,533,883, Cl. 425-131.500.
- Illinois Tool Works Inc.: *See—*
  - Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., 5,533,379, Cl. 72-316.000.
  - Gierut, Joseph J.; Suvada Rutkowski, Julie; and Dam, Robert, 5,534,671, Cl. 200-52.00R.
- Imabayashi, Satoshi: *See—*
  - Kokawa, Katsuzo; Yamamoto, Katsuhiko; Sakurabu, Tatsuki; Imabayashi, Satoshi; and Tao, Muneo, 5,533,669, Cl. 237-1.0SL.
- Imai, Akira: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Imai, Eiichi: *See—*
  - Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
- Imai, Hideki: *See—*
  - Kobayashi, Yasunori; Tanabe, Shin; Fukuda, Tatsuo; Miyazawa, Masazumi; Imai, Hideki; and Wani, Moriyuki, 5,533,413, Cl. 73-865.900.
- Imai, Hitoshi: *See—*
  - Niimi, Tomio, 5,535,175, Cl. 366-336.000.
- Imai, Tomoyasu; and Mukai, Ryohei, to Toyoda Koki Kabushiki Kaisha. Method and machine for grinding a workpiece. 5,533,931, Cl. 451-11.000.
- Imamura, Naoya: *See—*
  - Takahashi, Yonosuke; Imamura, Naoya; Nakamura, Hideyuki; and Kawabata, Kouya, 5,534,383, Cl. 430-201.000.
- Imamura, Youichi: *See—*
  - Kuroda, Kouichi; Imamura, Youichi; Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,533,370, Cl. 72-12.500.
- Imamura, Yukinaga; Yamanaka, Kazuya; Hosotani, Shiro; and Yazawa, Minobu, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Co., Ltd. Sequential access memory that can have circuit area reduced. 5,535,170, Cl. 365-239.000.
- Iman, Craig D.; and Tomilson, Robert E., to Calgon Corporation. Polyether polyamino methylene phosphonates for high pH scale control. 5,534,157, Cl. 210-700.000.
- Imanishi, Kazuo: *See—*
  - Ishihara, Tsuyoshi; Sakuragi, Hideyori; Imanishi, Kazuo; and Ishikawa, Haruhiko, 5,533,850, Cl. 411-171.000.
- Immordino, Salvatore C., Jr., to United States Gypsum Co. Machinable plaster. 5,534,059, Cl. 106-778.000.
- Imperial Chemical Industries PLC: *See—*
  - Roulstone, Brian J.; and Waters, Julian A., 5,534,585, Cl. 524-497.000.
- Imran, Mir A., to Cardiac Pathways Corporation. Steerable catheter with adjustable bend location and method. 5,533,967, Cl. 604-95.000.
- Inada, Yoshihiro; Yamashita, Shinji; and Nishimoto, Miki, to Mitsubishi Electric Semiconductor Software Corporation; and Mitsubishi Denki Kabushiki Kaisha. Sampling circuit, phase reference detecting circuit and sampling clock shifting circuit. 5,534,807, Cl. 327-234.000.
- Inamori, Masahito: *See—*
  - Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
- Incorvia, Michael J.; and Fischer, Stephen A., to Henkel Corporation. Composition and method for treating substrates to reduce electrostatic charge and resultant article. 5,534,192, Cl. 252-500.000.
- Industrial Technology Research Institute: *See—*
  - Chen, Chin-Fu; Lu, Wen-Hwa; and Chueh, Shan-Chang, 5,533,375, Cl. 72-254.000.
  - Gau, Tien-Ho; and Peng, Yu-Yin, 5,533,483, Cl. 123-308.000.
  - Tseng, Horng-Huei; and Lu, Chih-Yuan, 5,534,457, Cl. 437-52.000.
- Inernational Business Machines Corporation: *See—*
  - Stanasolovich, David; Syverson, William A.; and Warren, Ronald A., 5,533,540, Cl. 134-155.000.
- Inguaggiato, Bruno, to Sorin Biomedica, S.p.A. Activity sensor, particularly for heart pacemakers. 5,533,520, Cl. 128-782.000.
- Inokuchi, Hiroo: *See—*
  - Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
- Inokuchi, Takao: *See—*
  - Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, 5,534,327, Cl. 428-151.000.
- Inomata, Koichiro: *See—*
  - Okuno, Shiho; Hashimoto, Susumu; Yusu, Keiichiro; and Inomata, Koichiro, 5,534,355, Cl. 428-611.000.
- Inoue, Akira, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 5,534,727, Cl. 257-659.000.
- Inoue, Hiroyuki, to Fujitsu Limited. Recording apparatus having a transfer drum shifting device. 5,534,984, Cl. 355-271.000.
- Inoue, Kiyoshi: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Inoue, Kouji: *See—*
  - Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, 5,534,291, Cl. 427-221.000.
- Inoue, Masahiro: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Inoue, Naoto; and Yamaguchi, Kiyotaka, to Mitsumi Electric Co., Ltd. Magnetic head connecting structure having temporarily retaining pawls. 5,535,080, Cl. 360-129.000.
- Inoue, Seiya: *See—*
  - Aoki, Katsuhiko; Tsuchiya, Makio; and Inoue, Seiya, 5,535,430, Cl. 455-54.100.
- Inoue, Takuji: *See—*
  - Saito, Tsunenari; Kenmotsu, Shiro; and Inoue, Takuji, 5,534,096, Cl. 156-212.000.
- Insero, Mark A.: *See—*
  - Jacobs, Michael A.; and Insero, Mark A., 5,535,147, Cl. 364-705.070.
- Insite Peripherals, Inc.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Institut Francais du Petrole: *See—*
  - Travers, Christine; Courty, Philippe; and Sarrazin, Patrick, 5,534,658, Cl. 585-738.000.
- Institut Pasteur: *See—*
  - Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,534,439, Cl. 435-320.100.
- Instituto Mexicano Del Petroleo: *See—*
  - Miramontes Cardenas, Luis E.; Castillo Cervantes, Salavador; and Moran Pineda, Florencia M., 5,534,475, Cl. 502-304.000.
- Intel Corporation: *See—*
  - Bell, D. Michael; Gonzales, Mark A.; and Meredith, Susan S., 5,535,340, Cl. 395-292.000.
  - Durante, Richard J.; and Underwood, Keith F., 5,535,397, Cl. 395-740.000.
  - Fisch, Matthew A.; Brayton, James M.; and Malhotra, Ajay, 5,535,345, Cl. 395-309.000.
  - Grochowski, Edward; Zaidi, Ahmad; and Lan, James, 5,535,347, Cl. 395-375.000.
  - Kardach, James; Cho, Sung S.; Peterson, Nicholas B.; and Lane, Thomas R., 5,535,420, Cl. 395-868.000.
  - Keith, Michael, 5,535,138, Cl. 364-514.00R.
  - Massie, Harold L., 5,534,771, Cl. 323-285.000.
  - Moore, Alan; and Themins, Patrick A., 5,534,774, Cl. 324-158.100.
  - Nelson, Daryl J.; Tirumala, Muralidhar; Butler, Peter; and Budelman, Gerald A., 5,535,094, Cl. 361-697.000.
  - Prince, Paul E., 5,535,363, Cl. 395-474.000.
  - Raman, Rajesh; Tan, Chin S.; and Chang, Yung M., 5,535,370, Cl. 395-500.000.
  - Shah, Nilesh; and Prasad, Rajeev, 5,535,341, Cl. 395-306.000.
  - Smith, Ralph S.; and Kruegeer, William J., 5,535,336, Cl. 395-200.060.
  - Verseput, Jerry, 5,535,343, Cl. 395-308.000.
  - Wells, Steven; Hasbun, Robert N.; Domonkos, Sara; and Barbarich, Steven S., 5,535,369, Cl. 395-497.020.
- Intelpro Corporation: *See—*

  - Moretz, Herbert L.; and Brier, Daniel L., 5,533,212, Cl. 2-409.000.
- Intenational Business Machines Corporation: *See—*
  - Melas, Constantin M.; Rugar, Daniel; Sutardja, Pantas; and Wood, Roger W., 5,535,187, Cl. 369-59.000.
- InterBold: *See—*
  - Graef, Harry T.; and Harty, Michael J., 5,534,682, Cl. 235-379.000.
- InterDigital Technology Corporation: *See—*
  - Schilling, Donald L.; Garodnick, Joseph; Lomp, Gary; and Moore, Timothy F., III, 5,535,238, Cl. 375-200.000.
- Intergraph Corporation: *See—*
  - Edwards, Stephen W., 5,534,796, Cl. 326-93.000.
- Intermarine S.p.A.: *See—*
  - Marchetti, Giorgio; and Guzzo, Giovanni, 5,533,463, Cl. 114-357.000.
- International Business Machines Corporation: *See—*
  - Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Temullo, Luigi, Jr., 5,535,164, Cl. 365-201.000.
  - Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., 5,535,333, Cl. 395-200.030.
  - Barringer, Wayne A.; Decusatis, Casimer M.; and Stigliani, Daniel J., Jr., 5,535,139, Cl. 364-550.000.
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
  - Baskey, Michael E.; Mastrangelo, Colette A.; and Mayer, Paul M., 5,535,326, Cl. 395-182.020.
  - Bates, Cary L.; Ryan, Jeffrey M.; and Watts, Byron T., 5,534,887, Cl. 345-120.000.
  - Beach, David B., 5,534,079, Cl. 148-33.000.
  - Beeteson, John; and Knox, Andrew, 5,534,756, Cl. 315-370.000.
  - Benhase, Michael T.; Burton, David A.; McCauley, John N., Jr.; and Morton, Robert L., 5,535,372, Cl. 395-500.000.
  - Bergkvist, John J., Jr.; Carmon, Donald E.; and Vanover, Michael T., 5,535,380, Cl. 395-550.000.
  - Bradshaw, Richard L., 5,534,345, Cl. 428-323.000.
  - Brezoczky, Blasius; and Seki, Hajime, 5,535,073, Cl. 360-105.000.
  - Brigida, David J.; Moore, Victor S.; and Pate, Thomas K., 5,535,242, Cl. 375-222.000.
  - Burge, Benjamin D., 5,535,414, Cl. 395-827.000.
  - Burke, Michael G.; Carini, Paul R.; and Choi, Jong-Deok, 5,535,394, Cl. 395-700.000.
  - Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,533,256, Cl. 29-840.000.
  - Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., 5,534,812, Cl. 327-333.000.
  - Cattell, Kevin T.; Cromer, William R.; Lin, Shihta; Neuchterlein, Bruce E.; and Potok, Thomas E., 5,535,325, Cl. 395-161.000.
  - Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
  - Cheung, Yiu M.; Ng, Kenneth K. W.; and Strong, Hovey R., Jr., 5,535,217, Cl. 370-100.100.
  - Chiang, Alice; McBride, Kevin M.; and Yee, Calvin C., 5,535,422, Cl. 395-155.000.
  - Cohn, John M.; and Heng, Fook-Luen, 5,535,134, Cl. 364-491.000.
  - Correale, Anthony, Jr.; and Hendrickson, Gary T., 5,534,803, Cl. 327-108.000.
  - Cox, David E.; Gottschalk, Karl D.; Lawton, Craig M.; Linton, John F.; and Whitfield, John P., 5,535,335, Cl. 395-200.110.
  - Dang, Chi H.; and Dang, Chi T., 5,535,188, Cl. 369-84.000.
  - DeBrosse, John K.; Lary, Jenifer E.; and Sprogis, Edmund J., 5,534,732, Cl. 257-776.000.
  - DeFoster, Steven M.; Truestedt, Horst L.; and Thatcher, Raymond J., 5,535,035, Cl. 359-161.000.
  - Drake, Charles E.; Fifield, John A.; Wheeler, Richard D.; and Wolford, Barry J., 5,535,226, Cl. 371-40.100.
  - Edgar, Albert D., 5,534,945, Cl. 348-615.000.
  - Elder, David B.; Krosner, Stephen P.; Miller, Paul E.; and Skinner, Harold R., 5,535,389, Cl. 395-700.000.
  - Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., 5,535,375, Cl. 391-500.000.
  - Feeney, James W.; and Wilhelm, George W., Jr., 5,535,416, Cl. 395-834.000.
  - Gambino, Richard J.; McElfresh, Michael W.; McGuire, Thomas R.; and Plaskett, Thomas S., 5,534,360, Cl. 428-694.0ML.
  - Harris, Richard H.; Kinney, Michael J.; and Vorhees, Kevin H., 5,533,817, Cl. 400-124.280.
  - Hathaway, David J., 5,535,145, Cl. 364-578.000.
  - Hecht, Matthew S., 5,535,322, Cl. 395-155.000.
  - Ho, Wen-Jei; Stember, Michael J.; and Vanderlinden, Steven L., 5,535,368, Cl. 395-497.010.
  - Huynh, Bachvan; and Masenas, Charles J., Jr., 5,534,790, Cl. 326-27.000.
  - Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, 5,535,286, Cl. 382-109.000.
  - Ismail, Khaled E.; and Stern, Frank, 5,534,713, Cl. 257-24.000.
  - Iwano, Kazuo; Misono, Shinji; and Tezuka, Shu, 5,533,841, Cl. 408-1.00R.
  - Li, Shih-Gong; and Chang, David Y., 5,535,403, Cl. 395-800.000.
  - Lubahn, Ken E.; and Melville, Jim A., 5,535,100, Cl. 361-801.000.
  - Massaro, Timothy J.; and Schmidt, Dennis J., 5,535,321, Cl. 395-155.000.
  - Noguchi, Hiroyuki; Usui, Hideyuki; and Yonemochi, Kenshin, 5,535,093, Cl. 361-686.000.
  - O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, 5,534,066, Cl. 118-663.000.
  - Olnowich, Howard T., 5,535,373, Cl. 395-500.000.
  - Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, 5,535,213, Cl. 370-85.150.
  - Pascoe, Robert A.; and Ehnebuske, David L., 5,535,319, Cl. 395-148.000.
  - Patel, Rajesh S.; and Economikos, Laertis, 5,534,371, Cl. 430-5.000.
  - Peacock, James L.; and Otis, Bruce P., 5,534,662, Cl. 174-35.0GC.
  - Perfecto, Eric D.; Prasad, Chandrika; White, George E.; and Wong, Kwong H., 5,534,466, Cl. 437-208.000.
  - Rawson, Freeman L., III; and Sotomayor, Guy G., Jr., 5,535,401, Cl. 395-750.000.
  - Rooke, Matthew W., 5,535,067, Cl. 360-51.000.
  - Sakurai, Keizoh, 5,533,398, Cl. 73-573.000.
  - Scalia, Lorenzo; and Sewing, Barry D., 5,533,889, Cl. 425-315.000.
  - Trubey, Bradley S.; and Walker, Anthony D., 5,535,192, Cl. 370-16.100.
- International Computers Limited: *See—*
  - Speed, Paul F.; and Taylor, Richard N., 5,535,411, Cl. 395-800.000.
- International Hardcoat, Inc.: *See—*
  - Stadler, David M.; and Pernick, Jeffrey R., 5,534,126, Cl. 205-101.000.
- International Medication Systems, Limited: *See—*
  - Maier, Gunther L., 5,533,993, Cl. 604-411.000.
- International Superconductivity Technology Center: *See—*
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
  - Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
  - Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, 5,534,715, Cl. 257-33.000.
- International Technidyne Corporation: *See—*
  - Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.
- Interox International (Société anonyme): *See—*
  - Hoyos, Marc; Robberechts, Marcel; and Essemaeker, Paul, 5,534,115, Cl. 162-65.000.
- Intra Corporation: *See—*
  - Pierce, James H.; and Sayig, Robert J., II, 5,533,384, Cl. 73-47.000.
- Invisible Fence Company, Inc.: *See—*
  - Touchton, Scott F.; Peinetti, Donald L.; and Duffy, William J., Jr., 5,533,469, Cl. 119-721.000.
- Iowa State University Research Foundation, Inc.: *See—*
  - Fehr, Walter R.; and Hammond, Earl G., 5,534,425, Cl. 435-172.100.
- IPC Information Systems, Inc.: *See—*
  - Cotton, John M., 5,535,197, Cl. 370-60.000.
- Iritecna Societa per l'Impiantistica Industriale e l'Assetto del Territorio P.A.: *See—*
  - Barelli, Alfredo; and DePlano, Stefano, 5,533,893, Cl. 432-122.000.
  - Deplano, Stefano; Melis, Eugenio; and Millone, Roberto, 5,533,716, Cl. 266-114.000.
- Irro, Otmar; and Naeser, Helmut, to Siemens Nixdorf Informationssysteme Aktiengesellschaft. Replaceable separating agent metering device for a fuser roller. 5,534,986, Cl. 355-284.000.
- Isawa, Kazuyuki: *See—*
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
- Ishibashi, Kouichi: *See—*
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
- Ishida, Eiji, to Fuji Xerox Co., Ltd. Shared-data alteration status management apparatus. 5,535,332, Cl. 395-200.010.
- Ishida, Hisashi, to NEC Corporation. Multi-layer wiring board having a base block and a stacking block connected by an adhesive layer. 5,534,666, Cl. 174-260.000.
- Ishida, Masayuki: *See—*
  - Kawai, Kiyoyuki; Kimata, Yoshihide; and Ishida, Masayuki, 5,534,935, Cl. 348-448.000.
- Ishida, Tatsuaki: *See—*
  - Sugita, Ryuji; Tohma, Kiyokazu; Ishida, Tatsuaki; and Ban, Yasuaki, 5,534,324, Cl. 428-694.00T.
- Ishida, Yasuo; Ohta, Kazunari; and Yoshikawa, Harutoshi, to Takeda Chemical Industries, Ltd. Herbicidal imidazo[1,2-a]pyridin-3-ylsulfonylurea. 5,534,482, Cl. 504-215.000.
- Ishida, Yasushi: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Ishigami, Masahiro: *See—*
  - Yoshida, Ikio; and Ishigami, Masahiro, 5,535,436, Cl. 455-89.000.
- Ishiguro, Yukio; Sonoda, Youji; Okamoto, Kenji; Okamoto, Takamitsu; and Sakamoto, Hideki, to Kagome Kabushiki Kaisha; and Sonoda, Youji. Indene derivatives and antimicrobial agents containing same. 5,534,546, Cl. 514-681.000.
- Ishihara, Masamichi: *See—*

  Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.
Ishihara, Sadao: *See—*
  Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
Ishihara, Tsuyoshi; Sakuragi, Hideyori; Imanishi, Kazuo; and Ishikawa, Haruhiko, to Nissan Motor Co., Ltd.; Sannohashi Corporation; and Yorozu Corporation. Welding nut. 5,533,850, Cl. 411-171.000.
Ishii, Hiroshi: *See—*
  Takaki, Kouichi; Azumai, Mitsuo; and Ishii, Hiroshi, 5,534,808, Cl. 327-261.000.
Ishii, Kazuhiko: *See—*
  Abe, Tetsuya; Ishii, Kazuhiko; and Yokoshima, Minoru, 5,534,557, Cl. 522-15.000.
Ishii, Kiyoshi; and Ishikawa, Mizuho, to Kabushiki Kaisha Mold Gijutsu Kenkyusho; and Minebea Co., Ltd. Method for fabricating a lead screw made of synthetic resin material and having a core tube therein. 5,533,247, Cl. 29-527.400.
Ishii, Masanori, to Toko, Inc. Synchronous rectifying circuit. 5,534,769, Cl. 323-283.000.
Ishii, Satoshi: *See—*
  Kondo, Hiroshi; Ishizuka, Kou; Ishii, Satoshi; and Kaneda, Yasushi, 5,534,693, Cl. 250-237.00G.
Ishii, Yutaka: *See—*
  Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
Ishikawa, Haruhiko: *See—*
  Ishihara, Tsuyoshi; Sakuragi, Hideyori; Imanishi, Kazuo; and Ishikawa, Haruhiko, 5,533,850, Cl. 411-171.000.
Ishikawa, Hiroyuki: *See—*
  Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,534,045, Cl. 75-243.000.
Ishikawa, Mizuho: *See—*
  Ishii, Kiyoshi; and Ishikawa, Mizuho, 5,533,247, Cl. 29-527.400.
Ishikawa, Takatoshi; Ueda, Shinji; Sasaki, Hirotomo; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials. 5,534,394, Cl. 430-393.000.
Ishikawa, Yutaka; and Yoshida, Shinichi, to Sharp Kabushiki Kaisha. System including plurality of data driven processors connected to each other. 5,535,413, Cl. 395-800.000.
Ishizawa, Yoshiyuki, to Kabushiki Kaisha Toshiba. Disc recording/reproducing system. 5,535,186, Cl. 369-48.000.
Ishizuka, Kou: *See—*
  Kondo, Hiroshi; Ishizuka, Kou; Ishii, Satoshi; and Kaneda, Yasushi, 5,534,693, Cl. 250-237.00G.
Ismail, Khaled E.; and Stern, Frank, to International Business Machines Corporation. Complementary metal-oxide semiconductor transistor logic using strained SI/SIGE heterostructure layers. 5,534,713, Cl. 257-24.000.
Isoda, Takeshi: *See—*
  Abe, Takao; Isoda, Takeshi; Sato, Chisato; Mihira, Ado; Tamai, Satoshi; and Kumagai, Toshio, 5,534,510, Cl. 514-210.000.
ISP Investments Inc.: *See—*
  Zhong, Yuanzhen; and Wolf, Philip F., 5,534,564, Cl. 523-340.000.
Issa, Darrell E.; Birchfield, Jerry W.; Busse, Glenn R.; Perdue, Sidney B.; and Ward, Kenneth A. Advanced automotive automation and security system. 5,534,845, Cl. 340-425.500.
Isshiki, Isao: *See—*
  Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
Isshiki, Nobuyuki: *See—*
  Masukawa, Junichi; Isshiki, Nobuyuki; Ohji, Nobunori; Chin, Eiten; and Numata, Toshiharu, 5,534,065, Cl. 118-410.000.
Itagaki, Mikio: *See—*
  Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
Item Development: *See—*
  Sollevi, Alf, 5,534,504, Cl. 514-46.000.
Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, to Hitachi, Ltd. Character inputting method allowing input of a plurality of different types of character species, and information processing equipment adopting the same. 5,535,119, Cl. 364-419.030.
Ito, Kazuyuki: *See—*
  Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
Ito, Mitsuhiro; Tamashige, Takamiki; and Fujii, Satoru, to Onodo Cement Co., Ltd. Vortex pneumatic classifier. 5,533,629, Cl. 209-714.000.
Ito, Noritoshi: *See—*
  Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, 5,535,233, Cl. 372-87.000.
Ito, Ryu; Kaneko, Kenji; Hayashi, Satoshi; and Terai, Akiko, to Lion Corporation. Toothbrush. 5,533,227, Cl. 15-167.100.
Ito, Sadaharu. Apparatus for producing flat-bottomed edible containers. 5,533,439, Cl. 99-383.000.
Ito, Shinji: *See—*
  Kaneko, Yuji; and Ito, Shinji, 5,534,675, Cl. 219-69.130.
Ito, Shoko: *See—*
  Nomoto, Hideo; Okamura, Takanari; and Ito, Shoko, 5,533,864, Cl. 416-96.00A.
Ito, Wataru, to Fuji Photo Film Co., Ltd. Method for reducing noise in energy subtraction images. 5,535,289, Cl. 382-130.000.
Ito, Youichi; Hanaoka, Akihiro; and Tezuka, Kenichi, to Toyo Suisan Kaisha, Ltd. Method for manufacturing packed wet-type instant noodles. 5,534,273, Cl. 426-18.000.
Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, to Sumitomo Electric Industries, Ltd.; Tohoku Electric Power Co., Inc.; Matsushita Electric Industrial Co., Ltd.; and International Superconductivity Technology Center. $(Hg,Cu)Ba_2Ca_2Cu_3O_y$ oxide superconductor and method of preparing the same. 5,534,490, Cl. 505-490.000.
Itoh, Yasuhito: *See—*
  Kodaira, Kazuho; Itoh, Yasuhito; and Watanabe, Tetsuya, 5,533,565, Cl. 164-416.000.
Itoh, Yasunari, to PFU Limited. Graphic coloring system in a graphic-display system having separately stored shape/positional data and color data selectively combinable to form desired images of differing shapes and colors. 5,535,315, Cl. 395-131.000.
Itoi, Satoshi, to NEC Corporation. Optical disk apparatus and recording/reproduction method therefor. 5,535,182, Cl. 369-32.000.
Itoigawa, Minoru, to Ricoh Company, Ltd. Document feeder with stamp in document scanning apparatus. 5,535,022, Cl. 358-496.000.
ITT Corporation: *See—*
  Baril, Albert M.; Holmes, Roy H.; and Critzer, Mark R., 5,535,053, Cl. 359-409.000.
  Ostrander, James E.; and Klinger, Gary O., 5,533,761, Cl. 285-38.000.
IVAC Corporation: *See—*
  Holdaway, Charles R.; and Warner, Eric A., 5,534,691, Cl. 250-231.140.
Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, to Hitachi, Ltd. Semiconductor integrated circuit device having output and internal circuit MISFETS. 5,534,723, Cl. 257-360.000.
Iwama, Kazuaki: *See—*
  Fujii, Toshiro; Iwama, Kazuaki; Kato, Yuichi; and Ohyama, Katsuya, 5,533,872, Cl. 417-269.000.
Iwamoto, Takeshi: *See—*
  Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
Iwamura, Keiichi, to Canon Kabushiki Kaisha. Polynominal-set deriving apparatus and method. 5,535,140, Cl. 364-550.000.
Iwamura, Ryuichi, to Sony Corporation. Apparatus and method for decoding a plurality of encoded video signals. 5,534,928, Cl. 348-401.000.
Iwanaga, Koichi: *See—*
  Miki, Hideki; Iwanaga, Koichi; and Matsuno, Toshimi, 5,534,512, Cl. 514-242.000.
Iwano, Kazuo; Misono, Shinji; and Tezuka, Shu, to International Business Machines Corporation. Apparatus and method of drilling. 5,533,841, Cl. 408-1.00R.
Iwasa, Masao: *See—*
  Narumi, Eiji; and Iwasa, Masao, 5,533,595, Cl. 187-266.000.
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, to Canon Kabushiki Kaisha. Print control apparatus for effective multiple printing of images onto a common printing frame. 5,534,956, Cl. 354-76.000.
Iwata, Masakatsu: *See—*
  Sasai, Keizo; Iwata, Masakatsu; Sawada, Hirohisa; and Nakamura, Fumihiko, 5,534,910, Cl. 347-217.000.
Iwata, Masuo: *See—*
  Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, 5,534,291, Cl. 427-221.000.
Iwata, Noboru, to Daiichi Techno Co., Ltd. Squeeze type pump. 5,533,878, Cl. 417-477.300.
Iwata, Tetsuya, to Wacoal Corp. Lumbar support garments. 5,533,961, Cl. 602-19.000.
Iyer, Balakrishna R.: *See—*
  Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
Izaeva, Natalia V.: *See—*
  Solntsev, Stanislav S.; Tjurin, Vladimir M.; Izaeva, Natalia V.; Bersenev, Alexei Y.; and Solovjeva, Galina A., 5,534,300. Cl. 427-376.200.
Izumi, Hirokazu; Deguchi, Masanobu; Oku, Koji; Yamamoto, Shuuhei; and Katayama, Harumi, to Sharp Kabushiki Kaisha. Portable image processing apparatus. 5,535,010, Cl. 358-296.000.
Izumi, Yoshihiro: *See—*
  Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
J. M. Huber Corporation: *See—*
  Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., 5,534,057, Cl. 106-486.000.
J.P. Patent Holdings, L.L.C.: *See—*
  Pickrell, John W., 5,533,711, Cl. 254-273.000.
J. S. Staedtler GmbH & Co.: *See—*
  Heidenreiter, Thomas; and Schmidbauer, Ute, 5,533,824, Cl. 401-133.000.

Jackson Products, Inc.: *See—*
  Petrie, Michael J.; and Pleune, Daniel A., 5,533,206, Cl. 2-8.000.
Jackson, Ronald C.: *See—*
  Faber, Robert D.; and Jackson, Ronald C., 5,534,173, Cl. 508-203.000.
Jackson, Tom; Eck, Henry; and Lowe, Ray, to Hughes Electronics Corp. Method and device for canceling frequency offsets. 5,535,441, Cl. 455-182.200.
Jacobs, Michael A.; and Insero, Mark A., to Timex Corporation. Method and apparatus for downloading information from a controllable light source to a portable information device. 5,535,147, Cl. 364-705.070.
Jacobson, Howard W., to Du Pont de Nemours, E. I., and Company. White electroconductive powders with antimony and tin oxides. 5,534,193, Cl. 252-518.000.
Jadav, Anjana K.: *See—*
  Galleguillos, Ramiro; Radd, Billie L.; and Jadav, Anjana K., 5,534,245, Cl. 424-66.000.
Jaen, Juan C.: *See—*
  Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, 5,534,522, Cl. 514-299.000.
Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, to Robert Bosch GmbH. Electrical device, particularly switching and control device for motor vehicles. 5,535,098, Cl. 361-752.000.
Jakubiec, Steven M.: *See—*
  Baker, Gary L.; Jakubiec, Steven M.; Agar, Brian E.; and Brom, Erik, 5,533,353, Cl. 62-227.000.
Jalota, Satish: *See—*
  Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
James, Lisa R.: *See—*
  Alvarez, Cesar; and James, Lisa R., 5,535,324, Cl. 395-161.000.
Jang, Hyun-Soon: *See—*
  Kim, Chull-Soo; and Jang, Hyun-Soon, 5,535,171, Cl. 365-233.000.
Jangi, Shrirang; and Chen, Jie, to Hughes Electronics. Apparatus and method for dual tone multifrequency signal detection. 5,535,271, Cl. 379-351.000.
Janke & Kunkel GmbH & Co. KG IKA-Labortechnik: *See—*
  Stiegelmann, René; Eble, Erhard; and Siegel, Helmut, 5,533,800, Cl. 366-142.000.
Jansen, Robert W. Fishing lure head. 5,533,296, Cl. 43-42.360.
Januzelli, Jose L. L.: *See—*
  Bordighon, Marcos A.; and Januzelli, Jose L. L., 5,533,611, Cl. 206-63.300.
Japan as represented by Director General of Agency of Industrial Science and Technology: *See—*
  Yano, Tetsuo; Ooie, Toshihiko; Yoneda, Masafumi; Utsumi, Akihiro; Katsumura, Munehide; and Matsuda, Jun, 5,534,103, Cl. 156-272.800.
Japan Gore-Tex, Inc.: *See—*
  Moriya, Akira, 5,534,209, Cl. 264-171.130.
Jarboe, Patrick G.: *See—*
  Wirt, W. Gary; and Jarboe, Patrick G., 5,533,748, Cl. 280-728.300.
Jarecki, James J.; and Polzin, Bruce C., to Newell Operating Company. Resealble paint tray. 5,533,228, Cl. 15-257.060.
Jarman, Michael; and Coley, Helen M. Melamine derivatives for use in the treatment of cancer. 5,534,625, Cl. 544-196.000.
Jedlicka, Frederick B.; and Tomiser, Frank J., Jr., to Emerson Electric Co. Jointer/planer machine. 5,533,557, Cl. 144-253.800.
Jeffers, Frederick J., to Eastman Kodak Company. Method of currency or document validation by use of a temperature sensitive magnetic pattern. 5,533,759, Cl. 283-70.000.
Jeffway, Robert W., Jr.: *See—*
  Arad, Abraham A.; Pitrone, Anne; and Jeffway, Robert W., Jr., 5,533,920, Cl. 446-409.000.
Jenkins, Jeffrey A.; and Wiers, John W., to TRW Vehicle Safety Systems Inc. Air bag module. 5,533,745, Cl. 280-728.200.
Jenkins, Peter E., to MTN International, LLC. Low force actuatable fuel injector. 5,533,480, Cl. 123-294.000.
Jennejahn, Rosemary J.: *See—*
  Derosa, Thomas F.; Benfaremo, Nicholas; Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,534,171, Cl. 508-231.000.
Jennings, David F.: *See—*
  Anderson, Charles C.; Niemeyer, David A.; and Jennings, David F., 5,534,397, Cl. 430-530.000.
Jennings, David J.: *See—*
  Leuthold, Hans; Jennings, David J.; Heine, Gunter; and Nagarathnam, Lakshman, 5,533,812, Cl. 384-112.000.
Jenoptik Technologie GmbH: *See—*
  Seher, Bernd; Reuther, Frank; and Mueller, Lutz, 5,535,250, Cl. 378-34.000.
Jensen, Daniel L. Document carrier. 5,533,810, Cl. 383-66.000.
Jensen, Steven D.; and Fischer, Dan E., to Ultradent Products, Inc. Compositions and methods for priming and sealing dental and biological substrates. 5,534,562, Cl. 523-118.000.
Jerman, John H.; Toth, Ronald E.; Winchell, David A.; and Pennington, David W., to IC Sensors, Inc.; and Baxter International Inc. Pulsed thermal flow sensor system. 5,533,412, Cl. 73-861.950.
Jet Blast Products Corp.: *See—*
  Wilson, Timothy J.; and Jones, Steven E., 5,533,673, Cl. 239-227.000.
Jidosha Kiki Co., Ltd.: *See—*
  Ikeda, Masahiro, 5,534,670, Cl. 181-230.000.
Jing Mei Industrial Holdings, Ltd.: *See—*
  Ford, Joseph E.; Hilger, Ronald O.; and Chan, Raymond, 5,535,089, Cl. 361-231.000.
Jira, Alfred: *See—*
  Daubenbüchel, Werner; and Jira, Alfred, 5,534,218, Cl. 264-516.000.
JMA & Associates, Inc.: *See—*
  Rouda, Dawn V., 5,533,230, Cl. 15-339.000.
Joe, Truman: *See—*
  Gupta, Anoop; and Joe, Truman, 5,535,116, Cl. 364-134.000.
Joglekar, Manohar A.; Cramer, Joseph F., Jr.; and Korycan, George M., to Motorola, Inc. Radio telephone interface apparatus for speed-dialing of telephone numbers. 5,535,258, Cl. 379-58.000.
Johansson, Stefan; and Sandström, Unto, to CelsiusTech Electronics AB. Sight. 5,534,696, Cl. 250-330.000.
Johno, Masahiro; Yui, Tomoyuki; Matsumoto, Takahiro; and Arai, Yoshihisa, to Mitsubishi Gas Chemical Company, Inc. Anti-ferroelectric liquid crystal composition and liquid crystal display. 5,534,190, Cl. 252-299.650.
Johnsen, Rex N.: *See—*
  Steffen, Mark A.; Sutton, Lynn A.; Stuckey, Gregory K.; and Johnsen, Rex N., 5,533,590, Cl. 180-332.000.
Johnson, Bruce C., to Creative Integration & Design, Inc. Nasal dilator. 5,533,499, Cl. 128-200.240.
Johnson, Bruce C.: *See—*
  Doubek, William J.; Cohen, Daniel E.; and Johnson, Bruce C., 5,533,503, Cl. 128-200.240.
Johnson, Chris L.; and Deremo, Edwin J., to Cooper Industries, Inc. Portable peck feed drilling system. 5,533,842, Cl. 408-17.000.
Johnson Corporation, The: *See—*
  Reibel, John C.; and Schindhelm, Uwe, 5,533,569, Cl. 165-90.000.
Johnson, David D.: *See—*
  Ekchian, Leon K.; Johnson, David D.; and Smith, William F., 5,535,303, Cl. 395-24.000.
Johnson, Dennis W.; and Schulze, Karl H., to Babcock & Wilcox Company, The. Segmented heat exchanger flue gas treatment. 5,534,230, Cl. 422-173.000.
Johnson, Jerry L.: *See—*
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,483, Cl. 504-221.000.
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,484, Cl. 504-235.000.
  Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,485, Cl. 504-246.000.
Johnson, J. Herbert, to A. O. Smith Corporation. Stator for an electric vehicle and method for producing the stator. 5,534,736, Cl. 310-91.000.
Johnson, Kelly B.: *See—*
  Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.
Johnson, Kenneth W.: *See—*
  Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., 5,534,472, Cl. 502-116.000.
Johnson, Melvin H.: *See—*
  Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
Johnson, Michael G.; and Lemasa, George L., to Juno Enterprises, Inc. Rotary scanner. 5,535,061, Cl. 359-872.000.
Johnson, Raymond C., to Schenck Turner Inc. Spin cup and spin cup drive for applying viscous materials. 5,534,060, Cl. 118-55.000.
Johnson, Robert G.: *See—*
  Hocker, G. Benjamin; Holmen, James O.; and Johnson, Robert G., 5,534,111, Cl. 216-15.000.
Johnson, Ronald E.; Lock, William E.; and Shoup, Robert D., to Corning Incorporated. Method and apparatus for printing a color filter ink pattern. 5,533,447, Cl. 101-211.000.
Johnson, Terence, to Nokia Mobile Phones Limited. Radio with retractable antenna. 5,534,878, Cl. 343-702.000.
Johnson, Thomas R., to Caterpillar Inc. Vehicle with front and rear steering. 5,533,584, Cl. 180-415.000.
Johnson Worldwide Associates, Inc.: *See—*
  Semeia, Roberto, 5,533,543, Cl. 137-15.000.
Johnston, Gregory E.; and Malm, Robert E. Distance measuring interferometer having specific crossings detection circuit. 5,535,004, Cl. 356-358.000.
Johnston, James D.: *See—*
  Hall, Joseph L., II; and Johnston, James D., 5,535,300, Cl. 395-2.360.
Johnston, Richard F.: *See—*
  Bashkin, John S.; Barker, David L.; and Johnston, Richard F., 5,534,123, Cl. 204-455.000.
Johnston, Robert M.; Goldberg, Steven L.; and Cino, Paul M., to E. R. Squibb & Sons, Inc. Pseudomonas fluorescens lipase. 5,534,427, Cl. 435-198.000.
Jolly, Ronald P., to HMT, Inc. Floating roof. 5,533,640, Cl. 220-216.000.
Jolu, Etienne: *See—*
  Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, 5,534,622, Cl. 534-15.000.
Jones, Donald N.: *See—*
  Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., 5,535,375, Cl. 391-500.000.
Jones, Gary W.; and Zimmerman, Steven M., to FED Corporation. Field emission display devices, and field emission electron beam source and isolation structure components therefor. 5,534,743, Cl. 313-309.000.
Jones, Glenn E.: *See—*

  - Rivers, Craig J.; Lee, Roanne A.; and Jones, Glenn E., 5,534,663, Cl. 174-35.0GC.
- Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., to Exxon Chemical Patents Inc. (ECPI). Preparation of plasticizer esters from phthalic anhydride residue. 5,534,652, Cl. 560-98.000.
- Jones, Richard R.: *See—*
  - Streich, Steven G.; Crook, Ronald J.; and Jones, Richard R., 5,533,570, Cl. 166-153.000.
- Jones, Stephen H.: *See—*
  - Lee, KwyRo; Shur, Michael; and Jones, Stephen H., 5,535,231, Cl. 372-50.000.
- Jones, Steven E.: *See—*
  - Wilson, Timothy J.; and Jones, Steven E., 5,533,673, Cl. 239-227.000.
- Jones, Thaddeus M. Anti-perch attachment for a sensor. 5,533,390, Cl. 73-170.160.
- Joo, Tae-sik: *See—*
  - Kim, Suk-ki; An, Hyeong-keon; Joo, Tae-sik; and Lee, Suk-jung, 5,535,356, Cl. 395-430.000.
- Jordan, Henry J., Jr.; McNair, Robert J.; Emerson, Alan B.; Kennedy, Brian S.; and Zimmerman, Patrick J., to Baker Hughes Incorporated. Method for completing multi-lateral wells and maintaining selective re-entry into laterals. 5,533,573, Cl. 166-313.000.
- Jörder, Kurt; Schäfer, Werner; and Hettenbach, Hans, to Firma Carl Freudenberg. Flame barrier comprising a nonwoven fabric layer containing phenolic, para-aramid or melamine staple fibers in combination with vermiculite. 5,534,325, Cl. 428-102.000.
- Jörgens, Reinhard, to Carl-Zeiss-Stiftung. Laser microscope. 5,535,052, Cl. 359-388.000.
- Joshua Morris Publishing, Inc.: *See—*
  - Morris, Michael, 5,533,757, Cl. 281-15.100.
- Jou, Yu-Cheun: *See—*
  - Padovani, Roberto; Jou, Yu-Cheun; Kindred, Daniel R.; McDonough, John G.; and Rueth, Timothy I., 5,535,239, Cl. 375-205.000.
- JTJ Systems, Inc.: *See—*
  - Krieger, Joseph P., 5,534,159, Cl. 210-704.000.
- Jucker, John. Maintenance vehicle for servicing a sports facility, and a method of using the maintenance vehicle. 5,533,577, Cl. 172-21.000.
- Judkins, Ren. Window shade assembly with hold down. 5,533,559, Cl. 160-84.060.
- Julien, Christine E.; and Tuckey, Peter R., to Graco Childrens Products, Inc. Swing with a stabilizer and the stabilizer thereof. 5,533,936, Cl. 472-118.000.
- Jung, Hae-Mook, to Daewoo Electronics Co., Ltd. Method for constructing a quantization pattern codebook. 5,534,930, Cl. 348-405.000.
- Jung, Seung-Taeg, to Samsung Electronics Co., Ltd. Blower having propeller fan positioned axially and radially with respect to a surrounding shroud for quieter fan operation. 5,533,862, Cl. 415-220.000.
- Jung, Yeong C., to Samsung Electronics Co., Ltd. Compressor control circuit. 5,534,760, Cl. 318-442.000.
- Junino, Alex; Lagrange, Alain; and Genet, Alain, to L'Oreal. Keratinous fiber dyeing methods and compositions which contain sulfated methaphenylenediamine couplers in combination with oxidation dye precursors. 5,534,036, Cl. 8-411.000.
- Junino, Alex; Genet, Alain; and Lagrange, Alain, to L'Oreal. Dye composition for keratinic fibres containing sulfured metaphenylenediamines, dyeing process and new sulfured metaphenylenediamines and preparation method thereof. 5,534,037, Cl. 8-411.000.
- Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, to Taiho Pharmaceutical Company, Ltd. Antitumor potentiator and antitumor composition. 5,534,513, Cl. 514-249.000.
- Juno Enterprises, Inc.: *See—*
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- Juskey, Frank J.: *See—*
  - Miles, Barry M.; Juskey, Frank J.; and Banerji, Kingshuk, 5,535,101, Cl. 367-808.000.
- Jwo, Chun J., to Acer Peripherals, Inc. Fixation of speaker to a monitor. 5,535,285, Cl. 381-188.000.
- Kovári, Arpád: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Kaba, Takahiro; Nishi, Takashi; and Mitsuhashi, Tsuyoshi, to Kubota Corporation. Composite sintered material having fine particles of hard compound dispersed in grains of titanium or titanium alloy matrix. 5,534,353, Cl. 428-552.000.
- Kabinoff, Ken B.: *See—*
  - Surjaatmadja, Jim B.; Brune, Kenneth D.; and Kabinoff, Ken B., 5,533,571, Cl. 166-222.000.
- Kabushiki Kaisha Ace Denken: *See—*
  - Takemoto, Takatoshi; Kawashima, Kazunari; and Muto, Nobuyuki, 5,534,685, Cl. 235-487.000.
- Kabushiki Kaisha Environmental Engineering Laboratory: *See—*
  - Tsuchida, Yuji, 5,534,042, Cl. 71-9.000.
- Kabushiki Kaisha Japan: *See—*
  - Sato, Masayori; and Tago, Kouichi, 5,534,940, Cl. 348-556.000.
- Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
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- Kabushiki Kaisha Kenwood: *See—*
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- Kabushiki Kaisha Komatsu Seisakusho: *See—*
  - Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, 5,535,233, Cl. 372-87.000.
  - Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
  - Torii, Tetsuo; and Mizoguchi, Kiyokazu, 5,534,918, Cl. 348-53.000.
- Kabushiki Kaisha Meidensha: *See—*
  - Yamamoto, Akira; Okabe, Masaaki; Kaneko, Yoshio; and Shiraishi, Keiichi, 5,533,388, Cl. 73-117.000.
- Kabushiki Kaisha Mold Gijutsu Kenkyusho: *See—*
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- Kabushiki Kaisha TOPCON: *See—*
  - Kawashima, Hiroyuki; Ohtomo, Fumio; Saito, Susumu; and Minegishi, Isao, 5,535,003, Cl. 356-345.000.
- Kabushiki Kaisha Toshiba: *See—*
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  - Harada, Kentaro, 5,534,973, Cl. 355-202.000.
  - Hiroi, Kazuo, 5,535,117, Cl. 364-158.000.
  - Ide, Fumito, 5,534,979, Cl. 355-208.000.
  - Ishizawa, Yoshiyuki, 5,535,186, Cl. 369-48.000.
  - Kanzawa, Sinichi, 5,535,262, Cl. 379-67.000.
  - Kawai, Kiyoyuki; Kimata, Yoshihide; and Ishida, Masayuki, 5,534,935, Cl. 348-448.000.
  - Kawamura, Tsutomu, 5,533,252, Cl. 29-734.000.
  - Kobayashi, Takahiro, 5,535,252, Cl. 375-371.000.
  - Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.
  - Kurokawa, Osamu; and Sawa, Buntaro, 5,535,433, Cl. 455-79.000.
  - Nomoto, Hideo; Okamura, Takanari; and Ito, Shoko, 5,533,864, Cl. 416-96.00A.
  - Okuno, Shiho; Hashimoto, Susumu; Yusu, Keiichiro; and Inomata, Koichiro, 5,534,355, Cl. 428-611.000.
  - Sanjoh, Minako; Kojima, Shoichi; and Sueda, Naomichi, 5,535,304, Cl. 395-62.000.
  - Saruta, Susumu; and Sekiguchi, Yasuyuki, 5,535,283, Cl. 381-71.000.
  - Sasaki, Mamoru; Takubo, Chiaki; and Hiruta, Yoichi, 5,533,664, Cl. 228-180.100.
  - Scales, William F., 5,535,355, Cl. 395-428.000.
  - Shiobara, Yasuhisa, 5,535,214, Cl. 370-85.600.
  - Tanaka, Shigeru; and Ofosu-Amaah, William, 5,535,085, Cl. 361-58.000.
  - Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, 5,535,127, Cl. 364-464.020.
  - Yamaji, Takafumi, 5,534,827, Cl. 332-103.000.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Fujii, Toshiro; Iwama, Kazuaki; Kato, Yuichi; and Ohyama, Katsuya, 5,533,872, Cl. 417-269.000.
  - Takenaka, Kenji; Kato, Keiichi; and Kawamura, Chuichi, 5,533,870, Cl. 417-269.000.
  - Takenaka, Kenji; Kayukawa, Hiroaki; Murao, Kazushige; and Hiramatsu, Osamu, 5,533,871, Cl. 417-269.000.
- Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See—*
  - Ueno, Ryuzo; Ueno, Ryuji; Kato, Ichie; and Oda, Tomio, 5,534,547, Cl. 514-530.000.
- Kadono, Nobuaki; and Kidou, Kenichirou, to Murata Manufacturing Co., Ltd. Component supply method. 5,534,102, Cl. 156-250.000.
- Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., to Robertshaw Controls Company. Control unit and method of making the same. 5,534,680, Cl. 219-505.000.
- Kagome Kabushiki Kaisha: *See—*
  - Ishiguro, Yukio; Sonoda, Youji; Okamoto, Kenji; Okamoto, Takamitsu; and Sakamoto, Hideki, 5,534,546, Cl. 514-681.000.
- Kahl, Lothar: *See—*
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Kai, Haruki: *See—*
  - Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, 5,534,327, Cl. 428-151.000.
- Kaiser, Hasso: *See—*
  - Hoffacker, Gerd; Kaiser, Hasso; Reissmueller, Klaus; and Wirth, Guenter, 5,534,129, Cl. 205-241.000.
- Kaiser Marquardt, Inc.: *See—*
  - Campbell, John G.; and Ruttle, Daniel W., 5,533,331, Cl. 60-204.000.
- Kajiwara, Shoichiro; and Serizawa, Hirokazu, to Mitsubishi Gas Chemical Company, Inc. Method for the preparation of purified aqueous hydrogen peroxide solution. 5,534,238, Cl. 423-584.000.
- Kajiyama, Ryuichiro: *See—*
  - Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, 5,534,233, Cl. 422-191.000.
- Kaken Shoyaku Co., Ltd.: *See—*

  - Ono, Minoru; Tamura, Yuka; and Akasu, Michinori, 5,534,523, Cl. 514-308.000.
- Kako, Noritosbi: *See—*
  - Nomura, Toshio; Tagawa, Takao; and Kako, Noritoshi, 5,534,886, Cl. 345-104.000.
- Kallenbach, Thomas J.; Buchanan, Justin M.; Goodrich, Matthew H.; Skinner, Ronald V.; Poncelet, Greg R.; and Kallenbach, Trina J., to Fluidyne, Incorporated. Apparatus and method for modifying waste water. 5,534,147, Cl. 210-605.000.
- Kallenbach, Trina J.: *See—*
  - Kallenbach, Thomas J.; Buchanan, Justin M.; Goodrich, Matthew H.; Skinner, Ronald V.; Poncelet, Greg R.; and Kallenbach, Trina J., 5,534,147, Cl. 210-605.000.
- Källstrand, Göran; and Nilsson, Per-Gunnar, to Astra Aktiebolag. Disposable inhaler. 5,533,505, Cl. 128-203.150.
- Kalman, Jeffery M.: *See—*
  - Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,533,788, Cl. 29.7-440.100.
- Kamada, Katsushige; and Yoshida, Kazuaki, to Fuji Photo Film Co., Ltd. Method of processing silver halide color photographic materials. 5,534,395, Cl. 430-400.000.
- Kamata, Hideo: *See—*
  - Fujiki, Satoshi; and Kamata, Hideo, 5,534,305, Cl. 427-393.000.
- Kambara, Hideki; Anazawa, Takashi; Takahashi, Satoshi; and Murakami, Katsuhiko, to Hitachi, Ltd. Electrophoresis analyzer with wavelength selective detection. 5,534,703, Cl. 250-458.100.
- Kambara, Yoshihiko; Uehara, Yoshikazu; Abe, Takeya; and Asao, Koichi, to Mitsui Toatsu Chemicals, Inc. Process for preparing acrylamide. 5,534,655, Cl. 564-127.000.
- Kamen, Dean L.; Seale, Joseph B.; Briggs, Joseph; and Arnold, Finn, to Deka Products Limited Partnership. Method and system for measuring volume and controlling flow. 5,533,389, Cl. 73-149.000.
- Kamezaki, Hiroshi: *See—*
  - Aoki, Shigenori; Kamezaki, Hiroshi; Hida, Masaharu; and Yokouchi, Kishio, 5,534,331, Cl. 428-209.000.
- Kamioka, Noriaki; and Hoshi, Akio, to Canon Denshi Kabushiki Kaisha. Head driving device having a plurality of pins arranged for engagement with lead screw. 5,535,076, Cl. 360-106.000.
- Kamiya, Noboru: *See—*
  - Ozawa, Hiroyoshi; Kamiya, Noboru; and Futaya, Ryuji, 5,534,591, Cl. 525-194.000.
- Kamiyama, Tadamasa, to RP Topla Limited. Method for manufacturing synthetic resin containers. 5,534,216, Cl. 264-511.000.
- Kamprath, Christine K.: *See—*
  - Chong, Leighton K.; and Kamprath, Christine K., 5,535,120, Cl. 364-419.030.
- Kamuz, Alexander M.; Krivoshlykov, Sergej G.; and Oleksenko, Pavel F., to Ceram Optec Industries, Inc. Connector for multichannel transmission of optical signals through rotating interface. 5,535,294, Cl. 385-25.000.
- Kanasasi, Yoshihisa: *See—*
  - Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, 5,534,338, Cl. 428-242.000.
- Kanatake, Takashi: *See—*
  - Koshizuka, Hiroshi; and Kanatake, Takashi, 5,534,999, Cl. 356-338.000.
- Kanazawa, Manabu: *See—*
  - Tsukada, Isao; Kanazawa, Manabu; and Kikkawa, Shoushi, 5,533,822, Cl. 400-641.000.
- Kanda, Tomoyuki: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Kane, Anne V.: *See—*
  - Plaut, Andrew G.; and Kane, Anne V., 5,534,544, Cl. 514-552.000.
- Kaneda, Kazuhisa: *See—*
  - Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, 5,534,327, Cl. 428-151.000.
- Kaneda, Yasushi: *See—*
  - Kondo, Hiroshi; Ishizuka, Kou; Ishii, Satoshi; and Kaneda, Yasushi, 5,534,693, Cl. 250-237.00G.
- Kaneko, Kazuo; Katayama, Masayasu; and Kochi, Kiyoshi, to Co-Operative Facility For Aging Tester Development. Burn-in and test method of semiconductor wafers and burn-in boards for use in semiconductor wafer burn-in tests. 5,534,786, Cl. 324-760.000.
- Kaneko, Kenji: *See—*
  - Ito, Ryu; Kaneko, Kenji; Hayashi, Satoshi; and Terai, Akiko, 5,533,227, Cl. 15-167.100.
- Kaneko, Kikuzo: *See—*
  - Miyawaki, Isamu; and Kaneko, Kikuzo, 5,534,075, Cl. 127-46.100.
- Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, to Hitachi Chemical Co., Ltd. Composition for forming charge transport layer and electrophotographic member containing alkoxybenzene. 5,534,375, Cl. 430-58.000.
- Kaneko, Yoshio: *See—*
  - Yamamoto, Akira; Okabe, Masaaki; Kaneko, Yoshio; and Shiraishi, Keiichi, 5,533,388, Cl. 73-117.000.
- Kaneko, Yuji; and Ito, Shinji, to Sodick Co., Ltd. Power supply system for electric discharge machines. 5,534,675, Cl. 219-69.130.
- Kaneko, Yutaka: *See—*
  - Franke, Rickard; Brandstrom, Per; Kaneko, Yutaka; and Andersson, Bengt, 5,533,550, Cl. 141-51.000.
- Kanesan Manufacturing Co., Ltd.: *See—*
  - Fukuda, Yasuji, 5,533,235, Cl. 24-20.00R.
- Kankyokagakukogyo Kabushiki Kaisha: *See—*
  - Niimi, Tomio, 5,535,175, Cl. 366-336.000.
- Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., to Matsushita Electric Industrial Co., Ltd. Forward error correcting transmitter and receiver. 5,535,220, Cl. 371-2.100.
- Kanota, Keiji: *See—*
  - Sugisaki, Kiminori; and Kanota, Keiji, 5,535,275, Cl. 380-10.000.
- Kansas State University Research Foundation: *See—*
  - Setser, Carole S., 5,534,285, Cl. 426-552.000.
- Kanzawa, Sinichi, to Kabushiki Kaisha Toshiba. Electronic private exchange system having talking recording function. 5,535,262, Cl. 379-67.000.
- Kao Corporation: *See—*
  - Masukawa, Junichi; Isshiki, Nobuyuki; Ohji, Nobunori; Chin, Eiten; and Numata, Toshiharu, 5,534,065, Cl. 118-410.000.
  - Matsuo, Takashi; Adachi, Kumiko; and Yahagi, Kazuyuki, 5,534,248, Cl. 424-70.280.
  - Ueyama, Kenichi; and Kawamukai, Hiroshi, 5,534,322, Cl. 428-64.200.
- Kao, Jack: *See—*
  - Lee, Tong Y.; and Kao, Jack, 5,533,290, Cl. 40-717.000.
- Kaplan, Elisabeth: *See—*
  - Henkel, Herbert W.; Kaplan, Elisabeth; and Hall, Philip G., 5,534,181, Cl. 510-423.000.
- Kappel, Johannes: *See—*
  - Cadek, Walter; Kappel, Johannes; and Neuhold, Rudolf, 5,534,139, Cl. 210-96.100.
- Kapuscinski, Maria M.: *See—*
  - Derosa, Thomas F.; Benfaremo, Nicholas; Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,534,171, Cl. 508-231.000.
- Karakama, Tadao: *See—*
  - Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
- Karasawa, Yukio: *See—*
  - Fusegawa, Izumi; Yamagishi, Hirotoshi; Fujimaki, Nobuyoshi; and Karasawa, Yukio, 5,534,112, Cl. 156-662.100.
- Kardach, James; Cho, Sung S.; Peterson, Nicholas B.; and Lane, Thomas R., to Intel Corporation. Method and apparatus for interrupt signaling in a computer system. 5,535,420, Cl. 395-868.000.
- Karin, Michael; Hibi, Masahiko; and Linn, Anning, to University of California, The Regents of The. Oncoprotein protein kinase. 5,534,426, Cl. 435-194.000.
- Karino, Yukio: *See—*
  - Yasuda, Tomokazu; Karino, Yukio; Sakurai, Seiya; and Ogawa, Masataka, 5,534,398, Cl. 430-545.000.
- Karl, David H.; Chambers, Randall P.; and Dionisio, Vito, Jr., to Motorola, Inc. Portable radio battery latch. 5,535,437, Cl. 455-90.000.
- Karl Mayer Textilmaschinenfabrik GmbH: *See—*
  - Mista, Kresimir; and Hohne, Hans J., 5,533,366, Cl. 66-205.000.
- Karlow, James P.; Kumkoski, James M.; Boumarafi, Mohamed; and Hurford, Jonathan P., to Takata, Inc. Simplified inflatable restraint module. 5,533,750, Cl. 280-730.200.
- Karlsson, Rolf: *See—*
  - Hemström, Bengt; Persson, Johan; and Karlsson, Rolf, 5,534,144, Cl. 210-193.000.
- Karton, Yishai: *See—*
  - Fisher, Abraham; Karton, Yishai; Marciano, Daniele; Barak, Dov; and Meshulam, Haim, 5,534,520, Cl. 514-278.000.
- Karubian, Ralph K.; and Surman, Thomas G., to Kentmaster Mfg. Co., Inc. Animal head processing apparatus. 5,533,928, Cl. 452-135.000.
- Karvinen, Mikko; Kerttula, Reima; Laapotti, Jorma; and Pajula, Juhani, to Valmet Paper Machinery Inc. Compact press section with closed draw of the web in a paper machine. 5,534,116, Cl. 162-274.000.
- Kasahara, Yasunori, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for controlling a hardware merge sorter to sort a plurality of records greater than 2^n. 5,535,384, Cl. 395-600.000.
- Kasai, Takashi: *See—*
  - Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
- Kashihara, Keiichiro: *See—*
  - Okudaira, Tomonori; Kuroiwa, Takeharu; Fujiwara, Nobuo; and Kashihara, Keiichiro, 5,534,458, Cl. 437-52.000.
- Kashima, Tadaaki: *See—*
  - Nomura, Yasuhiko; Nishida, Ikuharu; and Kashima, Tadaaki, 5,534,336, Cl. 428-229.000.
- Kashimura, Makoto: *See—*
  - Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, 5,534,894, Cl. 346-134.000.
- Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, to Canon Kabushiki Kaisha. Ink jet head, ink jet apparatus and wiping method therefor. 5,534,898, Cl. 347-33.000.

- Kashiwa, Hirobumi: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Kaspari, William J.; and Stern, Roger A., to Vital Insite, Incorporated. Apparatus and method for noninvasive blood pressure measurement. 5,533,511, Cl. 128-672.000.
- Kast, Howard B. Toy motion simulator. 5,533,935, Cl. 472-130.000.
- Kataoka, Akira; Mimura, Hitoshi; Kuramoto, Manabu; and Tukita, Ryuichi, to ASICS Corporation. Hard plate of each of spike shoes for field and track events. 5,533,282, Cl. 36-129.000.
- Kataoka, Masaaki; Wakai, Akira; and Nakamura, Takehiko, to Uniroyal Chemical Company, Inc. Synergistic insecticidal compositions. 5,534,543, Cl. 514-517.000.
- Kataoka, Yuzo: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Katayama, Harumi: *See—*
  - Izumi, Hirokazu; Deguchi, Masanobu; Oku, Koji; Yamamoto, Shuuhei; and Katayama, Harumi, 5,535,010, Cl. 358-296.000.
- Katayama, Masayasu: *See—*
  - Kaneko, Kazuo; Katayama, Masayasu; and Kochi, Kiyoshi, 5,534,786, Cl. 324-760.000.
- Katayama Seiyakusyo Co., Ltd.: *See—*
  - Hayashi, Sadao; Nakanishi, Eiji; Kurita, Yasuyuki; and Okunishi, Masahiko, 5,534,508, Cl. 514-206.000.
- Katayama, Tsutao: *See—*
  - Hayakawa, Yuzo; Hirai, Tsuneo; and Katayama, Tsutao, 5,533,880, Cl. 425-328.000.
- Kato, Hideo: *See—*
  - Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, 5,534,362, Cl. 429-32.000.
- Kato, Ichie: *See—*
  - Ueno, Ryuzo; Ueno, Ryuji; Kato, Ichie; and Oda, Tomio, 5,534,547, Cl. 514-530.000.
- Kato, Keiichi: *See—*
  - Takenaka, Kenji; Kato, Keiichi; and Kawamura, Chuichi, 5,533,870, Cl. 417-269.000.
- Kato, Mamoru: *See—*
  - Ogisu, Yasuhiko; Kato, Mamoru; and Takahashi, Shigeyuki, 5,534,297, Cl. 427-322.000.
- Kato, Takahiro: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Kato, Takashi: *See—*
  - Nishigaki, Junji; and Kato, Takashi, 5,534,403, Cl. 430-585.000.
- Kato, Toshiyuki: *See—*
  - Fujinaga, Chikako; Tosaka, Akio; Kato, Toshiyuki; and Sato, Kaku, 5,534,089, Cl. 148-603.000.
  - Ohtani, Mitsuaki; Kato, Toshiyuki; and Hori, Yozo, 5,534,533, Cl. 514-372.000.
- Kato, Yasushi, to NEC Corporation. Semiconductor memory device with built-in accessing system for redundant information less affecting data access speed in standard mode. 5,535,161, Cl. 365-200.000.
- Kato, Yuichi: *See—*
  - Fujii, Toshiro; Iwama, Kazuaki; Kato, Yuichi; and Ohyama, Katsuya, 5,533,872, Cl. 417-269.000.
- Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, to Hitachi, Ltd. Television receiver capable of enlarging and compressing image. 5,534,934, Cl. 348-445.000.
- Katsumata, Yoshihiro: *See—*
  - Mizuno, Shigeru; Katsumata, Yoshihiro; and Takahashi, Nobuyuki, 5,534,072, Cl. 118-728.000.
- Katsumura, Munehide: *See—*
  - Yano, Tetsuo; Ooie, Toshihiko; Yoneda, Masafumi; Utsumi, Akihiro; Katsumura, Munehide; and Matsuda, Jun, 5,534,103, Cl. 156-272.800.
- Katto, Hisao: *See—*
  - Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.
- Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., to Lidak Pharmaceuticals. Sucrose ester-C20 to C28 alcohol formulations. 5,534,554, Cl. 514-724.000.
- Katz, Itzhak: *See—*
  - Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, 5,535,189, Cl. 369-102.000.
- Katz, Joseph M. Cellular telephone and marine band user's protective device. 5,535,439, Cl. 455-117.000.
- Katz, Lee R.: *See—*
  - Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., 5,534,554, Cl. 514-724.000.
- Kaufman, Benjamin J.: *See—*
  - Derosa, Thomas F.; Benfaremo, Nicholas; Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,534,171, Cl. 508-231.000.
- Kaufman, Mark S. Combination totebag and towel having an advertising medium and method of making the same. 5,533,653, Cl. 224-577.000.
- Kaun, Thomas D., to University of Chicago. Molten salt electrolyte separator. 5,534,367, Cl. 429-103.000.
- Kaune, Harald: *See—*
  - Angeler, Alois; Kaune, Harald; and Scheuten, Theo, 5,533,713, Cl. 266-218.000.
- Kausel, Wilfried; Kremser, Hannes; Stallbaumer, Hermann; and Winkler, Werner, to SEMCOTEC Handelsgesellschaft m.b.H. Circuitry for superimposing small, low energy signals and large, essentially higher energy signals. 5,535,273, Cl. 379-399.000.
- Kawabata, Kouya: *See—*
  - Takahashi, Yonosuke; Imamura, Naoya; Nakamura, Hideyuki; and Kawabata, Kouya, 5,534,383, Cl. 430-201.000.
- Kawabe, Yasumasa; and Sato, Kenichiro, to Fuji Photo Film Co., Ltd. Positive photoresist composition. 5,534,382, Cl. 430-192.000.
- Kawade, Hisaaki: *See—*
  - Kishi, Etsuro; Kawade, Hisaaki; Takimoto, Kiyoshi; and Yano, Koji, 5,535,185, Cl. 369-126.000.
- Kawagoe, Norimasa: *See—*
  - Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, 5,534,362, Cl. 429-32.000.
- Kawai, Kiyoyuki; Kimata, Yoshihide; and Ishida, Masayuki, to Kabushiki Kaisha Toshiba; and Nippon Television Network Corporation. Processing apparatus for progressive scan generation of a television signal. 5,534,935, Cl. 348-448.000.
- Kawakami, Akira: *See—*
  - Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, 5,534,370, Cl. 429-198.000.
- Kawakami, Yasunori; Iitsuka, Hiroyuki; Nishimura, Takuya; Hamai, Shinji; and Sahara, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Data transmission system and method. 5,535,208, Cl. 370-84.000.
- Kawamukai, Hiroshi: *See—*
  - Ueyama, Kenichi; and Kawamukai, Hiroshi, 5,534,322, Cl. 428-64.200.
- Kawamura, Chuichi: *See—*
  - Takenaka, Kenji; Kato, Keiichi; and Kawamura, Chuichi, 5,533,870, Cl. 417-269.000.
- Kawamura, Tomonori: *See—*
  - Koshizuka, Kunihiro; Kitamura, Shigehiro; Takimoto, Masataka; and Kawamura, Tomonori, 5,534,372, Cl. 430-10.000.
- Kawamura, Tsutomu, to Kabushiki Kaisha Toshiba. Slot insulator guide in assembly of dynamoelectric machine and coil inserting apparatus provided therewith. 5,533,252, Cl. 29-734.000.
- Kawamura, Yasuji: *See—*
  - Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, 5,534,327, Cl. 428-151.000.
- Kawanishi, Kaoru: *See—*
  - Asanuma, Tadashi; Matsuzawa, Hiroshi; Sasaki, Tateyo; and Kawanishi, Kaoru, 5,534,595, Cl. 525-326.500.
- Kawanishi, Toshiyuki: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Kawano, Kenji: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Kawano, Shizuo; and Nagata, Tadaaki, to Honda Giken Kogyo Kabushiki Kaisha. Device for adjusting a driving chain in a snowmobile. 5,533,585, Cl. 180-190.000.
- Kawasaki Jukogyo Kabushiki Kaisha: *See—*
  - Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.
- Kawasaki Steel Corporation: *See—*
  - Fujinaga, Chikako; Tosaka, Akio; Kato, Toshiyuki; and Sato, Kaku, 5,534,089, Cl. 148-603.000.
  - Nakayama, Osamu, 5,535,084, Cl. 361-56.000.
  - Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,534,045, Cl. 75-243.000.
  - Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.
- Kawase, Masaki: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Kawashima, Hiroyuki; Ohtomo, Fumio; Saito, Susumu; and Minegishi, Isao, to Kabushiki Kaisha TOPCON. Wavelength stabilizing light source apparatus by maintaining a constant phase difference. 5,535,003, Cl. 356-345.000.
- Kawashima, Kazunari: *See—*
  - Takemoto, Takatoshi; Kawashima, Kazunari; and Muto, Nobuyuki, 5,534,685, Cl. 235-487.000.
- Kawasumi, Yasushi: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Kayukawa, Hiroaki: *See—*

  - Takenaka, Kenji; Kayukawa, Hiroaki; Murao, Kazushige; and Hiramatsu, Osamu, 5,533,871, Cl. 417-269.000.
- Kearney, Mark B.: *See—*
  - Koglin, Dennis M.; and Kearney, Mark B., 5,534,816, Cl. 327-513.000.
- Kearns, Elizabeth K.: *See—*
  - Oh, Chan S.; and Kearns, Elizabeth K., 5,534,620, Cl. 530-413.000.
- Keegan, Richard G.: *See—*
  - Cahn, Charles R.; Keegan, Richard G.; Knight, Jerry E.; and Stansell, Thomas A., Jr., 5,535,278, Cl. 380-49.000.
- Keelan, Brian; and Pagano, Daniel, to Eastman Kodak Company. Film plane rotation in rigid cameras for depth of field and perspective control. 5,534,959, Cl. 354-160.000.
- Keightley, John, to Willetts, Miles D. Laser deflection apparatus for laser compass. 5,533,268, Cl. 33-290.000.
- Keijser, Olof, to Asea Brown Boveri AB. Flatness control in the rolling of strip. 5,535,129, Cl. 364-472.000.
- Keith, Michael, to Intel Corporation. Encoding and decoding video signals using dynamically generated quantization matrices. 5,535,138, Cl. 364-514.00R.
- Kelbrick, William J.; Rouble, Vincent J.; Larmer, Ralph D.; Pepper, Stuart L.; and Warburton, Eric T., to Purity Packaging A Division of Great Pacific Enterprises. Method for sterilizing internal surfaces of an edible liquid packaging machine. 5,534,222, Cl. 422-33.000.
- Keller, George E., II: *See—*
  - Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., 5,534,133, Cl. 208-39.000.
- Keller, Janis: *See—*
  - Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., 5,534,660, Cl. 800-205.000.
- Keller, Robert A.; and Price, William L., III, to Shakespeare. Spiral fabric. 5,534,333, Cl. 428-222.000.
- Kellett, Patti J.: *See—*
  - Miracle, Gregory S.; Sivik, Mark R.; and Kellett, Patti J., 5,534,179, Cl. 510-305.000.
- Kellogg Company: *See—*
  - Humbert, Robert D.; Saldanha, Leila; and Kepplinger, John, 5,534,275, Cl. 426-74.000.
- Kelman, Elliot. Hair cutting apparatus. 5,533,266, Cl. 30-122.000.
- Kemira Oy: *See—*
  - Luoma, Marjo; Torkkell, Keijo; Lylykangas, Reijo; and Virta, Pirkko, 5,534,476, Cl. 502-335.000.
- Kemmerer, James H., to Hayes Wheels International, Inc. Method for producing a vehicle wheel. 5,533,261, Cl. 29-894.322.
- Kenmotsu, Shiro: *See—*
  - Saito, Tsunenari; Kenmotsu, Shiro; and Inoue, Takuji, 5,534,096, Cl. 156-212.000.
- Kenmotsu, Toru: *See—*
  - Furukawa, Masahiko; Masuda, Toshio; and Kenmotsu, Toru, 5,533,324, Cl. 53-469.000.
- Kennedy, Brian S.: *See—*
  - Jordan, Henry J., Jr.; McNair, Robert J.; Emerson, Alan B.; Kennedy, Brian S.; and Zimmerman, Patrick J., 5,533,573, Cl. 166-313.000.
- Kennedy, Patrick J.: *See—*
  - Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., 5,535,274, Cl. 379-446.000.
- Kennedy, Stephen E. Method and system for music training. 5,533,903, Cl. 434-307.00R.
- Kentmaster Mfg. Co., Inc.: *See—*
  - Karubian, Ralph K.; and Surman, Thomas G., 5,533,928, Cl. 452-135.000.
- Kepplinger, John: *See—*
  - Humbert, Robert D.; Saldanha, Leila; and Kepplinger, John, 5,534,275, Cl. 426-74.000.
- Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, to Voest-Alpine Industrieanlagenbau GmbH; and Research Institute of Industrial Science & Technology, Incorporated Foundation. Process for producing molten pig iron or molten steel preproducts. 5,534,046, Cl. 75-446.000.
- Kerko, David J.: *See—*
  - Havens, Thomas G.; Kerko, David J.; and Morrell, JoAnn, 5,534,041, Cl. 65-30.100.
- Kerle, Thomas, to Eidos Lizenzverwertungs GmbH. Process and device for printing on textiles. 5,534,098, Cl. 156-230.000.
- Kerschbaum, Walter: *See—*
  - Hufendiek, Ernst-Wilhelm; Kerschbaum, Walter; and Werner, Johannes, 5,533,474, Cl. 123-196.0AB.
- Kerttula, Reima: *See—*
  - Karvinen, Mikko; Kerttula, Reima; Laapotti, Jorma; and Pajula, Juhani, 5,534,116, Cl. 162-274.000.
- Kesler, Robert H., to Haimbaugh Enterprises, Inc. Plant feeder and method for feeding plant roots. 5,533,300, Cl. 47-48.500.
- Keyes, Michael P.: *See—*
  - Tran, Nang T.; and Keyes, Michael P., 5,534,445, Cl. 437-21.000.
- Keyworth, Barrie P.; and McMullin, James N., to Telecommunication Research Laboratories. Method and apparatus for making optical components by direct dispensing of curable liquid. 5,534,101, Cl. 156-244.120.
- Khalil, Mohammed H.: *See—*
  - Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., 5,534,554, Cl. 514-724.000.
- Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., to Texaco Inc. Partial oxidation of partially liquified plastic materials. 5,534,040, Cl. 48-197.00R.
- Khoshnood, Nayson N.: *See—*
  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
- Khoury, Jihad; and Woods, Charles L., to United States of America, Air Force. Photorefractive holographic interference novelty filter. 5,535,024, Cl. 359-7.000.
- Khuchua, Galina N.: *See—*
  - Dobrotvorsky, Anatoly E.; Rozputnyak, Yaroslav A.; Khuchua, Galina N.; and Komissarova, Irina A., 5,534,262, Cl. 424-464.000.
- Khurges, Evgeny M.: *See—*
  - Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.
- Kiat, Ho B.; and Choy, Tan H., to Advanced Systems Automation Pte Ltd. Hydroelectric cylinder for improved power amplification and control. 5,533,336, Cl. 60-533.000.
- Kidou, Kenichirou: *See—*
  - Kadono, Nobuaki; and Kidou, Kenichirou, 5,534,102, Cl. 156-250.000.
- Kielmeyer, William H.: *See—*
  - Taylor, Thomas J.; and Kielmeyer, William H., 5,534,612, Cl. 528-129.000.
- Kier, Charles E., Jr., to Motor Wheel Corporation. Method of manufacturing a vehicle wheel. 5,533,260, Cl. 29-894.322.
- Kiger, Terry L.: *See—*
  - Benedict, Robert B.; and Kiger, Terry L., 5,533,658, Cl. 226-172.000.
- Kiguchi, Masao: *See—*
  - Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, 5,535,012, Cl. 358-400.000.
- Kihara, Hayato: *See—*
  - Mitsui, Shinichi; Kihara, Hayato; and Yoshimi, Shuji, 5,534,580, Cl. 524-417.000.
- Kikkawa, Shoushi: *See—*
  - Tsukada, Isao; Kanazawa, Manabu; and Kikkawa, Shoushi, 5,533,822, Cl. 400-641.000.
- Kikuchi, Makoto: *See—*
  - Tanabe, Keiji; and Kikuchi, Makoto, 5,535,353, Cl. 395-421.100.
- Kikuta, Jun-ichi: *See—*
  - Makino, Tadashi; Mizukami, Yashio; and Kikuta, Jun-ichi, 5,534,534, Cl. 514-388.000.
- Kikuta, Teruo: *See—*
  - Nikaya, Toshiki; Fukushima, Yoshifumi; and Kikuta, Teruo, 5,534,579, Cl. 524-460.000.
- Kilbane, Kevin: *See—*
  - Catherwood, Michael I.; Kilbane, Kevin; and Dobbs, Laura M., 5,535,376, Cl. 395-550.000.
- Kilbourn, Robert G.; Griffith, Owen W.; and Gross, Steven S., to Board of Regents, The University of Texas System; and Cornell Research Foundation, Inc. Parenteral amino acid formulations for the inhibition of systemic hypotension associated with nitric oxide production. 5,534,545, Cl. 514-565.000.
- Killian, Anthony, to TAP Pharmaceuticals, Inc. Method of treating preeclampsia. 5,534,548, Cl. 514-545.000.
- Kim, Cheol Y., to Goldstar Co., Ltd. Dual processor controlled compact disk-interactive system. 5,535,339, Cl. 395-280.000.
- Kim, Chull-Soo; and Jang, Hyun-Soon, to Samsung Electronics Co., Ltd. Data output buffer of a semiconducter memory device. 5,535,171, Cl. 365-233.000.
- Kim, Eun J., to Samsung Electronics Co., Ltd. Method and device for adjusting magnification of image. 5,535,007, Cl. 358-296.000.
- Kim, Hae Jong, to Goldstar Co., Ltd. Apparatus for reducing flickers of encoder when digitally converting video signals from non-interlaced to interlaced format. 5,534,936, Cl. 348-448.000.
- Kim, Jae K., to Hyundai Electronics Industries Co., Ltd. Method for fabrication a semiconductor device. 5,534,450, Cl. 437-34.000.
- Kim, Ji-Hyun, to Samsung Electronics Co., Ltd. Self-propelled cleaning robot operable in a cordless mode and a cord mode. 5,534,762, Cl. 318-568.120.
- Kim, Kyungseop: *See—*
  - Bae, Byungseong; Kim, Kyungseop; Yoon, Wonbong; and Lee, Seogyul, 5,535,028, Cl. 359-61.000.
- Kim, Kyung-Yeol, to SamSung Electronics Co., Ltd. Method for eliminating a paper jam of an image forming system and apparatus therefor. 5,534,976, Cl. 355-207.000.
- Kim, Myung-Ho: *See—*
  - Chung, Bum-Goo; and Kim, Myung-Ho, 5,534,083, Cl. 148-218.000.
- Kim, No-jin, to Samsung Electronics Co., Ltd. Viewfinder brightness control circuit for a camcorder employing iris output voltage and method therefor. 5,534,920, Cl. 348-333.000.
- Kim, Sang-Il: *See—*
  - Song, Il-Cheon; Kim, Sang-Il; and Lee, Young-Jin, 5,534,215, Cl. 264-345.000.
- Kim, Soon T., to Samsung Electronics Co., Ltd. Modulation/demodulation circuit for a digital signal recorder/reproducer. 5,535,245, Cl. 345-261.000.
- Kim, Suk-ki; An, Hyeong-keon; Joo, Tae-sik; and Lee, Suk-jung, to Samsung Electronics Co., Ltd. Digital data recording/playback system utilizing EEPROM and ROM memories as a storage medium. 5,535,356, Cl. 395-430.000.

Kim, Sung K.: *See—*
- Song, Kwang B.; Kim, Sung K.; and Shim, Jin S., 5,534,720, Cl. 257-232.000.

Kim, Sung S., to LG Semicon Co., Ltd. Method for forming silicon on insulator structured. 5,534,459, Cl. 437-89.000.

Kim, Tae-ryong; Park, Hee-su; and Moon, Dai-sick, to Samsung Electronics Co., Ltd. Semiconductor device having a corrosion-resistant metal wiring layer. 5,534,728, Cl. 257-692.000.

Kimata, Yoshihide: *See—*
- Kawai, Kiyoyuki; Kimata, Yoshihide; and Ishida, Masayuki, 5,534,935, Cl. 348-448.000.

Kimberly-Clark Corporation: *See—*
- Everhart, Dennis S.; Delucia, Mary L.; Timmons, Terry K.; and Wright, Robert D., 5,534,335, Cl. 428-224.000.
- Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., 5,533,991, Cl. 604-383.000.
- Stokes, Ty J., 5,534,339, Cl. 428-284.000.
- Yeo, Richard S., 5,533,990, Cl. 604-363.000.

Kimura, Kazuhiro: *See—*
- Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, 5,535,075, Cl. 360-105.000.

Kimura, Kozo; and Kiyohara, Tokuzo, to Matsushita Electric Industrial Co., Ltd. Cache memory control circuit and method for controlling reading and writing requests. 5,535,358, Cl. 395-445.000.

Kimura, Kozo: *See—*
- Hirata, Hiroaki; and Kimura, Kozo, 5,535,361, Cl. 395-472.000.

Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, to Sharp Kabushiki Kaisha. Liquid crystal display device with a photoconductor at each intersection of a linear luminous source and a linear electrode. 5,535,027, Cl. 359-58.000.

Kimura, Soichiro: *See—*
- Tuchida, Michiro; Nomura, Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, 5,534,955, Cl. 353-66.000.

Kimura, Takayuki: *See—*
- Matsuo, Masaaki; and Kimura, Takayuki, 5,533,451, Cl. 101-415.100.

Kimura, Tetsuo: *See—*
- Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, 5,534,894, Cl. 346-134.000.

Kinch, Michael A.: *See—*
- Schiebel, Richard A.; Kinch, Michael A.; and Koestner, Roland J., 5,534,719, Cl. 257-188.000.

Kindl, Gerhard, to Hoerbiger Ventilwerke Aktiengesellschaft. Induction regulator valve for rotary compressors. 5,533,873, Cl. 417-295.000.

Kindred, Daniel R.: *See—*
- Padovani, Roberto; Jou, Yu-Cheun; Kindred, Daniel R.; McDonough, John G.; and Rueth, Timothy I., 5,535,239, Cl. 375-205.000.

King, Gerald R.; Lloyd, Robert D.; and Nelson, Leonard E., to Motorola, Inc. Method and apparatus for selectively retaining messages received by a radio receiver based upon message content. 5,535,428, Cl. 455-38.400.

King, Kathleen: *See—*
- Baker, Joffre; Chien, Kenneth; King, Kathleen; Pennice, Diane; and Wood, William, 5,534,615, Cl. 530-350.000.

King, Roger M., to Beeson and Sons Limited. Container closure assembly. 5,533,633, Cl. 215-252.000.

Kinney, Michael J.: *See—*
- Harris, Richard H.; Kinney, Michael J.; and Vorhees, Kevin H., 5,533,817, Cl. 400-124.280.

Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor producing apparatus comprising wafer vacuum chucking device. 5,534,073, Cl. 118-728.000.

Kinugawa, Tadami: *See—*
- Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.

Kipp, Jeffrey J.: *See—*
- Adolphi, John; and Kipp, Jeffrey J., 5,534,963, Cl. 354-290.000.

Kira, Alan K., to Tecnetics Industries, Inc. System and method for sensing material level within a container. 5,533,392, Cl. 73-290.00B.

Kirby, Richard E.: *See—*
- Fearing, Oliver H., Jr.; Green, Peter J.; and Kirby, Richard E., 5,534,664, Cl. 174-50.000.

Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., to Kimberly-Clark Corporation. Bodyside cover for an absorbent article. 5,533,991, Cl. 604-383.000.

Kiriazis, Leonidas: *See—*
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Kirk, Ole: *See—*
- Godtfredsen, Sven E.; Kirk, Ole; and Damhus, Ture, 5,534,435, Cl. 435-262.500.

Kirk, Thomas C.; Schwartz, Curtis; and Weinstein, Barry, to Rohm and Haas Company. Process and laundry formulations for preventing the transfer of dye in laundry processes. 5,534,182, Cl. 8-137.000.

Kise, Katsuyuki, to Fuji Jukogyo Kabushiki Kaisha. Distance detection method and system using a stereoscopical imaging apparatus. 5,535,144, Cl. 364-561.000.

Kish, William J.: *See—*
- Hanson, Thomas A.; Kish, William J.; Novak, Jerome J.; and Vandervort, Annette L., 5,534,994, Cl. 356-73.100.

Kishi, Etsuro; Kawade, Hisaaki; Takimoto, Kiyoshi; and Yano, Koji, to Canon Kabushiki Kaisha. Information recording/reproduction apparatus using probe. 5,535,185, Cl. 369-126.000.

Kishi, Kazuhiro, to Kabushiki Kaisha Kenwood. FM tuner having improved tuning speed. 5,535,442, Cl. 455-134.100.

Kishi, Toru; and Takada, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Output circuit of PWM inverter wherein floating time is reduced. 5,535,115, Cl. 363-98.000.

Kiska, Stanley A., to Werner Co. Ladder rail cap. 5,533,591, Cl. 182-108.000.

Kiss, Pál: *See—*
- Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperbej, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.

Kistner, Matthew G.: *See—*
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Kisu, Hiroki; Ohkubo, Masaharu; Sakurai, Kazushige; Yamazaki, Michihito; Asano, Erika; Shimizu, Yasushi; and Ogata, Hiroaki, to Canon Kabushiki Kaisha. Charging member having a loosely supported charger portion. 5,534,344, Cl. 428-323.000.

Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, to Hitachi Maxell, Ltd. Organic electrolytic solution cell. 5,534,370, Cl. 429-198.000.

Kita, Kazunori, to Casio Computer Co., Ltd. Portable radio signal detecting system. 5,534,872, Cl. 342-146.000.

Kita, Kazushi, to SMC Corporation. Fluid cylinder assembly. 5,533,435, Cl. 91-519.000.

Kitagawara, Yutaka: *See—*
- Aihara, Ken; Kitagawara, Yutaka; and Takenaka, Takao, 5,533,387, Cl. 73-105.000.

Kitami, Tatsuo: *See—*
- Tuchida, Michiro; Nomura; Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, 5,534,955, Cl. 353-66.000.

Kitamura, Hiroshi; and Mitsuuchi, Masamichi, to Polyplastics Co., Ltd. Glass-reinforced thermoplastic resin compositions containing the anatase form of titanium dioxide as a white pigmenting agent. 5,534,584, Cl. 524-497.000.

Kitamura, Shigehiro: *See—*
- Koshizuka, Kunihiro; Kitamura, Shigehiro; Takimoto, Masataka; and Kawamura, Tomonori, 5,534,372, Cl. 430-10.000.

Kitani, Masashi: *See—*
- Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.

Kitano, Katsuhisa: *See—*
- Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.

Kitazawa, Eiichi: *See—*
- Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.

Kiuchi, Atsushi: *See—*
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Kiyohara, Takehiko: *See—*
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Kiyohara, Tokuzo: *See—*
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Kiyomiya, Tadashi: *See—*
- Ohoshi, Toshio; Kiyomiya, Tadashi; and Okita, Masami, 5,534,749, Cl. 313-497.000.

Kiyono, Junji, to NEC Corporation. Semiconductor memory device with CMOS-inverter storage cells. 5,535,154, Cl. 365-145.000.

Klaveness, Jo; Strande, Per; and Wiggen, Unni N., to Nycomed Imaging AS. Polymers containing diester units. 5,534,250, Cl. 424-78.370.

Kleckner, Robert J.; and Graveson, Sandra, to Xerox Corporation. Film loading pins and method for external drum scanners. 5,534,964, Cl. 354-344.000.

Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, to Dr. Ing. h.c.F. Porsche AG. Actuation mechanism for a top and a top receptacle cover of a motor vehicle. 5,533,777, Cl. 296-117.000.

Klein, Jeffrey L.: *See—*
- Fiordalice, Robert W.; Maniar, Papu D.; Klein, Jeffrey L.; and Roman, Bernard J., 5,534,462, Cl. 437-190.000.

Klemmensen, Daniel F.: *See—*
- Schulz, Gerald O.; and Klemmensen, Daniel F., 5,534,568, Cl. 524-69.000.

Klendworth, Douglas D.: *See—*
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Klersy, Patrick: *See—*
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- Ovshinsky, Stanford R.; Strand, David A.; and Klersy, Patrick, 5,534,712, Cl. 217-3.000.

Kliklok Corporation: *See—*
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Kline, Bruce R.: *See—*
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Kline, Lourdes O.: *See—*
- Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.

Kline, Robert J.; Larsen, Thomas E.; Schiesl, Mark A.; and Tait, Bruce E., to Minnesota Mining and Manufacturing Company. Strand alignment devices for high speed winding of magnetic tape. 5,533,690, Cl. 242-547.000.

Klinger, Gary O.: *See—*
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Klingler, Horst, to MAN Roland Druckmaschinen AG. Device for controlling the sheet inlet when starting up a sheet-processing printing machine. 5,533,448, Cl. 101-233.000.

Klöckner-Moeller GmbH: *See—*
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Klüpfel, Olaf, to Maschinenfabrik Möllers GmbH u. Co. Apparatus for and method of palletizing unit loads. 5,533,861, Cl. 414-794.200.

Kluth, Joachim: *See—*
- Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.

Kluyskems, Dominique: *See—*
- Shama, Elie W.; Legrand, Bertrand; and Kluyskems, Dominique, 5,533,340, Cl. 62-45.100.

Knaack, David: *See—*
- Laurance, Megan E.; Knaack, David; Fiore, Deborah M.; and Hegre, Orion D., 5,534,404, Cl. 435-3.000.

Knapman, John M.: *See—*
- Ibbotson, John B.; Knapman, John M.; Bird, Colin L.; Chapman, Sydney G.; and Henderson, Ian, 5,535,286, Cl. 382-109.000.

Knapp, Kenneth M. Foam pig with scraper strips. 5,533,224, Cl. 15-104.610.

Knaup, Günter: *See—*
- Drauz, Karlheinz; Knaup, Günter; and Groeger, Ulrich, 5,534,538, Cl. 514-19.000.

Knepper, Jeffrey A.; Flackett, Dale R.; and Asirvatham, Edward T., to AlliedSignal Inc. Room temperature vulcanizable silicone compositions employing phenyl substituted tris-functional ketoxime silanes. 5,534,588, Cl. 524-730.000.

KNF Neuberger GmbH: *See—*
- Hauser, Erwin, 5,533,874, Cl. 417-360.000.
- Von Der Heyde, Richard; Becker, Erich; and Riedlinger, Heinz, 5,533,886, Cl. 418-1.000.

Knight, Jerry E.: *See—*
- Cahn, Charles R.; Keegan, Richard G.; Knight, Jerry E.; and Stansell, Thomas A., Jr., 5,535,278, Cl. 380-49.000.

Knight, Phillip D.: *See—*
- Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Bums, Paul A.; and Weber, Lynda D., 5,534,401, Cl. 430-558.000.

Knipper, Aloysius: *See—*
- Reznik, David; and Knipper, Aloysius, 5,533,441, Cl. 99-455.000.

Knott, Erwin: *See—*
- Friedmann, Günter; Wiehan, Helmut; and Knott, Erwin, 5,533,877, Cl. 417-477.100.

Knox, Andrew: *See—*
- Beeteson, John; and Knox, Andrew, 5,534,756, Cl. 315-370.000.

Ko, Minoru S. H.: *See—*
- Takano, Toshiya; and Ko, Minoru S. H., 5,534,419, Cl. 435-691.000.

Koashi, Katsue; and Minami, Shigeo, to Kurashiki Boseki Kabushiki Kaisha. Method and apparatus for non-invasive measurement of blood sugar level. 5,533,509, Cl. 128-633.000.

Kobayashi, Akira: *See—*
- Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.

Kobayashi Bokafuku Kabushiki Kaisha: *See—*
- Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, 5,534,338, Cl. 428-242.000.

Kobayashi, Ieyasu: *See—*
- Chuujou, Takao; Kobayashi, Ieyasu; Hamano, Hisashi; and Etchu, Masami, 5,534,323, Cl. 428-65.300.

Kobayashi, Katsumi: *See—*
- Aso, Kazuyoshi; Noguchi, Masami; Kobayashi, Katsumi; and Yamagishi, Takeshi, 5,534,128, Cl. 205-176.000.

Kobayashi, Makoto: *See—*
- Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasusbi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.

Kobayashi, Takahiro, to Kabushiki Kaisha Toshiba. Clock synchronization circuit and clock synchronizing method in baseband demodulator of digital modulation type. 5,535,252, Cl. 375-371.000.

Kobayashi, Takehiko: *See—*
- Sakamoto, Nobuyuki; Kobayashi, Takehiko; and Horiguchi, Takashi, 5,534,214, Cl. 264-333.000.

Kobayashi, Torataro: *See—*
- Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, 5,534,338, Cl. 428-242.000.

Kobayashi, Yasumi; Takeuchi, Kousuke; Hirao, Yasuhiro; and Shibata, Kenichi, to Sanyo Electric Co., Ltd. Antenna duplexer. 5,534,829, Cl. 333-126.000.

Kobayashi, Yasunori; Tanabe, Shin; Fukuda, Tatsuo; Miyazawa, Masazumi; Imai, Hideki; and Wani, Moriyuki, to Yokogawa Electric Corporation; and Mitsubishi Chemical Corporation. Equipment diagnosis system. 5,533,413, Cl. 73-865.900.

Koch, Albert F., III; and Prater, David M., to Hewlett-Packard Company. Real time ultrasound endocardial displacement display. 5,533,510, Cl. 128-660.070.

Koch, Frederick W.: *See—*
- Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., 5,534,039, Cl. 44-367.000.

Koch, Garrett S.: *See—*
- Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Ternullo, Luigi, Jr., 5,535,164, Cl. 365-201.000.

Koch, Richard C., to Alpha Enterprises, Inc. Combination computer and removable paper holder. 5,533,702, Cl. 248-442.200.

Kochi, Kiyoshi: *See—*
- Kaneko, Kazuo; Katayama, Masayasu; and Kochi, Kiyoshi, 5,534,786, Cl. 324-760.000.

Kodaira, Kazuho; Itoh, Yasuhito; and Watanabe, Tetsuya, to Sumitomo Heavy Industries, Ltd. Mold oscillation device capable of automatically adjusting an oscillation of a mold used in a continuous casting machine. 5,533,565, Cl. 164-416.000.

Kodama, Yukinori: *See—*
- Endo, Tetsuya; Mochizuki, Hirohiko; Kodama, Yukinori; and Takemae, Yoshihiro, 5,535,169, Cl. 365-230.030.

Koegel, Andrea M.: *See—*
- Manders, Ernest K.; Koegel, Andrea M.; and Mackay, Donald R., 5,534,026, Cl. 623-15.000.

Koenen, Howard P. Work glove and illuminator assembly. 5,535,105, Cl. 362-103.000.

Koenig, Stephen. Educational device employing game situation. 5,533,731, Cl. 273-243.000.

Koestner, Roland J.: *See—*
- Schiebel, Richard A.; Kinch, Michael A.; and Koestner, Roland J., 5,534,719, Cl. 257-188.000.

Koevoets, Christiaan H. J.: *See—*
- Bailly, Christiaan M. E.; and Koevoets, Christiaan H. J., 5,534,600, Cl. 525-397.000.

Koga, Teiichiro: *See—*
- Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.

Koga, Toshio: *See—*
- Ohki, Junichi; and Koga, Toshio, 5,534,926, Cl. 348-385.000.

Kogen, Hiroshi: *See—*
- Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.

Koglin, Dennis M.; and Kearney, Mark B., to Delco Electronics Corporation. Programmable transducer amplifier circuit. 5,534,816, Cl. 327-513.000.

Kogo, Takashi: *See—*
- Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.

Koh, Yoshihiro, to NEC Corporation. Video signal interface. 5,534,883, Cl. 345-3.000.

Kohara, Takao: *See—*
- Nezu, Takashi; Matsumoto, Kenjiro; Kohara, Takao; Sakai, Hiroshi; and Uchiyama, Masaaki, 5,533,597, Cl. 188-319.000.

Kohara, Yuji: *See—*
- Hachiya, Tadashi; Takahashi, Yukitoshi; and Kohara, Yuji, 5,533,450, Cl. 101-365.000.

Köhler, Manfred: *See—*
- Leppard, David G.; Köhler, Manfred; and Misev, Ljubomir, 5,534,559, Cl. 522-64.000.

Kohno, Yasutaka, deceased (by Yoko Kohno, heir/legal representative): *See—*
- Nakanishi, Mamiko; Kohno, Yasutaka, deceased, 5,534,452, Cl. 437-40.00R.

Kohno, Yoko, heir/legal representative: *See—*
- Nakanishi, Mamiko; Kohno, Yasutaka, deceased, 5,534,452, Cl. 437-40.00R.

Kohriyama, Tetsuo: *See—*
- Hikita, Hiroshi; Kohriyama, Tetsuo; Nozawa, Yutaka; and Sugino, Yoshito, 5,534,307, Cl. 427-421.000.

Kohus, Louis M.; Henning, John C.; Huang, Chow-Chi; and Walter, Glen V. Pet habitat with enhanced viewing. 5,533,466, Cl. 119-459.000.

Koide, Takeharu: *See—*

Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.

Koike, Hiroyuki: *See—*

Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.

Koike, Yukiya: *See—*

Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, 5,534,255, Cl. 424-141.100.

Koishi, Musubu: *See—*

Takeshima, Akira; Koishi, Musubu; Warashina, Yoshihisa; and Mizushima, Yoshihiko, 5,534,992, Cl. 356-5.100.

Takeshima, Akira; and Koishi, Musubu, 5,535,044, Cl. 359-245.000.

Koishikawa, Naomi: *See—*

Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, 5,534,643, Cl. 554-227.000.

Koitabashi, Noribumi: *See—*

Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, 5,534,898, Cl. 347-33.000.

Koito Manufacturing Co., Ltd.: *See—*

Iiyama, Katsuhiko; and Nishizawa, Takaaki, 5,535,103, Cl. 362-66.000.

Koiwa, Masaichi, to Hitachi Construction Machinery Co., Ltd. Method and apparatus for nondestructive testing of physical characteristics of a specimen using ultrasonic waves. 5,533,411, Cl. 73-598.000.

Koizumi, Kaoru: *See—*

Miyoshi, Tetsuo; Hozumi, Yuuji; Yamagishi, Akira; and Koizumi, Kaoru, 5,534,695, Cl. 250-330.000.

Kojima, Hiroyuki: *See—*

Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.

Kojima, Masakatu: *See—*

Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.

Kojima, Masami: *See—*

Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.

Kojima, Shoichi: *See—*

Sanjoh, Minako; Kojima, Shoichi; and Sueda, Naomichi, 5,535,304, Cl. 395-62.000.

Kojima, Tetsuro: *See—*

Ishikawa, Takatoshi; Ueda, Shinji; Sasaki, Hirotomo; and Kojima, Tetsuro, 5,534,394, Cl. 430-393.000.

Kojima, Yasushi: *See—*

Hasegawa, Kazuhiro; Takahashi, Kenji; and Kojima, Yasushi, 5,534,191, Cl. 252-301.40H.

Kokawa, Katsuzo; Yamamoto, Katsuhiko; Sakurabu, Tatsuki; Imabayashi, Satoshi; and Tao, Muneo, to Matsushita Electric Industrial Co., Ltd. Heat transfer apparatus. 5,533,669, Cl. 237-1.0SL.

Kokko, Marko: *See—*

Alatalo, Hannu; and Kokko, Marko, 5,535,203, Cl. 370-66.000.

Kolb, Markus: *See—*

Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, 5,534,566, Cl. 524-27.000.

Kolchinsky, Alexander. Virtual processor module including a reconfigurable programmable matrix. 5,535,406, Cl. 395-800.000.

Komamura, Kouichi: *See—*

Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,534,045, Cl. 75-243.000.

Komarek, Dale W.; Moser, Paul; and Wroblewski, George T., Sr., to Hexacomb Corporation. Method and apparatus for manufacturing articles employing folded honeycomb panels. 5,533,956, Cl. 493-355.000.

Komissarova, Irina A.: *See—*

Dobrotvorsky, Anatoly E.; Rozputnyak, Yaroslav A.; Khuchua, Galina N.; and Komissarova, Irina A., 5,534,262, Cl. 424-464.000.

Komiya, Kaoru: *See—*

Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, 5,534,643, Cl. 554-227.000.

Komori, Hideki: *See—*

Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.

Kondo, Hiroshi; Ishizuka, Kou; Ishii, Satoshi; and Kaneda, Yasushi, to Canon Kabushiki Kaisha. Optical displacement detection apparatus employing diffraction gratings and a reference position sensor located on the scale. 5,534,693, Cl. 250-237.00G.

Kondo, Masaya: *See—*

Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.

Kondo, Tetsujiro, to Sony Corporation. Encoding method and apparatus of digital video signal. 5,534,931, Cl. 348-420.000.

Kondo, Tetsusai; and Matsui, Haruhiko, to Kabushiki Kaisha Kawai Gakki Seisakusho. Automatic performing system capable of detection and correction of errors in performance information. 5,535,224, Cl. 371-32.000.

Kondo, Yuji: *See—*

Mouri, Akihiro; Shibata, Tsuyoshi; and Kondo, Yuji, 5,533,452, Cl. 101-463.100.

Kondoh, Harufusa, to Mitsubishi Denki Kabushiki Kaisha. Priority processing of ATM cells using shift register stages. 5,535,202, Cl. 370-60.100.

Kondou, Toyoo, to NEC Corporation. Phase locked loop (PLL) circuit having variable loop filter for shortened locking time. 5,534,823, Cl. 331-16.000.

Kondou, Yoshimasa; Hanaoka, Masaaki; Nakamura, Shinji; and Doi, Fumiaki, to Seiko Epson Corporation. Method for automatically setting the internal and external port configuration of a computer system. 5,535,415, Cl. 395-828.000.

Konica Corporation: *See—*

Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.

Hirabayashi, Shigeto; and Sugita, Shuichi, 5,534,400, Cl. 430-558.000.

Koshizuka, Kunihiro; Kitamura, Shigehiro; Takimoto, Masataka; and Kawamura, Tomonori, 5,534,372, Cl. 430-10.000.

Takaki, Kouichi; Azumai, Mitsuo; and Ishii, Hiroshi, 5,534,808, Cl. 327-261.000.

Konicek, Jiri D.: *See—*

Zupancic, Joseph J.; Conrad, Jeffrey P.; Konicek, Jiri D.; and Tungare, Aroon V., 5,534,565, Cl. 523-454.000.

König, Klaus: *See—*

Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.

Konishi, Hiroo, to Hitachi, Ltd. Control equipment for high voltage direct current transmission system with equipment of self-commutated converter. 5,535,113, Cl. 363-35.000.

Konishi, Jin-emon; and Hamada, Giichi, to Nippon Zoki Pharmaceutical Co., Ltd. Pharmaceutical composition regulating function of a living body. 5,534,509, Cl. 514-210.000.

Koons, John J., to Heraeus Amersil, Inc. Vertical boat for holding semiconductor wafers. 5,534,074, Cl. 118-728.000.

Koopman, Philip J.; and Brajczewski, David C., to Otis Elevator Company. Implicit token media access protocol without collision detection. 5,535,212, Cl. 370-85.600.

Koppa, Daniel A.: *See—*

Pappas, Chris; Koppa, Daniel A.; Skeels, Roger E.; and Aquino, Agostino, 5,534,281, Cl. 426-383.000.

Kopper, David J., to Data General Corporation. Apparatus and method for copying and restoring disk files. 5,535,381, Cl. 395-600.000.

Korbonits, Dezso: *See—*

Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.

Körner, André; and Wostmann, Reinhard, to Hella KG Hueck & Co. Electrical connector. 5,533,910, Cl. 439-395.000.

Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, to Morton International, Inc. Hybrid inflator with elongated housing and center discharge. 5,533,751, Cl. 280-737.000.

Korycan, George M.: *See—*

Joglekar, Manohar A.; Cramer, Joseph F., Jr.; and Korycan, George M., 5,535,258, Cl. 379-58.000.

Kosaka, Nobuyuki: *See—*

Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.

Koshimura, Masami: *See—*

Tsunoda, Masakiyo; Nakajima, Hiroaki; and Koshimura, Masami, 5,534,843, Cl. 338-22.00R.

Koshizuka, Hiroshi; and Kanatake, Takashi, to Shinmikuni Kikai Ltd. Monitoring sub-micron particles. 5,534,999, Cl. 356-338.000.

Koshizuka, Kunihiro; Kitamura, Shigehiro; Takimoto, Masataka; and Kawamura, Tomonori, to Konica Corporation. IC card having image information. 5,534,372, Cl. 430-10.000.

Kostreski, Bruce W., to Bell Atlantic Network Services, Inc. Extended range video on demand distribution system. 5,534,912, Cl. 348-6.000.

Kotikian, Jacklin: *See—*

Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin, 5,535,393, Cl. 395-700.000.

Kotlarek, Peter A.: *See—*

Crum, Daniel R.; Simmons, Bill P.; Teegarden, Arlo F.; Rood, Jerry A.; and Kotlarek, Peter A., 5,533,875, Cl. 417-368.000.

Koura, Masato, to Mitsubishi Denki Kabushiki Kaisha. Timer apparatus capable of writing identical data to a plurality of timers built in a microcomputer. 5,535,379, Cl. 395-550.000.

Kovalev, Igor E.: *See—*

Aston, Roger; and Kovalev, Igor E., 5,534,492, Cl. 514-8.000.

Kowalski, Jacek; and Sureaud, Jean, to Gemplus Card International. Twin-contact chip card and method of communication with a card reader. 5,534,686, Cl. 235-492.000.

Kozak, Burton. Fastener driving tool insert. 5,533,429, Cl. 81-439.000.

Kozel, Charles A.; and Pearson, Nels G., to Methode Electronics, Inc. Electronic module socket with self-cleaning shorting contacts. 5,533,907, Cl. 439-188.000.

Kraemer, Richard J.: *See—*

Platter, Sanford; Aldred, Jeffrey K.; and Kraemer, Richard J., 5,534,145, Cl. 210-90.000.

Krapp, Hans-Dieter; Hanek, Martin; and Frings, Hubert, to U.S. Philips Corporation. Lamp/reflector unit. 5,534,742, Cl. 313-113.000.

Kratky, Bernard A., to University of Hawaii. Non-circulating hydroponic plant growing system. 5,533,299, Cl. 47-18.000.

Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., to 3Com Corporation. Multifunction network station with network addresses for functional units. 5,535,338, Cl. 395-200.200.

Krause, Siegfried; and Kiriazis, Leonidas, to BASF Lacke + Farben, AG. Metal/plastics composite containing inorganic fillers and processes for the production thereof. 5,534,582, Cl. 524-441.000.

Krauskopf, Leonard G.: *See—*

Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., 5,534,652, Cl. 560-98.000.

Kreimer-Birnbaum, Martha: *See—*

Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, 5,534,506, Cl. 514-185.000.

Kreisinger, Robert D.; Burns, Arthur G.; and Fernandez, Jose M., to Motorola, Inc. Battery with memory for storing charge procedure. 5,534,765, Cl. 320-30.000.

Kremsdorf, Dina: *See—*

Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,534,439, Cl. 435-320.100.

Kremser, Hannes: *See—*

Kausel, Wilfried; Kremser, Hannes; Stallbaumer, Hermann; and Winkler, Werner, 5,535,273, Cl. 379-399.000.

Krieger, Joseph P., to JTJ Systems, Inc. Portable wastewater treatment method. 5,534,159, Cl. 210-704.000.

Kriegsman, Daniel S.: *See—*

Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S., 5,534,865, Cl. 341-176.000.

Kriegsman, Edward M.: *See—*

Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S., 5,534,865, Cl. 341-176.000.

Kriegsman, Irving M.; Kriegsman, Edward M.; and Kriegsman, Daniel S. Ergonomic wireless remote control transmitter for use with consumer entertainment electronics appliance. 5,534,865, Cl. 341-176.000.

Krischer, Ellen L.: *See—*

Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.

Krishnakumar, Suppayan M.: *See—*

Collette, Wayne N.; and Krishnakumar, Suppayan M., 5,533,881, Cl. 425-525.000.

Krivoshlykov, Sergej G.: *See—*

Kamuz, Alexander M.; Krivoshlykov, Sergej G.; and Oleksenko, Pavel F., 5,535,294, Cl. 385-25.000.

Kroll, Mark W.; and Brewer, James E., to Angeion Corporation. Method and apparatus for generating biphasic waveforms in an implantable defibrillator. 5,534,015, Cl. 607-7.000.

Kronberger, Maximilian, to Robert Bosch GmbH. Fuel Injection system. 5,533,481, Cl. 123-299.000.

Kröner, Hubertus: *See—*

Aydin, Oral; Kröner, Hubertus; Wistuba, Eckehardt; and Fickeisen, Peter, 5,534,571, Cl. 524-272.000.

Krones AG: *See—*

Ahlers, Egon, 5,533,552, Cl. 141-144.000.

Kronmiller, David L.: *See—*

Netwig, Craig L.; and Kronmiller, David L., 5,534,146, Cl. 210-490.000.

Krosner, Stephen P.: *See—*

Elder, David B.; Krosner, Stephen P.; Miller, Paul E.; and Skinner, Harold R., 5,535,389, Cl. 395-700.000.

Kroy, Inc.: *See—*

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Kruegeer, William J.: *See—*

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Krug, Heidrun; Kunert, Jürgen; Schoon, Jürgen; and Walter, Horst, to Esselte Meto International Produktions GmbH. Thermal printer for printing labels. 5,534,890, Cl. 346-100.000.

Krull, Mark A.: *See—*

Fletcher, James R.; and Krull, Mark A., 5,533,697, Cl. 248-146.000.

Krupey, John, to Affinity Technology, Inc. Water insoluble cross-linked acid compositions. 5,534,597, Cl. 525-327.600.

Krupp Kautex Maschinenbau GmbH: *See—*

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Kruse, Martin: *See—*

Epple, Anton; Pfeiffer, Martin; Kruse, Martin; and Volz, Wolfgang, 5,533,779, Cl. 296-192.000.

Kruzick, Kent, to Galbreath, Inc. Waste handling container with sliding lid. 5,533,643, Cl. 220-331.000.

Kubisiak, David: *See—*

Bonne, Ulrich; Honda, Nobuaki; Kubisiak, David; and Ohnstein, Thomas R., 5,533,393, Cl. 73-355.020.

Kobo, Hirotsugu: *See—*

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Kubo, Mitsumasa: *See—*

Miura, Tohru; Kubo, Mitsumasa; and Mashimo, Akira, 5,535,183, Cl. 369-32.000.

Kubo, Takahiro, to Canon Kabushiki Kaisha. Image forming apparatus having a transfer member cleaning device. 5,534,983, Cl. 355-271.000.

Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, to Kabushiki Kaisha Toshiba. Process for producing Semiconductor silicon wafer. 5,534,294, Cl. 427-255.000.

Kubota Corporation: *See—*

Kaba, Takahiro; Nishi, Takashi; and Mitsuhashi, Tsuyoshi, 5,534,353, Cl. 428-552.000.

Kubushiki Kaisha Riken: *See—*

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Kuehnle, Manfred R.; and Statz, Hermann, to Kuehnle, Manfred R. Composite media with selectable radiation-transmission properties. 5,534,056, Cl. 106-455.000.

Kuhn, Karl J.: *See—*

Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, 5,534,566, Cl. 524-27.000.

Kukimoto, Tsutomu: *See—*

Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.

Sakaizawa, Katsuhiro; Urawa, Motoo; Kukimoto, Tsutomu; and Yoshida, Satoshi, 5,534,982, Cl. 355-246.000.

Kuklo, Anthony, Jr.: *See—*

Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.

Kukol, Peter: *See—*

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Kuleza, John E.: *See—*

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Kumagai, Toshio: *See—*

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Kumai, Hiroyuki: *See—*

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Kumano, Tomoyuki: *See—*

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Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.

Kumkoski, James M.: *See—*

Karlow, James P.; Kumkoski, James M.; Boumarafi, Mohamed; and Hurford, Jonathan P., 5,533,750, Cl. 280-730.200.

Kundel, Robert. Modular trench box sheeting. 5,533,838, Cl. 405-282.000.

Kunert, Heinz. Frameless insulating glazing unit and a method for the production thereof. 5,533,314, Cl. 52-788.100.

Kunert, Jürgen: *See—*

Krug, Heidrun; Kunert, Jürgen; Schoon, Jürgen; and Walter, Horst, 5,534,890, Cl. 346-100.000.

Kung, Steven C.; and Gleixner, Richard A., to Babcock & Wilcox Company, The. Induction heating of diffusion coatings. 5,534,313, Cl. 427-543.000.

Kunkel, Wolfgang: *See—*

Birkenbeil, Hans; Brand, Ulrich; Goor, Gustaaf; and Kunkel, Wolfgang, 5,534,149, Cl. 210-636.000.

Kuno, Koichi; and Mifune, Hiroyuki, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic material. 5,534,402, Cl. 430-596.000.

Kunst, David J.: *See—*

Smith, Gregory J.; and Kunst, David J., 5,534,788, Cl. 324-771.000.

Kuo, Po C.; Huang, Jin H.; and Chen, Shang C., to National Science Council of Republic of China. Method for producing Mn-Al thin films. 5,534,080, Cl. 148-121.000.

Kupfer, Rainer: *See—*

Bildhauer, Michael; Kupfer, Rainer; Siebott, Günther; Mees, Bernhard; and Friedrich, Herbert, 5,534,604, Cl. 526-253.000.

Kuramoto, Manabu: *See—*

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Kurita, Yasuyuki: *See—*
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Kuroda, Katsuya, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicle door lock device with super lock mechanism. 5,534,846, Cl. 340-426.000.
Kuroda, Kouichi; Imamura, Youichi; Nakasuji, Kazuyuki; and Hayashi, Chihiro, to Sumitomo Metal Industries, Ltd. Tube rolling method and apparatus. 5,533,370, Cl. 72-12.500.
Kuroiwa, Takeharu: *See—*
Okudaira, Tomonori; Kuroiwa, Takeharu; Fujiwara, Nobuo; and Kashihara, Keiichiro, 5,534,458, Cl. 437-52.000.
Kurokami, Yuzo, to NEC Corporation. Digital radio communication system. 5,535,248, Cl. 375-324.000.
Kurokawa, Masuyoshi, to Sony Corporation. Electronic processor for performing multiplication. 5,535,151, Cl. 364-760.000.
Kurokawa, Osamu; and Sawa, Buntaro, to Kabushiki Kaisha Toshiba. Hands-free circuitry providing audio signal adjustment based on speaker volume value. 5,535,433, Cl. 455-79.000.
Kuroyanagi, Akira: *See—*
Tsuzuki, Yasuaki; Kuroyanagi, Akira; and Nishizawa, Toshiaki, 5,534,454, Cl. 437-41.000.
Kusaka, Yosuke, to Nikon Corporation. Focus detecting device having light distribution detection. 5,534,688, Cl. 250-201.800.
Kusaka, Yukio: *See—*
Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, 5,534,477, Cl. 503-227.000.
Kusakabe, Yoshihiko: *See—*
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Kusamoto, Nobuo: *See—*
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Kusayama, Yosio, to Hitachi, Ltd. Feed water supply system of power plant. 5,533,337, Cl. 60-656.000.
Kussendrager, Klaas D.: *See—*
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Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, to Canon Kabushiki Kaisha. Method of treating active material. 5,534,069, Cl. 118-719.000.
Kuwabara, Nobuyuki: *See—*
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Kuwajima, Tetsuya, to Yamaha Corporation. Method for manufacturing a semiconductor device having planarized wiring. 5,534,461, Cl. 437-189.000.
Kuwashima, Tetsuhito: *See—*
Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
Kuwata, Tamotsu: *See—*
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Kyokado Engineering Co., Ltd.: *See—*
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Kyoto Dai-Ichi Kagaku Co., Ltd.: *See—*
Ueda, Hideo; Hiromoto, Mitsuo; Gang, Meng; and Yamasaki, Yutaka, 5,533,513, Cl. 128-719.000.
Laapotti, Jorma: *See—*
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Lach, Patrick: *See—*
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Ladner, David W.: *See—*
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,483, Cl. 504-221.000.
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,484, Cl. 504-235.000.
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,485, Cl. 504-246.000.
Ladner, Robert C.; Bird, Robert E.; and Hardman, Karl, to Enzon Labs, Inc. Immunoaffinity purification methods using single polypeptide chain binding molecules. 5,534,621, Cl. 530-413.000.
Ladouceur, Harold A., to Multifastener Corporation. Self-adjusting head for impacting fasteners into a panel. 5,533,250, Cl. 29-702.000.
La Fiandra, Carlo; and Shen, Gon-Yen, to Hughes Aircraft Company. Replaceable actuator assembly for optical mirror with kinematic mount. 5,535,043, Cl. 359-224.000.
Lafond, André; and Laliberte, Gérard, to 2986647 Canada Inc. Biological specimen cassette. 5,533,642, Cl. 220-326.000.
Lagerlef, David L.: *See—*
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Lagrange, Alain: *See—*
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Junino, Alex; Genet, Alain; and Lagrange, Alain, 5,534,037, Cl. 8-411.000.
LaGrone, Bobby D., to U.S. Rubber Reclaiming, Inc. Process to grind thermoset or thermoplastic materials. 5,533,680, Cl. 241-23.000.
Lahey Clinic Medical Center: *See—*
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Lahm, William; and Stevens, Timothy A., to Becton, Dickinson and Company. Thermoform dish insert. 5,534,227, Cl. 422-102.000.
Lai, Po-Shen: *See—*
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Laing, Simon G.; and Bowcock, Matthew P., to Security Domain Pty. Ltd. Method and system for secure, decentralized personalization of smart cards. 5,534,857, Cl. 340-825.340.
Lainiere de Picardie S.A.: *See—*
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Laliberte, Gérard: *See—*
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Lam, Clive C.; Curtis, William W., Jr.; and Grubbs, Roy C., to ICO, Inc. Method and apparatus for noncontact magnetic particle stray magnetic flux testing of cylindrical members. 5,534,775, Cl. 324-216.000.
Lam Research Corporation: *See—*
Lenz, Eric H.; and Brumbach, Henry, 5,534,110, Cl. 156-643.100.
Lenz, Eric H.; and Dible, Robert D., 5,534,751, Cl. 315-111.710.
Lamaster, Kenneth R.: *See—*
Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
Lamb-Grays Harbor Co.: *See—*
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Lambert, Gary F. Quick mount picture frame. 5,533,288, Cl. 40-754.000.
Lamming, Michael G., to Xerox Corporation. Real time user indexing of random access time stamp correlated databases. 5,535,063, Cl. 360-4.000.
Lamoureux, Laurent J. Expandable scaffold for hopper. 5,533,592; Cl. 182-128.000.
Lan, James: *See—*
Grochowski, Edward; Zaidi, Ahmad; and Lan, James, 5,535,347, Cl. 395-375.000.
Lancia, Frederick N. Bird feeding station. 5,533,467, Cl. 119-57.900.
Lander, Jack R., to United States Surgical Corporation. Trocar assembly with rotatable tip. 5,534,009, Cl. 606-185.000.
Landers, Robert J.: *See—*
Mahant-Shetti, Shivaling S.; and Landers, Robert J., 5,535,241, Cl. 375-219.000.
Landi, Curtis L.; Wilson, Susan L.; and Huber, Michael S., to Supracor Systems, Inc. Flexible ballistic resistant article having a thermoplastic elastomeric honeycomb panel. 5,534,343, Cl. 428-313.500.
Landsman, Howard A.: *See—*
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Lane, Alan J.: *See—*
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Lane, Thomas R.: *See—*
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Lang, Wilfried: *See—*
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Langenfelder, Frank: *See—*
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Langer, Hans J.; and Reichle, Johannes, to EOS GmbH Electro Optical Systems. Method and apparatus for production of three-dimensional objects. 5,534,104, Cl. 156-275.500.
LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., to Texas Instruments Incorporated. Method and system for a multi channel and search global position system signal processor. 5,535,237, Cl. 375-200.000.
Lareau, Albert F.: *See—*
Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., 5,534,057, Cl. 106-486.000.
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Larsen, Thomas E.: *See—*
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Larson, Michael W.: *See—*
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Larson, Pamela E.; and Nulty, John D., to Chrysler Corporation. Front crossmember assembly for a motor vehicle. 5,533,780, Cl. 296-194.000.
Larsson, Ake; and Uno, Kiyoshi, to Gambro KK. Process for preparing a stock solution composition for a medical treatment, and a soft bag having a magnetic stirrer to be used in the preparation of said stock solution composition. 5,533,804, Cl. 366-274.000.
Larvoire, Jean-François; Ribollet, Thierry; and Hays, Bertrand, to Hewlett-Packard Company. Apparatus for and method of preventing changes of computer configuration data by unauthorized users. 5,535,409, Cl. 395-800.000.
Lary, Jenifer E.: *See—*
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Laser Power Corporation: *See—*
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Laube, Samuel J. P.; and Stark, Elizabeth F., to United States of America, Air Force. Hierarchical feedback control of pulsed laser deposition. 5,535,128, Cl. 364-468.260.
Lauener Engineering, Ltd.: *See—*
Frischknecht, Bruno; Messerli, Peter; Fankhauser, Daniel; Roder, Rudolf; and Eigel, Rolf, 5,533,371, Cl. 72-21.100.
Laughlin, Raymond S.; and Golonka, Kenneth A., Sr., to Erico International Corp. Conduit clip. 5,533,696, Cl. 248-74.200.
Laurance, Megan E.; Knaack, David; Fiore, Deborah M.; and Hegre, Orion D., to CytoTherapeutics, Inc. Glucose responsive insulin secreting β-cell lines and method for producing same. 5,534,404, Cl. 435-3.000.
Lauw, Hiang P., to Hewlett-Packard Company. Specific dye set for thermal ink-jet printing. 5,534,051, Cl. 106-22.00R.
Lavigne, Gilles; and TenBokum, Léo, to Université de Montréal. Algometry management system. 5,533,514, Cl. 128-744.000.
Law, Wai L.: *See—*
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Lawson, Gerald P.; Ryan, Thomas A.; and Puetz, Gary R., to DCM Tech, Inc. Angle milling indicator. 5,533,273, Cl. 33-534.000.
Lawton, Arthur R., to Synectic Technology, Inc. Method and apparatus for controlling the temperature of cargo within a container. 5,533,275, Cl. 34-433.000.
Lawton, Craig M.: *See—*
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Layton, Allen C., to Oerlikon-Contraves AG. Beamrider guidance system using digital phase modulation encoding. 5,533,692, Cl. 244-3.130.
Lazarus, John P.: *See—*
Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
Le, Duy K., to AT&T Corp. Method and apparatus for controlling a plurality of systems via a boundary-scan port during testing. 5,535,222, Cl. 371-22.300.
Leach, Jerald G.; Coomes, Joseph A.; Marshall, Steve P.; and Simar, Laurence R., to Texas Instruments Incorporated. Block instruction. 5,535,348, Cl. 395-375.000.
Leake, Jonathan S., to Courtaulds PLC. Aminotriazine phosphonates in plastics. 5,534,573, Cl. 524-100.000.
Lear Corporation: *See—*
Fasano, Clarice; and Frelich, Jeffrey J., 5,534,097, Cl. 156-214.000.
Lebby, Michael S.; Blair, Thomas H.; and Witting, Gary F., to Motorola. Electronic book. 5,534,888, Cl. 345-121.000.
Lederle (Japan), Ltd.: *See—*
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Lee, Anson; and Pyko, Jan S., to Chrysler Corporation. Combustion detection via ionization current sensing for a "coil-on-plug" ignition system. 5,534,781, Cl. 324-380.000.
Lee, Daniel R.: *See—*
Gruskin, Elliott A.; Lee, Daniel R.; and Brown, Lloyd S., 5,534,288, Cl. 427-2.310.
Lee, Han-Chen: *See—*
Petersen, Robert V.; Hsu, Tsung-Min; Lee, Han-Chen; and Christy, Don, 5,534,260, Cl. 424-448.000.
Lee, Jae C.: *See—*
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Lee, James S.: *See—*
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Lee, Kai-Fu: *See—*
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Lee, Kenneth R. Book cover corner guard. 5,533,758, Cl. 281-20.000.
Lee, Kung H., to Du Pont de Nemours, E. I., and Company. Process for separating and recovering halocarbons from mixtures thereof. 5,534,151, Cl. 210-640.000.
Lee, KwyRo; Shur, Michael; and Jones, Stephen H., to Samsung Electronics Co., Ltd. Optoelectronic circuit including heterojunction bipolar transistor laser and photodetector. 5,535,231, Cl. 372-50.000.
Lee, Larry C. Y.: *See—*
Lee, Wade, 5,534,850, Cl. 340-565.000.
Lee, Lawrence J., Sr. Mold and method for making variable hardness castings. 5,533,563, Cl. 164-127.000.
Lee, Linda Q.: *See—*
Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin, 5,535,393, Cl. 395-700.000.
Lee, Michael. Keyboard structure for mobile computers. 5,535,091, Cl. 361-680.000.
Lee, Roanne A.: *See—*
Rivers, Craig J.; Lee, Roanne A.; and Jones, Glenn E., 5,534,663, Cl. 174-35.0GC.
Lee, Robert: *See—*
Cann, Ronald; Cann, Steve; Lee, Robert; and Haggerty, Kevin J., 5,533,955, Cl. 493-342.000.
Lee, Ron C.; Heil, Michael D.; Downey, Michael T.; and Barrasso, Michael J., to BOC Group, Inc., The. Cryogenic vapor recovery process and system. 5,533,338, Cl. 62-638.000.
Lee, Sang-in; and Park, Chang-soo, to Samsung Electronics Co., Ltd. Method for forming a wiring layer. 5,534,463, Cl. 437-195.000.
Lee, Seogyul: *See—*
Bae, Byungseong; Kim, Kyungseop; Yoon, Wonbong; and Lee, Seogyul, 5,535,028, Cl. 359-61.000.
Lee, Steven S.: *See—*
Phillips, Joseph E.; Oskorep, John J.; and Lee, Steven S., 5,534,860, Cl. 341-22.000.
Lee, Suk-jung: *See—*
Kim, Suk-ki; An, Hyeong-keon; Joo, Tae-sik; and Lee, Suk-jung, 5,535,356, Cl. 395-430.000.
Lee, Tong Y.; and Kao, Jack. Picture frame with sound producing means. 5,533,290, Cl. 40-717.000.
Lee, Vincent H.; and Yen, Wan-Ching, to University of Southern California. Methods and compositions to enhance epithelial drug transport. 5,534,496, Cl. 514-17.000.
Lee, Wade, to Lee, Larry C. Y. Transient control circuit for occupancy detector. 5,534,850, Cl. 340-565.000.
Lee, Whay C., to Motorola, Inc. Method for efficient aggregation of link metrics. 5,535,195, Cl. 370-54.000.
Lee, Young-Jin: *See—*
Song, Il-Cheon; Kim, Sang-Il; and Lee, Young-Jin, 5,534,215, Cl. 264-345.000.
Legare, Richard J.: *See—*
Gupta, Rakesh K.; and Legare, Richard J., 5,534,340, Cl. 428-286.000.
Leger, Alain: *See—*
Barbier, Bruno; Lach, Patrick; and Leger, Alain, 5,534,689, Cl. 250-206.200.
Leger, Jean-Michel; and Guttin, Christophe, to Commissariat A l'Energie Atomique. Coupled radio frequency field and light polarization magnetometer. 5,534,776, Cl. 324-304.000.
Leglaye, Dominique: *See—*
Duchemin, Pierre; Baurand, Gilles; and Leglaye, Dominique, 5,534,832, Cl. 335-16.000.
Legrand, Bertrand: *See—*
Shama, Elie W.; Legrand, Bertrand; and Kluyskems, Dominique, 5,533,340, Cl. 62-45.100.
Lehmann, Volker; and Marin, Heiner, to Siemens Aktiengesellschaft. Electric high-voltage circuit breaker. 5,534,673, Cl. 218-68.000.
Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, to Compagnie Oris Industrie, SA. Rare earth cryptates, processes for their preparation, synthesis intermediates and application as fluorescent tracers. 5,534,622, Cl. 534-15.000.
Lehnert, Otto: *See—*
Wagner, Reiner; and Lehnert, Otto, 5,533,233, Cl. 16-228.000.
Leibowitz, Lawrence M.; and Mai, Tuan A., to United States of America, Navy. System for (N•M)-bit correlation using N M-bit correlators. 5,535,402, Cl. 395-800.000.
Leidheiser, Henry, Jr.: *See—*
Bilder, Wayne H.; Granata, Richard D.; and Leidheiser, Henry, Jr., 5,534,289, Cl. 427-8.000.
Leigh, Todd A.; Sasuta, Michael D.; and Hefferan, John K., to Motorola, Inc. Method and apparatus for moving primary control of a call in a multiple site communication system. 5,535,426, Cl. 455-34.100.

- Leinen, Carolyn: *See—*
  - Leinen, James A., Sr.; Leinen, Carolyn; Leinen, James A., Jr.; and Leinen, Tammy M., 5,533,732, Cl. 273-375.000.
- Leinen, James A., Jr.: *See—*
  - Leinen, James A., Sr.; Leinen, Carolyn; Leinen, James A., Jr.; and Leinen, Tammy M., 5,533,732, Cl. 273-375.000.
- Leinen, James A., Sr.; Leinen, Carolyn; Leinen, James A., Jr.; and Leinen, Tammy M. Instant response target system. 5,533,732, Cl. 273-375.000.
- Leinen, Tammy M.: *See—*
  - Leinen, James A., Sr.; Leinen, Carolyn; Leinen, James A., Jr.; and Leinen, Tammy M., 5,533,732, Cl. 273-375.000.
- Leineweber, Willi: *See—*
  - Schimion, Werner; and Leineweber, Willi, 5,534,155, Cl. 210-695.000.
- Leining, Richard B., to United States of America, Air Force. Dosimeter capsule indicating service life of a rocket motor. 5,534,090, Cl. 149-15.000.
- Lelkes, Anthony; and Reid, Larry. Floor and baseboard treatment machine. 5,533,222, Cl. 15-4.000.
- Lemasa, George L.: *See—*
  - Johnson, Michael G.; and Lemasa, George L., 5,535,061, Cl. 359-872.000.
- Lemna Corporation, The: *See—*
  - McAnaney, David W.; and Dorner, John R., 5,534,141, Cl. 210-110.000.
- Lenz, Eric H.; and Brumbach, Henry, to Lam Research Corporation. Shadow clamp. 5,534,110, Cl. 156-643.100.
- Lenz, Eric H.; and Dible, Robert D., to Lam Research Corporation. Plasma etching apparatus utilizing plasma confinement. 5,534,751, Cl. 315-111.710.
- Leonard, Timothy J.; and Anderson, Daniel W., to Morton International, Inc. Apparatus for improved detachment of the deployment door of an airbag assembly. 5,533,749, Cl. 280-728.300.
- Leppard, David G.; Köhler, Manfred; and Misev, Ljubomir, to Ciba-Geigy Corporation. Daylight curing compositions containing bisacylphosphine oxide photoinitiators. 5,534,559, Cl. 522-64.000.
- Lerner, Jeremy: *See—*
  - Petersen, Joel; and Lerner, Jeremy, 5,534,386, Cl. 430-320.000.
- Lerner, Richard A.: *See—*
  - Moriarty, Ann M.; Alexander, Hannah; and Lerner, Richard A., 5,534,405, Cl. 435-5.000.
- Leroux, Thierry; and Meyer, Robert, to Commissariat a l'Energie Atomique. Micropoint emissive cathode electron source and field emission-excited cathodoluminescence display means using said source. 5,534,744, Cl. 313-309.000.
- Lesieur, Daniel: *See—*
  - Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
- Leska, Paul J., Sr.: *See—*
  - Haeg, Steven R.; Leska, Paul J., Sr.; and Zieman, Ricky L., 5,533,403, Cl. 73-669.000.
- Lesmann, Jörg; and Schäfer, Hermann G., to CG-Chemie GmbH. 1,3,5-triazine-2,4,6-tris-alkylaminocarboxylic acid amino esters, biocidal agents containing such esters, and methods of preparing them. 5,534,624, Cl. 544-196.000.
- Lessick, Nicolas P. Self-tensioning tailgate barrier. 5,533,773, Cl. 296-52.000.
- Leu, Paul. Golf club head. 5,533,729, Cl. 473-346.000.
- Leung, Chak M., to Read-Rite Corporation. Disk drive apparatus having up and down head supsensions independently loadable into a space between immediately adjacent disks. 5,535,074, Cl. 360-104.000.
- Leuthold, Hans; Jennings, David J.; Heine, Gunter; and Nagarathnam, Lakshman, to Seagate Technology, Inc. Single plate hydrodynamic bearing with self-balancing fluid level. 5,533,812, Cl. 384-112.000.
- Le Van Suu, Maurice G., to SGS-Thomson Microelectronics, S.A. Device for the connection of an apparatus to a transmission channel. 5,535,344, Cl. 395-309.000.
- Level One Communications, Inc.: *See—*
  - Everitt, James W.; and Takatori, Hiroshi, 5,534,863, Cl. 341-150.000.
- Lever Brothers Company, Division of Conopco,Inc.: *See—*
  - Chokappa, Kalyansundaram D.; and Naik, Vijay M., 5,534,212, Cl. 264-211.110.
- Levin, Gregg M., to Perfect Curve, Inc. Cap brim shaping, transport, storage and display device. 5,533,652, Cl. 223-84.000.
- Levitan, Gutman. Virtual personal channel in a television system. 5,534,911, Cl. 348-1.000.
- Leviton Manufacturing Co., Inc.: *See—*
  - Newman, Walter; and Endres, Paul, 5,533,916, Cl. 439-801.000.
- Levy, Harold J.; and McGill, Thomas C., to California Institute of Technology. Transistorless, multistable current-mode memory cells and memory arrays and methods of reading and writing to the same. 5,535,156, Cl. 365-175.000.
- Levy, Paul S., to VLSI Technology, Inc. High-frequency coaxial interface test fixture. 5,534,787, Cl. 324-761.000.
- Levy, Rony: *See—*
  - Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.
- Lew, Albert C.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
- Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., to UCAR Carbon Technology Corporation. Continuous method for increasing the Q. I. concentration of liquid tar while concurrently producing a Q. I. free tar. 5,534,133, Cl. 208-39.000.
- Lewis, Kenrick M.; and Ward, Eugene C., to OSi Specialties, Inc. Polysiloxane compositions. 5,534,609, Cl. 528-15.000.
- LG Semicon Co., Ltd.: *See—*
  - Kim, Sung S., 5,534,459, Cl. 437-89.000.
  - Song, Kwang B.; Kim, Sung K.; and Shim, Jin S., 5,534,720, Cl. 257-232.000.
- L'Hydraulique Chateaudun: *See—*
  - Grancher, Raymond, 5,533,551, Cl. 137-625.620.
- Li, Ching; Gaynor, Richard B.; and Nirula, Ajay, to Board of Regents, The University of Texas System. Cellular factor ILF. 5,534,631, Cl. 536-23.100.
- Li, Chung-Sheng: *See—*
  - Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, 5,535,213, Cl. 370-85.150.
- Li-Cor, Inc.: *See—*
  - Middendorf, Lyle R.; Bruce, Robert C.; and Eckles, Robert D., 5,534,125, Cl. 204-618.000.
- Li, Jeng-Wei: *See—*
  - Tsai, Keh-Chyuan; and Li, Jeng-Wei, 5,533,307, Cl. 52-167.300.
- Li, Ming-Shiu: *See—*
  - Ma, Chen-Chi M.; Wu, Hew-Der; and Li, Ming-Shiu, 5,534,302, Cl. 427-379.000.
- Li, Ping, to Multi-Tech Systems, Inc. Ringdown and ringback signalling for a computer-based multifunction personal communications system. 5,535,204, Cl. 370-76.000.
- Li, Shih-Gong; and Chang, David Y., to International Business Machines Corporation. Method and apparatus for displaying clusters on a computer network. 5,535,403, Cl. 395-800.000.
- Lian, Ming-Shih: *See—*
  - Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., 5,534,347, Cl. 428-375.000.
- Liang, Dexin: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Liang, Hongmei: *See—*
  - Schuster, Don A.; Liang, Hongmei; Burkhart, Larry J.; and Wedlake, Gary D., 5,533,568, Cl. 165-1.000.
- Liang, Mong-Song: *See—*
  - Wuu, Shou-Gwo; Liang, Mong-Song; Su, Chung-Hui; and Wang, Chen-Jong, 5,534,451, Cl. 437-40.000.
- Liang, Tsanyang; and Wands, Jack R., to General Hospital Corporation, The. Method of detecting antigenic nucleic acid-containing macromolecular entities. 5,534,406, Cl. 435-5.000.
- Liao, Mingfu: *See—*
  - Gasch, Robert; and Liao, Mingfu, 5,533,400, Cl. 73-593.000.
- Liao, Richard: *See—*
  - Lui, Gin-Fun; and Liao, Richard, 5,533,953, Cl. 482-96.000.
- Libkin, Leonid: *See—*
  - Griffin, Timothy G.; and Libkin, Leonid, 5,535,385, Cl. 395-600.000.
- Lichtblau, Josef; and Wallner, Heinrich. Method and an apparatus for the disposal of foam materials containing propellants and more particularly of foam materials such as polyurethane employed as insulating material for refrigeration devices. 5,534,077, Cl. 134-7.000.
- Lidak Pharmaceuticals: *See—*
  - Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., 5,534,554, Cl. 514-724.000.
- Liegl, Erwin: *See—*
  - Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, 5,535,098, Cl. 361-752.000.
- Life Technologies, Inc.: *See—*
  - Longo, Mary C.; Smith, Michael D.; and Harris, Raymond D., 5,534,428, Cl. 435-199.000.
- Lifetouch Portrait Studios, Inc.: *See—*
  - Adolphi, John; and Kipp, Jeffrey J., 5,534,963, Cl. 354-290.000.
- Light, Ronald R.: *See—*
  - Shih, Wayne K.; and Light, Ronald R., 5,534,570, Cl. 524-114.000.
- Lighthouse Digital Systems, Inc.: *See—*
  - Grant, Robert E., 5,535,036, Cl. 359-163.000.
- Lillis, William J.; and McEldowney, Justin A., to Burr-Brown Corporation. Low capacitance electronically controlled active bus terminator circuit and method. 5,534,792, Cl. 326-30.000.
- Lilly, Kevin, to Bruker Instruments, Inc. Sample changer for NMR spectrometers. 5,534,780, Cl. 324-321.000.
- Lin, Chiu-Sing; and Dziark, John J., to General Electric Company. Silicone sealants. 5,534,563, Cl. 523-122.000.
- Lin, Chung-Kuang; and Chang, Jung-Jen, to Fu Tai Umbrella Works, Ltd. Pocketable folding umbrella. 5,533,535, Cl. 135-20.100.
- Lin, Dong-ping, to Polygon Industries Corporation. In-line roller skate. 5,533,740, Cl. 280-11.220.
- Lin, Kyoko: *See—*
  - Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.

- Lin, Shihta: *See—*
  - Cattell, Kevin T.; Cromer, William R.; Lin, Shihta; Neuchterlein, Bruce E.; and Potok, Thomas E., 5,535,325, Cl. 395-161.000.
- Lindberg, Paul M., to Pulse Engineering, Inc. Low profile high power surface mount transformer. 5,534,838, Cl. 336-183.000.
- Linde Aktiengesellschaft: *See—*
  - Strenzke, Hilmar, 5,533,867, Cl. 417-53.000.
- Lindenfelser, William M.; and Donahue, Frederick A., to Xerox Corporation. Electronic auto-correction of misaligned segmented printbars. 5,534,895, Cl. 347-19.000.
- Lindquist, Lowell G.: *See—*
  - Foster, Mary E.; Simmons, Eugene R.; Lindquist, Lowell G.; and Bunnelle, William L., 5,534,575, Cl. 524-270.000.
- Ling, Geoffrey, to Cooper Industries, Inc. Ceiling mounted wallwash light fixture. 5,535,110, Cl. 362-297.000.
- Linhart, Helmut: *See—*
  - Quotschalla, Udo; and Linhart, Helmut, 5,534,645, Cl. 558-71.000.
- Linn, Anning: *See—*
  - Karin, Michael; Hibi, Masahiko; and Linn, Anning, 5,534,426, Cl. 435-194.000.
- Linton, John F.: *See—*
  - Cox, David E.; Gottschalk, Karl D.; Lawton, Craig M.; Linton, John F.; and Whitfield, John P., 5,535,335, Cl. 395-200.110.
- Lion Corporation: *See—*
  - Ito, Ryu; Kaneko, Kenji; Hayashi, Satoshi; and Terai, Akiko, 5,533,227, Cl. 15-167.100.
- Liou, Derlin. Powerfree glove and its making method. 5,534,350, Cl. 428-423.100.
- Liposome Technology, Inc.: *See—*
  - Zalipsky, Samuel; and Martin, Francis J., 5,534,259, Cl. 424-450.000.
- Lipotech S.A.: *See—*
  - De Paoli, Tomás; and Hager, Alfredo A., 5,534,268, Cl. 424-450.000.
- Little, William C.: *See—*
  - Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
- Litton Systems, Inc.: *See—*
  - Carruthers, Malcolm J., 5,534,747, Cl. 313-456.000.
  - Ekchian, Leon K.; Johnson, David D.; and Smith, William F., 5,535,303, Cl. 395-24.000.
  - Rose, Conrad M., 5,534,866, Cl. 342-13.000.
  - Rose, Conrad M., 5,534,867, Cl. 342-17.000.
  - Theiss, Alan J.; and Lyon, Douglas B., 5,534,750, Cl. 315-5.350.
- Liu, Benjamin Y. H., to MSP Corporation. Method and apparatus for depositing particles on surfaces. 5,534,309, Cl. 427-458.000.
- Liu, David K. Y., to Advanced Micro Devices, Inc. Method for protecting a stacked gate edge in a semiconductor device from self aligned source (SAS) etch. 5,534,455, Cl. 437-43.000.
- Livsey, Robert A.: *See—*
  - Wetzel, Donald C.; and Livsey, Robert A., 5,534,733, Cl. 307-9.100.
- Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., to Ajinomoto Co., Inc. Production of isoleucine by *escherichia coli* having isoleucine auxotrophy and no negative feedback inhibition of isoleucine production. 5,534,421, Cl. 435-116.000.
- Lloyd, Robert D.: *See—*
  - King, Gerald R.; Lloyd, Robert D.; and Nelson, Leonard E., 5,535,428, Cl. 455-38.400.
- LMC Operating Corp.: *See—*
  - Beeley, Micheal G., 5,533,796, Cl. 305-188.000.
- Lo, Shyh-Ching; Wang, Richard Y.; and Hayes, Michael M., to American Registry of Pathology. Adherent and invasive mycoplasma. 5,534,413, Cl. 435-7.320.
- Lo, Ying-Cheng: *See—*
  - Murphey, Randy; Bellotti, Marc; Lo, Ying-Cheng; and Edwards, Scott, 5,533,996, Cl. 604-283.000.
- Lobdell-Emery Manufacturing Company, The: *See—*
  - Regina, Michael E., 5,533,456, Cl. 108-51.100.
- Lochbaum, Kenneth. Attaching surface for aquatic exercise devices and users. 5,533,950, Cl. 482-51.000.
- Lock, William E.: *See—*
  - Johnson, Ronald E.; Lock, William E.; and Shoup, Robert D., 5,533,447, Cl. 101-211.000.
- Lockheed Idaho Technologies Company: *See—*
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- Loersky, Tatyana: *See—*
  - Bunimovich, Haim; and Loersky, Tatyana, 5,534,329, Cl. 428-192.000.
- Logan, Robert M.: *See—*
  - Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., 5,534,420, Cl. 435-71.300.
- Logan, Shawn M., to AT&T Corp. Oscillator with increased reliability start up. 5,534,826, Cl. 331-158.000.
- Logsdon, Dana K. Fleet light. 5,535,108, Cl. 362-183.000.
- Loi, Keith N.: *See—*
  - Young, Frederick A.; Hendrick, Louis W.; and Loi, Keith N., 5,534,881, Cl. 343-776.000.
- Loisy, François; and Germain, Jean-Luc, to Electricite de France - Service National. Method and device for detecting leaks in penetrations of a nuclear reactor vessel head during operation. 5,535,253, Cl. 376-250.000.
- Lombardi, John: *See—*
  - Lombardi, John A., 5,533,833, Cl 405-128.000.
- Lombardi, John A., to Lombardi, John. Bulk backfill in situ liner for hard rock environment. 5,533,833, Cl. 405-128.000.
- Lomp, Gary: *See—*
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- Long, Charles F., to General Motors Corporation. Wiring harness shroud. 5,534,665, Cl. 174-72.00A.
- Long, Hai: *See—*
  - Davis, Phillip D.; Sharma, Sudhir; and Long, Hai, 5,535,165, Cl. 365-201.000.
- Long, Joseph D., to Gilbarco Inc. Synchronization of prerecorded audio/video signals with multi-media controllers. 5,535,130, Cl. 364-479.000.
- Long, Norris R., to Coleman Company, Inc., The. Liquid fuel lantern with electronic ignition. 5,533,892, Cl. 431-264.000.
- Long-Hsiung, Chen. Spike means with air passage for drip chamber device 5,533,647, Cl. 222-83.000.
- Longo, Mary C.; Smith, Michael D.; and Harris, Raymond D., to Life Technologies, Inc. Cloned SstI/SacI restriction-modification system. 5,534,428, Cl. 435-199.000.
- Lonza Ltd.: *See—*
  - Quittmann, Wilhelm; and McGarrity, John, 5,534,651, Cl. 560-15.000.
- Loos, Albertus L. J. G. M.; and Selder, Otto R. A. M., to U.S. Philips Corporation. Magnetic resonance apparatus. 5,534,778, Cl. 324-318.000.
- Lopez, Alfred R., to Hazeltine Corporation. GPS antenna systems. 5,534,882, Cl. 343-891.000.
- Loral Aerospace Corp.: *See—*
  - Wisneskie, Bradley D., 5,534,293, Cl. 427-228.000.
- Lord Corporation: *See—*
  - Ozawa, Hiroyoshi; Kamiya, Noboru; and Futaya, Ryuji, 5,534,591, Cl. 525-194.000.
- L'Oreal: *See—*
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  - Junino, Alex; Genet, Alain; and Lagrange, Alain, 5,534,037, Cl. 8-411.000.
- Lorenz, Gisela: *See—*
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- Los, Marinus: *See—*
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,483, Cl. 504-221.000.
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,484, Cl. 504-235.000.
  - Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,534,485, Cl. 504-246.000.
- Louisiana State University Board of Supervisors, a Governing body of Louisiana State University Agricultural and Mechanical College: *See—*
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  - Jackson, Tom; Eck, Henry; and Lowe, Ray, 5,535,441, Cl. 455-182.200.
- Lowman, Henry: *See—*
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- LSI Logic Corporation: *See—*
  - Rostoker, Michael D., 5,534,467, Cl. 437-209.000.
- Lu, Chih-Yuan: *See—*
  - Tseng, Horng-Huei; and Lu, Chih-Yuan, 5,534,457, Cl. 437-52.000.
  - Tseng, Horng-Huei; and Lu, Chih-Yuan, 5,534,460, Cl. 437-187.000.
- Lu, Chyi H.: *See—*
  - LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., 5,535,237, Cl. 375-200.000.
- Lu, Tzu-Hao. Table tennis training system. 5,533,722, Cl. 273-30.000.
- Lu, Wen-Chin. Safety syringe with reliably externally connectable and internally retractable self-biased needle. 5,533,975, Cl. 604-110.000.
- Lu, Wen-Hwa: *See—*
  - Chen, Chin-Fu; Lu, Wen-Hwa; and Chueh, Shan-Chang, 5,533,375, Cl. 72-254.000.
- Lubahn, Ken E.; and Melville, Jim A., to International Business Machines Corporation. Snap-together/quick-release fastening assembly for supporting a circuit card. 5,535,100, Cl. 361-801.000.
- Lubrizol Corporation, The: *See—*
  - Cantiani, Robert, 5,534,175, Cl. 508-469.000.
  - Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., 5,534,039, Cl. 44-367.000.
  - Vinci, James N., 5,534,169, Cl. 508-460.000.
- Luca, Racca, to Ermes S.r.l. In-the-ear hearing aid. 5,535,282, Cl. 381-68.600.
- Lucas, Danielle: *See—*
  - Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.; Henning, Steven K.; and Lucas, Danielle, 5,534,592, Cl. 525-236.000.
- Lucas, Gary M.: *See—*
  - Bayly, Brian P.; Lucas, Gary M.; and Stuart, Van W., 5,534,610, Cl. 528-38.000.
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  - Critzer, W. Larry, 5,533,589, Cl. 180-287.000.
- Lucky Ltd.: *See—*
  - Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,534,637, Cl. 548-374.100.
- Lucky Metals Corporation: *See—*

- Hong, Young H.; Roh, Jae H.; and Woo, Sang M., 5,534,160, Cl. 210-710.000.
- Ludlow, M. John: *See—*
  - Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., 5,535,312, Cl. 395-115.000.
- Luedtke, Arthur: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Luetgert, Karine A.: *See—*
  - Pittman, Raymond H.; Ruggie, Mark A.; and Luetgert, Karine A., 5,534,352, Cl. 428-535.000.
- Lui, Gin-Fun; and Liao, Richard. Riding-type exerciser. 5,533,953, Cl. 482-96.000.
- Lukic, Goran, to Schneider (Europe) A.G. Methods for applying an elastic coating layer on stents. 5,534,287, Cl. 427-2.250.
- Luly, Jay R.: *See—*
  - Or, Yat S.; and Luly, Jay R., 5,534,632, Cl. 540-456.000.
- Lum, Thomas F.; and Wenzel, James F., to Motorola, Inc. Method for probing a semiconductor wafer. 5,534,784, Cl. 324-757.000.
- Luna, Daniel A.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- Lund, Peter B.: *See—*
  - Wallström, Eva; Lund, Peter B.; and Helgesen, Arne, 5,534,049, Cl. 106-22.00R.
- Lundberg, George A., Jr.: *See—*
  - Georgopoulos, George; and Lundberg, George A., Jr., 5,533,767, Cl. 292-320.000.
- Lundeberg, Joakim: *See—*
  - Uhlen, Mathias; and Lundeberg, Joakim, 5,534,424, Cl. 435-91.200.
- Luoma, Marjo; Torkkell, Keijo; Lylykangas, Reijo; and Virta, Pirkko, to Kemira Oy. Use of a super alloy as a substrate for catalysts. 5,534,476, Cl. 502-335.000.
- Lupinski, John H.; and Cole, Herbert S., Jr., to General Electric Company. High temperature polyether imide compositions and method for making. 5,534,602, Cl. 525-432.000.
- Luque, Eduardo R.: *See—*
  - Brumfield, David L.; Anderson, M. Neil; and Luque, Eduardo R., 5,534,002, Cl. 606-61.000.
- Lürssen, Klaus: *See—*
  - Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.
- Lüssi, André, to Sintra Holding AG. Autoclave. 5,535,141, Cl. 364-550.000.
- Luther Medical Products, Inc.: *See—*
  - Dickerson, Charles W.; Overton, Richard A.; and Luther, Ronald B., 5,533,988, Cl. 604-282.000.
- Luther, Ronald B.: *See—*
  - Dickerson, Charles W.; Overton, Richard A.; and Luther, Ronald B., 5,533,988, Cl. 604-282.000.
- Lutter, Heinz-Dieter: *See—*
  - Hinz, Werner; Zschiesche, Ruth; Lutter, Heinz-Dieter; and Bruchmann, Bernd, 5,534,185, Cl. 252-182.220.
- Lutz, Dieter: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Luz, Siegbert: *See—*
  - Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, 5,535,098, Cl. 361-752.000.
- Lybarger, Michael A.; and Beck, Stephen D., to General Electric Company. Appliance shipping restraint assembly. 5,533,367, Cl. 68-3.00R.
- Lylykangas, Reijo: *See—*
  - Luoma, Marjo; Torkkell, Keijo; Lylykangas, Reijo; and Virta, Pirkko, 5,534,476, Cl. 502-335.000.
- Lynam, Niall R.: *See—*
  - Caskey, Gregory T.; Lynam, Niall R.; and Hichwa, Bryant P., 5,535,056, Cl. 359-603.000.
- Lynch, Carroll L.; Graven, Robert E.; and Graven, Robert L. Modular planting system. 5,533,302, Cl. 47-82.000.
- Lynch, Michael W.: *See—*
  - Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., 5,534,472, Cl. 502-116.000.
- Lyon, Douglas B.: *See—*
  - Theiss, Alan J.; and Lyon, Douglas B., 5,534,750, Cl. 315-5.350.
- M. Fabrikant & Sons, Ltd.: *See—*
  - Freilich, Joseph, 5,533,364, Cl. 63-32.000.
- M-Systems Flash Disk Pioneers Ltd.: *See—*
  - Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.
- Ma, Chen-Chi M.; Wu, Hew-Der; and Li, Ming-Shiu, to National Science Council. Method of preparing a fiber reinforced modified phenolic resin composite. 5,534,302, Cl. 427-379.000.
- Mabee, Brian D., to Easom Engineering and Manufacturing Corporation. Electrically actuated disc stack having low response time due to reduced residual magnetism for use in drives, brakes and combinations thereof. 5,533,425, Cl. 74-661.000.
- MacDougall, Francis, to Very Vivid, Inc. Video image based control system. 5,534,917, Cl. 348-169.000.
- MacDowell, John F.: *See—*
  - Andrus, Ronald I.; and MacDowell, John F., 5,534,470, Cl. 501-32.000.
- Mack, Dale A.: *See—*
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- Mackay, Donald R.: *See—*
  - Manders, Ernest K.; Koegel, Andrea M.; and Mackay, Donald R., 5,534,026, Cl. 623-15.000.
- Mackin, Sean M.; and Brown, Jeffrey D., to Cramer Coil & Transformer Co., Inc. Miniature transformer. 5,534,839, Cl. 336-192.000.
- MacTough, Suzanne C.: *See—*
  - Ciccarone, Terrence M.; MacTough, Suzanne C.; and Williams, Theresa M., 5,534,537, Cl. 514-397.000.
- Madden, Thomas J.: *See—*
  - Mullooly, John F.; Davis, Franklin J.; Madden, Thomas J.; and Wright, Richard R., 5,533,330, Cl. 60-39.320.
- Maderek, Eugeniusz; and Brandau, Friedhelm, to Akzo Nobel N.V. Completely reyclable jacket made of synthetic polymer material. 5,533,210, Cl. 2-93.000.
- Maeda, Hiroshi: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Maeda, Kazuyuki; and Taka, Hideo, to Canon Kabushiki Kaisha. Active distance measuring apparatus. 5,534,991, Cl. 356-3.060.
- Maeda, Yoshiaki: *See—*
  - Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, 5,534,045, Cl. 75-243.000.
- Maemura, Kouji, to NEC Corporation. Cache memory unit including a replacement address register and address update circuitry for reduced cache overhead. 5,535,350, Cl. 395-403.000.
- Maerz, Karin: *See—*
  - Platzer, Stephan J. W.; Nuernberger, Siegfried; and Maerz, Karin, 5,534,384, Cl. 430-260.000.
- Maffey, George E.; Saar, David A.; and Simpson, Raymond W., to Emhart Inc. Remotely actuated door lock light. 5,535,104, Cl. 362-100.000.
- Magliocco, Lino G.: *See—*
  - Nagaraj, D. R.; Wang, Samuel S.; Lee, James S.; and Magliocco, Lino G., 5,533,626, Cl. 209-167.000.
- Magnatech Corporation: *See—*
  - Sanderson, Charles H., 5,534,156, Cl. 210-695.000.
- Magnavox Electronic Systems Company: *See—*
  - Cahn, Charles R.; Keegan, Richard G.; Knight, Jerry E.; and Stansell, Thomas A., Jr., 5,535,278, Cl. 380-49.000.
- Magnet-Motor Gesellschaft für magnetmotorische Technik mbH: *See—*
  - Heidelberg, Götz; Gründl, Andreas; and Ehrhart, Peter, 5,534,739, Cl. 310-179.000.
- Magotteaux International: *See—*
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- Magril, Tzvika: *See—*
  - Cohen, Yitzak; Brody, Rafael; Magril, Tzvika; and Eshet, Dan, 5,535,396, Cl. 395-733.000.
- Mahant-Shetti, Shivaling S.; and Landers, Robert J., to Texas Instruments Incorporated. Signal transmission system and method of operation. 5,535,241, Cl. 375-219.000.
- Mahmoud, Mohammad S.: *See—*
  - Purnell, Charles G.; Mahmoud, Mohammad S.; and Brownlie, Helen A., 5,534,220, Cl. 419-45.000.
- Mahoney, Robert P.: *See—*
  - Reed, Peter E.; and Mahoney, Robert P., 5,534,235, Cl. 423-121.000.
- Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, to Olin Corporation. Anodized aluminum substrate having increased breakdown voltage. 5,534,356, Cl. 428-615.000.
- Mai, Tuan A.: *See—*
  - Leibowitz, Lawrence M.; and Mai, Tuan A., 5,535,402, Cl. 395-800.000.
- Maier, Gunther L., to International Medication Systems, Limited. Medication injector with protected cannula and Y-site lockout. 5,533,993, Cl. 604-411.000.
- Maile, Michael S.: *See—*
  - Masters, Ronald A.; and Maile, Michael S., 5,534,198, Cl. 510-182.000.
- Main, Lauren O.; and Grant, Richard L., to Ethicon, Inc. Sealing means for endoscopic surgical anastomosis stapling instrument. 5,533,661, Cl. 227-176.100.
- Maiwald, Helmut; and Böhmler, Klaus, to TRW Repa GmbH. Mechanical acceleration sensor. 5,533,588, Cl. 180-282.000.
- Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., to AT&T Corp. Apparatus and method for integrating downstream data transfer over a cable television channel with upstream data carrier by other media. 5,534,913, Cl. 348-7.000.
- Majnaric, Anton B.; and Bjerke, William M., to Majnaric Technologies, Inc. Method and apparatus for bridge construction. 5,533,221, Cl. 14-73.000.
- Majnaric Technologies, Inc.: *See—*
  - Majnaric, Anton B.; and Bjerke, William M., 5,533,221, Cl. 14-73.000.
- Makihata, Yuuki: *See—*
  - Terawaki, Fumikazu; Ikeda, Yoshitaka; and Makihata, Yuuki, 5,534,705, Cl. 250-559.290.
- Makimoto, Mitsuo: *See—*

  - Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,534,831, Cl. 333-204.000.
- Makino, Hiroshi; and Sata, Teiji, to Fuji Xerox Co., Ltd. Dynamic air pressure bearing. 5,533,813, Cl. 384-115.000.
- Makino, Kenji: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Makino, Tadashi; Mizukami, Yashio; and Kikuta, Jun-ichi, to Takeda Chemical Industries, Ltd. Pharmaceutical compositions for oral use and method of preparing them. 5,534,534, Cl. 514-388.000.
- Malecha, Michael R., to Air-Lite Transport, Inc. Pressurized air system. 5,533,866, Cl. 417-44.900.
- Malhotra, Ajay: *See—*
  - Fisch, Matthew A.; Brayton, James M.; and Malhotra, Ajay, 5,535,345, Cl. 395-309.000.
- Malhotra, Shadi L., to Xerox Corporation. Migration imaging members. 5,534,374, Cl. 430-41.000.
- Mallinckrodt Medical, Inc.: *See—*
  - Verbruggen, Alfons M., 5,534,497, Cl. 514-18.000.
- Malm, Robert E.: *See—*
  - Johnston, Gregory E.; and Malm, Robert E., 5,535,004, Cl. 356-358.000.
- Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R. Child and infant enclosure structure. 5,533,215, Cl. 5-99.100.
- Malofsky, Bernard M.: *See—*
  - Malofsky, Adam G.; Malofsky, Bernard M.; and Glassberg, Paul R., 5,533,215, Cl. 5-99.100.
- Maloney, Michael J.; and McCalmont, David T., to Teknekron Infoswitch Corporation. Method and system for automatically monitoring the performance quality of call center service representatives. 5,535,256, Cl. 379-34.000.
- Man, Chiu-Kwan, to Chartered Semiconductor Manufacturing Pte. Ltd. Method of wafer cleaning after metal etch. 5,533,635, Cl. 216-67.000.
- MAN Gutehoffnungshütte Aktiengesellschaft: *See—*
  - Clausmeyer, Horst; Hoffmann, Dieter; and Weber, Wolfgang, 5,533,770, Cl. 295-1.000.
- MAN Roland Druckmaschinen AG: *See—*
  - Klingler, Horst, 5,533,448, Cl. 101-233.000.
- Mandel, SaraLynn. Free-standing stirrer appliance. 5,533,805, Cl. 366-285.000.
- Manders, Ernest K.; Koegel, Andrea M.; and Mackay, Donald R., to Penn State Research Foundation, The. Preparation of inexpensive, HIV-free human skin allograft. 5,534,026, Cl. 623-15.000.
- Mandro, Marc; and Bellerose, Jean, to Baxter International Inc. Syringe infusion pump having a syringe plunger sensor. 5,533,981, Cl. 604-208.000.
- Maniar, Papu D.: *See—*
  - Fiordalice, Robert W.; Maniar, Papu D.; Klein, Jeffrey L.; and Roman, Bernard J., 5,534,462, Cl. 437-190.000.
- Mann, William F.: *See—*
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- Mannesmann Aktiengesellschaft: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Mannesmann Aktiengesellshcaft: *See—*
  - Bullmann, Guido, 5,535,234, Cl. 373-8.000.
- Manning, Dennis P.: *See—*
  - Tice, Joseph B.; Diaz, Antonio A.; and Manning, Dennis P., 5,534,319, Cl. 428-36.910.
- Mano, Junji: *See—*
  - Miyazaki, Yukio; Okitaka, Takenori; Hatakenaka, Makoto; and Mano, Junji, 5,534,805, Cl. 327-144.000.
- Mao, Huazhong: *See—*
  - Portier, Ralph J.; and Mao, Huazhong, 5,534,143, Cl. 210-151.000.
- Marancik, William G.; Hong, Seungok; and Zhou, Rouyi, to Oxford Instruments Inc. Method for producing multifilamentary niobium-tin superconductor. 5,534,219, Cl. 419-4.000.
- Marcelino, Eduardo: *See—*
  - Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.
- Marcelletti, John F.: *See—*
  - Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., 5,534,554, Cl. 514-724.000.
- Marchal de Corny, René G. M.: *See—*
  - Alberola, Marcel P. G.; Marchal de Corny, René G. M.; and Alexandre, Georges M., 5,533,564, Cl. 164-342.000.
- Marchetti, Giorgio; and Guzzo, Giovanni, to Intermarine S.p.A. Hull structure of nonmetallic material. 5,533,463, Cl. 114-357.000.
- Marchetti, Richard J., to Unitrack Industries, Inc. Composite printed circuit card guide and holding device. 5,533,631, Cl. 211-41.000.
- Marciano, Daniele: *See—*
  - Fisher, Abraham; Karton, Yishai; Marciano, Daniele; Barak, Dov; and Meshulam, Haim, 5,534,520, Cl. 514-278.000.
- Marconi, Gary G.: *See—*
  - Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., 5,534,420, Cl. 435-71.300.
- Mariani, Mariangela: *See—*
  - Mongelli, Nicola; Biasoli, Giovanni; Mariani, Mariangela; and Sola, Francesco, 5,534,539, Cl. 514-422.000.
- Marin, Heiner: *See—*
  - Lehmann, Volker; and Marin, Heiner, 5,534,673, Cl. 218-68.000.
- Mark Solutions, Inc.: *See—*
  - Bielecki, James J., 5,533,305, Cl. 52-79.100.
- Marker Deutschland GmbH: *See—*
  - Boehm, Alfred; Messerschmidt, Werner; and Sedlmair, Gerhard, 5,533,744, Cl. 280-605.000.
- Markison, Timothy W.: *See—*
  - Grube, Gary W.; and Markison, Timothy W., 5,535,431, Cl. 455-54.100.
- Marks, Bruce G.; and Simpson, Theodore F., to Thomson Consumer Electronics, Inc. Color picture tube having shadow mask with improved aperture spacing. 5,534,746, Cl. 313-408.000.
- Marks, Patrick D.; and Smith, Michael W., to Goodyear Tire & Rubber Company, The. Method for tire tread application. 5,534,093, Cl. 156-128.600.
- Markyvech, Craig R.: *See—*
  - Bush, Kevin J.; Dua, Sanjay; Adams, Neil J.; and Markyvech, Craig R., 5,535,135, Cl. 364-496.000.
- Markyvech, Ronald K., to Eaton Corporation. Engine deceleration determination method/system for updating a control parameter. 5,533,946, Cl. 477-78.000.
- Marsh, John F.: *See—*
  - Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., 5,534,168, Cl. 508-396.000.
- Marshall, Carl J., Jr.: *See—*
  - Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., 5,534,057, Cl. 106-486.000.
- Marshall, John L.: *See—*
  - Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., 5,534,388, Cl. 430-338.000.
- Marshall, Mary C., to Southwest Research Institute. Apparatus for cleaning articles utilizing supercritical and near supercritical fluids. 5,533,538, Cl. 134-104.400.
- Marshall, Steve P.: *See—*
  - Leach, Jerald G.; Coomes, Joseph A.; Marshall, Steve P.; and Simar, Laurence R., 5,535,348, Cl. 395-375.000.
- Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, to BP Chemicals Limited. Gas phase polymerisation process. 5,534,607, Cl. 526-88.000.
- Martens, Jürgen: *See—*
  - Drauz, Karlheinz; and Martens, Jürgen, 5,534,541, Cl. 514-448.000.
- Martin, Berthold; and Benford, Howard L., to Chrysler Corporation. Five-speed automatic transmission. 5,533,945, Cl. 475-276.000.
- Martin, Francis J.: *See—*
  - Zalipsky, Samuel; and Martin, Francis J., 5,534,259, Cl. 424-450.000.
- Martin, J. Scott; and Carothers, James L., to Charles Machine Works, Inc., The. Digging chain. 5,533,939, Cl. 474-206.000.
- Martin Marietta Corporation: *See—*
  - Spencer, George L.; Duvoisin, Herbert A., III; and Vasicek, Jean, 5,535,291, Cl. 382-254.000.
- Martin Marietta Energy Systems, Inc.: *See—*
  - Scott, Charles D.; Petersen, James N.; and Davison, Brian H., 5,534,153, Cl. 210-661.000.
- Martin, Michael T.: *See—*
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- Martin, Richard J.: *See—*
  - Holst, Mark R.; Martin, Richard J.; Stilger, John D.; and Yee, Samson C., 5,533,890, Cl. 431-5.000.
- Martinez, David M.: *See—*
  - Barth, Walter; Fuchs, Rudolf; Langenfelder, Frank; and Martinez, David M., 5,533,581, Cl. 173-216.000.
- Martinez, Joe L., Jr.: *See—*
  - Romero, Guillermo L.; and Martinez, Joe L., Jr., 5,533,257, Cl. 29-890.030.
- Martinovaski, Jiri: *See—*
  - Oppermann, Rolf; Sauerschell, Wolfgang; and Martinovaski, Jiri, 5,533,484, Cl. 123-358.000.
- Maruyama, Jun: *See—*
  - Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
- Maruyama, Shigeyuki: *See—*
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- Maruyama, Teruo; and Abe, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Fluid rotary apparatus having tapered rotors. 5,533,887, Cl. 418-201.300.
- Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, to Ricoh Company, Ltd. Apparatus for removing image forming substance from sheet and sheet processing apparatus. 5,534,063, Cl. 118-60.000.
- Maruyama, Yusei: *See—*
  - Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
- Marvin, James C.: *See—*

- Harrison, John M. M.; Freeman, Gary M.; Marshall, Carl J., Jr.; Marvin, James C.; and Lareau, Albert F., 5,534,057, Cl. 106-486.000.
- Masaki, Kenichi: *See—*
  - Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, 5,533,446, Cl. 101-150.000.
- Masaki, Ryoso; Mutoh, Nobuyoshi; and Obara, Sanshiro, to Hitachi, Ltd. Vehicle driving control system having function for suppressing vibration. 5,534,764, Cl. 318-802.000.
- Masamitsu, Enoki, to Paceco Corp. Reorienting apparatus for a clamshell bucket. 5,533,769, Cl. 294-68.230.
- Maschinenfabrik Friese GmbH & Co. Kg.: *See—*
  - Reibel, John C.; and Schindhelm, Uwe, 5,533,569, Cl. 165-90.000.
- Maschinenfabrik Gustav Eirich: *See—*
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- Maschinenfabrik Möllers GmbH u. Co.: *See—*
  - Klüpfel, Olaf, 5,533,861, Cl. 414-794.200.
- Maschinenfabrik Rieter AG: *See—*
  - Wirz, Armin; and Busenhart, Peter, 5,533,686, Cl. 242-18.00A.
- Mase, Akira; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Electro-optical device system and method of driving an electro-optical device. 5,534,884, Cl. 345-87.000.
- Masenas, Charles J., Jr.: *See—*
  - Huynh, Bachvan; and Masenas, Charles J., Jr., 5,534,790, Cl. 326-27.000.
- Mashimo, Akira: *See—*
  - Miura, Tohru; Kubo, Mitsumasa; and Mashimo, Akira, 5,535,183, Cl. 369-32.000.
- Masonite Corporation: *See—*
  - Pittman, Raymond H.; Ruggie, Mark A.; and Luetgert, Karine A., 5,534,352, Cl. 428-535.000.
- Massachusetts Institute of Technology: *See—*
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  - Peoples, Oliver P.; and Sinskey, Anthony J., 5,534,432, Cl. 435-240.400.
- Massaro, Timothy J.; and Schmidt, Dennis J., to International Business Machines Corporation. Method and apparatus for variable complexity user interface in a data processing system. 5,535,321, Cl. 395-155.000.
- Massie, Harold L., to Intel Corporation. High precision DC-DC converter. 5,534,771, Cl. 323-285.000.
- Massini, Anthony L., Jr.; and Shepard, Roy D., to AT&T Corp. Solder wave measurement device. 5,533,663, Cl. 228-103.000.
- Masters, Ronald A.; and Maile, Michael S., to Procter & Gamble Company, The. Glass cleaner compositions having good filming/streaking characteristics and substantive modifier to provide long lasting bydrophilicity. 5,534,198, Cl. 510-182.000.
- Mastico, Robert A.; Stockley, Peter G.; and Talbot, Simon J., to British Technology Group Limited. Antigen-presenting capsid with fusion MS2-coat protein. 5,534,257, Cl. 424-192.100.
- Mastrangelo, Colette A.: *See—*
  - Baskey, Michael E.; Mastrangelo, Colette A.; and Mayer, Paul M., 5,535,326, Cl. 395-182.020.
- Masuda, Katsumi: *See—*
  - Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
- Masuda, Toshio: *See—*
  - Furukawa, Masahiko; Masuda, Toshio; and Kenmotsu, Toru, 5,533,324, Cl. 53-469.000.
- Masukawa, Junichi; Isshiki, Nobuyuki; Ohji, Nobunori; Chin, Eiten; and Numata, Toshiharu, to Kao Corporation. Coating apparatus. 5,534,065, Cl. 118-410.000.
- Masuya, Hirotomo; and Yamaoka, Masayoshi, to Takeda Chemical Industries, Ltd. Hydroquinone derivatives and intermediates for production thereof. 5,534,639, Cl. 549-62.000.
- Mathis, Gérard: *See—*
  - Lehn, Jean-Marie; Mathis, Gérard; Alpha, Béatrice; Deschenaux, Robert; and Jolu, Etienne, 5,534,622, Cl. 534-15.000.
- Matkowitch, Mario: *See—*
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- Matsuda, Jun: *See—*
  - Yano, Tetsuo; Ooie, Toshihiko; Yoneda, Masafumi; Utsumi, Akihiro; Katsumura, Munehide; and Matsuda, Jun, 5,534,103, Cl. 156-272.800.
- Matsuda, Yasumasa: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Sbigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Matsui, Haruhiko: *See—*
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- Matsui, Megumi: *See—*
  - Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
- Matsui, Shuichi: *See—*
  - Miyazawa, Kazutoshi; Matsui, Shuichi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,187, Cl. 252-299.010.
- Matsui, Takayuki: *See—*
  - Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
- Matsui, Yoshinori, to NEC Corporation. Semiconductor memory device for inputting and outputting data in a unit of bits. 5,535,163, Cl. 365-201.000.
- Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, to Canon Kabushiki Kaisha. Information transmit/receive apparatus onto which a sorter can be mounted via an adapter. 5,535,012, Cl. 358-400.000.
- Matsumoto, Kazuyuki: *See—*
  - Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.
- Matsumoto, Kenjiro: *See—*
  - Nezu, Takashi; Matsumoto, Kenjiro; Kohara, Takao; Sakai, Hiroshi; and Uchiyama, Masaaki, 5,533,597, Cl. 188-319.000.
- Matsumoto, Kiyoto, to NEC Corporation. Coupling structure for waveguide connection and process of forming the same. 5,535,295, Cl. 385-49.000.
- Matsumoto, Masashi: *See—*
  - Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,534,977, Cl. 355-208.000.
- Matsumoto, Takahiro: *See—*
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- Matsumoto, Tetsuro: *See—*
  - Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.
- Matsumoto, Yasuhiro: *See—*
  - Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, 5,535,012, Cl. 358-400.000.
- Matsunaga, Yusuke: *See—*
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- Matsuo Denshi Kabushiki Kaisha: *See—*
  - Matsuo, Fumitaka, 5,533,741, Cl. 280-238.000.
- Matsuo, Fumitaka, to Matsuo Denshi Kabushiki Kaisha. Bicylce with a double power train. 5,533,741, Cl. 280-238.000.
- Matsuo, Masaaki; and Kimura, Takayuki, to Toyo Ink Manufacturing Co., Ltd. Image transfer apparatus with transfer drum clamping mechanism. 5,533,451, Cl. 101-415.100.
- Matsuo, Michiaki: *See—*
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- Matsuo, Takashi; Adachi, Kumiko; and Yahagi, Kazuyuki, to Kao Corporation. Toiletry composition for hair care. 5,534,248, Cl. 424-70.280.
- Matsuoka, Hidetoshi; and Hirose, Fumiyasu, to Fujitsu Limited. Uniform load distributing method for use in executing parallel processing in parallel computer. 5,535,387, Cl. 395-650.000.
- Matsushita Electric Corporation of America: *See—*
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- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Hirata, Hiroaki; and Kimura, Kozo, 5,535,361, Cl. 395-472.000.
  - Horii, Seiji, 5,535,205, Cl. 370-79.000.
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
  - Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., 5,535,220, Cl. 371-2.100.
  - Kawakami, Yasunori; Iitsuka, Hiroyuki; Nishimura, Takuya; Hamai, Shinji; and Sahara, Yasuyuki, 5,535,208, Cl. 370-84.000.
  - Kimura, Kozo; and Kiyohara, Tokuzo, 5,535,358, Cl. 395-445.000.
  - Kishi, Toru; and Takada, Kazuyuki, 5,535,115, Cl. 363-98.000.
  - Kokawa, Katsuzo; Yamamoto, Katsuhiko; Sakurabu, Tatsuki; Imabayashi, Satoshi; and Tao, Muneo, 5,533,669, Cl. 237-1.0SL.
  - Maruyama, Teruo; and Abe, Yoshikazu, 5,533,887, Cl. 418-201.300.
  - Murata, Kazuyuki, 5,535,013, Cl. 358-432.000.
  - Nakatsu, Etsuto; Higashitani, Hiroshi; and Ohta, Haruo, 5,535,244, Cl. 375-261.000.
  - Sakai, Tadahiko, 5,534,127, Cl. 205-125.000.
  - Sugita, Ryuji; Tohma, Kiyokazu; Ishida, Tatsuaki; and Ban, Yasuaki, 5,534,324, Cl. 428-694.00T.
  - Takatori, Masahiro, 5,534,757, Cl. 315-382.000.
- Matsushita Electronics Corporation: *See—*
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- Matsushita Industrial Electric Co., Ltd.: *See—*
  - Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,534,831, Cl. 333-204.000.
- Matsushta Electric Industrial Co., Ltd.: *See—*
  - Tanaka, Yasuhiro; and Yamagata, Michihiro, 5,535,058, Cl. 359-711.000.
- Matsuura, Masataka: *See—*
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- Matsuura, Takaharu: *See—*
  - Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, 5,534,654, Cl. 564-90.000.
- Matsuura, Tatsuji: *See—*
  - Hiraki, Mitsuru; Sasaki, Yasuhiko; Seki, Koichi; and Matsuura, Tatsuji, 5,534,800, Cl. 327-57.000.
- Matsuzaki, Hiromi; Ojima, Satoshi; and Nakamura, Masashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Prosthesis for spanning a space formed upon removal of an intervertebral disk. 5,534,031, Cl. 623-17.000.

- Matsuzawa, Hiroshi: *See—*
  - Asanuma, Tadashi; Matsuzawa, Hiroshi; Sasaki, Tateyo; and Kawanishi, Kaoru, 5,534,595, Cl. 525-326.500.
- Matsuzawa, Yoshinori, to Olympus Optical Co., Ltd. Shake detection and compensation system using high-pass filter arithmetic means. 5,534,967, Cl. 354-430.000.
- Matthews, Norman L. Fastener bearing assembly. 5,533,852, Cl. 411-534.000.
- Mattos, Derwin W.; Shiffer, James D., II; and Wong, Jeffrey F., to VLSI Technology, Inc. Noise isolated I/O buffer. 5,534,791, Cl. 326-27.000.
- Mattson Technology, Inc.: *See—*
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- Matzawrakos, Panajiotis: *See—*
  - Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, 5,534,046, Cl. 75-446.000.
- Maughan, Kory W., to Pioneer Hi-Bred International, Inc. Inbred maize line PHKW3. 5,534,661, Cl. 800-200.000.
- Maurer, Gerald L., to National Research Labs. Method of reducing malodor using metal complex. 5,534,249, Cl. 424-76.300.
- MAVAG Verfahrenstechnik AG: *See—*
  - Meier, Hans P., 5,533,803, Cl. 366-273.000.
- Mawhirt, James A.: *See—*
  - Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; and Marcelino, Eduardo, 5,534,226, Cl. 422-73.000.
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  - Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
- May, Keith A.: *See—*
  - Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., 5,535,312, Cl. 395-115.000.
- Mayama, Shinya: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Maybelline Intermediate Co.: *See—*
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- Mayer, Paul M.: *See—*
  - Baskey, Michael E.; Mastrangelo, Colette A.; and Mayer, Paul M., 5,535,326, Cl. 395-182.020.
- Mayhan, Kenneth G. Compositions useful for removing products of metal corrosion. 5,534,177, Cl. 510-245.000.
- Mayhew, Gregory L.; and Huey, Henry E., to Hughes Aircraft Company. Time domain algebraic encoder/decoder. 5,535,225, Cl. 371-37.100.
- Mayne, Michael C.: *See—*
  - Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., 5,533,311, Cl. 52-309.900.
- Mayo, James D.; Duff, James M.; Hamer, Gordon K.; and Gardner, Sandra J., to Xerox Corporation. Tetrafluoro hydroxygallium phthalocyanines and photoconductive imaging members. 5,534,376, Cl. 430-59.000.
- Mayrhofer, Herbert: *See—*
  - Seufer-Wasserthal, Peter; Mayrhofer, Herbert; Wirth, Irma; and Pöchlauer, Peter, 5,534,436, Cl. 435-280.000.
- Mays, David S.; and Blevins, Robert E., to Diversified Technologies, Inc. Paper currency handling apparatus including a cash box securement and access device. 5,533,605, Cl. 194-206.000.
- Maytag Corporation: *See—*
  - Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., 5,533,311, Cl. 52-309.900.
- Mazer, Terrence B.: *See—*
  - Piontek, Carl J.; Mazer, Terrence B.; Walton, Joseph E.; and Geckle, Ronita K., 5,533,973, Cl. 604-83.000.
- Mazur, Richard J.: *See—*
  - Wood, James A.; Greer, David A.; and Mazur, Richard J., 5,535,122, Cl. 364-426.010.
- McAfee, Brenda J.; and Gignac, Manon, to Forintek Canada Corporation. Two stage method for the protection of lumber against sapstain. 5,534,252, Cl. 424-93.500.
- McAleavey, Michael E.: *See—*
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- McAnaney, David W.; and Dorner, John R., to Lemna Corporation, The. Wastewater treatment system with in-pond clarifier. 5,534,141, Cl. 210-110.000.
- McBride, Donald D.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- McBride, Kevin M.: *See—*
  - Chiang, Alice; McBride, Kevin M.; and Yee, Calvin C., 5,535,422, Cl. 395-155.000.
- McCaffrey, Kent. Method and apparatus for spreading material. 5,533,677, Cl. 239-677.000.
- McCalmont, David T.: *See—*
  - Maloney, Michael J.; and McCalmont, David T., 5,535,256, Cl. 379-34.000.
- McCamy, William G. Disc storage case. 5,533,615, Cl. 206-308.100.
- McCarthy, William F.; Brench, Colin E.; and Snow, Daniel M., to Digital Equipment Corporation. Enclosure for electronic modules. 5,535,099, Cl. 361-800.000.
- McCarty, Mark Lee: *See—*
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- McCauley, John N., Jr.: *See—*
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- McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, to Siemens Energy & Automation, Inc. Circuit breaker with molded cam surfaces. 5,534,835, Cl. 335-172.000.
- McConnell, Bobby L.: *See—*
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- McConnell, Jerry M. Funeral biers with exchangeable pictures and illumination devices. 5,533,241, Cl. 27-27.000.
- McCoy, John F., III: *See—*
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- McCurry, Patrick M., Jr.: *See—*
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- McCutchen, Wilmot H. Rotary vacuum distillation and desalination apparatus. 5,534,118, Cl. 202-205.000.
- McDonald, Kevin B.; Pierce, Stephen W.; Benowitz, Michael; and Terrett, David S., to Sentrol, Inc. Time multiplexed, false alarm resistant magnetically actuated security system. 5,534,849, Cl. 340-517.000.
- McDonald, Thomas L., to University of Nebraska, The Board of Regents of the. Hybridomas and monoclonal antibodies specific for unique determinants of nephropathy-related immunoglobulin G and complexes thereof. 5,534,431, Cl. 435-240.270.
- McDonnell Douglas Corp.: *See—*
  - Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., 5,534,873, Cl. 342-165.000.
- McDonough, John G.: *See—*
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  - Gambino, Richard J.; McElfresh, Michael W.; McGuire, Thomas R.; and Plaskett, Thomas S., 5,534,360, Cl. 428-694.0ML.
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- McGlynn, Charles L.; and Shu, Ker L., to Hughes Aircraft Company. Optical spectrometer system having a curved reflective imaging slit body. 5,534,700, Cl. 250-353.000.
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- McGrath, Michael C.: *See—*
  - Nelson, Kenneth J.; McGrath, Michael C.; and Avery, Timothy O., 5,535,081, Cl. 360-133.000.
- McGregor, Gerald C. Bicycle alarm system. 5,534,847, Cl. 340-432.000.
- McGuckin, Hugh G.; Carli, Jerel R.; Badger, John S.; and Waffle, Stephen J., to Eastman Kodak Company. Rinse composition for photographic paper containing alkyl ether sulfate and biocide, and method of use. 5,534,396, Cl. 430-463.000.
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- McKenzie, Philip J.: *See—*
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- McKinney, George W., III: *See—*
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- McLarty, George C., III; Waldrop, Anthony R.; and Anderson, Kathryn T., to Milliken Research Corporation. Seating structure. 5,533,789, Cl. 297-452.640.
- McManus, Richard L.: *See—*
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- McMillin, Carl R.: *See—*
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- McMullin, James N.: *See—*
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- McPartland, Richard J., to AT&T Corp. Compact and fast row driver/decoder for semiconductor memory. 5,534,797, Cl. 326-105.000.
- McPartland, Richard J.: *See*—
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- Meagher, James P., to Emerson Electric Co. Multiple plunger pedal switch assembly. 5,534,672, Cl. 200-61.890.
- Mears, James W., to Grinnell Corporation. Automatic on-off fire protection sprinkler. 5,533,576, Cl. 169-90.000.
- Mecklenburg, Karl R.: *See*—
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  - Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, 5,534,506, Cl. 514-185.000.
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  - Wahlstrand, John D.; Baxter, Daniel J.; Ecker, R. Michael; Greeninger, Daniel R.; and Yerich, Charles G., 5,534,018, Cl. 607-27.000.
- Mees, Bernhard: *See*—
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- Meg Trans Corp.: *See*—
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- Meggelaars, Michael M.; van den Biggelaar, Henricus A.; and Kussendrager, Klaas D., to Campina Melkunie B.V. Tableting excipient. 5,534,555, Cl. 514-777.000.
- Mehnert, Walter; and Theil, Thomas. Circuit arrangement for an inductive position indicator. 5,535,142, Cl. 364-559.000.
- Mehrens, Douglas W. Slidably repositionable hat. 5,533,211, Cl. 2-195.100.
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- Meier, Hans P., to MAVAG Verfahrenstechnik AG. Magnetic stirring apparatus with contactless coupling between stirring shaft and stirring tool. 5,533,803, Cl. 366-273.000.
- Meier, Peter, to Hilti Aktiengesellschaft. Expansion dowel and expansion dowel setting tool. 5,533,660, Cl. 227-147.000.
- Meier-Westhues, Hans-Ulrich: *See*—
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Meiji Milk Products Company, Ltd.: *See*—
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- Meistrell, William F.: *See*—
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- Melas, Constantin M.; Rugar, Daniel; Sutardja, Pantas; and Wood, Roger W., to Intenational Business Machines Corporation. High capacity run-length-limited coding system employing asymmetric and even-spaced codes. 5,535,187, Cl. 369-59.000.
- Melgoza, Rex: *See*—
  - Wu, Kung C.; and Melgoza, Rex, 5,533,418, Cl. 74-490.060.
- Melis, Eugenio: *See*—
  - Deplano, Stefano; Melis, Eugenio; and Millone, Roberto, 5,533,716, Cl. 266-114.000.
- Mellor, David J.: *See*—
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- Melville, Jim A.: *See*—
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- Mena, Raul. Dental implant device. 5,533,898, Cl. 433-173.000.
- Mendelson, Jeffrey B.: *See*—
  - Goldman, Matthew S.; and Mendelson, Jeffrey B., 5,535,216, Cl. 370-100.100.
- Mendez G., Antonio: *See*—
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- Meneghini, Giovanni: *See*—
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- Ménez, André: *See*—
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- Menk, Klaus-Dieter: *See*—
  - Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, 5,535,366, Cl. 395-486.000.
- Mennel, David B.: *See*—
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Mennenoh, Rich: *See*—
  - Patel, Indrajit; Bowerman, Harold; Rosenbaum, Larry; Mennenoh, Rich; and Ryan, Pat, 5,533,992, Cl. 604-403.000.
- Mennicke, Winfried; and Hassenrück, Karin, to Bayer Aktiengesellschaft. Polymeric dyestuffs and their use in inks for ink jet printing processes. 5,534,052, Cl. 106-22.00D.
- Menon, Raghu: *See*—
  - Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., 5,534,472, Cl. 502-116.000.
- Mento, Craig J.: *See*—
  - Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., 5,535,264, Cl. 379-89.000.
- Mentzer, Ray A., to National Semiconductor Corp. ESD protection circuit and method for BICMOS devices. 5,535,086, Cl. 361-91.000.
- Mercedes-Benz AG: *See*—
  - Epple, Anton; Pfeiffer, Martin; Kruse, Martin; and Volz, Wolfgang, 5,533,779, Cl. 296-192.000.
  - Hufendiek, Ernst-Wilhelm; Kerschbaum, Walter; and Werner, Johannes, 5,533,474, Cl. 123-196.0AB.
  - Rump, Siegfried; Steiner, Manfred; and Douglas, Brian, 5,535,123, Cl. 364-426.020.
  - Wörner, Otto; Reinhardt, Rudolf; and Schultz, Heinz, 5,533,602, Cl. 192-3.290.
- Merck & Co., Inc.: *See*—
  - Cama, Lovji D.; and Heck, James V., 5,534,507, Cl. 514-206.000.
  - Chartrain, Michel; and Armstrong, Joseph D., III, 5,534,422, Cl. 435-118.000.
  - Ciccarone, Terrence M.; MacTough, Suzanne C.; and Williams, Theresa M., 5,534,537, Cl. 514-397.000.
- Meredith, Susan S.: *See*—
  - Bell, D. Michael; Gonzales, Mark A.; and Meredith, Susan S., 5,535,340, Cl. 395-292.000.
- Mergui, Arie: *See*—
  - Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.
- Merit Medical Systems, Inc.: *See*—
  - Mottola, Jim; Nelson, Arlin D.; and Durham, Chris, 5,533,986, Cl. 604-264.000.
- Merkley, Kevin L.; Schumacher, Kurt G.; and Sutton, Alan R., to Storage Technology Corporation. Fault-tolerant system-to-system communications system and method utilizing multiple communications methods to transfer a single message. 5,535,334, Cl. 395-200.150.
- Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., to United States of America, Health and Human Services. Preparative two dimensional gel electrophoresis system. 5,534,121, Cl. 204-459.000.
- Merriman, Gregory H.: *See*—
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,636, Cl. 548-228.000.
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,640, Cl. 549-80.000.
- Meshulam, Haim: *See*—
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- Messerli, Peter: *See*—
  - Frischknecht, Bruno; Messerli, Peter; Fankhauser, Daniel; Roder, Rudolf; and Eigel, Rolf, 5,533,371, Cl. 72-21.100.
- Messerschmidt, Werner: *See*—
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- Metcalf, Gerald L.; Poff, Bradley C.; and Barker, John M., to Origin Medsystems, Inc. Trocar. 5,533,977, Cl. 604-164.000.
- Methode Electronics, Inc.: *See*—
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- Methold 's-Hertogenbosch B.V.: *See*—
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- Metzenthin, Tobias: *See*—
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- Meyer, Christopher: *See*—

  - Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., 5,535,375, Cl. 391-500.000.
- Meyer, Edwin R.: *See*—
  - Egawa, Ren; and Meyer, Edwin R., 5,534,944, Cl. 348-584.000.
- Meyer, Gabriel, to Becton Dickinson France S.A. Storage and transfer bottle designed for storing two components of a medicamental substance. 5,533,994, Cl. 604-416.000.
- Meyer, Hans U. Instrument for measuring lengths or angles. 5,534,859, Cl. 340-870.370.
- Meyer, Robert: *See*—
  - Leroux, Thierry; and Meyer, Robert, 5,534,744, Cl. 313-309.000.
- Meyer, Stephan, to Siemens Aktiengesellschaft. Method for determining anomalies in a line which is to be investigated. 5,534,783, Cl. 324-533.000.
- Meyer, Walter G., to Beloit Technologies, Inc. Dust removal system. 5,533,659, Cl. 226-189.000.
- Meyers, John D. Stadium seat cushion. 5,533,219, Cl. 5-653.000.
- Meyrueix, Remi: *See*—
  - Mignani, Gerard; Soula, Gerard; and Meyrueix, Remi, 5,535,048, Cl. 359-326.000.
- Mezger, Werner: *See*—
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- Michaelson, Wayne A.: *See*—
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- Michel, John H., to Westvaco Corporation. Center column extension for a clarifier. 5,534,163, Cl. 210-800.000.
- Michel, Uwe, to Siemens Nixdorf Informationssysteme Aktiengesellschaft. Recording/reproduction arrangement for data and command protocols in EDP system peripherals. 5,535,310, Cl. 395-113.000.
- Michels, Ruth, to St. Mary's Hospital and Medical Center, Inc. Cytological sampling method and device. 5,533,517, Cl. 128-758.000.
- Micron Technology, Inc.: *See*—
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  - Stroupe, Hugh; Sharan, Sujit; and Sandhu, Gurtej S., 5,533,924, Cl. 451-286.000.
- Microsoft Corporation: *See*—
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- Microtek International, Inc.: *See*—
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- MicroUnity Systems Engineering, Inc.: *See*—
  - Bateman, Bruce L., 5,535,166, Cl. 365-208.000.
- Midani, Mowaffak T.: *See*—
  - Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,534,913, Cl. 348-7.000.
- Middendorf, Lyle R.; Bruce, Robert C.; and Eckles, Robert D., to Li-Cor, Inc. DNA sequencing. 5,534,125, Cl. 204-618.000.
- Middleby Marshall Inc.: *See*—
  - Veltrop, Loren; Friedl, Joel G.; and Nevarez, Roberto, 5,533,806, Cl. 366-347.000.
- Midway Environmental Associates, Inc.: *See*—
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- Mielnik, Thaddeus: *See*—
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- Mifuji, Fumio, to Sanyo Electric Co., Ltd. Apparatus and method for mounting an air-core coil. 5,533,253, Cl. 29-741.000.
- Mifune, Hiroyuki: *See*—
  - Kuno, Koichi; and Mifune, Hiroyuki, 5,534,402, Cl. 430-596.000.
- Mignani, Gerard; Soula, Gerard; and Meyrueix, Remi, to Flamel Technologies. Nonlinearly optically active compounds. 5,535,048, Cl. 359-326.000.
- Mihalcheon, Arthur A., to Steel-Craft Door Products Ltd. Composite panel having interlocked skins and a bonded foam core. 5,533,312, Cl. 52-309.900.
- Mihalovics, György: *See*—
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperbej, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Sűo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Mihayashi, Keiji, to Fuji Photo Film Co., Ltd. Silver halide color photographic photosensitive material. 5,534,399, Cl. 430-553.000.
- Mihira, Ado: *See*—
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- Miki, Hideki; Iwanaga, Koichi; and Matsuno, Toshimi, to Takeda Chemical Industries, Ltd. 2-(substituted phenyl)-1, 2, 4-triazin-3-ones. 5,534,512, Cl. 514-242.000.
- Mikkelsen, Dennis L. Container with internal lift mechanism. 5,533,625, Cl. 206-565.000.
- Miles, Barry M.; Juskey, Frank J.; and Banerji, Kingshuk, to Motorola, Inc. Leadless integrated circuit package. 5,535,101, Cl. 367-808.000.
- Miles Inc.: *See*—
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- Millan, Jose: *See*—
  - Safont, Vicente; Millan, Jose; Rebordosa, Antonio; and Hernandez, Alejandro, 5,533,801, Cl. 366-249.000.
- Millard, Paul J.; Roth, Bruce L.; Yue, Stephen T.; and Haugland, Richard P., to Molecular Probes, Inc. Fluorescent viability assay using cyclic-substituted unsymmetrical cyanine dyes. 5,534,416, Cl. 436-34.000.
- Miller, George. Motor having non-coaxial, synchronized rotors. 5,534,738, Cl. 310-115.000.
- Miller, Harold J., III: *See*—
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- Miller, James S.; and Ganapathi, Jagadeesan, to Digital Equipment Corporation. Method of and system for displaying context sensitive and application independent help information. 5,535,323, Cl. 395-155.000.
- Miller, J. Stanley; and Thompson, Reginald, to PQ Corporation. Hollow borosilicate microspheres and method of making. 5,534,348, Cl. 428-402.000.
- Miller, Paul E.: *See*—
  - Elder, David B.; Krosner, Stephen P.; Miller, Paul E.; and Skinner, Harold R., 5,535,389, Cl. 395-700.000.
- Miller, Rene M. Child safety swing for playground swing. 5,533,934, Cl. 472-118.000.
- Miller, Sally E. Pocket panel educational or diagnostic tool. 5,533,902, Cl. 434-112.000.
- Miller, Scott C., to Zeneca Limited. Lactam derivatives. 5,534,525, Cl. 514-316.000.
- Millet, Hank E.: *See*—
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Milliken Research Corporation: *See*—
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- Millone, Roberto: *See*—
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- Mills, Michael E.: *See*—
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- Milovich, Dimitrije: *See*—
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- Mimura, Hitoshi: *See*—
  - Kataoka, Akira; Mimura, Hitoshi; Kuramoto, Manabu; and Tukita, Ryuichi, 5,533,282, Cl. 36-129.000.
- Mimura, Kenji. Differential gear. 5,533,424, Cl. 74-650.000.
- Min, Byoung W., to Samsung Electronics Co., Ltd. Automatic monitoring method for a video cassette recorder. 5,535,066, Cl. 360-31.000.
- Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, to Sumitomo Chemical Company, Limited. Acetylene derivatives, process for producing the same, liquid crystal composition containing the same as an active ingredient, and liquid crystal element using said liquid crystal composition. 5,534,188, Cl. 252-299.610.
- Minami, Shigeo: *See*—
  - Koashi, Katsue; and Minami, Shigeo, 5,533,509, Cl. 128-633.000.
- Minarelli, Alessandro; and Brizzi, Marco, to G. D S.p.A. Cigarette packet. 5,533,613, Cl. 206-268.000.
- Minasian, Karen: *See*—
  - Tonoyan, Lily; and Minasian, Karen, 5,533,208, Cl. 2-10.000.
- Minato, Kazuo: *See*—
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- Minebea Co., Ltd.: *See*—
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- Minguell I Juncosa, Genaro: *See*—
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- Minish, Sharon K.: *See*—
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- Minneman, Sue A. F. Mouthguard having an extra-oral portion and an intra-oral portion. 5,533,524, Cl. 128-859.000.
- Minnesota Mining and Manufacturing Company: *See*—
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  - Ali, M. Zaki, 5,534,633, Cl. 546-196.000.
  - Doyle, Kevin J.; and Eastlund, Gary N., 5,533,691, Cl. 242-597.400.
  - Hager, Patrick J.; and Goetz, Richard J., 5,534,589, Cl. 525-57.000.
  - Kline, Robert J.; Larsen, Thomas E.; Schiesl, Mark A.; and Tait, Bruce E., 5,533,690, Cl. 242-547.000.
  - Moore, Arthur R.; and Gustafson, Donald E., 5,535,190, Cl. 369-295.200.
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  - Sioutas, Constantinos, 5,533,498, Cl. 128-200.230.
  - Torterolo, Franco, 5,533,620, Cl. 206-408.000.
  - Tran, Nang T.; and Keyes, Michael P., 5,534,445, Cl. 437-21.000.
  - Wang, Paul J., 5,534,391, Cl. 430-271.100.
- Minns, Richard A., to Polaroid Corporation. Process and composition for cladding optical fibers. 5,534,558, Cl. 522-35.000.
- Minns, Richard A.: *See*—

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Miracle, Gregory S.; Sivik, Mark R.; and Kellett, Patti J. Detergent compositions comprising multiperacid-forming bleach activators. 5,534,179, Cl. 510-305.000.

Miracle, Gregory S.; and Sivik, Mark R. Automatic dishwashing compositions comprising multiperacid-forming bleach activators. 5,534,180, Cl. 510-220.000.

Miramontes Cardenas, Luis E.; Castillo Cervantes, Salavador; and Moran Pineda, Florencia M., to Instituto Mexicano Del Petroleo. Catalytically active ceramic monoliths for the reduction of leaded gasoline fueled engine pollutants and the production thereof. 5,534,475, Cl. 502-304.000.

Mischke, Mark R.: *See—*

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Mitchell, David. Ergonomic shovel. 5,533,768, Cl. 294-54.500.

Mitchell, David. Bale transporter. 5,533,855, Cl. 414-470.000.

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Mitsubishi Chemical Corporation: *See—*

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Mitsubishi Electric Engineering Co., Ltd.: *See—*

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Mitsubishi Gas Chemical Company, Inc.: *See—*

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Mitsubishi Materials Corporation: *See—*

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Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, 5,534,148, Cl. 210-605.000.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See—*

Kuroda, Katsuya, 5,534,846, Cl. 340-426.000.

Mitsui, Shigeyuki; and Hase, Yoshiaki, to Asics Corporation. Shoe having a skelton-shaped outer carapace. 5,533,279, Cl. 36-50.100.

Mitsui, Shinichi; Kihara, Hayato; and Yoshimi, Shuji, to Sumitomo Chemical Company, Limited. Styrenic resin composition and injection- and extrusion-molded articles. 5,534,580, Cl. 524-417.000.

Mitsui Toatsu Chemicals, Inc.: *See—*

Asanuma, Tadashi; Matsuzawa, Hiroshi; Sasaki, Tateyo; and Kawanishi, Kaoru, 5,534,595, Cl. 525-326.500.

Kambara, Yoshihiko; Uehara, Yoshikazu; Abe, Takeya; and Asao, Koichi, 5,534,655, Cl. 564-127.000.

Mitsumi Electric Co., Ltd.: *See—*

Inoue, Naoto; and Yamaguchi, Kiyotaka, 5,535,080, Cl. 360-129.000.

Mitsumori, Koji; Tomiyama, Takamichi; and Shibata, Keiichi, to Sony Corporation. Objective lens drive device and coil bobbin thereof. 5,535,059, Cl. 359-813.000.

Mitsuo, Koji. Method for producing and curing hydraulic material. 5,534,292, Cl. 427-228.000.

Mitsusada, Kazumichi: *See—*

Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.

Mitsuuchi, Masamichi: *See—*

Kitamura, Hiroshi; and Mitsuuchi, Masamichi, 5,534,584, Cl. 524-497.000.

Miura, Hironori: *See—*

Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.

Miura, Kosho, to Nikon Corporation. Camera in-finder display device. 5,534,966, Cl. 354-409.000.

Miura, Tohru; Kubo, Mitsumasa; and Mashimo, Akira, to TEAC Corporation. Optical disk reproducing device and its seek operation method. 5,535,183, Cl. 369-32.000.

Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, to Sony Corporation. Reproducing apparatus having a single microprocessor to perform data retrieval disc reproduction control. 5,535,184, Cl. 369-32.000.

Miwa, Satoshi: *See—*

Baba, Akira; Sugimura, Kazuo; Miwa, Satoshi; Yamamoto, Keizo; and Saito, Masayuki, 5,534,735, Cl. 307-117.000.

Miyadera, Tatsuo: *See—*

Yoshida, Kiyohide; Muramatsu, Gyo; Abe, Akira; and Miyadera, Tatsuo, 5,534,237, Cl. 423-239.100.

Miyahara, Hidetaka: *See—*

Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, 5,534,120, Cl. 205-464.000.

Miyake, Eiichi, to Sanei Giken Co., Ltd. Alignment method and apparatus in an exposing process. 5,534,969, Cl. 355-53.000.

Miyamoto, Hidenori; and Soshi, Isao, to Nikon Corporation. Printed circuit board having zig-zag contact arrangement. 5,534,667, Cl. 174-261.000.

Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,534,957, Cl. 354-106.000.

Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,534,958, Cl. 354-106.000.

Miyamoto, Satoshi: *See—*

Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, 5,534,643, Cl. 554-227.000.

Miyaoka, Seiji: *See—*

Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.

Miyashita, Mafumi; and Ozaki, Ichiro, to NEC Corporation. Radio receiver remotely controllable to inhibit the display of a received message. 5,535,427, Cl. 455-38.200.

Miyashita, Toshikazu, to NEC Corporation. Precise detection of frequency error for bursts modulated by predetermined symbol sequence. 5,535,249, Cl. 375-344.000.

Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, to Daikin Industries, Ltd. Air conditioner. 5,533,351, Cl. 62-174.000.

Miyawaki, Isamu; and Kaneko, Kikuzo, to Organo Corporation. Process for the production of glucose. 5,534,075, Cl. 127-46.100.

Miyazaki, Ken: *See—*

Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, 5,535,008, Cl. 358-342.000.

Miyazaki, Takeshi; Tanaka, Kazumi; Sakuranaga, Masanori; and Okamoto, Tadashi, to Canon Kabushiki Kaisha. Optically measuring an immunologically active material by degree of agglutination of an antigen-antibody reaction product. 5,534,441, Cl. 436-517.000.

Miyazaki, Yukio; Okitaka, Takenori; Hatakenaka, Makoto; and Mano, Junji, to Mitsubishi Denki Kabushiki Kaisha. Synchronized clock generating apparatus. 5,534,805, Cl. 327-144.000.

Miyazawa, Kazutoshi; Matsui, Shuichi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, to Chisso Corporation. Liquid crystalline compound and liquid crystal composition. 5,534,187, Cl. 252-299.010.

Miyazawa, Kazuyuki: *See—*

Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.

Miyazawa, Masazumi: *See—*

Kobayashi, Yasunori; Tanabe, Shin; Fukuda, Tatsuo; Miyazawa, Masazumi; Imai, Hideki; and Wani, Moriyuki, 5,533,413, Cl. 73-865.900.

Miyoshi, Tetsuo; Hozumi, Yuuji; Yamagishi, Akira; and Koizumi, Kaoru, to Mitsubishi Denki Kabushiki Kaisha. Thermal image analysis system. 5,534,695, Cl. 250-330.000.

Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, to Kabushiki Kaisha Komatsu Seisakusho. Laser device. 5,535,233, Cl. 372-87.000.

Mizoguchi, Kiyokazu: *See—*

Torii, Tetsuo; and Mizoguchi, Kiyokazu, 5,534,918, Cl. 348-53.000.

Mizoguchi, Shozo: *See—*

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Mizoguchi, Yoshiyuki: *See—*

Ikeda, Keiichi; and Mizoguchi, Yoshiyuki, 5,533,816, Cl. 400-120.070.

Mizukami, Miyuki: *See—*

Ogawa, Mamoru; Todo, Tatsuya; and Mizukami, Miyuki, 5,534,092, Cl. 156-89.000.

Mizukami, Yashio: *See—*

Makino, Tadashi; Mizukami, Yashio; and Kikuta, Jun-ichi, 5,534,534, Cl. 514-388.000.

Mizuno, Shigeru; Katsumata, Yoshihiro; and Takahashi, Nobuyuki, to Anelva Corporation. Integrated module multi-chamber CVD processing system and its method for processing subtrates. 5,534,072, Cl. 118-728.000.

Mizushima, Yoshihiko: *See—*

Takeshima, Akira; Koishi, Musubu; Warashina, Yoshihisa; and Mizushima, Yoshihiko, 5,534,992, Cl. 356-5.100.

Mobil Oil Corporation: *See—*

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Mochizuki, Hirohiko: *See—*

Endo, Tetsuya; Mochizuki, Hirohiko; Kodama, Yukinori; and Takemae, Yoshihiro, 5,535,169, Cl. 365-230.030.

Modine Manufacturing Co.: *See—*

Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.

Mogami, Akio: *See—*

Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, 5,534,338, Cl. 428-242.000.

Moheno, Phillip B. B., to San Diego State University. Anti-neoplastic compositions and methods for application thereof. 5,534,514, Cl. 514-249.000.

Molecular Dynamics: *See—*

Bashkin, John S.; Barker, David L.; and Johnston, Richard F., 5,534,123, Cl. 204-455.000.

Molecular Probes, Inc.: *See—*

Millard, Paul J.; Roth, Bruce L.; Yue, Stephen T.; and Haugland, Richard P., 5,534,416, Cl. 436-34.000.

Molloy, R. Michael: *See—*

Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., 5,534,420, Cl. 435-71.300.

Mollstam, Bo: *See—*

Casas, Ivan A.; and Mollstam, Bo, 5,534,253, Cl. 424-93.450.

Molnár née Bakó, Erzsébet: *See—*

Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.

Moltech Invent S.A.: *See—*

Sekhar, Jainagesh A., 5,534,130, Cl. 205-372.000.

Momany, Frank A.: *See—*

Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534,494, Cl. 514-16.000.

Mongelli, Nicola; Biasoli, Giovanni; Mariani, Mariangela; and Sola, Francesco, to Farmitalia Carlo Erba S.r.l. Biologically active ureido derivatives useful as anit-metastic agenst. 5,534,539, Cl. 514-422.000.

Mongoin, Jacques: *See—*

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Monroe, Bruce M.: *See—*

Bodager, Gregory A.; and Monroe, Bruce M., 5,534,380, Cl. 430-143.000.

Monsanto Company: *See—*

Chalupa, William F.; and Sanderson, George R., 5,534,286, Cl. 426-573.000.

Moog Inc.: *See—*

Garnjost, Kenneth D.; and Stegner, James C., 5,533,933, Cl. 472-60.000.

Moon, Dai-sick: *See—*

Kim, Tae-ryong; Park, Hee-su; and Moon, Dai-sick, 5,534,728, Cl. 257-692.000.

Moore, Alan; and Themins, Patrick A., to Intel Corporation. Apparatus for a test access architecture for testing of modules within integrated circuits. 5,534,774, Cl. 324-158.100.

Moore, Arthur R.; and Gustafson, Donald E., to Minnesota Mining and Manufacturing Company. Driver system for an updatable optical storage-media. 5,535,190, Cl. 369-295.200.

Moore Business Forms, Inc.: *See—*

Fontana, Sharon M., 5,533,459, Cl. 112-475.080.

Raby, James M., 5,534,320, Cl. 428-42.100.

Moore, Clyde R.; Fredrick, William A.; McIngvale, J. D.; and Wedell, Mark T., to Thomas & Betts Corporation. Quartz halogen flood light assembly having improved housing. 5,535,109, Cl. 362-267.000.

Moore, Emma E., to ZymoGenetics, Inc. Compositions and methods for stimulating the growth of osteoblasts. 5,533,836, Cl. 435-240.310.

Moore, H. Jack, Jr., to Southcorp Water Heaters USA, Inc. Balanced flue outdoor water heater. 5,533,495, Cl. 126-350.00R.

Moore, Timothy F., III: *See—*

Schilling, Donald L.; Garodnick, Joseph; Lomp, Gary; and Moore, Timothy F., III, 5,535,238, Cl. 375-200.000.

Moore, Victor S.: *See—*

Brigida, David J.; Moore, Victor S.; and Pate, Thomas K., 5,535,242, Cl. 375-222.000.

Moore, Walter A.: *See—*

Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.

Moormann, Alan E.: *See—*

Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.

Morales, Emmitt. Stud removal and fastening tool. 5,533,426, Cl. 81-53.200.

Morales, Florencio, Jr.: *See—*

Casamassina, Thomas; Morales, Florencio, Jr.; Salka, Barry A.; Fallon, John; Desai, Sureshchandra G.; and McCurry, Patrick M., Jr., 5,534,500, Cl. 252-353.000.

Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, to M-Systems Flash Disk Pioneers Ltd. Flash memory system providing both BIOS and user storage capability. 5,535,357, Cl. 395-430.000.

Moran Pineda, Florencia M.: *See—*

Miramontes Cardenas, Luis E.; Castillo Cervantes, Salavador; and Moran Pineda, Florencia M., 5,534,475, Cl. 502-304.000.

Mórász, Ferenc: *See—*

Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.

Moreland, Carl W., to Analog Devices, Inc. Selectable logic output stage. 5,534,794, Cl. 326-63.000.

Moretz, Herbert L.; and Brier, Daniel L., to Intelpro Corporation. Combination moisture management panty and panty hose system for women. 5,533,212, Cl. 2-409.000.

Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, to University of Toledo; Medical College of Ohio; and St. Vincent Medical Center. Use of purpurins, chlorins and purpurin- and chlorin-containing compositions. 5,534,506, Cl. 514-185.000.

Morgan, John R.: *See—*

Dailey, James H.; Morgan, John R.; and Saad, Karim I., 5,534,048, Cl. 106-1.220.

- Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, to International Superconductivity Technology Center. Bis(ethylenedithio)tetrathiafulvalene.cyanometalate complex. 5,534,638, Cl. 549-3.000.
- Mori, Hiroshi; and Bendo, Masatoshi, to Advantest Corporation. Measurement apparatus for evaluating characteristics of light emitting devices. 5,534,996, Cl. 356-218.000.
- Mori, Kenichi; and Tsukamoto, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Conductive layer connection structure of a semiconductor device and a method of manufacturing thereof. 5,534,730, Cl. 257-757.000.
- Mori, Shinsaku; Sasase, Iwao; and Takahashi, Kiyoshi, to Mori, Shinsaku; Sasase, Iwao; and TEAC Corporation. Duplex adaptive digital filter and method of operation. 5,535,149, Cl. 364-724.190.
- Mori, Takehiko: *See—*
  - Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
- Moriarty, Ann M.; Alexander, Hannah; and Lerner, Richard A., to Scripps Research Institute, The. Antibodies, diagnostic systems and methods for assaying HBxAg. 5,534,405, Cl. 435-5.000.
- Moriarty, Michael: *See—*
  - Tipley, Roger E.; Moriarty, Michael; and Taylor, Mark, 5,535,395, Cl. 395-729.000.
- Morigaki, Masakazu: *See—*
  - Seto, Nobuo; Yoshioka, Yasuhiro; and Morigaki, Masakazu, 5,534,390, Cl. 430-551.000.
- Morikawa, Takeshi: *See—*
  - Sugitani, Nobuyoshi; Okuwa, Masayuki; Morikawa, Takeshi; and Nonomura, Yutaka, 5,533,397, Cl. 73-504.160.
- Morimoto, Takao; and Nakano, Shinji, to Nippon Paint Co., Ltd. Vinyl monomer having linear carbonate and hydroxyl groups. 5,534,647, Cl. 558-275.000.
- Morita, Takashi: *See—*
  - Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,535,184, Cl. 369-32.000.
- Moriya, Akira, to Japan Gore-Tex, Inc. Method for manufacturing a liquid crystal polymer film and a liquid crystal polymer film made thereby. 5,534,209, Cl. 264-171.130.
- Morrell, JoAnn: *See—*
  - Havens, Thomas G.; Kerko, David J.; and Morrell, JoAnn, 5,534,041, Cl. 65-30.100.
- Morris, C. Edward: *See—*
  - Tarr, Yul J.; Morris, C. Edward; and Haegele, Glen T., 5,534,161, Cl. 210-744.000.
- Morris, James E.: *See—*
  - Huang, Chih-Yuan; Su, Yan-Kuin; and Morris, James E., 5,535,146, Cl. 364-578.000.
- Morris, Jerry L.; McAleavey, Michael E.; and Cheu, S. Scot. Battery module. 5,534,368, Cl. 429-152.000.
- Morris, John E., to Springs Window Fashions Division, Inc. Venetian blind headrail and mounting bracket system. 5,533,560, Cl. 160-178.100.
- Morris, Michael, to Joshua Morris Publishing, Inc. Children's book having noise making capability. 5,533,757, Cl. 281-15.100.
- Morterol, Frederic R. M. M.: *See—*
  - Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 5,534,607, Cl. 526-88.000.
- Morton International, Inc.: *See—*
  - Kort, Leland B.; Moore, Walter A.; Clark, Randall J.: Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.
  - Leonard, Timothy J.; and Anderson, Daniel W., 5,533,749, Cl. 280-728.300.
  - Rose, Larry D., 5,533,747, Cl. 280-728.200.
  - Whited, Timothy J., 5,533,746, Cl. 280-728.200.
  - Wirt, W. Gary; and Jarboe, Patrick G., 5,533,748, Cl. 280-728.300.
- Morton, Robert L.: *See—*
  - Benhase, Michael T.; Burton, David A.; McCauley, John N., Jr.; and Morton, Robert L., 5,535,372, Cl. 395-500.000.
- Moschini, Renzo; and Poggi, Stefano, to Weber S.r.l. Method and system for semiliquid die casting bigh performance mechanical components from rheocast ingots. 5,533,562, Cl. 164-71.100.
- Moser, Paul: *See—*
  - Komarek, Dale W.; Moser, Paul; and Wroblewski, George T., Sr., 5,533,956, Cl. 493-355.000.
- Moses Lake Industries, Inc.: *See—*
  - Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, 5,534,649, Cl. 558-277.000.
- Moshier, Mark W.; Haley, John C.; Haley, Bobby Z.; and Andrews, Stanley B., to Tyson Holding Company. Freezing system. 5,533,343, Cl. 62-63.000.
- Motor Wheel Corporation: *See—*
  - Kier, Charles E., Jr., 5,533,260, Cl. 29-894.322.
- Motorola: *See—*
  - Lebby, Michael S.; Blair, Thomas H.; and Witting, Gary F., 5,534,888, Cl. 345-121.000.
- Motorola, Inc.: *See—*
  - Ashley, James P.; and Proctor, Lee M., 5,535,194, Cl. 370-32.100.
  - Balzano, Quirino; Richards, Scott H.; and Claxton, Bruce A., 5,535,435, Cl. 455-89.000.
  - Biggs, Terry L.; Tietjen, Donald L.; and Wilson, Jesse R., 5,535,398, Cl. 395-750.000.
  - Boaz, Shachar; Yoram, Yeivin; and Yehuda, Rudin, 5,535,349, Cl. 395-401.000.
  - Bush, Kevin J.; Dua, Sanjay; Adams, Neil J.; and Markyvech, Craig R., 5,535,135, Cl. 364-496.000.
  - Catherwood, Michael I.; Kilbane, Kevin; and Dobbs, Laura M., 5,535,376, Cl. 395-550.000.
  - Cohen, Yitzak; Brody, Rafael; Magril, Tzvika; and Esbet, Dan, 5,535,396, Cl. 395-733.000.
  - Dong, Ping; Eyuboglu, M. Vedat; and Forney, George D., Jr., 5,535,228, Cl. 371-49.100.
  - Dupont, Pierre, 5,535,207, Cl. 370-80.000.
  - Erickson, Bart J.; and Anderson, Neal R., 5,534,876, Cl. 342-387.000.
  - Fiordalice, Robert W.; Maniar, Papu D.; Klein, Jeffrey L.; and Roman, Bernard J., 5,534,462, Cl. 437-190.000.
  - Gailus, Paul H.; Gannon, Mark A.; and Gillig, Steven F., 5,535,247, Cl. 375-297.000.
  - Goldberg, Steven J.; and Paterson, Hugh, 5,535,257, Cl. 379-57.000.
  - Gruender, Eugene H., Jr.; and Snowden, Ralph E., 5,535,367, Cl. 395-493.000.
  - Gunter, Brad D.; Andersor, David; Bersch, Danny A.; Anderson, Howard C.; and Garrity, Doug, 5,534,819, Cl. 327-553.000.
  - Hieatt, William R., III, 5,535,215, Cl. 370-95.100.
  - Hwang, B. Chester; Fernandez, Jose M.; Meadows, Vernon; Thomas, Simon; and Amero, Willard F., Jr., 5,534,366, Cl. 429-91.000.
  - Joglekar, Manohar A.; Cramer, Joseph F., Jr.; and Korycan, George M., 5,535,258, Cl. 379-58.000.
  - Karl, David H.; Chambers, Randall P.; and Dionisio, Vito, Jr., 5,535,437, Cl. 455-90.000.
  - King, Gerald R.; Lloyd, Robert D.; and Nelson, Leonard E., 5,535.428, Cl. 455-38.400.
  - Kreisinger, Robert D.; Burns, Arthur G.; and Fernandez, Jose M., 5,534,765, Cl. 320-30.000.
  - Lee, Whay C., 5,535,195, Cl. 370-54.000.
  - Leigh, Todd A.; Sasuta, Michael D.; and Hefferan, John K., 5,535,426, Cl. 455-34.100.
  - Lum, Thomas F.; and Wenzel, James F., 5,534,784, Cl. 324-757.000.
  - Miles, Barry M.; Juskey, Frank J.; and Banerji, Kingshuk, 5,535,101, Cl. 367-808.000.
  - Osborn, Stephen G.; and Goke, L. Rodney, 5,535,148, Cl. 364-718.000.
  - Peng, Chih-Jui, 5,535,351, Cl. 395-417.000.
  - Romero, Guillermo L.; and Martinez, Joe L., Jr., 5,533,257, Cl. 29-890.030.
  - Saionji, Osamu, 5,534,947, Cl. 348-664.000.
  - Schwab, Suzanne E., 5,535,313, Cl. 395-118.000.
  - Siddoway, Craig F.; and Giacomino, Gerald L., 5,535,434, Cl. 455-89.000.
  - Smolinske, Jeffrey C.; Clanton, Christopher L.; and Tran, Phieu M., 5,535,210, Cl. 370-85.200.
  - Thomas, Thomas L., Jr., 5,535,346, Cl. 395-375.000.
  - Yepez, Esteban, III; and DiPrizio, Giuseppe M., 5,535,168, Cl. 365-227.000.
  - Zhu, Qin-Fan; and Yong, Mei, 5,534,937, Cl. 348-466.000.
- Motoyama, Tetsuro; and Chang, Yueh-Lin, to Ricoh Company, Ltd.; and Ricoh Corporation. Debugging system for a hierarchically structured page description language. 5,535,318, Cl. 395-145.000.
- Mottola, Jim; Nelson, Arlin D.; and Durham, Chris, to Merit Medical Systems, Inc. Catheter apparatus with means for subcutaneous delivery of anesthetic agent or other fluid medicament. 5,533,986, Cl. 604-264.000.
- Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, to Adir et Compagnie. Aminoalkyl benzoxazolinones and benzothiazolinones. 5,534,511, Cl. 514-212.000.
- Mourad, Esther. Hair coloring applicator. 5,533,537, Cl. 132-148.000.
- Mourgues, Bernard, to Neopost Industrie. Method of checking daily consumption of postal charges by a postage meter and a postage meter enabling such monitoring to be performed. 5,535,126, Cl. 364-464.020.
- Mouri, Akihiro; Shibata, Tsuyoshi; and Kondo, Yuji, to Canon Kabushiki Kaisha. Method of peeling a release film from a photosensitive plate blank. 5,533,452, Cl. 101-463.100.
- Moussy, Francis, to University of Alberta, The Governors of the. Vascular bioartificial organ. 5,534,025, Cl. 623-11.000.
- Moyer, William P.: *See—*
  - Henry, Randall R.; Moyer, William P.; and Skotek, David A., 5,533,908, Cl. 439-329.000.
- MSP Corporation: *See—*
  - Liu, Benjamin Y. H., 5,534,309, Cl. 427-458.000.
- MTD Products Inc.: *See—*
  - Weirich, Mike; and Vogt, Kurt E., 5,533,416, Cl. 74-366.000.
- MTN International, LLC: *See—*
  - Jenkins, Peter E., 5,533,480, Cl. 123-294.000.
- MTS Systems Corporation: *See—*
  - Haeg, Steven R.; Leska, Paul J., Sr.; and Zieman, Ricky L., 5,533,403, Cl. 73-669.000.
- MTU Motoren-Und Turbinen-Union München GmbH: *See—*
  - Bamberg, Joachim; Steinhauser, Ludwig; Bayer, Erwin; and Adam, Peter, 5,534,308, Cl. 427-454.000.
- Mueller, Lutz: *See—*
  - Seher, Bernd; Reuther, Frank; and Mueller, Lutz, 5,535,250, Cl. 378-34.000.
- Mukai, Ryohei: *See—*
  - Imai, Tomoyasu; and Mukai, Ryobei, 5,533,931, Cl. 451-11.000.

- Mukherjee-Roy, Moitreyee; Pettersson, Charles R.; and Debner, Thomas G., to Texas Instruments Incorporated. Method and system for inspecting polished surface texture. 5,535,005, Cl. 356-371.000.
- Mulder, Martien, to Cordis Corporation. Balloon catheter with pressure indicator. 5,533,969, Cl. 604-100.000.
- Müller, Hanns P.: *See—*
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal sulphonylaminocarbonyl triazolinones having substituents bonded via oxygen. 5,534,486, Cl. 504-273.000.
- Mullooly, John F.; Davis, Franklin J.; Madden, Thomas J.; and Wright, Richard R., to United Technologies Corporation. Ignitor plug guide for a gas turbine engine combustor. 5,533,330, Cl. 60-39.320.
- Multi-Tech Systems, Inc.: *See—*
  - Li, Ping, 5,535,204, Cl. 370-76.000.
- Multifastener Corporation: *See—*
  - Ladouceur, Harold A., 5,533,250, Cl. 29-702.000.
- Mundy, G. R.: *See—*
  - Bonewald, Lynda; Mundy, G. R.; and Gallwitz, Wolf E., 5,534,524, Cl. 514-314.000.
- Muni, Ketan P.; and Sirhan, Motasim M., to Advanced Cardiovascular Systems, Inc. Low profile catheter with expandable outer tubular member. 5,533,968, Cl. 604-96.000.
- Murai, Ryukichi, to Yoshida Kogyo K.K. Lock fastener. 5,533,240, Cl. 24-615.000.
- Murakami, Haruji: *See—*
  - Shirai, Yoshimitsu; Murakami, Haruji; and Amaike, Takeshi, 5,534,210, Cl. 264-171.130.
- Murakami, Katsuhiko: *See—*
  - Kambara, Hideki; Anazawa, Takashi; Takahashi, Satoshi; and Murakami, Katsuhiko, 5,534,703, Cl. 250-458.100.
- Murakami, Kouji: *See—*
  - Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, 5,534,370, Cl. 429-198.000.
- Muramatsu, Gyo: *See—*
  - Yoshida, Kiyohide; Muramatsu, Gyo; Abe, Akira; and Miyadera, Tatsuo, 5,534,237, Cl. 423-239.100.
- Murao, Kazushige: *See—*
  - Takenaka, Kenji; Kayukawa, Hiroaki; Murao, Kazushige; and Hiramatsu, Osamu, 5,533,871, Cl. 417-269.000.
- Murasato, Shigetaka; and Hasegawa, Koichi, to Showa Denko K.K. Epitaxial wafer for light-emitting diode. 5,534,717, Cl. 257-94.000.
- Murat, Marie R. O. Newspaper storage and bundling system. 5,533,318, Cl. 53-390.000.
- Murata, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Image data compression and expansion apparatus, and image area discrimination processing apparatus therefor. 5,535,013, Cl. 358-432.000.
- Murata, Kenji: *See—*
  - Hisano, Seiichi; Saito, Kazuhisa: Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.
- Murata Manufacturing Co., Ltd.: *See—*
  - Goma, Shinji; and Bizen, Tatsuo, 5,534,825, Cl. 331-117.00R.
  - Kadono, Nobuaki; and Kidou, Kenichirou, 5,534,102, Cl. 156-250.000.
  - Nakamura, Takeshi, 5,533,396, Cl. 73-504.120.
  - Ogawa, Mamoru; Todo, Tatsuya; and Mizukami, Miyuki, 5,534,092, Cl. 156-89.000.
  - Sugiyama, Masaaki; and Ohta, Hiroyuki, 5,535,272, Cl. 379-373.000.
- Murata, Toshinori: *See—*
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
- Murden, Gregory: *See—*
  - Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., 5,534,873, Cl. 342-165.000.
- Murphey, Randy; Bellotti, Marc; Lo, Ying-Cheng; and Edwards, Scott, to Baxter International, Inc. Transfer set connector with permanent, integral cam opening closure and a method of using the same. 5,533,996, Cl. 604-283.000.
- Murphy, Thomas A.: *See—*
  - Castonguay, Roger N.; Smith, James J.; and Murphy, Thomas A., 5,534,833, Cl. 335-68.000.
- Mussetto, Michael S.: *See—*
  - Yujiri, Larry; Mussetto, Michael S.; and Uyeno, Gerald P., 5,534,874, Cl. 342-351.000.
- Muston, Robert L.; and Matkowitch, Mario, to Environmental Products Amalgamated Pty. Ltd. Apparatus for servicing refrigeration systems. 5,533,359, Cl. 62-292.000.
- Muto, Nobuyuki: *See—*
  - Takemoto, Takatoshi; Kawashima, Kazunari; and Muto, Nobuyuki, 5,534,685, Cl. 235-487.000.
- Mutoh, Nobuyoshi: *See—*
  - Masaki, Ryoso; Mutoh, Nobuyoshi; and Obara, Sanshiro, 5,534,764, Cl. 318-802.000.
- Mutschall, Hugo: *See—*
  - Focke, Heinz; and Mutschall, Hugo, 5,533,854, Cl. 414-412.000.
- Myers, William H. Comestible and liquid container carrier. 5,533,639, Cl. 220-23.800.
- Nabai, Hossein; and Rahbari, Homayoon. Hypodermic needle steady rest and removal tool. 5,533,979, Cl. 604-187.000.
- Nabisco, Inc.: *See—*
  - Pappas, Chris; Koppa, Daniel A.; Skeels, Roger E.; and Aquino, Agostino, 5,534,281, Cl. 426-383.000.
- Nadehara, Kouhei, to NEC Corporation. Circular buffer controller. 5,535,412, Cl. 395-800.000.
- Naef, Rainer F.: *See—*
  - Quigley, Michael C.; and Naef, Rainer F., 5,534,113, Cl. 159-49.000.
- Naeser, Helmut: *See—*
  - Irro, Otmar; and Naeser, Helmut, 5,534,986, Cl. 355-284.000.
- Nagamine, Hisayuki, to NEC Corporation. Semiconductor memory device. 5,534,724, Cl. 257-390.000.
- Nagano, Toru: *See—*
  - Endo, Takayoshi; Yagi, Sakai; and Nagano, Toru, 5,533,909, Cl. 439-381.000.
- Nagaraj, D. R.; Wang, Samuel S.; Lee, James S.; and Magliocco, Lino G., to Cytec Technology Corp. Method of depressing non-sulfide silicate gangue minerals. 5,533,626, Cl. 209-167.000.
- Nagarathnam, Lakshman: *See—*
  - Leuthold, Hans; Jennings, David J.; Heine, Gunter; and Nagarathnam, Lakshman, 5,533,812, Cl. 384-112.000.
- Nagasawa, Kenichi; Nakayama, Tadayoshi; Takahashi, Koji; and Takei, Masahiro, to Canon Kabushiki Kaisha. Information signal recording system using different compressing methods to obtain signals for recording along with a corresponding signal indicating the method of compression. 5,535,064, Cl. 360-9.100.
- Nagata, Tadaaki: *See—*
  - Kawano, Shizuo; and Nagata, Tadaaki, 5,533,585, Cl. 180-190.000.
- Nagaura, Toru, to Hival Ltd. Battery having divided electrode portions. 5,534,369, Cl. 429-161.000.
- Nagayama, Keiichi; Noguchi, Masami; and Sakakino, Takahiro, to Omron Corporation. Circuit breaking switch with fusible element that responds to current overloads. 5,534,842, Cl. 337-402.000.
- Nagler, Franz: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Nagura, Toshikazu: *See—*
  - Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, 5,534,477, Cl. 503-227.000.
- Naik, Vijay M.: *See—*
  - Chokappa, Kalyansundaram D.; and Naik, Vijay M., 5,534,212, Cl. 264-211.110.
- Naitoh, Ken, to Nissan Motor Co., Ltd. Fuel injection nozzle. 5,533,482, Cl. 123-305.000.
- Naive, Joel A.: *See—*
  - Deavenport, Joe E.; and Naive, Joel A., 5,534,755, Cl. 315-307.000.
- Nakagawa, Etsuo; and Sawada, Shinichi, to Chisso Corporation. Liquid crystal composition. 5,534,189, Cl. 252-299.630.
- Nakagawa, Etsuo: *See—*
  - Miyazawa, Kazutoshi; Matsui, Shuichi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,187, Cl. 252-299.010.
- Nakagawa, Hiromasa: *See—*
  - Hata, Masayuki; Nakagawa, Hiromasa; and Yamada, Tatsuo, 5,535,359, Cl. 395-446.000.
- Nakagawa, Kazuyo: *See—*
  - Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, 5,535,127, Cl. 364-464.020.
- Nakagawa, Tetsuya: *See—*
  - Watanabe, Takao; Nakagawa, Tetsuya; and Nakagome, Yoshinobu, 5,535,410, Cl. 395-800.000.
- Nakagome, Yoshinobu: *See—*
  - Watanabe, Takao; Nakagawa, Tetsuya; and Nakagome, Yoshinobu, 5,535,410, Cl. 395-800.000.
- Nakai, Yoshiharu: *See—*
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Nakajima, Akira: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Nakajima, Hiroaki: *See—*
  - Tsunoda, Masakiyo; Nakajima, Hiroaki; and Koshimura, Masami, 5,534,843, Cl. 338-22.00R.
- Nakajima, Tatsuo: *See—*
  - Tachimori, Masaharu; Yano, Takayuki; Tsumori, Yasuo; Nakajima, Tatsuo; and Hamaguchi, Isao, 5,534,446, Cl. 437-26.000.
- Nakamura, Fumihiko: *See—*
  - Sasai, Keizo; Iwata, Masakatsu; Sawada, Hirohisa; and Nakamura, Fumihiko, 5,534,910, Cl. 347-217.000.
- Nakamura, Hideyuki: *See—*
  - Takahashi, Yonosuke; Imamura, Naoya; Nakamura, Hideyuki; and Kawabata, Kouya, 5,534,383, Cl. 430-201.000.
- Nakamura, Kimihiko: *See—*
  - Takano, Masao; Okuno, Ryozo; and Nakamura, Kimihiko, 5,534,377, Cl. 430-102.000.
- Nakamura, Masashi: *See—*

  - Matsuzaki, Hiromi; Ojima, Satoshi; and Nakamura, Masashi, 5,534,031, Cl. 623-17.000.
- Nakamura, Michael D.; and Landsman, Howard A., to Tektronix, Inc. Digital video clock generation system. 5,534,939, Cl. 348-505.000.
- Nakamura, Mitsuhiro: *See*—
  - Shibata, Kohichi; and Nakamura, Mitsuhiro, 5,535,277, Cl. 380-28.000.
- Nakamura, Nobuyuki; and Arai, Tsuyoshi, to Nissei Plastic Industrial Co., Ltd. Speed control unit for an injection molding machine. 5,533,884, Cl. 425-145.000.
- Nakamura, Shinji: *See*—
  - Kondou, Yoshimasa; Hanaoka, Masaaki; Nakamura, Shinji; and Doi, Fumiaki, 5,535,415, Cl. 395-828.000.
- Nakamura, Shunji: *See*—
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Nakamura, Takao; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Process for preparing a layered structure containing at least one thin film of oxide superconductor. 5,534,491, Cl. 505-500.000.
- Nakamura, Takehiko: *See*—
  - Kataoka, Masaaki; Wakai, Akira; and Nakamura, Takehiko, 5,534,543, Cl. 514-517.000.
- Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Vibrating gyroscope. 5,533,396, Cl. 73-504.120.
- Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, to Fujitsu Limited. Imaging apparatus and photoconductor. 5,534,978, Cl. 355-211.000.
- Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, to Sony Corporation; and New Ojl Paper Co., Ltd. Image receiving sheet for thermal transfer printing. 5,534,477, Cl. 503-227.000.
- Nakanishi, Eiji: *See*—
  - Hayashi, Sadao; Nakanishi, Eiji; Kurita, Yasuyuki; and Okunishi, Masahiko, 5,534,508, Cl. 514-206.000.
- Nakanishi, Hiroshi: *See*—
  - Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi. 5,534,927, Cl. 348-400.000.
- Nakanishi, Mamiko; Kohno, Yasutaka, deceased (by Yoko Kohno, heir/legal representative), to Mitsubishi Denki Kabushiki Kaisha. Method for producing semiconductor device. 5,534,452, Cl. 437-40.00R.
- Nakano, Shinji: *See*—
  - Morimoto, Takao; and Nakano, Shinji, 5,534,647, Cl. 558-275.000.
- Nakashima, Toshiharu; Hamatani, Masato; and Ozawa, Ken, to Nikon Corporation. Scanning exposure apparatus. 5,534,970, Cl. 355-53.000.
- Nakasu, Eisuke: *See*—
  - Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi, 5,534,927, Cl. 348-400.000.
- Nakasuji, Kazuyuki: *See*—
  - Kuroda, Kouichi; Imamura, Youichi; Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,533,370, Cl. 72-12.500.
- Nakatsu, Etsuto; Higashitani, Hiroshi; and Ohta, Haruo, to Matsushita Electric Industrial Co., Ltd. Digital modulating/demodulating apparatus and a digital demodulating apparatus. 5,535,244, Cl. 375-261.000.
- Nakayama, Akihito, to Sony Corporation. Method for detecting origin point of position sensor. 5,534,692, Cl. 250-231.160.
- Nakayama, Hitoshi: *See*—
  - Watanabe, Satoshi; and Nakayama, Hitoshi, 5,534,364, Cl. 429-61.000.
- Nakayama, Osamu, to Kawasaki Steel Corporation. Semiconductor integrated circuit having protection circuits. 5,535,084, Cl. 361-56.000.
- Nakayama, Tadayoshi: *See*—
  - Nagasawa, Kenichi; Nakayama, Tadayoshi; Takahashi, Koji; and Takei, Masahiro, 5,535,064, Cl. 360-9.100.
- Nakayama, Yasuo: *See*—
  - Sugahara, Yuji; and Nakayama, Yasuo, 5,534,251, Cl. 424-85.200.
- Nakayama, Yoshiyuki: *See*—
  - Matsumoto, Hiroaki; Sobue, Ikuo; Ejiri, Seishi; Kiguchi, Masao; Matsumoto, Yasuhiro; and Nakayama, Yoshiyuki, 5,535,012, Cl. 358-400.000.
- Nalco Chemical Company: *See*—
  - Huddleston, David A.; and Gabel, Robert K., 5,534,611, Cl. 528-129.000.
  - Reed, Peter E.; and Mahoney, Robert P., 5,534,235, Cl. 423-121.000.
- Nalewajek, David; Eibeck, Richard E.; and Thomas, Raymond H. P., to AlliedSignal Inc. Refrigeration lubricants prepared by polymerizing alkene having a perfluoroalkyl group on one end thereof. 5,534,176, Cl. 252-68.000.
- Nalos, Ervin J.; and Axtell, James C., to Boeing Company, The. Pulsed-current electron beam method and apparatus for use in generating and amplifying electromagnetic energy. 5,534,824, Cl. 331-81.000.
- Namba, Hiroaki; and Fujino, Ken-ichi, to Nippon Paper Industries Co., Ltd. Aqueous polyolefin resin composition. 5,534,577, Cl. 524-377.000.
- Nambu, Fumio: *See*—
  - Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,534,536, Cl. 514-397.000.
- Namiki, Fumihiro: *See*—
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- NanoSystems LLC: *See*—
  - De Castro, Lan, 5,534,270, Cl. 424-490.000.
- Nappi, Bruce: *See*—
  - Coller, John A.; Nappi, Bruce; and Lane, Alan J., 5,533,515, Cl. 128-748.000.
- Narabayashi, Isamu: *See*—
  - Hasegawa, Hideo; Tateno, Kikuhei; Kuwata, Tamotsu; Yamamoto, Yoshiro; Hiraishi, Kumiko; Fujita, Osamu; and Narabayashi, Isamu, 5,534,240, Cl. 424-9.360.
- Narayan, Chandrasekhar: *See*—
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Narita, Noriaki: *See*—
  - Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, 5,534,291, Cl. 427-221.000.
- Narumi, Eiji; and Iwasa, Masao, to Otis Elevator Company. Traction-type elevator. 5,533,595, Cl. 187-266.000.
- Narutaki, Yozo: *See*—
  - Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
- Nasserbakht, Mitra, to Texas Instruments Incorporated. Parallel antifuse routing scheme (PARS) circuit and method for field programmable gate arrays. 5,534,793, Cl. 326-44.000.
- Nation, George W.: *See*—
  - Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, 5,535,213, Cl. 370-85.150.
- National Electrostatics Corp.: *See*—
  - Ferry, James A., 5,534,699, Cl. 250-396.00R.
- National Research Council of Canada: *See*—
  - Bamji, Soli S.; and Bulinski, A. T., 5,533,807, Cl. 374-45.000.
  - Parsons, Bruce L., 5,533,462, Cl. 114-140.000.
- National Research Labs: *See*—
  - Maurer, Gerald L., 5,534,249, Cl. 424-76.300.
- National Science Council: *See*—
  - Ma, Chen-Chi M.; Wu, Hew-Der; and Li, Ming-Shiu, 5,534,302, Cl. 427-379.000.
  - Tsai, Keh-Chyuan; and Li, Jeng-Wei, 5,533,307, Cl. 52-167.300.
- National Science Council of R.O.C.: *See*—
  - Huang, Chih-Yuan; Su, Yan-Kuin; and Morris, James E., 5,535,146, Cl. 364-578.000.
- National Science Council of Republic of China: *See*—
  - Kuo, Po C.; Huang, Jin H.; and Chen, Shang C., 5,534,080, Cl. 148-121.000.
- National Semiconductor Corp.: *See*—
  - Freitas, Oscar W., 5,535,219, Cl. 370-105.100.
  - Mentzer, Ray A., 5,535,086, Cl. 361-91.000.
  - Smith, Gregory J.; and Kunst, David J., 5,534,788, Cl. 324-771.000.
  - Wert, Joseph D.; and Duncan, Richard L., 5,534,795, Cl. 326-81.000.
- National Transcommunications Limited: *See*—
  - Beech, Brian H., 5,535,246, Cl. 375-285.000.
- Natori, Katsuhide: *See*—
  - Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, 5,534,740, Cl. 310-309.000.
- Natural Resource Recovery, Inc.: *See*—
  - Burrus, Thomas N., 5,534,207, Cl. 264-150.000.
- Nau, Günther: *See*—
  - Pollner, Reinhold; Noah, Michael; and Nau, Günther, 5,534,414, Cl. 435-794.000.
- Navarro, Richard R.; McMillin, Carl R.; and Zimmers, Karl B., to AcroMed Corporation. Spine disc. 5,534,030, Cl. 623-17.000.
- Navistar International Transportation Corp.: *See*—
  - Cailey, Fred L., 5,533,487, Cl. 123-568.000.
- Navratil, James D.: *See*—
  - Sprouse, Kenneth M.; and Navratil, James D., 5,534,363, Cl. 429-34.000.
- NEC Corporation: *See*—
  - Abe, Kazuhiko, 5,535,155, Cl. 365-154.000.
  - Akiyama, Shin-Ichiro, 5,534,799, Cl. 327-20.000.
  - Hamada, Takumu, 5,535,269, Cl. 379-233.000.
  - Ishida, Hisashi, 5,534,666, Cl. 174-260.000.
  - Itoi, Satoshi, 5,535,182, Cl. 369-32.000.
  - Kato, Yasushi, 5,535,161, Cl. 365-200.000.
  - Kiyono, Junji, 5,535,154, Cl. 365-145.000.
  - Koh, Yoshihiro, 5,534,883, Cl. 345-3.000.
  - Kondou, Toyoo, 5,534,823, Cl. 331-16.000.
  - Kurokami, Yuzo, 5,535,248, Cl. 375-324.000.
  - Maemura, Kouji, 5,535,350, Cl. 395-403.000.
  - Matsui, Yoshinori, 5,535,163, Cl. 365-201.000.
  - Matsumoto, Kiyoto, 5,535,295, Cl. 385-49.000.
  - Miyashita, Mafumi; and Ozaki, Ichiro, 5,535,427, Cl. 455-38.200.
  - Miyashita, Toshikazu, 5,535,249, Cl. 375-344.000.
  - Nadehara, Kouhei, 5,535,412, Cl. 395-800.000.
  - Nagamine, Hisayuki, 5,534,724, Cl. 257-390.000.
  - Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, 5,534,715, Cl. 257-33.000.
  - Ohki, Junichi; and Koga, Toshio, 5,534,926, Cl. 348-385.000.
  - Ohoka, Tsukasa, 5,534,726, Cl. 257-489.000.
  - Ono, Yuzo; and Oba, Akitomo, 5,535,055, Cl. 359-495.000.
  - Saeki, Takanori, 5,535,153, Cl. 365-72.000.
  - Saitoh, Sei, 5,534,885, Cl. 345-100.000.

  - Tajima, Kazuhito, 5,535,001, Cl. 356-345.000.
  - Tsubota, Masashi, 5,535,404, Cl. 395-800.000.
  - Ujiie, Masato, 5,534,464, Cl. 437-209.000.
  - Yamagata, Yasushi, 5,535,158, Cl. 365-185.290.
  - Yoneyama, Kenichi, 5,535,037, Cl. 359-177.000.
  - Yoshida, Ikio; and Ishigami, Masahiro, 5,535,436, Cl. 455-89.000.
- Nedderman, William H., Jr., to United States of America, Navy. Adjustable two-axis instrument mount. 5,533,699, Cl. 248-278.100.
- Needham, Kelly S., Sr.: *See*—
  - Eddy, John W.; Hutchinson, David F.; and Needham, Kelly S., Sr., 5,533,651, Cl. 222-185.100.
- Negev, Ben-Gurion University of the: *See*—
  - Arad, Shoshana (Malis); and Cohen, Ephraim, 5,534,417, Cl. 435-67.000.
- Negishi, Osamu: *See*—
  - Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
- Neill, Kenneth; and Ball, Keith W., to Square D Company. Power distribution switchboard assembly. 5,535,102, Cl. 361-832.000.
- Nejime, Yoshito: *See*—
  - Ono, Koichi; Nejime, Yoshito; and Yamamoto, Etsuji, 5,534,864, Cl. 341-156.000.
- Nellcor, Inc.: *See*—
  - Potratz, Robert S., 5,533,507, Cl. 128-633.000.
- Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., to Sandia Corp./Precision Fabrics Grp., Inc. Structurally efficient inflatable protective device. 5,533,755, Cl. 280-743.100.
- Nelson, Arlin D.: *See*—
  - Mottola, Jim; Nelson, Arlin D.; and Durham, Chris, 5,533,986, Cl. 604-264.000.
- Nelson, Daryl J.; Tirumala, Muralidhar; Butler, Peter; and Budelman, Gerald A., to Intel Corporation. Integrated circuit package with an integral heat sink and fan. 5,535,094, Cl. 361-697.000.
- Nelson, Joe A., II. Pump barrel seal assembly including seal/actuator element. 5,533,876, Cl. 417-456.000.
- Nelson, Kenneth J.; McGrath, Michael C.; and Avery, Timothy O., to Avatar Systems Corporation. Immobilizer for a data storage disk in a cartridge using an overcenter spring. 5,535,081, Cl. 360-133.000.
- Nelson, Leonard E.: *See*—
  - King, Gerald R.; Lloyd, Robert D.; and Nelson, Leonard E., 5,535,428, Cl. 455-38.400.
- Nelson, Ronald H.; and Milovich, Dimitrije, to Radius Engineering, Inc. Composite pole manufacturing process for varying non-circular cross-sections and curved center lines. 5,534,203, Cl. 264-101.000.
- Nemazi, John E., to Ryobi North America. Sandpaper pad and pad support for a detail sander. 5,533,926, Cl. 451-490.000.
- Nemecek, Daniel J.: *See*—
  - Terranova, Joseph C.; and Nemecek, Daniel J., 5,533,603, Cl. 192-35.000.
- Németh, Attila: *See*—
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Neopost Industrie: *See*—
  - Mourgues, Bernard, 5,535,126, Cl. 364-464.020.
- Nerly, Joseph F.: *See*—
  - Wittern, Francis A., Jr.; Walke, Gary L.; and Nerly, Joseph F., 5,533,645, Cl. 221-76.000.
- Netwig, Craig L.; and Kronmiller, David L. Process for producing in SITU polymerization of a reverse osmosis membrane and product therefrom. 5,534,146, Cl. 210-490.000.
- Neuchterlein, Bruce E.: *See*—
  - Cattell, Kevin T.; Cromer, William R.; Lin, Shihta; Neuchterlein, Bruce E.; and Potok, Thomas E., 5,535,325, Cl. 395-161.000.
- Neuenschwander, Kent W.: *See*—
  - Groneberg, Robert A.; Regan, John R.; Neuenschwander, Kent W.; and Scotese, Anthony C., 5,534,532, Cl. 514-367.000.
- Neuhof, Markus, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Elbow with access opening. 5,533,763, Cl. 285-127.000.
- Neuhold, Rudolf: *See*—
  - Cadek, Walter; Kappel, Johannes; and Neuhold, Rudolf, 5,534,139, Cl. 210-96.100.
- Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, to International Superconductivity Technology Center; and NEC Corporation. Josephson junction in a wiring pattern of a superconductor oxide. 5,534,715, Cl. 257-33.000.
- Neunhoeffer, Hans; Gerstung, Stefan; Clausen, Thomas; and Balzer, Wolfgang R., to Wella Aktiengesellschaft. Composition for the oxidative dyeing of hair containing 4,5-diaminopyrazole derivatives as well as new 4,5-diaminopyrazole derivatives and process for their synthesis. 5,534,267, Cl. 424-701.000.
- Nevarez, Roberto: *See*—
  - Veltrop, Loren; Friedl, Joel G.; and Nevarez, Roberto, 5,533,806, Cl. 366-347.000.
- New England Medical Center Hospitals, Inc.: *See*—
  - Plaut, Andrew G.; and Kane, Anne V., 5,534,544, Cl. 514-552.000.
- New Ojl Paper Co., Ltd.: *See*—
  - Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, 5,534,477, Cl. 503-227.000.
- Newell Operating Company: *See*—
  - Jarecki, James J.; and Polzin, Bruce C., 5,533,228, Cl. 15-257.060.
- Newman, Leon A.: *See*—
  - Ball, Gary A.; and Newman, Leon A., 5,534,993, Cl. 356-5.090.
- Newman, Perran V. L.; Zeller, Niel P.; and Ifland, Dwight D., to Gerry Baby Products Company. Wireless remote monitors employing reassurance tones. 5,533,959, Cl. 600-28.000.
- Newman, Robert M.: *See*—
  - Cross, David M.; Hueneke, Manfred H. K.; Farris, Ronald A.; McConnell, Bobby L.; and Newman, Robert M., 5,534,298, Cl. 427-358.000.
- Newman, Walter; and Endres, Paul, to Leviton Manufacturing Co., Inc. Reverse wire termination device. 5,533,916, Cl. 439-801.000.
- Nezu, Takashi; Matsumoto, Kenjiro; Kohara, Takao; Sakai, Hiroshi; and Uchiyama, Masaaki, to Tokico Ltd. Suspension control device. 5,533,597, Cl. 188-319.000.
- Ng, Kenneth K. W.: *See*—
  - Cheung, Yiu M.; Ng, Kenneth K. W.; and Strong, Hovey R., Jr., 5,535,217, Cl. 370-100.100.
- Ng, Tat K.; and D'Jamoos, Michael, to TranSwitch Corporation. Apparatus and method for limiting jitter in a telecommunications signal which is being mapped in another such signal by temporarily suspending measurement of available data. 5,535,218, Cl. 370-102.000.
- Nguyen, Ngoc-Thach: *See*—
  - Ackermann, Manfred; Nguyen, Ngoc-Thach; Schustek, Siegfried; and Tran, Quang-Ngoc, 5,533,415, Cl. 74-7.00E.
- Nguyen, Thai Q.: *See*—
  - Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., 5,534,812, Cl. 327-333.000.
- Nguyen, Vu T.: *See*—
  - Gromala, Joseph R.; and Nguyen, Vu T., 5,533,350, Cl. 62-155.000.
- Nguyen, Yu T.: *See*—
  - Gromala, Joseph R.; and Nguyen, Yu T., 5,533,349, Cl. 62-129.000.
- Nichols, Warren J.: *See*—
  - Williamson, Nigel D. L.; and Nichols, Warren J., 5,533,765, Cl. 285-212.000.
- Nicholson, John E.: *See*—
  - Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.
- Nickolaus, Edward L., Jr. Spray painter's cabinet. 5,533,799, Cl. 312-249.120.
- Niemann, Joseph B.: *See*—
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Niemeyer, David A.: *See*—
  - Anderson, Charles C.; Niemeyer, David A.; and Jennings, David F., 5,534,397, Cl. 430-530.000.
- Nii, Koji, to Mitsubishi Denki Kabushiki Kaisha. Multiport memory cell circuit having read buffer for reducing read access time. 5,535,159, Cl. 365-189.050.
- Niimi, Tomio, to Kankyokagakukogyo Kabushiki Kaisha; and Imai, Hitoshi. Stationary type mixing apparatus. 5,535,175, Cl. 366-336.000.
- Niino, Toshiki: *See*—
  - Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, 5,534,740, Cl. 310-309.000.
- Nijjar, Charanjit S.: *See*—
  - Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., 5,534,660, Cl. 800-205.000.
- Nikaya, Toshiki; Fukushima, Yoshifumi; and Kikuta, Teruo, to Nippon Shokubai Co., Ltd. Highly weather-resistant, single package, crosslinkable emulsion. 5,534,579, Cl. 524-460.000.
- Niki, Touru, to Canon Kabushiki Kaisha. Method of and apparatus for separating image. 5,535,287, Cl. 382-178.000.
- Nikko Chemical Institute Inc.: *See*—
  - Sakamoto, Nobuyuki; Kobayashi, Takehiko; and Horiguchi, Takashi, 5,534,214, Cl. 264-333.000.
- Nikon Corporation: *See*—
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
  - Kusaka, Yosuke, 5,534,688, Cl. 250-201.800.
  - Miura, Kosho, 5,534,966, Cl. 354-409.000.
  - Miyamoto, Hidenori; and Soshi, Isao, 5,534,667, Cl. 174-261.000.
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,957, Cl. 354-106.000.
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,958, Cl. 354-106.000.
  - Nakashima, Toshiharu; Hamatani, Masato; and Ozawa, Ken, 5,534,970, Cl. 355-53.000.
  - Ohtake, Motoyuki, 5,534,687, Cl. 250-201.400.
  - Shibuya, Masato, 5,535,054, Cl. 359-487.000.
  - Takagi, Tadao, 5,534,968, Cl. 354-432.000.
- Nilsson, Per-Gunnar: *See*—

- Källstrand, Göran; and Nilsson, Per-Gunnar, 5,533,505, Cl. 128-203.150.
- Nippon Denkai, Ltd.: *See—*
  - Aso, Kazuyoshi; Noguchi, Masami; Kobayashi, Katsumi; and Yamagishi, Takeshi, 5,534,128, Cl. 205-176.000.
- Nippon Denso Co., Ltd.: *See—*
  - Ohshima, Hisayoshi; and Yamada, Yoshiyasu, 5,534,698, Cl. 250-339.110.
- Nippon Electric Glass Co., Ltd.: *See—*
  - Hayashi, Masaaki, 5,534,469, Cl. 501-15.000.
- Nippon Hoso Kyokai: *See—*
  - Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi, 5,534,927, Cl. 348-400.000.
- Nippon Kayaku Kabushiki Kaisha: *See—*
  - Abe, Tetsuya; Ishii, Kazuhiko; and Yokoshima, Minoru, 5,534,557, Cl. 522-15.000.
- Nippon Paint Co., Ltd.: *See—*
  - Endou, Syunichi; Miyamoto, Satoshi; Komiya, Kaoru; and Koishikawa, Naomi, 5,534,643, Cl. 554-227.000.
  - Morimoto, Takao; and Nakano, Shinji, 5,534,647, Cl. 558-275.000.
  - Tsutsui, Koichi; and Rhue, Samuel A., 5,534,064, Cl. 118-308.000.
- Nippon Paper Industries Co., Ltd.: *See—*
  - Namba, Hiroaki; and Fujino, Ken-ichi, 5,534,577, Cl. 524-377.000.
- Nippon Shinyaku Co. Ltd.: *See—*
  - Seki, Junzo; Yamamoto, Hirofumi; Yamane, Shuji; Takahashi, Yutaka; and Ushimaru, Kouichi, 5,534,502, Cl. 514-31.000.
- Nippon Shokubai Co., Ltd.: *See—*
  - Nikaya, Toshiki; Fukushima, Yoshifumi; and Kikuta, Teruo, 5,534,579, Cl. 524-460.000.
  - Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, 5,534,148, Cl. 210-605.000.
- Nippon Steel Corporation: *See—*
  - Tachimori, Masaharu; Yano, Takayuki; Tsumori, Yasuo; Nakajima, Tatsuo; and Hamaguchi, Isao, 5,534,446, Cl. 437-26.000.
  - Wakoh, Masamitsu; Sawai, Takashi; and Mizoguchi, Shozo, 5,534,084, Cl. 148-328.000.
- Nippon Telegraph and Telephone Corporation: *See—*
  - Okada, Takashi; and Shirato, Tadashi, 5,534,828, Cl. 332-103.000.
- Nippon Television Network Corporation: *See—*
  - Kawai, Kiyoyuki; Kimata, Yoshihide; and Ishida, Masayuki, 5,534,935, Cl. 348-448.000.
- Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
  - Konishi, Jin-emon; and Hamada, Giichi, 5,534,509, Cl. 514-210.000.
- Nippondenso Co., Ltd.: *See—*
  - Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, 5,534,357, Cl. 428-629.000.
  - Tsuzuki, Yasuaki; Kuroyanagi, Akira; and Nishizawa, Toshiaki, 5,534,454, Cl. 437-41.000.
  - Watanabe, Takamoto; and Aoyama, Seiki, 5,534,809, Cl. 327-269.000.
- Nirula, Ajay: *See—*
  - Li, Ching; Gaynor, Richard B.; and Nirula, Ajay, 5,534,631, Cl. 536-23.100.
- Nishi, Takashi: *See—*
  - Kaba, Takahiro; Nishi, Takashi; and Mitsuhashi, Tsuyoshi, 5,534,353, Cl. 428-552.000.
- Nishi, Tohru; Kawamura, Yasuji; Minato, Kazuo; Kusamoto, Nobuo; Kai, Haruki; Kaneda, Kazuhisa; and Inokuchi, Takao, to Idemitsu Petrochemical Co., Ltd. Powdered leather and method of producing the same. 5,534,327, Cl. 428-151.000.
- Nishi, Tokumitsu: *See—*
  - Okuda, Kouji; Nishi, Tokumitsu; Takai, Hiroshi; and Hoshino, Hisakiyo, 5,534,091, Cl. 156-89.000.
- Nishida, Ikuharu: *See—*
  - Nomura, Yasuhiko; Nishida, Ikuharu; and Kashima, Tadaaki, 5,534,336, Cl. 428-229.000.
- Nishida, Masahiro: *See—*
  - Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, 5,535,308, Cl. 395-108.000.
- Nishida, Yukihiro: *See—*
  - Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi, 5,534,927, Cl. 348-400.000.
- Nishigaki, Junji; and Kato, Takashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,534,403, Cl. 430-585.000.
- Nishihara, Motohisa: *See—*
  - Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
- Nishihira, Keigo; Yoshida, Shinichi; and Tanaka, Shuji, to Ube Industries, Ltd. Process for continuously producing dimethyl carbonate. 5,534,648, Cl. 558-277.000.
- Nishii, Tadao: *See—*
  - Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, 5,535,075, Cl. 360-105.000.
- Nishii, Teruyuki, to Canon Kabushiki Kaisha. Data communication apparatus having an auto-calling function. 5,535,266, Cl. 379-100.000.
- Nishimoto, Miki: *See—*
  - Inada, Yoshihiro; Yamashita, Shinji; and Nishimoto, Miki, 5,534,807, Cl. 327-234.000.
- Nishimura, Masayuki. Composite motor. 5,534,737, Cl. 310-112.000.
- Nishimura, Shigeru: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Nishimura, Takuya: *See—*
  - Kawakami, Yasunori; Iitsuka, Hiroyuki; Nishimura, Takuya; Hamai, Shinji; and Sahara, Yasuyuki, 5,535,208, Cl. 370-84.000.
- Nishimura, Yutaka: *See—*
  - Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
- Nishio, Shiyouji: *See—*
  - Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.
- Nishizawa, Takaaki: *See—*
  - Iiyama, Katsuhiko; and Nishizawa, Takaaki, 5,535,103, Cl. 362-66.000.
- Nishizawa, Toshiaki: *See—*
  - Tsuzuki, Yasuaki; Kuroyanagi, Akira; and Nishizawa, Toshiaki, 5,534,454, Cl. 437-41.000.
- Nissan Motor Co., Ltd.: *See—*
  - Ishihara, Tsuyoshi; Sakuragi, Hideyori; Imanishi, Kazuo; and Ishikawa, Haruhiko, 5,533,850, Cl. 411-171.000.
  - Naitoh, Ken, 5,533,482, Cl. 123-305.000.
- Nissei Plastic Industrial Co., Ltd.: *See—*
  - Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, 5,534,204, Cl. 264-102.000.
  - Nakamura, Nobuyuki; and Arai, Tsuyoshi, 5,533,884, Cl. 425-145.000.
- Nissha Printing Co., Ltd.: *See—*
  - Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, 5,533,446, Cl. 101-150.000.
- Nissim, Yves; and Bensoussan, Marcel, to France Telecom. Process for producing an electrically controllable matrix of vertically structured quantum well components. 5,534,444, Cl. 437-5.000.
- Nitta, Tetsuhiro: *See—*
  - Hirano, Hirofumi; Bekki, Toshihiko; Kashimura, Makoto; Kiyohara, Takehiko; Nitta, Tetsuhiro; and Kimura, Tetsuo, 5,534,894, Cl. 346-134.000.
- NKK Corporation: *See—*
  - Ao, Norio; and Kubo, Hirotsugu, 5,535,235, Cl. 373-78.000.
- Noah, Michael: *See—*
  - Pollner, Reinhold; Noah, Michael; and Nau, Günther, 5,534,414, Cl. 435-794.000.
- Nobel, Gary M.; Wilson, Arthur K.; Brown, Patricia S.; and Arbeiter, Jason R., to Hewlett-Packard Company. Electrical interconnect system for multiple flexible circuits. 5,533,904, Cl. 439-67.000.
- Noble, Myron C., to Pi-Rod, Inc. Adjustable antenna support. 5,533,304, Cl. 52-40.000.
- Nobuoka, Kousuke, to Canon Kabushiki Kaisha. Image pickup apparatus for estimating a complementary color value of a target pixel. 5,534,919, Cl. 348-246.000.
- Noguchi, Hiroyuki; Usui, Hideyuki; and Yonemochi, Kenshin, to International Business Machines Corporation. Portable computer docking device having a first rotatable connector and a second connector. 5,535,093, Cl. 361-686.000.
- Noguchi, Masami: *See—*
  - Aso, Kazuyoshi; Noguchi, Masami; Kobayashi, Katsumi; and Yamagishi, Takeshi, 5,534,128, Cl. 205-176.000.
  - Nagayama, Keiichi; Noguchi, Masami; and Sakakino, Takahiro, 5,534,842, Cl. 337-402.000.
- Noguchi, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Magneto-optic disc apparatus with signal detector for detecting recorded signals based on split beams. 5,535,179, Cl. 369-13.000.
- Noguchi, Satoshi: *See—*
  - Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, 5,533,446, Cl. 101-150.000.
- Noguchi, Toshihiko: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Nokia Mobile Phones Limited: *See—*
  - Johnson, Terence, 5,534,878, Cl. 343-702.000.
- Nokia Telecommunications OY: *See—*
  - Alatalo, Hannu; and Kokko, Marko, 5,535,203, Cl. 370-66.000.
- Nolan, Joseph G., III: *See—*
  - Phillips, Christopher E.; Ahrens, Michael G.; Nolan, Joseph G., III; and Cooke, Laurence H., 5,534,798, Cl. 326-108.000.
- Nolu Plastics, Inc.: *See—*
  - Cairns, James W., 5,533,826, Cl. 403-389.000.
- Nomoto, Hideo; Okamura, Takanari; and Ito, Shoko, to Kabushiki Kaisha Toshiba. Turbine cooling blade having inner hollow structure with improved cooling. 5,533,864, Cl. 416-96.00A.
- Nomura & Shibatani: *See—*
  - Nomura, Ryuji; and Shibatani, Haruo, 5,534,229, Cl. 422-123.000.
- Nomura, Hiroshi; and Sasaki, Takamitsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Driving device for zoom lens barrel. 5,535,057, Cl. 359-694.000.
- Nomura, Masaaki: *See—*
  - Tuchida, Michiro; Nomura, Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, 5,534,955, Cl. 353-66.000.

- Nomura, Ryuji; and Shibatani, Haruo, to Nomura & Shibatani. Volatilization suppressing agent. 5,534,229, Cl. 422-123.000.
- Nomura, Toshio; Tagawa, Takao; and Kako, Noritoshi, to Sharp Kabushiki Kaisha. Display-integrated type tablet device. 5,534,886, Cl. 345-104.000.
- Nomura, Yasuhiko; Nishida, Ikuharu; and Kashima, Tadaaki, to Toyo Boseki Kabushiki Kaisha. Fabric superior in anti-drape stiffness, stiffness and soft handle, and manufacture thereof. 5,534,336, Cl. 428-229.000.
- Nonnenmacher, Martin, deceased (by Regine Nonnenmacher, legal representative): *See—*
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
- Nonnenmacher, Regine, legal representative: *See—*
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
- Nonomura, Yutaka: *See—*
  - Sugitani, Nobuyoshi; Okuwa, Masayuki; Morikawa, Takeshi; and Nonomura, Yutaka, 5,533,397, Cl. 73-504.160.
- Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, to Nippondenso Co., Ltd. Brazing sheet for vacuum brazing. 5,534,357, Cl. 428-629.000.
- Norand Corporation: *See—*
  - Danielson, Arvin D., 5,534,684, Cl. 235-472.000.
- Nordman, Dennis P.; and Schilling, Winston H., to Williams Electronics Games, Inc. Magnetic crane for a pinball game. 5,533,726, Cl. 273-119.00R.
- Nordqvist, Leif, to Cash Guard AB. Device for feeding and storing valuable documents. 5,533,627, Cl. 209-534.000.
- Nordson Corporation: *See—*
  - Benecke, Jurgen; Cieplik, Arthur; and Burmester, Thomas, 5,533,675, Cl. 239-413.000.
- Norman, Robert D.: *See—*
  - Harari, Eliyahou; Norman, Robert D.; and Mehrotra, Sanjay, 5,535,328, Cl. 395-182.050.
- Norris, David, to Advanced Micro Devices, Inc. Comparator circuit. 5,534,844, Cl. 340-146.200.
- Norsk Hydro A.S.: *See—*
  - Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Bøorretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, 5,534,531, Cl. 514-365.000.
- North, Diane: *See—*
  - Pearson, Scott D.; and North, Diane, 5,534,351, Cl. 428-516.000.
- Northern Telecom Limited: *See—*
  - Parker, James W.; Harrison, Paul M.; and Peall, Robert G., 5,534,442, Cl. 437-2.000.
- Northwestern University: *See—*
  - O'Halloran, Thomas V.; and Watton, Stephen P., 5,534,542, Cl. 514-492.000.
- Norton Performance Plastics Corporation: *See—*
  - Friedman, Michael, 5,534,593, Cl. 525-240.000.
- Nosal, Roger: *See—*
  - Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.
- Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., to Galsten Trading, Inc. Ready-to-assemble furniture with improved fastening means. 5,533,788, Cl. 29.7-440.100.
- Nourse, George R., to Controlled Power Limited Partnership. Automatic reclosing circuit breaker using controllable feeder transducer. 5,534,782, Cl. 324-500.000.
- Novacor Chemicals Ltd.: *See—*
  - Taylor, Joseph W.; Goyal, Shivendra K.; Aubee, Norman D. J.; and Bohnet, Nick K. K., 5,534,572, Cl. 524-275.000.
- Novak, Jerome J.: *See—*
  - Hanson, Thomas A.; Kish, William J.; Novak, Jerome J.; and Vandervort, Annette L., 5,534,994, Cl. 356-73.100.
- Novamax Technologies, Inc.: *See—*
  - Dailey, James H.; Morgan, John R.; and Saad, Karim I., 5,534,048, Cl. 106-1.220.
- Novamont S.P.A.: *See—*
  - Bastioli, Catia; and Bellotti, Vittorio, 5,534,150, Cl. 210-640.000.
- Novar Electronics Corporation: *See—*
  - Ott, James H.; Anglin, Mark E.; and Henderson, James P., 5,533,347, Cl. 62-115.000.
- Novo Nordisk A/S: *See—*
  - Godtfredsen, Sven E.; Kirk, Ole; and Damhus, Ture, 5,534,435, Cl. 435-262.500.
  - Sauerberg, Per; and Olesen, Preben H., 5,534,528, Cl. 514-342.000.
- Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., to Ohmeda Inc. Method and apparatus for detection of venous air emboli. 5,533,512, Cl. 128-719.000.
- Novus International, Inc.: *See—*
  - Read, Joseph R.; and Windham, Michael S., 5,533,648, Cl. 222-108.000.
- Nozaki, Takao: *See—*
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Nozawa, Yutaka: *See—*
  - Hikita, Hiroshi; Kohriyama, Tetsuo; Nozawa, Yutaka; and Sugino, Yoshito, 5,534,307, Cl. 427-421.000.
- Nuernberger, Siegfried: *See—*
  - Platzer, Stephan J. W.; Nuernberger, Siegfried; and Maerz, Karin, 5,534,384, Cl. 430-260.000.
- Nulty, John D.: *See—*
  - Larson, Pamela E.; and Nulty, John D., 5,533,780, Cl. 296-194.000.
- Numano, Masanori: *See—*
  - Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.
- Numata, Toshiharu: *See—*
  - Masukawa, Junichi; Isshiki, Nobuyuki; Objì, Nobunori; Chin, Eiten; and Numata, Toshiharu, 5,534,065, Cl. 118-410.000.
- Nusbaum, Helen: *See—*
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Nutrition Physiology: *See—*
  - Ware, Douglas R.; and Garner, Bryan E., 5,534,271, Cl. 426-2.000.
- Nutzman, Thomas M.: *See—*
  - Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.
- NWD International, Inc.: *See—*
  - Williamson, Nigel D. L., 5,533,764, Cl. 285-212.000.
  - Williamson, Nigel D. L.; and Nichols, Warren J., 5,533,765, Cl. 285-212.000.
- Nycomed Imaging AS: *See—*
  - Klaveness, Jo; Strande, Per; and Wiggen, Unni N., 5,534,250, Cl. 424-78.370.
- Nyquist, Jack K.: *See—*
  - Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
- O&K Orenstein & Koppel AG: *See—*
  - Esch, Uwe, 5,533,284, Cl. 37-348.000.
- Oak Technology, Inc.: *See—*
  - Verinsky, Phil; and Weddle, Gene, 5,535,327, Cl. 395-182.030.
- Oak Tree Packaging Corporation: *See—*
  - Fischer, Edward F., 5,533,623, Cl. 206-518.000.
- Oba, Akitomo: *See—*
  - Ono, Yuzo; and Oba, Akitomo, 5,535,055, Cl. 359-495.000.
- Obara, Sanshiro: *See—*
  - Masaki, Ryoso; Mutoh, Nobuyoshi; and Obara, Sanshiro, 5,534,764, Cl. 318-802.000.
- OBE-Werk Ohnmacht & Baumgärtner GmbH & Co., KG: *See—*
  - Wagner, Reiner; and Lehnert, Otto, 5,533,233, Cl. 16-228.000.
- Oberman, Mark L.: *See—*
  - Edwards, Glenn R.; Rothenberg, Stuart J.; and Oberman, Mark L., 5,533,531, Cl. 128-782.000.
- O'Briem, James J.; and Woo, Edmund P., to Dow Chemical Company, The. Method for the preparation of amide oligomers and polybenzazole polymers therefrom. 5,534,614, Cl. 528-183.000.
- O'Brien, Dennis W.: *See—*
  - Elmer, John W.; and O'Brien, Dennis W., 5,534,677, Cl. 219-121.350.
- O'Brien, Rita M., to Advanced Micro Devices. Sytem and method for merging disk change data from a floppy disk controller with data relating to an IDE drive controller. 5,535,419, Cl. 395-856.000.
- Occoris, S.A.: *See—*
  - Puig-Sureda Font, Jose, 5,533,698, Cl. 248-152.000.
- Ochi, Hisayuki: *See—*
  - Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
- Ochs, Martin: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Oda, Hajime: *See—*
  - Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.
- Oda, Koza: *See—*
  - Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
- Oda, Tomio: *See—*
  - Ueno, Ryuzo; Ueno, Ryuji; Kato, Ichie; and Oda, Tomio, 5,534,547, Cl. 514-530.000.
- Odai, Yoshiaki: *See—*
  - Yamada, Keiki; Ohnishi, Masaru; Odai, Yoshiaki; and Arima, Ryoji, 5,534,906, Cl. 347-171.000.
- Odashima, Hideo, to Mitsubishi Pencil Kabushiki Kaisha. Method for preparing baked pencil leads using concentric straightening plates. 5,534,206, Cl. 264-108.000.
- O'Dell, Gene W.: *See—*
  - Perry, Phillip G.; O'Dell, Gene W.; and van Asten, Ronny W. F., 5,534,172, Cl. 508-156.000.
- Odell, Robert B.: *See—*
  - Berger, Howard S.; Odell, Robert B.; and Gyure, Sandor, 5,533,970, Cl. 604-110.000.
- Oerlikon-Contraves AG: *See—*

- Layton, Allen C., 5,533,692, Cl. 244-3.130.
- Ofosu-Amaah, William: *See—*
  - Tanaka, Shigeru; and Ofosu-Amaah, William, 5,535,085, Cl. 361-58.000.
- Oftebro, Reidar: *See—*
  - Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Bøorretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, 5,534,531, Cl. 514-365.000.
- O'Gara-Hess & Eisenhardt Armoring Co., Inc.: *See—*
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- Ogata, Hiroaki: *See—*
  - Kisu, Hiroki; Ohkubo, Masaharu; Sakurai, Kazushige; Yamazaki, Michihito; Asano, Erika; Shimizu, Yasushi; and Ogata, Hiroaki, 5,534,344, Cl. 428-323.000.
- Ogawa, Mamoru; Todo, Tatsuya; and Mizukami, Miyuki, to Murata Manufacturing Co., Ltd. Method of manufacturing multilayer ceramic electronic component. 5,534,092, Cl. 156-89.000.
- Ogawa, Masataka: *See—*
  - Yasuda, Tomokazu; Karino, Yukio; Sakurai, Seiya; and Ogawa, Masataka, 5,534,398, Cl. 430-545.000.
- Ogawa, Yasunori: *See—*
  - Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
- Ogawa, Yasushi, to Ricoh Company, Ltd. Document retrieval system involving ranking of documents in accordance with a degree to which the documents fulfill a retrieval condition corresponding to a user entry. 5,535,382, Cl. 395-600.000.
- Ogisu, Yasuhiko; Kato, Mamoru; and Takahashi, Shigeyuki, to Toyoda Gosei Co., Ltd. Method for surface modification of polyolefin resin molded article and method for coating the surface of polyolefin resin molded article. 5,534,297, Cl. 427-322.000.
- Oguchi, Takahiro: *See—*
  - Yamano, Akihiko; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; and Shido, Shunichi, 5,535,018, Cl. 358-444.000.
- Ogura, Kimio, to Oyo Corporation. Deadweight dropping type wave source. 5,534,668, Cl. 181-106.000.
- Ogura, Kuniaki; Ishikawa, Hiroyuki; Maeda, Yoshiaki; and Komamura, Kouichi, to Kawasaki Steel Corporation. Water-atomized iron powder and method. 5,534,045, Cl. 75-243.000.
- Ogura, Masami; and Takanaski, Hiroshi, to Sharp Kabushiki Kaisha. LCD having an overcoat film only over a display portion and either an electrode terminal or a seal portion. 5,535,030, Cl. 359-74.000.
- Oh, Chan S.; and Kearns, Elizabeth K., to Beckman Instruments, Inc. Method of heterogenous purification using a bidentate conjugate. 5,534,620, Cl. 530-413.000.
- O'Halloran, Thomas V.; and Watton, Stephen P., to Northwestern University. Methods and materials relating to a bi-metallic cross-linking species. 5,534,542, Cl. 514-492.000.
- Ohashi, Tetsuyo: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Ohji, Nobunori: *See—*
  - Masukawa, Junichi; Isshiki, Nobuyuki; Ohji, Nobunori; Chin, Eiten; and Numata, Toshiharu, 5,534,065, Cl. 118-410.000.
- Ohki, Junichi; and Koga, Toshio, to NEC Corporation. Multiplex transmission method for motion picture signals and apparatus therefor. 5,534,926, Cl. 348-385.000.
- Ohkoshi, Kouji: *See—*
  - Kaneko, Susumu; Ohkoshi, Kouji; Endo, Keiichi; Miyaoka, Seiji; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,534,375, Cl. 430-58.000.
- Ohkubo, Masaharu: *See—*
  - Kisu, Hiroki; Ohkubo, Masaharu; Sakurai, Kazushige; Yamazaki, Michihito; Asano, Erika; Shimizu, Yasushi; and Ogata, Hiroaki, 5,534,344, Cl. 428-323.000.
- Ohmeda Inc.: *See—*
  - Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., 5,533,512, Cl. 128-719.000.
- Ohmori, Kazuo: *See—*
  - Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.
- Ohnishi, Hiroshi: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Ohnishi, Masaru: *See—*
  - Yamada, Keiki; Ohnishi, Masaru; Odai, Yoshiaki; and Arima, Ryoji, 5,534,906, Cl. 347-171.000.
- Ohno, Akio, to Canon Kabushiki Kaisha. Image forming apparatus having a rotatable image bearing member supported and positioned relative to a main body of the apparatus by a shaft and image forming means positioned relative to the shaft. 5,534,972, Cl. 355-200.000.
- Ohno, Kunio. Method and device for artificially increasing hair. 5,533,529, Cl. 132-200.000.
- Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, to Canon Kabushiki Kaisha. Image forming apparatus and developer for developing electrostatic images. 5,534,981, Cl. 355-245.000.
- Ohno, Shigeru: *See—*
  - Shirai, Shigeru; and Ohno, Shigeru, 5,534,392, Cl. 430-31.000.
- Ohno, Tsuyoshi: *See—*
  - Yoshizaki, Tsutomu; Maruyama, Shigeyuki; and Ohno, Tsuyoshi, 5,534,785, Cl. 324-758.000.
- Ohno, Yoshihiro; Atobe, Mitsuro; and Tanbo, Hitoshi, to Seiko Epson Corporation. Ink-jet recording apparatus. 5,534,900, Cl. 347-54.000.
- Ohnstein, Thomas R.: *See—*
  - Bonne, Ulrich; Honda, Nobuaki; Kubisiak, David; and Ohnstein, Thomas R., 5,533,393, Cl. 73-355.020.
- Ohoka, Tsukasa, to NEC Corporation. Semiconductor device provided with status detecting function. 5,534,726, Cl. 257-489.000.
- Ohoshi, Toshio; Kiyomiya, Tadashi; and Okita, Masami, to Sony Corporation. Field-emission display with black insulating layer between transparent electrode and conductive layer. 5,534,749, Cl. 313-497.000.
- Ohshima, Hisayoshi; and Yamada, Yoshiyasu, to Research Development Corporation; and Nippon Denso Co., Ltd. Solid state surface evaluation methods and devices. 5,534,698, Cl. 250-339.110.
- Ohta, Haruo: *See—*
  - Nakatsu, Etsuto; Higashitani, Hiroshi; and Ohta, Haruo, 5,535,244, Cl. 375-261.000.
- Ohta, Hiroyuki: *See—*
  - Sugiyama, Masaaki; and Ohta, Hiroyuki, 5,535,272, Cl. 379-373.000.
- Ohta, Kazunari: *See—*
  - Ishida, Yasuo; Ohta, Kazunari; and Yoshikawa, Harutoshi, 5,534,482, Cl. 504-215.000.
- Ohtagaki, Tomoko; and Sano, Yoshikazu, to Matsushita Electronics Corporation. Method of manufacturing a solid state imaging device. 5,534,443, Cl. 437-2.000.
- Ohtake, Motoyuki, to Nikon Corporation. Focus detecting optical system with an off-axis light source and light projecting lens. 5,534,687, Cl. 250-201.400.
- Ohtaki, Hideo: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Ohtani, Mitsuaki; Kato, Toshiyuki; and Hori, Yozo, to Shionogi & Co., Ltd. Carboxylate derivatives exhibiting phospholipase A2 inhibitory activity. 5,534,533, Cl. 514-372.000.
- Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, to Shionogi & Co., Ltd. Aromatic-sulfonamide-type hydroxamic acid derivative. 5,534,654, Cl. 564-90.000.
- Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, to Canon Kabushiki Kaisha. Transfer material carrying member and image forming apparatus making use of the same. 5,534,581, Cl. 524-430.000.
- Ohtani, Tadashi: *See—*
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
- Ohtomo, Fumio: *See—*
  - Kawashima, Hiroyuki; Ohtomo, Fumio; Saito, Susumu; and Minegishi, Isao, 5,535,003, Cl. 356-345.000.
- Ohtsuka, Tadao; and Shoda, Masao. Lens changeable image scanner and lens position control device in the same. 5,535,040, Cl. 359-210.000.
- Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, to Canon Kabushiki Kaisha. Fixing apparatus with variable fixing temperature. 5,534,987, Cl. 355-285.000.
- Ohtsuka, Yoshimichi: *See—*
  - Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi, 5,534,927, Cl. 348-400.000.
- Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, to Ono Pharmaceuticals Co. Ltd. Fused phenol derivatives. 5,534,536, Cl. 514-397.000.
- Ohyama, Katsuya: *See—*
  - Fujii, Toshiro; Iwama, Kazuaki; Kato, Yuichi; and Ohyama, Katsuya, 5,533,872, Cl. 417-269.000.
- Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, to Hitachi, Ltd. Control apparatus for and control method of gas turbine. 5,533,329, Cl. 60-39.030.
- Ojima, Satoshi: *See—*
  - Matsuzaki, Hiromi; Ojima, Satoshi; and Nakamura, Masashi, 5,534,031, Cl. 623-17.000.
- Ojo, Olukayode A.: *See—*
  - De Haan, Gerard; Biezen, Paul W. A. C.; Ojo, Olukayode A.; and Huijgen, Hendrik, 5,534,946, Cl. 348-619.000.
- Oka, Ken K.: *See—*
  - Friesen, Henry; and Oka, Ken K., 5,533,856, Cl. 414-711.000.
- Oka, Shinichi: *See—*
  - Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.
- Okabe, Masaaki: *See—*
  - Yamamoto, Akira; Okabe, Masaaki; Kaneko, Yoshio; and Shiraishi, Keiichi, 5,533,388, Cl. 73-117.000.

- Okabe, Masanobu, to Sony Corporation. Navigation system data recordable by user, recording medium thereof, and methods for recording/reproducing to/from the same. 5,535,125, Cl. 364-449.000.
- Okada, Takashi; and Shirato, Tadashi, to Nippon Telegraph and Telephone Corporation. Digitized quadrature modulator. 5,534,828, Cl. 332-103.000.
- Okamoto, Kayoko: *See—*
  - Igari, Yasutaka; Yamamoto, Kazumichi; Okamoto, Kayoko; and Yamagata, Yutaka, 5,534,269, Cl. 424-489.000.
- Okamoto, Kenji: *See—*
  - Ishiguro, Yukio; Sonoda, Youji; Okamoto, Kenji; Okamoto, Takamitsu; and Sakamoto, Hideki, 5,534,546, Cl. 514-681.000.
- Okamoto, Tadashi: *See—*
  - Miyazaki, Takeshi; Tanaka, Kazumi; Sakuranaga, Masanori; and Okamoto, Tadashi, 5,534,441, Cl. 436-517.000.
- Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, to Honda Giken Kogyo Kabushiki Kaisha. Fuel cell stack and method of pressing together the same. 5,534,362, Cl. 429-32.000.
- Okamoto, Takamitsu: *See—*
  - Ishiguro, Yukio; Sonoda, Youji; Okamoto, Kenji; Okamoto, Takamitsu; and Sakamoto, Hideki, 5,534,546, Cl. 514-681.000.
- Okamura, Nobuyuki; Yamagami, Atsushi; and Takaki, Satoshi, to Canon Kabushiki Kaisha. Plasma CVD process using a very-high-frequency and plasma CVD apparatus. 5,534,070, Cl. 118-723.00E.
- Okamura, Takanari: *See—*
  - Nomoto, Hideo; Okamura, Takanari; and Ito, Shoko, 5,533,864, Cl. 416-96.00A.
- Okano, Mitsuru: *See—*
  - Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, 5,535,317, Cl. 395-140.000.
- Oki Electric Industry Co., Ltd.: *See—*
  - Yanagawa, Atsuyuki; and Shimizu, Hisao, 5,535,407, Cl. 395-800.000.
- Okita, Masami: *See—*
  - Ohoshi, Toshio; Kiyomiya, Tadashi; and Okita, Masami, 5,534,749, Cl. 313-497.000.
- Okitaka, Takenori: *See—*
  - Miyazaki, Yukio; Okitaka, Takenori; Hatakenaka, Makoto; and Mano, Junji, 5,534,805, Cl. 327-144.000.
- Okonek, Lester J.: *See—*
  - Pullar, Gregory T.; Christensen, Robin B.; and Okonek, Lester J., 5,533,333, Cl. 60-327.000.
- Oku, Koji: *See—*
  - Izumi, Hirokazu; Deguchi, Masanobu; Oku, Koji; Yamamoto, Shuuhei; and Katayama, Harumi, 5,535,010, Cl. 358-296.000.
- Okuda, Kouichi: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Okuda, Kouji; Nishi, Tokumitsu; Takai, Hiroshi; and Hoshino, Hisakiyo, to Daihen Corporation. Joining method of ceramics and insertion member for heating and joining for use in the method. 5,534,091, Cl. 156-89.000.
- Okudaira, Tomonori; Kuroiwa, Takeharu; Fujiwara, Nobuo; and Kashihara, Keiichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a semiconductor device with high dielectric capacitor having sidewall spacers. 5,534,458, Cl. 437-52.000.
- Okuie, Takahiro: *See—*
  - Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, 5,535,071, Cl. 360-96.500.
- Okumura, Katsuya: *See—*
  - Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, 5,534,106, Cl. 156-636.100.
- Okunishi, Masahiko: *See—*
  - Hayashi, Sadao; Nakanishi, Eiji; Kurita, Yasuyuki; and Okunishi, Masahiko, 5,534,508, Cl. 514-206.000.
- Okuno, Ryozo: *See—*
  - Takano, Masao; Okuno, Ryozo; and Nakamura, Kimihiko, 5,534,377, Cl. 430-102.000.
- Okuno, Shiho; Hashimoto, Susumu; Yusu, Keiichiro; and Inomata, Koichiro, to Kabushiki Kaisha Toshiba. Artificial multilayer and method of manufacturing the same. 5,534,355, Cl. 428-611.000.
- Okuwa, Masayuki: *See—*
  - Sugitani, Nobuyoshi; Okuwa, Masayuki; Morikawa, Takeshi; and Nonomura, Yutaka, 5,533,397, Cl. 73-504.160.
- Okuyama, Kousuke: *See—*
  - Iwai, Hidetoshi; Mitsusada, Kazumichi; Ishihara, Masamichi; Matsumoto, Tetsuro; Miyazawa, Kazuyuki; Katto, Hisao; and Okuyama, Kousuke, 5,534,723, Cl. 257-360.000.
- Oldenziel, Daniel; and Griessmann, Marcel, to Endress + Hauser Flowtec AG. Clamp-on ultrasonic volumetric flowmeter. 5,533,408, Cl. 73-861.180.
- Oleksenko, Pavel F.: *See—*
  - Kamuz, Alexander M.; Krivoshlykov, Sergej G.; and Oleksenko, Pavel F., 5,535,294, Cl. 385-25.000.
- Olesen, Preben H.: *See—*
  - Sauerberg, Per; and Olesen, Preben H., 5,534,528, Cl. 514-342.000.
- Olin Corporation: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Olive, Graham J., to Rediffusion Simulation Limited. Method and apparatus for generating images simulating non-homogeneous fog effects. 5,535,374, Cl. 395-500.000.
- Olivetti-Canon Industriale, S.p.A.: *See—*
  - Rosso, Luciano; and Saraceno, Antonio, 5,534,985, Cl. 355-283.000.
- Olnowich, Howard T., to International Business Machines Corporation. Protocol-to-protocol translator for interfacing disparate serial network nodes to a common parallel switching network. 5,535,373, Cl. 395-500.000.
- Olsen, Ib I.: *See—*
  - Gee, Michael A.; and Olsen, Ib I., 5,534,365, Cl. 429-62.000.
- Olson, Roger A.: *See—*
  - Beach, William F.; Wary, John; and Olson, Roger A., 5,534,068, Cl. 118-719.000.
- Olson, Scott A.: *See—*
  - St. Germain, Jon P.; and Olson, Scott A., 5,534,007, Cl. 606-108.000.
- Olympus Optical Co., Ltd.: *See—*
  - Matsuzawa, Yoshinori, 5,534,967, Cl. 354-430.000.
  - Takase, Masami, 5,534,960, Cl. 354-173.100.
- Omron Corporation: *See—*
  - Nagayama, Keiichi; Noguchi, Masami; and Sakakino, Takahiro, 5,534,842, Cl. 337-402.000.
- O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, to International Business Machines Corporation. Fluid delivery apparatus having an infrared feedline sensor. 5,534,066, Cl. 118-663.000.
- Ong, Estelita S.: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Ono, Koichi; Nejime, Yoshito; and Yamamoto, Etsuji, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Pipelined analog-to-digital converter. 5,534,864, Cl. 341-156.000.
- Ono, Minoru; Tamura, Yuka; and Akasu, Michinori, to Kaken Shoyaku Co., Ltd. Anti-aids virus composition. 5,534,523, Cl. 514-308.000.
- Ono Pharmaceuticals Co. Ltd.: *See—*
  - Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,534,536, Cl. 514-397.000.
- Ono, Takeshi: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Ono, Yuzo; and Oba, Akitomo, to NEC Corporation. Optical head device and birefringent diffraction grating polarizer and polarizing hologram element used therein. 5,535,055, Cl. 359-495.000.
- Onodo Cement Co., Ltd: *See—*
  - Ito, Mitsuhiro; Tamashige, Takamiki; and Fujii, Satoru, 5,533,629, Cl. 209-714.000.
- Ooie, Toshihiko: *See—*
  - Yano, Tetsuo; Ooie, Toshihiko; Yoneda, Masafumi; Utsumi, Akihiro; Katsumura, Munehide; and Matsuda, Jun, 5,534,103, Cl. 156-272.800.
- Oomen, Emmanuel W. J. L., to U.S. Philips Corporation. Display device comprising a display screen provided with a light absorbing coating. 5,534,748, Cl. 313-479.000.
- Ootsuka, Shigeharu: *See—*
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- Oppermann, Hermann: *See—*
  - Huston, James S.; Houston, L. L.; Ring, David B.; and Oppermann, Hermann, 5,534,254, Cl. 424-135.100.
- Oppermann, Rolf; Sauerschell, Wolfgang; and Martinovaski, Jiri, to VDO Adolf Schindling AG. Speed control by an automatic load displacement device for an internal combustion engine of a motor vehicle. 5,533,484, Cl. 123-358.000.
- Oprysko, Modest M.: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Optobahn Corporation: *See—*
  - Uchida, Toshi K., 5,535,296, Cl. 385-89.000.
- Or, Yat S.; and Luly, Jay R., to Abbott Laboratories. Macrocyclic carbamate immunomodulators. 5,534,632, Cl. 540-456.000.
- OraVax, Inc.: *See—*
  - Weltzin, Richard A., 5,534,411, Cl. 435-7.200.
- Orenga, Sylvain, to Bio Merieux. Selective and differential medium for the growth and detection of Candida albicans. 5,534,415, Cl. 435-34.000.
- Organo Corporation: *See—*
  - Miyawaki, Isamu; and Kaneko, Kikuzo, 5,534,075, Cl. 127-46.100.
- Origin Medsystems, Inc.: *See—*
  - Metcalf, Gerald L.; Poff, Bradley C.; and Barker, John M., 5,533,977, Cl. 604-164.000.
- Ormco Corporation: *See—*
  - Andreiko, Craig A.; and Payne, Mark A., 5,533,895, Cl. 433-24.000.
- Örnberg, Rolf, to Hultdin Invest AB. Saw assembly. 5,533,432, Cl. 83-819.000.
- Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, to Institut Pasteur. Isolated DNA of human papillomavirus type 55 (HPV55). 5,534,439, Cl. 435-320.100.

- Osan, Frank: *See—*
  - Bennett, Cynthia; Brekner, Michael-Joachim; Herrmann-Schoenherr, Otto; and Osan, Frank, 5,534,606, Cl. 526-281.000.
- Osborn, Stephen G.; and Goke, L. Rodney, to Motorola Inc. Method and apparatus for approximating a sigmoidal response using digital circuitry. 5,535,148, Cl. 364-718.000.
- Osborne, William S., to Hewlett-Packard Company. Tubeless ink-jet printer priming cap system and method. 5,534,896, Cl. 347-29.000.
- Oshima, Kazunori: *See—*
  - Ushikubo, Takashi; Oshima, Kazunori; Ihara, Tatsuya; and Amatsu, Hiroyuki, 5,534,650, Cl. 558-319.000.
- OSi Specialties, Inc.: *See—*
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- Oskorep, John J.: *See—*
  - Phillips, Joseph E.; Oskorep, John J.; and Lee, Steven S., 5,534,860, Cl. 341-22.000.
- Osteen, David K.: *See—*
  - Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., 5,533,991, Cl. 604-383.000.
- Osterode, Martin: *See—*
  - Gessner, Dieter; and Osterode, Martin, 5,533,882, Cl. 425-564.000.
- Osti, Roberto; and Gamberini, Antonio, to G. D S.p.A. Method and a device for the formation of tubular overwrappings in heat-sealable material. 5,533,323, Cl. 53-466.000.
- Ostrander, James E.; and Klinger, Gary O., to ITT Corporation. Quick connector release member. 5,533,761, Cl. 285-38.000.
- Otis, Alton B., Jr.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Otis, Bruce P.: *See—*
  - Peacock, James L.; and Otis, Bruce P., 5,534,662, Cl. 174-35.0GC.
- Otis Elevator Company: *See—*
  - Koopman, Philip J.; and Brajczewski, David C., 5,535,212, Cl. 370-85.600.
  - Narumi, Eiji; and Iwasa, Masao, 5,533,595, Cl. 187-266.000.
- Otsuka, Haruhiko: *See—*
  - Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, 5,534,357, Cl. 428-629.000.
- Otsuka Pharmaceutical Co., Ltd.: *See—*
  - Sugahara, Yuji; and Nakayama, Yasuo, 5,534,251, Cl. 424-85.200.
- Ott, James H.; Anglin, Mark E.; and Henderson, James P., to Novar Electronics Corporation. Method of refrigeration case control. 5,533,347, Cl. 62-115.000.
- Outlaw, Tina O.: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Overfield, Anthony L.: *See—*
  - Stewart, Gregory N.; and Overfield, Anthony L., 5,535,371, Cl. 395-500.000.
- Overton, Richard A.: *See—*
  - Dickerson, Charles W.; Overton, Richard A.; and Luther, Ronald B., 5,533,988, Cl. 604-282.000.
- Ovshinsky, Stanford R.; Strand, David A.; Czubatyj, Wolodymyr; and Klersy, Patrick, to Energy Conversion Devices, Inc. Electrically erasable, directly overwritable, multibit single cell memory elements and arrays fabricated therefrom. 5,534,711, Cl. 257-3.000.
- Ovshinsky, Stanford R.; Strand, David A.; and Klersy, Patrick, to Energy Conversion Devices, Inc. Electrically erasable memory elements characterized by reduced current and improved thermal stability. 5,534,712, Cl. 217-3.000.
- Owens-Illinois Plastic Products Inc.: *See—*
  - Herman, James N.; and Hiltner, James E., 5,534,317, Cl. 428-35.700.
- Owensby, Joseph E.: *See—*
  - Stockley, Henry W., III; and Owensby, Joseph E., 5,533,622, Cl. 206-484.000.
- Oxford Instruments Inc.: *See—*
  - Marancik, William G.; Hong, Seungok; and Zhou, Rouyi, 5,534,219, Cl. 419-4.000.
- Oyo Corporation: *See—*
  - Ogura, Kimio, 5,534,668, Cl. 181-106.000.
- Ozaki, Ichiro: *See—*
  - Miyashita, Mafumi; and Ozaki, Ichiro, 5,535,427, Cl. 455-38.200.
- Ozawa, Hiroyoshi; Kamiya, Noboru; and Futaya, Ryuji, to Lord Corporation. Overcoat and adhesive compositions based on chlorinated polyolefins having high chlorine contents. 5,534,591, Cl. 525-194.000.
- Ozawa, Ken: *See—*
  - Nakashima, Toshiharu; Hamatani, Masato; and Ozawa, Ken, 5,534,970, Cl. 355-53.000.
- Ozeki, Hiroaki: *See—*
  - Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., 5,535,220, Cl. 371-2.100.
- Ozko, Inc.: *See—*
  - Roberts, Michael G.; and Bolen, Charles E., 5,534,303, Cl. 427-385.500.
  - Roberts, Michael G.; and Bolen, Charles E., 5,534,583, Cl. 524-476.000.
- P.W.T. S.p.A.: *See—*
  - Rinaldi, Fernando; Crivellaro, Guglielmo; and Denaro, Rinaldo, 5,534,676, Cl. 219-124.340.
- Pace, J. Gary: *See—*
  - Sands, Richard H.; Harkey, Jerry P.; and Pace, J. Gary, 5,533,472, Cl. 123-41.350.
- Pace, William. Roll rewinder apparatus. 5,533,688, Cl. 242-413.200.
- Paceco Corp.: *See—*
  - Masamitsu, Enoki, 5,533,769, Cl. 294-68.230.
- Pacific Communication Sciences, Inc.: *See—*
  - Riedel, Neal K., 5,535,299, Cl. 395-2.210.
- Padovani, Roberto; Jou, Yu-Cheun; Kindred, Daniel R.; McDonough, John G.; and Rueth, Timothy I., to Qualcomm Incorporated. Data burst randomizer. 5,535,239, Cl. 375-205.000.
- Pagano, Daniel: *See—*
  - Keelan, Brian; and Pagano, Daniel, 5,534,959, Cl. 354-160.000.
- Page, Phillip E.; Berman, Jonathan; Pence, Janet M.; and Minish, Sharon K., to Hoechst Marion Roussel, Inc. Aminoguanidine spray drying process. 5,534,551, Cl. 514-634.000.
- Pajula, Juhani: *See—*
  - Karvinen, Mikko; Kerttula, Reima; Laapotti, Jorma; and Pajula, Juhani, 5,534,116, Cl. 162-274.000.
- Palackal, Syriac J.: *See—*
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- Palmer, Bentley J.: *See—*
  - Hill, Ross H.; Palmer, Bentley J.; Avey, Alfred A., Jr.; Blair, Sharon L.; Chu, Chu-Hui W.; Gao, Meihua; and Law, Wai L., 5,534,312, Cl. 427-533.000.
- Palmquist, John M.: *See—*
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- Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Sőo, Mihály; Gyűre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, to Aktiebolaget Astra. Process for the preparation of 4-methyl-5-(2-chloroethyl)-thiazole and analogues thereof. 5,534,644, Cl. 558-14.000.
- Palsson, Bernhard Ø.; Clarke, Michael F.; and Chuck, Alice S. Y., to University of Michigan, Regents of the. Methods of increasing rates of infection by directing motion of vectors. 5,534,423, Cl. 435-172.100.
- Pan, Hong-Tsz; Yang, Ming-Tzong; and Shy, Shyi-Long, to United Microelectronics Corporation. Quantum chromeless lithography. 5,533,634, Cl. 216-12.000.
- Pan, Shien-Tai; Cheng, Ting; Georgiou, Christos J.; Nation, George W.; and Li, Chung-Sheng, to International Business Machines Corporation. Ring configurator for system interconnection using fully covered rings. 5,535,213, Cl. 370-85.150.
- Panasonic Technologies, Inc.: *See—*
  - Sevic, John F., 5,535,438, Cl. 455-110.000.
- Pankratz, Paul: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Pappas, Chris; Koppa, Daniel A.; Skeels, Roger E.; and Aquino, Agostino, to Nabisco, Inc. Method of making printed baked goods. 5,534,281, Cl. 426-383.000.
- Parabeam Industrie-en Handelsonderneming B.V.: *See—*
  - Andre De La Porte, Gilles; and Swinkels, Cornelis T. J. M., 5,534,318, Cl. 428-36.900.
- Park, Chang-soo: *See—*
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- Park, Daniel J., to Seiko Communications Systems, Inc. Method and apparatus for switching between redundant hardware in a wireless data communication system. 5,535,191, Cl. 370-16.000.
- Park, Hee-su: *See—*
  - Kim, Tae-ryong; Park, Hee-su; and Moon, Dai-sick, 5,534,728, Cl. 257-692.000.
- Parker, James W.; Harrison, Paul M.; and Peall, Robert G., to Northern Telecom Limited. Process of providing uniform photoresist thickness on an opto-electronic device. 5,534,442, Cl. 437-2.000.
- Parks, Terry, to Dell USA, L.P. Method and apparatus for low latency synchronization of signals having different clock speeds. 5,535,377, Cl. 395-550.000.
- Parks, Thomas R., to Food and Agrosystems, Inc. High air velocity convection oven. 5,533,444, Cl. 99-476.000.
- Parmigiani, Corrado Jr, to C.G.M. S.P.A. Protection device for a body-penetrating syringe needle. 5,533,984, Cl. 604-263.000.
- Parsons, Bruce L., to National Research Council of Canada. Keel arrangement for sailboat hull. 5,533,462, Cl. 114-140.000.
- Parthasarathi, Arvind: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Pascall, Brian. Fuel conditioning device. 5,533,490, Cl. 123-538.000.
- Pascoe, Robert A.; and Ehnebuske, David L., to International Business Machines Corporation. Method of creating and detecting device independent controls in a presentation data stream. 5,535,319, Cl. 395-148.000.
- Pase, Douglas M.: *See—*
  - Barriuso, Frank R.; Pase, Douglas M.; and Sielaff, David J., 5,535,365, Cl. 395-482.000.
- Pashos, Maria: *See—*

  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
- Paspa, Paul M., to Ventritex, Inc. Cardiac defibrillator with case that can be electrically active or inactive. 5,534,019, Cl. 607-38.000.
- Passow, Michael L.: *See—*
  - O'Neill, James A.; Passow, Michael L.; Cotler, Tina J.; Chapple-Sokol, Jonathan D.; Conti, Richard A.; and Singh, Jyothi, 5,534,066, Cl. 118-663.000.
- Patarin, Joel: *See—*
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- Pate, Thomas K.: *See—*
  - Brigida, David J.; Moore, Victor S.; and Pate, Thomas K., 5,535,242, Cl. 375-222.000.
- Patel, Indrajit; Bowerman, Harold; Rosenbaum, Larry; Mennenoh, Rich; and Ryan, Pat. Material for medical grade products and products made therefrom. 5,533,992, Cl. 604-403.000.
- Patel, Rajesh S.; and Economikos, Laertis, to International Business Machines Corporation. Repaired apertured laser metal mask. 5,534,371, Cl. 430-5.000.
- Paterson, Hugh: *See—*
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- Patterson, Liliana M.; and Tarlow, Kenneth A., to Patterson, Liliana M. Motorized accessory holder and method of using same. 5,533,632, Cl. 211-122.000.
- Patterson, Rachel M.: *See—*
  - Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., 5,534,121, Cl. 204-459.000.
- Patterson, Sam H.; Cheever, John D.; and Larson, Michael W., to SRAM Corporation. Bicycle derailleur. 5,533,937, Cl. 474-80.000.
- Patzenhauer, Andree; Geilhausen, Winfried; and Schneider, Rolf, to Fichtel & Sachs AG. Hydraulic, adjustable vibration damper for motor vehicles. 5,533,596, Cl. 188-299.000.
- Paulus, Peter: *See—*
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- Pavlovva, Zakataeva N.: *See—*
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- Pawlowski, George W.: *See—*
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- Payne, Charles C.; and Grattan, David A., to Rodel, Inc. Composition for reducing or eliminating static charge in adhesive film. 5,534,053, Cl. 106-236.000.
- Payne, Mark A.: *See—*
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- Peacock, James L.; and Otis, Bruce P., to International Business Machines Corporation. Chassis mounted electromagnetic interference grounding assembly for electronic modules. 5,534,662, Cl. 174-35.0GC.
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- Peall, Robert G.: *See—*
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- Pearson, Daniel A.: *See—*
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- Pearson, Nels G.: *See—*
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- Pearson, Scott D.; and North, Diane, to Minnesota Mining and Manufacturing Company. Laminar articles made from blends of ethylene-vinyl alcohol copolymers and olefin polymers. 5,534,351, Cl. 428-516.000.
- Peart, Stephen, to Axis Bicycle Incorporated. All-terrain bicycle frame. 5,533,742, Cl. 280-281.100.
- Peery, John R.: *See—*
  - Gyory, J. Richard; and Peery, John R., 5,533,972, Cl. 604-20.000.
- Pehau-Arnaudet, Gérard: *See—*
  - Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,534,439, Cl. 435-320.100.
- Pehoski, Richard J.; and Pessetti, Joseph A. Mallet and blade putter heads. 5,533,728, Cl. 473-252.000.
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  - Touchton, Scott F.; Peinetti, Donald L.; and Duffy, William J., Jr., 5,533,469, Cl. 119-721.000.
- Peitl, Friedrich: *See—*
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- Pence, Janet M.: *See—*
  - Page, Phillip E.; Berman, Jonathan; Pence, Janet M.; and Minish, Sharon K., 5,534,551, Cl. 514-634.000.
- Peng, Chih-Jui, to Motorola, Inc. Address translator with by-pass circuit and method of operation. 5,535,351, Cl. 395-417.000.
- Peng, Yu-Yin: *See—*
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- Penn State Research Foundation, The: *See—*
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- Pennice, Diane: *See—*
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- Pennington, David W.: *See—*
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- Pentoney, Stephen L., to Beckman Instruments, Inc. Apparatus and method for aligning capillary column and detection optics. 5,534,707, Cl. 204-452.000.
- Peoples, Oliver P.; and Sinskey, Anthony J., to Massachusetts Institute of Technology. Polyhydroxybutyrate polymerase. 5,534,432, Cl. 435-240.400.
- Pepe, Michael G.: *See—*
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- Pepper, Stuart L.: *See—*
  - Kelbrick, William J.; Rouble, Vincent J.; Larmer, Ralph D.; Pepper, Stuart L.; and Warburton, Eric T., 5,534,222, Cl. 422-33.000.
- Peptech (UK) Limited: *See—*
  - Aston, Roger; and Kovalev, Igor E., 5,534,492, Cl. 514-8.000.
- Perdue, Sidney B.: *See—*
  - Issa, Darrell E.; Birchfield, Jerry W.; Busse, Glenn R.; Perdue, Sidney B.; and Ward, Kenneth A., 5,534,845, Cl. 340-425.500.
- PERF-PAK: *See—*
  - Gale, Gregory, 5,533,667, Cl. 229-120.010.
- Perfect Curve, Inc.: *See—*
  - Levin, Gregg M., 5,533,652, Cl. 223-84.000.
- Perfecto, Eric D.; Prasad, Chandrika; White, George E.; and Wong, Kwong H., to International Business Machines Corporation. Method of making area direct transfer multilayer thin film structure. 5,534,466, Cl. 437-208.000.
- Perfetti, Thomas A.: *See—*
  - Young, Harvey J.; Brown, Thomas W.; Devine, Sara W.; and Perfetti, Thomas A., 5,533,530, Cl. 131-370.000.
- Perisho, Randal J., to Dura Automotive Holding, Inc. Parking brake system including an internal clutch spring. 5,533,420, Cl. 74-512.000.
- Perkins Limited: *See—*
  - Deane, Daniel, 5,533,475, Cl. 123-198.00C.
- Pernick, Jeffrey R.: *See—*
  - Stadler, David M.; and Pernick, Jeffrey R., 5,534,126, Cl. 205-101.000.
- Perrotto, Joseph A.: *See—*
  - Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
- Perry, Paul D.: *See—*
  - Cook, John E.; and Perry, Paul D., 5,533,488, Cl. 123-568.000.
- Perry, Phillip G.; O'Dell, Gene W.; and van Asten, Ronny W. F., to Xerox Corporation. Cutting fluid. 5,534,172, Cl. 508-156.000.
- Persson, Johan: *See—*
  - Hemström, Bengt; Persson, Johan; and Karlsson, Rolf, 5,534,144, Cl. 210-193.000.
- Pert, Candace B.; and Ruff, Michael R., to Advanced Peptides and Biotechnology Sciences. Treatment of non-HIV neuropathic pain syndromes. 5,534,495, Cl. 514-16.000.
- Perugini, Michael N.; and Crilly, Thomas I., III, to Burndy Corporation. Tool for on-site repairing and/or replacing of electrical connectors. 5,533,255, Cl. 29-758.000.
- Pessetti, Joseph A.: *See—*
  - Pehoski, Richard J.; and Pessetti, Joseph A., 5,533,728, Cl. 473-252.000.
- Pestco, Inc.: *See—*
  - Zlotnik, Arnold H.; Austin, John A.; and Zlotnik, Milton, 5,533,705, Cl. 248-645.000.
- Peterman, Douglas: *See—*
  - Peterman, Shadi; and Peterman, Douglas, 5,533,962, Cl. 602-54.000.
- Peterman, Shadi; and Peterman, Douglas. Ringless adhesive bandage. 5,533,962, Cl. 602-54.000.
- Peters, Henning: *See—*
  - Agro, Marc; Auer, Wolfgang; Hilt, Gerard; Peters, Henning; and Rust, Sabine, 5,533,776, Cl. 296-97.900.
- Peters, Lester L., to Cummins Engine Company, Inc. Dual event nozzle for low opening and high closing pressure injector. 5,533,672, Cl. 239-88.000.
- Peters, Timothy G.: *See—*
  - Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin, 5,535,393, Cl. 395-700.000.
- Petersen, James N.: *See—*
  - Scott, Charles D.; Petersen, James N.; and Davison, Brian H., 5,534,153, Cl. 210-661.000.
- Petersen, Joel; and Lerner, Jeremy, to Physical Optics Corporation. Homogenizer formed using coherent light and a holographic diffuser. 5,534,386, Cl. 430-320.000.

- Petersen, Robert V.; Hsu, Tsung-Min; Lee, Han-Chen; and Christy, Don, to University of Utah. Percutaneous drug delivery system. 5,534,260, Cl. 424-448.000.
- Peterson, Douglas R., to VTC Inc. Preamplifier noise filtering circuit. 5,534,818, Cl. 327-545.000.
- Peterson, Laverne R. Toppling toy. 5,533,919, Cl. 446-2.000.
- Peterson, Meldon L. Closure for a skin wound or incision. 5,534,010, Cl. 606-215.000.
- Peterson, Nicholas B.: *See—*
  - Kardach, James; Cho, Sung S.; Peterson, Nicholas B.; and Lane, Thomas R., 5,535,420, Cl. 395-868.000.
- Peterson, Ronald L.: *See—*
  - Bernardin, Frederick E.; and Peterson, Ronald L., 5,534,142, Cl. 210-141.000.
- Petko, Robert S.: *See—*
  - Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
- Petrie, Michael J.; and Pleune, Daniel A., to Jackson Products, Inc. Welding helmet with removable electronic quick change cartridge. 5,533,206, Cl. 2-8.000.
- Petroleum Containment, Inc.: *See—*
  - Arn, Robert W., 5,533,547, Cl. 137-360.000.
- Petschauer, Richard J.; Rothenberger, Roland D.; and Tumms, Paul G., to Unisys Corporation. Method of fabricating IC chips with table look-up estimated crosstalk voltages being less than noise margin. 5,535,133, Cl. 364-489.000.
- Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Børretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, to Norsk Hydro A.S. Compounds. 5,534,531, Cl. 514-365.000.
- Pettersson, Charles R.: *See—*
  - Mukherjee-Roy, Moitreyee; Pettersson, Charles R.; and Debner, Thomas G., 5,535,005, Cl. 356-371.000.
- Pettijohn, Ted M.: *See—*
  - Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,534,473, Cl. 502-117.000.
- Petty, Stephen E.: *See—*
  - Cook, F. Bert; Petty, Stephen E.; Meacham, Howard C., Jr.; Christensen, Richard N.; and McGahey, Kevin R., 5,533,362, Cl. 62-476.000.
- Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, to Alcatel N. V. Method of and circuit arrangement for freeing communications resources, particularly for use by a switching element. 5,535,366, Cl. 395-486.000.
- Pfeiffer, Martin: *See—*
  - Epple, Anton; Pfeiffer, Martin; Kruse, Martin; and Volz, Wolfgang, 5,533,779, Cl. 296-192.000.
- Pfertner, Kurt: *See—*
  - Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
- Pfizer Inc.: *See—*
  - Alker, David; Cross, Peter E.; and Wallis, Robert M., 5,534,626, Cl. 544-360.000.
- PFU Limited: *See—*
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- Pham, Hung M.: *See—*
  - Bahel, Vijay O.; Millet, Hank E.; Hickey, Mickey F.; Pham, Hung M.; Herroon, Gregory P.; Greschl, Gerald L.; and Niemann, Joseph B., 5,533,352, Cl. 62-180.000.
- Pharmacia AB: *See—*
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- Philip Morris Incorporated: *See—*
  - Cutright, Edwin L.; Scott, G. Robert; and Vogt, Howard W., Jr., 5,534,114, Cl. 162-139.000.
  - Garthaffner, Martin T.; and Honaker, Ronald D., 5,533,610, Cl. 198-458.000.
  - Wallace, Ronald; Goldberg, Henry; Mitchell, James; and Grosser, Harald, 5,533,528, Cl. 131-304.000.
- Phillips, Christopher E.; Ahrens, Michael G.; Nolan, Joseph G., III; and Cooke, Laurence H., to Crosspoint Solutions, Inc. Multiplexer with level shift capabilities. 5,534,798, Cl. 326-108.000.
- Phillips, Joseph E.; Oskorep, John J.; and Lee, Steven S. Multiple key array. 5,534,860, Cl. 341-22.000.
- Phillips Petroleum Company: *See—*
  - DeMasters, Jimmie G., 5,533,356, Cl. 62-260.000.
  - Randolph, Bruce B.; Abbott, Ronald G.; Child, Jonathan E.; and Del Rossi, Kenneth J., 5,534,657, Cl. 585-723.000.
  - Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,534,473, Cl. 502-117.000.
- Phipps, Joseph B., to Alza Corporation. Reduction of skin irritation during electrotransport. 5,533,971, Cl. 604-20.000.
- Physical Optics Corporation: *See—*
  - Petersen, Joel; and Lerner, Jeremy, 5,534,386, Cl. 430-320.000.
- Pi-Rod, Inc.: *See—*
  - Noble, Myron C., 5,533,304, Cl. 52-40.000.
- Pickels, Robert F., Jr. Surgical holster. 5,533,618, Cl. 206-363.000.
- Pickens, Bruce M.; and Pickens, Julie D. Food cutter. 5,533,269, Cl. 30-304.000.
- Pickens, Julie D.: *See—*
  - Pickens, Bruce M.; and Pickens, Julie D., 5,533,269, Cl. 30-304.000.
- Picker International, Inc.: *See—*
  - Young, Ian R.; and Eastham, John F., 5,534,779, Cl. 324-319.000.
- Pickrell, John W., to J.P. Patent Holdings, L.L.C. Apparatus and method for pulling cable. 5,533,711, Cl. 254-273.000.
- Piechowski, Todd A.: *See—*
  - Voegele, Kevin D.; and Piechowski, Todd A., 5,535,243, Cl. 375-259.000.
- Pierce, James H.; and Sayig, Robert J., II, to Intra Corporation. Apparatus for inspecting an engine valve seat. 5,533,384, Cl. 73-47.000.
- Pierce, Stephen W.: *See—*
  - McDonald, Kevin B.; Pierce, Stephen W.; Benowitz, Michael; and Terrett, David S., 5,534,849, Cl. 340-517.000.
- Pierfitte, Michel; and DeLorme, Pierre, to Sopha Medical. Tomographic acquisition method having two detectors with sighting center distinct from the center of rotation. 5,534,701, Cl. 250-363.040.
- Pierotti, L. John: *See—*
  - Kort, Leland B.; Moore, Walter A.; Clark, Randall J.; Johnson, Kelly B.; Pierotti, L. John; and Hussey, Brett, 5,533,751, Cl. 280-737.000.
- Pierpont, Robert L.; Cortes, John F.; Fabrisi, Michael J.; and Ryder, Kenneth F., to Rexam Cosmetic Packaging Inc. Sealed cosmetic dispenser. 5,533,823, Cl. 401-98.000.
- Pike, Robert D.; and Struve, David C. Roof tile anchoring clip. 5,533,313, Cl. 52-712.000.
- Pilkington Barnes Hind, Inc.: *See—*
  - Evans, John M., 5,534,038, Cl. 8-507.000.
- Pilosof, David; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark Lee; Trinh, Toan; and Zwerdling, Susan S., to Procter & Gamble Company, The. Fabric treating composition containing beta-cyclodextrin and essentially free of perfume. 5,534,165, Cl. 252-8.910.
- Pioch, Olivier, to Pioch S.A. Electronic apparatus for measuring the parameters of an oil transformer. 5,534,853, Cl. 340-646.000.
- Pioch S.A.: *See—*
  - Pioch, Olivier, 5,534,853, Cl. 340-646.000.
- Pioneer Hi-Bred International, Inc.: *See—*
  - Maughan, Kory W., 5,534,661, Cl. 800-200.000.
- Piontek, Carl J.; Mazer, Terrence B.; Walton, Joseph E.; and Geckle, Ronita K., to Abbott Laboratories. Alteration of nutritional product during enteral tube feeding. 5,533,973, Cl. 604-83.000.
- Piper, Samuel D., to Vortran Medical Technology, Inc. Powder inhaler with aerosolization occurring within each individual powder receptacle. 5,533,502, Cl. 128-203.210.
- Pirkle, Fred L., to Texan Corporation. Personal comfort apparatus. 5,533,354, Cl. 62-259.300.
- Pitney Bowes Inc.: *See—*
  - Seestrom, Frank E., 5,535,279, Cl. 380-55.000.
- Pitrone, Anne: *See—*
  - Arad, Abraham A.; Pitrone, Anne; and Jeffway, Robert W., Jr., 5,533,920, Cl. 446-409.000.
- Pittman, Raymond H.; Ruggie, Mark A.; and Luetgert, Karine A., to Masonite Corporation. Finishing process for textured panels, and structures made thereby. 5,534,352, Cl. 428-535.000.
- Plambeck, Kenneth E.: *See—*
  - Chang, Chung-Chia; Davoll, Gregory L.; El-Ruby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
- Plaskett, Thomas S.: *See—*
  - Gambino, Richard J.; McElfresh, Michael W.; McGuire, Thomas R.; and Plaskett, Thomas S., 5,534,360, Cl. 428-694.0ML.
- Plasma Energy Applied Technology Incorporated: *See—*
  - Springer, Marlin D.; Burns, William C.; and Barkley, Thomas, 5,534,659, Cl. 588-227.000.
- Platter, Sanford; Aldred, Jeffrey K.; and Kraemer, Richard J., to SweetWater, Inc. Compact water filtration pump. 5,534,145, Cl. 210-90.000.
- Platzer, Stephan J. W.; Buchmann, Andrea; and Buhr, Gerhard, to Agfa-Gevaert AG. Peel-apart process for the production of a colored image and imaged product produced through the process. 5,534,373, Cl. 430-15.000.
- Platzer, Stephan J. W.; Nuernberger, Siegfried; and Maerz, Karin, to Hoechst Aktiengesellschaft. Photosensitive material for the production of a multicolored image. 5,534,384, Cl. 430-260.000.
- Plaut, Andrew G.; and Kane, Anne V., to New England Medical Center Hospitals, Inc. Surfactants and emulsifying agents to inhibit Helicobacter. 5,534,544, Cl. 514-552.000.
- Plester, George, to Coca-Cola Company, The. Method and apparatus for making shaped cans. 5,533,373, Cl. 72-84.000.
- Pleune, Daniel A.: *See—*
  - Petrie, Michael J.; and Pleune, Daniel A., 5,533,206, Cl. 2-8.000.
- Pluess-Staufer AG: *See—*
  - Strauch, Dieter; and Belger, Peter, 5,533,678, Cl. 241-16.000.
- Pöchlauer, Peter: *See—*
  - Seufer-Wasserthal, Peter; Mayrhofer, Herbert; Wirth, Irma; and Pöchlauer, Peter, 5,534,436, Cl. 435-280.000.
- Poff, Bradley C.: *See—*
  - Metcalf, Gerald L.; Poff, Bradley C.; and Barker, John M., 5,533,977, Cl. 604-164.000.
- Poggi, Stefano: *See—*
  - Moschini, Renzo; and Poggi, Stefano, 5,533,562, Cl. 164-71.100.
- Polaroid Corporation: *See—*
  - Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.

  - Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., 5,534,388, Cl. 430-338.000.
  - Minns, Richard A., 5,534,558, Cl. 522-35.000.
- Polch, Ewaryst Z.; Williams, Carl D.; and Cordova, Jackie, to Quantum Corporation. Hydrodynamic bearing having inverted surface tension seals. 5,533,811, Cl. 384-107.000.
- Pollner, Reinhold; Noah, Michael; and Nau, Günther, to Behringwerke Aktiengesellschaft. Process for preparing conjugates consisting of a specific binding partner and a carbohydrate-containing protein. 5,534,414, Cl. 435-794.000.
- Polygen Holding Corporation: *See—*
  - Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 5,534,494, Cl. 514-16.000.
- Polygon Industries Corporation: *See—*
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- Polyplastics Co., Ltd.: *See—*
  - Kitamura, Hiroshi; and Mitsuuchi, Masamichi, 5,534,584, Cl. 524-497.000.
  - Shirai, Yoshimitsu; Murakami, Haruji; and Amaike, Takeshi, 5,534,210, Cl. 264-171.130.
- Polzin, Bruce C.: *See—*
  - Jarecki, James J.; and Polzin, Bruce C., 5,533,228, Cl. 15-257.060.
- Pompeo, Frank L.: *See—*
  - Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,533,256, Cl. 29-840.000.
- Poncelet, Greg R.: *See—*
  - Kallenbach, Thomas J.; Buchanan, Justin M.; Goodrich, Matthew H.; Skinner, Ronald V.; Poncelet, Greg R.; and Kallenbach, Trina J., 5,534,147, Cl. 210-605.000.
- Ponomarev, Viktor: *See—*
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- Poon, Peter C. H.: *See—*
  - Robinson, Michael G.; and Poon, Peter C. H., 5,534,704, Cl. 250-550.000.
- Pope, Laura E.: *See—*
  - Katz, David H.; Khalil, Mohammed H.; Marcelletti, John F.; Pope, Laura E.; and Katz, Lee R., 5,534,554, Cl. 514-724.000.
- Porter, Dennis. Holder for a container. 5,533,700, Cl. 248-311.200.
- Portier, Ralph J.; and Mao, Huazhong, to Louisiana State University Board of Supervisors, a Governing body of Louisiana State University Agricultural and Mechanical College. Microbubble generator for the transfer of oxygen to microbial inocula, and microbubble generator immobilized cell reactor. 5,534,143, Cl. 210-151.000.
- Portillo, Netza: *See—*
  - Bergland, Norman R.; Wisor, Donald R.; and Portillo, Netza, 5,533,458, Cl. 111-200.000.
- Poteet, Kenneth A.: *See—*
  - Reddy, Chitranjan N.; and Poteet, Kenneth A., 5,535,172, Cl. 365-230.030.
- Poth, Ulrich: *See—*
  - Röckrath, Ulrike; Betz, Peter; Poth, Ulrich; and Wigger, Georg, 5,534,306, Cl. 427-407.100.
- Potok, Thomas E.: *See—*
  - Cattell, Kevin T.; Cromer, William R.; Lin, Shihta; Neuchterlein, Bruce E.; and Potok, Thomas E., 5,535,325, Cl. 395-161.000.
- Potratz, Robert S., to Nellcor, Inc. Condensed oximeter system with noise reduction software. 5,533,507, Cl. 128-633.000.
- Potter, Andrew A.; and Harland, Richard J., to University of Saskatchewan. Haemophilus somnus outer membrane protein extract enriched with iron-regulated proteins. 5,534,256, Cl. 424-184.100.
- Pouletty, Philippe; and Chang, Chin-Hai, to SangStat Medical Corporation. Alloantigen enhancement assay. 5,534,412, Cl. 435-7.240.
- Poumey, Michel, to Cableco, Poumey, Gaz de Bordeaux and General Export Industries - Sogexi. Apparatus for supplying electrical power to an arc lamp including resonant circuit. 5,534,754, Cl. 315-278.000.
- Powell, Edward C. Two pointed shovel. 5,533,578, Cl. 172-378.000.
- Power Quality Engineering, Inc.: *See—*
  - Puckett, James D.; Weiss, Edward K.; Russell, Paul E.; and Pearson, J. Michael, 5,535,087, Cl. 361-118.000.
- Powers, William O.: *See—*
  - Rizk, Said; Powers, William O.; and Samsel, W. Scott, 5,533,982, Cl. 604-239.000.
- PQ Corporation: *See—*
  - Miller, J. Stanley; and Thompson, Reginald, 5,534,348, Cl. 428-402.000.
- Pradelski, William M. Ratchetable open-ended wrench. 5,533,428, Cl. 81-179.000.
- Prasad, Chandrika: *See—*
  - Perfecto, Eric D.; Prasad, Chandrika; White, George E.; and Wong, Kwong H., 5,534,466, Cl. 437-208.000.
- Prasad, Rajeev: *See—*
  - Shah, Nilesh; and Prasad, Rajeev, 5,535,341, Cl. 395-306.000.
- Prasad, Somuri V.; and Mecklenburg, Karl R., to United States of America, Air Force. Self-lubricating aluminum metal-matrix composites. 5,534,044, Cl. 75-231.000.
- Prater, David M.: *See—*
  - Koch, Albert F., III; and Prater, David M., 5,533,510, Cl. 128-660.070.
- Pratt, Michael J.: *See—*
  - Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,534,623, Cl. 534-560.000.
- Pray, James R.; Cornelius, Richard G.; and Arney, Michelle, to Scimed Lifesystems, Inc. Dilatation catheter with polymide encased stainless steel braid proximal shaft. 5,533,987, Cl. 604-280.000.
- Prece, Stephen V.: *See—*
  - Cone, Fred P.; Prece, Stephen V.; and Best, Donn A., 5,534,085, Cl. 148-336.000.
- President and Fellows of Harvard College: *See—*
  - Tabor, Stanley; and Richardson, Charles C., 5,534,407, Cl. 435-5.000.
- Pressman, Robert A.: *See—*
  - Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., 5,535,264, Cl. 379-89.000.
- Price, William L., III: *See—*
  - Keller, Robert A.; and Price, William L., III, 5,534,333, Cl. 428-222.000.
- Prince, Paul E., to Intel Corporation. Method and apparatus for skipping a snoop phase in sequential accesses by a processor in a shared multiprocessor memory system. 5,535,363, Cl. 395-474.000.
- Procter & Gamble Co., The: *See—*
  - Chapman, Benjamin E.; and Creedon, Michael T., 5,534,195, Cl. 510-444.000.
  - Chapman, Benjamin E.; and Creedon, Michael T., 5,534,196, Cl. 252-186.270.
  - Dixon, Cloyd, Jr.; and Hunter-Rinderle, Stephen J., 5,534,243, Cl. 424-49.000.
  - Fowler, Timothy J.; McManus, Richard L.; and Deckner, George E., 5,534,265, Cl. 424-489.000.
  - Heinzman, Stephen W.; Dupont, Jeffrey S.; and Tettenhorst, William C., 5,534,642, Cl. 554-98.000.
  - Masters, Ronald A.; and Maile, Michael S., 5,534,198, Cl. 510-182.000.
  - Pilosof, David; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark Lee; Trinh, Toan; and Zwerdling, Susan S., 5,534,165, Cl. 252-8.910.
  - Scheibel, Jeffrey J.; Connor, Daniel S.; and Fu, Yi-Chang, 5,534,197, Cl. 510-356.000.
  - Trokhan, Paul D.; Van Phan, Dean; and Huston, Larry L., 5,534,326, Cl. 428-131.000.
  - Underwood, David C., 5,534,184, Cl. 510-426.000.
- Proctor, Lee M.: *See—*
  - Ashley, James P.; and Proctor, Lee M., 5,535,194, Cl. 370-32.100.
- Production Tube, Inc.: *See—*
  - Benedict, Robert B.; and Kiger, Terry L., 5,533,658, Cl. 226-172.000.
- Profé, Hans J., to Hoechst Aktiengesellschaft. Method for the needling of material webs. 5,533,242, Cl. 28-107.000.
- Prok, Robert A., to Eveready Battery Company, Inc. Combination gas recombination/venting means for portable lighting device. 5,535,107, Cl. 362-158.000.
- Puckett, James D.; Weiss, Edward K.; Russell, Paul E.; and Pearson, J. Michael, to Power Quality Engineering, Inc. Circuit for reducing effects of transient events on electronic equipment. 5,535,087, Cl. 361-118.000.
- Puetz, Gary R.: *See—*
  - Lawson, Gerald P.; Ryan, Thomas A.; and Puetz, Gary R., 5,533,273, Cl. 33-534.000.
- Pugh, William C.; and McNally, John M., to Compusci, Inc. Power shedding device. 5,534,734, Cl. 307-38.000.
- Puig-Sureda Font, Jose, to Occoris, S.A. Supporting device, especially conceived for fish bowls. 5,533,698, Cl. 248-152.000.
- Pullar, Gregory T.; Christensen, Robin B.; and Okonek, Lester J., to Atlantic Richfield Company. Method and regulator for regulating the air pressure of a pressurized vessel. 5,533,333, Cl. 60-327.000.
- Pulse Engineering, Inc.: *See—*
  - Lindberg, Paul M., 5,534,838, Cl. 336-183.000.
- Pure Software, Inc.: *See—*
  - Hastings, Reed, 5,535,329, Cl. 395-183.110.
- Purity Packaging A Division of Great Pacific Enterprises: *See—*
  - Kelbrick, William J.; Rouble, Vincent J.; Larmer, Ralph D.; Pepper, Stuart L.; and Warburton, Eric T., 5,534,222, Cl. 422-33.000.
- Purnell, Charles G.; Mahmoud, Mohammad S.; and Brownlie, Helen A., to Brico Engineering Limited. Method of sintering machinable ferrous-based materials. 5,534,220, Cl. 419-45.000.
- Purushothaman, Sampath: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Puttick, Anthony J.: *See—*
  - Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.
  - Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., 5,534,388, Cl. 430-338.000.
- Pyko, Jan S.: *See—*
  - Lee, Ansen; and Pyko, Jan S., 5,534,781, Cl. 324-380.000.
- Qian, Xue-Yu; Yin, Gerald; Hills, Graham W.; and Steger, Robert, to Applied Materials, Inc. Method and apparatus for altering magnetic coil current to produce etch uniformity in a magnetic field-enhanced plasma reactor. 5,534,108, Cl. 156-643.100.
- Quadlux, Inc.: *See—*
  - Beaver, Robert I., II; and Sehestedt, William H., 5,534,679, Cl. 219-413.000.
- Qualcomm Incorporated: *See—*

- Padovani, Roberto; Jou, Yu-Cheun; Kindred, Daniel R.; McDonough, John G.; and Rueth, Timothy l., 5,535,239, Cl. 375-205.000.
- Quantum Chemical Corporation: *See—*
  - Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., 5,534,472, Cl. 502-116.000.
- Quantum Corporation: *See—*
  - Blitz, Martin C.; Stegeman, James C.; and Bareham, Peter B., 5,535,399, Cl. 395-750.000.
  - Polch, Ewaryst Z.; Williams, Carl D.; and Cordova, Jackie, 5,533,811, Cl. 384-107.000.
- Quigley, Michael C.; and Naef, Rainer F., to Courtaulds Fibres (Holdings) Limited & Buss AG. Forming solutions. 5,534,113, Cl. 159-49.000.
- Quinetics Corporation: *See—*
  - Ashbrook, Clifford L., 5,533,246, Cl. 29-275.000.
- Quittmann, Wilhelm; and McGarrity, John, to Lonza Ltd. Process for preparing γ-mercaptocarboxylic acid derivatives. 5,534,651, Cl. 560-15.000.
- Quotschalla, Udo; and Linhart, Helmut, to Ciba-Geigy Corporation. Trivalent phosphorous compounds stabilized with amines. 5,534,645, Cl. 558-71.000.
- Qutub, Ibrahim, to Freightliner Corporation. Fuel system for heating and cooling fuel. 5,533,486, Cl. 123-541.000.
- R F Prime Corporation: *See—*
  - Ralph, Loren E., 5,534,830, Cl. 333-128.000.
- R. J. Reynolds Tobacco Company: *See—*
  - Young, Harvey J.; Brown, Thomas W.; Devine, Sara W.; and Perfetti, Thomas A., 5,533,530, Cl. 131-370.000.
- Rabii, Khosro M.: *See—*
  - Bestler, Caitlin B.; and Rabii, Khosro M., 5,535,206, Cl. 370-79.000.
- Raby, James M., to Moore Business Forms, Inc. ID cards for impact and non-impact printers. 5,534,320, Cl. 428-42.100.
- Racosky, Michael D.: *See—*
  - Brown, Roger J.; Giese, Erik O.; and Racosky, Michael D., 5,533,281, Cl. 36-118.200.
- Radar Industries, Inc.: *See—*
  - Zmyslowski, Mark; and Larson, Erik W., 5,533,328, Cl. 59-15.000.
- Radd, Billie L.: *See—*
  - Galleguillos, Ramiro; Radd, Billie L.; and Jadav, Anjana K., 5,534,245, Cl. 424-66.000.
- Radics, Nancy: *See—*
  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
- Radius Engineering, Inc.: *See—*
  - Nelson, Ronald H.; and Milovich, Dimitrije, 5,534,203, Cl. 264-101.000.
- Radke, John C.; Ryan, Gregory J.; and Hershberger, Troy W. Method and apparatus for diagnosing joints. 5,533,519, Cl. 128-777.000.
- Rafecas I Martinez, Magdalena: *See—*
  - Boatella I Riera, Josep; Rafecas I Martinez, Magdalena; Codony I Salcedo, Rafael; Minguell I Juncosa, Genaro; and Cases I Sellart, Josep, 5,534,279, Cl. 426-266.000.
- Rahbari, Homayoon: *See—*
  - Nabai, Hossein; and Rahbari, Homayoon, 5,533,979, Cl. 604-187.000.
- Rainer, Florian; and Reheis, Ing N., to Schwarzkopf Technologies Corp. Process for the manufacturing of a cooling unit. 5,533,258, Cl. 29-890.030.
- Rainwater, Jewel G.; Benson, Paul; Belko, William R.; Deffeyes, Robert J.; Carlson, Arne B., deceased (by Mildred Carlson, executrix), to Visatech Corporation. Surround print process for the manufacture of electrode embedded dielectric green sheets. 5,534,290, Cl. 427-97.000.
- Ralph, Loren E., to R F Prime Corporation. Thick film balanced line structure, and microwave baluns, resonators, mixers, splitters, and filters constructed therefrom. 5,534,830, Cl. 333-128.000.
- Ralston, Edward J.: *See—*
  - Chuck, George S.; Dooner, Hugo K.; Courtney-Gutterson, Neal; Keller, Janis; Nijjar, Charanjit S.; and Ralston, Edward J., 5,534,660, Cl. 800-205.000.
- Raman, Rajesh; Tan, Chin S.; and Chang, Yung M., to Intel Corporation. Method and apparatus for realistic current and power calculation using simulation with realistic test vectors. 5,535,370, Cl. 395-500.000.
- Ramdahl, Thomas: *See—*
  - Pettersen, Erik O.; Larsen, Rold O.; Dornish, John M.; Bøorretzen, Bernt; Oftebro, Reidar; and Ramdahl, Thomas, 5,534,531, Cl. 514-365.000.
- Ramesh, Ram K.; Woods, Gerald B.; and Campbell, Robert W., to W. R. Grace & Co.-Conn. Film for cook-in applications with plural layers of nylon blends. 5,534,277, Cl. 426-129.000.
- Ramirez, German J.: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Randolph, Bruce B.; Abbott, Ronald G.; Child, Jonathan E.; and Del Rossi, Kenneth J., to Phillips Petroleum Company. Isoparaffin-olefin alkylation. 5,534,657, Cl. 585-723.000.
- Rang, Harald: *See—*
  - Wagner, Oliver; Eicken, Karl; Götz, Norbert; Rang, Harald; Ammermann, Eberhard; and Lorenz, Gisela, 5,534,653, Cl. 564-32.000.
- Ranganathan, Nagarajan; and Sastry, Raghu, to University of South Florida. VLSI architectures for polygon recognition. 5,535,292, Cl. 382-302.000.
- Ranieri, Vincent: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Rank Cintel Limited: *See—*
  - Baldwin, John L. E., 5,534,948, Cl. 348-675.000.
- Rankl, Wolfgang; and Weiss, Dieter, to Giesecke & Devrient GmbH. System for conducting transactions with a multifunctional card having an electronic purse. 5,534,683, Cl. 235-380.000.
- Rapoport, Stuart D.: *See—*
  - Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Ternullo, Luigi, Jr., 5,535,164, Cl. 365-201.000.
- Rapp, Jeffrey C.: *See—*
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Rauckman, Barbara S.: *See—*
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,636, Cl. 548-228.000.
  - Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,534,640, Cl. 549-80.000.
- Raufast, Charles: *See—*
  - Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 5,534,607, Cl. 526-88.000.
- Ravet, Georges: *See—*
  - Egraz, Jean-Bernard; Mongoin, Jacques; and Ravet, Georges, 5,534,586, Cl. 524-547.000.
- Rawlings, John P., to Climate Master, Inc. Subterranean heat exchange units comprising multiple secondary conduits and multi-tiered inlet and outlet manifolds. 5,533,355, Cl. 62-260.000.
- Rawson, Freeman L., III; and Sotomayor, Guy G., Jr., to International Business Machines Corporation. Method and system of power and thermal management for a data processing system using object-oriented program design. 5,535,401, Cl. 395-750.000.
- Ray, Partha S.: *See—*
  - Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Lew, Albert C.; Chaguturu, Munirathnam K.; Ray, Partha S.; Yeager, Walter H.; Silverman, Ian R.; Buser, John W.; Fiordeliso, James J.; and Dixson, John A., 5,534,518, Cl. 514-260.000.
- Razavi, Behzad, to AT&T Corp. Sample and hold circuitry in bipolar transistor technology using a bootstrapping technique. 5,534,802, Cl. 327-94.000.
- Read, Joseph R.; and Windham, Michael S., to Novus International, Inc. Portable storage and dispensing system. 5,533,648, Cl. 222-108.000.
- Read-Rite Corporation: *See—*
  - Leung, Chak M., 5,535,074, Cl. 360-104.000.
- Reaves, Donald G. Tie rod loosening tool for use with a tie rod assembly. 5,533,580, Cl. 173-114.000.
- Rebordosa, Antonio: *See—*
  - Safont, Vicente; Millan, Jose; Rebordosa, Antonio; and Hernandez, Alejandro, 5,533,801, Cl. 366-249.000.
- Recalde, Carlos E., to Stena Offshore Limited. Pipelay stinger. 5,533,834, Cl. 405-168.300.
- Recher, Daniel: *See—*
  - Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, 5,534,001, Cl. 606-61.000.
- Reddin, Lorin D.; Hepworth, Malcolm T.; Ben-Slimane, Rachid; and Welch, Glenn D. Recovery of manganese from leach solutions. 5,534,234, Cl. 423-50.000.
- Reddy, Chitranjan N.; and Poteet, Kenneth A., to Alliance Semiconductor Corporation. Dual-port random access memory having reduced architecture. 5,535,172, Cl. 365-230.030.
- Rediffusion Simulation Limited: *See—*
  - Olive, Graham J., 5,535,374, Cl. 395-500.000.
- Reed, Peter E.; and Mahoney, Robert P., to Nalco Chemical Company. Polymers containing phosphonic acid groups for the treatment of red mud in the Bayer process. 5,534,235, Cl. 423-121.000.
- Reents, Daniel B.; Cooper, Patrick R.; Garrett, James H.; and McKenzie, Philip J., to Compaq Computer Corporation. Circuit for controlling bias voltage used to regulate contrast in a display panel. 5,534,889, Cl. 345-132.000.
- Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin. System for parallel processing that compiles a filed sequence of instructions within an iteration space. 5,535,393, Cl. 395-700.000.
- Refractec, Inc.: *See—*
  - Hood, Larry; and Mendez G., Antonio, 5,533,999, Cl. 606-5.000.
- Regan, John R.: *See—*
  - Groneberg, Robert A.; Regan, John R.; Neuenschwander, Kent W.; and Scotese, Anthony C., 5,534,532, Cl. 514-367.000.
- Regina, Michael E., to Lobdell-Emery Manufacturing Company, The. Rack base construction and method of manufacture. 5,533,456, Cl. 108-51.100.
- Reheis, Ing N.: *See—*
  - Rainer, Florian; and Reheis, Ing N., 5,533,258, Cl. 29-890.030.
- Reibel, John C.; and Schindhelm, Uwe, to Johnson Corporation, The; and Maschinenfabrik Friese GmbH & Co. Kg. Stationary syphon system for rotating heat exchanger rolls. 5,533,569, Cl. 165-90.000.
- Reiche, John C.: *See—*

  - Bowles, Patrick J.; Bakanowski, Stephen M.; Beverle, Michael T.; Chou, Robert V.; Reiche, John C.; and Khoshnood, Nayson N., 5,534,678, Cl. 219-396.000.
- Reichle, Johannes: *See—*
  - Langer, Hans J.; and Reichle, Johannes, 5,534,104, Cl. 156-275.500.
- Reid, Larry: *See—*
  - Lelkes, Anthony; and Reid, Larry, 5,533,222, Cl. 15-4.000.
- Reiff, Francis H., to Digital Equipment Corporation. Method for addressing a block addressable memory using a gray code. 5,535,354, Cl. 395-421.070.
- Reiker, Kenneth H. Reversible escutcheon. 5,533,636, Cl. 220-3.800.
- Reilly Industries, Inc.: *See—*
  - Griggs, E. Sean; and Roder, William R., 5,534,137, Cl. 208-425.000.
  - Roder, William; and Scriven, Eric F. V., 5,534,134, Cl. 208-42.000.
- Reimer, Peter: *See—*
  - Freese, Manfred; Reimer, Peter; and Lasser, Theo, 5,533,998, Cl. 606-4.000.
- Reiner, Camille L.: *See—*
  - Reiner, Jay E.; and Reiner, Camille L., 5,533,213, Cl. 2-195.200.
- Reiner, Jay E.; and Reiner, Camille L. Baseball cap sizing strap attachment. 5,533,213, Cl. 2-195.200.
- Reinhardt, Rudolf: *See—*
  - Wörner, Otto; Reinhardt, Rudolf; and Schultz, Heinz, 5,533,602, Cl. 192-3.290.
- Reinhart, Tim: *See—*
  - Freeman, John O.; Howse, Richard H.; and Reinhart, Tim, 5,533,346, Cl. 62-89.000.
- Reinke, Michael J.: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Reissmueller, Klaus: *See—*
  - Hoffacker, Gerd; Kaiser, Hasso; Reissmueller, Klaus; and Wirth, Guenter, 5,534,129, Cl. 205-241.000.
- Rekieta, David W.: *See—*
  - LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., 5,535,237, Cl. 375-200.000.
- Rele, Meenakshi V.; Bansod, Snehal M.; and Srinivasan, Mandayam C., to Council of Scientific & Industrial Research. Strain of Cephalosporium having ATCC accession no. 74297, a process of isolating said strain of Cephalosporium and a process for preparing extracellular endoxylanase. 5,534,429, Cl. 435-200.000.
- Rembold, Manfred: *See—*
  - Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,534,629, Cl. 544-78.000.
- Remmers, Lee, to Clairson, Inc. Hollow wall anchor. 5,533,851, Cl. 411-344.000.
- Ren, Jianrong: *See—*
  - Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,534,623, Cl. 534-560.000.
- Renard, Pierre: *See—*
  - Diouf, Ousmane; Lesieur, Daniel; Depreux, Patrick; Guardiola-Lemaitre, Beatrice; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,534,517, Cl. 514-253.000.
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
- Renick, Stephen: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Research Development Corporation: *See—*
  - Ohshima, Hisayoshi; and Yamada, Yoshiyasu, 5,534,698, Cl. 250-339.110.
- Research Foundation, State University of New York at Buffalo, The: *See—*
  - Shin, Yong-Chul; and Sridhar, Ramalingam, 5,535,309, Cl. 395-24.000.
- Research Institute of Industrial Science & Technology, Incorporated Foundation: *See—*
  - Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, 5,534,046, Cl. 75-446.000.
- Resman, Mark F.; Egbert, William E.; and Mack, Dale A., to Hewlett-Packard Company. Adaptive method for dynamic allocation of random access memory to procedures having differing priorities based on first and second threshold levels of free RAM. 5,535,364, Cl. 395-478.000.
- Rettori, Marie-Claire: *See—*
  - Mouithys-Mickalad, Ange; Depreux, Patrick; Lesieur, Daniel; Adam, Gérard; Caignard, Daniel-Henri; Renard, Pierre; and Rettori, Marie-Claire, 5,534,511, Cl. 514-212.000.
- Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, to Bayer Aktiengesellschaft. Polyisocyanate-modified dicarboxylic (poly) anhydrides. 5,534,601, Cl. 525-424.000.
- Reuther, Frank: *See—*
  - Seher, Bernd; Reuther, Frank; and Mueller, Lutz, 5,535,250, Cl. 378-34.000.
- Revlon Consumer Products Corporation: *See—*
  - Hawkins, Geoffrey R.; and Goldberg, Marvin E., 5,533,532, Cl. 132-204.000.
- Rexam Cosmetic Packaging Inc.: *See—*
  - Pierpont, Robert L.; Cortes, John F.; Fabrisi, Michael J.; and Ryder, Kenneth F., 5,533,823, Cl. 401-98.000.
- Reynolds, Paul A., to Hydra Tools International PLC. Rotary metal cutting tool. 5,533,840, Cl. 407-41.000.
- Reynolds, Walker, Jr. Golf putter. 5,533,725, Cl. 473-307.000.
- Reznik, David; and Knipper, Aloysius. Apparatus for rapidly cooling liquid egg. 5,533,441, Cl. 99-455.000.
- Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See—*
  - Groneberg, Robert A.; Regan, John R.; Neuenschwander, Kent W.; and Scotese, Anthony C., 5,534,532, Cl. 514-367.000.
- Rhue, Samuel A.: *See—*
  - Tsutsui, Koichi; and Rhue, Samuel A., 5,534,064, Cl. 118-308.000.
- Ribollet, Thierry: *See—*
  - Larvoire, Jean-François; Ribollet, Thierry; and Hays, Bertrand, 5,535,409, Cl. 395-800.000.
- Richards, Scott H.: *See—*
  - Balzano, Quirino; Richards, Scott H.; and Claxton, Bruce A., 5,535,435, Cl. 455-89.000.
- Richardson, Charles C.: *See—*
  - Tabor, Stanley; and Richardson, Charles C., 5,534,407, Cl. 435-5.000.
- Richman, Kevin S.: *See—*
  - Covington, Michael J.; and Richman, Kevin S., 5,533,932, Cl. 460-119.000.
- Ricketts, David J., to Devtech Corporation. Bovine teat dip. 5,534,266, Cl. 424-672.000.
- Ricoh Company Ltd.: *See—*
  - Allen, James D., 5,535,290, Cl. 382-250.000.
  - Hasegawa, Hironobu, 5,534,974, Cl. 355-202.000.
  - Itoigawa, Minoru, 5,535,022, Cl. 358-496.000.
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Sbinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
  - Motoyama, Tetsuro; and Chang, Yueh-Lin, 5,535,318, Cl. 395-145.000.
  - Ogawa, Yasushi, 5,535,382, Cl. 395-600.000.
  - Sakaguchi, Norihiro, 5,534,916, Cl. 348-222.000.
  - Tsutsui, Kyoji; and Yamaguchi, Takehito, 5,534,907, Cl. 347-175.000.
  - Yano, Takashi, 5,535,211, Cl. 370-85.200.
- Ricoh Corporation: *See—*
  - Allen, James D., 5,535,290, Cl. 382-250.000.
  - Motoyama, Tetsuro; and Chang, Yueh-Lin, 5,535,318, Cl. 395-145.000.
- Ricon Corporation: *See—*
  - Tremblay, Jules M.; Balmer, David C.; and Ruff, Helmut, 5,533,594, Cl. 187-201.000.
- Riedel, Neal K., to Pacific Communication Sciences, Inc. Adaptive error control for ADPCM speech coders. 5,535,299, Cl. 395-2.210.
- Riedlinger, Heinz: *See—*
  - Von Der Heyde, Richard; Becker, Erich; and Riedlinger, Heinz, 5,533,886, Cl. 418-1.000.
- Rieger, Franz. Process for the pre-treatment of light metals and articles produced. 5,534,296, Cl. 427-304.000.
- Rigopoulos, Konstantinos R.: *See—*
  - Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., 5,534,652, Cl. 560-98.000.
- Riley, Michael C., to TRW Vehicle Safety Systems Inc. Air bag inflator. 5,533,754, Cl. 280-741.000.
- Riley, Wayne C., to Emerson Electric Co. Medical waste grinder. 5,533,681, Cl. 241-56.000.
- Rinaldi, Fernando; Crivellaro, Guglielmo; and Denaro, Rinaldo, to P.W.T. S.p.A.; and S & H S.n.c. di Guglielmo Crivellaro & C. System for automatically controlling weld material beading in orbital welding processes for medium- and large-size pipes. 5,534,676, Cl. 219-124.340.
- Ring, David B.: *See—*
  - Huston, James S.; Houston, L. L.; Ring, David B.; and Oppermann, Hermann, 5,534,254, Cl. 424-135.100.
- Riso Kagaku Corporation: *See—*
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  - Yamamoto, Yasuo, 5,534,099, Cl. 156-230.000.
- Rittal-Werk Rudolf Loh GmbH & Co. KG: *See—*
  - Neuhof, Markus, 5,533,763, Cl. 285-127.000.
- Rivera-Sanchez, Herbert: *See—*
  - Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., 5,535,333, Cl. 395-200.030.
- Rivers, Craig J.; Lee, Roanne A.; and Jones, Glenn E., to United States of America, Energy. Electrically shielded enclosure with magnetically retained removable cover. 5,534,663, Cl. 174-35.0GC.
- Rivin, Evgeny I. Method and means for enhancement of beam stiffness. 5,533,309, Cl. 52-223.800.
- Rizk, Said; Powers, William O.; and Samsel, W. Scott, to United States Surgical Corporation. Heat treated stainless steel needles. 5,533,982, Cl. 604-239.000.
- RJG Technologies, Inc.: *See—*
  - Wurst, Richard; and Groleau, Rodney J., 5,533,404, Cl. 73-756.000.
- Robberechts, Marcel: *See—*
  - Hoyos, Marc; Robberechts, Marcel; and Essemaeker, Paul, 5,534,115, Cl. 162-65.000.
- Robbins, Edward S., III. Reusable and re-collapsible container and associated cap. 5,533,638, Cl. 220-8.000.

- Robert Bosch G.m.b.H.: *See—*
  - Ackermann, Manfred; Nguyen, Ngoc-Thach; Schustek, Siegfried; and Tran, Quang-Ngoc, 5,533,415, Cl. 74-7.00E.
- Robert Bosch GmbH: *See—*
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  - Bronkal, Bernhard, 5,533,485, Cl. 123-456.000.
  - Gras, Jürgen; Hertzler, Siegfried; and Tjoa, Jan-Tian, 5,533,491, Cl. 123-676.000.
  - Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, 5,535,098, Cl. 361-752.000.
  - Kronberger, Maximilian, 5,533,481, Cl. 123-299.000.
  - Wild, Ernst; and Mezger, Werner, 5,533,479, Cl. 123-520.000.
- Roberts Filter Manufacturing Company: *See—*
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- Roberts, Gary F.: *See—*
  - Chen, Tsang J.; Chen, Jiann-Hsing; Lian, Ming-Shih; DeMejo, Lawrence P.; and Roberts, Gary F., 5,534,347, Cl. 428-375.000.
- Roberts, Michael G.; and Bolen, Charles E., to Ozko, Inc.; and Bolen, Charles E. Coating solution for treating basement walls. 5,534,303, Cl. 427-385.500.
- Roberts, Michael G.; and Bolen, Charles E., to Ozko, Inc.; and Bolen, Charles E. Coating solution for treating basement walls. 5,534,583, Cl. 524-476.000.
- Roberts, R. Lee; Eden, Douglas H.; and Taylor, Andrew S., to Roberts Filter Manufacturing Company. Air grid for underdrains and similar systems. 5,534,202, Cl. 261-122.100.
- Robertshaw Controls Company: *See—*
  - Gromala, Joseph R.; and Nguyen, Yu T., 5,533,349, Cl. 62-129.000.
  - Gromala, Joseph R.; and Nguyen, Vu T., 5,533,350, Cl. 62-155.000.
  - Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 5,534,680, Cl. 219-505.000.
- Robino & Galandrino S.p.A.: *See—*
  - Galandrino, Agostino, 5,533,317, Cl. 53-334.000.
- Robinson, Barry S., to Siemens Automotive L.P. Discrete filter and pressure regulator mounting for a fuel rail. 5,533,478, Cl. 123-510.000.
- Robinson, Larry P., to Air System Products, Inc. Drain system. 5,533,545, Cl. 137-195.000.
- Robinson, Michael G.; and Poon, Peter C. H., to Sharp Kabushiki Kaisha. Optical image correlator and system for performing parallel correlation. 5,534,704, Cl. 250-550.000.
- Robinson, Wilbur D. Attachable thin film prophylactic barrier. 5,534,346, Cl. 428-343.000.
- Rocca, Patrick: *See—*
  - Vreeke, Mark; and Rocca, Patrick, 5,534,132, Cl. 205-777.500.
- Roche, Emmanuel; Golding, Andrew R.; and Schabes, Yves, to Mitsubishi Electric Research Laboratories, Inc. System for correcting auxiliary verb sequences. 5,535,121, Cl. 364-419.080.
- Röckrath, Ulrike; Betz, Peter; Poth, Ulrich; and Wigger, Georg, to BASF Lacke + Farben, AG. Process for the preparation of a multicoat finish, non-aqueous coatings and autocrosslinkable polyacrylate resins. 5,534,306, Cl. 427-407.100.
- Rockwell International: *See—*
  - Brandt, Randy L., 5,534,837, Cl. 336-155.000.
- Rockwell International Corporation: *See—*
  - Creekmore, Veron R.; and Davis, John E., 5,534,697, Cl. 250-332.000.
  - Doremus, Lonnie R.; and Blaha, David L., 5,535,270, Cl. 379-266.000.
  - Sprouse, Kenneth M.; and Navratil, James D., 5,534,363, Cl. 429-34.000.
- Rodel, Inc.: *See—*
  - Payne, Charles C.; and Grattan, David A., 5,534,053, Cl. 106-236.000.
- Roder, Rudolf: *See—*
  - Frischknecht, Bruno; Messerli, Peter; Fankhauser, Daniel; Roder, Rudolf; and Eigel, Rolf, 5,533,371, Cl. 72-21.100.
- Roder, William; and Scriven, Eric F. V., to Reilly Industries, Inc. Low PAH pitch and process for same. 5,534,134, Cl. 208-42.000.
- Roder, William R.: *See—*
  - Griggs, E. Sean; and Roder, William R., 5,534,137, Cl. 208-425.000.
- Rodgers, Charles E.: *See—*
  - Diefes, Debra L.; Fan, Leopold C.; and Rodgers, Charles E., 5,534,875, Cl. 342-357.000.
- Rodgers, Kathleen E.; and Dizerega, Gere S., to University of Southern California. Retinoid-based compositions and method for preventing adhesion formation using the same. 5,534,261, Cl. 424-450.000.
- Rodriguez Perez, Julio: *See—*
  - Vazquez Lopez, Manuel; De La Cruz Moreno, Enrique; and Rodriguez Perez, Julio, 5,535,112, Cl. 363-20.000.
- Roehrlein, Gerhard: *See—*
  - Guempelein, Reinhold; and Roehrlein, Gerhard, 5,535,033, Cl. 359-144.000.
- Roerig, Arnold J., to Beloit Technologies, Inc. Position control for self-loading roll. 5,534,117, Cl. 162-358.300.
- Rogers, C. James: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Rogers, Russell L.; and Turk, Rodney E., to Aeroquip Corporation. Intraluminal stenting graft. 5,534,024, Cl. 623-1.000.
- Rogers, Wesley A., to Electronic Development Inc. Apparatus and method for monitoring radiation effects at different intensities. 5,534,772, Cl. 324-72.500.
- Roh, Jae H.: *See—*
  - Hong, Young H.; Roh, Jae H.; and Woo, Sang M., 5,534,160, Cl. 210-710.000.
- Rohm and Haas Company: *See—*
  - Gironda, Kevin F., 5,534,487, Cl. 504-290.000.
  - Kirk, Thomas C.; Schwartz, Curtis; and Weinstein, Barry, 5,534,182, Cl. 8-137.000.
  - Rokowski, Joseph M.; and Finch, William C., 5,534,310, Cl. 427-494.000.
  - Troy, Edward J.; and Rosado, Anibal, 5,534,594, Cl. 525-310.000.
- Rohm Co., Ltd.: *See—*
  - Uenoyama, Hiromi, 5,535,162, Cl. 365-200.000.
  - Yamamoto, Seiichi; and Hashimoto, Shinichi, 5,534,758, Cl. 318-112.000.
- Rokowski, Joseph M.; and Finch, William C., to Rohm and Haas Company. Method of improving adhesive of durable coatings on weathered substrates. 5,534,310, Cl. 427-494.000.
- Roll Systems, Inc.: *See—*
  - Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
- Roman, Bernard J.: *See—*
  - Fiordalice, Robert W.; Maniar, Papu D.; Klein, Jeffrey L.; and Roman, Bernard J., 5,534,462, Cl. 437-190.000.
- Romero, Guillermo L.; and Martinez, Joe L., Jr., to Motorola, Inc. Method for forming a heat dissipation apparatus. 5,533,257, Cl. 29-890.030.
- Rommens, Johanna M.: *See—*
  - Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., 5,534,438, Cl. 435-320.100.
- Ronan, Jeffrey J.: *See—*
  - Schenkel, Howard M.; Buzzard, Jon; and Ronan, Jeffrey J., 5,534,836, Cl. 335-284.000.
- Rood, Jerry A.: *See—*
  - Crum, Daniel R.; Simmons, Bill P.; Teegarden, Arlo F.; Rood, Jerry A.; and Kotlarek, Peter A., 5,533,875, Cl. 417-368.000.
- Rooke, Matthew W., to International Business Machines Corporation. Frequency controlled reference clock generator. 5,535,067, Cl. 360-51.000.
- Roper, Ralph E.; and Webb, Gary A., to AK Steel Corporation. Controlled material flow hydroforming. 5,533,372, Cl. 72-60.000.
- Rosado, Anibal: *See—*
  - Troy, Edward J.; and Rosado, Anibal, 5,534,594, Cl. 525-310.000.
- Rose, Andrew F. Electronic nose-clip with solar cell. 5,533,470, Cl. 119-721.000.
- Rose, Andrew M.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Rose, Conrad M., to Litton Systems, Inc. Emitter frequency-time measurement by a moving observer using no navigation input. 5,534,866, Cl. 342-13.000.
- Rose, Conrad M., to Litton Systems, Inc. Open loop countermeasure to passive direction finding and location of radar transmitters using Doppler techniques. 5,534,867, Cl. 342-17.000.
- Rose, Larry D., to Morton International, Inc. Airbag module with collapsible side wall. 5,533,747, Cl. 280-728.200.
- Rose, Steven E.: *See—*
  - Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, 5,534,522, Cl. 514-299.000.
- Rose, Wolfgang: *See—*
  - Fischinger, Claus-Dieter; Hizli, Adem; Rose, Wolfgang; and Waldmann, Heinrich, 5,533,704, Cl. 248-603.000.
- Rosemount Inc.: *See—*
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- Rosen, Mitchell S.; and Speir, Dean. Firearm accessory concealment holder. 5,533,657, Cl. 224-673.000.
- Rosenbaum, Larry: *See—*
  - Patel, Indrajit; Bowerman, Harold; Rosenbaum, Larry; Mennenoh, Rich; and Ryan, Pat, 5,533,992, Cl. 604-403.000.
- Rosenbloom, William J. Method and apparatus for the solvent extraction of oil from bitumen containing tar sand. 5,534,136, Cl. 208-390.000.
- Ross, Stuart: *See—*
  - Flohr, Daniel P.; and Ross, Stuart, 5,534,914, Cl. 348-15.000.
- Rossmark Medical Publishers Inc.: *See—*
  - Halperin, Mitchell L.; and Cheema-Dhadli, Surinder, 5,533,964, Cl. 604-4.000.
- Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., to Sony Corporation of Japan; and Sony Electronics, Inc. Random access audio/video processor with compressed video resampling to allow higher bandwidth throughput. 5,535,137, Cl. 364-514.00A.
- Rosso, Luciano; and Saraceno, Antonio, to Olivetti-Canon Industriale, S.p.A. Cleaning device for a fixing unit. 5,534,985, Cl. 355-283.000.
- Rostoker, Michael D., to LSI Logic Corporation. Semiconductor packages for high I/O semiconductor dies. 5,534,467, Cl. 437-209.000.
- Roth, Bruce L.: *See—*
  - Millard, Paul J.; Roth, Bruce L.; Yue, Stephen T.; and Haugland, Richard P., 5,534,416, Cl. 436-34.000.

- Roth, Robert J., to American Standard Inc. Refrigerant recovery systems employing series/parallel pumps. 5,533,345, Cl. 62-77.000.
- Roth, Scott R. Compaction roller assembly and grader. 5,533,283, Cl. 37-142.500.
- Rothenberg, Stuart J.: *See—*
  - Edwards, Glenn R.; Rothenberg, Stuart J.; and Oberman, Mark L., 5,533,531, Cl. 128-782.000.
- Rothenberger, Roland D.: *See—*
  - Petschauer, Richard J.; Rothenberger, Roland D.; and Tumms, Paul G., 5,535,133, Cl. 364-489.000.
- Rothnie, James B., Jr.: *See—*
  - Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin, 5,535,393, Cl. 395-700.000.
- Rouble, Vincent J.: *See—*
  - Kelbrick, William J.; Rouble, Vincent J.; Larmer, Ralph D.; Pepper, Stuart L.; and Warburton, Eric T., 5,534,222, Cl. 422-33.000.
- Rouda, Dawn V., to JMA & Associates, Inc. Vacuum cleaner attachment fitting. 5,533,230, Cl. 15-339.000.
- Roulstone, Brian J.; and Waters, Julian A., to Imperial Chemical Industries PLC. Polymer-modified particulate titanium dioxide. 5,534,585, Cl. 524-497.000.
- Rowles, Howard C.: *See—*
  - Howard, Lee J.; and Rowles, Howard C., 5,533,437, Cl. 95-42.000.
- Royal Doulton (UK) Limited: *See—*
  - Hulse, David K.; and Barnett, William C., 5,533,607, Cl. 198-448.000.
  - Hulse, David K., 5,533,609, Cl. 198-415.000.
- Rozputnyak, Yaroslav A.: *See—*
  - Dobrotvorsky, Anatoly E.; Rozputnyak, Yaroslav A.; Khuchua, Galina N.; and Komissarova, Irina A., 5,534,262, Cl. 424-464.000.
- RP Topla Limited: *See—*
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- Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., to Medtronic, Inc. Implantable medical device including a first enclosure portion having a feedthrough in a second interior surface. 5,535,097, Cl. 361-736.000.
- Rubscha, Robert F.; Tsai, Margaret C.; and Buddendeck, Mark H., to Xerox Corporation. Separating document trays imaging system. 5,534,989, Cl. 355-309.000.
- RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See—*
  - Dalferth, Hans H., 5,533,938, Cl. 474-164.000.
- Rueth, Timothy I.: *See—*
  - Padovani, Roberto; Jou, Yu-Cheun; Kindred, Daniel R.; McDonough, John G.; and Rueth, Timothy I., 5,535,239, Cl. 375-205.000.
- Ruff, Helmut: *See—*
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- Ruff, Michael R.: *See—*
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- Rugar, Daniel: *See—*
  - Melas, Constantin M.; Rugar, Daniel; Sutardja, Pantas; and Wood, Roger W., 5,535,187, Cl. 369-59.000.
- Ruggie, Mark A.: *See—*
  - Pittman, Raymond H.; Ruggie, Mark A.; and Luetgert, Karine A., 5,534,352, Cl. 428-535.000.
- Ruiz, Luis A. Apparatus and method for performing presbyopia corrective surgery. 5,533,997, Cl. 606-5.000.
- Rump, Siegfried; Steiner, Manfred; and Douglas, Brian, to Mercedes-Benz AG. Method for controlling the triggering sensitivity of a vehicle automatic braking process to match driver behavior. 5,535,123, Cl. 364-426.020.
- Rundhaug, Patrick A., to Chem-Pro. On-site electrochemical dehalogenation process and system. 5,534,124, Cl. 588-204.000.
- Rupert, Martha L.: *See—*
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- Ruppert, Siegfried: *See—*
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- Russek, Linda G. Alarm for patient monitor and life support equipment. 5,534,851, Cl. 340-573.000.
- Russell, Daniel M.: *See—*
  - Stefik, Mark J.; Russell, Daniel M.; Bobrow, Daniel G.; and Henderson, D. Austin, Jr., 5,534,975, Cl. 355-202.000.
- Russell, Ernest J., to Texas Instruments Incorporated. Integrated circuit lead frame for coupling to non-neighboring bond pads. 5,534,729, Cl. 257-692.000.
- Russell, Garfield B.: *See—*
  - Novotny, Mark A.; Boone, Thomas A.; Geisler, Jeffrey D.; Russell, Garfield B.; and Graybeal, John M., 5,533,512, Cl. 128-719.000.
- Russell, Paul E.: *See—*
  - Puckett, James D.; Weiss, Edward K.; Russell, Paul E.; and Pearson, J. Michael, 5,535,087, Cl. 361-118.000.
- Russell, Steven P.: *See—*
  - Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., 5,535,338, Cl. 395-200.200.
- Rust, Sabine: *See—*
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- Rutsch, Werner: *See—*
  - Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,534,629, Cl. 544-78.000.
- Ruttle, Daniel W.: *See—*
  - Campbell, John G.; and Ruttle, Daniel W., 5,533,331, Cl. 60-204.000.
- Ruvang, John A. Adjustable golf putter. 5,533,730, Cl. 473-251.000.
- RWE Energie Aktiengesellschaft: *See—*
  - Bullmann, Guido, 5,535,234, Cl. 373-8.000.
- Ryan, Gregory J.: *See—*
  - Radke, John C.; Ryan, Gregory J.; and Hershberger, Troy W., 5,533,519, Cl. 128-777.000.
- Ryan, James G.: *See—*
  - Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, 5,534,106, Cl. 156-636.100.
- Ryan, Jeffrey M.: *See—*
  - Bates, Cary L.; Ryan, Jeffrey M.; and Watts, Byron T., 5,534,887, Cl. 345-120.000.
- Ryan, Pat: *See—*
  - Patel, Indrajit; Bowerman, Harold; Rosenbaum, Larry; Mennenoh, Rich; and Ryan, Pat, 5,533,992, Cl. 604-403.000.
- Ryan, Thomas A.: *See—*
  - Lawson, Gerald P.; Ryan, Thomas A.; and Puetz, Gary R., 5,533,273, Cl. 33-534.000.
- Ryan, Thomas B.: *See—*
  - Ichiki, Shiro; and Ryan, Thomas B., 5,533,944, Cl. 475-252.000.
- Ryder, Kenneth F.: *See—*
  - Pierpont, Robert L.; Cortes, John F.; Fabrisi, Michael J.; and Ryder, Kenneth F., 5,533,823, Cl. 401-98.000.
- Ryder, Steven L. Sidestream aerosol generator and method in variable positions. 5,533,497, Cl. 128-200.210.
- Ryley, James F., Jr.: *See—*
  - Ashmead, James W.; Blaisdell, Charles T.; Johnson, Melvin H.; Nyquist, Jack K.; Perrotto, Joseph A.; and Ryley, James F., Jr., 5,534,328, Cl. 428-166.000.
- Ryobi Limited: *See—*
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- Rytter, Noel J.: *See—*
  - Hosseini, Javad; Cobo, Michael A.; Rytter, Noel J.; and Verheyen, Andrew G., 5,535,124, Cl. 364-426.030.
- S & H S.n.c. di Guglielmo Crivellaro & C.: *See—*
  - Rinaldi, Fernando; Crivellaro, Guglielmo; and Denaro, Rinaldo, 5,534,676, Cl. 219-124.340.
- S. C. Johnson & Son, Inc.: *See—*
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- Sa, Jong S.: *See—*
  - Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,534,637, Cl. 548-374.100.
- Saad, Karim I.: *See—*
  - Dailey, James H.; Morgan, John R.; and Saad, Karim I., 5,534,048, Cl. 106-1.220.
- Saar, David A.: *See—*
  - Maffey, George E.; Saar, David A.; and Simpson, Raymond W., 5,535,104, Cl. 362-100.000.
- Sacco, Edward. Adjustable arrow grip rest mount. 5,533,494, Cl. 124-44.500.
- Saeki, Takanori, to NEC Corporation. Semiconductor device. 5,535,153, Cl. 365-72.000.
- Safont, Vicente; Millan, Jose; Rebordosa, Antonio; and Hernandez, Alejandro, to Braun Aktiengesellschaft. Electrically operated hand mixer including an attachment. 5,533,801, Cl. 366-249.000.
- Sagawa, Morikazu: *See—*
  - Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, 5,534,831, Cl. 333-204.000.
- Sagiv, Efraim: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Sahara, Yasuyuki: *See—*
  - Kawakami, Yasunori; Iitsuka, Hiroyuki; Nishimura, Takuya; Hamai, Shinji; and Sahara, Yasuyuki, 5,535,208, Cl. 370-84.000.
- Sahatjian, Ronald A., to Boston Scientific Corporation. Sample collection. 5,533,516, Cl. 128-749.000.
- Saikawa, Hideo: *See—*
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- Saionji, Osamu, to Motorola, Inc. Advanced comb filter. 5,534,947, Cl. 348-664.000.
- Saito, Fujio: *See—*
  - Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
- Saito, Kazuhisa: *See—*
  - Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.

- Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, to Toyo Metallizing Kabushiki Kaisha; and Kobayashi Bokafuku Kabushiki Kaisha. Heat resistant cloth for fire fighting comprising In order: a fabric substrate, a rubber layer, a metal coated polyester film layer and a tetrafluoroethylene copolymer film layer. 5,534,338, Cl. 428-242.000.
- Saito, Masatoshi: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Saito, Masayuki: *See—*
  - Baba, Akira; Sugimura, Kazuo; Miwa, Satoshi; Yamamoto, Keizo; and Saito, Masayuki, 5,534,735, Cl. 307-117.000.
- Saito, Norio; and Soda, Yutaka, to Sony Corporation. Magnetoresistive head having magnetically balanced magnetoresistive elements laminated on opposite sides of an electrically conductive film. 5,535,077, Cl. 360-113.000.
- Saito, Susumu: *See—*
  - Kawashima, Hiroyuki; Ohtomo, Fumio; Saito, Susumu; and Minegishi, Isao, 5,535,003, Cl. 356-345.000.
- Saito, Tsunenari; Kenmotsu, Shiro; and Inoue, Takuji, to Sony Corporation. Cathode-ray tube apparatus and method of producing the same. 5,534,096, Cl. 156-212.000.
- Saitoh, Sei, to NEC Corporation. Circuit for driving liquid crystal device. 5,534,885, Cl. 345-100.000.
- Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, to Mita Industrial Co., Ltd. Image forming apparatus having a function to charge a photoreceptor drum at an appropriate potential. 5,534,977, Cl. 355-208.000.
- Saitoo, Syuuji: *See—*
  - Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
- Sakaegi, Yuji: *See—*
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- Sakaguchi, Norihiro, to Ricoh Company, Ltd. Digital electronic still camera operable in a text mode for photographing a bilevel image. 5,534,916, Cl. 348-222.000.
- Sakai, Hiroshi: *See—*
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- Sakai, Kiyoshi: *See—*
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- Sakai, Kunihiro: *See—*
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- Sakai, Tadahiko, to Matsushita Electric Industrial Co., Ltd. Method of forming solder bumps on electrodes of electronic component. 5,534,127, Cl. 205-125.000.
- Sakai, Yoshikazu: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Sakaizawa, Katsuhiro; Urawa, Motoo; Kukimoto, Tsutomu; and Yoshida, Satoshi, to Canon Kabushiki Kaisha. Developing apparatus. 5,534,982, Cl. 355-246.000.
- Sakakibara, Teigo: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Sakakino, Takahiro: *See—*
  - Nagayama, Keiichi; Noguchi, Masami; and Sakakino, Takahiro, 5,534,842, Cl. 337-402.000.
- Sakamoto, Hideki: *See—*
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- Sakamoto, Katsura: *See—*
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- Sakamoto, Nobuyuki; Kobayashi, Takehiko; and Horiguchi, Takashi, to Toyoko Giken Co., Ltd.; and Nikko Chemical Institute Inc. Process for coloring concrete. 5,534,214, Cl. 264-333.000.
- Sakashita, Seiji: *See—*
  - Kanno, Ippei; Sakashita, Seiji; Ozeki, Hiroaki; Hayashi, Daisuke; and Bowser, Todd S., 5,535,220, Cl. 371-2.100.
- Sako, Yuji; and Ootsuka, Shigeharu, to Mitsubishi Denki Kabushiki Kaisha. Magnetic coil assembly with surge absorber. 5,535,083, Cl. 361-38.000.
- Sakurabu, Tatsuki: *See—*
  - Kokawa, Katsuzo; Yamamoto, Katsuhiko; Sakurabu, Tatsuki; Imabayashi, Satoshi; and Tao, Muneo, 5,533,669, Cl. 237-1.0SL.
- Sakuragi, Hideyori: *See—*
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- Sakurai, Kazushige: *See—*
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- Sakurai, Keizoh, to International Business Machines Corporation. Method and apparatus for testing lead connections of electronic components. 5,533,398, Cl. 73-573.000.
- Sakurai, Seiya: *See—*
  - Yasuda, Tomokazu; Karino, Yukio; Sakurai, Seiya; and Ogawa, Masataka, 5,534,398, Cl. 430-545.000.
- Sakuranaga, Masanori: *See—*
  - Miyazaki, Takeshi; Tanaka, Kazumi; Sakuranaga, Masanori; ano Okamoto, Tadashi, 5,534,441, Cl. 436-517.000.
- Sakuta, Toshiyuki: *See—*
  - Suzuki, Tomohiro; and Sakuta, Toshiyuki, 5,534,817, Cl. 327-545.000.
- Saldanha, Leila: *See—*
  - Humbert, Robert D.; Saldanha, Leila; and Kepplinger, John, 5,534,275, Cl. 426-74.000.
- Salk Institute for Biological Studies, The: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Salka, Barry A.: *See—*
  - Casamassina, Thomas; Morales, Florencio, Jr.; Salka, Barry A.; Fallon, John; Desai, Sureshchandra G.; and McCurry, Patrick M., Jr., 5,534,500, Cl. 252-353.000.
- Sallstrom, Steve A.; Goman, Gerald E.; and Dunlap, Joel M., to Toro Company, The. All wheel hydraulic drive system. 5,533,325, Cl. 56-7.000.
- Sam, Huy: *See—*
  - Nakamura, Yoshinori; Sam, Huy; Kusaka, Yukio; Hayasi, Shigeo; and Nagura, Toshikazu, 5,534,477, Cl. 503-227.000.
- Samachisa, Gheorghe: *See—*
  - Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,534,456, Cl. 437-43.000.
- Samain, Daniel; and Gibilaro, Joëlle, to A Et S Biovecteurs. Particle for use as a milk fat globule substitute, composition containing same and process for the preparation of said particle. 5,534,501, Cl. 514-60.000.
- Samata, Shuichi: *See—*
  - Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.
- Sampson, Gerald A.; Sanden, Gordon J.; and Sampson, Harold D., to Allen United. Hollow, plastic horse stall gate. 5,533,468, Cl. 119-524.000.
- Sampson, Harold D.: *See—*
  - Sampson, Gerald A.; Sanden, Gordon J.; and Sampson, Harold D., 5,533,468, Cl. 119-524.000.
- Samsel, W. Scott: *See—*
  - Rizk, Said; Powers, William O.; and Samsel, W. Scott, 5,533,982, Cl. 604-239.000.
- Samsonite Corporation: *See—*
  - Van Himbeeck, Clemens; and Vanderwee, Johan, 5,533,600, Cl. 190-18.00R.
- Samsung Electronics Co., Ltd.: *See—*
  - Bae, Byungseong; Kim, Kyungseop; Yoon, Wonbong; and Lee, Seogyul, 5,535,028, Cl. 359-61.000.
  - Bang, Kug-Hyeon, 5,535,092, Cl. 361-685.000.
  - Choi, Jin-seung, 5,535,070, Cl. 360-84.000.
  - Han, Yong-Joo; and Bae, Myung-Ho, 5,535,152, Cl. 365-51.000.
  - Hwang, Myoungchun, 5,534,943, Cl. 348-724.000.
  - Hwang, Yun-Ic, 5,534,681, Cl. 219-685.000.
  - Jung, Seung-Taeg, 5,533,862, Cl. 415-220.000.
  - Jung, Yeong C., 5,534,760, Cl. 318-442.000.
  - Kim, Chull-Soo; and Jang, Hyun-Soon, 5,535,171, Cl. 365-233.000.
  - Kim, Eun J., 5,535,007, Cl. 358-296.000.
  - Kim, Ji-Hyun, 5,534,762, Cl. 318-568.120.
  - Kim, Kyung-Yeol, 5,534,976, Cl. 355-207.000.
  - Kim, No-jin, 5,534,920, Cl. 348-333.000.
  - Kim, Soon T., 5,535,245, Cl. 345-261.000.
  - Kim, Suk-ki; An, Hyeong-keon; Joo, Tae-sik; and Lee, Suk-jung, 5,535,356, Cl. 395-430.000.
  - Kim, Tae-ryong; Park, Hee-su; and Moon, Dai-sick, 5,534,728, Cl. 257-692.000.
  - Lee, KwyRo; Shur, Michael; and Jones, Stephen H., 5,535,231, Cl. 372-50.000.
  - Lee, Sang-in; and Park, Chang-soo, 5,534,463, Cl. 437-195.000.
  - Min, Byoung W., 5,535,066, Cl. 360-31.000.
  - Yang, Jian, 5,534,933, Cl. 348-433.000.
- Samuelson, Shel L. Device for piercing a nut. 5,533,265, Cl. 30-120.200.
- San Diego State University: *See—*
  - Moheno, Phillip B. B., 5,534,514, Cl. 514-249.000.
- Sanden, Gordon J.: *See—*
  - Sampson, Gerald A.; Sanden, Gordon J.; and Sampson, Harold D., 5,533,468, Cl. 119-524.000.
- Sander, Hans-Jürgen: *See—*
  - Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, 5,534,566, Cl. 524-27.000.
- Sanders, David L., to Chrysler Corporation. System for analyzing sound quality in automobile using musical intervals. 5,535,131, Cl. 364-487.000.
- Sanders, Stan A., to Sanders, Stan A.; and Meistrell, William F. Surfer's fin. 5,533,918, Cl. 444-64.000.

- Sanderson, Charles H., to Magnatech Corporation. Regulation of *Escherichia coli* and other microorganisms through magnetic water treatment. 5,534,156, Cl. 210-695.000.
- Sanderson, George R.: *See—*
  - Chalupa, William F.; and Sanderson, George R., 5,534,286, Cl. 426-573.000.
- Sandhu, Gurtej S.: *See—*
  - Stroupe, Hugh; Sharan, Sujit; and Sandhu, Gurtej S., 5,533,924, Cl. 451-286.000.
- Sandia Corp./Precision Fabrics Grp., Inc.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- SanDisk Corporation: *See—*
  - Harari, Eliyahou; Norman, Robert D.; and Mehrotra, Sanjay, 5,535,328, Cl. 395-182.050.
  - Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, 5,534,456, Cl. 437-43.000.
- Sandoz Ltd.: *See—*
  - Gadient, Fulvio, 5,534,503, Cl. 514-46.000.
- Sandrew, Barry B., to American Film Technologies, Inc. Method of color enhancing a monochrome image using multiple base colors for selected regions of the monochrome image. 5,534,915, Cl. 348-29.000.
- Sands, Richard H.; Harkey, Jerry P.; and Pace, J. Gary, to Chrysler Corporation. Oil jet nozzle for an internal combustion with reciprocating pistons. 5,533,472, Cl. 123-41.350.
- Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., to Goodyear Tire & Rubber Company, The. Silica reinforced rubber preparation and tire with tread thereof. 5,534,574, Cl. 524-262.000.
- Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., to Goodyear Tire & Rubber Company, The. Tire with silica reinforced rubber tread. 5,534,599, Cl. 525-342.000.
- Sandstrom, Paul H.: *See—*
  - Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.; Henning, Steven K.; and Lucas, Danielle, 5,534,592, Cl. 525-236.000.
  - Wideman, Lawson G.; and Sandstrom, Paul H., 5,534,578, Cl. 524-396.000.
- Sandström, Unto: *See—*
  - Johansson, Stefan; and Sandström, Unto, 5,534,696, Cl. 250-330.000.
- Sanei Giken Co., Ltd.: *See—*
  - Miyake, Eiichi, 5,534,969, Cl. 355-53.000.
- Sangiacomo, Fulvio, to Sangiacomo S.p.A. Device for cutting threads in circular stocking knitting machines. 5,533,365, Cl. 66-145.00R.
- Sangiacomo S.p.A.: *See—*
  - Sangiacomo, Fulvio, 5,533,365, Cl. 66-145.00R.
- SangStat Medical Corporation: *See—*
  - Pouletty, Philippe; and Chang, Chin-Hai, 5,534,412, Cl. 435-7.240.
- Sanjoh, Minako; Kojima, Shoichi; and Sueda, Naomichi, to Kabushiki Kaisha Toshiba. Inference system having a frame structure and method of storing information therein. 5,535,304, Cl. 395-62.000.
- Sankyo Company, Limited: *See—*
  - Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, 5,534,529, Cl. 514-357.000.
- Sannohashi Corporation: *See—*
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- Sano, Kazushi: *See—*
  - Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,534,361, Cl. 428-694.0RE.
- Sano, Yoshikazu: *See—*
  - Ohtagaki, Tomoko; and Sano, Yoshikazu, 5,534,443, Cl. 437-2.000.
- Santangelo, Massimo. Device for preventive support of the femur. 5,534,004, Cl. 606-68.000.
- Santel, Hans-Joachim: *See—*
  - Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.
- Sanyo Chemical Industries, Ltd.: *See—*
  - Horiie, Takafumi, 5,534,590, Cl. 525-71.000.
- Sanyo Electric Co., Ltd.: *See—*
  - Kobayashi, Yasumi; Takeuchi, Kousuke; Hirao, Yasuhiro; and Shibata, Kenichi, 5,534,829, Cl. 333-126.000.
  - Mifuji, Fumio, 5,533,253, Cl. 29-741.000.
  - Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, 5,535,071, Cl. 360-96.500.
- Saraceno, Antonio: *See—*
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- Sarrazin, Patrick: *See—*
  - Travers, Christine; Courty, Philippe; and Sarrazin, Patrick, 5,534,658, Cl. 585-738.000.
- Saruta, Susumu; and Sekiguchi, Yasuyuki, to Kabushiki Kaisha Toshiba. Active noise attenuating device. 5,535,283, Cl. 381-71.000.
- Sarvazyan, Armen; and Ponomarev, Viktor, to Artann Corporation. Method and apparatus for measuring acoustic parameters in liquids using cylindrical ultrasonic standing waves. 5,533,402, Cl. 73-645.000.
- Sasai, Keizo; Iwata, Masakatsu; Sawada, Hirohisa; and Nakamura, Fumihiko, to Canon Kabushiki Kaisha. Recording apparatus with ink sheet conveyance adjusted according to a detected ink sheet conveying state. 5,534,910, Cl. 347-217.000.
- Sasai, Keizo: *See—*
  - Awai, Takashi; and Sasai, Keizo, 5,533,821, Cl. 400-619.000.
- Sasaki, Hirotomo: *See—*
  - Ishikawa, Takatoshi; Ueda, Shinji; Sasaki, Hirotomo; and Kojima, Tetsuro, 5,534,394, Cl. 430-393.000.
- Sasaki, Mamoru; Takubo, Chiaki; and Hiruta, Yoichi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device. 5,533,664, Cl. 228-180.100.
- Sasaki, Shigeo: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Sasaki, Takamitsu: *See—*
  - Nomura, Hiroshi; and Sasaki, Takamitsu, 5,535,057, Cl. 359-694.000.
- Sasaki, Tateyo: *See—*
  - Asanuma, Tadashi; Matsuzawa, Hiroshi; Sasaki, Tateyo; and Kawanishi, Kaoru, 5,534,595, Cl. 525-326.500.
- Sasaki, Yasuhiko: *See—*
  - Hiraki, Mitsuru; Sasaki, Yasuhiko; Seki, Koichi; and Matsuura, Tatsuji, 5,534,800, Cl. 327-57.000.
- Sasaki, Yoshihiko: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
- Sasase, Iwao: *See—*
  - Mori, Shinsaku; Sasase, Iwao; and Takahashi, Kiyoshi, 5,535,149, Cl. 364-724.190.
- Sastry, Raghu: *See—*
  - Ranganathan, Nagarajan; and Sastry, Raghu, 5,535,292, Cl. 382-302.000.
- Sasuta, Michael D.: *See—*
  - Leigh, Todd A.; Sasuta, Michael D.; and Hefferan, John K., 5,535,426, Cl. 455-34.100.
- Sata, Teiji: *See—*
  - Makino, Hiroshi; and Sata, Teiji, 5,533,813, Cl. 384-115.000.
- Sato, Chisato: *See—*
  - Abe, Takao; Isoda, Takeshi; Sato, Chisato; Mihira, Ado; Tamai, Satoshi; and Kumagai, Toshio, 5,534,510, Cl. 514-210.000.
- Sato, Hiroshi, to Ryobi Limited. Structure of drive section of power tool. 5,533,925, Cl. 451-344.000.
- Sato, Hiroshi: *See—*
  - Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, 5,535,308, Cl. 395-108.000.
- Sato, Hiroto: *See—*
  - Shinoaki, Sakura; Sato, Hiroto; and Tanaka, Kyozo, 5,535,316, Cl. 395-134.000.
- Sato, Kaku: *See—*
  - Fujinaga, Chikako; Tosaka, Akio; Kato, Toshiyuki; and Sato, Kaku, 5,534,089, Cl. 148-603.000.
- Sato, Kenichiro: *See—*
  - Kawabe, Yasumasa; and Sato, Kenichiro, 5,534,382, Cl. 430-192.000.
- Sato, Masayori; and Tago, Kouichi, to Kabushiki Kaisha Japan. Apparatus and method for driving a liquid crystal display utilizing various television system formats. 5,534,940, Cl. 348-556.000.
- Sato, Shoichi: *See—*
  - Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.
- Sato, Shougo; Chen, Ding-Yu; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Contacting charging device for electrostatic photoreceptor drum. 5,535,088, Cl. 361-225.000.
- Sato, Takeshi: *See—*
  - Borland, William; Hayakawa, Keiichiro; Sato, Takeshi; and Smith, Jerome, 5,534,194, Cl. 252-518.000.
- Sato, Toshio: *See—*
  - Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, 5,535,127, Cl. 364-464.020.
- Sato, Yoshio: *See—*
  - Ohyama, Yoshishige; Nishimura, Yutaka; Sato, Yoshio; Nishihara, Motohisa; Azuhata, Shigeru; and Ito, Kazuyuki, 5,533,329, Cl. 60-39.030.
- Sattar, Abdul: *See—*
  - Gerson, Herman; and Sattar, Abdul, 5,534,055, Cl. 106-413.000.
- Sauber, Charles J. Cable stringing roller device. 5,533,710, Cl. 254-134.3PA.
- Sauer, Richard A.: *See—*
  - Schvester, Pascal; and Sauer, Richard A., 5,533,341, Cl. 62-50.100.
- Sauerberg, Per; and Olesen, Preben H., to Novo Nordisk A/S. Thiadiazolyl tetrhydrpyridines for treating glaucoma. 5,534,528, Cl. 514-342.000.
- Sauerschell, Wolfgang: *See—*
  - Oppermann, Rolf; Sauerschell, Wolfgang; and Martinovaski, Jiri, 5,533,484, Cl. 123-358.000.
- Saunders, Timothy W.: *See—*
  - Conrad, Peter E.; and Saunders, Timothy W., 5,533,650, Cl. 222-161.000.

- Savas, Stephen E., to Mattson Technology, Inc. Low frequency inductive RF plasma reactor. 5,534,231, Cl. 216-67.000.
- Sawa, Buntaro: *See—*
  - Kurokawa, Osamu; and Sawa, Buntaro, 5,535,433, Cl. 455-79.000.
- Sawada, Hirohisa: *See—*
  - Sasai, Keizo; Iwata, Masakatsu; Sawada, Hirohisa; and Nakamura, Fumihiko, 5,534,910, Cl. 347-217.000.
- Sawada, Shinichi: *See—*
  - Miyazawa, Kazutoshi; Matsui, Shuichi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,187, Cl. 252-299.010.
  - Nakagawa, Etsuo; and Sawada, Shinichi, 5,534,189, Cl. 252-299.630.
- Sawada, Yoshitsugu, to Yazaki Corporation. Electrical connection terminal. 5,533,914, Cl. 439-843.000.
- Sawai, Takashi: *See—*
  - Wakoh, Masamitsu; Sawai, Takashi; and Mizoguchi, Shozo, 5,534,084, Cl. 148-328.000.
- Sawanobori, Keiji, to Asahi Kogaku Kogyo Kabushiki Kaisha. CCD digital camera system with selectable memories. 5,534,921, Cl. 348-333.000.
- Sawatari, Norio: *See—*
  - Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, 5,534,978, Cl. 355-211.000.
- Say, James. Breakaway cord connector. 5,533,238, Cl. 24-115.00F.
- Sayig, Robert J., II: *See—*
  - Pierce, James H.; and Sayig, Robert J., II, 5,533,384, Cl. 73-47.000.
- Scafetta, Nazareno: *See—*
  - Tinti, Maria O.; Misiti, Domenico; Cavazza, Claudio; and Scafetta, Nazareno, 5,534,549, Cl. 514-551.000.
- Scales, William F., to Kabushiki Kaisha Toshiba. Controller for a storage device which allows either prestored or user defined firmware to be executed. 5,535,355, Cl. 395-428.000.
- Scalia, Lorenzo; and Sewing, Barry D., to International Business Machines Corporation. Apparatus for in-situ green sheet slitting. 5,533,889, Cl. 425-315.000.
- Scalone, Michelangelo; and Vogt, Peter, to Hoffmann-La Roche Inc. Process for preparing pyridine-2-carboxamides. 5,534,635, Cl. 546-323.000.
- Schaber, Christopher R. Hand grip assembly for cross-country exerciser or similarly-gripped exercise equipment. 5,533,952, Cl. 482-70.000.
- Schabes, Yves: *See—*
  - Roche, Emmanuel; Golding, Andrew R.; and Schabes, Yves, 5,535,121, Cl. 364-419.080.
- Schaefer, Donald B., Jr.: *See—*
  - Heggestad, Robert E.; and Schaefer, Donald B., Jr., 5,533,695, Cl. 246-62.000.
- Schäfer, Hermann G.: *See—*
  - Lesmann, Jörg; and Schäfer, Hermann G., 5,534,624, Cl. 544-196.000.
- Schäfer, Walter: *See—*
  - Reuter, Knud; Schäfer, Walter; Müller, Hanns P.; Meier-Westhues, Hans-Ulrich; Kahl, Lothar; and Bock, Manfred, 5,534,601, Cl. 525-424.000.
- Schäfer, Werner: *See—*
  - Jörder, Kurt; Schäfer, Werner; and Hettenbach, Hans, 5,534,325, Cl. 428-102.000.
- Schaffer, Ronald R.: *See—*
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- Scheel, Roger: *See—*
  - Brummond, Robert A.; Scheel, Roger; and Heidner, James L., 5,534,140, Cl. 210-106.000.
- Scheibel, Jeffrey J.; Connor, Daniel S.; and Fu, Yi-Chang, to Procter & Gamble Company, The. Gemini polyhydroxy fatty acid amides. 5,534,197, Cl. 510-356.000.
- Scheiwiller, René. Paving stone construction set. 5,533,827, Cl. 404-38.000.
- Schenck Turner Inc.: *See—*
  - Johnson, Raymond C., 5,534,060, Cl. 118-55.000.
- Schenk, Charles R.: *See—*
  - Socci, Vincent P.; Berryhill, Ross C.; Bradley, Eric K.; and Schenk, Charles R., 5,533,489, Cl. 123-571.000.
- Schenk, Johannes: *See—*
  - Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, 5,534,046, Cl. 75-446.000.
- Schenkel, Howard M.; Buzzard, Jon; and Ronan, Jeffrey J., to Sensormatic Electronics Corporation. Deactivator for theft-deterrent markers. 5,534,836, Cl. 335-284.000.
- Scheuten, Theo: *See—*
  - Angeler, Alois; Kaune, Harald; and Scheuten, Theo, 5,533,713, Cl. 266-218.000.
- Schick, Hans G., to Upchurch Scientific, Inc. Inlet filter and method of using same. 5,534,152, Cl. 210-656.000.
- Schickling, Robert A. Cutting rule. 5,533,431, Cl. 83-347.000.
- Schiebel, Richard A.; Kinch, Michael A.; and Koestner, Roland J., to Texas Instruments Incorporated. HGCDTE thin film transistor. 5,534,719, Cl. 257-188.000.
- Schiebold, Stefan: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Schierling, Bernhard; Göbel, Hilmar; and Carlson, Cora, to Fichtel & Sachs AG. Bearing arrangement for a device comprising two rotating components. 5,533,815, Cl. 384-482.000.
- Schiesl, Mark A.: *See—*
  - Kline, Robert J.; Larsen, Thomas E.; Schiesl, Mark A.; and Tait, Bruce E., 5,533,690, Cl. 242-547.000.
- Schill, Alfred. Skinning and trimming machine. 5,533,927, Cl. 452-127.000.
- Schilling, Donald L.; Garodnick, Joseph; Lomp, Gary; and Moore, Timothy F., III, to InterDigital Technology Corporation. Spread spectrum adaptive power control communications system and method. 5,535,238, Cl. 375-200.000.
- Schilling, Winston H.: *See—*
  - Nordman, Dennis P.; and Schilling, Winston H., 5,533,726, Cl. 273-119.00R.
- Schimion, Werner; and Leineweber, Willi, to SMS Schloemann-Siemag Aktiengesellschaft. Method for purification of cooling agents and/or lubricants used in rolling mills. 5,534,155, Cl. 210-695.000.
- Schindhelm, Uwe: *See—*
  - Reibel, John C.; and Schindhelm, Uwe, 5,533,569, Cl. 165-90.000.
- Schlage Lock Company: *See—*
  - Eagan, Bruce P., 5,533,368, Cl. 70-374.000.
- Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, to Synthes (U.S.A.). Osteosynthetic fixation element and manipulation device. 5,534,001, Cl. 606-61.000.
- Schlater, Jeffrey M.: *See—*
  - Mahulikar, Deepak; Sagiv, Efraim; Parthasarathi, Arvind; Jalota, Satish; Brock, Andrew J.; Holmes, Michael A.; Schlater, Jeffrey M.; Ramirez, German J.; and Liang, Dexin, 5,534,356, Cl. 428-615.000.
- Schlichter, Mark E.; and Barton, Mark S., to August Lotz Co., Inc. Polyurea/polyurethane edge coating and process for making. 5,534,295, Cl. 427-284.000.
- Schlosberg, Richard H.: *See—*
  - Jones, Larry O.; Daniels, Paul H.; Krauskopf, Leonard G.; Rigopoulos, Konstantinos R.; and Schlosberg, Richard H., 5,534,652, Cl. 560-98.000.
- Schlueter, Harald: *See—*
  - Bergmann, Udo; Schlueter, Harald; and Schmitt, Michael, 5,534,627, Cl. 546-30.000.
- Schlüsselbauer, Johann. Apparatus for manufacturing annular or tubular workpieces from concrete. 5,533,885, Cl. 425-185.000.
- Schmidbauer, Ute: *See—*
  - Heidenreiter, Thomas; and Schmidbauer, Ute, 5,533,824, Cl. 401-133.000.
- Schmidt, Dennis J.: *See—*
  - Massaro, Timothy J.; and Schmidt, Dennis J., 5,535,321, Cl. 395-155.000.
- Schmidt, Robert R.: *See—*
  - Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,534,486, Cl. 504-273.000.
- Schmidt-Brücken, Hans-Joachim: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Schmielau, Fritz. Training device for the therapy of patients having perception defects. 5,534,953, Cl. 351-203.000.
- Schmitt, Michael: *See—*
  - Bergmann, Udo; Schlueter, Harald; and Schmitt, Michael, 5,534,627, Cl. 546-30.000.
- Schmitz, David P. Cable coordinating apparatus and method. 5,533,917, Cl. 439-894.000.
- Schmon, Ewald: *See—*
  - Feyrer, Wolfgang; and Schmon, Ewald, 5,533,674, Cl. 239-288.500.
- Schneid, Josef: *See—*
  - Stotz, Wolf G.; and Schneid, Josef, 5,533,443, Cl. 100-38.000.
- Schneider (Europe) A.G.: *See—*
  - Lukic, Goran, 5,534,287, Cl. 427-2.250.
- Schneider Electric SA: *See—*
  - Cuingnet, Patrick, 5,534,840, Cl. 337-1.000.
- Schneider, Rolf: *See—*
  - Patzenhauer, Andree; Geilhausen, Winfried; and Schneider, Rolf, 5,533,596, Cl. 188-299.000.
- Schniedermeier, Henry W.: *See—*
  - Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., 5,533,379, Cl. 72-316.000.
- Schoal, Edward, Jr. Container for a roll of wound material. 5,533,621, Cl. 206-409.000.
- Schoelling, Hans W., to McNeil-PPC, Inc. Tampon applicator, especially for feminine hygiene. 5,533,966, Cl. 604-18.000.
- Schoon, Jürgen: *See—*
  - Krug, Heidrun; Kunert, Jürgen; Schoon, Jürgen; and Walter, Horst, 5,534,890, Cl. 346-100.000.
- Schrader, Bernhard, to Bruker Analytische Messtechnik GmbH. Raman spectrometer using a remote probe with enhanced efficiency. 5,534,997, Cl. 356-301.000.
- Schroeder, Jeff; and Taylor, Gary. Transportable incubator chamber for human and zoological applications. 5,534,669, Cl. 181-198.000.
- Schryver, Jeff: *See—*
  - Tokish, Leonard J., Jr.; Fallin, Thomas W.; and Schryver, Jeff, 5,534,005, Cl. 606-80.000.
- Schuett, Craig L.; and Showalter, Patrick. Remote safety release mechanism. 5,534,852, Cl. 340-573.000.

- Schull, Jerome W., to BellSouth Corporation. Telemetry system with improved verification of telemetry interface unit installation. 5,535,267, Cl. 379-106.000.
- Schuller International, Inc.: *See—*
  - Taylor, Thomas J.; and Kielmeyer, William H., 5,534,612, Cl. 528-129.000.
- Schultz, Heinz: *See—*
  - Wörner, Otto; Reinhardt, Rudolf; and Schultz, Heinz, 5,533,602, Cl. 192-3.290.
- Schulz, Gerald O.; and Klemmensen, Daniel F., to Goodyear Tire & Rubber Company, The. Asphalt cement modification. 5,534,568, Cl. 524-69.000.
- Schulze, Karl H.: *See—*
  - Johnson, Dennis W.; and Schulze, Karl H., 5,534,230, Cl. 422-173.000.
- Schumacher, Kurt G.: *See—*
  - Merkley, Kevin L.; Schumacher, Kurt G.; and Sutton, Alan R., 5,535,334, Cl. 395-200.150.
- Schumag AG: *See—*
  - Wetzels, Walter; and Hergemoeller, Rainer, 5,533,376, Cl. 72-283.000.
- Schustek, Siegfried: *See—*
  - Ackermann, Manfred; Nguyen, Ngoc-Thach; Schustek, Siegfried; and Tran, Quang-Ngoc, 5,533,415, Cl. 74-7.00E.
- Schuster, Don A.; Liang, Hongmei; Burkhart, Larry J.; and Wedlake, Gary D., to Carrier Corporation. Managing supplementary heat during defrost on heat pumps. 5,533,568, Cl. 165-1.000.
- Schutten, Michael J.: *See—*
  - Bonissone, Piero P.; Schutten, Michael J.; and Chiang, Kenneth H.-C., 5,534,766, Cl. 323-235.000.
- Schvester, Pascal; and Sauer, Richard A., to Air Liquide America Corporation. Apparatus and method for producing and injecting sterile cryogenic liquids. 5,533,341, Cl. 62-50.100.
- Schwab, Suzanne E., to Motorola, Inc. Automated quality control in a document conversion system. 5,535,313, Cl. 395-118.000.
- Schwartz, Curtis: *See—*
  - Kirk, Thomas C.; Schwartz, Curtis; and Weinstein, Barry, 5,534,182, Cl. 8-137.000.
- Schwartz, Frederick A.: *See—*
  - Eshel, Marc M.; Hunt, Guerney D. H.; Jones, Donald N.; Meyer, Christopher; and Schwartz, Frederick A., 5,535,375, Cl. 391-500.000.
- Schwartz, Lewis I.: *See—*
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Schwarzkopf Technologies Corp.: *See—*
  - Rainer, Florian; and Reheis, Ing N., 5,533,258, Cl. 29-890.030.
- SciMed Life Systems, Inc.: *See—*
  - St. Germain, Jon P.; and Olson, Scott A., 5,534,007, Cl. 606-108.000.
- Scimed Lifesystems, Inc.: *See—*
  - Pray, James R.; Cornelius, Richard G.; and Arney, Michelle, 5,533,987, Cl. 604-280.000.
- Scotese, Anthony C.: *See—*
  - Groneberg, Robert A.; Regan, John R.; Neuenschwander, Kent W.; and Scotese, Anthony C., 5,534,532, Cl. 514-367.000.
- Scott, Charles D.; Petersen, James N.; and Davison, Brian H., to Martin Marietta Energy Systems, Inc. Continuous fluidized-bed contactor with recycle of sorbent. 5,534,153, Cl. 210-661.000.
- Scott, G. Robert: *See—*
  - Cutright, Edwin L.; Scott, G. Robert; and Vogt, Howard W., Jr., 5,534,114, Cl. 162-139.000.
- Scott, Hugh L.: *See—*
  - LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., 5,535,237, Cl. 375-200.000.
- Scripps Research Institute, The: *See—*
  - Moriarty, Ann M.; Alexander, Hannah; and Lerner, Richard A., 5,534,405, Cl. 435-5.000.
- Scriven, Eric F. V.: *See—*
  - Roder, William; and Scriven, Eric F. V., 5,534,134, Cl. 208-42.000.
- Scully Signal Company: *See—*
  - Cadman, Gary R., 5,534,856, Cl. 340-825.340.
- Seabaugh, Alan C.: *See—*
  - Beam, Edward A., III; and Seabaugh, Alan C., 5,534,714, Cl. 257-25.000.
- Seagate Technology, Inc.: *See—*
  - Leuthold, Hans; Jennings, David J.; Heine, Gunter; and Nagarathnam, Lakshman, 5,533,812, Cl. 384-112.000.
- Seale, Joseph B. Conversion of liquid volume, density, and viscosity to frequency signals. 5,533,381, Cl. 73-19.030.
- Seale, Joseph B.: *See—*
  - Kamen, Dean L.; Seale, Joseph B.; Briggs, Joseph; and Arnold, Finn, 5,533,389, Cl. 73-149.000.
- Seaman, Michael J.: *See—*
  - Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., 5,535,338, Cl. 395-200.200.
- Seawell North America Inc.: *See—*
  - Garwood, Anthony J. M., 5,534,282, Cl. 426-396.000.
- Sebag, Albert; and Benguigui, Paul, to Askle. Inflatable, "telescopic" cells for cushions and mattresses. 5,533,220, Cl. 5-654.000.
- Security Domain Pty. Ltd.: *See—*
  - Laing, Simon G.; and Bowcock, Matthew P., 5,534,857, Cl. 340-825.340.
- Sedlmair, Gerhard: *See—*
  - Boehm, Alfred; Messerschmidt, Werner; and Sedlmair, Gerhard, 5,533,744, Cl. 280-605.000.
- Sedy, Josef, to Durametallic Corporation. Non-contacting seal with centering spring mounted in dovetailed grooved. 5,533,739, Cl. 277-81.00R.
- Seeberger, Georg: *See—*
  - Szabo, Zsolt; and Seeberger, Georg, 5,534,006, Cl. 606-100.000.
- Seestrom, Frank E., to Pitney Bowes Inc. Postage accounting system including means for transmitting a bit-mapped image of variable information for driving an external printer. 5,535,279, Cl. 380-55.000.
- Seher, Bernd; Reuther, Frank; and Mueller, Lutz, to Jenoptik Technologie GmbH. Device for manipulating a synchrotron beam bundle. 5,535,250, Cl. 378-34.000.
- Sehestedt, William H.: *See—*
  - Beaver, Robert I., II; and Sehestedt, William H., 5,534,679, Cl. 219-413.000.
- Seifried, Lynn M.: *See—*
  - Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.
- Seiko Communications Systems, Inc.: *See—*
  - Park, Daniel J., 5,535,191, Cl. 370-16.000.
- Seiko Epson Corporation: *See—*
  - Kondou, Yoshimasa; Hanaoka, Masaaki; Nakamura, Shinji; and Doi, Fumiaki, 5,535,415, Cl. 395-828.000.
  - Ohno, Yoshihiro; Atobe, Mitsuro; and Tanbo, Hitoshi, 5,534,900, Cl. 347-54.000.
- Seiko Instruments Inc.: *See—*
  - Takasu, Hiroaki; Takahashi, Kunihiro; and Yamazaki, Tsuneo, 5,534,722, Cl. 257-347.000.
- Seikosha Co., Ltd.: *See—*
  - Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.
  - Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, 5,535,308, Cl. 395-108.000.
- Sekhar, Jainagesh A. Method of reducing erosion of carbon-containing components of aluminum production cells. 5,534,119, Cl. 205-372.000.
- Sekhar, Jainagesh A., to Moltech Invent S.A. Application of phosphates of aluminum to carbonaceous components of aluminum production cells. 5,534,130, Cl. 205-372.000.
- Seki, Hajime: *See—*
  - Brezoczky, Blasius; and Seki, Hajime, 5,535,073, Cl. 360-105.000.
- Seki, Junzo; Yamamoto, Hirofumi; Yamane, Shuji; Takahashi, Yutaka; and Ushimaru, Kouichi, to Nippon Shinyaku Co. Ltd. Process for producing fat emulsion. 5,534,502, Cl. 514-31.000.
- Seki, Koichi: *See—*
  - Hiraki, Mitsuru; Sasaki, Yasuhiko; Seki, Koichi; and Matsuura, Tatsuji, 5,534,800, Cl. 327-57.000.
- Sekiguchi, Tadashi: *See—*
  - Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.
- Sekiguchi, Yasuyuki: *See—*
  - Saruta, Susumu; and Sekiguchi, Yasuyuki, 5,535,283, Cl. 381-71.000.
- Sekine, Yasuhiro: *See—*
  - Kuwabara, Hideshi; Kawasumi, Yasushi; Asaba, Tetsuo; Makino, Kenji; Kataoka, Yuzo; Sekine, Yasuhiro; and Nishimura, Shigeru, 5,534,069, Cl. 118-719.000.
- Selder, Otto R. A. M.: *See—*
  - Loos, Albertus L. J. G. M.; and Selder, Otto R. A. M., 5,534,778, Cl. 324-318.000.
- Self Industries, Inc.: *See—*
  - Hornsby, Gary L., 5,533,316, Cl. 53-137.200.
- Selkirk, James K.: *See—*
  - Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., 5,534,121, Cl. 204-459.000.
- Selman, Steven H.: *See—*
  - Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, 5,534,506, Cl. 514-185.000.
- SEMCOTEC Handelsgesellschaft m.b.H.: *See—*
  - Kausel, Wilfried; Kremser, Hannes; Stallbaumer, Hermann; and Winkler, Werner, 5,535,273, Cl. 379-399.000.
- Semeia, Roberto, to Johnson Worldwide Associates, Inc. Poppet seat for air regulating devices. 5,533,543, Cl. 137-15.000.
- Semiconductor Energy Laboratory Co., Ltd.: *See—*
  - Mase, Akira; and Yamazaki, Shunpei, 5,534,884, Cl. 345-87.000.
  - Takemura, Yasuhiko, 5,534,716, Cl. 257-72.000.
- Sensormatic Electronics Corporation: *See—*
  - Schenkel, Howard M.; Buzzard, Jon; and Ronan, Jeffrey J., 5,534,836, Cl. 335-284.000.
- Sentrol, Inc.: *See—*
  - McDonald, Kevin B.; Pierce, Stephen W.; Benowitz, Michael; and Terrett, David S., 5,534,849, Cl. 340-517.000.
- Serizawa, Hirokazu: *See—*
  - Kajiwara, Shoichiro; and Serizawa, Hirokazu, 5,534,238, Cl. 423-584.000.
- Service Machine Co.: *See—*
  - Fearing, Oliver H., Jr.; Green, Peter J.; and Kirby, Richard E., 5,534,664, Cl. 174-50.000.
- Sesekura, Takashi: *See—*

- Tsugai, Masahiro; Bessbo, Mikio; and Sesekura, Takashi, 5,534,773, Cl. 324-105.000.
- Seto, Nobuo; Yoshioka, Yasuhiro; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,534,390, Cl. 430-551.000.
- Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, to Kawasaki Steel Corporation; and Kawasaki Jukogyo Kabushiki Kaisha. Edging roll for rolling shape. 5,533,374, Cl. 72-247.000.
- Seto, Yoshihiro; and Doi, Yoshiyuki, to Fuji Photo Film Co., Ltd. Chemical analysis element supplier. 5,534,225, Cl. 422-64.000.
- Setser, Carole S., to Kansas State University Research Foundation. Low calorie chemically leavened cakes and surfactant systems therefor. 5,534,285, Cl. 426-552.000.
- Setsuo, Takeda: *See—*
  - Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, 5,534,513, Cl. 514-249.000.
- Seufer-Wasserthal, Peter; Mayrhofer, Herbert; Wirth, Irma; and Pöchlauer, Peter, to Chemie Linz GmbH. Enzymatic resolution of asymmetric alcohols by means of vinyl esters of polybasic carboxylic acids. 5,534,436, Cl. 435-280.000.
- Sevic, John F., to Panasonic Technologies, Inc. Phase linear class E amplifier for a satellite communication terminal which communicates with a low earth orbiting satellite. 5,535,438, Cl. 455-110.000.
- Sewing, Barry D.: *See—*
  - Scalia, Lorenzo; and Sewing, Barry D., 5,533,889, Cl. 425-315.000.
- Sextant Avionique: *See—*
  - Barbier, Bruno; Lach, Patrick; and Leger, Alain, 5,534,689, Cl. 250-206.200.
- Sgrignoli, Gary J.: *See—*
  - Citta, Richard W.; Sgrignoli, Gary J.; and Turner, Rudolf, 5,534,938, Cl. 348-495.000.
- SGS-Thomson Microelectronics S.A.: *See—*
  - Carre, Laurent; and Correard, Patrick, 5,535,173, Cl. 365-230.090.
  - Le Van Suu, Maurice G., 5,535,344, Cl. 395-309.000.
- SGS-Thomson Microelectronics S.r.l.: *See—*
  - Baldi, Livio, 5,534,448, Cl. 437-34.000.
  - Campardo, Giovanni; Costa, Raffaele; and Torricelli, Piero, 5,535,157, Cl. 365-185.050.
  - DeMicheli, Marco, 5,534,813, Cl. 327-346.000.
- Shah, Nilesh; and Prasad, Rajeev, to Intel Corporation. Apparatus and method for determining the status of data buffers in a bridge between two buses during a flush operation. 5,535,341, Cl. 395-306.000.
- Shakespeare: *See—*
  - Keller, Robert A.; and Price, William L., III, 5,534,333, Cl. 428-222.000.
- Shakulov, Rustem S.: *See—*
  - Livshits, Vitaly A.; Debabov, Vladimir G.; Fedorovva, Aaveilova O.; Pavlovva, Zakataeva N.; Shakulov, Rustem S.; Bachina, Tatyana A.; and Khurges, Evgeny M., 5,534,421, Cl. 435-116.000.
- Shama, Elie W.; Legrand, Bertrand; and Kluyskems, Dominique, to Hydro-Quebec; Econoden Inc.; and FRE Composites Inc. Double-walled container for transporting and storing a liquified gas. 5,533,340, Cl. 62-45.100.
- Shamouilian, Shamouil; and Clark, Daniel O., to Applied Materials, Inc. Chemical-mechanical polishing pad providing polishing unformity. 5,533,923, Cl. 451-41.000.
- Shao, Richard L.: *See—*
  - Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., 5,534,133, Cl. 208-39.000.
- Shapira, Shlomo: *See—*
  - Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, 5,535,189, Cl. 369-102.000.
- Sharan, Sujit: *See—*
  - Stroupe, Hugh; Sharan, Sujit; and Sandhu, Gurtej S., 5,533,924, Cl. 451-286.000.
- Sharma, Sudhir: *See—*
  - Davis, Phillip D.; Sharma, Sudhir; and Long, Hai, 5,535,165, Cl. 365-201.000.
- Sharp Kabushiki Kaisha: *See—*
  - Fujimori, Koichi; Yamagishi, Shinji; and Shinomiya, Tokihiko, 5,535,026, Cl. 359-51.000.
  - Ishikawa, Yutaka; and Yoshida, Shinichi, 5,535,413, Cl. 395-800.000.
  - Izumi, Hirokazu; Deguchi, Masanobu; Oku, Koji; Yamamoto, Shuuhei; and Katayama, Harumi, 5,535,010, Cl. 358-296.000.
  - Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
  - Nomura, Toshio; Tagawa, Takao; and Kako, Noritoshi, 5,534,886, Cl. 345-104.000.
  - Ogura, Masami; and Takanaski, Hiroshi, 5,535,030, Cl. 359-74.000.
  - Robinson, Michael G.; and Poon, Peter C. H., 5,534,704, Cl. 250-550.000.
  - Tagawa, Takao, 5,534,892, Cl. 345-173.000.
- Sharper Image Corporation: *See—*
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- Shavit, Tani: *See—*
  - Reeve, Christopher L.; Shavit, Tani; Rothnie, James B., Jr.; Peters, Timothy G.; Lee, Linda Q.; Mann, William F.; and Kotikian, Jacklin, 5,535,393, Cl. 395-700.000.
- Shaw, Jane M.: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Shaw, Jonathan L.; and Gray, Henry F., to United States of America, Navy. Production of structures by electrostatically-focused deposition. 5,534,311, Cl. 427-526.000.
- Sheinman, Yhoshua, to Weksler, Meir. Multi-jet generator device for use in printing. 5,534,904, Cl. 347-75.000.
- Shell Oil Company: *See—*
  - Gonzalez, Romulo, 5,533,574, Cl. 166-358.000.
  - Welch, James G., 5,533,760, Cl. 285-14.000.
  - Woldhuis, Alex F., 5,534,236, Cl. 423-237.000.
- Shelton, Lawrence S.: *See—*
  - Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., 5,533,379, Cl. 72-316.000.
- Shen, Gon-Yen: *See—*
  - La Fiandra, Carlo; and Shen, Gon-Yen, 5,535,043, Cl. 359-224.000.
- Shepard, Roy D.: *See—*
  - Massini, Anthony L., Jr.; and Shepard, Roy D., 5,533,663, Cl. 228-103.000.
- Sher, Jeffery L., to Winmint Manufacturing Pty Limited. Rotisserie. 5,533,440, Cl. 99-421.0HH.
- Sheridan, Ronald J. Projectile resistant window shield. 5,533,778, Cl. 296-152.000.
- Sherman, Arthur. Electrostatic chuck. 5,535,090, Cl. 361-234.000.
- Sherman, John C., to Hydronic Components, Inc. Ball valve with integrated removable flow venturi, flow balancing means, and pipe union means. 5,533,549, Cl. 137-557.000.
- Sherman, John V.: *See—*
  - Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., 5,534,183, Cl. 510-434.000.
- Sherwood, David E., Jr.: *See—*
  - Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Bartley, Burton H., 5,534,135, Cl. 208-120.000.
- Sheth, Vipul B.: *See—*
  - Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
- Shibata, Keiichi: *See—*
  - Mitsumori, Koji; Tomiyama, Takamichi; and Shibata, Keiichi, 5,535,059, Cl. 359-813.000.
- Shibata, Kenichi: *See—*
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- Shibata, Kohichi; and Nakamura, Mitsuhiro, to Mita Industrial Co., Ltd. Encryption communication apparatus. 5,535,277, Cl. 380-28.000.
- Shibata, Tsuyoshi: *See—*
  - Mouri, Akihiro; Shibata, Tsuyoshi; and Kondo, Yuji, 5,533,452, Cl. 101-463.100.
- Shibatani, Haruo: *See—*
  - Nomura, Ryuji; and Shibatani, Haruo, 5,534,229, Cl. 422-123.000.
- Shibib, Muhammed A., to AT&T Corp. Area-efficient layout for high voltage lateral devices. 5,534,721, Cl. 257-339.000.
- Shibuya, Masato, to Nikon Corporation. Illumination optical system. 5,535,054, Cl. 359-487.000.
- Shido, Shunichi: *See—*
  - Yamano, Akihiko; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; and Shido, Shunichi, 5,535,018, Cl. 358-444.000.
- Shiffer, James D., II: *See—*
  - Mattos, Derwin W.; Shiffer, James D., II; and Wong, Jeffrey F., 5,534,791, Cl. 326-27.000.
- Shih, Wayne K.; and Light, Ronald R., to Eastman Chemical Company. Plasticized polyesters for shrink film applications. 5,534,570, Cl. 524-114.000.
- Shim, Jin S.: *See—*
  - Song, Kwang B.; Kim, Sung K.; and Shim, Jin S., 5,534,720, Cl. 257-232.000.
- Shima, Toshio, to Shima, Yumiko. Articulated vertebral body spacer. 5,534,029, Cl. 623-17.000.
- Shima, Yumiko: *See—*
  - Shima, Toshio, 5,534,029, Cl. 623-17.000.
- Shimada, Shunsuke, to Kyokado Engineering Co., Ltd. Wall surface structure of reinforced earth structure. 5,533,839, Cl. 405-284.000.
- Shimamori, Takumi; and Uchida, Naoyuki, to Mitsubishi Chemical Corporation. Magneto-optical tape recording and reading-out method involving running tape in front of at least a single pole of a magnet to initialize or erase information. 5,535,180, Cl. 369-13.000.
- Shimizu, Hisao: *See—*
  - Yanagawa, Atsuyuki; and Shimizu, Hisao, 5,535,407, Cl. 395-800.000.
- Shimizu, Takashi: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
- Shimizu, Yasushi: *See—*
  - Kisu, Hiroki; Ohkubo, Masaharu; Sakurai, Kazushige; Yamazaki, Michihito; Asano, Erika; Shimizu, Yasushi; and Ogata, Hiroaki, 5,534,344, Cl. 428-323.000.
- Shimizu, Yukiharu: *See—*

  - Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.
- Shimomura, Katsuya: *See—*
  - Akiyama, Takehiro; Shimomura, Katsuya; Takekawa, Kouzi; and Doi, Takehito, 5,534,821, Cl. 331-8.000.
- Shimoyama, Yoshikazu: *See—*
  - Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, 5,534,233, Cl. 422-191.000.
- Shin, Dong-Koo, to Goldstar Co., Ltd. Cam driving apparatus for a stirling cycle module. 5,533,335, Cl. 60-517.000.
- Shin-Etsu Handotai Co., Ltd.: *See—*
  - Aihara, Ken; Kitagawara, Yutaka; and Takenaka, Takao, 5,533,387, Cl. 73-105.000.
  - Fusegawa, Izumi; Yamagishi, Hirotoshi; Fujimaki, Nobuyoshi; and Karasawa, Yukio, 5,534,112, Cl. 156-662.100.
- Shin, Yong-Chul; and Sridhar, Ramalingam, to Research Foundation, State University of New York at Buffalo, The. Single layer neural network circuit for performing linearly separable and non-linearly separable logical operations. 5,535,309, Cl. 395-24.000.
- Shing, Yeh. S. Foldable hair clip with a comb. 5,533,533, Cl. 132-279.000.
- Shinjo, Katsumi, to Yugenkaisha Shinjo Seisakusho. Method of making a mandrel for blind rivets. 5,533,377, Cl. 72-294.000.
- Shinkai, Masaru: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Shinmikuni Kikai Ltd.: *See—*
  - Koshizuka, Hiroshi; and Kanatake, Takashi, 5,534,999, Cl. 356-338.000.
- Shinoaki, Sakura; Sato, Hiroto; and Tanaka, Kyozo, to Tokyo Gas Co., Ltd. Computer program product for searching line data in graphic data base system. 5,535,316, Cl. 395-134.000.
- Shinomiya, Tokihiko: *See—*
  - Fujimori, Koichi; Yamagishi, Shinji; and Shinomiya, Tokihiko, 5,535,026, Cl. 359-51.000.
- Shinozaki, Fumiaki: *See—*
  - Takahashi, Yonosuke; and Shinozaki, Fumiaki, 5,534,905, Cl. 347-171.000.
- Shiobara, Yasuhisa, to Kabushiki Kaisha Toshiba. Timely processing of transmission and reception requests in a multi-node communication network. 5,535,214, Cl. 370-85.600.
- Shionogi & Co., Ltd.: *See—*
  - Ohtani, Mitsuaki; Kato, Toshiyuki; and Hori, Yozo, 5,534,533, Cl. 514-372.000.
  - Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, 5,534,654, Cl. 564-90.000.
- Shiota, Yusuke: *See—*
  - Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, 5,534,148, Cl. 210-605.000.
- Shirahase, Kazuhiro: *See—*
  - Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, 5,534,654, Cl. 564-90.000.
- Shirai, Kazushi; and Takeda, Norio, to Mitsubishi Gas Chemical Company, Inc. Faraday rotator. 5,535,046, Cl. 359-281.000.
- Shirai, Shigeru; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Process for electrophotographic imaging with layered light receiving member containing A-Si and Ge. 5,534,392, Cl. 430-31.000.
- Shirai, Yoshimitsu; Murakami, Haruji; and Amaike, Takeshi, to Polyplastics Co., Ltd. Method of taking out a fiber bundle and method of manufacturing a resin structure reinforced with long fibers. 5,534,210, Cl. 264-171.130.
- Shiraishi, Keiichi: *See—*
  - Yamamoto, Akira; Okabe, Masaaki; Kaneko, Yoshio; and Shiraishi, Keiichi, 5,533,388, Cl. 73-117.000.
- Shirasaki, Masataka. Optical interferometer with squeezed vacuum and reduced guided-acoustic-wave brillouin scattering noise. 5,535,000, Cl. 356-345.000.
- Shirato, Tadashi: *See—*
  - Okada, Takashi; and Shirato, Tadashi, 5,534,828, Cl. 332-103.000.
- Shirley, Arthur R., Jr.: *See—*
  - Bacardi, Jean M.; Camerer, Robert L.; Huey, Andrew M.; and Shirley, Arthur R., Jr., 5,534,349, Cl. 428-403.000.
- Shishikui, Yoshiaki; Nishida, Yukihiro; Nakasu, Eisuke; Ohtsuka, Yoshimichi; and Nakanishi, Hiroshi, to Nippon Hoso Kyokai. Method of performing high efficiency coding of image signal and system therefor. 5,534,927, Cl. 348-400.000.
- Shockley, William R.; and Gajnak, George E., to Digital Equipment Corporation. Method and system for certificate based alias detection. 5,534,855, Cl. 340-825.300.
- Shoda, Masao: *See—*
  - Ohtsuka, Tadao; and Shoda, Masao, 5,535,040, Cl. 359-210.000.
- Shoff, David E.: *See—*
  - Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
- Shoji, Hideo: *See—*
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- Shone, Robert L.: *See—*
  - Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.
- Shoup, Robert D.: *See—*
  - Johnson, Ronald E.; Lock, William E.; and Shoup, Robert D., 5,533,447, Cl. 101-211.000.
- Showa Denko K.K.: *See—*
  - Murasato, Shigetaka; and Hasegawa, Koichi, 5,534,717, Cl. 257-94.000.
- Showa Electric Wire & Cable Co., Ltd.: *See—*
  - Hirota, Tooru; Imai, Akira; Kumano, Tomoyuki; Ichihara, Masamitsu; Sakai, Yoshikazu; Inoue, Kiyoshi; and Maeda, Hiroshi, 5,534,087, Cl. 148-554.000.
- Showalter, Patrick: *See—*
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- Shtaygrud, Alex: *See—*
  - Hejlsberg, Anders; Stock, Jeffrey; Kukol, Peter; and Shtaygrud, Alex, 5,535,391, Cl. 395-700.000.
- Shu, Ker L.: *See—*
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- Shum, Sai P., to Ciba-Geigy Corporation. Substituted 1,3,2,4-diazadiphosphetidines and compositions stabilized therewith. 5,534,646, Cl. 558-80.000.
- Shunso Ishishara, Director–General of Agency Of Industrial Science And Technology: *See—*
  - Yoshida, Kiyohide; Muramatsu, Gyo; Abe, Akira; and Miyadera, Tatsuo, 5,534,237, Cl. 423-239.100.
- Shur, Michael: *See—*
  - Lee, KwyRo; Shur, Michael; and Jones, Stephen H., 5,535,231, Cl. 372-50.000.
- Shutt, Thomas C., to Echochem International, Inc. Method for producing cellulose insulation materials using liquid fire retardant compositions. 5,534,301, Cl. 427-377.000.
- Shuttleworth, Leslie; Bowman, Wayne A.; and Weber, Helmut, to Eastman Kodak Company. Thermal dye transfer system with receiver containing an acid moiety. 5,534,479, Cl. 503-227.000.
- Shuttleworth, Leslie: *See—*
  - Bowman, Wayne A.; Shuttleworth, Leslie; and Weber, Helmut, 5,534,478, Cl. 503-227.000.
- Shy, Shyi-Long: *See—*
  - Pan, Hong-Tsz; Yang, Ming-Tzong; and Shy, Shyi-Long, 5,533,634, Cl. 216-12.000.
- Siddoway, Craig F.; and Giacomino, Gerald L., to Motorola, Inc. Carry case having paging circuitry section. 5,535,434, Cl. 455-89.000.
- Sie, John J.; and Basawapatna, Ganesh R., to Encore Media Corporation. System for dynamic real-time television channel expansion. 5,534,941, Cl. 348-564.000.
- Siebott, Günther: *See—*
  - Bildhauer, Michael; Kupfer, Rainer; Siebott, Günther; Mees, Bernhard; and Friedrich, Herbert, 5,534,604, Cl. 526-253.000.
- Siegel, Helmut: *See—*
  - Stiegelmann, René; Eble, Erhard; and Siegel, Helmut, 5,533,800, Cl. 366-142.000.
- Siegel, Norman L.: *See—*
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Siegemund, Günter: *See—*
  - Appel, Wolfgang; Ebmeyer, Frank; Metzenthin, Tobias; and Siegemund, Günter, 5,534,634, Cl. 546-303.000.
- Siegrist, Daniel N.: *See—*
  - Feldpausch, Thomas G.; Carino, Phillip D.; Faiks, Frederick S.; DeBoer, David M.; Ellison, Samuel J.; and Siegrist, Daniel N., 5,533,798, Cl. 312-219.000.
- Sielaff, David J.: *See—*
  - Barriuso, Frank R.; Pase, Douglas M.; and Sielaff, David J., 5,535,365, Cl. 395-482.000.
- Siemens Aktiengesellschaft: *See—*
  - Guempelein, Reinhold; and Roehrlein, Gerhard, 5,535,033, Cl. 359-144.000.
  - Hendel, Horst, 5,534,834, Cl. 335-78.000.
  - Lehmann, Volker; and Marin, Heiner, 5,534,673, Cl. 218-68.000.
  - Meyer, Stephan, 5,534,783, Cl. 324-533.000.
  - Sutter, Ralf; Beerstecher, Lutz; Hruza, David; Stetter-Alle, Raimund; and Trackl, Karl, 5,533,539, Cl. 134-95.200.
  - Weigl, Manfred, 5,533,477, Cl. 123-494.000.
- Siemens Automotive Corporation: *See—*
  - Wakeman, Russell J., 5,533,249, Cl. 29-605.000.
- Siemens Automotive L.P.: *See—*
  - Robinson, Barry S., 5,533,478, Cl. 123-510.000.
- Siemens Automotive, S.A.: *See—*
  - Atanasyan, Alain A., 5,533,493, Cl. 123-698.000.
- Siemens Electric Ltd.: *See—*
  - Cook, John E.; and Perry, Paul D., 5,533,488, Cl. 123-568.000.
- Siemens Energy & Automation, Inc.: *See—*
  - McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, 5,534,835, Cl. 335-172.000.
- Siemens Nixdorf Informationssysteme Aktiengesellschaft: *See—*
  - Irro, Otmar; and Naeser, Helmut, 5,534,986, Cl. 355-284.000.
  - Michel, Uwe, 5,535,310, Cl. 395-113.000.
- Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*

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Silvano, Cristina, to Bull HN Information Systems Italia S.p.A. Digital information error correcting apparatus for single error correcting (SEC), double error detecting (DED), single byte error detecting (SBED), and odd numbered single byte error correcting (OSBEC). 5,535,227, Cl. 371-40.400.
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Simmons, Eugene R.: *See—*
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Simpson, Charles L., to CarboMedics, Inc. Orthopedic prosthetic implants with pyrolytic carbon or ceramic articulating surfaces. 5,534,033, Cl. 623-18.000.
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Sioutas, Constantinos, to Minnesota Mining and Manufacturing Company. Aerosol actuator having a linearly arranged canister receiving cavity, valve stem receptacle, orifice, and deagglomeration chamber. 5,533,498, Cl. 128-200.230.
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Smeets, Paulus M., to Van Doorne's Transmissie B.V. Drive belt. 5,533,940, Cl. 474-242.000.
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Tokish, Leonard J., Jr.; Fallin, Thomas W.; and Schryver, Jeff, 5,534,005, Cl. 606-80.000.
Smith, Blaine M., to Sharper Image Corporation. Ultrasonic pulse cleaner. 5,534,741, Cl. 310-317.000.
Smith, Christopher P., to Westinghouse Electric Corporation. Motor power measuring cell for motor operated valves. 5,533,410, Cl. 73-862.193.
Smith, Frank G.: *See—*
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Smith, Gregory J.; and Kunst, David J., to National Semiconductor Corporation. Integrated resistor for sensing electrical parameters. 5,534,788, Cl. 324-771.000.
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Smith, Michael W.: *See—*
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Smolinske, Jeffrey C.; Clanton, Christopher L.; and Tran, Phieu M., to Motorola, Inc. Method and system for resolution of channel access in data transmission systems. 5,535,210, Cl. 370-85.200.
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Societe Anonyme Dite Alcatel Radiotelephone: *See—*
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Societe Nationale Elf Aquitaine: *See—*

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Söderholm, Jan; and Cedraeus, Hugo. Packaging bag, preferably for perilous samples, and method for producing the packaging bag. 5,533,624, Cl. 206-524.300.
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Song, Kwang B.; Kim, Sung K.; and Shim, Jin S., to LG Semicon Co., Ltd. Solid state image sensing element. 5,534,720, Cl. 257-232.000.
Song, Tae K.; and Chandraratna, Roshantha A., to Allergan. Acetylenes disubstituted with 2-tetrahydropyranoxyaryl and aryl or heteroaryl groups having retinoid-like biological activity. 5,534,641, Cl. 549-416.000.
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Ohoshi, Toshio; Kiyomiya, Tadashi; and Okita, Masami, 5,534,749, Cl. 313-497.000.
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Saito, Tsunenari; Kenmotsu, Shiro; and Inoue, Takuji, 5,534,096, Cl. 156-212.000.
Sugisaki, Kiminori; and Kanota, Keiji, 5,535,275, Cl. 380-10.000.
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Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., 5,535,137, Cl. 364-514.00A.
Sony Electronics, Inc.: *See—*
Rossmere, David L.; Glenn, Robert S., Jr.; Brown, William B.; Carlucci, John B.; and Duffy, Robert W., 5,535,137, Cl. 364-514.00A.
Sopha Medical: *See—*
Pierfitte, Michel; and DeLorme, Pierre, 5,534,701, Cl. 250-363.040.
Sorbello, Robert M.; and Zaghloul, Amir I., to Comsat. Orthogonally polarized dual-band printed circuit antenna employing radiating elements capacitively coupled to feedlines. 5,534,877, Cl. 343-700.0MS.
Sorensen, Carl C.: *See—*
Slater, R. Winston; and Sorensen, Carl C., 5,535,095, Cl. 361-725.000.
Sorin Biomedica, S.p.A.: *See—*
Inguaggiato, Bruno, 5,533,520, Cl. 128-782.000.
Soshi, Isao: *See—*
Miyamoto, Hidenori; and Soshi, Isao, 5,534,667, Cl. 174-261.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,957, Cl. 354-106.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,958, Cl. 354-106.000.
Sotomayor, Guy G., Jr.: *See—*
Rawson, Freeman L., III; and Sotomayor, Guy G., Jr., 5,535,401, Cl. 395-750.000.
Soula, Gerard: *See—*
Mignani, Gerard; Soula, Gerard; and Meyrueix, Remi, 5,535,048, Cl. 359-326.000.
Southcorp Water Heaters USA, Inc.: *See—*
Moore, H. Jack, Jr., 5,533,495, Cl. 126-350.00R.
Southpac Trust International, Inc.: *See—*
Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,533,301, Cl. 47-72.000.
Weder, Donald E., 5,533,319, Cl. 53-397.000.
Weder, Donald E., 5,533,320, Cl. 53-399.000.
Southwest Research Institute: *See—*
Marshall, Mary C., 5,533,538, Cl. 134-104.400.
Soya, Takashi: *See—*
Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
Sozinho, Edward D.: *See—*
Holty, Anton G.; Wilson, Frederick J.; and Sozinho, Edward D., 5,533,654, Cl. 224-155.000.
Spahn, Robert G., to Eastman Kodak Company. Overcoat for optical tape having SbInSn recording layer. 5,534,385, Cl. 430-270.130.
Spears, Colin P.; and Gustavsson, Bengt G., to University of Southern California. 5,10,-methylene-tetrahydrofolate as a modulator of a chemotherapeutic agent. 5,534,519, Cl. 814-274.000.
Specialty Coating Systems, Inc.: *See—*
Beach, William F.; Wary, John; and Olson, Roger A., 5,534,068, Cl. 118-719.000.
Speckhart, Frank H. System for absorbing torsional and/or bending vibrations. 5,533,422, Cl. 74-573.00R.
Speed, Paul F.; and Taylor, Richard N., to International Computers Limited. Redundant computer system which boots one system as the primary computer from a shared drive. 5,535,411, Cl. 395-800.000.
Speir, Dean: *See—*
Rosen, Mitchell S.; and Speir, Dean, 5,533,657, Cl. 224-673.000.
Spencer, George L.; Duvoisin, Herbert A., III; and Vasicek, Jean, to Martin Marietta Corporation. Superresolution image enhancement for a SIMD array processor. 5,535,291, Cl. 382-254.000.
Spencer, Jeremy R.: *See—*
Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., 5,534,168, Cl. 508-396.000.
Sperber, Ferenc: *See—*
Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Ildikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
Spirk, John W.: *See—*
Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,533,788, Cl. 29.7-440.100.
Springer, Marlin D.; Burns, William C.; and Barkley, Thomas, to Plasma Energy Applied Technology Incorporated. Apparatus and method for treating hazardous waste. 5,534,659, Cl. 588-227.000.
Springs Window Fashions Division, Inc.: *See—*
Morris, John E., 5,533,560, Cl. 160-178.100.
Sprint Communications Company L.P.: *See—*
Gardner, Michael J., 5,535,200, Cl. 370-60.000.
Sprogis, Edmund J.: *See—*
DeBrosse, John K.; Lary, Jenifer E.; and Sprogis, Edmund J., 5,534,732, Cl. 257-776.000.
Sprouse, Kenneth M.; and Navratil, James D., to Rockwell International Corporation. Hollow artery anode wick for passive variable pressure regenerative fuel cells. 5,534,363, Cl. 429-34.000.
Square D Company: *See—*
Neill, Kenneth; and Ball, Keith W., 5,535,102, Cl. 361-832.000.
SRAM Corporation: *See—*
Patterson, Sam H.; Cheever, John D.; and Larson, Michael W., 5,533,937, Cl. 474-80.000.
Sridhar, Ramalingam: *See—*
Shin, Yong-Chul; and Sridhar, Ramalingam, 5,535,309, Cl. 395-24.000.
Srinivasan, Kasturi R.: *See—*
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Srinivasan, Mandayam C.: *See—*
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St. Mary's Hospital and Medical Center, Inc.: *See—*
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St. Vincent Medical Center: *See—*
Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, 5,534,506, Cl. 514-185.000.
Stack, Joseph M.: *See—*
Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
Stadler, David M.; and Pernick, Jeffrey R., to International Hardcoat, Inc. Apparatus and method for selective coating of metal parts. 5,534,126, Cl. 205-101.000.
Stadler, Rolf: *See—*
Giesenberg, Peter; Stadler, Rolf; and Lang, Wilfried, 5,533,433, Cl. 89-1.806.
Stallbaumer, Hermann: *See—*

- Kausel, Wilfried; Kremser, Hannes; Stallbaumer, Hermann; and Winkler, Werner, 5,535,273, Cl. 379-399.000.
- Stamet, Inc.: *See—*
  - Conrad, Peter E.; and Saunders, Timothy W., 5,533,650, Cl. 222-161.000.
- Stamos, Louis. Apparatus for controlling air flow through nasal passages. 5,533,504, Cl. 128-201.180.
- Stanasolovich, David; Syverson, William A.; and Warren, Ronald A., to Inernational Business Machines Corporation. Apparatus for uniform cleaning of wafers using megasonic energy. 5,533,540, Cl. 134-155.000.
- Standifer, Larry R. Detection and quantification of fluid leaks. 5,535,136, Cl. 364-510.000.
- Stanford University: *See—*
  - Gupta, Anoop; and Joe, Truman, 5,535,116, Cl. 364-134.000.
- Stanley, James C.: *See—*
  - Wakefield, Thomas W.; Stanley, James C.; and Andrews, Philip C., 5,534,619, Cl. 530-324.000.
- Stansell, Thomas A., Jr.: *See—*
  - Cahn, Charles R.; Keegan, Richard G.; Knight, Jerry E.; and Stansell, Thomas A., Jr., 5,535,278, Cl. 380-49.000.
- Stanton, Eddie. Releasable valve seat removal tool. 5,533,245, Cl. 29-221.600.
- Stark, Elizabeth F.: *See—*
  - Laube, Samuel J. P.; and Stark, Elizabeth F,, 5,535,128, Cl. 364-468.260.
- Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., to Unisys Corporation. Prompt issuing protocol for an intercept voice messaging system. 5,535,264, Cl. 379-89.000.
- Statz, Hermann: *See—*
  - Kuehnle, Manfred R.; and Statz, Hermann, 5,534,056, Cl. 106-455.000.
- Steel-Craft Door Products Ltd.: *See—*
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- Steelcase Inc.: *See—*
  - Feldpausch, Thomas G.; Carino, Phillip D.; Faiks, Frederick S.; DeBoer, David M.; Ellison, Samuel J.; and Siegrist, Daniel N., 5,533,798, Cl. 312-219.000.
- Steele, Robert E.; Burns, Mark E.; and Felden, David M., to General Motors Corporation. Automotive fault tolerant serial communication. 5,534,848, Cl. 340-517.000.
- Steffen, Mark A.; Sutton, Lynn A.; Stuckey, Gregory K.; and Johnsen, Rex N., to Caterpillar Inc. Steering switch integral with an implement control level. 5,533,590, Cl. 180-332.000.
- Steffens, Charles F., Jr.: *See—*
  - Brown, Louis R.; and Steffens, Charles F., Jr., 5,533,752, Cl. 280-739.000.
- Steffens, Wilhelm, to Klöckner-Moeller GmbH. Current limiting contact system for circuit breakers. 5,534,674, Cl. 218-154.000.
- Stefik, Mark J.; Russell, Daniel M.; Bobrow, Daniel G.; and Henderson, D. Austin, Jr., to Xerox Corporation. Document processing system utilizing document service cards to provide document processing services. 5,534,975, Cl. 355-202.000.
- Stegeman, James C.: *See—*
  - Blitz, Martin C.; Stegeman, James C.; and Bareham, Peter B., 5,535,399, Cl. 395-750.000.
- Steger, Robert: *See—*
  - Qian, Xue-Yu; Yin, Gerald; Hills, Graham W.; and Steger, Robert, 5,534,108, Cl. 156-643.100.
- Stegner, James C.: *See—*
  - Garnjost, Kenneth D.; and Stegner, James C., 5,533,933, Cl. 472-60.000.
- Stehle, Heinz; and Hoebel, Peter, to Dr. Ing.h.c.F. Porsche AG. Differential housing for the axle drive of a motor vehicle. 5,533,423, Cl. 74-606.00R.
- Stein, Daryl L., to Elf Atochem North America, Inc. Process for polymerization reactions with functionalized peroxides. 5,534,596, Cl. 525-330.300.
- Stein, Michael, to E. S. Originals, Inc. Sandal having adjustable straps. 5,533,278, Cl. 36-11.500.
- Steinbrecher, Lester E.: *See—*
  - Dollman, David Y., deceased; Dolan, Shawn E.; and Steinbrecher, Lester E., 5,534,082, Cl. 148-247.000.
- Steiner, Manfred: *See—*
  - Rump, Siegfried; Steiner, Manfred; and Douglas, Brian, 5,535,123, Cl. 364-426.020.
- Steinhauser, Ludwig: *See—*
  - Bamberg, Joachim; Steinhauser, Ludwig; Bayer, Erwin; and Adam, Peter, 5,534,308, Cl. 427-454.000.
- Steinmann, Alfred, to Ciba-Geigy Corporation. Polyethers containing hindered amines which can be cleaved off as stabilizers. 5,534,618, Cl. 528-419.000.
- Stelle, Gerald E.: *See—*
  - Adams, Edgar E.; Ellis, Darwin L.; and Stelle, Gerald E., 5,533,608, Cl. 198-478.100.
- Stember, Michael J.: *See—*
  - Ho, Wen-Jei; Stember, Michael J.; and Vanderlinden, Steven L., 5,535,368, Cl. 395-497.010.
- Stena Offshore Limited: *See—*
  - Recalde, Carlos E., 5,533,834, Cl. 405-168.300.
- Stenta, Emily P.: *See—*
  - Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,533,788, Cl. 29.7-440.100.
- Stenta, Roland A.: *See—*
  - Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,533,788, Cl. 29.7-440.100.
- Stephenson, Ronald R., to Boeing Company, The. Ceramic oxide compounds. 5,534,468, Cl. 501-12.000.
- Steris Corp.: *See—*
  - Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; Siegel, Norman L.; and Wilson, Joseph H., 5,534,162, Cl. 210-781.000.
- Stern, Frank: *See—*
  - Ismail, Khaled E.; and Stern, Frank, 5,534,713, Cl. 257-24.000.
- Stern, Roger A.: *See—*
  - Kaspari, William J.; and Stern, Roger A., 5,533,511, Cl. 128-672.000.
- Stern, Seth: *See—*
  - Green, Michael R.; Zapp, Maria L.; and Stern, Seth, 5,534,408, Cl. 435-5.000.
- Stetter-Alle, Raimund: *See—*
  - Sutter, Ralf; Beerstecher, Lutz; Hruza, David; Stetter-Alle, Raimund; and Trackl, Karl, 5,533,539, Cl. 134-95.200.
- Stevens, Craig L., to Applied Materials Inc. Self-calibration system for robot mechanisms. 5,535,306, Cl. 395-89.000.
- Stevens, David R.: *See—*
  - Alves, James F.; Cacnio, Gerry R.; and Stevens, David R., 5,535,314, Cl. 395-131.000.
- Stevens, Timothy A.: *See—*
  - Lahm, William; and Stevens, Timothy A., 5,534,227, Cl. 422-102.000.
- Steward, Frederick A., to Heritage Environmental Services, Inc. Micronutrient supplement. 5,534,043, Cl. 71-32.000.
- Stewart, Gregory N.; and Overfield, Anthony L., to Dell USA, L.P. Portable computer with automatic adaption to different device types on a standard port. 5,535,371, Cl. 395-500.000.
- St. Germain, Jon P.; and Olson, Scott A., to SciMed Life Systems, Inc. Stent deployment catheter with collapsible sheath. 5,534,007, Cl. 606-108.000.
- Stidham, Curtis R.; McPherson, Robert, Jr.; and Singer, Richard E., to Erico International Corp. Exothermic welding apparatus. 5,533,662, Cl. 228-33.000.
- Stiegelmann, René; Eble, Erhard; and Siegel, Helmut, to Janke & Kunkel GmbH & Co. KG IKA-Labortechnik. Procedure and apparatus for detecting viscosity change of a medium agitated by a magnetic stirrer. 5,533,800, Cl. 366-142.000.
- Stiffe, Susan A.: *See—*
  - Herb, Craig A.; Sun, Wei-Mei; Walling, Priscilla M.; and Stiffe, Susan A., 5,534,246, Cl. 424-66.000.
- Stigliani, Daniel J., Jr.: *See—*
  - Barringer, Wayne A.; Decusatis, Casimer M.; and Stigliani, Daniel J., Jr., 5,535,139, Cl. 364-550.000.
- Stiles, Mitchel B.: *See—*
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- Stilger, John D.: *See—*
  - Holst, Mark R.; Martin, Richard J.; Stilger, John D.; and Yee, Samson C., 5,533,890, Cl. 431-5.000.
- St. John, Ross. Modular fence apparatus. 5,533,714, Cl. 256-26.000.
- Stock, Jeffrey: *See—*
  - Hejlsberg, Anders; Stock, Jeffrey; Kukol, Peter; and Shtaygrud, Alex, 5,535,391, Cl. 395-700.000.
- Stocker Hinge Manufacturing Company: *See—*
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- Stockert Instrumente GmbH: *See—*
  - Friedmann, Günter; Wiehan, Helmut; and Knott, Erwin, 5,533,877, Cl. 417-477.100.
- Stockley, Henry W., III; and Owensby, Joseph E., to W. R. Grace & Co.-Conn. Peelable barrier layer VSP package, and method for making same. 5,533,622, Cl. 206-484.000.
- Stockley, Peter G.: *See—*
  - Mastico, Robert A.; Stockley, Peter G.; and Talbot, Simon J., 5,534,257, Cl. 424-192.100.
- Stokes, Ty J., to Kimberly-Clark Corporation. Polyolefin-polyamide conjugate fiber web. 5,534,339, Cl. 428-284.000.
- Stoldt, Stephen H.: *See—*
  - Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., 5,534,039, Cl. 44-367.000.
- Stone, Timothy D., to General Electric Company. Parabolically helical spline shaft coupling. 5,533,825, Cl. 403-359.000.
- Stoop, Gustaaf A. P.: *See—*
  - van Krieken, Frits M.; and Stoop, Gustaaf A. P., 5,534,017, Cl. 607-14.000.
- Storage Technology Corporation: *See—*
  - Merkley, Kevin L.; Schumacher, Kurt G.; and Sutton, Alan R., 5,535,334, Cl. 395-200.150.
- Stork Product Engineering B.V.: *See—*
  - Dassen, Antonius G. M.; and Hagg, Franklin, 5,533,865, Cl. 416-228.000.
- Stotz, Wolf G.; and Schneid, Josef, to Sulzer-Escher Wyss GmbH. Method for influencing the thickness and gloss and/or smoothness in the treatment of fiber material webs. 5,533,443, Cl. 100-38.000.
- Strabala, William M., to Midway Environmental Associates, Inc. Structural products manufactured from fly ash. 5,534,058, Cl. 106-708.000.
- Straeter, Joseph G.: *See—*

  - Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,533,301, Cl. 47-72.000.
- Straeter, William F.: *See—*
  - Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,533,301, Cl. 47-72.000.
- Strain, Mark R.: *See—*
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- Strand, David A.: *See—*
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  - Ovshinsky, Stanford R.; Strand, David A.; and Klersy, Patrick, 5,534,712, Cl. 217-3.000.
- Strande, Per: *See—*
  - Klaveness, Jo; Strande, Per; and Wiggen, Unni N., 5,534,250, Cl. 424-78.370.
- Strauch, Dieter; and Belger, Peter, to Pluess-Staufer AG. Method for the production of carbonates by wet grinding. 5,533,678, Cl. 241-16.000.
- Streich, Steven G.; Crook, Ronald J.; and Jones, Richard R., to Halliburton Company; and Atlantic Richfield Company. Apparatus for downhole injection and mixing of fluids into a cement slurry. 5,533,570, Cl. 166-153.000.
- Strenzke, Hilmar, to Linde Aktiengesellschaft. Method and hydrostatic drive system for operating an adjustable hydrostatic pump. 5,533,867, Cl. 417-53.000.
- Strohl, Niles E.: *See—*
  - Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., 5,535,338, Cl. 395-200.200.
- Strong, Hovey R., Jr.: *See—*
  - Cheung, Yiu M.; Ng, Kenneth K. W.; and Strong, Hovey R., Jr., 5,535,217, Cl. 370-100.100.
- Stroupe, Hugh; Sharan, Sujit; and Sandhu, Gurtej S., to Micron Technology, Inc. Polishing apparatus, a polishing wafer carrier apparatus, a replacable component for a particular polishing apparatus and a process of polishing wafers. 5,533,924, Cl. 451-286.000.
- Strout, Donald W.: *See—*
  - Crandall, Thomas L.; Strout, Donald W.; and Hansen, Eigil, 5,533,358, Cl. 62-292.000.
- Struve, David C.: *See—*
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- Strysko, Mark E.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Stuart, David M.: *See—*
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- Stuart, Van W.: *See—*
  - Bayly, Brian P.; Lucas, Gary M.; and Stuart, Van W., 5,534,610, Cl. 528-38.000.
- Stuckey, Gregory K.: *See—*
  - Steffen, Mark A.; Sutton, Lynn A.; Stuckey, Gregory K.; and Johnsen, Rex N., 5,533,590, Cl. 180-332.000.
- Sturgill, Lewis: *See—*
  - Barr, Arthur; Sturgill, Lewis; and De Jesus Munoz Contreras, Jose, 5,534,208, Cl. 264-160.000.
- Su, Chung-Hui: *See—*
  - Wuu, Shou-Gwo; Liang, Mong-Song; Su, Chung-Hui; and Wang, Chen-Jong, 5,534,451, Cl. 437-40.000.
- Su, Yan-Kuin: *See—*
  - Huang, Chih-Yuan; Su, Yan-Kuin; and Morris, James E., 5,535,146, Cl. 364-578.000.
- Süo, Mihály: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Gyori, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kovári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Suda, Hirofumi, to Canon Kabushiki Kaisha. Video camera apparatus. 5,534,923, Cl. 348-354.000.
- Suda, Tetsuya: *See—*
  - Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.
- Sudo, Gen: *See—*
  - Fujiwara, Koji; Sudo, Gen; and Arinaga, Kenji, 5,534,109, Cl. 156-643.100.
- Sueda, Naomichi: *See—*
  - Sanjoh, Minako; Kojima, Shoichi; and Sueda, Naomichi, 5,535,304, Cl. 395-62.000.
- Suematsu, Hiroyuki: *See—*
  - Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
- Sugahara, Yuji; and Nakayama, Yasuo, to Otsuka Pharmaceutical Co., Ltd. Stabilized il-1α medicinal composition. 5,534,251, Cl. 424-85.200.
- Sugawara, Eiji, to Fujitsu Limited. System for synchronizing real time clock by transmitted real time information. 5,535,251, Cl. 375-356.000.
- Sugawara, Tomoaki: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Sugimura, Kazuo: *See—*
  - Baba, Akira; Sugimura, Kazuo; Miwa, Satoshi; Yamamoto, Keizo; and Saito, Masayuki, 5,534,735, Cl. 307-117.000.
- Sugino, Yoshito: *See—*
  - Hikita, Hiroshi; Kohriyama, Tetsuo; Nozawa, Yutaka; and Sugino, Yoshito, 5,534,307, Cl. 427-421.000.
- Sugisaki, Kiminori; and Kanota, Keiji, to Sony Corporation. Apparatus and method for producing scrambled digital video signals. 5,535,275, Cl. 380-10.000.
- Sugita, Kenji: *See—*
  - Ohtani, Mitsuaki; Arita, Hitoshi; Sugita, Kenji; Matsuura, Takaharu; and Shirahase, Kazuhiro, 5,534,654, Cl. 564-90.000.
- Sugita, Ryuji; Tohma, Kiyokazu; Ishida, Tatsuaki; and Ban, Yasuaki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium and method for producing the same. 5,534,324, Cl. 428-694.00T.
- Sugita, Shuichi: *See—*
  - Hirabayashi, Shigeto; and Sugita, Shuichi, 5,534,400, Cl. 430-558.000.
- Sugitani, Nobuyoshi; Okuwa, Masayuki; Morikawa, Takeshi; and Nonomura, Yutaka, to Toyota Jidosha Kabushiki Kaisha. Vibration-sensing element and vibration-sensing gyro using the same. 5,533,397, Cl. 73-504.160.
- Sugiyama, Masaaki; and Ohta, Hiroyuki, to Murata Manufacturing Co., Ltd. Sensor circuit for a telephone line. 5,535,272, Cl. 379-373.000.
- Sugiyama, Yoshiaki: *See—*
  - Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,534,956, Cl. 354-76.000.
- Suh, Byoung W.: *See—*
  - Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,534,637, Cl. 548-374.100.
- Sule, Sandor. Hydraulic bicycle brake. 5,533,599, Cl. 188-344.000.
- Sulzer-Escher Wyss GmbH: *See—*
  - Stotz, Wolf G.; and Schneid, Josef, 5,533,443, Cl. 100-38.000.
- Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, to Teijin Limited. Monoclonal antibody specific to human α_2-plasmin inhibitor. 5,534,255, Cl. 424-141.100.
- Sumitomo Chemical Company, Limited: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188, Cl. 252-299.610.
  - Mitsui, Shinichi; Kihara, Hayato; and Yoshimi, Shuji, 5,534,580, Cl. 524-417.000.
- Sumitomo Electric Industries, Ltd.: *See—*
  - Hayashi, Noriki; and Yoshida, Noriyuki, 5,534,489, Cl. 505-474.000.
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
  - Nakamura, Takao; and Iiyama, Michitomo, 5,534,491, Cl. 505-500.000.
  - Tsuzuki, Yasushi; Yamagata, Shin-ichi; and Yamakawa, Akira, 5,533,930, Cl. 432-120.000.
- Sumitomo Heavy Industries Ltd.: *See—*
  - Fukaya, Sueo, 5,533,942, Cl. 475-178.000.
  - Kodaira, Kazuho; Itoh, Yasuhito; and Watanabe, Tetsuya, 5,533,565, Cl. 164-416.000.
- Sumitomo Metal Industries, Ltd.: *See—*
  - Kuroda, Kouichi; Imamura, Youichi; Nakasuji, Kazuyuki; and Hayashi, Chihiro, 5,533,370, Cl. 72-12.500.
- Sumitomo Wiring Systems, Ltd.: *See—*
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Summers, John D.; and Tam, Wilson, to Du Pont de Nemours, E. I., and Company. NLO dye compositions and use thereof in producing NLO elements. 5,534,201, Cl. 252-582.000.
- Sun Microsystems, Inc.: *See—*
  - Amri, Adel; and Hull, Thomas H., 5,535,199, Cl. 370-60.000.
  - Horstmann, Jens; and Testa, James, 5,535,223, Cl. 371-27.000.
- Sun, Wei-Mei: *See—*
  - Herb, Craig A.; Sun, Wei-Mei; Walling, Priscilla M.; and Stiffe, Susan A., 5,534,246, Cl. 424-66.000.
- Sundeen, Kelvin D.: *See—*
  - Bailly, Helen; Luedtke, Arthur; Pankratz, Paul; Allen, Joy; Outlaw, Tina O.; Fisher, Lance K.; and Sundeen, Kelvin D., 5,534,178, Cl. 510-367.000.
- Supracor Systems, Inc.: *See—*
  - Landi, Curtis L.; Wilson, Susan L.; and Huber, Michael S., 5,534,343, Cl. 428-313.500.
- Sureaud, Jean: *See—*
  - Kowalski, Jacek; and Sureaud, Jean, 5,534,686, Cl. 235-492.000.
- Surjaatmadja, Jim B.; Brune, Kenneth D.; and Kabinoff, Ken B., to Halliburton Company. Surface switchable down-jet/side-jet apparatus. 5,533,571, Cl. 166-222.000.
- Surman, Thomas G.: *See—*
  - Karubian, Ralph K.; and Surman, Thomas G.. 5,533,928, Cl. 452-135.000.
- Susar A/S: *See—*
  - Gjessing, Dag K.; and Hjelmstad, Jens F., 5,534,868, Cl. 342-26.000.
- Sutardja, Pantas: *See—*
  - Melas, Constantin M.; Rugar, Daniel; Sutardja, Pantas; and Wood, Roger W., 5,535,187, Cl. 369-59.000.

- Sutter, Ralf; Beerstecher, Lutz; Hruza, David; Stetter-Alle, Raimund; and Trackl, Karl, to Siemens Aktiengesellschaft. Apparatus for intensive cleaning of medical articles. 5,533,539, Cl. 134-95.200.
- Sutton, Alan R.: *See—*
  - Merkley, Kevin L.; Schumacher, Kurt G.; and Sutton, Alan R., 5,535,334, Cl. 395-200.150.
- Sutton, Lynn A.: *See—*
  - Steffen, Mark A.; Sutton, Lynn A.; Stuckey, Gregory K.; and Johnsen, Rex N., 5,533,590, Cl. 180-332.000.
- Suvada Rutkowski, Julie: *See—*
  - Gierut, Joseph J.; Suvada Rutkowski, Julie; and Dam, Robert, 5,534,671, Cl. 200-52.00R.
- Suwandhaputra, Johannes H., to AST Research, Inc. Method and circuitry for controlling voice mail, call logging and call blocking functions using a modem. 5,535,265, Cl. 379-97.000.
- Suyama, Masuo, to Fujitsu Limited. Optical amplifier and optical communication system with optical amplifier using pumping light beam. 5,535,050, Cl. 359-341.000.
- Suzuki, Akihiro: *See—*
  - Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, 5,535,071, Cl. 360-96.500.
- Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Indazolesulfonylurea derivative, its use and intermediate for its production. 5,534,481, Cl. 504-215.000.
- Suzuki, Etsurou: *See—*
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
- Suzuki, Hideki, to Fuji Photo Film Co., Ltd. Radiation image storage panel and radiation image reading method. 5,534,710, Cl. 250-588.000.
- Suzuki, Hidenobu: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Suzuki, Katsumi: *See—*
  - Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, 5,534,715, Cl. 257-33.000.
- Suzuki, Kazumi: *See—*
  - Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, 5,534,649, Cl. 558-277.000.
- Suzuki, Makoto: *See—*
  - Sato, Shougo; Chen, Ding-Yu; and Suzuki, Makoto, 5,535,088, Cl. 361-225.000.
- Suzuki, Masao: *See—*
  - Yamagami, Taku; Suzuki, Masao; and Sakaegi, Yuji, 5,535,011, Cl. 358-335.000.
- Suzuki, Seiji; Hori, Kiyotaka; Shiota, Yusuke; and Mitsui, Kiichiro, to Fuji Photo Film Co., Ltd.; and Nippon Shokubai Co., Ltd. Process for treating photographic waste solution. 5,534,148, Cl. 210-605.000.
- Suzuki, Shigeo, to Canon Kabushiki Kaisha. Information processing system with selection of input/output processing control according to precalculated input/output processing time. 5,535,418, Cl. 395-845.000.
- Suzuki, Tomohiro; and Sakuta, Toshiyuki, to Texas Instruments Incorporated; and Hitachi Ltd. Voltage generating circuit. 5,534,817, Cl. 327-545.000.
- Suzuki, Toyokazu: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Suzuki, Yoichiro: *See—*
  - Hidaka, Keiki; and Suzuki, Yoichiro, 5,534,871, Cl. 342-113.000.
- Swan, Richard E. Self-aligning flip-up sight. 5,533,292, Cl. 42-100.000.
- Swanson, Roger M.: *See—*
  - Ahl, David K.; Swanson, Roger M.; Apolito, James D.; and Wafler, Walter F., 5,533,720, Cl. 271-225.000.
- Swartz, David M.: *See—*
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- Sweeney, Niall; Caizza, Richard J.; Gravel, Marian H.; and Walters, Bronwen L., to Becton, Dickinson and Company. Protective cap assembly for a medical device passageway. 5,533,980, Cl. 604-192.000.
- SweetWater, Inc.: *See—*
  - Platter, Sanford; Aldred, Jeffrey K.; and Kraemer, Richard J., 5,534,145, Cl. 210-90.000.
- Swietlik, Joseph M.: *See—*
  - Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., 5,534,168, Cl. 508-396.000.
- Swinkels, Cornelis T. J. M.: *See—*
  - Andre De La Porte, Gilles; and Swinkels, Cornelis T. J. M., 5,534,318, Cl. 428-36.900.
- Swoboda, Gary L.; and Ehlig, Peter N., to Texas Instruments Incorporated. Processor condition sensing circuits, systems and methods. 5,535,331, Cl. 395-183.210.
- Sybase, Inc.: *See—*
  - Gower, Stefan F., 5,535,383, Cl. 395-600.000.
- Sygnator, Henry A.: *See—*
  - Binder, John; Schniedermeier, Henry W.; Shelton, Lawrence S.; Sygnator, Henry A.; and Gabriel, William L., 5,533,379, Cl. 72-316.000.
- Synectic Technology, Inc.: *See—*
  - Lawton, Arthur R., 5,533,275, Cl. 34-433.000.
- Synthes (U.S.A.): *See—*
  - Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, 5,534,001, Cl. 606-61.000.
- Syquest Technology, Inc.: *See—*
  - Witt, William F.; and Tannert, Hans K., 5,535,072, Cl. 360-99.060.
- System Analysis & Integration, Inc.: *See—*
  - Tinkham, Ronald B., 5,534,858, Cl. 340-870.070.
- Syverson, William A.: *See—*
  - Stanasolovich, David; Syverson, William A.; and Warren, Ronald A., 5,533,540, Cl. 134-155.000.
- Szabo, Zsolt; and Seeberger, Georg, to Szabo, Zsolt. Knockout tool for joint prostheses. 5,534,006, Cl. 606-100.000.
- Szabó née Kardos, Erzsébet: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Győri, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kővári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Szalay, Erzsébet: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Győri, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kővári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Szvoboda née Kanzel, Ida: *See—*
  - Pálosi, Endre; Korbonits, Dezso; Molnár née Bakó, Erzsébet; Szvoboda née Kanzel, Ida; Héja, Gergely; Kiss, Pál; Gönczi, Csaba; Sperber, Ferenc; Huszár, Csaba; Mihalovics, György; Németh, Attila; Süo, Mihály; Gyüre, Károl; Bóné, István; Mórász, Ferenc; Ledniczky, László; Szabó née Kardos, Erzsébet; Győri, Péter; Szalay, Erzsébet; Bán, Károly; Buttkai, Iidikó; Kővári, Arpád; and Garaczy, Sándor, 5,534,644, Cl. 558-14.000.
- Szynal, Joseph M.; and Guess, Ronald W., to Whirlpool Corporation. Refrigeration system configuration. 5,533,360, Cl. 62-298.000.
- Tabata, Fumio: *See—*
  - Higuchi, Toshiro; Egawa, Saku; Niino, Toshiki; Natori, Katsuhide; and Tabata, Fumio, 5,534,740, Cl. 310-309.000.
- Tabor, Stanley; and Richardson, Charles C., to President and Fellows of Harvard College. Method for nucleic acid hybridization using single-stranded DNA binding protein. 5,534,407, Cl. 435-5.000.
- Tachibana, Tetsuo: *See—*
  - Hijikata, Toshiyuki; and Tachibana, Tetsuo, 5,535,221, Cl. 371-5.500.
- Tachimori, Masaharu; Yano, Takayuki; Tsumori, Yasuo; Nakajima, Tatsuo; and Hamaguchi, Isao, to Nippon Steel Corporation. Process for producing buried insulator layer in semiconductor substrate. 5,534,446, Cl. 437-26.000.
- Tagawa, Takao, to Sharp Kabushiki Kaisha. Display-integrated type tablet device having and idle time in one display image frame to detect coordinates and having different electrode densities. 5,534,892, Cl. 345-173.000.
- Tagawa, Takao: *See—*
  - Nomura, Toshio; Tagawa, Takao; and Kako, Noritoshi, 5,534,886, Cl. 345-104.000.
- Tago, Kouichi: *See—*
  - Sato, Masayori; and Tago, Kouichi, 5,534,940, Cl. 348-556.000.
- Tai, King L.: *See—*
  - Frye, Robert C.; and Tai, King L., 5,534,465, Cl. 437-209.000.
- Taiho Pharmaceutical Company, Ltd.: *See—*
  - Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, 5,534,513, Cl. 514-249.000.
- Tait, Bruce E.: *See—*
  - Kline, Robert J.; Larsen, Thomas E.; Schiesl, Mark A.; and Tait, Bruce E., 5,533,690, Cl. 242-547.000.
- Taiwan Semiconductor Manufacturing Company: *See—*
  - Hua-Chu, Chung, 5,534,752, Cl. 315-111.810.
  - Wuu, Shou-Gwo; Liang, Mong-Song; Su, Chung-Hui; and Wang, Chen-Jong, 5,534,451, Cl. 437-40.000.
- Tajika, Hiroshi: *See—*
  - Kashino, Toshio; Fukuda, Tsuguhiro; Koitabashi, Noribumi; Tajika, Hiroshi; Arai, Atsushi; and Hirabayashi, Hiromitsu, 5,534,898, Cl. 347-33.000.
- Tajima, Kazuhito, to NEC Corporation. Symmetric Mach-Zehnder all-optical device. 5,535,001, Cl. 356-345.000.
- Taka, Hideo: *See—*
  - Maeda, Kazuyuki; and Taka, Hideo, 5,534,991, Cl. 356-3.060.
- Taka, Keisuke: *See—*
  - Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, 5,533,334, Cl. 60-426.000.
- Takada, Kazuyuki: *See—*
  - Kishi, Toru; and Takada, Kazuyuki, 5,535,115, Cl. 363-98.000.

- Takada, Kenzo; Tochikura, Akiko; and Yamaki, Mitsuo, to Hitachi Chemical Company Limited. Cell strain capable of multiplying an Epstein-Barr virus. 5,534,430, Cl. 435-240.200.
- Takada, Masahiko: *See—*
  - Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, 5,535,071, Cl. 360-96.500.
- Takada, Norihisa, to Fuji Photo Film Co., Ltd. Light scanning device. 5,535,042, Cl. 359-212.000.
- Takada, Toshiaki: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Takagi, Koji: *See—*
  - Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,535,184, Cl. 369-32.000.
- Takagi, Tadao, to Nikon Corporation. Camera having variable photometry conditions. 5,534,968, Cl. 354-432.000.
- Takagi, Yosiaki; Takizawa, Jun; and Fukushima, Katsuaki, to Honda Giken Kogyo Kabushiki Kaisha; and Hitachi Metals, Ltd. Fuel injector component. 5,534,081, Cl. 148-325.000.
- Takahama, Toru: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Takahashi, Hiroshi: *See—*
  - Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, 5,535,127, Cl. 364-464.020.
- Takahashi, Iwao: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Takahashi, Keiichiro: *See—*
  - Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, 5,535,308, Cl. 395-108.000.
- Takahashi, Kenji: *See—*
  - Hasegawa, Kazuhiro; Takahashi, Kenji; and Kojima, Yasushi, 5,534,191, Cl. 252-301.40H.
- Takahashi, Kiyoshi: *See—*
  - Mori, Shinsaku; Sasase, Iwao; and Takahashi, Kiyoshi, 5,535,149, Cl. 364-724.190.
- Takahashi, Koji: *See—*
  - Nagasawa, Kenichi; Nakayama, Tadayoshi; Takahashi, Koji; and Takei, Masahiro, 5,535,064, Cl. 360-9.100.
- Takahashi, Kunihiro: *See—*
  - Takasu, Hiroaki; Takahashi, Kunihiro; and Yamazaki, Tsuneo, 5,534,722, Cl. 257-347.000.
- Takahashi, Nobuyuki: *See—*
  - Mizuno, Shigeru; Katsumata, Yoshihiro; and Takahashi, Nobuyuki, 5,534,072, Cl. 118-728.000.
- Takahashi, Ryoji: *See—*
  - Fukumura, Chikashi; Iwata, Masuo; Narita, Noriaki; Inoue, Kouji; and Takahashi, Ryoji, 5,534,291, Cl. 427-221.000.
- Takahashi, Satoshi: *See—*
  - Kambara, Hideki; Anazawa, Takashi; Takahashi, Satoshi; and Murakami, Katsuhiko, 5,534,703, Cl. 250-458.100.
- Takahashi, Shigeyuki: *See—*
  - Ogisu, Yasuhiko; Kato, Mamoru; and Takahashi, Shigeyuki, 5,534,297, Cl. 427-322.000.
- Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, to Sony Corporation. Sliding-type magnetic head for magnetooptical recording. 5,535,075, Cl. 360-105.000.
- Takahashi, Toru: *See—*
  - Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, 5,534,978, Cl. 355-211.000.
- Takahashi, Yonosuke; Imamura, Naoya; Nakamura, Hideyuki; and Kawabata, Kouya, to Fuji Photo Film Co., Ltd. Image transfer sheet, its laminate and image forming method. 5,534,383, Cl. 430-201.000.
- Takahashi, Yonosuke; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Thermal-transfer recording process. 5,534,905, Cl. 347-171.000.
- Takahashi, Yukitoshi: *See—*
  - Hachiya, Tadashi; Takahashi, Yukitoshi; and Kohara, Yuji, 5,533,450, Cl. 101-365.000.
- Takahashi, Yutaka: *See—*
  - Seki, Junzo; Yamamoto, Hirofumi; Yamane, Shuji; Takahashi, Yutaka; and Ushimaru, Kouichi, 5,534,502, Cl. 514-31.000.
- Takai, Hiroshi: *See—*
  - Okuda, Kouji; Nishi, Tokumitsu; Takai, Hiroshi; and Hoshino, Hisakiyo, 5,534,091, Cl. 156-89.000.
- Takaki, Kouichi; Azumai, Mitsuo; and Ishii, Hiroshi, to Konica Corporation. Signal delay method, signal delay device and circuit for use in the apparatus. 5,534,808, Cl. 327-261.000.
- Takaki, Satoshi: *See—*
  - Okamura, Nobuyuki; Yamagami, Atsushi; and Takaki, Satoshi, 5,534,070, Cl. 118-723.00E.
- Takamatsu, Hiroshi: *See—*
  - Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, 5,534,120, Cl. 205-464.000.
- Takanaski, Hiroshi: *See—*
  - Ogura, Masami; and Takanaski, Hiroshi, 5,535,030, Cl. 359-74.000.
- Takano, Hirokuni, to Canon Kabushiki Kaisha. Electronic equipment having display unit and operation input unit. 5,534,891, Cl. 345-169.000.
- Takano, Manabu: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Takano, Masao; Okuno, Ryozo; and Nakamura, Kimihiko, to Tomoegawa Paper Co., Ltd. Nonmagnetic one-component developing method. 5,534,377, Cl. 430-102.000.
- Takano, Naoyuki: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188, Cl. 252-299.610.
- Takano, Toshiya; and Ko, Minoru S. H., to Daiichi Pharmaceutical Co., Ltd. Method of producing foreign gene products. 5,534,419, Cl. 435-691.000.
- Takao, Osamu: *See—*
  - Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, 5,535,071, Cl. 360-96.500.
- Takase, Masami, to Olympus Optical Co., Ltd. Camera capable of winding and rewinding film by revolution of motor. 5,534,960, Cl. 354-173.100.
- Takashimizu, Yoshihiro, to Fujitsu Limited. Supply/conveyance mechanism for sheets of paper. 5,533,721, Cl. 271-109.000.
- Takasu, Hiroaki; Takahashi, Kunihiro; and Yamazaki, Tsuneo, to Seiko Instruments Inc. Insulator substrate for a light valve device having an electrostatic protection region. 5,534,722, Cl. 257-347.000.
- Takata, Haruki: *See—*
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
- Takata, Inc.: *See—*
  - Karlow, James P.; Kumkoski, James M.; Boumarafi, Mohamed; and Hurford, Jonathan P., 5,533,750, Cl. 280-730.200.
- Takatori, Hiroshi: *See—*
  - Everitt, James W.; and Takatori, Hiroshi, 5,534,863, Cl. 341-150.000.
- Takatori, Masahiro, to Matsushita Electric Industrial Co., Ltd. Amplifying circuit for dynamic focus. 5,534,757, Cl. 315-382.000.
- Takeda Chemical Industries, Ltd.: *See—*
  - Hayakawa, Yuzo; Hirai, Tsuneo; and Katayama, Tsutao, 5,533,880, Cl. 425-328.000.
  - Igari, Yasutaka; Yamamoto, Kazumichi; Okamoto, Kayoko; and Yamagata, Yutaka, 5,534,269, Cl. 424-489.000.
  - Ishida, Yasuo; Ohta, Kazunari; and Yoshikawa, Harutoshi, 5,534,482, Cl. 504-215.000.
  - Makino, Tadashi; Mizukami, Yashio; and Kikuta, Jun-ichi, 5,534,534, Cl. 514-388.000.
  - Masuya, Hirotomo; and Yamaoka, Masayoshi, 5,534,639, Cl. 549-62.000.
  - Miki, Hideki; Iwanaga, Koichi; and Matsuno, Toshimi, 5,534,512, Cl. 514-242.000.
- Takeda, Nobuhiro, to Canon Kabushiki Kaisha. Image pickup device. 5,534,922, Cl. 348-340.000.
- Takeda, Norio: *See—*
  - Shirai, Kazushi; and Takeda, Norio, 5,535,046, Cl. 359-281.000.
- Takeda, Shigeru, to Hitachi, Ltd. Apparatus for dynamically collecting and editing management information during a software development process. 5,535,388, Cl. 395-650.000.
- Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, to Canon Kabushiki Kaisha. Thermal transfer recorder with ink sheet and recording medium conveyed according to recording mode. 5,534,908, Cl. 347-215.000.
- Takefuji, Nobuo: *See—*
  - Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
- Takegami, Masaaki: *See—*
  - Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.
- Takei, Fumio: *See—*
  - Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, 5,534,978, Cl. 355-211.000.
- Takei, Masahiro: *See—*
  - Nagasawa, Kenichi; Nakayama, Tadayoshi; Takahashi, Koji; and Takei, Masahiro, 5,535,064, Cl. 360-9.100.
- Takekawa, Kouzi: *See—*
  - Akiyama, Takehiro; Shimomura, Katsuya; Takekawa, Kouzi; and Doi, Takehito, 5,534,821, Cl. 331-8.000.
- Takekoshi, Nobuhiko: *See—*
  - Ohtani, Noriko; Fujimura, Naoto; Sakai, Kiyoshi; Sakakibara, Teigo; Inoue, Masahiro; Takekoshi, Nobuhiko; Mayama, Shinya; Ohtaki, Hideo; Kinugawa, Tadami; Takada, Toshiaki; and Hashimoto, Yuichi, 5,534,581, Cl. 524-430.000.
- Takemae, Yoshihiro: *See—*

  Endo, Tetsuya; Mochizuki, Hirohiko; Kodama, Yukinori; and Takemae, Yoshihiro, 5,535,169, Cl. 365-230.030.
Takemoto, Takatoshi; Kawashima, Kazunari; and Muto, Nobuyuki, to Kabushiki Kaisha Ace Denken. Repeatedly usable recording medium card and recording medium card processor. 5,534,685, Cl. 235-487.000.
Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device having transistors with different orientations of crystal channel growth with respect to current carrier direction. 5,534,716, Cl. 257-72.000.
Takenaka, Kenji; Kato, Keiichi; and Kawamura, Chuichi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Piston type compressor. 5,533,870, Cl. 417-269.000.
Takenaka, Kenji; Kayukawa, Hiroaki; Murao, Kazushige; and Hiramatsu, Osamu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Single-headed-piston-type swash-plate compressor having pulsation damping system. 5,533,871, Cl. 417-269.000.
Takenaka, Takao: *See—*
  Aihara, Ken; Kitagawara, Yutaka; and Takenaka, Takao, 5,533,387, Cl. 73-105.000.
Takeshi, Michiaki: *See—*
  Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, 5,535,075, Cl. 360-105.000.
Takeshima, Akira; Koishi, Musubu; Warashina, Yoshihisa; and Mizushima, Yoshihiko, to Hamamatsu Photonics K.K. Optical measuring apparatus. 5,534,992, Cl. 356-5.100.
Takeshima, Akira; and Koishi, Musubu, to Hamamatsu Photonics K.K. Optical frequency mixing apparatus. 5,535,044, Cl. 359-245.000.
Takeuchi, Kousuke: *See—*
  Kobayashi, Yasumi; Takeuchi, Kousuke; Hirao, Yasuhiro; and Shibata, Kenichi, 5,534,829, Cl. 333-126.000.
Takeuchi, Masamitsu; Ikei, Kazunori; Karakama, Tadao; Akashi, Mitsumasa; Akiyama, Teruo; Maruyama, Jun; and Taka, Keisuke, to Kabushiki Kaisha Komatsu Seisakusho. Pressurized fluid supply system. 5,533,334, Cl. 60-426.000.
Takeuchi, Yasuhiko: *See—*
  Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, 5,534,204, Cl. 264-102.000.
Takiguchi, Tsuyoshi: *See—*
  Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
Takimoto, Kiyoshi: *See—*
  Kishi, Etsuro; Kawade, Hisaaki; Takimoto, Kiyoshi; and Yano, Koji, 5,535,185, Cl. 369-126.000.
Takimoto, Masataka: *See—*
  Koshizuka, Kunihiro; Kitamura, Shigehiro; Takimoto, Masataka; and Kawamura, Tomonori, 5,534,372, Cl. 430-10.000.
Takizawa, Jun: *See—*
  Takagi, Yosiaki; Takizawa, Jun; and Fukushima, Katsuaki, 5,534,081, Cl. 148-325.000.
Takubo, Chiaki: *See—*
  Sasaki, Mamoru; Takubo, Chiaki; and Hiruta, Yoichi, 5,533,664, Cl. 228-180.100.
Talbot, Simon J.: *See—*
  Mastico, Robert A.; Stockley, Peter G.; and Talbot, Simon J., 5,534,257, Cl. 424-192.100.
Talleres de Escoriaza, S.A. (TESA): *See—*
  Valdajos-Gallego, Luis, 5,533,369, Cl. 70-493.000.
Tam, Wilson: *See—*
  Summers, John D.; and Tam, Wilson, 5,534,201, Cl. 252-582.000.
Tama Chemicals Co., Ltd.: *See—*
  Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, 5,534,649, Cl. 558-277.000.
Tamai, Satoshi: *See—*
  Abe, Takao; Isoda, Takeshi; Sato, Chisato; Mihira, Ado; Tamai, Satoshi; and Kumagai, Toshio, 5,534,510, Cl. 514-210.000.
Tamaru, Masatoshi: *See—*
  Suzuki, Chiharu; Masuda, Katsumi; Tamaru, Masatoshi; Inamori, Masahito; Takefuji, Nobuo; Yanagisawa, Katsutada; and Ogawa, Yasunori, 5,534,481, Cl. 504-215.000.
Tamashige, Takamiki: *See—*
  Ito, Mitsuhiro; Tamashige, Takamiki; and Fujii, Satoru, 5,533,629, Cl. 209-714.000.
Tamura, Takaaki: *See—*
  Cho, Tsurahide; Tamura, Takaaki; Cho, Toshitsura; and Suzuki, Kazumi, 5,534,649, Cl. 558-277.000.
Tamura, Toshiya: *See—*
  Hayakawa, Tsuyoshi; Oda, Hajime; Kogo, Takashi; Shimizu, Yukiharu; Sato, Shoichi; Tamura, Toshiya; and Kojima, Hiroyuki, 5,534,903, Cl. 347-71.000.
Tamura, Yuka: *See—*
  Ono, Minoru; Tamura, Yuka; and Akasu, Michinori, 5,534,523, Cl. 514-308.000.
Tan, Chin S.: *See—*
  Raman, Rajesh; Tan, Chin S.; and Chang, Yung M., 5,535,370, Cl. 395-500.000.
Tan, Loon-Seng; and Srinivasan, Kasturi R., to United States of America, Air Force. Benzobisazole polymers containing triarylamino moieties. 5,534,613, Cl. 528-176.000.
Tanabe, Keiji; and Kikuchi, Makoto, to Ando Electric Co., Ltd. Address generating circuit for data compression. 5,535,353, Cl. 395-421.100.
Tanabe, Shin: *See—*
  Kobayashi, Yasunori; Tanabe, Shin; Fukuda, Tatsuo; Miyazawa, Masazumi; Imai, Hideki; and Wani, Moriyuki, 5,533,413, Cl. 73-865.900.
Tanaka, Ginnosuke: *See—*
  Kita, Fusaji; Murakami, Kouji; Higashiguchi, Masaharu; Kawakami, Akira; and Tanaka, Ginnosuke, 5,534,370, Cl. 429-198.000.
Tanaka, Hidekazu; Arikawa, Kazuhiko; Asayama, Yoshinori; Akaza, Syunsuke; Lin, Kyoko; Negishi, Osamu; and Okano, Mitsuru, to Casio Computer Co., Ltd. Graph display apparatus for different coordinate systems. 5,535,317, Cl. 395-140.000.
Tanaka, Hideo: *See—*
  Takahashi, Tomoyuki; Kimura, Kazuhiro; Nishii, Tadao; Yazawa, Kenji; Asada, Kazutoshi; Tanaka, Hideo; and Takeshi, Michiaki, 5,535,075, Cl. 360-105.000.
Tanaka, Junichiro: *See—*
  Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, 5,534,233, Cl. 422-191.000.
Tanaka, Junji: *See—*
  Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, 5,534,120, Cl. 205-464.000.
Tanaka, Kazumi: *See—*
  Miyazaki, Takeshi; Tanaka, Kazumi; Sakuranaga, Masanori; and Okamoto, Tadashi, 5,534,441, Cl. 436-517.000.
Tanaka, Kenichi: *See—*
  Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.
Tanaka, Kyozo: *See—*
  Shinoaki, Sakura; Sato, Hiroto; and Tanaka, Kyozo, 5,535,316, Cl. 395-134.000.
Tanaka, Manabu: *See—*
  Okamoto, Takafumi; Tanaka, Manabu; Baba, Ichiro; Kato, Hideo; and Kawagoe, Norimasa, 5,534,362, Cl. 429-32.000.
Tanaka, Mitsugu, to Canon Kabushiki Kaisha. Data processing apparatus. 5,534,929, Cl. 348-405.000.
Tanaka, Nariaki, to Mita Industrial Co., Ltd. Electrophotographic image forming apparatus having a charge removing means. 5,534,980, Cl. 355-219.000.
Tanaka, Shigeru; and Ofosu-Amaah, William, to Kabushiki Kaisha Toshiba. Snubber energy recovery circuit for protecting switching devices from voltage and current. 5,535,085, Cl. 361-58.000.
Tanaka, Shoji: *See—*
  Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
  Mori, Hatsumi; Hirabayashi, Izumi; Tanaka, Shoji; Mori, Takehiko; Maruyama, Yusei; and Inokuchi, Hiroo, 5,534,638, Cl. 549-3.000.
  Neumann, Christian; Suzuki, Katsumi; Enomoto, Youichi; and Tanaka, Shoji, 5,534,715, Cl. 257-33.000.
Tanaka, Shuji: *See—*
  Nishihira, Keigo; Yoshida, Shinichi; and Tanaka, Shuji, 5,534,648, Cl. 558-277.000.
Tanaka, Yasuhiro; and Yamagata, Michihiro, to Matsushta Electric Industrial Co., Ltd. Focus error detecting element and optical head using the same. 5,535,058, Cl. 359-711.000.
Tanaka, Yasuyuki: *See—*
  Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, 5,534,357, Cl. 428-629.000.
Tanbo, Hitoshi: *See—*
  Ohno, Yoshihiro; Atobe, Mitsuro; and Tanbo, Hitoshi, 5,534,900, Cl. 347-54.000.
Tanese, Naoko: *See—*
  Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
Tangen, Amy J. High visibility animal collar. 5,535,106, Cl. 362-108.000.
Taniguchi, Atsuki; and Yamamoto, Chiyoko, to Fujitsu Limited. Parallel phase-locked loop oscillator circuits with average frequency calculation of input stage loop. 5,534,822, Cl. 331-2.000.
Taniguchi, Shigeki: *See—*
  Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
Taniguchi, Shoji, to Fujitsu Limited. Optical transceiver unit. 5,535,034, Cl. 359-152.000.
Tanizawa, Seiji, to Sony Corporation. Recording and reproducing apparatus having means for performing diagnostic functions. 5,535,065, Cl. 360-31.000.
Tanner, Walter K., Jr.: *See—*
  Fallon, Timothy R.; and Tanner, Walter K., Jr., 5,533,286, Cl. 40-545.000.
Tannert, Hans K.: *See—*
  Witt, William F.; and Tannert, Hans K., 5,535,072, Cl. 360-99.060.
Tanno, Koichi: *See—*
  Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.

Tao, Muneo: *See—*
  Kokawa, Katsuzo; Yamamoto, Katsuhiko; Sakurabu, Tatsuki; Imabayashi, Satoshi; and Tao, Muneo, 5,533,669, Cl. 237-1.0SL.
Tao, Yang, to Agri Tech Incorporated. Method and apparatus for sorting objects by color including stable color transformation. 5,533,628, Cl. 209-580.000.
TAP Pharmaceuticals, Inc.: *See—*
  Killian, Anthony, 5,534,548, Cl. 514-545.000.
Tarbell, Russell. Woodworking press. 5,533,709, Cl. 254-13.000.
Target Technologies, Inc.: *See—*
  Flohr, Daniel P.; and Ross, Stuart, 5,534,914, Cl. 348-15.000.
Tarlow, Kenneth A.: *See—*
  Patterson, Liliana M.; and Tarlow, Kenneth A., 5,533,632, Cl. 211-122.000.
Tarr, Yul J.; Morris, C. Edward; and Haegele, Glen T., to Cummins Engine Company, Inc. Automatic water drain and priming pump for fuel systems. 5,534,161, Cl. 210-744.000.
Tateno, Chikara R. Avocado peeler and slicer. 5,533,442, Cl. 99-541.000.
Tateno, Kikuhei: *See—*
  Hasegawa, Hideo; Tateno, Kikuhei; Kuwata, Tamotsu; Yamamoto, Yoshiro; Hiraishi, Kumiko; Fujita, Osamu; and Narabayashi, Isamu, 5,534,240, Cl. 424-9.360.
Taylor, Andrew S.: *See—*
  Roberts, R. Lee; Eden, Douglas H.; and Taylor, Andrew S., 5,534,202, Cl. 261-122.100.
Taylor, Brad, to Giga Operations Corporation. Pld connector for module having configuration of either first PLD or second PLD and reconfigurable bus for communication of two different bus protocols. 5,535,342, Cl. 395-307.000.
Taylor, Bruce: *See—*
  Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; Taylor, Bruce; and Fiske, John M., 5,533,719, Cl. 270-52.090.
Taylor, Gary: *See—*
  Schroeder, Jeff; and Taylor, Gary, 5,534,669, Cl. 181-198.000.
Taylor, Joseph W.; Goyal, Shivendra K.; Aubee, Norman D. J.; and Bohnet, Nick K. K., to Novacor Chemicals Ltd. Polyethylene with reduced melt fracture. 5,534,572, Cl. 524-275.000.
Taylor, Lloyd D.: *See—*
  Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., 5,534,388, Cl. 430-338.000.
Taylor, Mark: *See—*
  Tipley, Roger E.; Moriarty, Michael; and Taylor, Mark, 5,535,395, Cl. 395-729.000.
Taylor, Richard N.: *See—*
  Speed, Paul F.; and Taylor, Richard N., 5,535,411, Cl. 395-800.000.
Taylor, Robert G.: *See—*
  Nottingham, John R.; Spirk, John W.; Kalman, Jeffery M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,533,788, Cl. 29.7-440.100.
Taylor, Seabrook: *See—*
  Taylor, Shepard; and Taylor, Seabrook, 5,533,771, Cl. 296-26.000.
Taylor, Shepard; and Taylor, Seabrook. Multiple purpose truck tailgate apparatus. 5,533,771, Cl. 296-26.000.
Taylor, Thomas J.; and Kielmeyer, William H., to Schuller International, Inc. Glass fiber binding compositions, process of making glass fiber binding compositions, process of binding glass fibers, and glass fiber compositions. 5,534,612, Cl. 528-129.000.
TEAC Corporation: *See—*
  Miura, Tohru; Kubo, Mitsumasa; and Mashimo, Akira, 5,535,183, Cl. 369-32.000.
  Mori, Shinsaku; Sasase, Iwao; and Takahashi, Kiyoshi, 5,535,149, Cl. 364-724.190.
Tecle, Haile: *See—*
  Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, 5,534,522, Cl. 514-299.000.
Tecnetics Industries, Inc.: *See—*
  Kira, Alan K., 5,533,392, Cl. 73-290.00B.
Teegarden, Arlo F.: *See—*
  Crum, Daniel R.; Simmons, Bill P.; Teegarden, Arlo F.; Rood, Jerry A.; and Kotlarek, Peter A., 5,533,875, Cl. 417-368.000.
Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., to Hoechst Roussel Pharmaceuticals Inc. 1-alkyl-,1-alkenyl-,and 1-alkynylaryl-2-amino-1,3-propanediols and related compounds. 5,534,636, Cl. 548-228.000.
Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., to Hoechst Roussel Pharmaceuticals Inc. 1-alkyl-, 1-alkenyl-, and 1-alkynylaryl-2-amino-1,3-propanediols and related compounds. 5,534,640, Cl. 549-80.000.
Teich, Wesley W.: *See—*
  De Ruyter, Peter W.; Almey, Noel; Slanik, Josef; and Teich, Wesley W., 5,534,278, Cl. 426-237.000.
Teiji, Takechi: *See—*
  Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, 5,534,513, Cl. 514-249.000.
Teijin Limited: *See—*
  Chuujou, Takao; Kobayashi, Ieyasu; Hamano, Hisashi; and Etchu, Masami, 5,534,323, Cl. 428-65.300.
  Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, 5,534,255, Cl. 424-141.100.
Teirstein, Paul S. Method and apparatus for uninterrupted delivery of radiographic dye. 5,533,978, Cl. 604-183.000.
Teknekron Infoswitch Corporation: *See—*
  Maloney, Michael J.; and McCalmont, David T., 5,535,256, Cl. 379-34.000.
Tektronix, Inc.: *See—*
  Nakamura, Michael D.; and Landsman, Howard A., 5,534,939, Cl. 348-505.000.
Telecommunication Research Laboratories: *See—*
  Keyworth, Barrie P.; and McMullin, James N., 5,534,101, Cl. 156-244.120.
Teleflex, Inc.: *See—*
  Adler, Felix, 5,533,419, Cl. 74-502.400.
Telefonaktiebolaget LM Ericsson: *See—*
  Bergenlid, Lars H.; and Eklund, Ulf C., 5,535,429, Cl. 455-53.100.
Telemecanique: *See—*
  Duchemin, Pierre; Baurand, Gilles; and Leglaye, Dominique, 5,534,832, Cl. 335-16.000.
Telfer, Stephen J.: *See—*
  Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.
  Grasshoff, Jurgen M.; Marshall, John L.; Minns, Richard A.; Mischke, Mark R.; Puttick, Anthony J.; Taylor, Lloyd D.; and Telfer, Stephen J., 5,534,388, Cl. 430-338.000.
Telschow, Kenneth L.; and Siu, Bernard K., to Lockheed Idaho Technologies Company. Method and system for evaluating integrity of adherence of a conductor bond to a mating surface of a substrate. 5,535,006, Cl. 356-394.000.
TenBokum, Léo: *See—*
  Lavigne, Gilles; and TenBokum, Léo, 5,533,514, Cl. 128-744.000.
Teng, Hsi-Hsiung. Portable electronic insect-killing device. 5,533,298, Cl. 43-112.000.
Terai, Akiko: *See—*
  Ito, Ryu; Kaneko, Kenji; Hayashi, Satoshi; and Terai, Akiko, 5,533,227, Cl. 15-167.100.
Teramoto, Yoshihiko: *See—*
  Faley, Timothy L.; Mills, Michael E.; Teramoto, Yoshihiko; Turek, Douglas E.; and Yabuki, Kazuyuki, 5,534,205, Cl. 264-103.000.
Terashi, Taro: *See—*
  Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru: Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
Terawaki, Fumikazu; Ikeda, Yoshitaka; and Makihata, Yuuki, to Fanuc Ltd. Method for controlling robot attitude based on tool workpiece angle. 5,534,705, Cl. 250-559.290.
Terman, Michael, to Columbia University. Treatment method for depressive and neurovegetative disorders. 5,533,527, Cl. 128-898.000.
Ternullo, Luigi, Jr.: *See—*
  Adams, Robert D.; Connor, John; Koch, Garrett S.; Rapoport, Stuart D.; and Ternullo, Luigi, Jr., 5,535,164, Cl. 365-201.000.
Terra International, Inc.: *See—*
  Brennan, Joseph T., 5,534,480, Cl. 504-116.000.
Terranova, Joseph C.; and Nemecek, Daniel J., to Twin Disc, Incorporated. Internally-actuating and self-adjusting PTO clutch assembly. 5,533,603, Cl. 192-35.000.
Terrett, David S.: *See—*
  McDonald, Kevin B.; Pierce, Stephen W.; Benowitz, Michael; and Terrett, David S., 5,534,849, Cl. 340-517.000.
Terry, Allan D.: *See—*
  Critzer, W. Larry, 5,533,589, Cl. 180-287.000.
Teshima, Shoei: *See—*
  Nonoyama, Tatsuhiko; Teshima, Shoei; Otsuka, Haruhiko; Tanaka, Yasuyuki; and Hiragami, Kouji, 5,534,357, Cl. 428-629.000.
Testa, James: *See—*
  Horstmann, Jens; and Testa, James, 5,535,223, Cl. 371-27.000.
Tetra Laval Holdings & Finance S.A.: *See—*
  Franke, Rickard; Brandstrom, Per; Kaneko, Yutaka; and Andersson, Bengt, 5,533,550, Cl. 141-51.000.
Tettenhorst, William C.: *See—*
  Heinzman, Stephen W.; Dupont, Jeffrey S.; and Tettenhorst, William C., 5,534,642, Cl. 554-98.000.
Texaco Inc.: *See—*
  Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., 5,534,040, Cl. 48-197.00R.
Texan Corporation: *See—*
  Pirkle, Fred L., 5,533,354, Cl. 62-259.300.
Texas Instruments Incorporated: *See—*
  Beam, Edward A., III; and Seabaugh, Alan C., 5,534,714, Cl. 257-25.000.
  Hornbeck, Larry J., 5,535,047, Cl. 359-295.000.
  LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., 5,535,237, Cl. 375-200.000.
  Leach, Jerald G.; Coomes, Joseph A.; Marshall, Steve P.; and Simar, Laurence R., 5,535,348, Cl. 395-375.000.
  Mahant-Shetti, Shivaling S.; and Landers, Robert J., 5,535,241, Cl. 375-219.000.
  Mukherjee-Roy, Moitreyee; Pettersson, Charles R.; and Debner, Thomas G., 5,535,005, Cl. 356-371.000.

  - Nasserbakht, Mitra, 5,534,793, Cl. 326-44.000.
  - Russell, Ernest J., 5,534,729, Cl. 257-692.000.
  - Schiebel, Richard A.; Kinch, Michael A.; and Koestner, Roland J., 5,534,719, Cl. 257-188.000.
  - Suzuki, Tomohiro; and Sakuta, Toshiyuki, 5,534,817, Cl. 327-545.000.
  - Swoboda, Gary L.; and Ehlig, Peter N., 5,535,331, Cl. 395-183.210.
  - Wang, Chung C., 5,535,386, Cl. 395-600.000.
  - Yaklin, Daniel A., 5,534,770, Cl. 323-284.000.
- Tezuka, Kenichi: *See—*
  - Ito, Youichi; Hanaoka, Akihiro; and Tezuka, Kenichi, 5,534,273, Cl. 426-18.000.
- Tezuka, Shu: *See—*
  - Iwano, Kazuo; Misono, Shinji; and Tezuka, Shu, 5,533,841, Cl. 408-1.00R.
- Thatcher, Raymond J.: *See—*
  - DeFoster, Steven M.; Truestedt, Horst L.; and Thatcher, Raymond J., 5,535,035, Cl. 359-161.000.
- Theil, Thomas: *See—*
  - Mehnert, Walter; and Theil, Thomas, 5,535,142, Cl. 364-559.000.
- Theiss, Alan J.; and Lyon, Douglas B., to Litton Systems, Inc. Integral polepiece magnetic focusing system having enhanced gain and transmission. 5,534,750, Cl. 315-5.350.
- Themins, Patrick A.: *See—*
  - Moore, Alan; and Themins, Patrick A., 5,534,774, Cl. 324-158.100.
- Thermatrix, Inc.: *See—*
  - Holst, Mark R.; Martin, Richard J.; Stilger, John D.; and Yee, Samson C., 5,533,890, Cl. 431-5.000.
- Theurer, Josef; and Peitl, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegessellschaft m.b.H. Tamping tool assembly. 5,533,455, Cl. 104-12.000.
- Thieler, Wolfgang: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Thier, Howard F. Modular sleeping bag. 5,533,216, Cl. 5-413.00R.
- Think, Inc.: *See—*
  - Gaetano, Ralph R., 5,534,971, Cl. 355-126.000.
- Thinking Machines Corporation: *See—*
  - Hillis, W. Daniel, 5,535,408, Cl. 395-800.000.
- Thomas & Betts Corporation: *See—*
  - Moore, Clyde R.; Fredrick, William A.; McIngvale, J. D.; and Wedell, Mark T., 5,535,109, Cl. 362-267.000.
  - Wedell, Mark T., 5,535,111, Cl. 362-304.000.
- Thomas, Danny L.; and Bishop, Clinton L., to Dayco Products, Inc. Method of making toothed belts formed mainly of thermoplastic material. 5,534,217, Cl. 264-516.000.
- Thomas, David M.: *See—*
  - Belcher, Donald K.; and Thomas, David M., 5,535,039, Cl. 359-187.000.
- Thomas, Gordon A.: *See—*
  - Basiev, Tasoltan T.; Bridenbaugh, Paul M.; and Thomas, Gordon A., 5,535,051, Cl. 359-342.000.
- Thomas, John E.: *See—*
  - Tippins, George W.; Thomas, John E.; Tippins, William H.; and Gretz, Ronald D., 5,533,248, Cl. 29-527.700.
- Thomas, Peter: *See—*
  - Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
- Thomas, Raymond H. P.: *See—*
  - Nalewajek, David; Eibeck, Richard E.; and Thomas, Raymond H. P., 5,534,176, Cl. 252-68.000.
- Thomas, Robert E.: *See—*
  - Glaser, Stephen D.; Thomas, Robert E.; and Walsh, Robert J., 5,535,209, Cl. 370-84.000.
- Thomas, Simon: *See—*
  - Hwang, B. Chester; Fernandez, Jose M.; Meadows, Vernon; Thomas, Simon; and Amero, Willard F., Jr., 5,534,366, Cl. 429-91.000.
- Thomas, Thomas L., Jr., to Motorola, Inc. Data processor with future file with parallel update and method of operation. 5,535,346, Cl. 395-375.000.
- Thompson, Catherine C.: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Thompson, Dennis P.; Anderson, Patricia P.; and Slick, Donald, to General Electric Company. Synthesis of low silanol content, triorgano-stopped silicone fluids. 5,534,608, Cl. 528-12.000.
- Thompson, Kevin D., to Arctco, Inc. Adjustable suspension system. 5,533,586, Cl. 180-193.000.
- Thompson, Reginald: *See—*
  - Miller, J. Stanley; and Thompson, Reginald, 5,534,348, Cl. 428-402.000.
- Thomson Broadcast: *See—*
  - Florant, Olivier, 5,534,924, Cl. 348-364.000.
- Thomson Consumer Electronics, Inc.: *See—*
  - Beyers, Billy W., Jr.; and Blatter, Harold, 5,534,942, Cl. 348-569.000.
  - Marks, Bruce G.; and Simpson, Theodore F., 5,534,746, Cl. 313-408.000.
  - White, Charles M., 5,534,810, Cl. 327-308.000.
- Thomson - CSF: *See—*
  - Avignon, Bruno; Barre, Charles; and Canal, Yves, 5,534,870, Cl. 342-70.000.
  - Ayral, Jean-Luc; Tournois, Pascal; and Huignard, Jean-Pierre, 5,535,041, Cl. 359-211.000.
- Thornhill, Charlotte: *See—*
  - Thornhill, James A.; and Thornhill, Charlotte, 5,535,284, Cl. 381-154.000.
- Thornhill, H. G. Rusty: *See—*
  - Hain, John A., Jr.; and Thornhill, H. G. Rusty, 5,535,229, Cl. 371-53.000.
- Thornhill, James A.; and Thornhill, Charlotte. Woofer speaker and acoustically coupled sub-woofer speaker system. 5,535,284, Cl. 381-154.000.
- Thyssen de Reus B.V.: *See—*
  - van der Heiden, A. Th., 5,533,270, Cl. 33-403.000.
- Tibbitts, Gordon A., to Baker Hughes, Inc. Drill bit cutting element. 5,533,582, Cl. 175-430.000.
- Tice, Joseph B.; Diaz, Antonio A.; and Manning, Dennis P., to Bayer Corporation. Protective shell for insulating pipes and fittings. 5,534,319, Cl. 428-36.910.
- Tice, William W., to Miles Inc. Low torque media take-up device. 5,533,687, Cl. 242-348.100.
- Tietjen, Donald L.: *See—*
  - Biggs, Terry L.; Tietjen, Donald L.; and Wilson, Jesse R., 5,535,398, Cl. 395-750.000.
- Timex Corporation: *See—*
  - Jacobs, Michael A.; and Insero, Mark A., 5,535,147, Cl. 364-705.070.
- Timmons, Terry K.: *See—*
  - Everhart, Dennis S.; Delucia, Mary L.; Timmons, Terry K.; and Wright, Robert D., 5,534,335, Cl. 428-224.000.
- Ting, Tah-Kang J., to Etron Technology, Inc. Mixed mode output buffer circuit for CMOSIC. 5,534,789, Cl. 326-21.000.
- Tinkham, Ronald B., to System Analysis & Integration, Inc. Poletop switch automation system. 5,534,858, Cl. 340-870.070.
- Tinti, Maria O.; Misiti, Domenico; Cavazza, Claudio; and Scafetta, Nazareno, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Easters of acyl L-carnitines with gamma-hydroxybutyric acid and pharmaceutical compositions containing them for inhibiting neuronal degeneration and for the treatment of coma. 5,534,549, Cl. 514-551.000.
- Tipley, Roger E.; Moriarty, Michael; and Taylor, Mark, to Compaq Computer Corporation. Prioritization of microprocessors in multiprocessor computer systems. 5,535,395, Cl. 395-729.000.
- Tippins, George W.; Thomas, John E.; Tippins, William H.; and Gretz, Ronald D., to Tippins Incorporated. Method of steel processing using an inline grinder. 5,533,248, Cl. 29-527.700.
- Tippins Incorporated: *See—*
  - Tippins, George W.; Thomas, John E.; Tippins, William H.; and Gretz, Ronald D., 5,533,248, Cl. 29-527.700.
- Tippins, William H.: *See—*
  - Tippins, George W.; Thomas, John E.; Tippins, William H.; and Gretz, Ronald D., 5,533,248, Cl. 29-527.700.
- Tirrell, Steven G.; Becker, Theodore A.; Hattori, Kenneth M.; Crosby, Samuel C.; and Mayne, Michael C., to Maytag Corporation. Thermoformed plastic refrigerator door. 5,533,311, Cl. 52-309.900.
- Tirumala, Muralidhar: *See—*
  - Nelson, Daryl J.; Tirumala, Muralidhar; Butler, Peter; and Budelman, Gerald A., 5,535,094, Cl. 361-697.000.
- Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., to University of California, The Regents of the. TATA-binding protein associated factors drug screens. 5,534,410, Cl. 435-6.000.
- Tjoa, Jan-Tian: *See—*
  - Gras, Jürgen; Hertzler, Siegfried; and Tjoa, Jan-Tian, 5,533,491, Cl. 123-676.000.
- Tjurin, Vladimir M.: *See—*
  - Solntsev, Stanislav S.; Tjurin, Vladimir M.; Izaeva, Natalia V.; Bersenev, Alexei Y.; and Solovjeva, Galina A., 5,534,300, Cl. 427-376.200.
- Tochikura, Akiko: *See—*
  - Takada, Kenzo; Tochikura, Akiko; and Yamaki, Mitsuo, 5,534,430, Cl. 435-240.200.
- Toda, Masaaki: *See—*
  - Ohuchida, Shuichi; Nambu, Fumio; and Toda, Masaaki, 5,534,536, Cl. 514-397.000.
- Toda, Shoji: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188, Cl. 252-299.610.
- Todd, Alvin E. Silhouette image flag with cut-outs and improved flag suspending assembly. 5,533,464, Cl. 116-174.000.
- Todo, Tatsuya: *See—*
  - Ogawa, Mamoru; Todo, Tatsuya; and Mizukami, Miyuki, 5,534,092, Cl. 156-89.000.
- Tohma, Kiyokazu: *See—*
  - Sugita, Ryuji; Tohma, Kiyokazu; Ishida, Tatsuaki; and Ban, Yasuaki, 5,534,324, Cl. 428-694.00T.
- Tohoku Electric Power Co., Inc.: *See—*
  - Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
- Tokai Kogyo Kabushiki Kaisha: *See—*
  - Yada, Yukihiko; and Higuchi, Kazuyoshi, 5,534,316, Cl. 428-31.000.
- Tokico Ltd.: *See—*
  - Nezu, Takashi; Matsumoto, Kenjiro; Kohara, Takao; Sakai, Hiroshi; and Uchiyama, Masaaki, 5,533,597, Cl. 188-319.000.
- Tokish, Leonard J., Jr.; Fallin, Thomas W.; and Schryver, Jeff, to Smith & Nephew Richards, Inc. Surgical milling system. 5,534,005, Cl. 606-80.000.
- Toko, Inc.: *See—*

  - Ishii, Masanori, 5,534,769, Cl. 323-283.000.
- Tokyo Electron Kabushiki Kaisha: *See—*
  - Yamaga, Kenichi, 5,533,736, Cl. 277-3.000.
- Tokyo Electron Limited: *See—*
  - Asano, Takanobu, 5,533,243, Cl. 29-25.010.
- Tokyo Electron Tohoku Kahushiki Kaisha: *See—*
  - Yamaga, Kenichi, 5,533,736, Cl. 277-3.000.
- Tokyo Electron Tohoku Limited: *See—*
  - Asano, Takanobu, 5,533,243, Cl. 29-25.010.
- Tokyo Gas Co., Ltd.: *See—*
  - Shinoaki, Sakura; Sato, Hiroto; and Tanaka, Kyozo, 5,535,316, Cl. 395-134.000.
- Tokyo Kikai Seisakusho, Ltd.: *See—*
  - Hachiya, Tadashi; Takahashi, Yukitoshi; and Kohara, Yuji, 5,533,450, Cl. 101-365.000.
- Tomilson, Robert E.: *See—*
  - Iman, Craig D.; and Tomilson, Robert E., 5,534,157, Cl. 210-700.000.
- Tomiser, Frank J., Jr.: *See—*
  - Jedlicka, Frederick B.; and Tomiser, Frank J., Jr., 5,533,557, Cl. 144-253.800.
- Tomita, Hiromi: *See—*
  - Ito, Jun; Matsuda, Yasumasa; Kumai, Hiroyuki; Nakajima, Akira; Taniguchi, Shigeki; Kashiwa, Hirobumi; Suzuki, Toyokazu; Kawase, Masaki; and Tomita, Hiromi, 5,535,119, Cl. 364-419.030.
- Tomiyama, Koichi: *See—*
  - Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
- Tomiyama, Takamichi: *See—*
  - Mitsumori, Koji; Tomiyama, Takamichi; and Shibata, Keiichi, 5,535,059, Cl. 359-813.000.
- Tomlinson, Roger R.; and Baptista, Laura J. Musical beat jump-rope. 5,533,947, Cl. 482-6.000.
- Tomlinson, Terri L.: *See—*
  - Allen, James J., Jr.; Cooper, Ronald J.; Cox, Douglas H.; McNeil, William L.; Rivera-Sanchez, Herbert; and Tomlinson, Terri L., 5,535,333, Cl. 395-200.030.
- Tomoda, Akihiro: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Tomoegawa Paper Co., Ltd.: *See—*
  - Takano, Masao; Okuno, Ryozo; and Nakamura, Kimihiko, 5,534,377, Cl. 430-102.000.
- Tomoyuki, Yohji: *See—*
  - Ohtsuka, Yasumasa; Nakamura, Shunji; Soya, Takashi; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; Suzuki, Hidenobu; and Abe, Atsuyoshi, 5,534,987, Cl. 355-285.000.
- Tonoyan, Lily; and Minasian, Karen. Folding adjustable glasses on cap peak. 5,533,208, Cl. 2-10.000.
- Toray Industries, Inc.: *See—*
  - Hama, Kenji; Hiroe, Nobutake; and Kuroda, Junko, 5,534,334, Cl. 428-224.000.
- Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; and Wolf, Gerald L. Amphipathic polychelating compounds and methods of use. 5,534,241, Cl. 424-9.321.
- Torii, Tetsuo; and Mizoguchi, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Image processing apparatus for displaying images on left and right display screens. 5,534,918, Cl. 348-53.000.
- Torikoshi, Shinobu: *See—*
  - Katsumata, Kenji; Hirahata, Shigeru; Murata, Toshinori; Takata, Haruki; Torikoshi, Shinobu; Eda, Takanori; and Ishibashi, Kouichi, 5,534,934, Cl. 348-445.000.
- Torkkell, Keijo: *See—*
  - Luoma, Marjo; Torkkell, Keijo; Lylykangas, Reijo; and Virta, Pirkko, 5,534,476, Cl. 502-335.000.
- Tornquist, Gerald E.; and Hruska, Paul E. Self positioning nut. 5,533,863, Cl. 415-229.000.
- Toro Company, The: *See—*
  - Goman, Gerald E.; Fay, Malachy; and Dunlap, Joel M., 5,533,326, Cl. 56-7.000.
  - Sallstrom, Steve A.; Goman, Gerald E.; and Dunlap, Joel M., 5,533,325, Cl. 56-7.000.
- Torricelli, Piero: *See—*
  - Campardo, Giovanni; Costa, Raffaele; and Torricelli, Piero, 5,535,157, Cl. 365-185.050.
- Torterolo, Franco, to Minnesota Mining and Manufacturing Company. Foldable element for use in a case housing a roll of photosensitive material. 5,533,620, Cl. 206-408.000.
- Tosaka, Akio: *See—*
  - Fujinaga, Chikako; Tosaka, Akio; Kato, Toshiyuki; and Sato, Kaku, 5,534,089, Cl. 148-603.000.
- Tosaki, Yoshihiro: *See—*
  - Fukazawa, Toshio; Tosaki, Yoshihiro; Wada, Kumiko; Mitani, Satoru; and Yanagi, Terumi, 5,535,079, Cl. 360-126.000.
- Toth, Ronald E.: *See—*
  - Jerman, John H.; Toth, Ronald E.; Winchell, David A.; and Pennington, David W., 5,533,412, Cl. 73-861.950.
- Toto Ltd.: *See—*
  - Ando, Shigeru; Haraga, Hisato; Miyahara, Hidetaka; Tanaka, Junji; and Takamatsu, Hiroshi, 5,534,120, Cl. 205-464.000.
- Touchton, Scott F.; Peinetti, Donald L.; and Duffy, William J., Jr., to Invisible Fence Company, Inc. Programming apparatus for programmable animal control device. 5,533,469, Cl. 119-721.000.
- Tournois, Pascal: *See—*
  - Ayral, Jean-Luc; Tournois, Pascal; and Huignard, Jean-Pierre, 5,535,041, Cl. 359-211.000.
- Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., to Burroughs Wellcome Co.; and University of Michigan, The Regents of the. Therapeutic nucleosides. 5,534,535, Cl. 514-394.000.
- Toy Biz, Inc.: *See—*
  - Arad, Abraham A.; Pitrone, Anne; and Jeffway, Robert W., Jr., 5,533,920, Cl. 446-409.000.
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Nomura, Yasuhiko; Nishida, Ikuharu; and Kashima, Tadaaki, 5,534,336, Cl. 428-229.000.
- Toyo Ink Mannfacturing Co., Ltd.: *See—*
  - Matsuo, Masaaki; and Kimura, Takayuki, 5,533,451, Cl. 101-415.100.
- Toyo Metallizing Kabushiki Kaisha: *See—*
  - Saito, Masami; Mogami, Akio; Kanasasi, Yoshihisa; and Kobayashi, Torataro, 5,534,338, Cl. 428-242.000.
- Toyo Suisan Kaisha, Ltd.: *See—*
  - Ito, Youichi; Hanaoka, Akihiro; and Tezuka, Kenichi, 5,534,273, Cl. 426-18.000.
- Toyoda Gosei Co., Ltd.: *See—*
  - Ogisu, Yasuhiko; Kato, Mamoru; and Takahashi, Shigeyuki, 5,534,297, Cl. 427-322.000.
- Toyoda Koki Kabushiki Kaisha: *See—*
  - Imai, Tomoyasu; and Mukai, Ryohei, 5,533,931, Cl. 451-11.000.
- Toyoko Giken Co., Ltd.: *See—*
  - Sakamoto, Nobuyuki; Kobayashi, Takehiko; and Horiguchi, Takashi, 5,534,214, Cl. 264-333.000.
- Toyota, Eiichi: *See—*
  - Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
- Toyota Jidosha Kabushiki Kaisha: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
  - Sugitani, Nobuyoshi; Okuwa, Masayuki; Morikawa, Takeshi; and Nonomura, Yutaka, 5,533,397, Cl. 73-504.160.
- Trackl, Karl: *See—*
  - Sutter, Ralf; Beerstecher, Lutz; Hruza, David; Stetter-Alle, Raimund; and Trackl, Karl, 5,533,539, Cl. 134-95.200.
- Traini, Carlo; and Meneghini, Giovanni, to De Nora Permelec S.p.A. Cell having a porous diaphragm for chlor-alkali electrolysis and process using the same. 5,534,122, Cl. 204-266.000.
- Tran, Nang T.; and Keyes, Michael P., to Minnesota Mining and Manufacturing Company. Method of fabricating a polysilicon thin film transistor. 5,534,445, Cl. 437-21.000.
- Tran, Phieu M.: *See—*
  - Smolinske, Jeffrey C.; Clanton, Christopher L.; and Tran, Phieu M., 5,535,210, Cl. 370-85.200.
- Tran, Quang-Ngoc: *See—*
  - Ackermann, Manfred; Nguyen, Ngoc-Thach; Schustek, Siegfried; and Tran, Quang-Ngoc, 5,533,415, Cl. 74-7.00E.
- Trank, Robert D. Foldable stabilizing bracket for compressed air tanks. 5,533,701, Cl. 248-316.400.
- Trans-Link International Corp.: *See—*
  - Chong, Leighton K.; and Kamprath, Christine K., 5.535,120, Cl. 364-419.030.
- TranSwitch Corporation: *See—*
  - Ng, Tat K.; and D'Jamoos, Michael, 5,535,218, Cl. 370-102.000.
- Travers, Christine; Courty, Philippe; and Sarrazin, Patrick, to Institut Francais du Petrole. Process for reducing the benzene content of petrols. 5,534,658, Cl. 585-738.000.
- Trebing, Linda: *See—*
  - Schlapfer, Johannes F.; Frigg, Robert; Amrein, Thomas; Recher, Daniel; and Trebing, Linda, 5,534,001, Cl. 606-61.000.
- Tremblay, Jules M.; Balmer, David C.; and Ruff, Helmut, to Ricon Corporation. Chairlift with positioning carriage and swivel mechanism with safety interlock. 5,533,594, Cl. 187-201.000.
- Trinh, Thanh D.: *See—*
  - Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., 5,534,812, Cl. 327-333.000.
- Trinh, Toan: *See—*
  - Pilosof, David; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark Lee; Trinh, Toan; and Zwerdling, Susan S., 5,534,165, Cl. 252-8.910.
- Trokhan, Paul D.; Van Phan, Dean; and Huston, Larry L., to Procter & Gamble Company, The. Cellulosic fibrous structures having discrete regions with radially oriented fibers therein, apparatus therefor and process of making. 5,534,326, Cl. 428-131.000.
- Troup-Packman, Sue, to Hughes Aircraft Company. Iron-plated aluminum alloy parts. 5,534,358, Cl. 428-648.000.
- Troy, Edward J.; and Rosado, Anibal, to Rohm and Haas Company. Preparation of butadiene-based impact modifiers. 5,534,594, Cl. 525-310.000.
- Trubetskoy, Vladimir S.: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; and Wolf, Gerald L., 5,534,241, Cl. 424-9.321.

- Trubey, Bradley S.; and Walker, Anthony D., to International Business Machines Corporation. Serial network fault detection, isolation and restorative device. 5,535,192, Cl. 370-16.100.
- Truestedt, Horst L.: *See—*
  - DeFoster, Steven M.; Truestedt, Horst L.; and Thatcher, Raymond J., 5,535,035, Cl. 359-161.000.
- Trustees of Boston University: *See—*
  - Aldea, Gabriel S., 5,533,957, Cl. 600-16.000.
- Trutna, William R., Jr.; and Williamson, James B., to Hewlett-Packard Company. Resolution improvement of images recorded using storage phosphors. 5,534,702, Cl. 250-484.400.
- TRW Inc.: *See—*
  - Yujiri, Larry; Mussetto, Michael S.; and Uyeno, Gerald P., 5,534,874, Cl. 342-351.000.
- TRW Repa GmbH: *See—*
  - Maiwald, Helmut; and Böhmler, Klaus, 5,533,588, Cl. 180-282.000.
- TRW Vehicle Safety Systems Inc.: *See—*
  - Abraham, Michelle M., 5,533,753, Cl. 280-739.000.
  - Brown, Louis R.; and Steffens, Charles F., Jr., 5,533,752, Cl. 280-739.000.
  - Jenkins, Jeffrey A.; and Wiers, John W., 5,533,745, Cl. 280-728.200.
  - Riley, Michael C., 5,533,754, Cl. 280-741.000.
- Tsai, Keh-Chyuan; and Li, Jeng-Wei, to National Science Council. Seismic energy dissipation device. 5,533,307, Cl. 52-167.300.
- Tsai, Margaret C.: *See—*
  - Rubscha, Robert F.; Tsai, Margaret C.; and Buddendeck, Mark H., 5,534,989, Cl. 355-309.000.
- Tsao, Tien-Ren. Method and apparatus for determining image affine flow using artifical neural system with simple cells and lie germs. 5,535,302, Cl. 395-21.000.
- Tseng, Horng-Huei; and Lu, Chih-Yuan, to Industrial Technology Research Institute. Method of forming a stacked capacitor with an "I" shaped storage node. 5,534,457, Cl. 437-52.000.
- Tseng, Horng-Huei; and Lu, Chih-Yuan, to Vanguard International Semiconductor Corp. Optimized contact plug process. 5,534,460, Cl. 437-187.000.
- Tseng, Hsien-Chang. Thread tension device with latch for a sewing machine. 5,533,460, Cl. 112-254.000.
- Tseng, Liang-Chuan, to Hsu, Chun-Hsiung. Paper holder. 5,533,236, Cl. 24-67.500.
- Tsubota, Masashi, to NEC Corporation. Microprocessor status register having plural control information registers each set and cleared by on and off decoders receiving the same control data word. 5,535,404, Cl. 395-800.000.
- Tsuchida, Yuji, to Kabushiki Kaisha Environmental Engineering Laboratory. Method and apparatus for composting organic matters having high water content. 5,534,042, Cl. 71-9.000.
- Tsuchiya, Makio: *See—*
  - Aoki, Katsuhiko; Tsuchiya, Makio; and Inoue, Seiya, 5,535,430, Cl. 455-54.100.
- Tsuchiya, Norihiko: *See—*
  - Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.
- Tsuda, Kazunori: *See—*
  - Fujikawa, Masaru; Tsuda, Kazunori; and Honda, Munenobu, 5,533,712, Cl. 254-362.000.
- Tsugai, Masahiro; Bessho, Mikio; and Sesekura, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Method for compensating an offset voltage temperature drift in a semiconductor strain gage sensor. 5,534,773, Cl. 324-105.000.
- Tsujii, Hideki: *See—*
  - Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.
- Tsukada, Isao; Kanazawa, Manabu; and Kikkawa, Shoushi, to Canon Kabushiki Kaisha. Recording apparatus with easily assemblable roller. 5,533,822, Cl. 400-641.000.
- Tsukahara, Daiki: *See—*
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
- Tsukamoto, Katsuhiro: *See—*
  - Mori, Kenichi; and Tsukamoto, Katsuhiro, 5,534,730, Cl. 257-757.000.
- Tsumori, Yasuo: *See—*
  - Tachimori, Masaharu; Yano, Takayuki; Tsumori, Yasuo; Nakajima, Tatsuo; and Hamaguchi, Isao, 5,534,446, Cl. 437-26.000.
- Tsunoda, Masakiyo; Nakajima, Hiroaki; and Koshimura, Masami, to Mitsubishi Materials Corporation. Thermistor. 5,534,843, Cl. 338-22.00R.
- Tsuru, Hiroyuki: *See—*
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
- Tsutahara, Kouichirou: *See—*
  - Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
- Tsutsui, Koichi; and Rhue, Samuel A., to Nippon Paint Co., Ltd. Supplying method of powder paints to coaters and powder coating machine capable of pulverizing powder paint pellets into a sprayable powder. 5,534,064, Cl. 118-308.000.
- Tsutsui, Kyoji; and Yamaguchi, Takehito, to Ricoh Company, Ltd. Reversible thermosensitive coloring recording method, recording medium and recording apparatus for the recording method. 5,534,907, Cl. 347-175.000.
- Tsutsui, Yoshio: *See—*
  - Horie, Akira; Tsutsui, Yoshio; Ando, Takeshi; Matsui, Takayuki; Toyota, Eiichi; and Saitoo, Syuuji, 5,535,114, Cl. 363-58.000.
- Tsuzuki, Yasuaki; Kuroyanagi, Akira; and Nishizawa, Toshiaki, to Nippondenso Co., Ltd. Method of producing a semiconductor device having accurate current detection. 5,534,454, Cl. 437-41.000.
- Tsuzuki, Yasushi; Yamagata, Shin-ichi; and Yamakawa, Akira, to Sumitomo Electric Industries, Ltd. Apparatus for producing a silicon nitride sintered body. 5,533,930, Cl. 432-120.000.
- Tuchida, Michiro; Nomura, Masaaki; Kimura, Soichiro; Aosaki, Ko; and Kitami, Tatsuo, to Fuji Photo Film Co., Ltd. Reflection type projector. 5,534,955, Cl. 353-66.000.
- Tuckey, Peter R.: *See—*
  - Julien, Christine E.; and Tuckey, Peter R., 5,533,936, Cl. 472-118.000.
- Tukita, Ryuichi: *See—*
  - Kataoka, Akira; Mimura, Hitoshi; Kuramoto, Manabu; and Tukita, Ryuichi, 5,533,282, Cl. 36-129.000.
- Tumms, Paul G.: *See—*
  - Petschauer, Richard J.; Rothenberger, Roland D.; and Tumms, Paul G., 5,535,133, Cl. 364-489.000.
- Tung, Ming S. Methods and compositions for mineralizing and/or fluoridating calcified tissues with amorphous strontium compounds. 5,534,244, Cl. 424-52.000.
- Tungare, Aroon V.: *See—*
  - Zupancic, Joseph J.; Conrad, Jeffrey P.; Konicek, Jiri D.; and Tungare, Aroon V., 5,534,565, Cl. 523-454.000.
- Tupper, George I. F.; Allegranza, Anthony C.; and Doherty, Phillip J., to British Broadcasting Corporation. Compensating for non-linear effects in signal processing with active devices. 5,534,820, Cl. 330-149.000.
- Turek, Douglas E.: *See—*
  - Faley, Timothy L.; Mills, Michael E.; Teramoto, Yoshihiko; Turek, Douglas E.; and Yabuki, Kazuyuki, 5,534,205, Cl. 264-103.000.
- Turk, Rodney E.: *See—*
  - Rogers, Russell L.; and Turk, Rodney E., 5,534,024, Cl. 623-1.000.
- Turner, Rudolf: *See—*
  - Citta, Richard W.; Sgrignoli, Gary J.; and Turner, Rudolf, 5,534,938, Cl. 348-495.000.
- Twin Disc, Incorporated: *See—*
  - Terranova, Joseph C.; and Nemecek, Daniel J., 5,533,603, Cl. 192-35.000.
- Tyson Holding Company: *See—*
  - Moshier, Mark W.; Haley, John C.; Haley, Bobby Z.; and Andrews, Stanley B., 5,533,343, Cl. 62-63.000.
- Tzuzuki, Shogo: *See—*
  - Abe, Tadashi, 5,535,230, Cl. 372-43.000.
- U S West Technologies, Inc.: *See—*
  - Blumhardt, Mark S., 5,535,263, Cl. 379-67.000.
- Ube Industries, Ltd.: *See—*
  - Nishihira, Keigo; Yoshida, Shinichi; and Tanaka, Shuji, 5,534,648, Cl. 558-277.000.
- UCAR Carbon Technology Corporation: *See—*
  - Lewis, Irwin C.; Chang, Ching F.; Keller, George E., II; Gilleskie, Gary L.; and Shao, Richard L., 5,534,133, Cl. 208-39.000.
- Uchida, Naoyuki: *See—*
  - Shimamori, Takumi; and Uchida, Naoyuki, 5,535,180, Cl. 369-13.000.
- Uchida, Toshi K., to Optobahn Corporation. Integrated optoelectronic coupling and connector. 5,535,296, Cl. 385-89.000.
- Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, to Canon Kabushiki Kaisha. Replaceable ink tank. 5,534,899, Cl. 347-49.000.
- Uchikawa, Akira, to Unisia Jecs Corporation. Method and apparatus for self diagnosis of an internal combustion engine. 5,533,332, Cl. 60-274.000.
- Uchiyama, Masaaki: *See—*
  - Nezu, Takashi; Matsumoto, Kenjiro; Kohara, Takao; Sakai, Hiroshi; and Uchiyama, Masaaki, 5,533,597, Cl. 188-319.000.
- Ueda, Hideo; Hiromoto, Mitsuo; Gang, Meng; and Yamasaki, Yutaka, to Kyoto Dai-Ichi Kagaku Co., Ltd. Expiration collector. 5,533,513, Cl. 128-719.000.
- Ueda, Kayoko: *See—*
  - Minai, Masayoshi; Higashii, Takayuki; Toda, Shoji; Takano, Naoyuki; Ueda, Kayoko; and Fujisawa, Koichi, 5,534,188. Cl. 252-299.610.
- Ueda, Seiji: *See—*
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Ueda, Shinji: *See—*
  - Ishikawa, Takatoshi; Ueda, Shinji; Sasaki, Hirotomo; and Kojima, Tetsuro, 5,534,394, Cl. 430-393.000.
- Uehara, Yoshikazu: *See—*
  - Kambara, Yoshihiko; Uehara, Yoshikazu; Abe, Takeya; and Asao, Koichi, 5,534,655, Cl. 564-127.000.
- Ueno, Ryuji: *See—*
  - Ueno, Ryuzo; Ueno, Ryuji; Kato, Ichie; and Oda, Tomio, 5,534,547, Cl. 514-530.000.
- Ueno, Ryuzo; Ueno, Ryuji; Kato, Ichie; and Oda, Tomio, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Prostaglandins of the D series, and tranquilizers and soporifics containing the same. 5,534,547, Cl. 514-530.000.

- Ueno, Takeo: *See—*
  - Miyata, Kenji; Tsujii, Hideki; Oka, Shinichi; Takegami, Masaaki; Ueno, Takeo; and Suda, Tetsuya, 5,533,351, Cl. 62-174.000.
- Ueno, Yoshihiro: *See—*
  - Kubota, Atsuko; Kojima, Masakatu; Tsuchiya, Norihiko; Samata, Shuichi; Numano, Masanori; and Ueno, Yoshihiro, 5,534,294, Cl. 427-255.000.
- Uenoyama, Hiromi, to Rohm Co., Ltd. Electrically erasable read only memory. 5,535,162, Cl. 365-200.000.
- Ueyama, Kenichi; and Kawamukai, Hiroshi, to Kao Corporation. Recording medium. 5,534,322, Cl. 428-64.200.
- Uhlen, Mathias; and Lundeberg, Joakim, to Cemu Bioteknik AB. Chemical method for the analysis of DNA sequences. 5,534,424, Cl. 435-91.200.
- Ujiie, Masato, to NEC Corporation. Semiconductor device having a semiconductor chip mounted on an insulating body. 5,534,464, Cl. 437-209.000.
- Ulichney, Robert A., to Digital Equipment Corporation. Void and cluster apparatus and method for generating dither templates. 5,535,020, Cl. 358-457.000.
- Ulrich, Peter C.; and Wagle, Dilip R., to Alteon Inc. Methods of inhibiting the advanced glycosylation of proteins using tetramic and tetronic acids and compositions therefor. 5,534,540, Cl. 514-425.000.
- Ultradent Products, Inc.: *See—*
  - Jensen, Steven D.; and Fischer, Dan E., 5,534,562, Cl. 523-118.000.
- Umeyama, Mitsuhiro: *See—*
  - Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
- Underwood, David C., to Procter & Gamble Company, The. Concentrated liquid hard surface detergent compositions containing maleic acid-olefin copolymers. 5,534,184, Cl. 510-426.000.
- Underwood, Keith F.: *See—*
  - Durante, Richard J.; and Underwood, Keith F., 5,535,397, Cl. 395-740.000.
- Unilever Patent Holdings BV: *See—*
  - Baines, Stephen J.; and Hayward, Barry, 5,534,341, Cl. 428-288.000.
- Union Underwear Company, Inc.: *See—*
  - Wethington, Glenn; Claiborne, Jimmy D.; and Strain, Mark R., 5,533,461, Cl. 112-278.000.
- Unique Industries, Inc.: *See—*
  - Baer, Ronald W., 5,533,671, Cl. 239-10.000.
- Uniroyal Chemical Company, Inc.: *See—*
  - Kataoka, Masaaki; Wakai, Akira; and Nakamura, Takehiko, 5,534,543, Cl. 514-517.000.
- Unisia Jecs Corporation: *See—*
  - Uchikawa, Akira, 5,533,332, Cl. 60-274.000.
- UNISYS Corporation: *See—*
  - Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,535,405, Cl. 395-800.000.
  - Petschauer, Richard J.; Rothenberger, Roland D.; and Tumms, Paul G., 5,535,133, Cl. 364-489.000.
  - Starr, Mark T.; Mento, Craig J.; Faix, Carl R.; Pressman, Robert A.; and Cooper, Albert B., 5,535,264, Cl. 379-89.000.
- United Artists Theatre Circuit, Inc.: *See—*
  - Vetter, Richard, 5,534,954, Cl. 352-79.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
  - Gunton, David J., 5,535,445, Cl. 455-327.000.
- United Microelectronics Corporation: *See—*
  - Hong, Gary, 5,534,447, Cl. 437-27.000.
  - Pan, Hong-Tsz; Yang, Ming-Tzong; and Shy, Shyi-Long, 5,533,634, Cl. 216-12.000.
- United States Gypsum Co.: *See—*
  - Immordino, Salvatore C., Jr., 5,534,059, Cl. 106-778.000.
- United States of America
  - Air Force: *See—*
    - Clark, Natalie, 5,535,029, Cl. 359-63.000.
    - Khoury, Jihad; and Woods, Charles L., 5,535,024, Cl. 359-7.000.
    - Laube, Samuel J. P.; and Stark, Elizabeth F., 5,535,128, Cl. 364-468.260.
    - Leining, Richard B., 5,534,090, Cl. 149-15.000.
    - Prasad, Somuri V.; and Mecklenburg, Karl R., 5,534,044, Cl. 75-231.000.
    - Tan, Loon-Seng; and Srinivasan, Kasturi R., 5,534,613, Cl. 528-176.000.
  - Army: *See—*
    - Dutta, Mitra; and Zhou, Weimin, 5,535,045, Cl. 359-248.000.
  - Energy: *See—*
    - Rivers, Craig J.; Lee, Roanne A.; and Jones, Glenn E., 5,534,663, Cl. 174-35.0GC.
    - Wolpert, David H., 5,535,301, Cl. 395-20.000.
  - Health and Human Services: *See—*
    - Merrick, B. Alex; Patterson, Rachel M.; Hall, Robert G.; He, Chaoying; and Selkirk, James K., 5,534,121, Cl. 204-459.000.
  - National Aeronautics and Space Administration: *See—*
    - Ferris, Alice T., 5,533,380, Cl. 73-1.00B.
    - Weinstein, Leonard M., 5,534,995, Cl. 356-129.000.
  - Navy: *See—*
    - Bowman, Steven R.; Ganem, Joseph; and Feldman, Barry J., 5,535,232, Cl. 372-70.000.
    - Evans, Le Andra E.; White, Robert J.; Brown, Russell L.; Galliher, Kenneth R.; and Carlson, Mark E., 5,534,759, Cl. 318-139.000.
    - Leibowitz, Lawrence M.; and Mai, Tuan A., 5,535,402, Cl. 395-800.000.
    - Nedderman, William H., Jr., 5,533,699, Cl. 248-278.100.
    - Shaw, Jonathan L.; and Gray, Henry F., 5,534,311, Cl. 427-526.000.
    - Yang, Tsih C., 5,535,176, Cl. 367-13.000.
- U.S. Philips Corporation: *See—*
  - Blom, Anton C.; and Slegers, Frans, 5,534,753, Cl. 315-244.000.
  - De Haan, Gerard; Biezen, Paul W. A. C.; Ojo, Olukayode A.; and Huijgen, Hendrik, 5,534,946, Cl. 348-619.000.
  - Fuderer, Miha; and Van Ormondt, Dirk, 5,534,777, Cl. 324-309.000.
  - Krapp, Hans-Dieter; Hanek, Martin; and Frings, Hubert, 5,534,742, Cl. 313-113.000.
  - Loos, Albertus L. J. G. M.; and Selder, Otto R. A. M., 5,534,778, Cl. 324-318.000.
  - Oomen, Emmanuel W. J. L., 5,534,748, Cl. 313-479.000.
  - Van de Waterlaat, Adrianus C. J. G.; Vreeswijk, Franciscus; and Hamann, Theodora L., 5,534,932, Cl. 348-432.000.
- U.S. Robotics, Inc.: *See—*
  - Sommer, Gary W., 5,535,014, Cl. 358-434.000.
- U.S. Rubber Reclaiming, Inc.: *See—*
  - LaGrone, Bobby D., 5,533,680, Cl. 241-23.000.
- United States Surgical Corporation: *See—*
  - Granger, Richard N., 5,533,521, Cl. 128-774.000.
  - Gruskin, Elliott A.; Lee, Daniel R.; and Brown, Lloyd S., 5,534,288, Cl. 427-2.310.
  - Lander, Jack R., 5,534,009, Cl. 606-185.000.
  - Rizk, Said; Powers, William O.; and Samsel, W. Scott, 5,533,982, Cl. 604-239.000.
- United Technologies Corporation: *See—*
  - Andrus, James S., 5,534,086, Cl. 148-513.000.
  - Ball, Gary A.; and Newman, Leon A., 5,534,993, Cl. 356-5.090.
  - Cone, Fred P.; Prece, Stephen V.; and Best, Donn A., 5,534,085, Cl. 148-336.000.
  - Mullooly, John F.; Davis, Franklin J.; Madden, Thomas J.; and Wright, Richard R., 5,533,330, Cl. 60-39.320.
- Unitrack Industries, Inc.: *See—*
  - Marchetti, Richard J., 5,533,631, Cl. 211-41.000.
- Université de Montréal: *See—*
  - Lavigne, Gilles; and TenBokum, Léo, 5,533,514, Cl. 128-744.000.
- Universities Research Association, Inc.: *See—*
  - Cliff, Paul L., Jr., 5,535,096, Cl. 361-726.000.
- University of Alberta, The Governors of the: *See—*
  - Moussy, Francis, 5,534,025, Cl. 623-11.000.
- University of British Columbia, The: *See—*
  - Ansell, Steve, 5,534,499, Cl. 514-25.000.
  - Hayden, Michael; Goldberg, Paul; Andrew, Susan; and Rommens, Johanna M., 5,534,438, Cl. 435-320.100.
- University of California, The Regents of the: *See—*
  - Baker, Joffre; Chien, Kenneth; King, Kathleen; Pennice, Diane; and Wood, William, 5,534,615, Cl. 530-350.000.
  - Bowers, Mark; and Hankla, Allen, 5,535,049, Cl. 359-334.000.
  - Elmer, John W.; and O'Brien, Dennis W., 5,534,677, Cl. 219-121.350.
  - Karin, Michael; Hibi, Masahiko; and Linn, Anning, 5,534,426, Cl. 435-194.000.
  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
  - Van Putten, Maurice H. P. M.; and Felce, Andrew G., 5,533,567, Cl. 165-1.000.
- University of Chicago: *See—*
  - Kaun, Thomas D., 5,534,367, Cl. 429-103.000.
- University of Hawaii: *See—*
  - Kratky, Bernard A., 5,533,299, Cl. 47-18.000.
- University Of Massachusetts Medical Center: *See—*
  - Green, Michael R.; Zapp, Maria L.; and Stern, Seth, 5,534,408, Cl. 435-5.000.
- University of Michigan, Regents of the: *See—*
  - Palsson, Bernhard Ø.; Clarke, Michael F.; and Chuck, Alice S. Y., 5,534,423, Cl. 435-172.100.
  - Townsend, Leroy B.; Drach, John C.; Good, Steven S.; Daluge, Susan M.; and Martin, Michael T., 5,534,535, Cl. 514-394.000.
- University of Nebraska, The Board of Regents of the: *See—*
  - McDonald, Thomas L., 5,534,431, Cl. 435-240.270.
- University of Saskatchewan: *See—*
  - Potter, Andrew A.; and Harland, Richard J., 5,534,256, Cl. 424-184.100.
- University of South Florida: *See—*
  - Ranganathan, Nagarajan; and Sastry, Raghu, 5,535,292, Cl. 382-302.000.
- University of Southern California: *See—*
  - Lee, Vincent H.; and Yen, Wan-Ching, 5,534,496, Cl. 514-17.000.
  - Rodgers, Kathleen E.; and Dizerega, Gere S., 5,534,261, Cl. 424-450.000.
  - Spears, Colin P.; and Gustavsson, Bengt G., 5,534,519, Cl. 814-274.000.
- University of Toledo: *See—*
  - Morgan, Alan R.; Selman, Steven H.; and Kreimer-Birnbaum, Martha, 5,534,506, Cl. 514-185.000.
- University of Utah: *See—*
  - Petersen, Robert V.; Hsu, Tsung-Min; Lee, Han-Chen; and Christy, Don, 5,534,260, Cl. 424-448.000.

- University of Virginia Patent Foundation: *See*—
  - Wadley, Haydn N. G.; and Groves, James F., 5,534,314, Cl. 427-585.000.
- University of Waterloo: *See*—
  - Gillham, Robert W., 5,534,154, Cl. 210-668.000.
- Uniweld Products, Inc.: *See*—
  - Pearl, David S., II; and Smith, Frank G., 5,533,891, Cl. 431-154.000.
- Uno, Kiyoshi: *See*—
  - Larsson, Ake; and Uno, Kiyoshi, 5,533,804, Cl. 366-274.000.
- Uno, Teruhiko; Hirasawa, Toshio; Sato, Toshio; Nakagawa, Kazuyo; and Takahashi, Hiroshi, to Kabushiki Kaisha Toshiba. Processing apparatus for mail with stamps. 5,535,127, Cl. 364-464.020.
- Upchurch Scientific, Inc.: *See*—
  - Schick, Hans G., 5,534,152, Cl. 210-656.000.
- Urawa, Motoo: *See*—
  - Sakaizawa, Katsuhiro; Urawa, Motoo; Kukimoto, Tsutomu; and Yoshida, Satoshi, 5,534,982, Cl. 355-246.000.
- Ushikubo, Takashi; Oshima, Kazunori; Ihara, Tatsuya; and Amatsu, Hiroyuki, to Mitsubishi Chemical Corporation. Method for producing a nitrile. 5,534,650, Cl. 558-319.000.
- Ushimaru, Kouichi: *See*—
  - Seki, Junzo; Yamamoto, Hirofumi; Yamane, Shuji; Takahashi, Yutaka; and Ushimaru, Kouichi, 5,534,502, Cl. 514-31.000.
- Usiroyama, Hiroyuki: *See*—
  - Arai, Takeo; Sekiguchi, Tadashi; Habu, Takeshi; Nishio, Shiyouji; Usiroyama, Hiroyuki; Tanaka, Kenichi; and Kobayashi, Akira, 5,534,389, Cl. 430-401.000.
- Ustanik, Teresa: *See*—
  - Zanecchia, Denise; Heinrich, Ann M.; and Ustanik, Teresa, 5,534,952, Cl. 351-200.000.
- Usui, Hideyuki: *See*—
  - Noguchi, Hiroyuki; Usui, Hideyuki; and Yonemochi, Kenshin, 5,535,093, Cl. 361-686.000.
- Utsumi, Akihiro: *See*—
  - Yano, Tetsuo; Ooie, Toshihiko; Yoneda, Masafumi; Utsumi, Akihiro; Katsumura, Munehide; and Matsuda, Jun, 5,534,103, Cl. 156-272.800.
- Uyeno, Gerald P.: *See*—
  - Yujiri, Larry; Mussetto, Michael S.; and Uyeno, Gerald P., 5,534,874, Cl. 342-351.000.
- V. Kann Rasmussen Industri A/S: *See*—
  - Brade, Claus B.; and Bartholin, Niels, 5,533,391, Cl. 73-170.190.
- Valdajos-Gallego, Luis, to Talleres de Escoriaza, S.A. (TESA). Safety lock and flat key for such a lock. 5,533,369, Cl. 70-493.000.
- Vallone, Lee A.: *See*—
  - Baker, Albert D.; Blach, Heribert J.; Chen, James; Krischer, Ellen L.; Pashos, Maria; Radics, Nancy; and Vallone, Lee A., 5,535,198, Cl. 370-60.000.
- Valmet Paper Machinery Inc.: *See*—
  - Karvinen, Mikko; Kerttula, Reima; Laapotti, Jorma; and Pajula, Juhani, 5,534,116, Cl. 162-274.000.
- Valvtec Pty Limited: *See*—
  - Dixon, Lloyd J., 5,533,546, Cl. 137-218.000.
- Valyocsik, Ernest W., to Mobil Oil Corporation. Organic compound conversion with MCM-58. 5,534,656, Cl. 585-709.000.
- Van Doorne's Transmissie B.V.: *See*—
  - Smeets, Paulus M., 5,533,940, Cl. 474-242.000.
- van Asten, Ronny W. F.: *See*—
  - Perry, Phillip G.; O'Dell, Gene W.; and van Asten, Ronny W. F., 5,534,172, Cl. 508-156.000.
- Van Buskirk, Oral R.: *See*—
  - Ferretti, August; and Van Buskirk, Oral R., 5,533,465, Cl. 117-224.000.
- Van Dam, Aaldert C.; and Honings, Kenneth C., to Blueprint Automation, Inc. Closure checking apparatus for bagged goods. 5,533,315, Cl. 53-53.000.
- van den Biggelaar, Henricus A.: *See*—
  - Meggelaars, Michael M.; van den Biggelaar, Henricus A.; and Kussendrager, Klaas D., 5,534,555, Cl. 514-777.000.
- Vandergriff, Arvel L., to Vandergriff, Inc. Fountain dryer unit. 5,533,276, Cl. 34-583.000.
- Vandergriff, Inc.: *See*—
  - Vandergriff, Arvel L., 5,533,276, Cl. 34-583.000.
- van der Heiden, A. Th., to Thyssen de Reus B.V. Method and apparatus for measuring stairs. 5,533,270, Cl. 33-403.000.
- Vanderlinden, Steven L.: *See*—
  - Ho, Wen-Jei; Stember, Michael J.; and Vanderlinden, Steven L., 5,535,368, Cl. 395-497.010.
- Vandervort, Annette L.: *See*—
  - Hanson, Thomas A.; Kish, William J.; Novak, Jerome J.; and Vandervort, Annette L., 5,534,994, Cl. 356-73.100.
- Vanderwee, Johan: *See*—
  - Van Himbeeck, Clemens; and Vanderwee, Johan, 5,533,600, Cl. 190-18.00R.
- Van de Waterlaat, Adrianus C. J. G.; Vreeswijk, Franciscus; and Hamann, Theodora L., to U.S. Philips Corporation. Letterbox television system. 5,534,932, Cl. 348-432.000.
- van Doornmalen, Adrianus M. C. M.: *See*—
  - de Gier, Gertrudis M. G.; van Doornmalen, Adrianus M. C. M.; and Wingens, Hendrikus T. J. J., 5,533,682, Cl. 241-101.730.
- Vanguard International Semiconductor Corp.: *See*—
  - Tseng, Horng-Huei; and Lu, Chih-Yuan, 5,534,460, Cl. 437-187.000.
- Van Himbeeck, Clemens; and Vanderwee, Johan, to Samsonite Corporation. Recessed multipurpose garment bag hook. 5,533,600, Cl. 190-18.00R.
- van Krieken, Frits M.; and Stoop, Gustaaf A. P., to Vitatron Medical, B.V. Dual chamber pacemaker system with improved response to retrograde conduction. 5,534,017, Cl. 607-14.000.
- Van Ormondt, Dirk: *See*—
  - Fuderer, Miha; and Van Ormondt, Dirk, 5,534,777, Cl. 324-309.000.
- Vanover, Michael T.: *See*—
  - Bergkvist, John J., Jr.; Carmon, Donald E.; and Vanover, Michael T., 5,535,380, Cl. 395-550.000.
- Van Phan, Dean: *See*—
  - Trokhan, Paul D.; Van Phan, Dean; and Huston, Larry L., 5,534,326, Cl. 428-131.000.
- Van Putten, Maurice H. P. M.; and Felce, Andrew G., to University of California, The Regents of The. Method and apparatus for uniform heating and cooling. 5,533,567, Cl. 165-1.000.
- Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Burns, Paul A.; and Weber, Lynda D., to Eastman Kodak Company. Retouchable reversal silver halide photographic element with a pyrazoloazole magenta dye-forming coupler. 5,534,401, Cl. 430-558.000.
- Varshney, Usha; and Decker, Lawrence H., to American Research Corporation. Integrated laser ablation deposition system. 5,534,071, Cl. 118-726.000.
- Vasicek, Jean: *See*—
  - Spencer, George L.; Duvoisin, Herbert A., III; and Vasicek, Jean, 5,535,291, Cl. 382-254.000.
- Vattenfall Utveckling AB: *See*—
  - Hemström, Bengt; Persson, Johan; and Karlsson, Rolf, 5,534,144, Cl. 210-193.000.
- Vazquez Lopez, Manuel; De La Cruz Moreno, Enrique; and Rodriguez Perez, Julio, to Alcatel N.V. DC/DC conversion circuit. 5,535,112, Cl. 363-20.000.
- VDO Adolf Schindling AG: *See*—
  - Oppermann, Rolf; Sauerschell, Wolfgang; and Martinovaski, Jiri, 5,533,484, Cl. 123-358.000.
- Vecchione, Michael: *See*—
  - Cheney, Henry H., III; and Vecchione, Michael, 5,534,020, Cl. 607-108.000.
- Veltman, Joost, to FMC Corporation. Spiral tee for tin free steel containers. 5,533,438, Cl. 99-360.000.
- Veltrop, Loren; Friedl, Joel G.; and Nevarez, Roberto, to Middleby Marshall Inc. Guard for industrial size food mixer. 5,533,806, Cl. 366-347.000.
- Ventritex, Inc.: *See*—
  - Archer, Stephen T., 5,534,814, Cl. 327-427.000.
  - Hoffmann, Drew A.; and Bush, M. Elizabeth, 5,534,022, Cl. 607-122.000.
  - Paspa, Paul M., 5,534,019, Cl. 607-38.000.
- Verbruggen, Alfons M., to Mallinckrodt Medical, Inc. Technetium chelates to be used for determining the renal function. 5,534,497, Cl. 514-18.000.
- Vereinigte Dentalwerke Antaeos Beutelrock Zipperer Zdarsky Ehrler: *See*—
  - Zdarsky, Edward, 5,533,897, Cl. 433-102.000.
- Verheyen, Andrew G.: *See*—
  - Hosseini, Javad; Cobo, Michael A.; Rytter, Noel J.; and Verheyen, Andrew G., 5,535,124, Cl. 364-426.030.
- Verinsky, Phil; and Weddle, Gene, to Oak Technology, Inc. Method and apparatus for communicating formatted data from a mass storage device to a host computer. 5,535,327, Cl. 395-182.030.
- Vermiglio, Ezio N.: *See*—
  - Willey, Raymond L.; and Vermiglio, Ezio N., 5,533,492, Cl. 123-681.000.
- Vernay Laboratories, Inc.: *See*—
  - Atkinson, Gordon E.; and Solomon, Thomas J., 5,533,708, Cl. 251-149.100.
- Verseput, Jerry, to Intel Corporation. Method and apparatus for generating write signals. 5,535,343, Cl. 395-308.000.
- Verteg, Inc.: *See*—
  - Bran, Mario E., 5,534,076, Cl. 134-1.000.
- Very Inventive Physicians, Inc.: *See*—
  - De Faria-Correa, Marco A. M.; and Hochberg, Julio, 5,533,496, Cl. 128-898.000.
- Very Vivid, Inc.: *See*—
  - MacDougall, Francis, 5,534,917, Cl. 348-169.000.
- Vesborg, Steen, to Colgate-Palmolive Co. Container set comprising at least two containers. 5,533,553, Cl. 141-319.000.
- Vesica Medical, Inc.: *See*—
  - Greene, George R., Jr.; and Brenneman, Rodney, 5,534,011, Cl. 606-232.000.
- Vetter, Klaus-Dieter. Automatic hairpinlacing apparatus. 5,533,251, Cl. 29-727.000.
- Vetter, Richard, to United Artists Theatre Circuit, Inc. Motion picture system. 5,534,954, Cl. 352-79.000.
- VIAM-All Russian Institut of Aviation Materials: *See*—
  - Solntsev, Stanislav S.; Tjurin, Vladimir M.; Izaeva, Natalia V.; Bersenev, Alexei Y.; and Solovjeva, Galina A., 5,534,300, Cl. 427-376.200.
- Victor Company of Japan, Ltd.: *See*—
  - Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, 5,535,008, Cl. 358-342.000.
- Villamil, Clara I.: *See*—
  - Flynn, Daniel L.; Moormann, Alan E.; Becker, Daniel P.; Dappen, Michael S.; Nosal, Roger; Shone, Robert L.; and Villamil, Clara I., 5,534,521, Cl. 514-290.000.

- Vinci, James N., to Lubrizol Corporation, The. Methods for reducing friction between relatively slideable components using metal carboxylates. 5,534,169, Cl. 508-460.000.
- Virta, Pirkko: *See*—
  - Luoma, Marjo; Torkkell, Keijo; Lylykangas, Reijo; and Virta, Pirkko, 5,534,476, Cl. 502-335.000.
- Visatech Corporation: *See*—
  - Rainwater, Jewel G.; Benson, Paul; Belko, William R.; Deffeyes, Robert J.; Carlson, Arne B., deceased, 5,534,290, Cl. 427-97.000.
- Viswanathan, Thayamkulangara R.: *See*—
  - Gross, George F., Jr.; McPartland, Richard J.; and Viswanathan, Thayamkulangara R., 5,534,862, Cl. 341-144.000.
- Vital Insite, Incorporated: *See*—
  - Kaspari, William J.; and Stern, Roger A., 5,533,511, Cl. 128-672.000.
- Vitatron Medical, B.V.: *See*—
  - Boute, Willem, 5,534,016, Cl. 607-9.000.
  - van Krieken, Frits M.; and Stoop, Gustaaf A. P., 5,534,017, Cl. 607-14.000.
- VLSI Technology, Inc.: *See*—
  - Cassetti, David K., 5,535,360, Cl. 395-467.000.
  - Levy, Paul S., 5,534,787, Cl. 324-761.000.
  - Mattos, Derwin W.; Shiffer, James D., II; and Wong, Jeffrey F., 5,534,791, Cl. 326-27.000.
- Voegele, Kevin D.; and Piechowski, Todd A., to Rosemount Inc. Power supply for field mounted transmitter. 5,535,243, Cl. 375-259.000.
- Voest-Alpine Industrieanlagenbau GmbH: *See*—
  - Kepplinger, Werner; Matzawrakos, Panajiotis; Schenk, Johannes; Siuka, Dieter; and Böhm, Christian, 5,534,046, Cl. 75-446.000.
- Voge, Brendan A.: *See*—
  - Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
- Vogel, Wilfried: *See*—
  - Eastgate, Alan R.; and Vogel, Wilfried, 5,534,998, Cl. 356-316.000.
- Vogler, Erwin A., to Becton, Dickinson and Company. Blood collection assembly including mechanical phase separating insert. 5,533,518, Cl. 128-760.000.
- Vogt, Howard W., Jr.: *See*—
  - Cutright, Edwin L.; Scott, G. Robert; and Vogt, Howard W., Jr., 5,534,114, Cl. 162-139.000.
- Vogt, Kurt E.: *See*—
  - Weirich, Mike; and Vogt, Kurt E., 5,533,416, Cl. 74-366.000.
- Vogt, Lothar: *See*—
  - Chahabadi, Djahanyar; and Vogt, Lothar, 5,535,280, Cl. 381-13.000.
- Vogt, Peter: *See*—
  - Scalone, Michelangelo; and Vogt, Peter, 5,534,635, Cl. 546-323.000.
- Volan, Gregory D.: *See*—
  - Braitberg, Michael F.; Kennedy, Patrick J.; Hatcher, Lester B.; Andrea, Davide; and Volan, Gregory D., 5,535,274, Cl. 379-446.000.
- Volk, Robert S., to Binney & Smith Inc. Stencil holder and kit and method of making an image. 5,533,900, Cl. 434-87.000.
- Volke, Robert W. Adhesives composition for a wound dressing. 5,534,561, Cl. 523-111.000.
- Volkers, Jan; Wick, Volkhard; and Dabringhaus, Volker, to Gebr. Happich GmbH. Ashtray and container holder for motor vehicles. 5,533,772, Cl. 296-37.900.
- Volpi, John P.: *See*—
  - LaPadula, Leonard J., III; Pawlowski, George W.; Rekieta, David W.; Scott, Hugh L.; Lu, Chyi H.; Volpi, John P.; and Stiles, Mitchel B., 5,535,237, Cl. 375-200.000.
- Volz, Wolfgang: *See*—
  - Epple, Anton; Pfeiffer, Martin; Kruse, Martin; and Volz, Wolfgang, 5,533,779, Cl. 296-192.000.
- Von Der Heyde, Richard; Becker, Erich; and Riedlinger, Heinz, to KNF Neuberger GmbH. Membrane pump and method of operating the same. 5,533,886, Cl. 418-1.000.
- Vondracek, Hans, to Hoesch Federn GmbH. Method of optimizing the distribution of inherent stress in springs. 5,534,088, Cl. 148-580.000.
- Von Flatern, Valerie R. Paint roller sleeve storage container. 5,533,617, Cl. 206-361.000.
- Von Schuckmann, Alfred E. F., to Courtaulds Packaging Limited. Closure for container. 5,533,649, Cl. 222-153.140.
- Voorhis, Roger J., to Carrier Corporation. Air conditioning apparatus. 5,533,357, Cl. 62-277.000.
- Vorhees, Kevin H.: *See*—
  - Harris, Richard H.; Kinney, Michael J.; and Vorhees, Kevin H., 5,533,817, Cl. 400-124.280.
- Vortran Medical Technology, Inc.: *See*—
  - Piper, Samuel D., 5,533,502, Cl. 128-203.210.
- Vreeke, Mark; and Rocca, Patrick. Electrode and method for the detection of an affinity reaction. 5,534,132, Cl. 205-777.500.
- Vreeswijk, Franciscus: *See*—
  - Van de Waterlaat, Adrianus C. J. G.; Vreeswijk, Franciscus; and Hamann, Theodora L., 5,534,932, Cl. 348-432.000.
- VTC Inc.: *See*—
  - Peterson, Douglas R., 5,534,818, Cl. 327-545.000.
- Vulcan Peroxidation Systems, Inc.: *See*—
  - Bernardin, Frederick E.; and Peterson, Ronald L., 5,534,142, Cl. 210-141.000.
- W. L. Gore & Associates (UK) Ltd.: *See*—
  - Dawson, Keith; and Hayhurst, Robert, 5,534,062, Cl. 118-60.000.
- W. R. Grace & Co.-Conn.: *See*—
  - Ennis, Gary D., 5,534,276, Cl. 426-127.000.
  - Ramesh, Ram K.; Woods, Gerald B.; and Campbell, Robert W., 5,534,277, Cl. 426-129.000.
  - Stockley, Henry W., III; and Owensby, Joseph E., 5,533,622, Cl. 206-484.000.
- Wacoal Corp.: *See*—
  - Iwata, Tetsuya, 5,533,961, Cl. 602-19.000.
- Wada, Itaru: *See*—
  - Hio, Masahide; Nozaki, Takao; Hashiba, Hitoshi; Isshiki, Isao; Nakai, Yoshiharu; Ueda, Seiji; and Wada, Itaru, 5,533,905, Cl. 439-76.200.
- Wada, Kumiko: *See*—
  - Fukazawa, Toshio; Tosaki, Yoshihiro; Wada, Kumiko; Mitani, Satoru; and Yanagi, Terumi, 5,535,079, Cl. 360-126.000.
- Wada, Satoshi: *See*—
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Wada, Toshihide: *See*—
  - Uchikata, Yoshio; Hattori, Yoshifumi; Ara, Yoji; Kitani, Masashi; Suzuki, Etsurou; Wada, Toshihide; Hirabayashi, Hiromitsu; Saikawa, Hideo; Kojima, Masami; Hanabusa, Tadashi; Kawano, Kenji; Tanno, Koichi; Ohashi, Tetsuyo; Bekki, Toshihiko; Aono, Kenji; and Ikado, Masaharu, 5,534,899, Cl. 347-49.000.
  - Watanabe, Youichi; and Wada, Toshihide, 5,533,819, Cl. 400-226.000.
- Waddington, Simon D., to Zeneca Limited. Polyhydroxyalkanoates and film formation therefrom. 5,534,616, Cl. 528-503.000.
- Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, to Du Pont (UK) Limited. Process for preparing a polyunsaturated diazonium compounds. 5,534,623, Cl. 534-560.000.
- Wadley, Haydn N. G.; and Groves, James F., to University of Virginia Patent Foundation. Directed vapor deposition of electron beam evaporant. 5,534,314, Cl. 427-585.000.
- Wadzinski, Michael, to Appleton Papers Inc. Woven belt paper polisher. 5,533,244, Cl. 29-90.100.
- Waffle, Stephen J.: *See*—
  - McGuckin, Hugh G.; Carli, Jerel R.; Badger, John S.; and Waffle, Stephen J., 5,534,396, Cl. 430-463.000.
- Wafler, Walter F.: *See*—
  - Ahl, David K.; Swanson, Roger M.; Apolito, James D.; and Wafler, Walter F., 5,533,720, Cl. 271-225.000.
- Wagle, Dilip R.: *See*—
  - Ulrich, Peter C.; and Wagle, Dilip R., 5,534,540, Cl. 514-425.000.
- Wagner, Michael: *See*—
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Wagner, Oliver; Eicken, Karl; Götz, Norbert; Rang, Harald; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. P-hydroxyaniline derivatives, their preparation and their use. 5,534,653, Cl. 564-32.000.
- Wagner, Reiner; and Lehnert, Otto, to OBE-Werk Ohnmacht & Baumgärtner GmbH & Co., KG. Spring hinge. 5,533,233, Cl. 16-228.000.
- Wahl, Stefan: *See*—
  - Pfeiffer, Bodo; Banniza, Thomas; Cesar, Bozo; Wahl, Stefan; and Menk, Klaus-Dieter, 5,535,366, Cl. 395-486.000.
- Wahlstrand, John D.; Baxter, Daniel J.; Ecker, R. Michael; Greeninger, Daniel R.; and Yerich, Charles G., to Medtronic, Inc. Automatic lead recognition for implantable medical device. 5,534,018, Cl. 607-27.000.
- Wakabayashi, Hiroshi: *See*—
  - Higaki, Riichi; Tsuru, Hiroyuki; Wakabayashi, Hiroshi; Tsukahara, Daiki; Iida, Yoshikazu; and Ohtani, Tadashi, 5,534,965, Cl. 354-409.000.
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,957, Cl. 354-106.000.
  - Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,534,958, Cl. 354-106.000.
- Wakai, Akira: *See*—
  - Kataoka, Masaaki; Wakai, Akira; and Nakamura, Takehiko, 5,534,543, Cl. 514-517.000.
- Wakao, Hiroshi: *See*—
  - Groner, Bernd; Gouilleux, Fabrice; and Wakao, Hiroshi, 5,534,409, Cl. 435-6.000.
- Wakefield, Paul A. J.: *See*—
  - Brown, Barry D.; and Wakefield, Paul A. J., 5,535,261, Cl. 379-67.000.
- Wakefield, Thomas W.; Stanley, James C.; and Andrews, Philip C., to Board of Regents acting on behalf of University of Michigan, The. Peptides for heparin and low molecular weight heparin anticoagulation reversal. 5,534,619, Cl. 530-324.000.
- Wakeman, Russell J., to Siemens Automotive Corporation. Method of making a two piece stator with magnetic bobbin. 5,533,249, Cl. 29-605.000.
- Wakoh, Masamitsu; Sawai, Takashi; and Mizoguchi, Shozo, to Nippon Steel Corporation. Continuous-cast slab and steel product having dispersed fine particles. 5,534,084, Cl. 148-328.000.
- Waldmann, Heinrich: *See*—
  - Fischinger, Claus-Dieter; Hizli, Adem; Rose, Wolfgang; and Waldmann, Heinrich, 5,533,704, Cl. 248-603.000.
- Waldrop, Anthony R.: *See*—

  - McLarty, George C., III; Waldrop, Anthony R.; and Anderson, Kathryn T., 5,533,789, Cl. 297-452.640.
- Walke, Gary L.: *See—*
  - Wittern, Francis A., Jr.; Walke, Gary L.; and Nerly, Joseph F., 5,533,645, Cl. 221-76.000.
- Walker, Anthony D.: *See—*
  - Trubey, Bradley S.; and Walker, Anthony D., 5,535,192, Cl. 370-16.100.
- Walker, David H.; Gold, Harris; McKinney, George W., III; McCoy, John F., III; and Yu, Xiaohong, to Gel Sciences, Inc. Gel-based vapor extractor and methods. 5,534,186, Cl. 252-194.000.
- Walker, Joshua J. Display holder for optically read discs. 5,533,614, Cl. 206-308.100.
- Walker, Perry, to Gleason Corporation. Agricultural tires and wheel assemblies therefore. 5,533,793, Cl. 301-64.400.
- Wallace, Ronald; Goldberg, Henry; Mitchell, James; and Grosser, Harald, to Philip Morris Incorporated. Method and apparatus for elevating tobacco temperature. 5,533,528, Cl. 131-304.000.
- Waller, David P.: *See—*
  - Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.
- Walling, Priscilla M.: *See—*
  - Herb, Craig A.; Sun, Wei-Mei; Walling, Priscilla M.; and Stiffe, Susan A., 5,534,246, Cl. 424-66.000.
- Wallis, Robert M.: *See—*
  - Alker, David; Cross, Peter E.; and Wallis, Robert M., 5,534,626, Cl. 544-360.000.
- Wallner, Heinrich: *See—*
  - Lichtblau, Josef; and Wallner, Heinrich, 5,534,077, Cl. 134-7.000.
- Walls, Lloyd A.: *See—*
  - Cao, Tai A.; Dutta, Satyajit; Nguyen, Thai Q.; Trinh, Thanh D.; and Walls, Lloyd A., 5,534,812, Cl. 327-333.000.
- Wallström, Eva; Lund, Peter B.; and Helgesen, Arne, to Girobank A?S. Flexographic printing ink. 5,534,049, Cl. 106-22.00R.
- Walsh, Reed H.: *See—*
  - Huang, Nai Z.; Daly, Daniel T.; Koch, Frederick W.; Stoldt, Stephen H.; and Walsh, Reed H., 5,534,039, Cl. 44-367.000.
- Walsh, Robert J.: *See—*
  - Glaser, Stephen D.; Thomas, Robert E.; and Walsh, Robert J., 5,535,209, Cl. 370-84.000.
- Walsworth, Richard L.: *See—*
  - Chavannes, Theodore E.; and Walsworth, Richard L., 5,534,768, Cl. 323-267.000.
- Walter, Glen V.: *See—*
  - Kohus, Louis M.; Henning, John C.; Huang, Chow-Chi; and Walter, Glen V., 5,533,466, Cl. 119-459.000.
- Walter, Horst: *See—*
  - Krug, Heidrun; Kunert, Jürgen; Schoon, Jürgen; and Walter, Horst, 5,534,890, Cl. 346-100.000.
- Walter, James P.: *See—*
  - Sinclair, William Y.; and Walter, James P., 5,533,665, Cl. 228-180.100.
- Walters, Bronwen L.: *See—*
  - Sweeney, Niall; Caizza, Richard J.; Gravel, Marian H.; and Walters, Bronwen L., 5,533,980, Cl. 604-192.000.
- Walton, Joseph E.: *See—*
  - Piontek, Carl J.; Mazer, Terrence B.; Walton, Joseph E.; and Geckle, Ronita K., 5,533,973, Cl. 604-83.000.
- Wan, Lawrence A., to BEI Electronics, Inc. Ferroelectric thin film travelling wave rotation sensor. 5,533,394, Cl. 73-504.010.
- Wan, Lawrence A., to BEI Electronics, Inc. Thin film rotation sensor. 5,533,395, Cl. 73-504.010.
- Wandel & Goltermann Technologies, Inc.: *See—*
  - Zhang, Jing; and Gramley, Kenneth R., 5,535,193, Cl. 370-17.000.
- Wands, Jack R.: *See—*
  - Liang, Tsanyang; and Wands, Jack R., 5,534,406, Cl. 435-5.000.
- Wanek, Mary C.: *See—*
  - Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., 5,533,991, Cl. 604-383.000.
- Wang, Chen-Jong: *See—*
  - Wuu, Shou-Gwo; Liang, Mong-Song; Su, Chung-Hui; and Wang, Chen-Jong, 5,534,451, Cl. 437-40.000.
- Wang, Chung C., to Texas Instruments Incorporated. Transaction and version management system. 5,535,386, Cl. 395-600.000.
- Wang, Edith: *See—*
  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
- Wang, James C. Tubing. 5,533,985, Cl. 604-264.000.
- Wang, Kenneth Y.: *See—*
  - Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., 5,533,991, Cl. 604-383.000.
- Wang, King-sheng. Hidden type retractable handle assembly for a suitcase. 5,533,601, Cl. 190-115.000.
- Wang, Paul J., to Minnesota Mining and Manufacturing Company. Aziridine primer for flexographic printing plates. 5,534,391, Cl. 430-271.100.
- Wang, Richard Y.: *See—*
  - Lo, Shyh-Ching; Wang, Richard Y.; and Hayes, Michael M., 5,534,413, Cl. 435-7.320.
- Wang, Samuel S.: *See—*
  - Nagaraj, D. R.; Wang, Samuel S.; Lee, James S.; and Magliocco, Lino G., 5,533,626, Cl. 209-167.000.
- Wani, Moriyuki: *See—*
  - Kobayashi, Yasunori; Tanabe, Shin; Fukuda, Tatsuo; Miyazawa, Masazumi; Imai, Hideki; and Wani, Moriyuki, 5,533,413, Cl. 73-865.900.
- Warashina, Yoshihisa: *See—*
  - Takeshima, Akira; Koishi, Musubu; Warashina, Yoshihisa; and Mizushima, Yoshihiko, 5,534,992, Cl. 356-5.100.
- Warburton, Eric T.: *See—*
  - Kelbrick, William J.; Rouble, Vincent J.; Larmer, Ralph D.; Pepper, Stuart L.; and Warburton, Eric T., 5,534,222, Cl. 422-33.000.
- Ward, Eugene C.: *See—*
  - Lewis, Kenrick M.; and Ward, Eugene C., 5,534,609, Cl. 528-15.000.
- Ward, Kenneth A.: *See—*
  - Issa, Darrell E.; Birchfield, Jerry W.; Busse, Glenn R.; Perdue, Sidney B.; and Ward, Kenneth A., 5,534,845, Cl. 340-425.500.
- Wardle, Robert A.: *See—*
  - Cleverley, John A.; Wardle, Robert A.; Swietlik, Joseph M.; Marsh, John F.; and Spencer, Jeremy R., 5,534,168, Cl. 508-396.000.
- Ware, Douglas R.; and Garner, Bryan E., to Nutrition Physiology. Process for improving the utilization of feedstuffs by ruminants. 5,534,271, Cl. 426-2.000.
- Wargnier, David M.: *See—*
  - Boeck, Harold W.; Wargnier, David M.; and Baurhenn, Charles, 5,533,378, Cl. 72-302.000.
- Warner, Eric A.: *See—*
  - Holdaway, Charles R.; and Warner, Eric A., 5,534,691, Cl. 250-231.140.
- Warner-Lambert Company: *See—*
  - Ando, Howard Y.; Barrett, Stephen D.; Jaen, Juan C.; Rose, Steven E.; and Tecle, Haile, 5,534,522, Cl. 514-299.000.
  - Bapat, Swati, 5,534,552, Cl. 514-667.000.
- Warren, Ronald A.: *See—*
  - Stanasolovich, David; Syverson, William A.; and Warren, Ronald A., 5,533,540, Cl. 134-155.000.
- Warwick, Dennis J., to Data Card Corporation. Magnetic multi-track read/write head with recessed core gap structure and shield arrangement. 5,535,078, Cl. 360-119.000.
- Wary, John: *See—*
  - Beach, William F.; Wary, John; and Olson, Roger A., 5,534,068, Cl. 118-719.000.
- Watanabe, Hisao: *See—*
  - Maruyama, Tooru; Takahashi, Iwao; Saito, Masatoshi; Fujita, Shigeru; Watanabe, Hisao; Terashi, Taro; Sugawara, Tomoaki; Shinkai, Masaru; Kawanishi, Toshiyuki; and Igarashi, Masato, 5,534,063, Cl. 118-60.000.
- Watanabe, Keizo, to Fujitsu Limited. Channel switching control in mobile telecommunication system. 5,535,425, Cl. 455-33.200.
- Watanabe, Satoshi; and Nakayama, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Battery box device for electric vehicle. 5,534,364, Cl. 429-61.000.
- Watanabe, Takamoto; and Aoyama, Seiki, to Nippondenso Co., Ltd. Pulse phase difference encoding circuit. 5,534,809, Cl. 327-269.000.
- Watanabe, Takao; Nakagawa, Tetsuya; and Nakagome, Yoshinobu, to Hitachi, Ltd. Parallel processor having decoder for selecting switch from the group of switches and concurrently inputting MIMD instructions while performing SIMD operation. 5,535,410, Cl. 395-800.000.
- Watanabe, Tetsuya: *See—*
  - Kodaira, Kazuho; Itoh, Yasuhito; and Watanabe, Tetsuya, 5,533,565, Cl. 164-416.000.
- Watanabe, Youichi; and Wada, Toshihide, to Canon Kabushiki Kaisha. Character by character thermal recording device with ink sheet feed control. 5,533,819, Cl. 400-226.000.
- Watanuki, Tsuneo: *See—*
  - Nakamura, Yasushige; Sawatari, Norio; Takei, Fumio; Takahashi, Toru; Sakamoto, Katsura; and Watanuki, Tsuneo, 5,534,978, Cl. 355-211.000.
- Watari, Hirokazu: *See—*
  - Seto, Tsuneo; Hatanaka, Atsushi; Egeyama, Harumi; Miura, Hironori; Ohmori, Kazuo; and Watari, Hirokazu, 5,533,374, Cl. 72-247.000.
- Waterman, Kenneth C.: *See—*
  - Boggs, Roger A.; Grasshoff, Jurgen M.; Mischke, Mark R.; Puttick, Anthony J.; Telfer, Stephen J.; Waller, David P.; and Waterman, Kenneth C., 5,534,393, Cl. 430-348.000.
- Waters, Julian A.: *See—*
  - Roulstone, Brian J.; and Waters, Julian A., 5,534,585, Cl. 524-497.000.
- Watson, Richard J.: *See—*
  - Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,534,913, Cl. 348-7.000.
- Watton, Stephen P.: *See—*
  - O'Halloran, Thomas V.; and Watton, Stephen P., 5,534,542, Cl. 514-492.000.
- Watts, Byron T.: *See—*
  - Bates, Cary L.; Ryan, Jeffrey M.; and Watts, Byron T., 5,534,887, Cl. 345-120.000.
- Watts, Raymond F., to Exxon Chemical Patents Inc. Mixed phosphorus- and sulfur-containing reaction products useful in power transmitting compositions. 5,534,170, Cl. 508-161.000.
- Wayne State University: *See—*
  - Gibson, Ronald F.; and Ayorinde, Emmanuel O., 5,533,399, Cl. 73-579.000.
- Webasto Karosseriesysteme GmbH: *See—*
  - Färber, Manfred, 5,533,766, Cl. 292-144.000.
- Webb, Gary A.: *See—*

  - Roper, Ralph E.; and Webb, Gary A., 5,533,372, Cl. 72-60.000.
- Webb, Thomas R.: *See—*
  - Brunck, Terence K.; Pepe, Michael G.; Pearson, Daniel A.; and Webb, Thomas R., 5,534,498, Cl. 514-19.000.
- Weber, Helmut: *See—*
  - Bowman, Wayne A.; Shuttleworth, Leslie; and Weber, Helmut, 5,534,478, Cl. 503-227.000.
  - Shuttleworth, Leslie; Bowman, Wayne A.; and Weber, Helmut, 5,534,479, Cl. 503-227.000.
- Weber, Lynda D.: *See—*
  - Vargas, J. R.; Harder, John W.; Knight, Phillip D.; Burns, Paul A.; and Weber, Lynda D., 5,534,401, Cl. 430-558.000.
- Weber S.r.l.: *See—*
  - Moschini, Renzo; and Poggi, Stefano, 5,533,562, Cl. 164-71.100.
- Weber, Wolfgang: *See—*
  - Clausmeyer, Horst; Hoffmann, Dieter; and Weber, Wolfgang, 5,533,770, Cl. 295-1.000.
- Weddle, Gene: *See—*
  - Verinsky, Phil; and Weddle, Gene, 5,535,327, Cl. 395-182.030.
- Wedell, Mark T., to Thomas & Betts Corporation. Quartz halogen flood light assembly having improved lamp and reflector. 5,535,111, Cl. 362-304.000.
- Wedell, Mark T.: *See—*
  - Moore, Clyde R.; Fredrick, William A.; McIngvale, J. D.; and Wedell, Mark T., 5,535,109, Cl. 362-267.000.
- Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Apparatus for providing a decorative cover for a flower pot using a collar. 5,533,301, Cl. 47-72.000.
- Weder, Donald E., to Family Trust U/T/A, The; and Southpac trust International Inc. Method of wrapping a floral grouping with a sheet of wrapping material having information choice blocks. 5,533,319, Cl. 53-397.000.
- Weder, Donald E., to Family Trust U/I/A, The; and Southpac Trust International, Inc. Method of wrapping a floral grouping with a wrapper having varying adhesion. 5,533,320, Cl. 53-399.000.
- Wedlake, Gary D.: *See—*
  - Schuster, Don A.; Liang, Hongmei; Burkhart, Larry J.; and Wedlake, Gary D., 5,533,568, Cl. 165-1.000.
- Wehner, Wolfgang; Drewes, Rolf; Kuhn, Karl J.; Sander, Hans-Jürgen; and Kolb, Markus, to Ciba-Geigy Corporation. Stabilized halogen-containing polymers. 5,534,566, Cl. 524-27.000.
- Weichman, Alan R.; Ferrell, Barton G.; Butters, William G.; Murden, Gregory; Alldredge, Phillip D.; Latham, L. Adam; Courtney, Mike J.; and Degroot, Paul J., to McDonnell Douglas Corp. Near field RCS test facility and testing method. 5,534,873, Cl. 342-165.000.
- Weigl, Manfred, to Siemens Aktiengesellschaft. Apparatus for ascertaining an operating state of an injection pump. 5,533,477, Cl. 123-494.000.
- Weiland, Pamela: *See—*
  - Weiland, Raymond F., 5,533,790, Cl. 299-1.500.
- Weiland, Raymond F., to Weiland, Raymond F.; and Weiland, Pamela. Floor milling machines. 5,533,790, Cl. 299-1.500.
- Weinberger, Cary A.: *See—*
  - Evans, Roland M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,534,418, Cl. 435-69.100.
- Weinreich, Michael. Chord keyboard system using one chord to select a group from among several groups and another chord to select a character from the selected group. 5,535,421, Cl. 395-887.000.
- Weinstein, Barry: *See—*
  - Kirk, Thomas C.; Schwartz, Curtis; and Weinstein, Barry, 5,534,182, Cl. 8-137.000.
- Weinstein, Leonard M., to United States of America, National Aeronautics and Space Administration. Schlieren system and method for moving objects. 5,534,995, Cl. 356-129.000.
- Weinzierl, Robert O. J.: *See—*
  - Tjian, Robert; Comai, Lucio; Dynlacht, Brian D.; Hoey, Timothy; Ruppert, Siegfried; Tanese, Naoko; Wang, Edith; and Weinzierl, Robert O. J., 5,534,410, Cl. 435-6.000.
- Weirich, Mike; and Vogt, Kurt E., to MTD Products Inc. Transmission shift key. 5,533,416, Cl. 74-366.000.
- Weiss, Dieter: *See—*
  - Rankl, Wolfgang; and Weiss, Dieter, 5,534,683, Cl. 235-380.000.
- Weiss, Edward K.: *See—*
  - Puckett, James D.; Weiss, Edward K.; Russell, Paul E.; and Pearson, J. Michael, 5,535,087, Cl. 361-118.000.
- Weiss, Helga: *See—*
  - Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Nonnenmacher, Martin, deceased; and Weiss, Helga, 5,534,359, Cl. 428-688.000.
- Weksler, Meir: *See—*
  - Sheinman, Yhoshua, 5,534,904, Cl. 347-75.000.
- Welch, George. Method for dehydration of solid foods. 5,534,280, Cl. 426-321.000.
- Welch, Glenn D.: *See—*
  - Reddin, Lorin D.; Hepworth, Malcolm T.; Ben-Slimane, Rachid; and Welch, Glenn D., 5,534,234, Cl. 423-50.000.
- Welch, James G., to Shell Oil Company. Method and device for containing fluids. 5,533,760, Cl. 285-14.000.
- Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., to Phillips Petroleum Company. Catalyst systems for producing broad molecular weight polyolefin. 5,534,473, Cl. 502-117.000.
- Welch, Michael C.: *See—*
  - Gopalkrishnan, Sridhar; Sherman, John V.; Guiney, Kathleen M.; Durocher, David T.; and Welch, Michael C., 5,534,183, Cl. 510-434.000.
- Welker, John B.: *See—*
  - Hughes, Gregory G.; Guntly, Leon A.; Welker, John B.; Hill, David T.; Henkes, Jerome P.; Reinke, Michael J.; and Rogers, C. James, 5,533,259, Cl. 29-890.043.
- Wella Aktiengesellschaft: *See—*
  - Neunhoeffer, Hans; Gerstung, Stefan; Clausen, Thomas; and Balzer, Wolfgang R., 5,534,267, Cl. 424-701.000.
- Wells, James A.: *See—*
  - Cunningham, Brian C.; Lowman, Henry; and Wells, James A., 5,534,617, Cl. 530-399.000.
- Wells, Steven; Hasbun, Robert N.; Domonkos, Sara; and Barbarich, Steven S., to Intel Corporation. Method for allocating memory in a solid state memory disk. 5,535,369, Cl. 395-497.020.
- Weltzin, Richard A., to OraVax, Inc. Monoclonal IgA antibody specific for respiratory syncytial virus, a hybridoma cell line that produces this antibody amd methods of using the antibody to diagnose RSV infection. 5,534,411, Cl. 435-7.200.
- Wenzel, James F.: *See—*
  - Lum, Thomas F.; and Wenzel, James F., 5,534,784, Cl. 324-757.000.
- Werner Co.: *See—*
  - Kiska, Stanley A., 5,533,591, Cl. 182-108.000.
- Werner, Johannes: *See—*
  - Hufendiek, Ernst-Wilhelm; Kerschbaum, Walter; and Werner, Johannes, 5,533,474, Cl. 123-196.0AB.
- Wert, Joseph D.; and Duncan, Richard L., to National Semiconductor Corporation. Voltage translation and overvoltage protection. 5,534,795, Cl. 326-81.000.
- Wesseler, Matthias, to Fresenius AG. Connector system for connecting liquid containers. 5,534,228, Cl. 422-103.000.
- Westendorf, Holger: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Western Atlas International, Inc.: *See—*
  - Ellis, James; and Crawford, Alan W., 5,533,454, Cl. 102-202.100.
- Westinghouse Air Brake Company: *See—*
  - Wood, James A.; Greer, David A.; and Mazur, Richard J., 5,535,122, Cl. 364-426.010.
- Westinghouse Electric Corporation: *See—*
  - Smith, Christopher P., 5,533,410, Cl. 73-862.193.
- Westling, John. Gauge to measure proper positioning of starter motors on engines. 5,533,274, Cl. 33-600.000.
- Westvaco Corporation: *See—*
  - Coke, Jay E., 5,534,433, Cl. 435-240.540.
  - Coke, Jay E., 5,534,434, Cl. 435-240.540.
  - Michel, John H., 5,534,163, Cl. 210-800.000.
- Wethington, Glenn; Claiborne, Jimmy D.; and Strain, Mark R., to Union Underwear Company, Inc. Pocket hemmer having a thread break sensor. 5,533,461, Cl. 112-278.000.
- Wetzel, Donald C.; and Livsey, Robert A., to Meg Trans Corp. Digital dimming and flashing circuit for locomotive ditch lights. 5,534,733, Cl. 307-9.100.
- Wetzels, Walter; and Hergemoeller, Rainer, to Schumag AG. Method for preparing a tubular blank having a thick wall for a following cascade drawing operation. 5,533,376, Cl. 72-283.000.
- Wheary, David, to AT&T Corp. Apparatus for stripping cable. 5,533,264, Cl. 30-90.100.
- Wheeler, Richard D.: *See—*
  - Drake, Charles E.; Fifield, John A.; Wheeler, Richard D.; and Wolford, Barry J., 5,535,226, Cl. 371-40.100.
- Whinery, Larry D.: *See—*
  - Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., 5,533,755, Cl. 280-743.100.
- Whirlpool Corporation: *See—*
  - Szynal, Joseph M.; and Guess, Ronald W., 5,533,360, Cl. 62-298.000.
- Whitaker Corporation, The: *See—*
  - Fasnacht, Matthew J.; and Schaffer, Ronald R., 5,535,298, Cl. 385-135.000.
  - Gallo, Esdras; and Diniz, Milton E., 5,533,254, Cl. 29-750.000.
  - Henry, Randall R.; Moyer, William P.; and Skotek, David A., 5,533,908, Cl. 439-329.000.
  - Hunt, James A.; Rupert, Martha L.; Brockway, David L.; Fisher, Douglas G.; Baker, Ronald J.; and Swartz, David M., 5,533,901, Cl. 439-79.000.
- White, Allen R.: *See—*
  - Gowni, Shiva P.; and White, Allen R., 5,534,806, Cl. 327-170.000.
- White, Charles M., to Thomson Consumer Electronics, Inc. Power stage bias circuit with improved efficiency and stability. 5,534,810, Cl. 327-308.000.
- White, George E.: *See—*
  - Perfecto, Eric D.; Prasad, Chandrika; White, George E.; and Wong, Kwong H., 5,534,466, Cl. 437-208.000.
- White, Robert J.: *See—*
  - Evans, Le Andra E.; White, Robert J.; Brown, Russell L.; Galliher, Kenneth R.; and Carlson, Mark E., 5,534,759, Cl. 318-139.000.
- Whited, Timothy J., to Morton International, Inc. Tethered cover for a panel opening in an air bag inflator system. 5,533,746, Cl. 280-728.200.
- Whitehead, Howard A.: *See—*

- Kirby, Robert E.; Whitehead, Howard A.; Wanek, Mary C.; Osteen, David K.; and Wang, Kenneth Y., 5,533,991, Cl. 604-383.000.
- Whitfield, John P.: *See—*
  - Cox, David E.; Gottschalk, Karl D.; Lawton, Craig M.; Linton, John F.; and Whitfield, John P., 5,535,335, Cl. 395-200.110.
- Whitney, David. Router guide apparatus. 5,533,556, Cl. 144-144.520.
- Wick, Volkhard: *See—*
  - Volkers, Jan; Wick, Volkhard; and Dabringhaus, Volker, 5,533,772, Cl. 296-37.900.
- Widauer, Josef O., to Medichemie AG. Ursodeoxycholic acid-containing medicament in a liquid adminstration form. 5,534,505, Cl. 514-169.000.
- Wideman, Lawson G.; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Silica reinforced rubber composition containing salts of salicylic acid. 5,534,578, Cl. 524-396.000.
- Wiehan, Helmut: *See—*
  - Friedmann, Günter; Wiehan, Helmut; and Knott, Erwin, 5,533,877 Cl. 417-477.100.
- Wiers, John W.: *See—*
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- Wiggen, Unni N.: *See—*
  - Klaveness, Jo; Strande, Per; and Wiggen, Unni N., 5,534,250, Cl. 424-78.370.
- Wigger, Georg: *See—*
  - Röckrath, Ulrike; Betz, Peter; Poth, Ulrich; and Wigger, Georg, 5,534,306, Cl. 427-407.100.
- Wignot, Leroy S. Negative feedback control circuit having a common line for input and output signal. 5,535,443, Cl. 455-196.100.
- Wiklund, Craig L.: *See—*
  - Ruben, David A.; Galvin, Jeffrey L.; Simmons, Bill R.; Kline, Lourdes O.; Seifried, Lynn M.; Wiklund, Craig L.; Nicholson, John E.; and Nutzman, Thomas M., 5,535,097, Cl. 361-736.000.
- Wilczynski, Janusz S.: *See—*
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- Wild, Ernst; and Mezger, Werner, to Robert Bosch GmbH. Method and system for a fuel tank ventilation. 5,533,479, Cl. 123-520.000.
- Wilhelm, George W., Jr.: *See—*
  - Feeney, James W.; and Wilhelm, George W., Jr., 5,535,416, Cl. 395-834.000.
- Wilhite, David: *See—*
  - Chang, Chung-Chia; Davoll, Gregory L.; El-Rnby, Mohamed H.; Friske, Craig A.; Iyer, Balakrishna R.; Lazarus, John P.; Wilhite, David; and Plambeck, Kenneth E., 5,534,861, Cl. 341-79.000.
- Wilk, Peter J. Intrapericardial assist device and associated method. 5,533,958, Cl. 600-18.000.
- Wilkinson, William T. Remote controlled movable ball amusement device. 5,533,921, Cl. 446-409.000.
- Wilkinson, William T. Combination exercise device. 5,533,948, Cl. 482-27.000.
- Will, Jeff D.: *See—*
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- Willamette Industries Inc.: *See—*
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- Willemsen, Stephanus: *See—*
  - Geursen, Herman J.; and Willemsen, Stephanus, 5,534,304, Cl. 427-389.900.
- Willetts, Miles D.: *See—*
  - Keightley, John, 5,533,268, Cl. 33-290.000.
- Willey, Raymond L.; and Vermiglio, Ezio N., to Ford Motor Company. Gaseous fuel injection control system using averaged fuel pressure compensation. 5,533,492, Cl. 123-681.000.
- Williams, Carl D.: *See—*
  - Polch, Ewaryst Z.; Williams, Carl D.; and Cordova, Jackie, 5,533,811, Cl. 384-107.000.
- Williams, Charles A., to O'Gara-Hess & Eisenhardt Armoring Co., Inc. Armoring assembly. 5,533,781, Cl. 296-204.000.
- Williams, Christopher C.: *See—*
  - Furlani, Edward P.; Williams, Christopher C.; and Ghosh, Syamal K., 5,535,181, Cl. 369-13.000.
- Williams Electronics Games, Inc.: *See—*
  - DeMar, Lawrence E., 5,533,727, Cl. 463-23.000.
  - Nordman, Dennis P.; and Schilling, Winston H., 5,533,726, Cl. 273-119.00R.
- Williams, Howard M., Jr., to Hubbell Incorporated. Weatherproof electrical enclosure. 5,533,637, Cl. 220-3.800.
- Williams, John J. A.; and Gianni, Christian J. W., to Fisher & Paykel Limited. Methods of and/or apparatus for electronically commutated motor control. 5,534,763, Cl. 318-799.000.
- Williams, Peter K.: *See—*
  - Hogan, Thomas C.; and Williams, Peter K., 5,535,337, Cl. 395-200.190.
- Williams, Roger O.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Williams, Stephen P.: *See—*
  - Chiao, James; Godwin, Jimmy D.; Otis, Alton B., Jr.; Rose, Andrew M.; Williams, Roger O.; Williams, Stephen P.; and Strysko, Mark E., 5,535,069, Cl. 360-77.030.
- Williams, Terry L.: *See—*
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- Williams, Theresa M.: *See—*
  - Ciccarone, Terrence M.; MacTough, Suzanne C.; and Williams, Theresa M., 5,534,537, Cl. 514-397.000.
- Williamson, James B.: *See—*
  - Trutna, William R., Jr.; and Williamson, James B., 5,534,702, Cl. 250-484.400.
- Williamson, Nigel D. L., to NWD International, Inc. Transverse hydraulic coupling with lipped port. 5,533,764, Cl. 285-212.000.
- Williamson, Nigel D. L.; and Nichols, Warren J., to NWD International, Inc. Crimped tube-to-port hydraulic fittings. 5,533,765, Cl. 285-212.000.
- Wilson, Arthur K.: *See—*
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- Wilson, Frederick J.: *See—*
  - Holty, Anton G.; Wilson, Frederick J.; and Sozinho, Edward D., 5,533,654, Cl. 224-155.000.
- Wilson, Jesse R.: *See—*
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- Wilson, Joseph H.: *See—*
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- Wilson, Susan L.: *See—*
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- Wilson, Timothy J.; and Jones, Steven E., to Jet Blast Products Corp. Nozzle system imparting compound motion. 5,533,673, Cl. 239-227.000.
- Winchell, David A.: *See—*
  - Jerman, John H.; Toth, Ronald E.; Winchell, David A.; and Pennington, David W., 5,533,412, Cl. 73-861.950.
- Windham, Michael S.: *See—*
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- Wingens, Hendrikus T. J. J.: *See—*
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- Winkler, J. A., III. Vehicle wash detergent/foam and method. 5,534,199, Cl. 510-242.000.
- Winkler, Werner: *See—*
  - Kausel, Wilfried; Kremser, Hannes; Stallbaumer, Hermann; and Winkler, Werner, 5,535,273, Cl. 379-399.000.
- Winmint Manufacturing Pty Limited: *See—*
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- Winslow, Linda N.; Klendworth, Douglas D.; Menon, Raghu; Lynch, Michael W.; Fields, Garry L.; and Johnson, Kenneth W., to Quantum Chemical Corporation. Vanadium-containing catalyst system. 5,534,472, Cl. 502-116.000.
- Wire Technologies, Inc.: *See—*
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- Wirt, W. Gary; and Jarboe, Patrick G., to Morton International, Inc. Invisible instrument panel or dasbboard airbag cover door. 5,533,748, Cl. 280-728.300.
- Wirth, Guenter: *See—*
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- Wirth, Irma: *See—*
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- Wirz, Armin; and Busenhart, Peter, to Maschinenfabrik Rieter AG. Methods and apparatus for the winding of filaments. 5,533,686, Cl. 242-18.00A.
- Wisconsin Alumini Research Foundation: *See—*
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- Wisneskie, Bradley D., to Loral Aerospace Corp. Method for producing hafnium carbide surfaces on carbon based materials. 5,534,293, Cl. 427-228.000.
- Wisor, Donald R.: *See—*
  - Bergland, Norman R.; Wisor, Donald R.; and Portillo, Netza, 5,533,458, Cl. 111-200.000.
- Wistuba, Eckehardt: *See—*
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- Witco GmbH: *See—*
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- Witels Apparate-Maschinen Albert GmbH & Co KG: *See—*
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- Witman, David F.: *See—*
  - Arjavalingam, Gnanalingam; Deutsch, Alina; Doany, Fuad E.; Furman, Bruce K.; Hunt, Donald J.; Narayan, Chandrasekhar; Oprysko, Modest M.; Purushothaman, Sampath; Ranieri, Vincent; Renick, Stephen; Shaw, Jane M.; Wilczynski, Janusz S.; and Witman, David F., 5,534,094, Cl. 156-155.000.
- Witt, William F.; and Tannert, Hans K., to Syquest Technology, Inc. Removable cartridge disk drive with cartridge interlocking and spindle motor telescoping mechanisms. 5,535,072, Cl. 360-99.060.

- Witte, Donald H. Decorative art form. 5,534,315, Cl. 428-7.000.
- Wittern, Francis A., Jr.; Walke, Gary L.; and Nerly, Joseph F., to Fawn Engineering Corporation. Split door for vending machine. 5,533,645, Cl. 221-76.000.
- Witting, Gary F.: *See—*
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- Woldhuis, Alex F., to Shell Oil Company. Removing ammonia from an ammonia-containing gas mixture. 5,534,236, Cl. 423-237.000.
- Wolf, Gerald L.: *See—*
  - Torchilin, Vladimir P.; Trubetskoy, Vladimir S.; and Wolf, Gerald L., 5,534,241, Cl. 424-9.321.
- Wolf, Philip F.: *See—*
  - Zhong, Yuanzhen; and Wolf, Philip F., 5,534,564, Cl. 523-340.000.
- Wolfberg, Larry; and Harper, John, to Advanced Licensing Limited Partnership. Method and apparatus for automatic numbering of forms on a rotary printing press. 5,533,453, Cl. 101-485.000.
- Wolford, Barry J.: *See—*
  - Drake, Charles E.; Fifield, John A.; Wheeler, Richard D.; and Wolford, Barry J., 5,535,226, Cl. 371-40.100.
- Wolpert, David H., to United States of America, Energy. Method for guessing the response of a physical system to an arbitrary input. 5,535,301, Cl. 395-20.000.
- Wong, Jeffrey F.: *See—*
  - Mattos, Derwin W.; Shiffer, James D., II; and Woog, Jeffrey F., 5,534,791, Cl. 326-27.000.
- Wong, Kwong H.: *See—*
  - Perfecto, Eric D.; Prasad, Chandrika; White, George E.; and Wong, Kwong H., 5,534,466, Cl. 437-208.000.
- Wong, Patrick S.-L.; Edgren, David E.; Dong, Liang C.; and Ferrari, Vincent J., to Alza Corporation. Active agent dosage form comprising a matrix and at least two insoluble bands. 5,534,263, Cl. 424-473.000.
- Woo, Ann K., to Advanced Micro Devices, Inc. CMOS power-on reset circuit using hysteresis. 5,534,804, Cl. 327-143.000.
- Woo, Edmund P.: *See—*
  - O'Briem, James J.; and Woo, Edmund P., 5,534,614, Cl. 528-183.000.
- Woo, Sang M.: *See—*
  - Hong, Young H.; Roh, Jae H.; and Woo, Sang M., 5,534,160, Cl. 210-710.000.
- Wood, James A.; Greer, David A.; and Mazur, Richard J., to Westinghouse Air Brake Company. Method of and an apparatus for providing a safety check of the brake retardation capability of a brake system on a vehicle. 5,535,122, Cl. 364-426.010.
- Wood, Roger W.: *See—*
  - Melas, Constantin M.; Rugar, Daniel; Sutardja, Pantas; and Wood, Roger W., 5,535,187, Cl. 369-59.000.
- Wood, Thomas J., to Medlife, Inc. Nasal tube assembly. 5,533,506, Cl. 128-207.180.
- Wood, William: *See—*
  - Baker, Joffre; Chien, Kenneth; King, Kathleen; Pennice, Diane; and Wood, William, 5,534,615, Cl. 530-350.000.
- Woodard, Daniel L.; and Howard, Adriann J., to Becton, Dickinson and Company. Silicon tetrahydrazide for purification of DNA. 5,534,054, Cl. 106-287.110.
- Woods, Charles L.: *See—*
  - Khoury, Jihad; and Woods, Charles L., 5,535,024, Cl. 359-7.000.
- Woods, Gerald B.: *See—*
  - Ramesh, Ram K.; Woods, Gerald B.; and Campbell, Robert W., 5,534,277, Cl. 426-129.000.
- World Wide Equine: *See—*
  - Capps, R. Scott, 5,533,894, Cl. 433-1.000.
- Wörner, Otto; Reinhardt, Rudolf; and Schultz, Heinz, to Mercedes-Benz AG. Turbine wheel of a hydrodynamic converter. 5,533,602, Cl. 192-3.290.
- Wostmann, Reinhard: *See—*
  - Körner, André; and Wostmann, Reinhard, 5,533,910, Cl. 439-395.000.
- Wright, Richard R.: *See—*
  - Mullooly, John F.; Davis, Franklin J.; Madden, Thomas J.; and Wright, Richard R., 5,533,330, Cl. 60-39.320.
- Wright, Robert D.: *See—*
  - Everhart, Dennis S.; Delucia, Mary L.; Timmons, Terry K.; and Wright, Robert D., 5,534,335, Cl. 428-224.000.
- Wroblewski, George T., Sr.: *See—*
  - Komarek, Dale W.; Moser, Paul; and Wroblewski, George T., Sr., 5,533,956, Cl. 493-355.000.
- Wu, Chih-Siung; and Lai, Po-Shen, to Advanced Micro Devices, Inc. Apparatus and method for automatic sense and establishment of 5V and 3.3V operation. 5,534,801, Cl. 327-72.000.
- Wu, Hew-Der: *See—*
  - Ma, Chen-Chi M.; Wu, Hew-Der; and Li, Ming-Shiu, 5,534,302, Cl. 427-379.000.
- Wu, Kung C.; and Melgoza, Rex, to Wu, Kung C. Spherical robotic shoulder joint. 5,533,418, Cl. 74-490.060.
- Wu, Samuel C., to Bott, Glenn. Apparatus and method for ejecting workpieces from forming machines. 5,533,853, Cl. 413-31.000.
- Wurst, Richard; and Groleau, Rodney J., to RJG Technologies, Inc. Mold pressure sensor body. 5,533,404, Cl. 73-756.000.
- Wuu, Shou-Gwo; Liang, Mong-Song; Su, Chung-Hui; and Wang, Chen-Jong, to Taiwan Semiconductor Manufacturing Company. Method for fabricating a reduced area metal contact to a thin polysilicon layer contact structure having low ohmic resistance. 5,534,451, Cl. 437-40.000.
- Wyatt, William D.: *See—*
  - Button, Donald D.; Wyatt, William D.; and McGrath, James F., 5,534,880, Cl. 343-774.000.
- Wychnanek, Rainer: *See—*
  - Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Joachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; and Wychnanek, Rainer, 5,533,583, Cl. 80-65.400.
- Wydrinski, Raymond: *See—*
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- Wysong, Joel F.: *See—*
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- Xerox Corporation: *See—*
  - Ahl, David K.; Swanson, Roger M.; Apolito, James D.; and Wafler, Walter F., 5,533,720, Cl. 271-225.000.
  - Anderson, David G.; and Claflin, Alfred J., 5,534,897, Cl. 347-32.000.
  - Campbell, Hugh P., 5,533,473, Cl. 123-146.50A.
  - Dalal, Edul N.; Blaszak, Sue E.; Gruber, Robert L.; Bertrand, Jacques C.; and Ciccarelli, Roger N., 5,534,379, Cl. 430-106.000.
  - Drake, Donald J., 5,534,901, Cl. 347-63.000.
  - Eschbach, Reiner, 5,535,019, Cl. 358-456.000.
  - Gerbasi, Dennis G., 5,534,988, Cl. 355-298.000.
  - Gundlach, Kurt B., 5,534,050, Cl. 106-20.00R.
  - Hammer, Tim D.; Enzien, Colleen R.; Acebo, Juan C.; Ludlow, M. John; and May, Keith A., 5,535,312, Cl. 395-115.000.
  - Harris, Ellis D., 5,534,990, Cl. 355-327.000.
  - Hoesly, David D., 5,534,902, Cl. 347-104.000.
  - Kleckner, Robert J.; and Graveson, Sandra, 5,534,964, Cl. 354-344.000.
  - Lamming, Michael G., 5,535,063, Cl. 360-4.000.
  - Lindenfelser, William M.; and Donahue, Frederick A., 5,534,895, Cl. 347-19.000.
  - Malhotra, Shadi L., 5,534,374, Cl. 430-41.000.
  - Mayo, James D.; Duff, James M.; Hamer, Gordon K.; and Gardner, Sandra J., 5,534,376, Cl. 430-59.000.
  - Perry, Phillip G.; O'Dell, Gene W.; and van Asten, Ronny W. F., 5,534,172, Cl. 508-156.000.
  - Rubscha, Robert F.; Tsai, Margaret C.; and Buddendeck, Mark H., 5,534,989, Cl. 355-309.000.
  - Stefik, Mark J.; Russell, Daniel M.; Bobrow, Daniel G.; and Henderson, D. Austin, Jr., 5,534,975, Cl. 355-202.000.
- Xiang, Kun. Add-on adjustable back support for car seat. 5,533,787, Cl. 297-284.500.
- Yabuki, Hiroyuki; Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, to Matsushita Industrial Electric Co., Ltd. Plane type strip-line filter in which strip line is shortened and dual mode resonator in which two types microwaves are independently resonated. 5,534,831, Cl. 333-204.000.
- Yabuki, Kazuyuki: *See—*
  - Faley, Timothy L.; Mills, Michael E.; Teramoto, Yoshihiko; Turek, Douglas E.; and Yabuki, Kazuyuki, 5,534,205, Cl. 264-103.000.
- Yada, Yukihiko; and Higuchi, Kazuyoshi, to Tokai Kogyo Kabushiki Kaisha. Molding and method of producing the same. 5,534,316, Cl. 428-31.000.
- Yagi, Sakai: *See—*
  - Endo, Takayoshi; Yagi, Sakai; and Nagano, Toru, 5,533,909, Cl. 439-381.000.
- Yahagi, Kazuyuki: *See—*
  - Matsuo, Takashi; Adachi, Kumiko; and Yahagi, Kazuyuki, 5,534,248, Cl. 424-70.280.
- Yaklin, Daniel A., to Texas Instruments Incorporated. Method and device for resistive load compensation. 5,534,770, Cl. 323-284.000.
- Yamada, Keiki; Ohnishi, Masaru; Odai, Yoshiaki; and Arima, Ryoji, to Mitsubishi Denki Kabushiki Kaisha. Electric field assisted thermal recording apparatus. 5,534,906, Cl. 347-171.000.
- Yamada, Masakatsu: *See—*
  - Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
- Yamada, Shuji: *See—*
  - Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,534,977, Cl. 355-208.000.
- Yamada, Tatsuo: *See—*
  - Hata, Masayuki; Nakagawa, Hiromasa; and Yamada, Tatsuo, 5,535,359, Cl. 395-446.000.
- Yamada, Yoshiyasu: *See—*
  - Ohshima, Hisayoshi; and Yamada, Yoshiyasu, 5,534,698, Cl. 250-339.110.
- Yamaga, Kenichi, to Tokyo Electron Kabushiki Kaisha; and Tokyo Electron Tohoku Kabushiki Kaisha. Thermal processing apparatus. 5,533,736, Cl. 277-3.000.
- Yamagami, Atsushi: *See—*
  - Okamura, Nobuyuki; Yamagami, Atsushi; and Takaki, Satoshi, 5,534,070, Cl. 118-723.00E.
- Yamagami, Taku; Suzuki, Masao; and Sakaegi, Yuji, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus. 5,535,011, Cl. 358-335.000.
- Yamagata, Michihiro: *See—*
  - Tanaka, Yasuhiro; and Yamagata, Michihiro, 5,535,058, Cl. 359-711.000.
- Yamagata, Shin-ichi: *See—*

Tsuzuki, Yasushi; Yamagata, Shin-ichi; and Yamakawa, Akira, 5,533,930, Cl. 432-120.000.
Yamagata, Yasushi, to NEC Corporation. Non-volatile semiconductor memory device and method for erasure and production thereof. 5,535,158, Cl. 365-185.290.
Yamagata, Yutaka: *See—*
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Yamagishi, Akira: *See—*
  Miyoshi, Tetsuo; Hozumi, Yuuji; Yamagishi, Akira; and Koizumi, Kaoru, 5,534,695, Cl. 250-330.000.
Yamagishi, Hiromasa; Takada, Masahiko; Okuie, Takahiro; Takao, Osamu; Yoneda, Haruhiko; and Suzuki, Akihiro, to Sanyo Electric Co., Ltd. Cassette loading device for use in magnetic recording-reproduction apparatus. 5,535,071, Cl. 360-96.500.
Yamagishi, Hirotoshi: *See—*
  Fusegawa, Izumi; Yamagishi, Hirotoshi; Fujimaki, Nobuyoshi; and Karasawa, Yukio, 5,534,112, Cl. 156-662.100.
Yamagishi, Shinji: *See—*
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Yamagishi, Takeshi: *See—*
  Aso, Kazuyoshi; Noguchi, Masami; Kobayashi, Katsumi; and Yamagishi, Takeshi, 5,534,128, Cl. 205-176.000.
Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, to Victor Company of Japan, Ltd. Method for jump-reproducing video data of moving picture coded with high efficiency. 5,535,008, Cl. 358-342.000.
Yamaguchi, Atsuo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit. 5,535,160, Cl. 365-189.010.
Yamaguchi, Kiyotaka: *See—*
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Yamaguchi, Takehito: *See—*
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Yamaha Corporation: *See—*
  Kuwajima, Tetsuya, 5,534,461, Cl. 437-189.000.
Yamaharu, Eikichi. Method and apparatus for pretreating electronic component manufacturing frame. 5,533,922, Cl. 451-38.000.
Yamaji, Takafumi, to Kabushiki Kaisha Toshiba. Modulator. 5,534,827, Cl. 332-103.000.
Yamakawa, Akira: *See—*
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Yamaki, Mitsuo: *See—*
  Takada, Kenzo; Tochikura, Akiko; and Yamaki, Mitsuo, 5,534,430, Cl. 435-240.200.
Yamamoto, Akira; Okabe, Masaaki; Kaneko, Yoshio; and Shiraishi, Keiichi, to Kabushiki Kaisha Meidensha. Apparatus for electromagnetically isolating an automobile. 5,533,388, Cl. 73-117.000.
Yamamoto, Ayako: *See—*
  Itoh, Makoto; Yamamoto, Ayako; Isawa, Kazuyuki; Adachi, Seiji; Yamauchi, Hisao; and Tanaka, Shoji, 5,534,490, Cl. 505-490.000.
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Yamamoto, Etsuji: *See—*
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Yamamoto, Katsuhiko: *See—*
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Yamamoto, Kazumichi: *See—*
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Yamamoto, Osamu; Hirohama, Seiya; Kajiyama, Ryuichiro; Shimoyama, Yoshikazu; and Tanaka, Junichiro, to Chiyoda Corporation. Liquid flow control device, reactor using same and liquid flow control method. 5,534,233, Cl. 422-191.000.
Yamamoto, Seiichi; and Hashimoto, Shinichi, to Rohm Co., Ltd. Optical disk drive circuit and optical disk drive device using the same. 5,534,758, Cl. 318-112.000.
Yamamoto, Shuuhei: *See—*
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Yamamoto, Yasuo, to Riso Kagaku Corporation. Process for producing heat-sensitive stencil sheet. 5,534,099, Cl. 156-230.000.
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Yamano, Akihiko; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; and Shido, Shunichi, to Canon Kabushiki Kaisha. Information processing apparatus. 5,535,018, Cl. 358-444.000.
Yamaoka, Masayoshi: *See—*
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Yamasaki, Yutaka: *See—*
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Yamashita, Shinji: *See—*
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Yamazaki, Satoshi, to Dai Nippon Printing Co., Ltd. Method of reading hologram information. 5,535,023, Cl. 359-2.000.
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Yanagawa, Atsuyuki; and Shimizu, Hisao, to Oki Electric Industry Co., Ltd. Data processing system for locally updating customer data distributed by a host computer to a remote facility and for returning the updated customer data to the host computer. 5,535,407, Cl. 395-800.000.
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Yang, Jian, to Samsung Electronics Co., Ltd. Apparatus for processing NTSC TV signals having digital signals on quadrature-phase video carrier. 5,534,933, Cl. 348-433.000.
Yang, Ming-Tzong: *See—*
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Yang, Tsih C., to United States of America, Navy. Method and system for sensing with an active acoustic array. 5,535,176, Cl. 367-13.000.
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Yasuda, Tomokazu; Karino, Yukio; Sakurai, Seiya; and Ogawa, Masataka, to Puji Photo Film Co., Ltd. Silver halide photographic material comprising emulsion layer containing color coupler. 5,534,398, Cl. 430-545.000.
Yazaki Corporation: *See—*
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  Noguchi, Hiroyuki; Usui, Hideyuki; and Yonemochi, Kenshin, 5,535,093, Cl. 361-686.000.
Yoneyama, Kenichi, to NEC Corporation. Optical repeater. 5,535,037, Cl. 359-177.000.
Yong, Mei: *See—*
  Zhu, Qin-Fan; and Yong, Mei, 5,534,937, Cl. 348-466.000.
Yoon, Wonbong: *See—*
  Bae, Byungseong; Kim, Kyungseop; Yoon, Wonbong; and Lee, Seogyul, 5,535,028, Cl. 359-61.000.
Yoram, Yeivin: *See—*
  Boaz, Shachar; Yoram, Yeivin; and Yehuda, Rudin, 5,535,349, Cl. 395-401.000.
Yorozu Corporation: *See—*
  Ishihara, Tsuyoshi; Sakuragi, Hideyori; Imanishi, Kazuo; and Ishikawa, Haruhiko, 5,533,850, Cl. 411-171.000.
Yoshida, Akira; Oda, Koza; Ishihara, Sadao; Kasai, Takashi; Saito, Fujio; Koike, Hiroyuki; Koga, Teiichiro; Kitazawa, Eiichi; Kogen, Hiroshi; and Hayakawa, Ichiro, to Sankyo Company, Limited. Substituted aromatic amides and ureas derivatives having anti-hypercholesteremic activity, their preparation and their therapeutic uses. 5,534,529, Cl. 514-357.000.
Yoshida, Ikio; and Ishigami, Masahiro, to NEC Corporation. Portable transceiver and ESN transfer system therefor. 5,535,436, Cl. 455-89.000.
Yoshida, Kazuaki: *See—*
  Kamada, Katsushige; and Yoshida, Kazuaki, 5,534,395, Cl. 430-400.000.
Yoshida, Kazuo: *See—*
  Kinoshita, Yoshimi; Kanda, Tomoyuki; Kitano, Katsuhisa; Yoshida, Kazuo; Ohnishi, Hiroshi; Yamanishi, Kenichiro; Sasaki, Shigeo; Komori, Hideki; Eshima, Taizo; Tsutahara, Kouichirou; Noguchi, Toshihiko; Takahama, Toru; Kusakabe, Yoshihiko; Iwamoto, Takeshi; and Kosaka, Nobuyuki, 5,534,073, Cl. 118-728.000.
Yoshida, Kiyohide; Muramatsu, Gyo; Abe, Akira; and Miyadera, Tatsuo, to Kubushiki Kaisha Riken; and Shunso Ishishara, Director–General of Agency Of Industrial Science And Technology. Method of cleaning an exhaust gas and exhaust gas cleaner therefor. 5,534,237, Cl. 423-239.100.
Yoshida Kogyo K.K.: *See—*
  Murai, Ryukichi, 5,533,240, Cl. 24-615.000.
Yoshida, Masaru: *See—*
  Kimura, Naofumi; Ishii, Yutaka; Yoshida, Masaru; Matsuura, Masataka; Hatano, Akitsugu; Narutaki, Yozo; Fujiwara, Sayuri; Izumi, Yoshihiro; and Yamamoto, Yoshitaka, 5,535,027, Cl. 359-58.000.
Yoshida, Nobuhiko: *See—*
  Sumi, Yoshihiko; Koike, Yukiya; Ichikawa, Yataro; Yoshida, Nobuhiko; and Aoki, Nobuo, 5,534,255, Cl. 424-141.100.
Yoshida, Noriyuki: *See—*
  Hayashi, Noriki; and Yoshida, Noriyuki, 5,534,489, Cl. 505-474.000.
Yoshida, Satoshi: *See—*
  Sakaizawa, Katsuhiro; Urawa, Motoo; Kukimoto, Tsutomu; and Yoshida, Satoshi, 5,534,982, Cl. 355-246.000.
Yoshida, Shinichi: *See—*
  Ishikawa, Yutaka; and Yoshida, Shinichi, 5,535,413, Cl. 395-800.000.
  Nishihira, Keigo; Yoshida, Shinichi; and Tanaka, Shuji, 5,534,648, Cl. 558-277.000.
Yoshida, Takehiro, to Canon Kabushiki Kaisha. Facsimile apparatus for transmitting a plurality of originals in a single communication. 5,535,015, Cl. 358-438.000.
Yoshida, Takehiro: *See—*
  Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Wada, Satoshi; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Yokoyama, Minoru; Tomoda, Akihiro; Ishida, Yasushi; Awai, Takashi; and Yamada, Masakatsu, 5,534,908, Cl. 347-215.000.
Yoshii, Fumihiko: *See—*
  Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,535,184, Cl. 369-32.000.
Yoshii, Kinya: *See—*
  Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; Umeyama, Mitsuhiro; Funahashi, Makoto; Shimizu, Takashi; Sasaki, Yoshihiko; and Hasebe, Masahiro, 5,533,943, Cl. 475-198.000.
Yoshikawa, Harutoshi: *See—*
  Ishida, Yasuo; Ohta, Kazunari; and Yoshikawa, Harutoshi, 5,534,482, Cl. 504-215.000.
Yoshimi, Shuji: *See—*
  Mitsui, Shinichi; Kihara, Hayato; and Yoshimi, Shuji, 5,534,580, Cl. 524-417.000.
Yoshimoto, Shinichi; and Namiki, Fumihiro, to Fujitsu Limited. Radiation image reading apparatus. 5,534,709, Cl. 250-588.000.
Yoshioka, Yasuhiro: *See—*
  Seto, Nobuo; Yoshioka, Yasuhiro; and Morigaki, Masakazu, 5,534,390, Cl. 430-551.000.
Yoshizaki, Tsutomu; Maruyama, Shigeyuki; and Ohno, Tsuyoshi, to Fujitsu Limited. Integrated circuit bare chip carrier. 5,534,785, Cl. 324-758.000.
Young, Frederick A.; Hendrick, Louis W.; and Loi, Keith N., to Hughes Aircraft Company. Microwave filter assembly having a nonsymmetrical waveguide and an antenna. 5,534,881, Cl. 343-776.000.
Young, Harvey J.; Brown, Thomas W.; Devine, Sara W.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Tobacco reconstitution process. 5,533,530, Cl. 131-370.000.
Young, Ian R.; and Eastham, John F., to Picker International, Inc. Magnet systems. 5,534,779, Cl. 324-319.000.
Young, Jerry. Motorcycle trainer. 5,533,899, Cl. 434-61.000.
Young, Michael E. Engine oil draining system. 5,533,554, Cl. 141-383.000.
Young, Raymond A.: *See—*
  Denes, Ferencz S.; and Young, Raymond A., 5,534,232, Cl. 422-186.260.
Yu, Xiaohong: *See—*
  Walker, David H.; Gold, Harris; McKinney, George W., III; McCoy, John F., III; and Yu, Xiaohong, 5,534,186, Cl. 252-194.000.
Yuan, Jack H.; Harari, Eliyahou; Chien, Henry; and Samachisa, Gheorghe, to SanDisk Corporation. Method of making dense flash EEPROM cell array and peripheral supporting circuits formed in deposited field oxide with sidewall spacers. 5,534,456, Cl. 437-43.000.
Yue, Stephen T.: *See—*
  Millard, Paul J.; Roth, Bruce L.; Yue, Stephen T.; and Haugland, Richard P., 5,534,416, Cl. 436-34.000.
Yugenkaisha Shinjo Seisakusho: *See—*
  Shinjo, Katsumi, 5,533,377, Cl. 72-294.000.
Yui, Tomoyuki: *See—*
  Johno, Masahiro; Yui, Tomoyuki; Matsumoto, Takahiro; and Arai, Yoshihisa, 5,534,190, Cl. 252-299.650.
Yuji, Yamada: *See—*
  Junji, Uchida; Hiroyuki, Okabe; Teiji, Takechi; Setsuo, Takeda; and Yuji, Yamada, 5,534,513, Cl. 514-249.000.
Yujiri, Larry; Mussetto, Michael S.; and Uyeno, Gerald P., to TRW Inc. Rotating mirror drum radiometer imaging system. 5,534,874, Cl. 342-351.000.
Yurtsev, Anatoly: *See—*
  Moran, Dov; Levy, Rony; Deitcher, David; Mergui, Arie; Ban, Amir; and Yurtsev, Anatoly, 5,535,357, Cl. 395-430.000.
Yusa, Hiroshi: *See—*
  Ohno, Manabu; Ochi, Hisayuki; Kuwashima, Tetsuhito; Suematsu, Hiroyuki; Imai, Eiichi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; Kukimoto, Tsutomu; and Yusa, Hiroshi, 5,534,981, Cl. 355-245.000.
Yusu, Keiichiro: *See—*
  Okuno, Shiho; Hashimoto, Susumu; Yusu, Keiichiro; and Inomata, Koichiro, 5,534,355, Cl. 428-611.000.
Yuyama, Shoji. Apparatus for storing and transporting drugs. 5,533,606, Cl. 198-349.000.
Zabriskie, Kenneth A.: *See—*
  Majeti, Venkata C.; Midani, Mowaffak T.; Watson, Richard J.; and Zabriskie, Kenneth A., 5,534,913, Cl. 348-7.000.
Zaghloul, Amir I.: *See—*
  Sorbello, Robert M.; and Zaghloul, Amir I., 5,534,877, Cl. 343-700.0MS.

Zaidi, Ahmad: *See—*
  Grochowski, Edward; Zaidi, Ahmad; and Lan, James, 5,535,347, Cl. 395-375.000.
Zaleski, Edward R.; and Cole, Mark S., to Allergan, Inc. Reusable cartridge assembly for a phaco machine. 5,533,976, Cl. 604-153.000.
Zalipsky, Samuel; and Martin, Francis J., to Liposome Technology, Inc. Polymer compound and coated particle composition. 5,534,259, Cl. 424-450.000.
Zamerovsky, Edward. Frame structure with load-bearing joints. 5,533,310, Cl. 52-263.000.
Zander, Dennis R., to Eastman Kodak Company. Method and apparatus for preventing unauthorized recycling of single-use camera and permitting authorized reuse of the camera. 5,534,962, Cl. 354-289.120.
Zanecchia, Denise; Heinrich, Ann M.; and Ustanik, Teresa, to Alcon Laboratories, Inc. Pupillometer. 5,534,952, Cl. 351-200.000.
Zanzig, David J.: *See—*
  Halasa, Adel F.; Hsu, Wen-Liang; Zanzig, David J.; Sandstrom, Paul H.; Henning, Steven K.; and Lucas, Danielle, 5,534,592, Cl. 525-236.000.
  Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., 5,534,574, Cl. 524-262.000.
  Sandstrom, Paul H.; Zanzig, David J.; and Sinsky, Mark S., 5,534,599, Cl. 525-342.000.
Zapp, Maria L.: *See—*
  Green, Michael R.; Zapp, Maria L.; and Stern, Seth, 5,534,408, Cl. 435-5.000.
Zdarsky, Edward, to Vereinigte Dentalwerke Antaeos Beutelrock Zipperer Zdarsky Ehrler. Instrument for preparing the root-canal. 5,533,897, Cl. 433-102.000.
Zedan, David M.: *See—*
  Damerow, Robert L.; and Zedan, David M., 5,533,421, Cl. 74-563.000.
Zeindler, Heidi, to Zewa AG. Pacifier thermometer. 5,534,013, Cl. 606-234.000.
Zeissner, Alexander: *See—*
  Kleemann, Klaus; May, Herbert; Aydt, Matthias; Pfertner, Kurt; Zeissner, Alexander; and Thomas, Peter, 5,533,777, Cl. 296-117.000.
Zell, Peter: *See—*
  Hillebrenner, H. William; Sheth, Vipul B.; Stack, Joseph M.; Curtis, Charles T.; Butler, Kevin H.; Shoff, David E.; Petko, Robert S.; Little, William C.; Mielnik, Thaddeus; and Zell, Peter, 5,534,221, Cl. 422-33.000.
Zeller, Niel P.: *See—*
  Newman, Perran V. L.; Zeller, Niel P.; and Ifland, Dwight D., 5,533,959, Cl. 600-28.000.
Zeneca Limited: *See—*
  Miller, Scott C., 5,534,525, Cl. 514-316.000.
  Waddington, Simon D., 5,534,616, Cl. 528-503.000.
Zenith Electronics Corporation: *See—*
  Bestler, Caitlin B.; and Rabii, Khosro M., 5,535,206, Cl. 370-79.000.
Zewa AG: *See—*
  Zeindler, Heidi, 5,534,013, Cl. 606-234.000.
Zexel Torsen Inc.: *See—*
  Ichiki, Shiro; and Ryan, Thomas B., 5,533,944, Cl. 475-252.000.
Zhang, Jing; and Gramley, Kenneth R., to Wandel & Goltermann Technologies, Inc. Multiport analyzing with time stamp synchronizing. 5,535,193, Cl. 370-17.000.
Zheng, Qin, to Mitsubishi Electric Research Laboratories, Inc. Traffic shaping system using two dimensional timing chains. 5,535,201, Cl. 370-60.100.
Zhermack S.p.A.: *See—*
  Busin, Tiziano; and Faccio, Enrico, 5,534,560, Cl. 523-109.000.
Zhong, Sifen, to Cognitech Inc. Image compression by optimal reconstruction. 5,534,925, Cl. 348-384.000.
Zhong, Yuanzhen; and Wolf, Philip F., to ISP Investments Inc. Process for the color stabilization of an aqueous N-vinyl heterocyclic copolymer solution. 5,534,564, Cl. 523-340.000.
Zhou, Rouyi: *See—*
  Marancik, William G.; Hong, Seungok; and Zhou, Rouyi, 5,534,219, Cl. 419-4.000.
Zhou, Weimin: *See—*
  Dutta, Mitra; and Zhou, Weimin, 5,535,045, Cl. 359-248.000.
Zhu, Qin-Fan; and Yong, Mei, to Motorola, Inc. Minimum-delay jitter smoothing device and method for packet video communications. 5,534,937, Cl. 348-466.000.
Zicker, Robert G.; and Dion, John K., to GTE Mobile Communictions Services. Cellular radiotelephone with dialed number analysis. 5,535,260, Cl. 379-63.000.
Ziegler, Christiane, to fischerwerks Artur Ficher GmbH & Co. Container for a magnetic tape cassette. 5,533,619, Cl. 206-387.120.
Ziegler, Michael L.: *See—*
  Bridges, K. Monroe; Brooks, Robert; Bryg, William R.; Burger, Stephen G.; Hamilton, Eric W.; Nusbaum, Helen; Voge, Brendan A.; and Ziegler, Michael L., 5,535,352, Cl. 395-418.000.
Zieman, Ricky L.: *See—*
  Haeg, Steven R.; Leska, Paul J., Sr.; and Zieman, Ricky L., 5,533,403, Cl. 73-669.000.
Zimmer, Inc.: *See—*
  Hodorek, Robert A., 5,534,027, Cl. 623-16.000.
  Hodorek, Robert A., 5,534,032, Cl. 623-18.000.
Zimmerman, Gary, to Hewlett-Packard Company. Method and apparatus for image-type determination to enable choice of an optimum data compression procedure. 5,535,311, Cl. 395-114.000.
Zimmerman, Patrick J.: *See—*
  Jordan, Henry J., Jr.; McNair, Robert J.; Emerson, Alan B.; Kennedy, Brian S.; and Zimmerman, Patrick J., 5,533,573, Cl. 166-313.000.
Zimmerman, Steven M.: *See—*
  Jones, Gary W.; and Zimmerman, Steven M., 5,534,743, Cl. 313-309.000.
Zimmermann, Norbert: *See—*
  Brueckmann, Ralf; Dix, Johannes P.; Fikentscher, Rolf; Herrmann, Manfred; and Zimmermann, Norbert, 5,534,166, Cl. 8-557.000.
Zimmers, Karl B.: *See—*
  Navarro, Richard R.; McMillin, Carl R.; and Zimmers, Karl B., 5,534,030, Cl. 623-17.000.
Zitz, Jeffrey A.: *See—*
  Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,533,256, Cl. 29-840.000.
Zlotnik, Arnold H.; Austin, John A.; and Zlotnik, Milton, to Pestco, Inc. Drive for deodorant apparatus. 5,533,705, Cl. 248-645.000.
Zlotnik, Milton: *See—*
  Zlotnik, Arnold H.; Austin, John A.; and Zlotnik, Milton, 5,533,705, Cl. 248-645.000.
Zmijewski, Milton J., Jr.: *See—*
  Debono, Manuel; Logan, Robert M.; Marconi, Gary G.; Molloy, R. Michael; and Zmijewski, Milton J., Jr., 5,534,420, Cl. 435-71.300.
Zmyslowski, Mark; and Larson, Erik W., to Radar Industries, Inc. Method of forming a clevis link. 5,533,328, Cl. 59-15.000.
Zogg, Alan R. One-piece corrugated tray. 5,533,954, Cl. 493-310.000.
Zoppi, Gianni, to Ecochem Aktiengesellschaft. Process for heavy metals electrowinning. 5,534,131, Cl. 205-560.000.
Zschiesche, Ruth: *See—*
  Hinz, Werner; Zschiesche, Ruth; Lutter, Heinz-Dieter; and Bruchmann, Bernd, 5,534,185, Cl. 252-182.220.
Zupancic, Joseph J.; Conrad, Jeffrey P.; Konicek, Jiri D.; and Tungare, Aroon V., to AlliedSignal Inc. Solvent free epoxy resin compositions containing substituted cyanoguanidines. 5,534,565, Cl. 523-454.000.
Zwerdling, Susan S.: *See—*
  Pilosof, David; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark Lee; Trinh, Toan; and Zwerdling, Susan S., 5,534,165, Cl. 252-8.910.
ZymoGenetics, Inc.: *See—*
  Moore, Emma E., 5,533,836, Cl. 435-240.310.
Zywietz, Martin: *See—*
  Jakob, Gert; Liegl, Erwin; Luz, Siegbert; Bohmwetsch, Gerd; and Zywietz, Martin, 5,535,098, Cl. 361-752.000.
2986647 Canada Inc.: *See—*
  Lafond, André; and Laliberte, Gérard, 5,533,642, Cl. 220-326.000.
3COM Corporation: *See—*
  Hogan, Thomas C.; and Williams, Peter K., 5,535,337, Cl. 395-200.190.
  Krause, Jeffrey; Strohl, Niles E.; Seaman, Michael J.; Russell, Steven P.; and Hart, John H., 5,535,338, Cl. 395-200.200.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9th DAY OF JULY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

Bahrmann, Helmut; Haubs, Michael; Kreuder, Willi; and Muller, Thomas, to Hoechst Aktiengesellschaft. Process for separating organometallic compounds and/or metal carbonyls from their solutions in organic media. Re. 35,292, Cl. 210-644.000.
Hamada, Akihiko: *See—*
  Hiraoka, Hidenori; and Hamada, Akihiko, Re. 35,293, Cl. 473-372.000.
Haubs, Michael: *See—*
  Bahrmann, Helmut; Haubs, Michael; Kreuder, Willi; and Muller, Thomas, Re. 35,292, Cl. 210-644.000.
Hiraoka, Hidenori; and Hamada, Akihiko, to Sumitomo Rubber Industries, Ltd. Solid golf ball. Re. 35,293, Cl. 473-372.000.
Hoechst Aktiengesellschaft: *See—*
  Bahrmann, Helmut; Haubs, Michael; Kreuder, Willi; and Muller, Thomas, Re. 35,292, Cl. 210-644.000.
Kreuder, Willi: *See—*
  Bahrmann, Helmut; Haubs, Michael; Kreuder, Willi; and Muller, Thomas, Re. 35,292, Cl. 210-644.000.
Lafond, Luc, to Tremco, Inc. Apparatus for laying strip on glass or like material. Re. 35,291, Cl. 156-109.000.
Masquelier, Michael P.: *See—*
  Vasquez, Barbara; Masquelier, Michael P.; Roth, Scott S.; and Ray, Wayne J., Re. 35,294, Cl. 437-70.000.
Motorola, Inc.: *See—*
  Vasquez, Barbara; Masquelier, Michael P.; Roth, Scott S.; and Ray, Wayne J., Re. 35,294, Cl. 437-70.000.
Muller, Thomas: *See—*
  Bahrmann, Helmut; Haubs, Michael; Kreuder, Willi; and Muller, Thomas, Re. 35,292, Cl. 210-644.000.
Ray, Wayne J.: *See—*
  Vasquez, Barbara; Masquelier, Michael P.; Roth, Scott S.; and Ray, Wayne J., Re. 35,294, Cl. 437-70.000.
Roth, Scott S.: *See—*
  Vasquez, Barbara; Masquelier, Michael P.; Roth, Scott S.; and Ray, Wayne J., Re. 35,294, Cl. 437-70.000.
Sumitomo Rubber Industries, Ltd.: *See—*
  Hiraoka, Hidenori; and Hamada, Akihiko, Re. 35,293, Cl. 473-372.000.
Tremco, Inc.: *See—*
  Lafond, Luc, Re. 35,291, Cl. 156-109.000.
Vasquez, Barbara; Masquelier, Michael P.; Roth, Scott S.; and Ray, Wayne J., to Motorola, Inc. Polysilicon encapsulated localized oxidation of silicon. Re. 35,294, Cl. 437-70.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Iggulden, Jerry R.: *See—*
  Streck, Donald A.; and Iggulden, Jerry R., B1 5,012,350, Cl. 358-335.000.
Streck, Donald A.; and Iggulden, Jerry R., to Streck, Donald A.; and Iggulden, Jerry R. Television local wireless transmission and control. B1 5,012,350, Cl. 358-335.000.

LIST OF DESIGN PATENTEES

AB Konstruktions-Bakelit: *See—*
  Envall, Sune, 371,487, Cl. D7-397.000.
Aiwa Co., Ltd.: *See—*
  Morita, Takashi. 371,512, Cl. D9-415.000.
Akiyama, Osamu; Fujii, Yoshito; Tsujimoto, Kazuo; Osaka, Kazumi; and Koyama, Keiichi, to Sharp Kabushiki Kaisha. Combined television set and video tape recorder. 371,552, Cl. D14-129.000.
Alexander, H. A. M. Dankers: *See—*
  Muller-Deisig, Wolfgang; and Alexander, H. A. M. Dankers, 371,663, Cl. D34-25.000.
All-Pak Machinery Systems, Inc.: *See—*
  Poole, Bryan H., 371,667, Cl. D34-29.000.
AM System Silkeborg A/S: *See—*
  Kainz, Kurt, 371,470, Cl. D6-469.000.
American Standard Inc.: *See—*
  Kaiser, Jack N., 371,598, Cl. D23-313.000.
American Tack & Hardware Co., Inc.: *See—*
  Hollinger, Fred, 371,507, Cl. D8-373.000.
Anthro Corporation: *See—*
  Linder, Steven E., 371,661, Cl. D34-21.000.
Anwyl-Davies, Nicholas T. G., to Dynatec, Ltd. Concave sided portable safety light. 371,617, Cl. D26-39.000.
Assenburg B.V.: *See—*
  Muller-Deisig, Wolfgang; and Alexander, H. A. M. Dankers, 371,663, Cl. D34-25.000.
Avocet Medical, Inc.: *See—*
  Wong, Gilbert Y.; Yoshimoto, Max K.; and Edson, John C., 371,605, Cl. D24-169.000.
B.M.M.D. Inc.: *See—*
  Beaulieu, Dale, 371,493, Cl. D8-7.000.
Backstrom, Mikael: *See—*
  Herbst, Walter B.; Backstrom, Mikael; and Lazar, Ralph, 371,495, Cl. D8-50.000.
  Herbst, Walter B.; Backstrom, Mikael; and Lazar, Ralph, 371,496, Cl. D8-50.000.
Bao, Alain: *See—*
  Ryan, Kelly; and Bao, Alain, 371,525, Cl. D11-231.000.
Barton, Leslie W.; and Karr, Freddie L., to Classic Balloon Corp. Combined balloon and card ballast. 371,574, Cl. D19-2.000.
Bass, Charles J.; Goodin, John W.; LeBeau, Mark W.; Prindle, Carl E.; and Tyler, William C., to Black & Decker Inc. Vacuum cleaner. 371,651, Cl. D32-18.000.
Bausch & Lomh Incorporated: *See—*
  Valls, William H.; Schweitzer, David W.; and Hamilton, Jonathan C., 371,458, Cl. D3-266.000.
Bazz Inc.: *See—*
  Benghozi, Simon, 371,623, Cl. D26-88.000.
  Benghozi, Simon, 371,624, Cl. D26-110.000.
Beaulieu, Dale, to B.M.M.D. Inc. Hand tool for aerating turf. 371,493, Cl. D8-7.000.
Below, Randall J.: *See—*
  Siemon, John A.; and Below, Randall J., 371,540, Cl. D13-146.000.
Benghozi, Simon, to Bazz Inc. Bowl-shaped chandelier. 371,623, Cl. D26-88.000.
Benghozi, Simon, to Bazz Inc. Floor lamp with conical translucent shade. 371,624, Cl. D26-110.000.
Berntsen, James L.: *See—*
  Scudder, James A.; and Berntsen, James L., 371,513, Cl. D9-434.000.
Betts, John H.; and Kinnear, Gary E., to Polaroid Corporation. Automatic film processor for self-developing peel-apart film. 371,565, Cl. D16-246.000.
Biefnot, Henri; Boonants, Marius; and Hubert, Marcel. Articulated bed. 371,467, Cl. D6-392.000.
Bissell Inc.: *See—*
  Umbach, Steven, 371,652, Cl. D32-22.000.
Black & Decker Inc.: *See—*
  Bass, Charles J.; Goodin, John W.; LeBeau, Mark W.; Prindle, Carl E.; and Tyler, William C., 371,651, Cl. D32-18.000.
  Nolan, Patrick B., 371,618, Cl. D26-43.000.
  Szymanski, Aaron, 371,619, Cl. D26-43.000.
Blackman, Stephen E.: *See—*

  Pickett, Mark A.; and Blackman, Stephen E., 371,631, Cl. D26-149.000.
Bly, Richard F.; and Wilson, Kent S., to Holgate Toy Company. Toy rocker. 371,461, Cl. D6-345.000.
Boat-A-System, Inc.: *See—*
  Pieper, Raymond J.; and Sieland, Robert, 371,595, Cl. D22-147.000.
Boehnke, Ulrich K., to Diemold Machine Company, Inc. Bucket top fishing bait tray. 371,593, Cl. D22-136.000.
Boettinger, Volker: *See—*
  Guber, Wolfgang; and Boettinger, Volker, 371,516, Cl. D10-75.000.
Boisson, Judi. Lawn chair. 371,466, Cl. D6-370.000.
Boonants, Marius: *See—*
  Biefnot, Henri; Boonants, Marius; and Hubert, Marcel, 371,467, Cl. D6-392.000.
Boone, David D., to Lynx Golf Inc. Golf glove having a reinforced thumb portion. 371,640, Cl. D29-117.000.
Boston Acoustics, Inc.: *See—*
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Wright, Jack R. Multiple-unit mobile display pavilion. 371,527, Cl. D12-97.000.
Yamaguchi, Susumu: *See—*
  Nagamine, Toshihide; and Yamaguchi, Susumu, 371,653, Cl. D32-22.000.
Yamamoto, Tokuzo; and Yamane, Nobuhiro, to Kabushiki Kaisha Toshiba. Optical disk cartridge. 371,548, Cl. D14-114.000.
Yamane, Nobuhiro: *See—*
  Yamamoto, Tokuzo; and Yamane, Nobuhiro, 371,548, Cl. D14-114.000.
Yates, Robert T., to Creative Nail Design, Inc. Combined display and dispensing rack for cosmetic products. 371,478, Cl. D6-515.000.
YKK Corporation: *See—*
  Ikehara, Chikako, 371,523, Cl. D11-221.000.
  Ikehara, Chikako, 371,524, Cl. D11-221.000.
Yokajty, Joseph E.: *See—*
  Chapman, Steven S.; Jackson, Daniel C.; McBride, John K.; Rydelek, James G.; and Yokajty, Joseph E., 371,563, Cl. D16-218.000.
Yoon, Young-Bin, to Daewoo Electronics Co., Ltd. Fork lift truck. 371,669, Cl. D34-34.000.
Yoshimoto, Max K.: *See—*
  Wong, Gilbert Y.; Yoshimoto, Max K.; and Edson, John C., 371,605, Cl. D24-169.000.
Yoshizawa, Nanase, to Sony Corporation. Headphone. 371,558, Cl. D14-205.000.
Young, John. Pipe wrench support stand. 371,505, Cl. D8-349.000.
Young, Roger L. Momentum removable bed for pickup truck. 371,535, Cl. D12-221.000.
Zenith Data Systems Corporation: *See—*
  Ojeda, Peter A., 371,545, Cl. D14-107.000.
Zimmermann, Guido; and Buttenbender, Klaus, to J. Wagner GmbH. Wallpaper stripper. 371,648, Cl. D32-15.000.

LIST OF PLANT PATENTEES

Dura Flor S.A.: *See—*
  Skotak, Chester, Jr., 9,604, Cl. Plt.-88.800.
Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant '3-91'. 9,602, Cl. Plt.-86.100.
Geo. J. Ball, Inc.: *See—*
  Leue, Ellen F., 9,603, Cl. Plt.-87.600.
Leue, Ellen F., to Geo. J. Ball, Inc. Impatiens plant named 'Sparkler Rose'. 9,603, Cl. Plt.-87.600.
Ott, Cleveland. 'Red and White' Poinsettia. 9,601, Cl. Plt.-86.100.
Paul Ecke Ranch, Inc.: *See—*
  Fruehwirth, Franz, 9,602, Cl. Plt.-86.100.
Skotak, Chester, Jr., to Dura Flor S.A. Neoregelia plant named 'Nonis'. 9,604, Cl. Plt.-88.800.
Weatherly, Lilia M., to Weeks Wholesale Rose Grower, Inc. Floribunda rose plant named 'Proberg'. 9,600, Cl. Plt.-22.000.
Weeks Wholesale Rose Grower, Inc.: *See—*
  Weatherly, Lilia M., 9,600, Cl. Plt.-22.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 9, 1996

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

8	5,533,206
10	5,533,207
	5,533,208
60	5,533,209
93	5,533,210
195.1	5,533,211
195.2	5,533,213
409	5,533,212

CLASS 4

502	5,533,214

CLASS 5

99.1	5,533,215
413 R	5,533,216
453	5,533,217
636	5,533,218
653	5,533,219
654	5,533,220

CLASS 8

94.21	5,534,035
137	5,534,182
411	5,534,036
	5,534,037
507	5,534,038
557	5,534,166

CLASS 14

73	5,533,221

CLASS 15

4	5,533,222
104.002	5,533,223
104.61	5,533,224
104.92	5,533,225
119.2	5,533,226
167.1	5,533,227
257.06	5,533,228
310	5,533,229
339	5,533,230

CLASS 16

34	5,533,231
114 R	5,533,232
228	5,533,233
308	5,533,234

CLASS 24

20 R	5,533,235
67.5	5,533,236
115 F	5,533,238
289	5,533,237
339	5,533,239
615	5,533,240

CLASS 27

27	5,533,241

CLASS 28

107	5,533,242

CLASS 29

25.01	5,533,243
90.1	5,533,244
221.6	5,533,245
275	5,533,246
440.1	5,533,788
527.4	5,533,247
527.7	5,533,248
605	5,533,249
702	5,533,250
727	5,533,251
734	5,533,252
741	5,533,253
750	5,533,254
758	5,533,255
840	5,533,256
890.03	5,533,257
	5,533,258
890.043	5,533,259
894.322	5,533,260
	5,533,261

CLASS 30

29	5,533,262
87	5,533,263
90.1	5,533,264
120.2	5,533,265
122	5,533,266
304	5,533,269

CLASS 33

245	5,533,267
290	5,533,268
403	5,533,270
502	5,533,271
506	5,533,272
534	5,533,273
600	5,533,274

CLASS 34

433	5,533,275
583	5,533,276

CLASS 36

7.6	5,533,277
11.5	5,533,278
50.1	5,533,279
101	5,533,280
118.2	5,533,281
129	5,533,282

CLASS 37

142.5	5,533,283
348	5,533,284

CLASS 40

544	5,533,289
545	5,533,286
584	5,533,285
591	5,533,287
717	5,533,290
754	5,533,288

CLASS 42

7	5,533,291
100	5,533,292

CLASS 43

12	5,533,293
15	5,533,294
21.2	5,533,295
42.36	5,533,296
57.1	5,533,297
112	5,533,298

CLASS 44

367	5,534,039

CLASS 47

18	5,533,299
48.5	5,533,300
72	5,533,301
82	5,533,302

CLASS 48

197 R	5,534,040

CLASS 52

16	5,533,303
40	5,533,304
79.1	5,533,305
144	5,533,306
167.3	5,533,307
204.5	5,533,308
223.8	5,533,309
263	5,533,310
309.9	5,533,311
	5,533,312
712	5,533,313
788.1	5,533,314

CLASS 53

53	5,533,315
137.2	5,533,316
334	5,533,317
390	5,533,318
397	5,533,319
399	5,533,320
415	5,533,321
451	5,533,322
466	5,533,323
469	5,533,324

CLASS 56

7	5,533,325
	5,533,326

CLASS 57

311	5,533,327

CLASS 59

15	5,533,328

CLASS 60

39.03	5,533,329
39.32	5,533,330
204	5,533,331
274	5,533,332
327	5,533,333
426	5,533,334
517	5,533,335
533	5,533,336
656	5,533,337

CLASS 62

45.1	5,533,340
50.1	5,533,341
51.1	5,533,342
63	5,533,343
66	5,533,344
77	5,533,345
89	5,533,346
115	5,533,347
129	5,533,348
	5,533,349
155	5,533,350
174	5,533,351
180	5,533,352
227	5,533,353
259.3	5,533,354
260	5,533,355
	5,533,356
277	5,533,357
292	5,533,358
	5,533,359
298	5,533,360
457.2	5,533,361
476	5,533,362
638	5,533,338
654	5,533,339

CLASS 63

14.1	5,533,363
32	5,533,364

CLASS 65

30.1	5,534,041

CLASS 66

145 R	5,533,365
205	5,533,366

CLASS 68

3.00 R	5,533,367

CLASS 70

374	5,533,368
493	5,533,369

CLASS 71

9	5,534,042
32	5,534,043

CLASS 72

12.5	5,533,370
21.1	5,533,371
60	5,533,372
84	5,533,373
247	5,533,374
254	5,533,375
283	5,533,376
294	5,533,377
302	5,533,378
316	5,533,379

CLASS 73

1 B	5,533,380
7	5,533,382
19.03	5,533,381
40.5 A	5,533,383
47	5,533,384
49.3	5,533,385
65.01	5,533,386
105	5,533,387
117	5,533,388
149	5,533,389
170.16	5,533,390
170.19	5,533,391
290 B	5,533,392
355.02	5,533,393
504.01	5,533,394
	5,533,395
504.12	5,533,396
504.16	5,533,397
573	5,533,398
579	5,533,399
593	5,533,400
598	5,533,411
622	5,533,401
645	5,533,402
669	5,533,403
756	5,533,404
760	5,533,405
861.18	5,533,408
861.95	5,533,412
862.193	5,533,410
862.23	5,533,409
863.22	5,533,406
864.25	5,533,407
865.9	5,533,413
866.1	5,533,414

CLASS 74

7 E	5,533,415
366	5,533,416
424.8 R	5,533,417
490.06	5,533,418
502.4	5,533,419
512	5,533,420
563	5,533,421
573 R	5,533,422
606 R	5,533,423
650	5,533,424
661	5,533,425

CLASS 75

231	5,534,044
243	5,534,045
446	5,534,046

CLASS 80

65.4	5,533,583

CLASS 81

53.2	5,533,426
63.2	5,533,427
179	5,533,428
439	5,533,429

CLASS 83

171	5,533,430
347	5,533,431
819	5,533,432

CLASS 89

1.806	5,533,433
7	5,533,434

CLASS 91

519	5,533,435

CLASS 92

146	5,533,436

CLASS 95

24	5,534,047
42	5,533,437

CLASS 99

360	5,533,438
383	5,533,439
421 HH	5,533,440
455	5,533,441
476	5,533,444
541	5,533,442

CLASS 100

38	5,533,443
150	5,533,457

CLASS 101

123	5,533,445
150	5,533,446
211	5,533,447
233	5,533,448
350	5,533,449
365	5,533,450
415.1	5,533,451
463.1	5,533,452
485	5,533,453

CLASS 102

202.1	5,533,454

CLASS 104

12	5,533,455

CLASS 106

1.22	5,534,048
20 R	5,534,050
22 D	5,534,052
22 R	5,534,049
	5,534,051
236	5,534,053
287.11	5,534,054
413	5,534,055
455	5,534,056
486	5,534,057
708	5,534,058
778	5,534,059

CLASS 108

51.1	5,533,456

CLASS 111

200	5,533,458

CLASS 112

254	5,533,460
278	5,533,461
475.08	5,533,459

CLASS 114

140	5,533,462
357	5,533,463

CLASS 116

174	5,533,464

CLASS 117

224	5,533,465

CLASS 118

55	5,534,060
59	5,534,061
60	5,534,062
	5,534,063
308	5,534,064
410	5,534,065
663	5,534,066
681	5,534,067
719	5,534,068
	5,534,069
723 E	5,534,070
726	5,534,071
728	5,534,072
	5,534,073
	5,534,074

CLASS 119

57.9	5,533,467
459	5,533,466
524	5,533,468
721	5,533,469
	5,533,470

CLASS 122

4 D	5,533,471

CLASS 123

41.35	5,533,472
146.50 A	5,533,473
196 AB	5,533,474
198 C	5,533,475
267	5,533,476
294	5,533,480
299	5,533,481
305	5,533,482
308	5,533,483
358	5,533,484
456	5,533,485
494	5,533,477
510	5,533,478
520	5,533,479
538	5,533,490
541	5,533,486
568	5,533,487
	5,533,488
571	5,533,489
676	5,533,491
681	5,533,492
698	5,533,493

CLASS 124

44.5	5,533,494

CLASS 126

350 R	5,533,495

CLASS 127

46.1	5,534,075

CLASS 128

200.21	5,533,497
	5,533,501
200.23	5,533,498
200.24	5,533,499
	5,533,503
201.18	5,533,504
201.25	5,533,500
203.15	5,533,505
203.21	5,533,502
207.18	5,533,506
633	5,533,507
	5,533,509
634	5,533,508
660.07	5,533,510
672	5,533,511
719	5,533,512
	5,533,513
731	5,533,522
744	5,533,514
748	5,533,515
749	5,533,516
758	5,533,517
760	5,533,518
774	5,533,521
777	5,533,519
782	5,533,520
	5,533,531
859	5,533,523
	5,533,524
878	5,533,526
898	5,533,496
	5,533,527

CLASS 131

304	5,533,528
370	5,533,530

CLASS 132

148	5,533,537
200	5,533,529
204	5,533,532
279	5,533,533
286	5,533,534

CLASS 134

1	5,534,076
7	5,534,077
10	5,534,078
95.2	5,533,539
104.4	5,533,538
155	5,533,540

CLASS 135

20.1	5,533,535
22	5,533,541
65	5,533,536
125	5,533,542

CLASS 137

15	5,533,543
85	5,533,544
195	5,533,545
218	5,533,546
360	5,533,547
540	5,533,548
557	5,533,549
625.62	5,533,551

CLASS 141

51	5,533,550
144	5,533,552
319	5,533,553
383.000	5,533,554

CLASS 144

24.13	5,533,555
144.52	5,533,556
253.8	5,533,557

CLASS 148

33	5,534,079
121	5,534,080
218	5,534,083
247	5,534,082
325	5,534,081
328	5,534,084
336	5,534,085
513	5,534,086
554	5,534,087
580	5,534,088
603	5,534,089

CLASS 149

15	5,534,090

CLASS 150

105	5,533,558

CLASS 156

89	5,534,091
	5,534,092
109	Re.35,291
128.6	5,534,093
155	5,534,094
209	5,534,095
212	5,534,096
214	5,534,097
230	5,534,098
	5,534,099
	5,534,100
244.12	5,534,101
250	5,534,102
272.8	5,534,103
275.5	5,534,104
324	5,534,105
636.1	5,534,106
643.1	5,534,107
	5,534,108
	5,534,109
	5,534,110
662.1	5,534,112

CLASS 159

49	5,534,113

CLASS 160

84.06	5,533,559
178.1	5,533,560
188	5,533,561

CLASS 162

63	5,534,115
139	5,534,114
274	5,534,116
358.3	5,534,117

CLASS 164

71.1	5,533,562
127	5,533,563
342	5,533,564
416	5,533,565

CLASS 165

1	5,533,566
	5,533,567
	5,533,568
90	5,533,569

CLASS 166

153	5,533,570
222	5,533,571
250.05	5,533,572
313	5,533,573
358	5,533,574

CLASS 168

4	5,533,575

CLASS 169

90	5,533,576

CLASS 172

21	5,533,577
378	5,533,578

CLASS 173

17	5,533,579
114	5,533,580
216	5,533,581

CLASS 174

35 GC	5,534,662
	5,534,663
50	5,534,664
72 A	5,534,665
260	5,534,666
261	5,534,667

CLASS 175

430	5,533,582

CLASS 180

190	5,533,585
193	5,533,586
235	5,533,587
282	5,533,588
287	5,533,589
332	5,533,590
415	5,533,584

CLASS 181

106	5,534,668
198	5,534,669
230	5,534,670

CLASS 182

108	5,533,591
128	5,533,592
141	5,533,593

CLASS 187

201	5,533,594
266	5,533,595

CLASS 188

299	5,533,596
319	5,533,597
322.17	5,533,598
344	5,533,599

CLASS 190

18 R	5,533,600
115	5,533,601

CLASS 192

3.29	5,533,602
35	5,533,603

CLASS 193

35 MD	5,533,604

CLASS 194

206	5,533,605

CLASS 198

349	5,533,606
415	5,533,609
448	5,533,607
458	5,533,610
478.1	5,533,608

CLASS 200

52 R	5,534,671
61.89	5,534,672

CLASS 202

205.000	5,534,118

CLASS 204

266	5,534,122
452	5,534,707
455	5,534,123
459	5,534,121
618	5,534,125

CLASS 205

101	5,534,126
125	5,534,127
176	5,534,128
241	5,534,129
372	5,534,119
	5,534,130
464	5,534,120
560	5,534,131
777.5	5,534,132

CLASS 206

63.3	5,533,611
268	5,533,612
	5,533,613
308.1	5,533,614
	5,533,615
335	5,533,616
361	5,533,617
363	5,533,618
387.12	5,533,619
408	5,533,620
409	5,533,621
484	5,533,622
518	5,533,623
524.3	5,533,624
565	5,533,625

CLASS 208

39	5,534,133
42	5,534,134
120	5,534,135
390	5,534,136
425	5,534,137

CLASS 209

167	5,533,626
534	5,533,627
580	5,533,628
714	5,533,629

CLASS 210

86	5,534,138
90	5,534,145
96.1	5,534,139
106	5,534,140
110	5,534,141
141	5,534,142
151	5,534,143
193	5,534,144
490	5,534,146
605	5,534,147
	5,534,148
636	5,534,149
640	5,534,150
	5,534,151
644	Re.35,292
636	5,534,152
661	5,534,153
668	5,534,154
695	5,534,155
	5,534,156
700	5,534,157
703	5,534,158
704	5,534,159
710	5,534,160
744	5,534,161
781	5,534,162
800	5,534,163

CLASS 211

40	5,533,630
41	5,533,631
122	5,533,632

CLASS 215

252	5,533,633

CLASS 216

12	5,533,634
15	5,534,111
67	5,533,635
	5,534,231

CLASS 217

3	5,534,712

CLASS 218

68	5,534,673
154	5,534,674

CLASS 219

69.13	5,534,675
121.35	5,534,677
124.34	5,534,676
396	5,534,678
413	5,534,679
505	5,534,680
685	5,534,681

CLASS 220

3.8	5,533,636
	5,533,637
8	5,533,638
23.8	5,533,639
216	5,533,640
323	5,533,641
326	5,533,642
331	5,533,643
414	5,533,644

CLASS 221

76	5,533,645
185	5,533,646

CLASS 222

83	5,533,647
108	5,533,648
153.14	5,533,649
161	5,533,650
185.1	5,533,651

CLASS 223

84	5,533,652

CLASS 224

155	5,533,654
577	5,533,653
602	5,533,655
667	5,533,656
673	5,533,657

CLASS 226

172	5,533,658
189	5,533,659

CLASS 227

147	5,533,660
176.1	5,533,661

CLASS 228

33	5,533,662
103	5,533,663
180.1	5,533,664
	5,533,665

CLASS 229

109	5,533,666
120.01	5,533,667

CLASS 235

379	5,534,682
380	5,534,683
472	5,534,684
487	5,534,685
492	5,534,686

CLASS 236

49.3	5,533,668

CLASS 237

1 SL	5,533,669

CLASS 238

187	5,533,670

CLASS 239

10	5,533,671
88	5,533,672
227	5,533,673
288.5	5,533,674
413	5,533,675
663	5,533,676
677	5,533,677

CLASS 241

16	5,533,678
17	5,533,679
23	5,533,680
56	5,533,681
101.73	5,533,682
169	5,533,683
222	5,533,684
275	5,533,685

CLASS 242

18 A	5,533,686
348.1	5,533,687
413.2	5,533,688
532.5	5,533,689
547	5,533,690
597.4	5,533,691

CLASS 244

3.13	5,533,692
131	5,533,693
153 R	5,533,694

CLASS 246

62	5,533,695

CLASS 248

74.2	5,533,696
146	5,533,697
152	5,533,698
278.1	5,533,699
311.2	5,533,700
316.4	5,533,701
442.2	5,533,702
550	5,533,703
603	5,533,704
645	5,533,705

CLASS 250

201.4	5,534,687
201.8	5,534,688
206.2	5,534,689
222.1	5,534,690
231.14	5,534,691
231.16	5,534,692
237 G	5,534,693
330	5,534,694
	5,534,695
	5,534,696
332	5,534,697
339.11	5,534,698
353	5,534,700
363.04	5,534,701
396 R	5,534,699
458.1	5,534,703
484.4	5,534,702
550	5,534,704
559.29	5,534,705
574	5,534,706
577	5,534,708
588	5,534,709
	5,534,710

CLASS 251

44	5,533,706
129.15	5,533,707
149.1	5,533,708

CLASS 252

8	5,534,164
8.91	5,534,165
68	5,534,176
182.22	5,534,185
186.27	5,534,196
194	5,534,186
299.01	5,534,187
299.61	5,534,188
299.63	5,534,189
299.65	5,534,190
301.4 H	5,534,191
353	5,534,500
500	5,534,192
518	5,534,193
	5,534,194
582	5,534,201

CLASS 254

13	5,533,709
134.3 PA	5,533,710
273	5,533,711
362	5,533,712

CLASS 256

26	5,533,714
45	5,533,715

CLASS 257

3	5,534,711
24	5,534,713
25	5,534,714
33	5,534,715
72	5,534,716
94	5,534,717
98	5,534,718
188	5,534,719
232	5,534,720
339	5,534,721
347	5,534,722
360	5,534,723
390	5,534,724
434	5,534,725
489	5,534,726
659	5,534,727
692	5,534,728
	5,534,729
757	5,534,730
759	5,534,731
776	5,534,732

CLASS 261

122.1	5,534,202

CLASS 264

101	5,534,203
102	5,534,204
103	5,534,205
108	5,534,206
150	5,534,207
160	5,534,208
171.13	5,534,209
	5,534,210
211.11	5,534,212
308	5,534,211
328.1	5,534,213
333	5,534,214
345	5,534,215
511	5,534,216
516	5,534,217
	5,534,218

CLASS 266

114	5,533,716
218	5,533,713

CLASS 269

42	5,533,717
296	5,533,718

CLASS 270

52.09	5,533,719

CLASS 271

109	5,533,721
225	5,533,720

CLASS 273

30	5,533,722
72 R	5,533,723
73 C	5,533,724
119 R	5,533,726
243	5,533,731
375	5,533,732
400	5,533,733
402	5,533,734
411	5,533,735

CLASS 277

3	5,533,736
23	5,533,737
27	5,533,738
81 R	5,533,739

CLASS 280

11.22	5,533,740
238	5,533,741
281.1	5,533,742
507	5,533,743
605	5,533,744
728.2	5,533,745
	5,533,746
	5,533,747
728.3	5,533,748
	5,533,749
730.2	5,533,750
737	5,533,751
739	5,533,752
	5,533,753
741	5,533,754
743.1	5,533,755
806	5,533,756

CLASS 281

15.1	5,533,757
20	5,533,758

CLASS 283

70	5,533,759

CLASS 285

14	5,533,760
38	5,533,761
101	5,533,762
127	5,533,763
212	5,533,764
	5,533,765

CLASS 292

144	5,533,766
320	5,533,767

CLASS 294

54.5	5,533,768
68.23	5,533,769

CLASS 295

1	5,533,770

CLASS 296

26	5,533,771
37.9	5,533,772
52	5,533,773
66	5,533,774
68.1	5,533,775
97.9	5,533,776
117	5,533,777
152	5,533,778
192	5,533,779
194	5,533,780
204	5,533,781

CLASS 297

188.18	5,533,782
195.13	5,533,783
217.1	5,533,784
250.1	5,533,785
256.15	5,533,786
284.5	5,533,787
452.64	5,533,789

CLASS 299

1.5	5,533,790

CLASS 300

4	5,533,791
11	5,533,792

CLASS 301

64.4	5,533,793
105.1	5,533,794

CLASS 303

6.1	5,533,795

CLASS 305

188	5,533,796

CLASS 307

9.100	5,534,733
38	5,534,734
117	5,534,735

CLASS 310

91	5,534,736
112	5,534,737
115	5,534,738
179	5,534,739
309	5,534,740
317	5,534,741

CLASS 312

138.1	5,533,797
219	5,533,798
249.12	5,533,799

CLASS 313

113	5,534,742
309	5,534,743
	5,534,744
408	5,534,746
456	5,534,747
479	5,534,748
497	5,534,749

CLASS 315

5.35	5,534,750
111.71	5,534,751
111.81	5,534,752
244	5,534,753
278	5,534,754
307	5,534,755
370	5,534,756
382	5,534,757

CLASS 318

112	5,534,758
139	5,534,759
442	5,534,760
568.1	5,534,761
568.12	5,534,762
799	5,534,763
802	5,534,764

CLASS 320

30	5,534,765

CLASS 323

235	5,534,766
267	5,534,768
283	5,534,769
284	5,534,770
285	5,534,771

CLASS 324

72.5	5,534,772
105	5,534,773
158.1	5,534,774
216	5,534,775
304	5,534,776
309	5,534,777
318	5,534,778
319	5,534,779
321	5,534,780
380	5,534,781
500	5,534,782
533	5,534,783
757	5,534,784
758	5,534,785
760	5,534,786
761	5,534,787
771	5,534,788

CLASS 326

21	5,534,789
27	5,534,790
	5,534,791
30	5,534,792
44	5,534,793
63	5,534,794
81	5,534,795
93	5,534,796
105	5,534,797
108	5,534,798

CLASS 327

20	5,534,799
57	5,534,800
72	5,534,801
94	5,534,802
108	5,534,803
143	5,534,804
144	5,534,805
170	5,534,806
234	5,534,807
261	5,534,808
269	5,534,809
308	5,534,810
309	5,534,811
333	5,534,812
346	5,534,813
427	5,534,814
437	5,534,815
513	5,534,816
545	5,534,817
	5,534,818
553	5,534,819

CLASS 330

149	5,534,820

CLASS 331

2	5,534,822
8	5,534,821
16	5,534,823
81	5,534,824
117 R	5,534,825
158	5,534,826

CLASS 332

103	5,534,827
	5,534,828

CLASS 333

126	5,534,829
128	5,534,830
204	5,534,831

CLASS 335

16	5,534,832
68	5,534,833
78	5,534,834
172	5,534,835
284	5,534,836

CLASS 336

155	5,534,837
183	5,534,838
192	5,534,839

CLASS 337

1	5,534,840
402	5,534,842

CLASS 338

22 R	5,534,843

CLASS 340

146.2	5,534,844
425.5	5,534,845
426	5,534,846
432	5,534,847
517	5,534,848
	5,534,849
565	5,534,850
573	5,534,851
	5,534,852
646	5,534,853
648	5,534,854
825.300	5,534,855
825.340	5,534,856
	5,534,857
870.07	5,534,858
870.37	5,534,859

CLASS 341

22	5,534,860
79	5,534,861
144	5,534,862
150	5,534,863
156	5,534,864
176	5,534,865

CLASS 342

13	5,534,866
17	5,534,867
26	5,534,868
27	5,534,869
70	5,534,870
113	5,534,871
146	5,534,872
165	5,534,873
351	5,534,874
357	5,534,875
387	5,534,876

CLASS 343

700 MS	5,534,877
702	5,534,878
713	5,534,879
774	5,534,880
776	5,534,881
891	5,534,882

CLASS 345

3	5,534,883
87	5,534,884
100	5,534,885
104	5,534,886
120	5,534,887
121	5,534,888
132	5,534,889
169	5,534,891
173	5,534,892
179	5,534,893
261	5,535,245

CLASS 346

100	5,534,890
134	5,534,894

CLASS 347

19	5,534,895
29	5,534,896
32	5,534,897
33	5,534,898
49	5,534,899
54	5,534,900
63	5,534,901
71	5,534,903
75	5,534,904
104	5,534,902
171	5,534,905
	5,534,906
175	5,534,907
215	5,534,908
216	5,534,909
217	5,534,910

CLASS 348

1	5,534,911
6	5,534,912
7	5,534,913
15	5,534,914
29	5,534,915
53	5,534,918
169	5,534,917
222	5,534,916
246	5,534,919
333	5,534,920
	5,534,921
340	5,534,922
354	5,534,923
364	5,534,924
384	5,534,925
385	5,534,926
400	5,534,927
401	5,534,928
405	5,534,929
	5,534,930
420	5,534,931
432	5,534,932
433	5,534,933
445	5,534,934
448	5,534,935
	5,534,936
466	5,534,937
495	5,534,938
505	5,534,939
556	5,534,940
564	5,534,941
569	5,534,942
584	5,534,944
615	5,534,945
619	5,534,946
664	5,534,947
675	5,534,948
724	5,534,943
742	5,534,949
758	5,534,950
832	5,534,951

CLASS 351

200	5,534,952
203	5,534,953

CLASS 352

79	5,534,954

CLASS 353

66	5,534,955

CLASS 354

76	5,534,956
106	5,534,957
	5,534,958
160	5,534,959
173.1	5,534,960
264	5,534,961
289.12	5,534,962
290	5,534,963
344	5,534,964
409	5,534,965
	5,534,966
430	5,534,967
432	5,534,968

CLASS 355

53	5,534,969
	5,534,970
126	5,534,971
200	5,534,972
202	5,534,973
	5,534,974
	5,534,975
207	5,534,976
208	5,534,977
	5,534,979
211	5,534,978
219	5,534,980
245	5,534,981
246	5,534,982
271	5,534,983
	5,534,984
283	5,534,985
284	5,534,986
285	5,534,987
298	5,534,988
309	5,534,989
327	5,534,990

CLASS 356

3.06	5,534,991
5.09	5,534,993
5.1	5,534,992
73.1	5,534,994
129	5,534,995
218	5,534,996
301	5,534,997
316	5,534,998
338	5,534,999
345	5,535,000
	5,535,001
	5,535,002
	5,535,003
358	5,535,004
371	5,535,005
394	5,535,006

CLASS 358

296	5,535,007
	5,535,009
	5,535,010
335	5,535,011
	B1 5,012,350
342	5,535,008
400	5,535,012
432	5,535,013
434	5,535,014
438	5,535,015
442	5,535,016
444	5,535,017
	5,535,018
456	5,535,019
457	5,535,020
474	5,535,021
496	5,535,022

CLASS 359

2	5,535,023
7	5,535,024
40	5,535,025
51	5,535,026
58	5,535,027
61	5,535,028
63	5,535,029
74	5,535,030
113	5,535,031
140	5,535,032
144	5,535,033
152	5,535,034
161	5,535,035
163	5,535,036
177	5,535,037
180	5,535,038
187	5,535,039
210	5,535,040
211	5,535,041
212	5,535,042
224	5,535,043
245	5,535,044
248	5,535,045
281	5,535,046
295	5,535,047
326	5,535,048
334	5,535,049
341	5,535,050
342	5,535,051
388	5,535,052
409	5,535,053
487	5,535,054
495	5,535,055
603	5,535,056
694	5,535,057
711	5,535,058
813	5,535,059
835	5,535,060
872	5,535,061

CLASS 360

3	5,535,062
4	5,535,063
9.100	5,535,064
31	5,535,065
	5,535,066
51	5,535,067
73.04	5,535,068
77.03	5,535,069
84	5,535,070
96.5	5,535,071
99.06	5,535,072
104	5,535,074
105	5,535,073
	5,535,075
106	5,535,076
113	5,535,077
119	5,535,078
126	5,535,079
129	5,535,080
133	5,535,081

CLASS 361

18	5,535,082
38	5,535,083
56	5,535,084
58	5,535,085
91	5,535,086
118	5,535,087
225	5,535,088
231	5,535,089
234	5,535,090
680	5,535,091
685	5,535,092
686	5,535,093
697	5,535,094
725	5,535,095
726	5,535,096
736	5,535,097
752	5,535,098
800	5,535,099
801	5,535,100
832	5,535,102

CLASS 362

66	5,535,103
100	5,535,104
103	5,535,105
108	5,535,106
158	5,535,107
183	5,535,108
267	5,535,109
297	5,535,110
304	5,535,111

CLASS 363

20	5,535,112
35	5,535,113
58	5,535,114
98	5,535,115

CLASS 364

134	5,535,116
158	5,535,117
401 R	5,535,118
419.03	5,535,119
	5,535,120
419.08	5,535,121
426.01	5,535,122
426.02	5,535,123
426.03	5,535,124
449	5,535,125
464.02	5,535,126
	5,535,127
468.26	5,535,128
472	5,535,129
479	5,535,130
487	5,535,131
489	5,535,132
	5,535,133
491	5,535,134
496	5,535,135
510	5,535,136
514 A	5,535,137
514 R	5,535,138
550	5,535,139
	5,535,140
	5,535,141
559	5,535,142
560	5,535,143
561	5,535,144
578	5,535,145
	5,535,146
705.07	5,535,147
718	5,535,148
724.19	5,535,149
	5,535,150
760	5,535,151

CLASS 365

51	5,535,152
72	5,535,153
145	5,535,154
154	5,535,155
175	5,535,156
185.05	5,535,157
185.29	5,535,158
189.01	5,535,160
189.05	5,535,159
200	5,535,161
	5,535,162
201	5,535,163
	5,535,164
	5,535,165
208	5,535,166
218	5,535,167
227	5,535,168
230.03	5,535,169
	5,535,172
230.09	5,535,173
233	5,535,171
235	5,535,174
239	5,535,170

CLASS 366

142	5,533,800
249	5,533,801
256	5,533,802
273	5,533,803
274	5,533,804
285	5,533,805
336	5,535,175
347	5,533,806

CLASS 367

13	5,535,176
81	5,535,177
808	5,535,101

CLASS 368

180	5,535,178

CLASS 369

13	5,535,179
	5,535,180
	5,535,181
32	5,535,182
	5,535,183
	5,535,184
48	5,535,186
59	5,535,187
84	5,535,188
102	5,535,189
126	5,535,185
295.200	5,535,190

CLASS 370

16	5,535,191
16.1	5,535,192
17	5,535,193
32.1	5,535,194
54	5,535,195
60	5,535,196
	5,535,197
	5,535,198
	5,535,199
	5,535,200
60.1	5,535,201
	5,535,202
66	5,535,203
76	5,535,204
79	5,535,205
	5,535,206
80	5,535,207
84	5,535,208
	5,535,209
85.15	5,535,213
85.2	5,535,210
	5,535,211
85.6	5,535,212
	5,535,214
95.1	5,535,215
100.1	5,535,216
	5,535,217
102	5,535,218
105.1	5,535,219

CLASS 371

2.1	5,535,220
5.5	5,535,221
22.3	5,535,222
27	5,535,223
32	5,535,224
37.1	5,535,225
40.1	5,535,226
40.4	5,535,227
49.1	5,535,228
53	5,535,229

CLASS 372

43	5,535,230
50	5,535,231
70	5,535,232
87	5,535,233

CLASS 373

8	5,535,234
78	5,535,235
89	5,535,236

CLASS 374

45	5,533,807

CLASS 375

200	5,535,237
	5,535,238
205	5,535,239
219	5,535,240
	5,535,241
222	5,535,242
259	5,535,243
261	5,535,244
285	5,535,246
297	5,535,247
324	5,535,248
344	5,535,249
356	5,535,251
371	5,535,252

CLASS 376

250	5,535,253

CLASS 378

34	5,535,250
113	5,535,254
200	5,535,255

CLASS 379

34	5,535,256
57	5,535,257
58	5,535,258
59	5,535,259
63	5,535,260
67	5,535,261
	5,535,262
	5,535,263
89	5,535,264
97	5,535,265
100	5,535,266
106	5,535,267
233	5,535,269
266	5,535,270
351	5,535,271
373	5,535,272

399	5,535,273
446	5,535,274
CLASS 380	
10	5,535,275
25	5,535,276
28	5,535,277
49	5,535,278
55	5,535,279
CLASS 381	
13	5,535,280
28	5,535,281
68.6	5,535,282
71	5,535,283
154	5,535,284
188	5,535,285
CLASS 382	
109	5,535,286
130	5,535,289
178	5,535,287
236	5,535,288
250	5,535,290
254	5,535,291
302	5,535,292
CLASS 383	
11	5,533,809
66	5,533,810
CLASS 384	
107	5,533,811
112	5,533,812
115	5,533,813
123	5,533,814
482	5,533,815
CLASS 385	
18	5,535,293
25	5,535,294
49	5,535,295
89	5,535,296
90	5,535,297
135	5,535,298
CLASS 391	
500	5,535,375
CLASS 395	
2.21	5,535,299
2.36	5,535,300
2.65	5,535,305
20	5,535,301
21	5,535,302
24	5,535,303
	5,535,309
62	5,535,304
89	5,535,306
108	5,535,307
	5,535,308
113	5,535,310
114	5,535,311
115	5,535,312
118	5,535,313
131	5,535,314
	5,535,315
134	5,535,316
140	5,535,317
145	5,535,318
148	5,535,319
150	5,535,320
155	5,535,321
	5,535,322
	5,535,323
	5,535,422
161	5,535,324
	5,535,325
182.02	5,535,326
182.03	5,535,327
182.05	5,535,328
183.11	5,535,329
183.12	5,535,330
183.21	5,535,331
200.01	5,535,332
200.03	5,535,333
200.06	5,535,336
200.11	5,535,335
200.15	5,535,334
200.19	5,535,337
200.20	5,535,338
280	5,535,339
292	5,535,340
306	5,535,341
307	5,535,342
308	5,535,343
309	5,535,344
	5,535,345
375	5,535,346
	5,535,347
	5,535,348
401	5,535,349
403	5,535,350
417	5,535,351
418	5,535,352
421.07	5,535,354
421.1	5,535,353
428	5,535,355
430	5,535,356
	5,535,357
445	5,535,358
446	5,535,359
467	5,535,360
472	5,535,361
474	5,535,362
	5,535,363
478	5,535,364
482	5,535,365
486	5,535,366
493	5,535,367
497.01	5,535,368
497.02	5,535,369
500	5,535,370
	5,535,371
	5,535,372
	5,535,373
	5,535,374
550	5,535,376
	5,535,377
	5,535,379
	5,535,380
600	5,535,378
	5,535,381
	5,535,382
	5,535,383
	5,535,384
	5,535,385
	5,535,386
650	5,535,387
	5,535,388
700	5,535,389
	5,535,390
	5,535,391
	5,535,392
	5,535,393
	5,535,394
729	5,535,395
733	5,535,396
740	5,535,397
750	5,535,398
	5,535,399
	5,535,400
	5,535,401
800	5,535,402
	5,535,403
	5,535,404
	5,535,405
	5,535,406
	5,535,407
	5,535,408
	5,535,409
	5,535,410
	5,535,411
	5,535,412
	5,535,413
827	5,535,414
828	5,535,415
834	5,535,416
842	5,535,417
845	5,535,418
856	5,535,419
868	5,535,420
887	5,535,421
CLASS 400	
120.07	5,533,816
124.28	5,533,817
208	5,533,818
226	5,533,819
472	5,533,820
619	5,533,821
641	5,533,822
CLASS 401	
98	5,533,823
133	5,533,824
CLASS 403	
359	5,533,825
389	5,533,826
CLASS 404	
38	5,533,827
75	5,533,828
81	5,533,829
96	5,533,830
114	5,533,831
CLASS 405	
63	5,533,832
128	5,533,833
168.3	5,533,834
229	5,533,835
262	5,533,837
282	5,533,838
284	5,533,839
CLASS 407	
41	5,533,840
CLASS 408	
1 R	5,533,841
17	5,533,842
241 R	5,533,843
CLASS 409	
159	5,533,844
175	5,533,845
201	5,533,846
234	5,533,847
CLASS 410	
105	5,533,848
CLASS 411	
120	5,533,849
171	5,533,850
344	5,533,851
534	5,533,852
CLASS 413	
31	5,533,853
CLASS 414	
412	5,533,854
470	5,533,855
711	5,533,856
751	5,533,858
757	5,533,857
772	5,533,859
789	5,533,860
794.2	5,533,861
CLASS 415	
220	5,533,862
229	5,533,863
CLASS 416	
96 A	5,533,864
228	5,533,865
CLASS 417	
44.9	5,533,866
53	5,533,867
	5,533,868
234	5,533,869
269	5,533,870
	5,533,871
	5,533,872
295	5,533,873
360	5,533,874
368	5,533,875
456	5,533,876
477.1	5,533,877
477.3	5,533,878
553	5,533,879
CLASS 418	
1	5,533,886
201.3	5,533,887
CLASS 419	
4	5,534,219
45	5,534,220
CLASS 422	
33	5,534,221
	5,534,222
61	5,534,223
63	5,534,224
64	5,534,225
73	5,534,226
102	5,534,227
103	5,534,228
123	5,534,229
173	5,534,230
186.26	5,534,232
191	5,534,233
CLASS 423	
50	5,534,234
121	5,534,235
237	5,534,236
239.1	5,534,237
584	5,534,238
713	5,534,239
CLASS 424	
9.321	5,534,241
9.36	5,534,240
45	5,534,242
49	5,534,243
52	5,534,244
66	5,534,245
	5,534,246
70.28	5,534,248
76.3	5,534,249
78.37	5,534,250
85.2	5,534,251
93.45	5,534,253
93.5	5,534,252
135.1	5,534,254
141.1	5,534,255
184.1	5,534,256
192.1	5,534,257
231.1	5,534,258
448	5,534,260
450	5,534,259
	5,534,261
	5,534,268
464	5,534,262
473	5,534,263
489	5,534,265
	5,534,269
490	5,534,270
672	5,534,266
701	5,534,267
707	5,534,247
CLASS 425	
64	5,533,888
131.5	5,533,883
145	5,533,884
185	5,533,885
315	5,533,889
328	5,533,880
525	5,533,881
564	5,533,882
CLASS 426	
2	5,534,271
3	5,534,272
18	5,534,273
66	5,534,274
74	5,534,275
127	5,534,276
129	5,534,277
237	5,534,278
266	5,534,279
321	5,534,280
383	5,534,281
396.000	5,534,282
515	5,534,283
531	5,534,284
552	5,534,285
573	5,534,286
CLASS 427	
2.25	5,534,287
2.31	5,534,288
8	5,534,289
97	5,534,290
221	5,534,291
228	5,534,292
	5,534,293
255	5,534,294
284	5,534,295
304	5,534,296
322	5,534,297
358	5,534,298
373	5,534,299
376.2	5,534,300
377	5,534,301
379	5,534,302
385.5	5,534,303
389.9	5,534,304
393	5,534,305
407.1	5,534,306
421	5,534,307
454	5,534,308
458	5,534,309
494	5,534,310
526	5,534,311
533	5,534,312
543	5,534,313
585	5,534,314
CLASS 428	
7	5,534,315
31	5,534,316
35.7	5,534,317
36.9	5,534,318
36.91	5,534,319
42.1	5,534,320
64.2	5,534,321
	5,534,322
65.3	5,534,323
102	5,534,325
131	5,534,326
151	5,534,327
166	5,534,328
192	5,534,329
198	5,534,330
209	5,534,331
222	5,534,333
224	5,534,334
	5,534,335
229	5,534,336
236	5,534,337
242	5,534,338
284	5,534,339
286	5,534,340
288	5,534,341
313.5	5,534,343
323	5,534,344
	5,534,345
343	5,534,346
375	5,534,347
402	5,534,348
403	5,534,349
423.1	5,534,350
516	5,534,351
535	5,534,352
552	5,534,353
593	5,534,354
611	5,534,355
615	5,534,356
629	5,534,357
648	5,534,358
688	5,534,359
694 ML	5,534,360
694 RE	5,534,361
694 T	5,534,324
CLASS 429	
32	5,534,362
34	5,534,363
61	5,534,364
62	5,534,365
91	5,534,366
103	5,534,367
152	5,534,368
161	5,534,369
198	5,534,370
CLASS 430	
5	5,534,371
10	5,534,372
15	5,534,373
31	5,534,392
41	5,534,374
58	5,534,375
59	5,534,376
102	5,534,377
106	5,534,379
106.6	5,534,378
143	5,534,380
156	5,534,381
192	5,534,382
201	5,534,383
260	5,534,384
270.13	5,534,385
271.1	5,534,391
320	5,534,386
325	5,534,387
338	5,534,388
348	5,534,393
393	5,534,394
400	5,534,395
401	5,534,389
463	5,534,396
530	5,534,397
345	5,534,398
551	5,534,390
553	5,534,399
558	5,534,400
	5,534,401
585	5,534,403
596	5,534,402
CLASS 431	
5	5,533,890
134	5,533,891
264	5,533,892
CLASS 432	
120	5,533,930
122	5,533,893
CLASS 433	
1	5,533,894
24	5,533,895
64	5,533,896
102	5,533,897
173	5,533,898
CLASS 434	
61	5,533,899
87	5,533,900
112	5,533,902
307 R	5,533,903
CLASS 435	
3	5,534,404
5	5,534,405
	5,534,406
	5,534,407
	5,534,408
6	5,534,409
	5,534,410
7.2	5,534,411
7.24	5,534,412
7.32	5,534,413
34	5,534,415
67	5,534,417
69.1	5,534,418
71.3	5,534,420
91.2	5,534,424
116	5,534,421
118	5,534,422
172.1	5,534,423
	5,534,425
194	5,534,426
198	5,534,427
199	5,534,428
200	5,534,429
240.2	5,534,430
240.27	5,534,431
240.31	5,533,836
240.4	5,534,432
240.54	5,534,433
	5,534,434
262.5	5,534,435
280	5,534,436
290.3	5,534,437
320.1	5,534,438
	5,534,439
691	5,534,419
794	5,534,414
CLASS 436	
34	5,534,416
89	5,534,440
517	5,534,441
CLASS 437	
2	5,534,442
	5,534,443
5	5,534,444
21	5,534,445
26	5,534,446
27	5,534,447
34	5,534,448
	5,534,449
	5,534,450
40	5,534,451
40 R	5,534,452
41	5,534,453
	5,534,454
43	5,534,455
	5,534,456
52	5,534,457
	5,534,458
70	Re.35,294
89	5,534,459
187	5,534,460
189	5,534,461
190	5,534,462
195	5,534,463
208	5,534,466
209	5,534,464
	5,534,465
	5,534,467
CLASS 439	
67	5,533,904
76.2	5,533,905
79	5,533,901
159	5,533,906
188	5,533,907
329	5,533,908
381	5,533,909
395	5,533,910
459	5,533,911
521	5,533,912
678	5,533,915
801	5,533,916
810	5,533,913
843	5,533,914
894	5,533,917
CLASS 444	
64	5,533,918
CLASS 446	
2	5,533,919
409	5,533,920
	5,533,921
CLASS 451	
11	5,533,931
38	5,533,922
41	5,533,923
286	5,533,924
344	5,533,925
490	5,533,926
CLASS 452	
127	5,533,927
135	5,533,928
CLASS 454	
369	5,533,929
CLASS 455	
33.1	5,535,423
	5,535,424
33.2	5,535,425
34.1	5,535,426

38.2	5,535,427
38.4	5,535,428
53.1	5,535,429
54.1	5,535,430
	5,535,431
77	5,535,432
79	5,535,433
89	5,535,434
	5,535,435
	5,535,436
90	5,535,437
110	5,535,438
117	5,535,439
134	5,535,440
134.1	5,535,442
182.2	5,535,441
196.1	5,535,443
232.1	5,535,444
327	5,535,445
CLASS 460	
119	5,533,932
CLASS 463	
23	5,533,727
CLASS 472	
60	5,533,933
118	5,533,934
	5,533,936
130	5,533,935
CLASS 473	
251	5,533,730
252	5,533,728
307	5,533,725
346	5,533,729
372	Re.35,293
CLASS 474	
80	5,533,937
164	5,533,938
206	5,533,939
242	5,533,940
267	5,533,941
CLASS 475	
178	5,533,942
198	5,533,943
252	5,533,944
276	5,533,945
CLASS 477	
78	5,533,946
CLASS 482	
6	5,533,947
27	5,533,948
47	5,533,949
51	5,533,950
54	5,533,951
70	5,533,952
96	5,533,953
CLASS 493	
310	5,533,954
342	5,533,955
355	5,533,956
CLASS 501	
12	5,534,468
15	5,534,469
32	5,534,470
CLASS 502	
4	5,534,471
116	5,534,472
117	5,534,473
152	5,534,474
304	5,534,475
335	5,534,476
CLASS 503	
227	5,534,477
	5,534,478
	5,534,479
CLASS 504	
116	5,534,480
215	5,534,481
	5,534,482
221	5,534,483
235	5,534,484
246	5,534,485
273	5,534,486
290	5,534,487
CLASS 505	
474	5,534,489
490	5,534,490
500	5,534,491
CLASS 508	
156	5,534,172
161	5,534,170
203	5,534,173
231	5,534,171
396	5,534,168
460	5,534,169
469	5,534,175
543	5,534,174
CLASS 510	
182	5,534,198
220	5,534,180
242	5,534,199
245	5,534,177
280	5,534,167
305	5,534,179
356	5,534,197
367	5,534,178
396	5,534,200
423	5,534,181
426	5,534,184
434	5,534,183
444	5,534,195
CLASS 514	
3	5,534,488
8	5,534,492
12	5,534,493
16	5,534,494
	5,534,495
17	5,534,496
18	5,534,497
19	5,534,498
	5,534,538
25	5,534,499
31	5,534,502
46	5,534,503
	5,534,504
60	5,534,501
169	5,534,505
185	5,534,506
206	5,534,507
	5,534,508
210	5,534,509
	5,534,510
212	5,534,511
242	5,534,512
248	5,534,515
249	5,534,513
	5,534,514
253	5,534,516
	5,534,517
260	5,534,518
278	5,534,520
290	5,534,521
299	5,534,522
308	5,534,523
314	5,534,524
316	5,534,525
324	5,534,526
333	5,534,527
342	5,534,528
357	5,534,529
361	5,534,530
365	5,534,531
367	5,534,532
372	5,534,533
388	5,534,534
394	5,534,535
397	5,534,536
	5,534,537
422	5,534,539
425	5,534,540
448	5,534,541
492	5,534,542
517	5,534,543
530	5,534,547
545	5,534,548
551	5,534,349
552	5,534,544
565	5,534,545
620	5,534,550
634	5,534,551
667	5,534,552
669	5,534,553
681	5,534,546
724	5,534,554
777	5,534,555
CLASS 521	
49	5,534,556
CLASS 522	
15	5,534,557
35	5,534,558
64	5,534,559
CLASS 523	
109	5,534,560
111	5,534,561
118	5,534,562
122	5,534,563
340	5,534,564
454	5,534,565
CLASS 524	
27	5,534,566
69	5,534,568
99	5,534,569
100	5,534,573
114	5,534,570
262	5,534,574
270	5,534,575
272	5,534,571
275	5,534,572
377	5,534,576
	5,534,577
396	5,534,578
417	5,534,580
430	5,534,581
441	5,534,582
460	5,534,579
476	5,534,583
497	5,534,584
	5,534,585
547	5,534,586
575	5,534,587
730	5,534,588
CLASS 525	
57	5,534,589
71	5,534,590
194	5,534,591
236	5,534,592
240	5,534,593
310	5,534,594
326.5	5,534,595
327.6	5,534,597
329.2	5,534,598
330.3	5,534,596
342	5,534,599
397	5,534,600
424	5,534,601
432	5,534,602
CLASS 526	
88	5,534,607
253	5,534,604
260	5,534,605
281	5,534,606
CLASS 528	
12	5,534,608
15	5,534,609
38	5,534,610
129	5,534,611
	5,534,612
176	5,534,613
183	5,534,614
419	5,534,618
503	5,534,616
CLASS 530	
324	5,534,619
350	5,534,615
399	5,534,617
413	5,534,620
	5,534,621
CLASS 534	
15	5,534,622
560	5,534,623
752	5,534,630
CLASS 536	
23.1	5,534,631
CLASS 540	
456	5,534,632
CLASS 544	
78	5,534,629
196	5,534,624
	5,534,625
360	5,534,626
CLASS 546	
30	5,534,627
196	5,534,633
303	5,534,634
323	5,534,635
CLASS 548	
228	5,534,636
374.1	5,534,637
CLASS 549	
3	5,534,638
62	5,534,639
80	5,534,640
416	5,534,641
CLASS 554	
98	5,534,642
227	5,534,643
CLASS 558	
14	5,534,644
71	5,534,645
80	5,534,646
275	5,534,647
277	5,534,648
	5,534,649
319	5,534,650
CLASS 560	
15	5,534,651
98	5,534,652
CLASS 564	
32	5,534,653
90	5,534,654
127	5,534,655
CLASS 585	
709	5,534,656
723	5,534,657
738	5,534,658
CLASS 588	
204	5,534,124
227	5,534,659
CLASS 600	
16	5,533,957
18	5,533,958
28	5,533,959
CLASS 602	
19	5,533,961
54	5,533,962
75	5,533,963
CLASS 604	
4	5,533,964
18	5,533,966
20	5,533,971
	5,533,972
83	5,533,973
95	5,533,967
96	5,533,968
100	5,533,969
110	5,533,970
	5,533,974
	5,533,975
153	5,533,976
164	5,533,977
183	5,533,978
187	5,533,979
192	5,533,980
208	5,533,981
239	5,533,982
249	5,533,983
263	5,533,984
264	5,533,985
	5,533,986
280	5,533,987
282	5,533,988
283	5,533,996
327	5,533,989
363	5,533,990
383	5,533,991
403	5,533,992
411	5,533,993
416	5,533,994
890.1	5,533,995
CLASS 606	
4	5,533,998
5	5,533,997
	5,533,999
15	5,534,000
36	5,534,003
61	5,534,001
	5,534,002
68	5,534,004
80	5,534,005
100	5,534,006
108	5,534,007
148	5,534,008
185	5,534,009
215	5,534,010
232	5,534,011
	5,534,012
234	5,534,013
236	5,534,014
CLASS 607	
7	5,534,015
9	5,534,016
14	5,534,017
27	5,534,018
38	5,534,019
108	5,534,020
112	5,534,021
122	5,534,022
CLASS 623	
1	5,534,024
8	5,534,023
11	5,534,025
15	5,534,026
16	5,534,027
17	5,534,028
	5,534,029
	5,534,030
	5,534,031
18	5,534,032
	5,534,033
32	5,534,034
CLASS 800	
200	5,534,661
205	5,534,660
CLASS 814	
274	5,534,519

CLASSIFICATION OF DESIGNS

D2—	886	371,451
	901	371,452
	962	371,453
	972	371,454
D3—	201	371,455
	224	371,456
	231	371,457
	266	371,458
D4—	127	371,459
D6—	328	371,460
	345	371,461
	349	371,462
		371,463
	355	371,464
	356	371,465
	370	371,466
	392	371,467
	422	371,468
	436	371,469
	469	371,470
	475	371,471
	479	371,472
	480	371,473
	501	371,474
		371,475
	502	371,476
		371,477
	515	371,478
	520	371,483
	542	371,479
	552	371,480
	566	371,484
	575	371,481
	626	371,482
D7—	392.1	371,485
	393	371,486
	397	371,487
	412	371,488
	513	371,489
	521	371,490
	643	371,491
D8—	7	371,493
	14	371,492
	14.1	371,494
	50	371,495
		371,496
	72	371,497
	105	371,498
	107	371,499
	302	371,500
	307	371,501
	331	371,502
		371,503
	349	371,504
		371,505
	354	371,506
	373	371,507
	396	371,508
	397	371,509
D9—	344	371,510
	345	371,511
	415	371,512
	434	371,513
	448	371,514
D10—	46	371,515
	75	371,516
	81	371,517
D11--	25	371,518
	164	371,519
		371,520
		371,521
		371,522
	221	371,523
		371,524
	231	371,525
D12—	86	371,526
	97	371,527
	107	371,528
	114	371,529
	178	371,530
	186	371,531
	191	371,532
	209	371,533
	220	371,534
	221	371,535
	333	371,536
	409	371,537
	419	371,538
D13—	120	371,539
	146	371,540
	147	371,541
		371,542
	162	371,543
D14—	100	371,544
	107	371,545
	109	371,546
	113	371,547
	114	371,548
		371,549
	116	371,550
	126	371,551
	129	371,552
	147	371,553
	160	371,554
	188	371,555
	191	371,556
		371,557
	205	371,558
	224	371,559
	230	371,560
D15—	6	371,561
	7	371,562
D16—	218	371,563
	231	371,564
	246	371,565
	311	371,566
	315	371,567
	335	371,568
		371,569
D18—	1	371,570
		371,571
	14	371,572
	36	371,573
D19—	2	371,574
	3	371,575
	49	371,576

CLASSIFICATION OF PATENTS

D20—	42	371,577		144	371,594			371,611			371,628	D32—	1	371,647			371,664
D21—	31	371,578		147	371,595			371,612		134	371,629		15	371,648		27	371,665
	37	371,579	D23—	216	371,596	D26—	4	371,613		142	371,630		18	371,649		29	371,666
	64	371,580		280.3	371,597		28	371,614		149	371,631			371,650			371,667
	108	371,581		313	371,598			371,615	D27—	163	371,632			371,651		33	371,668
		371,582		351	371,599		38	371,616			371,633		22	371,652		34	371,669
		371,583		386	371,600		39	371,617	D28—	31	371,634			371,653		38	371,670
		371,584	D24—	122	371,601		43	371,618		51	371,635			371,654			
	124	371,585		128	371,602			371,619		60	371,636		40	371,655			
	191	371,586		129	371,603		68	371,620		85	371,637		41	371,656			
	200	371,587		145	371,604		81	371,621	D29—	106	371,638	D34—	1	371,657			
	210	371,588		169	371,605		87	371,622		112	371,639		5	371,658			
	214	371,589		173	371,606		88	371,623		117	371,640		6	371,659			
	234	371,590		21:	371,607		110	371,624	D30—	108	371,641		14	371,660			
D22—	108	371,591	D25—	68	371,608		133	371,625		122	371,643		21	371,661			
	118	371,592		119	371,609			371,626		133	371,644		23	371,662			
	136	371,593		124	371,610			371,627		160	371,645		25	371,663			

CLASSIFICATION OF PLANTS

P.—	22	9,600	86.1	9,601		9,602	87.6	9,603	88.8	9,604

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PATENTS

01 : 5,533,316
5,533,346
5,533,382
5,533,555
5,533,638
5,533,725
5,534,659
5,534,796
5,535,136
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